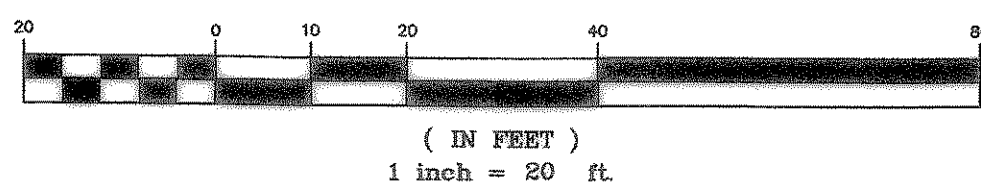


GRAPHIC SCALE



OUTLET RATING CURVE

Elevation (ft)	Discharge (cfs)	Velocity (ft/s)
0	0	0
0.5	0.3	2.69
1	0.48	4.34
1.5	0.61	5.51
2	0.72	6.48
2.5	0.81	7.32
3	0.89	8.07
3.5	0.97	8.76
4	1.04	9.4
4.5	1.1	10
5	1.17	10.56
5.5	1.22	11.09
6	1.28	11.6
6.5	1.34	12.09
7	1.39	12.56
7.5	1.44	13.02
8	1.49	13.45
8.5	1.53	13.88
9	1.58	14.29
9.5	1.62	14.69
10	1.66	15.08

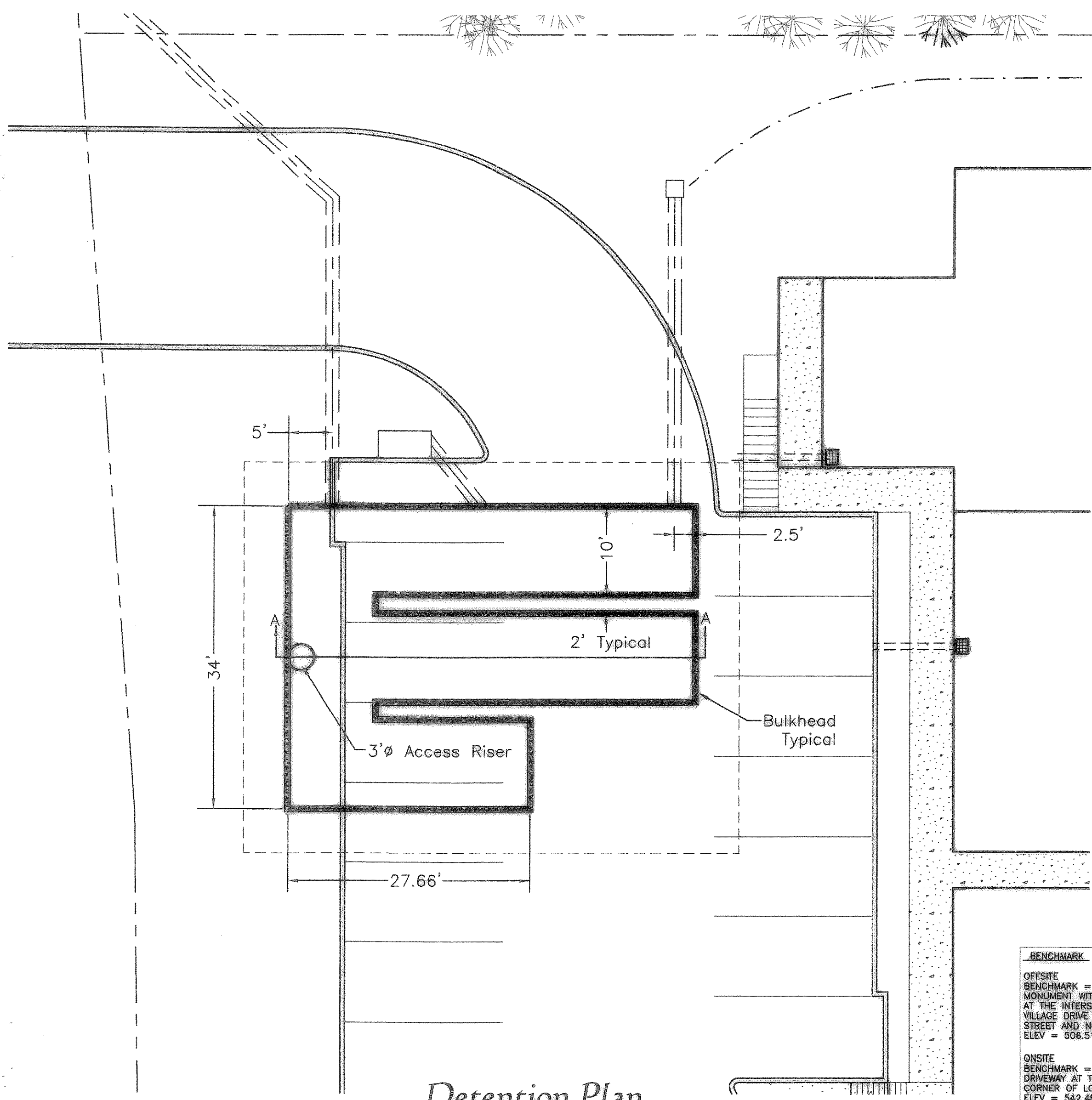
DRAINAGE AREA CALCULATIONS										
ID	Area		Existing				Proposed			
	sf	acres	I	C	CA	Q _e	I	C	CA	Q _p
A1	3771	0.082	9.8	0.9	0.074	0.72	9.8	0.9	0.074	0.72
A2	2100	0.048	8.25	0.35	0.017	0.14	9.8	0.9	0.043	0.43
A3	14971	0.344	8.25	0.35	0.120	0.99	9.8	0.9	0.309	3.03
A4	1250	0.029	8.25	0.35	0.010	0.08	9.8	0.9	0.026	0.25
A5	7283.8	0.167	8.25	0.35	0.069	0.48	9.8	0.9	0.180	1.47
A6	17792.9	0.408	8.25	0.35	0.143	1.18	9.8	0.9	0.388	3.60
A7	3744.2	0.086	8.25	0.35	0.030	0.25	9.8	0.9	0.077	0.76
Total		1.164			0.453	3.85			1.048	10.27

MODIFIED RATIONAL METHOD DETENTION VOLUME CALCULATIONS										
Return Period	Existing					Proposed				
	Area ¹	T _e	i	c	Q _{base}	Area ²	T _e	i	c	Q _p
100	1.08	20	8.25	0.35	3.13	0.92	10	9.80	0.90	8.1

T _d (min)	I (in/hr)	CA	Q _e (cfs)	W _h (ft ³)	V _h (ft ³)	Total Storage
10	9.8	0.827	8.11	4863	1013	3852
20	8.25	0.827	6.83	8192	1520	6672
30	6.82	0.827	5.64	10138	2026	8132
40	5.8	0.827	4.80	11518	2333	8985
45	5.34	0.827	4.42	11930	2786	9144
50	5	0.827	4.14	12412	3039	9372
55	4.72	0.827	3.91	12888	3293	9596
60	4.44	0.827	3.67	13226	3546	9800
70	3.95	0.827	3.27	13727	4093	9675
80	3.6	0.827	2.98	14208	4559	9739
90	3.29	0.827	2.72	14701	5066	9635
100	3.05	0.827	2.52	15142	5572	9570
110	2.85	0.827	2.36	15564	6079	9486

- Notes:
- A1 drains offsite and is unchanged over existing conditions; therefore, it does not influence detention calculations.
 - A2, A4, and A7 drain offsite and are undetained; therefore, the project must overdetain to account for their respective flows.

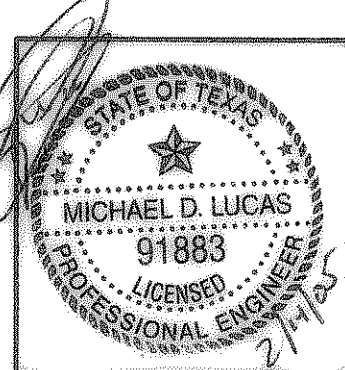
¹ Existing = A_{total} - A1 = 1.164 - 0.082 = 1.082 acres
² Detained = A_{total} - A1 - A2 - A4 - A7 = 1.164 - 0.082 - 0.048 - 0.25 - 0.75 = 0.922 acres
³ Q_{allow} = Q_{base} - Q_{offp} - Q_{off2} - Q_{off3} = 3.13 - 0.35 - 0.25 - 0.75 = 1.69 cfs



Detention Plan

1" = 10'

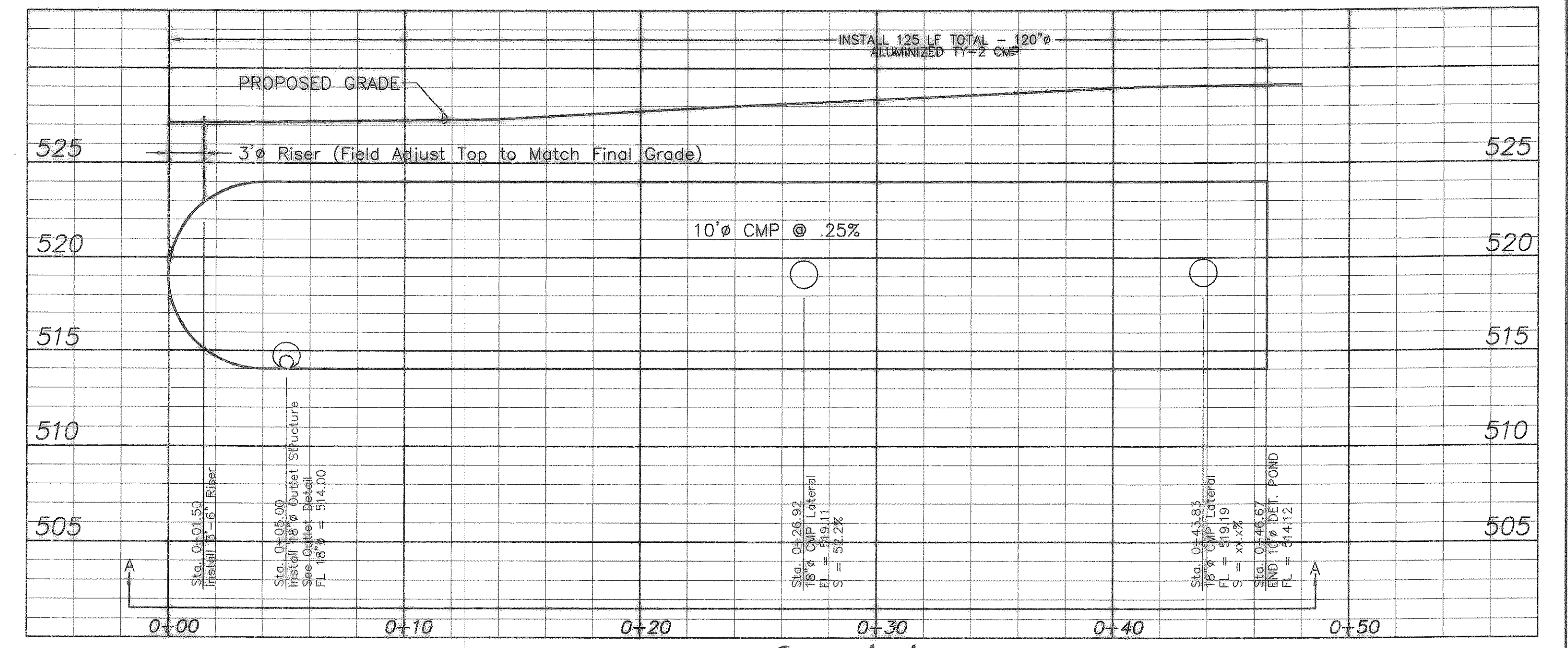
BENCHMARK
 OFFSITE
 BENCHMARK = TOP OF CITY OF ROCKWALL CONCRETE MONUMENT WITH ALUMINUM DISK STAMPED ROSS LOCATED AT THE INTERSECTION OF THE RAILROAD TRACK WITH VILLAGE DRIVE ON THE WEST SIDE OF THE PAVEMENT OF STREET AND NORTH SIDE OF RAILROAD TRACKS.
 ELEV = 506.51 NAVD 88
 ONSITE
 BENCHMARK = "X" FOUND IN CONCRETE IN EDGE OF DRIVEWAY AT THE EAST CORNER OF LOT 3 AND THE SOUTH CORNER OF LOT 2 OF LAKEWOOD PARK ADDITION.
 ELEV = 542.48



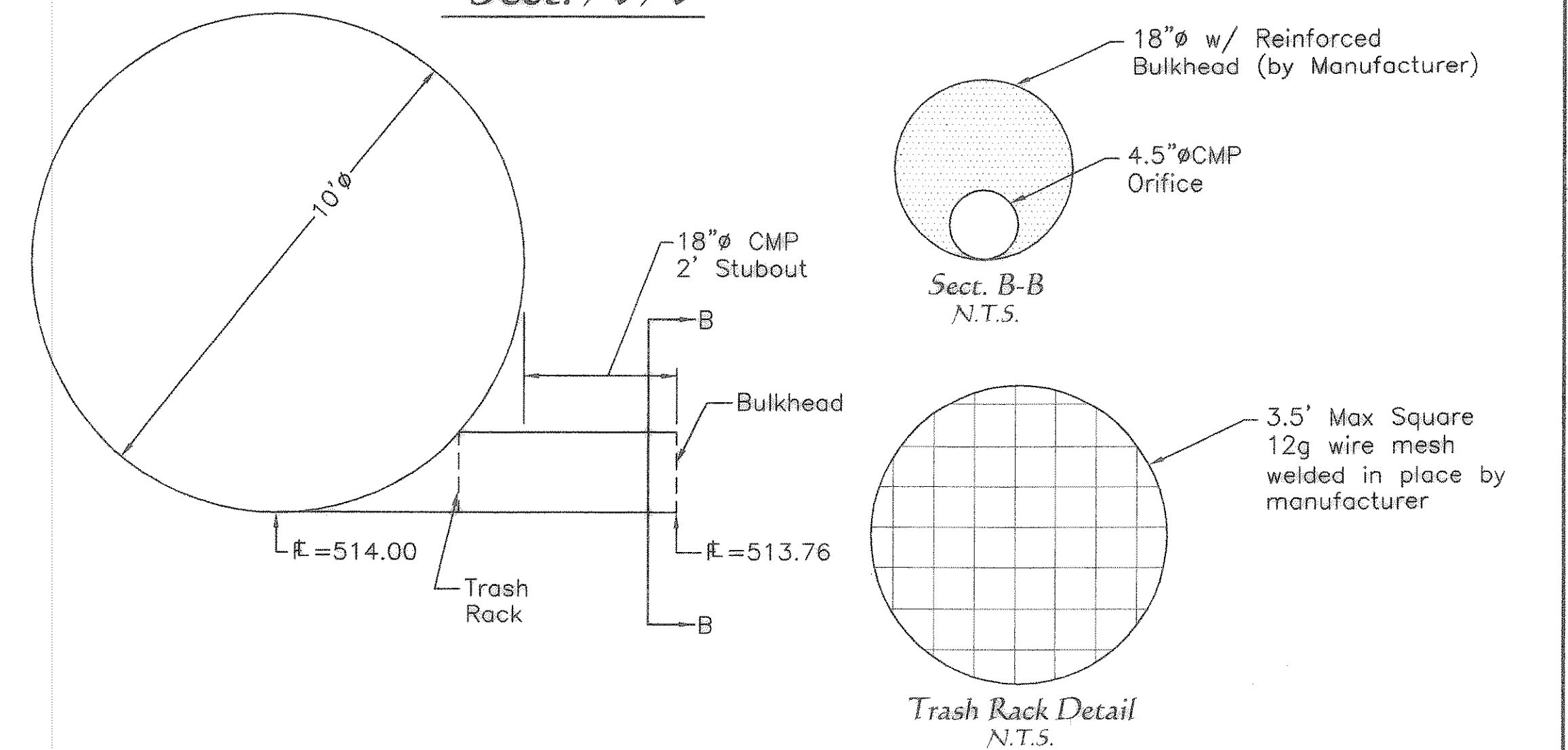
revisions	date

Example Calculations:
 Rational Method
 Existing Condition: Q=CIA, C=.35, A=1.16ac, I=8.25in/hr, Q_{ex}=35(8.25)1.16=3.3cfs
 Proposed Condition: Q=CIA, C=.9, A=1.16ac, I=9.8in/hr, Q_p=9(9.8)(1.16)=10.2cfs
STORAGE
 Storage Required= 9741 ft³
 10" Detention Pipe= 78.5 ft²/ft³
 9674 ft³/78.5 = 124.1 ft of pipe
 Storage Provided
 125 LF (78.5 ft³/LF)= 9812.5 ft³
OUT FLOW ORIFICE [4.5" ORIFICE]
 Q_o=1.69 cfs
 Q_{out}=q_{orifice}=Cd AV/2gn
 Cd=.60
 A=(4.5"/12")² * 3.14159/4 = 110ft²
 h=Pipe#-orifice elevation
 h=10' - (4.5"/12")=9.813'
 Q = .6(110) * (32.2)(9.813)
 = 1.66 cfs
 Q=1.66< Q_{allow}=1.69

RECORD DRAWING:
 6/6/06
 AQUATERRA ENGINEERING CONSULTANTS, LLC
 DATE

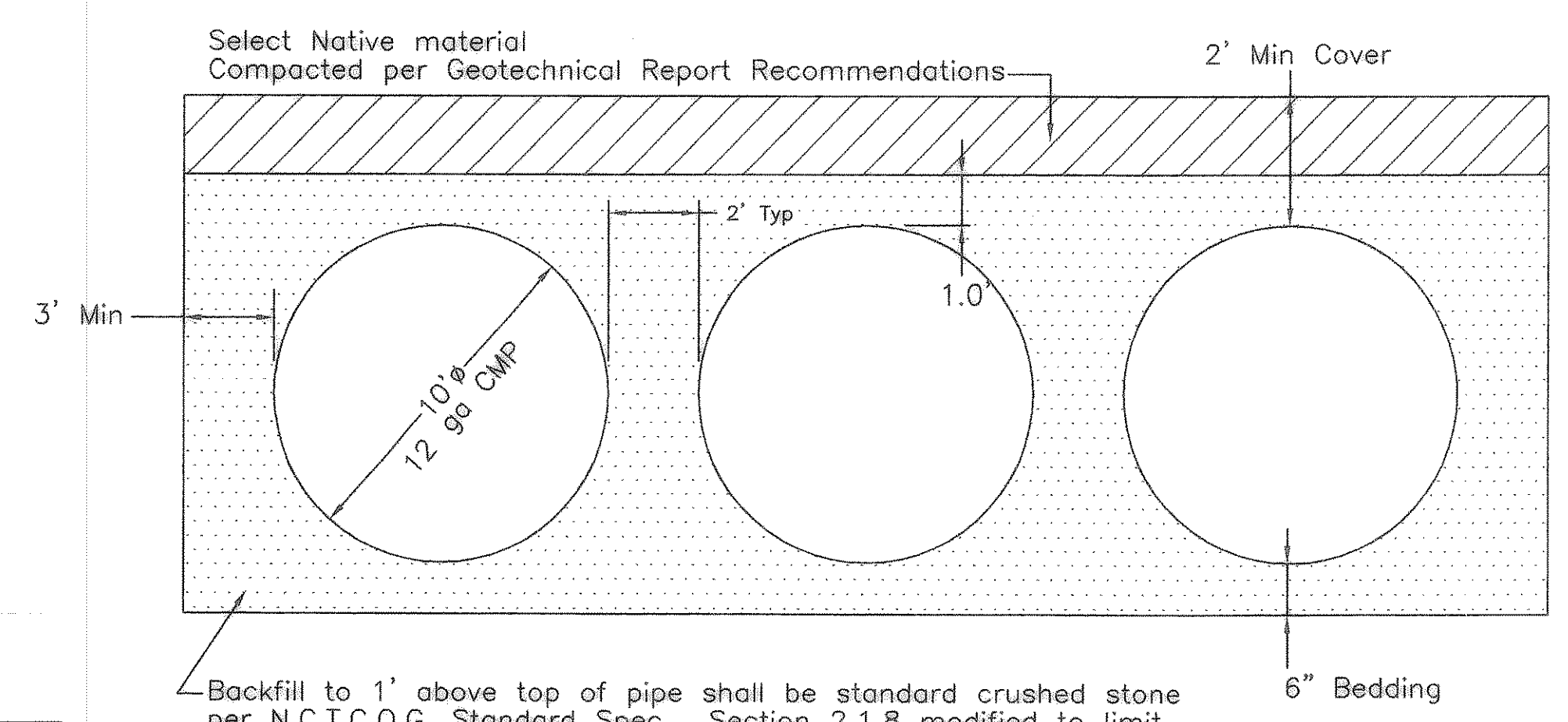


Sect. A-A



Outlet & Orifice Detail

N.T.S.



C.M.P. Embedment Detail

N.T.S.

<p>1932 Culberson Drive Rockwall, Texas 75087 ph: 972-732-8314 fax: 972-732-8314 email: lucasconsulting@charter.net</p>	RIDGEMARK DETENTION PLAN ROCKWALL, TEXAS				sheet no. 7
	design LCS	drawn LCS	scale 1"=20'	date OCT. 2004	notes