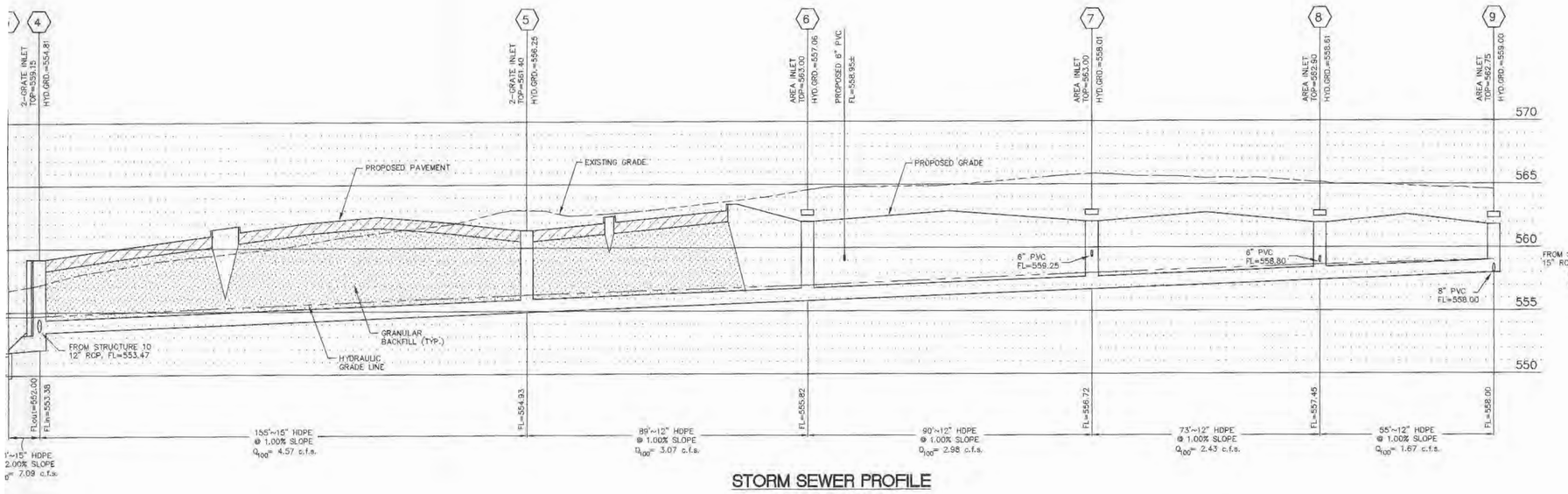
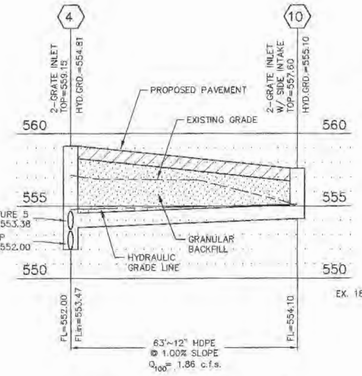


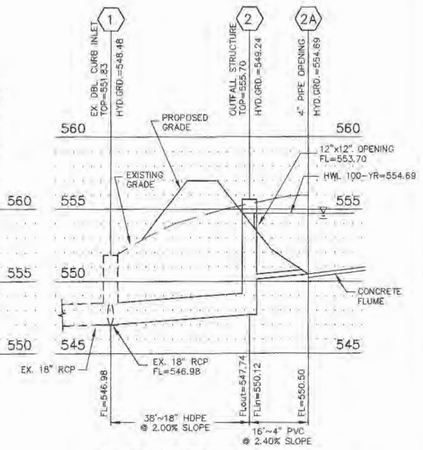
STORM SEWER PROFILE

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



STORM SEWER PROFILE

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



STORM SEWER PROFILE

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

HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP SHEET C8) FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)

Project name: *Belleau Creek Plaza* — Calculated By: *MWE*
Project number: *6106* — Checked By: *BAH*
Project Location: *St. Peters, MO* — Date: *03/09/2005*

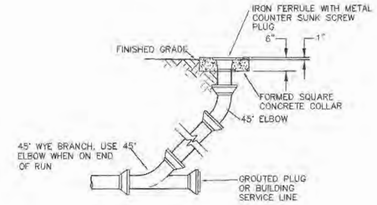
Bend Coefficients:
5°=0.06, 20°=0.24, 35°=0.4, 50°=0.50, 65°=0.57, 80°=0.65
10°=0.11, 25°=0.30, 40°=0.43, 55°=0.52, 70°=0.60, 85°=0.67
15°=0.18, 30°=0.35, 45°=0.47, 60°=0.55, 75°=0.62, 90°=0.70

Structure Number	LINE Upper structure	LINE Lower structure	FLOW LINE ELEVATIONS Upper structure	FLOW LINE ELEVATIONS Lower Structure	Length (ft)	Flowline Grade ft/ft	Pipe Size (in.)	Full Flow Cap. (cfs)	Total (Q) (cfs)	Mean Full Flow Vel.(V) (ft/s)	Bend Coef.	Velocity Head (V_h) (ft)	QV_h (ft^3/s)	Pipe Coef. (n)	HEAD LOSS H_f (ft)	HEAD LOSS Junction (ft)	HEAD LOSS Bend (ft)	HEAD LOSS Total H_{tot}	Hydraulic Elevations Upper E. + Dia.	Hydraulic Elevations Lower H.E. +H_f	Hydraulic Elevations Lower H.E.	Structure Upper H.E. + H_{tot}	TOP Structure Elevation	Free Board	Structure Number
10	10	4	554.1	553.47	63.17	0.0100	12	3.57	1.86	2.37		0.09	0.16	0.013	0.17	0.00	0.00	0.00	555.10	554.98	554.81	555.10	557.6	2.50	10
9	9	8	558	557.45	55.00	0.0100	12	3.57	1.67	2.13		0.07	0.12	0.013	0.12	0.00	0.00	0.00	559.00	558.73	558.61	559.00	562.75	3.75	9
8	8	7	557.45	556.72	72.60	0.0101	12	3.58	2.43	3.09	0.18	0.15	0.36	0.013	0.34	0.13	0.03	0.16	558.45	558.35	558.01	558.61	562.9	4.29	8
7	7	6	556.72	555.82	90.38	0.0100	12	3.56	2.98	3.79	0.7	0.22	0.67	0.013	0.63	0.14	0.16	0.29	557.72	557.69	557.06	558.01	563	4.99	7
6	6	5	555.82	554.93	89.45	0.0099	12	3.56	3.07	3.91	0.47	0.24	0.73	0.013	0.66	0.03	0.11	0.14	556.82	556.92	556.25	557.06	563	5.94	6
5	5	4	554.93	553.38	155.35	0.0100	15	6.47	4.57	3.72		0.22	0.98	0.013	0.78	0.07	0.00	0.07	556.18	555.47	554.69	556.25	561.4	5.15	5
4	4	3	552	551.50	10.00	0.0500	15	14.48	7.09	5.78		0.52	3.67	0.013	0.12	0.00	0.00	0.00	553.25	554.81	554.69	554.81	559.15	4.34	4
2	2	1	547.74	546.98	38.33	0.0198	18	14.83	7.35	4.16		0.27	1.97	0.013	0.19	0.00	0.00	0.00	549.24	548.67	548.48	549.24	555.7	6.46	2
													ASSUME HYDRAULIC FLOW LINE @ END OF PIPE = 100-YEAR HIGH WATER IN BASIN =554.69												

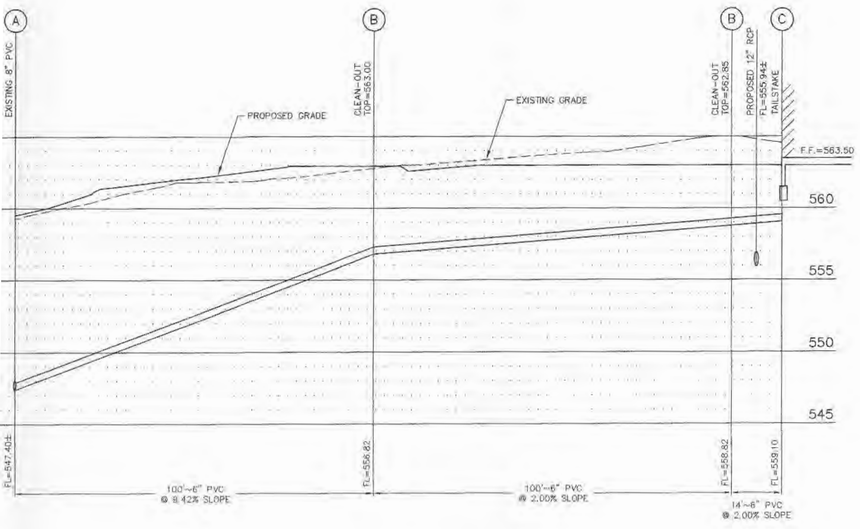
FORMULAS:
MEAN FULL FLOW VELOCITY: $V = Q_{RCP}/A_{RCP}$
FRICTION LOSS (H_f): $Hf = 2.87\ n^2\ (LV^2/d^{1.75})$
VELOCITY HEAD: $V_h = V^2/2g$

JUNCTION LOSSES (JUNC) = $[Q_{out}Vh_{out} - Sum\ (Q_{in}V_{in})]x1.33/Q_{out}$
BEND LOSSES (BEND) = $(V^2_{in}/2g)$ * 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 $QV_{(out)} > QV_{(sum\ in)}$, NO JUNCTION LOSSES TO BE CALCULATED.

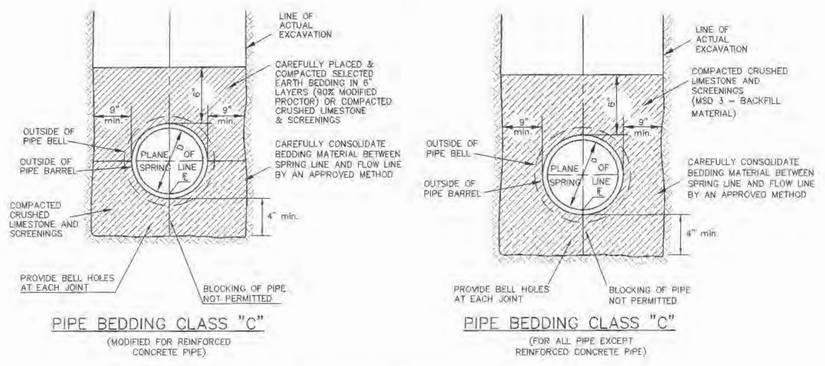


DETAIL OF SEWER CLEANOUT



SANITARY SEWER PROFILE

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

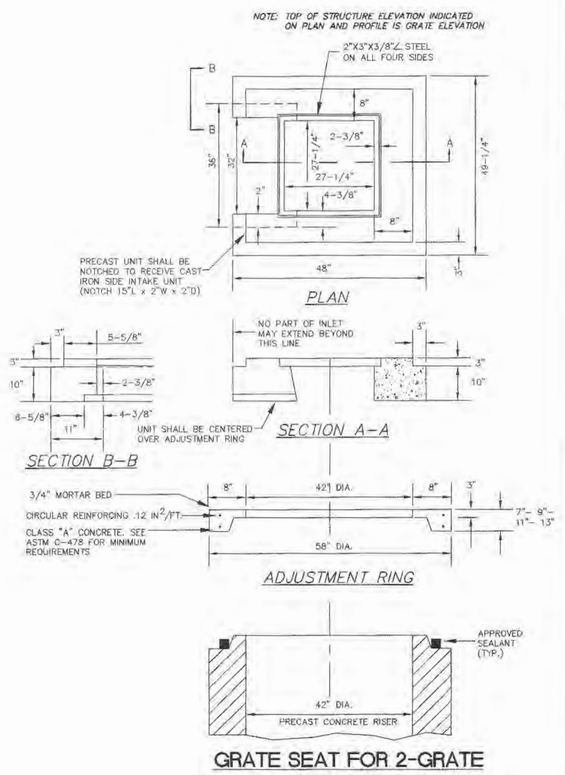


PIPE BEDDING CLASS "C"
(MODIFIED FOR REINFORCED CONCRETE PIPE)

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

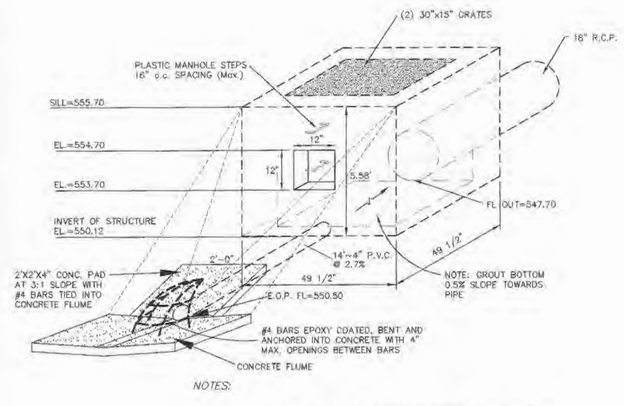
PIPE BEDDING DETAILS

(N.T.S.)



GRATE SEAT FOR 2-GRATE INLET WITH SIDE INTAKE

NOTE: CONTRACTOR SHALL STAKEOUT CURB-LINE WHEN LOCATING INLET FOR PROPER INLET PLACEMENT/ORIENTATION IN FIELD.

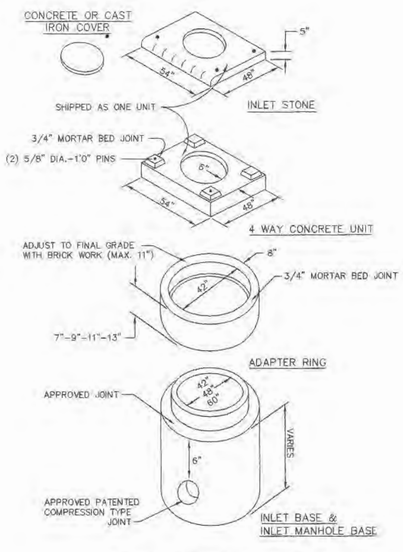


NOTES:

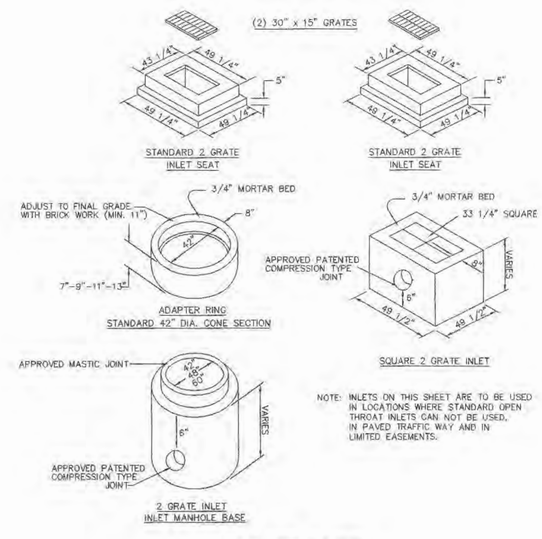
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW, PRIOR TO CONSTRUCTION OF STRUCTURE.
2. ALTERNATES MAY BE CONSIDERED FOR PRECAST STRUCTURE. CONTRACTOR TO SUBMIT TO ENGINEER FOR REVIEW.

OUTFALL STRUCTURE

(N.T.S.)



PRECAST AREA INLET



NOTE: INLETS ON THIS SHEET ARE TO BE USED IN LOCATIONS WHERE STANDARD OPEN THROAT INLETS CAN NOT BE USED, IN PAVED TRAFFIC WAY AND IN LIMITED EASEMENTS.

2 GRATE INLET

ISSUE FOR PERMIT & BIDDING