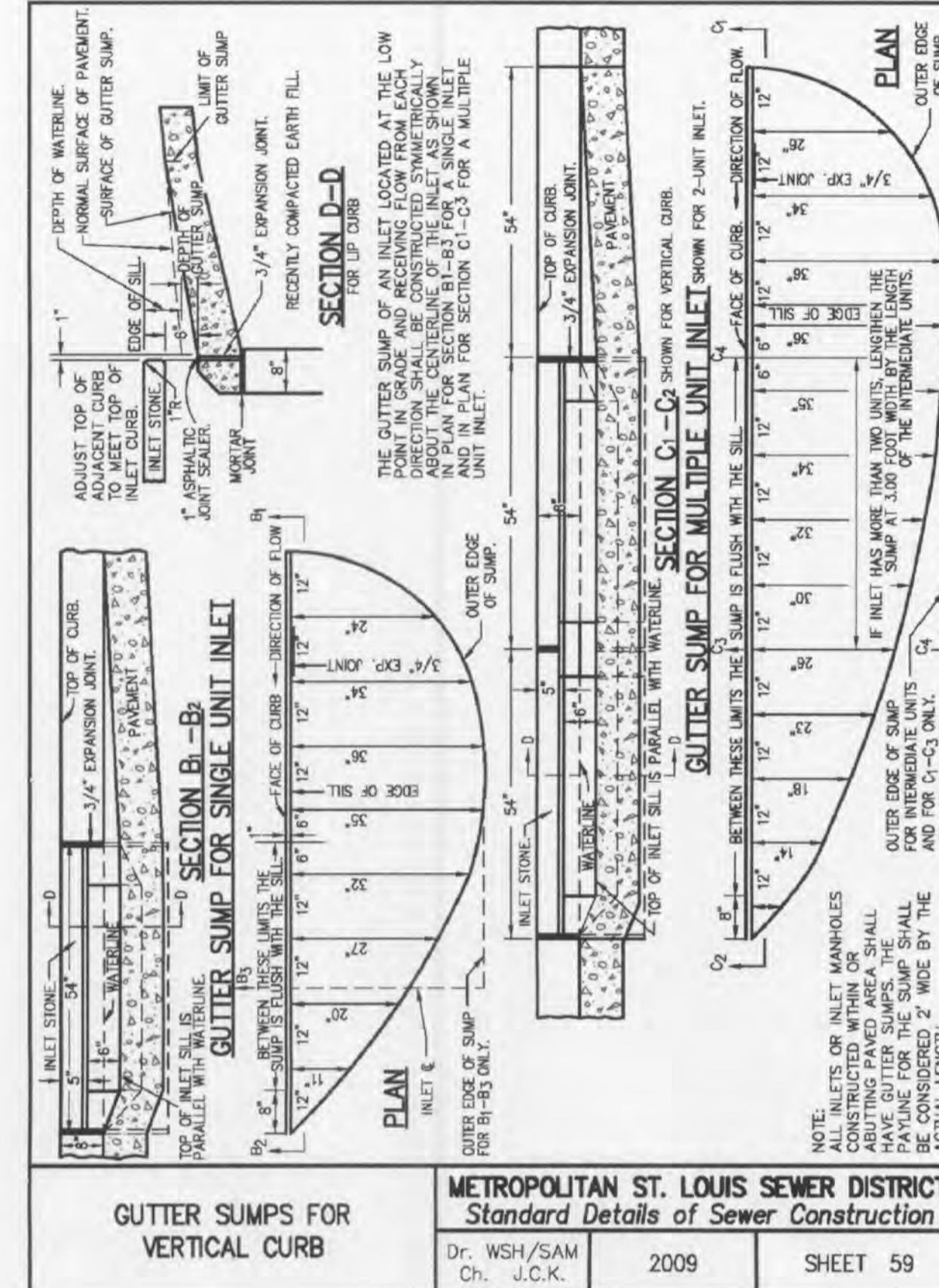
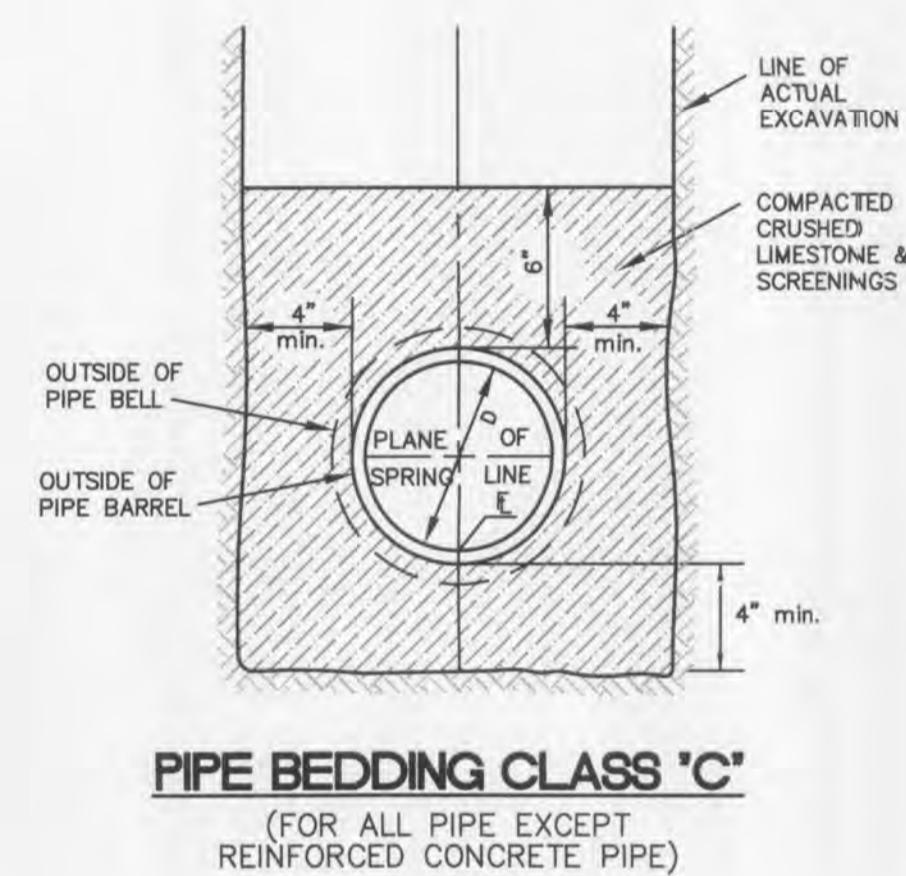
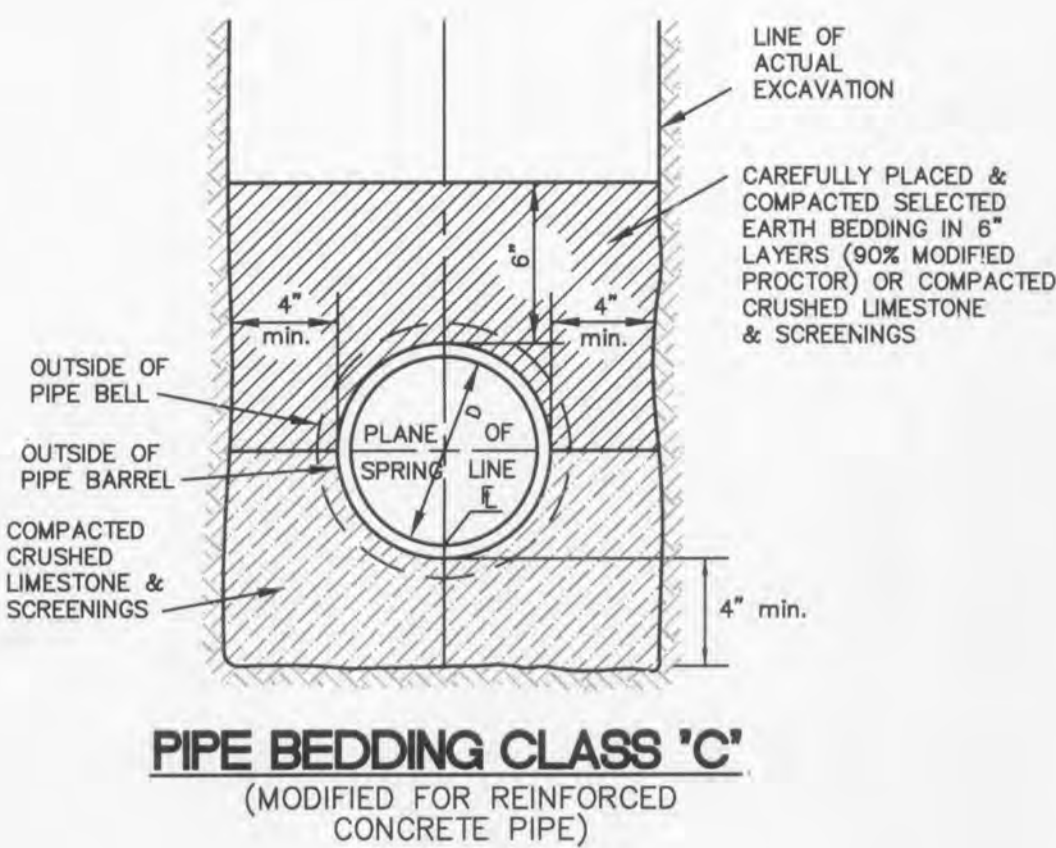


Hydraflow Hydraulic Grade Line Computations

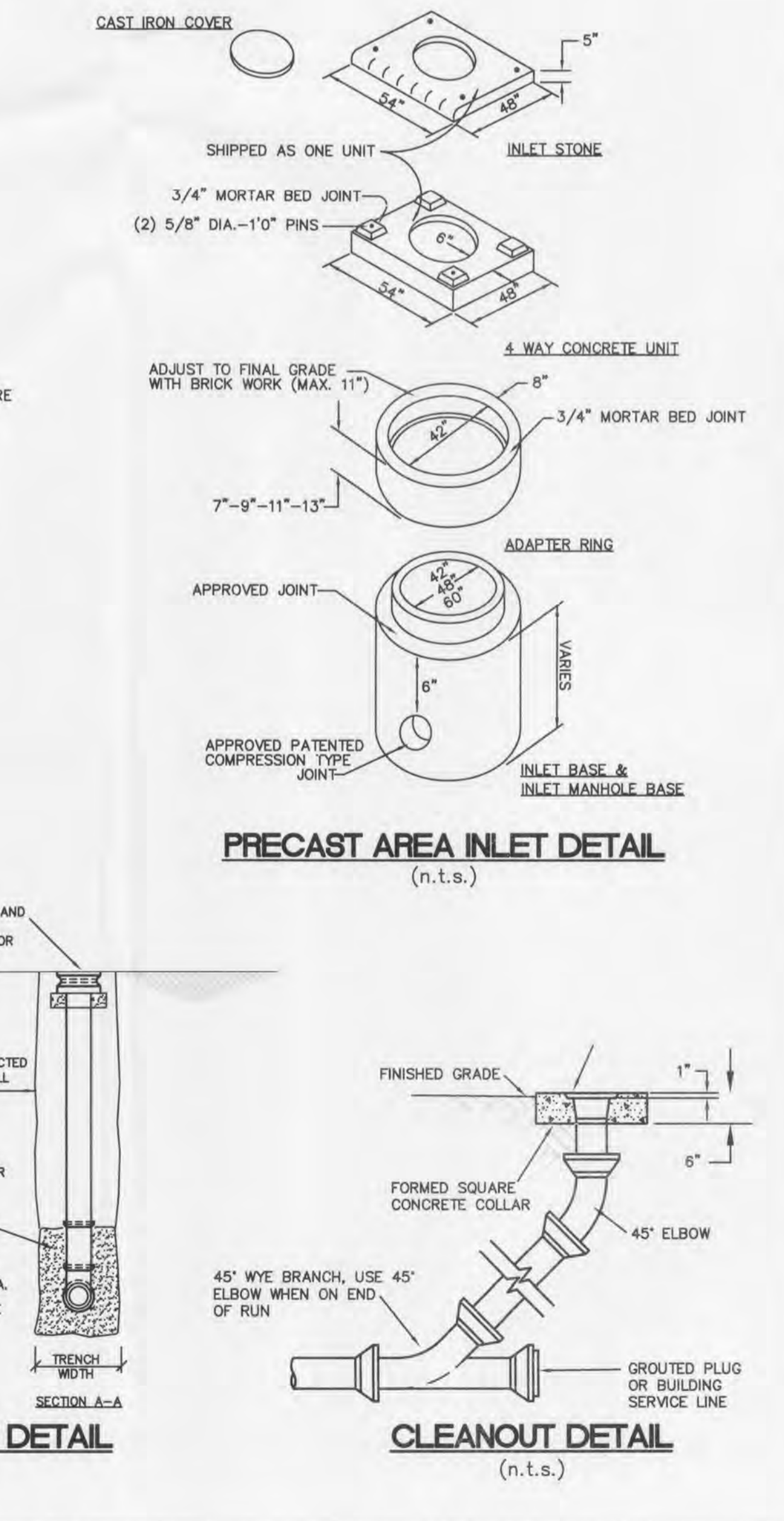
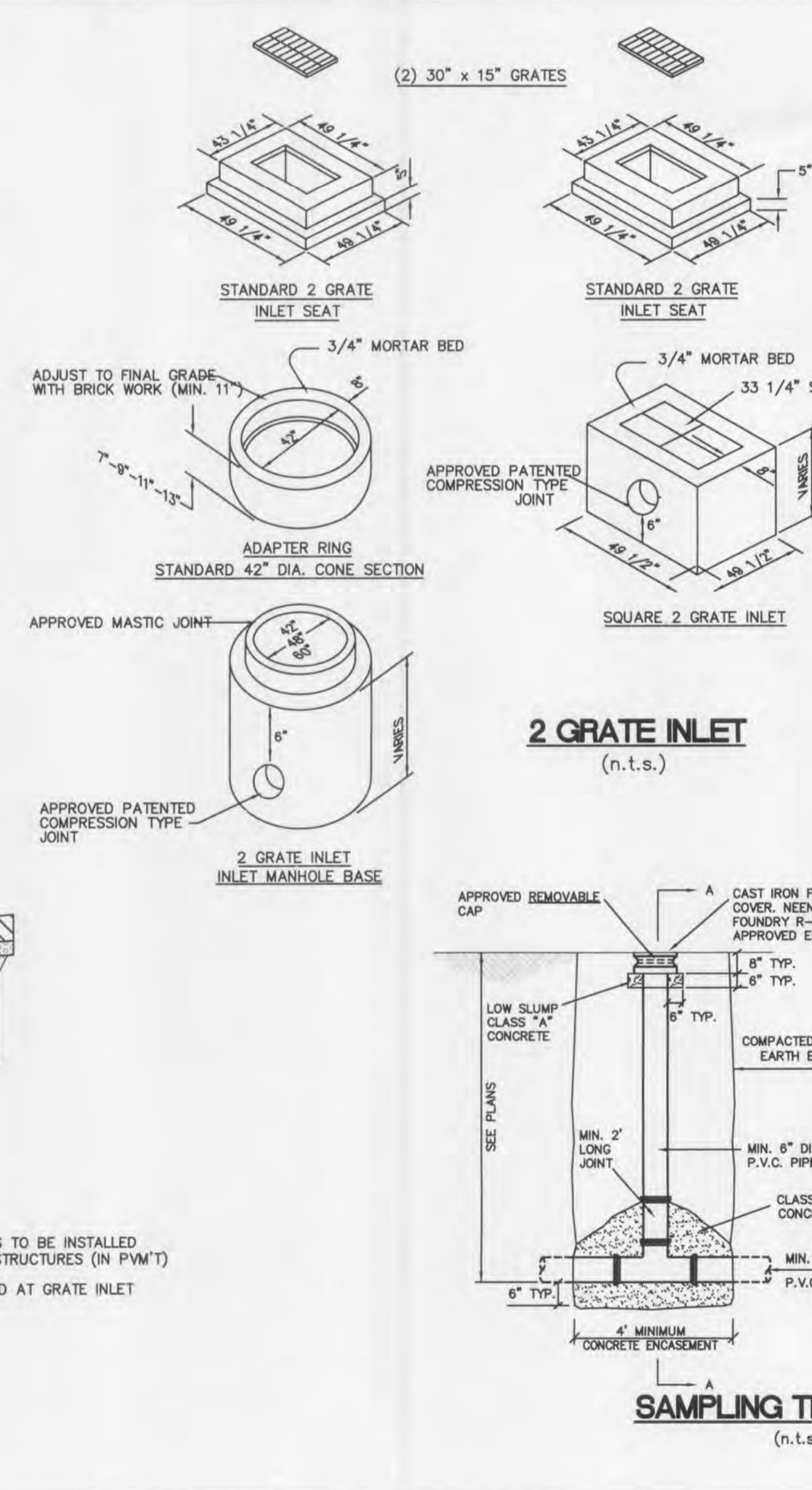
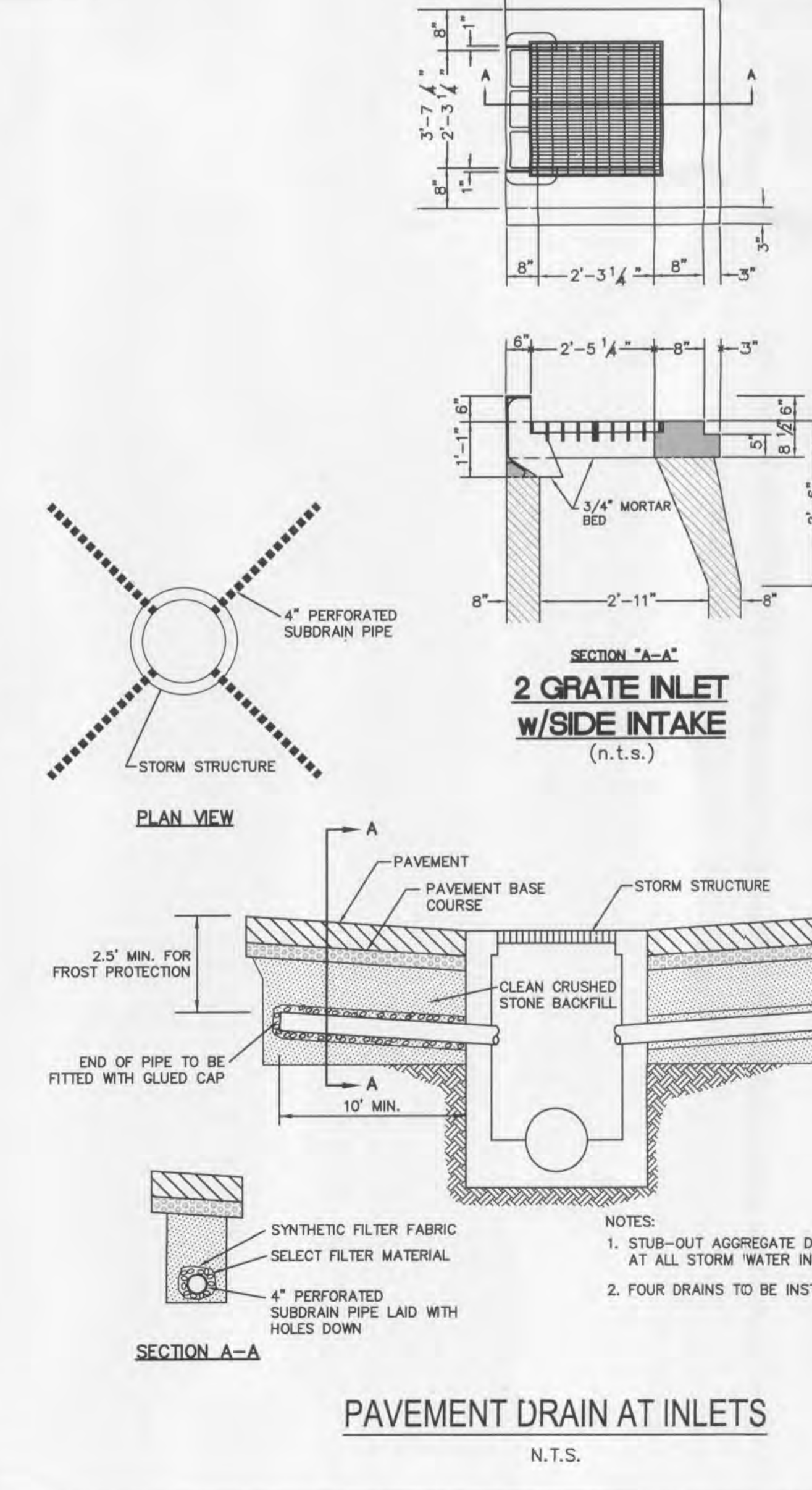
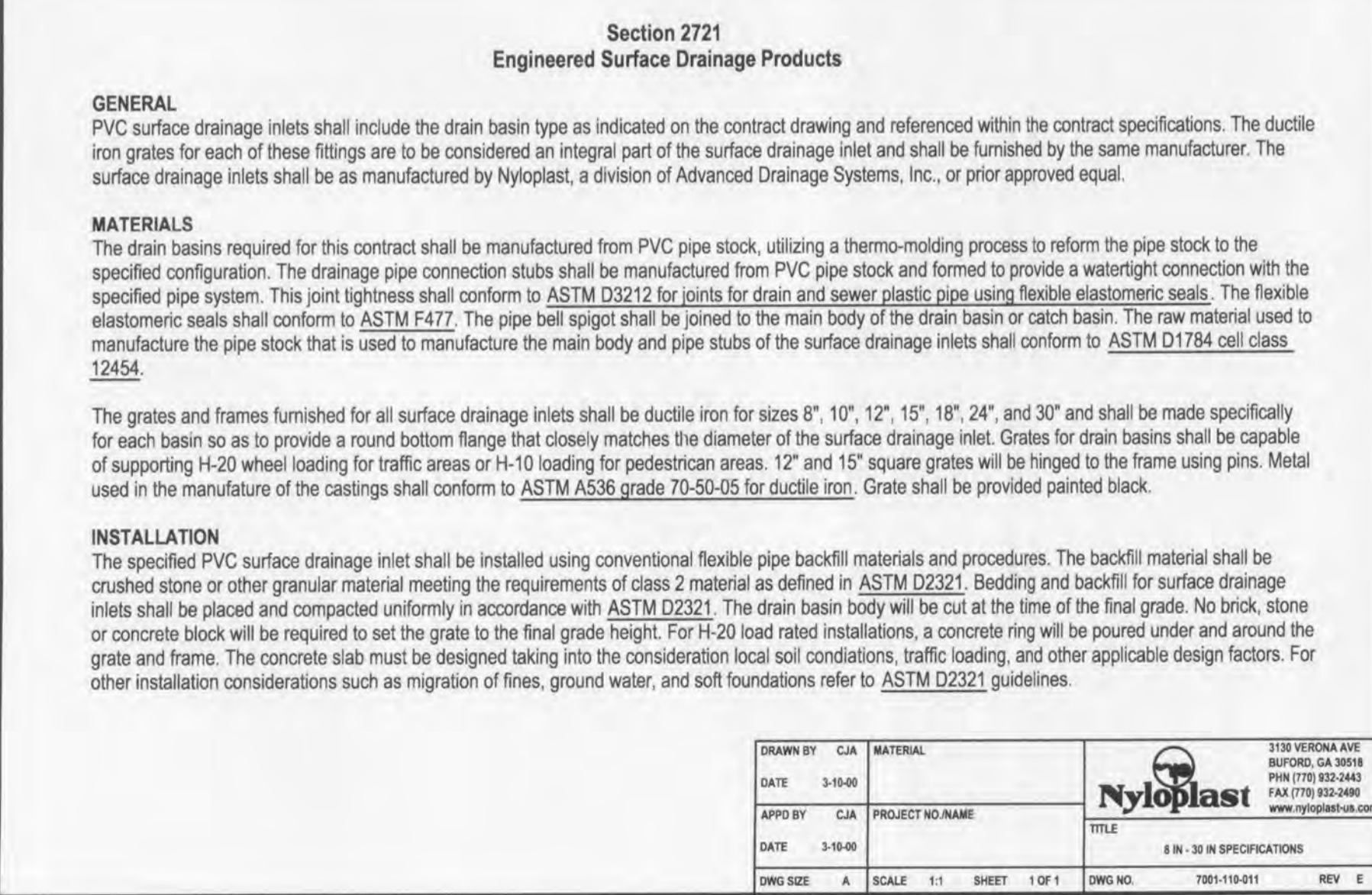
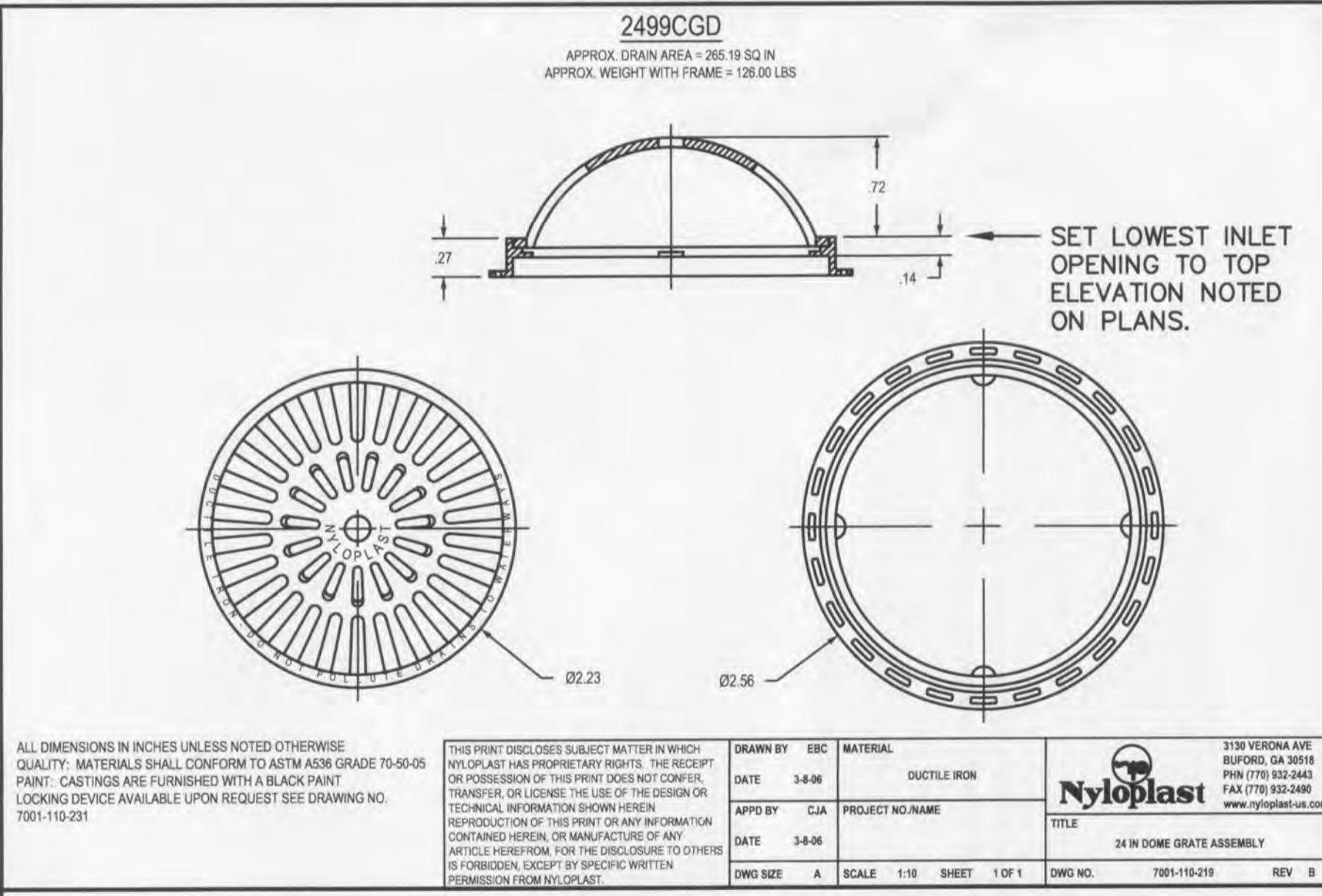
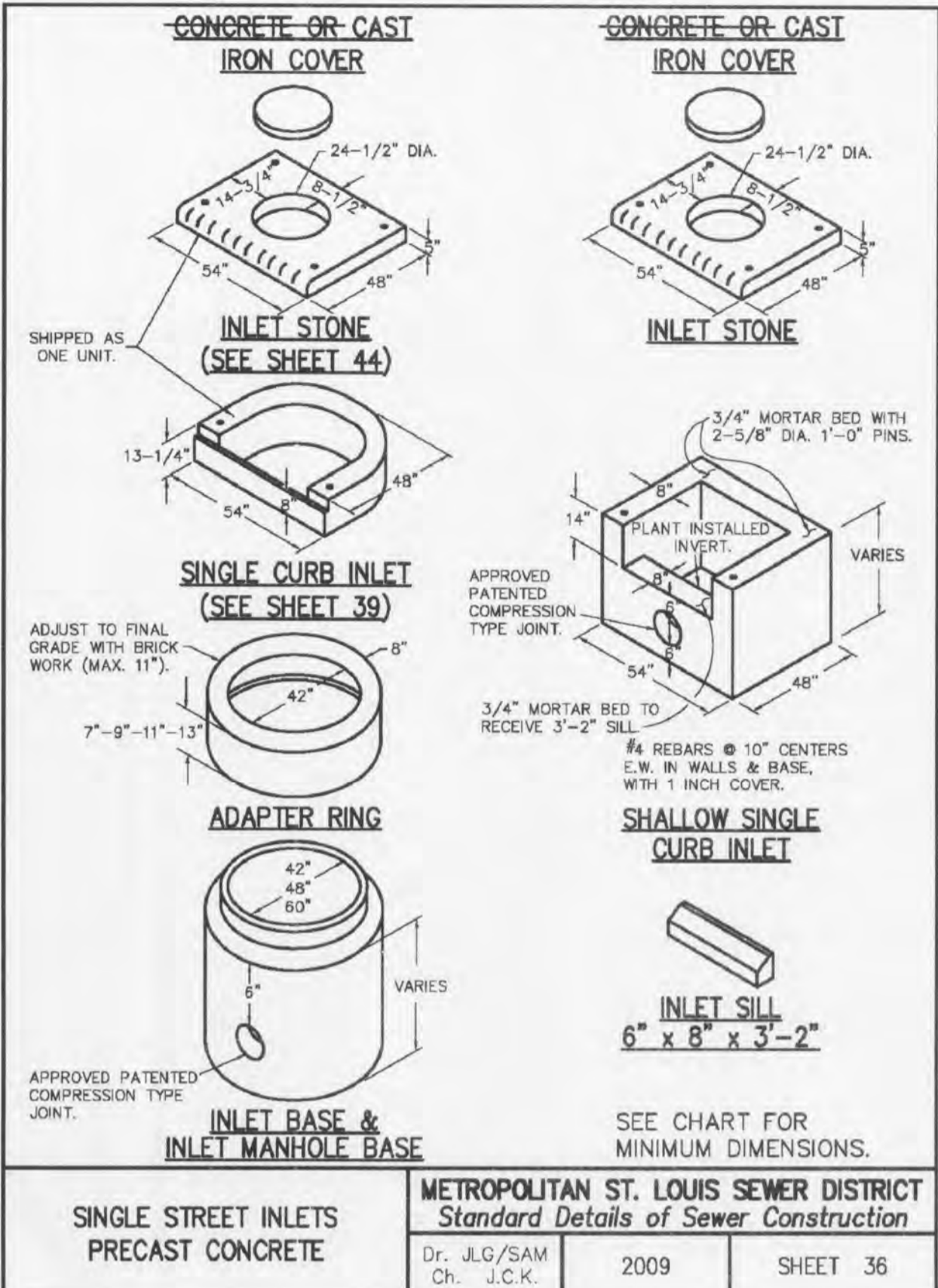
Line	Size	Q	Downstream										Upstream										Check	JL	Minor
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Len (ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Energy loss (ft)	Loss (ft)			
1	24	21.89	529.00	536.00	2.00	3.14	6.97	0.76	535.78	0.937	53.9	529.78	535.51	2.00	3.14	6.97	0.75	536.26	0.937	0.937	0.505	0.75	0.57		
2	21	21.89	534.71	538.13	1.42	2.10	10.44	1.89	537.83	1.933	307	540.74	542.49	1.75	2.41	9.10	1.29	543.78	1.908	1.921	5.900	0.75	0.97		
3	18	12.57	540.74	543.46	1.50	1.77	7.11	0.79	544.24	1.433	205	542.90	546.40	1.50	1.77	7.11	0.79	547.18	1.433	1.433	2.941	1.00	0.79		
4	12	3.40	542.90	547.18	1.00	0.79	4.33	0.29	547.47	0.912	62.0	544.05	547.75	1.00	0.79	4.33	0.29	548.04	0.912	0.912	0.565	0.45	0.13		
5	12	0.88	544.05	547.88	1.00	0.79	1.12	0.02	547.90	0.061	51.7	544.87	547.91	1.00	0.79	1.12	0.02	547.93	0.061	0.061	0.032	0.75	0.01		
6	12	0.42	544.87	547.93	1.00	0.79	0.53	0.00	547.93	0.014	28.4	545.67	547.93	1.00	0.79	0.53	0.00	547.93	0.014	0.014	0.004	1.00	0.00		
7	12	5.08	542.90	547.18	1.00	0.79	6.48	0.65	547.84	2.044	93.0	547.65	549.08	1.00	0.79	6.48	0.65	549.74	2.043	2.043	1.900	0.85	0.56		
8	12	3.72	547.65	549.64	1.00	0.79	4.74	0.36	549.99	1.062	89.4	549.50	550.61	1.00	0.79	4.74	0.36	550.96	1.091	1.091	0.978	1.00	0.35		
9	12	0.89	547.85	549.64	1.00	0.79	1.13	0.02	549.66	0.062	38.2	549.40	549.80	1.00	0.79	1.13	0.02	549.84	0.062	0.062	0.029	1.00	0.14		
10	12	1.52	544.29	547.88	1.00	0.79	1.94	0.06	547.94	0.182	158	548.24	548.17	1.00	0.79	1.94	0.06	548.23	0.182	0.182	0.289	1.00	0.08		
11	10	1.28	546.44	548.23	0.83	0.55	2.37	0.09	548.31	0.347	62.5	547.07	548.44	0.83	0.55	2.37	0.09	548.83	0.347	0.347	0.217	0.15	0.01		
12	10	1.18	547.27	548.46	0.83	0.55	2.16	0.07	548.53	0.290	31.7	547.59	548.55	0.83	0.55	2.16	0.07	548.62	0.290	0.290	0.092	0.15	0.01		
13	8	1.03	547.79	548.56	0.67	0.35	2.95	0.14	548.70	0.728	40.0	548.19	548.83	0.64	0.34	3.00	0.14	548.97	0.632	0.680	0.272	0.15	0.02		
14	8	0.84	548.39	548.85	0.46	0.26	3.28	0.17	549.02	0.723	40.0	548.79	549.22	0.43	0.24	3.51	0.19	549.41	0.853	0.788	N/A	0.15	0.03		
15	8	0.63	548.99	549.33	0.34	0.16	3.46	0.19	549.52	0.888	48.2	549.47	549.84	0.37	0.20	3.12	0.16	550.00	0.744	0.866	N/A	0.75	0.11		
16	8	0.41	549.67	549.96	0.29	0.14	2.84	0.13	550.08	0.789	33.3	550.00	550.30	0.20	0.15	2.67	0.11	550.41	0.651	0.710	N/A	1.00	0.11		

Project File: ex_2013-02-05.stm I-D-F File: SAMPLE.IDF Total number of lines: 16 Run Date: 02-05-2013

NOTES: Initial tailwater elevation = 535 (ft). * Normal depth assumed. ** Critical depth assumed.



NOTE: DETAILS SHOWN FOR PRIVATE CONSTRUCTION AND CONTRACTOR'S USE ONLY. REFER TO MSD SPECIFICATIONS AND DETAILS PRIOR TO CONSTRUCTION.



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4088 WINGHAVEN BLVD.
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STATE OF MISSOURI
GEORGE MICHAEL STOCK
NUMBER PE-25116
3/26/13
GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY
NUMBER: 000996

SEWER DETAILS AND HYDRAULICS

Developer / Owner (Under Contract)
Chesterfield Childcare Properties, LLC
23 Bopp Lane
St. Louis, Mo 63131

Facility Operator
Concord Properties, LLC
23 Bopp Lane
St. Louis, Mo 63131

DATE: 01/15/13
JOB NO.: 212-5043

REVISIONS:
1 02/05/13 - CITY/WATER REVISIONS
2 03/12/13 - CITY REVISIONS
3 03/26/13 - CITY REQUIRED SETS

P+Z No. 9831.4104
(APPROVED JANUARY 4, 2013)
City No.

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