1050 TAWADINA ROAD
OTTAWA, ON
INFILTRATION FACILITY DESIGN

1050 TAWADINA
INFILTRATION FACILITY

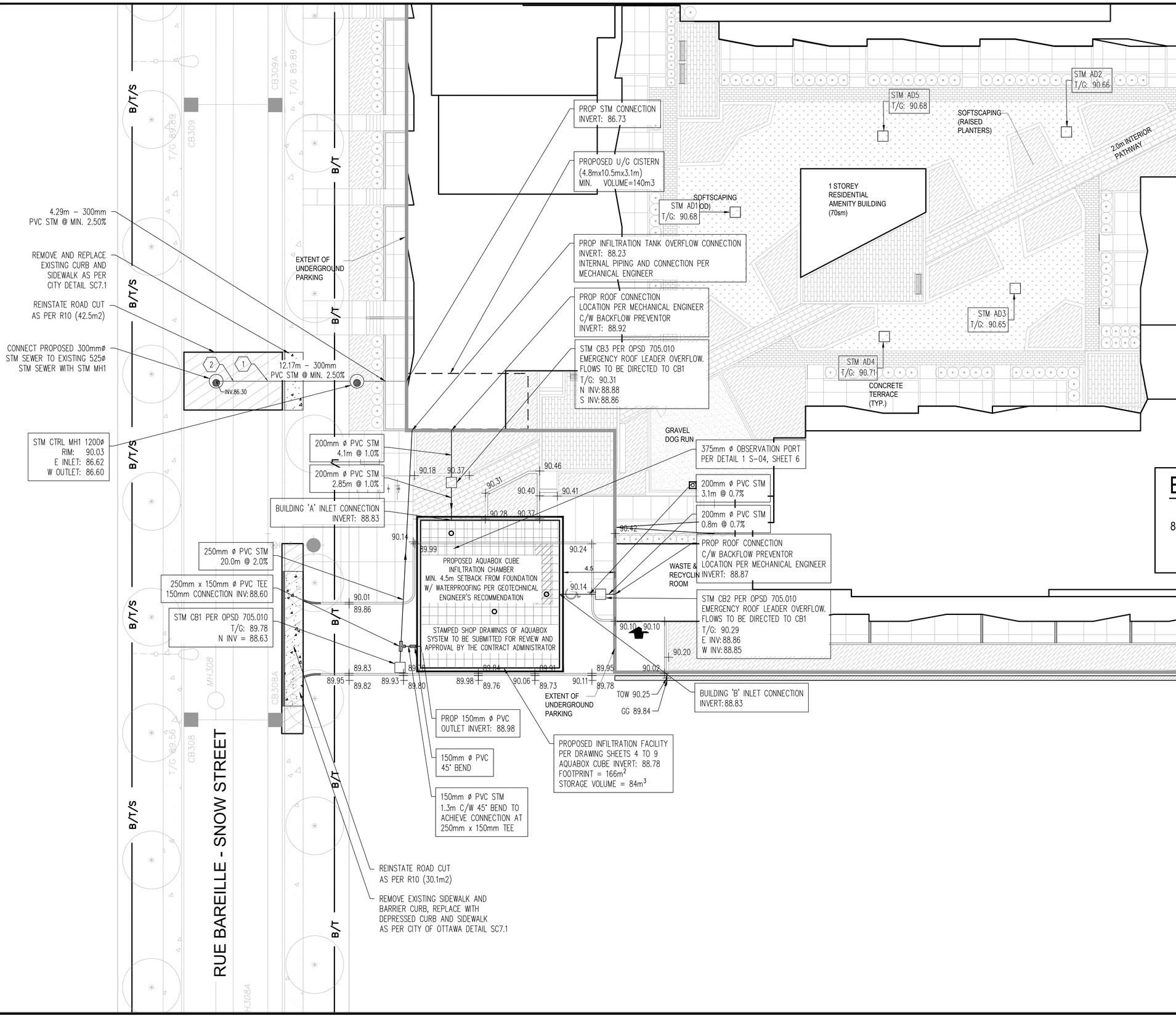
ISSUED FOR REVIEW

LIST OF DRAWINGS:

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed _____
Date _____ 2024
Plan Number _____

D07-12-23-0023

#67407



PHASE 4

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed _____
Date _____ 2024
Plan Number _____

GENERAL NOTES:

1. ALL ELEVATIONS ARE IN METRES AND REFERENCED TO LOCAL DATUM. ALL DIMENSIONS ARE IN METRIC UNITS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT AND SURVEY CONTROL DURING CONSTRUCTION.
3. THE CONTRACTOR IS RESPONSIBLE FOR LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL DELINEATE THE REQUIRED WORKING AREA ON-SITE PRIOR TO THE START OF WORK AND SHALL CONFINE OPERATIONS WITHIN THE DEFINED AREA. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO ANY WATER/WATERCOURSE/WETLAND NATURAL FEATURE, STORM SEWER OR SANITARY SEWER.
5. EROSION AND SEDIMENT CONTROL MEASURES (AND TREE/SHRUB PROTECTION BARRIERS) WILL BE IMPLEMENTED PRIOR TO AND MAINTAINED DURING THE CONSTRUCTION PHASES TO PREVENT ENTRY OF SEDIMENT INTO THE INFILTRATION FACILITY. THESE EROSION AND SEDIMENT CONTROL MEASURES WILL BE REMOVED FOLLOWING CONSTRUCTION COMPLETION AND WHEN DISTURBED AREAS HAVE BEEN STABILIZED AND VEGETATION ESTABLISHED.
6. ALL AREAS WHICH REMAIN DISTURBED FOR MORE THAN 30 DAYS MUST BE STABILIZED TO THE SATISFACTION OF THE RELEVANT AGENCIES, THE CLIENT AND OR THE SITE ENGINEER.
7. ALL SITE RESTORATION TO BE IN ACCORDANCE WITH THE LANDSCAPE REHABILITATION PLANS AND DETAILS.
8. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL DEBRIS.
9. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED DAILY TO ENSURE THAT THEY ARE FUNCTIONING PROPERLY AND ARE MAINTAINED AND/OR UPGRADED AS REQUIRED

THE POSITION OF THE POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UTILITIES AND STRUCTURES ARE N O T NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK

THE CONTRACTOR SHALL CONFIRM THE POSITION AND EXACT LOCATION OF ALL SUCH UTILITIES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM MADE DURING THE COURSE OF THE CONTRACT WORK.

LEGEND:

- HEAVY DUTY SILT FENCE
- SEDIMENT LOG
- AQUABOX CUBE INFILTRATION FACILITY
- SEWER PIPE
- CATCHBASIN
- CONSTRUCTION ACCESS
- 375mm Ø OBSERVATION PORT

No.	REVISIONS	By	Date
6			
5			
4			
3	SUBMISSION No.3 FOR ISSUED REVIEW	JM	01:04:24
2	SUBMISSION No.2 FOR ISSUED REVIEW	JM	07:11:23
1	SUBMISSION No.1 FOR ISSUED REVIEW	JM	11:09:23

02 OF 09

Aquafor Beech Limited
#2-202-2600 SKYMARK Ave,
MISSISSAUGA, ONTARIO, L4W 5B2
PHONE: (905) 629-0099, FAX: (905) 629-0089

Project Title

1050 TAWADINA ROAD STORMWATER MANAGEMENT

INFILTRATION FACILITY DESIGN

LICENSED PROFESSIONAL ENGINEER
C. J. DEWICH
100134682
01/04/2024
PROVINCE OF ONTARIO

Drawing Title

GENERAL PLAN

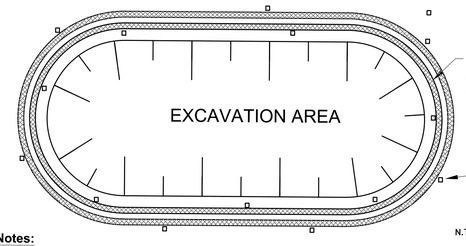
Scale

1:150

Design	Date
J.M.	01/04/2024
Drawn	Checked
J.M.	
Project No.	Drawing No.
XXXXXX	GP-1

D07-12-23-0023

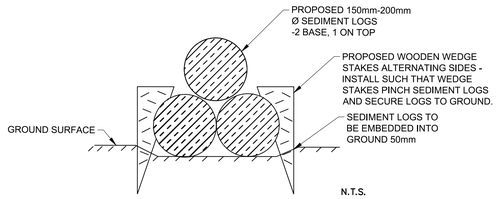
#67407



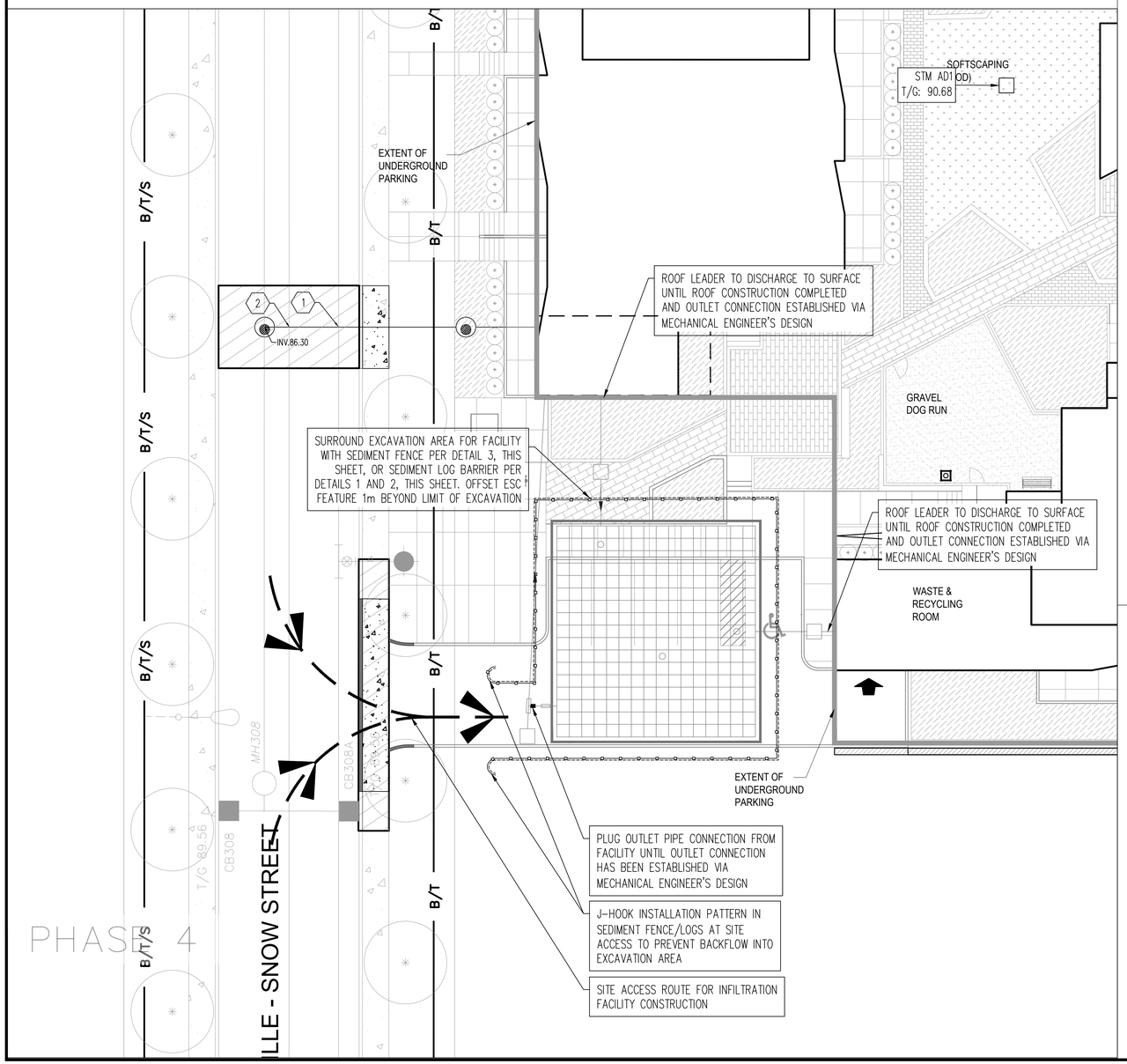
Notes:

1. SEDIMENT LOGS SHALL BE INSTALLED AROUND THE PERIMETER OF THE EXCAVATION AREA IDENTIFIED IN THE PLANS.
2. SEDIMENT LOGS DAMAGED DURING CONSTRUCTION ACTIVITIES SHALL BE REMOVED AND REPLACED PRIOR TO CONTINUING THE WORKS.
3. SEDIMENT LOGS SHALL BE STAKED IN PLACE USING WEDGE STAKES OR WEIGHTED BARRIERS SUCH AS SAND BAGS OR BRICKS SUCH THAT THE BOTTOM ROWS OF SEDIMENT LOGS ARE SECURED TO GROUND SURFACE. STAKES SHALL NOT BE INSTALLED THROUGH THE SEDIMENT LOGS.
4. WHERE PLACED ON PERVIOUS SURFACES, SEDIMENT LOGS TO BE TRENCHED INTO NATIVE SOIL MIN. 50mm DEPTH.

DTL 01 SEDIMENT LOG DETAIL



DTL 02 SEDIMENT LOG CONFIGURATION DETAIL

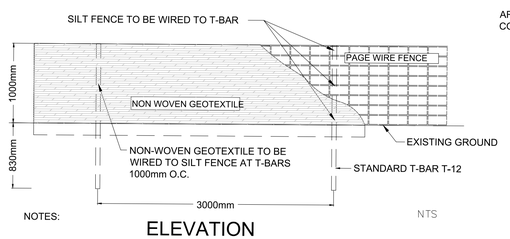


INFILTRATION FACILITY ESC NOTES

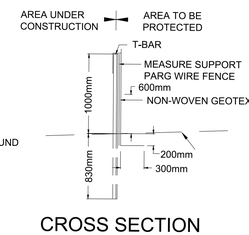
1. DURING CONSTRUCTION, PROVISIONS SHALL BE MADE FOR PROPER WATER MANAGEMENT AND DRAINAGE OF THE SITE. THIS SHALL INCLUDE ALL APPLICABLE SILT TRAPS, ALL EROSION CONTROL MEASURES, TEMPORARY WATER COLLECTION DITCHES AND OVERFLOW STRUCTURES DENOTED WITHIN THIS ESC PLAN, AS WELL AS THE PROPER MAINTENANCE OF SUCH THROUGHOUT THE CONSTRUCTION PERIOD. AT NO TIME SHALL SEDIMENT LADEN WATER BE ALLOWED TO ENTER THE EXCAVATED/BACKFILLED OR COMPLETED INFILTRATION CHAMBER AREA. PRIOR TO THE COMPLETION OF ROOFTOP AREAS FOR BUILDING 'A' AND BUILDING 'B', AS WELL AS CONNECTION OF THE OUTLET TO THE UNDERGROUND CISTERN, NO SITE DRAINAGE AND/OR STORM DRAINAGE IS TO ENTER THE PROPOSED INFILTRATION CHAMBER AREA. SHOULD SEDIMENT ENTER THE FACILITY PRIOR TO RECEIVING APPROVAL FROM FIELD ENGINEER, THE INFILTRATION RATE OF THE CONTAMINATED AREA SHOULD BE TESTED USING THE GUELPH PERMEAMETER TEST OR DOUBLE-RING INFILTRATION TEST, TO CONFIRM NO LOSS IN INFILTRATION POTENTIAL. SHOULD A LOSS OF INFILTRATION CAPACITY BE CONFIRMED, THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REPAIR/ REMEDIATION OF THE CONTAMINATED AREA TO THE SATISFACTION OF THE CLIENT/ ENGINEER/ LANDSCAPE ARCHITECT, USING APPROVED MEASURES/ MATERIALS AND PRACTICES.
2. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED / AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, THEN ALTERNATIVE MEASURES SHOULD BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS.
3. ADHERENCE TO CONSTRUCTION SEQUENCING IS REQUIRED AS PART OF THE ESC PLAN. CONSTRUCTION SEQUENCING IS AN INTEGRAL COMPONENT OF ESC PROCEDURES/ PRACTICES AND HAS BEEN DESIGNED IN ORDER TO ENSURE THAT NO CONTAMINATION/ REDUCTION IN INFILTRATION CAPACITY TAKES PLACE AS A RESULT OF CONSTRUCTION ACTIVITIES.
4. TEMPORARY SEDIMENT CONTROLS TO BE INSTALLED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED WITHIN 48 HOURS OF THE INSPECTION.
5. SEDIMENT LOG/SOCKS, HEAVY DUTY SEDIMENT FENCE, OR APPROVED EQUIVALENT SHALL BE INSTALLEDALONG THE PERIMETER OF THE EXCAVATION AREA OF THE INFILTRATION CHAMBER WITH A 1.0m SETBACK PRIOR TO FACILITY CONSTRUCTION TO PREVENT SEDIMENT ENTRY INTO THE INFILTRATION CHAMBER.
6. ANY AND ALL ACCUMULATED AND/OR STORED WATER WITHIN THE EXCAVATED AREAS SHALL BE ALLOTTED SUFFICIENT TIME TO SETTLE OUT SUSPENDED SEDIMENTS AS DETERMINED BY THE FIELD ENGINEER PRIOR TO PUMPING/DISCHARGE TO A DESIGNATED AREA AND SEDIMENT BAG.
7. AFTER THE COMMENCEMENT OF EXCAVATION, SHOULD A SIGNIFICANT STORM EVENT OCCUR THAT FILLS OR PARTIALLY FILLS THE EXCAVATED AREA/CONSTRUCTION SITE, PUMPING SHOULD BE UNDERTAKEN AS PER NOTE 6.
8. NO RUNOFF FROM THE EXCAVATED AREA AND UNVEGETATED AREAS SHALL BE DISCHARGED OFF SITE INTO ACTIVE AND/OR INACTIVE STORM SEWERS. SEE NOTE 6 ABOVE.
9. CONTRACTOR IS RESPONSIBLE FOR ANY REMEDIATION/REPAIR OF INFILTRATION FACILITIES DAMAGED AS A RESULT OF INADEQUATE OR IMPROPER SEDIMENT CONTROL.
10. THE CONTRACTOR SHALL DELINEATE THE REQUIRED WORKING AREA ON-SITE PRIOR TO THE START OF WORK AND SHALL CONFINE OPERATIONS WITHIN THE DEFINED AREA.
11. TEMPORARY TOPSOIL AND/OR FILL MATERIAL STOCKPILE AREAS TO BE ENCLOSED WITH SILTATION CONTROL FENCE. MATERIALS ARE NOT TO BE STOCKPILED UPSTREAM OF PROPOSED FACILITY.
12. LOCATION OF STOCKPILE AREAS TO BE DETERMINED ON-SITE PRIOR TO CONSTRUCTION AND APPROVED BY THE ENGINEER.
13. WORKING AREAS, ACCESS REQUIREMENTS, AND TEMPORARY MATERIAL STORAGE AREAS TO BE MAINTAINED IN GOOD CONDITION BY THE CONTRACTOR AT ALL TIMES. AREAS AFFECTED BY THE CONTRACTOR'S ACTIVITIES TO BE REINSTATED TO THE EXISTING CONDITIONS OR BETTER.
14. NO RUNOFF FROM EXCAVATED OR UNVEGETATED AREAS SHALL BE DISCHARGED OFF SITE INTO ACTIVE AND/OR INACTIVE STORM SEWERS OR WATERCOURSES.
15. ALL ACCUMULATED SEDIMENTS TO BE REMOVED PRIOR TO THE REMOVAL OF CONTROLS AND DISPOSED OF IN AN APPROVED ON-SITE LOCATION BY THE CONTRACTOR (LOCATION TO BE DETERMINED IN THE FIELD).
16. ON-SITE EQUIPMENT REFUELING AND MAINTENANCE TO BE ONLY COMPLETED IN DESIGNATED AREAS.
17. SEDIMENT CONTROLS TO BE INSPECTED DAILY AND AFTER EACH RAINFALL EVENT. SEDIMENT CONTROLS TO BE MAINTAINED AND REPAIRED BY THE CONTRACTOR UNTIL COMPLETION OF CONSTRUCTION AND SITE RESTORATION.
18. ANY DAMAGE TO EXISTING FEATURES OR SURFACES DUE TO CONSTRUCTION ACTIVITY SHALL BE REINSTATED TO EXISTING CONDITIONS OR BETTER PRIOR TO COMPLETION OF CONSTRUCTION ACTIVITIES ON SITE TO THE SATISFACTION OF THE RELEVANT AGENCIES, THE CLIENT, AND/OR THE SITE ENGINEER.
19. ALL ROADWAYS TO BE CLEANED OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.
20. EROSION PROTECTION TO BE PROVIDED AROUND ALL EXISTING STORM AND SANITARY MHs , DICBs AND CBs PRIOR TO CONSTRUCTION.
21. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE RESTORATION, AND REINSTATE AFFECTED AREAS TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE RELEVANT AGENCIES, THE CLIENT, AND/OR THE SITE ENGINEER.

INFILTRATION FACILITY CONSTRUCTION SEQUENCING NOTES

1. EROSION AND SEDIMENTATION PROTECTION MEASURES ARE REQUIRED PRIOR TO THE COMMENCEMENT OF ANY AND ALL EXCAVATION ACTIVITIES.
2. ROUGH EXCAVATION OF THE INFILTRATION FACILITY IS PERMITTED TO A MAXIMUM 100mm OF FINAL GRADE AT INVERT OF 19mm LEVELING COURSE ANGULAR STONE. FINAL GRADE OF THE INFILTRATION FACILITY TO BE EXCAVATED IMMEDIATELY PRIOR TO BACKFILLING WITH SPECIFIED AGGREGATE AVOID PREMATURE FACILITY CLOGGING.
3. EXCAVATION, 19mm ANGULAR STONE BACKFILLING AND CHAMBER INSTALLATION IS ONLY TO OCCUR AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
4. EXCAVATION OF FINAL 100mm OF NATIVE MATERIAL TO FINAL FACILITY INVERT AS PER DESIGN DRAWINGS. SURFACE OF EXCAVATION SHALL BE SCARIFIED PRIOR TO INSTALLATION OF BACKFILL MATERIALS.
5. INSTALL AQUABOX CHAMBER COMPONENTS TO SPECIFIED LOCATIONS AND DEPTHS AS MARKED ON THE ASSOCIATED DESIGN DRAWINGS. MAKE ALL REQUIRED PIPE CONNECTIONS.
6. APPLY19mm ANGULAR STONE IN 300mm LIFTS UNTIL DESIRED ELEVATION IS ACHIEVED.
7. SURFACE INSTALLATION:
   A. APPLY AND COMPACT BACKFILL MATERIAL/PARKING LOT SUB BASE MATERIALS APPROVED BY THE CONTRACT ADMINISTRATOR TO MINIMUM 300mm THICKNESS.
   B. INSTALL PROPOSED IMPERVIOUS SURFACE MATERIAL ABOVE INFILTRATION FACILITY AREA AS PER DESIGN DRAWING.



- SILTATION CONTROL FENCE TO BE TERRAFIX TERRAFENCE, OR EQUIVALENT, OR CONSTRUCTED AS INDICATED BELOW.
- GEOTEXTILE TO BE NON-WOVEN WITH A MINIMUM EQUIVALENT OPENING SIZE OF 0.15mm AND A MAXIMUM EQUIVALENT OPENING SIZE OF 0.25mm
- NON-WOVEN GEOTEXTILE TO HAVE A HORIZONTAL OVERLAP OF 1 METER AT JOINTS.
- SILT FENCE TO BE UV STABILIZED HIGH DENSITY POLYETHYLENE OR APPROVED EQUAL.



DTL 03 HEAVY DUTY SEDIMENT FENCE DETAIL

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH
Signed _____
Date _____ 2024
Plan Number _____

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- 375mm Ø OBSERVATION PORT

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5			
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03 OF 09

Aquafor Beech Limited
#6-202-2600 SKYMARK Ave,
MISSISSAUGA, ONTARIO, L4W 5B2
PHONE: (905) 629-0099, FAX: (905) 629-0089

Project Title
1050 TAWADINA ROAD STORMWATER MANAGEMENT
INFILTRATION FACILITY DESIGN

LICENSED PROFESSIONAL ENGINEER
C. J. DENICH
100134582
01/04/2024
PROVINCE OF ONTARIO

Drawing Title
EROSION & SEDIMENT CONTROL PLAN

Scale
1:150

Design	Date
J.M.	01/04/2024
Drawn	Checked
J.M.	
Project No.	Drawing No.
XXXXXX	ESC-1

D07-12-23-0023

#67407

1 S-02 NOTES

NOTES:

a. All dimensions are measured in meters unless noted otherwise.

b. Reference Aquabox standard drawings and notes for detailed information.

c. Reference current Aquabox Module installation instructions for proper installation practices.

https://www.geoplastglobal.com/en/downloads/aquabox

d. Engineer of record to confirm conformance to manufacturer's allowable proximity to other structures and slopes.

e. All inlet and pipe locations and designs by others.

f. The sub-grade and side backfill needs to be compacted to 97%, unless noted otherwise.

g. During and after installation, the AquaBox Module area should be clearly marked and roped off to prevent unauthorized construction and equipment trafficking over the modules.

h. Top of Ground water is to be maintained 610 mm (2 ft) below the module to prevent buoyancy, unless otherwise noted by engineer.

i. The quantities related to stone and geosynthetics are estimated values as the roll size, overlaps, waste, ect. may vary.

j. Materials must be stored in a manner to prevent prolonged exposure to UV light.

k. Materials shall not be handled in temperatures lower than 4.4 °C to prevent damage.

l. Storm tank system is not considered complete until all backfill is installed to the minimum depth shown on Detail 5 Typical System Cross-Section. The installer MUST insure that the project site remains dry and free of water (both surface and groundwater) until the installation is complete, including the backfill as noted, to avoid damage to the tank system due to buoyancy.

Material Quantity (AQUABOX HP)

AquaBox HP	0
Sidewall Grid HP	0
Top Cap HP	1088
Single Joint	1022
Double Joint	0

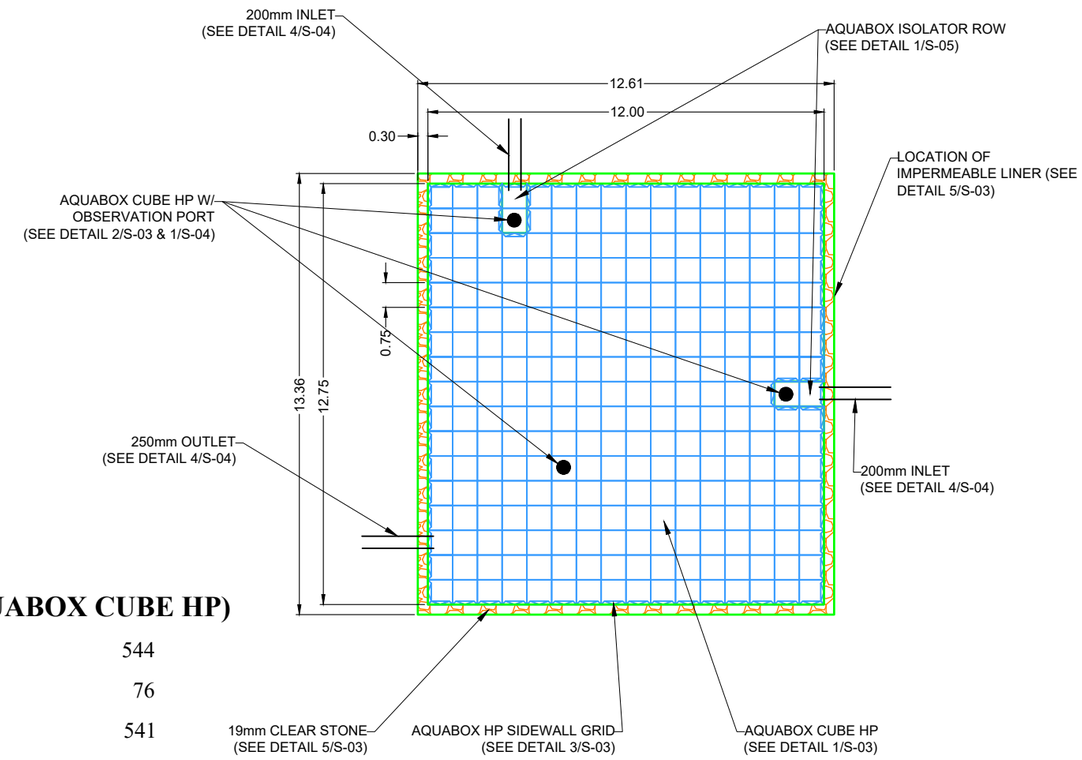
Material Quantity (AQUABOX CUBE HP)

AquaBox Cube HP	544
Sidewall Grid Cube HP	76
Circular Cap D400 HP	541
Surface Grate	3

Elevations

Leveling Stone Bottom	88.40
Bottom of Module	88.50
Module Invert	88.55
Top of Module	88.90
Top of Stone Backfill	89.20
Minimum Finished Grade *Must consider frost line, varies by region	89.50
Maximum Finished Grade	90.80

Contractor to confirm that quantities shipped to site match those listed above. Please report any discrepancy or damage to Layfield immediately.



2 S-02 MODULE LAYOUT SCALE: NTS

LICENSED PROFESSIONAL ENGINEER
J. CLARK
100573196
PROVINCE OF ONTARIO
2024-04-01

LAYFIELD
117 Basaltic Rd,
Concord, ON L4K 1G4 Canada
Ph: (905) 761-9123
www.layfieldgroup.com

Total Storage Volume		87.11 m^3
Module Storage Volume		57.26 m^3
Stone Storage Volume		29.86 m^3
System Footprint		168.46 m^2
Estimated Geotextile Fabric	NuBarrier	417 m^2
Estimated Geotextile Fabric	LP8	642 m^2
Estimated Liner (Sides Only)		154 m^2
Estimated GeoGrid		---- m^2
Estimated Stone Volume		74.65 m^3
Excavation Required		187.19 m^3
Minimum Excavation Depth		1.11 m
Stone Type		19mm Clear Stone
Stone Void Space		40%
Number of Module Layers		0.5
Allowable Loading		HS-25
Surface	Paved Surface	Vegetated/ Unpaved
Minimum Top Cover	0.60 m	0.80 m
Maximum Tank Depth	2.30 m	2.20 m

1050 TAWADINA ROAD

Ottawa, ON

REV	Record of Changes	Date	By
0	Preliminary Drawing	09-04-2023	PE
1	Resize Tank	31OCT2023	PE
2	Liner Added	07NOV2023	PE
3	Piping Adjustments	28MAR2024	PE

Project Number: OP2023-7273

Page Name: Module Layout

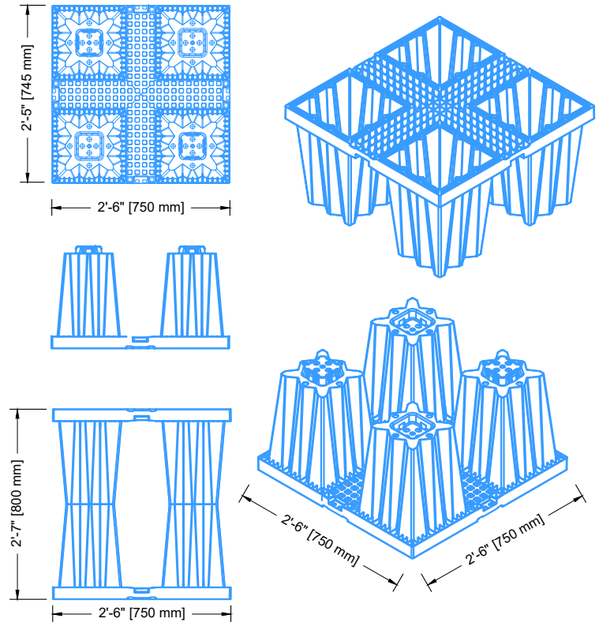
Drawn by: PE | Checked By: JF

Scale: NTS | Date: 09-04-2023

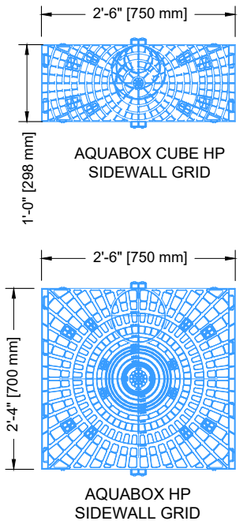
THIS LAYOUT DRAWING WAS PREPARED TO SUPPORT THE ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO REVIEW THE INFORMATION AND ENSURE THAT THE LAYOUT AND DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS AND THAT THE AQUABOX SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH GEOPLAST'S REQUIREMENTS. LAYFIELD DOES NOT REVIEW OR APPROVE PLANS, SIZING OR DESIGNS.

Sheet:

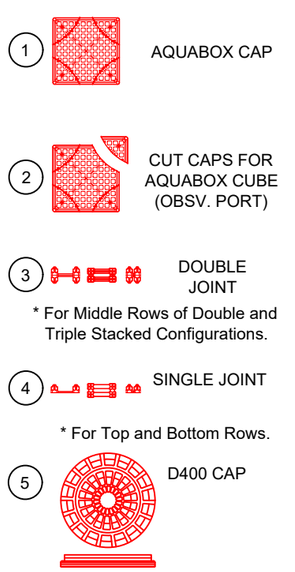
04 OF 09

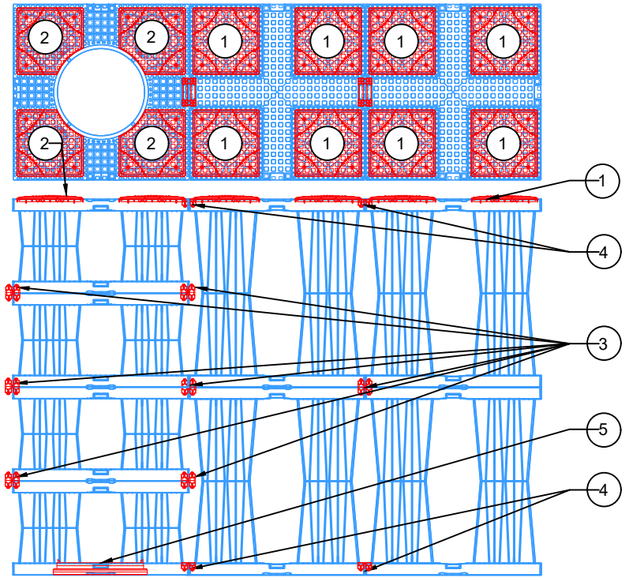


1 S-03 AQUABOX HP



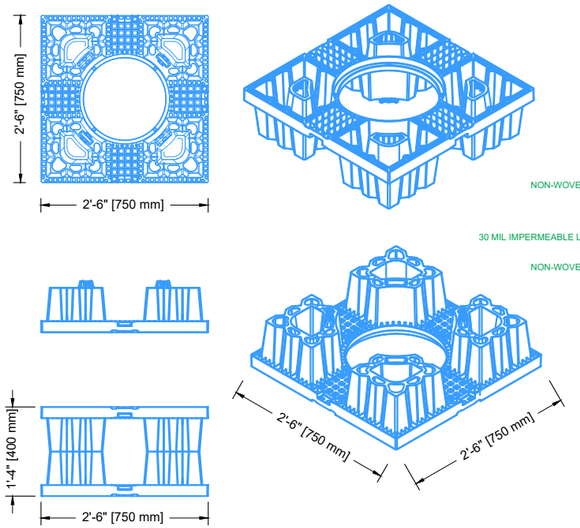
3 S-03 AQUABOX SIDEWALL GRID



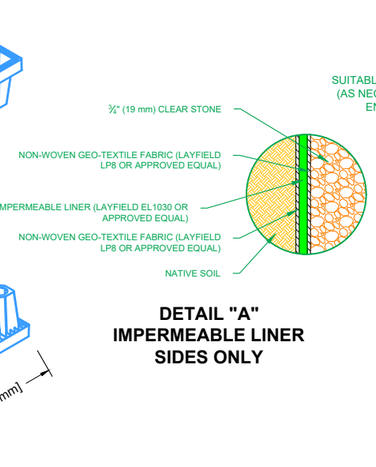


NOTE: THIS DETAIL DEPICTS ONLY THE LOCATION OF AQUABOX ACCESSORIES (CAPS/ CONNECTORS) AND DOES **NOT** REPRESENT THE PROJECT-SPECIFIC STACKING CONFIGURATION. REFER TO DETAIL 5/S-03 FOR STACKING CONFIGURATION AND CROSS-SECTIONAL DETAILS.

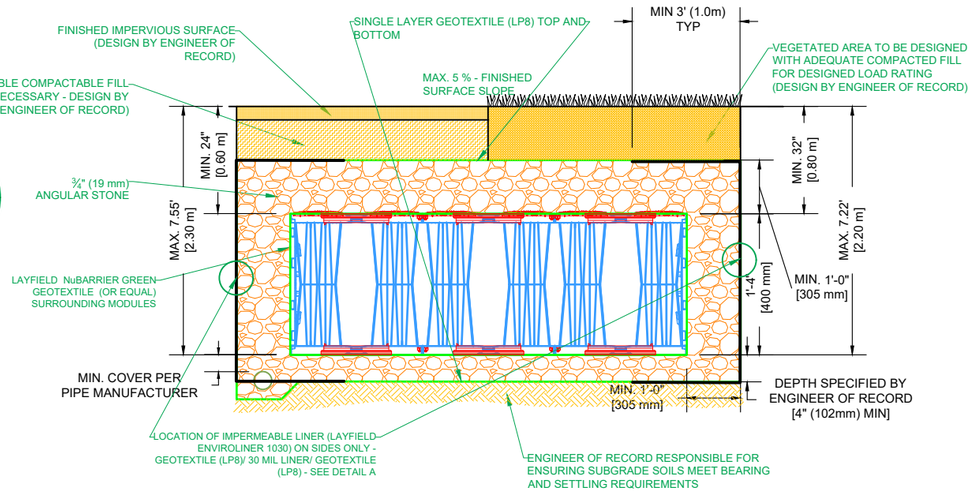
4 S-03 AQUABOX ACCESSORIES CAPS AND JOINTS



2 S-03 AQUABOX CUBE HP



DETAIL "A" IMPERMEABLE LINER SIDES ONLY



5 S-03 TYPICAL SYSTEM CROSS SECTION

LAYFIELD
117 Basaltic Rd,
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Stone Void Space		40%
Number of Module Layers		0.5
Allowable Loading		HS-25

Surface	Paved Surface	Vegetated/ Unpaved
Minimum Top Cover	0.60 m	0.80 m
Maximum Tank Depth	2.30 m	2.20 m

1050 TAWADINA ROAD

Ottawa, ON

REV	Record of Changes	Date	By
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1	Resize Tank	31OCT2023	PE
2	Liner Added	07NOV2023	PE
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Project Number: OP2023-7273

Page Name: TYP. Construction Details

Drawn by: PE | Checked By: JF

Scale: NTS | Date: 09-04-2023

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2024-04-01

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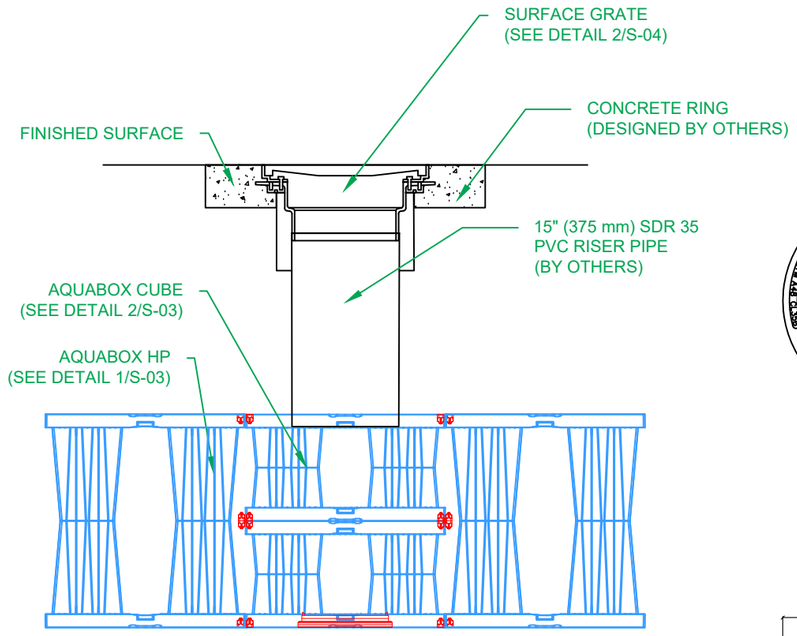
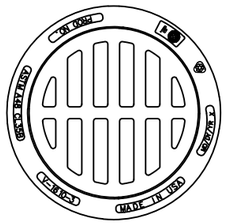
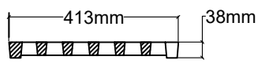
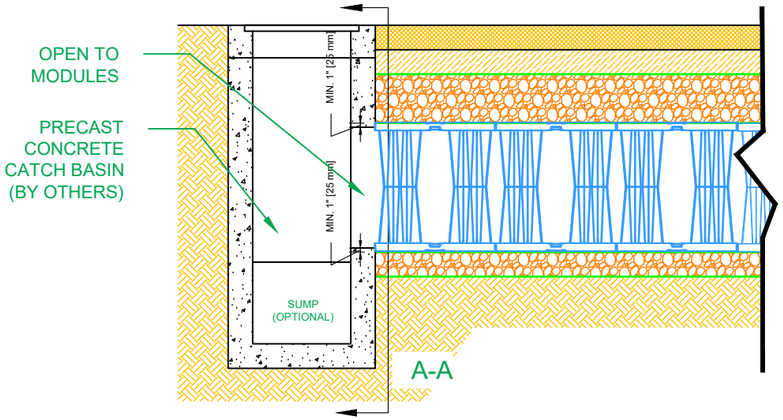
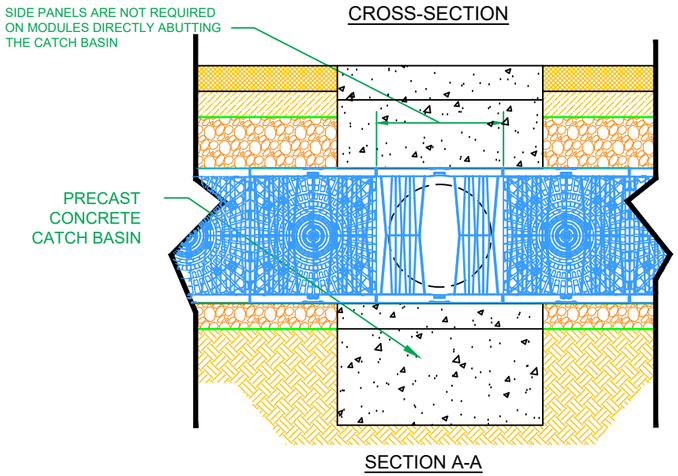






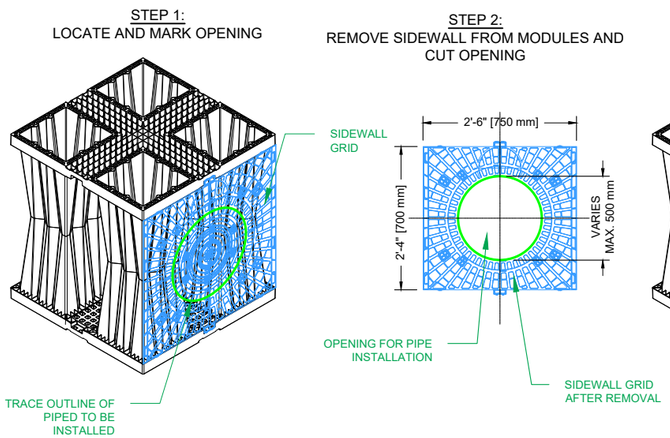




1 S-04 AQUABOX OBSERVATION PORT

2 S-04 OBSERVATION PORT SURFACE GRATE

3 S-04 AQUABOX CATCHBASIN ABUTMENT (IF APPLICABLE)



4 S-04 PIPE CONNECTION DETAIL

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Page Name: TYP. Pipe Penetration Details

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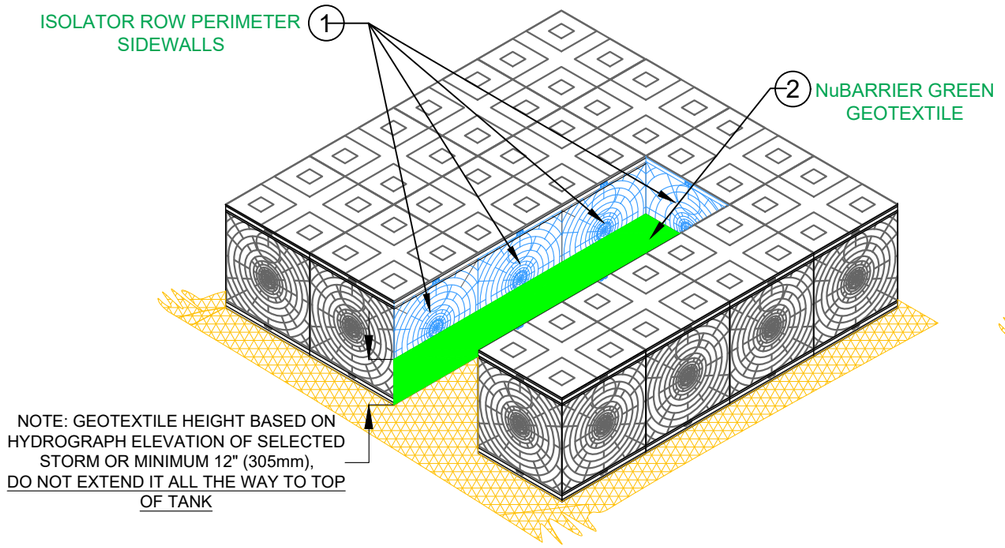
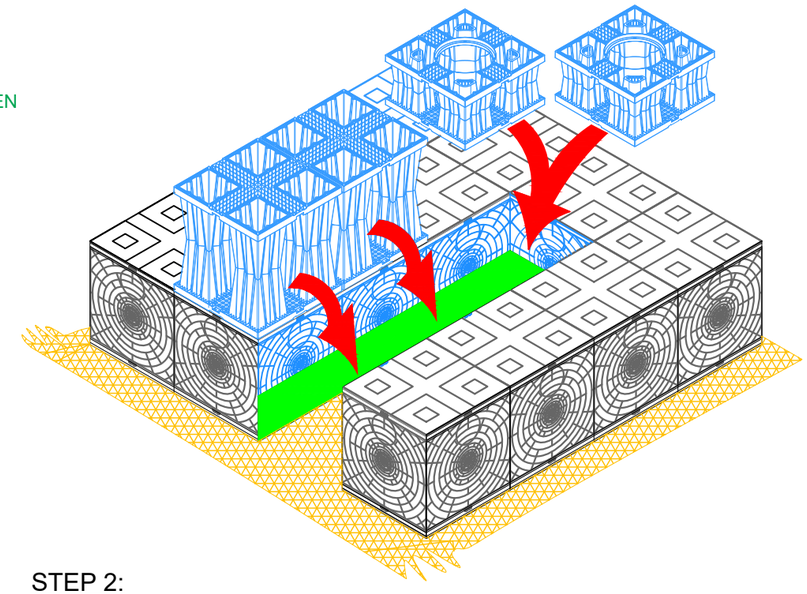
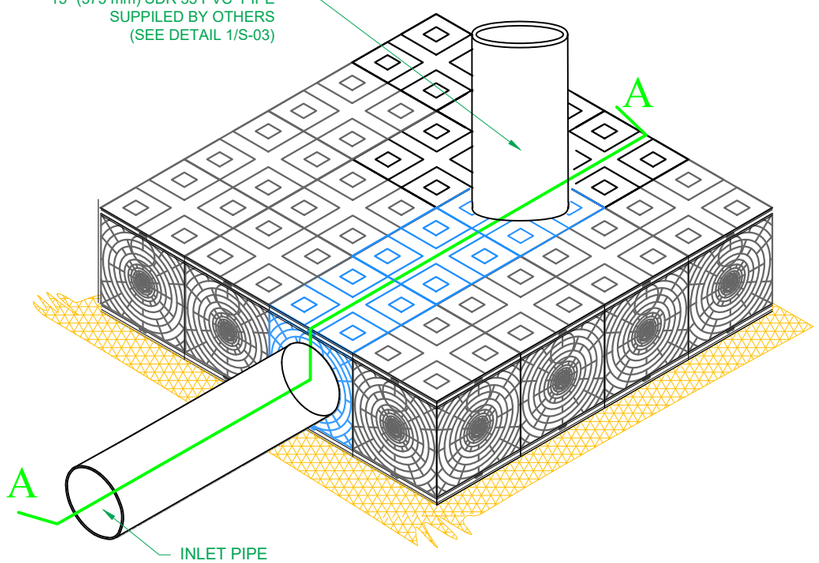


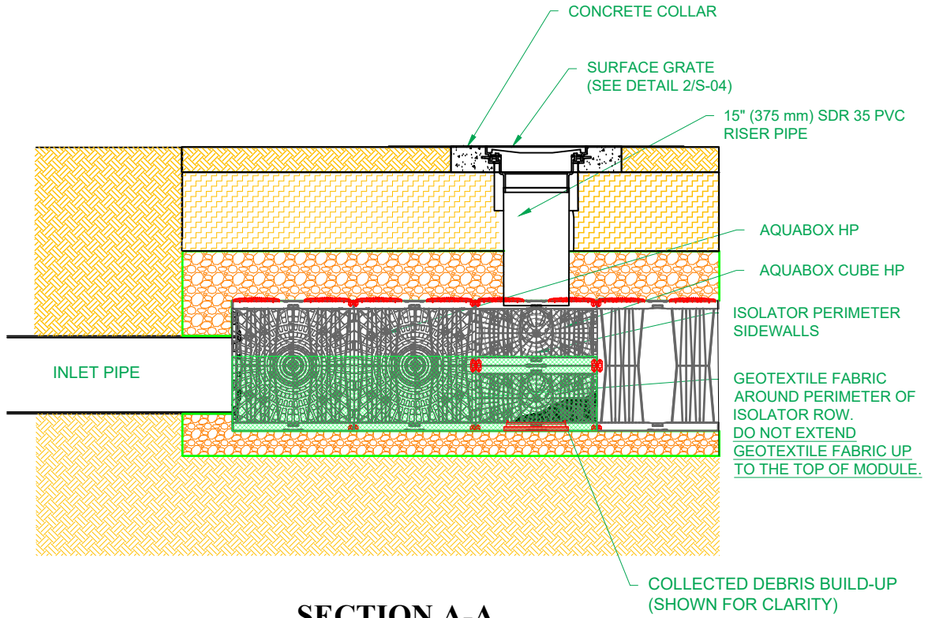
STEP 1:
INSTALL ISOLATER ROW PERIMETER SIDEWALLS AND ATTACH GEOTEXTITLE TO THEM.



STEP 2:
PLACE AQUABOX HP AND AQUABOX HP CUBE MODULES IN THE ISOLATER ROW AS PER MODULE LAYOUT 2/S-02



STEP 3:
INSTALL INLET PIPE AS PER DETAIL 4/S-04 AND CONNECTOR PIPE FOR OBSERVATION PORT AS PER DETAIL 1/S-04



SECTION A-A

1 S-05 **ISOLATOR ROW INSTALLATION DETAIL**

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General Conditions

- Review installation procedures and coordinate the installation with other construction activities, such as grading, excavation, utilities, construction access, erosion control, etc.
- Engineered Contract Drawings supersede all provided documentation, as the information furnished in this document is based on a typical installation.
- Coordinate the installation with the manufacturer's representative/distributor to be on-site to review start-up procedures and installation instructions.
- Components shall be unloaded, handled and stored in an area protected from traffic and in a manner to prevent damage.
- Assembled modules may be walked on, but vehicular traffic is prohibited until backfilled per the Manufacturer's requirements. Protect the installation against damage with highly visible construction tape, fencing, or other means until construction is complete.
- Ensure all construction occurs in accordance with Federal, Provincial and Local Laws, Ordinances, Regulations, and Safety Requirements.
- Extra care and caution should be taken when temperatures are at or below -5.0° C.

NOT FOR CONSTRUCTION

These drawings shall not be used for construction until they have been reviewed for all design aspects (structural, geotechnical, stormwater) and approved by the Engineer of Record for the Project.

It is the Buyer's responsibility to ensure that the design into which the Product will be used has been approved by the Engineer of Record (not Layfield) with a review that may include, but not be limited to, Inlet and outlet configurations including inverts and pipe connections, storage volume, system footprint, Aquabox elevations including cover soil requirements, buoyancy and groundwater conditions, and proximity to structures and slopes.

Site design/engineering elements may include but not be limited to the following:

- Review elevations and if necessary adjust grading to ensure the chamber cover requirements are met.
- Evaluating site-specific information on soil conditions and/or bearing capacity.
- Assessing the bearing resistance (allowable bearing capacity) of the subgrade soils and the depth of foundation stone with consideration for the range of expected soil moisture conditions.

1.0 Basin Excavation

1. Stake out and excavate to elevations per approved plans. Excavation Requirements:
   a. Sub-grade excavation must be a minimum of 4" (102 mm) below the designed AquaBox Module invert.
   b. The excavation should extend a minimum of 12" (305 mm) beyond the AquaBox dimensions in each length and width (an additional 24" [610 mm] in total length and total width) to allow for adequate placement of side backfill material.
   c. Remove objectionable material encountered within the excavation, including protruding material from the walls.
   d. Furnish, install, monitor, and maintain excavation support (e.g., shoring, bracing, trench boxes, etc.) as required by Federal, Provincial and Local Laws, Ordinances, Regulations, and Safety Requirements.

2.0 Sub-Grade Requirements

1. Sub-grade shall be unfrozen, level (plus or minus 1%), and free of lumps, or debris with no standing water, mud or muck. Do not use materials nor mix with materials that are frozen and/or coated with ice or frost.
2. Unstable, unsuitable, and/or compromised areas should be brought to the Engineer's attention and mitigating efforts determined prior to compacting the sub-grade.
3. Sub-grade must be compacted to 97% Standard Proctor Density or as approved by the Engineer of Record. If code requirements restrict subgrade compaction, it is the requirement of the geotechnical engineer to verify that the bearing capacity and settlement criteria for support of the system are met.

* The Engineer of Record shall confirm minimum soil bearing capacity required based on Load Rating and top cover depth. Minimum soil bearing capacity is required so that settlements are less than 1" through the entire sub-grade and do not exceed long-term 1/2" differential settlement between any two adjacent units within the system. Sub-grade must be designed to ensure soil bearing capacity is maintained throughout all soil saturation levels.

3.0 Leveling Bed Installation

1. Install geotextile fabric and/or liner material, as specified.
   a. Geotextile fabric shall be placed per the manufacturer's recommendations.
   b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. After the geotextile is secured, place a minimum 4" (102 mm) Leveling Bed.
   a. Material should be a 3/4" (19 mm) angular stone meeting AASTHO #56, 57, 67, 68 Material specifications.
   b. Material should be raked free of voids, lumps, debris, sharp objects, and plate vibrated to a level with a maximum 1% slope.
3. Correct any unsatisfactory conditions.

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4.0 AquaBox Module Assembly and Placement

1.0 AquaBox Assembly

AquaBox modules are delivered to the site as palletized components requiring simple assembly. No special equipment, tools or bonding agents are required; only a rubber mallet. The modules can be pre-assembled either inside or outside the trench. The pre-assembled modules must then be organized according to the design specifications.

ASSEMBLY INSTRUCTIONS:

1. Each AquaBox features plug and socket connections which makes assembling the modules quick and easy. Simply lay one element on the ground and join it to another by applying some pressure on the top.

GENERAL NOTES:

- Remove packaging material and check for any damage. Report any damaged components to an AquaBox Distributor or Layfield personnel.
- AquaBox components are backed by a 50 year warranty when installed per the manufacturer's recommendations.

2.0 AquaBox Placement

1. Install geotextile fabric and/or liner material, as specified.
   a. Geotextile fabric shall be placed per the manufacturer's recommendations.
   b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. Mark the footprint of the modules for placement.
   a. Ensure module perimeter outline is square or similar prior to Module placement.
   b. Care should be taken to note any connections, ports or other irregular units to be placed.
3. Install the individual modules by hand, as detailed below.
   a. The modules should be installed as shown in the AquaBox submittal drawings. Place AquaBox Cubes at the location of observation ports.
   b. Modules are connected horizontally to adjacent modules with Single or Double Joints.
   c. Use Single Joints for Bottom and Top rows while Double Joints are used for middle rows in Double or Triple stacking configuration.
   d. For double/ triple stack configurations:
      i. Use the Single Joints for the first bottom row.
      ii. Install Double Joints on all the middle rows.
      iii. Place the upper module directly on top of the bottom module in the same direction.

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4. Install the modules to completion, taking care to avoid damage to the geotextile and/or liner material.
5. Once all the modules have been placed, Install SIDEWALLS on the perimeter and CAPS on the top.
6. Locate any ports or other penetration of the AquaBox.
    a. Install ports/penetrations in accordance with the approved submittals, contract documents, and manufacturer's recommendations.
6. Upon completion of module installation, wrap the modules in geotextile fabric and/or liner.
    a. Geotextile fabric shall be wrapped and secured per the manufacturer's recommendations.
    b. Seal any ports/penetrations per the Manufacturer's requirements

Notes:

- If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations

6.0 Side Backfill

1. Inspect all geotextiles, ensuring that no voids or damage exists; which will allow sediment into the AquaBox system.
2. Adjust the stone/soil interface geotextile along the side of the native soil to ensure the geotextile is taught to the native soil.
3. Once the geotextile is secured, begin to place the Side Backfill.
    a. Material should be a 3/4" (19 mm) angular stone meeting AASTHO #56, 57, 67, 68 Material specifications.
    b. Backfill sides "evenly" around the perimeter without exceeding single 12" (305 mm) lifts.
    c. Place material utilizing an excavator, dozer, or conveyor boom.
    d. Utilize a plate vibrator to settle the stone and provide uniform distribution.

Notes:

- Do not apply vehicular load to the modules during placement of side backfill. All material placement should occur with equipment located on the native soil surrounding the system.
- If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations

7.0 Top Backfill (Stone)

1. Begin to place the Top Backfill.
    a. Material should be a 3/4" (19 mm) angular stone meeting AASTHO #56, 57, 67, 68 Material specifications.
    b. Place material utilizing an excavator, dozer, or conveyor boom and use a walk-behind plate vibrator to settle the stone and provide even distribution.

DO NOT DRIVE ON THE MODULES WITHOUT REQUIRED MINIMUM COVER.

2. Upon completion of Top Backfilling, wrap the system in geotextile fabric and/or liner per the manufacturer's recommendations.
3. Install metallic tape around the perimeter of the system to mark the area for future utility detection.

Notes:

- If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations.
- Only Low Ground Pressure tracked equipment can be used during construction with at least 300 mm suitably compacted covering created over the AquaBox System. Abrupt maneuvers such as steering should be avoided at this stage.
- The passage of heavy goods vehicles with a wheel load of more than 50 kN over the basin is possible if the thickness of the covering is adequately compacted and not less than 600 mm. When dumping the backfill material, the load per wheel shall not exceed 50 kN.

8.0 Suitable Compactable Fill

Following Top Backfill placement and geotextile fabric wrapping; complete the installation as noted below.

Vegetated Area

1. Place fill onto the geotextile.
    a. Maximum 12" (305 mm) lifts, compacted with a vibratory plate or walk behind roller to a minimum of 90% Standard Proctor Density.
    b. The minimum top cover/backfill to finished grade must not be less then that shown on Detail 5 Typical System Cross Section, and the maximum depth from final grade to the bottom of the lowest module should not exceed that shown on Detail 5.
2. Finish to the surface and complete with vegetative cover.

Impervious Area

1. Place fill onto the geotextile.
    a. Maximum 12" (305 mm) lifts, compacted with a vibratory plate or walk behind roller to a minimum of 90% Standard Proctor Density.
    b. b. The minimum top cover/backfill to finished grade must not be less then that shown on Detail 5 Typical System Cross Section, and the maximum depth from final grade to the bottom of the lowest module should not exceed that shown on Detail 5.
2. Finish to the surface and complete with asphalt, concrete, etc.

Notes:

- Adequate cover for frost protection must be considered, this will vary by Region.
- A vibratory roller may only be utilized after a minimum cover has been placed or for the installation of the asphalt wearing course.
- If damage occurs to the geotextile fabric, repair the material in accordance with the geotextile Manufacturer's recommendations.
- For most recent installation guidelines visit: https://www.geoplastglobal.com/en/downloads/aquabox

9.0 Inspection and Maintenance

If the following inspections and maintenance procedures are not followed as specified below then the end-user is responsible for the performance of the modules. This maintenance procedure must be performed after termination of site operations, heavy rainfall, flooding, or any incident that will vary the flow of water drastically.

Inspection

1. Inspect all observation ports, inflow, and outflow connection and the discharge area
2. Identify and log any sediment and debris accumulation, system backup, or discharge rate changes.
3. If there is a sufficient need for a cleanout, contact a local cleaning company for assistance.
4. Inspect module for any damaged components, movement, or other irregularities and replace immediately.

Cleaning:

1. If a pre-treatment device is installed, follow manufacturer recommendations.
2. Using a vacuum pump truck, evacuate debris from the inflow and outflow points.
3. Flush the system with clean water, forcing debris from the system.
4. Repeat steps 2 and 3 until no debris is evident

Notes:

- For spray probe cleaning, the use of a 90° rotating nozzle with a 45° water jet is recommended. The nozzles used should have a pressure of 80 to 120 bar; higher pressures may damage the geotextile.

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