

Job Number: 20-21424 CAD File Name: P:\ACAD\Longboat\Arts\Longboat.dwg Sheet Title: DRAINAGE DETAILS Plot Date and Time: 19990310.1412 Copyright © 1988 ZOLLER, NAJJAR & SHROYER, INC.

**DIMENSIONS & QUANTITIES**

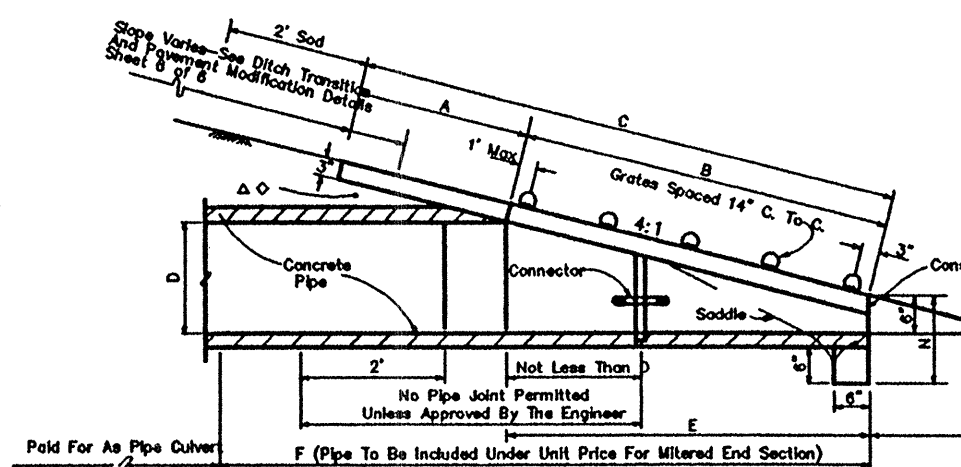
**OVAL PIPE**

Pipe Size	Span S	DIMENSIONS & QUANTITIES																		
		A	B	C	E	F	G	M	N	Standard Weight Pipe	Extra Strong Pipe									
12"	10'	2.30	3.08	5.42	3.03	3'	1.80	4.92	7.79	10.58	13.42	1.21	0.68	1.04	1.41	1.77	8	9	11	12
14"	10'	2.40	3.29	6.09	3.20	3'	1.90	5.38	8.71	12.04	15.38	1.23	0.78	1.19	1.63	2.06	9	10	12	13
16"	10'	2.50	3.49	9.09	3.30	3'	2.00	6.00	10.50	14.50	18.50	1.25	0.85	1.33	1.83	2.33	10	11	13	14
18"	10'	2.60	3.69	12.09	3.40	3'	2.10	6.90	12.60	17.60	22.60	1.27	0.95	1.45	1.95	2.45	11	12	14	15
20"	10'	2.70	3.89	15.09	3.50	3'	2.20	7.80	14.70	20.70	26.70	1.29	1.05	1.55	2.05	2.55	12	13	15	16
22"	10'	2.80	4.09	18.09	3.60	3'	2.30	8.70	16.80	23.80	30.80	1.31	1.15	1.65	2.15	2.65	13	14	16	17
24"	10'	2.90	4.29	21.09	3.70	3'	2.40	9.60	18.90	26.90	34.90	1.33	1.25	1.75	2.25	2.75	14	15	17	18
26"	10'	3.00	4.49	24.09	3.80	3'	2.50	10.50	21.00	30.00	38.00	1.35	1.35	1.85	2.35	2.85	15	16	18	19
28"	10'	3.10	4.69	27.09	3.90	3'	2.60	11.40	23.10	33.10	42.10	1.37	1.45	1.95	2.45	2.95	16	17	19	20
30"	10'	3.20	4.89	30.09	4.00	3'	2.70	12.30	25.20	35.20	45.20	1.39	1.55	2.05	2.55	3.05	17	18	20	21
32"	10'	3.30	5.09	33.09	4.10	3'	2.80	13.20	27.30	37.30	47.30	1.41	1.65	2.15	2.65	3.15	18	19	21	22
34"	10'	3.40	5.29	36.09	4.20	3'	2.90	14.10	29.40	39.40	49.40	1.43	1.75	2.25	2.75	3.25	19	20	22	23
36"	10'	3.50	5.49	39.09	4.30	3'	3.00	15.00	31.50	41.50	51.50	1.45	1.85	2.35	2.85	3.35	20	21	23	24
38"	10'	3.60	5.69	42.09	4.40	3'	3.10	15.90	33.60	43.60	53.60	1.47	1.95	2.45	2.95	3.45	21	22	24	25
40"	10'	3.70	5.89	45.09	4.50	3'	3.20	16.80	35.70	45.70	55.70	1.49	2.05	2.55	3.05	3.55	22	23	25	26
42"	10'	3.80	6.09	48.09	4.60	3'	3.30	17.70	37.80	47.80	57.80	1.51	2.15	2.65	3.15	3.65	23	24	26	27
44"	10'	3.90	6.29	51.09	4.70	3'	3.40	18.60	39.90	49.90	59.90	1.53	2.25	2.75	3.25	3.75	24	25	27	28
46"	10'	4.00	6.49	54.09	4.80	3'	3.50	19.50	42.00	51.00	61.00	1.55	2.35	2.85	3.35	3.85	25	26	28	29
48"	10'	4.10	6.69	57.09	4.90	3'	3.60	20.40	44.10	53.10	63.10	1.57	2.45	2.95	3.45	3.95	26	27	29	30
50"	10'	4.20	6.89	60.09	5.00	3'	3.70	21.30	46.20	55.20	65.20	1.59	2.55	3.05	3.55	4.05	27	28	30	31
52"	10'	4.30	7.09	63.09	5.10	3'	3.80	22.20	48.30	57.30	67.30	1.61	2.65	3.15	3.65	4.15	28	29	31	32
54"	10'	4.40	7.29	66.09	5.20	3'	3.90	23.10	50.40	59.40	69.40	1.63	2.75	3.25	3.75	4.25	29	30	32	33
56"	10'	4.50	7.49	69.09	5.30	3'	4.00	24.00	52.50	61.50	71.50	1.65	2.85	3.35	3.85	4.35	30	31	33	34

**ROUND PIPE**

Pipe Size	Span S	DIMENSIONS & QUANTITIES																		
		A	B	C	E	F	G	M	N	Standard Weight Pipe	Extra Strong Pipe									
12"	10'	2.30	3.08	5.42	3.03	3'	1.80	4.92	7.79	10.58	13.42	1.21	0.68	1.04	1.41	1.77	8	9	11	12
14"	10'	2.40	3.29	6.09	3.20	3'	1.90	5.38	8.71	12.04	15.38	1.23	0.78	1.19	1.63	2.06	9	10	12	13
16"	10'	2.50	3.49	9.09	3.30	3'	2.00	6.00	10.50	14.50	18.50	1.25	0.85	1.33	1.83	2.33	10	11	13	14
18"	10'	2.60	3.69	12.09	3.40	3'	2.10	6.90	12.60	17.60	22.60	1.27	0.95	1.45	1.95	2.45	11	12	14	15
20"	10'	2.70	3.89	15.09	3.50	3'	2.20	7.80	14.70	20.70	26.70	1.29	1.05	1.55	2.05	2.55	12	13	15	16
22"	10'	2.80	4.09	18.09	3.60	3'	2.30	8.70	16.80	23.80	30.80	1.31	1.15	1.65	2.15	2.65	13	14	16	17
24"	10'	2.90	4.29	21.09	3.70	3'	2.40	9.60	18.90	26.90	34.90	1.33	1.25	1.75	2.25	2.75	14	15	17	18
26"	10'	3.00	4.49	24.09	3.80	3'	2.50	10.50	21.00	30.00	38.00	1.35	1.35	1.85	2.35	2.85	15	16	18	19
28"	10'	3.10	4.69	27.09	3.90	3'	2.60	11.40	23.10	33.10	42.10	1.37	1.45	1.95	2.45	2.95	16	17	19	20
30"	10'	3.20	4.89	30.09	4.00	3'	2.70	12.30	25.20	35.20	45.20	1.39	1.55	2.05	2.55	3.05	17	18	20	21
32"	10'	3.30	5.09	33.09	4.10	3'	2.80	13.20	27.30	37.30	47.30	1.41	1.65	2.15	2.65	3.15	18	19	21	22
34"	10'	3.40	5.29	36.09	4.20	3'	2.90	14.10	29.40	39.40	49.40	1.43	1.75	2.25	2.75	3.25	19	20	22	23
36"	10'	3.50	5.49	39.09	4.30	3'	3.00	15.00	31.50	41.50	51.50	1.45	1.85	2.35	2.85	3.35	20	21	23	24
38"	10'	3.60	5.69	42.09	4.40	3'	3.10	15.90	33.60	43.60	53.60	1.47	1.95	2.45	2.95	3.45	21	22	24	25
40"	10'	3.70	5.89	45.09	4.50	3'	3.20	16.80	35.70	45.70	55.70	1.49	2.05	2.55	3.05	3.55	22	23	25	26
42"	10'	3.80	6.09	48.09	4.60	3'	3.30	17.70	37.80	47.80	57.80	1.51	2.15	2.65	3.15	3.65	23	24	26	27
44"	10'	3.90	6.29	51.09	4.70	3'	3.40	18.60	39.90	49.90	59.90	1.53	2.25	2.75	3.25	3.75	24	25	27	28
46"	10'	4.00	6.49	54.09	4.80	3'	3.50	19.50	42.00	51.00	61.00	1.55	2.35	2.85	3.35	3.85	25	26	28	29
48"	10'	4.10	6.69	57.09	4.90	3'	3.60	20.40	44.10	53.10	63.10	1.57	2.45	2.95	3.45	3.95	26	27	29	30
50"	10'	4.20	6.89	60.09	5.00	3'	3.70	21.30	46.20	55.20	65.20	1.59	2.55	3.05	3.55	4.05	27	28	30	31
52"	10'	4.30	7.09	63.09	5.10	3'	3.80	22.20	48.30	57.30	67.30	1.61	2.65	3.15	3.65	4.15	28	29	31	32
54"	10'	4.40	7.29	66.09	5.20	3'	3.90	23.10	50.40	59.40	69.40	1.63	2.75	3.25	3.75	4.25	29	30	32	33
56"	10'	4.50	7.49	69.09	5.30	3'	4.00	24.00	52.50	61.50	71.50	1.65	2.85	3.35	3.85	4.35	30	31	33	34

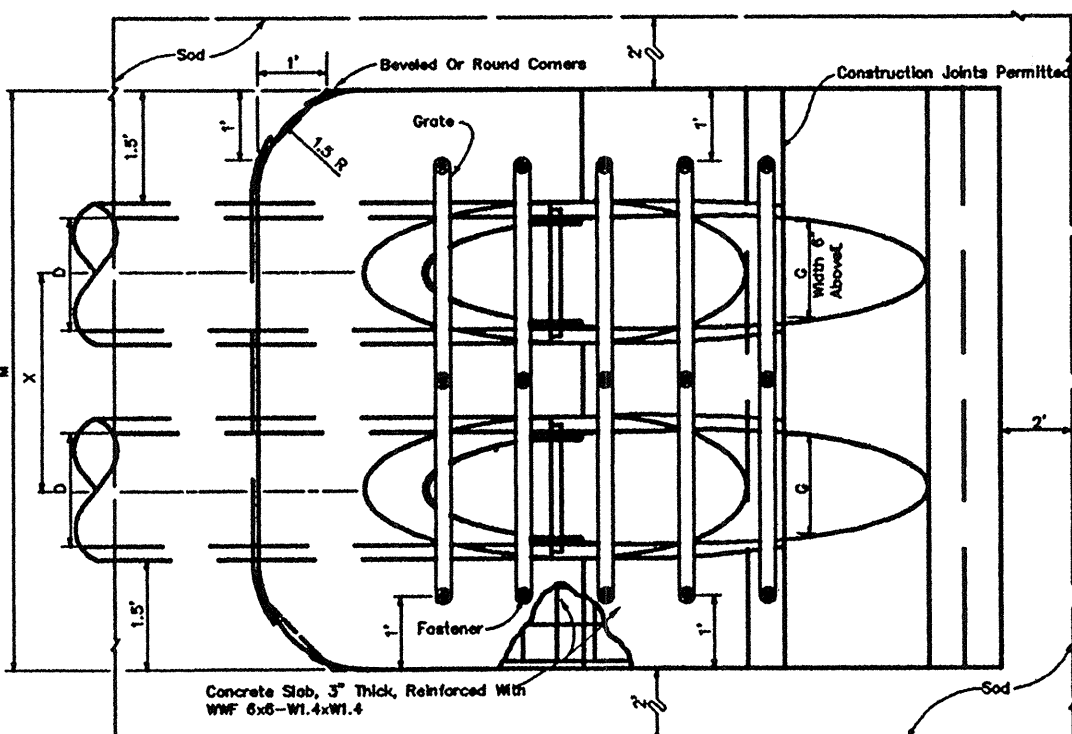
NOTES:  
 1. SAFETY GRATING FOR 30" (34" x 53") OR LARGER SIDE DRAINS ONLY.  
 2. SOD TO BE PLACED 18" AROUND THE PERIMETER OF THE WALL. SOD TO BE BAHIA, ST. AUGUSTINE SOD WHERE THERE IS TIDAL OR HEAVY CONCENTRATION OF SALT.



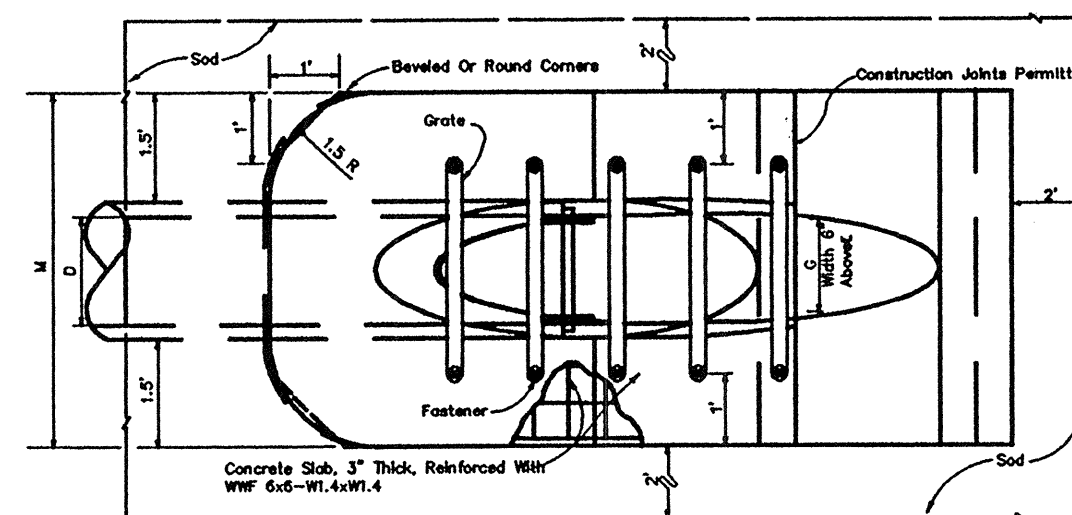
**SECTION**

**MITERED END SECTION DETAIL**

N.T.S.



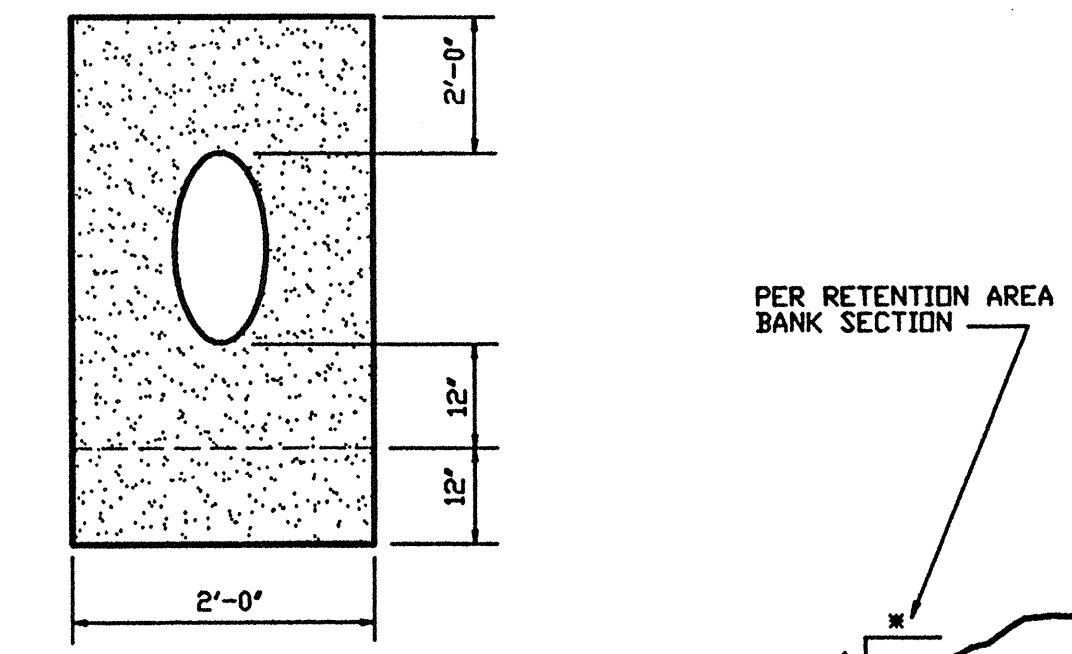
**TOP VIEW-MULTIPLE PIPE**



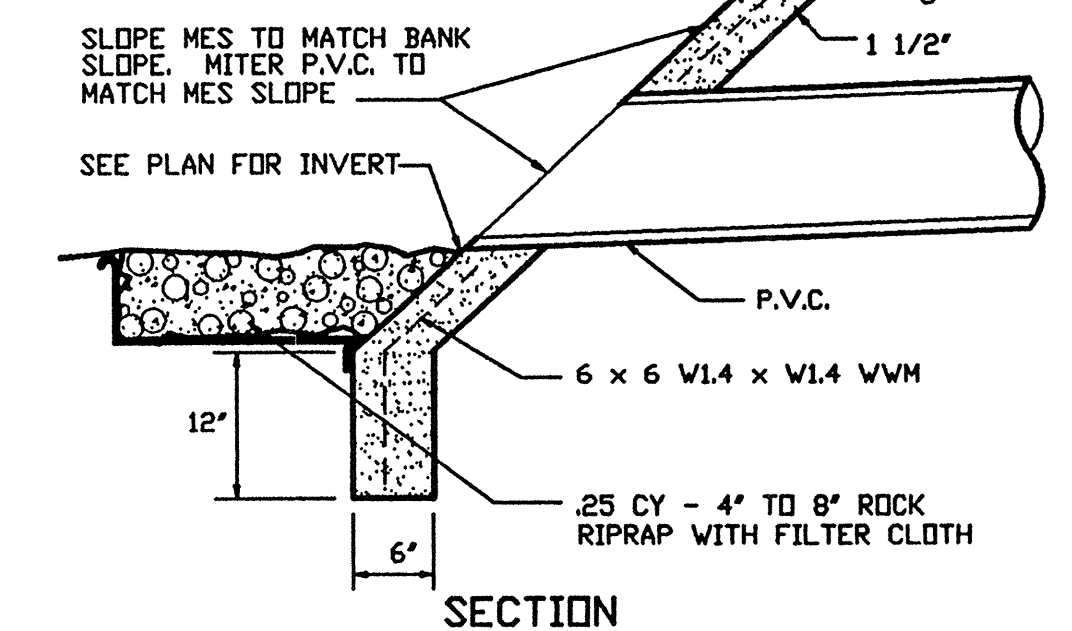
**TOP VIEW-SINGLE PIPE**

**P.V.C. MITERED END SECTION**

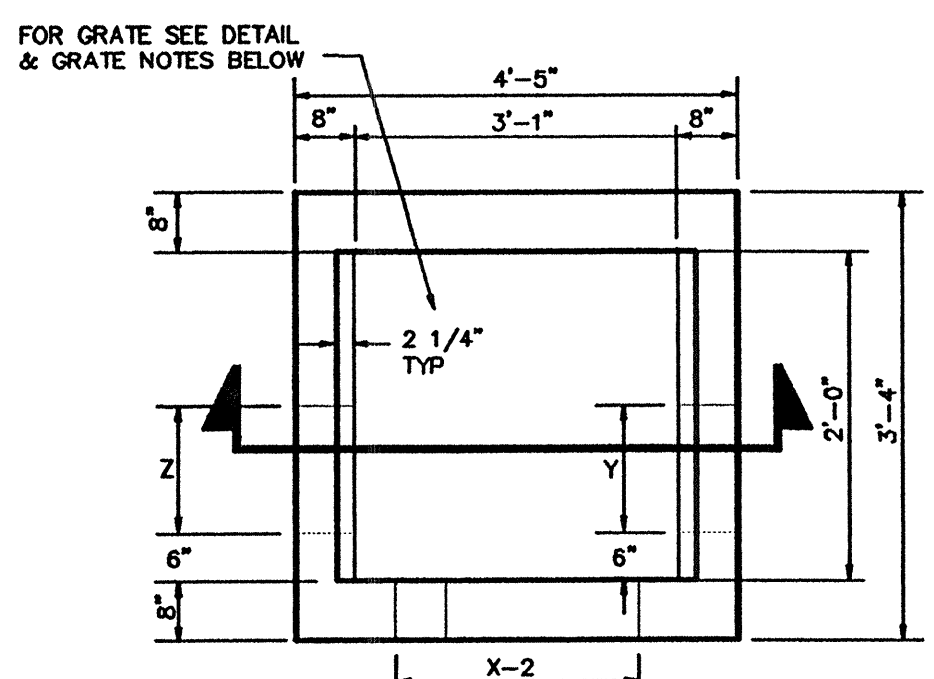
NOT TO SCALE



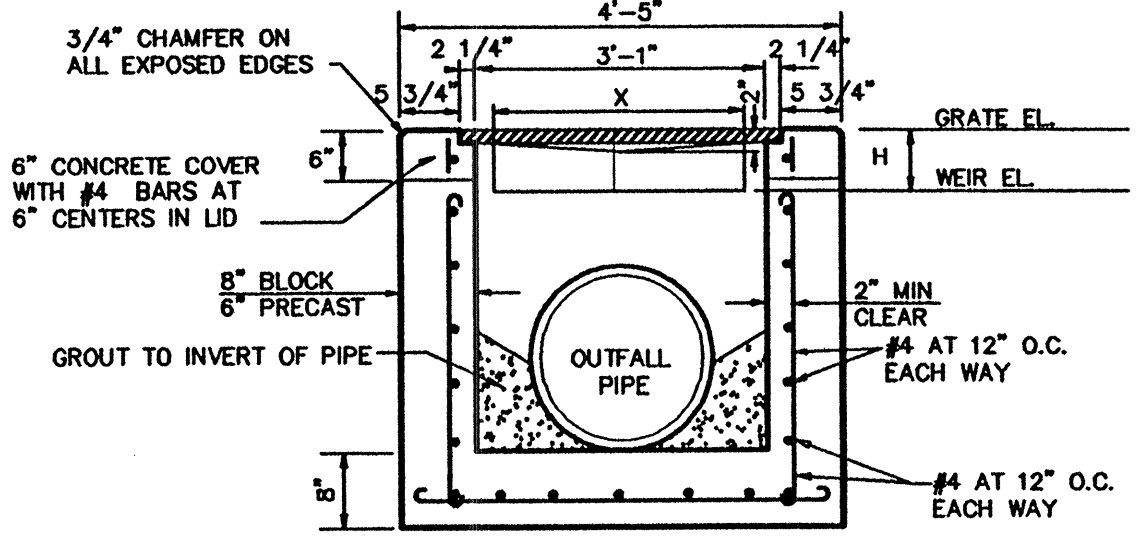
**PLAN**



**SECTION**



**PLAN VIEW**



**SECTION**

- NOTES:  
 1. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION. SHOULD ANY VARIANCE OF THIS DETAIL BE NECESSARY.  
 2. BENCH MARKS WITH THE ELEVATIONS CLEARLY AND PERMANENTLY MARKED ARE TO BE PLACED ON THE TOP OF ALL OUTFALL CONTROL STRUCTURES.  
 3. GREASE/OIL SKIMMER TO BE ATTACHED TO WINDOW SIDE OF STRUCTURE (PER DETAIL).  
 4. ALL CONTROL STRUCTURES SHALL HAVE A SEPARATE TOP SLAB TO ALLOW FOR FINAL ADJUSTMENT TO DESIGN GRADE. PRECAST CONTROL STRUCTURES SHALL BE CAST SO AS TO ALLOW A MINIMUM OF 6" OF BRICK ADJUSTMENT FOR CONSTRUCTION OF THE WEIRS.

- GRATE NOTES:  
 1. ALL GRATES TO BE GALVANIZED STEEL.  
 2. TRAFFIC BEARING GRATE TO BE U.S. FOUNDRY NO. 6611.  
 3. NON-TRAFFIC BEARING GRATE TO BE U.S. FOUNDRY NO. 6610.

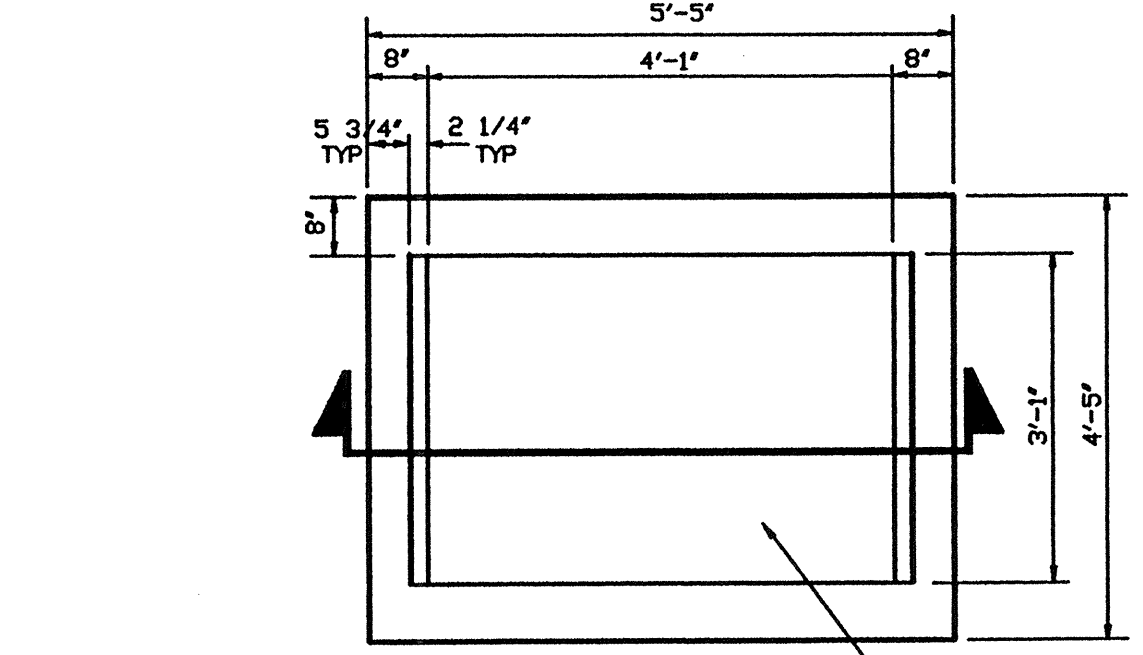
**CONTROL STRUCTURE DETAIL TYPE "C" INLET**

N.T.S.

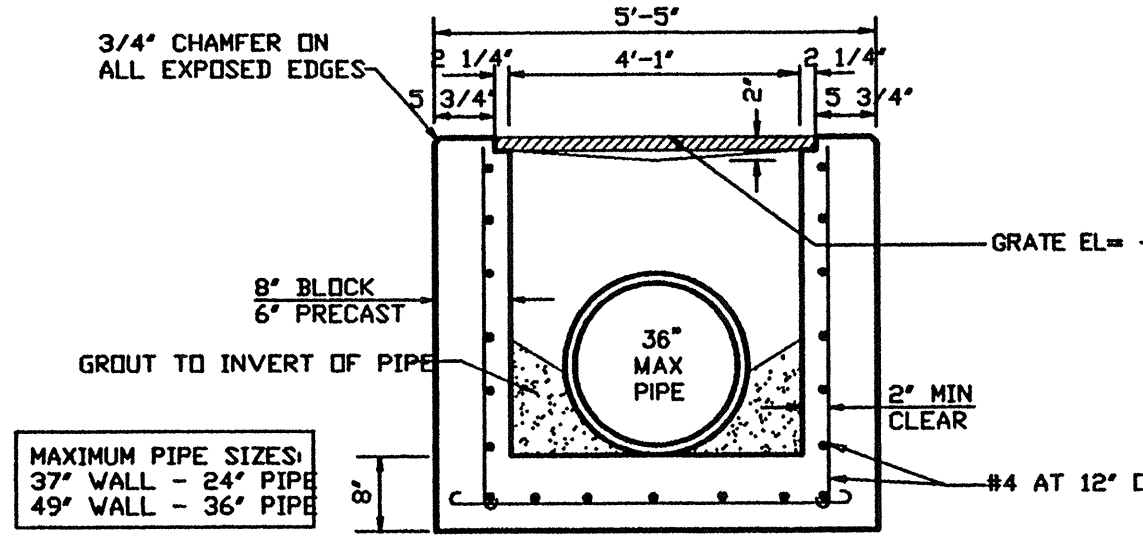
**CONTROL STRUCTURE DATA CHART**

STRUCTURE	WEIR EL.	WEIR OPENING X	H	OUTFALL PIPE SIZE	OUTFALL PIPE INV. EL.	GRATE EL.
CS-1	3.44	3'-0"	0'-4"	14" X 23"	1.80	3.77

\* WEIR OPENING EXTENDS TO TOP OF GRATE



**PLAN VIEW**



**SECTION**

- NOTES:  
 1. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION. SHOULD ANY VARIANCE OF THIS DETAIL BE NECESSARY.  
 2. BENCH MARKS WITH THE ELEVATIONS CLEARLY AND PERMANENTLY MARKED ARE TO BE PLACED ON THE TOP OF ALL OUTFALL CONTROL STRUCTURES.

- GRATE NOTES:  
 1. ALL GRATES TO BE GALVANIZED STEEL.  
 2. TRAFFIC BEARING GRATE TO BE U.S. FOUNDRY NO. 6626.  
 3. NON-TRAFFIC BEARING GRATE TO BE U.S. FOUNDRY NO. 6625.

**TYPE "D" INLET**

NOT TO SCALE