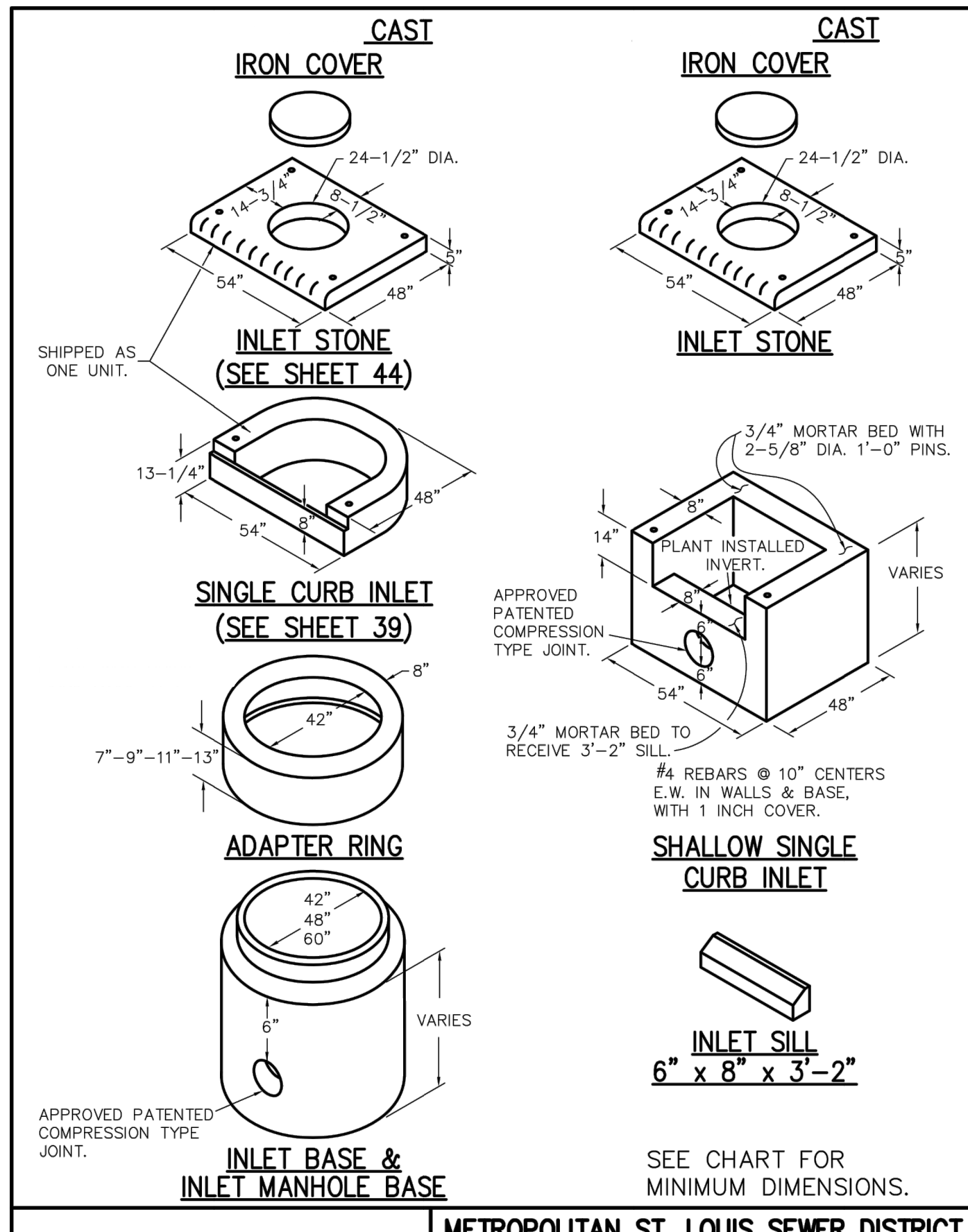


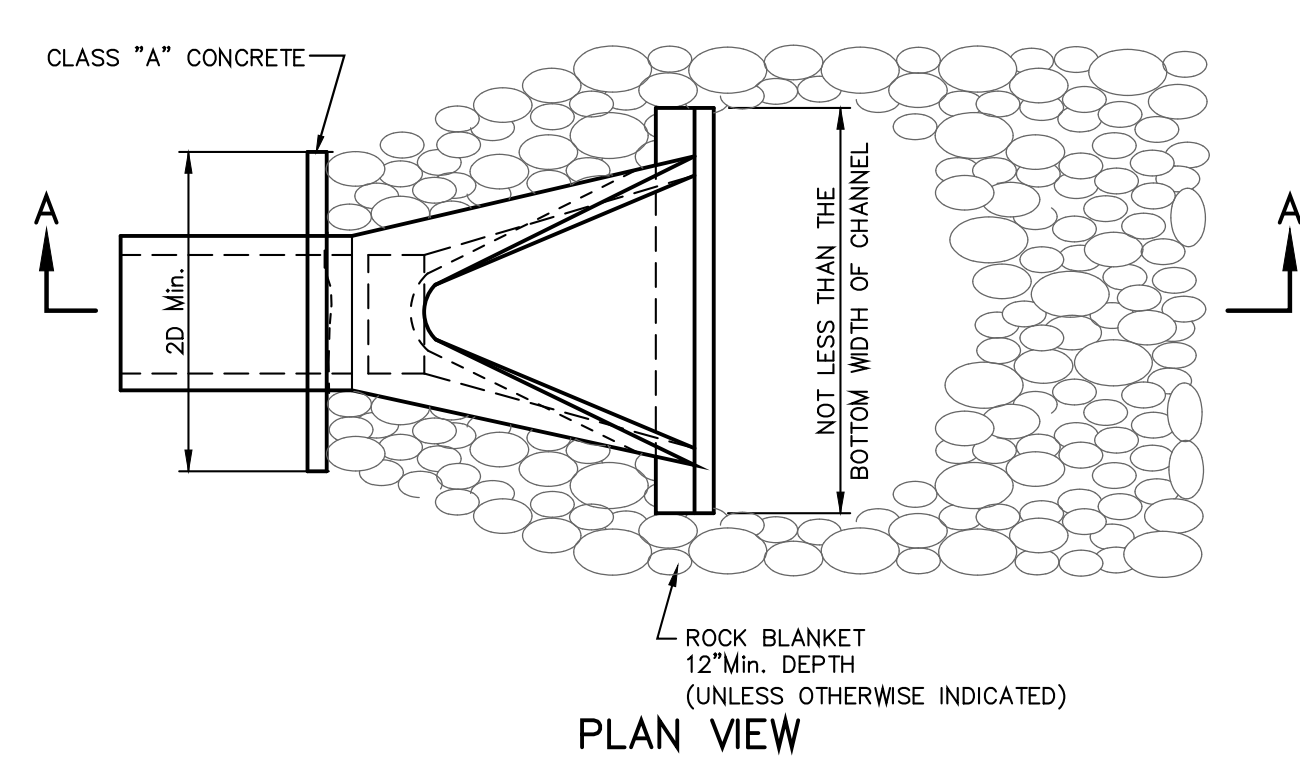
2 GRATE INLET



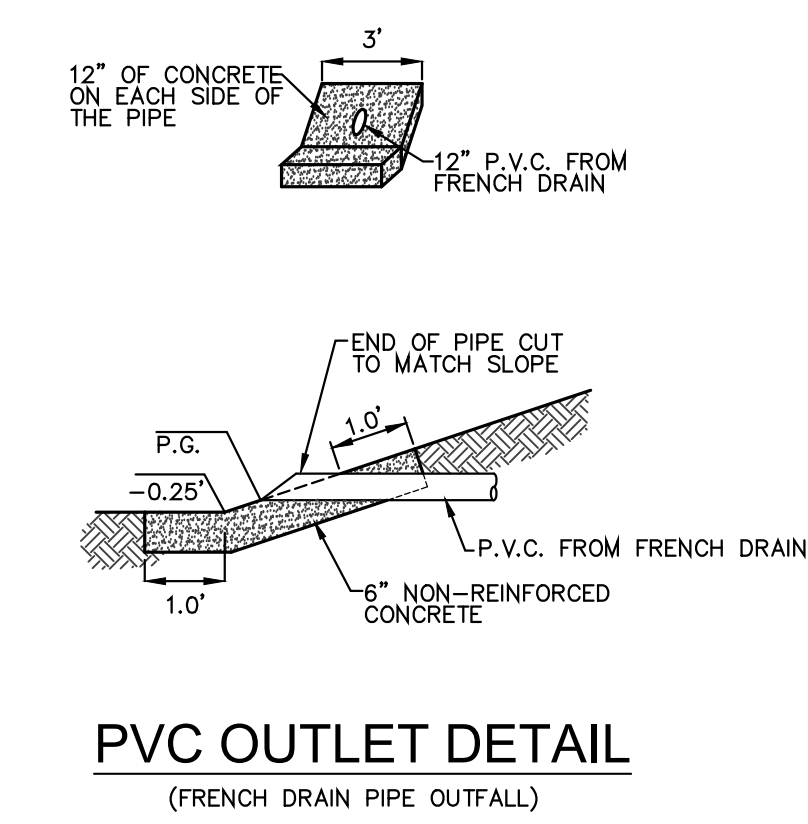
GENERAL NOTE

1. A 5/8" TRASH BAR SHALL BE CENTERED WITHIN THE OPENING(S) OF ALL INLETS.
2. ALL INLET COVERS SHALL BE CAST IRON.
3. ALL STORM SEWER INLET STRUCTURES SHALL BE PERMANENTLY PROVIDED WITH A MARKER/SYMBOL THAT STATES "DUMP NO WASTE DRAINS TO STREAM".

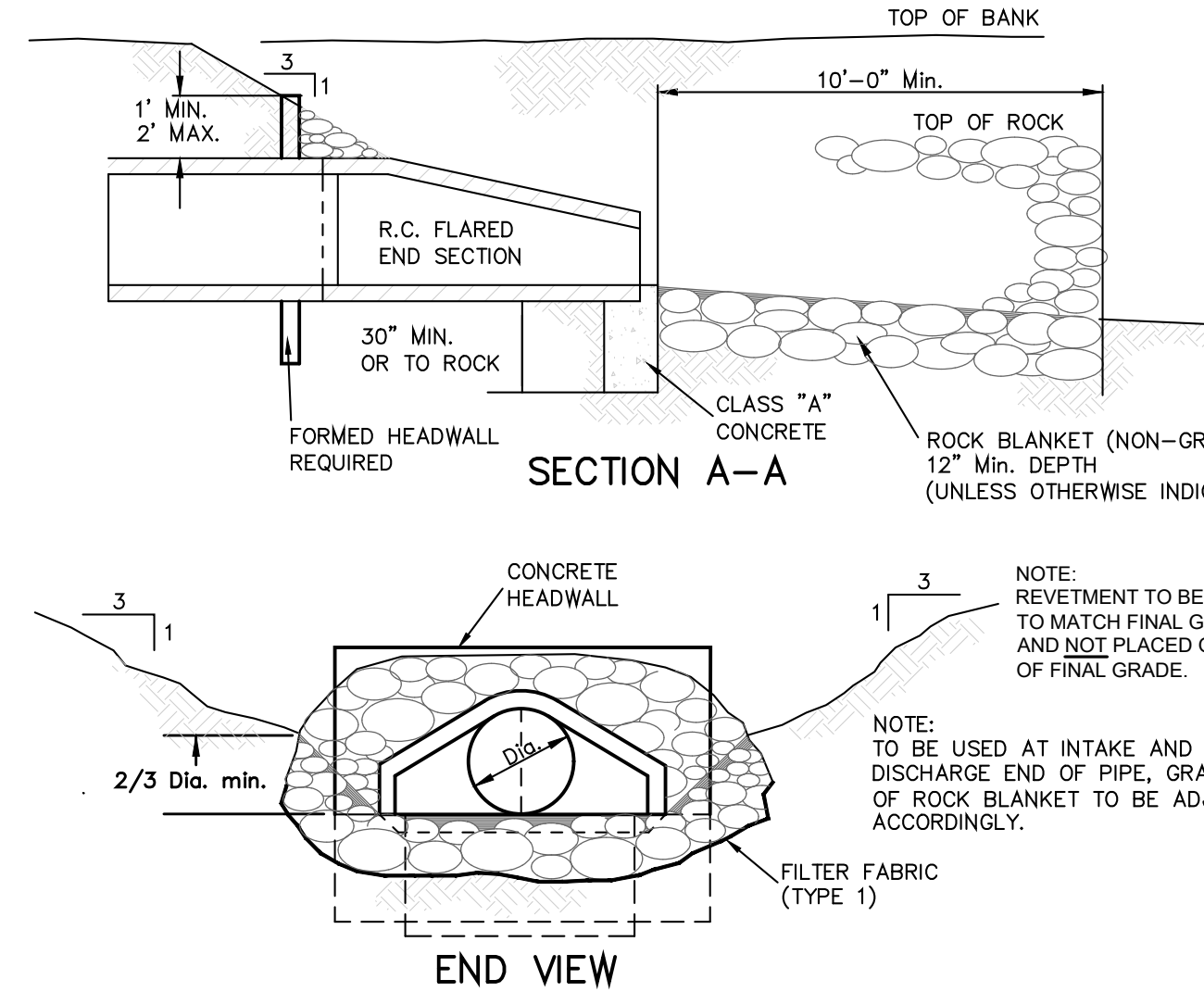
METROPOLITAN ST. LOUIS SEWER DISTRICT Standard Details of Sewer Construction			
Dr. JLG/SAM	2009	SHEET 36	
Ch. J.C.K.			



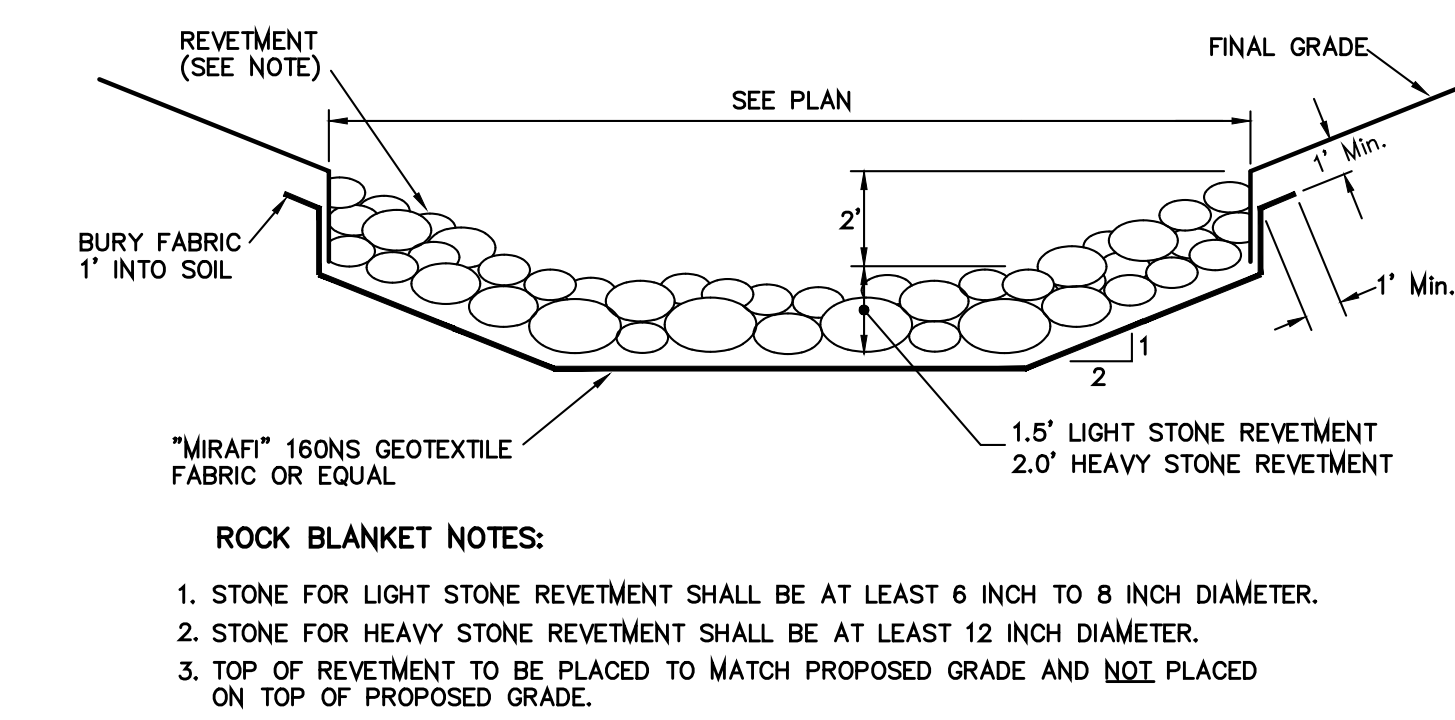
DETAIL OF SEWER CLEANOUT



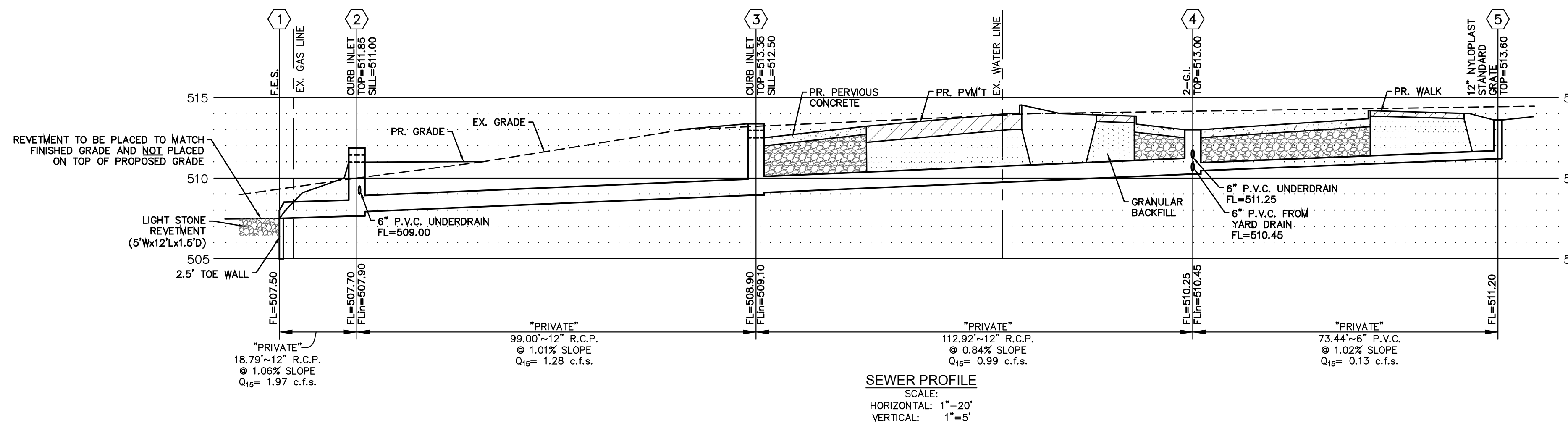
PVC OUTLET DETAIL
(FRENCH DRAIN PIPE OUTFALL)



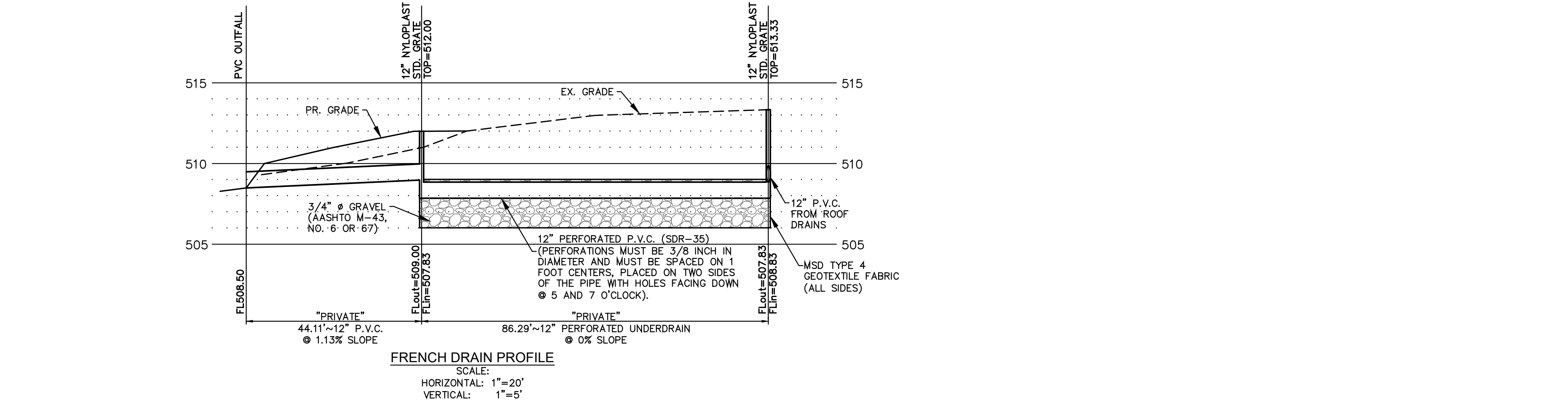
FLARED END SECTION
(FOR ONSITE USE ONLY)



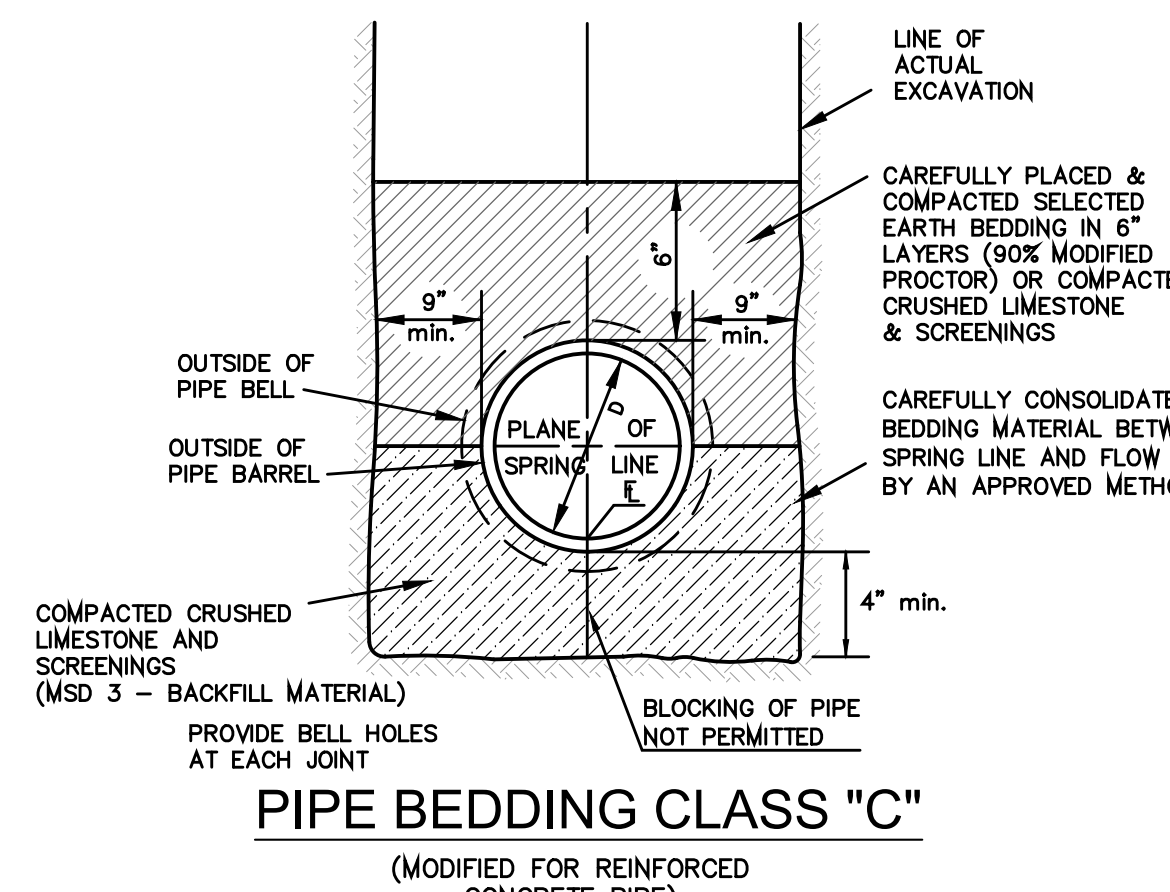
ROCK BLANKET DETAIL
(FOR LOCATIONS SEE PLANS)



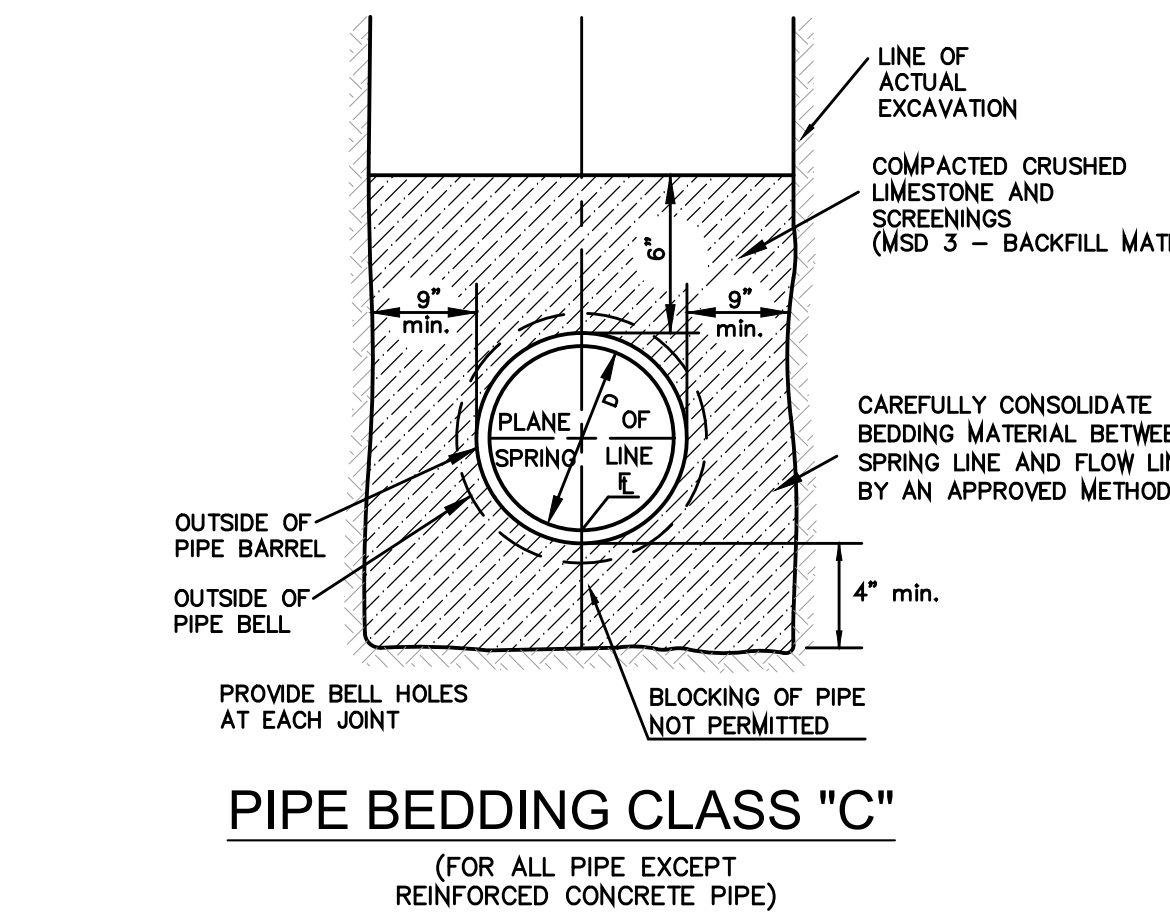
SEWER PROFILE
SCALE:
HORIZONTAL: 1"=20'
VERTICAL: 1"=5'



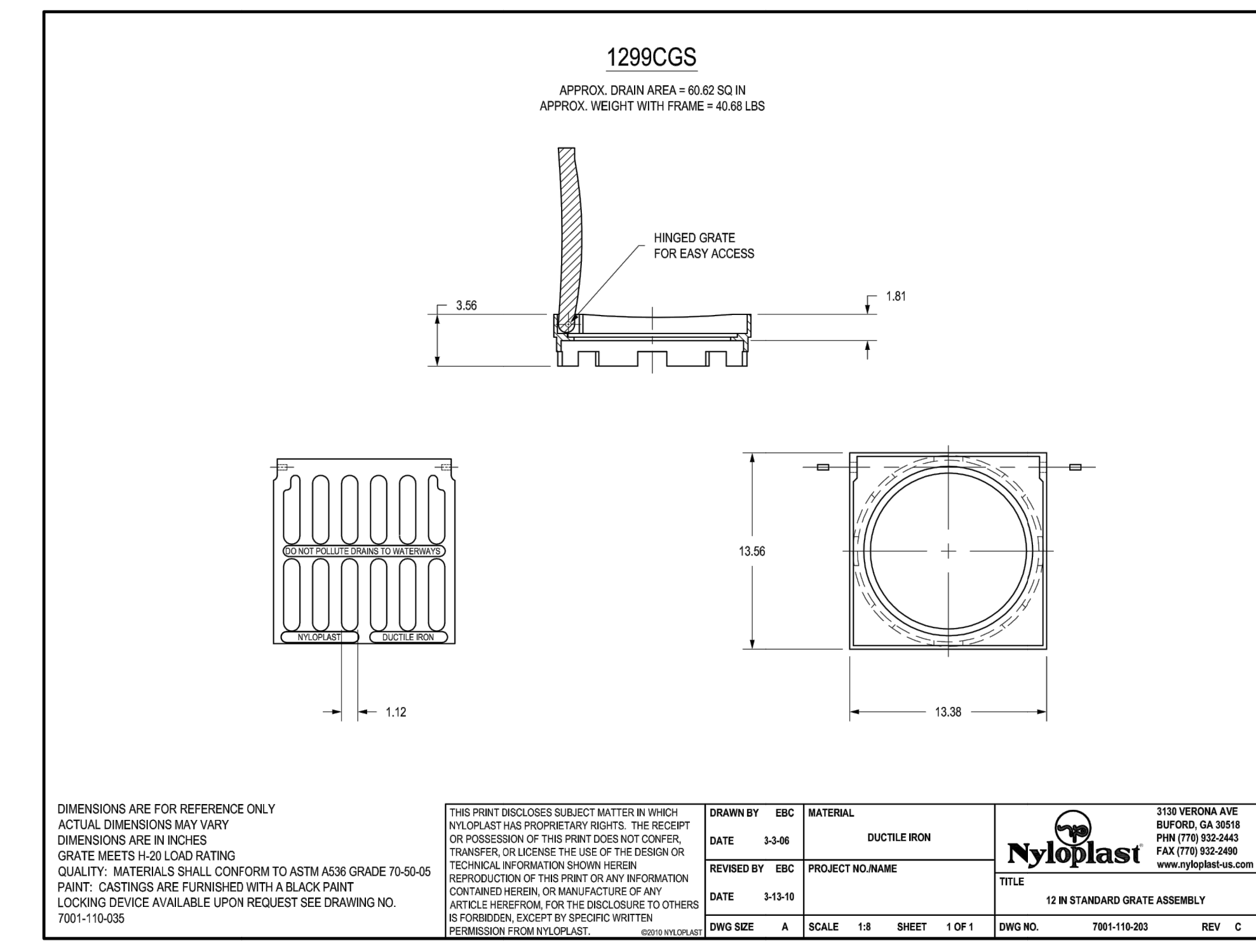
FRENCH DRAIN PROFILE
SCALE:
HORIZONTAL: 1"=20'
VERTICAL: 1"=5'



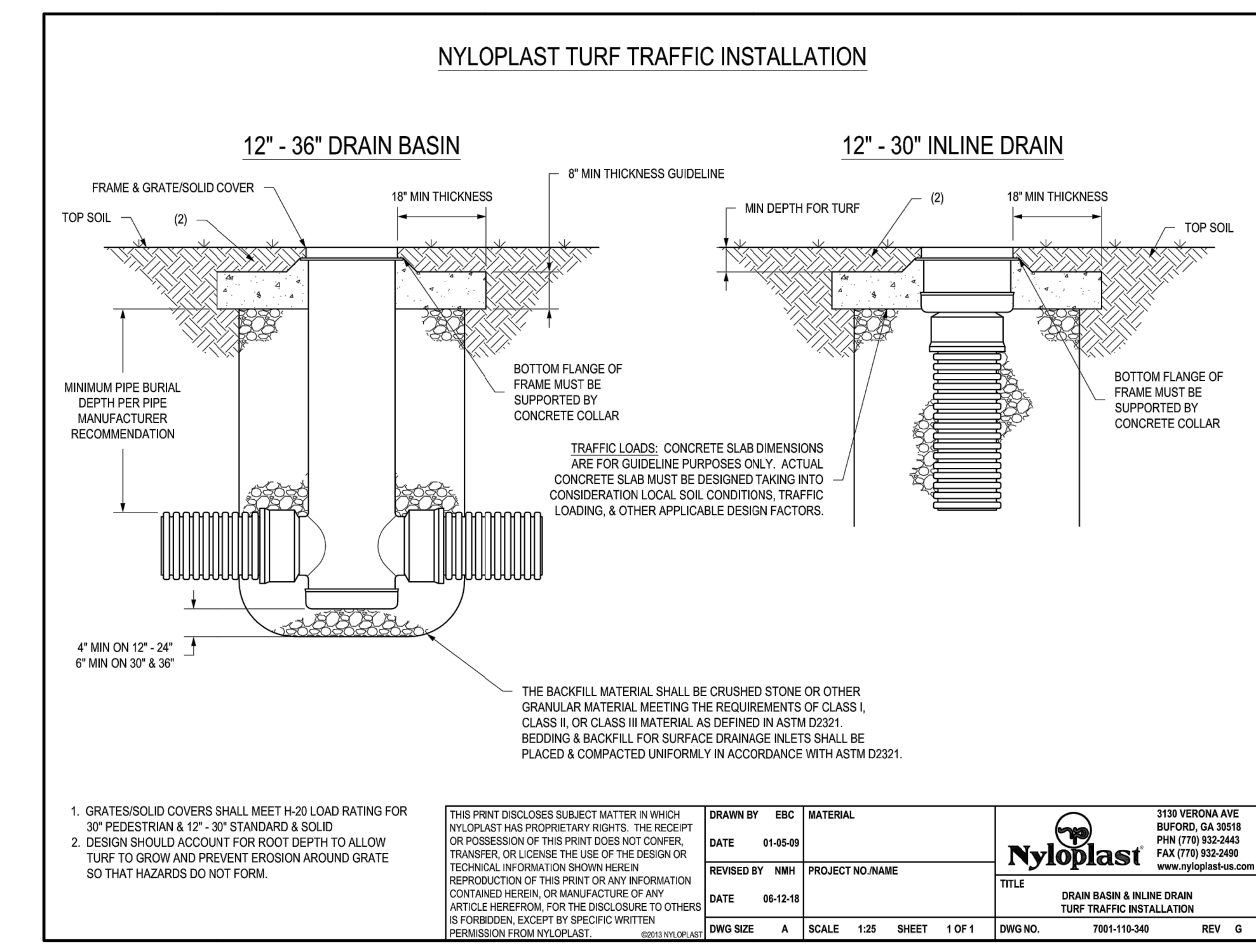
PIPE BEDDING CLASS "C"
(MODIFIED FOR REINFORCED CONCRETE PIPE)



PIPE BEDDING CLASS "C"
(FOR ALL PIPE EXCEPT REINFORCED CONCRETE PIPE)



1299CGS	APPROX. DRAIN AREA = 66.62 SQ IN	APPROX. WEIGHT WITH FRAME = 40.8 LBS
DIMENSIONS ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY.		
THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONSTITUTE A TRANSFER OF INTELLECTUAL PROPERTY RIGHTS IN ANY PATENT, TRADE SECRET, OR OTHER PROPRIETARY INFORMATION CONTAINED HEREIN OR MANUFACTURE OF ANY ARTICLE, INSTRUMENT, OR DEVICE OR TO OTHERS. PERMISSION IS GRANTED BY NYLOPLAST TO OTHERS TO REPRODUCE THIS PRINT FOR PERSONAL USE ONLY.		
DRAWN BY: EBC	DATE: 3-26-06	MATERIAL: DOCTILE IRON
REVISION BY: EBC	DATE: 3-13-10	PROJECT NO: NAME
DATE: 3-13-10	SCALE: 1/8" = 1'-0"	SHEET: 1 OF 1
DWG NO: 7001-110-200		REV: C



1. GRATES/SOLID COVERS SHALL MEET H-20 LOAD RATING FOR 30' PRESTRAIN & 12" - 30" STANDARD & SOLID.			THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONSTITUTE A TRANSFER OF INTELLECTUAL PROPERTY RIGHTS IN ANY PATENT, TRADE SECRET, OR OTHER PROPRIETARY INFORMATION CONTAINED HEREIN OR MANUFACTURE OF ANY ARTICLE, INSTRUMENT, OR DEVICE OR TO OTHERS. PERMISSION IS GRANTED BY NYLOPLAST TO OTHERS TO REPRODUCE THIS PRINT FOR PERSONAL USE ONLY.
2. DESIGN SHOULD ACCOUNT FOR ROOT DEPTH TO ALLOW TURF TO GROW AND PREVENT EROSION AROUND GRATE.	DATE: 04-05-09	MATERIAL: NYLOPLAST	318 WILSON AVE SUITE 200 OFALLON, IL 62450 PH: (773) 932-2440 FAX: (773) 932-2499 WWW.NYLOPLAST.COM
	DATE: 06-15-16	PROJECT NO: NAME	TITLE: DRAIN BASIN & INLINE DRAIN TURF TRAFFIC INSTALLATION
	DWG NO: A	SCALE: 1/8" = 1'-0"	SHEET: 1 OF 1 DWG NO: 7001-110-240 REV: G

HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA PLAN FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)																							
15 YR																							
Project name: FSM Abandon																							
Project number: 1823																							
Project location: Ofallon, MO																							
Calculated By: JWB																							
Checked By: PKB																							
Date: 9/26/2018																							
Bend Coefficients:																							
5' = 0.06 20' = 0.24 35' = 0.40 50' = 0.50 65' = 0.57 80' = 0.65																							
10' = 0.11 25' = 0.30 40' = 0.43 55' = 0.52 70' = 0.60 85' = 0.67																							
15' = 0.18 30' = 0.35 45' = 0.47 60' = 0.55 75' = 0.62 90' = 0.70																							
HEAD LOSS																							
Structure Number	Upper structure	Lower structure	Length (ft)	Flowline Grade (ft)	Pipe Size (in.)	Full Flow Cap. (cfs)	Total Q (cfs)	Mean Full Flow Vel (ft/s)	Vel (ft/s)	Q ₁₀ (cfs)	Pipe Coef. (n)	H _f (ft)	Junction H _l (ft)	Bend H _l (ft)	Total H _l (ft)	Upper F.L. + Dia.	Lower H.L. + H _l	Structure Elevation	Free Board	Structure Number			
Deck Grate	Deck Grate	End of Pipe	508.34	507.42	156.57	0.0059	8	0.93	0.75	2.15	0.00	0.07	0.05	0.013	0.60	0.00	509.01	508.69	508.09	509.01	509.84	0.83	Deck Grate
Assume Starting Hydraulic Grade at Top of 8" Pipe																							
5	5	4	511.20	510.45	75.33	0.0100	6	0.56	0.13	0.66	0.00	0.01	0.00	0.013	0.04	0.01	511.70	511.32	511.28	511.71	513.60	1.89	5
4	4	3	510.25	509.10	112.92	0.0102	12	3.61	0.99	1.26	0.02	0.02	0.03	0.09	0.03	0.03	510.19	510.10	510.10	511.28	513.00	1.72	4
3	3	2	508.90	507.90	99.00	0.0101	12	3.59	1.28	1.63	0.50	0.04	0.05	0.013	0.13	0.03	509.50	509.03	508.90	509.94	512.50	2.56	3
2	2	1	507.50	507.50	18.79	0.0106	12	3.69	1.97	2.51	0.43	0.19	0.19	0.013	0.06	0.09	508.70	508.56	508.50	508.81	513.00	2.19	2
Assume Starting Hydraulic Grade at Top of 12" Pipe																							
FORMULAS:																							
MEAN FULL FLOW VELOCITY: $V = Q_{10} / A_{flow}$																							
FRICTION LOSS (H _f): $H_f = 2.87 n^2 (L/V^{4.75})$																							
VELOCITY HEAD: $V_h = V^2 / 2g$																							
JUNCTION LOSSES (JUNC.): $J = Q_{10} V_{h1} - \sum Q_{10} V_{h2}$																							
BEND LOSSES (BEND): $B = (V^2 / 2g) \times \text{ANGLE COEFFICIENT}$																							
Note: 1. IF MORE THAN ONE INCOMING LINE, CALCULATE EACH BEND LOSS AND ADD TOGETHER.																							
2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP.																							
3. IF $Q_{10} \geq Q_{10max}$, NO JUNCTION LOSSES TO BE CALCULATED.																							

Note:
Stormwater design is based on the Rational Method per City of Ofallon Government Code Chapter 405, Article V
Runoff Factors
1.87 c.f.u./acre for pervious areas
3.85 c.f.u./acre for impervious areas