Item 1 Specifications Section 09671 Epoxy Flooring
Part 2 - Products, paragraph **2.3 Components**
Under item 1 **delete** sub-item .9 and **replace** with "Basis-of-Design Product: Sika Canada Inc., Sikafloor Duochem-9205."

Under item 4 **delete** sub-item .12 and **replace** with "Basis-of-Design Product: Sika Canada Inc., Sikafloor 510 LPL"

Item 2 Specifications Section 08520 Aluminum Windows and Doors
Part 2 – Products, paragraph **2.4 Fabrication**
Add item 8 – "Insulated Panels –Spandrel Glass, mineral wools semi-rigid insulation in galvanized steel back pan to be held in place with stick pins clips and continuously sealed to frame. Panel finish: Duranar XL, three coat, coil-coated finish containing Kynar 500 polyvinylidene fluoride resin. Colour: to Consultant's selection"

Item 3 Specifications Section 07112 Air / Vapour Barrier
Part 2 – Products, paragraph **2.1 Membranes**
Delete item 4 – Air Barrier in its entirety.

Item 4 Specification Section 07212 – Rigid Insulation
Part 2 – Products, paragraph **2.1 Insulation**
Add item

" 2. **Cavity Wall Insulation - Masonry:** Expanded polystyrene insulation to CAN/CGSB-51.20-M87, Type 4 butt or ship lapped edges. For use in cavity wall construction above and below grade.

.1 Thickness 100 mm or as indicated.
.2 Acceptable Material: "Cavitymate" Type 3 as manufactured by Dow Chemical Canada Inc.
.3 Acceptable Material: "Celfort 300" as manufactured by Celfortec Inc. or approved equal."

And item

"3. Cavity Wall Insulation – Metal Panel: water-repellent and semi-rigid thermal insulation to CAN/ULC-S702-97, formed of bonded basalt fibres. For use in cavity wall construction or portions thereof with metal panel or siding cladding.

.1 Acceptable Material: 100mm "CavityRock MD" as manufactured by Rockwool Inc.
.2 Acceptable Material: 100mm "MB PLUS" as manufactured by Fibrex Insulations Inc."

Item 5 Specification Section 08800 Glazing
Part 2-Products paragraph 2.1 Materials
Add item

" 10. Spandrel Glass (SG) - 6 mm clear tempered float glass conforming to CAN/CGSB-12.3; Opaci-coat 300 by ICD High Performance Coating on 2nd surface.

a. Spandrel Glass-1 (SG-1) colour by Architect from standard colour range.
b. Spandrel Glass-2 (SG-2) colour by Architect from standard colour range."

Delete item 4 – Wired Glass in its entirety.

Item 6 Specification Section 00200 Instruction to Bidders
Under item 4. Subcontractor **add** subitem
"2. **The List of Subcontractors in the Tender Form can be issued 1 hour after tender closing."**
and subitem
"3. The List of Subcontractors to be submitted by email to the following
- Grguric Architects office@2gai.com and to
- the Diocese asmith@thecatholiccemeteries.ca"

Item 7 Refer to attached A8.00. The frames for doors **107, 109, 111, and 112** have been revised to a hollow metal (HM) frame. The frame for door **102A** has bee revised to screen **SC3**. The material for **SC3** in the screen schedule has been **revised to aluminium (ALUM).**

Item 8 Specification Section 09330 Floor Porcelain Tile
Part 2-Products, paragraph 2.1 Tiles
Under item 1. **Delete** subitem .1 and replace with "
Acceptable material: Vitra – Cement Mix Series, distributed by Centura Tiles. Size 600 mm x 600 mm, plus trim and 600 mm x 100 mm bullnosed base. Allow 2 colors from manufacturer's full line.
Acceptable equal: Daltile/American Olean and Crossville."

Item 9 **Clarification** – Refer to revised A2.00 for the extent of the epoxy floor and sealed concrete floor in the Circulation Area (Rm 110) and Retort Room (Rm 121).

Electrical

Refer to attached Electrical Addendum No. E3 and E4 Issued by NRG Consultants Inc dated October 20, 2023 and October 23, 2023

Questions and Answers

Question 1
L-1 drawing indicates strip along asphalt roadway has a 1.5m sodded width, however, scales at 3m. Clarify.

Answer 1
We previously noted a minimum 1.5m sod strip but I have updated the plan to note 3m along the roadway

Question 2
Same for L-2 loop area, where scale is 2m, but notes indicate 1.5m width. Clarify.

Answer 2
We previously noted a minimum 1.5m sod strip but I have updated the plan to note 2m along the building, parking lot and turn around

Question 3
Could you provide specifications for Sodding, Seeding & Planting. Mainly for installation procedures & Warranty requirements.

Answer 3
We typically do not include specifications for a project that only involves only planting as all of the details, notes, and noted specifications (Canada Landscape Standards) provide all the information required. We have noted a 1 year warranty in our landscape notes but this will need to be confirmed by the client as we do not have a contract for the construction phase of the project and do not want to speak on their behalf if they require a longer warranty period.

Question 4
If native topsoil can be used, are there any amendments for the Seeding & Sodding areas?

Answer 4
Planting notes and details are provided on the drawing and the Landscape Notes refer to the applicable sections (seed and sod) of the Canadian Landscape Standards.

Question 5
L-2 drawing indicates that septic field is seeded, however, septic fields must be sodded. Clarify.

Answer 5
This area has been proposed to be seeded with Turf/sod mix. This area will not be naturalized as this seed will be mowed.

Question 6
Please provide further information and detail regarding the feeder from the existing administration basement utility room 002 to 200A disconnect switch in crematorium building. We need the following clarified and more information to be provided to accurately quote:

- Who is responsible for the tie-in of this feeder to the existing equipment in administration basement utility room 002? If by electrical contractor, we need to know what we are tying into. Is it during afterhours? Do we need to supply and install an overcurrent device in the existing equipment? If so, we require photos and information of the existing equipment
- No detail or information is provided on how the feeder will enter the existing administration building and what routing is required inside the building to the basement utility room 002. Please provide this information as electrical contractor cannot quote this based on assumptions.
- Please confirm the distance provided of 2,100 feet on the site plan on drawing E02 is for the underground duct bank section only from building to building. Confirm this

distance does not include any additional conduit and wire required from underground to electrical equipment in the buildings

Answer 6
Refer to electrical addendum E3

Question 7
Please confirm all EMT conduit fittings inside of building must be watertight as per specification

Answer 7
Refer to electrical addendum E3

Question 8
Please confirm supply and install of all hand dryers is not part of the electrical scope of work

Answer 8
Refer to electrical addendum E3

Question 9
Please clarify that electrical contractor to include for all communication rough-in which includes conduit stub up to ceiling space only. Confirm no conduit is required in the ceiling space and J-hooks are not required. If so, provide what is required and to what location

Answer 9
Refer to electrical addendum E3

Question 10
Please clarify that electrical contractor to include for all security rough-in which includes conduit stub up to ceiling space only. Confirm no conduit is required in the ceiling space and J-hooks are not required. If so, provide what is required and to what location

Answer 10
Refer to electrical addendum E3

Question 11
Electrical specification speaks to wiremold to be installed in exposed areas. Electrical drawings do not show any wiremold or what locations require wiremold. Please revise electrical drawings to show the wiremold in every location that it is required. This includes all vertical and horizontal runs, please also provide a detail showing how the design is intended with transitions to conduit.

Answer 11
Refer to electrical addendum E3

Question 12
Would you please be able to provide us with the latest SWM report complete with the Hydrostorm HS10 sizing report? It is requested by the manufactures of the structures.

Answer 12
Please refer to the attached SWM report prepared by S. Llewellyn and Associates Ltd dated July 2022.

Question 13
Could you provide a Site Service specification for material & installation procedures?

Answer 13
Our specifications are on our drawings. We do not provide separate written specs.

Question 14
Door frame schedule indicates 6 wood frames. Could you provide a jamb section including width of jamb, casing type, trim profile, & species of wood required. Stained?

Answer 14
All doors are to have hollow metal (HM) frames. Refer to Item #7.

Question 15
Can you provide a jamb schedule for metal frames indicating all profiles?

Answer 15
All doors with a hollow metal frame will have the same jamb profile. The over all dimensions of the profile are shown in the jamb details found on A5.00

Question 16
Door 102A indicates having a frame SC2, was this to be a ST2?

Answer 16
The frame of Door 102A is to be SC3 which is screen type ST2. Refer to item #7.

Question 17
Door Screen SC3 has 2 doors, but they are not listed or have any door dimensions, rating, paint requirements etc. Clarify

Answer 17
The doors in SC3 are to be Door 102A.

Question 18
In reference to Add#3 item#1 the base layer of ISO has been requested as a base layer of 4.5" thick plus another layer at 2" thick.
4.5" ISO is special order only and not readily available. Standard ISO sizing ends at 4" thick.

Can we substitute with a base layer of 4" and second layer at 2.5" achieving the same overall thickness.

Answer 18
Any combination of insulation thicknesses is acceptable as long as the number of layers does not exceed 2 layers and the thickness of the insulation is 165mm (6.5").

Question 19

It would appear the RTU supplier (Carrier is basis of design) is not quoting this project.

Their reason……"Engineer spec-d a product that is no longer available with Carrier"

Answer 19
The equipment schedule has two alternates, Trane and Lennox.

Question 20
Is there a cut/fill plan available for this project?

Answer 20
A cut/fill plan was not prepared for this site.

Question 21
Electrical contractor needs further detail including a detail drawing showing how the duct bank and all conduits are transitioning from underground to inside of administration building. We also require information on the existing building exterior for penetrations to enter building. A detail drawings is required to show routing inside the admin building from penetration location to existing panel PP-1

Answer 21
Refer to electrical addendum E3

Question 22
Electrical contractor requires pictures and information of the existing panel PP-1 and existing manufacture information to quote the correct 200A-3P breakers

Answer 22
Refer to electrical addendum E3

Question 23
Electrical contractor needs clarification if all work in the admin building, including power shutdown, is to be done during regular business hours

Answer 23
Refer to electrical addendum E3

Question 24
Duct bank note #8 on drawing E02 says to fix spacers to avoid floating during Concreting. However, in the section, it is Clean sand filling. Please confirm whether we go for sand filling or concreting ?

Answer 24
Refer to electrical addendum E3

Question 25
In speaking with a rep at Sika the following came up:
1. Sika 261 is typically a tinted epoxy and generally they like the quartz broadcast to be put into a clear epoxy. He is recommending 9205 instead of the 261 prime coat and body coat.
2. Regarding the 2002 and then the 510 LPL coats, he recommended doing 2 coats of 510 instead.
Please advise.

Answer 25
The proposed changes suggested by Sika are acceptable. Refer to Item #1

Question 26
Can we use directional drilling with HDPE conduits in highlighted area, instead of directional boring with steel casing? This approach could potentially offer significant cost savings.
Directional drilling is only HDPE conduits, while directional boring is steel casing has conduits.
Could you please provide us with more information.

Answer 26
Refer to electrical addendum E3

Question 27
The 200A feeder shown to feed the new crematorium from the Administration Basement Utility room is not sized properly. This run will require an additional parallel run which will increase our duct bank size as shown and we will need to add an additional spare conduit.

Answer 27
Refer to electrical addendum E3

Question 28
We are also concerned with the difficulty of pulling the feeders from the second manhole to the new Crematorium as this is a great distance. We propose installing an additional 1-2 manholes along the roadway leading to the building from the second manhole. This will decrease the distance of the greatest pull.

Answer 28
Refer to electrical addendum E3

Question 29
Will splices of the building feeder done inside the manholes be accepted? If so, are there any specific requirements for these splices.

Answer 29
Refer to electrical addendum E3

Question 30
Will aluminum cabling be accepted for all feeders above 100A?

Answer 30
Refer to electrical addendum E3

Question 31
What colour is the curtainwall framing finish?

Answer 31
Medium Bronzed Anodized

Question 32
Has there been a spandrel colour chosen?

Answer 32
Colour to be provided after tender award.

Question 33
Where the spandrel and back pans are? Do the back pans need to be skinned with the framing finish?

Answer 33
Back pans can be galvanized steel where they are not visible on the interior. Where the back pans are visible, they should be coloured to match the frame colour.

Question 34
On a couple of the elevation drawings, there are posts that require aluminum cladding. Is this under my contract, or will that be taken care of by someone else?

Answer 34
Cladding of the structural posts is to be done by the same supplier as the ACM panels

Question 35
The ACM specs call for 2 different colours, one of them being Wood Grain..
Do you have any clue where this wood grain to be?
The panels on the Feature Tower Wall are oversized if we run the wood grain horizontally,
Not sure if vertical is the Architect's intent.

Answer 35
Refer to question #7 on addendum #3

Question 36
Can we submit the Proposed Subcontractors (Section 9 on the Tender Form) one hour post tender via email along with the unit rates?

Answer 36
Submission of the List of Subcontractors 1 hour after the tender closes by email is acceptable. Refer to item #6

Question 37
Reference 9.1.4 of the Supplementary Conditions:
1. Please define what can be considered a reasonable precaution necessary to protect the place of work. Would site fencing around areas of work and security cameras be considered reasonable.
2. Is it the intent that the General Contractor carry the cost of a security guard even if it is deemed unnecessary.

Answer 37
1) **Site fencing and security cameras would be considered reasonable precautions for the protection of the work site and owner's adjacent property.**
2) **A security guard will not be necessary.**

Question 38
In lieu of torch grade, can we use self-adhering Blueskin throughout masonry cavity walls.

Answer 38
Using self-adhering Blueskin on the masonry cavity walls is acceptable.

Question 39
Please provide a spec for the rigid insulation in above ground masonry walls.

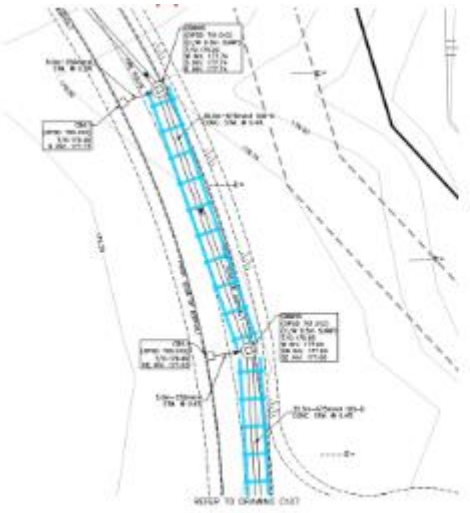
Answer 39
Refer to item #4.

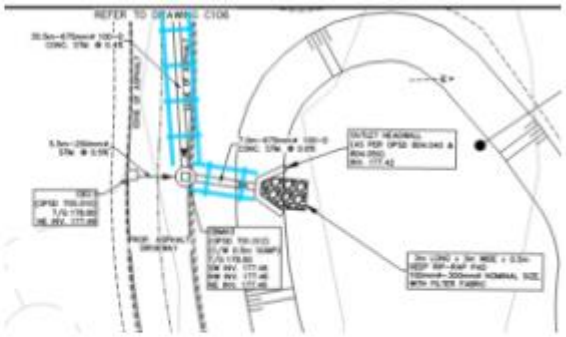
Question 40
DWG M6. Acoustic Treatment Of Ducts – "Supply and install all acoustic insulation as indicated on the drawings by cross hatching or by notation". The acoustic insulation shall be 25mm thick fibre glass insulation. DWG M5, Detail 4 – HVAC-1 & HVAC-2 Plenum Details – The detail indicates the plenum with cross hatching, but the insulation is 1" thick Armaflex installed on the exterior of the ductwork. Please confirm which one will be required for this tender.

Answer 40
1. **Crosshatched areas of both supply and return air plenums shall have ½" thick cement board installed on the bottom inside surface of the duct.**
2. **Crosshatched areas of both supply and return air plenums shall have AP Armaflex 1" thick insulation, 25/50 smoke and flame spread tested to CAN/ULC- S102 applied to all interior surfaces of the duct.**

Question 41
Is it the intent that 575 & 675 Storm Sewers are to have rigid insulation?

Answer 41
Insulation to be as per Engineering Drawing Notes and Detail Dwg. C109 and to be applied to storm sewer sections noted below.





Question 42
On C108 it says "Dewatering Pump (Sized by Others)". Who is responsible for the pump and please provide spec.

Answer 42
Dewatering is the responsibility of the Contractor who will be responsible for supplying the pump size necessary to complete the work.

Question 43
Section 10620 indicates accordion door partitions, but they have an incorrect length. Clarify

Answer 43
The door for the viewing room (Room 109) is to be the full width of the room from the face of the door pocket to the shared wall with the circulation area (Room 110).
The 2 doors in the circulation area (Room 110) are to go from the shared wall with the viewing room (Room 109) to the bulkhead along the face of the retorts.

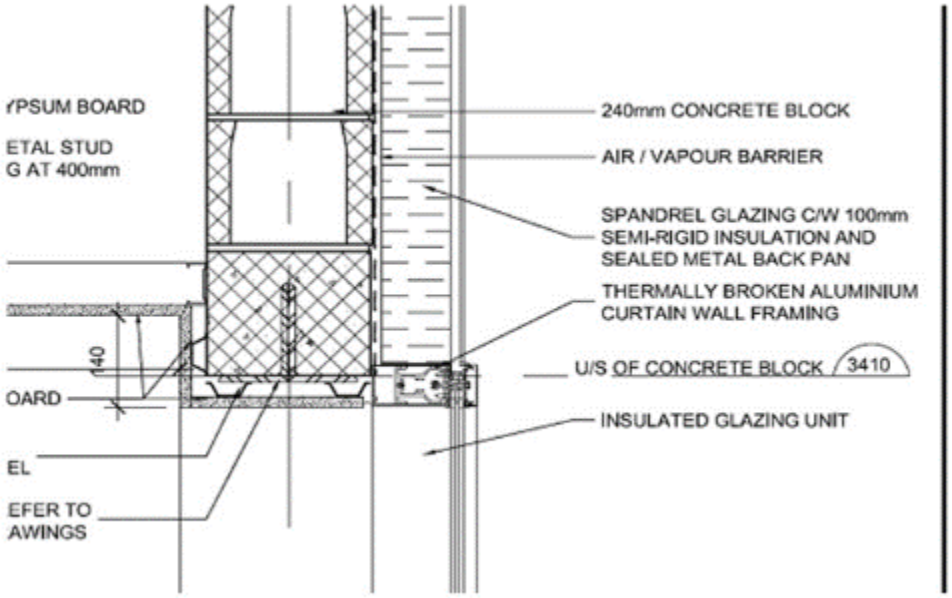
Question 44
Geotechnical report states the topsoil's depths provided are "not considered sufficient for estimating quantities or associated cost". Please provide a topsoil thickness that we are to use for this tender.

Answer 44
Refer to geotechnical report for topsoil depth at borehole location and to determine the average topsoil depth.

Question 45
Vestibule frame SC3 calls for Hollow Metal on the screen schedule but door 102A is calling for aluminum frame and door on door schedule above. Please confirm if it's hollow metal or aluminum frame and door?

Answer 45
The material for screen SC3 is to be aluminum. Refer to Item #7.

Question 46
For SG-1/SG-2 spandrel glass, I would interpret this detail below as single spandrel with backpan. Can you confirm if they are, or are they sealed units with backpan?



Answer 46
Spandrel Glass SG-1 / SG-2 is to be a single spandrel with an insulated back pan. Refer to items 2 and 5.

Question 47
Are all windows are curtain wall based on detail above and none are bullnose 970 series as mentioned on the specs?

Answer 47
As per the window frame types/schedule, window W9 is to be an aluminium frame (970 series).

Question 48
Are all windows are fixed, and non-operable? 1/A3.00 has a note "Firefighting Access", please clarify what it means.

Answer 48
All windows are fixed and non-operable. The note "Firefighting Access" just denoted a window that, when broken, is of sufficient size to satisfy the building code requirement for fire fighting access to the building.

Question 49
Fire rated glass are ceramic and not Georgian Wire Glass, correct?

Answer 49
All fire rated glass is to be ceramic. Refer to item #5.

Question 50
Please confirm Heavy Duty Asphalt detail on Drawing A1.20 is to read a total thickness of 720mm instead of 550mm.

Answer 50
Overall thickness of the Heavy Duty asphalt is to be 720mm.

Question 51
It is unclear whether excavated native backfill is suitable for site servicing backfill under proposed pavement areas (ie, the zone from 300mm above top of pipe to subgrade) . Please confirm whether bidders are to backfill site servicing with excavated native soils or granular B.

Answer 51
Native fill can be used for trench backfill if it is suitable.

Question 52
There is a large landscape area north of the "heavy duty asphalt fire truck turn around area" with an annotation stating "Area to be regraded to promote drainage toward proposed asphalt roadway". Will it be permissible to use topsoil as fill in this area to achieve the proposed grades indicated per C102 & C103?

Answer 52
Topsoil can be used to meet grades within landscaped areas.

Question 53
Section 02210 "Site Grading", 3. "Grading" note 5 shows rough grading under grassed areas as 150mm below finish grades. Landscape drawing L-1 has annotations pointing to the grassed areas with a requirement on 200mm of topsoil. Please confirm depth what bidders are to assume as depth of topsoil in grassed areas.

Answer 53
Grassed areas to receive 200mm of topsoil as per the landscape drawings.

Question 54
1.Will any work pertaining to work inside the regional flood line of Ex. Watercourse SMT-1 such as the installation of a temporary crossing and/or the work involved to install the 6000mm x 1500mm precast box culvert be subject to any kind of a “in-water working window”? Do you have a permit with the conservation authority?

Answer 54
A Conservation Authority Permit has been issued for the work. In Creek works are subject to the "in-water working window".

Question 55
Drawing C108 says that the dewatering pumps are to be sized by others. Is there any information of flows that can be provided?

Answer 55
Refer to question #42.

Question 56
When is the anticipated start date of this project?

Answer 56
It is anticipated that the contractor will start onsite mid November 2023 (November 15).

Question 57
Specification says to stock pile topsoil onsite and to retain top soil onsite. Please provide area where topsoil is to be stockpiled?

Answer 57
Location of topsoil stockpile is to be coordinated with architect onsite after tender award.

Question 58
The Geo –technical report is dated October 9, 2014. Is this report currently accurate? Has any work onsite occurred such as stripping, etc. that would affect the findings in the borehole logs?

Answer 58
The only work that has occurred onsite has been to the south of the creek. No work has been preformed on the north side of the creek where the crematorium is located.

Question 59
There is no analytical testing on the soils. Are we to assume that all excess soil is to remain onsite and if so where will it be stockpiled?

Answer 59
Refer to question #57.

Question 60
Specifications call for clear stone to the underside of the building slab and exterior concrete slabs and the structural and architectural drawing calls for granular limestone. Please advise which is correct?

Answer 60
For the underside of slabs on grade clear crushed stone is to be used as indicated in the specification and drawings S0.0,

Question 61
Is there a comms spec, or a specific structured cabling system manufacturer required? Are patch cables required? If so, what quantities and lengths? Can all work be done during regular business hours?

Answer 61
Refer to electrical addendum E4

Question 62
I can't find the distributor for **(PT) American Olean, Graniti Fiandre - Urban Active, 24"x24", Slate Finish** I have contacted Daltile (distributor for American Olean) and Shnier (distributor for Graniti Fiandre) and they both said it's not theirs. Can you clarify with the designer please?

Answer 62
Refer to Item #8

Question 63
The room Finish Schedule show The Circulation room 110 to have epoxy floor and the Retort room 121 to have sealed concrete – Drawing A 2.00 show these rooms to be the same room (see below) – can you please identify which floor type is to be in this area?

Answer 63
Refer to Item #9

End of Addendum No. 4

Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road, Milton ON

October 20, 2023

ELECTRICAL ADDENDUM #E3 **NRG Consultants Inc.**

This addendum issued before the closing of tenders, comprises clarifications and changes to the specifications and drawings and is hereby made a part thereof.

Questions & Responses

Q1. Please provide further information and detail regarding the feeder from the existing Administration Basement Utility Room 002 to the 200A disconnect switch in the Crematorium Building. We need the following clarified and more information to be provided to accurately quote:

a) Who is responsible for the tie-in of this feeder to the existing equipment in the Administration Basement Utility Room 002? If by Electrical Contractor, we need to know what we are tying into. Is it during afterhours? Do we need to supply and install an over-current device in existing equipment? If so, we require photos and information of the existing equipment.

b) No detail or information is provided on how the feeder will enter the existing Administration Building and what routing is required inside the building to the Basement Utility Room 002. Please provide this information as Electrical Contractor cannot quote this based on assumptions.

c) Please confirm the distance provided of 2,100 ft. on the Site Plan on Drawing E02 is for the underground duct bank section only from building to building. Confirm this distance does not include any additional conduit and wire required from underground to electrical equipment in the buildings

R1. a) Tie-in of feeder to the existing equipment in the Administration Building Basement Utility Room 002 is by the Electrical Contractor. Tie-in will be to an existing 200A-3P breaker in existing 800A Square D Switchboard PP-1. Tie-in connection may be performed during regular day-time hours. A new over-current device is not required.

b) From the existing Administration Building Basement Utility Room 002, five (5) conduit stub-outs to match requirements of Underground Duct Bank Section C-C are provided through the basement wall terminating underground at an exterior point 2000mm to the west of the basement wall. Within the existing Administration Building Basement Utility Room 002 allow for two (2) 3000mm runs of 100mm (4") EMT conduit c/w power cables from the stub-outs to existing Switchboard PP-1.

c) The distance provided of 2,100 ft. on the Site Plan on Drawing E03 is from the Administration Building Basement Utility Room 002 exterior conduit stub-outs to the Crematorium Building Elect / Mech Room 117 exterior wall only.

Q2. Please confirm all EMT conduit fittings inside the building must be watertight per specification.

R2. All EMT conduit fitting inside both building shall be watertight type. Set-screw type are not permitted.

Q3. Please confirm supply and install of all hand dryers is not part of the electrical scope of work.

R3. All hand dryers shown on the drawings are to be supplied and installed by the Electrical Contractor.

Q4. Please clarify that Electrical Contractor to include for all communication rough-in which includes conduit stub-up to ceiling space only. Confirm no conduit is required in the ceiling space and J-hooks are not required. If, so provide what is required and to what location.

R4. All data and telephone outlets shown on the drawings to consist of recessed outlet box and conduit stub-up into ceiling space only. No above ceiling conduits or J-hooks are required.

Q5. Please clarify that Electrical Contractor to include for all security rough-in which includes conduit stub-up to ceiling space only. Confirm no conduit is required in the ceiling space and J-hooks are not required. If, so provide what is required and to what location.

R5. All security device outlets shown on the drawings to consist of recessed outlet box and conduit stub-up into ceiling space only. No above ceiling conduits or J-hooks are required.

Q6. Electrical specification speaks to wiremold to be installed in exposed areas. Electrical drawings do not show any wiremold or what locations require wiremold. Please revise electrical drawings to show wiremold in every location that it is required. This includes all vertical and horizontal runs, please also provide a detail showing how the design is intended with transitions to conduit.

R6. Conduits to be concealed in all Public Areas. Surface wiremold may be used in Public Areas only if concealed conduits are not possible. Architect's and Engineer's prior approval required before installation.

Q7. Electrical Contractor needs further detail including a detail drawing showing how the duct bank and all conduits are transitioning from underground to inside of Administration Building. We also required information on the existing building exterior for penetrations to enter the building. A detailed drawings is required to show routing inside The Administration Building from penetration location to existing Panel PP-1.

R7. Refer to response R1 (b) above

Q8. Electrical Contractor requires pictures and information of the existing Panel PP-1 and existing manufacturer information to quote the correct 200A-3P breaker.

R8. Refer to response R1 (a) above.

Q9. Electrical Contractor needs clarification if all work in Administration Building, including power shut-down, is to be done during regular business hours.

R9. Refer to response R1 (a) above.

Q10. Duct Bank Note #8 on Drawing E02 says to fix spacers to avoid floating during concreting. However, in the Section, it is clean sand filling. Please confirm whether we go for sand filling or concreting?

R10. Clean sand filling is to be used.

Q11. Can we use directional drilling with HDPE conduits in highlighted area, instead of directional boring with steel casing? Directional drilling is only HDPE conduits, while directional boring is steel casing has conduits. Could you please provide us with more information.

R11. Directional drilling with HDPE conduits is preferred.

Q12. The 200A feeder shown to feed the new Crematorium Building from the Administration Building Basement Utility Room is not sized properly. This run will require an additional parallel run which will increase our duct bank size as shown and we will need to add an additional spare conduit.

R12. Refer to Drawing E02, Underground Duct Bank Section C-C: Revise Duct #2 use for Power Service Cables. (No spare 100mm duct required).
Refer to Drawing E04, Conduit & Wire Schedule: Revise Item # 1 to 8 - #350MCM RWU90 Copper + GND in 2 – 100mm (4") Dia. PVC DB-II underground ducts. (ie. Parallel cable run).
Refer to Drawing E04, Conduit & Wire Schedule: Revise Item # 2 to 8 - #350MCM RWU90 Copper + GND in 2 – 76mm (3") Dia. EMT conduits. (ie. Parallel cable run).

Q13. We are also concerned with the difficulty of pulling the feeders from the second manhole to the new Crematorium Building as this is a great distance. We propose installing an additional 1 – 2 manholes along the roadway leading to the building from the second manhole. This will decrease the distance of the greatest pull.

R13. Provide one (1) additional manhole between the existing Administration Building and the first manhole shown. Provide two (2) additional manholes between the second manhole shown and the new Crematorium Building.

Q14. Will splices of the building feeder done inside the manholes be accepted? If so, are there any specific requirements for these splices?

R14. Splices will not be accepted.

Q15. Will aluminum cabling be accepted for all feeders above 100A?

R15. All cables to be copper.

General

1. Drawing E01, Electrical Notes, Item #19 – Electrical Cash Allowances: Revise two (2) items as follows:

    1. $50,000 For Connection of Power Service.

    5. $75,000 For Possible Additional Electrical Work.

END OF ELECTRICAL ADDENDUM #E3 **NRG Consultants Inc.**

Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road, Milton ON

October 23, 2023

ELECTRICAL ADDENDUM #E4 **NRG Consultants Inc.**

This addendum issued before the closing of tenders, comprises clarifications and changes to the specifications and drawings and is hereby made a part thereof.

Questions & Responses

Q1. *(a) Is there a Communications Specification, or a specific Structured Cabling System Manufacturer required? Are patch cables required? If so, what quantities and lengths?*

(b) Can all work be done during regular business hours?

R1. (a) There is no specific Communications Specification nor specific Structured Cabling System Manufacturer. Electrical Contractor to provide data outlet boxes c/w conduits to T-Bar ceiling space in locations shown on the drawings. Data jacks, Cat. 6 wiring, terminations, testing and patch cables by Owner's Data Subcontractor.

(b) All work can be performed during regular business hours.

END OF ELECTRICAL ADDENDUM #E4 **NRG Consultants Inc.**

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Stormwater Management Report

HOLY FAMILY CATHOLIC CEMETERY PHASE 2
(CREMATORIUM BUILDING)

THE CATHOLIC CEMETERIES
OF THE DIOCESE OF HAMILTON

TOWN OF MILTON

Revised: July 2022
June 2021

SLA File: 13084

3228 South Service Road, Suite 105, East Wing Burlington, Ontario L7N 3H8
Tel. (905) 631-6978 Fax (905) 631-8927

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION AND BACKGROUND

1.1 OVERVIEW

S. Llewellyn & Associates Limited has been retained by The Catholic Cemeteries of the Dioceses of Hamilton to provide consulting engineering services for the proposed Phase 2 portion of the Holy Family Catholic Cemetery development at the corner of Regional Road No. 25 and Lower Baseline Road in the Town of Milton (see Figure 1.0 for location plan). This report will outline the stormwater management strategy for the proposed development.

The proposed Phase 2 portion of the development consists of constructing one (1) single storey building for use as a crematorium facility. Additionally, there will be an associated asphalt parking lot with concrete curbing/sidewalks, landscaped areas and an asphalt roadway which will connect to the previously completed portion of the cemetery.

This Stormwater Management Report will provide detailed information of the proposed servicing scheme for this development. Please refer to the site engineering plans prepared by S. Llewellyn and Associates Limited and the site plan prepared by Grguric Architects for additional information.

1.2 BACKGROUND INFORMATION

The following documents were referenced in the preparation of this report:

Ref. 1: MOE Stormwater Management Practices Planning and Design Manual (Ministry of Environment, March 2003)

Ref. 2: Guidelines for Site Plan Approval (Town of Milton, January 2020)

Ref. 3: Stormwater Management Report for the Proposed Developments at Regional Road No. 25 and lower baseline Road, Milton, Ontario (AMEC Environmental, February 2012)

Ref. 4: Hydrogeological Investigation Proposed Holy Family Catholic Cemetery (First Phase) Part of Lot 1 Concession 2, Town of Milton, Ontario (Terraprobe, May 2014)

Ref. 5: Erosion & Sediment Control Guidelines for Urban Construction (December 2006)

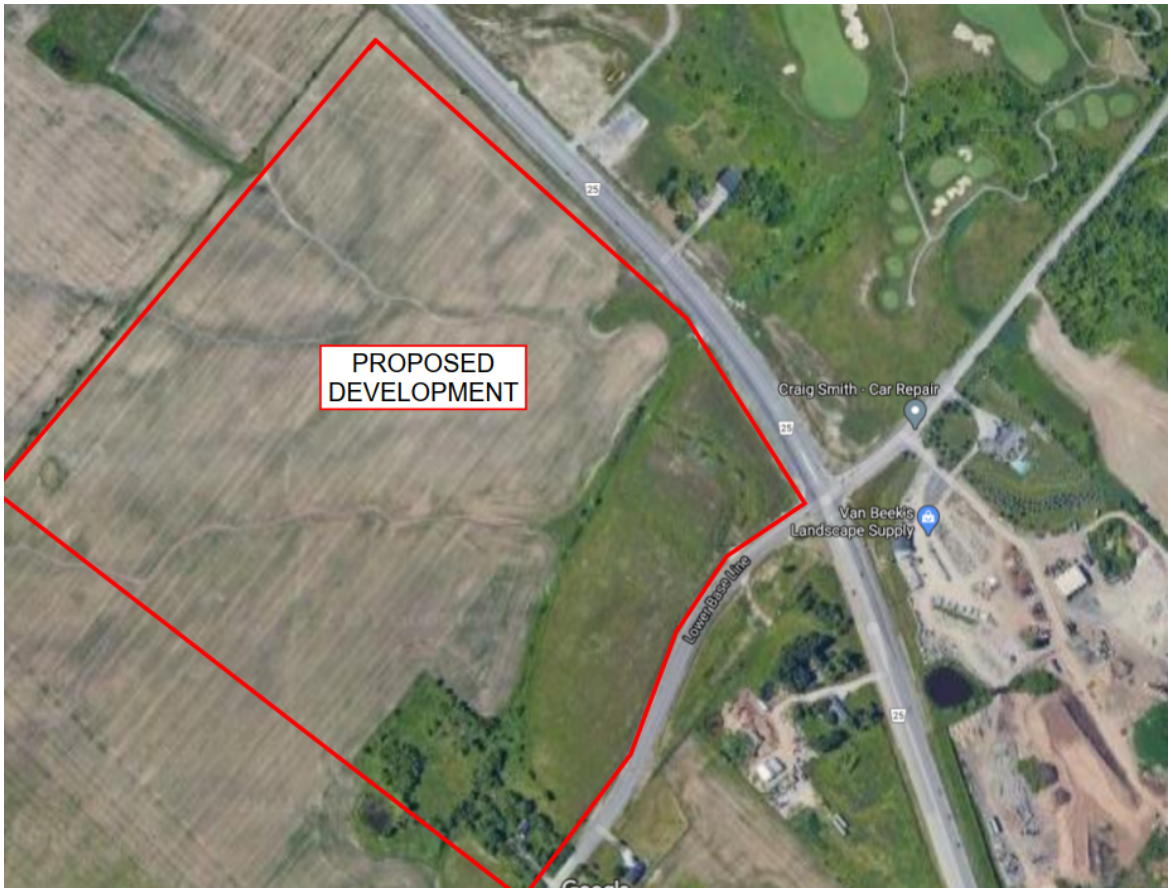


Figure 1.0 – Location Plan

2.0 STORMWATER MANAGEMENT

The following stormwater management (SWM) criteria will be applied to the site, in accordance with the Town of Milton:

Quantity Control

The stormwater discharge rate from the proposed site shall be controlled to the discharge rate that was previously modeled in the "Stormwater Management Report for the Proposed Cemetery Developments at Regional Road No. 25 and Lower Baseline Road, Milton, Ontario" (October 2012), prepared by AMEC Environmental for the correlating catchment area.

Quality Control

The stormwater runoff from the proposed parking areas on site must meet Level 1 (Enhanced) stormwater quality control (80% TSS removal, 90% average annual runoff treatment). Quality control is not warranted for the asphalt road system on site as vehicular traffic is generally limited. These criteria are in accordance with the "Stormwater Management Report for the Proposed Cemetery Developments at Regional Road No. 25 and Lower Baseline Road, Milton, Ontario" (October 2012), prepared by AMEC Environmental.

Erosion Control
Erosion and sediment control measures will be implemented in accordance with the standards of the Town of Milton.

3.0 EXISTING CONDITIONS

In the existing condition, the 4.1-hectare area comprising the Phase 2 portion of the site consists entirely of agricultural land. The site is bound by Regional Road No. 25 to the north, Lower Base line Road to the east, and existing agricultural lands to the west and south. Discharge from this section of the site sheet drains towards the watercourse SMT-4 previously defined in the 2009 report titled "Meander Belt Width Assessment" completed by Parish Geomorphic for this development. This watercourse ultimately discharges to Sixteen Mile Creek.

One catchment area, Catchment 101, has been identified in the existing condition. Catchment 101 represents the drainage area for the entire Phase 2 portion of the site which discharges to watercourse SMT-4. See Table 3.1 below and the Pre-Development Drainage Area Plan in Appendix A for details.

Table 3.1 – Existing Conditions Catchment Areas

Catchment ID	Description	Area (ha)	Percent Impervious	Run-off Coefficient
101	Sheet drainage to Watercourse SMT-4	4.1	0%	0.25

An analysis was performed on Catchment 101 using the SWMHYMO hydrologic modeling program developed by J.F. Sabourin & Associates for the 2-year to 100-year design storms. In order to stay consistent with the SWMHYMO modeling previously completed by AMEC, the same Town of Milton 12 hr SCS storm files were utilized in the SWMHYMO modeling carried out in this report. Additionally, the same CN values and weighted initial abstraction calculations from the AMEC stormwater management report were also utilized. A summary of the results can be found in Table 3.2 and detailed SWMHYMO input/output information can be found in Appendix C.

Table 3.2 – Existing Condition Stormwater Discharge

Storm Event	Catchment 101 Discharge (m^3/s)
2-Yr Event	0.175
5-Yr Event	0.308
10-Yr Event	0.403
25-Yr Event	0.526
50-Yr Event	0.619
100-Yr Event	0.713

4.0 PROPOSED CONDITIONS

The proposed Phase 2 portion of the development consists of constructing one (1) single storey building for use as a crematorium facility. Additionally, there will be an associated asphalt parking lot with concrete curbing/sidewalks, landscaped areas and an asphalt roadway which will connect to the previously completed portion of the cemetery. Furthermore, this catchment also includes the future development of a mausoleum building with an associated asphalt parking lot with concrete curbing/sidewalks and landscaped areas. It is proposed to service the site with a private storm sewer system designed and constructed in accordance with the standards and specifications of the Town of Milton.

SWMHYMO modeling for the catchment area encompassing Phase 2 was previously completed as part of the "Stormwater Management Report for the Proposed Cemetery Developments at Regional Road No. 25 and Lower Baseline Road, Milton, Ontario" (October 2012), prepared by AMEC Environmental. The discharge rates for the 2-100 year and regional storm events for Catchment area 201 have been controlled to the discharge rates for the correlating catchment area in the AMEC Stormwater Management Report. The detailed SWMHYMO input/output file for Catchment B1d can be found in Appendix B with the summary results in Table 4.1 below:

Table 4.1 – Catchment Area B1d Proposed Condition Discharge Rate

Storm Event	Catchment B1d Controlled Discharge (m^3/s)	Required Storage (m^3)
2-Yr	0.103	482
5-Yr	0.160	767
10-Yr	0.194	983
25-Yr	0.227	1266
50-Yr	0.249	1484
100-Yr	0.269	1709
Regional Storm	0.467	2231

One catchment area, Catchment 201, has been identified in the proposed condition. Catchment 201 represents the drainage area for the proposed development which will be captured and controlled by the proposed storm sewer system & detention pond before ultimately discharging to the existing watercourse SMT-4. See Table 4.2 below and the Post-Development Drainage Area Plan in Appendix A for details.

Table 4.2 – Proposed Condition Catchment Areas

Catchment ID	Description	Area (ha)	Percent Impervious	Run-off Coefficient
201	Controlled discharge to watercourse SMT-4	4.1	36%	0.49

4.1 WATER QUANTITY CONTROL

It is proposed to apply quantity control measures to the runoff from Catchment 201 by means of a 300mmø orifice pipe to restrict discharge from the site to the specified discharge rate in the Stormwater Management Report completed by AMEC Environmental. Refer to the Grading & Servicing Plan for the orifice location.

With the installation of on-site quantity control measures for Catchment 201, it will be required to provide stormwater storage during storm events up to and including the 100-year event. To provide the required storage, a dry detention pond has been graded at the northeast corner of the property, which will provide the required volume of stormwater storage. It should be noted that this detention pond is in accordance with the pond proposed in the Stormwater Management Report completed by AMEC for the corresponding catchment area. Furthermore, as noted in the May 2014 hydrogeological report prepared by Terraprobe, groundwater on site is generally found at approximately 1.0m below the ground surface; however, because the site consists of low permeability glacial till which will act as a natural liner there will be no significant effect on groundwater levels or groundwater quality due to the construction of the proposed pond. Furthermore, due to the native soil's impermeability characteristics pond operating levels are also not anticipated to be affected by groundwater. Details of the proposed pond can be found on the Grading & Servicing Plan. The stage-storage-discharge characteristics can be seen in Table 4.3 below and Appendix A for details.

Table 4.3 – Proposed Condition Stage-Storage-Discharge

Elevation (m)	Storage (m^3)	Discharge (m^3/s)
177.30 (Bottom of Pond)	0	0.0033
177.50 (0.2m Depth)	310	0.0512
177.70 (0.4m Depth)	646	0.1169
177.90 (0.6m Depth)	1009	0.1650
178.10 (0.8m Depth)	1400	0.2014
178.30 (1.0m Depth)	1820	0.2322
178.50 (Top of Pond)	2270	0.5311

An analysis was performed on the proposed condition site using the SWMHYMO hydrologic modeling program to determine the volume of stormwater storage that is required during the 2-year to 100-year Town of Milton 12 hr SCS design storm and the regional storm event. As noted in section 3.0 to stay consistent with the AMEC Stormwater Management Report the same storm files, CN values and weighted initial abstractions have been utilized. A summary of the results can be found in Table 4.4 and detailed SWMHYMO input/output information can be found in Appendix C.

Table 4.4 – Proposed Condition Stormwater Discharge			
Storm Event	Catchment 201 Controlled Discharge (m^3/s)	Allowable Discharge[1] (m^3/s)	Required Storage (m^3)
2-Yr	0.090	0.103	501
5-Yr	0.138	0.160	796
10-Yr	0.165	0.194	1011
25-Yr	0.192	0.227	1294
50-Yr	0.210	0.249	1510
100-Yr	0.226	0.269	1732
Regional Storm	0.454	0.467	2194
[1] Allowable discharge = Discharge Rate from Table 4.1			

This analysis determined the following:

- The 2-year to 100-year and regional post development controlled discharge will not exceed the allowable discharge rate computed by AMEC with the installation of a 300mmø orifice pipe.

- Catchment 201 will require 1732m^3 of stormwater storage during the 100-year event, which can be accommodated by the proposed dry pond, having a volume of 2270m^3 at the top of pond elevation.

- The proposed pond is in accordance with the "Stormwater Management Report for the Proposed Cemetery Developments at Regional Road No. 25 and Lower Baseline Road, Milton, Ontario" (October 2012), prepared by AMEC Environmental.

- The fill generated from the proposed pond will be distributed across Phase 2 to bring the site up to the proposed finished grades.

4.2 FLOODPLAIN MODELLING

As part of the proposed asphalt road system, it is required to cross the existing watercourse SMT-1. The proposed crossing of STM-1 will be completed using a 6000mm x 1500mm concrete box culvert. Furthermore, the proposed box culvert will be counter-sunk by 15% (225mm) in accordance with the recommendations from Conservation Halton. The HEC-RAS modeling completed as part of the AMEC Stormwater Management Report was revised to analyze the effect of the culvert crossing on SMT-1 upstream of the culvert.

The 6000mm x 1500mm box culvert exceeds the specifications set out in the AMEC report which states that the soffit of the culvert requires 0.3m freeboard from the 25-year flood elevation. The proposed culvert is not overtopped during any storm event and the minor flood plain increase immediately upstream of the culvert has been reflected on the

updated drawings. Furthermore, the HEC-RAS model shows that there will be no increase in the regional flood line elevation at the development site property limits. Please refer to the Floodplain Memo in Appendix E for further details.

4.3 WATER QUALITY CONTROL

The proposed development is required to achieve an “Enhanced” (80% TSS removal) level of water quality protection. To achieve this criteria, discharge from the parking area surrounding the proposed crematorium building will be subject to treatment from a HydroStorm oil/grit separator before ultimately discharging to the private storm sewer system. The HydroStorm sizing software was used to determine the required size of oil/grit separator unit for the site. It was determined that a HydroStorm HS10 will provide 85% TSS removal and 96% average annual runoff treatment, which satisfies the requirements for an “Enhanced” level for quality control. Refer to the Hydroworks Sizing Summary Report in Appendix D for details.

HydroStorm units require regular inspection and maintenance as per the manufacturer’s specifications to ensure the unit operates properly. See HydroStorm Maintenance Manual in Appendix D for details.

Quality control is not warranted for the asphalt road system on site as vehicular traffic is generally limited. These criteria are in accordance with the “Stormwater Management Report for the Proposed Cemetery Developments at Regional Road No. 25 and Lower Baseline Road, Milton, Ontario” (October 2012), prepared by AMEC Environmental.

5.0 SEDIMENT AND EROSION CONTROL

In order to minimize erosion during the grading and site servicing period of construction, the following measures will be implemented:

- Install silt fencing along the outer boundary of the site to ensure that sediment does not migrate to the adjacent properties;
- Install sediment control (silt sacks) in the proposed catchbasins as well as the nearby existing catchbasins to ensure that no untreated runoff enters the existing conveyance system;
- Stabilize all disturbed or landscaped areas with hydro seeding/sodding to minimize the opportunity for erosion.

To ensure and document the effectiveness of the erosion and sediment control structures, an appropriate inspection and maintenance program is necessary. The program will include the following activities:

- Inspection of the erosion and sediment controls (e.g. silt fences, sediment traps, outlets, vegetation, etc.) with follow up reports to the governing municipality; and
- The developer and/or his contractor shall be responsible for any costs incurred during the remediation of problem areas.

Prior to completion of construction, the following permanent erosion measure will be implemented:

- Place river stone as sized on the drawings at the inlet and outlet of the culvert and at the pond outlet to provide sufficient energy dissipation to prevent erosion of the watercourse and adjacent lands. Detailed stone sizing calculations are provided in Appendix A.

For details on the proposed erosion and sediment control for the proposed site, see the Grading & Servicing Plan included in the engineering drawings.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information provided herein, it is concluded that the proposed Phase 2 development of Holy Family Cemetery can be constructed to meet the requirements of the Town of Milton. Therefore, it is recommended that:

- The development be graded and serviced in accordance with the Grading & Servicing Plan prepared by S. Llewellyn & Associates Limited;
- A 300mmø orifice pipe be installed as per the Grading & Servicing Plan and this report to provide adequate quantity control for the proposed site;
- A dry detention pond be graded as per the Grading & Servicing Plan and this report to provide sufficient stormwater surface storage for the proposed development;
- A HydroStorm HS10 oil/grit separator be installed as per the Grading & Servicing Plan and this report to provide efficient stormwater quality control for the proposed development;
- Erosion and sediment controls be installed as described in this report to meet Town of Milton requirements;

We trust the information enclosed is satisfactory. Should you have any questions please do not hesitate to contact our office.

Prepared by:
S. LLEWELLYN & ASSOCIATES LIMITED

S. DeGrow, Dipl. T.

S. Frankovich, P.Eng.

APPENDIX A

STORMWATER MANAGEMENT INFORMATION

S:\13084\WORKING\CURRENT\13084-DAP.dwg

6/30/2022 10:20:12 AM - Steven DeGrow

PIN 24934-0153 (LT)

PIN 24934-0083 (LT)

101
4.10
0
0.25

POND
Edge of Pond

LEGEND

PERVIOUS AREA

201
0.39
11
0.32

DRAINAGE AREA I.D.
DRAINAGE AREA (ha)
PERCENT IMPERVIOUS
RUNOFF COEFFICENT

DIRECTION OF SHEET FLOW

FIGURE 1.0
PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

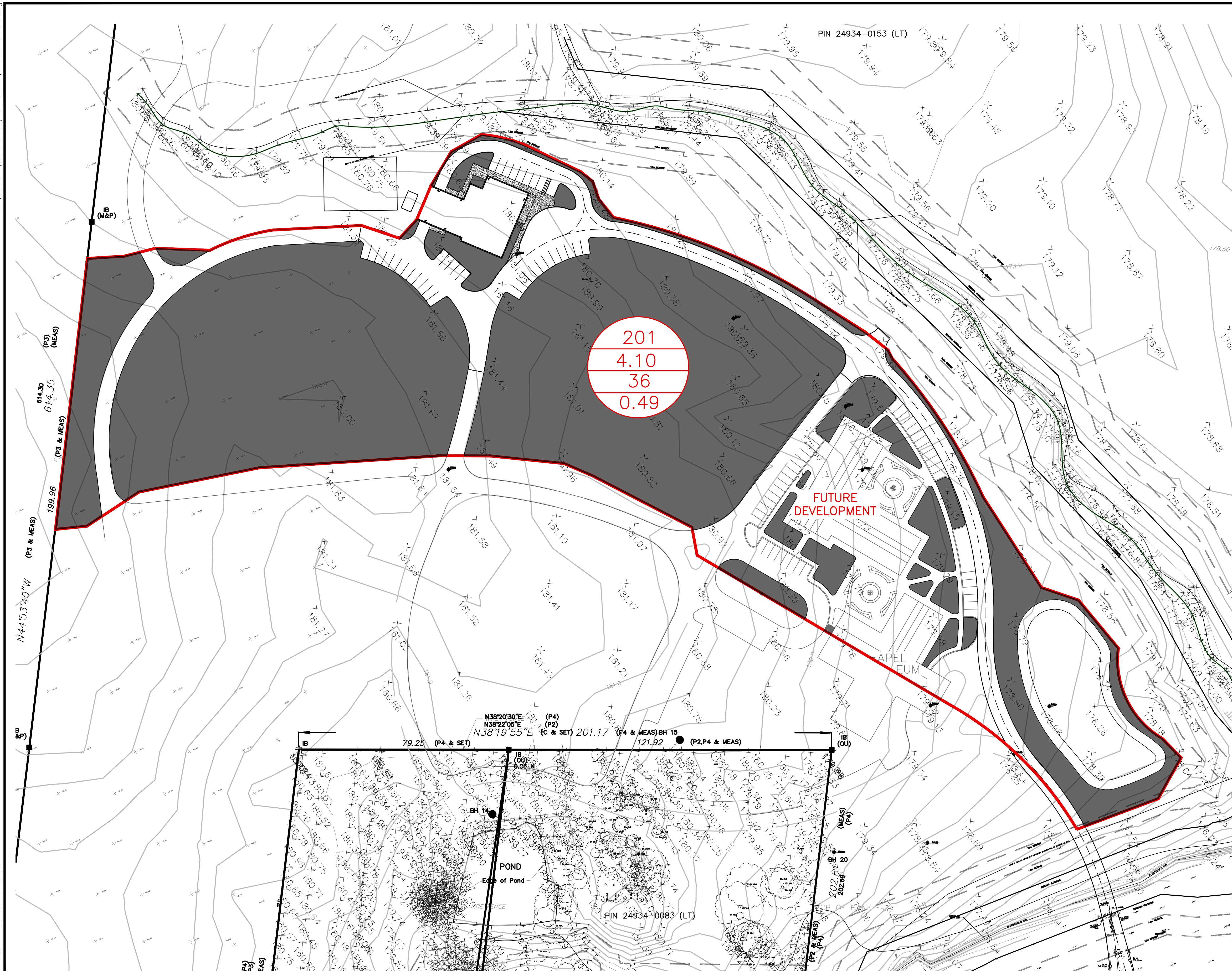
SCALE: 1:1500

PROJECT: HOLY FAMILY CATHOLIC CEMETERY, MILTON
PROJECT No.: 13084

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Tel. (905) 631-6978
Website: www.sla.on.ca
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8



LEGEND

PERVIOUS AREA

201	DRAINAGE AREA I.D.
0.39	DRAINAGE AREA (ha)
11	PERCENT IMPERVIOUS
0.32	RUNOFF COEFFICENT

→ DIRECTION OF SHEET FLOW

FIGURE 2.0 POST–DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE: 1:1500

PROJECT: HOLY FAMILY CATHOLIC CEMETERY, MILTON
PROJECT No.: 13084

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

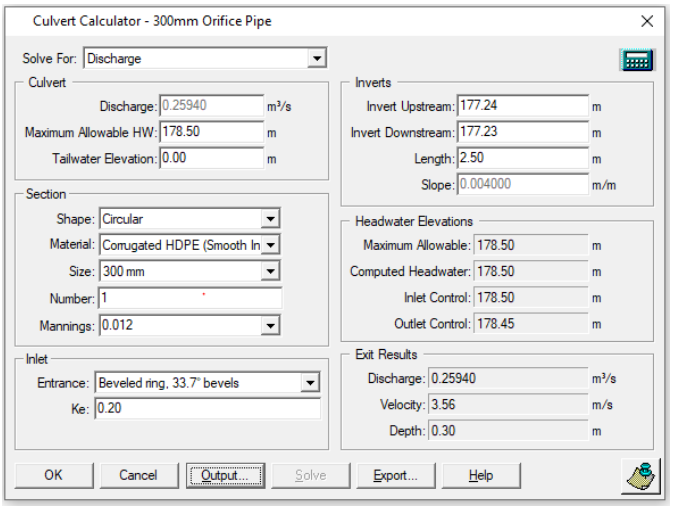
Tel. (905) 631–6978
Website: www.sla.on.ca
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

Rating Table Report
300mm Orifice Pipe

Range Data:				
	Minimum	Maximum	Increment	
Allowable HW E	177.30	178.50	0.05	m

HW Elev. (m)	Discharge (m³/s)
177.30	0.00332
177.35	0.01071
177.40	0.02162
177.45	0.03539
177.50	0.05123
177.55	0.06822
177.60	0.08541
177.65	0.10194
177.70	0.11690
177.75	0.12997
177.80	0.14239
177.85	0.15413
177.90	0.16499
177.95	0.17481
178.00	0.18412
178.05	0.19297
178.10	0.20144
178.15	0.20956
178.20	0.21738
178.25	0.22493
178.30	0.23224
178.35	0.23932
178.40	0.24619
178.45	0.25288
178.50	0.25940



Holy Family Cemetery
Milton, Ontario

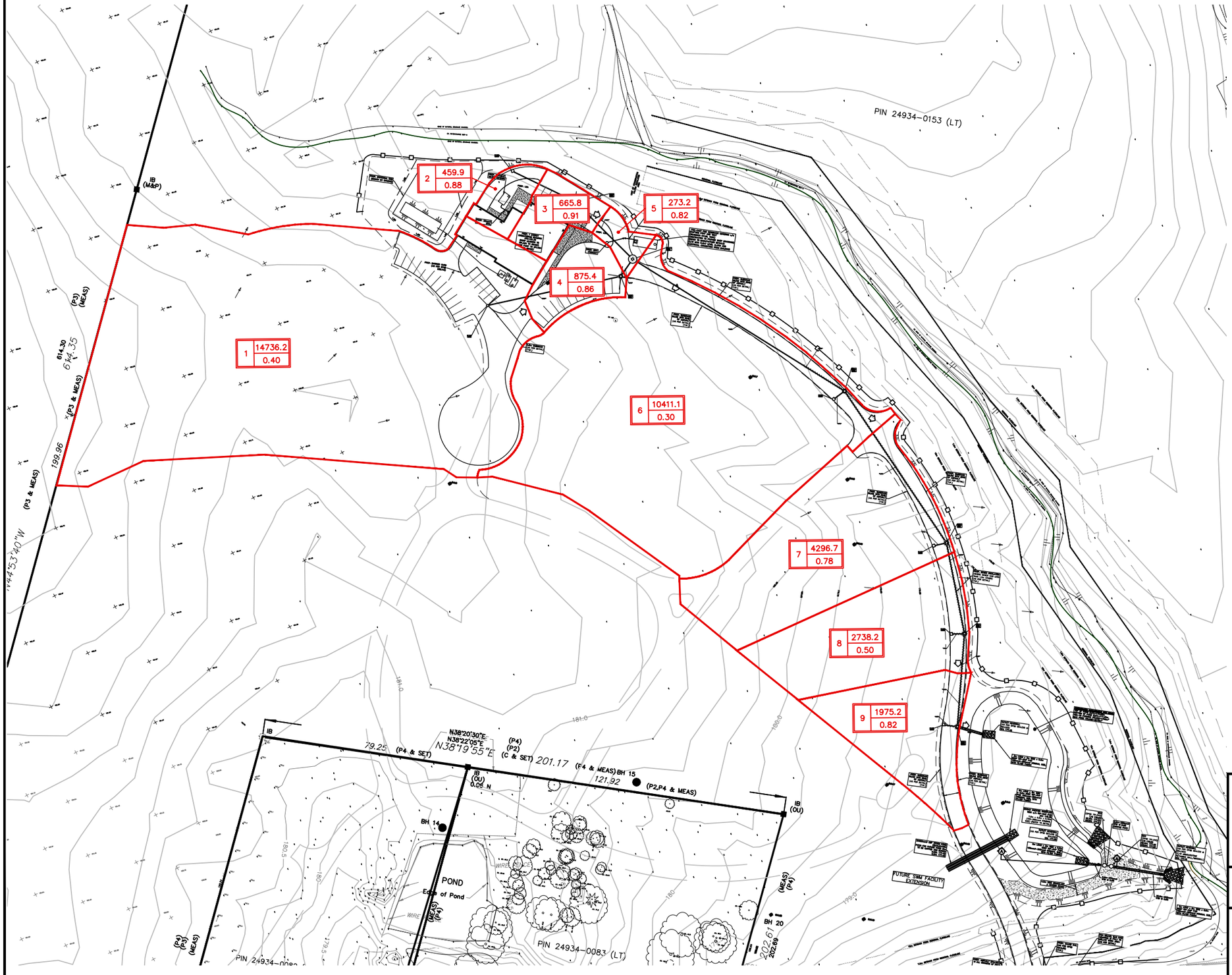
S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

STAGE-STORAGE-DISCHARGE CALCULATIONS

Outlet Device (Quantity)

Type:	Orifice Pipe 1	Type:	Broad crested overflow weir
Diameter (mm)	300	Sill Elevation (m)	178.35
Area (m^2)	0.07069	Length (m)	2.8
Invert Elev. (m)	177.27	Discharge (Q)=	$1.67\ L\ H^{1.5}$
C/L Elev. (m)	177.42		
Disch. Coeff. (C_d)	0.8		
Discharge (Q) =	$C_d\ A\ (2\ g\ H)^{0.5}$		
Number of Orifices:	1		

		Pond Volumes			Outlet No. 1		Outlet No. 2		
	Elevation m	Pond Area m^2	Pond Increm. Volume m^3	Cumulative Tank Volume m^3	H m	Discharge m^3/s	H m	Discharge m^3/s	Total Discharge m^3/s
Orifice Invert	177.27	0	0	0	0.000	0.0000			**0.0000**
Bottom of Pond	177.30	1491	0	0	0.030	0.0033			**0.0033**
0.10m Depth of ponding	177.40	1548	152	152	0.130	0.0216			**0.0216**
0.20m Depth of ponding	177.50	1613	158	310	0.230	0.0512			**0.0512**
0.30m Depth	177.60	1678	165	475	0.330	0.0854			**0.0854**
0.40m Depth of Ponding	177.70	1745	171	646	0.430	0.1169			**0.1169**
0.50m Depth of Ponding	177.80	1814	178	824	0.530	0.1424			**0.1424**
0.60m Depth of Ponding	177.90	1884	185	1009	0.630	0.1650			**0.1650**
0.70m Depth of Ponding	178.00	1955	192	1200	0.730	0.1841			**0.1841**
0.80m Depth	178.10	2027	199	1400	0.830	0.2014			**0.2014**
0.90m Depth of Ponding	178.20	2101	206	1606	0.930	0.2174			**0.2174**
1.00m Depth of Ponding	178.30	2176	214	1820	1.030	0.2322			**0.2322**
Weir Sill Elevation	178.35	2214	110	1930	1.080	0.2393	0.000	0.0000	**0.2393**
1.10m Depth of Ponding	178.40	2252	112	2041	1.130	0.2462	0.050	0.0523	**0.2985**
Top of Pond	178.50	2330	229	2270	1.230	0.2594	0.150	0.2717	**0.5311**



LEGEND

DRAINAGE AREA I.D. | 13 | 5000.9 DRAINAGE AREA (m^2) | 0.25 RUNOFF COEFFICENT

PROPOSED CONDITION
STORM SEWER DRAINAGE AREA PLAN

SCALE: 1:1500

PROJECT: HOLY FAMILY CATHOLIC CEMETERY, MILTON
PROJECT No.: 13084

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Tel. (905) 631-6978
Fax (905) 631-8927
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

Project No. 13084
Sheet No. 1
Checked by:
Computed by: YM
Date: June 21, 2022

TOWN OF MILTON

STORM SEWER DESIGN - (5 year Town of Milton)

Project: Holy Family Catholic Cemetery

$$i = \frac{A}{(T+B)^C}$$

A= 959.00
B= 5.70
C= 0.8024
n= 0.013

Area No.	Street Name	From MH	To MH	Area [ha]	C	A*C	Cumulative A*C	Time of Conc. [min]	Intensity [mm/hr]	Qpeak [m³/s]	Pipe Characteristcs					Travel Time [min]	Fraction Full [%]	Remarks
											Diameter [mm]	Slope [%]	Length [m]	Capacity [m³/s]	Velocity [m/s]			
Drainage to Stormwater Management Dry Pond																		
1		CB9.1	CBMH9	1.47	0.40	0.59	0.59	10.00	105.25	0.172	**450**	**1.50%**	**52.0**	0.315	1.92	0.45	55%	
								10.45										
4		CBMH9	CBMH8	0.09	0.86	0.08	0.67	10.45	102.89	0.190	**450**	**1.00%**	**8.0**	0.257	1.57	0.08	74%	
								10.54										
2		CB10.1	CBMH10	0.05	0.88	0.04	0.04	10.00	105.25	0.013	**250**	**1.00%**	**26.5**	0.054	1.06	0.42	24%	
								10.42										
3		CBMH10	CBMH8	0.07	0.91	0.06	0.11	10.42	103.06	0.031	**300**	**1.60%**	**31.0**	0.111	1.52	0.34	28%	
								10.76										
5		CBMH8	CBMH7	0.03	0.82	0.02	0.80	10.76	101.35	0.225	**525**	**0.40%**	**95.5**	0.283	1.27	1.25	79%	
								12.01										
6		CBMH7	CBMH6	1.04	0.30	0.31	1.11	12.01	95.55	0.295	**600**	**0.40%**	**70.0**	0.406	1.39	0.84	73%	
								12.85										
7		CBMH6	CBMH5	0.43	0.78	0.34	1.45	12.85	92.06	0.370	**675**	**0.40%**	**35.5**	0.555	1.50	0.39	67%	
								13.25										
8		CBMH5	CBMH3	0.27	0.50	0.14	1.58	13.25	90.52	0.398	**675**	**0.40%**	**35.5**	0.555	1.50	0.39	72%	
								13.64										
9		CBMH3	Headwall	0.20	0.82	0.16	1.74	13.64	89.04	0.431	**675**	**0.60%**	**7.0**	0.680	1.84	0.06	63%	
								13.70										

Holy Family
Milton, Ontario

RIVER STONE SIZING WITHIN SMT-1

River Stone sizing calculations based on procedures outlined in Chapter 5 of the MTO Drainage Manual.

RIVER STONE APRON HYDRUALIC CHARACTERISTICS

Consider a cross-section through the river stone apron immediately downstream of the culvert structure:

Bottom width (m) =	4.5	
Long. Slope (%) **(S)** =	0.55	
Side slope H:V =	3 : 1	
Mannings 'n' =	0.030	
Flow rate (m^3/s) =	12.660	***(Worst case scenario - Regional Storm)***
Analysis results from HEC-RAS:		
Depth of flow (m) =	1.28	
Flow velocity (m/s) =	1.51	
Area of flow (m^2) =	8.39	
Wetted Perim. (m) =	6.77	
Hydraulic Radius (m) ***(R)*** =	1.239	

DETERMINE SHEAR STRESS ON CHANNEL BED AND BANK

Unit weight of water (γ) N/m^3 = 9810

Mean boundary shear stress (τ_c) :

$\tau_c = \gamma$ R S= **67** **N/m^2**

Shear stress on channel bottom (τ_b) :

$\tau_b = K_b \tau_c$= 1.43 x 67 = **96** **N/m^2** (governs)

Shear stress on channel bank (τ_b) :

$\tau_s = K_{bk} \tau_c$= 1.29 x 67 = **86** **N/m^2**

Note: K_b & K_{bk} from Design Sheets 2.11 and 2.12 of the MTO Drainage Manual

---

DETERMINE RIVER STONE SIZING

Based on Equation 5.31 (MTO drainage manual), the critical shear stress on a particle can be determined by:

$\tau_{cb} = 0.0642 \times D_{50} \times 9.81$

τ_{cb} = 126

$\tau_{cs} = Kcs \times \tau cb$ Kcs=0.775

$\tau_{cs} = 0.775 \times 126$ *Note: Equation 5.37 or Design Chart 2.14*

$\tau_{cs} = 97.65$

For D_{50} (mm)= 200 $\tau_{cs} = Tcb \times 0.775$ **98 N/m^2 > 96 ... O.K.**

Therefore, use minimum 200 mm riverstone (D_{50} = 250 mm) at all locations

APPENDIX B

AMEC SWMHYMO INPUT/OUTPUT INFORMATION

FUTURE LAND USE CONDITIONS WITH STORMWATER MANAGEMENT

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
*#  Date        : 08-16-2011
*#  Modeller    : [C. Silvestri]
*#  Company     : Philips Engineering Ltd
*#  License #   :  3569108
*#*************************************************************************

START               START=0.0  HRS  METOUT=2  NSTORM=1  NRUN=1
                    MILSCS12.002
*
READ STORM          "STORM.001"
*
* Existing Conditions
*
* Subarea 103 - Existing Conditions Conditions Entering Property
CALIB NASHYD        ID= 1  NHYD=103  DT=5 min  AREA=42.1 ha  DWF=0.0 cms
                    CN=86.0  IA=2.5 mm  N=3.0  Tp=0.399 hrs  END=-1
*
* Route through Channel 104
ROUTE CHANNEL       ID=2  NHYD=2104  IDIN=1  DT=5.0 min
                    CHLGTH=440 m  CHSLP=1 %  FPSLP=1 %
                    VSN=104  NSEG=3
                    ROUGH DIST(m)
                      0.04  59
                     -0.03  60
                      0.04  89

                    DIST(m)  ELEV(m)
                       0.0    179.5
                      18.0    178.5
                      59.0    178.0
                      59.5    177.7
                      60.0    178.0
                      89.0    178.5
*
* Subarea 104 - Creek Block Upstream of Proposed 5 acre Pond
CALIB NASHYD        ID= 3  NHYD=104  DT=5 min  AREA= 24.1 ha  DWF=0.0 cms
                    CN=86.0  IA=2.5 mm  N=3.0  Tp=0.208 hrs  END=-1
*
ADD HYD             ID= 1  NHYD=1104  IDI= 3  IDII= 2
*
* Route through channel 105
ROUTE CHANNEL       ID=2  NHYD=2105  IDIN=1  DT=5.0 min
                    CHLGTH=365 m  CHSLP=0.4 %  FPSLP=0.4 %
                    VSN=105  NSEG=3
                    ROUGH DIST(m)
                      0.04  52
                     -0.03  53
                      0.04  100

                    DIST(m)  ELEV(m)
                       0.0    178.0
                      28.0    177.0
                      52.0    176.9
                      52.5    176.6
                      53.0    176.9
                      80.0    177.0
                     100.0    177.5
*
* Subarea 105 - Creek Block Upstream of Proposed Pond 2nd 5 acre pond
CALIB NASHYD        ID=3  NHYD=105  DT=5 min  AREA= 19.2 ha  DWF=0.0 cms
                    CN=86.8  IA=2.5 mm  N=3.0  Tp=0.176 hrs  END=-1
*
```

```
ADD HYD             ID=1  NHYD=1105  IDI=3  IDII=2
*
ROUTE CHANNEL       ID=2  NHYD=2106  IDIN=1  DT=5.0 min
                    CHLGTH=385 m  CHSLP=0.67 %  FPSLP=0.67 %
                    VSN=106  NSEG=3
                    ROUGH DIST(m)
                      0.04  77
                     -0.03  78
                      0.04  120

                    DIST(m)  ELEV(m)
                       0.0    176.0
                      20.0    175.5
                      32.0    175.0
                      58.0    174.5
                      77.0    174.5
                      77.5    174.2
                      78.0    174.5
                     102.0    175.0
                     120.0    175.5
*
* Subarea 106 - Creek Block Upstream of Pond
CALIB NASHYD        ID= 3  NHYD=106  DT=5 min  AREA= 15.3 ha  DWF=0.0 cms
                    CN=87.2  IA=2.5 mm  N=3.0  Tp=0.168 hrs  END=-1
*
ADD HYD             ID= 1  NHYD=1106  IDI= 3  IDII= 2
*
* Subarea 107 - East drainage area for tributary
CALIB STANDHYD      ID= 3  NHYD=107  DT=5 min  AREA= 15.27 ha
                    XIMP=0.10  TIMP=0.17  DWF=0.0 cms  LOSS=2  CN=88
                    DPSP=2.5 mm  SLPP=1.27 %  LGP=717  MNP=0.250  SCP=0.0
                    DPSI=1.57 mm  SLPI=1.27 %  LGI=100  MNI=0.017  SCI=0.0
                    END=-1
*
ADD HYD             ID=2  NHYD=1107  IDI=1  IDII=3
*
* Route Eastern Section of Tributary through Channel-108
ROUTE CHANNEL       ID=1  NHYD=2108  IDIN=2  DT=5.0 min
                    CHLGTH=1300 m  CHSLP=1.67 %  FPSLP=1.67 %
                    VSN=108  NSEG=3
                    ROUGH DIST(m)
                      0.04  65
                     -0.03  66
                      0.04  110

                    DIST(m)  ELEV(m)
                       0.0    172.0
                      42.0    167.5
                      51.0    160.0
                      65.0    159.0
                      65.5    158.7
                      66.0    159.0
                      88.0    165.0
                     110.0    170.0
*
* Subarea 108
CALIB NASHYD        ID= 2  NHYD=108  DT=5 min  AREA=33.5 ha  DWF=0.0 cms
                    CN=86.8  IA=2.5 mm  N=3.0  Tp=0.295 hrs  END=-1
*
ADD HYD             ID=3  NHYD=004  IDI=1  IDII=2
PRINT HYD           ID=3  NPCYC=-1
*
* CALULATE FLOWS ENTERING SITE FROM NORTHWEST
* Subarea 101 -
CALIB STANDHYD      ID= 4  NHYD=101  DT=5 min  AREA= 287.8 ha
```

```
                    XIMP=0.20  TIMP=0.495  DWF=0.0 cms  LOSS=2  CN=83.4
                    DPSP=5.0 mm  SLPP=0.625 %  LGP=700  MNP=0.250  SCP=0.0
                    DPSI=1.57 mm  SLPI=0.625 %  LGI=3200  MNI=0.017  SCI=0.0
                    END=-1
*
*
*Route NHYD=101 through channel 102
ROUTE CHANNEL       ID=5  NHYD=2101  IDIN=4  DT=5.0 min
                    CHLGTH=700 m  CHSLP=0.42 %  FPSLP=0.42 %
                    VSN=102  NSEG=3
                    ROUGH DIST(m)
                      0.04  110
                     -0.03  111
                      0.04  160

                    DIST(m)  ELEV(m)
                       0.0    182.5
                      90.0    180.0
                     110.0    179.8
                     110.5    179.5
                     111.0    179.8
                     130.0    180.0
                     160.0    182.5
*
* Subarea 102 -
CALIB STANDHYD      ID= 4  NHYD=102  DT=5 min  AREA= 272.9 ha
                    XIMP=0.13  TIMP=0.275  DWF=0.0 cms  LOSS=2  CN=84
                    DPSP=5.0 mm  SLPP=0.98 %  LGP=1350  MNP=0.250  SCP=0.0
                    DPSI=1.57 mm  SLPI=0.98 %  LGI=40   MNI=0.017  SCI=0.0
                    END=-1
*
* Node 001
ADD HYD             ID= 6  NHYD= 001  IDI=4  IDII=5
PRINT HYD           ID= 6  NPCYC=-1
*
*Route NHYD=001 through channel 109
ROUTE CHANNEL       ID=4  NHYD=2109  IDIN=6  DT=5.0 min
                    CHLGTH=1000 m  CHSLP=0.54 %  FPSLP=0.54 %
                    VSN=109  NSEG=3
                    ROUGH DIST(m)
                      0.04  50
                     -0.03  51
                      0.04  88

                    DIST(m)  ELEV(m)
                       0.0    176.0
                      14.0    175.5
                      18.0    175.0
                      26.0    174.0
                      42.0    173.0
                      50.0    173.0
                      50.5    172.7
                      51.0    173.0
                      58.0    173.5
                      88.0    174.0
* Subarea 109
CALIB NASHYD        ID= 5  NHYD=109  DT=5 min  AREA= 35.1 ha  DWF=0.0 cms
                    CN=86.8  IA=2.5 mm  N=3.0  Tp=0.318 hrs  END=-1
*
ADD HYD             ID= 6  NHYD=1109  IDI=4  IDII=5
*
*Route NHYD=1109 through Channel 110
ROUTE CHANNEL       ID=4  NHYD=2110  IDIN=6  DT=5.0 min
                    CHLGTH=900 m  CHSLP=0.71 %  FPSLP=0.71 %
                    VSN=110  NSEG=3
```

```
                    ROUGH DIST(m)
                      0.04  61
                     -0.03  62
                      0.04  114

                    DIST(m)  ELEV(m)
                       0.0    175.0
                      10.0    172.5
                      18.0    170.0
                      20.0    168.0
                      61.0    167.5
                      61.5    167.2
                      62.0    167.5
                      80.0    170.0
                      98.0    172.5
                     114.0    175.5
*
* Subarea 110
CALIB NASHYD          ID= 5  NHYD=110  DT=5 min  AREA= 21.8 ha  DWF=0.0 cms
                      CN=87.2  IA=2.5 mm  N=3.0  Tp=0.215 hrs  END=-1
*
ADD HYD               ID= 6  NHYD= 1110  IDI=4  IDII=5
*
*Route NHYD=1110 through Channel 111
ROUTE CHANNEL         ID=4  NHYD=2111  IDIN=6  DT=5.0 min
                      CHLGTH=920 m  CHSLP=1.25 %  FPSLP=1.25 %
                      VSN=111  NSEG=3
                      ROUGH DIST(m)
                        0.04  56
                       -0.03  57
                        0.04  105

                      DIST(m)  ELEV(m)
                         0.0    172.0
                        16.0    170.0
                        44.0    159.0
                        56.0    159.0
                        56.5    158.7
                        57.0    159.0
                        84.0    170.0
                       105.0    175.0
*
* Subarea 111
CALIB NASHYD          ID= 1  NHYD=0111  DT=5 min  AREA=17.3 ha  DWF=0.0 cms
                      CN=86.4  IA=2.5mm  N=3.0  Tp=0.235 hrs  END=-1
* Node 002
ADD HYD               ID=2  NHYD= 002  IDI=1  IDII=4
PRINT HYD             ID=2  NPCYC=-1
*
*
*#*********************************************************
*# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
* At confluence of two main branches
ADD HYD               ID=9  NHYD=1108  IDI=3  IDII=2
*#*********************************************************
*
* Calculations for South-West section of site (3 subcatchments have been created
for catchment 201)
*
*#*************************************************************************************
****
*# SUBCATCHMENT CONTAINING CEMETERY LANDS
*#*************************************************************************************
****
*# PROPOSED IMPERVIOUSNESS LESS THAN 20%
```

```
*# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS
SURFACES
*#
*#*******************************
*# DRAINAGE FROM 201A (EXTERNAL)
*#*******************************
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=1  NHYD="201A"  DT=5 min  AREA=68.2 ha  DWF=0.0 cms
                    CN=86.0  IA=5 mm  N=3.0  Tp=0.47 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
*#Route NHYD=201A through Channel SMT-2
ROUTE CHANNEL       ID=2  NHYD="SMT-2R" IDIN=1  DT=5.0 min
                    CHLGTH=450 m  CHSLP=0.75 %  FPSLP=0.75 %
                    VSN=CA1  NSEG=3
                    ROUGH DIST(m)
                      0.04  35
                     -0.03  45
                      0.04  90

                    DIST(m)  ELEV(m)
                       0.0    101.0
                      35.0    100.5
                      40.0    100.0
                      45.0    100.5
                      90.0    101.0
*%-----------------|-------------------------------------------------------------|
*#*********************************************
*# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
*#*********************************************
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=1  NHYD="A1a"  DT=5 min  AREA=0.8 ha  DWF=0.0 cms
                    CN=87.69  IA=5 mm  N=3.0  Tp=0.27 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=3  NHYD="A1b"  DT=3 min  AREA=6.1 ha  DWF=0.0 cms
                    CN=86.13  IA=5 mm  N=3.0  Tp=0.07 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=4  NHYD="A1c"  DT=3 min  AREA=3.2 ha  DWF=0.0 cms
                    CN=87.24  IA=5 mm  N=3.0  Tp=0.14 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=6  NHYD="A1d"  DT=5 min  AREA=5.3 ha  DWF=0.0 cms
                    CN=87.31  IA=5 mm  N=3.0  Tp=0.21 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR     IDout=[7],   NHYD=["A1d"],  IDin=[6],
                    RDT=[5](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [  0.0 ,  0.0  ]
                                   [  0.034, 0.028]
                                   [  0.103, 0.043]
                                   [  0.142, 0.059]
                                   [  0.198, 0.093]
                                   [  0.241, 0.129]
                                   [  0.278, 0.168]
                                   [  0.310, 0.209]
                                   [   -1   ,  -1  ]  (max twenty pts)
                          IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["A1dPND"], IDs to add=[7+8]
*%-----------------|-------------------------------------------------------------|
*#*************************************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
*#*************************************************************
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[5], NHYD=["SMT2"], IDs to add=[1+2+3+4+6]
*%-----------------|-------------------------------------------------------------|
```

```
*#*******************************
*# DRAINAGE FROM 201B (EXTERNAL)
*#*******************************
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=1  NHYD="201B"  DT=5 min  AREA=13.4 ha  DWF=0.0 cms
                   CN=86.0  IA=5 mm  N=3.0  Tp=0.31 hrs  END=-1

*#*********************************************************************
*# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
*#*********************************************************************
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=2  NHYD="B1a"  DT=3 min  AREA=4.6 ha  DWF=0.0 cms
                   CN=87.02  IA=5 mm  N=3.0  Tp=0.17 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR    IDout=[4],   NHYD=["B1a"],  IDin=[2],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0 ,  0.0  ]
                                  [  0.034, 0.019]
                                  [  0.103, 0.029]
                                  [  0.142, 0.040]
                                  [  0.198, 0.062]
                                  [  0.241, 0.087]
                                  [  0.278, 0.114]
                                  [  0.310, 0.142]
                                  [  0.325, 0.158]
                                  [   -1  ,   -1  ]  (max twenty pts)
                         IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["B1aPND"], IDs to add=[4+8]
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["201B"], IDs to add=[1+2]
*%-----------------|-------------------------------------------------------------|
*#*****************************************************
*# Route NHYD=201B + B1a through Channel SMT-4
*#*****************************************************
ROUTE CHANNEL      ID=1  NHYD="SMT-4R" IDIN=3  DT=5.0 min
                   CHLGTH=600 m  CHSLP=0.85 %  FPSLP=0.85 %
                   VSN=CB1  NSEG=3
                   ROUGH DIST(m)
                     0.04  35
                    -0.03  45
                     0.04  90

                   DIST(m)  ELEV(m)
                      0.0    101.0
                     35.0    100.5
                     40.0    100.0
                     45.0    100.5
                     90.0    101.0
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=3  NHYD="B1b"  DT=3 min  AREA=5.0 ha  DWF=0.0 cms
                   CN=86.14  IA=5 mm  N=3.0  Tp=0.17 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=4  NHYD="B1c"  DT=3 min  AREA=1.0 ha  DWF=0.0 cms
                   CN=87.71  IA=5 mm  N=3.0  Tp=0.10 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["B1b/c"], IDs to add=[3+4]
*%-----------------|-------------------------------------------------------------|
*#*****************************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
*#*****************************************************
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["B1East"], IDs to add=[1+2]
```

```
*%-----------------|-------------------------------------------------------------|
*#################################################################################
*# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
*#################################################################################
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD     ID=[1], NHYD=["B1d"], DT=[3](min), AREA=[4.3](ha),
                   XIMP=[0.2535], TIMP=[0.2535], DWF=[0.0](cms), LOSS=[2],
                   SCS curve number CN=[86],
                   Pervious   surfaces: IAper=[5](mm), SLPP=[0.85](%),
                                        LGP=[30](m), MNP=[0.035], SCP=[0](min),
                   Impervious surfaces: IAimp=[0.5](mm), SLPI=[0.85](%),
                                        LGI=[50](m), MNI=[0.013], SCI=[0](min),
                   END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR    IDout=[4],   NHYD=["B1d"],  IDin=[1],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                  (cms) - (ha-m)
                                [  0.0 ,  0.0  ]
                                [  0.034, 0.031]
                                [  0.103, 0.048]
                                [  0.142, 0.065]
                                [  0.198, 0.101]
                                [  0.241, 0.139]
                                [  0.278, 0.180]
                                [  0.310, 0.223]
                                [   -1  ,  -1  ]  (max twenty pts)
                         IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[1], NHYD=["B1dPND"], IDs to add=[4+8]
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=2  NHYD="B1f"  DT=3 min  AREA=3.5 ha  DWF=0.0 cms
                   CN=87.36  IA=5 mm  N=3.0  Tp=0.11 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR    IDout=[4],   NHYD=["B1f"],  IDin=[2],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                  (cms) - (ha-m)
                                [  0.0 ,  0.0  ]
                                [  0.044, 0.025]
                                [  0.076, 0.038]
                                [  0.099, 0.052]
                                [  0.132, 0.081]
                                [  0.159, 0.112]
                                [  0.182, 0.145]
                                [  0.202, 0.181]
                                [  0.212, 0.199]
                                [   -1  ,  -1  ]  (max twenty pts)
                         IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["B1fPND"], IDs to add=[4+8]
*%-----------------|-------------------------------------------------------------|
CALIB STANDHYD     ID=[7], NHYD=["B1e"], DT=[3](min), AREA=[3.6](ha),
                   XIMP=[0.2694], TIMP=[0.2694], DWF=[0.0](cms), LOSS=[2],
                   SCS curve number CN=[86],
                   Pervious   surfaces: IAper=[5](mm), SLPP=[1.15](%),
                                        LGP=[30](m), MNP=[0.035], SCP=[0](min),
                   Impervious surfaces: IAimp=[0.5](mm), SLPI=[1.15](%),
                                        LGI=[50](m), MNI=[0.013], SCI=[0](min),
                   END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR    IDout=[6],   NHYD=["B1e"],  IDin=[7],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                  (cms) - (ha-m)
```

```
                                        SWM.dat
                                      [  0.0 , 0.0  ]
                                      [  0.034, 0.041]
                                      [  0.103, 0.062]
                                      [  0.142, 0.085]
                                      [  0.198, 0.133]
                                      [  0.241, 0.184]
                                      [  0.278, 0.240]
                                      [  0.310, 0.299]
                                      [   -1  ,  -1   ]  (max twenty pts)
                            IDovf=[8], NHYDovf=["OVR"]
*%----------------|-------------------------------------------------------|
ADD HYD           IDsum=[7], NHYD=["B1ePND"], IDs to add=[6+8]
*%----------------|-------------------------------------------------------|
ADD HYD           IDsum=[2], NHYD=["B1West"], IDs to add=[1+2+7]
*%----------------|-------------------------------------------------------|
*#*************************************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
*#*************************************************************
*%----------------|-------------------------------------------------------|
ADD HYD           IDsum=[4], NHYD=["SMT4"], IDs to add=[2+3]
*%----------------|-------------------------------------------------------|
*#*******************************
*# DRAINAGE FROM 201C (EXTERNAL)
*#*******************************
CALIB NASHYD      ID=1  NHYD="201C"  DT=5 min  AREA=91.0 ha  DWF=0.0 cms
                  CN=86.0  IA=5 mm  N=3.0  Tp=0.50 hrs  END=-1
*#*********************************************
*# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
*#*********************************************
*%----------------|-------------------------------------------------------|
CALIB NASHYD      ID=2  NHYD="C1a"  DT=5 min  AREA=7.0 ha  DWF=0.0 cms
                  CN=86.0  IA=5 mm  N=3.0  Tp=0.21 hrs  END=-1
*%----------------|-------------------------------------------------------|
*#*******************************************
*# C1a SWM FACILITY
*#*******************************************
ROUTE RESERVOIR   IDout=[6],   NHYD=["C1a"],  IDin=[2],
                  RDT=[5](min),
                        TABLE of ( OUTFLOW-STORAGE ) values
                                   (cms) - (ha-m)
                                 [  0.0 ,  0.0  ]
                                 [  0.034, 0.021]
                                 [  0.103, 0.032]
                                 [  0.142, 0.043]
                                 [  0.198, 0.067]
                                 [  0.241, 0.093]
                                 [  0.278, 0.120]
                                 [  0.310, 0.150]
                                 [  0.325, 0.165]
                                 [   -1  ,  -1   ]  (max twenty pts)
                            IDovf=[8], NHYDovf=["OVR"]
*%----------------|-------------------------------------------------------|
*#*******************************************
*# DISCHARGE FROM C1a SWM FACILITY
*#*******************************************
ADD HYD           IDsum=[2], NHYD=["C1aPND"], IDs to add=[6+8]
*%----------------|-------------------------------------------------------|
CALIB NASHYD      ID=3  NHYD="C1b"  DT=2 min  AREA=0.5 ha  DWF=0.0 cms
                  CN=86.54  IA=5 mm  N=3.0  Tp=0.04 hrs  END=-1
*%----------------|-------------------------------------------------------|
*#*************************************************************
*# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
*#*************************************************************
ADD HYD           IDsum=[2], NHYD=["EX+MC"], IDs to add=[1+2+3]
*%----------------|-------------------------------------------------------|
```

```
*#########################################
*# Route NHYD=201C through Channel SMT-1
*#########################################
ROUTE CHANNEL        ID=1  NHYD=["SMT-1"]  IDIN=2  DT=5.0 min
                     CHLGTH=275 m  CHSLP=0.50 %  FPSLP=0.50 %
                     VSN=CC1  NSEG=3
                     ROUGH DIST(m)
                       0.04  35
                      -0.03  45
                       0.04  90

                     DIST(m)  ELEV(m)
                        0.0    101.0
                       35.0    100.5
                       40.0    100.0
                       45.0    100.5
                       90.0    101.0

*%-----------------|-------------------------------------------------------|
CALIB NASHYD         ID=7,  NHYD=["C2"],  DT=3 min,  AREA=3.8 ha, DWF=0.0 cms,
                     CN=86.14, IA=5 mm, N=3.0, Tp=0.17 hrs,  END=-1
*%-----------------|-------------------------------------------------------|
*#################################################
*# TOTAL DRAINAGE FROM SUBCATCHMENTS
*# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
*#################################################
ADD HYD              IDsum=[1], NHYD=["SMT1"], IDs to add=[1+7]
*%-----------------|-------------------------------------------------------|
*#############################################
*# CONFLUENCE SMT 1-4
*#############################################
*%-----------------|-------------------------------------------------------|
ADD HYD              IDsum=[2], NHYD=["SMT1-4"], IDs to add=[4+1]
*%-----------------|-------------------------------------------------------|
*#############################
*# DRAINAGE FROM 201D (EXTERNAL)
*#############################
CALIB NASHYD         ID=2  NHYD="201D"  DT=5 min  AREA=28.9 ha  DWF=0.0 cms
                     CN=86.0  IA=5 mm  N=3.0  Tp=0.41 hrs  END=-1
*%-----------------|-------------------------------------------------------|
*#########################
*# SUBCATCHMENT 201D ROUTED
*# THROUGH Channel SMT-3
*#########################
*%-----------------|-------------------------------------------------------|
ROUTE CHANNEL        ID=3  NHYD="SMT-3R"  IDIN=2  DT=5.0 min
                     CHLGTH=100 m  CHSLP=0.70 %  FPSLP=0.70 %
                     VSN=CD1  NSEG=3
                     ROUGH DIST(m)
                       0.04  10
                      -0.03  15
                       0.04  20

                     DIST(m)  ELEV(m)
                        0.0    178.0
                       26.0    177.6
                       30.0    176.0
                       34.0    177.57
                       50.0    178.0
*%-----------------|-------------------------------------------------------|
*#####################################
*# DRAINAGE FROM CEMETERY LANDS D1a, D1b
*#####################################
*%-----------------|-------------------------------------------------------|
CALIB NASHYD         ID=2,  NHYD=["D1a"],  DT=3 min,  AREA=1.9 ha,  DWF=0.0 cms
```

```
                    CN=87.99,  IA=5 mm,  N=3.0,  Tp=0.13 hrs,  END=-1
*%-----------------|-------------------------------------------------------|
CALIB NASHYD        ID=7,  NHYD=["D1b"],  DT=3 min,  AREA=1.9 ha,  DWF=0.0 cms
                    CN=86.0,  IA=5 mm,  N=3.0,  Tp=0.09 hrs,  END=-1
*%-----------------|-------------------------------------------------------|
*#*********************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
*#*********************************************
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["SMT3"], IDs to add=[2+3+7]
*%-----------------|-------------------------------------------------------|
*#*********************************************
*# CONFLUENCE SMT 1-3
*#*********************************************
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["SMT1-3"], IDs to add=[1+4+6]
*%-----------------|-------------------------------------------------------|
*#*****************************************************************
*# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
*#*****************************************************************
ADD HYD             ID=[8]   NHYD=["1201"] IDs to add=[1+4+6+5]
*%-----------------|-------------------------------------------------------|
*Route NHYD=201 through Channel 202
ROUTE CHANNEL       ID=3  NHYD=2202  IDIN=8  DT=5.0 min
                    CHLGTH=475 m  CHSLP=1.05 %  FPSLP=1.05 %
                    VSN=202  NSEG=3
                    ROUGH DIST(m)
                      0.04  55
                     -0.03  56
                      0.04  105

                    DIST(m)  ELEV(m)
                       0.0    180.0
                      15.0    175.0
                      55.0    174.9
                      55.5    174.6
                      56.0    174.9
                      70.0    175.0
                     105.0    180.0
*
* Subarea 202
CALIB NASHYD        ID= 4  NHYD=202  DT=5 min  AREA=21.6 ha  DWF=0.0 cms
                    CN=86.8  IA=2.5 mm  N=3.0  Tp=0.303 hrs  END=-1
*
ADD HYD             ID=2   NHYD=1202 IDI=3  IDII=4
*
* Subarea 203
CALIB NASHYD        ID= 3  NHYD=203  DT=5 min  AREA=26.3 ha  DWF=0.0 cms
                    CN=86.8  IA=2.5mm  N=3.0  Tp=0.240 hrs  END=-1
*
* Node 003 - exit from site
ADD HYD             ID= 4  NHYD=003  IDI=3  IDII=2
PRINT HYD           ID= 4  NPCYC=-1
*
*#*************************************************************
*# SUBCATCHMENT 204 AREA REVISED
*# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
*#*************************************************************
*
*Subarea 204 - off site
CALIB NASHYD        ID= 2  NHYD=204  DT=5 min  AREA=53.6 ha  DWF=0.0 cms
                    CN=87.6  IA=5 mm  N=3.0  Tp=0.626 hrs  END=-1
*
ADD HYD             ID= 3  NHYD= 1204  IDI= 2  IDII= 4
*
```

```
*#*************************************************************
*# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
*#*************************************************************
*
*#*********************************************************
*# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
*#*********************************************************
*
* Confluence of tributaries off site
*#*********************************************************
*# ID REVISED TO ID=9, PREVIOUSLY ID=1
*#*********************************************************
ADD HYD              ID=2  NHYD=008  IDI=9  IDII=3
PRINT HYD            ID=2  NPCYC=-1
*#*********************************************************
*
START                START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=2
                     MILSCS12.005
*
START                START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=3
                     MILSCS12.010
*
START                START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=4
                     MILSCS12.025
*
START                START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=5
                     MILSCS12.050
*
START                START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=6
                     MILSCS12.100



FINISH
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
    S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                    9   9  9   9 # 3569108
     StormWater Management HYdrologic Model          999    999  =========

*****************************************************************************
*************************** SWMHYMO-99 Ver/4.02 ***************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*****************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.Com                  *******
*****************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: Philips Engineering Ltd                       +++++++
+++++++                Burlington          SERIAL#:3569108          +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*****************************************************************************
*******           ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *******
*******           Maximum value for ID numbers  :     10           *******
*******           Max. number of rainfall points:  15000           *******
*******           Max. number of flow points    :  15000           *******
*****************************************************************************

*** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
***-----------------------------------------------------------------------***
***    ID:  Hydrograph IDentification numbers, (1-10).                    ***
***  NHYD:  Hydrograph reference numbers, (6 digits or characters).       ***
***  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).     ***
*** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).       ***
*** TpeakDate_hh:mm is the date and time of the peak flow.                ***
***  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).          ***
***  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).          ***
***    *:   see WARNING or NOTE message printed at end of run.           ***
***   **:   see  ERROR  message printed at end of run.                   ***
*****************************************************************************
*****************************************************************************

:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

*****************************************************************************

*********************   S U M M A R Y   O U T P U T   *********************
*****************************************************************************
*       DATE: 2011-12-06     TIME: 12:10:18     RUN COUNTER: 000138        *
*****************************************************************************
* Input   filename: G:\Work\105128\water\SWMHYMO\2011NO~1\SWM.dat            *
* Output  filename: G:\Work\105128\water\SWMHYMO\2011NO~1\SWM.out            *
* Summary filename: G:\Work\105128\water\SWMHYMO\2011NO~1\SWM.sum            *
* User comments:                                                            *
* 1:_____________________________________________________________________*
* 2:_____________________________________________________________________*
* 3:_____________________________________________________________________*
*****************************************************************************
```

```
#******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#******************************************************************************
 RUN:COMMAND#
 001:0001-------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
 001:0002-------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = TOWN OF MILTON 12 HOUR 2 YEAR SCS STORM (1998 IDF DATA)
      [SDT=12.00:SDUR=  12.00:PTOT=  42.82]
 001:0003---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:000103    42.10    1.550 No_date    6:18   19.90 .465
      [CN= 86.0: N= 3.00]
      [Tp=  .40:DT= 6.00]
 001:0004---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:000103    42.10    1.550 No_date    6:18   19.90  n/a
      [RDT= 6.00] out<- 02:002104    42.10    1.365 No_date    6:30   19.90  n/a
      [L/S/n=  440./1.000/.030]
      {Vmax=  .616:Dmax=  .476}
 001:0005---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000104    24.10    1.349 No_date    6:06   19.90 .465
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
 001:0006---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000104    24.10    1.349 No_date    6:06   19.90  n/a
                       + 02:002104    42.10    1.365 No_date    6:30   19.90  n/a
      [DT= 6.00]  SUM=   01:001104    66.20    2.167 No_date    6:12   19.90  n/a
 001:0007---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001104    66.20    2.167 No_date    6:12   19.90  n/a
      [RDT= 6.00] out<- 02:002105    66.20    1.825 No_date    6:30   19.90  n/a
      [L/S/n=  365./ .400/.030]
      {Vmax=  .367:Dmax=  .456}
 001:0008---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000105    19.20    1.210 No_date    6:00   20.59 .481
      [CN= 86.8: N= 3.00]
      [Tp=  .18:DT= 6.00]
 001:0009---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000105    19.20    1.210 No_date    6:00   20.59  n/a
                       + 02:002105    66.20    1.825 No_date    6:30   19.90  n/a
      [DT= 6.00]  SUM=   01:001105    85.40    2.302 No_date    6:12   20.06  n/a
 001:0010---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001105    85.40    2.302 No_date    6:12   20.06  n/a
      [RDT= 6.00] out<- 02:002106    85.40    2.166 No_date    6:30   20.06  n/a
      [L/S/n=  385./ .670/.030]
      {Vmax=  .536:Dmax=  .448}
 001:0011---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000106    15.30    1.020 No_date    6:00   20.95 .489
      [CN= 87.2: N= 3.00]
      [Tp=  .17:DT= 6.00]
 001:0012---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000106    15.30    1.020 No_date    6:00   20.95  n/a
                       + 02:002106    85.40    2.166 No_date    6:30   20.06  n/a
      [DT= 6.00]  SUM=   01:001106   100.70    2.496 No_date    6:18   20.19  n/a
 001:0013---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      03:000107    15.27     .309 No_date    6:00   24.51 .572
```

```
     [XIMP=.10:TIMP=.17]
     [LOSS= 2 :CN= 88.0]
     [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=    .0]
     [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=    .0]
001:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:001106   100.70    2.496 No_date    6:18   20.19  n/a
                    +   03:000107    15.27     .309 No_date    6:00   24.51  n/a
     [DT= 6.00]  SUM=   02:001107   115.97    2.662 No_date    6:18   20.76  n/a
001:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 02:001107   115.97    2.662 No_date    6:18   20.76  n/a
     [RDT= 6.00] out<- 01:002108   115.97    2.426 No_date    6:42   20.76  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.288:Dmax=  .530}
001:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:000108    33.50    1.559 No_date    6:12   20.59 .481
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
001:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:002108   115.97    2.426 No_date    6:42   20.76  n/a
                    +   02:000108    33.50    1.559 No_date    6:12   20.59  n/a
     [DT= 6.00]  SUM=   03:000004   149.47    3.445 No_date    6:18   20.72  n/a
001:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           03:000004   149.47    3.445 No_date    6:18   20.72  n/a
001:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD      04:000101   287.80    4.326 No_date    6:42   25.83 .603
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=    .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=    .0]
001:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 04:000101   287.80    4.326 No_date    6:42   25.83  n/a
     [RDT= 6.00] out<- 05:002101   287.80    4.264 No_date    7:48   25.83  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .508:Dmax=  .579}
001:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      04:000102   272.90    6.080 No_date    6:00   21.82 .510
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 84.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=    .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=    .0]
001:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:000102   272.90    6.080 No_date    6:00   21.82  n/a
                    +   05:002101   287.80    4.264 No_date    7:48   25.83  n/a
     [DT= 6.00]  SUM=   06:000001   560.70    7.428 No_date    7:42   23.88  n/a
001:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           06:000001   560.70    7.428 No_date    7:42   23.88  n/a
001:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:000001   560.70    7.428 No_date    7:42   23.88  n/a
     [RDT= 6.00] out<- 04:002109   560.70    7.227 No_date    7:54   23.88  n/a
     [L/S/n= 1000./ .540/.030]
     {Vmax=  .938:Dmax=  .777}
001:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        05:000109    35.10    1.570 No_date    6:12   20.59 .481
     [CN= 86.8: N= 3.00]
     [Tp=  .32:DT= 6.00]
001:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:002109   560.70    7.227 No_date    7:54   23.88  n/a
                    +   05:000109    35.10    1.570 No_date    6:12   20.59  n/a
     [DT= 6.00]  SUM=   06:001109   595.80    7.409 No_date    7:54   23.68  n/a
001:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:001109   595.80    7.409 No_date    7:54   23.68  n/a
     [RDT= 6.00] out<- 04:002110   595.80    7.199 No_date    8:12   23.68  n/a
     [L/S/n=  900./ .710/.030]
     {Vmax=  .803:Dmax=  .715}
001:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     CALIB NASHYD       05:000110    21.80    1.270 No_date    6:06   20.95 .489
      [CN= 87.2: N= 3.00]
      [Tp=  .22:DT= 6.00]
 001:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:002110   595.80    7.199 No_date    8:12   23.68  n/a
                    +   05:000110    21.80    1.270 No_date    6:06   20.95  n/a
      [DT= 6.00]  SUM=  06:001110   617.60    7.301 No_date    8:06   23.59  n/a
 001:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:001110   617.60    7.301 No_date    8:06   23.59  n/a
      [RDT= 6.00] out<- 04:002111   617.60    7.223 No_date    8:18   23.59  n/a
      [L/S/n=  920./1.250/.030]
      {Vmax= 1.164:Dmax=  .530}
 001:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000111    17.30     .926 No_date    6:06   20.24 .473
      [CN= 86.4: N= 3.00]
      [Tp=  .23:DT= 6.00]
 001:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:000111    17.30     .926 No_date    6:06   20.24  n/a
                    +   04:002111   617.60    7.223 No_date    8:18   23.59  n/a
      [DT= 6.00]  SUM=  02:000002   634.90    7.293 No_date    8:18   23.50  n/a
 001:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000002   634.90    7.293 No_date    8:18   23.50  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 001:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000004   149.47    3.445 No_date    6:18   20.72  n/a
                    +   02:000002   634.90    7.293 No_date    8:18   23.50  n/a
      [DT= 6.00]  SUM=  09:001108   784.37    8.531 No_date    8:06   22.97  n/a
#*********************************************************
#*************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 001:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201A      68.20    2.032 No_date    6:24   18.06 .422
      [CN= 86.0: N= 3.00]
      [Tp=  .47:DT= 6.00]
#Route NHYD=201A through Channel SMT-2
 001:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201A      68.20    2.032 No_date    6:24   18.06  n/a
      [RDT= 6.00] out<- 02:SMT-2R    68.20    1.979 No_date    6:30   18.06  n/a
      [L/S/n=  450./ .750/.030]
      {Vmax= 1.046:Dmax=  .439}
#*********************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*********************************************
 001:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:A1a         .80     .038 No_date    6:06   19.46 .455
      [CN= 87.7: N= 3.00]
      [Tp=  .27:DT= 6.00]
 001:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:A1b        6.10     .524 No_date    6:00   18.17 .424
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 001:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:A1c        3.20     .219 No_date    6:03   19.08 .446
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 001:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:A1d        5.30     .290 No_date    6:06   19.14 .447
```

```
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 001:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d          5.30      .290 No_date    6:06   19.14  n/a
      [RDT= 6.00] out<- 07:A1d          5.30      .103 No_date    6:30   19.14  n/a
            overflow <= 08:OVR           .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.4308E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:A1d          5.30      .103 No_date    6:30   19.14  n/a
                      + 08:OVR           .00      .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  06:A1dPND       5.30      .103 No_date    6:30   19.14  n/a
#*****************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*****************************************************************
 001:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:A1a           .80      .038 No_date    6:06   19.46  n/a
                      + 02:SMT-2R      68.20     1.979 No_date    6:30   18.06  n/a
                      + 03:A1b          6.10      .524 No_date    6:00   18.17  n/a
                      + 04:A1c          3.20      .219 No_date    6:03   19.08  n/a
                      + 06:A1dPND       5.30      .103 No_date    6:30   19.14  n/a
      [DT= 3.00]  SUM=  05:SMT2        83.60     2.211 No_date    6:24   18.29  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 001:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201B        13.40      .537 No_date    6:12   18.06 .422
      [CN= 86.0: N= 3.00]
      [Tp=  .31:DT= 6.00]
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 001:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1a          4.60      .280 No_date    6:03   18.89 .441
      [CN= 87.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 001:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1a          4.60      .280 No_date    6:03   18.89  n/a
      [RDT= 3.00] out<- 04:B1a          4.60      .116 No_date    6:21   18.89  n/a
            overflow <= 08:OVR           .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.3268E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1a          4.60      .116 No_date    6:21   18.89  n/a
                      + 08:OVR           .00      .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  02:B1aPND       4.60      .116 No_date    6:21   18.89  n/a
 001:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201B        13.40      .537 No_date    6:12   18.06  n/a
                      + 02:B1aPND       4.60      .116 No_date    6:21   18.89  n/a
      [DT= 3.00]  SUM=  03:201B        18.00      .642 No_date    6:12   18.28  n/a
#*********************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*********************************************************
 001:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:201B        18.00      .642 No_date    6:12   18.28  n/a
  *   [RDT= 3.00] out<- 01:SMT-4R      18.00      .543 No_date    6:24   18.28  n/a
      [L/S/n=  600./ .850/.030]
      {Vmax=  .817:Dmax=  .277}
 001:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:B1b          5.00      .291 No_date    6:03   18.17 .424
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
 001:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:B1c          1.00      .082 No_date    6:00   19.48 .455
      [CN= 87.7: N= 3.00]
      [Tp=  .10:DT= 3.00]
 001:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     ADD HYD              03:B1b          5.00      .291 No_date    6:03    18.17  n/a
                      +   04:B1c          1.00      .082 No_date    6:00    19.48  n/a
       [DT= 3.00]   SUM=  02:B1b/c        6.00      .366 No_date    6:03    18.39  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*************************************************************
 001:0053--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD              01:SMT-1R     18.00      .543 No_date    6:24    18.28  n/a
                      +   02:B1b/c       6.00      .366 No_date    6:03    18.39  n/a
       [DT= 3.00]   SUM=  03:B1East     24.00      .712 No_date    6:15    18.30  n/a
#*************************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*************************************************************************
 001:0054--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      01:B1d          4.30      .415 No_date    6:00    24.21 .565
       [XIMP=.25:TIMP=.25]
       [LOSS= 2 :CN= 86.0]
       [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=    .0]
       [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=    .0]
 001:0055--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 01:B1d          4.30      .415 No_date    6:00    24.21  n/a
       [RDT= 3.00] out<- 04:B1d          4.30      .103 No_date    6:15    24.21  n/a
             overflow <= 08:OVR           .00      .000 No_date    0:00      .00  n/a
     {MxStoUsed=.4822E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0056--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD              04:B1d          4.30      .103 No_date    6:15    24.21  n/a
                      +   08:OVR           .00      .000 No_date    0:00      .00  n/a
       [DT= 3.00]   SUM=  01:B1dPND       4.30      .103 No_date    6:15    24.21  n/a
 001:0057--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD         02:B1f          3.50      .268 No_date    6:00    19.18 .448
       [CN= 87.4: N= 3.00]
       [Tp=  .11:DT= 3.00]
 001:0058--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1f          3.50      .268 No_date    6:00    19.18  n/a
       [RDT= 3.00] out<- 04:B1f          3.50      .057 No_date    6:21    19.18  n/a
             overflow <= 08:OVR           .00      .000 No_date    0:00      .00  n/a
     {MxStoUsed=.3035E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0059--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD              04:B1f          3.50      .057 No_date    6:21    19.18  n/a
                      +   08:OVR           .00      .000 No_date    0:00      .00  n/a
       [DT= 3.00]   SUM=  02:B1fPND       3.50      .057 No_date    6:21    19.18  n/a
 001:0060--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      07:B1e          3.60      .358 No_date    6:00    24.60 .574
       [XIMP=.27:TIMP=.27]
       [LOSS= 2 :CN= 86.0]
       [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=    .0]
       [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=    .0]
 001:0061--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 07:B1e          3.60      .358 No_date    6:00    24.60  n/a
       [RDT= 3.00] out<- 06:B1e          3.60      .053 No_date    6:24    24.60  n/a
             overflow <= 08:OVR           .00      .000 No_date    0:00      .00  n/a
     {MxStoUsed=.4674E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0062--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD              06:B1e          3.60      .053 No_date    6:24    24.60  n/a
                      +   08:OVR           .00      .000 No_date    0:00      .00  n/a
       [DT= 3.00]   SUM=  07:B1ePND       3.60      .053 No_date    6:24    24.60  n/a
 001:0063--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD              01:B1dPND       4.30      .103 No_date    6:15    24.21  n/a
                      +   02:B1West      3.50      .057 No_date    6:21    19.18  n/a
                      +   07:B1ePND      3.60      .053 No_date    6:24    24.60  n/a
       [DT= 3.00]   SUM=  02:B1West     11.40      .212 No_date    6:18    22.79  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*************************************************************
 001:0064--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     ADD HYD            02:B1West     11.40      .212 No_date    6:18    22.79  n/a
                    +   03:B1East     24.00      .712 No_date    6:15    18.30  n/a
      [DT= 3.00]  SUM=  04:SMT4       35.40      .922 No_date    6:15    19.75  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
#*******************************
 001:0065--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201C      91.00    2.603 No_date    6:24    18.06 .422
      [CN= 86.0: N= 3.00]
      [Tp=  .50:DT= 6.00]
#*************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*************************************
 001:0066--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:C1a        7.00      .360 No_date    6:06    18.06 .422
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
#*************************************
# C1a SWM FACILITY
#*************************************
 001:0067--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a        7.00      .360 No_date    6:06    18.06  n/a
      [RDT= 6.00] out<- 06:C1a        7.00      .149 No_date    6:30    18.06  n/a
            overflow <= 08:OVR         .00      .000 No_date    0:00      .00  n/a
     {MxStoUsed=.4651E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
#*************************************
# DISCHARGE FROM C1a SWM FACILITY
#*************************************
 001:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            06:C1a        7.00      .149 No_date    6:30    18.06  n/a
                    +   08:OVR         .00      .000 No_date    0:00      .00  n/a
      [DT= 6.00]  SUM=  02:C1aPND     7.00      .149 No_date    6:30    18.06  n/a
 001:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:C1b         .50      .047 No_date    6:00    18.49 .432
      [CN= 86.5: N= 3.00]
      [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 001:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201C      91.00    2.603 No_date    6:24    18.06  n/a
                    +   02:EX+MC      7.00      .149 No_date    6:30    18.06  n/a
                    +   03:C1b         .50      .047 No_date    6:00    18.49  n/a
      [DT= 2.00]  SUM=  02:EX+MC     98.50    2.757 No_date    6:24    18.07  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 001:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:EX+MC     98.50    2.757 No_date    6:24    18.07  n/a
  *    [RDT= 2.00] out<- 01:SMT-1    98.50    2.704 No_date    6:28    18.07  n/a
      [L/S/n=  275./ .500/.030]
      {Vmax=  .960:Dmax=  .525}
 001:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:C2         3.80      .222 No_date    6:03    18.17 .424
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 001:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      98.50    2.704 No_date    6:28    18.07  n/a
                    +   07:C2         3.80      .222 No_date    6:03    18.17  n/a
      [DT= 2.00]  SUM=  01:SMT1     102.30    2.771 No_date    6:26    18.07  n/a
#*****************************************
```

```
# CONFLUENCE SMT 1-4
#*****************************************
 001:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:SMT4       35.40      .922 No_date    6:15   19.75  n/a
                       + 01:SMT1      102.30     2.771 No_date    6:26   18.07  n/a
       [DT= 2.00]  SUM=  02:SMT1-4    137.70     3.627 No_date    6:24   18.50  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 001:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:201D       28.90      .955 No_date    6:18   18.06 .422
       [CN= 86.0: N= 3.00]
       [Tp=  .41:DT= 6.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 001:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D       28.90      .955 No_date    6:18   18.06  n/a
       [RDT= 6.00] out<- 03:SMT-3R     28.90      .955 No_date    6:18   18.06  n/a
       [L/S/n=  100./ .700/.030]
       {Vmax= 1.039:Dmax=  .600}
#*************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#*************************************
 001:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:D1a         1.90      .138 No_date    6:03   19.73 .461
       [CN= 88.0: N= 3.00]
       [Tp=  .13:DT= 3.00]
 001:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        07:D1b         1.90      .150 No_date    6:00   18.06 .422
       [CN= 86.0: N= 3.00]
       [Tp=  .09:DT= 3.00]
#*********************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*********************************************
 001:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:D1a         1.90      .138 No_date    6:03   19.73  n/a
                       + 03:SMT-3R     28.90      .955 No_date    6:18   18.06  n/a
                       + 07:D1b         1.90      .150 No_date    6:00   18.06  n/a
       [DT= 3.00]  SUM=  06:SMT3       32.70     1.034 No_date    6:18   18.16  n/a
#*******************************************
# CONFLUENCE SMT 1-3
#*******************************************
 001:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     2.771 No_date    6:26   18.07  n/a
                       + 04:SMT4       35.40      .922 No_date    6:15   19.75  n/a
                       + 06:SMT3       32.70     1.034 No_date    6:18   18.16  n/a
       [DT= 2.00]  SUM=  03:SMT1-3    170.40     4.613 No_date    6:24   18.44  n/a
#*************************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*************************************************************************
 001:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     2.771 No_date    6:26   18.07  n/a
                       + 04:SMT4       35.40      .922 No_date    6:15   19.75  n/a
                       + 06:SMT3       32.70     1.034 No_date    6:18   18.16  n/a
                       + 05:SMT2       83.60     2.211 No_date    6:24   18.29  n/a
       [DT= 2.00]  SUM=  08:1201      254.00     6.824 No_date    6:24   18.39  n/a
 001:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 08:1201      254.00     6.824 No_date    6:24   18.39  n/a
  *    [RDT= 2.00] out<- 03:002202    254.00     6.497 No_date    6:32   18.39  n/a
       [L/S/n=  475./1.050/.030]
       {Vmax=  .937:Dmax=  .439}
 001:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:000202     21.60      .992 No_date    6:12   20.59 .481
```

```
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 001:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:002202   254.00    6.497 No_date    6:32   18.39  n/a
                       + 04:000202    21.60     .992 No_date    6:12   20.59  n/a
      [DT= 2.00]  SUM=   02:001202   275.60    7.099 No_date    6:30   18.56  n/a
 001:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000203    26.30    1.414 No_date    6:06   20.59 .481
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 001:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000203    26.30    1.414 No_date    6:06   20.59  n/a
                       + 02:001202   275.60    7.099 No_date    6:30   18.56  n/a
      [DT= 2.00]  SUM=   04:000003   301.90    7.789 No_date    6:26   18.74  n/a
 001:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           04:000003   301.90    7.789 No_date    6:26   18.74  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 001:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:000204    53.60    1.399 No_date    6:30   19.39 .453
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 001:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:000204    53.60    1.399 No_date    6:30   19.39  n/a
                       + 04:000003   301.90    7.789 No_date    6:26   18.74  n/a
      [DT= 2.00]  SUM=   03:001204   355.50    9.158 No_date    6:26   18.84  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 001:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             09:001108   784.37    8.531 No_date    8:06   22.97  n/a
                       + 03:001204   355.50    9.158 No_date    6:26   18.84  n/a
      [DT= 2.00]  SUM=   02:000008  1139.87   17.516 No_date    6:26   21.68  n/a
 001:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           02:000008  1139.87   17.516 No_date    6:26   21.68  n/a
#*************************************************************
  ** END OF RUN :   1

********************************************************************************



 RUN:COMMAND#
 002:0001-------------------------------------------------------------------------
     START
      [TZERO =     .00 hrs on        0]
      [METOUT=   2     (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   2 ]
#*******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
```

```
#*******************************************************************************
 002:0002-------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = TOWN OF MILTON 12 HOUR 5 YEAR SCS STORM (1998 IDF DATA)
      [SDT=12.00:SDUR=  12.00:PTOT=  59.90]
 002:0003---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:000103    42.10    2.620 No_date    6:18   33.36 .557
      [CN= 86.0: N= 3.00]
      [Tp=  .40:DT= 6.00]
 002:0004---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:000103    42.10    2.620 No_date    6:18   33.36  n/a
      [RDT= 6.00] out<- 02:002104    42.10    2.367 No_date    6:24   33.36  n/a
      [L/S/n=  440./1.000/.030]
      {Vmax=  .674:Dmax=  .523}
 002:0005---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000104    24.10    2.266 No_date    6:06   33.36 .557
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
 002:0006---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000104    24.10    2.266 No_date    6:06   33.36  n/a
                       + 02:002104    42.10    2.367 No_date    6:24   33.36  n/a
      [DT= 6.00]  SUM=   01:001104    66.20    3.774 No_date    6:12   33.36  n/a
 002:0007---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001104    66.20    3.774 No_date    6:12   33.36  n/a
      [RDT= 6.00] out<- 02:002105    66.20    3.330 No_date    6:24   33.36  n/a
      [L/S/n=  365./ .400/.030]
      {Vmax=  .447:Dmax=  .501}
 002:0008---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000105    19.20    2.033 No_date    6:00   34.31 .573
      [CN= 86.8: N= 3.00]
      [Tp=  .18:DT= 6.00]
 002:0009---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000105    19.20    2.033 No_date    6:00   34.31  n/a
                       + 02:002105    66.20    3.330 No_date    6:24   33.36  n/a
      [DT= 6.00]  SUM=   01:001105    85.40    4.327 No_date    6:12   33.57  n/a
 002:0010---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001105    85.40    4.327 No_date    6:12   33.57  n/a
      [RDT= 6.00] out<- 02:002106    85.40    4.052 No_date    6:24   33.57  n/a
      [L/S/n=  385./ .670/.030]
      {Vmax=  .643:Dmax=  .514}
 002:0011---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000106    15.30    1.704 No_date    6:00   34.79 .581
      [CN= 87.2: N= 3.00]
      [Tp=  .17:DT= 6.00]
 002:0012---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000106    15.30    1.704 No_date    6:00   34.79  n/a
                       + 02:002106    85.40    4.052 No_date    6:24   33.57  n/a
      [DT= 6.00]  SUM=   01:001106   100.70    4.757 No_date    6:18   33.76  n/a
 002:0013---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      03:000107    15.27     .416 No_date    6:00   39.17 .654
      [XIMP=.10:TIMP=.17]
      [LOSS= 2 :CN= 88.0]
      [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
 002:0014---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:001106   100.70    4.757 No_date    6:18   33.76  n/a
                       + 03:000107    15.27     .416 No_date    6:00   39.17  n/a
      [DT= 6.00]  SUM=   02:001107   115.97    4.936 No_date    6:18   34.47  n/a
 002:0015---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:001107   115.97    4.936 No_date    6:18   34.47  n/a
      [RDT= 6.00] out<- 01:002108   115.97    4.469 No_date    6:30   34.47  n/a
      [L/S/n= 1300./1.670/.030]
      {Vmax= 1.530:Dmax=  .739}
 002:0016---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    CALIB NASHYD       02:000108    33.50    2.609 No_date    6:12   34.31 .573
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
002:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:002108   115.97    4.469 No_date    6:30   34.47  n/a
                     + 02:000108    33.50    2.609 No_date    6:12   34.31  n/a
     [DT= 6.00]  SUM=  03:000004   149.47    6.397 No_date    6:18   34.44  n/a
002:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD          03:000004   149.47    6.397 No_date    6:18   34.44  n/a
002:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     04:000101   287.80    5.852 No_date    6:30   40.72 .680
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
002:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:000101   287.80    5.852 No_date    6:30   40.72  n/a
     [RDT= 6.00] out<- 05:002101   287.80    5.169 No_date    6:48   40.72  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .590:Dmax=  .627}
002:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD     04:000102   272.90    9.096 No_date    6:00   35.71 .596
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 84.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
002:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:000102   272.90    9.096 No_date    6:00   35.71  n/a
                     + 05:002101   287.80    5.169 No_date    6:48   40.72  n/a
     [DT= 6.00]  SUM=  06:000001   560.70   10.973 No_date    7:24   38.28  n/a
002:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD          06:000001   560.70   10.973 No_date    7:24   38.28  n/a
002:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 06:000001   560.70   10.973 No_date    7:24   38.28  n/a
     [RDT= 6.00] out<- 04:002109   560.70   10.670 No_date    7:30   38.28  n/a
     [L/S/n= 1000./ .540/.030]
     {Vmax= 1.003:Dmax=  .890}
002:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:000109    35.10    2.633 No_date    6:12   34.31 .573
     [CN= 86.8: N= 3.00]
     [Tp=  .32:DT= 6.00]
002:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:002109   560.70   10.670 No_date    7:30   38.28  n/a
                     + 05:000109    35.10    2.633 No_date    6:12   34.31  n/a
     [DT= 6.00]  SUM=  06:001109   595.80   11.000 No_date    7:30   38.05  n/a
002:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 06:001109   595.80   11.000 No_date    7:30   38.05  n/a
     [RDT= 6.00] out<- 04:002110   595.80   10.801 No_date    7:48   38.05  n/a
     [L/S/n=  900./ .710/.030]
     {Vmax=  .849:Dmax=  .763}
002:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:000110    21.80    2.112 No_date    6:06   34.79 .581
     [CN= 87.2: N= 3.00]
     [Tp=  .22:DT= 6.00]
002:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:002110   595.80   10.801 No_date    7:48   38.05  n/a
                     + 05:000110    21.80    2.112 No_date    6:06   34.79  n/a
     [DT= 6.00]  SUM=  06:001110   617.60   10.976 No_date    7:48   37.93  n/a
002:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 06:001110   617.60   10.976 No_date    7:48   37.93  n/a
     [RDT= 6.00] out<- 04:002111   617.60   10.929 No_date    7:54   37.93  n/a
     [L/S/n=  920./1.250/.030]
     {Vmax= 1.316:Dmax=  .648}
002:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:000111    17.30    1.556 No_date    6:06   33.83 .565
```

```
      [CN= 86.4: N= 3.00]
      [Tp=  .23:DT= 6.00]
 002:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:000111    17.30     1.556 No_date    6:06   33.83  n/a
                    +   04:002111   617.60    10.929 No_date    7:54   37.93  n/a
      [DT= 6.00]  SUM=  02:000002   634.90    11.066 No_date    7:54   37.82  n/a
 002:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000002   634.90    11.066 No_date    7:54   37.82  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 002:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000004   149.47     6.397 No_date    6:18   34.44  n/a
                    +   02:000002   634.90    11.066 No_date    7:54   37.82  n/a
      [DT= 6.00]  SUM=  09:001108   784.37    15.005 No_date    6:24   37.18  n/a
#*********************************************************
#*************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 002:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201A      68.20     3.579 No_date    6:18   31.31 .523
      [CN= 86.0: N= 3.00]
      [Tp=  .47:DT= 6.00]
#Route NHYD=201A through Channel SMT-2
 002:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201A      68.20     3.579 No_date    6:18   31.31  n/a
      [RDT= 6.00] out<- 02:SMT-2R    68.20     3.503 No_date    6:24   31.31  n/a
      [L/S/n=  450./ .750/.030]
      {Vmax= 1.190:Dmax=  .534}
#*********************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*********************************************
 002:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:A1a         .80      .066 No_date    6:06   33.28 .556
      [CN= 87.7: N= 3.00]
      [Tp=  .27:DT= 6.00]
 002:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:A1b        6.10      .892 No_date    6:00   31.46 .525
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 002:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:A1c        3.20      .374 No_date    6:03   32.74 .547
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 002:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:A1d        5.30      .499 No_date    6:06   32.82 .548
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 002:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d        5.30      .499 No_date    6:06   32.82  n/a
      [RDT= 6.00] out<- 07:A1d        5.30      .167 No_date    6:30   32.82  n/a
           overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.7395E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:A1d        5.30      .167 No_date    6:30   32.82  n/a
                    +   08:OVR          .00      .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  06:A1dPND      5.30      .167 No_date    6:30   32.82  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*************************************************************
```

```
 002:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:A1a          .80      .066 No_date    6:06   33.28  n/a
                      + 02:SMT-2R     68.20     3.503 No_date    6:24   31.31  n/a
                      + 03:A1b         6.10      .892 No_date    6:00   31.46  n/a
                      + 04:A1c         3.20      .374 No_date    6:03   32.74  n/a
                      + 06:A1dPND      5.30      .167 No_date    6:30   32.82  n/a
       [DT= 3.00]  SUM= 05:SMT2       83.60     3.918 No_date    6:24   31.55  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 002:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201B      13.40      .942 No_date    6:12   31.31 .523
       [CN= 86.0: N= 3.00]
       [Tp=  .31:DT= 6.00]
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 002:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1a         4.60      .484 No_date    6:03   32.48 .542
       [CN= 87.0: N= 3.00]
       [Tp=  .17:DT= 3.00]
 002:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1a         4.60      .484 No_date    6:03   32.48  n/a
       [RDT= 3.00] out<- 04:B1a        4.60      .185 No_date    6:24   32.48  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.5711E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1a         4.60      .185 No_date    6:24   32.48  n/a
                      + 08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 3.00]  SUM= 02:B1aPND       4.60      .185 No_date    6:24   32.48  n/a
 002:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201B      13.40      .942 No_date    6:12   31.31  n/a
                      + 02:B1aPND      4.60      .185 No_date    6:24   32.48  n/a
       [DT= 3.00]  SUM= 03:201B       18.00     1.113 No_date    6:12   31.61  n/a
#*********************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*********************************************************
 002:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:201B      18.00     1.113 No_date    6:12   31.61  n/a
  *    [RDT= 3.00] out<- 01:SMT-4R   18.00      .979 No_date    6:21   31.61  n/a
       [L/S/n=  600./ .850/.030]
       {Vmax=  .943:Dmax=  .342}
 002:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:B1b         5.00      .509 No_date    6:03   31.47 .525
       [CN= 86.1: N= 3.00]
       [Tp=  .17:DT= 3.00]
 002:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:B1c         1.00      .138 No_date    6:00   33.30 .556
       [CN= 87.7: N= 3.00]
       [Tp=  .10:DT= 3.00]
 002:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:B1b         5.00      .509 No_date    6:03   31.47  n/a
                      + 04:B1c         1.00      .138 No_date    6:00   33.30  n/a
       [DT= 3.00]  SUM= 02:B1b/c        6.00      .634 No_date    6:03   31.77  n/a
#*********************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*********************************************************
 002:0053--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT-4R     18.00      .979 No_date    6:21   31.61  n/a
                      + 02:B1b/c       6.00      .634 No_date    6:03   31.77  n/a
       [DT= 3.00]  SUM= 03:B1East     24.00     1.316 No_date    6:12   31.65  n/a
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*********************************************************************
 002:0054--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
 *  CALIB STANDHYD     01:B1d         4.30      .678 No_date    6:00   38.43 .642
     [XIMP=.25:TIMP=.25]
     [LOSS= 2 :CN= 86.0]
     [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=    .0]
     [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=    .0]
 002:0055--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 01:B1d         4.30      .678 No_date    6:00   38.43  n/a
     [RDT= 3.00] out<- 04:B1d         4.30      .160 No_date    6:15   38.43  n/a
           overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
    {MxStoUsed=.7671E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0056--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:B1d         4.30      .160 No_date    6:15   38.43  n/a
                     + 08:OVR          .00      .000 No_date    0:00     .00  n/a
     [DT= 3.00]  SUM=  01:B1dPND      4.30      .160 No_date    6:15   38.43  n/a
 002:0057--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:B1f         3.50      .457 No_date    6:00   32.88 .549
     [CN= 87.4: N= 3.00]
     [Tp=  .11:DT= 3.00]
 002:0058--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 02:B1f         3.50      .457 No_date    6:00   32.88  n/a
     [RDT= 3.00] out<- 04:B1f         3.50      .100 No_date    6:21   32.88  n/a
           overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
    {MxStoUsed=.5322E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0059--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:B1f         3.50      .100 No_date    6:21   32.88  n/a
                     + 08:OVR          .00      .000 No_date    0:00     .00  n/a
     [DT= 3.00]  SUM=  02:B1fPND      3.50      .100 No_date    6:21   32.88  n/a
 002:0060--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD     07:B1e         3.60      .599 No_date    6:00   38.88 .649
     [XIMP=.27:TIMP=.27]
     [LOSS= 2 :CN= 86.0]
     [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=    .0]
     [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=    .0]
 002:0061--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 07:B1e         3.60      .599 No_date    6:00   38.88  n/a
     [RDT= 3.00] out<- 06:B1e         3.60      .118 No_date    6:15   38.88  n/a
           overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
    {MxStoUsed=.7088E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 002:0062--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            06:B1e         3.60      .118 No_date    6:15   38.88  n/a
                     + 08:OVR          .00      .000 No_date    0:00     .00  n/a
     [DT= 3.00]  SUM=  07:B1ePND      3.60      .118 No_date    6:15   38.88  n/a
 002:0063--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:B1dPND      4.30      .160 No_date    6:15   38.43  n/a
                     + 02:B1West      3.50      .100 No_date    6:21   32.88  n/a
                     + 07:B1ePND      3.60      .118 No_date    6:15   38.88  n/a
     [DT= 3.00]  SUM=  02:B1West     11.40      .377 No_date    6:15   36.87  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*************************************************************
 002:0064--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            02:B1West     11.40      .377 No_date    6:15   36.87  n/a
                     + 03:B1East     24.00     1.316 No_date    6:12   31.65  n/a
     [DT= 3.00]  SUM=  04:SMT4       35.40     1.691 No_date    6:12   33.33  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
#*******************************
 002:0065--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       01:201C       91.00     4.591 No_date    6:24   31.31 .523
     [CN= 86.0: N= 3.00]
     [Tp=  .50:DT= 6.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 002:0066--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     CALIB NASHYD       02:C1a         7.00      .627 No_date    6:06   31.31 .523
       [CN= 86.0: N= 3.00]
       [Tp=  .21:DT= 6.00]
#*****************************************
# C1a SWM FACILITY
#*****************************************
 002:0067--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a         7.00      .627 No_date    6:06   31.31  n/a
       [RDT= 6.00] out<- 06:C1a         7.00      .228 No_date    6:30   31.31  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.8510E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
#*****************************************
# DISCHARGE FROM C1a SWM FACILITY
#*****************************************
 002:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            06:C1a         7.00      .228 No_date    6:30   31.31  n/a
                      + 08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 6.00]  SUM=  02:C1aPND      7.00      .228 No_date    6:30   31.31  n/a
 002:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:C1b          .50      .079 No_date    6:00   31.92 .533
       [CN= 86.5: N= 3.00]
       [Tp=  .04:DT= 2.00]
#*****************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*****************************************************************
 002:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201C       91.00    4.591 No_date    6:24   31.31  n/a
                      + 02:EX+MC       7.00      .228 No_date    6:30   31.31  n/a
                      + 03:C1b          .50      .079 No_date    6:00   31.92  n/a
       [DT= 2.00]  SUM=  02:EX+MC      98.50    4.826 No_date    6:24   31.31  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 002:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:EX+MC      98.50    4.826 No_date    6:24   31.31  n/a
  *    [RDT= 2.00] out<- 01:SMT-1     98.50    4.720 No_date    6:28   31.31  n/a
       [L/S/n=  275./ .500/.030]
       {Vmax=  .988:Dmax=  .620}
 002:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:C2          3.80      .387 No_date    6:03   31.47 .525
       [CN= 86.1: N= 3.00]
       [Tp=  .17:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 002:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1       98.50    4.720 No_date    6:28   31.31  n/a
                      + 07:C2          3.80      .387 No_date    6:03   31.47  n/a
       [DT= 2.00]  SUM=  01:SMT1      102.30    4.832 No_date    6:26   31.32  n/a
#*******************************************
# CONFLUENCE SMT 1-4
#*******************************************
 002:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:SMT4       35.40    1.691 No_date    6:12   33.33  n/a
                      + 01:SMT1      102.30    4.832 No_date    6:26   31.32  n/a
       [DT= 2.00]  SUM=  02:SMT1-4    137.70    6.342 No_date    6:24   31.84  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 002:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:201D       28.90    1.681 No_date    6:18   31.31 .523
       [CN= 86.0: N= 3.00]
       [Tp=  .41:DT= 6.00]
#*************************
```

```
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#***************************
 002:0076---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D       28.90     1.681 No_date    6:18   31.31  n/a
      [RDT= 6.00] out<- 03:SMT-3R     28.90     1.686 No_date    6:18   31.31  n/a
      [L/S/n=  100./ .700/.030]
      {Vmax= 1.201:Dmax=  .715}
#************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#************************************
 002:0077---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:D1a          1.90      .234 No_date    6:03   33.65 .562
      [CN= 88.0: N= 3.00]
      [Tp=  .13:DT= 3.00]
 002:0078---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        07:D1b          1.90      .257 No_date    6:00   31.31 .523
      [CN= 86.0: N= 3.00]
      [Tp=  .09:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*************************************************
 002:0079---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:D1a          1.90      .234 No_date    6:03   33.65  n/a
                       + 03:SMT-3R      28.90     1.686 No_date    6:18   31.31  n/a
                       + 07:D1b          1.90      .257 No_date    6:00   31.31  n/a
      [DT= 3.00]  SUM=  06:SMT3        32.70     1.832 No_date    6:12   31.45  n/a
#*******************************************
# CONFLUENCE SMT 1-3
#*******************************************
 002:0080---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     4.832 No_date    6:26   31.32  n/a
                       + 04:SMT4       35.40     1.691 No_date    6:12   33.33  n/a
                       + 06:SMT3       32.70     1.832 No_date    6:12   31.45  n/a
      [DT= 2.00]  SUM=  03:SMT1-3     170.40     8.070 No_date    6:22   31.76  n/a
#*********************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*********************************************************************
 002:0081---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     4.832 No_date    6:26   31.32  n/a
                       + 04:SMT4       35.40     1.691 No_date    6:12   33.33  n/a
                       + 06:SMT3       32.70     1.832 No_date    6:12   31.45  n/a
                       + 05:SMT2       83.60     3.918 No_date    6:24   31.55  n/a
      [DT= 2.00]  SUM=  08:1201      254.00    11.975 No_date    6:24   31.69  n/a
 002:0082---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 08:1201      254.00    11.975 No_date    6:24   31.69  n/a
  *   [RDT= 2.00] out<- 03:002202    254.00    11.518 No_date    6:30   31.69  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax=  .996:Dmax=  .547}
 002:0083---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:000202      21.60     1.661 No_date    6:12   34.31 .573
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 002:0084---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:002202    254.00    11.518 No_date    6:30   31.69  n/a
                       + 04:000202     21.60     1.661 No_date    6:12   34.31  n/a
      [DT= 2.00]  SUM=  02:001202    275.60    12.594 No_date    6:28   31.90  n/a
 002:0085---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000203      26.30     2.371 No_date    6:06   34.31 .573
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 002:0086---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000203      26.30     2.371 No_date    6:06   34.31  n/a
                       + 02:001202    275.60    12.594 No_date    6:28   31.90  n/a
      [DT= 2.00]  SUM=  04:000003    301.90    13.840 No_date    6:24   32.11  n/a
```

```
 002:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          04:000003    301.90    13.840 No_date    6:24    32.11  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 002:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:000204     53.60     2.443 No_date    6:30    33.17 .554
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 002:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:000204     53.60     2.443 No_date    6:30    33.17  n/a
                      + 04:000003    301.90    13.840 No_date    6:24    32.11  n/a
      [DT= 2.00]  SUM=  03:001204    355.50    16.223 No_date    6:24    32.27  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 002:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            09:001108    784.37    15.005 No_date    6:24    37.18  n/a
                      + 03:001204    355.50    16.223 No_date    6:24    32.27  n/a
      [DT= 2.00]  SUM=  02:000008   1139.87    31.228 No_date    6:24    35.64  n/a
 002:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000008   1139.87    31.228 No_date    6:24    35.64  n/a
#*************************************************************
  ** END OF RUN :   2

********************************************************************************



 RUN:COMMAND#
 003:0001--------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   3 ]
#*******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#*******************************************************************************
 003:0002--------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = TOWN OF MILTON 12 HOUR 10 YEAR SCS STORM (1998 IDF DATA)
      [SDT=12.00:SDUR=  12.00:PTOT=  71.35]
 003:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000103     42.10     3.384 No_date    6:18    43.02 .603
      [CN= 86.0: N= 3.00]
      [Tp=  .40:DT= 6.00]
 003:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:000103     42.10     3.384 No_date    6:18    43.02  n/a
      [RDT= 6.00] out<- 02:002104     42.10     3.104 No_date    6:24    43.02  n/a
      [L/S/n=  440./1.000/.030]
```

```
     {Vmax=  .706:Dmax=  .548}
003:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:000104    24.10     2.918 No_date     6:06   43.02 .603
     [CN= 86.0: N= 3.00]
     [Tp=  .21:DT= 6.00]
003:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:000104    24.10     2.918 No_date     6:06   43.02  n/a
                      | 02:002104    12.10     3.104 No_date     6:24   43.02  n/a
     [DT= 6.00]  SUM=  01:001104    66.20     4.951 No_date     6:12   43.02  n/a
003:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 01:001104    66.20     4.951 No_date     6:12   43.02  n/a
     [RDT= 6.00] out<- 02:002105    66.20     4.443 No_date     6:24   43.02  n/a
     [L/S/n=  365./ .400/.030]
     {Vmax=  .485:Dmax=  .528}
003:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB NASHYD        03:000105    19.20     2.617 No_date     6:00   44.11 .618
     [CN= 86.8: N= 3.00]
     [Tp=  .18:DT= 6.00]
003:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:000105    19.20     2.617 No_date     6:00   44.11  n/a
                      + 02:002105    66.20     4.443 No_date     6:24   43.02  n/a
     [DT= 6.00]  SUM=  01:001105    85.40     5.810 No_date     6:12   43.26  n/a
003:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 01:001105    85.40     5.810 No_date     6:12   43.26  n/a
     [RDT= 6.00] out<- 02:002106    85.40     5.445 No_date     6:24   43.26  n/a
     [L/S/n=  385./ .670/.030]
     {Vmax=  .688:Dmax=  .549}
003:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB NASHYD        03:000106    15.30     2.188 No_date     6:00   44.67 .626
     [CN= 87.2: N= 3.00]
     [Tp=  .17:DT= 6.00]
003:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:000106    15.30     2.188 No_date     6:00   44.67  n/a
                      + 02:002106    85.40     5.445 No_date     6:24   43.26  n/a
     [DT= 6.00]  SUM=  01:001106   100.70     6.468 No_date     6:12   43.48  n/a
003:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      03:000107    15.27      .543 No_date     7:18   49.47 .693
     [XIMP=.10:TIMP=.17]
     [LOSS= 2 :CN= 88.0]
     [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
003:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:001106   100.70     6.468 No_date     6:12   43.48  n/a
                      + 03:000107    15.27      .543 No_date     7:18   49.47  n/a
     [DT= 6.00]  SUM=  02:001107   115.97     6.740 No_date     6:12   44.27  n/a
003:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 02:001107   115.97     6.740 No_date     6:12   44.27  n/a
     [RDT= 6.00] out<- 01:002108   115.97     6.271 No_date     6:24   44.27  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.756:Dmax=  .885}
003:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:000108    33.50     3.352 No_date     6:12   44.11 .618
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
003:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:002108   115.97     6.271 No_date     6:24   44.27  n/a
                      + 02:000108    33.50     3.352 No_date     6:12   44.11  n/a
     [DT= 6.00]  SUM=  03:000004   149.47     8.909 No_date     6:18   44.23  n/a
003:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           03:000004   149.47     8.909 No_date     6:18   44.23  n/a
003:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD      04:000101   287.80     7.769 No_date     6:30   51.12 .716
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
```

```
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
 003:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 04:000101   287.80    7.769 No_date    6:30   51.12  n/a
      [RDT= 6.00] out<- 05:002101   287.80    7.095 No_date    8:06   51.12  n/a
      [L/S/n=  700./ .420/.030]
      {Vmax=  .629:Dmax=  .665}
 003:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD     04:000102   272.90   11.431 No_date    6:00   45.60 .639
      [XIMP=.13:TIMP=.28]
      [LOSS= 2 :CN= 84.0]
      [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
 003:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:000102   272.90   11.431 No_date    6:00   45.60  n/a
                      + 05:002101   287.80    7.095 No_date    8:06   51.12  n/a
      [DT= 6.00]  SUM=  06:000001   560.70   15.616 No_date    7:12   48.44  n/a
 003:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          06:000001   560.70   15.616 No_date    7:12   48.44  n/a
 003:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 06:000001   560.70   15.616 No_date    7:12   48.44  n/a
      [RDT= 6.00] out<- 04:002109   560.70   15.100 No_date    7:18   48.44  n/a
      [L/S/n= 1000./ .540/.030]
      {Vmax= 1.061:Dmax=  .999}
 003:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:000109    35.10    3.387 No_date    6:12   44.11 .618
      [CN= 86.8: N= 3.00]
      [Tp=  .32:DT= 6.00]
 003:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:002109   560.70   15.100 No_date    7:18   48.44  n/a
                      + 05:000109    35.10    3.387 No_date    6:12   44.11  n/a
      [DT= 6.00]  SUM=  06:001109   595.80   15.601 No_date    7:18   48.18  n/a
 003:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 06:001109   595.80   15.601 No_date    7:18   48.18  n/a
      [RDT= 6.00] out<- 04:002110   595.80   15.282 No_date    7:30   48.18  n/a
      [L/S/n=  900./ .710/.030]
      {Vmax=  .917:Dmax=  .824}
 003:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       05:000110    21.80    2.707 No_date    6:06   44.67 .626
      [CN= 87.2: N= 3.00]
      [Tp=  .22:DT= 6.00]
 003:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:002110   595.80   15.282 No_date    7:30   48.18  n/a
                      + 05:000110    21.80    2.707 No_date    6:06   44.67  n/a
      [DT= 6.00]  SUM=  06:001110   617.60   15.506 No_date    7:30   48.06  n/a
 003:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 06:001110   617.60   15.506 No_date    7:30   48.06  n/a
      [RDT= 6.00] out<- 04:002111   617.60   15.514 No_date    7:36   48.06  n/a
      [L/S/n=  920./1.250/.030]
      {Vmax= 1.570:Dmax=  .794}
 003:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000111    17.30    2.004 No_date    6:06   43.56 .610
      [CN= 86.4: N= 3.00]
      [Tp=  .23:DT= 6.00]
 003:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:000111    17.30    2.004 No_date    6:06   43.56  n/a
                      + 04:002111   617.60   15.514 No_date    7:36   48.06  n/a
      [DT= 6.00]  SUM=  02:000002   634.90   15.688 No_date    7:36   47.93  n/a
 003:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000002   634.90   15.688 No_date    7:36   47.93  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 003:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000004   149.47    8.909 No_date    6:18   44.23  n/a
                      + 02:000002   634.90   15.688 No_date    7:36   47.93  n/a
      [DT= 6.00]  SUM=  09:001108   784.37   20.743 No_date    6:24   47.23  n/a
```

```
#*************************************************************
#*************************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 003:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201A       68.20     4.704 No_date    6:18   40.88 .573
      [CN= 86.0: N= 3.00]
      [Tp=  .47:DT= 6.00]
#Route NHYD=201A through Channel SMT-2
 003:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:201A       68.20     4.704 No_date    6:18   40.88  n/a
      [RDT= 6.00] out<- 02:SMT-2R     68.20     4.572 No_date    6:24   40.88  n/a
      [L/S/n=  450./ .750/.030]
      {Vmax= 1.219:Dmax=  .580}
#*********************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*********************************************
 003:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:A1a         .80      .085 No_date    6:06   43.16 .605
      [CN= 87.7: N= 3.00]
      [Tp=  .27:DT= 6.00]
 003:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:A1b         6.10     1.150 No_date    6:00   41.05 .575
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 003:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:A1c         3.20      .483 No_date    6:03   42.54 .596
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 003:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:A1d         5.30      .647 No_date    6:06   42.63 .597
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 003:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d         5.30      .647 No_date    6:06   42.63  n/a
      [RDT= 6.00] out<- 07:A1d         5.30      .204 No_date    6:30   42.63  n/a
           overflow <= 08:OVR           .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.9833E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 003:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:A1d         5.30      .204 No_date    6:30   42.63  n/a
                    +   08:OVR           .00      .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  06:A1dPND      5.30      .204 No_date    6:30   42.63  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*************************************************************
 003:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:A1a         .80      .085 No_date    6:06   43.16  n/a
                    +   02:SMT-2R     68.20     4.572 No_date    6:24   40.88  n/a
                    +   03:A1b         6.10     1.150 No_date    6:00   41.05  n/a
                    +   04:A1c         3.20      .483 No_date    6:03   42.54  n/a
                    +   06:A1dPND      5.30      .204 No_date    6:30   42.63  n/a
      [DT= 3.00]  SUM=  05:SMT2       83.60     5.093 No_date    6:24   41.14  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 003:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201B       13.40     1.232 No_date    6:12   40.88 .573
      [CN= 86.0: N= 3.00]
      [Tp=  .31:DT= 6.00]
```

```
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 003:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1a         4.60      .629 No_date    6:03   42.24 .592
      [CN= 87.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 003:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1a         4.60      .629 No_date    6:03   42.24  n/a
      [RDT= 3.00] out<- 04:B1a         4.60      .222 No_date    6:24   42.24  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.7621E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 003:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1a         4.60      .222 No_date    6:24   42.24  n/a
                      + 08:OVR          .00      .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  02:B1aPND      4.60      .222 No_date    6:24   42.24  n/a
 003:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201B       13.40     1.232 No_date    6:12   40.88  n/a
                      + 02:B1aPND      4.60      .222 No_date    6:24   42.24  n/a
      [DT= 3.00]  SUM=  03:201B       18.00     1.440 No_date    6:12   41.23  n/a
#*********************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*********************************************************
 003:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:201B       18.00     1.440 No_date    6:12   41.23  n/a
  *   [RDT= 3.00] out<- 01:SMT-4R     18.00     1.283 No_date    6:21   41.23  n/a
      [L/S/n=  600./ .850/.030]
      {Vmax= 1.004:Dmax=  .376}
 003:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:B1b         5.00      .663 No_date    6:03   41.06 .575
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
 003:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:B1c         1.00      .178 No_date    6:00   43.19 .605
      [CN= 87.7: N= 3.00]
      [Tp=  .10:DT= 3.00]
 003:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:B1b         5.00      .663 No_date    6:03   41.06  n/a
                      + 04:B1c         1.00      .178 No_date    6:00   43.19  n/a
      [DT= 3.00]  SUM=  02:B1b/c       6.00      .824 No_date    6:03   41.42  n/a
#*********************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*********************************************************
 003:0053--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT-4R     18.00     1.283 No_date    6:21   41.23  n/a
                      + 02:B1b/c       6.00      .824 No_date    6:03   41.42  n/a
      [DT= 3.00]  SUM=  03:B1East     24.00     1.746 No_date    6:12   41.27  n/a
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*********************************************************************
 003:0054--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD     01:B1d         4.30      .891 No_date    6:00   48.48 .679
      [XIMP=.25:TIMP=.25]
      [LOSS= 2 :CN= 86.0]
      [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=    .0]
      [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=    .0]
 003:0055--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 01:B1d         4.30      .891 No_date    6:00   48.48  n/a
      [RDT= 3.00] out<- 04:B1d         4.30      .194 No_date    6:12   48.48  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.9826E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 003:0056--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1d         4.30      .194 No_date    6:12   48.48  n/a
                      + 08:OVR          .00      .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  01:B1dPND      4.30      .194 No_date    6:12   48.48  n/a
```

```
 003:0057---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:B1f         3.50      .591 No_date    6:00   42.70 .598
       [CN= 87.4: N= 3.00]
       [Tp=  .11:DT= 3.00]
 003:0058---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1f         3.50      .591 No_date    6:00   42.70  n/a
       [RDT= 3.00] out<- 04:B1f         3.50      .120 No_date    6:21   42.70  n/a
             overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.7078E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 003:0059---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:B1f         3.50      .120 No_date    6:21   42.70  n/a
                       + 08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 3.00]  SUM=  02:B1fPND      3.50      .120 No_date    6:21   42.70  n/a
 003:0060---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      07:B1e         3.60      .757 No_date    6:00   48.95 .686
       [XIMP=.27:TIMP=.27]
       [LOSS= 2 :CN= 86.0]
       [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=   .0]
       [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=   .0]
 003:0061---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 07:B1e         3.60      .757 No_date    6:00   48.95  n/a
       [RDT= 3.00] out<- 06:B1e         3.60      .147 No_date    6:12   48.95  n/a
             overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.8931E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 003:0062---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             06:B1e         3.60      .147 No_date    6:12   48.95  n/a
                       + 08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 3.00]  SUM=  07:B1ePND      3.60      .147 No_date    6:12   48.95  n/a
 003:0063---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:B1dPND      4.30      .194 No_date    6:12   48.48  n/a
                       + 02:B1West      3.50      .120 No_date    6:21   42.70  n/a
                       + 07:B1ePND      3.60      .147 No_date    6:12   48.95  n/a
       [DT= 3.00]  SUM=  02:B1West     11.40      .459 No_date    6:15   46.86  n/a
#*****************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*****************************************************************
 003:0064---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:B1West     11.40      .459 No_date    6:15   46.86  n/a
                       + 03:B1East     24.00     1.746 No_date    6:12   41.27  n/a
       [DT= 3.00]  SUM=  04:SMT4       35.40     2.203 No_date    6:12   43.07  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
#*******************************
 003:0065---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:201C       91.00     6.019 No_date    6:24   40.88 .573
       [CN= 86.0: N= 3.00]
       [Tp=  .50:DT= 6.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 003:0066---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:C1a         7.00      .817 No_date    6:06   40.88 .573
       [CN= 86.0: N= 3.00]
       [Tp=  .21:DT= 6.00]
#*****************************************
# C1a SWM FACILITY
#*****************************************
 003:0067---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a         7.00      .817 No_date    6:06   40.88  n/a
       [RDT= 6.00] out<- 06:C1a         7.00      .272 No_date    6:30   40.88  n/a
             overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1155E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
#*****************************************
# DISCHARGE FROM C1a SWM FACILITY
#*****************************************
```

```
 003:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             06:C1a         7.00      .272 No_date    6:30   40.88  n/a
                       + 08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 6.00]   SUM= 02:C1aPND      7.00      .272 No_date    6:30   40.88  n/a
 003:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:C1b          .50      .101 No_date    6:00   41.59 .583
       [CN= 86.5: N= 3.00]
       [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 003:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:201C       91.00    6.019 No_date    6:24   40.88  n/a
                       + 02:EX+MC       7.00     .272 No_date    6:30   40.88  n/a
                       + 03:C1b          .50     .101 No_date    6:00   41.59  n/a
       [DT= 2.00]   SUM= 02:EX+MC      98.50    6.300 No_date    6:24   40.88  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 003:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:EX+MC      98.50    6.300 No_date    6:24   40.88  n/a
  *    [RDT= 2.00] out<- 01:SMT-1      98.50    6.156 No_date    6:28   40.88  n/a
       [L/S/n=  275./ .500/.030]
       {Vmax=  .972:Dmax=  .669}
 003:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        07:C2          3.80     .504 No_date    6:03   41.06 .575
       [CN= 86.1: N= 3.00]
       [Tp=  .17:DT= 3.00]
#*****************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*****************************************************
 003:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1       98.50    6.156 No_date    6:28   40.88  n/a
                       + 07:C2          3.80     .504 No_date    6:03   41.06  n/a
       [DT= 2.00]   SUM= 01:SMT1      102.30    6.302 No_date    6:26   40.89  n/a
#*******************************************
# CONFLUENCE SMT 1-4
#*******************************************
 003:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:SMT4       35.40    2.203 No_date    6:12   43.07  n/a
                       + 01:SMT1      102.30    6.302 No_date    6:26   40.89  n/a
       [DT= 2.00]   SUM= 02:SMT1-4    137.70    8.236 No_date    6:24   41.45  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 003:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:201D       28.90    2.202 No_date    6:18   40.88 .573
       [CN= 86.0: N= 3.00]
       [Tp=  .41:DT= 6.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 003:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D       28.90    2.202 No_date    6:18   40.88  n/a
       [RDT= 6.00] out<- 03:SMT-3R     28.90    2.209 No_date    6:18   40.88  n/a
       [L/S/n=  100./ .700/.030]
       {Vmax= 1.285:Dmax=  .824}
#*************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#*************************************
 003:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:D1a         1.90     .301 No_date    6:03   43.58 .611
       [CN= 88.0: N= 3.00]
```

```
      [Tp=  .13:DT= 3.00]
 003:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *   CALIB NASHYD       07:D1b         1.90      .333 No_date    6:00   40.88 .573
      [CN= 86.0: N= 3.00]
      [Tp=  .09:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*************************************************
 003:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:D1a         1.90      .301 No_date    6:03   43.58  n/a
                    +   03:SMT-3R     28.90     2.209 No_date    6:18   40.88  n/a
                    +   07:D1b         1.90      .333 No_date    6:00   40.88  n/a
      [DT= 3.00]  SUM=  06:SMT3       32.70     2.406 No_date    6:12   41.04  n/a
#*******************************************
# CONFLUENCE SMT 1-3
#*******************************************
 003:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      102.30     6.302 No_date    6:26   40.89  n/a
                    +   04:SMT4       35.40     2.203 No_date    6:12   43.07  n/a
                    +   06:SMT3       32.70     2.406 No_date    6:12   41.04  n/a
      [DT= 2.00]  SUM=  03:SMT1-3    170.40    10.500 No_date    6:20   41.37  n/a
#*************************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*************************************************************************
 003:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      102.30     6.302 No_date    6:26   40.89  n/a
                    +   04:SMT4       35.40     2.203 No_date    6:12   43.07  n/a
                    +   06:SMT3       32.70     2.406 No_date    6:12   41.04  n/a
                    +   05:SMT2       83.60     5.093 No_date    6:24   41.14  n/a
      [DT= 2.00]  SUM=  08:1201      254.00    15.564 No_date    6:24   41.29  n/a
 003:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:1201      254.00    15.564 No_date    6:24   41.29  n/a
  *    [RDT= 2.00] out<- 03:002202   254.00    15.058 No_date    6:30   41.29  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax= 1.038:Dmax=  .608}
 003:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:000202     21.60     2.136 No_date    6:12   44.11 .618
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 003:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:002202    254.00    15.058 No_date    6:30   41.29  n/a
                    +   04:000202     21.60     2.136 No_date    6:12   44.11  n/a
      [DT= 2.00]  SUM=  02:001202    275.60    16.484 No_date    6:26   41.52  n/a
 003:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000203     26.30     3.049 No_date    6:06   44.11 .618
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 003:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000203     26.30     3.049 No_date    6:06   44.11  n/a
                    +   02:001202    275.60    16.484 No_date    6:26   41.52  n/a
      [DT= 2.00]  SUM=  04:000003    301.90    18.143 No_date    6:22   41.74  n/a
 003:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          04:000003    301.90    18.143 No_date    6:22   41.74  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 003:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:000204     53.60     3.185 No_date    6:30   43.04 .603
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 003:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:000204     53.60     3.185 No_date    6:30   43.04  n/a
                    +   04:000003    301.90    18.143 No_date    6:22   41.74  n/a
      [DT= 2.00]  SUM=  03:001204    355.50    21.237 No_date    6:24   41.94  n/a
```

```
#*********************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*********************************************************
#*********************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*********************************************************
#*********************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*********************************************************
 003:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            09:001108    784.37   20.743 No_date    6:24   47.23  n/a
                    +   03:001204    355.50   21.237 No_date    6:24   41.94  n/a
      [DT= 2.00]   SUM=  02:000008   1139.87   41.980 No_date    6:24   45.58  n/a
 003:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000008   1139.87   41.980 No_date    6:24   45.58  n/a
#*********************************************************
  ** END OF RUN :   3

**************************************************************************************




 RUN:COMMAND#
 004:0001--------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   4 ]
#**************************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#**************************************************************************************
 004:0002--------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = TOWN OF MILTON 12 HOUR 25 YEAR SCS STORM (1998 IDF DATA)
      [SDT=12.00:SDUR=  12.00:PTOT=  85.71]
 004:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000103    42.10    4.375 No_date    6:18   55.58 .649
      [CN= 86.0: N= 3.00]
      [Tp=  .40:DT= 6.00]
 004:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:000103    42.10    4.375 No_date    6:18   55.58  n/a
      [RDT= 6.00] out<- 02:002104    42.10    4.069 No_date    6:24   55.58  n/a
      [L/S/n=  440./1.000/.030]
      {Vmax=  .746:Dmax=  .578}
 004:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000104    24.10    3.761 No_date    6:06   55.58 .649
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
 004:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000104    24.10    3.761 No_date    6:06   55.58  n/a
                    +   02:002104    42.10    4.069 No_date    6:24   55.58  n/a
      [DT= 6.00]   SUM=  01:001104    66.20    6.498 No_date    6:12   55.58  n/a
 004:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001104    66.20    6.498 No_date    6:12   55.58  n/a
      [RDT= 6.00] out<- 02:002105    66.20    5.922 No_date    6:24   55.58  n/a
      [L/S/n=  365./ .400/.030]
      {Vmax=  .535:Dmax=  .561}
```

```
004:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB NASHYD       03:000105     19.20     3.371 No_date    6:00    56.83 .663
     [CN= 86.8: N= 3.00]
     [Tp=  .18:DT= 6.00]
004:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            03:000105     19.20     3.371 No_date    6:00    56.83  n/a
                   +   02:002105     66.20     5.922 No_date    6:24    55.58  n/a
     [DT= 6.00]  SUM=  01:001105     85.40     7.819 No_date    6:12    55.86  n/a
004:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 01:001105     85.40     7.819 No_date    6:12    55.86  n/a
     [RDT= 6.00] out<- 02:002106     85.40     7.403 No_date    6:18    55.86  n/a
     [L/S/n=  385./ .670/.030]
     {Vmax=  .752:Dmax=  .593}
004:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB NASHYD       03:000106     15.30     2.811 No_date    6:00    57.46 .670
     [CN= 87.2: N= 3.00]
     [Tp=  .17:DT= 6.00]
004:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            03:000106     15.30     2.811 No_date    6:00    57.46  n/a
                   +   02:002106     85.40     7.403 No_date    6:18    55.86  n/a
     [DT= 6.00]  SUM=  01:001106    100.70     8.785 No_date    6:12    56.11  n/a
004:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD     03:000107     15.27      .773 No_date    7:00    62.69 .731
     [XIMP=.10:TIMP=.17]
     [LOSS= 2 :CN= 88.0]
     [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
004:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:001106    100.70     8.785 No_date    6:12    56.11  n/a
                   +   03:000107     15.27      .773 No_date    7:00    62.69  n/a
     [DT= 6.00]  SUM=  02:001107    115.97     9.202 No_date    6:12    56.97  n/a
004:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 02:001107    115.97     9.202 No_date    6:12    56.97  n/a
     [RDT= 6.00] out<- 01:002108    115.97     8.454 No_date    6:24    56.97  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.809:Dmax=  .937}
004:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:000108     33.50     4.320 No_date    6:06    56.83 .663
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
004:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:002108    115.97     8.454 No_date    6:24    56.97  n/a
                   +   02:000108     33.50     4.320 No_date    6:06    56.83  n/a
     [DT= 6.00]  SUM=  03:000004    149.47    11.991 No_date    6:18    56.94  n/a
004:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD          03:000004    149.47    11.991 No_date    6:18    56.94  n/a
004:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     04:000101    287.80    10.437 No_date    6:24    64.45 .752
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
004:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 04:000101    287.80    10.437 No_date    6:24    64.45  n/a
     [RDT= 6.00] out<- 05:002101    287.80     9.803 No_date    7:54    64.45  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .693:Dmax=  .718}
004:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD     04:000102    272.90    14.475 No_date    6:00    58.41 .681
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 84.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
004:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:000102    272.90    14.475 No_date    6:00    58.41  n/a
```

```
                    +  05:002101   287.80     9.803 No_date    7:54   64.45  n/a
     [DT= 6.00]  SUM=  06:000001   560.70    21.500 No_date    7:00   61.51  n/a
 004:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD         06:000001   560.70    21.500 No_date    7:00   61.51  n/a
 004:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:000001   560.70    21.500 No_date    7:00   61.51  n/a
      [RDT= 6.00] out<- 04:002109   560.70    20.781 No_date    7:12   61.51  n/a
      [L/S/n= 1000./ .540/.030]
      {Vmax= 1.117:Dmax= 1.103}
 004:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      05:000109    35.10     4.361 No_date    6:12   56.83 .663
      [CN= 86.8: N= 3.00]
      [Tp=  .32:DT= 6.00]
 004:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:002109   560.70    20.781 No_date    7:12   61.51  n/a
                    +  05:000109    35.10     4.361 No_date    6:12   56.83  n/a
      [DT= 6.00]  SUM=  06:001109   595.80    21.502 No_date    7:12   61.23  n/a
 004:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:001109   595.80    21.502 No_date    7:12   61.23  n/a
      [RDT= 6.00] out<- 04:002110   595.80    21.186 No_date    7:24   61.23  n/a
      [L/S/n=  900./ .710/.030]
      {Vmax= 1.022:Dmax=  .902}
 004:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      05:000110    21.80     3.471 No_date    6:06   57.46 .670
      [CN= 87.2: N= 3.00]
      [Tp=  .22:DT= 6.00]
 004:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           04:002110   595.80    21.186 No_date    7:24   61.23  n/a
                    +  05:000110    21.80     3.471 No_date    6:06   57.46  n/a
      [DT= 6.00]  SUM=  06:001110   617.60    21.487 No_date    7:18   61.10  n/a
 004:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:001110   617.60    21.487 No_date    7:18   61.10  n/a
      [RDT= 6.00] out<- 04:002111   617.60    21.666 No_date    7:18   61.10  n/a
      [L/S/n=  920./1.250/.030]
      {Vmax= 2.098:Dmax=  .985}
 004:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:000111    17.30     2.582 No_date    6:06   56.20 .656
      [CN= 86.4: N= 3.00]
      [Tp=  .23:DT= 6.00]
 004:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           01:000111    17.30     2.582 No_date    6:06   56.20  n/a
                    +  04:002111   617.60    21.666 No_date    7:18   61.10  n/a
      [DT= 6.00]  SUM=  02:000002   634.90    21.913 No_date    7:18   60.97  n/a
 004:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD         02:000002   634.90    21.913 No_date    7:18   60.97  n/a
#*************************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 004:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD           03:000004   149.47    11.991 No_date    6:18   56.94  n/a
                    +  02:000002   634.90    21.913 No_date    7:18   60.97  n/a
      [DT= 6.00]  SUM=  09:001108   784.37    29.062 No_date    6:24   60.20  n/a
#*************************************************************
#*****************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*****************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 004:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD      01:201A      68.20     6.168 No_date    6:18   53.37 .623
      [CN= 86.0: N= 3.00]
      [Tp=  .47:DT= 6.00]
```

```
#Route NHYD=201A through Channel SMT-2
 004:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201A       68.20    6.168 No_date    6:18   53.37  n/a
      [RDT= 6.00] out<- 02:SMT-2R     68.20    5.939 No_date    6:24   53.37  n/a
      [L/S/n=  450./ .750/.030]
      {Vmax= 1.207:Dmax=  .627}
#*************************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*************************************************
 004:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:A1a          .80     .111 No_date    6:06   55.97 .653
      [CN= 87.7: N= 3.00]
      [Tp=  .27:DT= 6.00]
 004:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   *  CALIB NASHYD       03:A1b         6.10    1.480 No_date    6:00   53.56 .625
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 004:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:A1c         3.20     .623 No_date    6:03   55.27 .645
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 004:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:A1d         5.30     .836 No_date    6:06   55.38 .646
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 004:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d         5.30     .836 No_date    6:06   55.38  n/a
      [RDT= 6.00] out<- 07:A1d         5.30     .243 No_date    6:30   55.38  n/a
            overflow <= 08:OVR          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1317E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 004:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:A1d         5.30     .243 No_date    6:30   55.38  n/a
                    +   08:OVR          .00     .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  06:A1dPND      5.30     .243 No_date    6:30   55.38  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*************************************************************
 004:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:A1a          .80     .111 No_date    6:06   55.97  n/a
                    +   02:SMT-2R     68.20    5.939 No_date    6:24   53.37  n/a
                    +   03:A1b         6.10    1.480 No_date    6:00   53.56  n/a
                    +   04:A1c         3.20     .623 No_date    6:03   55.27  n/a
                    +   06:A1dPND      5.30     .243 No_date    6:30   55.38  n/a
      [DT= 3.00]  SUM=  05:SMT2       83.60    6.583 No_date    6:24   53.65  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 004:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201B       13.40    1.607 No_date    6:12   53.36 .623
      [CN= 86.0: N= 3.00]
      [Tp=  .31:DT= 6.00]
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 004:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1a         4.60     .815 No_date    6:03   54.92 .641
      [CN= 87.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 004:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1a         4.60     .815 No_date    6:03   54.92  n/a
      [RDT= 3.00] out<- 04:B1a         4.60     .262 No_date    6:24   54.92  n/a
            overflow <= 08:OVR          .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1027E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 004:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1a         4.60     .262 No_date    6:24   54.92  n/a
```

```
                    +  08:OVR          .00      .000 No_date    0:00      .00  n/a
     [DT= 3.00]   SUM=  02:B1aPND      4.60      .262 No_date    6:24    54.92  n/a
 004:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201B       13.40     1.607 No_date    6:12    53.36  n/a
                    +  02:B1aPND      4.60      .262 No_date    6:24    54.92  n/a
     [DT= 3.00]   SUM=  03:201B       18.00     1.853 No_date    6:12    53.76  n/a
#*********************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*********************************************************
 004:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:201B       18.00     1.853 No_date    6:12    53.76  n/a
  *   [RDT= 3.00] out<- 01:SMT-4R     18.00     1.679 No_date    6:18    53.76  n/a
      [L/S/n=  600./ .850/.030]
      {Vmax= 1.071:Dmax=  .414}
 004:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:B1b         5.00      .863 No_date    6:03    53.58 .625
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
 004:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:B1c         1.00      .229 No_date    6:00    56.01 .653
      [CN= 87.7: N= 3.00]
      [Tp=  .10:DT= 3.00]
 004:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:B1b         5.00      .863 No_date    6:03    53.58  n/a
                    +  04:B1c         1.00      .229 No_date    6:00    56.01  n/a
     [DT= 3.00]   SUM=  02:B1b/c       6.00     1.069 No_date    6:03    53.98  n/a
#*********************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*********************************************************
 004:0053--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT-4R     18.00     1.679 No_date    6:18    53.76  n/a
                    +  02:B1b/c       6.00     1.069 No_date    6:03    53.98  n/a
     [DT= 3.00]   SUM=  03:B1East     24.00     2.306 No_date    6:09    53.82  n/a
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*********************************************************************
 004:0054--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD     01:B1d         4.30     1.131 No_date    6:00    61.44 .717
      [XIMP=.25:TIMP=.25]
      [LOSS= 2 :CN= 86.0]
      [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=   .0]
 004:0055--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 01:B1d         4.30     1.131 No_date    6:00    61.44  n/a
      [RDT= 3.00] out<- 04:B1d         4.30      .227 No_date    6:12    61.44  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00      .00  n/a
    {MxStoUsed=.1266E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 004:0056--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1d         4.30      .227 No_date    6:12    61.44  n/a
                    +  08:OVR          .00      .000 No_date    0:00      .00  n/a
     [DT= 3.00]   SUM=  01:B1dPND      4.30      .227 No_date    6:12    61.44  n/a
 004:0057--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1f         3.50      .762 No_date    6:00    55.45 .647
      [CN= 87.4: N= 3.00]
      [Tp=  .11:DT= 3.00]
 004:0058--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1f         3.50      .762 No_date    6:00    55.45  n/a
      [RDT= 3.00] out<- 04:B1f         3.50      .144 No_date    6:21    55.45  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00      .00  n/a
    {MxStoUsed=.9434E-01, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 004:0059--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1f         3.50      .144 No_date    6:21    55.45  n/a
                    +  08:OVR          .00      .000 No_date    0:00      .00  n/a
     [DT= 3.00]   SUM=  02:B1fPND      3.50      .144 No_date    6:21    55.45  n/a
 004:0060--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
  *  CALIB STANDHYD     07:B1e        3.60     .958 No_date    6:00   61.94 .723
      [XIMP=.27:TIMP=.27]
      [LOSS= 2 :CN= 86.0]
      [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=   .0]
 004:0061---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 07:B1e        3.60     .958 No_date    6:00   61.94  n/a
      [RDT= 3.00] out<- 06:B1e        3.60     .176 No_date    6:12   61.94  n/a
            overflow <= 08:OVR         .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1140E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 004:0062---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            06:B1e        3.60     .176 No_date    6:12   61.94  n/a
                      + 08:OVR         .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  07:B1ePND     3.60     .176 No_date    6:12   61.94  n/a
 004:0063---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:B1dPND     4.30     .227 No_date    6:12   61.44  n/a
                      + 02:B1West     3.50     .144 No_date    6:21   55.45  n/a
                      + 07:B1ePND     3.60     .176 No_date    6:12   61.94  n/a
      [DT= 3.00]  SUM=  02:B1West    11.40     .544 No_date    6:15   59.76  n/a
#*****************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*****************************************************************
 004:0064---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:B1West    11.40     .544 No_date    6:15   59.76  n/a
                      + 03:B1East    24.00    2.306 No_date    6:09   53.82  n/a
      [DT= 3.00]  SUM=  04:SMT4      35.40    2.843 No_date    6:09   55.73  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
#*******************************
 004:0065---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201C      91.00    7.875 No_date    6:24   53.37 .623
      [CN= 86.0: N= 3.00]
      [Tp=  .50:DT= 6.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 004:0066---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:C1a        7.00    1.064 No_date    6:06   53.36 .623
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
#*****************************************
# C1a SWM FACILITY
#*****************************************
 004:0067---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a        7.00    1.064 No_date    6:06   53.36  n/a
      [RDT= 6.00] out<- 06:C1a        7.00     .317 No_date    6:30   53.36  n/a
            overflow <= 08:OVR         .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1580E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
#*****************************************
# DISCHARGE FROM C1a SWM FACILITY
#*****************************************
 004:0068---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            06:C1a        7.00     .317 No_date    6:30   53.36  n/a
                      + 08:OVR         .00     .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  02:C1aPND     7.00     .317 No_date    6:30   53.36  n/a
 004:0069---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:C1b         .50     .129 No_date    6:00   54.18 .632
      [CN= 86.5: N= 3.00]
      [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 004:0070---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201C      91.00    7.875 No_date    6:24   53.37  n/a
                      + 02:EX+MC      7.00     .317 No_date    6:30   53.36  n/a
```

```
                    +  03:C1b          .50      .129 No_date    6:00    54.18  n/a
      [DT= 2.00]  SUM=  02:EX+MC      98.50    8.203 No_date    6:24    53.37  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 004:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL    -> 02:EX+MC      98.50    8.203 No_date    6:24    53.37  n/a
  *     [RDT= 2.00] out<- 01:SMT-1      98.50    8.023 No_date    6:28    53.37  n/a
        [L/S/n=  275./ .500/.030]
        {Vmax=  .962:Dmax=  .719}
 004:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD        07:C2         3.80     .656 No_date    6:03    53.58 .625
        [CN= 86.1: N= 3.00]
        [Tp=  .17:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 004:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD             01:SMT1      98.50    8.023 No_date    6:28    53.37  n/a
                    +  07:C2          3.80     .656 No_date    6:03    53.58  n/a
      [DT= 2.00]  SUM=  01:SMT1      102.30    8.217 No_date    6:26    53.38  n/a
#*******************************************
# CONFLUENCE SMT 1-4
#*******************************************
 004:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD             04:SMT4      35.40    2.843 No_date    6:09    55.73  n/a
                    +  01:SMT1      102.30    8.217 No_date    6:26    53.38  n/a
      [DT= 2.00]  SUM=  02:SMT1-4    137.70   10.672 No_date    6:24    53.98  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 004:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD        02:201D      28.90    2.879 No_date    6:18    53.37 .623
        [CN= 86.0: N= 3.00]
        [Tp=  .41:DT= 6.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 004:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL    -> 02:201D      28.90    2.879 No_date    6:18    53.37  n/a
        [RDT= 6.00] out<- 03:SMT-3R    28.90    2.890 No_date    6:18    53.37  n/a
        [L/S/n=  100./ .700/.030]
        {Vmax= 1.374:Dmax=  .911}
#*************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#*************************************
 004:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD        02:D1a        1.90     .386 No_date    6:00    56.45 .659
        [CN= 88.0: N= 3.00]
        [Tp=  .13:DT= 3.00]
 004:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *   CALIB NASHYD        07:D1b        1.90     .431 No_date    6:00    53.36 .623
        [CN= 86.0: N= 3.00]
        [Tp=  .09:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*************************************************
 004:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD             02:D1a        1.90     .386 No_date    6:00    56.45  n/a
                    +  03:SMT-3R    28.90    2.890 No_date    6:18    53.37  n/a
                    +  07:D1b         1.90     .431 No_date    6:00    53.36  n/a
      [DT= 3.00]  SUM=  06:SMT3      32.70    3.153 No_date    6:12    53.55  n/a
#*******************************************
```

```
# CONFLUENCE SMT 1-3
#*****************************************
 004:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     8.217 No_date    6:26    53.38  n/a
                       + 04:SMT4       35.40     2.843 No_date    6:09    55.73  n/a
                       + 06:SMT3       32.70     3.153 No_date    6:12    53.55  n/a
      [DT= 2.00]  SUM=  03:SMT1-3    170.40    13.656 No_date    6:20    53.90  n/a
#*********************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*********************************************************************
 004:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30     8.217 No_date    6:26    53.38  n/a
                       + 04:SMT4       35.40     2.843 No_date    6:09    55.73  n/a
                       + 06:SMT3       32.70     3.153 No_date    6:12    53.55  n/a
                       + 05:SMT2       83.60     6.583 No_date    6:24    53.65  n/a
      [DT= 2.00]  SUM=  08:1201      254.00    20.162 No_date    6:24    53.82  n/a
 004:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 08:1201      254.00    20.162 No_date    6:24    53.82  n/a
  *   [RDT= 2.00] out<- 03:002202    254.00    19.614 No_date    6:28    53.82  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax= 1.089:Dmax=  .643}
 004:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:000202     21.60     2.748 No_date    6:12    56.83 .663
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 004:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:002202    254.00    19.614 No_date    6:28    53.82  n/a
                       + 04:000202     21.60     2.748 No_date    6:12    56.83  n/a
      [DT= 2.00]  SUM=  02:001202    275.60    21.497 No_date    6:26    54.05  n/a
 004:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000203     26.30     3.924 No_date    6:06    56.83 .663
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 004:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000203     26.30     3.924 No_date    6:06    56.83  n/a
                       + 02:001202    275.60    21.497 No_date    6:26    54.05  n/a
      [DT= 2.00]  SUM=  04:000003    301.90    23.708 No_date    6:22    54.29  n/a
 004:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           04:000003    301.90    23.708 No_date    6:22    54.29  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 004:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:000204     53.60     4.144 No_date    6:30    55.83 .651
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 004:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:000204     53.60     4.144 No_date    6:30    55.83  n/a
                       + 04:000003    301.90    23.708 No_date    6:22    54.29  n/a
      [DT= 2.00]  SUM=  03:001204    355.50    27.701 No_date    6:24    54.53  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 004:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             09:001108    784.37    29.062 No_date    6:24    60.20  n/a
                       + 03:001204    355.50    27.701 No_date    6:24    54.53  n/a
      [DT= 2.00]  SUM=  02:000008   1139.87    56.763 No_date    6:24    58.43  n/a
 004:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     PRINT HYD          02:000008  1139.87    56.763 No_date    6:24    58.43  n/a
#*********************************************************
  ** END OF RUN :   4

*******************************************************************************



 RUN:COMMAND#
 005:0001-------------------------------------------------------------------------
      START
       [TZERO =    .00 hrs on        0]
       [METOUT=   2    (1=imperial, 2=metric output)]
       [NSTORM=   1 ]
       [NRUN  =   5 ]
#*******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#*******************************************************************************
 005:0002-------------------------------------------------------------------------
      READ STORM
       Filename = STORM.001
       Comment  = TOWN OF MILTON 12 HOUR 50 YEAR SCS STORM (1998 IDF DATA)
       [SDT=12.00:SDUR=  12.00:PTOT=  96.33]
 005:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:000103    42.10    5.123 No_date    6:18   65.13 .676
       [CN= 86.0: N= 3.00]
       [Tp=  .40:DT= 6.00]
 005:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL    -> 01:000103    42.10    5.123 No_date    6:18   65.13  n/a
       [RDT= 6.00] out<- 02:002104    42.10    4.792 No_date    6:24   65.13  n/a
       [L/S/n=  440./1.000/.030]
       {Vmax=  .770:Dmax=  .596}
 005:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       03:000104    24.10    4.395 No_date    6:06   65.13 .676
       [CN= 86.0: N= 3.00]
       [Tp=  .21:DT= 6.00]
 005:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            03:000104    24.10    4.395 No_date    6:06   65.13  n/a
                       + 02:002104    42.10    4.792 No_date    6:24   65.13  n/a
       [DT= 6.00]  SUM=  01:001104    66.20    7.676 No_date    6:12   65.13  n/a
 005:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL    -> 01:001104    66.20    7.676 No_date    6:12   65.13  n/a
       [RDT= 6.00] out<- 02:002105    66.20    7.046 No_date    6:18   65.13  n/a
       [L/S/n=  365./ .400/.030]
       {Vmax=  .565:Dmax=  .583}
 005:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *   CALIB NASHYD       03:000105    19.20    3.938 No_date    6:00   66.47 .690
       [CN= 86.8: N= 3.00]
       [Tp=  .18:DT= 6.00]
 005:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            03:000105    19.20    3.938 No_date    6:00   66.47  n/a
                       + 02:002105    66.20    7.046 No_date    6:18   65.13  n/a
       [DT= 6.00]  SUM=  01:001105    85.40    9.318 No_date    6:12   65.43  n/a
 005:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL    -> 01:001105    85.40    9.318 No_date    6:12   65.43  n/a
       [RDT= 6.00] out<- 02:002106    85.40    8.847 No_date    6:18   65.43  n/a
       [L/S/n=  385./ .670/.030]
       {Vmax=  .784:Dmax=  .620}
 005:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
 *  CALIB NASHYD       03:000106    15.30     3.279 No_date    6:00    67.15 .697
     [CN= 87.2: N= 3.00]
     [Tp=  .17:DT= 6.00]
005:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            03:000106    15.30     3.279 No_date    6:00    67.15  n/a
                   +   02:002106    85.40     8.847 No_date    6:18    65.43  n/a
     [DT= 6.00]  SUM=  01:001106   100.70    10.545 No_date    6:12    65.69  n/a
005:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm-----R.V.-R.C.
 *  CALIB STANDHYD     03:000107    15.27      .957 No_date    6:54    72.64 .754
     [XIMP=.10:TIMP=.17]
     [LOSS= 2 :CN= 88.0]
     [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
005:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:001106   100.70    10.545 No_date    6:12    65.69  n/a
                   +   03:000107    15.27      .957 No_date    6:54    72.64  n/a
     [DT= 6.00]  SUM=  02:001107   115.97    11.089 No_date    6:12    66.60  n/a
005:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 02:001107   115.97    11.089 No_date    6:12    66.60  n/a
     [RDT= 6.00] out<- 01:002108   115.97    10.128 No_date    6:24    66.60  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.852:Dmax=  .977}
005:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       02:000108    33.50     5.055 No_date    6:06    66.47 .690
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
005:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            01:002108   115.97    10.128 No_date    6:24    66.60  n/a
                   +   02:000108    33.50     5.055 No_date    6:06    66.47  n/a
     [DT= 6.00]  SUM=  03:000004   149.47    14.265 No_date    6:18    66.57  n/a
005:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD          03:000004   149.47    14.265 No_date    6:18    66.57  n/a
005:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD     04:000101   287.80    12.760 No_date    6:24    74.47 .773
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
005:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 04:000101   287.80    12.760 No_date    6:24    74.47  n/a
     [RDT= 6.00] out<- 05:002101   287.80    12.373 No_date    7:42    74.47  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .759:Dmax=  .765}
005:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD     04:000102   272.90    14.347 No_date    6:00    68.10 .707
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 84.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
005:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD            04:000102   272.90    14.347 No_date    6:00    68.10  n/a
                   +   05:002101   287.80    12.373 No_date    7:42    74.47  n/a
     [DT= 6.00]  SUM=  06:000001   560.70    21.656 No_date    7:48    71.37  n/a
005:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD          06:000001   560.70    21.656 No_date    7:48    71.37  n/a
005:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:000001   560.70    21.656 No_date    7:48    71.37  n/a
     [RDT= 6.00] out<- 04:002109   560.70    21.245 No_date    8:00    71.37  n/a
     [L/S/n= 1000./ .540/.030]
     {Vmax= 1.118:Dmax= 1.106}
005:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD       05:000109    35.10     5.094 No_date    6:12    66.47 .690
     [CN= 86.8: N= 3.00]
     [Tp=  .32:DT= 6.00]
005:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    ADD HYD             04:002109   560.70   21.245 No_date    8:00   71.37  n/a
                    +   05:000109    35.10    5.094 No_date    6:12   66.47  n/a
     [DT= 6.00]   SUM=  06:001109   595.80   21.750 No_date    8:00   71.08  n/a
005:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:001109   595.80   21.750 No_date    8:00   71.08  n/a
     [RDT= 6.00] out<- 04:002110   595.80   21.511 No_date    8:06   71.08  n/a
     [L/S/n=  900./ .710/.030]
     {Vmax= 1.027:Dmax=  .906}
005:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        05:000110    21.80    4.044 No_date    6:06   67.15 .697
     [CN= 87.2: N= 3.00]
     [Tp=  .22:DT= 6.00]
005:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:002110   595.80   21.511 No_date    8:06   71.08  n/a
                    +   05:000110    21.80    4.044 No_date    6:06   67.15  n/a
     [DT= 6.00]   SUM=  06:001110   617.60   21.806 No_date    8:06   70.94  n/a
005:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:001110   617.60   21.806 No_date    8:06   70.94  n/a
     [RDT= 6.00] out<- 04:002111   617.60   21.776 No_date    8:06   70.94  n/a
     [L/S/n=  920./1.250/.030]
     {Vmax= 2.102:Dmax=  .990}
005:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:000111    17.30    3.018 No_date    6:06   65.79 .683
     [CN= 86.4: N= 3.00]
     [Tp=  .23:DT= 6.00]
005:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:000111    17.30    3.018 No_date    6:06   65.79  n/a
                    +   04:002111   617.60   21.776 No_date    8:06   70.94  n/a
     [DT= 6.00]   SUM=  02:000002   634.90   22.010 No_date    8:06   70.80  n/a
005:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           02:000002   634.90   22.010 No_date    8:06   70.80  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
005:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:000004   149.47   14.265 No_date    6:18   66.57  n/a
                    +   02:000002   634.90   22.010 No_date    8:06   70.80  n/a
     [DT= 6.00]   SUM=  09:001108   784.37   32.959 No_date    6:18   70.00  n/a
#*********************************************************
#*************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
005:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:201A      68.20    7.276 No_date    6:18   62.87 .653
     [CN= 86.0: N= 3.00]
     [Tp=  .47:DT= 6.00]
#Route NHYD=201A through Channel SMT-2
005:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 01:201A      68.20    7.276 No_date    6:18   62.87  n/a
     [RDT= 6.00] out<- 02:SMT-2R    68.20    6.982 No_date    6:24   62.87  n/a
     [L/S/n=  450./ .750/.030]
     {Vmax= 1.194:Dmax=  .658}
#*************************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*************************************************
005:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:A1a         .80     .130 No_date    6:06   65.68 .682
     [CN= 87.7: N= 3.00]
     [Tp=  .27:DT= 6.00]
005:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
  *   CALIB NASHYD       03:A1b        6.10     1.727 No_date    6:00   63.08 .655
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 005:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       04:A1c        3.20      .727 No_date    6:03   64.92 .674
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 005:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       06:A1d        5.30      .978 No_date    6:06   65.04 .675
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 005:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 06:A1d        5.30      .978 No_date    6:06   65.04  n/a
       [RDT= 6.00] out<- 07:A1d        5.30      .268 No_date    6:36   65.04  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
      {MxStoUsed=.1580E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 005:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            07:A1d        5.30      .268 No_date    6:36   65.04  n/a
                     +   08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 6.00]  SUM=  06:A1dPND      5.30      .268 No_date    6:36   65.04  n/a
#*****************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*****************************************************************
 005:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:A1a         .80      .130 No_date    6:06   65.68  n/a
                     +   02:SMT-2R    68.20     6.982 No_date    6:24   62.87  n/a
                     +   03:A1b        6.10     1.727 No_date    6:00   63.08  n/a
                     +   04:A1c        3.20      .727 No_date    6:03   64.92  n/a
                     +   06:A1dPND     5.30      .268 No_date    6:36   65.04  n/a
       [DT= 3.00]  SUM=  05:SMT2      83.60     7.714 No_date    6:24   63.20  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 005:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:201B      13.40     1.891 No_date    6:12   62.87 .653
      [CN= 86.0: N= 3.00]
      [Tp=  .31:DT= 6.00]
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 005:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:B1a        4.60      .954 No_date    6:03   64.55 .670
      [CN= 87.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 005:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 02:B1a        4.60      .954 No_date    6:03   64.55  n/a
       [RDT= 3.00] out<- 04:B1a        4.60      .289 No_date    6:27   64.55  n/a
            overflow <= 08:OVR          .00      .000 No_date    0:00     .00  n/a
      {MxStoUsed=.1235E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 005:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            04:B1a        4.60      .289 No_date    6:27   64.55  n/a
                     +   08:OVR          .00      .000 No_date    0:00     .00  n/a
       [DT= 3.00]  SUM=  02:B1aPND      4.60      .289 No_date    6:27   64.55  n/a
 005:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:201B      13.40     1.891 No_date    6:12   62.87  n/a
                     +   02:B1aPND     4.60      .289 No_date    6:27   64.55  n/a
       [DT= 3.00]  SUM=  03:201B      18.00     2.160 No_date    6:12   63.30  n/a
#*******************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*******************************************************
 005:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 03:201B      18.00     2.160 No_date    6:12   63.30  n/a
   *   [RDT= 3.00] out<- 01:SMT-4R    18.00     1.969 No_date    6:18   63.30  n/a
       [L/S/n=  600./ .850/.030]
       {Vmax= 1.113:Dmax=  .439}
```

```
005:0050---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:B1b         5.00     1.014 No_date     6:03    63.09 .655
     [CN= 86.1: N= 3.00]
     [Tp=  .17:DT= 3.00]
005:0051---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        04:B1c         1.00      .267 No_date     6:00    65.72 .682
     [CN= 87.7: N= 3.00]
     [Tp=  .10:DT= 3.00]
005:0052---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:B1b         5.00     1.014 No_date     6:03    63.09  n/a
                    +   04:B1c         1.00      .267 No_date     6:00    65.72  n/a
     [DT= 3.00]  SUM=   02:B1b/c       6.00     1.253 No_date     6:03    63.53  n/a
#*********************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*********************************************************
005:0053---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:SMT-4R     18.00     1.969 No_date     6:18    63.30  n/a
                    +   02:B1b/c       6.00     1.253 No_date     6:03    63.53  n/a
     [DT= 3.00]  SUM=   03:B1East     24.00     2.731 No_date     6:09    63.35  n/a
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*********************************************************************
005:0054---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      01:B1d         4.30     1.310 No_date     6:00    71.22 .739
     [XIMP=.25:TIMP=.25]
     [LOSS= 2 :CN= 86.0]
     [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=    .0]
     [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=    .0]
005:0055---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR ->  01:B1d         4.30     1.310 No_date     6:00    71.22  n/a
     [RDT= 3.00] out<-  04:B1d         4.30      .249 No_date     6:12    71.22  n/a
           overflow <=  08:OVR          .00      .000 No_date     0:00      .00  n/a
    {MxStoUsed=.1484E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
005:0056---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:B1d         4.30      .249 No_date     6:12    71.22  n/a
                    +   08:OVR          .00      .000 No_date     0:00      .00  n/a
     [DT= 3.00]  SUM=   01:B1dPND      4.30      .249 No_date     6:12    71.22  n/a
005:0057---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:B1f         3.50      .889 No_date     6:00    65.12 .676
     [CN= 87.4: N= 3.00]
     [Tp=  .11:DT= 3.00]
005:0058---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR ->  02:B1f         3.50      .889 No_date     6:00    65.12  n/a
     [RDT= 3.00] out<-  04:B1f         3.50      .159 No_date     6:24    65.12  n/a
           overflow <=  08:OVR          .00      .000 No_date     0:00      .00  n/a
    {MxStoUsed=.1126E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
005:0059---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:B1f         3.50      .159 No_date     6:24    65.12  n/a
                    +   08:OVR          .00      .000 No_date     0:00      .00  n/a
     [DT= 3.00]  SUM=   02:B1fPND      3.50      .159 No_date     6:24    65.12  n/a
005:0060---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      07:B1e         3.60     1.108 No_date     6:00    71.75 .745
     [XIMP=.27:TIMP=.27]
     [LOSS= 2 :CN= 86.0]
     [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=    .0]
     [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=    .0]
005:0061---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR ->  07:B1e         3.60     1.108 No_date     6:00    71.75  n/a
     [RDT= 3.00] out<-  06:B1e         3.60      .197 No_date     6:12    71.75  n/a
           overflow <=  08:OVR          .00      .000 No_date     0:00      .00  n/a
    {MxStoUsed=.1328E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
005:0062---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             06:B1e         3.60      .197 No_date     6:12    71.75  n/a
                    +   08:OVR          .00      .000 No_date     0:00      .00  n/a
     [DT= 3.00]  SUM=   07:B1ePND      3.60      .197 No_date     6:12    71.75  n/a
```

```
 005:0063--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:B1dPND      4.30      .249 No_date     6:12   71.22  n/a
                       + 02:B1West      3.50      .159 No_date     6:24   65.12  n/a
                       + 07:B1ePND      3.60      .197 No_date     6:12   71.75  n/a
       [DT= 3.00]  SUM=  02:B1West     11.40      .604 No_date     6:15   69.51  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*************************************************************
 005:0064--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:B1West     11.40      .604 No_date     6:15   69.51  n/a
                       + 03:B1East     24.00     2.731 No_date     6:09   63.35  n/a
       [DT= 3.00]  SUM=  04:SMT4       35.40     3.326 No_date     6:09   65.34  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
#*******************************
 005:0065--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:201C       91.00     9.278 No_date     6:24   62.87 .653
       [CN= 86.0: N= 3.00]
       [Tp=  .50:DT= 6.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 005:0066--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:C1a         7.00     1.249 No_date     6:06   62.87 .653
       [CN= 86.0: N= 3.00]
       [Tp=  .21:DT= 6.00]
#*****************************************
# C1a SWM FACILITY
#*****************************************
 005:0067--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a         7.00     1.249 No_date     6:06   62.87  n/a
       [RDT= 6.00] out<- 06:C1a        6.55      .325 No_date     6:18   62.87  n/a
             overflow <= 08:OVR         .45      .593 No_date     6:18   62.87  n/a
     {MxStoUsed=.1641E+00, TotOvfVol=.2836E-01, N-Ovf=    2, TotDurOvf=    0.hrs}
#*****************************************
# DISCHARGE FROM C1a SWM FACILITY
#*****************************************
 005:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             06:C1a         6.55      .325 No_date     6:18   62.87  n/a
                       + 08:OVR          .45      .593 No_date     6:18   62.87  n/a
       [DT= 6.00]  SUM=  02:C1aPND      7.00      .918 No_date     6:18   62.87  n/a
 005:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:C1b          .50      .150 No_date     6:00   63.75 .662
       [CN= 86.5: N= 3.00]
       [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 005:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:201C       91.00     9.278 No_date     6:24   62.87  n/a
                       + 02:EX+MC       7.00      .918 No_date     6:18   62.87  n/a
                       + 03:C1b          .50      .150 No_date     6:00   63.75  n/a
       [DT= 2.00]  SUM=  02:EX+MC      98.50    10.147 No_date     6:18   62.87  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 005:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:EX+MC      98.50    10.147 No_date     6:18   62.87  n/a
  *    [RDT= 2.00] out<- 01:SMT-1     98.50     9.589 No_date     6:24   62.87  n/a
       [L/S/n=  275./ .500/.030]
       {Vmax=  .962:Dmax=  .760}
 005:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        07:C2          3.80      .770 No_date     6:03   63.09 .655
       [CN= 86.1: N= 3.00]
       [Tp=  .17:DT= 3.00]
```

```
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 005:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1       98.50    9.589 No_date    6:24   62.87  n/a
                       + 07:C2          3.80     .770 No_date    6:03   63.09  n/a
      [DT= 2.00]  SUM=  01:SMT1      102.30    9.852 No_date    6:24   62.88  n/a
#*******************************************
# CONFLUENCE SMT 1-4
#*******************************************
 005:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:SMT4       35.40    3.326 No_date    6:09   65.34  n/a
                       + 01:SMT1      102.30    9.852 No_date    6:24   62.88  n/a
      [DT= 2.00]  SUM=  02:SMT1-4    137.70   12.820 No_date    6:22   63.51  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 005:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:201D       28.90    3.390 No_date    6:18   62.87 .653
       [CN= 86.0: N= 3.00]
       [Tp=  .41:DT= 6.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 005:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D       28.90    3.390 No_date    6:18   62.87  n/a
       [RDT= 6.00] out<- 03:SMT-3R     28.90    3.403 No_date    6:18   62.87  n/a
       [L/S/n=  100./ .700/.030]
       {Vmax= 1.429:Dmax=  .967}
#*************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#*************************************
 005:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:D1a         1.90     .450 No_date    6:00   66.20 .687
       [CN= 88.0: N= 3.00]
       [Tp=  .13:DT= 3.00]
 005:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        07:D1b         1.90     .504 No_date    6:00   62.87 .653
       [CN= 86.0: N= 3.00]
       [Tp=  .09:DT= 3.00]
#************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#************************************************
 005:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:D1a         1.90     .450 No_date    6:00   66.20  n/a
                       + 03:SMT-3R     28.90    3.403 No_date    6:18   62.87  n/a
                       + 07:D1b         1.90     .504 No_date    6:00   62.87  n/a
      [DT= 3.00]  SUM=  06:SMT3       32.70    3.716 No_date    6:12   63.06  n/a
#*******************************************
# CONFLUENCE SMT 1-3
#*******************************************
 005:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30    9.852 No_date    6:24   62.88  n/a
                       + 04:SMT4       35.40    3.326 No_date    6:09   65.34  n/a
                       + 06:SMT3       32.70    3.716 No_date    6:12   63.06  n/a
      [DT= 2.00]  SUM=  03:SMT1-3    170.40   16.370 No_date    6:20   63.42  n/a
#*********************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*********************************************************************
 005:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30    9.852 No_date    6:24   62.88  n/a
                       + 04:SMT4       35.40    3.326 No_date    6:09   65.34  n/a
                       + 06:SMT3       32.70    3.716 No_date    6:12   63.06  n/a
```

```
                    +  05:SMT2      83.60    7.714 No_date    6:24   63.20  n/a
     [DT= 2.00]  SUM=  08:1201     254.00   23.922 No_date    6:22   63.35  n/a
 005:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 08:1201     254.00   23.922 No_date    6:22   63.35  n/a
  *   [RDT= 2.00] out<- 03:002202   254.00   23.248 No_date    6:28   63.35  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax= 1.134:Dmax=  .672}
 005:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:000202    21.60    3.208 No_date    6:12   66.47 .690
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 005:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:002202   254.00   23.248 No_date    6:28   63.35  n/a
                    +  04:000202    21.60    3.208 No_date    6:12   66.47  n/a
      [DT= 2.00]  SUM=  02:001202   275.60   25.525 No_date    6:24   63.59  n/a
 005:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000203    26.30    4.582 No_date    6:06   66.47 .690
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 005:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000203    26.30    4.582 No_date    6:06   66.47  n/a
                    +  02:001202   275.60   25.525 No_date    6:24   63.59  n/a
      [DT= 2.00]  SUM=  04:000003   301.90   28.161 No_date    6:22   63.84  n/a
 005:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           04:000003   301.90   28.161 No_date    6:22   63.84  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 005:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:000204    53.60    4.865 No_date    6:30   65.53 .680
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 005:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:000204    53.60    4.865 No_date    6:30   65.53  n/a
                    +  04:000003   301.90   28.161 No_date    6:22   63.84  n/a
      [DT= 2.00]  SUM=  03:001204   355.50   32.849 No_date    6:22   64.10  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 005:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             09:001108   784.37   32.959 No_date    6:18   70.00  n/a
                    +  03:001204   355.50   32.849 No_date    6:22   64.10  n/a
      [DT= 2.00]  SUM=  02:000008  1139.87   65.757 No_date    6:22   68.16  n/a
 005:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           02:000008  1139.87   65.757 No_date    6:22   68.16  n/a
#*************************************************************
  ** END OF RUN :   5

*******************************************************************************



 RUN:COMMAND#
 006:0001--------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
```

```
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   6 ]
#*******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#*******************************************************************************
 006:0002-------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = TOWN OF MILTON 12 HOUR 100 YEAR SCS STORM (1998 IDF DATA)
      [SDT=12.00:SDUR=  12.00:PTOT= 106.96]
 006:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:000103    42.10    5.881 No_date    6:18   74.84 .700
      [CN= 86.0: N= 3.00]
      [Tp=  .40:DT= 6.00]
 006:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:000103    42.10    5.881 No_date    6:18   74.84  n/a
      [RDT= 6.00] out<- 02:002104    42.10    5.531 No_date    6:24   74.84  n/a
      [L/S/n=  440./1.000/.030]
      {Vmax=  .795:Dmax=  .614}
 006:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000104    24.10    5.036 No_date    6:06   74.84 .700
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
 006:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000104    24.10    5.036 No_date    6:06   74.84  n/a
                       + 02:002104    42.10    5.531 No_date    6:24   74.84  n/a
      [DT= 6.00]  SUM=  01:001104    66.20    8.873 No_date    6:12   74.84  n/a
 006:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001104    66.20    8.873 No_date    6:12   74.84  n/a
      [RDT= 6.00] out<- 02:002105    66.20    8.238 No_date    6:18   74.84  n/a
      [L/S/n=  365./ .400/.030]
      {Vmax=  .595:Dmax=  .604}
 006:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000105    19.20    4.511 No_date    6:00   76.26 .713
      [CN= 86.8: N= 3.00]
      [Tp=  .18:DT= 6.00]
 006:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000105    19.20    4.511 No_date    6:00   76.26  n/a
                       + 02:002105    66.20    8.238 No_date    6:18   74.84  n/a
      [DT= 6.00]  SUM=  01:001105    85.40   10.898 No_date    6:12   75.16  n/a
 006:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 01:001105    85.40   10.898 No_date    6:12   75.16  n/a
      [RDT= 6.00] out<- 02:002106    85.40   10.393 No_date    6:18   75.16  n/a
      [L/S/n=  385./ .670/.030]
      {Vmax=  .821:Dmax=  .648}
 006:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:000106    15.30    3.750 No_date    6:00   76.98 .720
      [CN= 87.2: N= 3.00]
      [Tp=  .17:DT= 6.00]
 006:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000106    15.30    3.750 No_date    6:00   76.98  n/a
                       + 02:002106    85.40   10.393 No_date    6:18   75.16  n/a
      [DT= 6.00]  SUM=  01:001106   100.70   12.397 No_date    6:12   75.43  n/a
 006:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      03:000107    15.27    1.172 No_date    6:48   82.70 .773
      [XIMP=.10:TIMP=.17]
      [LOSS= 2 :CN= 88.0]
      [Pervious     area: IAper= 2.50:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
      [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
 006:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
    ADD HYD             01:001106   100.70   12.397 No_date    6:12   75.43  n/a
                    +   03:000107    15.27    1.172 No_date    6:48   82.70  n/a
     [DT= 6.00]  SUM=   02:001107   115.97   13.099 No_date    6:12   76.39  n/a
006:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 02:001107   115.97   13.099 No_date    6:12   76.39  n/a
     [RDT= 6.00] out<- 01:002108   115.97   11.941 No_date    6:24   76.39  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.901:Dmax= 1.020}
006:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:000108    33.50    5.799 No_date    6:06   76.26 .713
     [CN= 86.8: N= 3.00]
     [Tp=  .29:DT= 6.00]
006:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:002108   115.97   11.941 No_date    6:24   76.39  n/a
                    +   02:000108    33.50    5.799 No_date    6:06   76.26  n/a
     [DT= 6.00]  SUM=   03:000004   149.47   16.688 No_date    6:18   76.36  n/a
006:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           03:000004   149.47   16.688 No_date    6:18   76.36  n/a
006:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD      04:000101   287.80   15.077 No_date    6:24   84.59 .791
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 83.4]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
006:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 04:000101   287.80   15.077 No_date    6:24   84.59  n/a
     [RDT= 6.00] out<- 05:002101   287.80   14.785 No_date    7:36   84.59  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .799:Dmax=  .801}
006:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      04:000102   272.90   16.381 No_date    6:00   77.94 .729
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 84.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
006:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:000102   272.90   16.381 No_date    6:00   77.94  n/a
                    +   05:002101   287.80   14.785 No_date    7:36   84.59  n/a
     [DT= 6.00]  SUM=   06:000001   560.70   26.504 No_date    7:42   81.35  n/a
006:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           06:000001   560.70   26.504 No_date    7:42   81.35  n/a
006:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:000001   560.70   26.504 No_date    7:42   81.35  n/a
     [RDT= 6.00] out<- 04:002109   560.70   25.911 No_date    7:48   81.35  n/a
     [L/S/n= 1000./ .540/.030]
     {Vmax= 1.158:Dmax= 1.177}
006:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        05:000109    35.10    5.835 No_date    6:12   76.26 .713
     [CN= 86.8: N= 3.00]
     [Tp=  .32:DT= 6.00]
006:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:002109   560.70   25.911 No_date    7:48   81.35  n/a
                    +   05:000109    35.10    5.835 No_date    6:12   76.26  n/a
     [DT= 6.00]  SUM=   06:001109   595.80   26.500 No_date    7:48   81.05  n/a
006:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:001109   595.80   26.500 No_date    7:48   81.05  n/a
     [RDT= 6.00] out<- 04:002110   595.80   26.330 No_date    7:54   81.05  n/a
     [L/S/n=  900./ .710/.030]
     {Vmax= 1.131:Dmax=  .969}
006:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        05:000110    21.80    4.622 No_date    6:06   76.98 .720
     [CN= 87.2: N= 3.00]
     [Tp=  .22:DT= 6.00]
006:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:002110   595.80   26.330 No_date    7:54   81.05  n/a
```

```
                    +  05:000110    21.80     4.622 No_date    6:06   76.98  n/a
     [DT= 6.00]  SUM=  06:001110   617.60    26.681 No_date    7:54   80.91  n/a
 006:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:001110   617.60    26.681 No_date    7:54   80.91  n/a
      [RDT= 6.00] out<- 04:002111   617.60    26.569 No_date    8:00   80.91  n/a
      [L/S/n=  920./1.250/.030]
      {Vmax= 2.173:Dmax= 1.057}
 006:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:000111    17.30     3.458 No_date    6:06   75.55 .706
      [CN= 86.4: N= 3.00]
      [Tp=  .23:DT= 6.00]
 006:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:000111    17.30     3.458 No_date    6:06   75.55  n/a
                    +  04:002111   617.60    26.569 No_date    8:00   80.91  n/a
      [DT= 6.00]  SUM=  02:000002   634.90    26.845 No_date    8:00   80.76  n/a
 006:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD           02:000002   634.90    26.845 No_date    8:00   80.76  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 006:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:000004   149.47    16.688 No_date    6:18   76.36  n/a
                    +  02:000002   634.90    26.845 No_date    8:00   80.76  n/a
      [DT= 6.00]  SUM=  09:001108   784.37    40.288 No_date    6:18   79.92  n/a
#*********************************************************
#*************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 006:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:201A      68.20     8.399 No_date    6:18   72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .47:DT= 6.00]
#Route NHYD=201A through Channel SMT-2
 006:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201A      68.20     8.399 No_date    6:18   72.54  n/a
      [RDT= 6.00] out<- 02:SMT-2R    68.20     8.049 No_date    6:24   72.54  n/a
      [L/S/n=  450./ .750/.030]
      {Vmax= 1.187:Dmax=  .684}
#*********************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*********************************************
 006:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        01:A1a         .80      .149 No_date    6:06   75.54 .706
      [CN= 87.7: N= 3.00]
      [Tp=  .27:DT= 6.00]
 006:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        03:A1b        6.10     1.976 No_date    6:00   72.77 .680
      [CN= 86.1: N= 3.00]
      [Tp=  .07:DT= 3.00]
 006:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:A1c        3.20      .832 No_date    6:03   74.73 .699
      [CN= 87.2: N= 3.00]
      [Tp=  .14:DT= 3.00]
 006:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        06:A1d        5.30     1.121 No_date    6:06   74.86 .700
      [CN= 87.3: N= 3.00]
      [Tp=  .21:DT= 6.00]
 006:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d        5.30     1.121 No_date    6:06   74.86  n/a
      [RDT= 6.00] out<- 07:A1d        5.30      .291 No_date    6:36   74.86  n/a
```

```
          overflow <= 08:OVR          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1850E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             07:A1d         5.30     .291 No_date    6:36   74.86  n/a
                    +   08:OVR          .00     .000 No_date    0:00     .00  n/a
      [DT= 6.00]  SUM=  06:A1dPND      5.30     .291 No_date    6:36   74.86  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*************************************************************
 006:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:A1a          .80     .149 No_date    6:06   75.54  n/a
                    +   02:SMT-2R     68.20    8.049 No_date    6:24   72.54  n/a
                    +   03:A1b         6.10    1.976 No_date    6:00   72.77  n/a
                    +   04:A1c         3.20     .832 No_date    6:03   74.73  n/a
                    +   06:A1dPND      5.30     .291 No_date    6:36   74.86  n/a
      [DT= 3.00]  SUM=  05:SMT2       83.60    8.867 No_date    6:24   73.01  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 006:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        01:201B       13.40    2.177 No_date    6:12   72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .31:DT= 6.00]
#*************************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*************************************************************************
 006:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:B1a         4.60    1.095 No_date    6:03   74.34 .695
      [CN= 87.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 006:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE RESERVOIR -> 02:B1a         4.60    1.095 No_date    6:03   74.34  n/a
     [RDT= 3.00] out<- 04:B1a         4.60     .313 No_date    6:27   74.34  n/a
          overflow <= 08:OVR          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.1451E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:B1a         4.60     .313 No_date    6:27   74.34  n/a
                    +   08:OVR          .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  02:B1aPND      4.60     .313 No_date    6:27   74.34  n/a
 006:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:201B       13.40    2.177 No_date    6:12   72.54  n/a
                    +   02:B1aPND      4.60     .313 No_date    6:27   74.34  n/a
      [DT= 3.00]  SUM=  03:201B       18.00    2.469 No_date    6:12   73.00  n/a
#*********************************************************
# Route NHYD=201B + B1a through Channel SMT-4
#*********************************************************
 006:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL   -> 03:201B       18.00    2.469 No_date    6:12   73.00  n/a
  *   [RDT= 3.00] out<- 01:SMT-4R    18.00    2.268 No_date    6:18   73.00  n/a
      [L/S/n=  600./ .850/.030]
      {Vmax= 1.151:Dmax=  .462}
 006:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        03:B1b         5.00    1.166 No_date    6:03   72.79 .680
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
 006:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        04:B1c         1.00     .305 No_date    6:00   75.58 .707
      [CN= 87.7: N= 3.00]
      [Tp=  .10:DT= 3.00]
 006:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             03:B1b         5.00    1.166 No_date    6:03   72.79  n/a
                    +   04:B1c         1.00     .305 No_date    6:00   75.58  n/a
      [DT= 3.00]  SUM=  02:B1b/c       6.00    1.439 No_date    6:03   73.25  n/a
#*********************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
```

```
#*********************************************************
 006:0053---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT-4R    18.00    2.268 No_date    6:18   73.00  n/a
                       + 02:B1b/c      6.00    1.439 No_date    6:03   73.25  n/a
      [DT= 3.00]   SUM=  03:B1East    24.00    3.160 No_date    6:09   73.06  n/a
#*************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*************************************************************
 006:0054---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   *  CALIB STANDHYD      01:B1d        4.30    1.489 No_date    6:00   81.14 .759
      [XIMP=.25:TIMP=.25]
      [LOSS= 2 :CN= 86.0]
      [Pervious     area: IAper= 5.00:SLPP= .85:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI= .85:LGI=  50.:MNI=.013:SCI=   .0]
 006:0055---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 01:B1d        4.30    1.489 No_date    6:00   81.14  n/a
      [RDT= 3.00] out<- 04:B1d        4.30     .269 No_date    6:12   81.14  n/a
            overflow <= 08:OVR         .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1709E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0056---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:B1d        4.30     .269 No_date    6:12   81.14  n/a
                       + 08:OVR         .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]   SUM=  01:B1dPND     4.30     .269 No_date    6:12   81.14  n/a
 006:0057---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:B1f        3.50    1.018 No_date    6:00   74.95 .701
      [CN= 87.4: N= 3.00]
      [Tp=  .11:DT= 3.00]
 006:0058---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1f        3.50    1.018 No_date    6:00   74.95  n/a
      [RDT= 3.00] out<- 04:B1f        3.50     .173 No_date    6:24   74.95  n/a
            overflow <= 08:OVR         .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1314E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0059---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:B1f        3.50     .173 No_date    6:24   74.95  n/a
                       + 08:OVR         .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]   SUM=  02:B1fPND     3.50     .173 No_date    6:24   74.95  n/a
 006:0060---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
   *  CALIB STANDHYD      07:B1e        3.60    1.258 No_date    6:00   81.68 .764
      [XIMP=.27:TIMP=.27]
      [LOSS= 2 :CN= 86.0]
      [Pervious     area: IAper= 5.00:SLPP=1.15:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI=1.15:LGI=  50.:MNI=.013:SCI=   .0]
 006:0061---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 07:B1e        3.60    1.258 No_date    6:00   81.68  n/a
      [RDT= 3.00] out<- 06:B1e        3.60     .214 No_date    6:15   81.68  n/a
            overflow <= 08:OVR         .00     .000 No_date    0:00     .00  n/a
     {MxStoUsed=.1522E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 006:0062---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             06:B1e        3.60     .214 No_date    6:15   81.68  n/a
                       + 08:OVR         .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]   SUM=  07:B1ePND     3.60     .214 No_date    6:15   81.68  n/a
 006:0063---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:B1dPND     4.30     .269 No_date    6:12   81.14  n/a
                       + 02:B1West     3.50     .173 No_date    6:24   74.95  n/a
                       + 07:B1ePND     3.60     .214 No_date    6:15   81.68  n/a
      [DT= 3.00]   SUM=  02:B1West    11.40     .654 No_date    6:15   79.41  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*************************************************************
 006:0064---------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:B1West    11.40     .654 No_date    6:15   79.41  n/a
                       + 03:B1East    24.00    3.160 No_date    6:09   73.06  n/a
      [DT= 3.00]   SUM=  04:SMT4      35.40    3.805 No_date    6:09   75.11  n/a
#*******************************
# DRAINAGE FROM 201C (EXTERNAL)
```

```
#******************************
 006:0065--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201C      91.00   10.699 No_date    6:24   72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .50:DT= 6.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 006:0066--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:C1a        7.00    1.436 No_date    6:06   72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .21:DT= 6.00]
#*****************************************
# C1a SWM FACILITY
#*****************************************
 006:0067--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:C1a        7.00    1.436 No_date    6:06   72.54  n/a
      [RDT= 6.00] out<- 06:C1a        6.03     .325 No_date    6:12   72.54  n/a
            overflow <= 08:OVR         .97     .994 No_date    6:12   72.54  n/a
     {MxStoUsed=.1618E+00, TotOvfVol=.7036E-01, N-Ovf=    2, TotDurOvf=    0.hrs}
#*****************************************
# DISCHARGE FROM C1a SWM FACILITY
#*****************************************
 006:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            06:C1a        6.03     .325 No_date    6:12   72.54  n/a
                      + 08:OVR         .97     .994 No_date    6:12   72.54  n/a
      [DT= 6.00]  SUM=  02:C1aPND     7.00    1.319 No_date    6:12   72.54  n/a
 006:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:C1b         .50     .171 No_date    6:00   73.49 .687
      [CN= 86.5: N= 3.00]
      [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 006:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201C      91.00   10.699 No_date    6:24   72.54  n/a
                      + 02:EX+MC      7.00    1.319 No_date    6:12   72.54  n/a
                      + 03:C1b         .50     .171 No_date    6:00   73.49  n/a
      [DT= 2.00]  SUM=  02:EX+MC     98.50   11.713 No_date    6:18   72.55  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 006:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 02:EX+MC     98.50   11.713 No_date    6:18   72.55  n/a
  *   [RDT= 2.00] out<- 01:SMT-1     98.50   11.183 No_date    6:22   72.55  n/a
      [L/S/n=  275./ .500/.030]
      {Vmax=  .965:Dmax=  .789}
 006:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       07:C2         3.80     .886 No_date    6:03   72.79 .680
      [CN= 86.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 006:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      98.50   11.183 No_date    6:22   72.55  n/a
                      + 07:C2         3.80     .886 No_date    6:03   72.79  n/a
      [DT= 2.00]  SUM=  01:SMT1     102.30   11.525 No_date    6:22   72.55  n/a
#*****************************************
# CONFLUENCE SMT 1-4
#*****************************************
 006:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:SMT4      35.40    3.805 No_date    6:09   75.11  n/a
                      + 01:SMT1     102.30   11.525 No_date    6:22   72.55  n/a
```

```
      [DT= 2.00]  SUM=  02:SMT1-4    137.70    14.977 No_date    6:20    73.21  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
#*****************************
 006:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:201D       28.90     3.907 No_date    6:18    72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .41:DT= 6.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 006:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D       28.90     3.907 No_date    6:18    72.54  n/a
      [RDT= 6.00] out<- 03:SMT-3R     28.90     3.923 No_date    6:18    72.54  n/a
      [L/S/n=  100./ .700/.030]
      {Vmax= 1.481:Dmax= 1.020}
#************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#************************************
 006:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:D1a         1.90      .515 No_date    6:00    76.09 .711
      [CN= 88.0: N= 3.00]
      [Tp=  .13:DT= 3.00]
 006:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       07:D1b         1.90      .578 No_date    6:00    72.54 .678
      [CN= 86.0: N= 3.00]
      [Tp=  .09:DT= 3.00]
#*********************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*********************************************
 006:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:D1a         1.90      .515 No_date    6:00    76.09  n/a
                      + 03:SMT-3R     28.90     3.923 No_date    6:18    72.54  n/a
                      + 07:D1b         1.90      .578 No_date    6:00    72.54  n/a
      [DT= 3.00]  SUM=  06:SMT3       32.70     4.289 No_date    6:12    72.75  n/a
#*******************************************
# CONFLUENCE SMT 1-3
#*******************************************
 006:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      102.30    11.525 No_date    6:22    72.55  n/a
                      + 04:SMT4       35.40     3.805 No_date    6:09    75.11  n/a
                      + 06:SMT3       32.70     4.289 No_date    6:12    72.75  n/a
      [DT= 2.00]  SUM=  03:SMT1-3    170.40    19.103 No_date    6:18    73.12  n/a
#*********************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*********************************************************************
 006:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:SMT1      102.30    11.525 No_date    6:22    72.55  n/a
                      + 04:SMT4       35.40     3.805 No_date    6:09    75.11  n/a
                      + 06:SMT3       32.70     4.289 No_date    6:12    72.75  n/a
                      + 05:SMT2       83.60     8.867 No_date    6:24    73.01  n/a
      [DT= 2.00]  SUM=  08:1201      254.00    27.734 No_date    6:20    73.09  n/a
 006:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 08:1201      254.00    27.734 No_date    6:20    73.09  n/a
  *   [RDT= 2.00] out<- 03:002202    254.00    27.015 No_date    6:26    73.09  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax= 1.184:Dmax=  .702}
 006:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:000202     21.60     3.673 No_date    6:12    76.26 .713
      [CN= 86.8: N= 3.00]
      [Tp=  .30:DT= 6.00]
 006:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:002202    254.00    27.015 No_date    6:26    73.09  n/a
                      + 04:000202     21.60     3.673 No_date    6:12    76.26  n/a
```

```
      [DT= 2.00]  SUM=  02:001202   275.60    29.716 No_date    6:24   73.34  n/a
 006:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000203    26.30     5.247 No_date    6:06   76.26 .713
      [CN= 86.8: N= 3.00]
      [Tp=  .24:DT= 6.00]
 006:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000203    26.30     5.247 No_date    6:06   76.26  n/a
                      + 02:001202   275.60    29.716 No_date    6:24   73.34  n/a
      [DT= 2.00]  SUM=  04:000003   301.90    32.906 No_date    6:20   73.59  n/a
 006:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          04:000003   301.90    32.906 No_date    6:20   73.59  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 006:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:000204    53.60     5.593 No_date    6:30   75.38 .705
      [CN= 87.6: N= 3.00]
      [Tp=  .63:DT= 6.00]
 006:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:000204    53.60     5.593 No_date    6:30   75.38  n/a
                      + 04:000003   301.90    32.906 No_date    6:20   73.59  n/a
      [DT= 2.00]  SUM=  03:001204   355.50    38.245 No_date    6:22   73.86  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 006:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            09:001108   784.37    40.288 No_date    6:18   79.92  n/a
                      + 03:001204   355.50    38.245 No_date    6:22   73.86  n/a
      [DT= 2.00]  SUM=  02:000008  1139.87    78.317 No_date    6:20   78.03  n/a
 006:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000008  1139.87    78.317 No_date    6:20   78.03  n/a
#*************************************************************
 006:0002-------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0008 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0011 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0013 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
      *** WARNING: For areas with impervious ratios below
                   20%, this routine may not be applicable.
 001:0021 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
 001:0038 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0049 ROUTE CHANNEL   ->
      *** WARNING: Requested routing DT > than inflow DT.
                   Routing DT set to inflow hydrograph DT.
```

```
001:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
001:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
001:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
001:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
001:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
002:0008 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
002:0011 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
002:0013 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
     *** WARNING: For areas with impervious ratios below
                  20%, this routine may not be applicable.
002:0021 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0038 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
002:0049 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
002:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
002:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
002:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
002:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
002:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
003:0008 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
003:0011 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
003:0013 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
```

```
     *** WARNING: For areas with impervious ratios below
                  20%, this routine may not be applicable.
003:0021 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
003:0038 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
003:0049 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
003:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
003:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
003:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
003:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
003:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
003:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
004:0008 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
004:0011 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
004:0013 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
     *** WARNING: For areas with impervious ratios below
                  20%, this routine may not be applicable.
004:0021 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
004:0038 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
004:0049 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
004:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
004:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
004:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
004:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
004:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
004:0082 ROUTE CHANNEL   ->
```

```
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
005:0008 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
005:0011 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
005:0013 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
     *** WARNING: For areas with impervious ratios below
                  20%, this routine may not be applicable.
005:0021 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
005:0038 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
005:0049 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
005:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
005:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
005:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
005:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
005:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
005:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
006:0008 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
006:0011 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
006:0013 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
     *** WARNING: For areas with impervious ratios below
                  20%, this routine may not be applicable.
006:0021 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
006:0038 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
006:0049 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
006:0054 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
                  Use a smaller DT or a larger area.
006:0060 CALIB STANDHYD
     *** WARNING: Storage Coefficient is smaller than DT!
```

```
                  Use a smaller DT or a larger area.
006:0069 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
006:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
006:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
006:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
  Simulation ended on 2011-12-06     at 12:10:23
================================================================================
```

```
2     Metric units
*#*************************************************************************
*#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
*#  Date        : 08-16-2011
*#  Modeller    : [C. Silvestri]
*#  Company     : Philips Engineering Ltd
*#  License #   :  3569108
*#*************************************************************************
START                 START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=1
                      HAZEL.STM
*
READ STORM            "STORM.001"
*
*
* Subarea 103 - Entering Property
CALIB NASHYD          ID= 1  NHYD=103  DT=5 min  AREA=42.1 ha  DWF=0.0 cms
                      CN=94  IA=0 mm  N=3.0  Tp=0.399 hrs  END=-1
*
* Route through Channel 104
ROUTE CHANNEL         ID=2  NHYD=2104  IDIN=1  DT=5.0 min
                      CHLGTH=440 m  CHSLP=1 %  FPSLP=1 %
                      VSN=104  NSEG=3
                      ROUGH DIST(m)
                        0.04  59
                       -0.03  60
                        0.04  89

                      DIST(m)  ELEV(m)
                         0.0    179.5
                        18.0    178.5
                        59.0    178.0
                        59.5    177.7
                        60.0    178.0
                        89.0    178.5
*
* Subarea 104 - Creek Block Upstream of Proposed 5 acre Pond
CALIB NASHYD          ID= 3  NHYD=104  DT=5 min  AREA= 24.1 ha  DWF=0.0 cms
                      CN=94.0  IA=0 mm  N=3.0  Tp=0.208 hrs  END=-1
*
ADD HYD               ID= 1  NHYD=1104  IDI= 3  IDII= 2
*
* Route through channel 105
ROUTE CHANNEL         ID=2  NHYD=2105  IDIN=1  DT=5.0 min
                      CHLGTH=365 m  CHSLP=0.4 %  FPSLP=0.4 %
                      VSN=105  NSEG=3
                      ROUGH DIST(m)
                        0.04  52
                       -0.03  53
                        0.04  100

                      DIST(m)  ELEV(m)
                         0.0    178.0
                        28.0    177.0
                        52.0    176.9
                        52.5    176.6
                        53.0    176.9
                        80.0    177.0
                       100.0    177.5
*
* Subarea 105 - Creek Block Upstream of Proposed Pond 2nd 5 acre pond
CALIB NASHYD          ID=3  NHYD=105  DT=5 min  AREA= 19.2 ha  DWF=0.0 cms
                      CN=95  IA=0 mm  N=3.0  Tp=0.176 hrs  END=-1
*
ADD HYD               ID=1  NHYD=1105  IDI=3  IDII=2
*
```

```
ROUTE CHANNEL        ID=2  NHYD=2106  IDIN=1  DT=5.0 min
                     CHLGTH=385 m  CHSLP=0.67 %  FPSLP=0.67 %
                     VSN=106  NSEG=3
                     ROUGH DIST(m)
                       0.04  77
                      -0.03  78
                       0.04  120

                     DIST(m)  ELEV(m)
                        0.0    176.0
                       20.0    175.5
                       32.0    175.0
                       58.0    174.5
                       77.0    174.5
                       77.5    174.2
                       78.0    174.5
                      102.0    175.0
                      120.0    175.5
*
* Subarea 106 - Creek Block Upstream of Pond
CALIB NASHYD         ID= 3  NHYD=106  DT=5 min  AREA= 15.3 ha  DWF=0.0 cms
                     CN=95  IA=0 mm  N=3.0  Tp=0.168 hrs  END=-1
*
ADD HYD              ID= 1  NHYD=1106  IDI= 3  IDII= 2
*
* Subarea 107 - East drainage area for tributary
CALIB STANDHYD       ID= 3  NHYD=107  DT=5 min  AREA= 15.27 ha
                     XIMP=0.10  TIMP=0.17  DWF=0.0 cms  LOSS=2  CN=93
                     DPSP=5.0 mm  SLPP=1.27 %  LGP=717  MNP=0.250  SCP=0.0
                     DPSI=1.57 mm  SLPI=1.27 %  LGI=100  MNI=0.017  SCI=0.0
                     END=-1
*
ADD HYD              ID=2  NHYD=1107  IDI=1  IDII=3
*
* Route Eastern Section of Tributary through Channel-108
ROUTE CHANNEL        ID=1  NHYD=2108  IDIN=2  DT=5.0 min
                     CHLGTH=1300 m  CHSLP=1.67 %  FPSLP=1.67 %
                     VSN=108  NSEG=3
                     ROUGH DIST(m)
                       0.04  65
                      -0.03  66
                       0.04  110

                     DIST(m)  ELEV(m)
                        0.0    172.0
                       42.0    167.5
                       51.0    160.0
                       65.0    159.0
                       65.5    158.7
                       66.0    159.0
                       88.0    165.0
                      110.0    170.0
*
* Subarea 108
CALIB NASHYD         ID= 2  NHYD=108  DT=5 min  AREA=33.5 ha  DWF=0.0 cms
                     CN=95  IA=0 mm  N=3.0  Tp=0.295 hrs  END=-1
*
ADD HYD              ID=3  NHYD=004  IDI=1  IDII=2
PRINT HYD            ID=3  NPCYC=-1
*
* CALULATE FLOWS ENTERING SITE FROM NORTHWEST
* Subarea 101 -
CALIB STANDHYD       ID= 4  NHYD=101  DT=5 min  AREA= 287.8 ha
                     XIMP=0.20  TIMP=0.495  DWF=0.0 cms  LOSS=2  CN=93
                     DPSP=5.0 mm  SLPP=0.625 %  LGP=700  MNP=0.250  SCP=0.0
```

```
                    DPSI=1.57 mm  SLPI=0.625 %  LGI=3200  MNI=0.017  SCI=0.0
                    END=-1
*
*
*Route NHYD=101 through channel 102
ROUTE CHANNEL       ID=5  NHYD=2101  IDIN=4  DT=5.0 min
                    CHLGTH=700 m  CHSLP=0.42 %  FPSLP=0.42 %
                    VSN=102  NSEG=3
                    ROUGH DIST(m)
                      0.04  110
                     -0.03  111
                      0.04  160

                    DIST(m)  ELEV(m)
                       0.0    182.5
                      90.0    180.0
                     110.0    179.8
                     110.5    179.5
                     111.0    179.8
                     130.0    180.0
                     160.0    182.5
*
* Subarea 102 -
CALIB STANDHYD      ID= 4  NHYD=102  DT=5 min  AREA= 272.9 ha
                    XIMP=0.13  TIMP=0.275  DWF=0.0 cms  LOSS=2  CN=93
                    DPSP=5.0 mm  SLPP=0.98 %  LGP=1350  MNP=0.250  SCP=0.0
                    DPSI=1.57 mm  SLPI=0.98 %  LGI=40  MNI=0.017  SCI=0.0
                    END=-1
*
* Node 001
ADD HYD             ID= 6  NHYD= 001  IDI=4  IDII=5
PRINT HYD           ID= 6  NPCYC=-1
*
*Route NHYD=001 through channel 109
ROUTE CHANNEL       ID=4  NHYD=2109  IDIN=6  DT=5.0 min
                    CHLGTH=1000 m  CHSLP=0.54 %  FPSLP=0.54 %
                    VSN=109  NSEG=3
                    ROUGH DIST(m)
                      0.04  50
                     -0.03  51
                      0.04  88

                    DIST(m)  ELEV(m)
                       0.0    176.0
                      14.0    175.5
                      18.0    175.0
                      26.0    174.0
                      42.0    173.0
                      50.0    173.0
                      50.5    172.7
                      51.0    173.0
                      58.0    173.5
                      88.0    174.0
* Subarea 109
CALIB NASHYD        ID= 5  NHYD=109  DT=5 min  AREA= 35.1 ha  DWF=0.0 cms
                    CN=95  IA=0 mm  N=3.0  Tp=0.318 hrs  END=-1
*
ADD HYD             ID= 6  NHYD=1109  IDI=4  IDII=5
*
*Route NHYD=1109 through Channel 110
ROUTE CHANNEL       ID=4  NHYD=2110  IDIN=6  DT=5.0 min
                    CHLGTH=900 m  CHSLP=0.71 %  FPSLP=0.71 %
                    VSN=110  NSEG=3
                    ROUGH DIST(m)
                      0.04  61
```

```
                    -0.03  62
                     0.04  114

                    DIST(m)  ELEV(m)
                       0.0    175.0
                      10.0    172.5
                      18.0    170.0
                      20.0    168.0
                      61.0    167.5
                      61.5    167.2
                      62.0    167.5
                      80.0    170.0
                      98.0    172.5
                     114.0    175.5
*
* Subarea 110
CALIB NASHYD         ID= 5  NHYD=110  DT=5 min  AREA= 21.8 ha  DWF=0.0 cms
                     CN=95  IA=0 mm  N=3.0  Tp=0.215 hrs  END=-1
*
ADD HYD              ID= 6  NHYD= 1110  IDI=4  IDII=5
*
*Route NHYD=1110 through Channel 111
ROUTE CHANNEL        ID=4  NHYD=2111  IDIN=6  DT=5.0 min
                     CHLGTH=920 m  CHSLP=1.25 %  FPSLP=1.25 %
                     VSN=111  NSEG=3
                     ROUGH DIST(m)
                       0.04  56
                      -0.03  57
                       0.04  105

                     DIST(m)  ELEV(m)
                        0.0    172.0
                       16.0    170.0
                       44.0    159.0
                       56.0    159.0
                       56.5    158.7
                       57.0    159.0
                       84.0    170.0
                      105.0    175.0
*
* Subarea 111
CALIB NASHYD         ID= 1  NHYD=0111  DT=5 min  AREA=17.3 ha  DWF=0.0 cms
                     CN=94  IA=0mm  N=3.0  Tp=0.235 hrs  END=-1
* Node 002
ADD HYD              ID=2  NHYD= 002  IDI=1  IDII=4
PRINT HYD            ID=2  NPCYC=-1
*
*
*#*********************************************************
*# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
* At confluence of two main branches
ADD HYD              ID=9  NHYD=1108  IDI=3  IDII=2
*#*********************************************************
*
* Calculations for South-West section of site (3 subcatchments have been created
for catchment 201)
*#*************************************************************************
****
*# SUBCATCHMENT CONTAINING CEMETERY LANDS
*#*************************************************************************
****
*# PROPOSED IMPERVIOUSNESS LESS THAN 20%
*# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS
SURFACES
*#
```

```
*#################################
*# DRAINAGE FROM 201A (EXTERNAL)
*#################################
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=1  NHYD="201A"  DT=5 min  AREA=68.2 ha  DWF=0.0 cms
                   CN=94.0  IA=3 mm  N=3.0  Tp=0.47 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
*#Route NHYD=201A through Channel SMT-2
ROUTE CHANNEL      ID=2  NHYD="SMT-2" IDIN=1  DT=5.0 min
                   CHLGTH=450 m  CHSLP=0.75 %  FPSLP=0.75 %
                   VSN=CA1  NSEG=3
                   ROUGH DIST(m)
                     0.04  35
                    -0.03  45
                     0.04  90

                   DIST(m)  ELEV(m)
                      0.0    101.0
                     35.0    100.5
                     40.0    100.0
                     45.0    100.5
                     90.0    101.0
*%-----------------|-------------------------------------------------------------|
*#################################################
*# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
*#################################################
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=1  NHYD="A1a"  DT=5 min  AREA=0.8 ha  DWF=0.0 cms
                   CN=94.19  IA=3 mm  N=3.0  Tp=0.27 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=3  NHYD="A1b"  DT=3 min  AREA=6.1 ha  DWF=0.0 cms
                   CN=94.01  IA=3 mm  N=3.0  Tp=0.07 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=4  NHYD="A1c"  DT=3 min  AREA=3.2 ha  DWF=0.0 cms
                   CN=94.14  IA=3 mm  N=3.0  Tp=0.14 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD       ID=6  NHYD="A1d"  DT=5 min  AREA=5.3 ha  DWF=0.0 cms
                   CN=94.15  IA=3 mm  N=3.0  Tp=0.21 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
ROUTE RESERVOIR    IDout=[7],   NHYD=["A1d"],  IDin=[6],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0  ,  0.0  ]
                                  [  0.034, 0.028]
                                  [  0.103, 0.043]
                                  [  0.142, 0.059]
                                  [  0.198, 0.093]
                                  [  0.241, 0.129]
                                  [  0.278, 0.168]
                                  [  0.310, 0.209]
                                  [   -1  ,  -1   ]  (max twenty pts)
                         IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[6], NHYD=["A1dPND"], IDs to add=[7+8]
*%-----------------|-------------------------------------------------------------|
*#############################################################
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
*#############################################################
*%-----------------|-------------------------------------------------------------|
ADD HYD            IDsum=[5], NHYD=["SMT2"], IDs to add=[1+2+3+4+6]
*%-----------------|-------------------------------------------------------------|
*#################################
*# DRAINAGE FROM 201B (EXTERNAL)
*#################################
```

```
*%----------------|-------------------------------------------------------|
CALIB NASHYD       ID=1  NHYD="201B"  DT=5 min  AREA=13.4 ha  DWF=0.0 cms
                   CN=94.0  IA=3 mm  N=3.0  Tp=0.31 hrs  END=-1

*#*********************************************************************
*# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
*#*********************************************************************
*%----------------|-------------------------------------------------------|
CALIB NASHYD       ID=2  NHYD="B1a"  DT=3 min  AREA=4.6 ha  DWF=0.0 cms
                   CN=94.11  IA=3 mm  N=3.0  Tp=0.17 hrs  END=-1
*%----------------|-------------------------------------------------------|
ROUTE RESERVOIR    IDout=[4],   NHYD=["B1a"],  IDin=[2],
                   RDT=[5](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0 ,  0.0   ]
                                  [  0.034, 0.019]
                                  [  0.103, 0.029]
                                  [  0.142, 0.040]
                                  [  0.198, 0.062]
                                  [  0.241, 0.087]
                                  [  0.278, 0.114]
                                  [  0.310, 0.142]
                                  [  0.325, 0.158]
                                  [   -1   ,  -1   ]  (max twenty pts)
                         IDovf=[8], NHYDovf=["OVR"]
*%----------------|-------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["B1aPND"], IDs to add=[4+8]
*%----------------|-------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["SMT-4"], IDs to add=[1+2]
*%----------------|-------------------------------------------------------|
*#Route NHYD=201B + B1a through Channel SMT-4
ROUTE CHANNEL      ID=1  NHYD="SMT-4R" IDIN=3  DT=5.0 min
                   CHLGTH=600 m  CHSLP=0.85 %  FPSLP=0.85 %
                   VSN=CB1  NSEG=3
                   ROUGH DIST(m)
                     0.04  35
                    -0.03  45
                     0.04  90

                   DIST(m)  ELEV(m)
                      0.0    101.0
                     35.0    100.5
                     40.0    100.0
                     45.0    100.5
                     90.0    101.0
*%----------------|-------------------------------------------------------|
CALIB NASHYD       ID=3  NHYD="B1b"  DT=3 min  AREA=5.0 ha  DWF=0.0 cms
                   CN=94.02  IA=3 mm  N=3.0  Tp=0.17 hrs  END=-1
*%----------------|-------------------------------------------------------|
CALIB NASHYD       ID=4  NHYD="B1c"  DT=3 min  AREA=1.0 ha  DWF=0.0 cms
                   CN=94.19  IA=3 mm  N=3.0  Tp=0.10 hrs  END=-1
*%----------------|-------------------------------------------------------|
ADD HYD            IDsum=[2], NHYD=["B1b/c"], IDs to add=[3+4]
*%----------------|-------------------------------------------------------|
*#*****************************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
*#*****************************************************
*%----------------|-------------------------------------------------------|
ADD HYD            IDsum=[3], NHYD=["B1East"], IDs to add=[1+2]
*%----------------|-------------------------------------------------------|
*#*********************************************************************
*# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
*#*********************************************************************
*%----------------|-------------------------------------------------------|
```

```
CALIB STANDHYD      ID=[1], NHYD=["B1d"], DT=[3](min), AREA=[4.3](ha),
                    XIMP=[0.2535], TIMP=[0.2535], DWF=[0.0](cms), LOSS=[2],
                    SCS curve number CN=[94],
                    Pervious   surfaces: IAper=[5](mm), SLPP=[1.00](%),
                                         LGP=[30](m), MNP=[0.035], SCP=[0](min),
                    Impervious surfaces: IAimp=[0.5](mm), SLPI=[1.00](%),
                                         LGI=[50](m), MNI=[0.013], SCI=[0](min),
                    END=-1
*%-----------------|-------------------------------------------------------|
ROUTE RESERVOIR     IDout=[4],   NHYD=["B1d"],  IDin=[1],
                    RDT=[5](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0 ,  0.0  ]
                                  [  0.034, 0.031]
                                  [  0.103, 0.048]
                                  [  0.142, 0.065]
                                  [  0.198, 0.101]
                                  [  0.241, 0.139]
                                  [  0.278, 0.180]
                                  [  0.310, 0.223]
                                  [   -1   ,  -1   ]  (max twenty pts)
                          IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[1], NHYD=["B1dPND"], IDs to add=[4+8]
*%-----------------|-------------------------------------------------------|
CALIB NASHYD        ID=2  NHYD="B1f"  DT=3 min  AREA=3.5 ha  DWF=0.0 cms
                    CN=94.15  IA=3 mm  N=3.0  Tp=0.11 hrs  END=-1
*%-----------------|-------------------------------------------------------|
ROUTE RESERVOIR     IDout=[4],   NHYD=["B1f"],  IDin=[2],
                    RDT=[5](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0 ,  0.0  ]
                                  [  0.044, 0.025]
                                  [  0.076, 0.038]
                                  [  0.099, 0.052]
                                  [  0.132, 0.081]
                                  [  0.159, 0.112]
                                  [  0.182, 0.145]
                                  [  0.202, 0.181]
                                  [  0.212, 0.199]
                                  [   -1   ,  -1   ]  (max twenty pts)
                          IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------|
ADD HYD             IDsum=[2], NHYD=["B1fPND"], IDs to add=[4+8]
*%-----------------|-------------------------------------------------------|
CALIB STANDHYD      ID=[7], NHYD=["B1e"], DT=[3](min), AREA=[3.6](ha),
                    XIMP=[0.2694], TIMP=[0.2694], DWF=[0.0](cms), LOSS=[2],
                    SCS curve number CN=[94],
                    Pervious   surfaces: IAper=[5](mm), SLPP=[1.00](%),
                                         LGP=[30](m), MNP=[0.035], SCP=[0](min),
                    Impervious surfaces: IAimp=[0.5](mm), SLPI=[1.00](%),
                                         LGI=[50](m), MNI=[0.013], SCI=[0](min),
                    END=-1
*%-----------------|-------------------------------------------------------|
ROUTE RESERVOIR     IDout=[6],   NHYD=["B1e"],  IDin=[7],
                    RDT=[5](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                    (cms) - (ha-m)
                                  [  0.0 , 0.0  ]
                                  [  0.034, 0.041]
                                  [  0.103, 0.062]
                                  [  0.142, 0.085]
                                  [  0.198, 0.133]
```

```
                                    SWMR.dat
                                   [  0.241, 0.184]
                                   [  0.278, 0.240]
                                   [  0.310, 0.299]
                                   [   -1   ,  -1  ]  (max twenty pts)
                          IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------|
ADD HYD           IDsum=[7], NHYD=["B1ePND"], IDs to add=[6+8]
*%-----------------|-------------------------------------------------------|
ADD HYD           IDsum=[2], NHYD=["B1d/e/f"], IDs to add=[1+2+7]
*%-----------------|-------------------------------------------------------|
*#*****************************************************************
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
*#*****************************************************************
*%-----------------|-------------------------------------------------------|
ADD HYD           IDsum=[4], NHYD=["SMT4"], IDs to add=[2+3]
*%-----------------|-------------------------------------------------------|
*#*********************************
*# DRAINAGE FROM 201C (EXTERNAL)
*#*********************************
CALIB NASHYD      ID=1  NHYD="201C"  DT=5 min  AREA=91.0 ha  DWF=0.0 cms
                  CN=94.0  IA=3 mm  N=3.0  Tp=0.50 hrs  END=-1
*#*****************************************
*# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
*#*****************************************
*%-----------------|-------------------------------------------------------|
CALIB NASHYD      ID=2  NHYD="C1a"  DT=5 min  AREA=7.0 ha  DWF=0.0 cms
                  CN=94.11  IA=3 mm  N=3.0  Tp=0.21 hrs  END=-1
*%-----------------|-------------------------------------------------------|
ROUTE RESERVOIR   IDout=[6],   NHYD=["C1a"],  IDin=[2],
                  RDT=[5](min),
                        TABLE of ( OUTFLOW-STORAGE ) values
                                   (cms) - (ha-m)
                                   [  0.0  ,  0.0  ]
                                   [  0.034, 0.021]
                                   [  0.103, 0.032]
                                   [  0.142, 0.043]
                                   [  0.198, 0.067]
                                   [  0.241, 0.093]
                                   [  0.278, 0.120]
                                   [  0.310, 0.150]
                                   [  0.325, 0.165]
                                   [   -1   ,  -1  ]  (max twenty pts)
                          IDovf=[8], NHYDovf=["OVR"]
*%-----------------|-------------------------------------------------------|
ADD HYD           IDsum=[2], NHYD=["C1aPND"], IDs to add=[6+8]
*%-----------------|-------------------------------------------------------|
CALIB NASHYD      ID=3  NHYD="C1b"  DT=2 min  AREA=0.5 ha  DWF=0.0 cms
                  CN=94.06 IA=3 mm  N=3.0  Tp=0.04 hrs  END=-1
*%-----------------|-------------------------------------------------------|
*#*****************************************************************
*# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
*#*****************************************************************
ADD HYD           IDsum=[2], NHYD=["EX+MC"], IDs to add=[1+2+3]
*%-----------------|-------------------------------------------------------|
*#*****************************************
*# Route NHYD=201C through Channel SMT-1
*#*****************************************
ROUTE CHANNEL     ID=1  NHYD="SMT-1"  IDIN=2  DT=5.0 min
                  CHLGTH=275 m  CHSLP=0.50 %  FPSLP=0.50 %
                  VSN=CC1  NSEG=3
                  ROUGH DIST(m)
                    0.04  35
                   -0.03  45
                    0.04  90
```

```
                    DIST(m)  ELEV(m)
                       0.0    101.0
                      35.0    100.5
                      40.0    100.0
                      45.0    100.5
                      90.0    101.0

*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=7  NHYD="C2"  DT=3 min  AREA=3.8 ha  DWF=0.0 cms
                    CN=94.02  IA=3 mm  N=3.0  Tp=0.17 hrs  END=-1
*%-----------------|-------------------------------------------------------------|
*#################################################
*# TOTAL DRAINAGE FROM SUBCATCHMENTS
*# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
*#################################################
ADD HYD             IDsum=[1], NHYD=["SMT1"], IDs to add=[1+7]
*%-----------------|-------------------------------------------------------------|
*#############################################
*# CONFLUENCE SMT 1-4
*#############################################
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[2], NHYD=["SMT1-4"], IDs to add=[4+1]
*%-----------------|-------------------------------------------------------------|
*#############################
*# DRAINAGE FROM 201D (EXTERNAL)
*#############################
CALIB NASHYD        ID=2  NHYD="201D"  DT=5 min  AREA=28.9 ha  DWF=0.0 cms
                    CN=94.0  IA=3 mm  N=3.0  Tp=0.41 hrs  END=-1
*%-----------------|-------------------------------------------------------------|

*#########################
*# SUBCATCHMENT 201D ROUTED
*# THROUGH Channel SMT-3
*#########################
*%-----------------|-------------------------------------------------------------|
ROUTE CHANNEL       ID=3  NHYD="SMT-3"  IDIN=2  DT=5.0 min
                    CHLGTH=100 m  CHSLP=0.70 %  FPSLP=0.70 %
                    VSN=CD1  NSEG=3
                    ROUGH DIST(m)
                      0.04  10
                     -0.03  15
                      0.04  20

                    DIST(m)  ELEV(m)
                       0.0    178.0
                      26.0    177.6
                      30.0    176.0
                      34.0    177.57
                      50.0    178.0
*%-----------------|-------------------------------------------------------------|
*#####################################
*# DRAINAGE FROM CEMETERY LANDS D1a, D1b
*#####################################
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=2,  NHYD=["D1a"],  DT=3 min,  AREA=1.9 ha,  DWF=0.0 cms
                    CN=94.22,  IA=3 mm,  N=3.0,  Tp=0.13 hrs,  END=-1
*%-----------------|-------------------------------------------------------------|
CALIB NASHYD        ID=7,  NHYD=["D1b"],  DT=3 min,  AREA=1.9 ha,  DWF=0.0 cms
                    CN=94.00,  IA=3 mm,  N=3.0,  Tp=0.09 hrs,  END=-1
*%-----------------|-------------------------------------------------------------|
*#################################################
*# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
*#################################################
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[6], NHYD=["STM3"], IDs to add=[2+3+7]
```

```
*%-----------------|-------------------------------------------------------------|
*#*****************************************
*# CONFLUENCE SMT 1-3
*#*****************************************
*%-----------------|-------------------------------------------------------------|
ADD HYD             IDsum=[3], NHYD=["SMT1-3"], IDs to add=[1+4+6]
*%-----------------|-------------------------------------------------------------|
*#*************************************************************
*# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
*#*************************************************************
ADD HYD             ID=[8]   NHYD=["1201"] IDs to add=[1+4+5+6]
*%-----------------|-------------------------------------------------------------|
*
*
*Route NHYD=201 through Channel 202
ROUTE CHANNEL       ID=3  NHYD=2202  IDIN=8  DT=5.0 min
                    CHLGTH=475 m  CHSLP=1.05 %  FPSLP=1.05 %
                    VSN=202  NSEG=3
                    ROUGH DIST(m)
                      0.04  55
                     -0.03  56
                      0.04  105

                    DIST(m)  ELEV(m)
                       0.0    180.0
                      15.0    175.0
                      55.0    174.9
                      55.5    174.6
                      56.0    174.9
                      70.0    175.0
                     105.0    180.0
*
* Subarea 202
CALIB NASHYD        ID= 4  NHYD=202  DT=5 min  AREA=21.6 ha  DWF=0.0 cms
                    CN=95  IA=0 mm  N=3.0  Tp=0.303 hrs  END=-1
*
ADD HYD             ID=2   NHYD=1202 IDI=3  IDII=4
*
* Subarea 203
CALIB NASHYD        ID= 3  NHYD=203  DT=5 min  AREA=26.3 ha  DWF=0.0 cms
                    CN=95  IA=0mm  N=3.0  Tp=0.240 hrs  END=-1
*
* Node 003 - exit from site
ADD HYD             ID= 4  NHYD=003  IDI=3  IDII=2
PRINT HYD           ID= 4  NPCYC=-1
*
*#*************************************************************
*# SUBCATCHMENT 204 AREA REVISED
*# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
*#*************************************************************
*
*Subarea 204 - off site
CALIB NASHYD        ID= 2  NHYD=204  DT=5 min  AREA=53.6 ha  DWF=0.0 cms
                    CN=95  IA=0 mm  N=3.0  Tp=0.626 hrs  END=-1
*
ADD HYD             ID= 3  NHYD= 1204  IDI= 2  IDII= 4
*
*#*************************************************************
*# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
*#*************************************************************
*
*#*********************************************************
*# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
*#*********************************************************
*
```

```
* Confluence of tributaries off site
*#*********************************************************
*# ID REVISED TO ID=9, PREVIOUSLY ID=1
*#*********************************************************
ADD HYD              ID=2  NHYD=008  IDI=9  IDII=3
PRINT HYD            ID=2  NPCYC=-1
*#*********************************************************

FINISH
```

```
SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999  =========
S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9 Ver. 4.02
    S   W W   M   M  H   H    Y    M   M  O   O       9999   9999 July 1999
SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9 =========
                                                     9   9  9   9 # 3569108
     StormWater Management HYdrologic Model           999    999  =========

*****************************************************************************
*************************** SWMHYMO-99 Ver/4.02 ***************************
*******  A single event and continuous hydrologic simulation model  *******
*******     based on the principles of HYMO and its successors      *******
*******                  OTTHYMO-83 and OTTHYMO-89.                 *******
*****************************************************************************
******* Distributed by:  J.F. Sabourin and Associates Inc.          *******
*******                  Ottawa,  Ontario: (613) 727-5199          *******
*******                  Gatineau, Quebec: (819) 243-6858          *******
*******                  E-Mail: swmhymo@jfsa.com                  *******
*****************************************************************************

+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+++++++ Licensed user: Philips Engineering Ltd                       +++++++
+++++++                Burlington          SERIAL#:3569108          +++++++
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*****************************************************************************
*******          ++++++ PROGRAM ARRAY DIMENSIONS ++++++              *******
*******          Maximum value for ID numbers  :     10             *******
*******          Max. number of rainfall points:  15000             *******
*******          Max. number of flow points    :  15000             *******
*****************************************************************************

*** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
***-----------------------------------------------------------------------***
***    ID:  Hydrograph IDentification numbers, (1-10).                    ***
***  NHYD:  Hydrograph reference numbers, (6 digits or characters).       ***
***  AREA:  Drainage area associated with hydrograph, (ac.) or (ha.).     ***
*** QPEAK:  Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s).       ***
*** TpeakDate_hh:mm is the date and time of the peak flow.                ***
***  R.V.:  Runoff Volume of simulated hydrograph, (in) or (mm).          ***
***  R.C.:  Runoff Coefficient of simulated hydrograph, (ratio).          ***
***     *:  see WARNING or NOTE message printed at end of run.            ***
***    **:  see  ERROR  message printed at end of run.                    ***
*****************************************************************************
*****************************************************************************

:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

*****************************************************************************

********************   S U M M A R Y   O U T P U T   ********************
*****************************************************************************
*       DATE: 2011-12-06     TIME: 12:48:29     RUN COUNTER: 000140        *
*****************************************************************************
* Input   filename: G:\Work\105128\water\SWMHYMO\2011NO~1\REG\SWMR.dat       *
* Output  filename: G:\Work\105128\water\SWMHYMO\2011NO~1\REG\SWMR.out       *
* Summary filename: G:\Work\105128\water\SWMHYMO\2011NO~1\REG\SWMR.sum       *
* User comments:                                                            *
* 1:_____________________________________________________________________   *
* 2:_____________________________________________________________________   *
* 3:_____________________________________________________________________   *
*****************************************************************************
```

```
#*******************************************************************************
#  Project Name: [Holy Family Catholic Cemetery]    Project Number: [111063]
#  Date        : 08-16-2011
#  Modeller    : [C. Silvestri]
#  Company     : Philips Engineering Ltd
#  License #   :  3569108
#*******************************************************************************
 RUN:COMMAND#
 001:0001-------------------------------------------------------------------------
     START
      [TZERO =    .00 hrs on        0]
      [METOUT=   2    (1=imperial, 2=metric output)]
      [NSTORM=   1 ]
      [NRUN  =   1 ]
 001:0002-------------------------------------------------------------------------
     READ STORM
      Filename = STORM.001
      Comment  = Regional storm event (Hurricane Hazel)
      [SDT=60.00:SDUR=  12.00:PTOT= 212.00]
 001:0003--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000103    42.10    5.719 No_date   10:05  196.94 .929
      [CN= 94.0: N= 3.00]
      [Tp=  .40:DT= 5.00]
 001:0004--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:000103    42.10    5.719 No_date   10:05  196.94  n/a
      [RDT= 5.00] out<- 02:002104    42.10    5.626 No_date   10:15  196.94  n/a
      [L/S/n=  440./1.000/.030]
      {Vmax=  .789:Dmax=  .610}
 001:0005--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000104    24.10    3.506 No_date   10:00  196.94 .929
      [CN= 94.0: N= 3.00]
      [Tp=  .21:DT= 5.00]
 001:0006--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000104    24.10    3.506 No_date   10:00  196.94  n/a
                      + 02:002104    42.10    5.626 No_date   10:15  196.94  n/a
      [DT= 5.00]  SUM=  01:001104    66.20    8.880 No_date   10:05  196.94  n/a
 001:0007--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:001104    66.20    8.880 No_date   10:05  196.94  n/a
      [RDT= 5.00] out<- 02:002105    66.20    8.712 No_date   10:10  196.94  n/a
      [L/S/n=  365./ .400/.030]
      {Vmax=  .596:Dmax=  .605}
 001:0008--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000105    19.20    2.806 No_date   10:00  199.42 .941
      [CN= 95.0: N= 3.00]
      [Tp=  .18:DT= 5.00]
 001:0009--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000105    19.20    2.806 No_date   10:00  199.42  n/a
                      + 02:002105    66.20    8.712 No_date   10:10  196.94  n/a
      [DT= 5.00]  SUM=  01:001105    85.40   11.273 No_date   10:05  197.50  n/a
 001:0010--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:001105    85.40   11.273 No_date   10:05  197.50  n/a
      [RDT= 5.00] out<- 02:002106    85.40   11.137 No_date   10:10  197.50  n/a
      [L/S/n=  385./ .670/.030]
      {Vmax=  .830:Dmax=  .655}
 001:0011--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:000106    15.30    2.237 No_date   10:00  199.42 .941
      [CN= 95.0: N= 3.00]
      [Tp=  .17:DT= 5.00]
 001:0012--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000106    15.30    2.237 No_date   10:00  199.42  n/a
                      + 02:002106    85.40   11.137 No_date   10:10  197.50  n/a
      [DT= 5.00]  SUM=  01:001106   100.70   13.116 No_date   10:05  197.79  n/a
 001:0013--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD     03:000107    15.27    1.602 No_date   11:00  193.07 .911
```

```
     [XIMP=.10:TIMP=.17]
     [LOSS= 2 :CN= 93.0]
     [Pervious     area: IAper= 5.00:SLPP=1.27:LGP= 717.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI=1.27:LGI= 100.:MNI=.017:SCI=   .0]
001:0014--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:001106   100.70   13.116 No_date   10:05  197.79  n/a
                      + 03:000107    15.27    1.602 No_date   11:00  193.07  n/a
     [DT= 5.00]  SUM=  02:001107   115.97   14.432 No_date   10:10  197.17  n/a
001:0015--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 02:001107   115.97   14.432 No_date   10:10  197.17  n/a
     [RDT= 5.00] out<- 01:002108   115.97   14.097 No_date   10:20  197.17  n/a
     [L/S/n= 1300./1.670/.030]
     {Vmax= 1.934:Dmax= 1.048}
001:0016--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        02:000108    33.50    4.791 No_date   10:00  199.42 .941
     [CN= 95.0: N= 3.00]
     [Tp=  .29:DT= 5.00]
001:0017--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             01:002108   115.97   14.097 No_date   10:20  197.17  n/a
                      + 02:000108    33.50    4.791 No_date   10:00  199.42  n/a
     [DT= 5.00]  SUM=  03:000004   149.47   18.476 No_date   10:15  197.67  n/a
001:0018--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           03:000004   149.47   18.476 No_date   10:15  197.67  n/a
001:0019--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB STANDHYD      04:000101   287.80   26.354 No_date   11:15  200.03 .944
     [XIMP=.20:TIMP=.50]
     [LOSS= 2 :CN= 93.0]
     [Pervious     area: IAper= 5.00:SLPP= .63:LGP= 700.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .63:LGI=3200.:MNI=.017:SCI=   .0]
001:0020--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 04:000101   287.80   26.354 No_date   11:15  200.03  n/a
     [RDT= 5.00] out<- 05:002101   287.80   26.125 No_date   11:25  200.03  n/a
     [L/S/n=  700./ .420/.030]
     {Vmax=  .955:Dmax=  .954}
001:0021--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
 *  CALIB STANDHYD      04:000102   272.90   24.298 No_date   11:00  195.30 .921
     [XIMP=.13:TIMP=.28]
     [LOSS= 2 :CN= 93.0]
     [Pervious     area: IAper= 5.00:SLPP= .98:LGP=1350.:MNP=.250:SCP=   .0]
     [Impervious   area: IAimp= 1.57:SLPI= .98:LGI=  40.:MNI=.017:SCI=   .0]
001:0022--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:000102   272.90   24.298 No_date   11:00  195.30  n/a
                      + 05:002101   287.80   26.125 No_date   11:25  200.03  n/a
     [DT= 5.00]  SUM=  06:000001   560.70   49.278 No_date   11:00  197.73  n/a
001:0023--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    PRINT HYD           06:000001   560.70   49.278 No_date   11:00  197.73  n/a
001:0024--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:000001   560.70   49.278 No_date   11:00  197.73  n/a
 *   [RDT= 5.00] out<- 04:002109   560.70   48.639 No_date   11:35  197.73  n/a
     [L/S/n= 1000./ .540/.030]
     {Vmax= 1.225:Dmax= 1.295}
001:0025--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    CALIB NASHYD        05:000109    35.10    4.969 No_date   10:00  199.42 .941
     [CN= 95.0: N= 3.00]
     [Tp=  .32:DT= 5.00]
001:0026--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ADD HYD             04:002109   560.70   48.639 No_date   11:35  197.73  n/a
                      + 05:000109    35.10    4.969 No_date   10:00  199.42  n/a
     [DT= 5.00]  SUM=  06:001109   595.80   50.677 No_date   11:20  197.83  n/a
001:0027--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
    ROUTE CHANNEL    -> 06:001109   595.80   50.677 No_date   11:20  197.83  n/a
     [RDT= 5.00] out<- 04:002110   595.80   50.591 No_date   11:30  197.83  n/a
     [L/S/n=  900./ .710/.030]
     {Vmax= 1.529:Dmax= 1.203}
001:0028--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
```

```
     CALIB NASHYD       05:000110    21.80    3.178 No_date    10:00  199.42 .941
       [CN= 95.0: N= 3.00]
       [Tp=  .22:DT= 5.00]
 001:0029--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:002110   595.80   50.591 No_date    11:30  197.83  n/a
                    +   05:000110    21.80    3.178 No_date    10:00  199.42  n/a
       [DT= 5.00]  SUM=  06:001110   617.60   51.769 No_date    11:15  197.88  n/a
 001:0030--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 06:001110   617.60   51.769 No_date    11:15  197.88  n/a
       [RDT= 5.00] out<- 04:002111   617.60   51.727 No_date    11:20  197.88  n/a
       [L/S/n=  920./1.250/.030]
       {Vmax= 2.629:Dmax= 1.406}
 001:0031--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:000111    17.30    2.508 No_date    10:00  196.94 .929
       [CN= 94.0: N= 3.00]
       [Tp=  .23:DT= 5.00]
 001:0032--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:000111    17.30    2.508 No_date    10:00  196.94  n/a
                    +   04:002111   617.60   51.727 No_date    11:20  197.88  n/a
       [DT= 5.00]  SUM=  02:000002   634.90   52.989 No_date    11:15  197.86  n/a
 001:0033--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000002   634.90   52.989 No_date    11:15  197.86  n/a
#*********************************************************
# ID revised to ID=9, PREVIOUSLY ID=1 WAS BEING OVER-WRITEN
 001:0034--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000004   149.47   18.476 No_date    10:15  197.67  n/a
                    +   02:000002   634.90   52.989 No_date    11:15  197.86  n/a
       [DT= 5.00]  SUM=  09:001108   784.37   68.678 No_date    11:05  197.82  n/a
#*********************************************************
#*************************************************************************
# SUBCATCHMENT CONTAINING CEMETERY LANDS
#*************************************************************************
# PROPOSED IMPERVIOUSNESS LESS THAN 20%
# THEREFORE, CN VALUE HAS BEEN MODIFIED TO ACCOUNT FOR PROPOSED IMPERVIOUS SURF
#
#*******************************
# DRAINAGE FROM 201A (EXTERNAL)
#*******************************
 001:0035--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201A      68.20    8.910 No_date    10:10  193.95 .915
       [CN= 94.0: N= 3.00]
       [Tp=  .47:DT= 5.00]
#Route NHYD=201A through Channel SMT-2
 001:0036--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 01:201A      68.20    8.910 No_date    10:10  193.95  n/a
       [RDT= 5.00] out<- 02:SMT-2    68.20    8.827 No_date    10:20  193.95  n/a
       [L/S/n=  450./ .750/.030]
       {Vmax= 1.184:Dmax=  .694}
#*********************************************
# DRAINAGE FROM CEMETERY LANDS A1a, A1b, A1c, A1d
#*********************************************
 001:0037--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:A1a         .80     .115 No_date    10:00  194.42 .917
       [CN= 94.2: N= 3.00]
       [Tp=  .27:DT= 5.00]
 001:0038--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD       03:A1b        6.10     .890 No_date    10:00  193.98 .915
       [CN= 94.0: N= 3.00]
       [Tp=  .07:DT= 3.00]
 001:0039--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:A1c        3.20     .467 No_date    10:00  194.30 .917
       [CN= 94.1: N= 3.00]
       [Tp=  .14:DT= 3.00]
 001:0040--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       06:A1d        5.30     .771 No_date    10:00  194.33 .917
```

```
      [CN= 94.2: N= 3.00]
      [Tp=  .21:DT= 5.00]
 001:0041--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 06:A1d          5.30      .771 No_date    10:00  194.33  n/a
      [RDT= 5.00] out<- 07:A1d          4.56      .310 No_date     9:55  194.33  n/a
            overflow <= 08:OVR           .74      .460 No_date    10:00  194.33  n/a
     {MxStoUsed=.2085E+00, TotOvfVol=.1447E+00, N-Ovf=    2, TotDurOvf=    1.hrs}
 001:0042--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            07:A1d          4.56      .310 No_date     9:55  194.33  n/a
                      + 08:OVR           .74      .460 No_date    10:00  194.33  n/a
      [DT= 5.00]  SUM=  06:A1dPND       5.30      .770 No_date    10:00  194.33  n/a
#*****************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201A + A1a + A1b + A1c + A1d
#*****************************************************************
 001:0043--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:A1a           .80      .115 No_date    10:00  194.42  n/a
                      + 02:SMT-2       68.20     8.827 No_date    10:20  193.95  n/a
                      + 03:A1b          6.10      .890 No_date    10:00  193.98  n/a
                      + 04:A1c          3.20      .467 No_date    10:00  194.30  n/a
                      + 06:A1dPND       5.30      .770 No_date    10:00  194.33  n/a
      [DT= 3.00]  SUM=  05:SMT2        83.60    10.587 No_date    10:15  194.07  n/a
#*******************************
# DRAINAGE FROM 201B (EXTERNAL)
#*******************************
 001:0044--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       01:201B       13.40     1.897 No_date    10:00  193.95 .915
      [CN= 94.0: N= 3.00]
      [Tp=  .31:DT= 5.00]
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1a, B1b, B1c (B-Series, East Drainage)
#*********************************************************************
 001:0045--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:B1a         4.60      .671 No_date    10:00  194.23 .916
      [CN= 94.1: N= 3.00]
      [Tp=  .17:DT= 3.00]
 001:0046--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1a          4.60      .671 No_date    10:00  194.23  n/a
      [RDT= 3.00] out<- 04:B1a          4.17      .325 No_date    10:00  194.23  n/a
            overflow <= 08:OVR           .43      .345 No_date    10:00  194.23  n/a
     {MxStoUsed=.1577E+00, TotOvfVol=.8385E-01, N-Ovf=    1, TotDurOvf=    1.hrs}
 001:0047--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            04:B1a          4.17      .325 No_date    10:00  194.23  n/a
                      + 08:OVR           .43      .345 No_date    10:00  194.23  n/a
      [DT= 3.00]  SUM=  02:B1aPND       4.60      .670 No_date    10:00  194.23  n/a
 001:0048--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            01:201B       13.40     1.897 No_date    10:00  193.95  n/a
                      + 02:B1aPND       4.60      .670 No_date    10:00  194.23  n/a
      [DT= 3.00]  SUM=  03:SMT-4       18.00     2.568 No_date    10:00  194.02  n/a
#Route NHYD=201B + B1a through Channel SMT-4
 001:0049--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL   -> 03:SMT-4       18.00     2.568 No_date    10:00  194.02  n/a
  *   [RDT= 3.00] out<- 01:SMT-4R      18.00     2.442 No_date    10:09  194.02  n/a
      [L/S/n=  600./ .850/.030]
      {Vmax= 1.162:Dmax=  .468}
 001:0050--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       03:B1b         5.00      .729 No_date    10:00  194.00 .915
      [CN= 94.0: N= 3.00]
      [Tp=  .17:DT= 3.00]
 001:0051--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       04:B1c         1.00      .146 No_date    10:00  194.42 .917
      [CN= 94.2: N= 3.00]
      [Tp=  .10:DT= 3.00]
 001:0052--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:B1b         5.00      .729 No_date    10:00  194.00  n/a
                      + 04:B1c         1.00      .146 No_date    10:00  194.42  n/a
```

```
      [DT= 3.00]  SUM=  02:B1b/c      6.00      .875 No_date   10:00  194.07  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B + B1a + B1b + B1c
#*************************************************************
 001:0053--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT-4R    18.00    2.442 No_date   10:09  194.02  n/a
                     +   02:B1b/c      6.00     .875 No_date   10:00  194.07  n/a
      [DT= 3.00]  SUM=  03:B1East    24.00    3.237 No_date   10:06  194.04  n/a
#*********************************************************************
# DRAINAGE FROM CEMETERY LANDS B1d, B1e, B1f (B-series, West Drainage)
#*********************************************************************
 001:0054--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      01:B1d        4.30     .629 No_date   10:00  196.92 .929
      [XIMP=.25:TIMP=.25]
      [LOSS= 2 :CN= 94.0]
      [Pervious     area: IAper= 5.00:SLPP=1.00:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI=1.00:LGI=  50.:MNI=.013:SCI=   .0]
 001:0055--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 01:B1d        4.30     .629 No_date   10:00  196.92  n/a
      [RDT= 3.00] out<- 04:B1d        4.09     .310 No_date   10:15  196.92  n/a
           overflow <= 08:OVR          .21     .157 No_date   10:15  196.92  n/a
    {MxStoUsed=.2231E+00, TotOvfVol=.4185E-01, N-Ovf=    1, TotDurOvf=    1.hrs}
 001:0056--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:B1d        4.09     .310 No_date   10:15  196.92  n/a
                     +   08:OVR          .21     .157 No_date   10:15  196.92  n/a
      [DT= 3.00]  SUM=  01:B1dPND     4.30     .467 No_date   10:15  196.92  n/a
 001:0057--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:B1f        3.50     .511 No_date   10:00  194.33 .917
      [CN= 94.2: N= 3.00]
      [Tp=  .11:DT= 3.00]
 001:0058--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 02:B1f        3.50     .511 No_date   10:00  194.33  n/a
      [RDT= 3.00] out<- 04:B1f        3.22     .212 No_date   10:09  194.33  n/a
           overflow <= 08:OVR          .28     .226 No_date   10:09  194.33  n/a
    {MxStoUsed=.1987E+00, TotOvfVol=.5475E-01, N-Ovf=    2, TotDurOvf=    1.hrs}
 001:0059--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             04:B1f        3.22     .212 No_date   10:09  194.33  n/a
                     +   08:OVR          .28     .226 No_date   10:09  194.33  n/a
      [DT= 3.00]  SUM=  02:B1fPND     3.50     .438 No_date   10:09  194.33  n/a
 001:0060--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB STANDHYD      07:B1e        3.60     .526 No_date   10:00  197.23 .930
      [XIMP=.27:TIMP=.27]
      [LOSS= 2 :CN= 94.0]
      [Pervious     area: IAper= 5.00:SLPP=1.00:LGP=  30.:MNP=.035:SCP=   .0]
      [Impervious   area: IAimp=  .50:SLPI=1.00:LGI=  50.:MNI=.013:SCI=   .0]
 001:0061--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE RESERVOIR -> 07:B1e        3.60     .526 No_date   10:00  197.23  n/a
      [RDT= 3.00] out<- 06:B1e        3.60     .277 No_date   11:03  197.23  n/a
           overflow <= 08:OVR          .00     .000 No_date    0:00     .00  n/a
    {MxStoUsed=.2379E+00, TotOvfVol=.0000E+00, N-Ovf=    0, TotDurOvf=    0.hrs}
 001:0062--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             06:B1e        3.60     .277 No_date   11:03  197.23  n/a
                     +   08:OVR          .00     .000 No_date    0:00     .00  n/a
      [DT= 3.00]  SUM=  07:B1ePND     3.60     .277 No_date   11:03  197.23  n/a
 001:0063--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:B1dPND     4.30     .467 No_date   10:15  196.92  n/a
                     +   02:B1d/e/     3.50     .438 No_date   10:09  194.33  n/a
                     +   07:B1ePND     3.60     .277 No_date   11:03  197.23  n/a
      [DT= 3.00]  SUM=  02:B1d/e/    11.40    1.115 No_date   10:15  196.22  n/a
#*************************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201B+B1a+B1b+B1c+B1d+B1e+B1f
#*************************************************************
 001:0064--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:B1d/e/    11.40    1.115 No_date   10:15  196.22  n/a
                     +   03:B1East    24.00    3.237 No_date   10:06  194.04  n/a
```

```
      [DT= 3.00]  SUM=  04:SMT4       35.40     4.237 No_date   10:15  194.74  n/a
#*****************************
# DRAINAGE FROM 201C (EXTERNAL)
#*****************************
 001:0065--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       01:201C      91.00    11.714 No_date   10:15  193.95 .915
       [CN= 94.0: N= 3.00]
       [Tp=  .50:DT= 5.00]
#*****************************************
# DRAINAGE FROM CEMETERY LANDS C1a, C1b, C2
#*****************************************
 001:0066--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       02:C1a        7.00     1.018 No_date   10:00  194.23 .916
       [CN= 94.1: N= 3.00]
       [Tp=  .21:DT= 5.00]
 001:0067--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE RESERVOIR -> 02:C1a        7.00     1.018 No_date   10:00  194.23  n/a
       [RDT= 5.00] out<- 06:C1a        5.25      .325 No_date    9:30  194.23  n/a
            overflow <= 08:OVR         1.75      .692 No_date   10:00  194.23  n/a
      {MxStoUsed=.1642E+00, TotOvfVol=.3391E+00, N-Ovf=    2, TotDurOvf=    2.hrs}
 001:0068--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            06:C1a        5.25      .325 No_date    9:30  194.23  n/a
                       + 08:OVR        1.75      .692 No_date   10:00  194.23  n/a
       [DT= 5.00]  SUM=  02:C1aPND     7.00     1.017 No_date   10:00  194.23  n/a
 001:0069--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *   CALIB NASHYD       03:C1b         .50      .073 No_date   10:00  194.10 .916
       [CN= 94.1: N= 3.00]
       [Tp=  .04:DT= 2.00]
#*************************************************************
# DISCHARGE FROM EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS
#*************************************************************
 001:0070--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:201C      91.00    11.714 No_date   10:15  193.95  n/a
                       + 02:EX+MC      7.00     1.017 No_date   10:00  194.23  n/a
                       + 03:C1b         .50      .073 No_date   10:00  194.10  n/a
       [DT= 2.00]  SUM=  02:EX+MC     98.50    12.666 No_date   10:14  193.98  n/a
#*****************************************
# Route NHYD=201C through Channel SMT-1
#*****************************************
 001:0071--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ROUTE CHANNEL   -> 02:EX+MC     98.50    12.666 No_date   10:14  193.98  n/a
  *    [RDT= 2.00] out<- 01:SMT-1     98.50    12.602 No_date   10:18  193.98  n/a
       [L/S/n=  275./ .500/.030]
       {Vmax=  .968:Dmax=  .805}
 001:0072--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      CALIB NASHYD       07:C2         3.80      .554 No_date   10:00  194.00 .915
       [CN= 94.0: N= 3.00]
       [Tp=  .17:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS
# EXTERNAL LANDS (WEST) + MILTON CEMETERY LANDS + C2
#*************************************************
 001:0073--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            01:SMT1      98.50    12.602 No_date   10:18  193.98  n/a
                       + 07:C2         3.80      .554 No_date   10:00  194.00  n/a
       [DT= 2.00]  SUM=  01:SMT1     102.30    13.045 No_date   10:16  193.98  n/a
#*********************************************
# CONFLUENCE SMT 1-4
#*********************************************
 001:0074--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
      ADD HYD            04:SMT4      35.40     4.237 No_date   10:15  194.74  n/a
                       + 01:SMT1     102.30    13.045 No_date   10:16  193.98  n/a
       [DT= 2.00]  SUM=  02:SMT1-4   137.70    17.256 No_date   10:16  194.17  n/a
#*****************************
# DRAINAGE FROM 201D (EXTERNAL)
```

```
#*****************************
 001:0075--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:201D      28.90     3.899 No_date    10:10  193.95 .915
      [CN= 94.0: N= 3.00]
      [Tp=  .41:DT= 5.00]
#*************************
# SUBCATCHMENT 201D ROUTED
# THROUGH Channel SMT-3
#*************************
 001:0076--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 02:201D      28.90     3.899 No_date    10:10  193.95  n/a
      [RDT= 5.00] out<- 03:SMT-3      28.90     3.904 No_date    10:10  193.95  n/a
      [L/S/n=  100./ .700/.030]
      {Vmax= 1.480:Dmax= 1.020}
#***************************************
# DRAINAGE FROM CEMETERY LANDS D1a, D1b
#***************************************
 001:0077--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        02:D1a        1.90      .277 No_date    10:00  194.50 .917
      [CN= 94.2: N= 3.00]
      [Tp=  .13:DT= 3.00]
 001:0078--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
  *  CALIB NASHYD        07:D1b        1.90      .277 No_date    10:00  193.95 .915
      [CN= 94.0: N= 3.00]
      [Tp=  .09:DT= 3.00]
#*************************************************
# TOTAL DRAINAGE FROM SUBCATCHMENTS 201D+D1a+D1b
#*************************************************
 001:0079--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             02:D1a        1.90      .277 No_date    10:00  194.50  n/a
                       + 03:SMT-3     28.90     3.904 No_date    10:10  193.95  n/a
                       + 07:D1b        1.90      .277 No_date    10:00  193.95  n/a
      [DT= 3.00]  SUM=   06:STM3      32.70     4.386 No_date    10:03  193.99  n/a
#*****************************************
# CONFLUENCE SMT 1-3
#*****************************************
 001:0080--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30    13.045 No_date    10:16  193.98  n/a
                       + 04:SMT4       35.40     4.237 No_date    10:15  194.74  n/a
                       + 06:STM3       32.70     4.386 No_date    10:03  193.99  n/a
      [DT= 2.00]  SUM=   03:SMT1-3    170.40    21.519 No_date    10:16  194.13  n/a
#*************************************************************************
# TOTAL DRAINAGE FROM SUBJECT LANDS + EXT.SUBCATCHMENTS 201A/B/C/D
#*************************************************************************
 001:0081--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             01:SMT1      102.30    13.045 No_date    10:16  193.98  n/a
                       + 04:SMT4       35.40     4.237 No_date    10:15  194.74  n/a
                       + 05:SMT2       83.60    10.587 No_date    10:15  194.07  n/a
                       + 06:STM3       32.70     4.386 No_date    10:03  193.99  n/a
      [DT= 2.00]  SUM=   08:1201      254.00    32.100 No_date    10:16  194.12  n/a
 001:0082--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ROUTE CHANNEL    -> 08:1201      254.00    32.100 No_date    10:16  194.12  n/a
  *    [RDT= 2.00] out<- 03:002202    254.00    31.916 No_date    10:20  194.12  n/a
      [L/S/n=  475./1.050/.030]
      {Vmax= 1.247:Dmax=  .735}
 001:0083--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        04:000202     21.60     3.079 No_date    10:00  199.42 .941
      [CN= 95.0: N= 3.00]
      [Tp=  .30:DT= 5.00]
 001:0084--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD             03:002202    254.00    31.916 No_date    10:20  194.12  n/a
                       + 04:000202     21.60     3.079 No_date    10:00  199.42  n/a
      [DT= 2.00]  SUM=   02:001202    275.60    34.698 No_date    10:18  194.53  n/a
 001:0085--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD        03:000203     26.30     3.821 No_date    10:00  199.42 .941
```

```
      [CN= 95.0: N= 3.00]
      [Tp=  .24:DT= 5.00]
 001:0086--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            03:000203    26.30    3.821 No_date    10:00  199.42  n/a
                    +   02:001202   275.60   34.698 No_date    10:18  194.53  n/a
      [DT= 2.00]  SUM=   04:000003   301.90   37.995 No_date    10:16  194.96  n/a
 001:0087--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          04:000003   301.90   37.995 No_date    10:16  194.96  n/a
#*************************************************************
# SUBCATCHMENT 204 AREA REVISED
# NEW AREA = 70.0 ha, PREVIOUSLY = 52.3 ha
#*************************************************************
 001:0088--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     CALIB NASHYD       02:000204    53.60    6.507 No_date    10:30  199.42 .941
      [CN= 95.0: N= 3.00]
      [Tp=  .63:DT= 5.00]
 001:0089--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            02:000204    53.60    6.507 No_date    10:30  199.42  n/a
                    +   04:000003   301.90   37.995 No_date    10:16  194.96  n/a
      [DT= 2.00]  SUM=   03:001204   355.50   44.391 No_date    10:18  195.63  n/a
#*************************************************************
# ROUTE through Channel 205 ELIMINATED,  OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# SUBCATCHMENT 205 ELIMINTATED, OUTSIDE OF STUDY AREA
#*************************************************************
#*************************************************************
# ID REVISED TO ID=9, PREVIOUSLY ID=1
#*************************************************************
 001:0090--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     ADD HYD            09:001108   784.37   68.678 No_date    11:05  197.82  n/a
                    +   03:001204   355.50   44.391 No_date    10:18  195.63  n/a
      [DT= 2.00]  SUM=   02:000008  1139.87  107.826 No_date    11:00  197.14  n/a
 001:0091--------------ID:NHYD-------AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
     PRINT HYD          02:000008  1139.87  107.826 No_date    11:00  197.14  n/a
#*************************************************************
 001:0092-------------------------------------------------------------------------
      FINISH
-------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 001:0013 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
      *** WARNING: For areas with impervious ratios below
                   20%, this routine may not be applicable.
 001:0021 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
 001:0024 ROUTE CHANNEL   ->
      *** WARNING: TRAVEL TIME TABLE was exceeded
 001:0038 CALIB NASHYD
      *** WARNING: Time step is too large for value of TP.
                   R.V. may be ok.  Peak flow could be off.
 001:0049 ROUTE CHANNEL   ->
      *** WARNING: Requested routing DT > than inflow DT.
                   Routing DT set to inflow hydrograph DT.
 001:0054 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
 001:0060 CALIB STANDHYD
      *** WARNING: Storage Coefficient is smaller than DT!
                   Use a smaller DT or a larger area.
 001:0069 CALIB NASHYD
```

```
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
001:0071 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
001:0078 CALIB NASHYD
     *** WARNING: Time step is too large for value of TP.
                  R.V. may be ok.  Peak flow could be off.
001:0082 ROUTE CHANNEL   ->
     *** WARNING: Requested routing DT > than inflow DT.
                  Routing DT set to inflow hydrograph DT.
  Simulation ended on 2011-12-06     at 12:48:30
================================================================================
```

APPENDIX C

SWMHYMO INPUT/OUTPUT INFORMATION

```
2     Metric units
*#**************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#**************************************************************************|
*#
*#**************************************************************************|
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    MILSCS12.002
*
READ STORM          STORM_FILENAME "STORM.001"
*
*#**************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#**************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
CALIB NASHYD        ID=[1], NHYD=["101"], DT=[1]min, AREA=[4.1](ha),
                    DWF=[0](cms),  CN/C=[86], IA=[5.00](mm),
                    N=[3], TP=[0.28]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#**************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#**************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
CALIB STANDHYD      ID=[1], NHYD=["201"], DT=[1](min), AREA=[4.1](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[86],
                    Pervious   surfaces: IAper=[5.00](mm), SLPP=[2.0](%),
                                         LGP=[5.0](m), MNP=[0.250], SCP=[0](min)
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[15](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ======================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#**************************************************************************|
*#
ROUTE RESERVOIR     IDout=[2],   NHYD=["201-SWM"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                   (cms) - (ha-m)
                                     0.0033       0
                                     0.0216   0.01520
                                     0.0512   0.03100
                                     0.0854   0.04750
                                     0.1169   0.06460
                                     0.1424   0.08240
                                     0.1650   0.10090
                                     0.1841   0.12000
                                     0.2014   0.14000
                                     0.2174   0.16060
                                     0.2322   0.18200
                                     0.2393   0.19300
                                     0.2985   0.20410
                                     0.5311   0.22700
                                     -1        -1   (max twenty pts)
                    IDovf=[3], NHYDovf=["OFL-ORF"]
*%-----------------|-------------------------------------------------------|
*
START               START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=[005]
                    MILSCS12.005
*
START               START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=[010]
                    MILSCS12.010
*
START               START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=[025]
                    MILSCS12.025
*
START               START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=[050]
                    MILSCS12.050
*
START               START=0.0  HRS  METOUT=0  NSTORM=1  NRUN=[100]
                    MILSCS12.100
*
FINISH
```

```
================================================================================

   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO       999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
                                                          9   9  9   9   # 3902680
        StormWater Management HYdrologic Model            999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.Com                   *********
 ********************************************************************************

 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: S. Llewellyn & Associates Ltd                +++++++++
 +++++++++                Burlington            SERIAL#:3902680       +++++++++
 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********           ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********           Maximum value for ID numbers  :     10            *********
 *********           Max. number of rainfall points: 105408            *********
 *********           Max. number of flow points    : 105408            *********
 ********************************************************************************


 *********************   D E T A I L E D   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2022-06-28     TIME: 17:43:18     RUN COUNTER: 000743          *
 ********************************************************************************
 * Input   filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084.dat                     *
 * Output  filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084.out                     *
 * Summary filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084.sum                     *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************

--------------------------------------------------------------------------------
001:0001--------------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
  ** END OF RUN :   1

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
            #  1=MILSCS12.002
--------------------------------------------------------------------------------
002:0002--------------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
--------------------------------------------------------------------------------
002:0002--------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 2 YEAR SCS STORM
| Ptotal=  42.82 mm|    Comments: TOWN OF MILTON 12 HOUR 2 YEAR SCS STORM
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .20    .850 |   3.20   1.690 |   6.20  10.360 |   9.20   1.690
               .40    .850 |   3.40   1.690 |   6.40   6.130 |   9.40   1.690
               .60    .850 |   3.60   1.690 |   6.60   4.440 |   9.60   1.690
               .80    .850 |   3.80   1.690 |   6.80   4.230 |   9.80   1.690
              1.00    .850 |   4.00   1.690 |   7.00   2.960 |  10.00   1.690
              1.20    .850 |   4.20   2.960 |   7.20   2.540 |  10.20    .850
              1.40    .850 |   4.40   2.960 |   7.40   2.540 |  10.40    .850
              1.60    .850 |   4.60   2.960 |   7.60   2.540 |  10.60    .850
              1.80    .850 |   4.80   2.960 |   7.80   2.540 |  10.80    .850
              2.00    .850 |   5.00   2.960 |   8.00   2.540 |  11.00    .850
              2.20   1.690 |   5.20   3.810 |   8.20   1.690 |  11.20    .850
              2.40   1.690 |   5.40   5.500 |   8.40   1.690 |  11.40    .850
              2.60   1.690 |   5.60  12.690 |   8.60   1.690 |  11.60    .850
              2.80   1.690 |   5.80  27.710 |   8.80   1.690 |  11.80    .850
              3.00   1.690 |   6.00  57.950 |   9.00   1.690 |  12.00    .850

--------------------------------------------------------------------------------
002:0003--------------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*****************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .175 (i)
     TIME TO PEAK    (hrs)=    6.200
     RUNOFF VOLUME    (mm)=   18.064
     TOTAL RAINFALL   (mm)=   42.816
     RUNOFF COEFFICIENT   =     .422

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0004--------------------------------------------------------------------------
*#*****************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*****************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.48         2.62
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n            =       .015         .250

     Max.eff.Inten.(mm/hr)=      57.95        33.73
                  over (min)        1.00         4.00
     Storage Coeff.  (min)=       1.11 (ii)    4.24 (ii)
     Unit Hyd. Tpeak (min)=       1.00         4.00
     Unit Hyd. peak  (cms)=       1.01          .27
                                                          *TOTALS*
     PEAK FLOW       (cms)=        .24          .21          .452 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00         6.000
     RUNOFF VOLUME    (mm)=      41.82        18.06        26.615
     TOTAL RAINFALL   (mm)=      42.82        42.82        42.816
     RUNOFF COEFFICIENT   =        .98          .42          .622

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0005--------------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ======================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*****************************************************************************|
*#
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                          .003  .0000E+00   |     .184  .1200E+00
                          .022  .1520E-01   |     .201  .1400E+00
                          .051  .3100E-01   |     .217  .1606E+00
                          .085  .4750E-01   |     .232  .1820E+00
                          .117  .6460E-01   |     .239  .1930E+00
                          .142  .8240E-01   |     .299  .2041E+00
                          .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10      .452     6.000     26.615
     OUTFLOW<02: (201-SW)       4.10      .090     6.217     26.617
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   19.959
                  TIME SHIFT OF PEAK FLOW         (min)=    13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.5009E-01

--------------------------------------------------------------------------------
002:0006--------------------------------------------------------------------------
*
  ** END OF RUN :   4

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 005
    NSTORM=   1
            #  1=MILSCS12.005
--------------------------------------------------------------------------------
```

```
005:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*********************************************************************|
*#
*#*********************************************************************|
*
----------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 5 YEAR SCS STORM
| Ptotal=  59.90 mm|    Comments: TOWN OF MILTON 12 HOUR 5 YEAR SCS STORM
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .20   1.180 |   3.20   2.370 |   6.20  14.500 |   9.20   2.370
             .40   1.180 |   3.40   2.370 |   6.40   8.580 |   9.40   2.370
             .60   1.180 |   3.60   2.370 |   6.60   6.220 |   9.60   2.370
             .80   1.180 |   3.80   2.370 |   6.80   5.920 |   9.80   2.370
            1.00   1.180 |   4.00   2.370 |   7.00   4.140 |  10.00   2.370
            1.20   1.180 |   4.20   4.140 |   7.20   3.550 |  10.20   1.180
            1.40   1.180 |   4.40   4.140 |   7.40   3.550 |  10.40   1.180
            1.60   1.180 |   4.60   4.140 |   7.60   3.550 |  10.60   1.180
            1.80   1.180 |   4.80   4.140 |   7.80   3.550 |  10.80   1.180
            2.00   1.180 |   5.00   4.140 |   8.00   3.550 |  11.00   1.180
            2.20   2.370 |   5.20   5.330 |   8.20   2.370 |  11.20   1.180
            2.40   2.370 |   5.40   7.700 |   8.40   2.370 |  11.40   1.180
            2.60   2.370 |   5.60  17.760 |   8.60   2.370 |  11.60   1.180
            2.80   2.370 |   5.80  38.780 |   8.80   2.370 |  11.80   1.180
            3.00   2.370 |   6.00  81.100 |   9.00   2.370 |  12.00   1.180

----------------------------------------------------------------------------
005:0003----------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*********************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .308 (i)
     TIME TO PEAK    (hrs)=    6.183
     RUNOFF VOLUME    (mm)=   31.312
     TOTAL RAINFALL   (mm)=   59.897
     RUNOFF COEFFICIENT   =     .523

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

----------------------------------------------------------------------------
005:0004----------------------------------------------------------------------
*#*********************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*********************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.48         2.62
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     15.00         5.00
     Mannings n           =      .015         .250

     Max.eff.Inten.(mm/hr)=     81.10        56.43
               over (min)        1.00         4.00
     Storage Coeff.  (min)=      .97 (ii)    3.52 (ii)
     Unit Hyd. Tpeak (min)=      1.00         4.00
     Unit Hyd. peak  (cms)=      1.09          .31
                                                    *TOTALS*
     PEAK FLOW       (cms)=       .33          .38          .710 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00         6.000
     RUNOFF VOLUME    (mm)=     58.90        31.31        41.242
     TOTAL RAINFALL   (mm)=     59.90        59.90        59.897
     RUNOFF COEFFICIENT   =       .98          .52          .689

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

----------------------------------------------------------------------------
005:0005----------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ======================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*********************************************************************|
*#
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                         .003  .0000E+00   |     .184  .1200E+00
                         .022  .1520E-01   |     .201  .1400E+00
                         .051  .3100E-01   |     .217  .1606E+00
                         .085  .4750E-01   |     .232  .1820E+00
                         .117  .6460E-01   |     .239  .1930E+00
                         .142  .8240E-01   |     .299  .2041E+00
                         .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10      .710     6.000     41.242
     OUTFLOW<02: (201-SW)       4.10      .138     6.217     41.243
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   19.486
                  TIME SHIFT OF PEAK FLOW         (min)=    13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.7958E-01

----------------------------------------------------------------------------
005:0006----------------------------------------------------------------------
*
----------------------------------------------------------------------------
005:0002----------------------------------------------------------------------
*
  ** END OF RUN :   9

**************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on        0
    METOUT=   2 (output = METRIC)
    NRUN  = 010
    NSTORM=   1
           #  1=MILSCS12.010
----------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*#*********************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#               2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*********************************************************************|
*#
*#*********************************************************************|
*
----------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 10 YEAR SCS STORM
| Ptotal=  71.35 mm|    Comments: TOWN OF MILTON 12 HOUR 10 YEAR SCS STORM
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .20   1.410 |   3.20   2.820 |   6.20  17.270 |   9.20   2.820
             .40   1.410 |   3.40   2.820 |   6.40  10.220 |   9.40   2.820
             .60   1.410 |   3.60   2.820 |   6.60   7.400 |   9.60   2.820
             .80   1.410 |   3.80   2.820 |   6.80   7.050 |   9.80   2.820
            1.00   1.410 |   4.00   2.820 |   7.00   4.940 |  10.00   2.820
            1.20   1.410 |   4.20   4.940 |   7.20   4.230 |  10.20   1.410
            1.40   1.410 |   4.40   4.940 |   7.40   4.230 |  10.40   1.410
            1.60   1.410 |   4.60   4.940 |   7.60   4.230 |  10.60   1.410
            1.80   1.410 |   4.80   4.940 |   7.80   4.230 |  10.80   1.410
            2.00   1.410 |   5.00   4.940 |   8.00   4.230 |  11.00   1.410
            2.20   2.820 |   5.20   6.350 |   8.20   2.820 |  11.20   1.410
            2.40   2.820 |   5.40   9.170 |   8.40   2.820 |  11.40   1.410
            2.60   2.820 |   5.60  21.150 |   8.60   2.820 |  11.60   1.410
            2.80   2.820 |   5.80  46.180 |   8.80   2.820 |  11.80   1.410
            3.00   2.820 |   6.00  96.590 |   9.00   2.820 |  12.00   1.410

----------------------------------------------------------------------------
010:0003----------------------------------------------------------------------
*
*#*********************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*********************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .403 (i)
     TIME TO PEAK    (hrs)=    6.183
     RUNOFF VOLUME    (mm)=   40.880
     TOTAL RAINFALL   (mm)=   71.354
     RUNOFF COEFFICIENT   =     .573

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

----------------------------------------------------------------------------
010:0004----------------------------------------------------------------------
*#*********************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*********************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    4.10
```

```
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.48         2.62
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=      96.59        72.73
               over (min)        1.00         3.00
     Storage Coeff.  (min)=        .90 (ii)    3.21 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.14          .36
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .40          .50          .896 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00         6.000
     RUNOFF VOLUME    (mm)=      70.35        40.88        51.491
     TOTAL RAINFALL   (mm)=      71.35        71.35        71.354
     RUNOFF COEFFICIENT   =        .99          .57          .722

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
010:0005----------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ==================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*************************************************************************|
*#
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                          .003  .0000E+00   |     .184  .1200E+00
                          .022  .1520E-01   |     .201  .1400E+00
                          .051  .3100E-01   |     .217  .1606E+00
                          .085  .4750E-01   |     .232  .1820E+00
                          .117  .6460E-01   |     .239  .1930E+00
                          .142  .8240E-01   |     .299  .2041E+00
                          .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10      .896     6.000     51.491
     OUTFLOW<02: (201-SW)       4.10      .165     6.217     51.493
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   18.444
                  TIME SHIFT OF PEAK FLOW         (min)=    13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1011E+00

--------------------------------------------------------------------------------
010:0006----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
010:0002----------------------------------------------------------------------
*
  ** END OF RUN :  24

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
           #  1=MILSCS12.025
--------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*#*************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#            2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*************************************************************************|
*#
*#*************************************************************************|
*
--------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 25 YEAR SCS STORM
| Ptotal=  85.71 mm|    Comments: TOWN OF MILTON 12 HOUR 25 YEAR SCS STORM
--------------------
            TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
             hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
             .20   1.690 |   3.20   3.390 |   6.20  20.750 |   9.20   3.390
             .40   1.690 |   3.40   3.390 |   6.40  12.280 |   9.40   3.390
             .60   1.690 |   3.60   3.390 |   6.60   8.890 |   9.60   3.390
             .80   1.690 |   3.80   3.390 |   6.80   8.470 |   9.80   3.390
            1.00   1.690 |   4.00   3.390 |   7.00   5.930 |  10.00   3.390
            1.20   1.690 |   4.20   5.930 |   7.20   5.080 |  10.20   1.690
            1.40   1.690 |   4.40   5.930 |   7.40   5.080 |  10.40   1.690
            1.60   1.690 |   4.60   5.930 |   7.60   5.080 |  10.60   1.690
            1.80   1.690 |   4.80   5.930 |   7.80   5.080 |  10.80   1.690
            2.00   1.690 |   5.00   5.930 |   8.00   5.080 |  11.00   1.690
            2.20   3.390 |   5.20   7.620 |   8.20   3.390 |  11.20   1.690
            2.40   3.390 |   5.40  11.010 |   8.40   3.390 |  11.40   1.690
            2.60   3.390 |   5.60  25.410 |   8.60   3.390 |  11.60   1.690
            2.80   3.390 |   5.80  55.480 |   8.80   3.390 |  11.80   1.690
            3.00   3.390 |   6.00 116.040 |   9.00   3.390 |  12.00   1.690

--------------------------------------------------------------------------------
025:0003----------------------------------------------------------------------
*
*#*************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .526 (i)
     TIME TO PEAK    (hrs)=    6.183
     RUNOFF VOLUME    (mm)=   53.365
     TOTAL RAINFALL   (mm)=   85.706
     RUNOFF COEFFICIENT   =     .623

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
025:0004----------------------------------------------------------------------
*#*************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.48         2.62
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     116.04        92.90
               over (min)        1.00         3.00
     Storage Coeff.  (min)=        .84 (ii)    2.93 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.18          .38
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .48          .65         1.124 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00         6.000
     RUNOFF VOLUME    (mm)=      84.71        53.36        64.648
     TOTAL RAINFALL   (mm)=      85.71        85.71        85.706
     RUNOFF COEFFICIENT   =        .99          .62          .754

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
025:0005----------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ==================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*************************************************************************|
*#
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                          .003  .0000E+00   |     .184  .1200E+00
                          .022  .1520E-01   |     .201  .1400E+00
                          .051  .3100E-01   |     .217  .1606E+00
                          .085  .4750E-01   |     .232  .1820E+00
                          .117  .6460E-01   |     .239  .1930E+00
                          .142  .8240E-01   |     .299  .2041E+00
                          .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10     1.124     6.000     64.648
     OUTFLOW<02: (201-SW)       4.10      .192     6.217     64.650
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   17.107
                  TIME SHIFT OF PEAK FLOW         (min)=    13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1294E+00

--------------------------------------------------------------------------------
025:0006----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
*
--------------------------------------------------------------------------------
025:0002----------------------------------------------------------------------
```

```
*
--------------------------------------------------------------------------------
025:0002--------------------------------------------------------------------------
*
  ** END OF RUN :  49

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 050
    NSTORM=   1
           #  1=MILSCS12.050
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#            2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 50 YEAR SCS STORM
| Ptotal=  96.33 mm|    Comments: TOWN OF MILTON 12 HOUR 50 YEAR SCS STORM
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .20   1.900 |   3.20   3.810 |   6.20  23.320 |   9.20   3.810
               .40   1.900 |   3.40   3.810 |   6.40  13.800 |   9.40   3.810
               .60   1.900 |   3.60   3.810 |   6.60  10.000 |   9.60   3.810
               .80   1.900 |   3.80   3.810 |   6.80   9.520 |   9.80   3.810
              1.00   1.900 |   4.00   3.810 |   7.00   6.660 |  10.00   3.810
              1.20   1.900 |   4.20   6.660 |   7.20   5.710 |  10.20   1.900
              1.40   1.900 |   4.40   6.660 |   7.40   5.710 |  10.40   1.900
              1.60   1.900 |   4.60   6.660 |   7.60   5.710 |  10.60   1.900
              1.80   1.900 |   4.80   6.660 |   7.80   5.710 |  10.80   1.900
              2.00   1.900 |   5.00   6.660 |   8.00   5.710 |  11.00   1.900
              2.20   3.810 |   5.20   8.570 |   8.20   3.810 |  11.20   1.900
              2.40   3.810 |   5.40  12.380 |   8.40   3.810 |  11.40   1.900
              2.60   3.810 |   5.60  28.560 |   8.60   3.810 |  11.60   1.900
              2.80   3.810 |   5.80  62.360 |   8.80   3.810 |  11.80   1.900
              3.00   3.810 |   6.00 130.420 |   9.00   3.810 |  12.00   1.900

--------------------------------------------------------------------------------
050:0003--------------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*****************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .619 (i)
     TIME TO PEAK    (hrs)=    6.183
     RUNOFF VOLUME    (mm)=   62.866
     TOTAL RAINFALL   (mm)=   96.328
     RUNOFF COEFFICIENT   =     .653

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
050:0004--------------------------------------------------------------------------
*#*****************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*****************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.48         2.62
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     130.42       107.93
               over (min)        1.00         3.00
     Storage Coeff.  (min)=        .80 (ii)    2.77 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.21          .40
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .53          .76         1.293 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00         6.000
     RUNOFF VOLUME    (mm)=      95.33        62.86        74.552
     TOTAL RAINFALL   (mm)=      96.33        96.33        96.328
     RUNOFF COEFFICIENT   =        .99          .65          .774

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
050:0005--------------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ======================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*****************************************************************************|
*#
---------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                           (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                          .003  .0000E+00   |     .184  .1200E+00
                          .022  .1520E-01   |     .201  .1400E+00
                          .051  .3100E-01   |     .217  .1606E+00
                          .085  .4750E-01   |     .232  .1820E+00
                          .117  .6460E-01   |     .239  .1930E+00
                          .142  .8240E-01   |     .299  .2041E+00
                          .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     --------------------       (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10     1.293     6.000     74.552
     OUTFLOW<02: (201-SW)       4.10      .210     6.217     74.552
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   16.235
                  TIME SHIFT OF PEAK FLOW          (min)=   13.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1510E+00

--------------------------------------------------------------------------------
050:0006--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*
--------------------------------------------------------------------------------
050:0002--------------------------------------------------------------------------
*
  ** END OF RUN :  99

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 100
    NSTORM=   1
           #  1=MILSCS12.100
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#            2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : JUNE 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: TOWN OF MILTON 12 HOUR 100 YEAR SCS STOR
| Ptotal= 106.96 mm|    Comments: TOWN OF MILTON 12 HOUR 100 YEAR SCS STOR
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
               .20   2.110 |   3.20   4.230 |   6.20  25.900 |   9.20   4.230
               .40   2.110 |   3.40   4.230 |   6.40  15.330 |   9.40   4.230
               .60   2.110 |   3.60   4.230 |   6.60  11.100 |   9.60   4.230
               .80   2.110 |   3.80   4.230 |   6.80  10.570 |   9.80   4.230
              1.00   2.110 |   4.00   4.230 |   7.00   7.400 |  10.00   4.230
              1.20   2.110 |   4.20   7.400 |   7.20   6.340 |  10.20   2.110
              1.40   2.110 |   4.40   7.400 |   7.40   6.340 |  10.40   2.110
              1.60   2.110 |   4.60   7.400 |   7.60   6.340 |  10.60   2.110
              1.80   2.110 |   4.80   7.400 |   7.80   6.340 |  10.80   2.110
              2.00   2.110 |   5.00   7.400 |   8.00   6.340 |  11.00   2.110
              2.20   4.230 |   5.20   9.510 |   8.20   4.230 |  11.20   2.110
              2.40   4.230 |   5.40  13.740 |   8.40   4.230 |  11.40   2.110
              2.60   4.230 |   5.60  31.710 |   8.60   4.230 |  11.60   2.110
              2.80   4.230 |   5.80  69.230 |   8.80   4.230 |  11.80   2.110
              3.00   4.230 |   6.00 144.810 |   9.00   4.230 |  12.00   2.110

--------------------------------------------------------------------------------
100:0003--------------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
```

```
*#************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
---------------------
| CALIB NASHYD       |   Area    (ha)=    4.10   Curve Number   (CN)=86.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .280

     Unit Hyd Qpeak  (cms)=     .559

     PEAK FLOW       (cms)=     .713 (i)
     TIME TO PEAK    (hrs)=    6.167
     RUNOFF VOLUME    (mm)=   72.542
     TOTAL RAINFALL   (mm)=  106.961
     RUNOFF COEFFICIENT   =     .678

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0004----------------------------------------------------------------------
*#************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
---------------------
| CALIB STANDHYD     |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
---------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.48         2.62
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      15.00         5.00
     Mannings n           =       .015         .250

     Max.eff.Inten.(mm/hr)=     144.81       123.00
               over (min)        1.00         3.00
     Storage Coeff.  (min)=        .77 (ii)    2.63 (ii)
     Unit Hyd. Tpeak (min)=       1.00         3.00
     Unit Hyd. peak  (cms)=       1.24          .41
                                                    *TOTALS*
     PEAK FLOW       (cms)=        .59          .87          1.463 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00          6.000
     RUNOFF VOLUME    (mm)=     105.96        72.54         84.573
     TOTAL RAINFALL   (mm)=     106.96       106.96        106.961
     RUNOFF COEFFICIENT   =        .99          .68           .791

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN* =  86.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
100:0005----------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DDUAL STAGE ORIFICE DEVICE
*# ======================================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#************************************************************************|
*#
--------------------
| ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
|  IN>01:(201   )   |
| OUT<02:(201-SW)   |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                          .003  .0000E+00   |     .184  .1200E+00
                          .022  .1520E-01   |     .201  .1400E+00
                          .051  .3100E-01   |     .217  .1606E+00
                          .085  .4750E-01   |     .232  .1820E+00
                          .117  .6460E-01   |     .239  .1930E+00
                          .142  .8240E-01   |     .299  .2041E+00
                          .165  .1009E+00   |     .531  .2270E+00

     ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
     -------------------        (ha)     (cms)     (hrs)       (mm)
     INFLOW >01: (201   )       4.10     1.463     6.000     84.573
     OUTFLOW<02: (201-SW)       4.10      .226     6.233     84.574
    OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                  TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                  CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                  PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=   15.450
                  TIME SHIFT OF PEAK FLOW         (min)=    14.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=.1732E+00

------------------------------------------------------------------------------
100:0006----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
     FINISH
------------------------------------------------------------------------------
*******************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 002:0005 ROUTE RESERVOIR
      *** WARNING: First OUTFLOW value in table should be ZERO.
      *** WARNING: First OUTFLOW value in table should be ZERO.
      *** WARNING: First OUTFLOW value in table should be ZERO.
      *** WARNING: First OUTFLOW value in table should be ZERO.
      *** WARNING: First OUTFLOW value in table should be ZERO.
   Simulation ended on 2022-06-28     at 17:43:21
===============================================================================
```

```
2     Metric units
*#**************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : June 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#**************************************************************************|
*#
*#**************************************************************************|
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    HAZEL.STM
*
READ STORM          STORM_FILENAME "STORM.001"
*
*#**************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#**************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
CALIB NASHYD        ID=[1], NHYD=["101"], DT=[1]min, AREA=[4.1](ha),
                    DWF=[0](cms),  CN/C=[94], IA=[5.00](mm),
                    N=[3], TP=[0.28]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*#**************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#**************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
CALIB STANDHYD      ID=[1], NHYD=["201"], DT=[1](min), AREA=[4.1](ha),
                    XIMP=[0.36], TIMP=[0.36], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[94],
                    Pervious   surfaces: IAper=[5.00](mm), SLPP=[2.0](%),
                                         LGP=[5.0](m), MNP=[0.250], SCP=[0](min)
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[15](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|------------------------------------------------------------|
*#
*# ROUTE CATCHMENT 201 THROUGH DUAL STAGE ORIFICE
*# ==============================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#**************************************************************************|
*#
ROUTE RESERVOIR     IDout=[2],   NHYD=["201-SWM"],  IDin=[1],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                       0.0033       0
                                       0.0216   0.01520
                                       0.0512   0.03100
                                       0.0854   0.04750
                                       0.1169   0.06460
                                       0.1424   0.08240
                                       0.1650   0.10090
                                       0.1841   0.12000
                                       0.2014   0.14000
                                       0.2174   0.16060
                                       0.2322   0.18200
                                       0.2393   0.19300
                                       0.2985   0.20410
                                       0.5311   0.22700
                                       -1         -1   (max twenty pts)
                    IDovf=[3], NHYDovf=["OFL-ORF"]
*%-----------------|------------------------------------------------------------|
ADD HYD             IDsum=[4], NHYD=[201+ORF], IDs to add=[2, 3]
*%-----------------|------------------------------------------------------------|

*
FINISH
```

```
================================================================================
   SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO       999    999    =========
   S      W W W  MM MM  H   H   Y Y   MM MM  O   O     9   9  9   9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
       S   W W   M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
   SSSSS   W W   M   M  H   H    Y    M   M   OOO            9      9   =========
                                                          9   9  9   9   # 3902680
        StormWater Management HYdrologic Model            999    999    =========

 ********************************************************************************
 ***************************** SWMHYMO Ver/4.05  ********************************
 *********  A single event and continuous hydrologic simulation model  *********
 *********     based on the principles of HYMO and its successors      *********
 *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
 ********************************************************************************
 ********* Distributed by:  J.F. Sabourin and Associates Inc.          *********
 *********                  Ottawa,  Ontario: (613) 836-3884           *********
 *********                  Gatineau, Quebec: (819) 243-6858           *********
 *********                  E-Mail: swmhymo@jfsa.com                   *********
 ********************************************************************************

 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 +++++++++ Licensed user: S. Llewellyn & Associates Ltd                +++++++++
 +++++++++                Burlington            SERIAL#:3902680       +++++++++
 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

 ********************************************************************************
 *********          ++++++ PROGRAM ARRAY DIMENSIONS ++++++             *********
 *********          Maximum value for ID numbers  :     10            *********
 *********          Max. number of rainfall points: 105408            *********
 *********          Max. number of flow points    : 105408            *********
 ********************************************************************************


 **********************   D E T A I L E D   O U T P U T   **********************
 ********************************************************************************
 *         DATE: 2022-06-28     TIME: 18:00:31     RUN COUNTER: 000744         *
 ********************************************************************************
 * Input   filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084HAZ.dat                 *
 * Output  filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084HAZ.out                 *
 * Summary filename: T:\PROJECTS\13084\SWM\SWMHYMO\13084HAZ.sum                 *
 * User comments:                                                               *
 * 1:_____________________________________________________________________________*
 * 2:_____________________________________________________________________________*
 * 3:_____________________________________________________________________________*
 ********************************************************************************

--------------------------------------------------------------------------------
001:0001----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : June 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
  ** END OF RUN :   1

********************************************************************************




--------------------
| START            |  Project  dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
--------------------  Rainfall dir.: T:\PROJECTS\13084\SWM\SWMHYMO\
    TZERO =    .00 hrs on      0
    METOUT=   2 (output = METRIC)
    NRUN  = 002
    NSTORM=   1
            #  1=HAZEL.STM
--------------------------------------------------------------------------------
002:0002----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: HOLY FAMILY CATHOLIC CEMETERY
*#           2523 lOWER BASE LINE, MILTON, ONTARIO
*#  JOB NUMBER  : 13084
*#       Date   : MARCH 2021
*#    Revised   : June 2022
*#    Company   : S. LLEWELLYN & ASSOCIATES LIMITED
*#       File   : 13084.DAT
*#*****************************************************************************|
*#
*#*****************************************************************************|
*
--------------------------------------------------------------------------------
002:0002----------------------------------------------------------------------
*
--------------------
| READ STORM       |    Filename: Regional storm event (Hurricane Hazel)
| Ptotal= 212.00 mm|    Comments: Regional storm event (Hurricane Hazel)
--------------------
              TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
              1.00   6.360 |   4.00  12.720 |   7.00  23.320 |  10.00  53.000
              2.00   4.240 |   5.00  16.960 |   8.00  12.720 |  11.00  38.160
              3.00   6.360 |   6.00  12.720 |   9.00  12.720 |  12.00  12.720

--------------------------------------------------------------------------------
002:0003----------------------------------------------------------------------
*
*#*****************************************************************************|
*#
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ==============================================
*#
*#*****************************************************************************|
*# CATCHMENT 101 - PRE DEVELOPMENT DISCHARGE TO EXISTING WATERCOURSE (HYDROLOGIC
*
----------------------
| CALIB NASHYD       |   Area    (ha)=    4.10   Curve Number   (CN)=94.00
| 01:101    DT= 1.00 |   Ia      (mm)=   5.000   # of Linear Res.(N)= 3.00
----------------------   U.H. Tp(hrs)=    .280

    Unit Hyd Qpeak  (cms)=     .559

    PEAK FLOW       (cms)=     .587 (i)
    TIME TO PEAK    (hrs)=   10.050
    RUNOFF VOLUME    (mm)=  191.965
    TOTAL RAINFALL   (mm)=  212.000
    RUNOFF COEFFICIENT   =     .905

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0004----------------------------------------------------------------------
*#*****************************************************************************|
*#
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#
*#*****************************************************************************|
*# CATCHMENT 201 - CONTROLLED DISCHARGE TO WATERCOURSE SMT-4
*
----------------------
| CALIB STANDHYD     |   Area    (ha)=    4.10
| 01:201    DT= 1.00 |   Total Imp(%)=   36.00   Dir. Conn.(%)=   36.00
----------------------
                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.48         2.62
    Dep. Storage     (mm)=       1.00         5.00
    Average Slope     (%)=       1.00         2.00
    Length            (m)=      15.00         5.00
    Mannings n            =       .015         .250

    Max.eff.Inten.(mm/hr)=      53.00        52.52
              over (min)        1.00         4.00
    Storage Coeff.  (min)=      1.15 (ii)    3.77 (ii)
    Unit Hyd. Tpeak (min)=      1.00         4.00
    Unit Hyd. peak  (cms)=       .99          .29
                                                        *TOTALS*
    PEAK FLOW       (cms)=       .22          .38          .600 (iii)
    TIME TO PEAK    (hrs)=      9.32        10.00        10.000
    RUNOFF VOLUME    (mm)=    211.00       191.96       198.818
    TOTAL RAINFALL   (mm)=    212.00       212.00       212.000
    RUNOFF COEFFICIENT   =      1.00          .91          .938

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  94.0    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
002:0005----------------------------------------------------------------------
*#
*# ROUTE CATCHMENT 201 THROUGH DUAL STAGE ORIFICE
*# ==============================================
*# POST DEVELOPEMENT FLOWS FROM CATCHMENT 201
*#*****************************************************************************|
*#
--------------------
| ROUTE RESERVOIR  |    Requested routing time step =  1.0 min.
|  IN>01:(201   )  |
| OUT<02:(201-SW)  |    =========  OUTLFOW STORAGE TABLE  =========
--------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                          (cms)    (ha.m.)   |    (cms)    (ha.m.)
      *** WARNING: First OUTFLOW value in table should be ZERO.
                         .003  .0000E+00   |     .184  .1200E+00
                         .022  .1520E-01   |     .201  .1400E+00
                         .051  .3100E-01   |     .217  .1606E+00
                         .085  .4750E-01   |     .232  .1820E+00
                         .117  .6460E-01   |     .239  .1930E+00
                         .142  .8240E-01   |     .299  .2041E+00
                         .165  .1009E+00   |     .531  .2270E+00

    ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
    --------------------       (ha)     (cms)     (hrs)       (mm)
    INFLOW >01: (201   )       4.10      .600    10.000    198.818
    OUTFLOW<02: (201-SW)       4.10      .454    10.133    198.820
   OVERFLOW<03: (OFL-OR)        .00      .000      .000       .000

                TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
                CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                PEAK   FLOW   REDUCTION [Qout/Qin](%)=   75.600
                TIME SHIFT OF PEAK FLOW         (min)=     8.00
                MAXIMUM  STORAGE   USED       (ha.m.)=.2194E+00

--------------------------------------------------------------------------------
002:0006----------------------------------------------------------------------
----------------------
| ADD HYD (       201) | ID: NHYD         AREA     QPEAK   TPEAK   R.V.    DWF
----------------------                    (ha)     (cms)   (hrs)   (mm)   (cms)
                    ID1 02:201-SWM        4.10     .454   10.13 198.82    .000
                   +ID2 03:OFL-ORF         .00     .000     .00    .00    .000
                    ==========================================================
                    SUM 04:       201     4.10     .454   10.13 198.82    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
002:0007----------------------------------------------------------------------
*
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
 002:0005 ROUTE RESERVOIR
     *** WARNING: First OUTFLOW value in table should be ZERO.
   Simulation ended on 2022-06-28     at 18:00:31
================================================================================
```

APPENDIX D

QUALITY CONTROL INFORMATION

Hydroworks Sizing Summary

Holy Family Cemetery Crematorium

03-31-2021

Recommended Size: HS 10

A HydroStorm HS 10 is recommended to provide 80 % annual TSS removal based on a drainage area of 1.69 (ha) with an imperviousness of 30.3 % and Hamilton RBG, Ontario rainfall for the ETV Canada particle size distribution.

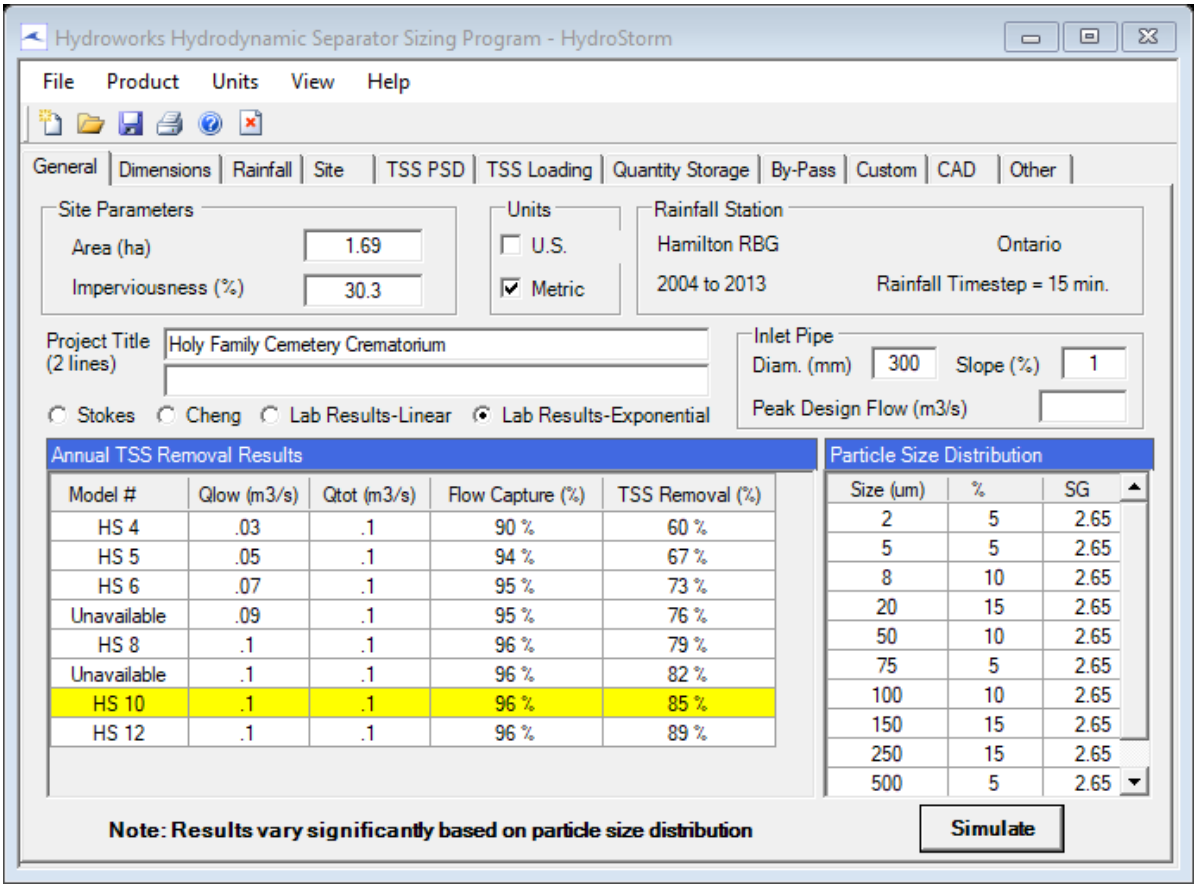
The recommended HydroStorm HS 10 treats 96 % of the annual runoff and provides 85 % annual TSS removal for the Hamilton RBG rainfall records and ETV Canada particle size distribution.

The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .1 (m3/s) for the given 300 (mm) pipe diameter at 1% slope. The headloss was calculated to be 99 (mm) based on a flow depth of 300 (mm) (full pipe flow).

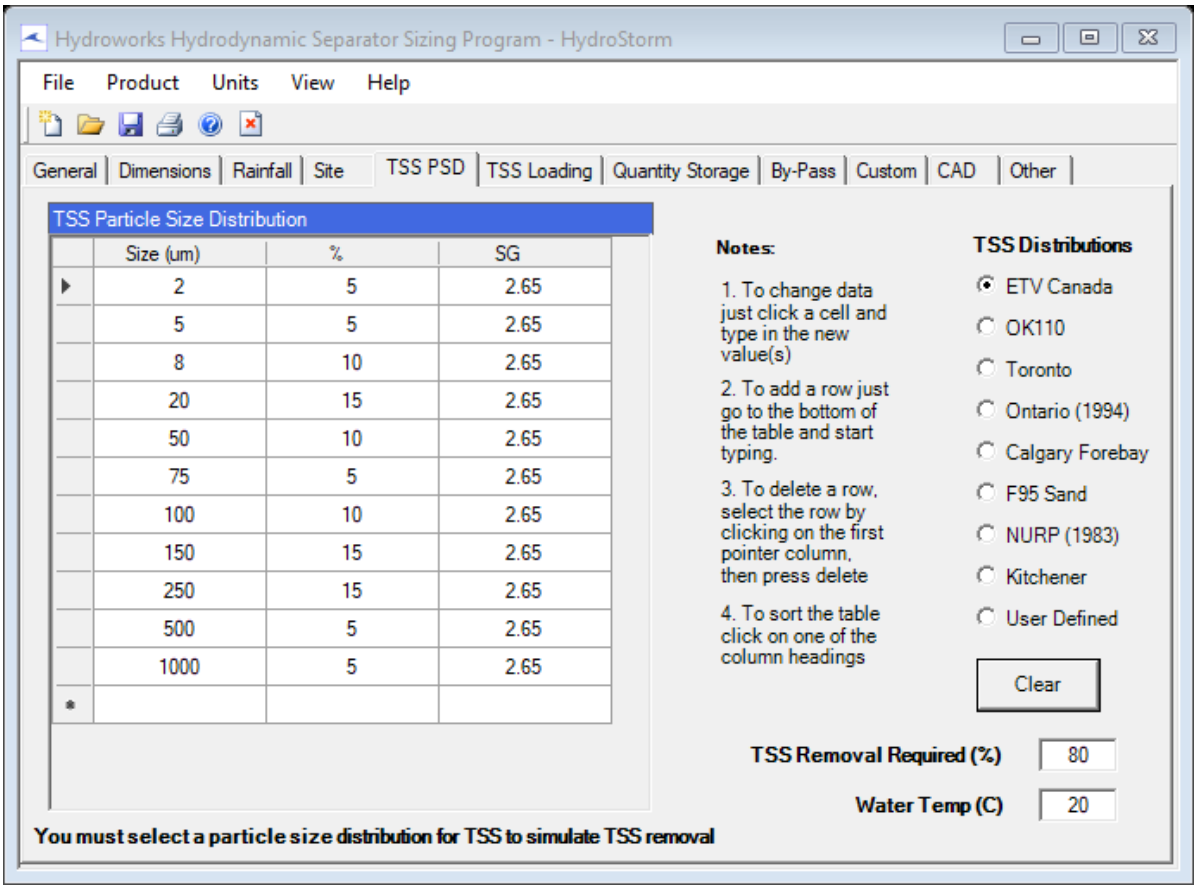
This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

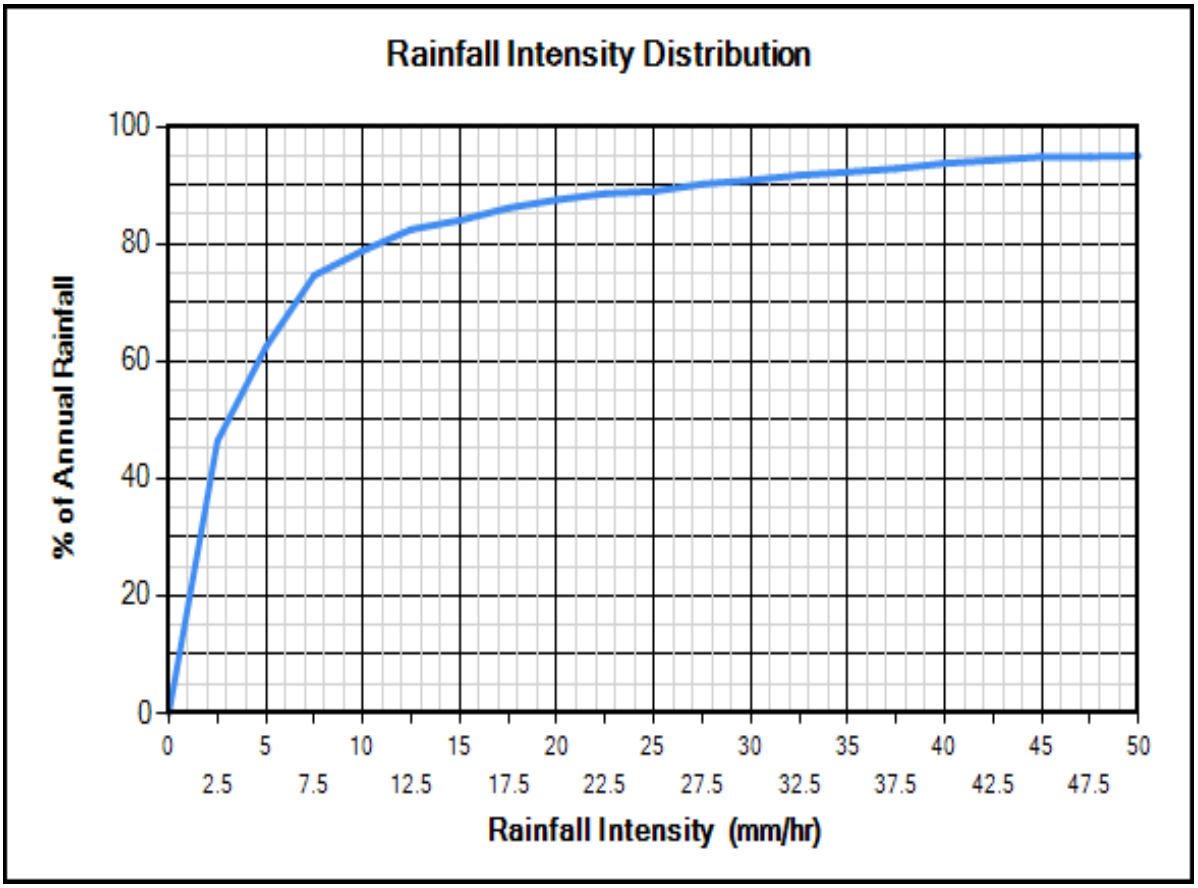
TSS Removal Sizing Summary



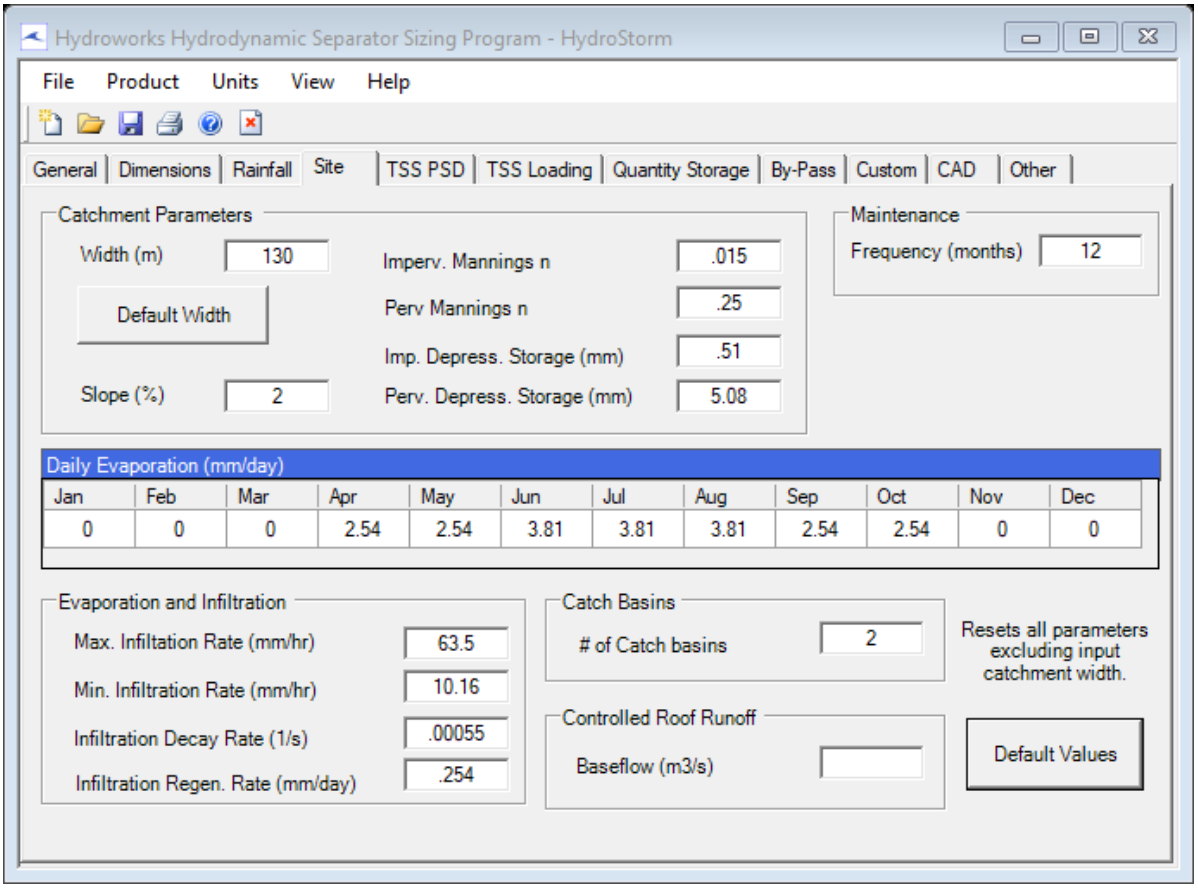
TSS Particle Size Distribution



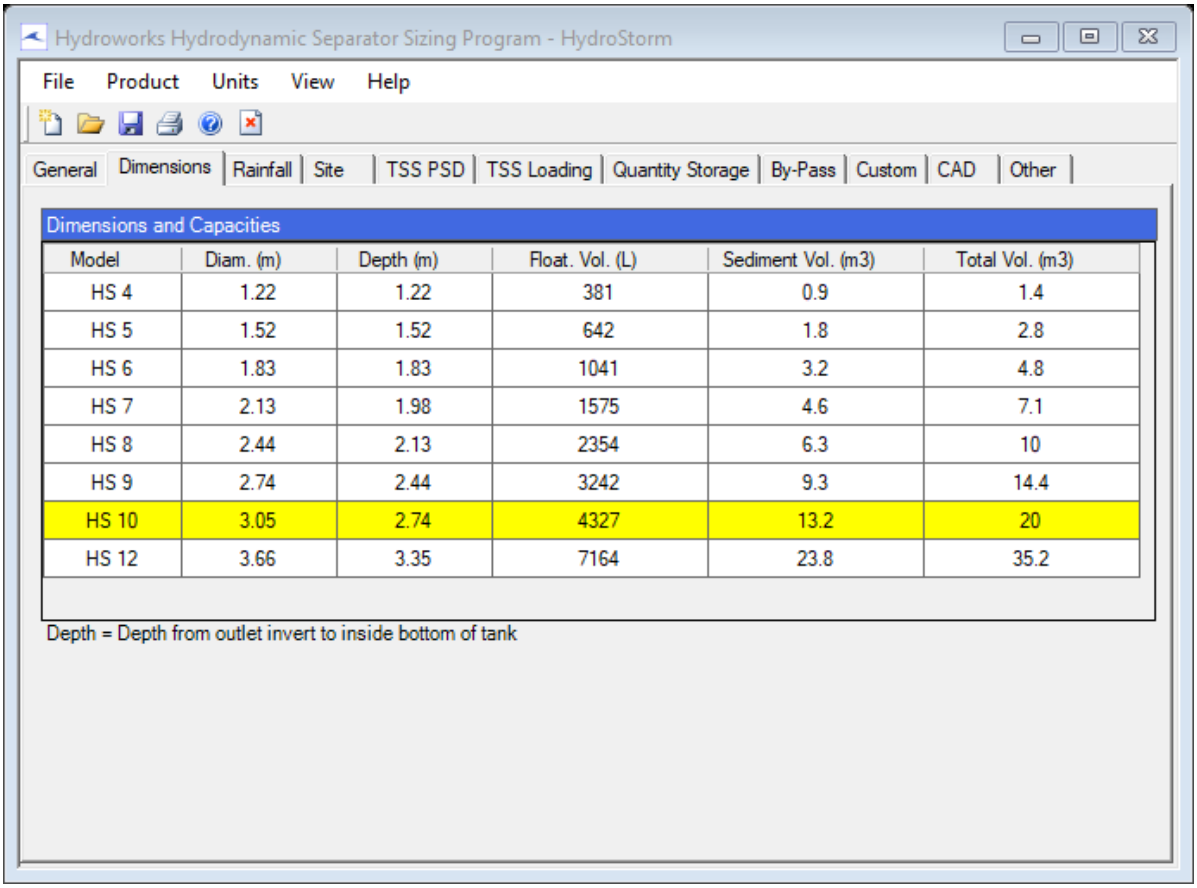
Rainfall Station - Hamilton RBG, Ontario(2004 to 2013)



Site Physical Characteristics



Dimensions And Capacities

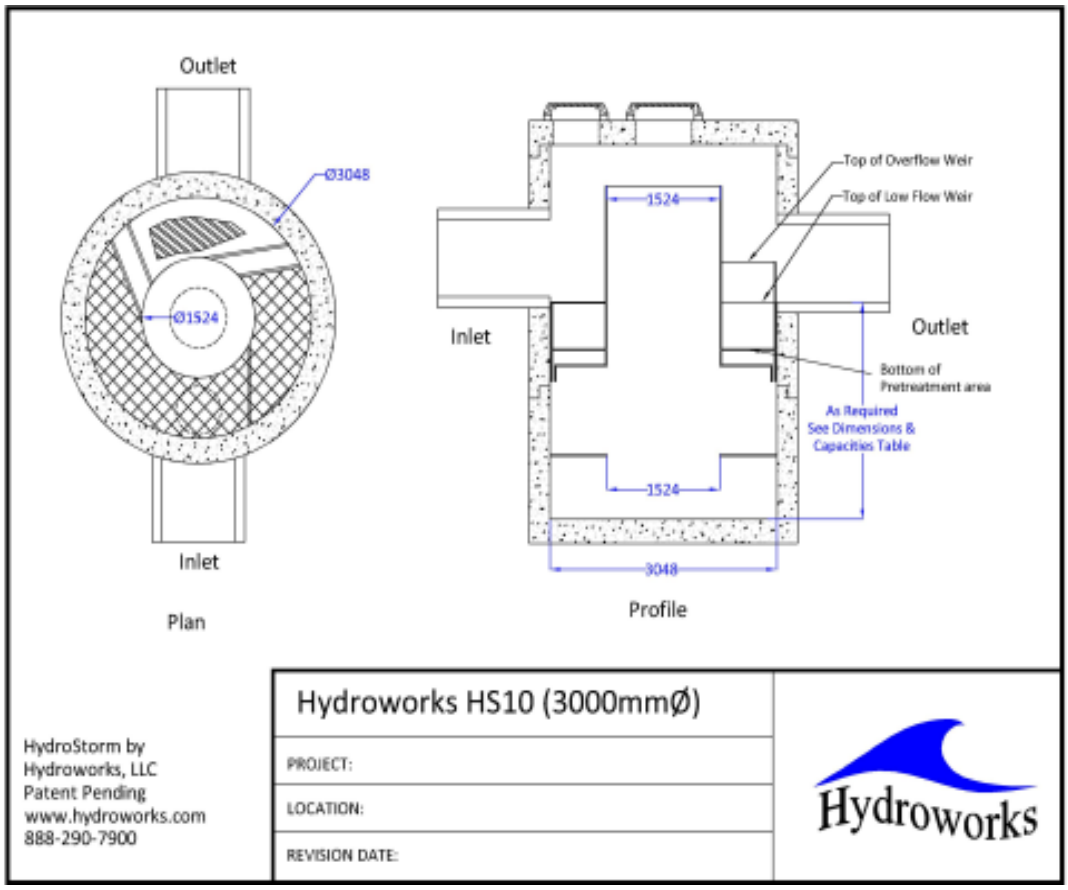


Dimensions and Capacities

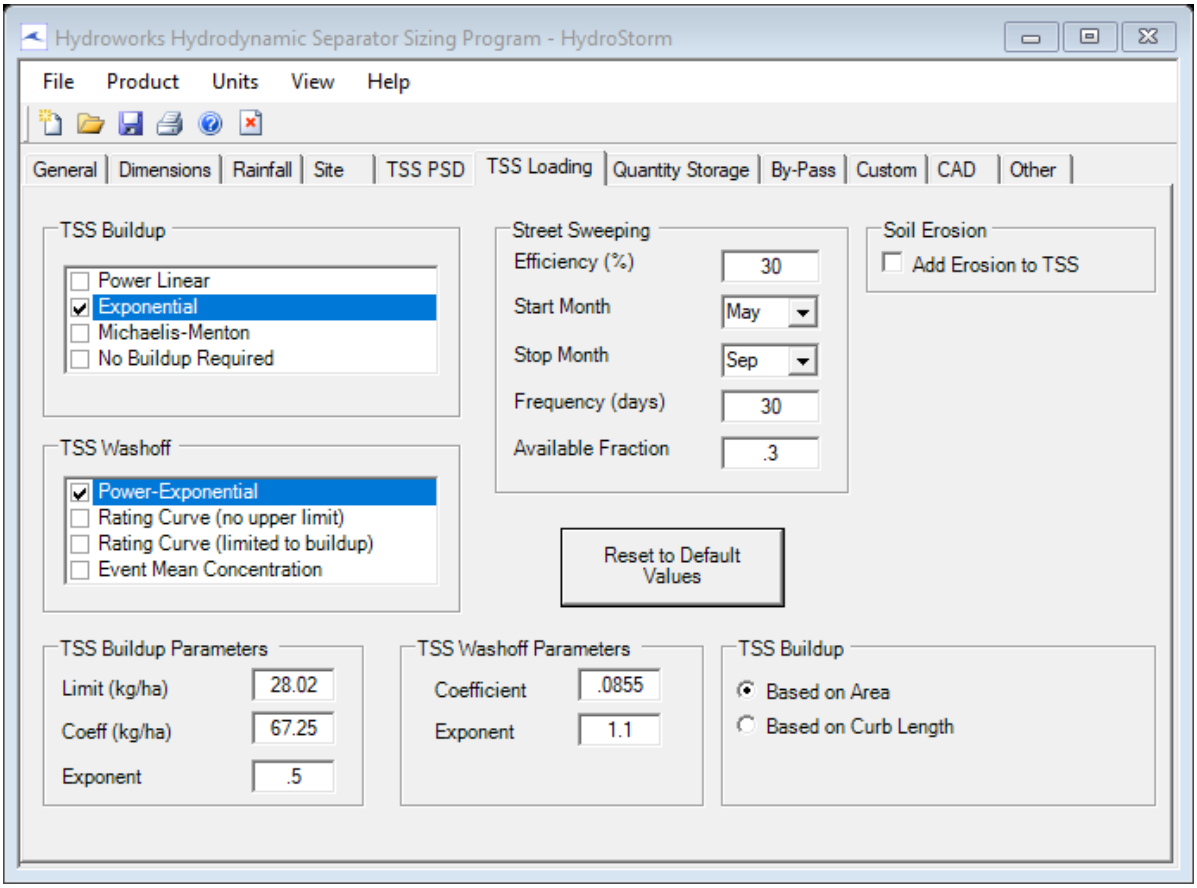
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	642	1.8	2.8
HS 6	1.83	1.83	1041	3.2	4.8
HS 7	2.13	1.98	1575	4.6	7.1
HS 8	2.44	2.13	2354	6.3	10
HS 9	2.74	2.44	3242	9.3	14.4
HS 10	3.05	2.74	4327	13.2	20
HS 12	3.66	3.35	7164	23.8	35.2

Depth = Depth from outlet invert to inside bottom of tank

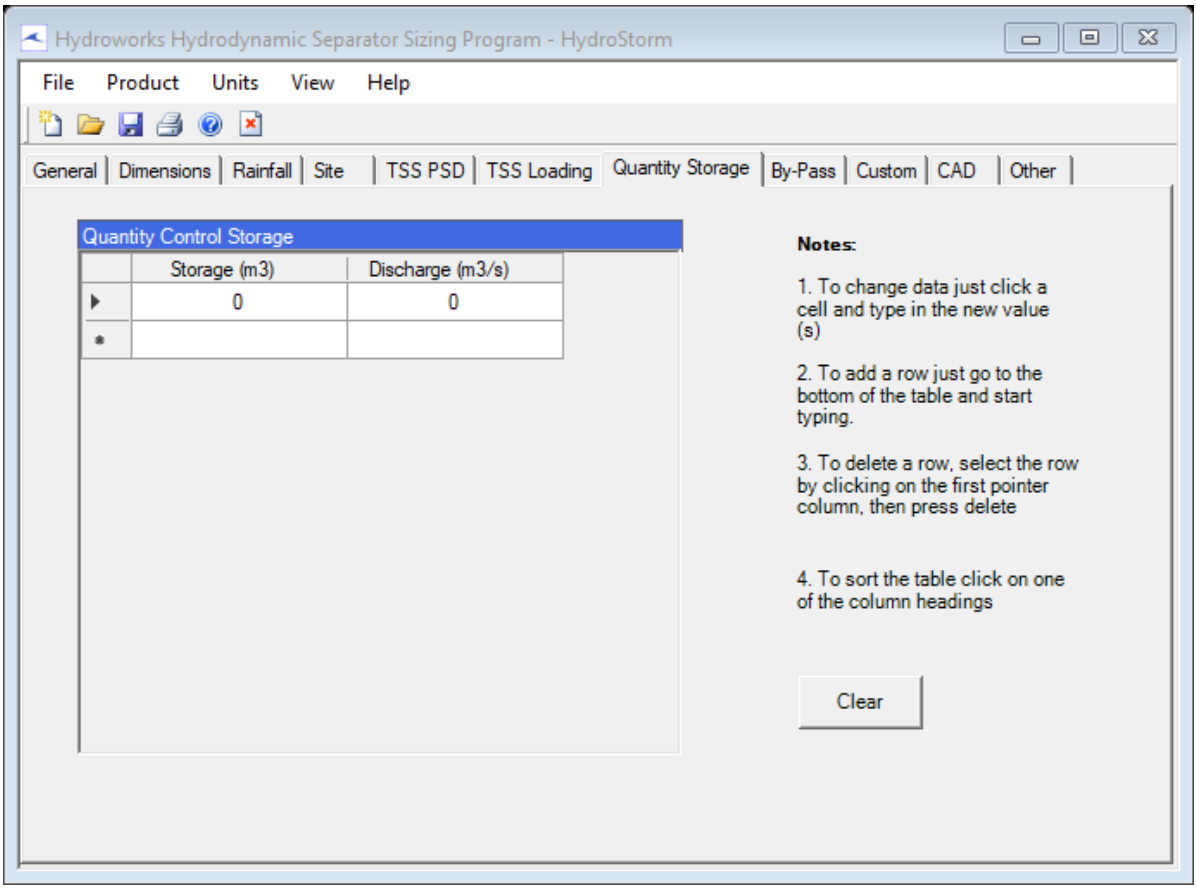
Generic HS 10 CAD Drawing



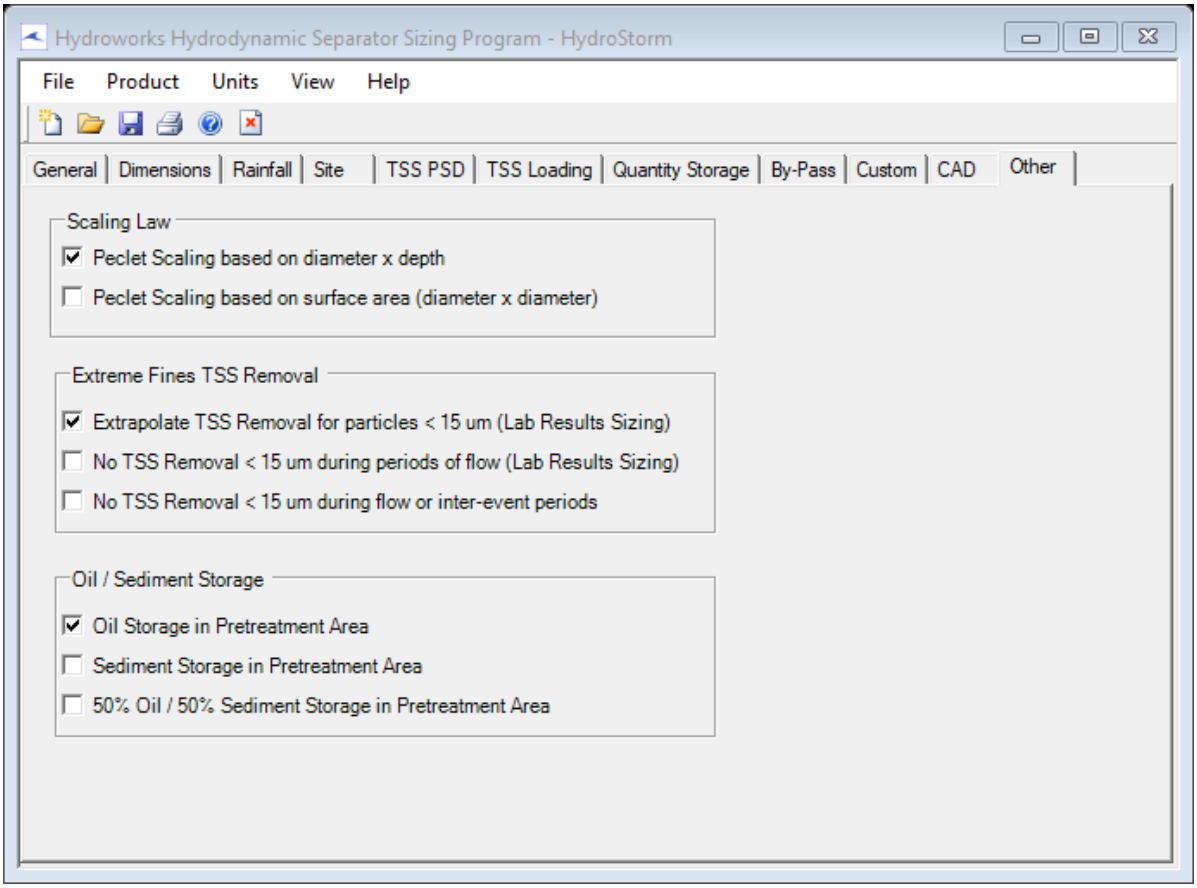
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Hydroworks Sizing Program - Version 4.9

◆ Verification Statement ◆ Verification Statement ◆ Verification Statement ◆

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

Hydroworks® HydroStorm (HS) Hydrodynamic Separator

Developed by Hydroworks, LLC
Clark, NJ, USA

In accordance with

ISO 14034:2016

Environmental management — Environmental technology verification (ETV)

John D. Wiebe, PhD
Executive Chairman
GLOBE Performance Solutions

May 15, 2018
Vancouver, BC, Canada

Verification Body
GLOBE Performance Solutions
404 – 999 Canada Place | Vancouver, B.C | Canada |V6C 3E2

Technology description and application

The Hydroworks® HydroStorm (HS) Hydrodynamic Separator is a concrete cylindrical device with an annular pre-treatment channel, an inner chamber, and lower collection sump. A schematic of the HS 4 test unit is shown in Figure 1. The pre-treatment channel extends below the outlet pipe invert and contains three intermediate low-flow weirs (flush with the outlet invert), and two downstream higher bypass weirs that extend above the outlet invert. The higher weirs bypass high flows to prevent oil and solids from being scoured out of the separator.

As water enters the unit through one or more inlets, coarser solids immediately start to settle below a horizontal grate extending from the inlet to two sets of lower weirs near the outlet pipe. The grating is positioned over the pre-treatment channel to help displace the inflow turbulence and protect the captured sediment from scour. Openings are located on the horizontal plate upstream of each weir to allow the flow to be conveyed into the inner chamber and lower sump. The weirs are positioned to create a counter clockwise rotation of water in the inner chamber to minimize turbulence and maximize settling. After water spirals down the inner chamber to the main settling chamber towards the floor of the separator where it deposits suspended sediments, it flows upwards between the wall of the unit and the outer edge of the disk extended from the inner chamber and through an arced opening at the bottom of the pre-treatment disk, downstream of the bypass weirs, where it is conveyed into the outlet pipe. An annular secondary horizontal plate with 32% of open-perforations is located within the lower sump to protect the collected sediment from scour. Oil and light liquids enter the inner chamber through the holes, reaching the bottom of the pre-treatment area and rises to the top of the water level where they are trapped.

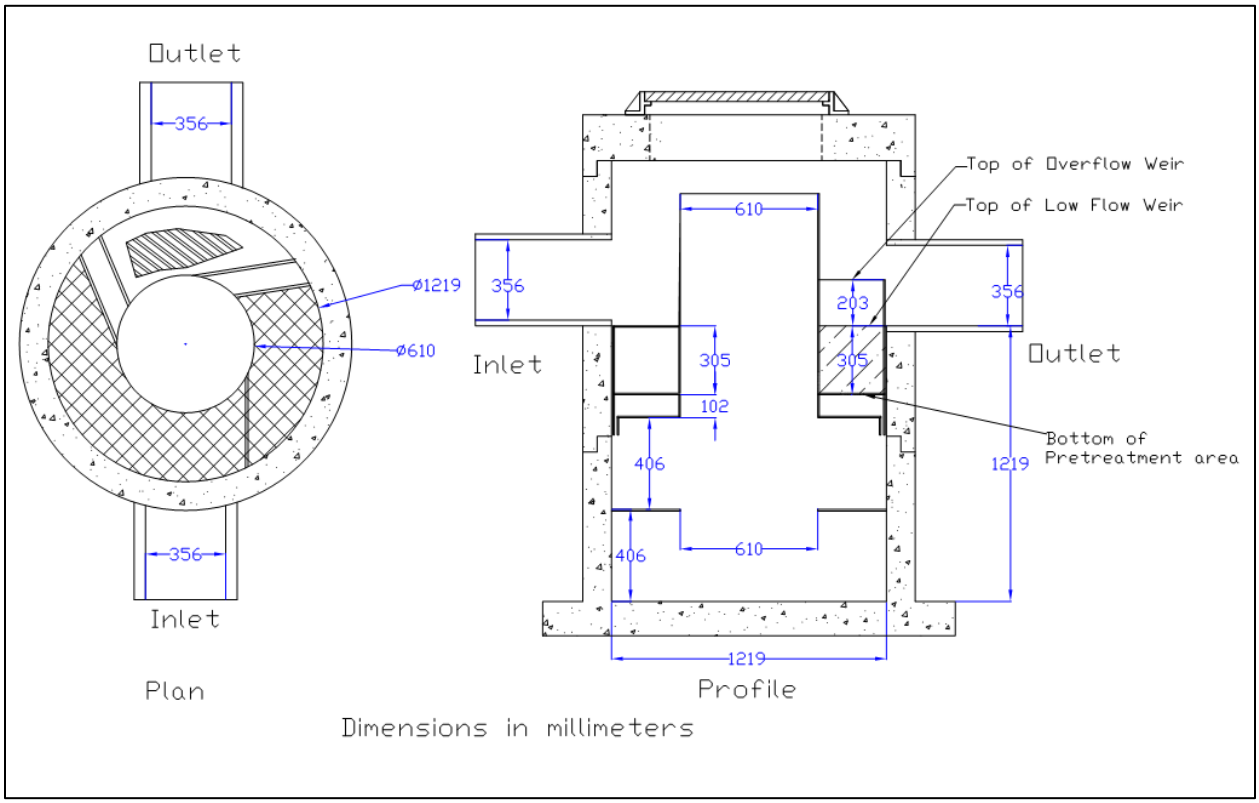


Figure 1: Schematic of the Hydroworks® HS4 Hydrodynamic Separator treatment unit tested as part of this verification.

Performance conditions

The data and results published in this Technology Fact Sheet were obtained from the testing program conducted on the Hydroworks® HS4 Hydrodynamic Separator, in accordance with the *Procedure for Laboratory Testing of Oil-Grit Separators (Version 3.0, June 2014)*. The Procedure was prepared by the Toronto and Region Conservation Authority (TRCA) for the Canadian Environmental Technology Verification Program. A copy of the Procedure may be accessed on the Canadian ETV website at www.etvcanada.ca.

Performance claim(s)

Capture test[1]:

During the capture test, the Hydroworks® HS Hydrodynamic Separator, with a false floor set to 50% of the manufacturer's recommended maximum sediment storage depth and a constant influent test sediment concentration of 200 mg/L, removes 69, 64, 60, 56, 46, 41, and 36 percent of influent sediment by mass at surface loading rates of 40, 80, 200, 400, 600, 1000, and 1400 L/min/m^2, respectively.

Scour test[1]:

During the scour test, the Hydroworks® HS Hydrodynamic Separator, with 10.2 cm (4 inches) of test sediment pre-loaded onto a false floor reaching 50% of the manufacturer's recommended maximum sediment sump storage depth and sediment loaded onto the pre-treatment channel emulating depositional pattern of the 40 L/min/m^2 capture test, generate corrected effluent concentrations of 22.4, 28.5, 20.0, 19.1, and 24.4 mg/L at 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2, respectively.

Light liquid re-entrainment test[1]:

During the light liquid re-entrainment test, the Hydroworks® HS Hydrodynamic Separator with surrogate low-density polyethylene beads preloaded within the inner chamber, representing a floating light liquid volume equal to a depth of 50.8 mm over the sedimentation area, retains 100, 99.9, 95.4, 95.7, and 97.5 percent of loaded beads by mass during the 5-minute duration surface loading rates of 200, 800, 1400, 2000, and 2600 L/min/m^2, respectively.

Performance results

The test sediment consisted of ground silica (1 – 1000 micron) with a specific gravity of 2.65, uniformly mixed to meet the particle size distribution specified in the testing procedure. The *Procedure for Laboratory Testing of Oil Grit Separators* requires that the three sample average of the test sediment particle size distribution (PSD) meet the specified PSD percent less than values within a boundary threshold of 6%. The comparison of the average test sediment PSD to the CETV specified PSD in Figure 2indicates that the test sediment used for the capture and scour tests met this condition.

[1] The claim can be applied to other units smaller or larger than the tested unit as long as the untested units meet the scaling rule specified in the Procedure for Laboratory of Testing of Oil Grit Separators (Version 3.0, June 2014)

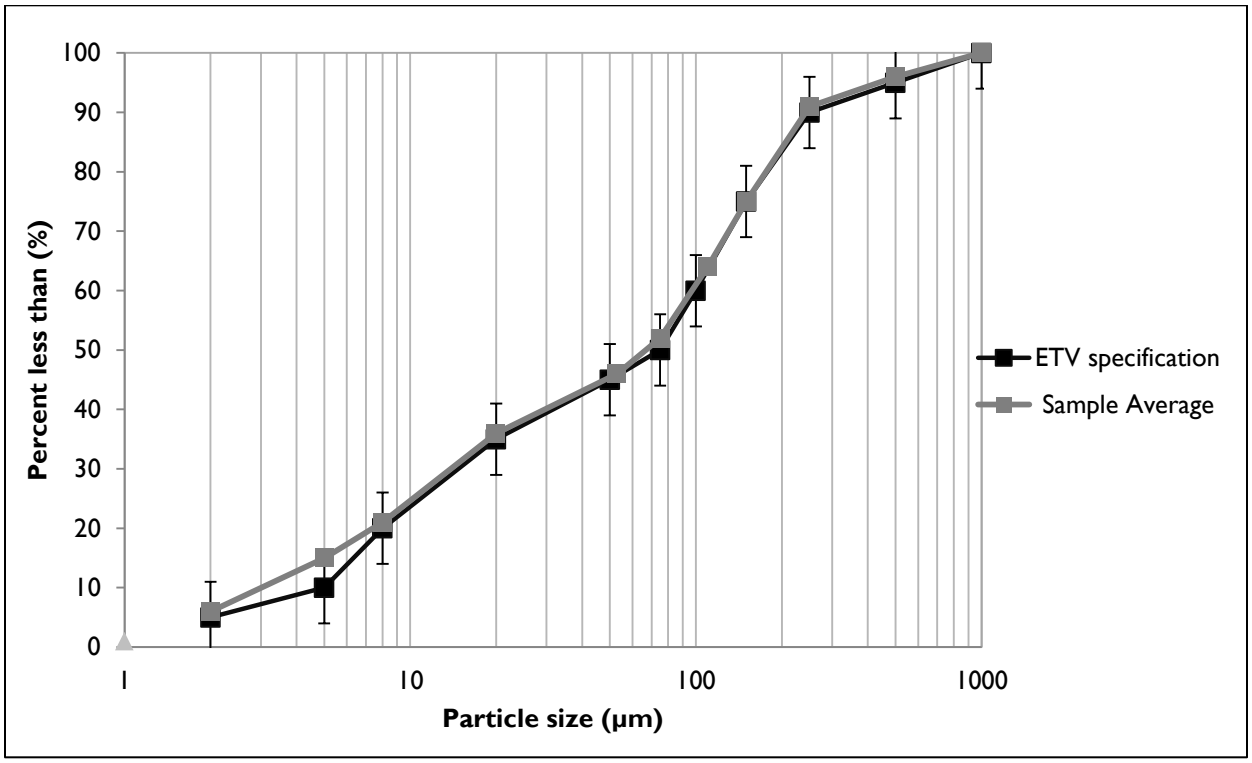


Figure 2. The three sample average particle size distribution (PSD) of the test sediment used for the capture and scour test compared to the specified PSD.

The capacity of the device to retain sediment was determined at seven surface loading rates using the modified mass balance method. This method involved measuring the mass and particle size distribution of the injected and retained sediment for each test run. Performance was evaluated with a false floor at 0.15 m from the bottom, simulating the technology filled to 50% of the manufacturer's recommended maximum sediment storage depth. The test was carried out with clean water that maintained a sediment concentration below 20 mg/L. Based on these conditions, removal efficiencies for individual particle size classes and for the test sediment as a whole were determined for each of the tested surface loading rates (Table 1).

In some instances, the removal efficiencies were above 100% for certain particle size fractions. These discrepancies are not unique to any one test laboratory and may be attributed to errors relating to the blending of sediment, collection of representative samples for laboratory submission, and laboratory analysis of PSD. Due to these errors, caution should be exercised in applying the removal efficiencies by particle size fraction for the purposes of sizing the tested device (see Bulletin # CETV 2016-11-0001). The results for "all particle sizes by mass balance" (see Table 1 and 2) are based on measurements of the total injected and retained sediment mass, and are therefore not subject to blending, sampling or PSD analysis errors.

Table 1. Removal efficiencies (%) of the HS4 unit at specified surface loading rates.

Particle size fraction (µm)	Surface loading rate (L/min/m²)						
	40	80	200	400	600	1000	1400
>500	73	100*	98	67	100*	100*	26
250 - 500	100	100*	92	64	100*	98	48
150 - 250	100*	75	89	72	89	60	69
105 - 150	94	100*	100*	100*	78	99	91
75 - 105	96	76	79	95	68	54	46
53 - 75	87	100*	100*	100*	56	69	65
20 - 53	71	54	46	44	19	14	10
8 - 20	38	23	15	8	2	2	2
5 – 8	13	6	1	1	0	0	0
<5	8	0	0	0	0	0	0
All particle sizes by mass balance	**68.6**	**64.0**	**60.0**	**56.1**	**46.1**	**41.2**	**35.7**

* Removal efficiencies were calculated to be above 100%. Calculated values ranged between 103 and 194% (average 128%). See text and Bulletin # CETV 2016-11-0001 for more information.

Figure 3 compares the particle size distribution (PSD) of the three sample average of the test sediment to the PSD of the sediment retained by the HS4 unit at each of the tested surface loading rates. As expected, the capture efficiency for fine particles in the unit was generally found to decrease as surface loading rates increased.

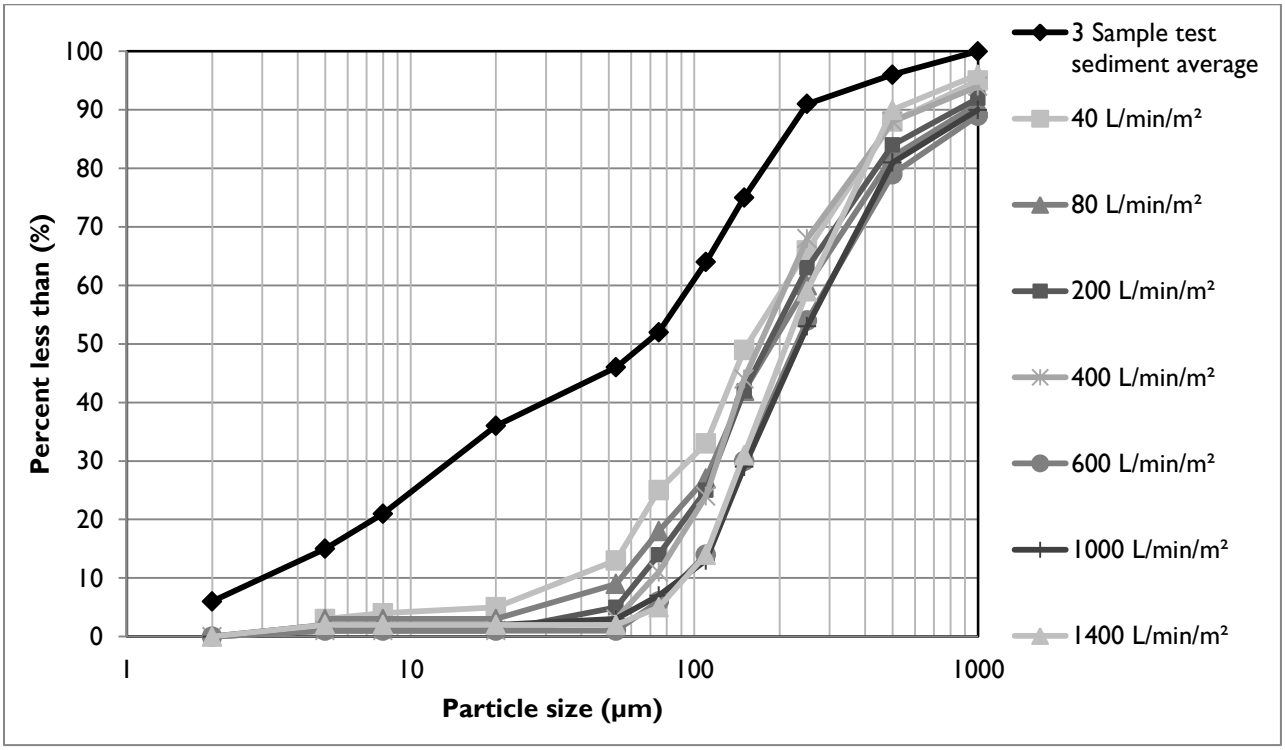


Figure 3. Particle size distribution of sediment retained in the HS4 unit in relation to the injected test sediment average.

For the sediment scour and re-suspension test, two tests were conducted. The first test was conducted with the secondary plate used in the capture tests. The second used a perforated secondary plate. Since sediment during the capture tests was found to settle in the pre-treatment channel, and in roughly the same quantities on the secondary plate and collection sump, all three of these surfaces were preloaded with sediment during the first test. The pre-treatment channel only captures coarse sediment. Therefore, this area was pre-loaded with sediment having a PSD similar to the PSD of the sediment that settled in this area during the 40 L/min/m^2 SLR sediment capture test. The pre-loaded sediment in the pre-treatment channel was shaped and leveled to correspond with sedimentation patterns and depths observed by the laboratory technician during the 40 L/min/m^2 SLR capture test. It should be noted that the actual sediment preloaded in this area was finer than the PSD of sediment captured in the same area during the 40 L/min/m^2 SLR capture test, particularly for particle sizes less than the median size. Both the sump and secondary plate were pre-loaded with the 1-1000 µm sediment mix to a depth of 10.2 cm. The preloaded sediment in the lower sump was placed on a false floor to mimic a device filled to 50% of the manufacturer's maximum recommended sediment storage depth.

After pre-loading the sediment, clean water was run through the device at five SLRs over a 25 minute period. At each SLR, five effluent samples were collected over a four minute interval (one per minute) with the first sample collected at the beginning of each flow rate, and the last collected just prior to the one minute transition to the next flow rate or end of the test. Effluent samples were analyzed for Suspended Sediment Concentration (SSC) and PSD by methods prescribed in the *Procedure*. The effluent samples were subsequently adjusted based on the background concentration of the influent water and the smallest 5% of particles captured during the 40 L/min/m^2 sediment capture test (7 um), as per the method described in Bulletin # CETV 2016-09-0001.

Measurements of sediment depths in the sump after the first test showed that most of the sediment from the secondary plate was carried into the lower sump. During this process, the fine sediment was likely re-suspended and carried out of the unit with the flow. The average adjusted effluent suspended sediment concentrations for each SLR ranged from 11.3 mg/L at the 200 L/min/m2 SLR to 196.7 mg/L at the 1400 L/min/m2 SLR. Effluent SSCs declined after the 1400 L/min/m2 SLR because the unit begins to bypass flow at this rate. It should be noted that this was a very conservative test as sediment was preloaded in three areas, rather than in the lower sump alone, and the preloaded sediment on the pre-treatment channel and secondary plate had a finer PSD than the sediment found to settle in these areas during the lowest SLR capture test.

The second sediment scour test was conducted on an identical unit but with a 32% open-area perforated secondary plate of the same size and orientation as the solid plate used in the first test. The perforated plate was intended to allow most of the sediment to settle in the lower sump, while still protecting against sediment scour, and not affecting the capacity of the unit to capture sediment. A second capture test was run at the 600 L/min/m^2 SLR to confirm that the perforated plate would have the same flow characteristics and removal efficiencies as the solid plate. Results of this comparison presented in Table 2 show that removal efficiencies were not affected and that the collection sump was receiving the majority of sediment transported into the lower chamber. Based on the observed sediment deposition zones, the second repeat test with the perforated plate had sediment preloaded in the pre-treatment channel and the lower collection sump only (*i.e.* the major deposition zones). The collection sump was preloaded with 10.2 cm of the 1- 1000 µm test sediment mix, as in the first test, and the pre-treatment channel was preloaded in much the same way as the first test, but with a sediment PSD that more closely mimicked the PSD of sediment observed to settle in this area during the 40 L/min/m^2 sediment capture test.

Table 2: Injected mass captured at the 600 L/min/m^2 SLR for two different configurations of the secondary plate

Secondary Plate type	Target Surface Loading Rate (L/min/m^2)	Tested Flow Rate (L/min)	Removal Efficiency (%)	Pre-treatment Channel (%)	Secondary Plate (%)	Outlet Dispersion Plate (%)	Collection Sump (%)
Solid Plate	600	736.2	46.1	24.7	8.5	3.1	9.9
Perforated Plate	600	740.9	45.9	25.8	2.7	3.0	14.5

Results of the second test are presented in Table 3. Background concentrations were maintained below 10.5 mg/L. The average adjusted effluent suspended sediment concentrations ranged from 19.1 to 28.5 mg/L. Since the commercially available unit will have a perforated secondary plate, these concentrations are the appropriate values to consider for approvals. The verifier acknowledges that the sediment capture removal efficiencies were not all tested with the perforated plate (see variance notes below), but that the repeat test results at the 600 L/min/m^2 SLR and a statement from the independent test laboratory were sufficient to provide reasonable confidence that the added perforations in the secondary plate would have negligible influence on sediment removal efficiencies.

Table 3. Scour test adjusted effluent sediment concentrations

Run	Surface loading rate (L/min/m^2)	Run time (min)	Background sample concentration (mg/L)[a]	Average adjusted effluent suspended sediment concentration (mg/L)[b]
1	200	5	3.6	22.4
2	800	5	8.9	28.5
3	1400	5	7.6	20.0
4	2000	5	10.4	19.1
5	2600	5	6.0	24.4

[a] Background concentrations shown here are approximate values based on graphical interpolation

[b] The adjusted effluent suspended sediment concentration represents the actual measured effluent concentration minus the background concentration. For more information see Bulletin # CETV 2016-09-0001. Adjusted concentrations were only calculated for the average of the five samples collected per surface loading rate.

The results of the light liquid re-entrainment test used to evaluate the unit's capacity to prevent re-entrainment of light liquids are reported in Table 4. The test involved preloading 58.3 L (corresponding to a 5 cm depth over the collection sump area of 1.17m^2) of surrogate low-density polyethylene beads (Dow Chemical Dowlex™ 2517) within the inner chamber and running clean water through the device continuously at five surface loading rates (200, 800, 1400, 2000, and 2600 L/min/m^2). Each flow rate was maintained for 5 minutes with approximately 1 minute transition time between flow rates (30 minutes total). The effluent flow was screened to capture all re-entrained pellets throughout the test. Results showed maximum re-entrainment of 4.6% at 1400 L/min/m^2, which is the highest SLR without bypass. Re-entrainment decreased at subsequent SLRs as bypass volumes increased.

Table 4. Light liquid re-entrainment test results for the HS4

Surface Loading Rate (L/min/m²)	Time Stamp (min)	Amount of Beads Re-entrained			
		Mass (g)	Volume (L)	% of Pre-loaded Mass Re-entrained	% of Pre-loaded Mass Retained
200	1:00 – 6:00	0	0	0.00	100
800	7:00 – 12:00	49	0.1	0.1	99.9
1400	13:00 – 18:00	1523	2.7	4.6	95.4
2000	19:00 – 24:00	1445	2.5	4.3	95.7
2600	25:00 – 30:00	847	1.5	2.5	97.5
Interim Collection Net		39	0.1	0.1	99.9
Total Re-entrained		3902	6.8	11.7	--
Total Retained		29,497	51.5	--	88.3
Total Loaded		33,399	58.3	--	--

Variances from testing Procedure

The following deviations from the *Procedure for Laboratory Testing of Oil-Grit Separators* (Version 3.0, June 2014) have been noted:

1. The Procedure stipulates that the tested device "must be a full scale, commercially available device with the same configuration and components that would be typical for an actual installation." As noted above, the sediment capture tests were conducted with a solid secondary plate. The solid secondary plate was later modified to a 32% open area perforated plate to reduce sediment settling on the plate, while continuing to provide scour prevention. As described above, the scour test was repeated with the perforated secondary plate, but the sediment capture test was only repeated at the 600 L/min/m² SLR (i.e. one of seven tested SLRs). Removal efficiency results for the repeat test showed very close correspondence with the earlier test using the solid plate and much of the sediment that previously settled on the secondary plate was deposited in the lower collection sump (see Table 2). The independent laboratory provided the following statement regarding the potential for the added perforations to affect sediment removal efficiencies: "Taking into account the close proximity of the plate to the collection sump, as well as our knowledge of sediment transport, it is expected that the deposited sediment would have settled in the lower sump, with no impact on removal efficiency, if the plate was removed." While the verifier acknowledges that stronger evidence would have been provided by additional repeat testing at a lower and higher SLR, the close correlation between the original and repeat test, combined with the statement from the lab were sufficient to provide reasonable confidence that adding the perforations would not likely have changed the capture test results significantly.

2. The repeat test at the 600 L/min/m² SLR had background concentrations exceeding the 20 mg/L threshold during the last half of the test. The exceedances occurred in 4 of the 8 samples collected, reaching a maximum of 28.4 mg/L. The experimental apparatus is a closed loop system. Therefore, the sediment in the background samples consists of fine particles not captured by the device, and would therefore not likely bias the mass balance results.

3. It was necessary to change flow meters during the sediment scour and light liquid re-entrainment test, as the required flows exceeded the minimum and/or maximum range of any single meter. When the flow capacity of the selected meter was reached, the flow was shut down over a period of approximately 10 seconds and all flow data saved. The next data acquisition file was executed and flow increased at a rate that corresponded to reaching each previous target flow after a period of 1-minute. This procedure was approved by CETV prior to testing, in recognition that most particles susceptible to scour at low flows would not be in the sump at higher flows. Similarly, re-entrainment of the oil beads was not expected to be significantly affected by the flow meter change.

4. As part of the capture test, evaluation of the 40 and 80 L/min/m^2 surface loading rate was split into 3 and 2 parts, respectively, due to the long duration needed to feed the required minimum of 11.3 kg of test sediment into the unit. At the end of the first and second parts of the test, the flow rates were gradually shutdown to prevent capture of particles that would have been washed out under normal circumstances. The amended procedure was reviewed and approved by the verifier prior to testing.

Verification

The verification was completed by the Verification Expert, Toronto and Region Conservation Authority, contracted by GLOBE Performance Solutions, using the International Standard ***ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)***. Data and information provided by Hydroworks, LLC to support the performance claim included the following: Performance test report prepared by Alden Research Laboratory, Inc., and dated February 2018. This report is based on testing completed in accordance with the *Procedure for Laboratory Testing of Oil-Grit Separators* (Version 3.0, June 2014).

What is ISO14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV), and was developed and published by the *International Organization for Standardization (ISO)*. The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the Hydroworks® HS Hydrodynamic Separator please contact:

Hydroworks, LLC
136 Central Ave., 2nd FL
Clark, NJ
07066 USA
Tel: 888-290-7900
Email: info@hydroworks.com
www.hydroworks.com

For more information on ISO 14034:2016 / ETV please contact:

GLOBE Performance Solutions
404 – 999 Canada Place
Vancouver, BC
V6C 3E2 Canada
Tel: 604-695-5018 / Toll Free: 1-855-695-5018
etv@globeperformance.com
www.globeperformance.com

Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.0

Please call Hydroworks at 888-290-7900 or email us at support@hydroworks.com if you have any questions regarding the Inspection Checklist. Please fax a copy of the completed checklist to Hydroworks at 888-783-7271 for our records.

Introduction

The HydroStorm is a state of the art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.

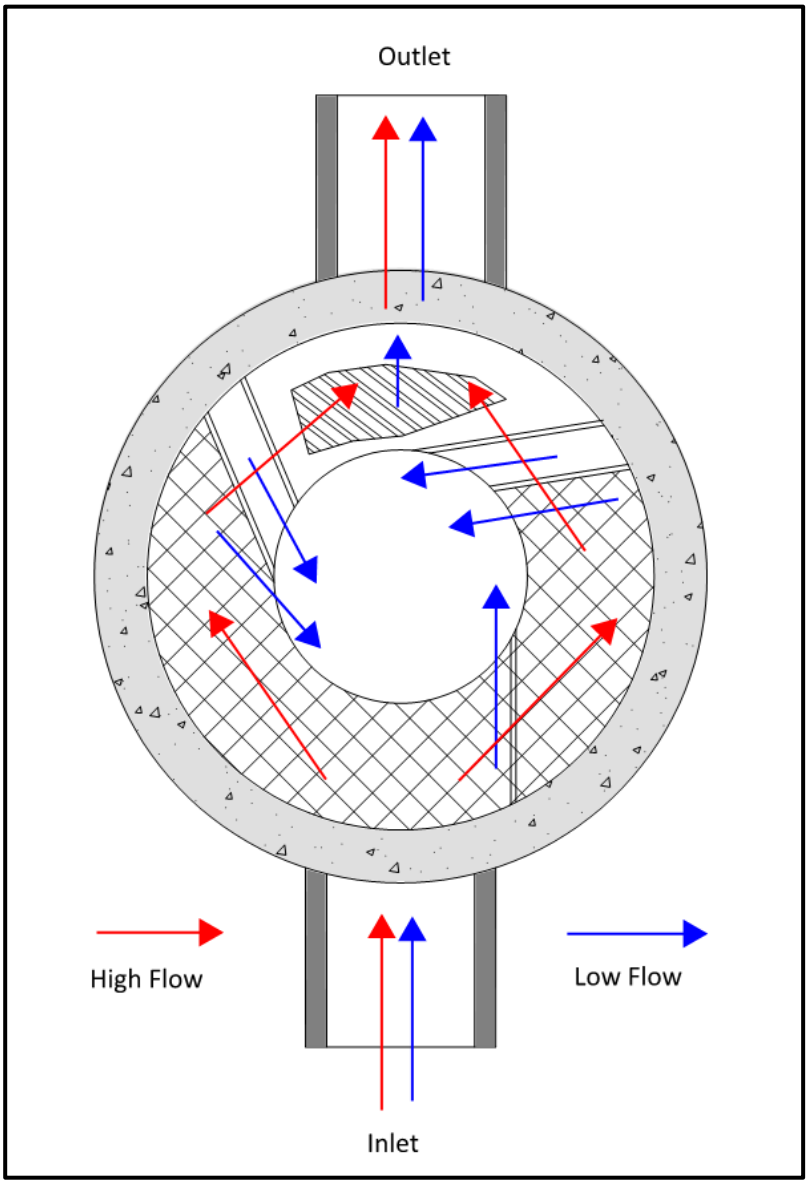


Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

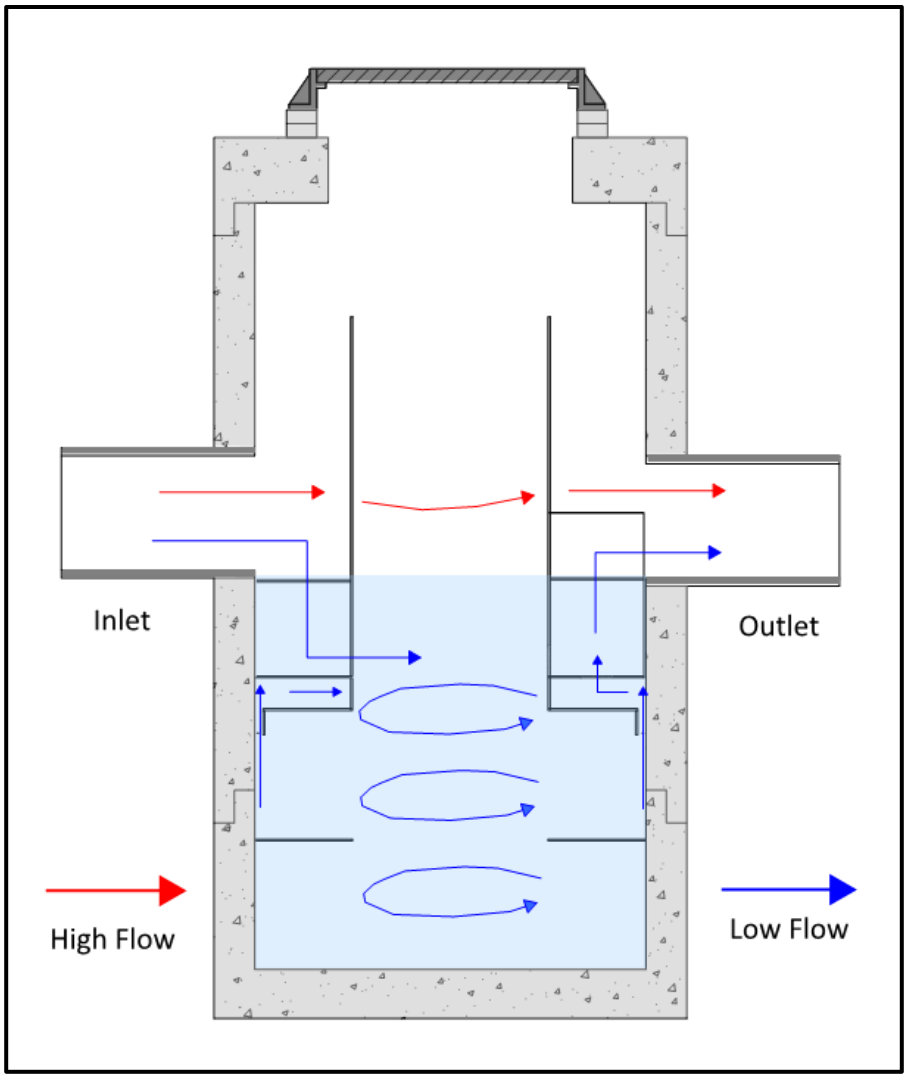


Figure 2. Hydroworks HydroStorm Operation – Profile View

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.

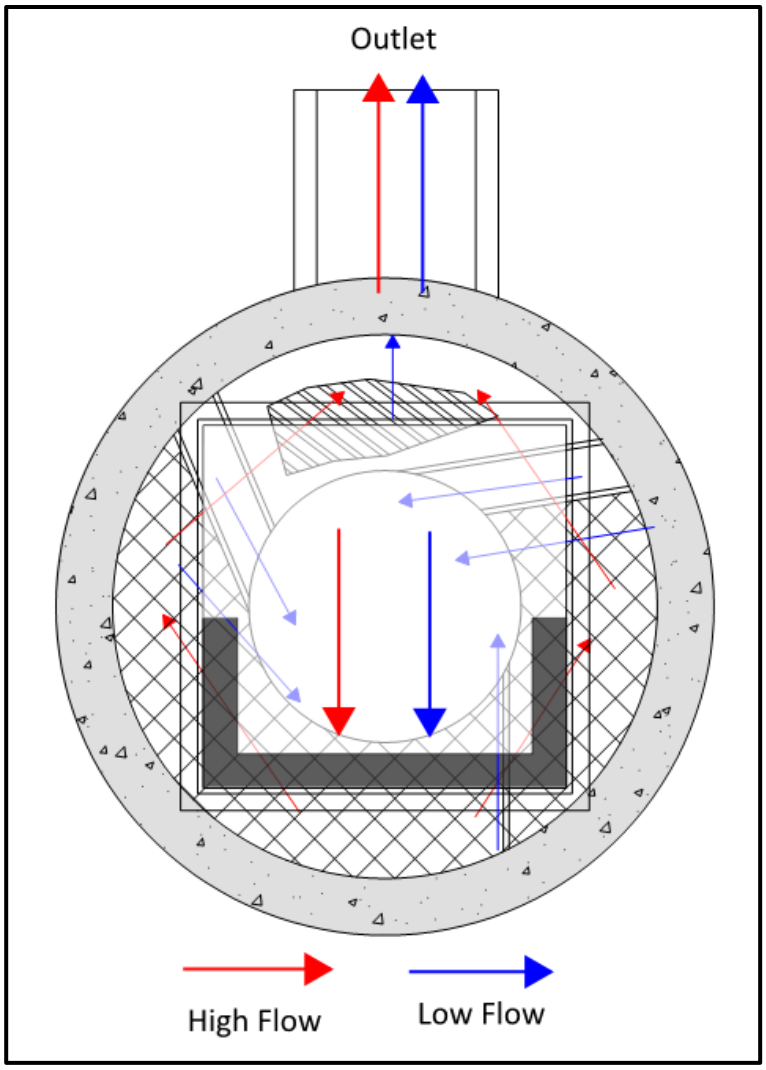


Figure 3. Hydroworks HS 4i Funnel

Inspection

Procedure

Floatables

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

Hydroworks

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5" (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24” or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.

In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature. Disposal of the water will depend on local requirements. Disposal options for the decanted water may include:

1. Discharge into a nearby sanitary sewer manhole
2. Discharge into a nearby LID practice (grassed swale, bioretention)
3. Discharge through a filter bag into a downstream storm drain connection

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

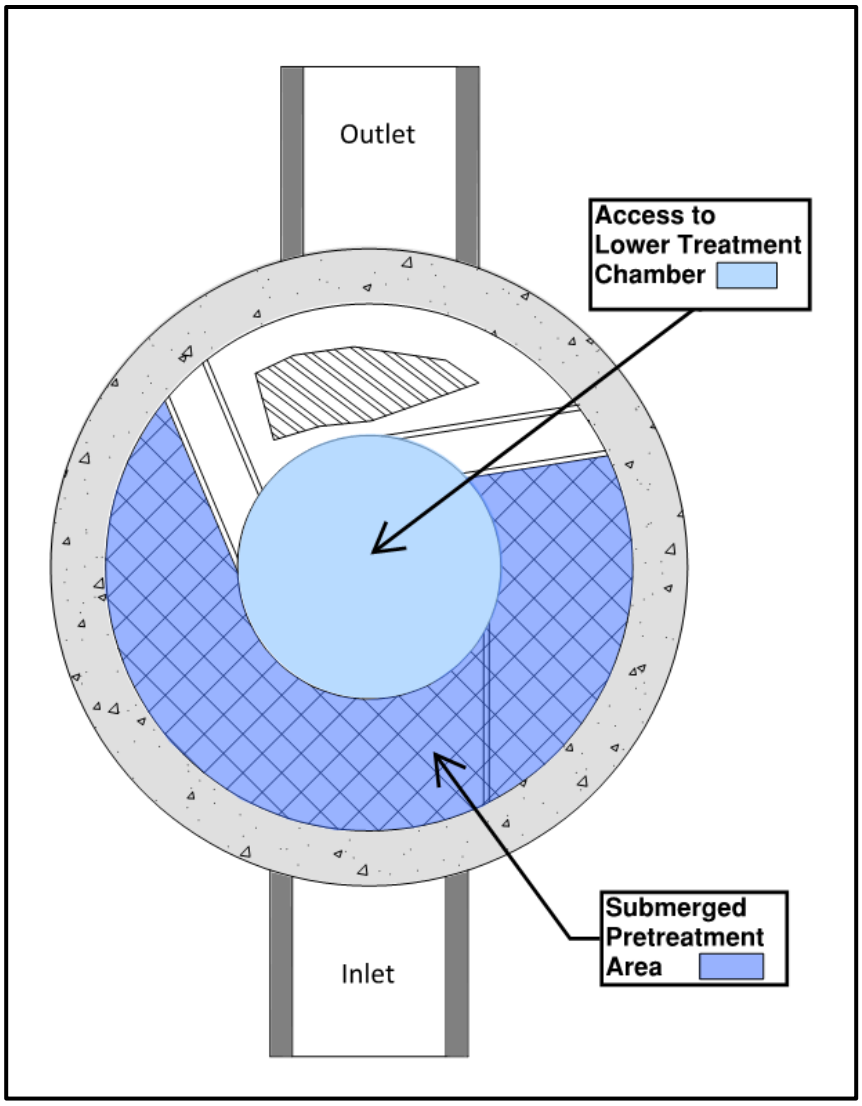


Figure 3. Maintenance Access

Frequency

Construction Period

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24” (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft. Therefore, maintenance for sediment accumulation is required if the depth of sediment is 1 ft or greater in separators with standard water (sump) depths (Table 1).

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total water depth in the separator through the central access tube should be taken and compared to water depth given in Table 1. The standard water depth from Table 1 should be subtracted from the measured water depth and the resulting extra depth should be added to the 1 ft to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured water depth in the HS-7 is 7 feet, then the sediment maintenance depth for that HS-7 is 2 ft (= 1 + 7 – 6) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 1 Standard Dimensions for Hydroworks HydroStorm Models

Model	Diameter (ft)	Total Water Depth (ft)	Sediment Maintenance Depth for Table 1 Total Water Depth(ft)
HS-3	3	3	1
HS-4	4	4	1
HS-5	5	4	1
HS-6	6	4	1
HS-7	7	6	1
HS-8	8	7	1
HS-9	9	7.5	1
HS-10	10	8	1
HS-11	11	9	1
HS-12	12	9.5	1

HYDROSTORM INSPECTION SHEET

Date _____
Date of Last Inspection _____

Site _____
City _____
State _____
Owner _____

GPS Coordinates _____

Date of last rainfall _____

Site Characteristics	**Yes**	**No**
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	**Yes**	**No**
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____“

Routine Measurements

Floating debris depth	**< 0.5” (13mm)**	☐	**>0.5” 13mm)**	☐ *
Floating debris coverage	**< 50% of surface area**	☐	**> 50% surface area**	☐ *
Sludge depth	**< 12” (300mm)**	☐	**> 12” (300mm)**	☐ ****

* Maintenance required
** Repairs required
*** Further investigation is required

Hydroworks

Other Comments:

Hydroworks

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.

APPENDIX E

FLOODPLAIN ANALYSIS MEMO

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

TECHNICAL MEMORANDUM

To:	Matthew Lauzon, Planning and Regulations Analyst Conservation Halton	**From:**	Steven DeGrow Steven Frankovich
		Date:	July 6, 2022
Project:	Holy Family Catholic Cemetery 2523 Lower Base line Milton, ON	**Pages:** **Job #:**	4 + Appendix 13084
Re:	Floodplain Analysis for the proposed crossing culvert crossing of Sixteen Mile Creek Tributary		

Introduction

S. Llewellyn & Associates Limited has been retained by The Catholic Cemeteries of the Dioceses of Hamilton to provide consulting engineering services for the proposed Phase 2 portion of the Holy Family Catholic Cemetery development at the corner of Regional Road No. 25 and Lower Baseline Road in the Town of Milton (see Figure 1.0 for location plan). The property is traversed by a tributary of Sixteen Mile Creek that flows in a northeastern direction (see Figure 1.0 for location plan). Furthermore, the northeastern quadrant of the property has been redeveloped and converted from agricultural to cemetery lands with an associated asphalt roadway system. The remaining undeveloped portion of the site currently remains agricultural lands.

The proposed Phase 2 portion of the development consists of constructing one (1) single storey building for use as a crematorium facility. Additionally, there will be an associated asphalt parking lot with concrete curbing/sidewalks, landscaped areas, and an asphalt roadway that will connect to the existing cemetery roadway system. In order to connect the roadway system, it will be required to cross SMT-1 which is a tributary of the Sixteen Mile Creek. This technical memorandum will provide detailed information on the proposed watercourse crossing that has been designed to provide safe ingress/egress.

Background

The following information was used in the preparation of this memo:

Ref. 1: Topographic surveys from Mackay, Mackay & Peters Limited. (December 01, 2014)

Ref. 2: Stormwater Management Report for the proposed Cemetery Developments At Regional Road No. 25 And Lower Baseline Road In The Town of (AMEC Environment & Infrastructure, February 2012)

Ref. 3: Conservation Halton Planning & Permits Map-arcgis.com

Figure 1 – Location Plan

Hydraulic Modeling Information

Hydraulic analysis of the watercourse was performed using the HEC-RAS program developed by the U.S. Army Corp. of Engineers. The current HEC-RAS model for the tributaries of Sixteen Mile Creek which traverse the site was originally prepared by AMEC Environmental & Infrastructure.

Existing HEC-RAS Model

The HEC-RAS hydraulic model provided to S. Llewellyn & Associates was analyzed as provided to establish the existing condition water surface elevations (WSEL) for the 5-year to Regional storm events. See Appendix A for the output listing of the existing conditions. The existing condition WSEL's are also noted in Table 1.

The existing model consisted of nineteen (19) cross sections along SMT-1 with seven (7) downstream of the existing box culvert crossing Regional Road 25 and twelve upstream. Furthermore, there are six (6) cross sections along SMT-2, two (2) cross sections along SMT 3, and five (5) cross sections along SMT-4.

PROPOSED CONDITIONS MODEL INFORMATION

Under proposed conditions, the cross-section data was adjusted based on the proposed box culvert. To accurately model the proposed culvert in HEC-RAS an additional, 3 cross sections were added before and after the culvert. It is proposed to install a 6.0m span x 1.5m rise closed bottom box culvert that is counter sunk 15% (0.225m) as per Conservation Halton's requirements. The roadway system will cross SMT-1 over the culvert structure. The culvert will have a total length of approximately 10.0 m.

Boundary Conditions – The boundary conditions of the original model were maintained in the proposed conditions model.

Cross-Section Flows – The flow rates applied to the cross-sections for the 5-yr, 10-yr, 25-yr, 50-yr, 100-yr, and Regional storm events in the AMEC HEC-RAS model were maintained in the proposed condition. The hydrology in the original HEC-RAS model was derived from the SWMHYMO file for the future conditions with stormwater management controls which were included in the "Stormwater Management Report for the proposed Cemetery Developments At Regional Road No. 25 and Lower Baseline Road In the Town of Milton" completed in February 2012 by AMEC Environmental & Infrastructure. Since this SWMHYMO model stipulates the maximum permissible post-development flow rates from the site the hydrology in the original AMEC HEC-RAS model is conservative.

Culvert Cross-Section – The proposed culvert cross-section was entered into HEC-RAS model as depicted in the technical drawings completed by MCON products for the typical 6.0m span closed bottom box culvert. The road deck is conservatively 1.29m above the soffit of the culvert at the crown of the road. This accounts for the thickness of the culvert wall along with the pavement buildup over the culvert. See Appendix B for proposed conditions output information.

ANALYSIS RESULTS AND COMMENTS

Table 1.0 summarizes the calculated water surface elevations for the existing and proposed conditions upstream and downstream of the proposed bridge work. Figure 2.0 shows cross-section locations as well as the existing and proposed Regional Event floodline elevations.

The analysis results indicate the following:

- With the installation of the 6.0m x 1.5m box culvert there is a slight increase in the calculated water surface elevation (WSEL) upstream of the culvert crossing. This increase in water surface elevation extends from the proposed culvert to the upstream cross section 2415.

- Downstream of the proposed culvert crossing there is no change in water surface elevation during any of the storm events.

- All storm events including the regional storm will pass under the structure.

S:\13084\WORKING\CURRENT\13084-CROSS SECTION PLAN.dwg

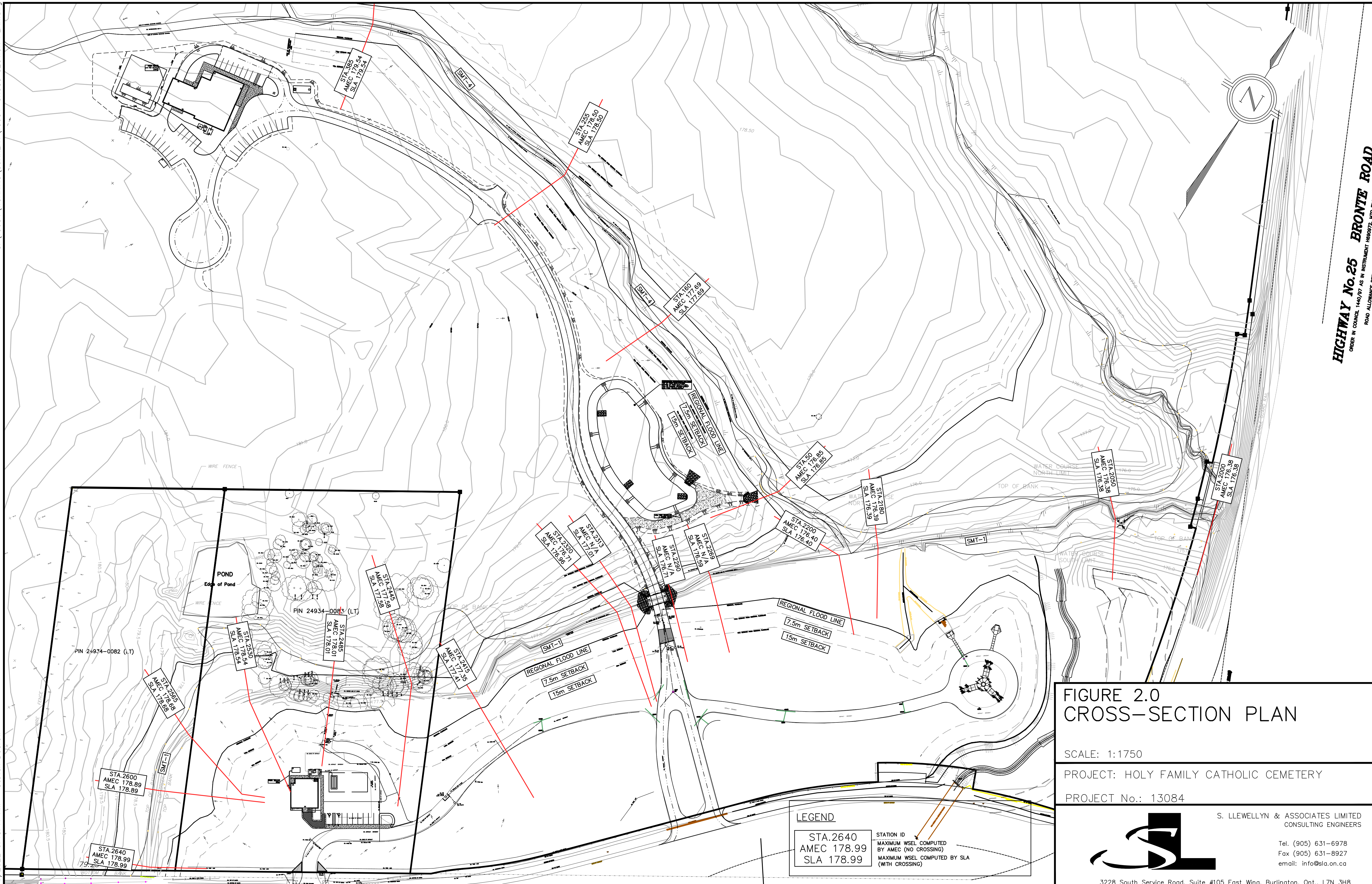


FIGURE 2.0
CROSS–SECTION PLAN

SCALE: 1:1750

PROJECT: HOLY FAMILY CATHOLIC CEMETERY

PROJECT No.: 13084

S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Tel. (905) 631–6978
Fax (905) 631–8927
email: info@sla.on.ca

3228 South Service Road, Suite #105 East Wing, Burlington, Ont., L7N 3H8

7/6/2022 8:48:41 AM – Steven DeGrow

Table 1 - Comparision of Existing & Proposed Water Surface Elevations (see Fig. 2.0 for x-section locations)

Reach	River Sta	Profile	Q Total	Existing W.S. Elev	Proposed W.S. Elev	Difference in WSEL
			(m^3/s)	(m)	(m)	(m)
SMT-4	385	2 YR	0.54	179.33	179.33	0.00
SMT-4	385	5 YR	0.94	179.41	179.41	0.00
SMT-4	385	10 YR	1.23	179.45	179.45	0.00
SMT-4	385	25 YR	1.61	179.49	179.49	0.00
SMT-4	385	50 YR	1.89	179.51	179.51	0.00
SMT-4	385	100 YR	2.18	179.54	179.54	0.00
SMT-4	385	REG	1.90	179.51	179.51	0.00
SMT-4	255	2 YR	0.54	178.35	178.35	0.00
SMT-4	255	5 YR	0.94	178.41	178.41	0.00
SMT-4	255	10 YR	1.23	178.44	178.44	0.00
SMT-4	255	25 YR	1.61	178.47	178.47	0.00
SMT-4	255	50 YR	1.89	178.49	178.49	0.00
SMT-4	255	100 YR	2.18	178.50	178.50	0.00
SMT-4	255	REG	1.90	178.49	178.49	0.00
SMT-4	160	2 YR	0.54	177.54	177.54	0.00
SMT-4	160	5 YR	0.94	177.59	177.59	0.00
SMT-4	160	10 YR	1.23	177.62	177.62	0.00
SMT-4	160	25 YR	1.61	177.65	177.65	0.00
SMT-4	160	50 YR	1.89	177.67	177.67	0.00
SMT-4	160	100 YR	2.18	177.69	177.69	0.00
SMT-4	160	REG	1.90	177.67	177.67	0.00
SMT-4	50	2 YR	0.54	176.75	176.75	0.00
SMT-4	50	5 YR	0.94	176.78	176.78	0.00
SMT-4	50	10 YR	1.23	176.80	176.80	0.00
SMT-4	50	25 YR	1.61	176.82	176.82	0.00
SMT-4	50	50 YR	1.89	176.83	176.83	0.00
SMT-4	50	100 YR	2.18	176.85	176.85	0.00
SMT-4	50	REG	1.90	176.83	176.83	0.00
SMT-1	2640	2 YR	2.76	178.69	178.69	0.00
SMT-1	2640	5 YR	4.83	178.77	178.77	0.00
SMT-1	2640	10 YR	6.30	178.82	178.82	0.00
SMT-1	2640	25 YR	8.20	178.88	178.88	0.00
SMT-1	2640	50 YR	10.15	178.93	178.93	0.00
SMT-1	2640	100 YR	11.71	178.97	178.97	0.00
SMT-1	2640	REG	12.67	178.99	178.99	0.00
SMT-1	2600	2 YR	2.76	178.49	178.49	0.00
SMT-1	2600	5 YR	4.83	178.61	178.61	0.00
SMT-1	2600	10 YR	6.30	178.68	178.68	0.00
SMT-1	2600	25 YR	8.20	178.75	178.75	0.00
SMT-1	2600	50 YR	10.15	178.81	178.81	0.00
SMT-1	2600	100 YR	11.71	178.86	178.86	0.00
SMT-1	2600	REG	12.67	178.89	178.89	0.00
SMT-1	2565	2 YR	2.76	178.31	178.31	0.00
SMT-1	2565	5 YR	4.83	178.40	178.40	0.00
SMT-1	2565	10 YR	6.30	178.46	178.46	0.00
SMT-1	2565	25 YR	8.20	178.53	178.53	0.00
SMT-1	2565	50 YR	10.15	178.59	178.59	0.00
SMT-1	2565	100 YR	11.71	178.65	178.65	0.00
SMT-1	2565	REG	12.67	178.68	178.68	0.00
SMT-1	2530	2 YR	2.76	177.98	177.98	0.00
SMT-1	2530	5 YR	4.83	178.15	178.15	0.00
SMT-1	2530	10 YR	6.30	178.24	178.24	0.00
SMT-1	2530	25 YR	8.20	178.33	178.33	0.00
SMT-1	2530	50 YR	10.15	178.43	178.43	0.00
SMT-1	2530	100 YR	11.71	178.50	178.50	0.00
SMT-1	2530	REG	12.67	178.54	178.54	0.00
SMT-1	2485	2 YR	2.76	177.50	177.50	0.00
SMT-1	2485	5 YR	4.83	177.62	177.62	0.00
SMT-1	2485	10 YR	6.30	177.71	177.71	0.00
SMT-1	2485	25 YR	8.20	177.82	177.82	0.00
SMT-1	2485	50 YR	10.15	177.92	177.92	0.00
SMT-1	2485	100 YR	11.71	177.98	177.98	0.00
SMT-1	2485	REG	12.67	178.01	178.01	0.00
SMT-1	2445	2 YR	2.76	177.18	177.18	0.00
SMT-1	2445	5 YR	4.83	177.29	177.29	0.00
SMT-1	2445	10 YR	6.30	177.36	177.36	0.00
SMT-1	2445	25 YR	8.20	177.44	177.44	0.00
SMT-1	2445	50 YR	10.15	177.50	177.50	0.00
SMT-1	2445	100 YR	11.71	177.56	177.56	0.00
SMT-1	2445	REG	12.67	177.58	177.58	0.00
SMT-1	2415	2 YR	2.76	176.92	176.93	0.01
SMT-1	2415	5 YR	4.83	177.05	177.05	0.00
SMT-1	2415	10 YR	6.30	177.12	177.13	0.01
SMT-1	2415	25 YR	8.20	177.20	177.22	0.02
SMT-1	2415	50 YR	10.15	177.27	177.30	0.03
SMT-1	2415	100 YR	11.71	177.32	177.37	0.05
SMT-1	2415	REG	12.67	177.35	177.41	0.06
SMT-1	2320	2 YR	2.76	176.19	176.26	0.07
SMT-1	2320	5 YR	4.83	176.34	176.45	0.11
SMT-1	2320	10 YR	6.30	176.43	176.56	0.13
SMT-1	2320	25 YR	8.20	176.53	176.70	0.17
SMT-1	2320	50 YR	10.15	176.61	176.81	0.20
SMT-1	2320	100 YR	11.71	176.67	176.90	0.23
SMT-1	2320	REG	12.67	176.71	176.96	0.25

Reach	River Sta	Profile	Q Total	Existing W.S. Elev	Proposed W.S. Elev	Difference in WSEL
			(m^3/s)	(m)	(m)	(m)
(Note: Cross-Section 2313 only in Proposed Model)						
SMT-1	2313	2 YR	2.76		176.34	N/A
SMT-1	2313	5 YR	4.83		176.54	N/A
SMT-1	2313	10 YR	6.30		176.64	N/A
SMT-1	2313	25 YR	8.20		176.77	N/A
SMT-1	2313	50 YR	10.15		176.88	N/A
SMT-1	2313	100 YR	11.71		176.96	N/A
SMT-1	2313	REG	12.67		177.01	N/A
6.0mx1.5m Box Culvert @ River Station 2308						
(Note: Cross-Section 2290 only in Proposed Model)						
SMT-1	2290	2 YR	2.76		176.30	N/A
SMT-1	2290	5 YR	4.83		176.45	N/A
SMT-1	2290	10 YR	6.30		176.53	N/A
SMT-1	2290	25 YR	8.20		176.61	N/A
SMT-1	2290	50 YR	10.15		176.66	N/A
SMT-1	2290	100 YR	11.71		176.69	N/A
SMT-1	2290	REG	12.67		176.71	N/A
(Note: Cross-Section 2269 only in Proposed Model)						
SMT-1	2269	2 YR	2.76		176.11	N/A
SMT-1	2269	5 YR	4.83		176.24	N/A
SMT-1	2269	10 YR	6.30		176.32	N/A
SMT-1	2269	25 YR	8.20		176.41	N/A
SMT-1	2269	50 YR	10.15		176.50	N/A
SMT-1	2269	100 YR	11.71		176.56	N/A
SMT-1	2269	REG	12.67		176.59	N/A
SMT-1	2200	2 YR	3.63	175.39	175.39	0.00
SMT-1	2200	5 YR	6.34	175.56	175.56	0.00
SMT-1	2200	10 YR	8.24	175.64	175.64	0.00
SMT-1	2200	25 YR	10.67	175.73	175.73	0.00
SMT-1	2200	50 YR	12.82	175.79	175.79	0.00
SMT-1	2200	100 YR	14.98	175.95	175.95	0.00
SMT-1	2200	REG	17.26	176.40	176.40	0.00
SMT-1	2180	2 YR	3.63	175.17	175.17	0.00
SMT-1	2180	5 YR	6.34	175.32	175.32	0.00
SMT-1	2180	10 YR	8.24	175.40	175.40	0.00
SMT-1	2180	25 YR	10.67	175.49	175.49	0.00
SMT-1	2180	50 YR	12.82	175.55	175.55	0.00
SMT-1	2180	100 YR	14.98	175.90	175.90	0.00
SMT-1	2180	REG	17.26	176.39	176.39	0.00
SMT-1	2050	2 YR	4.61	174.56	174.56	0.00
SMT-1	2050	5 YR	8.07	174.77	174.77	0.00
SMT-1	2050	10 YR	10.50	174.97	174.97	0.00
SMT-1	2050	25 YR	13.66	175.27	175.27	0.00
SMT-1	2050	50 YR	16.37	175.50	175.50	0.00
SMT-1	2050	100 YR	19.10	175.90	175.90	0.00
SMT-1	2050	REG	21.52	176.38	176.38	0.00
SMT-1	2040	2 YR	4.61	174.46	174.46	0.00
SMT-1	2040	5 YR	8.07	174.70	174.70	0.00
SMT-1	2040	10 YR	10.50	174.94	174.94	0.00
SMT-1	2040	25 YR	13.66	175.26	175.26	0.00
SMT-1	2040	50 YR	16.37	175.49	175.49	0.00
SMT-1	2040	100 YR	19.10	175.89	175.89	0.00
SMT-1	2040	REG	21.52	176.38	176.38	0.00
SMT-1	2000	2 YR	6.82	174.18	174.18	0.00
SMT-1	2000	5 YR	11.98	174.60	174.60	0.00
SMT-1	2000	10 YR	15.56	174.88	174.88	0.00
SMT-1	2000	25 YR	20.16	175.23	175.23	0.00
SMT-1	2000	50 YR	23.25	175.47	175.47	0.00
SMT-1	2000	100 YR	27.73	175.89	175.89	0.00
SMT-1	2000	REG	32.10	176.38	176.38	0.00

Therefore, the proposed crossing does not present an increased flooding risk to life or property.

S. Llewellyn & Associates Limited.

S. DeGrow, Dipl.T

Steven Frankovich, P.Eng.

APPENDIX A

HEC-RAS-ORIGINAL AMEC OUTPUT

3228 South Service Road, Suite 105, East Wing Burlington, Ontario L7N 3H8
Tel. (905) 631-6978 info@sla.on.ca

HEC-RAS Plan: PROP_RVA_2,1 Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
SMT-1	UPPER	2600	2 YR	2.76	178.00	178.49	178.44	178.54	0.005158	1.15	4.36	31.13	0.64
SMT-1	UPPER	2600	5 YR	4.83	178.00	178.61		178.66	0.003718	1.21	8.68	37.20	0.57
SMT-1	UPPER	2600	10 YR	6.30	178.00	178.68		178.73	0.003416	1.27	11.26	39.75	0.56
SMT-1	UPPER	2600	25 YR	8.20	178.00	178.75		178.81	0.003268	1.35	14.22	42.49	0.56
SMT-1	UPPER	2600	50 YR	10.15	178.00	178.81		178.87	0.003222	1.43	16.96	44.88	0.56
SMT-1	UPPER	2600	100 YR	11.71	178.00	178.86		178.92	0.003193	1.49	19.08	46.64	0.57
SMT-1	UPPER	2600	REG	12.67	178.00	178.89		178.95	0.003181	1.53	20.33	47.64	0.57
SMT-1	UPPER	2565	2 YR	2.76	177.80	178.31		178.37	0.004890	1.28	4.23	20.74	0.64
SMT-1	UPPER	2565	5 YR	4.83	177.80	178.40	178.36	178.50	0.006644	1.70	6.21	25.37	0.77
SMT-1	UPPER	2565	10 YR	6.30	177.80	178.46	178.42	178.57	0.006864	1.86	7.83	28.61	0.80
SMT-1	UPPER	2565	25 YR	8.20	177.80	178.53	178.49	178.66	0.006777	2.00	9.99	32.18	0.81
SMT-1	UPPER	2565	50 YR	10.15	177.80	178.59		178.73	0.006456	2.09	12.29	35.18	0.80
SMT-1	UPPER	2565	100 YR	11.71	177.80	178.65		178.78	0.006117	2.14	14.23	37.53	0.79
SMT-1	UPPER	2565	REG	12.67	177.80	178.68		178.81	0.005922	2.17	15.43	38.91	0.78
SMT-1	UPPER	2530	2 YR	2.76	177.50	177.98	177.97	178.09	0.013476	1.49	1.85	7.70	0.97
SMT-1	UPPER	2530	5 YR	4.83	177.50	178.15	178.09	178.25	0.006677	1.46	4.07	18.22	0.74
SMT-1	UPPER	2530	10 YR	6.30	177.50	178.24	178.16	178.34	0.005329	1.50	5.92	23.21	0.69
SMT-1	UPPER	2530	25 YR	8.20	177.50	178.33	178.23	178.44	0.004456	1.54	8.42	28.62	0.65
SMT-1	UPPER	2530	50 YR	10.15	177.50	178.43		178.53	0.003743	1.56	11.33	33.85	0.61
SMT-1	UPPER	2530	100 YR	11.71	177.50	178.50		178.60	0.003274	1.56	13.93	37.91	0.58
SMT-1	UPPER	2530	REG	12.67	177.50	178.54		178.64	0.002984	1.55	15.65	39.36	0.56
SMT-1	UPPER	2485	2 YR	2.76	176.82	177.50	177.43	177.62	0.005856	1.78	2.93	9.00	0.74
SMT-1	UPPER	2485	5 YR	4.83	176.82	177.62	177.61	177.83	0.008310	2.40	4.14	10.71	0.91
SMT-1	UPPER	2485	10 YR	6.30	176.82	177.71	177.71	177.96	0.008736	2.66	5.13	11.94	0.95
SMT-1	UPPER	2485	25 YR	8.20	176.82	177.82	177.82	178.09	0.008457	2.85	6.56	13.52	0.95
SMT-1	UPPER	2485	50 YR	10.15	176.82	177.92	177.92	178.21	0.008396	3.04	7.93	14.87	0.97
SMT-1	UPPER	2485	100 YR	11.71	176.82	177.98	177.98	178.30	0.008667	3.21	8.87	15.72	0.99
SMT-1	UPPER	2485	REG	12.67	176.82	178.01	178.01	178.35	0.008930	3.33	9.38	16.22	1.01
SMT-1	UPPER	2445	2 YR	2.76	176.80	177.18	177.18	177.30	0.012237	1.57	2.20	12.05	0.95
SMT-1	UPPER	2445	5 YR	4.83	176.80	177.29	177.29	177.45	0.010592	1.83	3.80	15.97	0.93
SMT-1	UPPER	2445	10 YR	6.30	176.80	177.36	177.36	177.53	0.009884	1.97	4.96	18.29	0.93
SMT-1	UPPER	2445	25 YR	8.20	176.80	177.44	177.44	177.63	0.009499	2.13	6.39	20.79	0.93
SMT-1	UPPER	2445	50 YR	10.15	176.80	177.50	177.50	177.71	0.009083	2.25	7.88	23.15	0.93
SMT-1	UPPER	2445	100 YR	11.71	176.80	177.56	177.56	177.77	0.008708	2.33	9.13	25.21	0.92
SMT-1	UPPER	2445	REG	12.67	176.80	177.58	177.58	177.81	0.008606	2.38	9.85	26.32	0.92
SMT-1	UPPER	2415	2 YR	2.76	176.50	176.92		176.98	0.004343	1.10	3.03	13.89	0.59
SMT-1	UPPER	2415	5 YR	4.83	176.50	177.05		177.13	0.004351	1.34	5.09	18.88	0.62
SMT-1	UPPER	2415	10 YR	6.30	176.50	177.12		177.22	0.004420	1.48	6.49	21.52	0.64
SMT-1	UPPER	2415	25 YR	8.20	176.50	177.20		177.31	0.004398	1.62	8.33	24.56	0.65
SMT-1	UPPER	2415	50 YR	10.15	176.50	177.27		177.39	0.004404	1.74	10.16	27.18	0.66
SMT-1	UPPER	2415	100 YR	11.71	176.50	177.32		177.45	0.004441	1.83	11.56	28.89	0.67
SMT-1	UPPER	2415	REG	12.67	176.50	177.35		177.49	0.004448	1.88	12.41	29.89	0.68
SMT-1	UPPER	2320	2 YR	2.76	175.75	176.19	176.19	176.34	0.011851	1.74	1.85	7.84	0.96
SMT-1	UPPER	2320	5 YR	4.83	175.75	176.34	176.34	176.53	0.009785	2.02	3.27	11.99	0.93
SMT-1	UPPER	2320	10 YR	6.30	175.75	176.43	176.43	176.64	0.008713	2.13	4.50	15.15	0.90
SMT-1	UPPER	2320	25 YR	8.20	175.75	176.53	176.53	176.75	0.008097	2.28	6.08	18.56	0.89
SMT-1	UPPER	2320	50 YR	10.15	175.75	176.61	176.61	176.85	0.007611	2.39	7.80	21.88	0.88
SMT-1	UPPER	2320	100 YR	11.71	175.75	176.67	176.67	176.92	0.007325	2.47	9.20	24.26	0.88
SMT-1	UPPER	2320	REG	12.67	175.75	176.71	176.71	176.96	0.007168	2.51	10.06	25.62	0.87
SMT-1	MID	2200	2 YR	3.63	174.75	175.39		175.43	0.001690	0.92	6.62	27.38	0.40
SMT-1	MID	2200	5 YR	6.34	174.75	175.56		175.60	0.001653	1.09	12.38	40.84	0.41
SMT-1	MID	2200	10 YR	8.24	174.75	175.64		175.69	0.001675	1.18	16.03	46.26	0.42
SMT-1	MID	2200	25 YR	10.67	174.75	175.73	175.49	175.78	0.001739	1.28	20.28	51.86	0.43
SMT-1	MID	2200	50 YR	12.82	174.75	175.79	175.55	175.85	0.001802	1.37	23.76	56.21	0.45
SMT-1	MID	2200	100 YR	14.98	174.75	175.95		175.99	0.001182	1.23	33.47	67.13	0.37
SMT-1	MID	2200	REG	17.26	174.75	176.40		176.41	0.000284	0.76	69.84	92.15	0.19
SMT-1	MID	2180	2 YR	3.63	174.75	175.17	175.17	175.31	0.011158	1.70	2.57	12.16	0.93
SMT-1	MID	2180	5 YR	6.34	174.75	175.32	175.32	175.49	0.009071	1.95	4.85	20.86	0.89
SMT-1	MID	2180	10 YR	8.24	174.75	175.40	175.40	175.58	0.007844	2.02	7.02	28.66	0.86
SMT-1	MID	2180	25 YR	10.67	174.75	175.49	175.49	175.68	0.006950	2.10	10.03	36.83	0.83
SMT-1	MID	2180	50 YR	12.82	174.75	175.55	175.55	175.74	0.006848	2.21	12.29	40.70	0.83
SMT-1	MID	2180	100 YR	14.98	174.75	175.90		175.95	0.001476	1.33	30.21	63.67	0.41
SMT-1	MID	2180	REG	17.26	174.75	176.39		176.40	0.000293	0.76	69.02	91.73	0.20
SMT-1	MID2	2050	2 YR	4.61	173.75	174.56		174.63	0.003115	1.44	6.55	19.76	0.55
SMT-1	MID2	2050	5 YR	8.07	173.75	174.77		174.86	0.002838	1.64	11.73	27.43	0.55
SMT-1	MID2	2050	10 YR	10.50	173.75	174.97		175.04	0.001923	1.54	17.36	31.22	0.47
SMT-1	MID2	2050	25 YR	13.66	173.75	175.27		175.31	0.001045	1.33	27.72	37.27	0.36
SMT-1	MID2	2050	50 YR	16.37	173.75	175.50		175.53	0.000748	1.25	36.75	41.84	0.31
SMT-1	MID2	2050	100 YR	19.10	173.75	175.90		175.92	0.000369	1.01	55.23	49.91	0.23
SMT-1	MID2	2050	REG	21.52	173.75	176.38		176.40	0.000177	0.81	81.82	60.21	0.16
SMT-1	MID2	2040	2 YR	4.61	173.75	174.46	174.40	174.59	0.005954	1.79	4.76	16.28	0.74
SMT-1	MID2	2040	5 YR	8.07	173.75	174.70		174.83	0.004093	1.87	9.88	25.26	0.65
SMT-1	MID2	2040	10 YR	10.50	173.75	174.94		175.01	0.002186	1.61	16.45	30.64	0.50

HEC-RAS Plan: PROP_RVA_2,1 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
SMT-1	MID2	2040	25 YR	13.66	173.75	175.26		175.30	0.001088	1.35	27.26	37.02	0.37
SMT-1	MID2	2040	50 YR	16.37	173.75	175.49		175.53	0.000765	1.26	36.41	41.68	0.31
SMT-1	MID2	2040	100 YR	19.10	173.75	175.89		175.92	0.000372	1.02	55.03	49.83	0.23
SMT-1	MID2	2040	REG	21.52	173.75	176.38		176.39	0.000177	0.81	81.71	60.16	0.16
SMT-1	Lower	2000	2 YR	6.82	173.50	174.18	174.07	174.31	0.007470	1.66	4.42	11.15	0.71
SMT-1	Lower	2000	5 YR	11.98	173.50	174.60	174.28	174.69	0.002678	1.44	13.67	33.70	0.46
SMT-1	Lower	2000	10 YR	15.56	173.50	174.88	174.44	174.94	0.001415	1.24	24.96	45.43	0.35
SMT-1	Lower	2000	25 YR	20.16	173.50	175.23	174.58	175.27	0.000742	1.06	42.67	56.39	0.27
SMT-1	Lower	2000	50 YR	23.25	173.50	175.47	174.65	175.50	0.000503	0.96	57.26	63.85	0.22
SMT-1	Lower	2000	100 YR	27.73	173.50	175.89	174.75	175.90	0.000270	0.80	86.45	75.85	0.17
SMT-1	Lower	2000	REG	32.10	173.50	176.38	174.82	176.39	0.000144	0.67	127.35	93.65	0.13
SMT-1	Lower	800		Culvert									
SMT-4	SMT-4	385	2 YR	0.54	178.98	179.33		179.35	0.003283	0.51	1.04	5.89	0.39
SMT-4	SMT-4	385	5 YR	0.94	178.98	179.41		179.43	0.003446	0.62	1.57	8.73	0.42
SMT-4	SMT-4	385	10 YR	1.23	178.98	179.45		179.47	0.003561	0.68	1.94	10.92	0.43
SMT-4	SMT-4	385	25 YR	1.61	178.98	179.49		179.52	0.003611	0.76	2.45	14.34	0.45
SMT-4	SMT-4	385	50 YR	1.89	178.98	179.51		179.55	0.003686	0.81	2.84	16.52	0.46
SMT-4	SMT-4	385	100 YR	2.18	178.98	179.54		179.57	0.003718	0.85	3.27	18.58	0.46
SMT-4	SMT-4	385	REG	1.90	178.98	179.51		179.55	0.003691	0.81	2.85	16.56	0.46
SMT-4	SMT-4	255	2 YR	0.54	178.15	178.35	178.35	178.41	0.026649	1.02	0.53	5.18	1.02
SMT-4	SMT-4	255	5 YR	0.94	178.15	178.41	178.41	178.47	0.025173	1.10	0.86	7.20	1.01
SMT-4	SMT-4	255	10 YR	1.23	178.15	178.44	178.44	178.50	0.023765	1.13	1.09	8.36	1.00
SMT-4	SMT-4	255	25 YR	1.61	178.15	178.47	178.47	178.54	0.023633	1.19	1.35	9.49	1.01
SMT-4	SMT-4	255	50 YR	1.89	178.15	178.49	178.49	178.56	0.022911	1.22	1.54	10.27	1.01
SMT-4	SMT-4	255	100 YR	2.18	178.15	178.50	178.50	178.59	0.022912	1.29	1.69	10.83	1.02
SMT-4	SMT-4	255	REG	1.90	178.15	178.49	178.49	178.56	0.022802	1.22	1.55	10.29	1.00
SMT-4	SMT-4	160	2 YR	0.54	177.37	177.54		177.55	0.003022	0.43	1.46	12.95	0.36
SMT-4	SMT-4	160	5 YR	0.94	177.37	177.59		177.60	0.003189	0.55	2.18	15.06	0.39
SMT-4	SMT-4	160	10 YR	1.23	177.37	177.62		177.64	0.003302	0.61	2.64	16.27	0.41
SMT-4	SMT-4	160	25 YR	1.61	177.37	177.65		177.67	0.003467	0.68	3.19	17.60	0.43
SMT-4	SMT-4	160	50 YR	1.89	177.37	177.67		177.70	0.003546	0.73	3.59	18.52	0.44
SMT-4	SMT-4	160	100 YR	2.18	177.37	177.69	177.58	177.72	0.003639	0.77	3.97	19.35	0.45
SMT-4	SMT-4	160	REG	1.90	177.37	177.67		177.70	0.003549	0.73	3.60	18.54	0.44
SMT-4	SMT-4	50	2 YR	0.54	176.62	176.75	176.75	176.78	0.029702	0.80	0.67	10.35	1.00
SMT-4	SMT-4	50	5 YR	0.94	176.62	176.78	176.78	176.83	0.027142	0.93	1.02	12.59	1.00
SMT-4	SMT-4	50	10 YR	1.23	176.62	176.80	176.80	176.85	0.025754	1.00	1.27	13.96	1.00
SMT-4	SMT-4	50	25 YR	1.61	176.62	176.82	176.82	176.88	0.023421	1.08	1.57	15.26	0.98
SMT-4	SMT-4	50	50 YR	1.89	176.62	176.83	176.83	176.90	0.022688	1.14	1.78	16.10	0.99
SMT-4	SMT-4	50	100 YR	2.18	176.62	176.85	176.85	176.92	0.021769	1.19	2.01	16.94	0.98
SMT-4	SMT-4	50	REG	1.90	176.62	176.83	176.83	176.90	0.022640	1.14	1.79	16.12	0.98

APPENDIX B

HEC-RAS PROPOSED CONDITIONS OUTPUT

3228 South Service Road, Suite 105, East Wing Burlington, Ontario L7N 3H8
Tel. (905) 631-6978 info@sla.on.ca

HEC-RAS Plan: CULVERT CROSSING SMT-1 Locations: User Defined

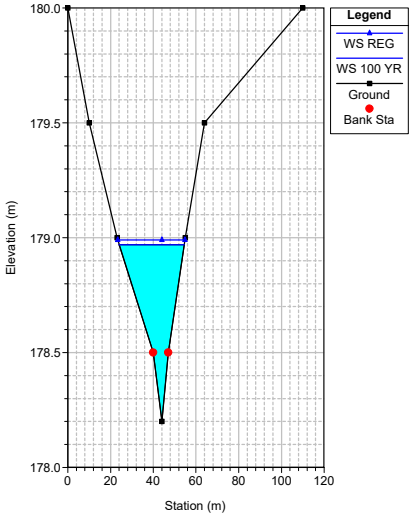
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
SMT-1	UPPER	2640	2 YR	2.76	178.20	178.69		178.75	0.004525	1.09	3.29	16.52	0.60
SMT-1	UPPER	2640	5 YR	4.83	178.20	178.77	178.72	178.87	0.006085	1.46	4.84	20.69	0.72
SMT-1	UPPER	2640	10 YR	6.30	178.20	178.82	178.78	178.95	0.006758	1.66	5.93	23.18	0.77
SMT-1	UPPER	2640	25 YR	8.20	178.20	178.88	178.85	179.03	0.007348	1.87	7.32	26.01	0.82
SMT-1	UPPER	2640	50 YR	10.15	178.20	178.93	178.91	179.11	0.007761	2.04	8.72	28.58	0.85
SMT-1	UPPER	2640	100 YR	11.71	178.20	178.97	178.96	179.16	0.008006	2.16	9.84	30.47	0.88
SMT-1	UPPER	2640	REG	12.66	178.20	178.99	178.99	179.19	0.008155	2.23	10.50	31.53	0.89
SMT-1	UPPER	2600	2 YR	2.76	178.00	178.49	178.44	178.54	0.005165	1.15	4.35	31.12	0.64
SMT-1	UPPER	2600	5 YR	4.83	178.00	178.61		178.66	0.003717	1.21	8.68	37.20	0.57
SMT-1	UPPER	2600	10 YR	6.30	178.00	178.68		178.73	0.003416	1.27	11.26	39.75	0.56
SMT-1	UPPER	2600	25 YR	8.20	178.00	178.75		178.81	0.003268	1.35	14.22	42.49	0.56
SMT-1	UPPER	2600	50 YR	10.15	178.00	178.81		178.87	0.003222	1.43	16.96	44.88	0.56
SMT-1	UPPER	2600	100 YR	11.71	178.00	178.86		178.92	0.003193	1.49	19.08	46.64	0.57
SMT-1	UPPER	2600	REG	12.66	178.00	178.89		178.95	0.003181	1.53	20.32	47.64	0.57
SMT-1	UPPER	2565	2 YR	2.76	177.80	178.31	178.24	178.38	0.004872	1.28	4.24	20.76	0.64
SMT-1	UPPER	2565	5 YR	4.83	177.80	178.40	178.36	178.50	0.006646	1.70	6.21	25.37	0.77
SMT-1	UPPER	2565	10 YR	6.30	177.80	178.46	178.42	178.57	0.006864	1.86	7.83	28.61	0.80
SMT-1	UPPER	2565	25 YR	8.20	177.80	178.53	178.49	178.66	0.006777	2.00	9.99	32.18	0.81
SMT-1	UPPER	2565	50 YR	10.15	177.80	178.59		178.73	0.006456	2.09	12.29	35.18	0.80
SMT-1	UPPER	2565	100 YR	11.71	177.80	178.65		178.78	0.006117	2.14	14.23	37.53	0.79
SMT-1	UPPER	2565	REG	12.66	177.80	178.68		178.81	0.005922	2.17	15.42	38.90	0.78
SMT-1	UPPER	2530	2 YR	2.76	177.50	177.98	177.97	178.09	0.013605	1.49	1.84	7.68	0.97
SMT-1	UPPER	2530	5 YR	4.83	177.50	178.15	178.09	178.25	0.006676	1.46	4.07	18.22	0.74
SMT-1	UPPER	2530	10 YR	6.30	177.50	178.24	178.16	178.34	0.005329	1.50	5.92	23.21	0.69
SMT-1	UPPER	2530	25 YR	8.20	177.50	178.33	178.23	178.44	0.004456	1.54	8.42	28.62	0.65
SMT-1	UPPER	2530	50 YR	10.15	177.50	178.43		178.53	0.003743	1.56	11.33	33.85	0.61
SMT-1	UPPER	2530	100 YR	11.71	177.50	178.50		178.60	0.003274	1.56	13.93	37.91	0.58
SMT-1	UPPER	2530	REG	12.66	177.50	178.54		178.64	0.002984	1.55	15.64	39.36	0.56
SMT-1	UPPER	2485	2 YR	2.76	176.82	177.50	177.43	177.62	0.005823	1.77	2.94	9.01	0.74
SMT-1	UPPER	2485	5 YR	4.83	176.82	177.62	177.61	177.83	0.008310	2.40	4.14	10.71	0.91
SMT-1	UPPER	2485	10 YR	6.30	176.82	177.71	177.71	177.96	0.008736	2.66	5.13	11.94	0.95
SMT-1	UPPER	2485	25 YR	8.20	176.82	177.82	177.82	178.09	0.008457	2.85	6.56	13.52	0.95
SMT-1	UPPER	2485	50 YR	10.15	176.82	177.92	177.92	178.21	0.008396	3.04	7.93	14.87	0.97
SMT-1	UPPER	2485	100 YR	11.71	176.82	177.98	177.98	178.30	0.008667	3.21	8.87	15.72	0.99
SMT-1	UPPER	2485	REG	12.66	176.82	178.01	178.01	178.35	0.008937	3.33	9.37	16.21	1.01
SMT-1	UPPER	2445	2 YR	2.76	176.80	177.18	177.18	177.30	0.012237	1.57	2.20	12.05	0.95
SMT-1	UPPER	2445	5 YR	4.83	176.80	177.29	177.29	177.45	0.010592	1.83	3.80	15.97	0.93
SMT-1	UPPER	2445	10 YR	6.30	176.80	177.36	177.36	177.53	0.009884	1.97	4.96	18.29	0.93
SMT-1	UPPER	2445	25 YR	8.20	176.80	177.44	177.44	177.63	0.009499	2.13	6.39	20.79	0.93
SMT-1	UPPER	2445	50 YR	10.15	176.80	177.50	177.50	177.71	0.009083	2.25	7.88	23.15	0.93
SMT-1	UPPER	2445	100 YR	11.71	176.80	177.56	177.56	177.77	0.008708	2.33	9.13	25.21	0.92
SMT-1	UPPER	2445	REG	12.66	176.80	177.58	177.58	177.81	0.008607	2.38	9.84	26.31	0.92
SMT-1	UPPER	2415	2 YR	2.76	176.50	176.93		176.98	0.004162	1.08	3.09	14.06	0.58
SMT-1	UPPER	2415	5 YR	4.83	176.50	177.05		177.14	0.004102	1.32	5.23	19.17	0.60
SMT-1	UPPER	2415	10 YR	6.30	176.50	177.13		177.22	0.003946	1.43	6.84	22.13	0.61
SMT-1	UPPER	2415	25 YR	8.20	176.50	177.22		177.32	0.003894	1.55	8.82	25.31	0.62
SMT-1	UPPER	2415	50 YR	10.15	176.50	177.30		177.41	0.003628	1.63	11.11	28.36	0.61
SMT-1	UPPER	2415	100 YR	11.71	176.50	177.37		177.48	0.003320	1.66	13.21	30.79	0.59
SMT-1	UPPER	2415	REG	12.66	176.50	177.41		177.52	0.003249	1.69	14.32	32.01	0.59
SMT-1	UPPER	2320	2 YR	2.76	175.75	176.26	176.24	176.41	0.009341	1.76	1.97	7.35	0.88
SMT-1	UPPER	2320	5 YR	4.83	175.75	176.45	176.41	176.63	0.007202	1.99	3.65	10.75	0.82
SMT-1	UPPER	2320	10 YR	6.30	175.75	176.56	176.51	176.75	0.006471	2.10	4.91	12.72	0.80
SMT-1	UPPER	2320	25 YR	8.20	175.75	176.70	176.61	176.89	0.005348	2.16	6.86	15.27	0.75
SMT-1	UPPER	2320	50 YR	10.15	175.75	176.81	176.71	177.01	0.004882	2.25	8.75	17.67	0.73
SMT-1	UPPER	2320	100 YR	11.71	175.75	176.90	176.77	177.11	0.004649	2.32	10.45	21.22	0.73
SMT-1	UPPER	2320	REG	12.66	175.75	176.96	176.78	177.16	0.004286	2.32	11.83	23.71	0.70
SMT-1	UPPER	2313	2 YR	2.76	175.73	176.34	176.02	176.37	0.000929	0.71	3.91	11.90	0.30
SMT-1	UPPER	2313	5 YR	4.83	175.73	176.54	176.14	176.58	0.001100	0.93	5.19	14.23	0.34
SMT-1	UPPER	2313	10 YR	6.30	175.73	176.64	176.21	176.70	0.001219	1.07	5.91	15.53	0.36
SMT-1	UPPER	2313	25 YR	8.20	175.73	176.77	176.30	176.84	0.001319	1.21	6.76	17.28	0.39
SMT-1	UPPER	2313	50 YR	10.15	175.73	176.88	176.38	176.97	0.001441	1.36	7.48	19.92	0.41
SMT-1	UPPER	2313	100 YR	11.71	175.73	176.96	176.44	177.07	0.001511	1.46	8.04	22.52	0.43
SMT-1	UPPER	2313	REG	12.66	175.73	177.01	176.47	177.13	0.001530	1.51	8.39	24.16	0.43
SMT-1	UPPER	2308		Culvert									
SMT-1	UPPER	2290	2 YR	2.76	175.63	176.30	176.03	176.34	0.001974	0.97	2.87	7.60	0.42
SMT-1	UPPER	2290	5 YR	4.83	175.63	176.45	176.19	176.54	0.002577	1.30	3.86	12.65	0.50
SMT-1	UPPER	2290	10 YR	6.30	175.63	176.53	176.28	176.65	0.003053	1.52	4.39	15.08	0.55
SMT-1	UPPER	2290	25 YR	8.20	175.63	176.61	176.39	176.77	0.003662	1.78	4.94	17.88	0.61
SMT-1	UPPER	2290	50 YR	10.15	175.63	176.66	176.49	176.88	0.004617	2.08	5.28	19.61	0.70
SMT-1	UPPER	2290	100 YR	11.71	175.63	176.69	176.56	176.96	0.005503	2.32	5.48	20.65	0.77
SMT-1	UPPER	2290	REG	12.66	175.63	176.71	176.60	177.01	0.005963	2.45	5.62	21.37	0.80
SMT-1	UPPER	2269	2 YR	2.76	175.54	176.11	176.11	176.25	0.013954	1.67	1.65	5.82	1.01

HEC-RAS Plan: CULVERT CROSSING SMT-1 Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
SMT-1	UPPER	2269	5 YR	4.83	175.54	176.24	176.24	176.43	0.013317	1.89	2.55	7.25	1.02
SMT-1	UPPER	2269	10 YR	6.30	175.54	176.32	176.32	176.53	0.011591	2.01	3.21	9.55	0.98
SMT-1	UPPER	2269	25 YR	8.20	175.54	176.41	176.41	176.64	0.010700	2.17	4.10	12.09	0.97
SMT-1	UPPER	2269	50 YR	10.15	175.54	176.50	176.50	176.75	0.009033	2.23	5.45	16.71	0.92
SMT-1	UPPER	2269	100 YR	11.71	175.54	176.56	176.56	176.82	0.008468	2.31	6.55	19.81	0.90
SMT-1	UPPER	2269	REG	12.66	175.54	176.59	176.59	176.86	0.008170	2.34	7.26	21.59	0.89
SMT-1	MID	2200	2 YR	3.63	174.75	175.39		175.43	0.001690	0.92	6.62	27.38	0.40
SMT-1	MID	2200	5 YR	6.34	174.75	175.56		175.60	0.001653	1.09	12.38	40.84	0.41
SMT-1	MID	2200	10 YR	8.24	174.75	175.64		175.69	0.001675	1.18	16.03	46.26	0.42
SMT-1	MID	2200	25 YR	10.67	174.75	175.73	175.49	175.78	0.001739	1.28	20.28	51.86	0.43
SMT-1	MID	2200	50 YR	12.82	174.75	175.79	175.55	175.85	0.001802	1.37	23.76	56.21	0.45
SMT-1	MID	2200	100 YR	14.98	174.75	175.95		175.99	0.001182	1.23	33.47	67.13	0.37
SMT-1	MID	2200	REG	17.26	174.75	176.40		176.41	0.000284	0.76	69.84	92.15	0.19
SMT-1	MID	2180	2 YR	3.63	174.75	175.17	175.17	175.31	0.011158	1.70	2.57	12.16	0.93
SMT-1	MID	2180	5 YR	6.34	174.75	175.32	175.32	175.49	0.009071	1.95	4.85	20.86	0.89
SMT-1	MID	2180	10 YR	8.24	174.75	175.40	175.40	175.58	0.007844	2.02	7.02	28.66	0.86
SMT-1	MID	2180	25 YR	10.67	174.75	175.49	175.49	175.68	0.006950	2.10	10.03	36.83	0.83
SMT-1	MID	2180	50 YR	12.82	174.75	175.55	175.55	175.74	0.006848	2.21	12.29	40.70	0.83
SMT-1	MID	2180	100 YR	14.98	174.75	175.90		175.95	0.001476	1.33	30.21	63.67	0.41
SMT-1	MID	2180	REG	17.26	174.75	176.39		176.40	0.000293	0.76	69.02	91.73	0.20
SMT-1	MID2	2050	2 YR	4.61	173.75	174.56		174.63	0.003115	1.44	6.55	19.76	0.55
SMT-1	MID2	2050	5 YR	8.07	173.75	174.77		174.86	0.002838	1.64	11.73	27.43	0.55
SMT-1	MID2	2050	10 YR	10.50	173.75	174.97		175.04	0.001923	1.54	17.36	31.22	0.47
SMT-1	MID2	2050	25 YR	13.66	173.75	175.27		175.31	0.001045	1.33	27.72	37.27	0.36
SMT-1	MID2	2050	50 YR	16.37	173.75	175.50		175.53	0.000748	1.25	36.75	41.84	0.31
SMT-1	MID2	2050	100 YR	19.10	173.75	175.90		175.92	0.000369	1.01	55.23	49.91	0.23
SMT-1	MID2	2050	REG	21.52	173.75	176.38		176.40	0.000177	0.81	81.82	60.21	0.16
SMT-1	MID2	2040	2 YR	4.61	173.75	174.46	174.40	174.59	0.005954	1.79	4.76	16.28	0.74
SMT-1	MID2	2040	5 YR	8.07	173.75	174.70		174.83	0.004093	1.87	9.88	25.26	0.65
SMT-1	MID2	2040	10 YR	10.50	173.75	174.94		175.01	0.002186	1.61	16.45	30.64	0.50
SMT-1	MID2	2040	25 YR	13.66	173.75	175.26		175.30	0.001088	1.35	27.26	37.02	0.37
SMT-1	MID2	2040	50 YR	16.37	173.75	175.49		175.53	0.000765	1.26	36.41	41.68	0.31
SMT-1	MID2	2040	100 YR	19.10	173.75	175.89		175.92	0.000372	1.02	55.03	49.83	0.23
SMT-1	MID2	2040	REG	21.52	173.75	176.38		176.39	0.000177	0.81	81.71	60.16	0.16
SMT-1	Lower	2000	2 YR	6.82	173.50	174.18	174.07	174.31	0.007470	1.66	4.42	11.15	0.71
SMT-1	Lower	2000	5 YR	11.98	173.50	174.60	174.28	174.69	0.002678	1.44	13.67	33.70	0.46
SMT-1	Lower	2000	10 YR	15.56	173.50	174.88	174.44	174.94	0.001415	1.24	24.96	45.43	0.35
SMT-1	Lower	2000	25 YR	20.16	173.50	175.23	174.58	175.27	0.000742	1.06	42.67	56.39	0.27
SMT-1	Lower	2000	50 YR	23.25	173.50	175.47	174.65	175.50	0.000503	0.96	57.26	63.85	0.22
SMT-1	Lower	2000	100 YR	27.73	173.50	175.89	174.75	175.90	0.000270	0.80	86.45	75.85	0.17
SMT-1	Lower	2000	REG	32.10	173.50	176.38	174.82	176.39	0.000144	0.67	127.35	93.65	0.13
SMT-1	Lower	800		Culvert									
SMT-4	SMT-4	385	2 YR	0.54	178.98	179.33		179.35	0.003283	0.51	1.04	5.89	0.39
SMT-4	SMT-4	385	5 YR	0.94	178.98	179.41		179.43	0.003446	0.62	1.57	8.73	0.42
SMT-4	SMT-4	385	10 YR	1.23	178.98	179.45		179.47	0.003561	0.68	1.94	10.92	0.43
SMT-4	SMT-4	385	25 YR	1.61	178.98	179.49		179.52	0.003611	0.76	2.45	14.34	0.45
SMT-4	SMT-4	385	50 YR	1.89	178.98	179.51		179.55	0.003686	0.81	2.84	16.52	0.46
SMT-4	SMT-4	385	100 YR	2.18	178.98	179.54		179.57	0.003718	0.85	3.27	18.58	0.46
SMT-4	SMT-4	385	REG	1.90	178.98	179.51		179.55	0.003691	0.81	2.85	16.56	0.46
SMT-4	SMT-4	255	2 YR	0.54	178.15	178.35	178.35	178.41	0.026649	1.02	0.53	5.18	1.02
SMT-4	SMT-4	255	5 YR	0.94	178.15	178.41	178.41	178.47	0.025173	1.10	0.86	7.20	1.01
SMT-4	SMT-4	255	10 YR	1.23	178.15	178.44	178.44	178.50	0.023765	1.13	1.09	8.36	1.00
SMT-4	SMT-4	255	25 YR	1.61	178.15	178.47	178.47	178.54	0.023633	1.19	1.35	9.49	1.01
SMT-4	SMT-4	255	50 YR	1.89	178.15	178.49	178.49	178.56	0.022911	1.22	1.54	10.27	1.01
SMT-4	SMT-4	255	100 YR	2.18	178.15	178.50	178.50	178.59	0.022912	1.29	1.69	10.83	1.02
SMT-4	SMT-4	255	REG	1.90	178.15	178.49	178.49	178.56	0.022802	1.22	1.55	10.29	1.00
SMT-4	SMT-4	160	2 YR	0.54	177.37	177.54		177.55	0.003022	0.43	1.46	12.95	0.36
SMT-4	SMT-4	160	5 YR	0.94	177.37	177.59		177.60	0.003189	0.55	2.18	15.06	0.39
SMT-4	SMT-4	160	10 YR	1.23	177.37	177.62		177.64	0.003302	0.61	2.64	16.27	0.41
SMT-4	SMT-4	160	25 YR	1.61	177.37	177.65		177.67	0.003467	0.68	3.19	17.60	0.43
SMT-4	SMT-4	160	50 YR	1.89	177.37	177.67		177.70	0.003546	0.73	3.59	18.52	0.44
SMT-4	SMT-4	160	100 YR	2.18	177.37	177.69	177.58	177.72	0.003639	0.77	3.97	19.35	0.45
SMT-4	SMT-4	160	REG	1.90	177.37	177.67		177.70	0.003549	0.73	3.60	18.54	0.44
SMT-4	SMT-4	50	2 YR	0.54	176.62	176.75	176.75	176.78	0.029702	0.80	0.67	10.35	1.00
SMT-4	SMT-4	50	5 YR	0.94	176.62	176.78	176.78	176.83	0.027142	0.93	1.02	12.59	1.00
SMT-4	SMT-4	50	10 YR	1.23	176.62	176.80	176.80	176.85	0.025754	1.00	1.27	13.96	1.00
SMT-4	SMT-4	50	25 YR	1.61	176.62	176.82	176.82	176.88	0.023421	1.08	1.57	15.26	0.98
SMT-4	SMT-4	50	50 YR	1.89	176.62	176.83	176.83	176.90	0.022688	1.14	1.78	16.10	0.99
SMT-4	SMT-4	50	100 YR	2.18	176.62	176.85	176.85	176.92	0.021769	1.19	2.01	16.94	0.98
SMT-4	SMT-4	50	REG	1.90	176.62	176.83	176.83	176.90	0.022640	1.14	1.79	16.12	0.98

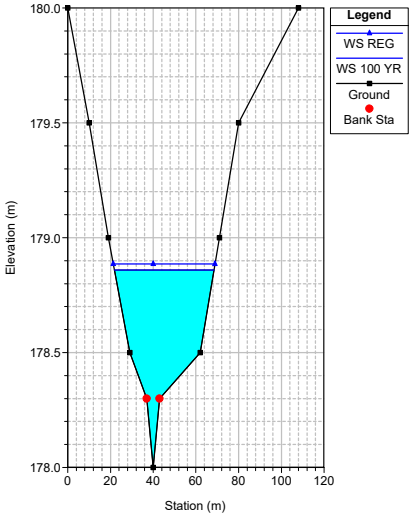
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2640



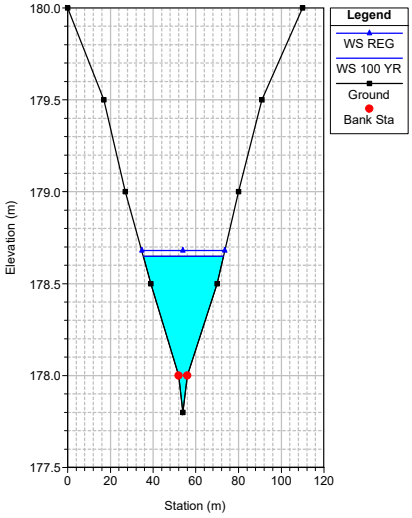
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2600



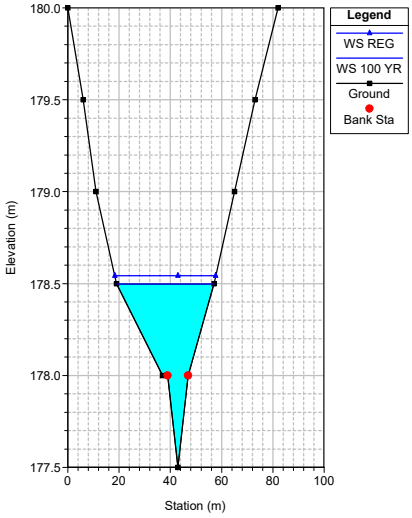
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2565



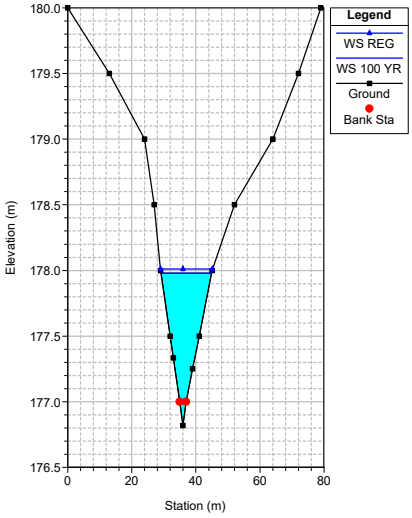
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2530



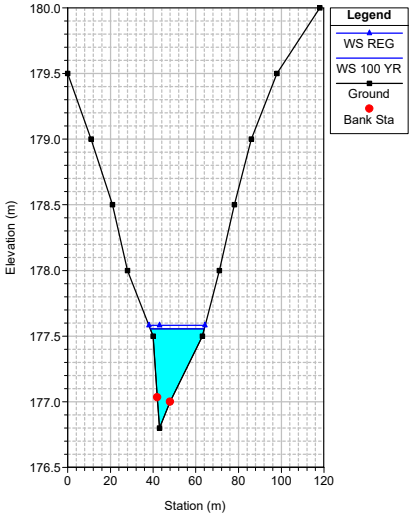
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2485



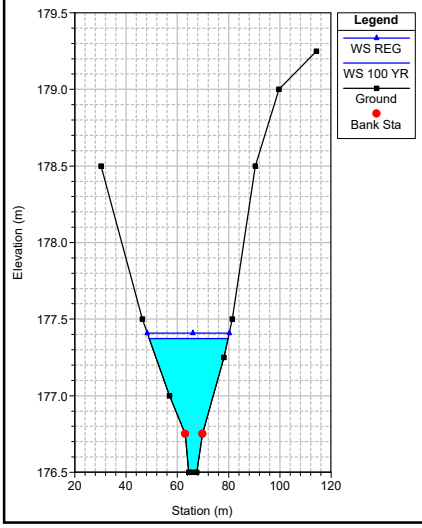
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2445



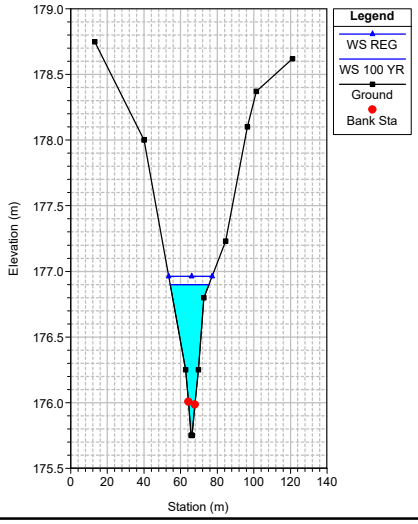
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2415 2415+00



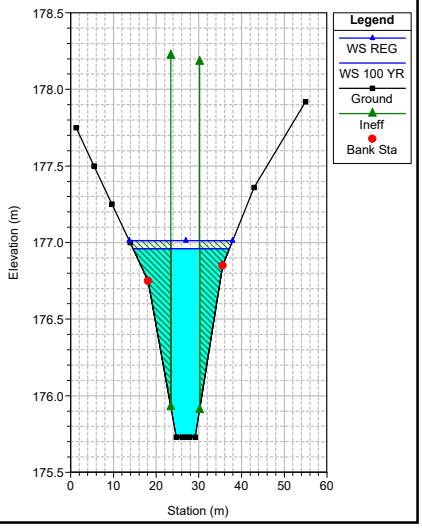
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2320 2320+00



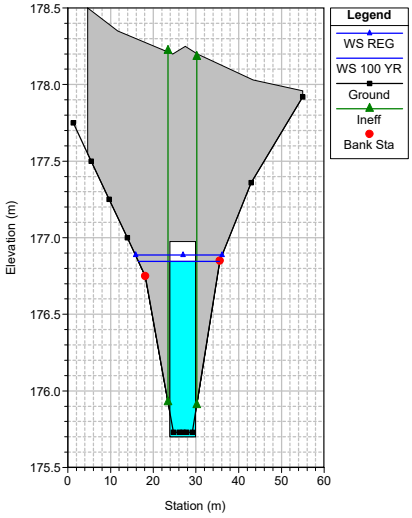
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2313



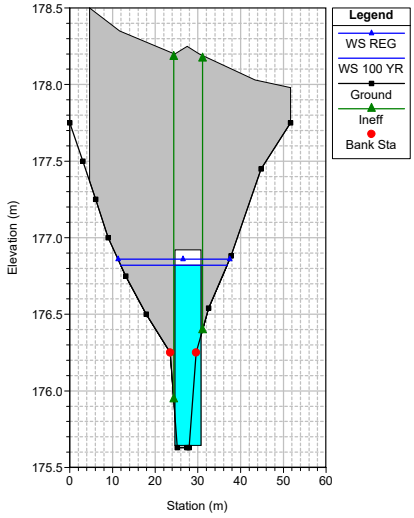
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2308 Culv SMT-1 CROSSING SLA



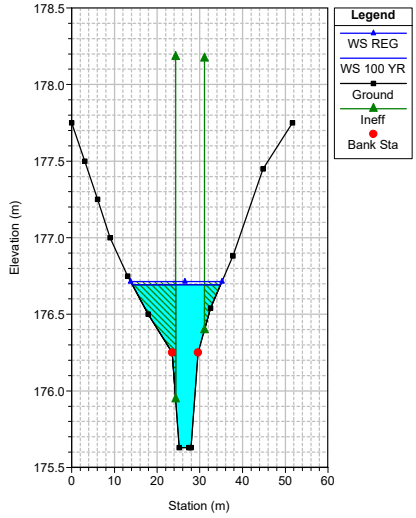
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2308 Culv SMT-1 CROSSING SLA



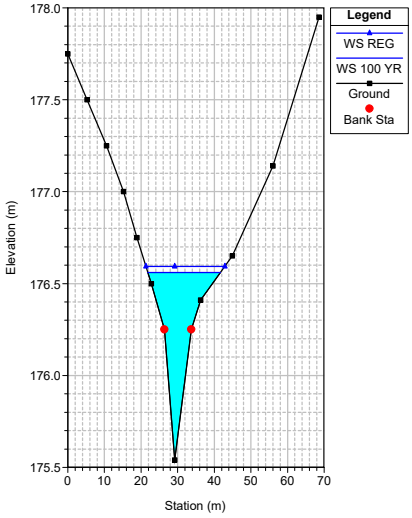
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2290



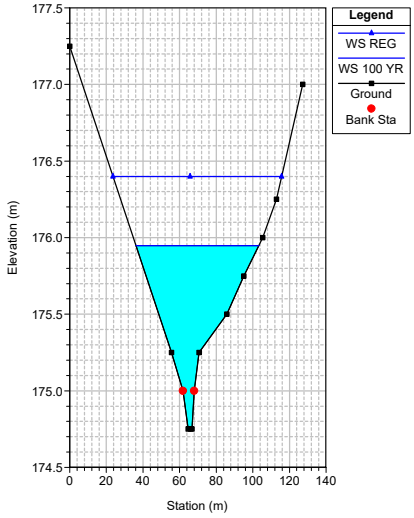
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = UPPER RS = 2269



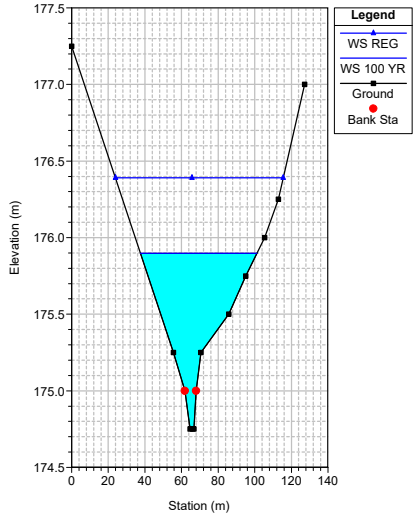
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = MID RS = 2200 copy of 2180+00



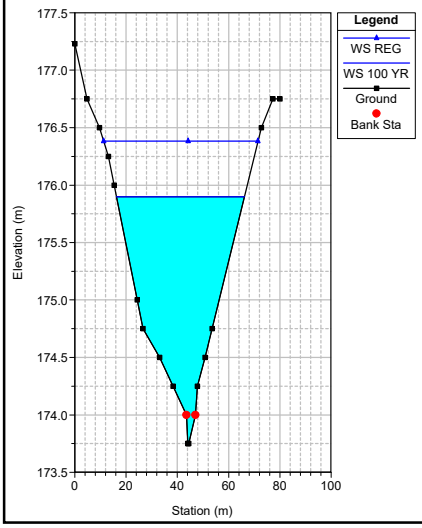
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = MID RS = 2180 2180+00



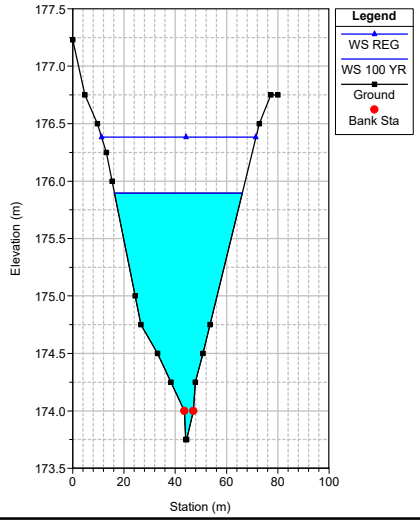
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = MID2 RS = 2050 2050+00



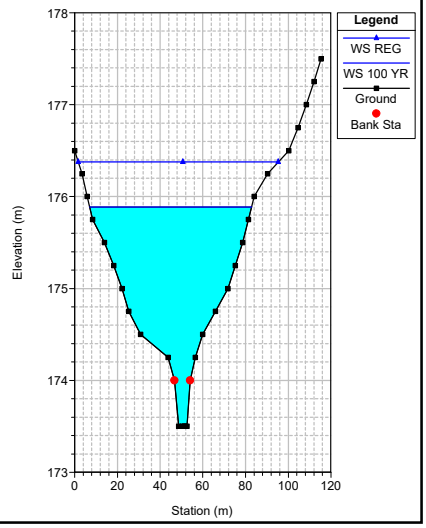
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = MID2 RS = 2040



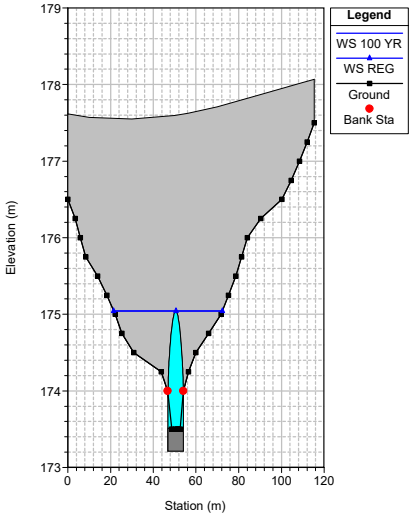
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = Lower RS = 2000 2000+00



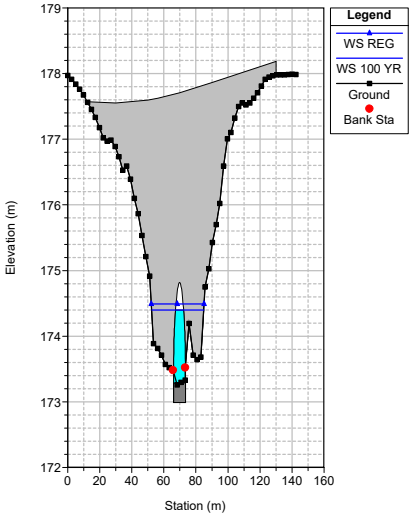
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = Lower RS = 800 Culv



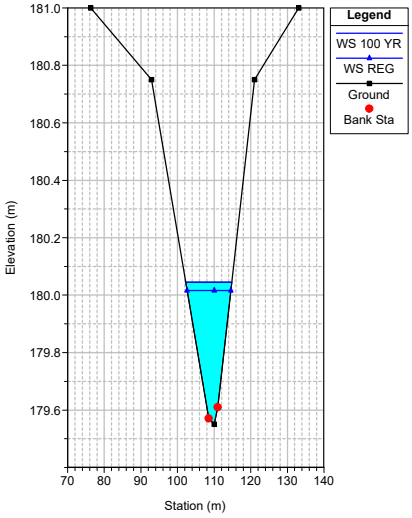
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-1 Reach = Lower RS = 800 Culv



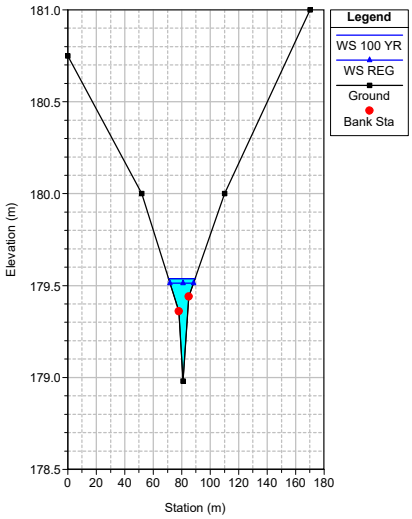
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-4 Reach = SMT-4 RS = 525



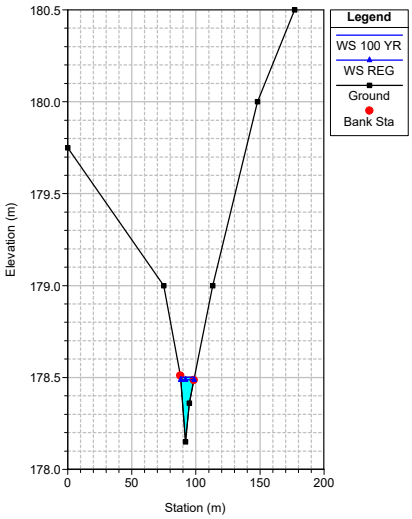
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-4 Reach = SMT-4 RS = 385



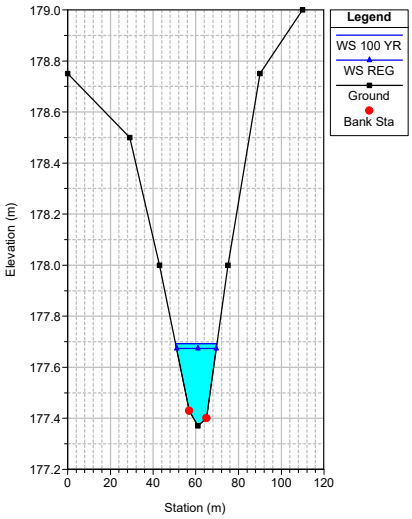
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-4 Reach = SMT-4 RS = 255



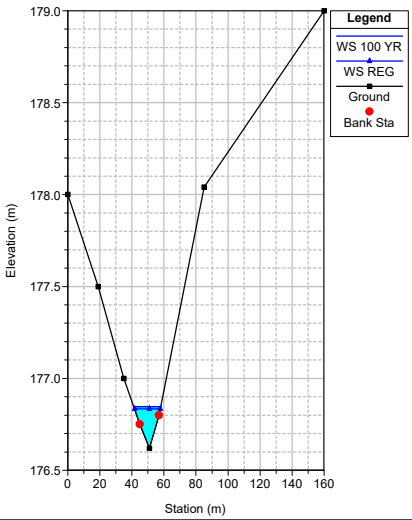
SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

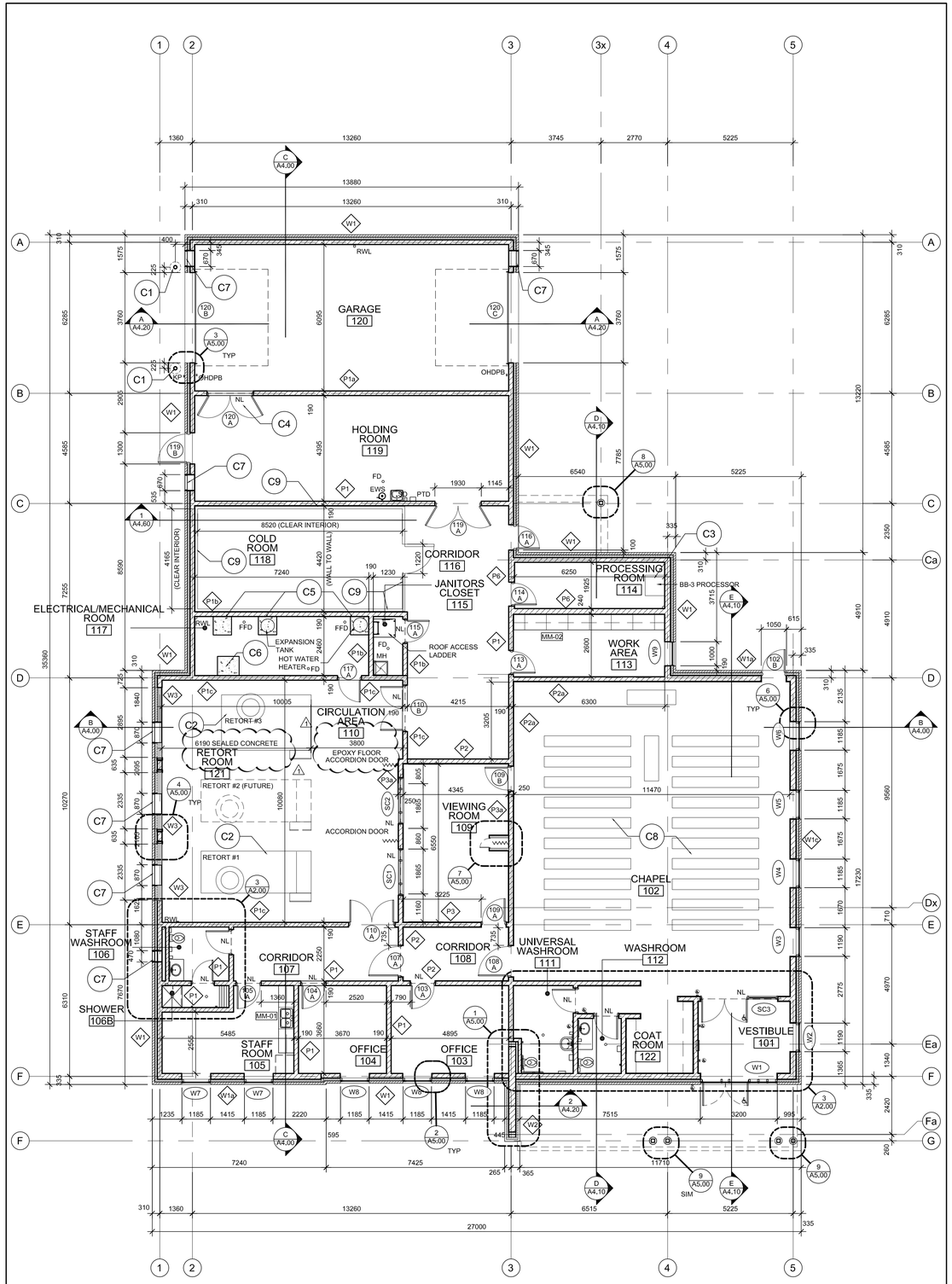
River = SMT-4 Reach = SMT-4 RS = 160



SW Tributary Area - Rattle Snake Point1 Plan: CULVERT CROSSING SMT-1 2022-06-29

River = SMT-4 Reach = SMT-4 RS = 50





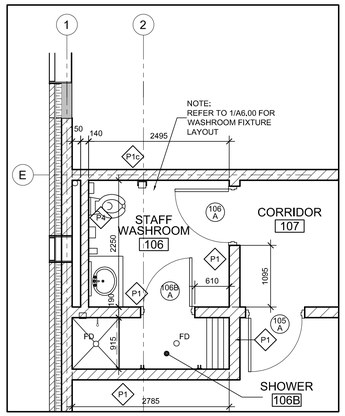
1 FLOOR PLAN
A2.00 SCALE 1:100

GENERAL NOTES

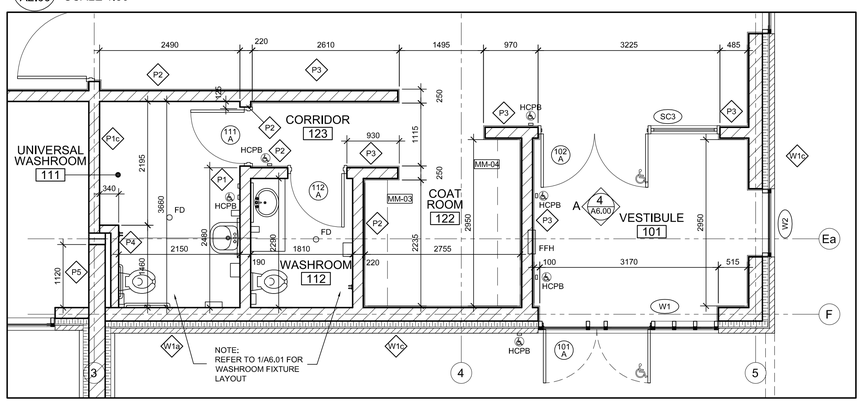
1. MECHANICAL AND ELECTRICAL ITEMS SHOWN, I.E. DUCTWORK, PIPING, LIGHT FIXTURES, ETC. ARE FOR REFERENCE ONLY AND ARE NOT INCLUSIVE. REFER TO MECHANICAL AND ELECTRICAL DRAWING FOR ALL RELATED
2. CONNECTIONS OF ALL NON STRUCTURAL ELEMENTS AND EQUIPMENT TO SUPPORTING STRUCTURE TO BE DESIGNED TO COMPLY WITH ARTICLE 4.1.8.18 OF THE 2012 ONTARIO BUILDING CODE FOR SEISMIC LOADS. CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING THESE CONNECTIONS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER IF APPLICABLE.
3. TRANSITIONS BETWEEN FLOOR FINISHES TO BE MADE SMOOTH, CONTINUOUS & FLUSH. GRIND DOWN FLOOR SLAB ACROSS DOOR THRESHOLDS WHERE APPLICABLE TO SUIT THICKNESS OF MATERIALS AND ENSURE FLOOR FINISH MATERIALS ARE INSTALLED FLUSH THROUGHOUT
4. APPLIANCES SHOWN IN KITCHENS, KITCHENETTES AND LAUNDRY ROOMS ARE SHOWN FOR REFERENCE. SUPPLY & INSTALL BY OTHERS, NOT IN CONTRACT, INCLUDES BUT IS NOT LIMITED TO; WASHERS, DRYERS, FRIDGES, STOVES, MICROWAVES, ETC.
5. CONCRETE FLOOR SLAB TO BE SLOPED TOWARDS FLOOR DRAIN (FD) LOCATIONS. REFER TO AND COORDINATE WITH MECHANICAL DRAWINGS FOR ALL FLOOR DRAIN LOCATIONS.
6. NL - DENOTES A NON-LOAD BEARING LINTEL. REFER TO STRUCTURAL DRAWINGS FOR LINTEL CONSTRUCTION.

CONSTRUCTION NOTES

- C1 — 150mm DIA CONCRETE FILLED STEEL BOLLARD. REFER TO DETAIL 6/A1,20
- C2 — OWNER SUPPLIED RETORTS. CONTRACTOR RESPONSIBLE FOR UNLOADING OF RETORTS, MOVING THEM INTO THE BUILDING AND FINAL HOOK UPS. REFER TO AND COORDINATE W/ MECHANICAL AND ELECTRICAL DRAWINGS
- C3 — OWNER SUPPLIED EQUIPMENT. CONTRACTOR RESPONSIBLE MOVING THEM INTO THE BUILDING AND FINAL HOOK UPS. REFER TO AND COORDINATE W/ MECHANICAL AND ELECTRICAL DRAWINGS
- C4 — NL - DENOTES NON-LOAD BEARING LINTEL. REFER TO STRUCTURAL DRAWINGS FOR LINTEL CONSTRUCTION
- C5 — 760mm X 760mm x 100MM HOUSE KEEPING PAD. REFER TO AND COORDINATE LOCATION OF PAD W/ MECHANICAL DRAWINGS.
- C6 — 900mm X 800mm x 100MM HOUSE KEEPING PAD FOR FLOOR MOUNTED ELECTRICAL TRANSFORMER. REFER TO AND COORDINATE LOCATION AND SIZE OF PAD W/ ELECTRICAL DRAWINGS.
- C7 — MECHANICAL LOUVRE. REFER TO AND COORDINATE LOCATION AND SIZE OF OPENING W/ MECHANICAL DRAWINGS.
- C8 — CHAPEL FURNISHING SHOWN FOR INFORMTAION PURPOSES ONLY. FURNISHING TO BE SUPPLIED BY OWNER
- C9 — 100mm THK x 2440mm HIGH INSULATED METAL PANELS (IMP) C/W 100mm THK IMP CEILING SUSPENDED FROM STRUCTURE ABOVE BY 10mm GALVANIZED THREADED RODS AT 1800mm O/C (MAX). PROVIDE A 1220mm x 2135mm INSULATED COLD STORAGE (ICS) DOOR C/W LATCH. PROVIDE A CONTINUOUS SELF ADHERING AIR/VAPOUR BARRIER TO THE INTERIOR FACE OF THE SURROUNDING CONCRETE BLOCK WALL. PROVIDE 25mm VERTICAL METAL HAT CHANNELS AT EACH WALL PANEL JOINT.



2 ENLARGED STAFF WASHROOM FLOOR PLAN
A2.00 SCALE 1:50



3 ENLARGED FLOOR PLAN
A2.00 SCALE 1:50

EXTERIOR WALL TYPES

REFER TO STRUCTURAL FOR MASONRY REINFORCING.

NO.	DESCRIPTION	REMARKS
W1, W1a, W1b, W1c	-90mm BRICK VENEER **OR** -90mm ARCHITECTURAL MASONRY (AS PER ELEVATIONS & SECTIONS) -25mm AIR SPACE -100mm RIGID INSULATION -AIR / VAPOUR BARRIER ON -CONC. BLOCK * REFER TO ELEVATIONS FOR EXTENT OF BRICK TYPES, MASONRY & PATTERN LOCATIONS * SEE REMARKS FOR VARIATIONS OF SIMILAR TYPES	W1 190mm CONCRETE BLOCK W1a 240mm CONCRETE BLOCK W1b SAME AS W1 W/ 16mm GYPSUM BOARD ON 13mm RESILIENT CHANNELS ON INTERIOR SIDE W1c SAME AS W1a W/ 16mm GYPSUM BOARD ON 13mm RESILIENT CHANNELS ON INTERIOR SIDE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
W2	-57mm ALUMINUM COMPOSITE PANEL (C/W EXTRUSION SYSTEM AND THERMAL SEPARATORS) -100mm GALV. METAL 'Z' SUB-GIRTS -100mm SEMI-RIGID INSULATION FILLED CAV. -AIR / VAPOUR BARRIER ON EA FACE OF -290mm CONC. BLOCK	
W3	-90mm ARCHITECTURAL MASONRY (AS PER ELEVATIONS & SECTIONS) -25mm AIR SPACE -100mm RIGID INSULATION -AIR / VAPOUR BARRIER ON -13mm EXTERIOR GRADE SHEATHING -150mm METAL STUDS @ 400mm O/C -16mm GYPSUM BOARD	W1 190mm CONCRETE BLOCK

INTERIOR WALL PARTITION TYPES

REFER TO STRUCTURAL FOR MASONRY REINFORCING.

NO.	DESCRIPTION	REMARKS
P1, P1a, P1b, P1c	- 190mm CONC. BLOCK * SEE REMARKS FOR VARIATIONS OF SIMILAR TYPES	P1a 1 1/2 hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2,1,1) P1b 1hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2,1,1) P1c 75% SOLID UNITS 2hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2,1,1) • EXTEND TO U/S OF STRUCTURE ABOVE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P2, P2a	- 190mm CONC. BLOCK - 13mm RESILIENT CHANNEL (HORIZONTAL) - 16mm GYPSUM BOARD * SEE REMARKS FOR VARIATIONS OF SIMILAR TYPES	P2a 75% SOLID UNITS 2 hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2,1,1) • EXTEND TO U/S OF STRUCTURE ABOVE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P3, P3a	- 16mm GYPSUM BOARD - 13mm RESILIENT CHANNEL AT 400mm O/C (HORIZONTAL) ON EA SIDE OF - 190mm CONC. BLOCK	P3a 75% SOLID UNITS 2 hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2,1,1) • EXTEND TO U/S OF STRUCTURE ABOVE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P4	PLUMBING WALL - 140mm CONC. BLOCK	• EXTEND TO 150mm ABOVE ADJACENT CEILING • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P5	- 290mm CONC. BLOCK	• 2 hr FIRE RESISTANCE RATING (OBC SB-2 TABLE 2.1.1) • EXTEND TO U/S OF STRUCTURE ABOVE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P6	- 240mm CONC. BLOCK (GROUT FILL BLOCK CELLS)	• EXTEND TO U/S OF STRUCTURE ABOVE • BULL-NOSE BLOCKS AT ALL EXPOSED CORNERS
P7	- 16mm GYPSUM BOARD - 92mm METAL STUDS AT 400mm O/C - 16mm GYPSUM BOARD	• EXTEND TO U/S OF CEILING

THE CATHOLIC CEMETERIES of the Diocese of Hamilton

TRUE NORTH

ABBREVIATIONS LEGEND

CONC	CONCRETE
C/W	COMPLETE WITH
DIA	DIAMETER
EA	EACH
EQ	EQUAL
EWS	EYE WASH STATION
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
FFH	FORCE FLOW HEATER
HCPB	HANDICAPPED PUSH BUTTON
HR	HOUR
KP	KEY PAD
MH	MOP HOLDER
MIN	MINUTE
MM	MILLIMETER
OHDPB	OVERHEAD DOOR PUSH BUTTON
PTD	PAPER TOWEL DISPENSER
RWL	RAIN WATER LEADER
SD	SOAP DISPENSER
TYP	TYPICAL
U/S	UNDERSIDE
W/	WITH

NO	REVISIONS	DATE
4	ISSUED FOR ADDENDUM 4 (1)	2023-10-24
5.	ISSUED FOR TENDER	2023-09-21
4.	ISSUED FOR BUILDING PERMIT	2023-05-26
3.	RE-ISSUED FOR SPA REVIEW #2	2022-07-15
2.	ISSUED FOR SITE PLAN APPROVAL	2021-06-03
1.	ISSUED FOR PRE-CONSULTATION	2020-05-27

DRAWINGS ARE NOT TO BE SCALED. CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON THE PROJECT, AND MUST REPORT ANY DISCREPANCIES TO THE ARCHITECTS BEFORE PROCEEDING WITH THE WORK. THE USE OF THIS DRAWING OR PART THEREOF IS FORBIDDEN WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECTS.

HOLY FAMILY CEMETERY CREMATORIUM
2543 LOWER BASE LINE ROAD
MILTON, ONTARIO

FLOOR PLAN

GRGURIC ARCHITECTS INCORPORATED
28 KING STREET EAST, UNIT B
STONEY CREEK, ONTARIO, L8G 1J8
Tel. 905-664-8735 Fax. 905-664-8737
Web: www.2gai.com

SCALE: AS NOTED	PROJECT: 2019-08
START DATE: OCT. 2019	
DRAWN: D.W.	DRAWING: A2.00
CHECKED: J.G.	
PRINT DATE	10/24/23

S:\Data\2019\2019-08-Holy-Family-Crematorium-Milton\65Drawings\12-Working Drawings\2019-08-A2.00.dwg

ROOM FINISH SCHEDULE

RM. NO.	ROOM NAME	FLOOR FINISH		WALLS		CEILING			REMARKS
		FINISH	BASE	MAT'L	FINISH	MAT'L	FINISH	HEIGHT	
GROUND FLOOR									
101	VESTIBULE	PT	PT	GYP. BOARD	PAINT	GYP. BOARD	PAINT	3655	
102	CHAPEL	CPT	CPT	GYP. BOARD	PAINT	ACT-1 GYP. BOARD	-- PAINT	4095 3500	
103	OFFICE	CPT	CPT	CONC. BLOCK	PAINT	ACT-2	--	2745	
104	OFFICE	CPT	CPT	CONC. BLOCK	PAINT	ACT-2	--	2745	
105	STAFF ROOM	LVT	RB	CONC. BLOCK	PAINT	ACT-2	--	2745	
106	STAFF WASHROOM	PT	--	CONC. BLOCK	PAINT / CWT	GYP. BOARD	PAINT	2745	
106B	SHOWER	PT	--	CONC. BLOCK	CWT	GYP. BOARD	PAINT	2400	MOISTURE RESISTANT GYP. BOARD
107	CORRIDOR	LVT	RB	CONC. BLOCK	PAINT	ACT-2	--	2745	
108	CORRIDOR	LVT	RB	GYP.BOARD	PAINT	ACT-2	--	2745	
109	VIEWING ROOM	CPT	CPT	GYP. BOARD	PAINT	GYP. BOARD	PAINT	2745	
110	CIRCULATION AREA	EPOXY	RB	CONC. BLOCK	PAINT	ACT-2	--	3050	
111	UNIVERSAL WASHROOM	PT		GYP. BOARD	PAINT / CWT	GYP. BOARD	PAINT	2745	
112	WASHROOM	PT		GYP. BOARD	PAINT / CWT	GYP. BOARD	PAINT	2745	
113	WORK AREA	SC	RB	CONC. BLOCK	PAINT	GYP. BOARD	PAINT	3050	
114	PROCESSING ROOM	SC	RB	CONC. BLOCK	PAINT	GYP. BOARD	PAINT	3050	
115	JANITORS CLOSET	SC		CONC. BLOCK	PAINT	--	--	--	
116	CORRIDOR	SC		CONC. BLOCK	PAINT	ACT-2	--	3050	
117	ELECTRICAL/MECHANICAL ROOM	SC	RB	CONC. BLOCK	PAINT	--	--	2745	
118	COLD ROOM	SC		INTERIOR FINISH OF INSULATED METAL PANELS					
119	HOLDING ROOM	SC		CONC. BLOCK	PAINT	ACT-3	--	3050	
120	GARAGE	SC	RB	CONC. BLOCK	PAINT	GYP. BOARD	PAINT	4385	
121	RETORT ROOM	SC	RB	CONC. BLOCK	PAINT	--	PAINT	--	
122	COAT ROOM	CPT	CPT	GYP. BOARD	PAINT	GYP. BOARD	PAINT	2745	
123	CORRIDOR	CPT	CPT	GYP. BOARD	PAINT	GYP. BOARD	PAINT	2745	

ROOM FINISH SCHEDULE NOTES

1. SCHEDULES ARE TO BE READ IN CONJUNCTION WITH ALL DRAWINGS AND SPECIFICATIONS.
2. PAINT ALL EXPOSED MISCELLANEOUS METALS AND SERVICES (E.G. DUCTS, CONDUITS, PIPING, ETC.) WHERE CEILINGS AND WALLS ARE SCHEDULED TO BE PAINTED.
3. EXISTING WALLS SHALL BE CHASED AND OPENINGS CREATED AS REQUIRED TO EXECUTE THE WORK.
4. MAKE GOOD ALL MATERIALS AND FINISHED WHERE DISTURBED AND ALTERATIONS OCCUR. REFER TO MECHANICAL AND ELECTRICAL DOCUMENTS FOR FULL EXTENT OF WORK REQUIRED. NOTE THAT MAKING GOOD INCLUDES WORK ASSOCIATED WITH THE INSTALLATION OF SERVICES SHOWN ON DRAWINGS.

DOOR / SCREEN SCHEDULE

ROOM NO	ROOM NAME	DOOR NO.	DOOR / SCREEN								FRAME				REMARKS
			WIDTH	HEIGHT	THK	FIRE	TYPE	MAT'L	FIN.	GLASS	TYPE	MAT'L	FIN.	GLASS	
GROUND FLOOR															
101	VESTIBULE	101A	(2) 950	2440	44		3	ALUM	ANOD	DGS	W1	ALUM	ANOD	DGS	HDO, HPB,WS, TH, CH, INS, PH, CL
102	CHAPEL	102A	(2) 950	2440	44		3	ALUM	ANOD	TG	SC3	ALUM	ANOD	TG	HDO, HPB, PH, CH
102	CHAPEL	102B	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	WS, TH, INS, CL, PH. NOTE: NO EXTERIOR HARDWARE REQUIRED.
103	OFFICE	103A	950	2150	44		1	SCWD	PLAM	-	A	HM	PAINT	-	
104	OFFICE	104A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
105	STAFF ROOM	105A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
106	STAFF WASHROOM	106A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
106A	SHOWER	106A A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
107	CORRIDOR	107A	1220	2150	44		1	SCWD	PLAM	-	A	HM	PAINT	-	
108	CORRIDOR	108A	1220	2150	44	90 MIN	1	SCWD	PLAM	-	A	HM	PAINT	-	CL
109	VIEWING ROOM	109A	950	2150	44		2	SCWD	PLAM	-	A	HM	PAINT	-	
109	VIEWING ROOM	109B	950	2150	44	90 MIN	2	SCWD	PLAM	-	A	HM	PAINT	-	CL
110	CIRCULATION AREA	110A	(2) 950	2150	44	90 MIN	1	HM	PAINT	-	B	HM	PAINT	-	CL
110	CIRCULATION AREA	110B	(2) 950	2150	44	90 MIN	1	HM	PAINT	-	B	HM	PAINT	-	CL
111	UNIVERSAL WASHROOM	111A	950	2150	44		1	SCWD	PLAM	-	A	HM	PAINT	-	HDO, HPB, ES
112	WASHROOM	112A	950	2150	44		1	SCWD	PLAM	-	A	HM	PAINT	-	
113	WORK AREA	119A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
114	PROCESSING ROOM	114A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	
115	JANITORS CLOSET	128A	950	2150	44	45 MIN	1	HM	PAINT	-	A	HM	PAINT	-	CL
116	CORRIDOR	116A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	WS, TH, INS, CL, PH
117	ELECTRICAL/MECHANICAL	117A	950	2150	44	90 MIN	1	HM	PAINT	-	A	HM	PAINT	-	CL
119	HOLDING ROOM	119A	(2) 950	2150	44		1	HM	PAINT	-	B	HM	PAINT	-	
119	HOLDING ROOM	119A	950	2150	44		1	HM	PAINT	-	A	HM	PAINT	-	WS, TH, INS, CL, PH
120	GARAGE	120A	(2) 950	2150	44	60 MIN	1	HM	PAINT	-	B	HM	PAINT	-	CL, WS, DS, TH
120	GARAGE	120B	3760	2800	-		4	-	-	-	-	-	-	-	OVERHEAD DOOR. REFER TO SPEC., ADO
120	GARAGE	120C	3760	2800	-		4	-	-	-	-	-	-	-	OVERHEAD DOOR. REFER TO SPEC., ADO
SCREENS															
101	VESTIBULE	SC3	-	-	-	-	-	-	-	-	ST2	ALUM	ANOD	TG	
109	VIEWING ROOM	SC1	-	-	-	90 MIN	-	-	-	-	ST1	HM	PAINT	FG	
109	VIEWING ROOM	SC2	-	-	-	90 MIN	-	-	-	-	ST1	HM	PAINT	FG	

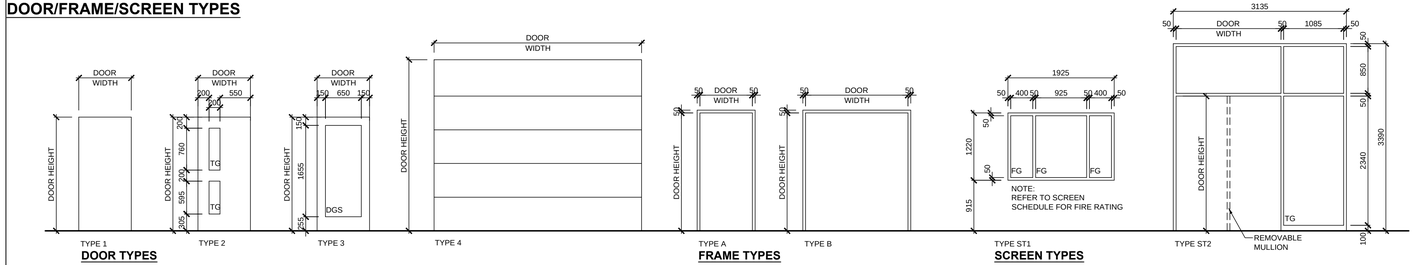
DOOR/SCREEN SCHEDULE NOTES

1. GENERAL CONTRACTOR TO FIELD VERIFY ALL DOOR & FRAME / SCREEN QUANTITIES & DIMENSIONS PRIOR TO FABRICATION
2. GENERAL CONTRACTOR TO CO-ORDINATE LOCATION & INSTALLATION OF PUSH BUTTON / AUTOMATIC DOOR OPERATIONS AND ALL OTHER RELATED TRADES. TO BE SUPPLIED BY GENERAL CONTRACTOR & INSTALLED BY ELECTRICAL
3. REFER TO DOOR SCHEDULE FOR FIRE RESISTANCE RATINGS FOR DOOR, FRAMES & GLAZED FRAMES / SCREENS.
4. ALL HM. DOORS & FRAMES TO BE PAINTED.
5. REFER TO PLANS / DETAILS & WALL SECTIONS FOR LOCATIONS OF REQUIRED STEEL LINTELS / ANGLES (BY GENERAL CONTRACTOR) AND ANY FORMED ALUMINUM CLOSURE ANGLES OR SUPPORTS FOR DOOR / FRAMES (BY DOOR / FRAME INSTALLER)
6. REFER TO DOOR HARDWARE SCHEDULE FOR ALL HOLD OPEN DEVICES, STRIKES, SECURITY, DOOR OPENERS, CLOSERS, PANIC HARDWARE, OVERHEAD STOPS, PUSH & KICK PLATES, ETC. & ANY OTHER DOOR HARDWARE REQUIREMENTS.

LEGEND

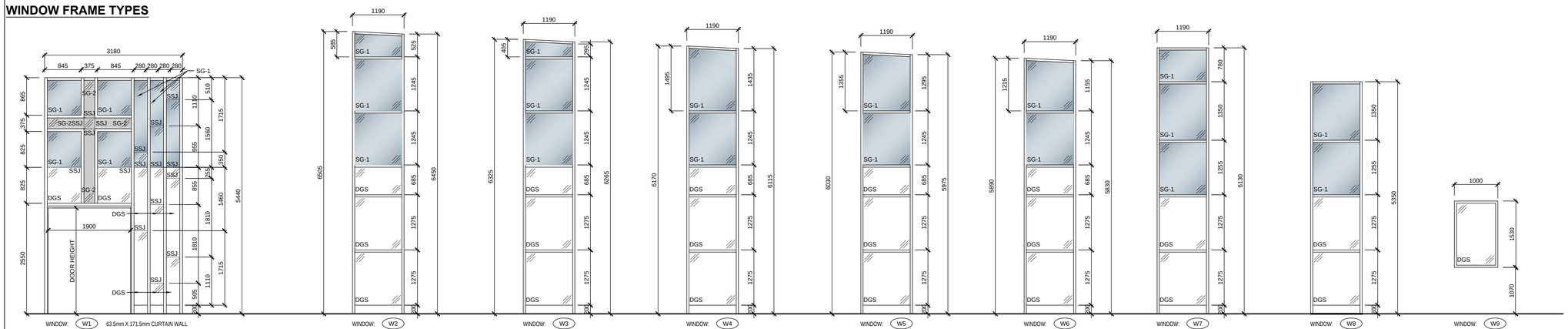
ACT-x	ACOUSTIC CEILING TILE
ADO	AUTOMATIC DOOR OPERATOR
AFF	ABOVE FINISHED FLOOR
ANOD	ANODIZED
CH	CONTINUOUS HINGE
CL	CLOSER
CLG	CEILING
CONC	CONCRETE
CWT	CERAMIC WALL TILE
DGS	DOUBLE GLAZED SEALED INSULATING GLASS UNITS
DS	DOOR SWEEP
ES	ELECTRIC STRIKE
EX	EXISTING
EXP	EXPOSED
FG	FIRE RATED GLASS
HDO	HANDICAP DOOR OPERATOR
HPB	HANDICAPPED PUSH BUTTON
HM	HOLLOW METAL
INS	THERMALLY INSULATED DOOR / FRAME
LVT	LUXURY VINYL TILE
MTL	METAL
PH	PANIC HARDWARE
PLAM	PLASTIC LAMINATE
PT	PORCELAIN TILE
RB	RUBBER BASE
RM	REMOVEABLE MULLION
SC	SEALED CONCRETE
SCWD	SOLID CORE WOOD DOOR
SG-xx	SPANDREL GLASS
STRUCT	STRUCTURE
SSJ	STRUCTURAL SILICONE JOINT
TG	TEMPERED GLASS
TH	THRESHOLD
THK	THICKNESS
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITE TILE
VAR	VARIES
WD	WOOD
WS	WEATHER STRIPPING
W/	WITH

DOOR/FRAME/SCREEN TYPES



DOOR TYPES | **FRAME TYPES** | **SCREEN TYPES**

WINDOW FRAME TYPES



WINDOW TYPES

THE CATHOLIC CEMETERIES
of the Diocese of Hamilton

NO	REVISIONS	DATE
5	ISSUED FOR ADDENDUM 4 (2)	2023-10-23
4	ISSUED FOR ADDENDUM 3 (1)	2023-10-16
3	ISSUED FOR TENDER	2023-09-21
2	ISSUED PER CITY COMMENTS	2023-07-24
1	ISSUED FOR BUILDING PERMIT	2023-05-26

HOLY FAMILY CEMETERY
CREMATORIUM
2543 LOWER BASE LINE ROAD
MILTON, ONTARIO

ROOM FINISH AND DOOR SCHEDULES

GRGURIC ARCHITECTS INCORPORATED
28 KING STREET EAST, UNIT B
STONEY CREEK, ONTARIO, L8G 1J8
Tel. 905-664-8735 Fax. 905-664-8737
Web: www.2gai.com

SCALE: AS NOTED	PROJECT: 2019-08
START DATE: OCT. 2019	
DRAWN: D.W.	DRAWING: A8.00
CHECKED: J.G.	
PRINT DATE	10/23/23

S:\Data\2019\2019-08 Holy Family Crematorium Milton\05Drawings\12 Working Drawings\2019-08 A8.00 Schedules.dwg

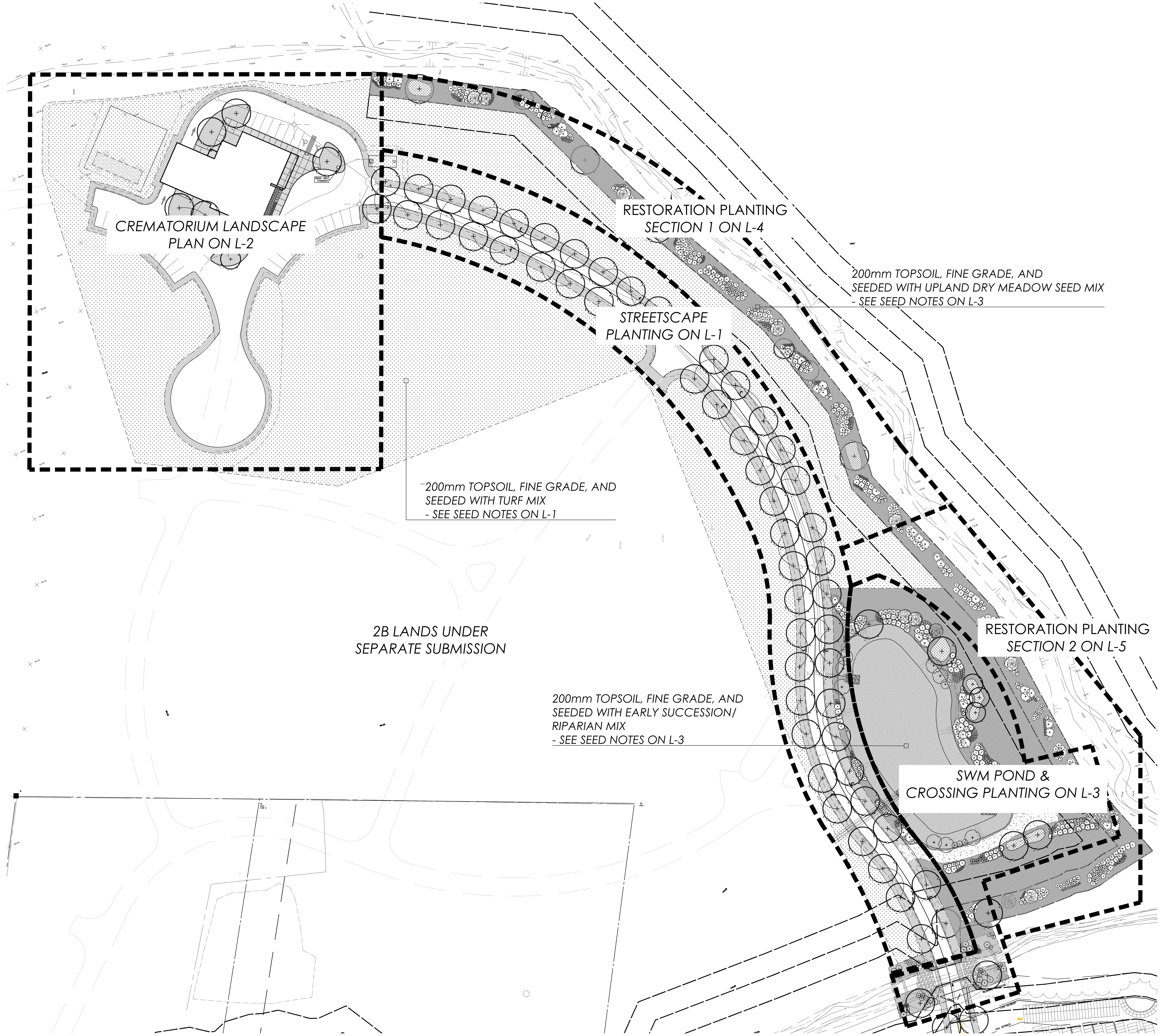
project #: 20-115

Holy Family Cemetery
Crematorium Building

ISSUED FOR SI #1
October 17, 2023

CLIENT:

The Catholic Cemeteries
2523 Lower Base Line
Milton, ON



DRAWING SCHEDULE:

SHEET	DRAWING
L-1	Landscape Plan (Street Planting)
L-2	Landscape Plan (Crematorium Building)
L-3	Storm Water Management Pond
L-4	Landscape Plan (Restoration Planting Section 1)
L-5	Landscape Plan and Details (Restoration Planting Section 2)

adesso design inc.
landscape architecture

218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca

project #: 20-115

LANDSCAPE NOTES:

1. All work to be carried out in accordance with by-laws and codes having jurisdiction over site location.
2. Complete all work to the satisfaction of the Landscape Architect.
3. Report any changes, discrepancies or substitutions to the Landscape Architect for review. Obtain approval from the Landscape Architect before proceeding.
4. It is the contractor's responsibility to determine existing service locations.
5. Exact locations of plant material will be determined by placement of site services such as hydro vaults, meters, utilities roof rain water leaders, driveways, light standards, etc.
6. All plant material locations to be staked or marked out and approved by Landscape Architect prior to installation.
7. Supply all plant material in accordance with the Canadian Standards for Nursery Stock (8th ed.).
8. Install plant material according to details shown.
9. Supply and place mulch in accordance with Canadian Landscape Standard (Section 10, Mulching). Disturbed soil areas around trees and shrubs are to be covered with shredded conifer bark mulch such as 'Cedar Bark Mulch' by All Treat Farms or 'Classic Cedar Mulch' by Gro-Bark, or approved equivalent. Alternative mulches must be approved by the Landscape Architect.
10. Contractor to utilize layout dimensions where provided
11. Provide planting bed area as noted on the drawing or to accommodate mature size of plant material.
12. All support systems must be removed by the contractor at time of final acceptance. No extras will be paid to complete this work
13. Supply and place topsoil in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) to a minimum depth of 200mm unless otherwise specified.
14. Supply and place sod in accordance with Canadian Landscape Standard (Section 7, Lawns & Grass and Section 8, Turfgrass Sod)unless otherwise specified.
15. Supply and place seed in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) unless otherwise specified. All 5:1 or greater slopes to be seeded with tacifier. Contractor to provide necessary erosion control protection as required to ensure soil stabilization and proper seed germination.
16. All dimensions in meters unless otherwise noted.
17. If discrepancies arise between plant material count shown on drawing and plant list, the drawing shall be considered correct.
18. Contractor to provide minimum one (1) year warranty (including trees on municipal property) from date accepted on all work unless otherwise specified.
19. Any site plan or grading and servicing shown is for information only. Refer to approved drawings.
20. Not for construction unless stamped, signed and dated by Landscape Architect.
21. Drawings not to be reproduced without written consent from Landscape Architect.
22. Approval of landscape plan to be obtained from municipality.
23. All plant material to be planted a minimum of 1.0m from any swales or ditches.
24. For grading and servicing information refer to the consulting Engineer's drawings.
25. For lighting information and power distribution refer to the electrical consultant's drawings.

SEED NOTES:

1. Areas to be seeded with turf mix shall receive an application of seed at the rate of 25-30 kg/hectare or 2 kg/100m² for spot applications, in the following mixture:

Turfline Turbo Seed Mix	
Turf Perennial Ryegrass	60%
QuickAction® Perennial Ryegrass	10%
TXR Turf Annual Ryegrass	20%
Kentucky Bluegrass	10%

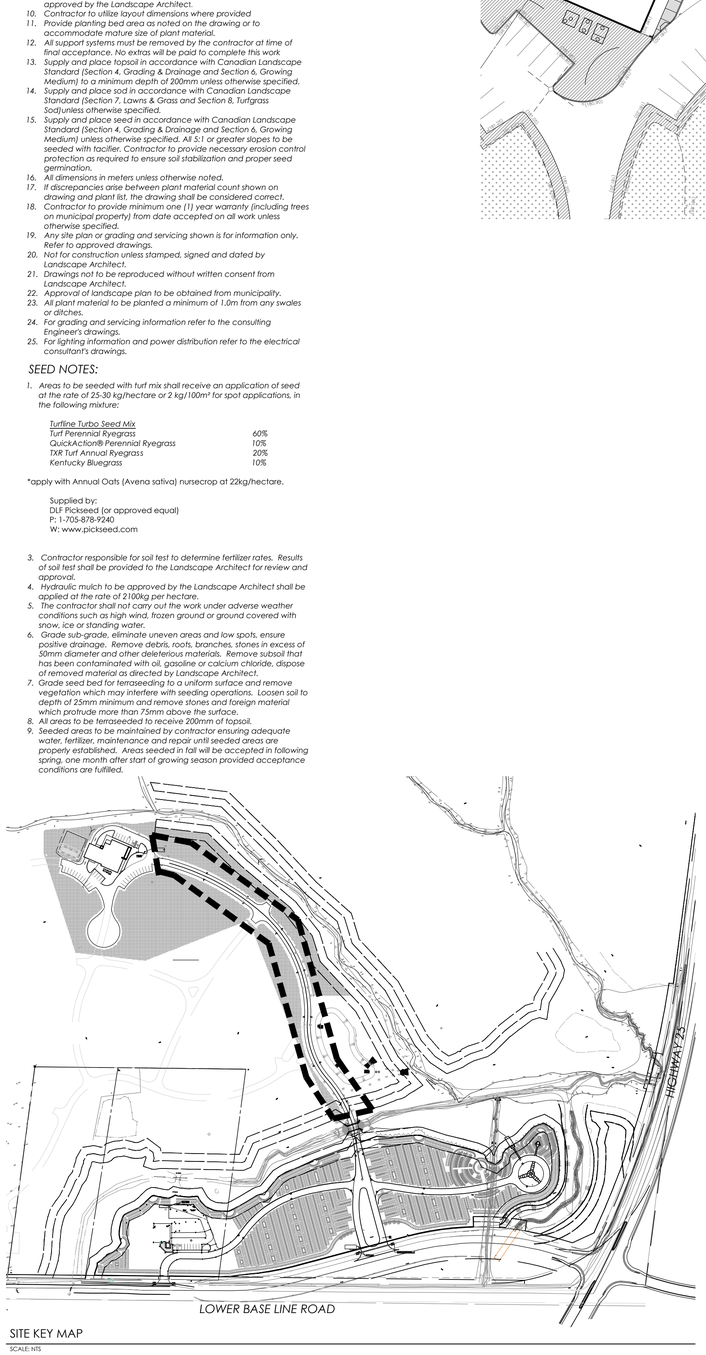
*apply with Annual Oats (Avena sativa) nursecrop at 22kg/hectare.

Supplied by;
DLF Pickseed (or approved equal)
P: 1-705-878-9240
W: www.pickseed.com

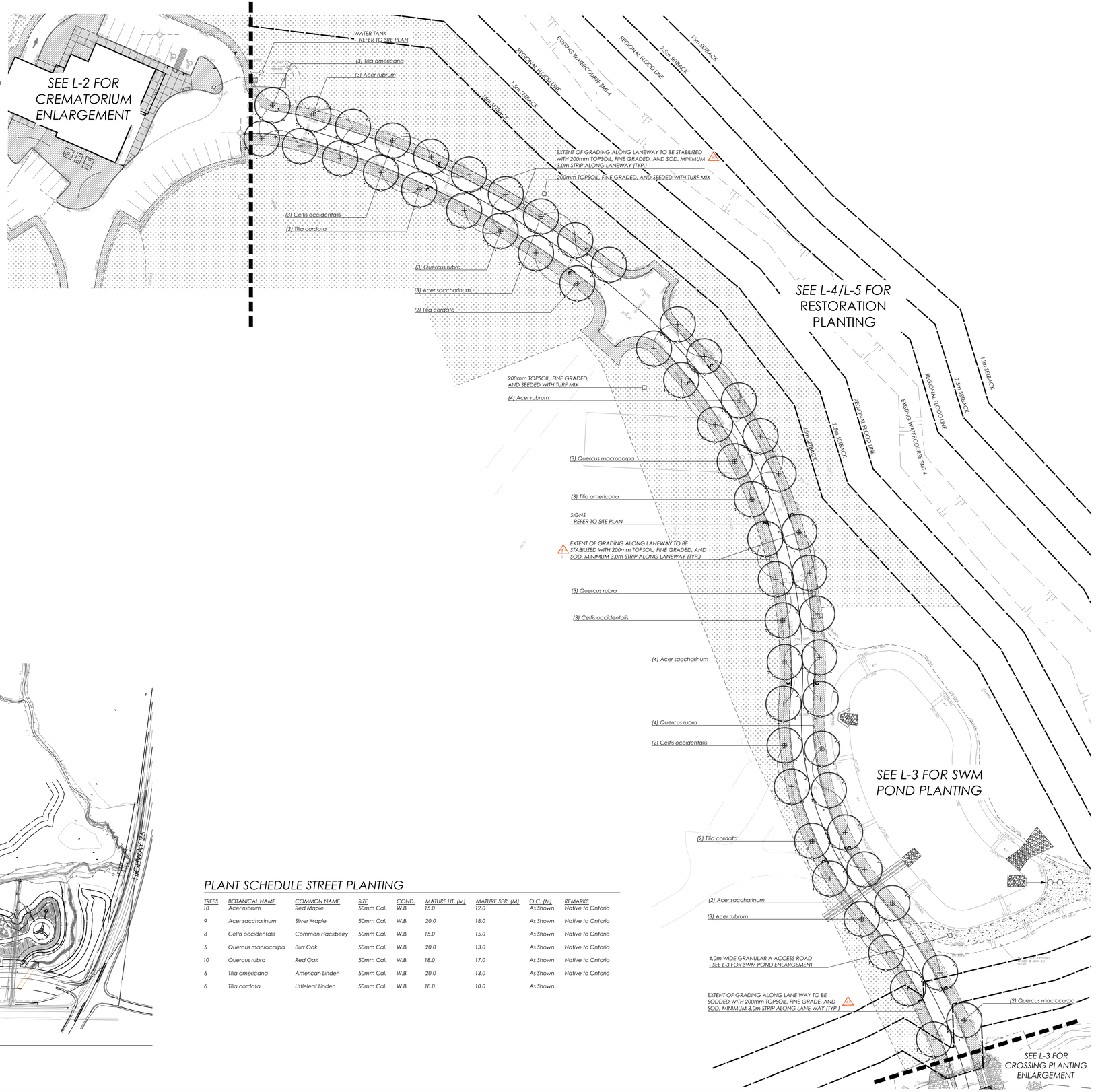
3. Contractor responsible for soil test to determine fertilizer rates. Results of soil test shall be provided to the Landscape Architect for review and approval.
4. Hydraulic mulch to be approved by the Landscape Architect shall be applied at the rate of 2100kg per hectare.
5. The contractor shall not carry out the work under adverse weather conditions such as high wind, frozen ground or ground covered with snow, ice or standing water.
6. Grade sub-grade, eliminate uneven areas and low spots, ensure positive drainage. Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride, dispose of removed material as directed by Landscape Architect.
7. Grade seed bed for terraseeding to a uniform surface and remove vegetation which may interfere with seeding operations. Loosen soil to depth of 25mm minimum and remove stones and foreign material which protrude more than 75mm above the surface.
8. All areas to be terraseeded to receive 200mm of topsoil.
9. Seeded areas to be maintained by contractor ensuring adequate water, fertilizer, maintenance and repair until seeded areas are properly established. Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

north

5 0 5 10 20
1:500 (m)



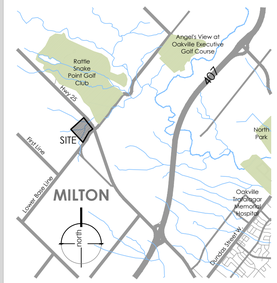
SITE KEY MAP
SCALE: NTS



PLANT SCHEDULE STREET PLANTING

TREES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
10	Acer rubrum	Red Maple	50mm Cal.	W.B.	15.0	12.0	As Shown	Native to Ontario
9	Acer saccharinum	Silver Maple	50mm Cal.	W.B.	20.0	18.0	As Shown	Native to Ontario
8	Celtis occidentalis	Common Hackberry	50mm Cal.	W.B.	15.0	15.0	As Shown	Native to Ontario
5	Quercus macrocarpa	Burr Oak	50mm Cal.	W.B.	20.0	13.0	As Shown	Native to Ontario
10	Quercus rubra	Red Oak	50mm Cal.	W.B.	18.0	17.0	As Shown	Native to Ontario
6	Tilia americana	American Linden	50mm Cal.	W.B.	20.0	13.0	As Shown	Native to Ontario
6	Tilia cordata	Littleleaf Linden	50mm Cal.	W.B.	18.0	10.0	As Shown	

KEY MAP - N.T.S.



LEGEND

- proposed deciduous tree
- 181.98 — existing elevation
- (179.70) + — proposed elevation
- min. 200mm topsoil, fine grade & sod
- min. 200mm topsoil, fine grade & seed with turf mix

ISSUED FOR TENDER

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2021-06-25	Issued for Submission
2	2022-09-21	Issued for Submission
3	2022-12-15	Issued for Submission
4	2023-05-26	Issued for Permit
5	2023-05-31	Issued for Tender
6	2023-10-17	Issued for SI #1

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — MARIO PATRUNO — OALA — MEMBER

CLIENT
The Catholic Cemeteries

MUNICIPALITY
Town of Milton

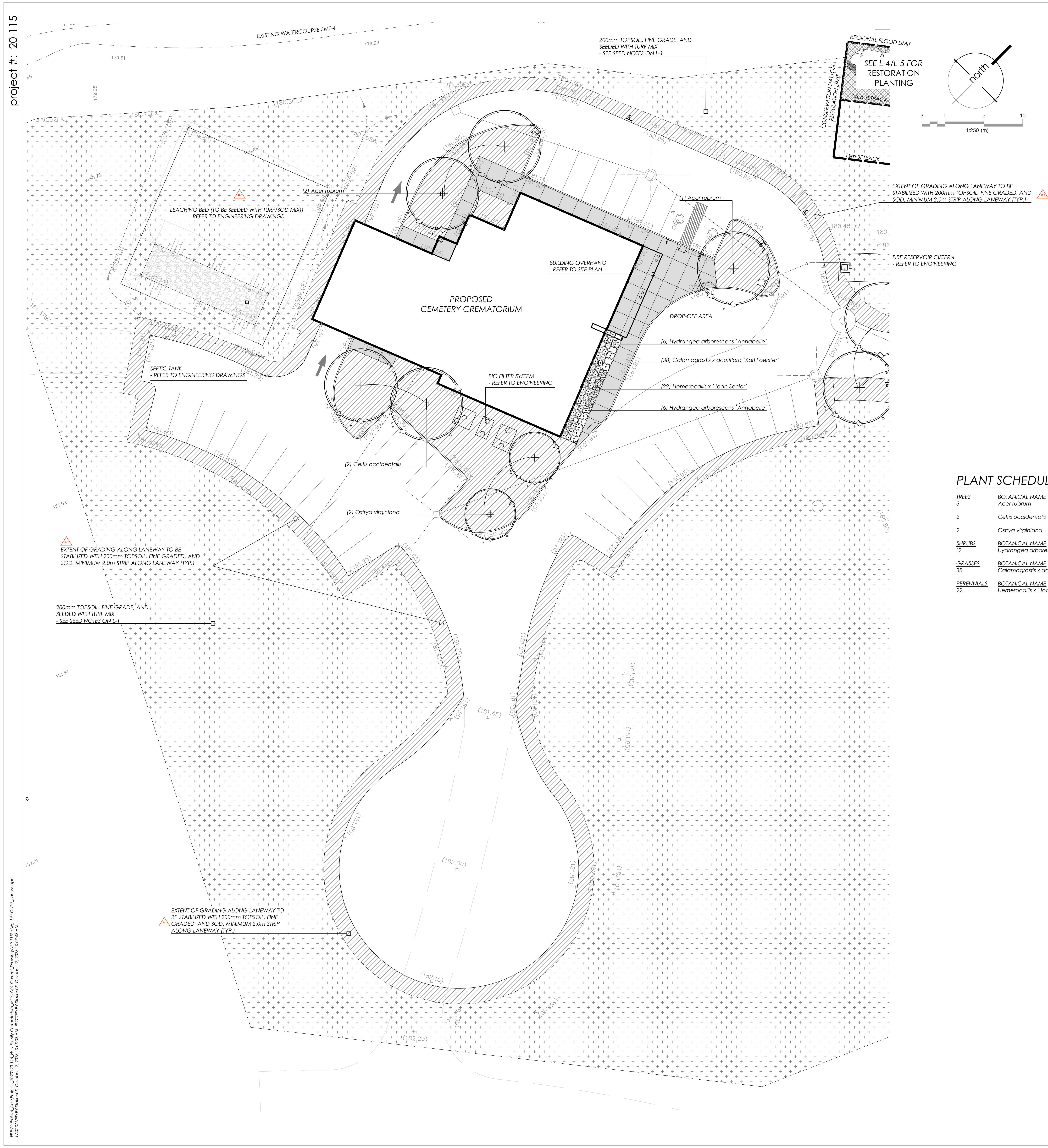
PROJECT
Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road

MUNICIPAL FILE NUMBER
SP 19/21

SHEET
Landscape Plan
(Street Planting)

L-1

adesso design inc.
landscape architecture
218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca

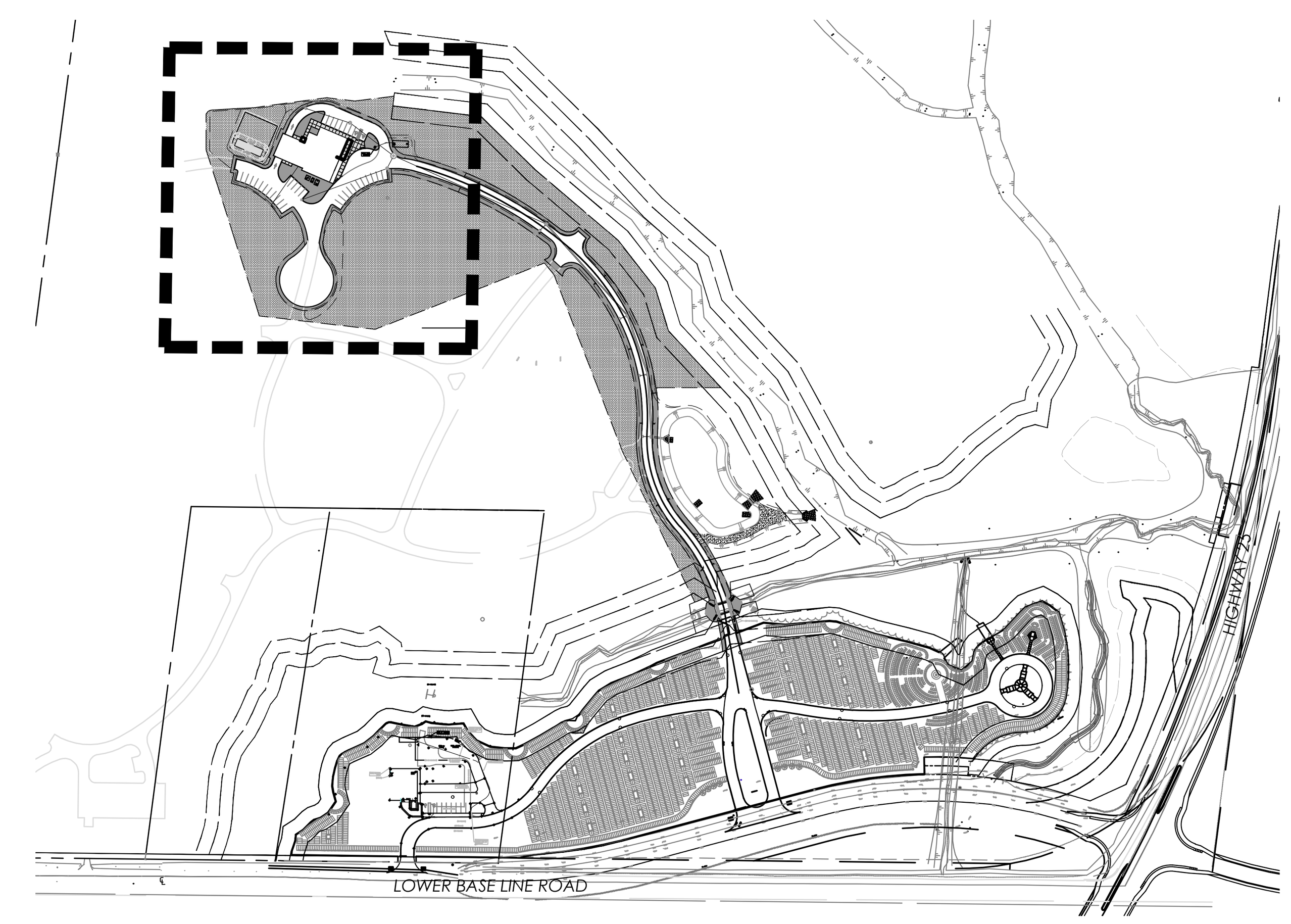


LANDSCAPE NOTES:

1. All work to be carried out in accordance with by-laws and codes having jurisdiction over site location.
2. Complete all work to the satisfaction of the Landscape Architect.
3. Report any changes, discrepancies or substitutions to the Landscape Architect for review. Obtain approval from the Landscape Architect before proceeding.
4. It is the contractor's responsibility to determine existing service locations.
5. Exact locations of plant material will be determined by placement of site services such as hydro vaults, meters, utilities roof rain water leaders, driveways, light standards, etc.
6. All plant material locations to be staked or marked out and approved by Landscape Architect prior to installation.
7. Supply all plant material in accordance with the Canadian Standards for Nursery Stock (8th ed.).
8. Install plant material according to details shown.
9. Supply and place mulch in accordance with Canadian Landscape Standard (Section 10, Mulching). Disturbed soil areas around trees and shrubs are to be covered with shredded conifer bark mulch such as 'Cedar Bark Mulch' by All Treat Farms or 'Classic Cedar Mulch' by Gro-Bark, or approved equivalent. Alternative mulches must be approved by the Landscape Architect.
10. Contractor to utilize layout dimensions where provided
11. Provide planting bed area as noted on the drawing or to accommodate mature size of plant material.
12. All support systems must be removed by the contractor at time of final acceptance. No extras will be paid to complete this work
13. Supply and place topsoil in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) to a minimum depth of 200mm unless otherwise specified.
14. Supply and place sod in accordance with Canadian Landscape Standard (Section 7, Lawns & Grass and Section 8, Turfgrass Sod)unless otherwise specified.
15. Supply and place seed in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) unless otherwise specified. All 5:1 or greater slopes to be seeded with tacifier. Contractor to provide necessary erosion control protection as required to ensure soil stabilization and proper seed germination.
16. All dimensions in meters unless otherwise noted.
17. If discrepancies arise between plant material count shown on drawing and plant list, the drawing shall be considered correct.
18. Contractor to provide minimum one (1) year warranty (including trees on municipal property) from date accepted on all work unless otherwise specified.
19. Any site plan or grading and servicing shown is for information only. Refer to approved drawings.
20. Not for construction unless stamped, signed and dated by Landscape Architect.
21. Drawings not to be reproduced without written consent from Landscape Architect.
22. Approval of landscape plan to be obtained from municipality.
23. All plant material to be planted a minimum of 1.0m from any swales or ditches.
24. For grading and servicing information refer to the consulting Engineer's drawings.
25. For lighting information and power distribution refer to the electrical consultant's drawings.

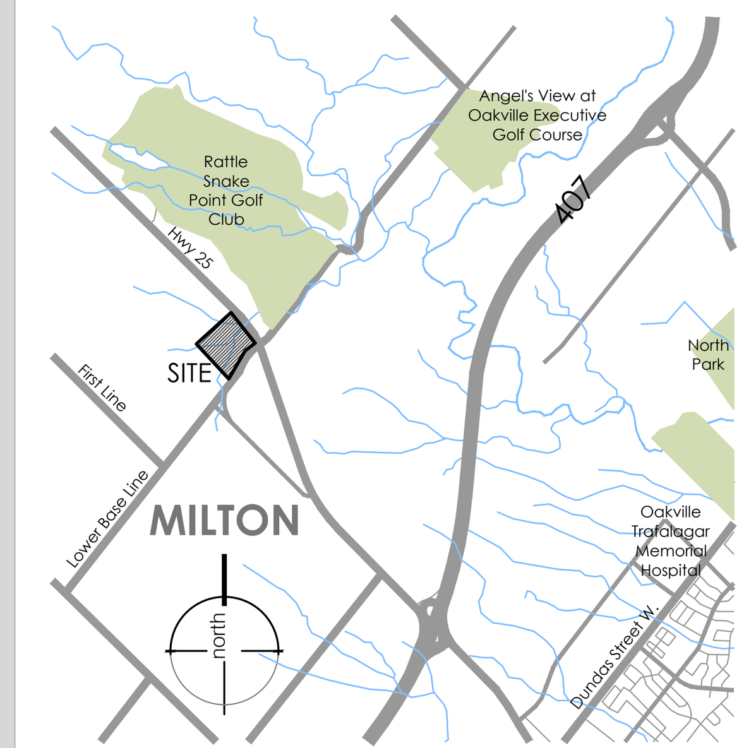
PLANT SCHEDULE CREMATORIUM

TREES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
3	Acer rubrum	Red Maple	50mm Cal.	W.B.	15.0	12.0	As Shown	Native to Ontario
2	Celtis occidentalis	Common Hackberry	50mm Cal.	W.B.	15.0	15.0	As Shown	Native to Ontario
2	Ostrya virginiana	Ironwood	50mm Cal.	W.B.	10.0	7.0	As Shown	Native to Ontario
SHRUBS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
12	Hydrangea arborescens `Annabelle`	Annabelle Hydrangea	30cm	#3 cont.	1.1	1.0	0.90	
GRASSES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
38	Calamagrostis x acutiflora `Karl Foerster`	Karl Foerster Feather Reed Grass	--	#1 cont.	1.25	0.60	0.50	
PERENNIALS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
22	Hemerocallis x `Joan Senior`	Joan Senior Daylily	--	#1 cont.	0.60	0.50	0.40	Rebloomer



SITE KEY MAP
SCALE: NTS

KEY MAP - N.T.S.



LEGEND

- proposed deciduous tree
- proposed shrub
- proposed perennial
- existing elevation
- proposed elevation
- min. 200mm topsoil, fine grade & sod
- min. 200mm topsoil, fine grade & seed with turf mix
- C.I.P. concrete

ISSUED FOR TENDER

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2021-06-25	Issued for Submission
2	2022-09-21	Issued for Submission
3	2022-12-15	Issued for Submission
4	2023-05-26	Issued for Permit
5	2023-05-31	Issued for Tender
6	2023-10-17	Issued for SI #1 #1

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
MARIO PATITUCCI
OALA
MEMBER

CLIENT
The Catholic Cemeteries

MUNICIPALITY
Town of Milton

PROJECT
Holy Family Cemetery Crematorium Building
2523 Lower Base Line Road

MUNICIPAL FILE NUMBER
SP 19/21

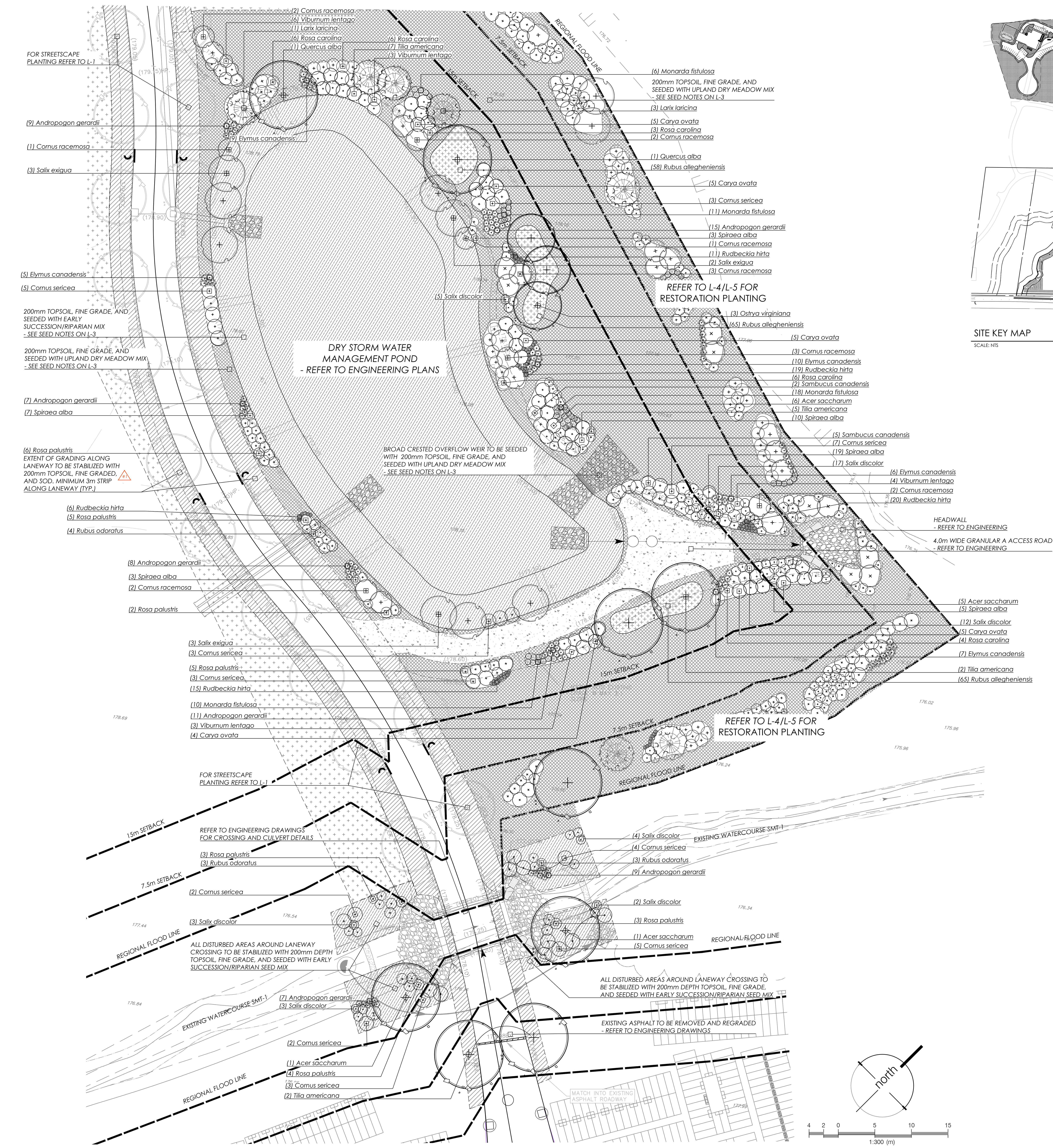
SHEET
Landscape Plan (Crematorium)

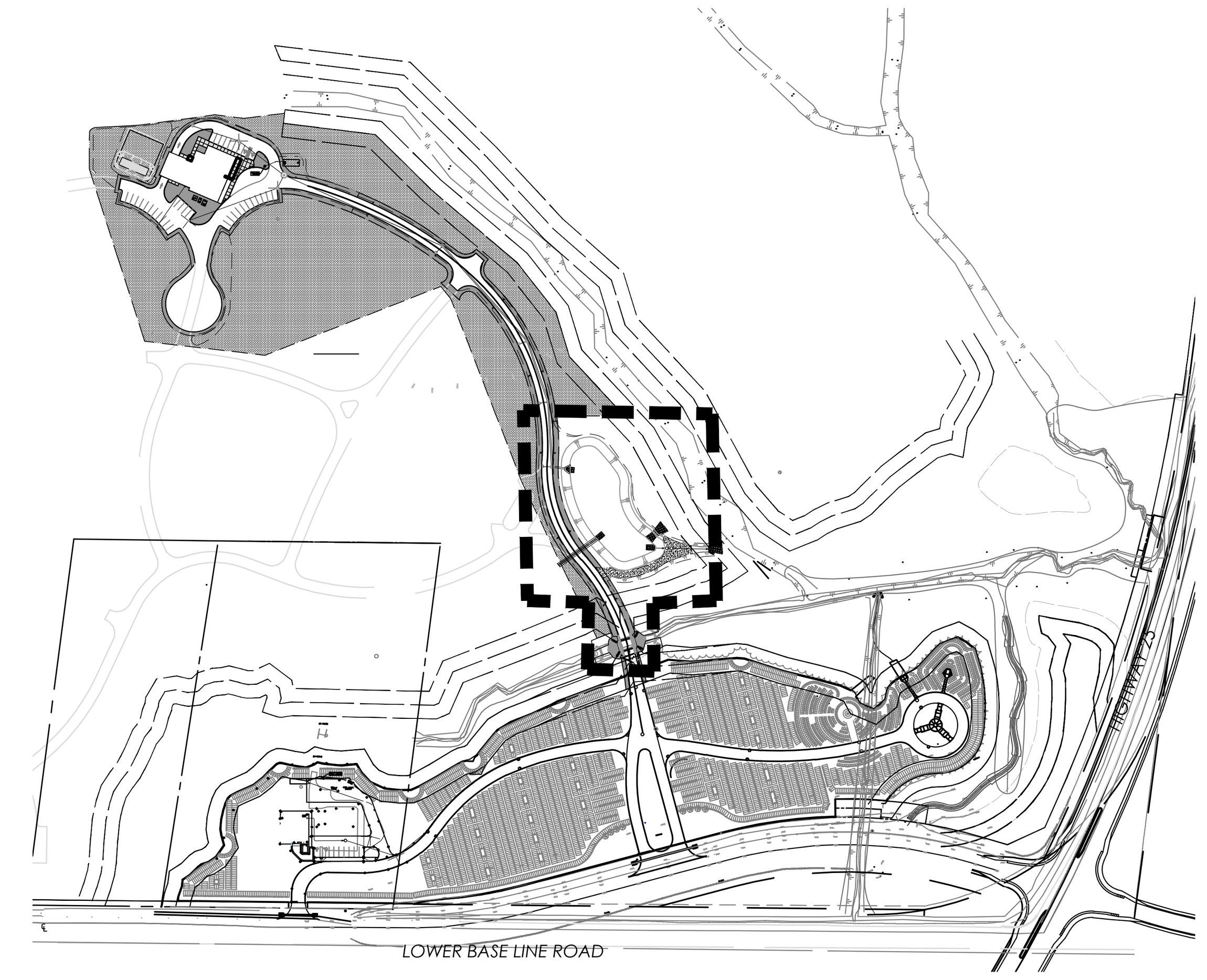
L-2

adesso design inc.
landscape architecture

218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca

project #: 20-115





SITE KEY MAP

SCALE: NTS

LANDSCAPE NOTES:

1. All areas to be terraseeded to be completed as soon as possible after the required topsoil application.
2. For fall seeding, a short term biodegradable erosion control blanket is to be use on any slope to stabilize the soil prior to vegetation establishment and prior to the spring freshnet.
3. Areas to be seeded with seed mix shall receive an application of naturalization seed at the rate of 25-30 kg/hectare or 2 kg/100m² for spot applications, in the following mixture:

Conservation Halton Upland Dry Meadow Mix

Common Name	Botanical Name	Percentage of Mix (%)
Black Eyed Susan	*Rudbeckia hirta*	15
Big Bluestem	*Andropogon gerardii*	30
Blue Wood Aster	*Symphyotrichum cordifolius*	1
Canada Goldenrod	*Solidago canadensis*	2
Canada Anemone	*Anemone canadensis*	1
Common Milkweed	*Asclepias syriaca*	5
Evening Primrose	*Oenethera biennis*	2
Grass Leaved Goldenrod	*Euthamia graminifolia*	1
Little Bluestem	*Schizachyrium scoparium*	20
Meadow/Open Field Sedge	*Carex granularis*	12
New England Aster	*Symphyotrichum novae-angliae*	1
Virgins Bower	*Clematis virginiana*	5
Wild Bergamot	*Monarda fistulosa*	5

Conservation Halton Early Succession/Riparian Mix

Common Name	Botanical Name	Percentage of Mix (%)
Black Eyed Susan	*Rudbeckia hirta*	5
Blue Vervain	*Verbena hastata*	10
Canada Anemone	*Anemone canadensis*	1
Canada Blue-joint	*Calamagrostis canadensis*	2
Canada Goldenrod	*Solidago canadensis*	2
Little Bluestem	*Schizachyrium scoparuim*	10
Common Milkweed	*Asclepias syriaca*	5
Fowl Bluegrass	*Poa palustris*	25
Meadow/Open Field Sedge	*Carex granularis*	20
New England Aster	*Symphyotrichum novae-angliae*	1
Path Rush	*Juncus tenuis*	10
Purple Stemmed Aster	*Symphyotrichum puniceum*	1
Virgins Bower	*Clematis virginiana*	4
Wild Bergamot	*Monarda fistulosa*	4

*apply with Annual Oats (Avena sativa) nursecrop at 22kg/hectare.

Supplied by:
Ontario Seed Company (OSC) (or approved equal)
P: 1-519-886-0557
www.oscseeds.com

4. Contractor responsible for soil test to determine fertilizer rates. Results of soil test shall be provided to the Landscape Architect for review and approval.
5. Hydraulic mulch to be approved by the Landscape Architect shall be applied at the rate of 2100kg per hectare.
6. The contractor shall not carry out the work under adverse weather conditions such as high wind, frozen ground or ground covered with snow, ice or standing water.
7. Grade sub-grade, eliminate uneven areas and low spots, ensure positive drainage. Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride, dispose of removed material as directed by Landscape Architect.
8. Grade seed bed for terraseeding to a uniform surface and remove vegetation which may interfere with seeding operations. Loosen soil to depth of 25mm minimum and remove stones and foreign material which protrude more than 75mm above the surface.
9. Seeded areas to be maintained by contractor ensuring adequate water, fertilizer, maintenance and repair until seeded areas are properly established. Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.
10. All areas to be terraseeded to receive a minimum of 200mm topsoil

SWM POND

BLOCK AREA:	4096.81 s.m.		
DRY POND AREA:	2359.96 s.m.		
RIP RAP/HARDSCAPE AREA:	327.95 s.m.		
PLANTABLE UPLAND POND AREA:	**1408.89 s.m.**		
		REQUIRED	PROVIDED
TOTAL TREES (5 TREES/ 100 s.m.)		70	71
TOTAL SHRUBS (25 SHRUBS/ 100 s.m.)		352	392

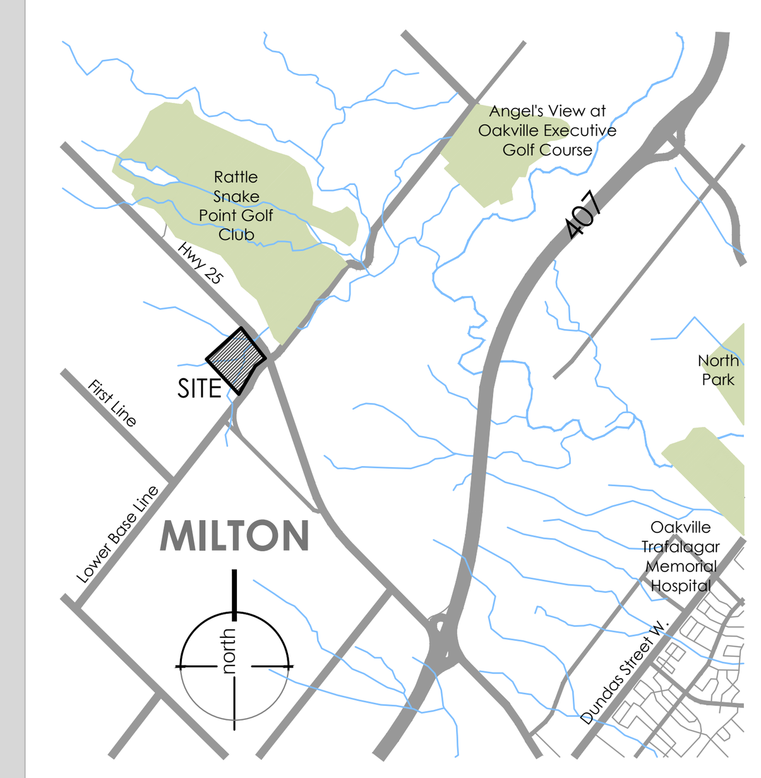
PLANT SCHEDULE SWM POND

TREES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
1	Acer saccharinum	Silver Maple	50mm Cal.	W.B.	20.0	18.0	As Shown	Native to Ontario
4	Larix laricina	Tamarack	200cm Ht.	W.B.	8.0	8.0	As Shown	Native to Ontario
3	Ostrya virginiana	Ironwood	50mm Cal.	W.B.	10.0	7.0	As Shown	Native to Ontario
2	Quercus alba	White Oak	50mm Cal.	W.B.	18.0	18.0	As Shown	Native to Ontario
2	Tilia americana	American Linden	50mm Cal.	W.B.	20.0	13.0	As Shown	Native to Ontario
WHIPS AND SAPLINGS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
11	Acer saccharum	Sugar Maple	150cm Ht.	#7 cont.	25.0	16.0	6.0	Native to Ontario
24	Carya ovata	Shagbark Hickory	150cm Ht.	#7 cont.	25.0	15.0	6.0	Native to Ontario
12	Tilia americana	American Linden	150cm Ht.	#7 cont.	20.0	15.0	2.0	Native to Ontario
SHRUBS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
16	Cornus racemosa	Gray Dogwood	60cm	#3 cont.	3.0	3.0	2.5	Native to Ontario
21	Cornus sericea	Red Osier Dogwood	50cm	#3 cont.	1.75	2.0	1.75	Native to Ontario
25	Rosa carolina	Pasture Rose	30cm	#2 cont.	1.5	1.75	1.6	Native to Ontario
18	Rosa palustris	Swamp Rose	30cm	#2 cont.	1.5	1.5	1.3	Native to Ontario
4	Rubus odoratus	Flowering Raspberry	30cm	#2 cont.	1.5	1.25	1.0	Native to Ontario
34	Salix discolor	Pussy Willow	60cm	#3 cont.	5.0	1.25	1.1	Native to Ontario
8	Salix exigua	Sandbar Willow	50cm	#3 cont.	3.0	5.0	4.0	Native to Ontario
7	Sambucus canadensis	Elderberry	50cm	#3 cont.	2.5	2.0	1.75	Native to Ontario
41	Spiraea alba	Meadowsweet	40cm	#3 cont.	1.25	1.25	1.1	Native to Ontario
16	Viburnum lentago	Nannyberry	50cm	#3 cont.	5.0	1.75	1.5	Native to Ontario
GRASSES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
50	Andropogon gerardii	Big Bluestem	--	#1 cont.	1.7	0.80	0.70	Native to Ontario
37	Elymus canadensis	Canada Wild Rye	--	#1 cont.	1.25	0.70	0.60	Native to Ontario
PERENNIALS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
45	Monarda fistulosa	Wild Bergamot	--	#1 cont.	0.90	0.80	0.70	Native to Ontario
71	Rudbeckia hirta	Black-Eyed Susan	--	#1 cont.	0.60	0.50	0.40	Native to Ontario
GROUND COVERS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
188	Rubus allegheniensis	Allegheny Blackberry	30cm	#2 cont.	1.0	1.5	1.25	Native to Ontario

PLANT SCHEDULE CROSSING/CULVERT

TREES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
2	Acer saccharum	Sugar Maple	50mm Cal.	W.B.	30.0	18.0	As Shown	Native to Ontario
2	Tilia americana	American Linden	50mm Cal.	W.B.	20.0	13.0	As Shown	Native to Ontario
SHRUBS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
15	Cornus sericea	Red Osier Dogwood	50cm	#3 cont.	1.75	2.0	1.75	Native to Ontario
10	Rosa palustris	Swamp Rose	30cm	#2 cont.	1.5	1.5	1.3	Native to Ontario
6	Rubus odoratus	Flowering Raspberry	30cm	#2 cont.	1.5	1.25	1.0	Native to Ontario
9	Salix discolor	Pussy Willow	60cm	#3 cont.	5.0	1.25	1.1	Native to Ontario
GRASSES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
16	Andropogon gerardii	Big Bluestem	--	#1 cont.	1.7	0.80	0.70	Native to Ontario

KEY MAP - N.T.S.



LEGEND

- proposed deciduous tree
- proposed coniferous tree
- proposed shrub
- existing elevation
- proposed elevation
- min. 200mm topsoil, fine grade & sod
- min. 200mm topsoil, fine grade & seed with Upland Dry Meadow Seed Mix
- min. 200mm topsoil, fine grade & seed with Early Succession/Riparian Seed Mix
- min. 200mm topsoil, fine grade & seed with turf mix
- C.I.P. concrete

FOR LANDSCAPE NOTES REFER TO L-2

ISSUED FOR TENDER

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2021-06-25	Issued for Submission
2	2022-09-21	Issued for Submission
3	2022-12-15	Issued for Submission
4	2023-05-26	Issued for Permit
5	2023-05-31	Issued for Tender
6	2023-10-17	Issued for SI #1

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — OALA — MEMBER

CLIENT
The Catholic Cemeteries

MUNICIPALITY
Town of Milton

PROJECT
Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road

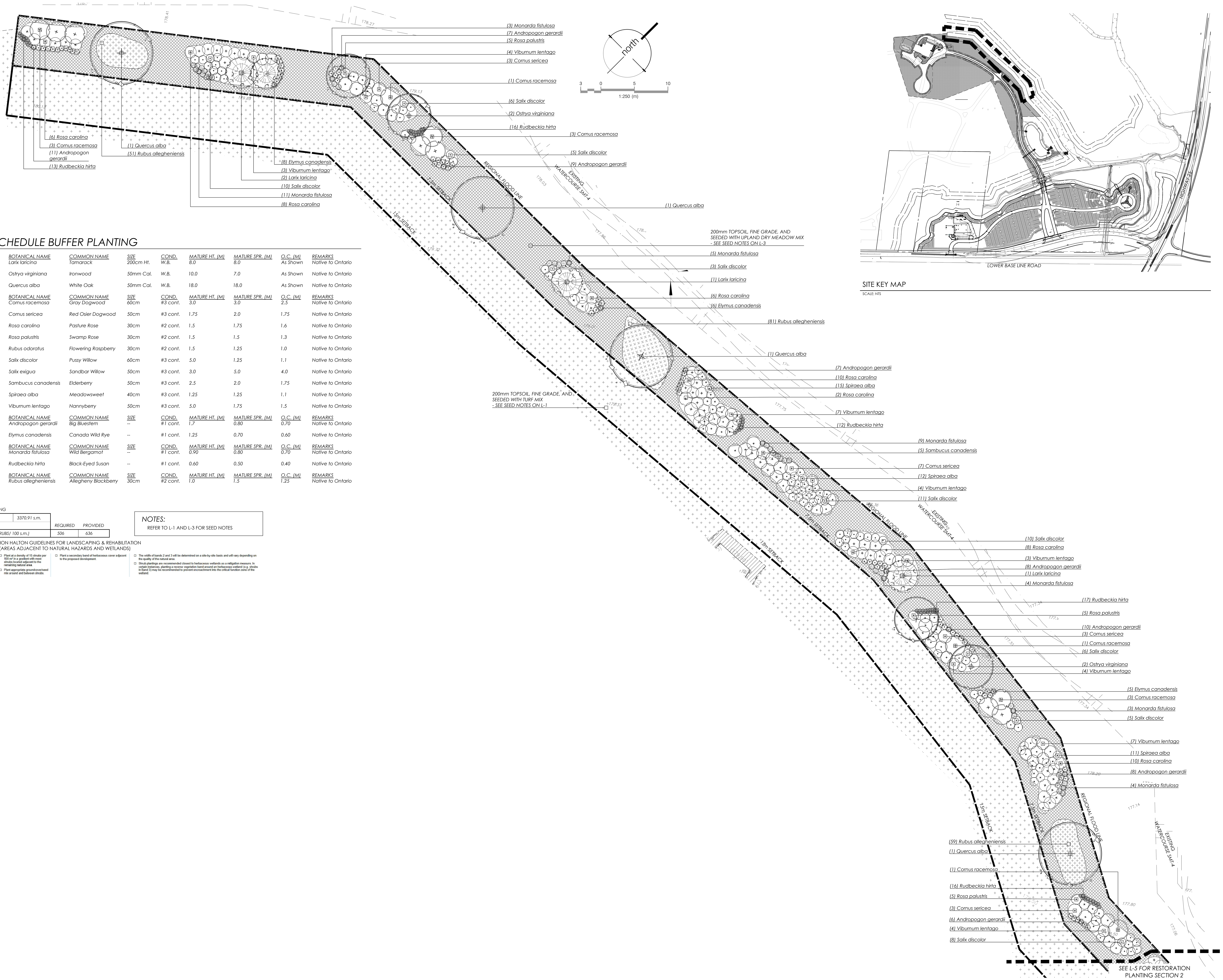
MUNICIPAL FILE NUMBER
SP 19/21

SHEET
Landscape Plan
(SWM Pond & Road Crossing)) L-3

adesso design inc.
landscape architecture

218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca

project #: 20-115



PLANT SCHEDULE BUFFER PLANTING

TREES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
8	Larix laricina	Tamarack	200cm Ht.	W.B.	8.0	8.0	As Shown	Native to Ontario
4	Ostrya virginiana	Ironwood	50mm Cal.	W.B.	10.0	7.0	As Shown	Native to Ontario
5	Quercus alba	White Oak	50mm Cal.	W.B.	18.0	18.0	As Shown	Native to Ontario
SHRUBS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
31	Cornus racemosa	Gray Dogwood	60cm	#3 cont.	3.0	3.0	2.5	Native to Ontario
35	Cornus sericea	Red Osier Dogwood	50cm	#3 cont.	1.75	2.0	1.75	Native to Ontario
84	Rosa carolina	Pasture Rose	30cm	#2 cont.	1.5	1.75	1.6	Native to Ontario
53	Rosa palustris	Swamp Rose	30cm	#2 cont.	1.5	1.5	1.3	Native to Ontario
4	Rubus odoratus	Flowering Raspberry	30cm	#2 cont.	1.5	1.25	1.0	Native to Ontario
99	Salix discolor	Pussy Willow	60cm	#3 cont.	5.0	1.25	1.1	Native to Ontario
2	Salix exigua	Sandbar Willow	50cm	#3 cont.	3.0	5.0	4.0	Native to Ontario
12	Sambucus canadensis	Elderberry	50cm	#3 cont.	2.5	2.0	1.75	Native to Ontario
69	Spiraea alba	Meadowsweet	40cm	#3 cont.	1.25	1.25	1.1	Native to Ontario
51	Viburnum lentago	Nannyberry	50cm	#3 cont.	5.0	1.75	1.5	Native to Ontario
GRASSES	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
87	Andropogon gerardii	Big Bluestem	--	#1 cont.	1.7	0.80	0.70	Native to Ontario
31	Elymus canadensis	Canada Wild Rye	--	#1 cont.	1.25	0.70	0.60	Native to Ontario
PERENNIALS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
49	Monarda fistulosa	Wild Bergamot	--	#1 cont.	0.90	0.80	0.70	Native to Ontario
82	Rudbeckia hirta	Black-Eyed Susan	--	#1 cont.	0.60	0.50	0.40	Native to Ontario
GROUND COVERS	BOTANICAL NAME	COMMON NAME	SIZE	COND.	MATURE HT. (M)	MATURE SPR. (M)	O.C. (M)	REMARKS
191	Rubus allegheniensis	Allegheny Blackberry	30cm	#2 cont.	1.0	1.5	1.25	Native to Ontario

RESTORATION PLANTING

		REQUIRED	PROVIDED
BLOCK AREA:	3370.91 s.m.		
TOTAL SHRUBS (15 SHRUBS/ 100 s.m.)		506	636

AS PER CONSERVATION HALTON GUIDELINES FOR LANDSCAPING & REHABILITATION PLANS SECTION 3.4 (AREAS ADJACENT TO NATURAL HAZARDS AND WETLANDS)

Shallow marshes, meadow marshes, along wetland pond edges, wet meadows/prairies, or similar shallow aquatic habitats	☐ Plant at a density of 15 shrubs per 100 m² in a gradient with most shrubs located adjacent to the remaining natural area. ☐ Plant appropriate groundcover/seed mix around and between shrubs.	☐ Plant a secondary band of herbaceous cover adjacent to the proposed development.	☐ The width of bands 2 and 3 will be determined on a site-by-site basis and will vary depending on the quality of the natural area. ☐ Shrub plantings are recommended closest to herbaceous wetlands as a mitigation measure. In certain instances, planting a reverse vegetation band around an herbaceous wetland (e.g. shrubs in Band 3) may be recommended to prevent encroachment into the critical function zone of the wetland.

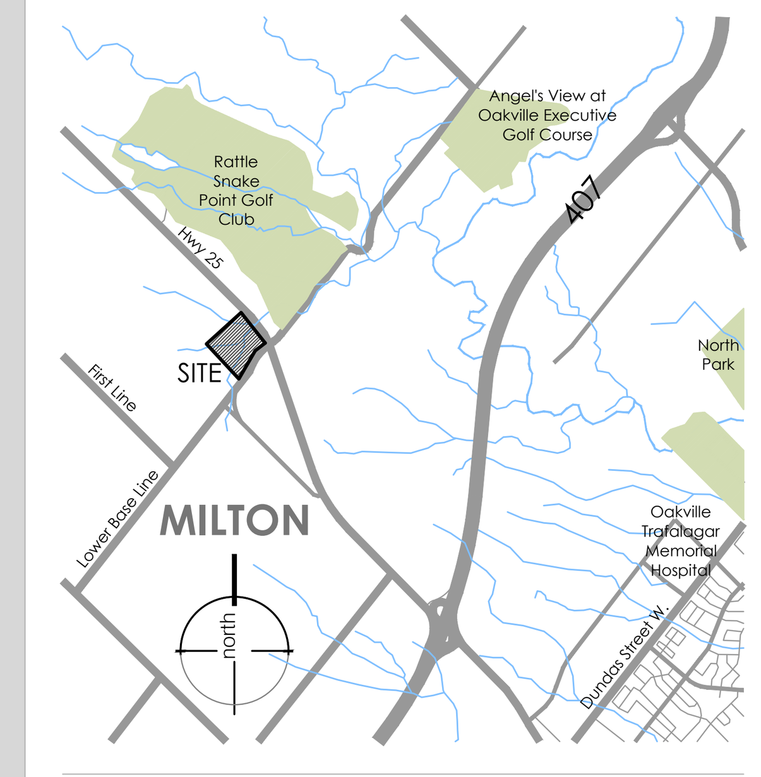
NOTES:

REFER TO L-1 AND L-3 FOR SEED NOTES

SITE KEY MAP

SCALE: NTS

KEY MAP - N.T.S.



LEGEND

- proposed deciduous tree
- proposed coniferous tree
- proposed shrub
- 181.98 existing elevation
- (179.70) proposed elevation
- min. 200mm topsoil, fine grade & seed with turf mix
- min. 200mm topsoil, fine grade & seed with Upland Dry Meadow Mix

FOR LANDSCAPE NOTES REFER TO L-2

ISSUED FOR TENDER

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2021-06-25	Issued for Submission
2	2022-09-21	Issued for Submission
3	2022-12-15	Issued for Submission
4	2023-05-26	Issued for Permit
5	2023-05-31	Issued for Tender
6	2023-10-17	Issued for SI #1

STAMP

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS — MARIO PATITUCCI — OALA — MEMBER

CLIENT
The Catholic Cemeteries

MUNICIPALITY
Town of Milton

PROJECT
Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road

MUNICIPAL FILE NUMBER
SP 19/21

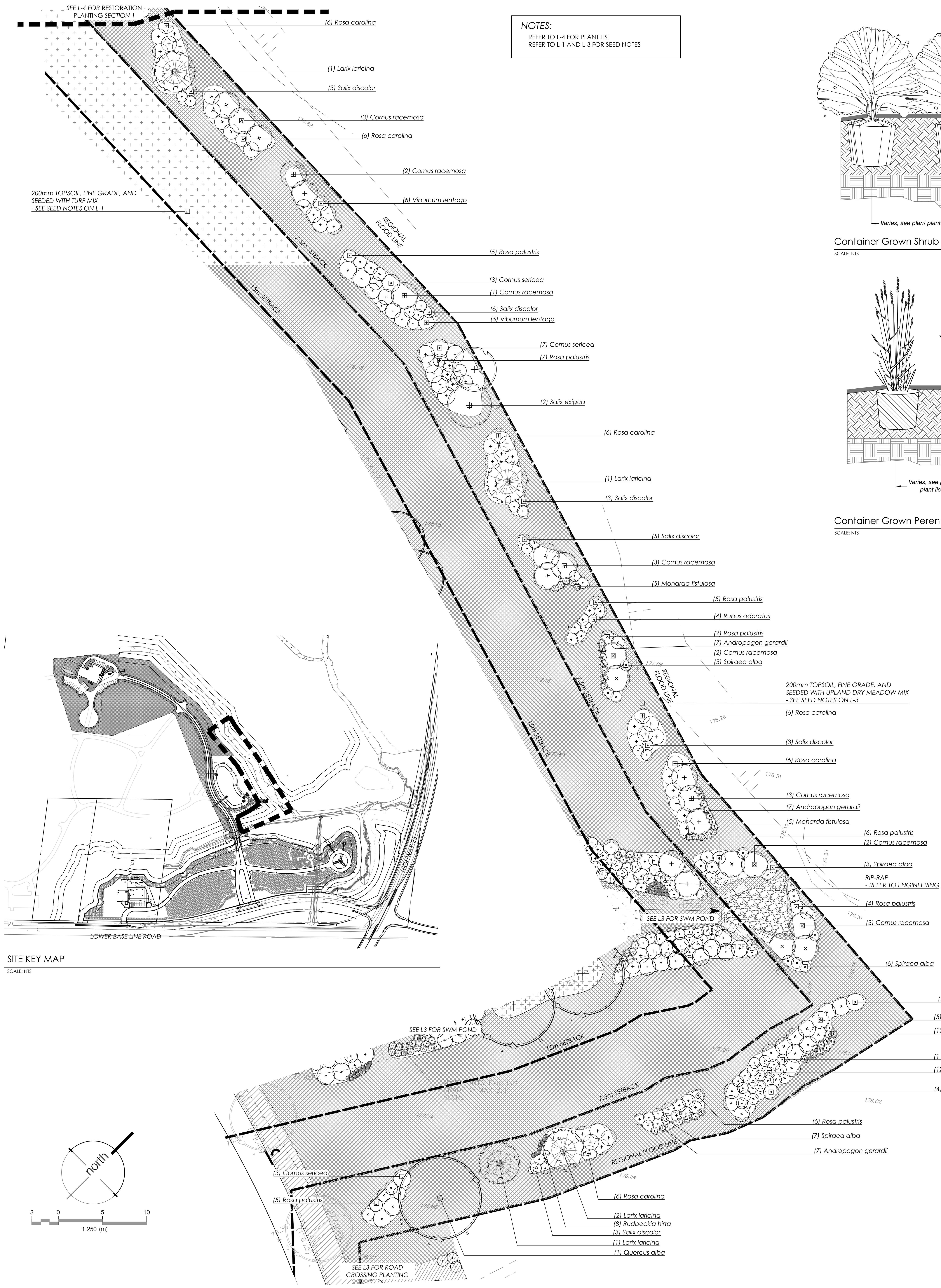
SHEET
Landscape Plan
RESTORATION PLANTING
SECTION 1

L-4

adesso design inc.
landscape architecture

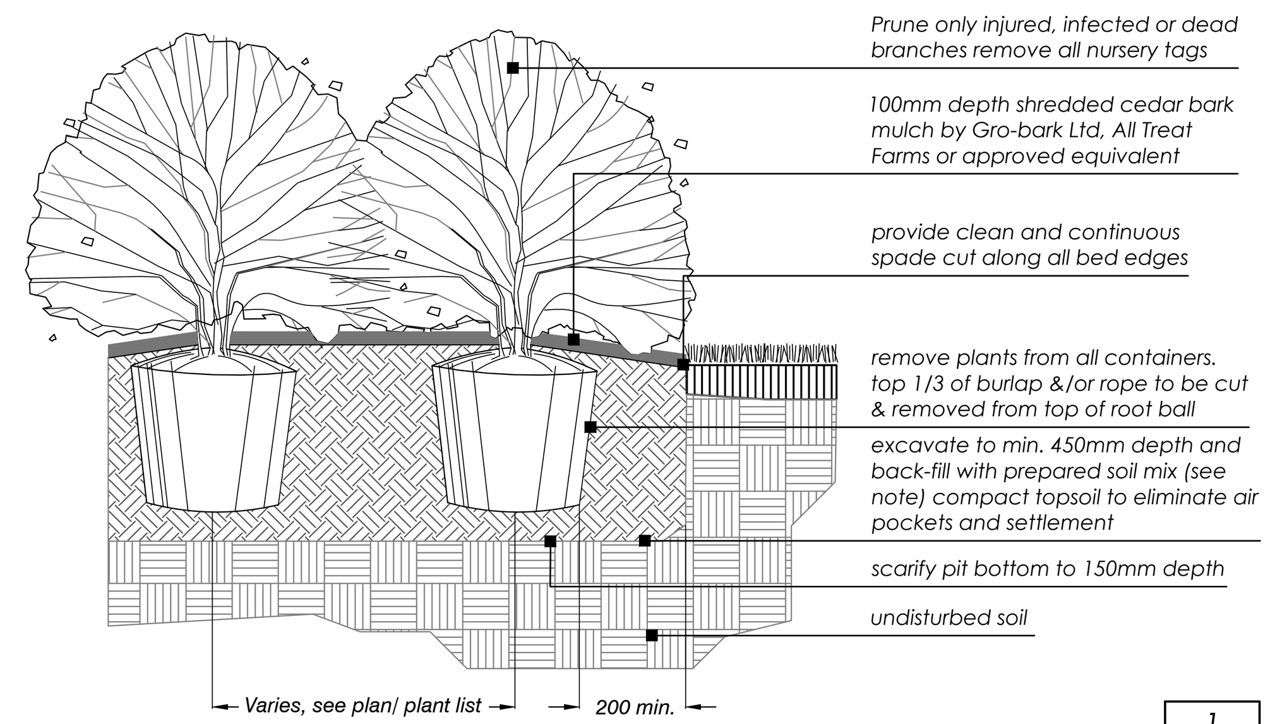
218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca

project #: 20-115

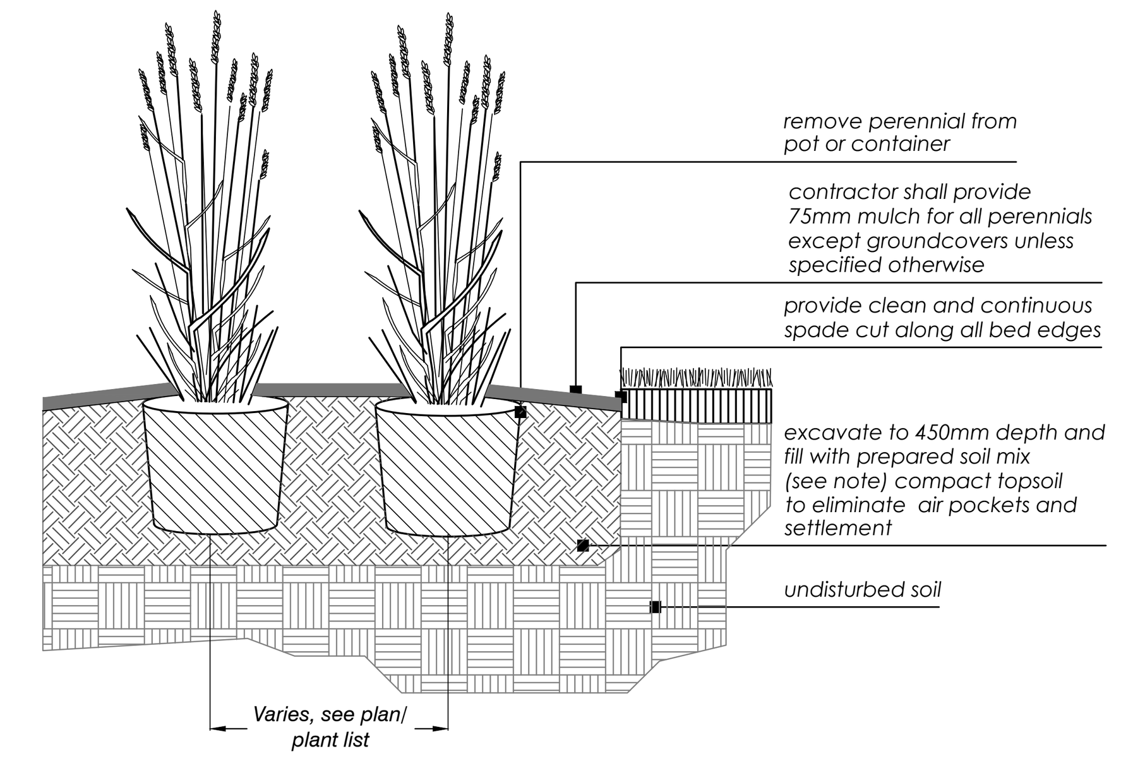


NOTES:
REFER TO L-4 FOR PLANT LIST
REFER TO L-1 AND L-3 FOR SEED NOTES

SITE KEY MAP
SCALE: NTS



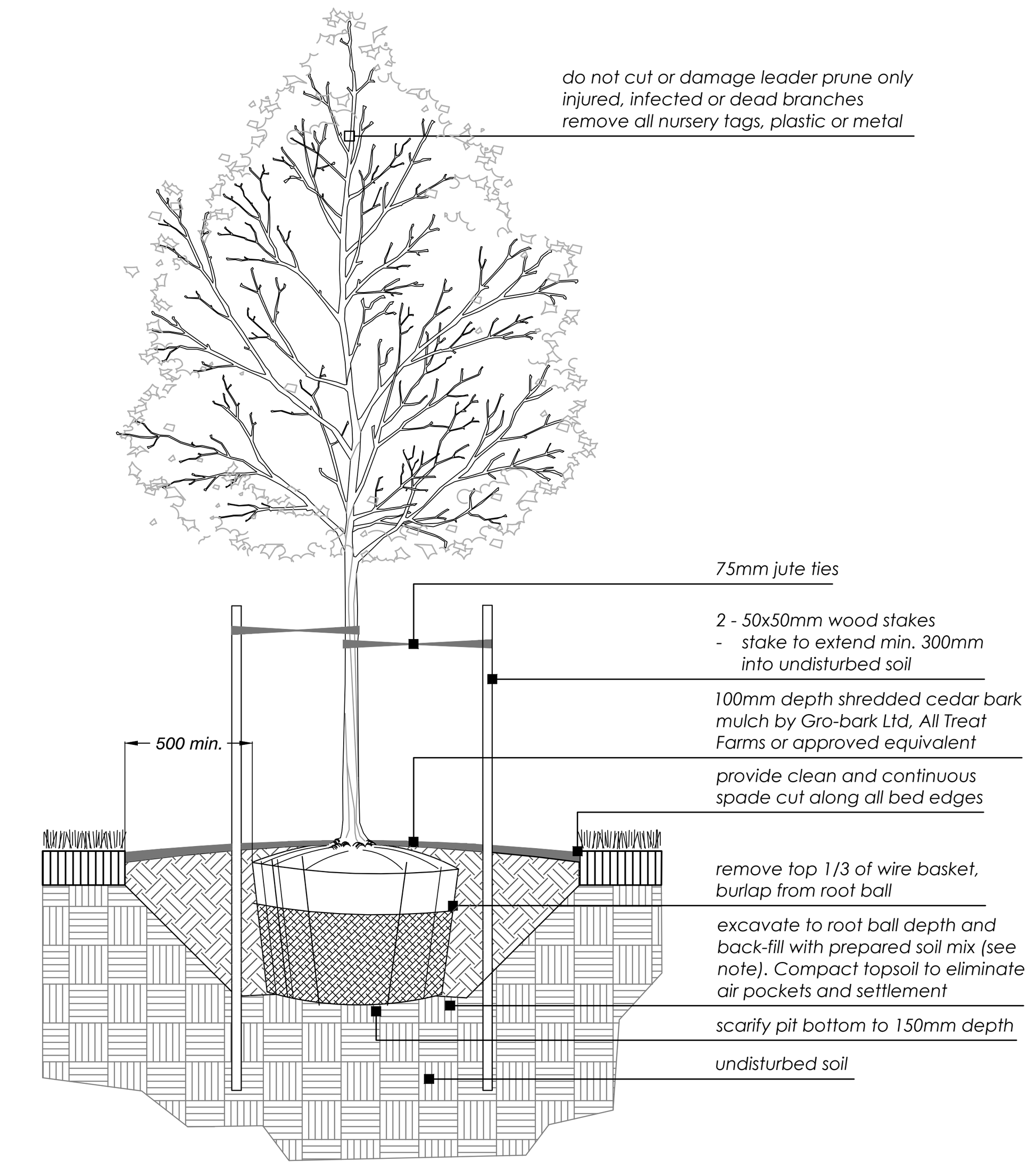
Container Grown Shrub — 1 / L-5
SCALE: NTS



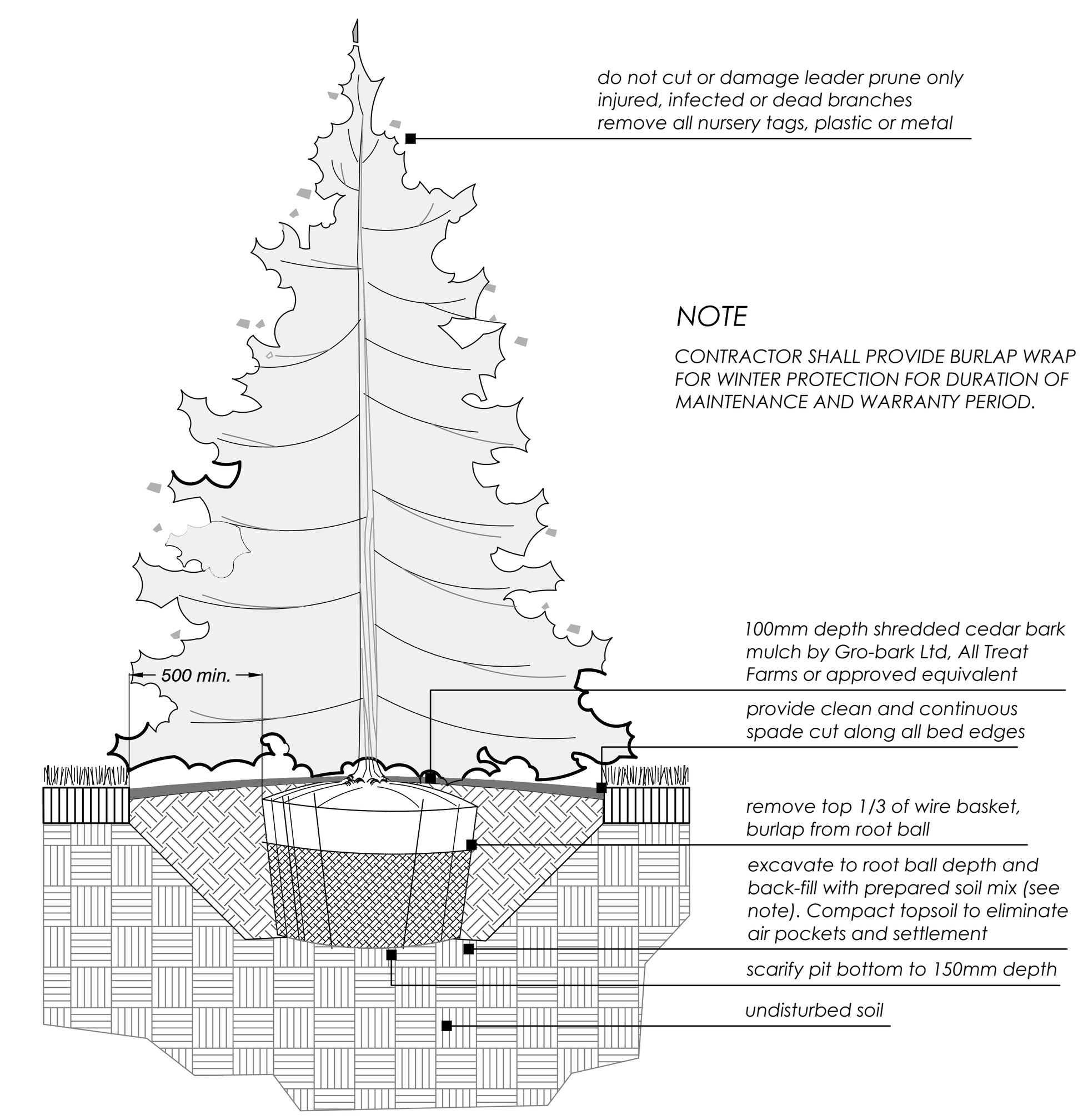
Container Grown Perennial — 2 / L-5
SCALE: NTS

PLANTING NOTES:

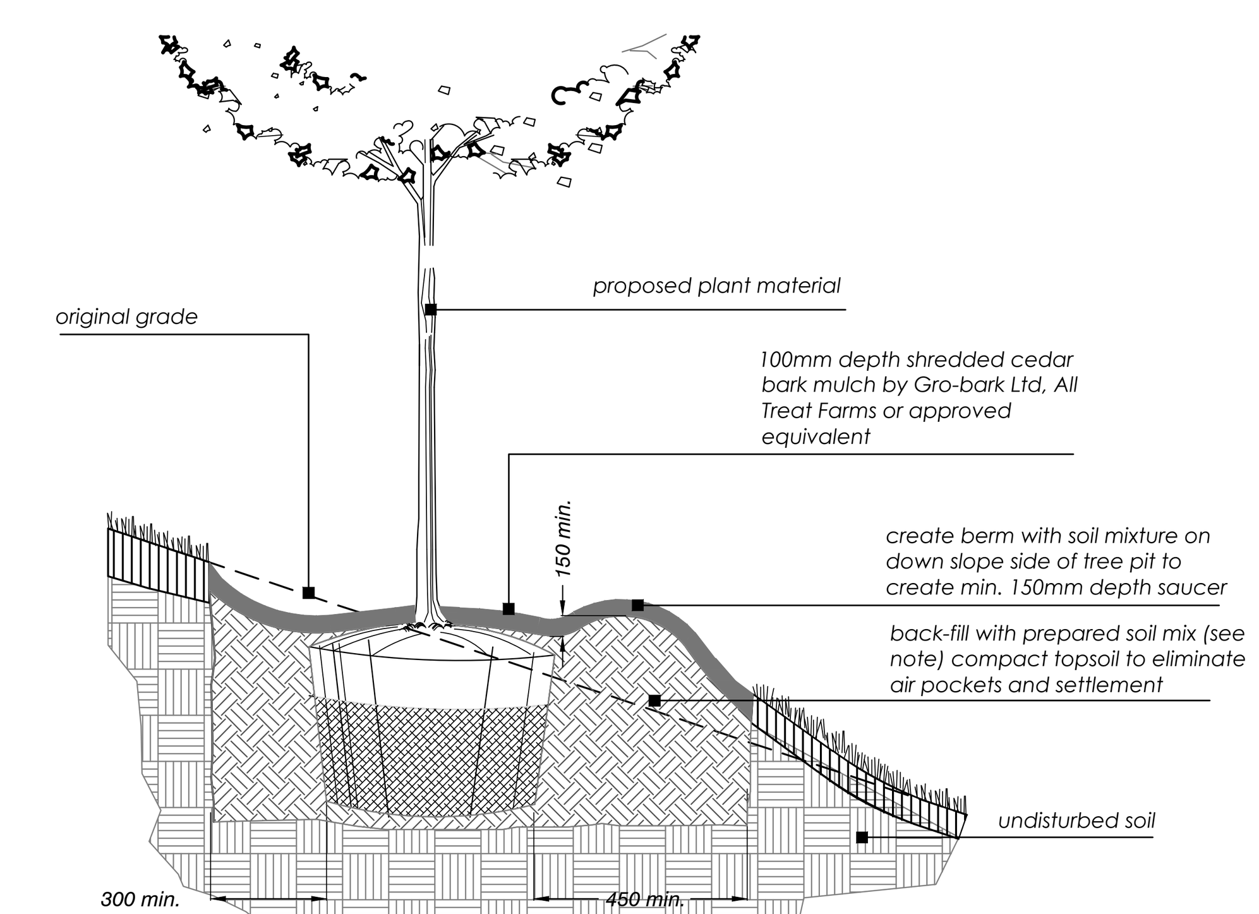
1. *Soil mixture: four (4) parts native soil, one (1) part well rotted compost.If existing soil is not suitable provide triple mix topsoil or approved equal.*
2. *Saucer shall be soaked with water and mulched immediately following planting.*
3. *Massed shrubs shall be planted in continuous mulched beds unless otherwise noted.*
4. *Staking schedule;*
   < 30mm caliper size/ 2500mm ht. - one stake
   > 30mm caliper size/ 2500mm ht. - two stakes
   > 70mm caliper - three stakes
5. *All support systems must be removed once tree is established.*
6. *All trees to be straight and planted vertically regardless of slope.*
7. *Top of root flare shall be positioned 50mm above grade.*
8. The following depths of soil are required for planting;
   - 20cm topsoil for sod;
   - 45cm of topsoil for perennials;
   - 45cm of topsoil for shrubs;
   - 90cm of topsoil for trees



Balled & Burlapped/ Wire Basket Deciduous Tree — 3 / L-5
SCALE: NTS

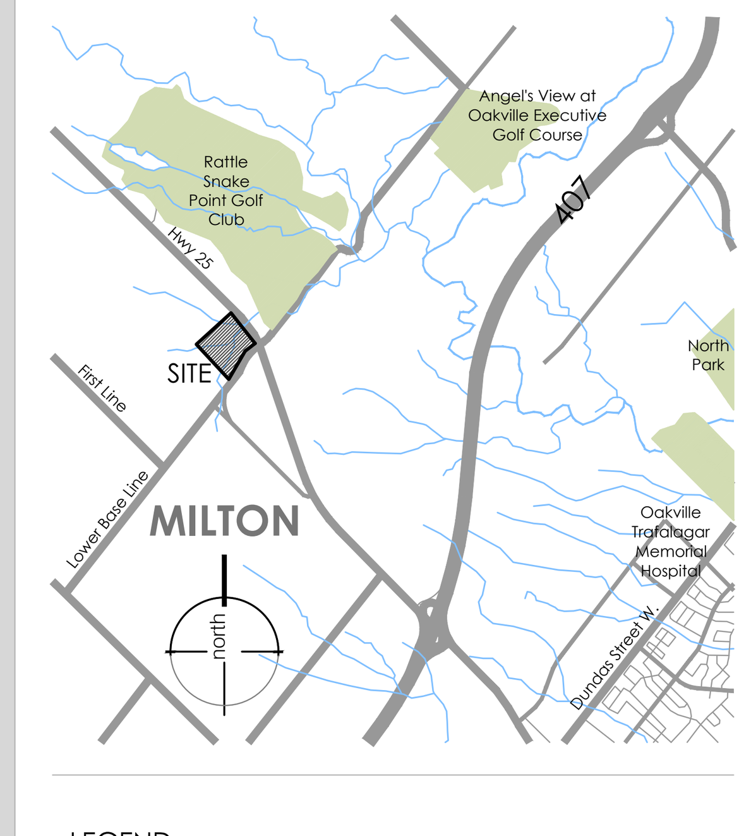


Balled & Burlapped/ Wire Basket Coniferous Tree — 4 / L-5
SCALE: NTS



Slope Planting — 5 / L-5
SCALE: NTS

KEY MAP - N.T.S.



LEGEND

proposed deciduous tree
proposed coniferous tree
proposed shrub
181.98	existing elevation
(179.70)	proposed elevation
	min. 200mm topsoil, fine grade & seed with turf mix
	min. 200mm topsoil, fine grade & seed with Upland Dry Meadow Mix

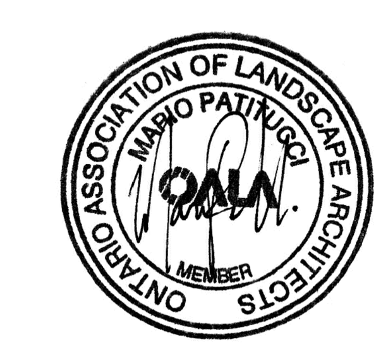
FOR LANDSCAPE NOTES REFER TO L-2

ISSUED FOR TENDER

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2021-06-25	Issued for Submission
2	2022-09-21	Issued for Submission
3	2022-12-15	Issued for Submission
4	2023-05-26	Issued for Permit
5	2023-05-31	Issued for Tender
6	2023-10-17	Issued for SI #1

STAMP



CLIENT
The Catholic Cemeteries

MUNICIPALITY
Town of Milton

PROJECT
Holy Family Cemetery
Crematorium Building
2523 Lower Base Line Road

MUNICIPAL FILE NUMBER
SP 19/21

SHEET
Landscape Plan and Details
RESTORATION PLANTING
SECTION 2

L-5

adesso design inc.
landscape architecture

218 Locke Street South, 2nd Floor
Hamilton, ON L8P 4B4
t. 905.526.8876
www.adessodesigninc.ca