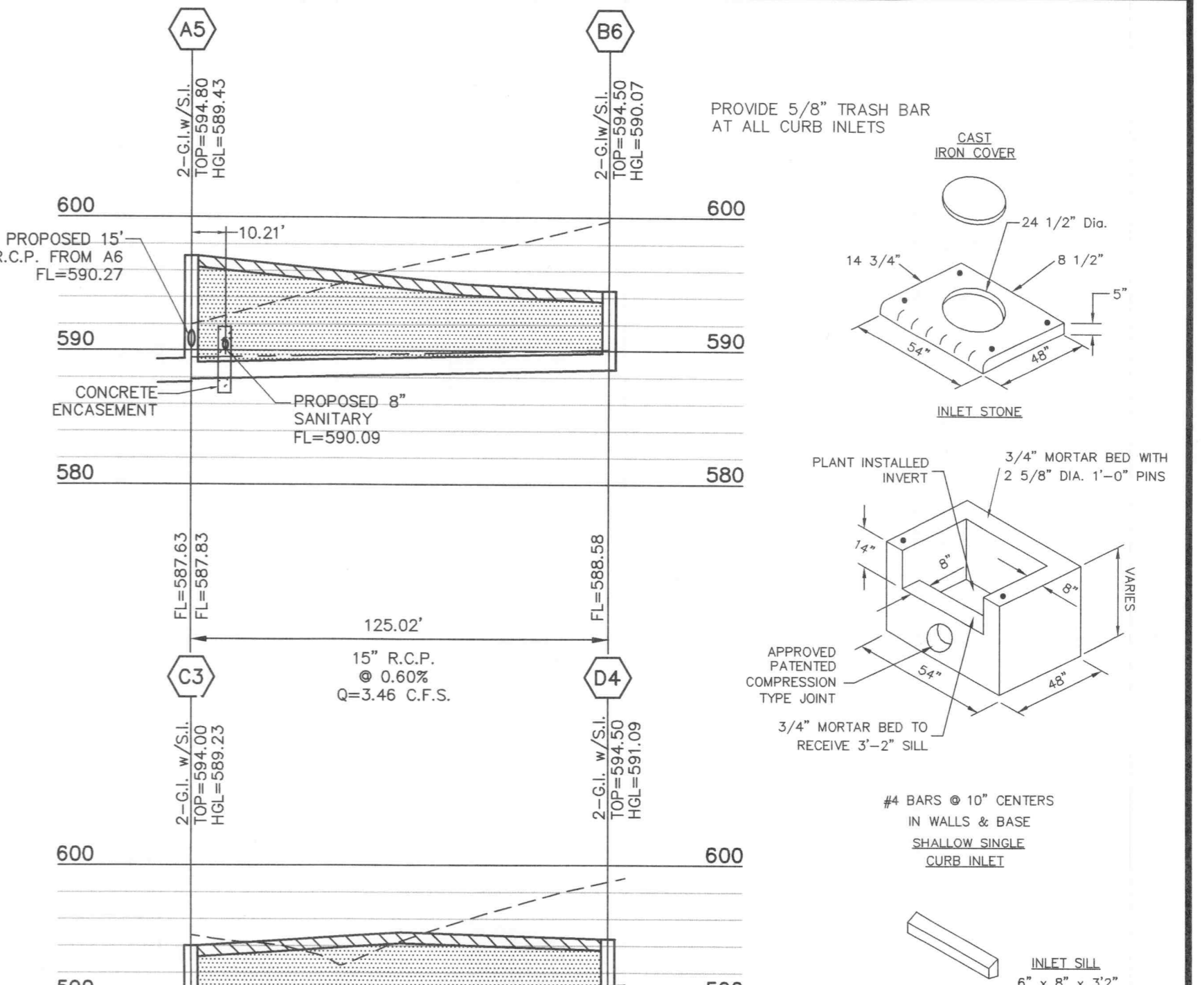
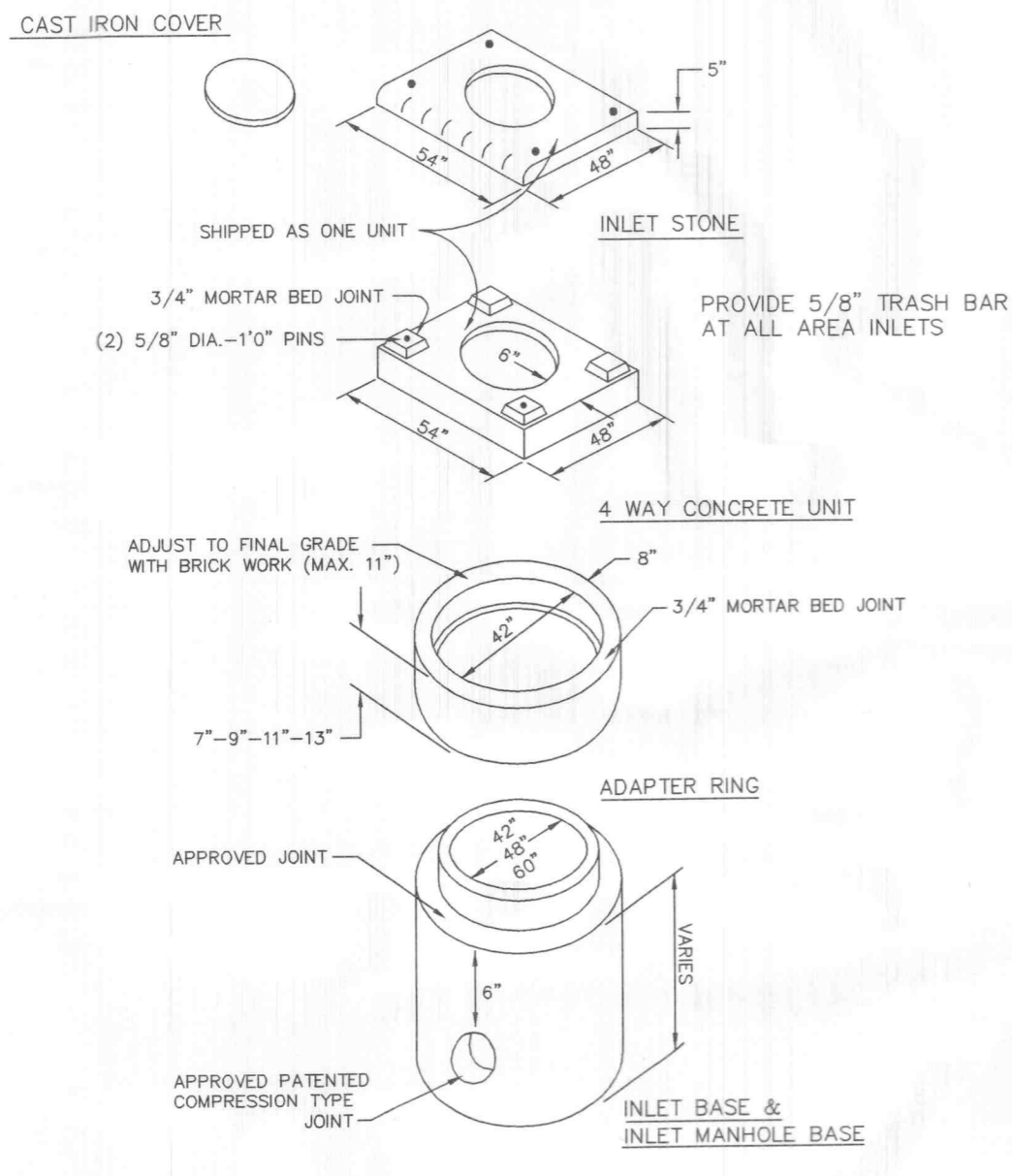


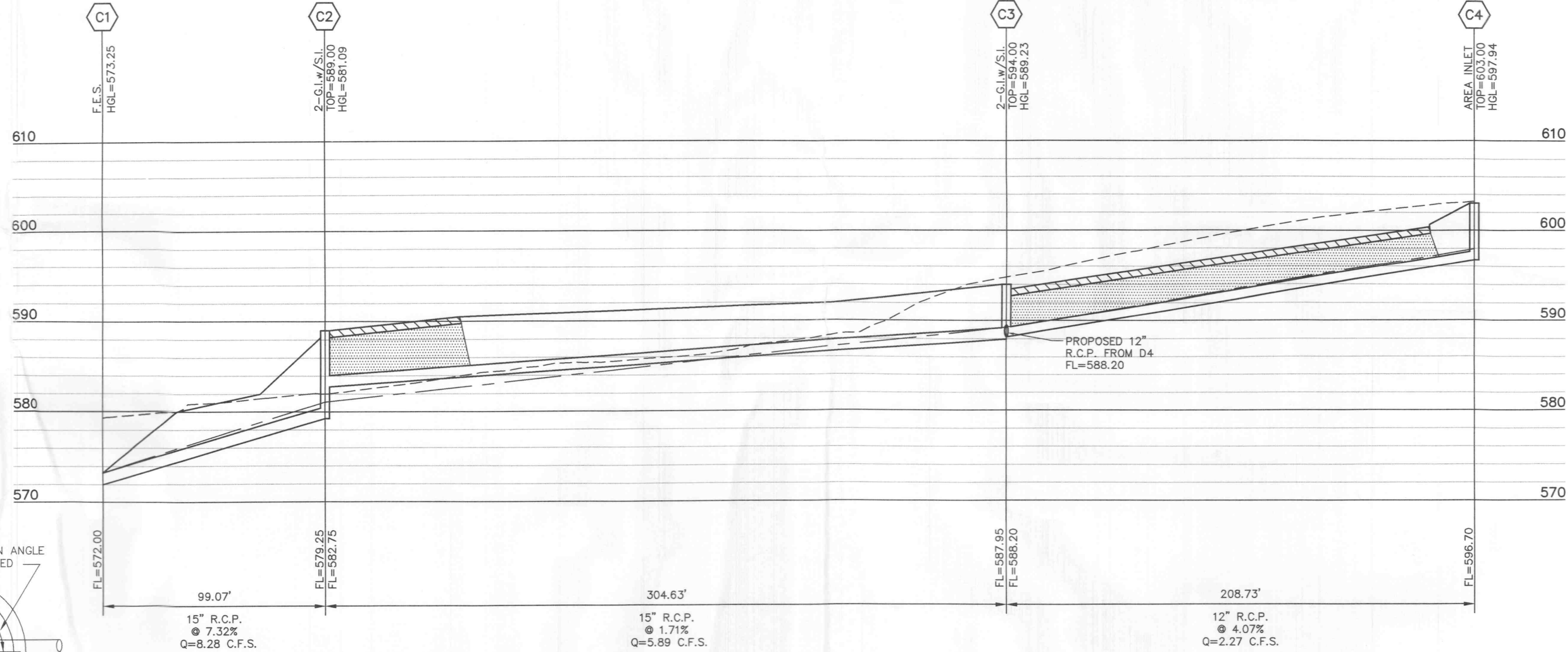
PRIVATE STORM SEWER PROFILE
 HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=10'



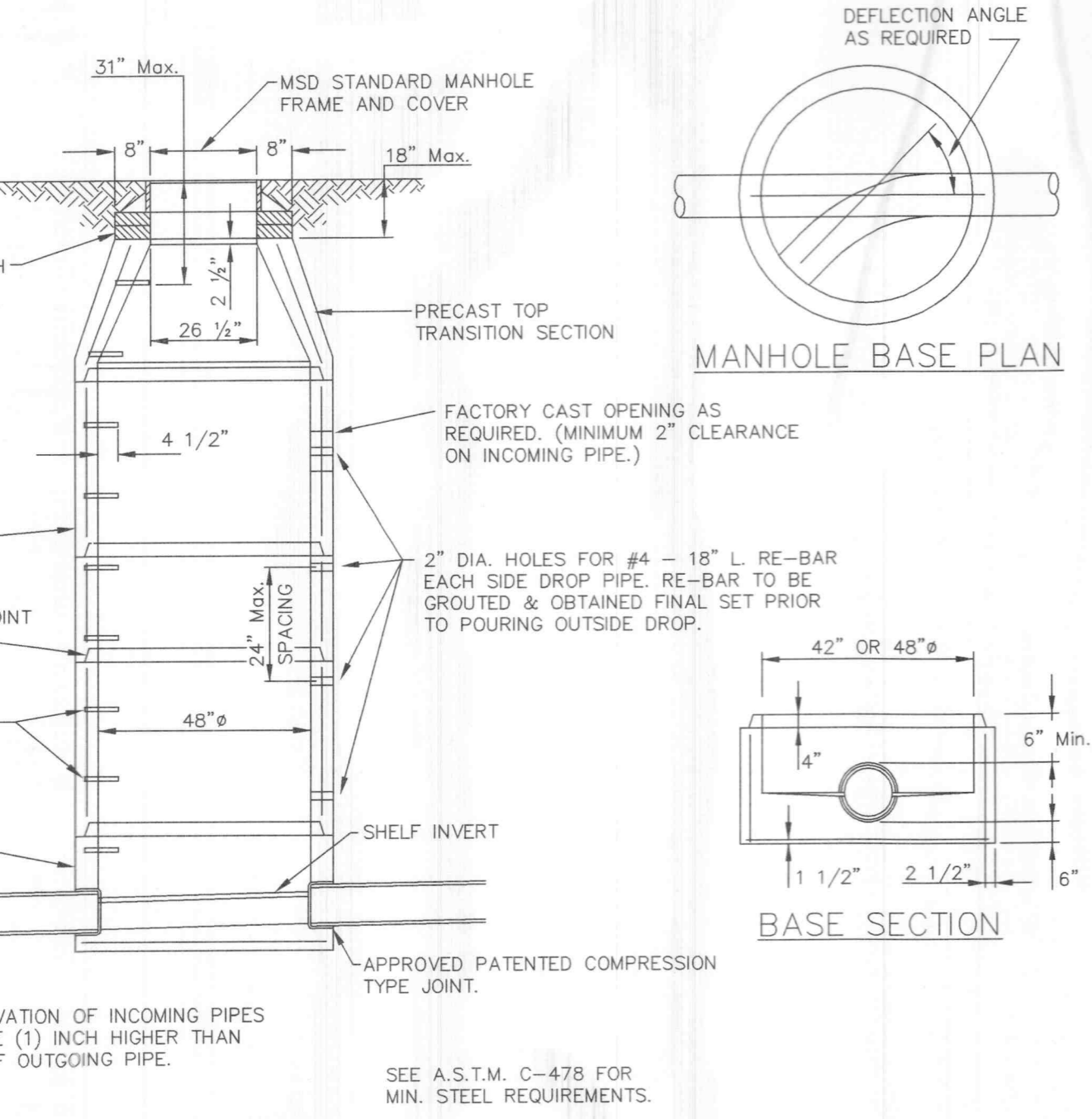
PRIVATE STORM SEWER PROFILES
 HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=10'



PRECAST AREA INLET
(n.t.s.)



PRIVATE STORM SEWER PROFILE
 HORIZONTAL SCALE: 1"=40'
 VERTICAL SCALE: 1"=10'



PRECAST MANHOLE
(n.t.s.)

HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP SHEET C13 FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)

Project name: **ASHLEY FURNITURE** Calculated By: **JPP**
 Project number: **204-3381** Checked By: **MGR**
 Storm: **15yr-20min.** Date: **01-13-05**

Structure Number	Upper structure	Lower structure	FLOW LINE ELEVATIONS		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 (Vh) (ft)	Qv (ft³/s)	Pipe Coef. (n)	Hf (ft)	Junction (ft)	Bend (ft)	Total (ft)	Hydraulic Elevations				Structure TOP Elevation	Free Board	Structure Number
			Upper	Lower															Upper	Lower	H ₁	H ₂			
A9	A9	A8	596.30	595.95	35.45	0.0099	12	3.55	2.77	3.53	0	0.19	0.54	0.013	0.21	0.00	0.00	0.00	597.30	597.21	597.00	603.80	6.50	A9	
A8	A8	A7	595.75	595.20	35.20	0.0100	15	6.47	3.27	2.66	0	0.11	0.36	0.013	0.14	0.00	0.00	0.00	597.00	596.59	596.45	597.00	6.00	A8	
A7	A7	A6	595.00	593.3	136.13	0.0075	15	7.24	7.00	5.70	0	0.51	3.54	0.013	1.60	0.00	0.00	0.00	596.25	596.15	594.55	596.25	7.15	A7	
A6	A6	A5	593.05	590.29	198.76	0.0139	18	12.41	7.93	4.49	0	0.31	2.48	0.013	1.13	0.00	0.00	0.00	594.55	592.92	591.79	594.55	8.95	A6	
A5	A5	A4	587.63	586.48	115.45	0.0100	21	15.86	11.81	4.91	0	0.37	4.42	0.013	0.64	0.00	0.00	0.00	589.38	588.87	588.23	589.38	6.52	A5	
A4	A4	A3	586.28	584.46	181.85	0.0100	21	15.89	12.50	5.20	0	0.42	5.24	0.013	1.13	0.00	0.00	0.00	588.03	587.24	586.21	588.03	5.72	A4	
A3	A3	A2	584.21	583.13	108.50	0.0100	21	15.85	13.46	5.60	0	0.49	6.55	0.013	0.78	0.00	0.00	0.00	585.96	585.66	584.88	585.96	7.44	A3	
A2	A2	A1	582.88	574.00	56.98	0.1558	21	62.72	18.23	7.58	0	0.89	16.26	0.013	0.75	0.00	0.00	0.00	584.63	576.50	575.75	584.63	6.37	A2	
A1	A1		574.00																					A1	
B6	B6	A5	588.58	587.63	125.02	0.0076	15	5.65	3.46	2.82	0	0.12	0.43	0.013	0.36	0.13	0.11	0.24	589.83	589.79	589.43	590.07	594.50	4.43	B6
A5	A5		587.83																						A5
C4	C4	C3	596.70	588.20	208.73	0.0407	12	7.21	2.27	2.89	0	0.13	0.39	0.013	0.85	0.11	0.13	0.24	597.70	590.08	589.23	597.94	603.00	5.06	C4
C3	C3	C2	587.95	582.75	304.63	0.0171	15	8.46	5.89	4.80	0	0.36	2.11	0.013	2.53	0.00	0.03	0.03	589.20	586.53	584.00	589.23	594.00	4.77	C3
C2	C2	C1	579.25	572.00	99.07	0.0732	15	17.52	8.28	6.75	0	0.71	5.85	0.013	1.63	0.31	0.28	0.59	580.50	574.88	573.25	581.09	589.00	7.91	C2
C1	C1		572.00																						C1
D4	D4	C3	589.50	588.20	125.76	0.0103	12	3.63	2.73	3.48	0	0.19	0.51	0.013	0.74	0.31	0.28	0.59	590.50	589.97	589.23	591.09	594.50	3.41	D4
C3	C3		587.95																						C3

FORMULAS:
 MEAN FULL FLOW VELOCITY: $V = Q_{full} / A_{pipe}$
 FRICTION LOSS (H): $H_f = 2.47 n^2 (L/V^{4.75})$
 VELOCITY HEAD: $V_h = V^2 / 2g$
 JUNCTION LOSSES (JUNC.): $Q_{in} V_{in} + \sum (Q_{in} V_{in}) \times 1.33 / Q_{out}$
 BEND LOSSES (BEND): $(V_h) \times \text{ANGLE COEFFICIENT}$

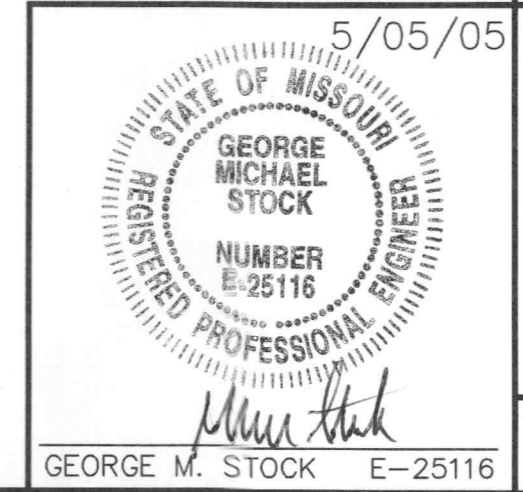
Notes:
 1. IF MORE THAN ONE INCOMING LINE, CALCULATE EACH BEND LOSS AND ADD TOGETHER.
 2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP.
 3. IF $Q_{inlet} > Q_{outlet}$, NO JUNCTION LOSSES TO BE CALCULATED.

LINETYPE LEGEND

- EXISTING GRADE.....
- PROPOSED GRADE.....
- HYDRAULIC GRADE.....
- PROPOSED PAVEMENT.....
- GRANULAR BACKFILL.....
- COMPACTED FILL.....

- 05/20/05 REVISED PER CITY COMMENT LETTER DATED 4-11-05
- 04/29/05 REVISED WATER LINE PER PWS NO. 2 COMMENTS
- 04/26/05 REVISED FOR M&DOT COMMENTS
- 04-21-05 REVISED WATER LINE CONNECTION
- 04-15-05 REVISED SANITARY SEWER
- 04-12-05 REVISED SANITARY SEWER-EX. WATER LINE CONFLICT
- 04-07-05 REVISED SANITARY SEWER PER AS-BUILT CONDITIONS
- 02-15-05 REVISED SANITARY PROFILE-SHOWED EX. STORM CROSSING
- 01-20-05 REVISED PER M&DOT'S COMMENTS/RAISED SITE
- 12-16-04 REVISED PER ST. CHARLES COUNTY WATER NO. 2 COMMENTS
- 11-24-04 REVISED PER CITY COMMENT LETTER DATED 11-15-04

P&Z NOS: 98-126.03
 98-126.04



SEWER PROFILES, DETAILS, AND HYDRAULICS
 TERRA RETAIL DEVELOPMENT/ASHLEY FURNITURE

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DRAWN BY: J.P.P. DATE: 10/20/04 CHECKED BY: G.M.S. DATE: 10/20/04 JOB NUMBER: 204-3381 SHEET: C7 of 23

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