

OPERATIONS AND MAINTENANCE MANUAL FOR BMP at

Johnson County Training Facility

1081 Hospital Road

**Submitted:
June 8, 2023**

Prepared by:



**CrossRoad Engineers, P.C.
115 N 17th Avenue
Beech Grove, IN 46107
phone: (317) 780-1555
email: info@crossroadengineers.com**

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This document was prepared by Gregory J. Ilko, CrossRoad Engineers, P.C., 115 N 17th Avenue, Beech Grove, IN 46107.

I affirm, Gregory J. Ilko, under the penalty of perjury, that I have taken care to redact each Social Security number in this document, unless required by law.

BMP Owner & Operator Information

Owner: Johnson County
Contact: Jason Miller
Address: 86 W Court Street
Franklin, IN 46131
Email Address: jmiller@co.johnson.in.us
Business Phone: 317-260-9093

The BMP Owner is responsible for all costs associated with the maintenance and inspection of all BMPs as required by the City of Franklin. The term “BMP Owner” shall mean the owner at any time and from time to time of the property upon which the BMP is situated and any and all successors or assigns of such person or entity as the owner or owners of fee simple title to all or any portion of the real property covered hereby, whether by sale, assignment, inheritance, operation of law, trustee’s sale, foreclosure, or otherwise, but not including the holder of any lien or encumbrance on such real property.

The BMP Owner also grants the City of Franklin personnel right-of-entry to the property to inspect and maintain the BMP.

BMP Location and Description

A BMP, Best Management Practice, is defined as a structural measure (wetland, pond, sand filter, mechanical unit, etc.) or non-structural measure (restrictive zoning, reduced impervious area, etc.). BMP’s are designed for the benefit of stormwater quality and quantity. An isolator row via an underground chamber detention system is being utilized for the Johnson County Training Center project:

- An underground detention chamber system will be utilized for the stormwater quantity treatment from the project. The underground detention chamber system shall collect surface water from impervious areas via a storm sewer network. In addition to stormwater quantity treatment, the underground detention chamber system also provides stormwater quality treatment as a result of the runoff & sediment filtering through the surrounding geotextile fabric & stone as water fills the system via the isolator row. The underground detention chamber system shall be maintained and inspected per the check list within **Appendix C**. Please refer to **Appendix A** for the underground detention chamber and outlet structure details.

The Johnson County Training Center project is located in the southern portion of the property located at 1081 Hospital Road in Franklin, IN. The underground detention chamber system is located beneath the shooting range that is south and west of the training center buildings.

The underground detention chamber system and outlet structure are located in a drainage easement. Direct maintenance access to the system is provided from the existing drive access as well as the proposed drive access to the shooting range. See **Appendix B** for easement exhibit and description.

The following operations and maintenance information shall be utilized to properly inspect and maintain the underground detention and storm sewer infrastructure.

Maintenance and Inspection Guidelines

Maintenance and inspection as described below is the responsibility of the BMP Owner. Any additional procedures deemed necessary by annual City inspections shall be incorporated into these guidelines.

Routine Maintenance

The BMP Owner shall be responsible for the following minimum operations for maintaining the BMPs, in addition to maintaining and updating the BMP Operations and Maintenance Manual per the City of Franklin requirements:

Storm Sewer Infrastructure

- Remove trash and debris from inlet castings
- Remove trash and debris from inside of any storm structures
- Remove sediment deposits from structures and pipes when accumulated depth reaches 1/4 of pipe diameter

Swales and Ditches

- Mow and maintain vegetation to a maximum height of 5 inches
- Maintain swales with uniform slopes and unobstructed by buildings and fences
- Remove trash and debris from swales
- Grade and reseed eroded areas
- Mowing and/or trimming vegetation within the grassed areas. All clippings should be removed and properly disposed of.
- Maintain grass areas without the overuse of fertilizers, herbicides, pesticides, etc.

Underground Detention, Detention Outfall, and Emergency Spillway

- Removal of sediment, debris and litter from inlet and outlet structures within the underground detention chamber system and storm sewer system.
- Remove debris from outlet control structure, detention outfall, and emergency spillway
- Inspect outfall and emergency spillway for erosion, regrade, and replace riprap as necessary
- Remove sediment accumulation from underground detention in accordance with typical operations and maintenance underground detention and isolator row guidelines
- Maintain and update the BMP Operations and Maintenance Manual as necessary.
- Inspection and removal of debris and sediment from underground detention chamber system Isolator Rows

Remedial Maintenance

The owner shall be responsible for correcting and/or replacing any portions of the BMP in unsatisfactory condition. Corrections and/or replacement of any portions of the BMP in unsatisfactory condition shall be required. This includes, but is not limited to:

- Repairing/replacing the outlet control structure
- Replacing any portion of the inlet/outlet pipes within the detention facility
- Grading and reseeding eroded areas
- Replacing end sections at all inlets and outlets
- Replacing any portion of damaged storm sewer or underdrain pipes
- Replacing riprap as necessary at pipe inlet and outlet locations

BMP Inspection

Annual inspections of permanent BMPs shall be performed by the City. Routine inspections are the responsibility of the BMP Owner. These inspections shall be accomplished as scheduled below:

MAINTENANCE ITEM	INSPECTION SCHEDULE
Outlet Control Structure	Quarterly and After Major Storms
Isolator Row	Quarterly and After Major Storms
Underground Detention Sediment Removal	Biannually
Pond Outlet and Principal Spillway	Annually
Storm Inlets, Pipes, and Swales	Monthly and After Major Storms
Vegetated Open Areas	Monthly and After Major Storms
Miscellaneous	Monthly

The approved maintenance plan and inspection forms provided in **Appendix C** shall be used as guidance for performing maintenance and inspections activities. These forms shall be completed and retained by the BMP Owner and produced upon request by the City.

The City shall be notified of any changes in BMP ownership, major repairs, or BMP failure in writing within 30 days. Notification shall be addressed to:

*City of Franklin
Department of Public Works
796 S State Street
Franklin, IN 46131*

In the event that the City finds a BMP in need of maintenance or repair, the City will notify the BMP Owner of the necessary maintenance or repairs and give the landowner a timeframe for completing the maintenance or repairs. If the maintenance or repairs are not completed within the designated timeframe, the City shall perform the repairs or maintenance and bill the landowner for the actual costs for the work.

The BMP Owner shall be responsible for all costs associated with the maintenance and inspection of the BMP and all fees required by the City of Franklin.

Sediment Removal

Sediment accumulation in the Isolator Row shall be inspected on a quarterly basis and after major storm events. Sediment accumulation in the storm sewer inlets and manholes shall be inspected on a monthly basis and after major storm events. In order to determine sediment accumulation in the Isolator Row, a visual inspection through the inspection ports shall be completed using a flashlight. Sediment accumulation depth shall be checked through the inspection port utilizing a stadia rod. If the average sediment accumulation depth is 3 inches or greater, sediment removal shall be required.

Sediment removal from the Isolator Rows shall be accomplished using the JetVac or similar process which will not disturb or destroy the underground chambers, base stone or geotextile fabric wrap. A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable. Multiple passes of the JetVac shall be applied until backflush water is clean.

The sedimentation and any other debris taken from the system shall be disposed of in compliance with all applicable Federal, State and Local requirements. Immediate remedial maintenance shall be completed if any damage to system occurs.

Removal of the sediment accumulation from the storm sewer inlets and manholes shall be performed every year. The sedimentation and any other debris taken from the structures shall be disposed of in compliance with all applicable Federal, State and Local requirements. The removal of sediment shall be accomplished by methods which will not disturb or destroy the structures. Immediate remedial maintenance shall be completed in the case of any of the aforementioned occurrences.

Statement of Compliance

I hereby certify that I am the _____ Director _____ and duly authorized agent of
(title)

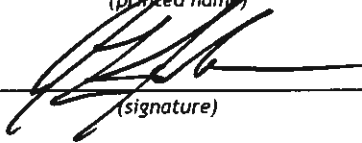
Johnson County Maintenance Department, and that I have read the preceding manual and shall comply
(company/agency)
with all terms and requirements stated herein.

I understand that this BMP O&M Manual has been created per requirements of the City of
Franklin Stormwater Design and Construction Specifications Manual.

I recognize that it shall be the right of the City and authorized representatives to enter the
property containing the BMP for maintenance and inspection purposes, and that this
access shall be granted without hindrances by means of the utility and drainage easement
previously described in this manual.

Jason Miller

(printed name)

A handwritten signature in black ink, appearing to read 'J. Miller', is written over a horizontal line. Below the signature, the word '(signature)' is printed.

(signature)

6/6/2023

(date)

Acknowledgement

State of Indiana, County of Marion, SS:

Before me, the undersigned Notary Public in and for said County, personally appeared Jason Miller, Director of Johnson County Maintenance Department, and acknowledged the execution of the foregoing Manual on this 6th day of June, 2023 and stated that he/she is the party authorized by the said company/agency to execute the foregoing Manual.

Witness my hand and seal this said last named date.

My Commission Expires

3/29/2029

Johnson

County of Residence

Annette Engmark
Notary Public

Annette Engmark
Printed Name



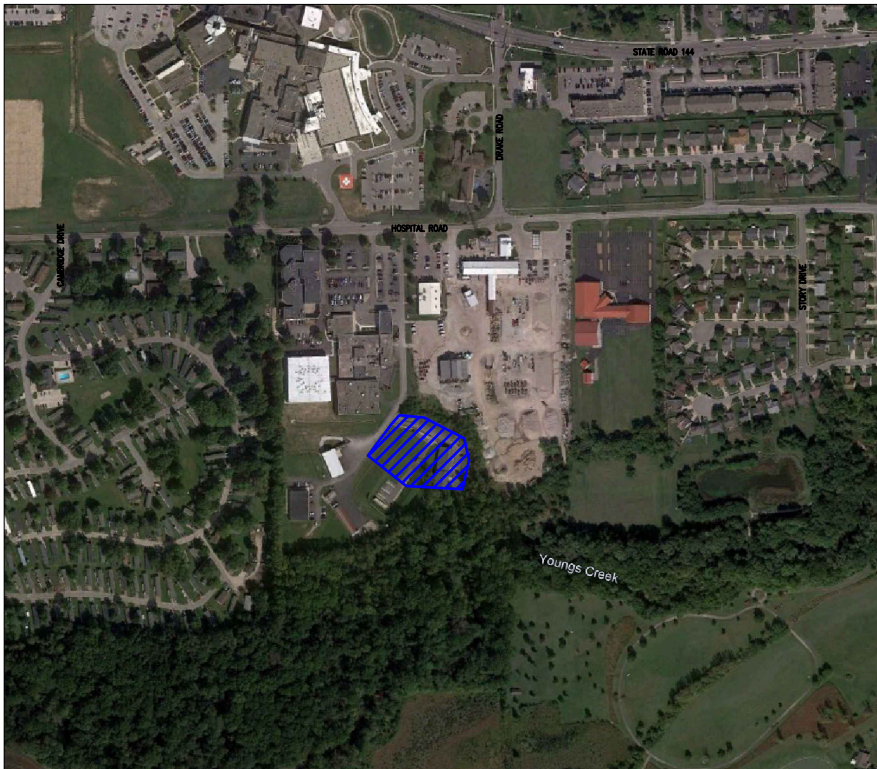
APPENDIX A

BMP Site Drawings

EXHIBIT 1 - LOCATION AND VICINITY MAPS

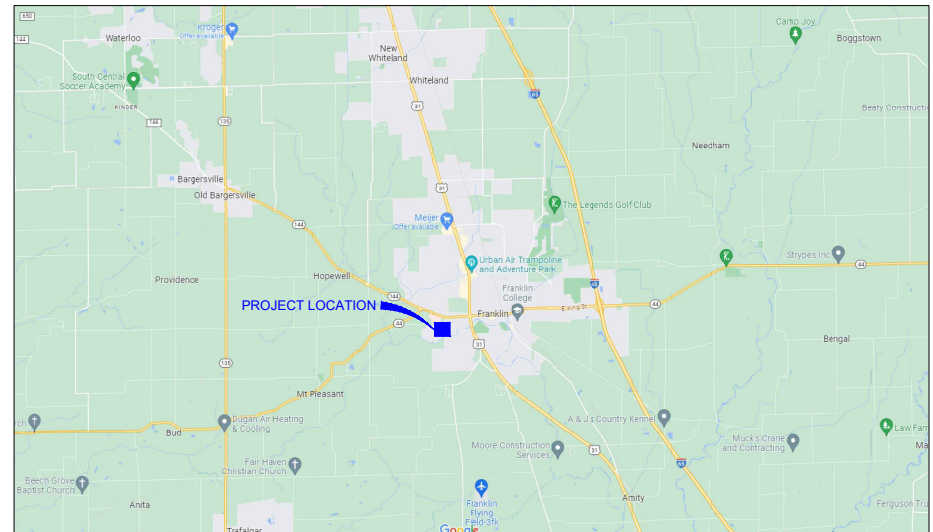
JOHNSON COUNTY TRAINING CENTER

1081 HOSPITAL ROAD, FRANKLIN, IN



LOCATION MAP

NOT TO SCALE



VICINITY MAP

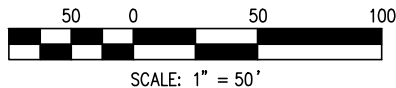
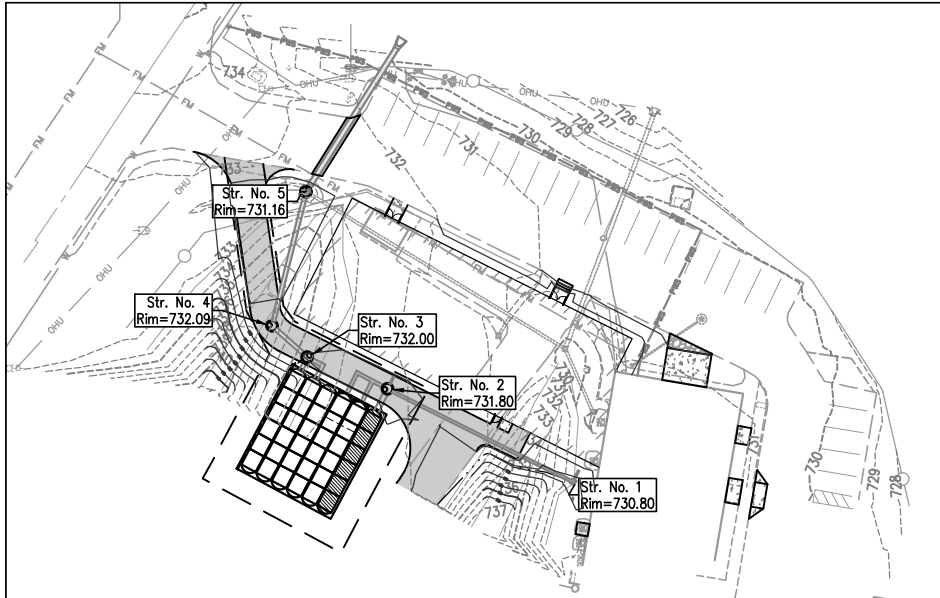
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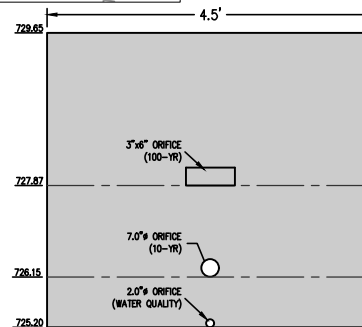


Transportation &
Development Consultants
100 N. 10th Street, Suite 200, Franklin, IN 46161
JUNE 8, 2023

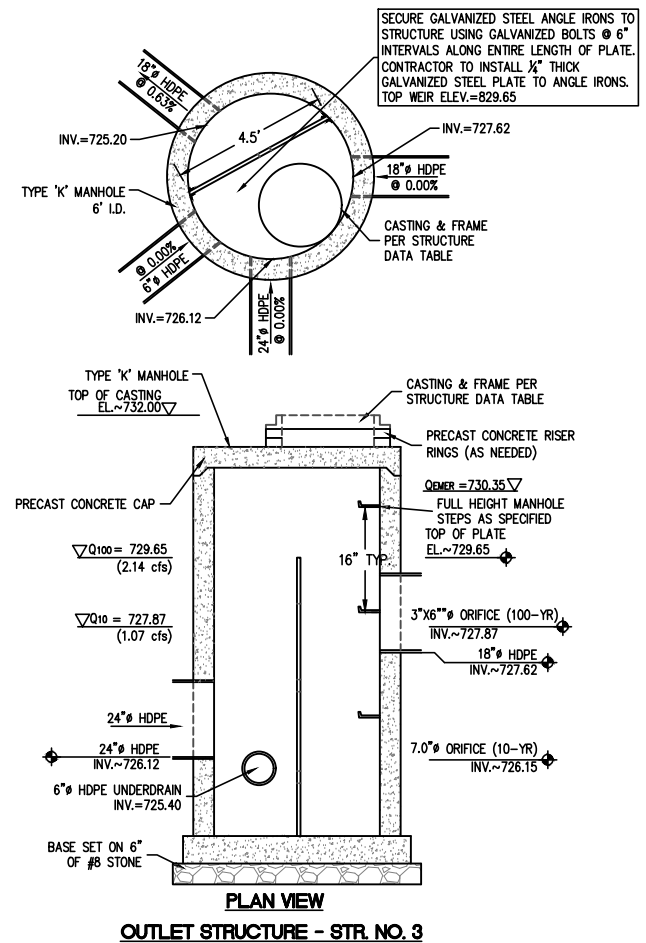
JOHNSON COUNTY TRAINING CENTER 1081 HOSPITAL ROAD EXHIBIT 2 - OVERALL DRAINAGE PLAN



PREPARED BY:



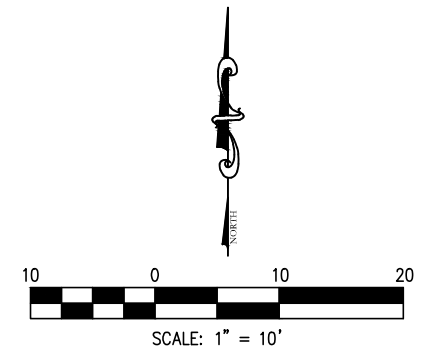
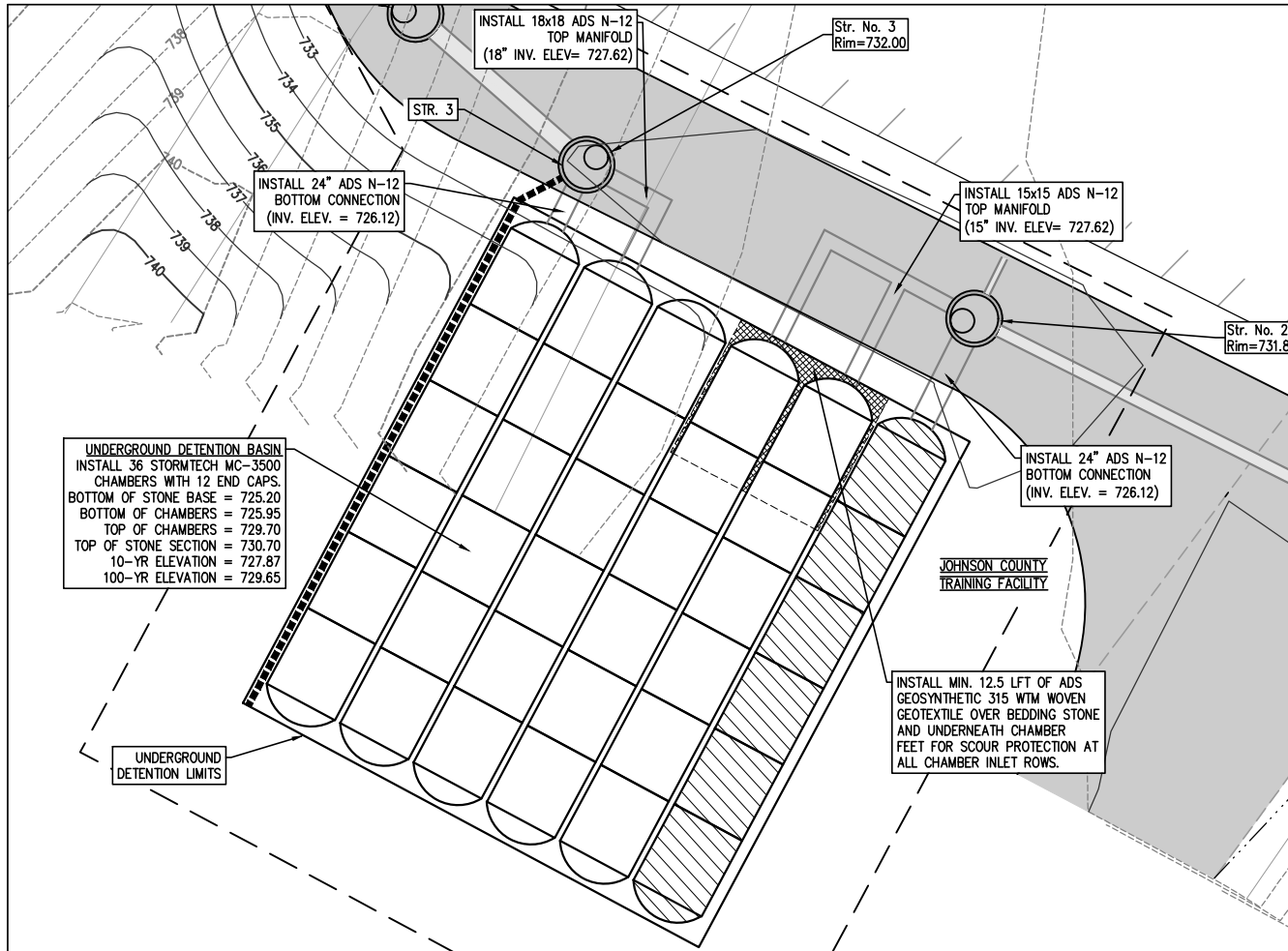
SHARP CRESTED WEIR DETAIL



JOHNSON COUNTY TRAINING FACILITY

1081 HOSPITAL ROAD

EXHIBIT 3 - DETENTION PLAN



PREPARED BY:



JUNE 4, 2023

JOHNSON COUNTY TRAINING FACILITY

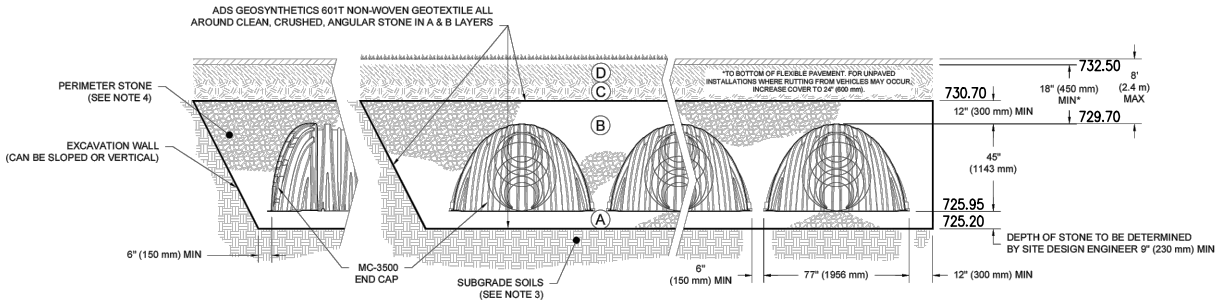
1081 HOSPITAL ROAD

EXHIBIT 4 - UNDERGROUND BASIN MC-3500 CROSS SECTION

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2-4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

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



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x78 DESIGNATION SS.
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT². AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

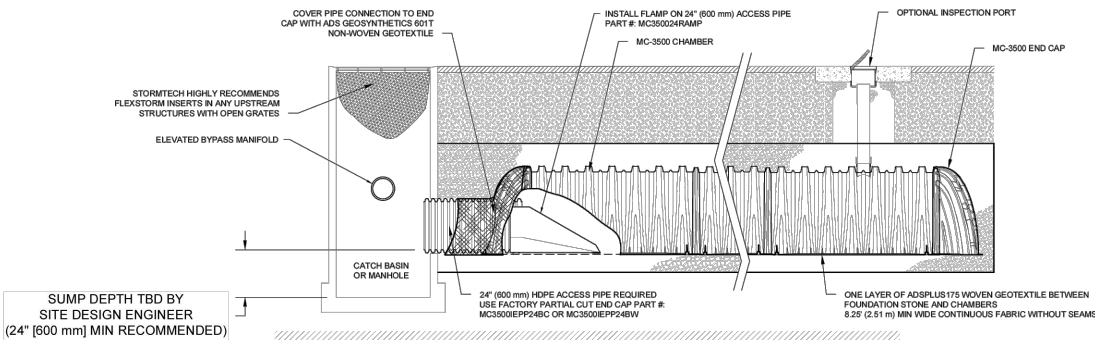
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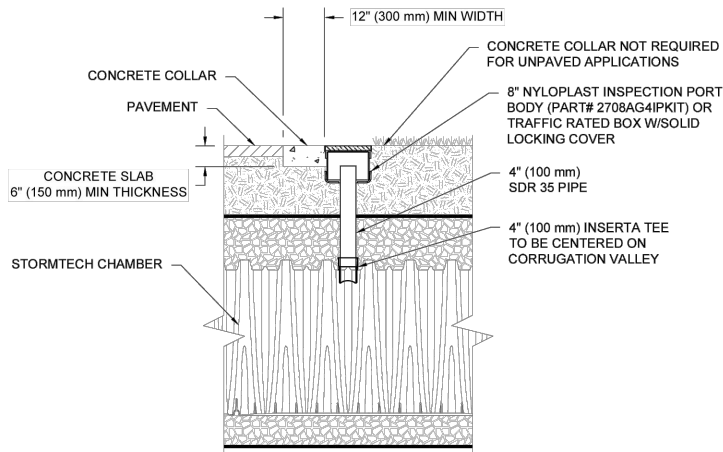
JOHNSON COUNTY TRAINING FACILITY

1081 HOSPITAL ROAD

EXHIBIT 5 - MC-3500 ISOLATOR & INSPECTION PORT DETAILS



MC-3500 ISOLATOR ROW PLUS DETAIL



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

**4" PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)**

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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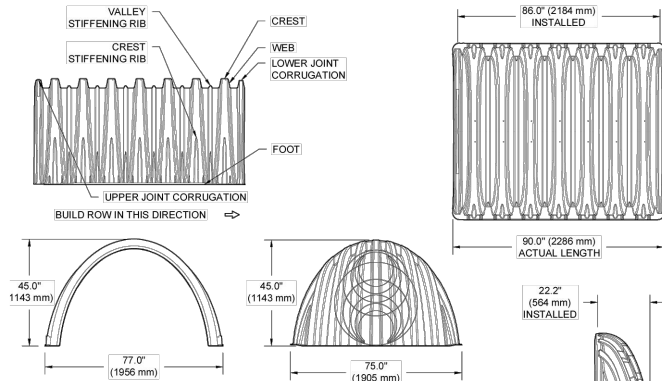


JOHNSON COUNTY TRAINING FACILITY

1081 HOSPITAL ROAD

EXHIBIT 6 - MC-3500 TECH. SPECS & INSERTA-TEE DETAIL

MC-3500 TECHNICAL SPECIFICATIONS



NOMINAL CHAMBER SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH)
 CHAMBER STORAGE
 MINIMUM INSTALLED STORAGE*
 WEIGHT

Size (W x H x L)	Storage (cu ft)	Storage (m³)	Weight (lbs)
77.0" X 45.0" X 86.0"	109.9	3.11	134
(1956 mm X 1143 mm X 2184 mm)	175.0	4.98	60.8

NOMINAL END CAP SPECIFICATIONS
 SIZE (W X H X INSTALLED LENGTH)
 END CAP STORAGE
 MINIMUM INSTALLED STORAGE*
 WEIGHT

Size (W x H x L)	Storage (cu ft)	Storage (m³)	Weight (lbs)
75.0" X 45.0" X 22.2"	14.9	0.42	49
(1905 mm X 1143 mm X 564 mm)	45.1	1.28	22.2

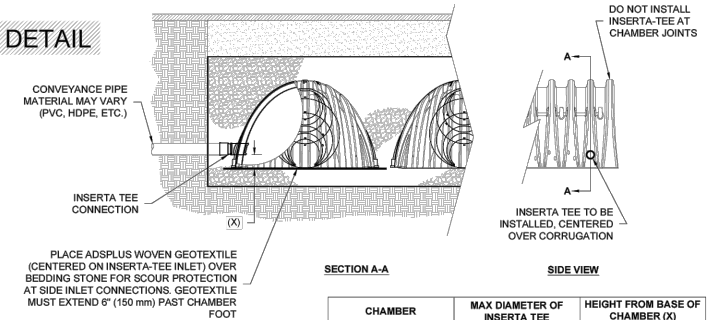
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

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

PART #	STUB	B	C
MC3500IEPP05T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B	---	---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B	---	---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B	---	---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B	---	---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B	---	---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW	---	---	---
MC3500IEPP18BC	---	---	1.77" (45 mm)
MC3500IEPP18BW	---	---	---
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW	---	---	---
MC3500IEPP24BC	---	---	2.06" (52 mm)
MC3500IEPP24BW	---	---	---
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

INSERTA-TEE SIDE INLET DETAIL



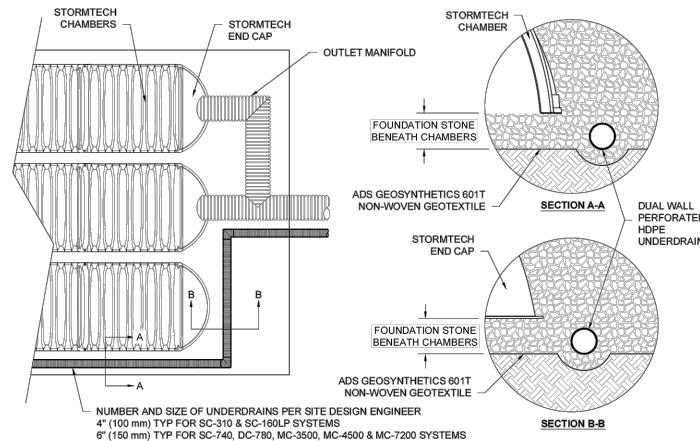
- NOTES:**
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
 - CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

SECTION A-A

SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)

INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON



UNDERDRAIN DETAIL

PREPARED BY:



JUNE 4, 2023

JOHNSON COUNTY TRAINING FACILITY

1081 HOSPITAL ROAD

EXHIBIT 7 - MC 3500 IMPORTANT NOTES

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
 - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
 - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
 - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

PREPARED BY:



JUNE 8, 2023

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

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONESHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6" (150 mm)
6. MAINTAIN MINIMUM - SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
 - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
 - NO RUBBER Tired LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

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

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

APPENDIX B

Stormwater Easements

EXHIBIT "A"

DRAINAGE AND ACCESS EASEMENT

PART OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 12 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, FRANKLIN TOWNSHIP, JOHNSON COUNTY, INDIANA, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHWEST QUARTER SECTION; THENCE NORTH 88 DEGREES 34 MINUTES 00 SECONDS EAST (ASSUMED BEARING) ON AND ALONG THE NORTH LINE OF SAID QUARTER SECTION A DISTANCE OF 2185.56 FEET; THENCE SOUTH 01 DEGREE 26 MINUTES 00 SECONDS EAST A DISTANCE OF 22.00 FEET; THENCE NORTH 88 DEGREES 34 MINUTES 00 SECONDS EAST A DISTANCE OF 42.37 FEET TO THE **PLACE OF BEGINNING**; THENCE CONTINUING NORTH 88 DEGREES 34 MINUTES 00 SECONDS EAST A DISTANCE OF 15.00 FEET; THENCE SOUTH 01 DEGREE 26 MINUTES 00 SECONDS EAST A DISTANCE OF 277.00 FEET; THENCE NORTH 88 DEGREES 34 MINUTES 00 SECONDS EAST A DISTANCE OF 105.00 FEET; THENCE SOUTH 01 DEGREE 26 MINUTES 00 SECONDS EAST A DISTANCE OF 357.49 FEET; THENCE SOUTH 31 DEGREES 54 MINUTES 56 SECONDS WEST A DISTANCE OF 92.17 FEET; THENCE NORTH 68 DEGREES 16 MINUTES 50 SECONDS EAST A DISTANCE OF 40.22 FEET; THENCE SOUTH 08 DEGREES 09 MINUTES 34 SECONDS EAST A DISTANCE OF 78.68 FEET; THENCE SOUTH 35 DEGREES 45 MINUTES 39 SECONDS EAST A DISTANCE OF 7.88 FEET; THENCE SOUTH 63 DEGREES 21 MINUTES 43 SECONDS EAST A DISTANCE OF 60.18 FEET; THENCE SOUTH 28 DEGREES 10 MINUTES 31 SECONDS WEST A DISTANCE OF 74.80 FEET; THENCE NORTH 61 DEGREES 49 MINUTES 29 SECONDS WEST A DISTANCE OF 63.00 FEET; THENCE NORTH 28 DEGREES 10 MINUTES 31 SECONDS EAST A DISTANCE OF 56.86 FEET; THENCE NORTH 28 DEGREES 06 MINUTES 04 SECONDS WEST A DISTANCE OF 19.62 FEET; THENCE NORTH 08 DEGREES 09 MINUTES 34 SECONDS WEST A DISTANCE OF 70.00 FEET; THENCE NORTH 68 DEGREES 16 MINUTES 50 SECONDS WEST A DISTANCE OF 49.47 FEET; THENCE NORTH 31 DEGREES 54 MINUTES 56 SECONDS EAST A DISTANCE OF 105.62 FEET; THENCE NORTH 01 DEGREE 26 MINUTES 00 SECONDS WEST A DISTANCE OF 338.00 FEET; THENCE SOUTH 88 DEGREES 34 MINUTES 00 SECONDS WEST A DISTANCE OF 105.00 FEET; THENCE NORTH 01 DEGREE 26 MINUTES 00 SECONDS WEST A DISTANCE OF 292.00 FEET TO THE **PLACE OF BEGINNING**.

CONTAINING 0.165 ACRES, MORE OR LESS.

I, GEORGE W. CHARLES, II, A REGISTERED LAND SURVEYOR IN THE STATE OF INDIANA, DO HEREBY CERTIFY THAT THIS DESCRIPTION IS BASED ON INSTRUMENT NO. 98016529, AS RECORDED IN THE OFFICE OF THE RECORDER OF JOHNSON COUNTY, INDIANA. NO FIELDWORK WAS PERFORMED AND THEREFORE, THIS DESCRIPTION IS SUBJECT TO ANY OVERLAPS, GAPS OR INCONSISTENCIES THAT A FIELD SURVEY MIGHT REVEAL.



A handwritten signature in black ink that reads "G. W. Charles II".

GEORGE W. CHARLES, II
INDIANA LAND SURVEYOR
NO. LS 20800117

PREPARED BY:



COUNTY: JOHNSON
SECTION: 22
TOWNSHIP: 12 NORTH
RANGE: 4 EAST

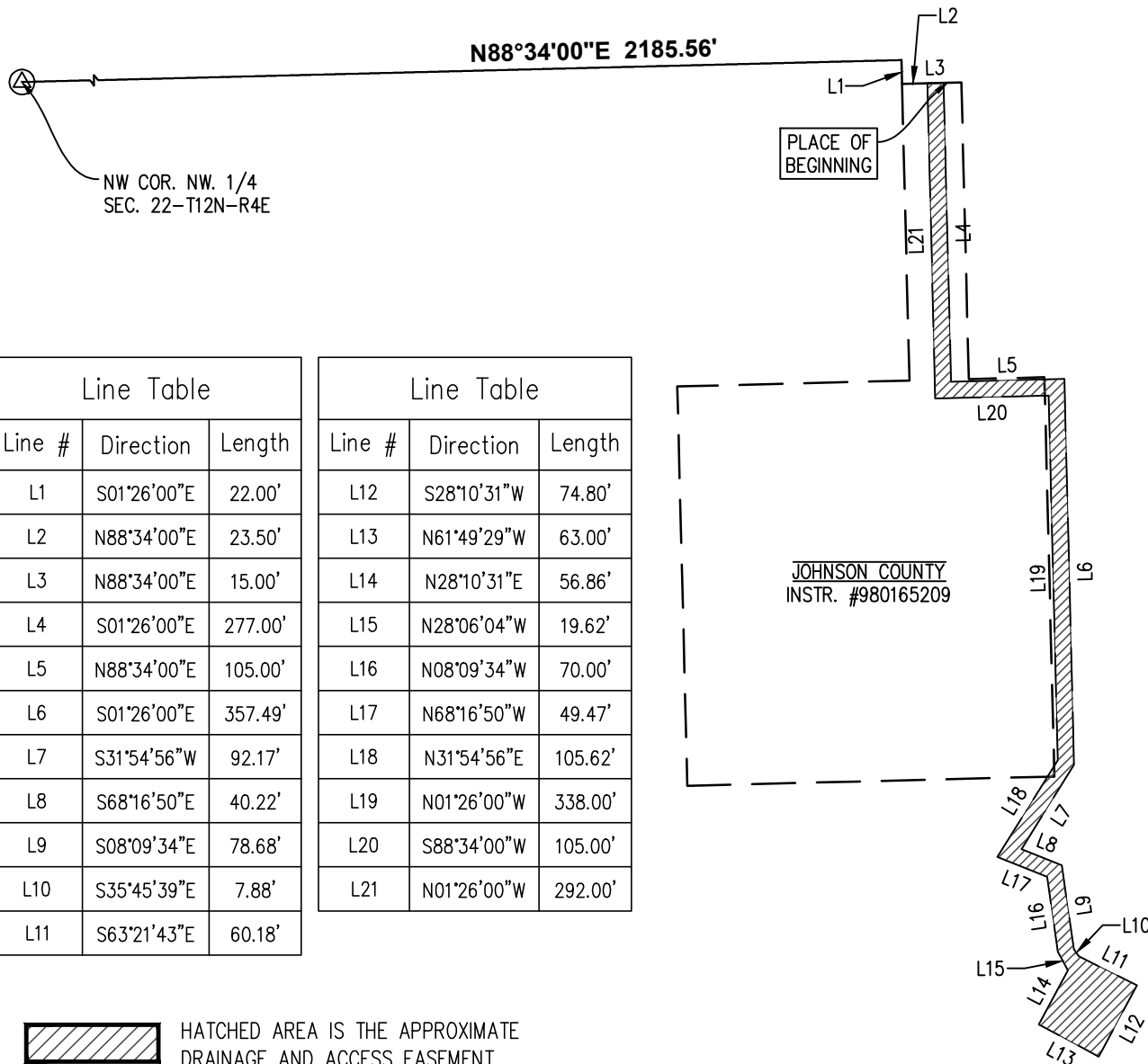
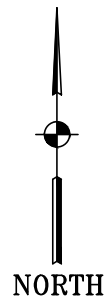
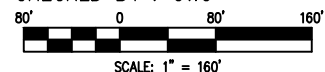
EXHIBIT "B"

DRAINAGE AND ACCESS EASEMENT

OWNER: JOHNSON COUNTY

DRAWN BY : KLF 06.08.23

CHECKED BY : GWC



Line Table		
Line #	Direction	Length
L1	S01°26'00"E	22.00'
L2	N88°34'00"E	23.50'
L3	N88°34'00"E	15.00'
L4	S01°26'00"E	277.00'
L5	N88°34'00"E	105.00'
L6	S01°26'00"E	357.49'
L7	S31°54'56"W	92.17'
L8	S68°16'50"E	40.22'
L9	S08°09'34"E	78.68'
L10	S35°45'39"E	7.88'
L11	S63°21'43"E	60.18'

Line Table		
Line #	Direction	Length
L12	S28°10'31"W	74.80'
L13	N61°49'29"W	63.00'
L14	N28°10'31"E	56.86'
L15	N28°06'04"W	19.62'
L16	N08°09'34"W	70.00'
L17	N68°16'50"W	49.47'
L18	N31°54'56"E	105.62'
L19	N01°26'00"W	338.00'
L20	S88°34'00"W	105.00'
L21	N01°26'00"W	292.00'



HATCHED AREA IS THE APPROXIMATE
DRAINAGE AND ACCESS EASEMENT



NO FIELDWORK WAS PERFORMED AND THEREFORE, THIS DESCRIPTION IS SUBJECT TO ANY OVERLAPS, GAPS OR INCONSISTENCIES THAT A FIELD SURVEY MIGHT REVEAL. THIS PLOT WAS PREPARED FROM INFORMATION OBTAINED FROM INSTRUMENT NO. 98016529 AS RECORDED IN THE OFFICE OF THE RECORDER OF JOHNSON COUNTY, INDIANA. THE EASEMENT IS SUBJECT TO ANY OVERLAPS, GAPS, OR OTHER INCONSISTENCIES THAT A SURVEY MIGHT REVEAL.

G. W. Charles II

GEORGE W. CHARLES, II
INDIANA LAND SURVEYOR
NO. LS 20800117

07-18-18
DATE

PREPARED BY:



APPENDIX C

Maintenance Plan and Inspection Forms

Isolator[®] Row Plus

O&M Manual



The Isolator[®] Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC-310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row FLAMP[™] (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

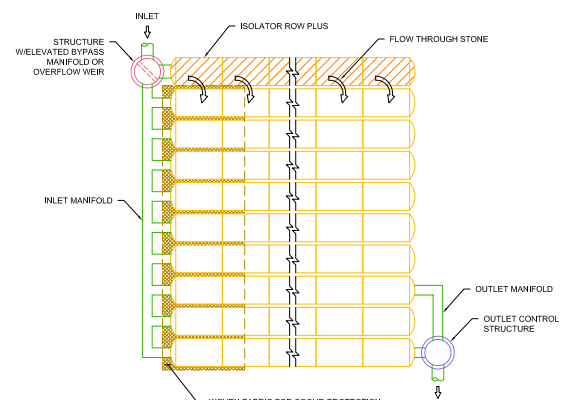
Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.



Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.



StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

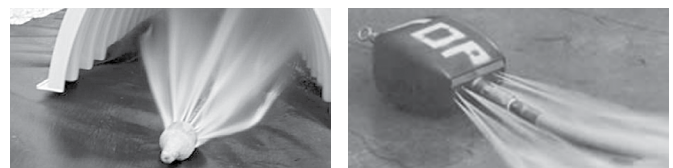
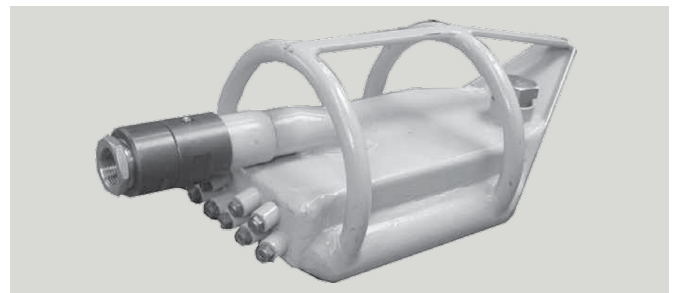
If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided

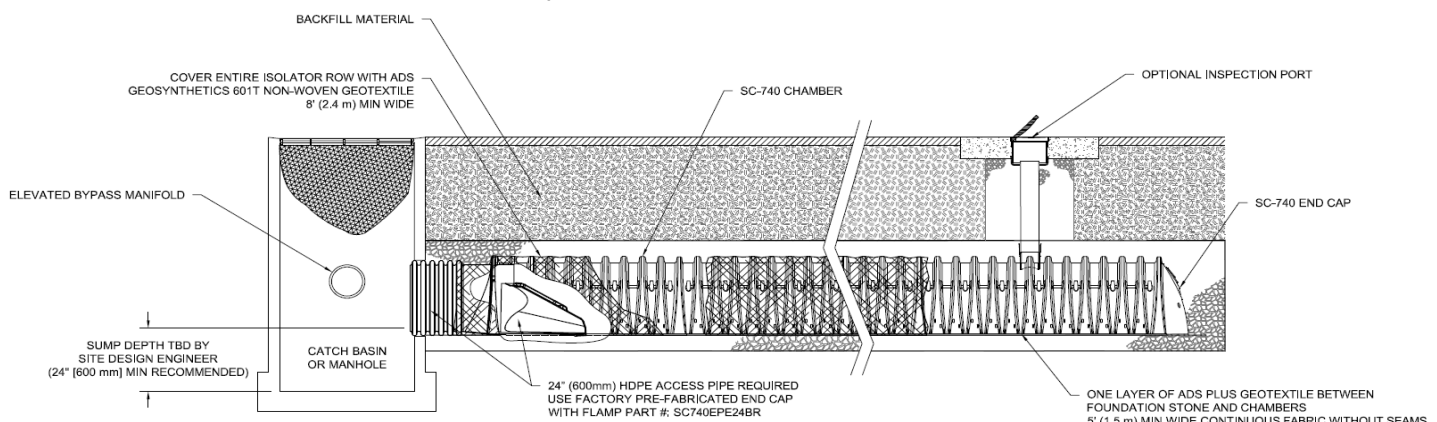
via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row PLUS (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

- A) Inspection ports (if present)
 - i. Remove lid from floor box frame
 - ii. Remove cap from inspection riser
 - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
 - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Row Plus
 - i. Remove cover from manhole at upstream end of Isolator Row Plus
 - ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
 - 1. Mirrors on poles or cameras may be used to avoid a confined space entry
 - 2. Follow OSHA regulations for confined space entry if entering manhole
 - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.

Step 2

Clean out Isolator Row Plus using the JetVac process.

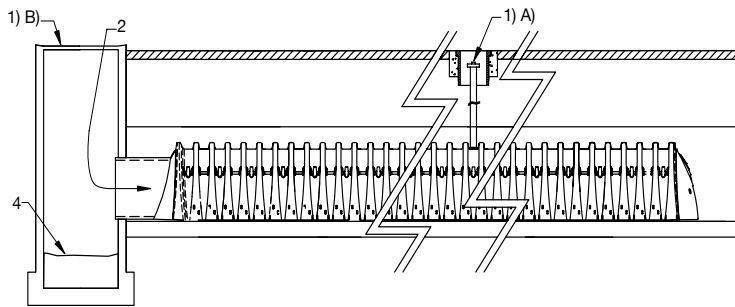
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi- ment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com

800-821-6710

Stormwater Pond Operation, Maintenance, and Management Inspection Checklist for BMP Owners

Project: _____ Owner Change since last inspection? Y N

Owner Name, Address, Phone _____

Number _____

Location: _____

Site Status: ____

Date: _____

Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
Embankment and Emergency Spillway (Inspect annually and after major storms)		
1. Vegetation		
2. Erosion on embankment		
3. Animal burrows		
4. Cracking, bulging or sliding of dam		
A. Location:		
B. Describe		
5. Drains clear and functioning		
6. Leaks or seeps on embankment		
A. Location		
B. Describe		
7. Slope protection failure		
8. Emergency spillway clear of obstructions		
9. Other (describe)		

FIGURE 702-05: Private Operation, Maintenance & Management – Stormwater Ponds

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
Riser and Principal spillway (Inspect annually)		
Circle Type: Reinforced concrete, corrugated pipe, masonry		
1. Low flow orifice blocked		
2. Trash rack		
A. debris removal needed		
B. corrosion noted		
3. Excessive sediment buildup in riser		
4. Concrete/Masonry condition		
A. cracks or displacement		
B. spalling		
5. Metal pipe condition		
6. Control Valve operational		
7. Pond drain valve operational		
8. Outfall channels functioning		
9. Other (describe)		
Permanent Pool (Inspect monthly)		
1. Undesirable vegetative growth		
2. Floatable debris removal needed		
3. Visible pollution		
4. Shoreline problem		
5. Other (describe)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
<u>Sediment Forebays</u>		
1. Sedimentation noted		
2. Sediment cleanout needed (over 50% full)		
Other (Inspect monthly)		
1. Erosion at outfalls into pond		
2. Headwalls and endwalls		
3. Encroachment into pond or easement area		
4. Complaints from residents		
5. Public hazards (describe)		

Additional Comments

Actions to be taken:

Timeframe:

Stormwater Infrastructure Operation, Maintenance, and Management Inspection Checklist for BMP Owners

Project: _____ Owner Change since last Inspection? ☐ Y

Owner Name, Address, Phone: _____

Number: _____

Location: _____

Site Status: _____

Date: _____

Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
Storm Inlets and Pipes (Inspect Monthly and After Major Storms)		
1. Inlet castings clear of trash/debris		
2. Inlet structures clear of trash/debris		
3. Sediment deposits in structures and pipes (max. accumulated depth 1/4 of pipe diameter)		
Drainage Swales (Inspect Monthly and After Major Storms)		
1. Mow and maintain vegetation (max. height 5 inches)		
2. Uniform swale slopes maintained		
3. Flowline unobstructed by buildings/fences		
4. Grade and reseed eroded areas		

Additional Comments:

Actions to be taken:

Timeframe:

Inspection and Maintenance Checklist Catch Basins, Manholes, and Inlets

Site Name:	
Owner Name:	
Owner Address:	
Owner Phone Number:	
Emergency Phone Number:	
Location:	
Date:	
Time:	
Inspector:	
Change in ownership since last inspection?	Y OR N

Maintenance Item	Maintenance (1 or 2)*	Maintenance is needed:	Comments
Trash & Debris		Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%	
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	
Sediment		Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	
Structure Damage to Frame and/or Top Slab		Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (Intent is to make sure no material is running into basin).	
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	
Fractures or Cracks in Basin Walls/Bottom		Maintenance person judges that structure is unsound.	
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	
Settlement/Misalignment		If failure of basin has created a safety, function, or design problem.	
Vegetation		Vegetation growing across and blocking more than 10% of the basin opening.	
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	
Contaminants and Pollution		Any evidence of oil, gasoline, contaminants or other pollutants (Coordinate removal/cleanup with local water quality response agency).	
Catch Basin Cover		Cover is missing or only partially in place. Any open catch basin requires maintenance.	
		Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	
		One maintenance person cannot remove lid after applying normal lifting pressure (Intent is to keep cover from sealing off access to maintenance).	
Ladder		Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	
Metal Grates		Trash and debris that is blocking more than 20% of grate surface inletting capacity.	

*Maintenance: Enter 1 if maintenance is need and include WO#. Enter 2 if maintenance was performed same day

Inspection and Maintenance Checklist Conveyance Stormwater Pipe

Site Name:	
Owner Name:	
Owner Address:	
Owner Phone Number:	
Emergency Phone Number:	
Location:	
Date:	
Time:	
Inspector:	
Change in ownership since last inspection?	Y OR N

Maintenance Item	Maintenance (1 or 2)*	Maintenance is needed:	Comments
Sediment & Debris		Accumulated sediment exceeds buildup 1/4" of the pipe diameter up to maximum of 6"	
Vegetation		Vegetation that reduces free movement of water through the pipes	
Damaged Pipe		Protective coating is damaged; rust is causing more than 50% deterioration to any part of the pipe	
		Any dent that decreases the cross section area of pipe by more than 20% or puncture that impacts performance	

*Maintenance: Enter 1 if maintenance is need and include WO#. Enter 2 if maintenance was performed same day.