

STORMWATER CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
- CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- 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.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
 - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES 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 AASHTO FOR THERMOPLASTIC PIPE.
 - A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
 - STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

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

- STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500MC-4500 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.
 - STORMTECH RECOMMENDS 3 BACKFILL METHODS:
 - STONE/SHOFTER 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.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 8" (203 mm) SPACING BETWEEN THE CHAMBER ROWS.
- END CAPS SHALL BE FASTENED TO CHAMBERS WITH (3) 2-1/2" COARSE THREAD SCREWS.
- INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
- STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
- 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

- STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500MC-4500 CONSTRUCTION GUIDE".
- 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-3500MC-4500 CONSTRUCTION GUIDE".
 - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500MC-4500 CONSTRUCTION GUIDE".
- 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.

PROPOSED ELEVATIONS

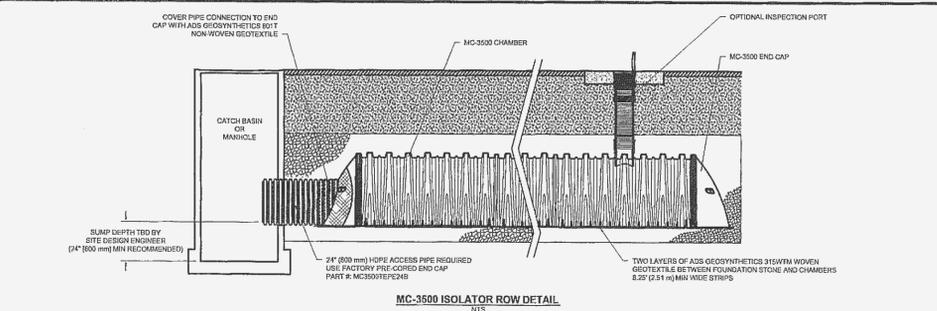
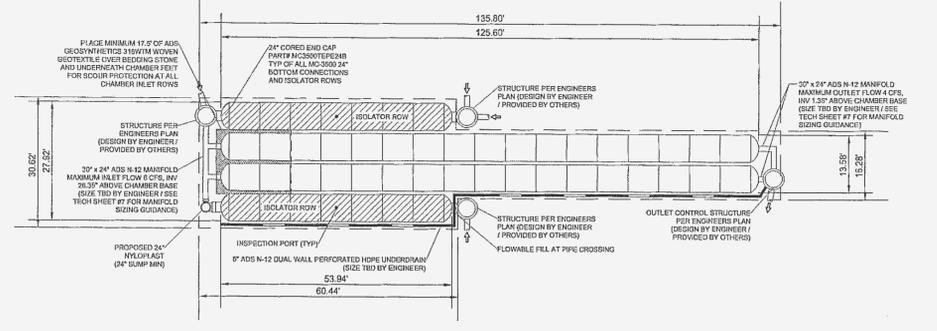
MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)	577.75
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)	572.25
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)	571.75
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)	571.25
MINIMUM ALLOWABLE GRADE (TOP OF REINFORCED CONCRETE PAVEMENT)	571.75
TOP OF STONE	570.75
TOP OF CHAMBER	569.75
24" TOP MANHOLE INVERT:	568.25
24" ISOLATOR ROW INVERT:	566.11
24" BOTTOM MANHOLE INVERT:	566.00
DISCHARGE INVERT:	565.00
BOTTOM OF STONE:	565.00

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBERS COVER REQUIREMENTS ARE MET.

PROPOSED LAYOUT

140' STORMTECH MC-3500 CHAMBERS
 60' STORMTECH MC-3500 END CAPS
 INSTALLED WITH 12" COVER STONE, 4/5" STONE VOID
 INSTALLED SYSTEM VOLUME: 10,314 CF (PERIMETER STONE) INCLUDED
 AREA OF SYSTEM: 3,971 SF
 PERIMETER OF SYSTEM: 333 FT

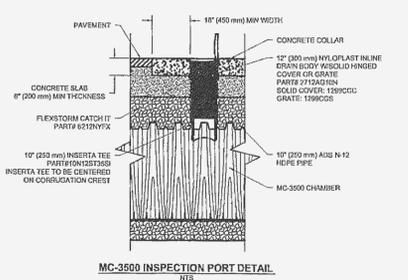


INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- INSPECTION POINTS (IF PRESENT)
 - REMOVE/OPEN LID OR NYLOPLAST BLIND DRAIN
 - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - USING A FLASHLIGHT AND STADA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - LOWER CHAMBER INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - IF SEDIMENT IS AT OR ABOVE 2" (50 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
 - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
 - WORKERS ON POLES OR CHAMBERS MAY BE USED TO AVOID A COMPOUND SPACE ENTRY IF ENTIRE MANHOLE IS FOLLOWING OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTIRE MANHOLE IS
 - IF SEDIMENT IS AT OR ABOVE 2" (50 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE AT-VA PROCESS
- A PNEUMATIC CLEANING MODEL WITH REAR FACING SPREAD OF 60" (1.5 m) OR MORE IS PREFERRED
 - APPLY MULTIPLE PASSES OF AT-VA UNTIL MUCK/SLURRY WATER IS CLEAN
 - VACUUM STRUCTURE SLUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN HASHS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

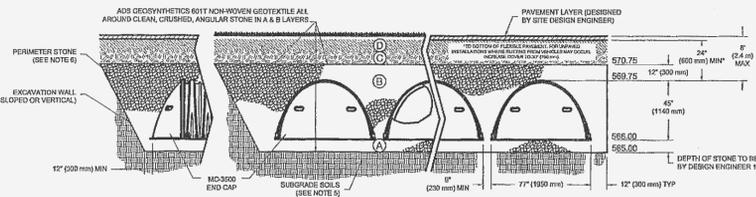
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACUUMING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

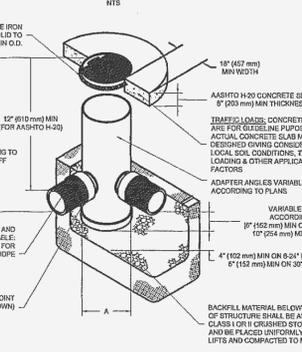
MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT	
D	FINAL FILL MATERIAL FOR LAYER 12 STARTS FROM THE TOP OF THE 12" (300 mm) MINIMUM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH. GRANULAR ABOVE. NOTE THAT PAVEMENT SURFACE MAY BE PART OF THIS LAYER.	NA	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRONGER MATERIAL AND PREPARATION REQUIREMENTS.	
C	FINAL FILL MATERIAL FOR LAYER 11 STARTS FROM THE TOP OF THE EMBEDMENT STONE BY LAYER 10 (300 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE "C" LAYER.	AASHTO M43 A-1, A-2, A-3 OR AASHTO M43 3, 307, 4, 465, 5, 58, 67, 6, 8, 7, 7A, 8, 9, 30		BEGIN COMPACTING AFTER 2" (50 mm) OF MATERIAL OVER THE CHAMBER IS REACHED. COMPACT ADDITIONAL LAYERS IN 2" (50 mm) MAXIMUM LIFT TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR SUBGRADE AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (OR LAYER) TO THE "C" LAYER ABOVE.	AASHTO M43 3, 4	NO COMPACTION REQUIRED.	
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. **	

- PLEASE NOTE:
- THE REFERRED 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 #4 (AASHTO M43) STONE."
 - STORMTECH CONSTRUCTION REQUIREMENTS ARE MET FOR "C" LOCATION MATERIALS WHICH PLACE AND COMPACTED IN 2" (50 mm) MAXIMUM LIFT USING TWO FULL CONFORMANCES WITH A VIBRATORY COMPACTOR. FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY EXCAVATION OR USING WITHOUT COMPACTOR EQUIPMENT FOR SPECIAL LOAD DESIGN. CONTACT STORMTECH FOR COMPACTOR REQUIREMENTS.



- NOTES:
- MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
 - MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
 - "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
 - THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
 - THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION BROW 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.
 - ONCE LAYER "C" IS PLACED, ANY FILL 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.

NYLOPLAST DRAIN BASIN

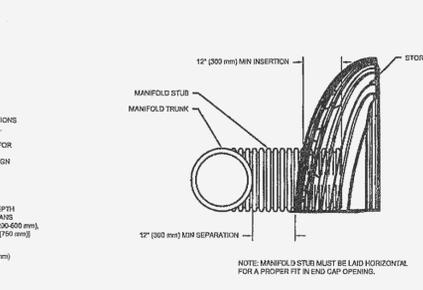


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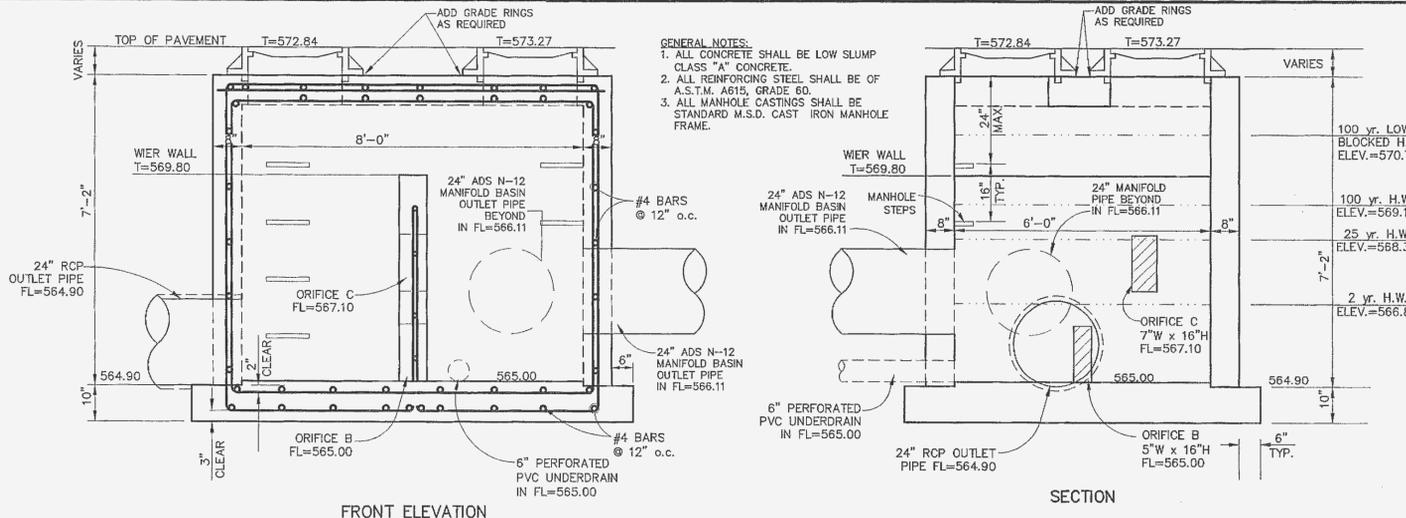
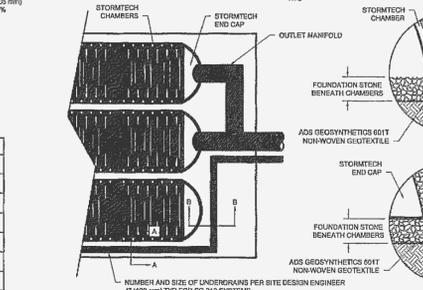
- 6" (152 mm) NYLOPLAST GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A818 GRATE TO 905.
- 12" (305 mm) NYLOPLAST GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A818 GRATE TO 905.
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM B312 FOR CORRUGATED HOPE ADS A HANDED DUAL WALL & 50R 35 PVC.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: WWW.NYLOPLAST-USA.COM
- TO ORDER CALL: 800-821-6115

A	PART #	GRATE/SOLID COVER OPTIONS
6"	2856G	PERFORATED LIGHT DUTY
6"	2810G	PERFORATED LIGHT DUTY
12"	2812G	PERFORATED LIGHT DUTY
12"	2818G	PERFORATED LIGHT DUTY
12"	2818AG	PERFORATED LIGHT DUTY
12"	2820G	PERFORATED LIGHT DUTY
12"	2820AG	PERFORATED LIGHT DUTY
12"	2830G	PERFORATED LIGHT DUTY

MC-SERIES END CAP INSERTION DETAIL



UNDERDRAIN DETAIL



OUTFALL STRUCTURE 102

SCALE: 1" = 2'

SHOP DRAWING REVIEW NOTE:
 ENGINEER APPROVED, SIGNED AND SEALED
 SHOP DRAWINGS MUST BE SUBMITTED TO THE
 CITY OF OFFALLON PRIOR TO CONSTRUCTION OF
 THIS STRUCTURE.

CVS pharmacy
 NORTHERN 13,225-LEFT
 CHAMFER DRIVE-THRU
 STORE NUMBER: 10134
 SVC VETERANS HERBERT PARKWAY & HWY. K
 OFFALLON, MO
 PROJECT TYPE: NEW CONSTRUCTION
 DEAL TYPE Fee for Service/Loan/Type B
 CS PROJECT NUMBER: 52332

NORR
 ARCHITECTS ENGINEERS PLANNERS
 719 Grandview Street
 Suite 1000
 Detroit, MI 48226
 (313) 524-1110

PREMIER CIVIL ENGINEERING
 308 TCW Court
 Lake Saint Louis, MO 63387
 Phone: (314) 925-7444 Fax: (314) 925-7457
 Missouri Certificate of Authority # E-2011000031
 Missouri Certificate of Authority # LS-2012007649

ENGINEERS AUTHENTICATION
 The responsibility for professional engineering liability on the
 project is hereby limited to the seal of plans authorized by the seal,
 signature, and data hereon attached. Responsibility is disclaimed
 for all other engineering plans involved in this project and
 specifically excludes revisions after this date unless reauthorized.

STATE OF MISSOURI
 PROFESSIONAL ENGINEER
 STEVE MANICH P.E.
 PE200007195

Developer / Owner Information
T.M. CROWLEY & ASSOCIATES
 Utility Details
 P+Z No. 20-13
 APPROVED 9-5-13
 City No.
 Sheet Number:
19
 PCE PROJECT NO. 094201

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NOTE
 Underground utilities and structures have
 been plotted from available information and
 therefore, their location must be considered
 approximate only. It is the responsibility
 of the individual contractors to notify the
 utility companies before actual construction.