

DRAINAGE / DETENTION CALCULATIONS

EXIST. CONDITIONS
(12.26 ACRES)

C	0.35
Tc	20 minutes
Q100	8.3 in / hr
Q100	.35 x 8.3 x 12.26 = 35.62 cfs
(ALLOWABLE RELEASE RATE)	

PROPOSED CONDITIONS
(12.26 ACRES)

C	0.90
Tc	10 minutes
Q100	9.8 in / hr
Q100	.90 x 9.8 x 12.26 = 108.13 cfs

Storm Duration (minutes)	Inflow/Outflow (1/2 Factor)	Q in CFS	Sec/Min	Storage (Cu Ft)
10	Inflow: 108.13 Outflow: 0.5	10	35.62	64878
20	Inflow: 108.13 Outflow: 0.5	20	35.62	23272
30	Inflow: 108.13 Outflow: 0.5	30	35.62	43506
40	Inflow: 108.13 Outflow: 0.5	40	35.62	108896
50	Inflow: 108.13 Outflow: 0.5	50	35.62	32058
60	Inflow: 108.13 Outflow: 0.5	60	35.62	77838
70	Inflow: 108.13 Outflow: 0.5	70	35.62	139032
80	Inflow: 108.13 Outflow: 0.5	80	35.62	42744
90	Inflow: 108.13 Outflow: 0.5	90	35.62	98288
100	Inflow: 108.13 Outflow: 0.5	100	35.62	153800
110	Inflow: 108.13 Outflow: 0.5	110	35.62	53430
120	Inflow: 108.13 Outflow: 0.5	120	35.62	100170

Pond Elevation	Increment	Area (sf)	Increment Storage	Cummul Storage
522	0	0	0	0
523	1	16909	5305	5305
524	1	23409	17009	22314
525	1	25317	24363	46677
526	1	27225	26371	73048
527	1	29455	28340	101388
528	1	31685	30570	131958

Pond Storage Volume Required = 103,938 cubic feet
Pond Storage Volume Provided = 131,958 cubic feet

NOTE:
1. Drainage Areas 2 through 8 & 10 through 20, go to detention pond.
Areas 9, 21 & 23 goes to existing inlet in F.M. 3097
2. Areas 9, 21 & 23 developed conditions = 26.89 cfs
Existing undeveloped conditions = 26.89 cfs (from Kimley-Horn and Associates, record drawing, dated 9-19-05)

* MAXIMUM VOLUME REQUIRED IS 103,938 CFS
@ THE 60 MIN. STORM DURATION

INLET DESIGN CALCULATIONS

Inlet No.	Location	Design Storm Frequency (yrs)	AREA RUNOFF Q = CIA				Carry-Over From Upstream Inlet (c.f.s.)	Total Gutter Flow (c.f.s.)	Gutter Capacity (c.f.s.)	Gutter Slope (ft/100ft)	Crown Type	SELECTED INLET		Inlet Capacity (c.f.s.)
			Time of Conc. (min)	Intensity (in./hr.)	Runoff Coeff. "c"	Area (ac.)						"q" (c.f.s./in.)	Length "L" (Feet)	
1	LINE "A"	100	10	9.8	0.80	1.34	11.82	1.25	13.07	1.00%	Parabolic	10'	IA	16.50
2	LINE "A"	100	10	9.8	0.80	1.52	13.41	0	13.41	1.00%	Parabolic	10'	IA	16.50
3	LINE "B"	100	10	9.8	0.80	1.65	14.53	0	14.53	1.00%	Parabolic	3'x3'	V	15.00
4	LINE "B"	100	10	9.8	0.80	0.27	2.38	0	2.38	1.00%	Parabolic	5'	I	2.50
5	LINE "B"	100	10	9.8	0.80	0.27	2.38	0	2.38	1.00%	Parabolic	5'	I	2.50
6	LINE "C"	100	10	9.8	0.80	0.85	7.50	0	7.50	3.73%	Parabolic	15'	I	8.30
7	LINE "C"	100	10	9.8	0.80	1.23	10.85	0	10.85	1.00%	Parabolic	15'	I	9.80
8	LINE "C"	100	10	9.8	0.80	0.79	6.96	0	6.96	1.00%	Parabolic	15'	I	9.80
9	LINE "D"	100	10	9.8	0.80	0.59	5.20	0	5.20	3.97%	Parabolic	10'	IA	5.00
10	LINE "D"	100	10	9.8	0.80	0.59	5.20	1.23	6.43	2.80%	Parabolic	15'	I	9.00
11	LINE "D"	100	10	9.8	0.80	0.67	5.91	4.32	10.23	2.24%	Parabolic	15'	I	9.00

DRAINAGE CALCULATIONS

AREA NO.	AREA (AC.)	TC (MIN.)	C	100 IN/HR	Q 100 C.F.S.	DRAINS TO
1	0.16	10	0.90	9.80	1.41	By pond
2	0.59	10	0.90	9.80	5.20	10' Inlet/Pond
3	0.59	10	0.90	9.80	5.20	15' Inlet/Pond
4	0.67	10	0.90	9.80	5.91	15' Inlet/Pond
5	0.49	10	0.90	9.80	4.32	15' Inlet/Pond
6	1.34	10	0.90	9.80	11.82	10' Inlet/Pond
7	0.40	10	0.90	9.80	3.53	10' Inlet/Pond
8	2.72	10	0.90	9.80	12.62	Ex. 10' Inlet/Pond
9	0.34	10	0.90	9.80	3.00	Ex. "Y"
10	0.83	10	0.90	9.80	7.32	10' Inlet/Pond
11	0.63	10	0.90	9.80	5.56	18" Culv./Pond
12	1.52	10	0.90	9.80	13.41	10' Inlet/Pond
13	0.85	10	0.90	9.80	7.50	10' Inlet/Pond
14	0.79	10	0.90	9.80	6.96	15' Inlet/Pond
15	0.57	10	0.90	9.80	5.03	"Y" Inlet/Pond
16	0.57	10	0.90	9.80	5.03	"Y" Inlet/Pond
17	0.51	10	0.90	9.80	4.50	"Y" Inlet/Pond
18	0.27	10	0.90	9.80	2.38	5' Inlet/Pond
19	0.27	10	0.90	9.80	2.38	5' Inlet/Pond
20	2.59	10	0.90	9.80	22.84	"Y" Inlet/Pond
21	1.70	10	0.90	9.80	14.99	Ex. "Y"
22	0.79	10	0.90	9.80	6.97	Prop. 18" Culv.
23	1.01	10	0.90	9.80	8.90	Ex. "Y"
24	0.24	10	0.90	9.80	2.12	By pond

LEGEND

- EX. CONTOUR ----- 500
- DRAINAGE DIVIDE - - - - -
- AREA NO. (1)
- RUNOFF - Q₁₀₀ (2)
- INLET NO. (3)
- FLOW DIRECTION →

BENCHMARK:
THE BASIS OF BEARING AND ELEVATION DATUM FOR THIS SURVEY IS THE TEXAS STATE PLANE, NORTH CENTRAL ZONE, GEODETIC BEARING ESTABLISHED BY GPS MEASUREMENTS TAKEN FROM BASE STATIONS "DENTON CORS ARP", "ARLINGTON RRP2 CORS ARP", AND "SAGINAW TEXAS CORS ARP". GPS MEASUREMENT WERE ALSO TAKEN ON SITE ON MARCH 27, 2007.
CONVERGENCE ANGLE AT "DENTON CORS ARP" IS 00 DEGREES 43 MINUTES 45.545 SECONDS, AS COMPUTED BY CORPSCON VERSION 5.11.05.

CONSTRUCTION RECORD DRAWINGS
JANUARY 2009

Revision	Date	Description

Owner:
Whittle Development Co.
PO Box 369 • Rockwall, Texas • 75087
Phone: 972-771-5253

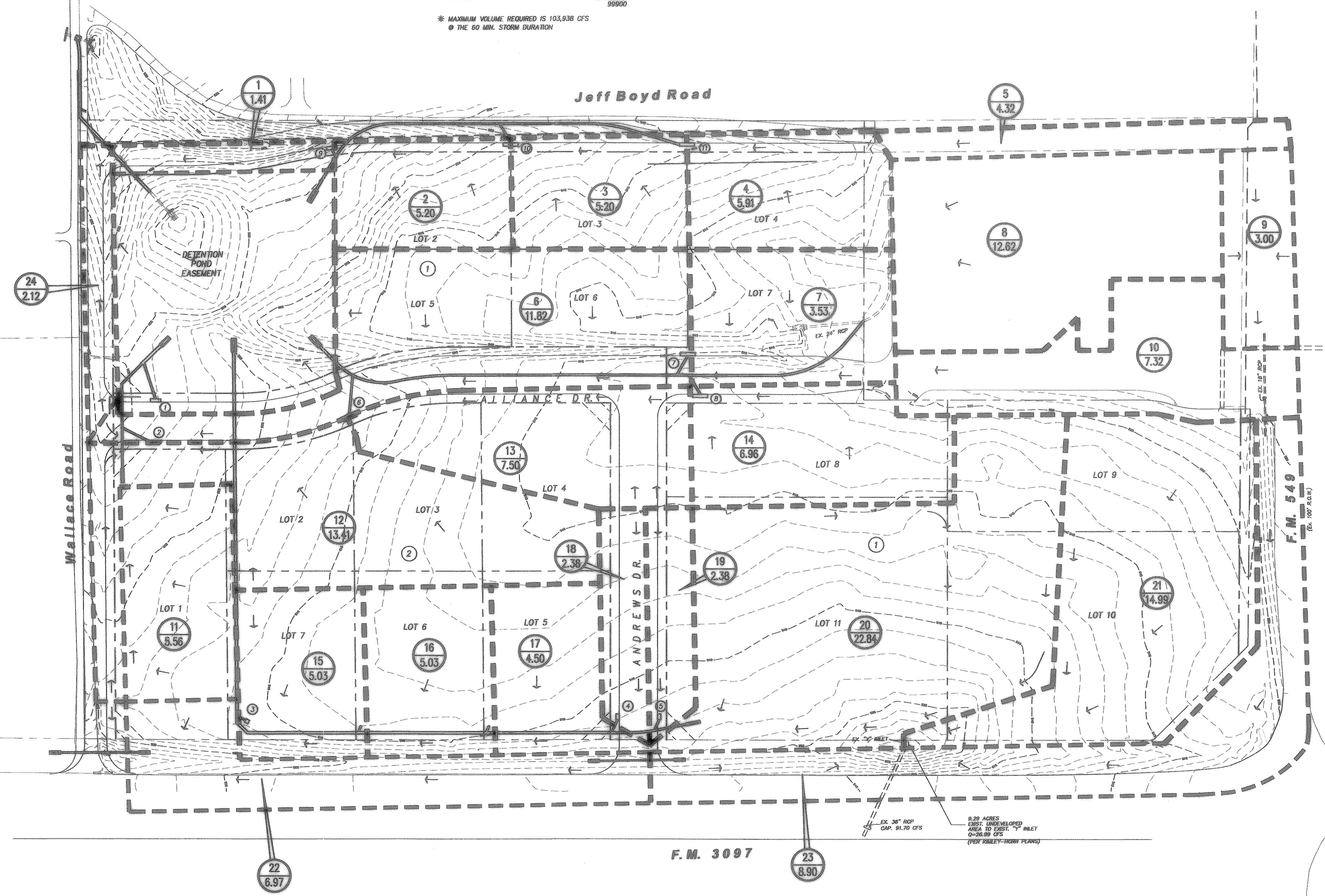
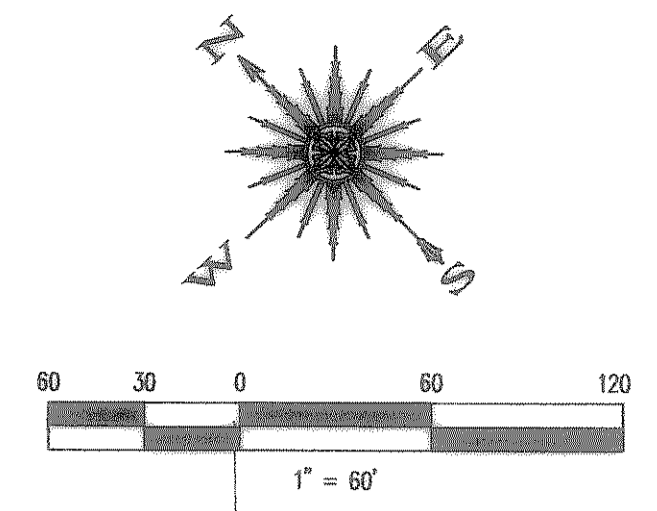
ALLIANCE ADDITION

F.C. CUNY CORPORATION
#2 Horizon Court • Ste. 300 • Heath, Texas 75032
Phone: 469-402-7700
Fax: 469-402-0700

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY CHRISTOPHER R. CUNY, P.E. 65642

1-15-2009

Drawn By: F.C. CUNY	Checked By: F.C. CUNY
Date: 1-09	Project No.: 07-003
Sheet Title: Drainage Area Map	
Scale: 1" = 60'	Sheet No.: 9 of 15



Z:\Projects\5-Residential\Whittle-Horizon\fcc design\hor-dan.dwg Wed Jan 14 15:06:00 2009