

PROJECT INFORMATION	
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PROJECT NO:	170074



## WICKED GREENZ

O'FALLON, MO

### STORMWATER CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH SC-740, SC-310, OR APPROVED EQUAL.
- CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
- 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 PRESENCE.
- CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC 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 OR ASTM F2922 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 THE SC-310/SC-740 SYSTEM

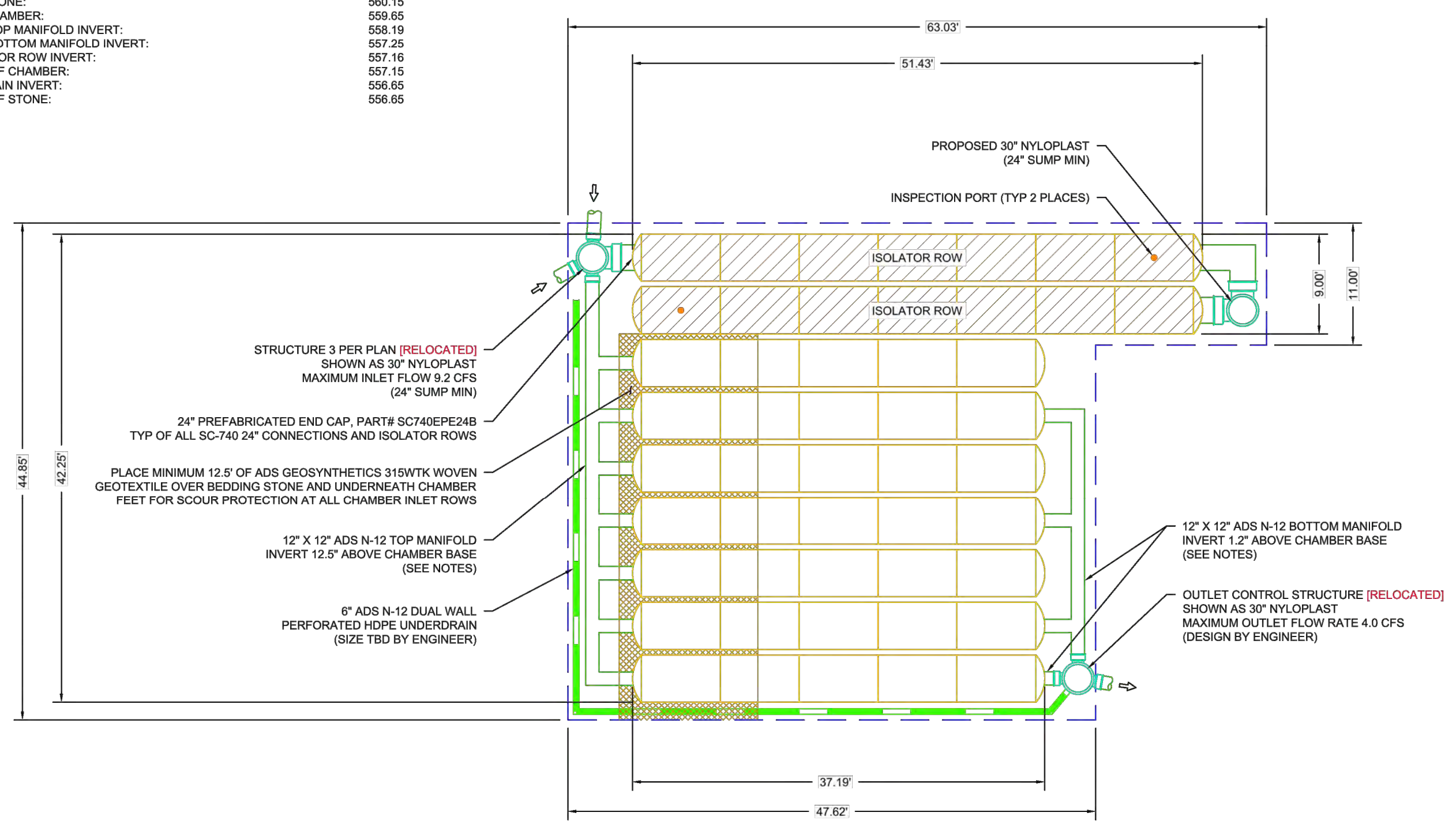
- STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
- CHAMBERS 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.
- THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4"-2" (20-50 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- 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 SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
    - NO RUBBER Tired LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 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 THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.
- CONTACT STORMTECH AT 1-888-892-2894 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

- PROPOSED LAYOUT**
- (4) STORMTECH SC-740 CHAMBERS
  - (8) STORMTECH SC-740 END CAPS
  - INSTALLED WITH 6" COVER STONE, 40% STONE VOID
  - INSTALLED SYSTEM VOLUME: 4,577 CF (PERIMETER STONE INCLUDED)
  - AREA OF SYSTEM: 2,305 FT<sup>2</sup>
  - PERIMETER OF SYSTEM: 216 FT
- PROPOSED ELEVATIONS**
- |   |        |
|---|--------|
| MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT UNPAVED):        | 567.65 |
| MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):           | 561.65 |
| MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):             | 561.15 |
| MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):      | 561.15 |
| MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT): | 561.15 |
| TOP OF STONE:   | 560.15 |
| TOP OF CHAMBER:   | 559.65 |
| 12" X 12" TOP MANIFOLD INVERT:                            | 559.19 |
| 12" X 12" BOTTOM MANIFOLD INVERT:                         | 557.25 |
| 24" ISOLATOR ROW INVERT:                                  | 557.16 |
| BOTTOM OF CHAMBER:  | 557.15 |
| UNDERDRAIN INVERT:  | 556.65 |
| BOTTOM OF STONE:  | 556.65 |

- NOTES**
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
  - DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
  - THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.



### COMPUTING WATER QUALITY PEAK DISCHARGE RATE (PER APPENDIX D-10) & STORAGE VOLUME (PER MSD 4.080.02)

Curve Number, CN =	97	{Based on WQ rainfall depth}
Time of Concentration, T <sub>c</sub> =	5	minutes
Site Area, A =	0.96	acres
MSD WQ Rainfall Depth, P =	1.14	inches
Impervious Area Percentage, I =	72.5%	
Volumetric Runoff Coefficient, R <sub>v</sub> =	0.7025	{Note: R <sub>v</sub> =0.05+0.009(I)}
Initial Abstraction, I <sub>a</sub> =	0.0714	inches {Note: I <sub>a</sub> =(200/CN)-2}
Ratio I <sub>a</sub> /P =	0.0627	
WQ Post-Development Runoff Depth, Q <sub>a</sub> =	0.8009	inches {Note: Q <sub>a</sub> =P x R <sub>v</sub> }
Unit Peak Factor, q <sub>u</sub> =	1000	{(from Exhibit 4-II)}
Peak Discharge, Q <sub>p</sub> =	1.20	cfs {Note: Q <sub>p</sub> =q <sub>u</sub> *A*Q <sub>a</sub> (where A is in sq. miles)}
Water Quality Storage Volume, WQ <sub>v</sub> =	2791	cf {WQ <sub>v</sub> per MSD not D-10}
		{Note: WQ <sub>v</sub> =(P/12*Q <sub>p</sub> *A)*43560 (where A is in Acres)}

### Summary of Storage Volume & Release Rates Per 24-HR Storm Event

DRAINAGE AREA CALCULATION REFERENCES				
	EXISTING	PROPOSED	P-BYPASS	P-DETENTION
AREA (AC)	0.96	0.96	0.38	0.58
CN	76	91	84	96
TIME (MIN)	20.0	13.4	13.4	13.4

COMPARISON OF RUNOFF RATES (CFS) - from hydraflow					
24-HOUR EVENT	EXISTING		PROPOSED		Δ IN PRE-POST RELEASE RATES
	TOTAL	<BYPASS>	Outfall Str. Max	TOTAL	
2	1.16	0.77	0.35	1.12	(0.04)
15	2.45	1.39	1.02	2.41	(0.04)
25	3.20	1.72	1.47	3.19	(0.01)

NOTE: The proposed total release rates is less than that of the existing

UNDERGROUND DETENTION SPECIFICATIONS				
24-HOUR EVENT	STORAGE VOLUME (CF)	MAXIMUM DEPTH (FT)	MAXIMUM ELEV. (FT)	LFB* ELEV. (FT)
2	2,091	1.15	558.15	
15	3,067	1.73	558.73	
25	3,478	2.01	559.01	
25*	4,199	2.58		559.58
100*	4,283	2.69		559.69

\* low flow blocked (LFB) - 3" DIA blocked

- NOTES:**
- SEE SHEET C001 FOR GENERAL NOTES
  - CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICT ALL WORK ASSOCIATED WITH THIS PROJECT.

### DRAINAGE NOTES:

- THE PROPOSED PROJECT IS WITHIN DUCKETT CREEK SEWER DISTRICT
- THE TOTAL PROJECT SITE IS 0.96 ACRES. THE TOTAL DISTURBED AREA IS 0.91 ACRES. THE DISTURBED AREA INCLUDES 0.07 ACRES OF RIGHT-OF-WAY.
- WATERSHED: DARDENNE CREEK
- PER THE NATIONAL RESOURCE CONSERVATION SERVICE (NRCS) THE SITE IS WITHIN HYDROLOGIC SOIL GROUP 'C' HAVING A SLOW INFILTRATION RATE WHEN THOROUGHLY WET.
- UNDERGROUND DETENTION HAS BEEN SIZED TO ACCOUNT FOR THE DIFFERENTIAL FROM THE PROJECT SITE (LOT 2) ONLY.

NOTE TO CONTRACTOR: PRIOR TO ANY EXCAVATION FOR UNDERGROUND UTILITIES, CONTRACTOR SHALL EXPOSE AND VERIFY LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL EXISTING UTILITIES INCLUDING BUT NOT LIMITED TO GAS, WATER, BROADBAND, PHONE, SANITARY AND STORM SEWERS. ANY CONFLICT SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER AND APPROPRIATE AUTHORITIES



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1-800-DIG-RITE

P&Z CUP#25.16  
OCT. 31, 2016  
DANIEL KOZIATEK  
2004017198  
\*HAND SIGNATURE ON FILE

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4015 HIGHWAY K  
OFALLON, MISSOURI 63368  
STORMWATER MANAGEMENT

DATE: SEPT. 2016 DRAWN BY: MRV  
1" = 20' CHECKED BY: DRK  
PROJECT NO: 162-880  
APPROVED BY: DRK\*

DRAWING NO. HD2  
SHEET 13 OF 14

**REVISION RECORD**

NO	DATE	DESCRIPTION
1	12/01/16	INITIAL IMPROVEMENT PLAN SUBMITTED TO CITY, COTTLEVILLE FIRE AND UTILITIES
2	03/07/17	RESUBMITTED TO CITY OF FALLOON
3	04/11/17	FINAL SUBMITAL TO CITY, COTTLEVILLE FIRE AND UTILITIES FOR APPROVAL
4		
5		
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9		
10		

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