

QUAIL RUN RETENTION CALCULATIONS

POND NO. 1 (EXISTING POND)

Total Acreage In Plat:	
Phase I	25.33 Acres
Phase II	40.06 Acres
Total	65.39 Acres
Greenbelt Phase I	6.10 Acres
Greenbelt Phase II	1.47 Acres
Total	7.57 Acres
Total Developed Acreage:	
65.39 Acres	
Less Greenbelts	-7.57 Acres
Total	57.82 Acres

Detention Required:	
Developed	(57.82) (.50) (9.8) = 283.32 cfs
Undeveloped	(57.82) (.35) (8.3) = 167.97 cfs
Detention Required = 115.35 cfs	
Allowed Release Rate = 167.97 cfs	

POND No. 2	
Drainage Area Captured 16.75 Acres	
Developed	(16.75) (0.50) (9.8) = 82.08 cfs
Undeveloped	(16.75) (0.35) (8.3) = 48.66 cfs
Detention Required = 32.42 cfs	
Allowed Release Rate = 48.66 cfs	

Off Site (Area 5)	(6.30 acres) (.35) (8.3) = 18.30 cfs
Total Flow Into Pond	= 100.38 cfs
Total Allowed Release Rate	= 66.96 cfs

Calculate Average "C"	
16.75 (.50)	= 8.375
6.30 (.35)	= 2.205
23.05	= 10.58
Average "C"	= 10.58/23.05 = 0.459

CHECK VARIOUS DURATION STORMS	
15 min	I = 9.1 Q = (0.459) (9.1) (23.05) = 96.28 cfs
20 min	I = 8.3 Q = (0.459) (8.3) (23.05) = 87.81 cfs
30 min	I = 6.9 Q = (0.459) (6.9) (23.05) = 73.00 cfs
40 min	I = 5.7 Q = (0.459) (5.7) (23.05) = 60.31 cfs
50 min	I = 5.0 Q = (0.459) (5.0) (23.05) = 52.90 cfs
60 min	I = 4.4 Q = (0.459) (4.4) (23.05) = 46.55 cfs

CHECK STORAGE REQUIRED	
15 min storm	Inflow (15) (96.28) (60) = 96,652 CF
	Outflow (0.5)(30)(66.96)(60) = 26,388 CF
20 min storm	Inflow (20) (87.31) (60) = 105,372 CF
	Outflow (0.5)(35)(66.96)(60) = 35,064 CF
30 min storm	Inflow (30) (73.00) (60) = 131,400 CF
	Outflow (0.5)(45)(66.96)(60) = 90,396 CF
40 min storm	Inflow (40) (60.31) (60) = 144,744 CF
	Outflow (0.5)(55)(66.96)(60) = 110,484 CF
50 min storm	Inflow (50) (52.90) (60) = 158,700 CF
	Outflow (0.5)(65)(66.96)(60) = 130,572 CF

Maximum Storage Volume required is 41,004 CF at the 30 minute storm duration.

Check Allowed Release	
Phase I And 2	65.39Ac.(0.35)(8.3) = 189.96 cfs
Off Site Area 5	6.30Ac.(0.35)(8.3) = 18.30 cfs
Off Site Area 1	44.76Ac.(0.35)(7.2) = 112.80 cfs
Total Release Allowed	321.06 cfs
Released Without Detention:	
Greenbelt Area 1	3.73Ac.(0.35)(8.3) = 10.84 cfs
Lots 1 Through 5, Blk. A	1.06Ac.(0.50)(9.8) = 5.19 cfs
Lots 1 Through 18, Blk. E	3.95Ac.(0.50)(9.8) = 19.35 cfs
Sub-total Release	40.90 cfs
Lots 1 Through 18, Blk. E	3.95Ac.(0.50)(9.8) = 19.35 cfs
Line "D"	105.37 cfs
Line "O"	72.34 cfs
Line "P"	18.18 cfs
Line "B" (Below Pond)	14.01 cfs
Sub-total Release	250.80 cfs

Released Allowed Pond No. 1	
321.06 cfs	
Less Sub-total Release	-250.80 cfs
Allowed Release Pond No. 1	70.26 cfs

Calculate Average "C" for Pond:	
44.76 (.35)	= 15.666
1.70 (.35)	= .595
4.80 (.50)	= 2.400
51.26	= 18.661
Average "C"	= 18.661/51.26 = 0.364

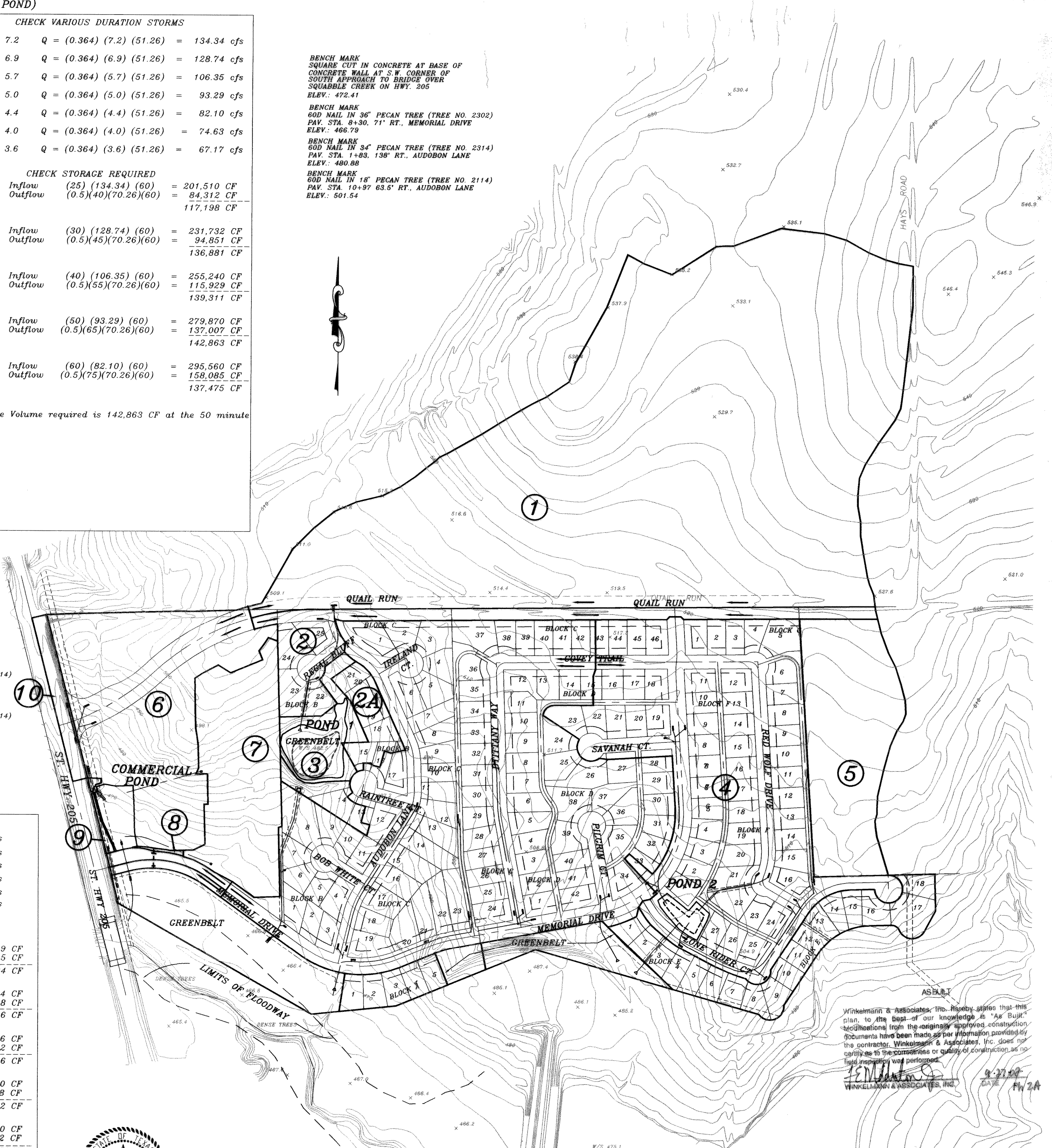
Maximum Storage Volume required is 142,863 CF at the 50 minute storm duration.

BENCH MARK SQUARE CUT IN CONCRETE AT BASE OF CONCRETE WALL AT S.W. CORNER OF SOUTH APPROACH TO BRIDGE OVER SQUABBLE CREEK ON HWY. 205 ELEV. 472.41

BENCH MARK 60D NAIL IN 34" PECAN TREE (TREE NO. 2314) PAV. STA. 1+83.138' RT., AUDOBON LANE ELEV. 480.88

BENCH MARK 60D NAIL IN 36" PECAN TREE (TREE NO. 2302) PAV. STA. 8+30.71' RT., MEMORIAL DRIVE ELEV. 466.79

BENCH MARK 60D NAIL IN 18" PECAN TREE (TREE NO. 2114) PAV. STA. 10+97.635' RT., AUDOBON LANE ELEV. 501.54



QUAIL RUN COMMERCIAL RETENTION POND

Total Area Of Plat 15.61 acres	
TOTAL COMMERCIAL AREA DEVELOPED 15.61 ACRES	
Developed	(15.61) (0.80) (9.8) = 122.38 cfs
Undeveloped	(15.61) (0.35) (8.3) = 45.35 cfs
TOTAL TO BE RETAINED 78.77 cfs	
ALLOWED RELEASE 45.35 cfs	

Drainage Captured by the Pond:	
Total Area Developed	14.89
Plus Highway R.O.W.	0.76
Plus Pond	0.72
TOTAL 16.37	

Flow into Pond:	
(14.89) (.80) (9.8)	= 116.74 cfs
(1.48) (.35) (8.3)	= 4.30 cfs
TOTAL	121.04 cfs

Calculate Average "C":	
14.89 (.80)	= 11.912
1.48 (.35)	= 0.518
16.37	= 12.43
Average "C"	= 12.43/16.37 = 0.7593

CHECK VARIOUS DURATION STORMS	
15 min	I = 9.1 Q = (0.7598) (9.1) (16.37) = 113.11 cfs
20 min	I = 8.3 Q = (0.7598) (8.3) (16.37) = 103.17 cfs
30 min	I = 6.9 Q = (0.7598) (6.9) (16.37) = 85.76 cfs
40 min	I = 5.7 Q = (0.7598) (5.7) (16.37) = 70.85 cfs
50 min	I = 5.0 Q = (0.7598) (5.0) (16.37) = 62.15 cfs
60 min	I = 4.4 Q = (0.7598) (4.4) (16.37) = 54.69 cfs

CHECK STORAGE REQUIRED	
15 min storm	Inflow (15) (113.11) (60) = 101,799 CF
	Outflow (0.5)(30)(45.35)(60) = 40,815 CF
	60,984 CF
20 min storm	Inflow (20) (103.17) (60) = 123,804 CF
	Outflow (0.5)(35)(46.35)(60) = 47,618 CF
	76,186 CF
30 min storm	Inflow (30) (85.76) (60) = 154,386 CF
	Outflow (0.5)(45)(46.35)(60) = 61,222 CF
	93,164 CF
40 min storm	Inflow (40) (70.85) (60) = 170,040 CF
	Outflow (0.5)(55)(45.35)(60) = 74,828 CF
	95,212 CF
50 min storm	Inflow (50) (62.15) (60) = 186,450 CF
	Outflow (0.5)(65)(45.35)(60) = 88,432 CF
	98,018 CF
60 min storm	Inflow (60) (54.69) (60) = 196,884 CF
	Outflow (0.5)(75)(45.35)(60) = 102,038 CF
	94,846 CF

Maximum Storage Volume required is 98,018 CF at the 50 minute storm duration.



REV.	6/11/01
REV.	5/11/01
REV.	3/3/01
REV.	2/21/15

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RETENTION POND DRAINAGE AREA MAP
QUAIL RUN VALLEY NO.1 AND NO. 2
QUAIL RUN VALLEY RETAIL
CITY OF ROCKWALL

SHEET NO.	14
JOB NO.	0020

Winkelmann & Associates, Inc. hereby states that this plan to the best of our knowledge is "As Built" and is based on the original approved construction documents. It is the responsibility of the contractor, Winkelmann & Associates, Inc. to verify the accuracy of the construction as no field inspection was performed.

9-27-09
WINKELMANN & ASSOCIATES, INC. DATE: 9/27/09