

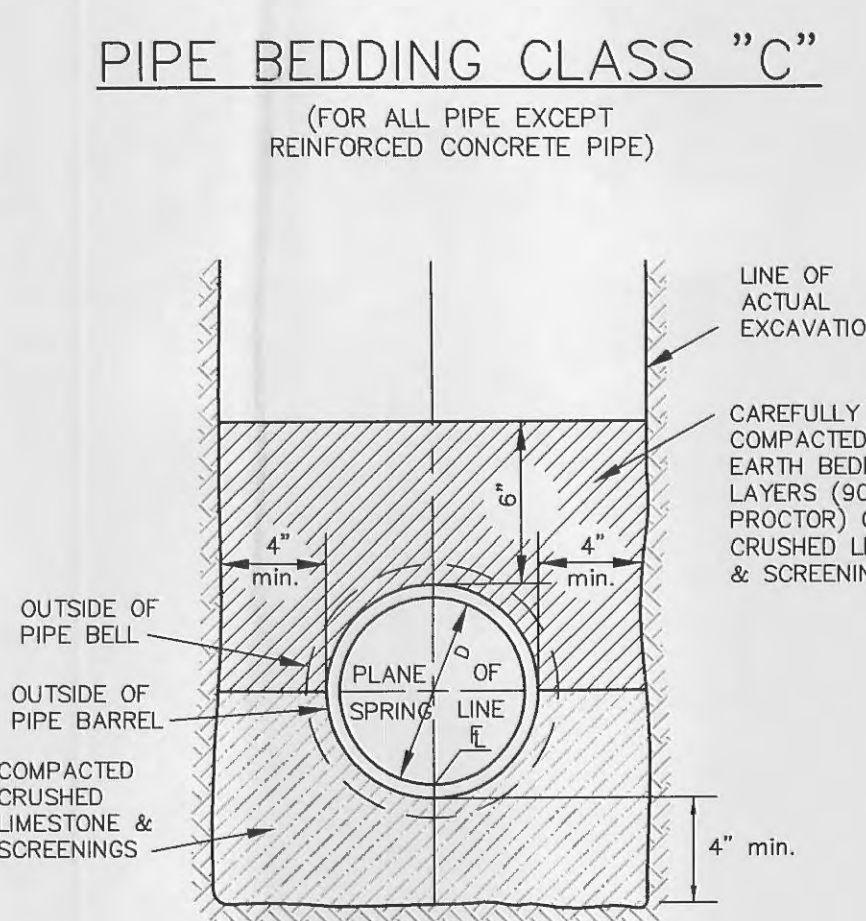
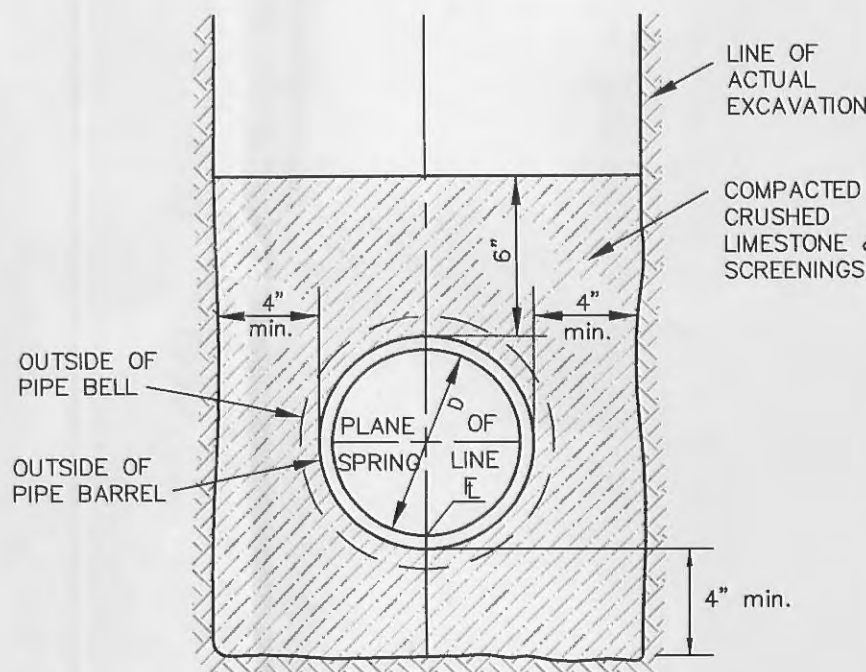
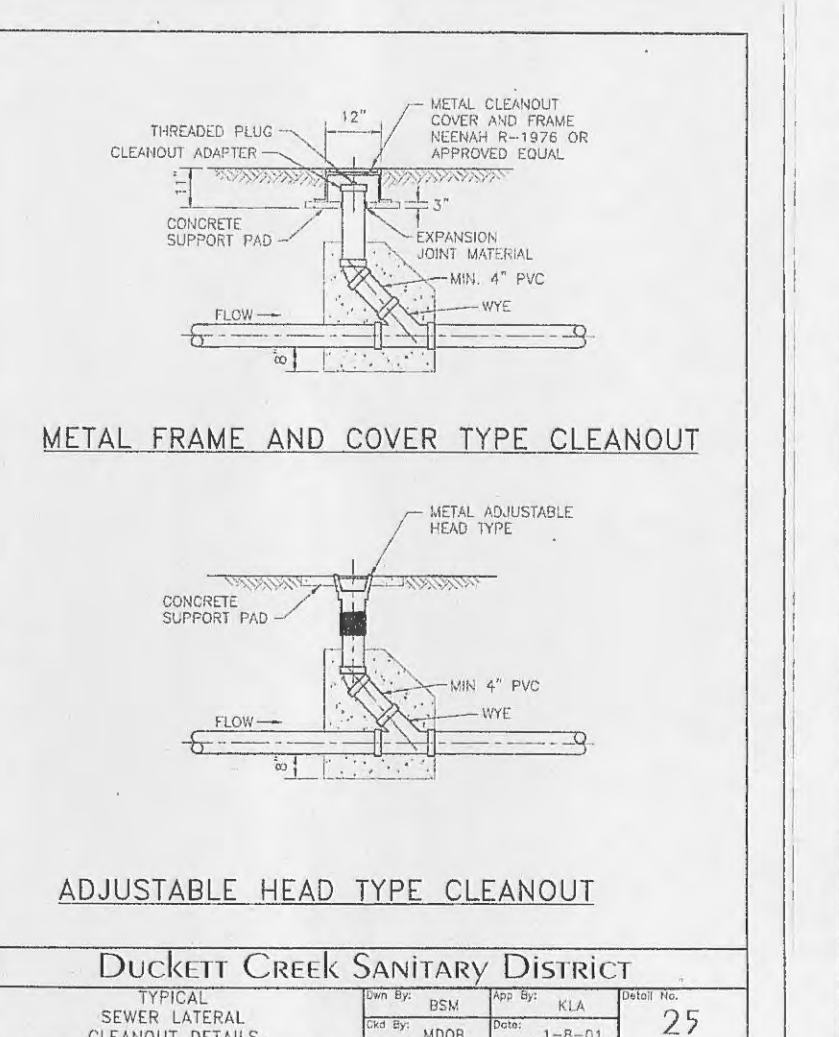
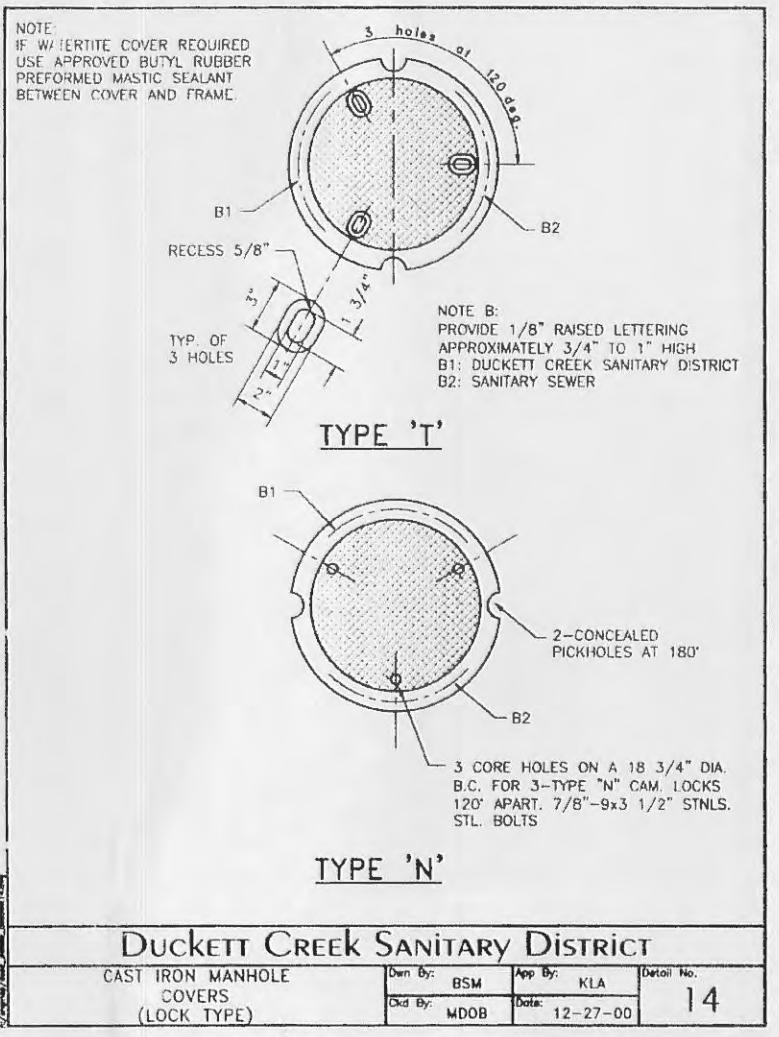
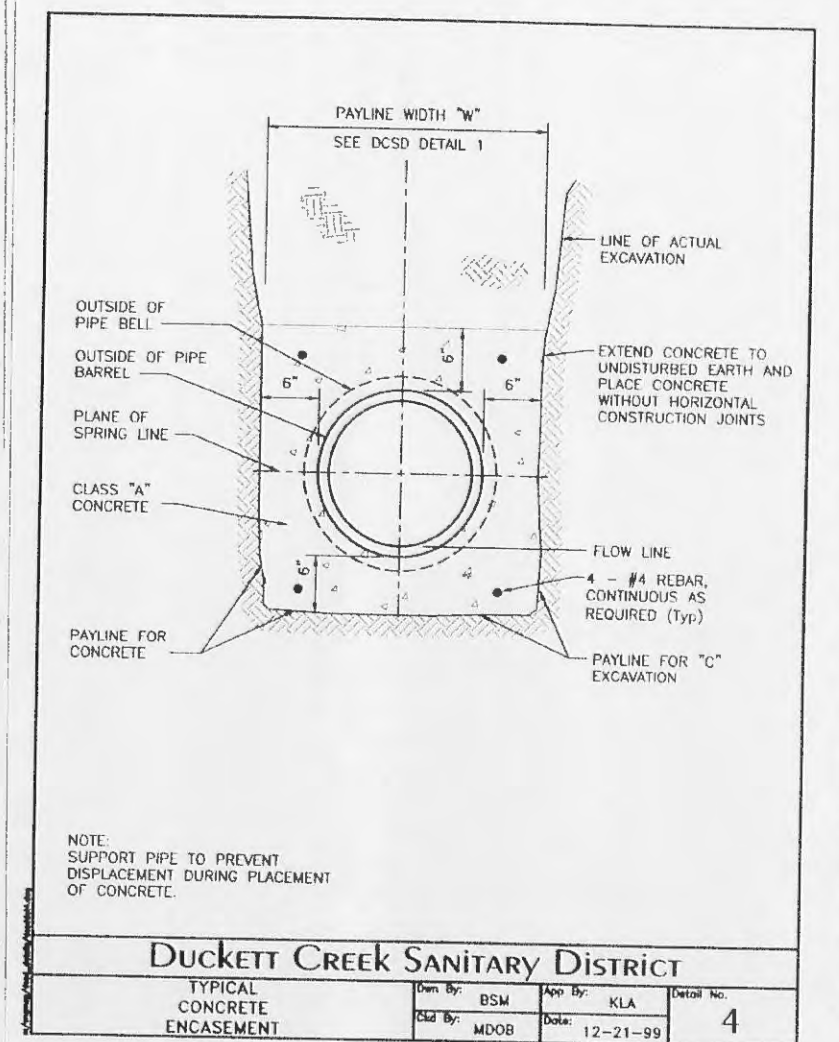
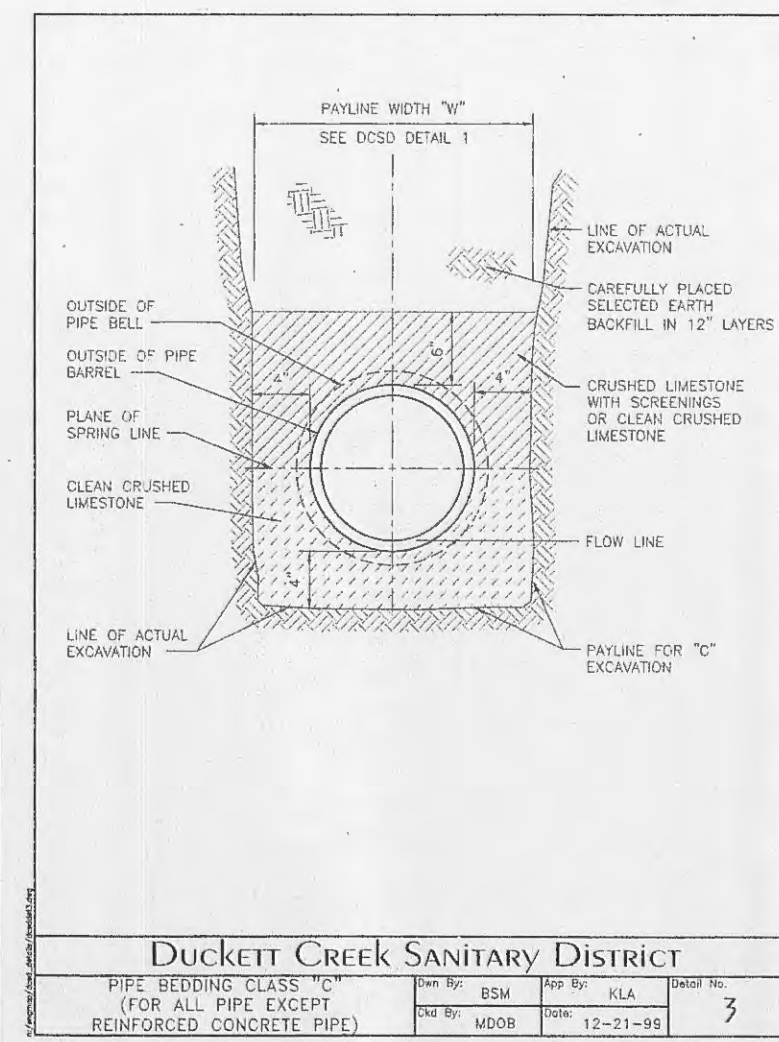
includes minor losses at drop structure
check for multiple incoming lines for additional junction losses

partial flow															check for multiple incoming lines and													
structure number	line upper	reach lower	flowline elevation		length (feet)	slope (ft/ft)	pipe size (in)	drainage area (ac)	coeff (cfs/ac)	flow (cfs)	flow vel (ft/sec)	hydraulic radius (in)	vel head (ft)	Q x Vh (ft ⁴ /sec)	pipe hf	minor loss	structure loss	total loss (hmt)	hydraulic elevations			freeboard (ft)	roughness coeff	pipe capacity	drop structure			
			upper	lower															upper reach HE + hmt	entering HGL top of pipe in drop struc.	top of structure							
16	16	15	555.80	553.19	146.82	0.0178	15	x	x	5.79	7.53	4.17	0.88	5.10	2.58	0.00	0.00	557.05	557.97	555.39	557.97	550.88	560.50	2.53	0.013	8.64	0.20	
15	15	14	552.99	549.61	135.89	0.0249	15	x	x	8.10	9.22	4.38	1.32	10.69	3.36	0.92	0.92	554.24	554.47	551.11	555.39	554.44	561.35	5.96	0.013	10.22	0.20	
14	14	EX C1	549.61	547.92	95.97	0.0176	18	x	x	8.56	7.96	4.56	0.98	8.42	1.68	0.00	0.00	551.11	550.80	549.12	551.11	549.42	554.80	3.69	0.013	13.98	0.00	
EX C1	EX C1		547.92																									

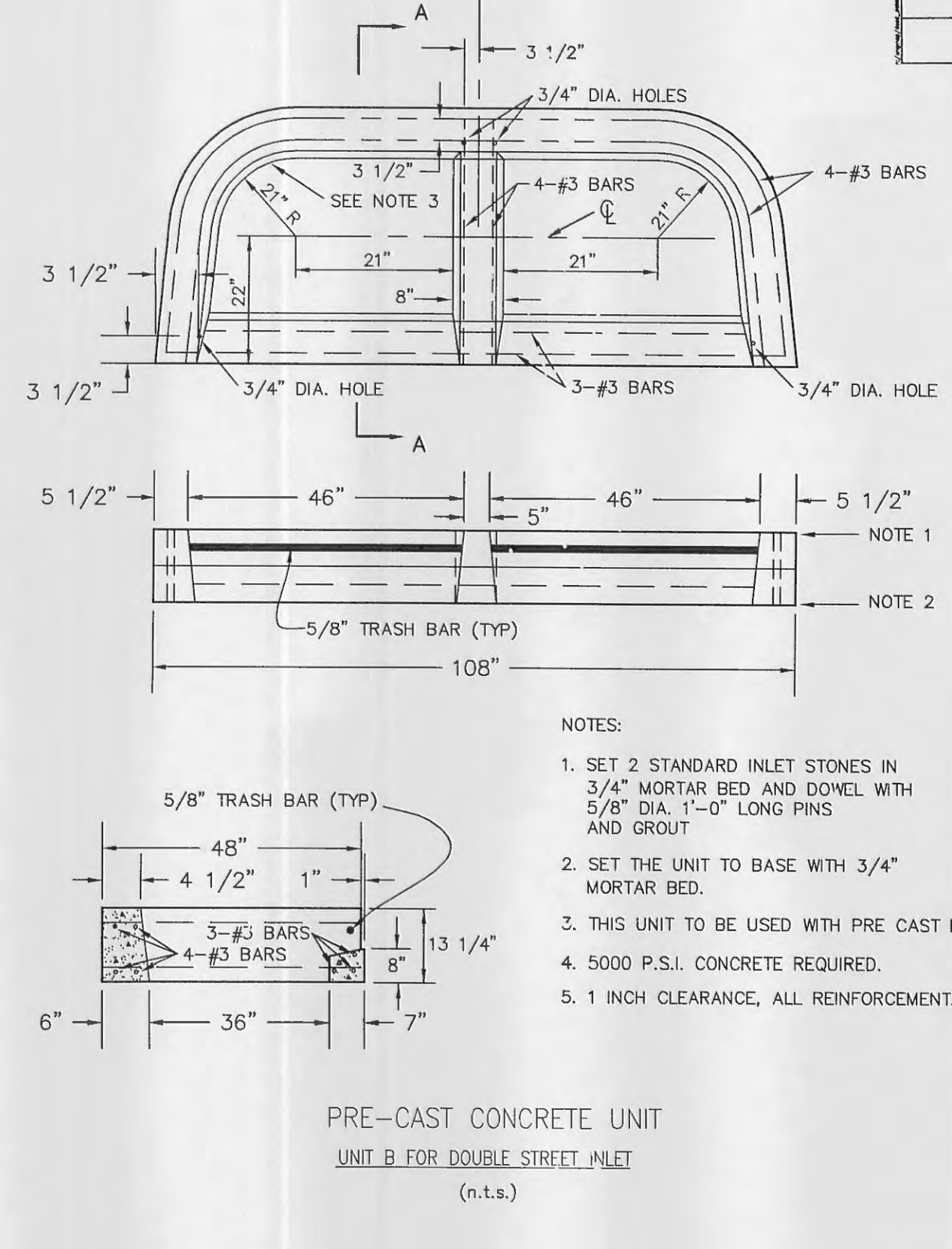
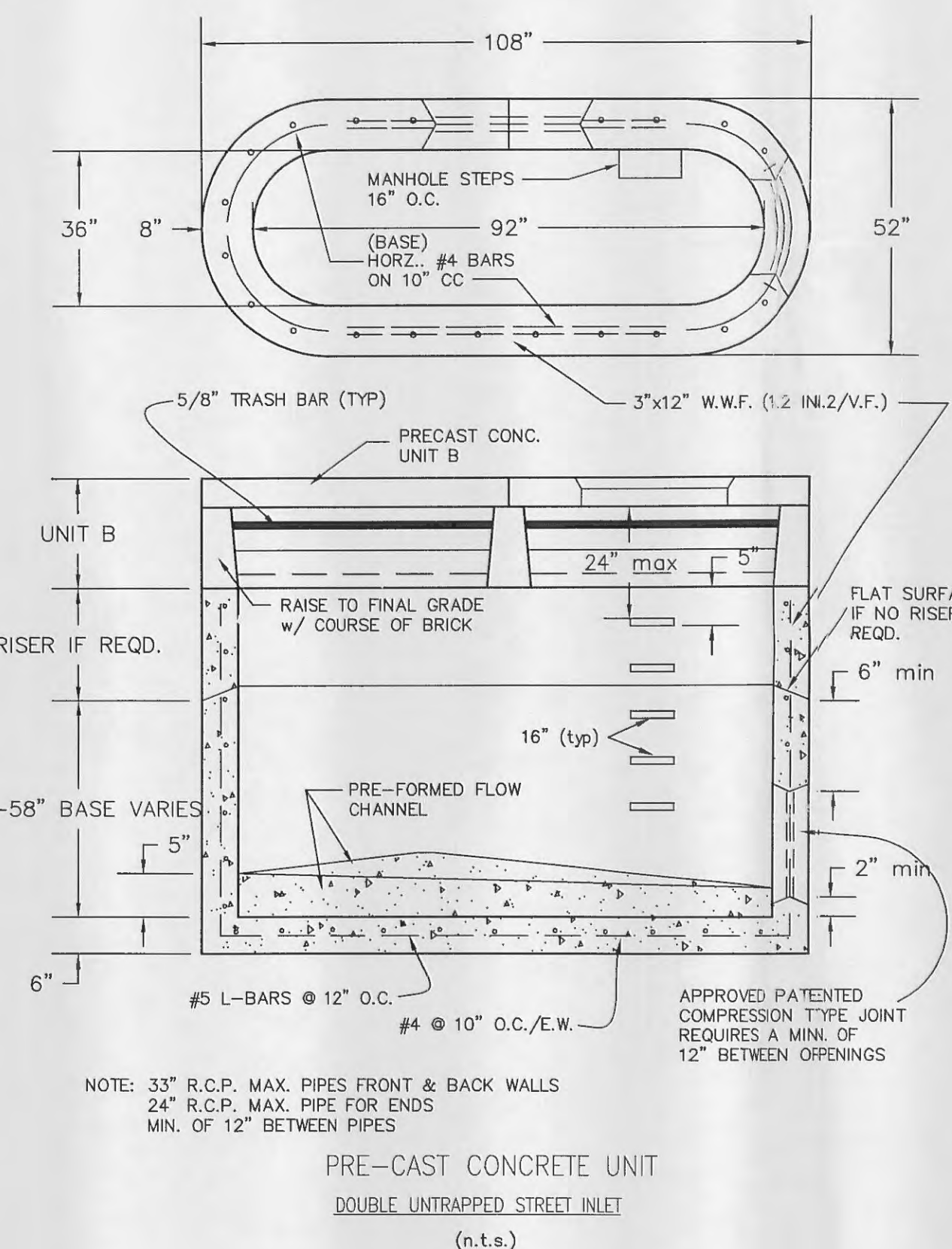
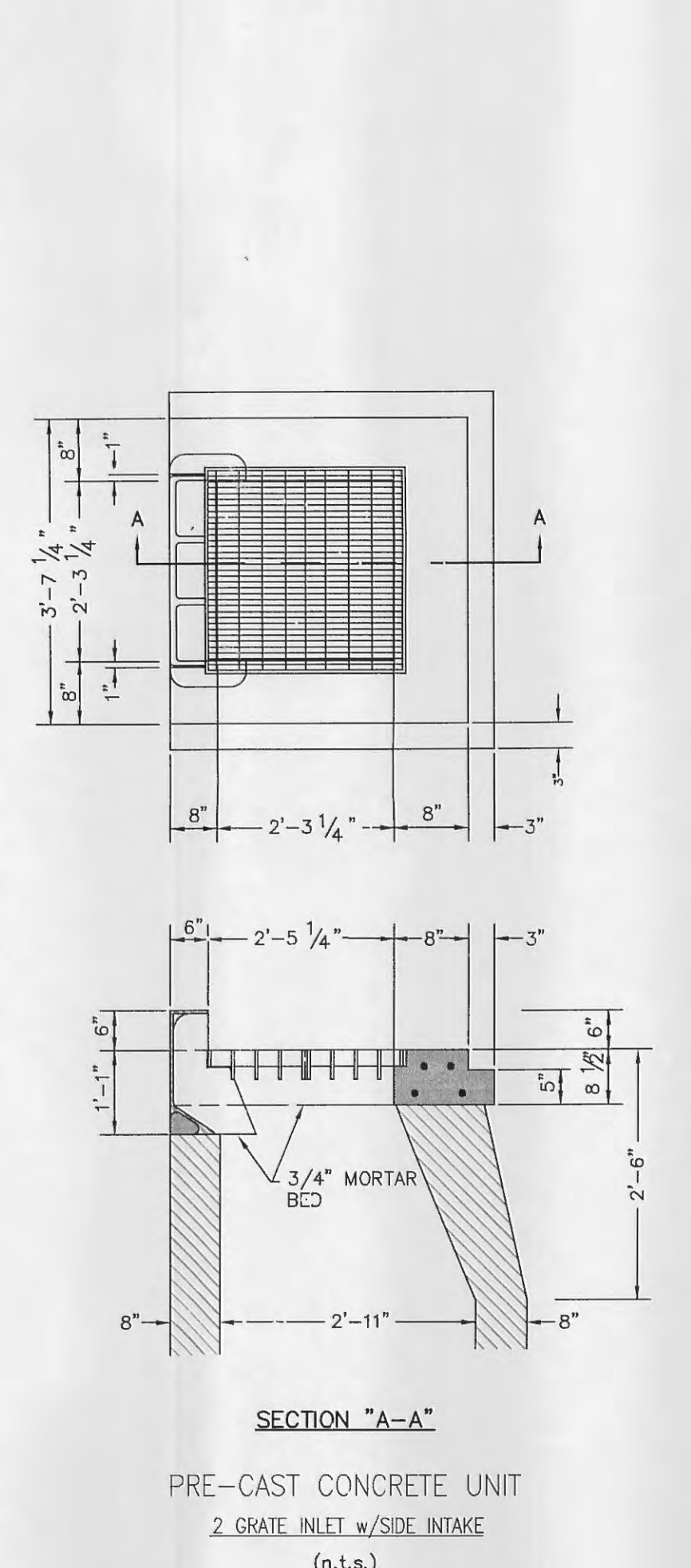
structure number	line upper	reach lower	flowline elevation		length (feet)	slope (ft/ft)	pipe size (in)	drainage area (ac)	coeff (cfs/ac)	flow (cfs)	flow vel (ft/sec)	hydraulic radius (in)	vel head (ft)	Q x Vh (ft ⁴ /sec)	pipe hf	minor loss	structure loss	total loss (hmt)	hydraulic elevations			freeboard (ft)	roughness coeff	pipe capacity	drop structure			
			upper	lower															upper reach HE + hmt	entering HGL top of pipe in drop struc.	top of structure							
13	13	5	557.90	557.11	39.37	0.0201	12	x	x	0.72	4.56	1.79	0.32	0.23	0.78	0.00	0.00	558.90	558.90	553.50	558.90	553.50	562.10	3.20	0.013	5.00	4.61	
5	5		552.50																									

structure number	line upper	reach lower	flowline elevation		length (feet)	slope (ft/ft)	pipe size (in)	drainage area (ac)	coeff (cfs/ac)	flow (cfs)	flow vel (ft/sec)	hydraulic radius (in)	vel head (ft)	Q x Vh (ft ⁴ /sec)	pipe hf	minor loss	structure loss	total loss (hmt)	hydraulic elevations			freeboard (ft)	roughness coeff	pipe capacity	drop structure			
			upper	lower															upper reach HE + hmt	entering HGL top of pipe in drop struc.	top of structure							
4	4	3	543.37	542.79	75.25	0.0077	42	x	x	62.09	9.87	11.72	1.51	93.92	0.58	0.00	0.00	546.87	546.67	546.09	546.87	546.29	565.92	19.05	0.013	88.66	0.20	
3	3	2	542.59	541.26	166.00	0.0080	42	x	x	62.09	10.02	11.65	1.95	96.80	1.32	0.00	0.00	546.09	545.88	544.56	546.09	544.76	563.40	17.31	0.013	90.30	0.20	
2	2	1	541.06	540.58	60.47	0.0079	42	x	x	62.09	9.97	11.67	1.54	95.84	0.47	0.00	0.00	544.56	544.35	543.88	544.56	544.08	555.10	10.54	0.013	89.88	0.20	
1	1		540.38																									

structure number	line upper	reach lower	flowline elevation		length (feet)	slope (ft/ft)	pipe size (in)	drainage area (ac)	coeff (cfs/ac)	flow (cfs)	flow vel (ft/sec)	hydraulic radius (in)	vel head (ft)	Q x Vh (ft ⁴ /sec)	pipe hf	minor loss	structure loss	total loss (hmt)	hydraulic elevations			freeboard (ft)	roughness coeff	pipe capacity	drop structure			
			upper	lower															upper reach HE + hmt	entering HGL top of pipe in drop struc.	top of structure							
9	9	8	558.05	557.67	37.56	0.0101	18	x	x	8.78	6.68	5.32	0.69	6.08	0.38	0.00	0.00	559.55	559.56	559.19	559.55	559.00	562.05	2.49	0.013	10.59	0.00	
8	8	7	557.47	557.24	22.96	0.0100	18	x	x	8.78	6.65	5.33	0.69	6.03	0.23	0.00	0.00	558.97	559.19	558.96	559.19	558.74	563.10	3.91	0.013	10.54	0.20	
7	7	6	557.04	555.76	128.29	0.0100	18	x	x	9.56	6.74	5.43	0.71	6.74	1.27	0.16	0.23	0.38	558.54	558.58	557.31	558.96	557.26	561.90	2.94	0.013	10.52	0.20
6	6	5	555.56	553.39	108.45	0.0200	18	x	x	13.23	9.50	5.41	1.40	18.54	2.15	0.00	0.25	0.25	557.06	556.84	554.69	557.31	554.89	561.90	4.59	0.013	14.90	0.20
5	5	EX4	553.19	552.20	49.57	0.0200	18	x	x	13.95	9.56	5.46	1.42	19.80	0.98	0.00	0.00	0.00	554.69	543.05	542.07	554.69	553.70	563.16	8.47	0.013	14.88	0.63
EX4	EX4		543.57																									



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



- △ - 05/03/06 REVISED PER CITY COMMENTS
- △ - 04/25/06 REVISED PER CITY, SEWER DISTRICT AND CLIENT COMMENTS
- △ - 03/22/06 REVISED PER CITY AND CLIENT COMMENTS

APC LAB FACILITY
SEWER DETAILS AND HYDRAULIC CALCULATIONS

Stock & Associates
Consulting Engineers, Inc.

257 Chesterfield Business Parkway
St. Louis, MO 63005
PH. (636) 530-9100
FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

DRAWN BY: A.C.D. DATE: 01/23/06 CHECKED BY: D.P.B. DATE: 01/23/06 DATE: 01/23/06 JOB NUMBER: 205-3635.1 SHEET: C7 of C12

