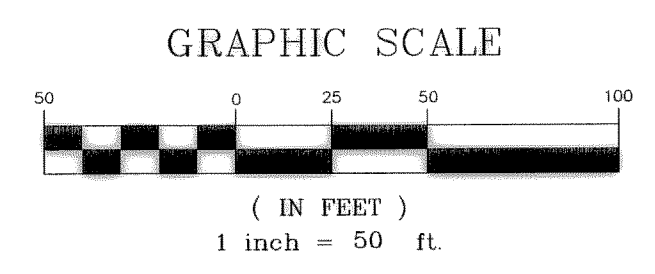
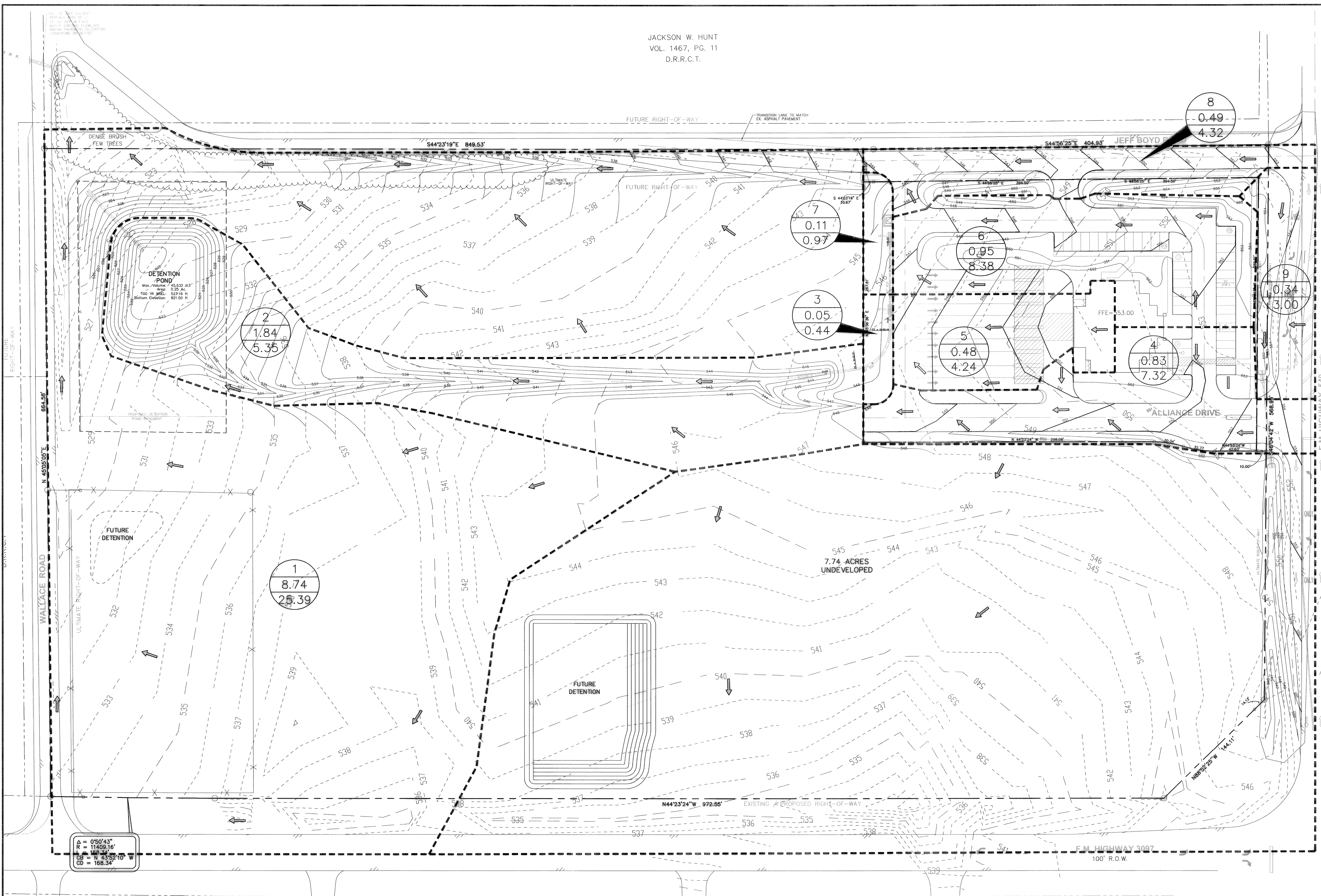


JACKSON W. HUNT
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D.R.R.C.T.



Drainage / Detention Calculations
Modified Rational Method - 100 yr
Alliance - Phase I Detention Pond

Onsite Existing Conditions
Flow To Existing Culvert
Q100yr 35.62 cfs
Ultimate Allowable Release Rate*

Onsite Proposed Conditions		Flow to Detention Pond	
Pond By-Pass Flow		Developed	
Area	0.60 acres	Area	2.31 acres
Time (Tc)	10 minutes	Time (Tc)	10 minutes
C value	0.90	C value	0.90
I-100yr	9.8 in/hr	I-100yr	9.8 in/hr
Q100yr	5.29 cfs	Q100yr	20.37 cfs
Undeveloped		Undeveloped	
Area	8.74 acres	Area	1.84 acres
Time (Tc)	20 minutes	Time (Tc)	20 minutes
C value	0.35	C value	0.35
I-100yr	8.3 in/hr	I-100yr	8.3 in/hr
Q100yr	25.39 cfs	Q100yr	5.35 cfs
Total By-Pass Flow		Phase I Detention Pond	
Q100yr	30.68 cfs	Allowable Release Rate**	4.93 cfs

Runoff to Detention Pond vs. Time

Time (min)	I-100yr (in/hr)	C value	Area (ac)	Runoff (cfs)
10	9.80	0.66	4.15	26.69
15	9.00	0.66	4.15	24.51
20	8.30	0.66	4.15	22.60
30	7.00	0.66	4.15	19.06
40	5.80	0.66	4.15	15.79
50	5.00	0.66	4.15	13.62
60	4.50	0.66	4.15	12.25
70	4.00	0.66	4.15	10.89
80	3.75	0.66	4.15	10.21
90	3.45	0.66	4.15	9.39
100	3.20	0.66	4.15	8.71

Inflow vs. Time

Time (min)	Runoff (cfs)	Inflow (ft ³)
10	26.69	16,011
15	24.51	22,056
20	22.60	27,121
30	19.06	34,310
40	15.79	37,904
50	13.62	40,845
60	12.25	44,113
70	10.89	45,746
80	10.21	49,014
90	9.39	50,729
100	8.71	52,282

Outflow vs. Time

Time In (min)	Time Out (min)	Release (cfs)	Outflow (ft ³)
10	20	4.93	2,960
15	25	4.93	3,700
20	30	4.93	4,440
30	40	4.93	5,920
40	50	4.93	7,400
50	60	4.93	8,880
60	70	4.93	10,361
70	80	4.93	11,841
80	90	4.93	13,321
90	100	4.93	14,801
100	110	4.93	16,281

Detention Volume

Time In (min)	Inflow (ft ³)	Outflow (ft ³)	Storage (ft ³)
10	16,011	2,960	13,051
15	22,056	3,700	18,356
20	27,121	4,440	22,681
30	34,310	5,920	28,390
40	37,904	7,400	30,504
50	40,845	8,880	31,965
60	44,113	10,361	33,752
70	45,746	11,841	33,906
80	49,014	13,321	35,693
90	50,729	14,801	35,929
100	52,282	16,281	36,001

*ULTIMATE ALLOWABLE RELEASE RATE IS BASED UPON EXISTING DRAINAGE CONDITIONS. SEE SHEET C-9.
Volume Provided - 100 YR
Pond = 45,632 FT³

BENCHMARK #1 (BM1)
TOP OF FLANGE NUT ON CONCRETE BASE OF LIGHT POLE OF THE FOOTBALL FIELD AND TRACK AT THE NORTHWEST END.
EL. = 529.40

LEGEND

- 1 - DRAINAGE AREA NUMBER
- 10.57 - ACRES
- 36.26 - Q₁₀₀
- PROPERTY BOUNDARY
- DRAINAGE AREA BOUNDARY
- DRAINAGE DITCH
- ← FLOW ARROW

INLET CALCULATIONS

DRAINAGE AREA NO.	AREA (AC)	C (coeff)	t _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (CFS)	INLET TYPE	INLET CAPACITY (CFS)	COMMENT
1	8.74	0.35	20	8.30	25.39	-	-	POND BY-PASS
2	1.84	0.35	20	8.30	5.35	-	-	DET. POND
3	0.05	0.90	10	9.80	0.44	-	-	DET. POND
4	0.83	0.90	10	9.80	7.32	FLUME	13.5	DET. POND
5	0.48	0.90	10	9.80	4.24	10' C.I.	5.6	DET. POND
6	0.95	0.90	10	9.80	8.38	10' C.I.	14.0	DET. POND
7	0.11	0.90	10	9.80	0.97	-	-	POND BY-PASS
8	0.49	0.90	10	9.80	4.32	FLUME	9.6	POND BY-PASS
9	0.34	0.90	10	9.80	3.00	-	-	TO FUTURE DET. POND

DETERMINATION OF C-VALUE FOR DETENTION CALCULATIONS

DEVELOPED:
AREA = 2.31 ACRES
C = 0.90

UNDEVELOPED:
AREA = 1.84 ACRES
C = 0.35

WEIGHTED AVERAGE OF C:

$$C = \frac{(CA)_{DEVELOPED} + (CA)_{UNDEVELOPED}}{A_d + A_u}$$

C = 0.66

RECORD DRAWING
THIS RECORD DRAWING REFLECTS TO THE BEST OF THE DESIGN ENGINEER'S KNOWLEDGE AND BELIEF THE LOCATION AND CONSTRUCTION OF THE WORK INFORMATION AS PROVIDED BY THE CONTRACTORS.

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ALLIANCE
ROCKWALL COUNTY
CITY OF ROCKWALL, TEXAS

PROPOSED DRAINAGE AREA MAP

Scale: 1" = 50'
Designed by: KHA
Drawn by: MSB
Checked by: NES
Date: SEPTEMBER, 2005
Project No. 064015000

SHEET
C-11