

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:	
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) = 86,652 CF Outflow (0.5)(30)(66.96)(60) = 60,264 CF = 26,388 CF
20 min storm	Inflow (20) (87.31) (60) = 105,372 CF Outflow (0.5)(35)(66.96)(60) = 70,308 CF = 35,064 CF
30 min storm	Inflow (30) (73.00) (60) = 131,400 CF Outflow (0.5)(45)(66.96)(60) = 90,396 CF = 41,004 CF
40 min storm	Inflow (40) (60.31) (60) = 144,744 CF Outflow (0.5)(55)(66.96)(60) = 110,484 CF = 34,260 CF
50 min storm	Inflow (50) (52.90) (60) = 158,700 CF Outflow (0.5)(65)(66.96)(60) = 130,572 CF = 28,128 CF

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

Check Allowed Release		CHECK VARIOUS DURATION STORMS	
Phase 1 And 2	65.39Ac.(0.35)(8.3) = 189.96 cfs	25 min	I = 7.2 Q = (0.364) (7.2) (51.26) = 134.34 cfs
Off Site Area 5	6.30Ac.(0.35)(8.3) = 18.30 cfs	30 min	I = 6.9 Q = (0.364) (6.9) (51.26) = 128.74 cfs
Off Site Area 1	44.76Ac.(0.35)(7.2) = 112.80 cfs	40 min	I = 5.7 Q = (0.364) (5.7) (51.26) = 106.35 cfs
Total Release Allowed	321.06 cfs	50 min	I = 5.0 Q = (0.364) (5.0) (51.26) = 93.29 cfs
Released Without Detention:		60 min	I = 4.4 Q = (0.364) (4.4) (51.26) = 82.10 cfs
Greenbelt Area 1	3.73Ac.(0.35)(8.3) = 10.84 cfs	70 min	I = 4.0 Q = (0.364) (4.0) (51.26) = 74.63 cfs
Lots 1 Through 5, Blk. A	1.06Ac.(0.50)(9.8) = 5.19 cfs	80 min	I = 3.6 Q = (0.364) (3.6) (51.26) = 67.17 cfs
Lots 1 Through 18, Blk. E	3.95Ac.(0.50)(9.8) = 19.35 cfs	CHECK STORAGE REQUIRED	
Sub-total Release	40.90 cfs	25 min storm	Inflow (25) (134.34) (60) = 201,510 CF Outflow (0.5)(40)(70.26)(60) = 84,312 CF = 117,198 CF
Lots 1 Through 18, Blk. E	3.95Ac.(0.50)(9.8) = 19.35 cfs	30 min storm	Inflow (30) (128.74) (60) = 231,732 CF Outflow (0.5)(45)(70.26)(60) = 94,851 CF = 136,881 CF
Line "D"	72.34 cfs	40 min storm	Inflow (40) (106.35) (60) = 255,240 CF Outflow (0.5)(55)(70.26)(60) = 115,929 CF = 139,311 CF
Line "P"	18.18 cfs	50 min storm	Inflow (50) (93.29) (60) = 279,870 CF Outflow (0.5)(65)(70.26)(60) = 137,007 CF = 142,863 CF
Line "B" (Below Pond)	14.01 cfs	60 min storm	Inflow (60) (82.10) (60) = 295,560 CF Outflow (0.5)(75)(70.26)(60) = 158,085 CF = 137,475 CF
Sub-total Release	250.80 cfs	Maximum Storage Volume required is 142,863 CF at the 50 minute storm duration.	
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

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

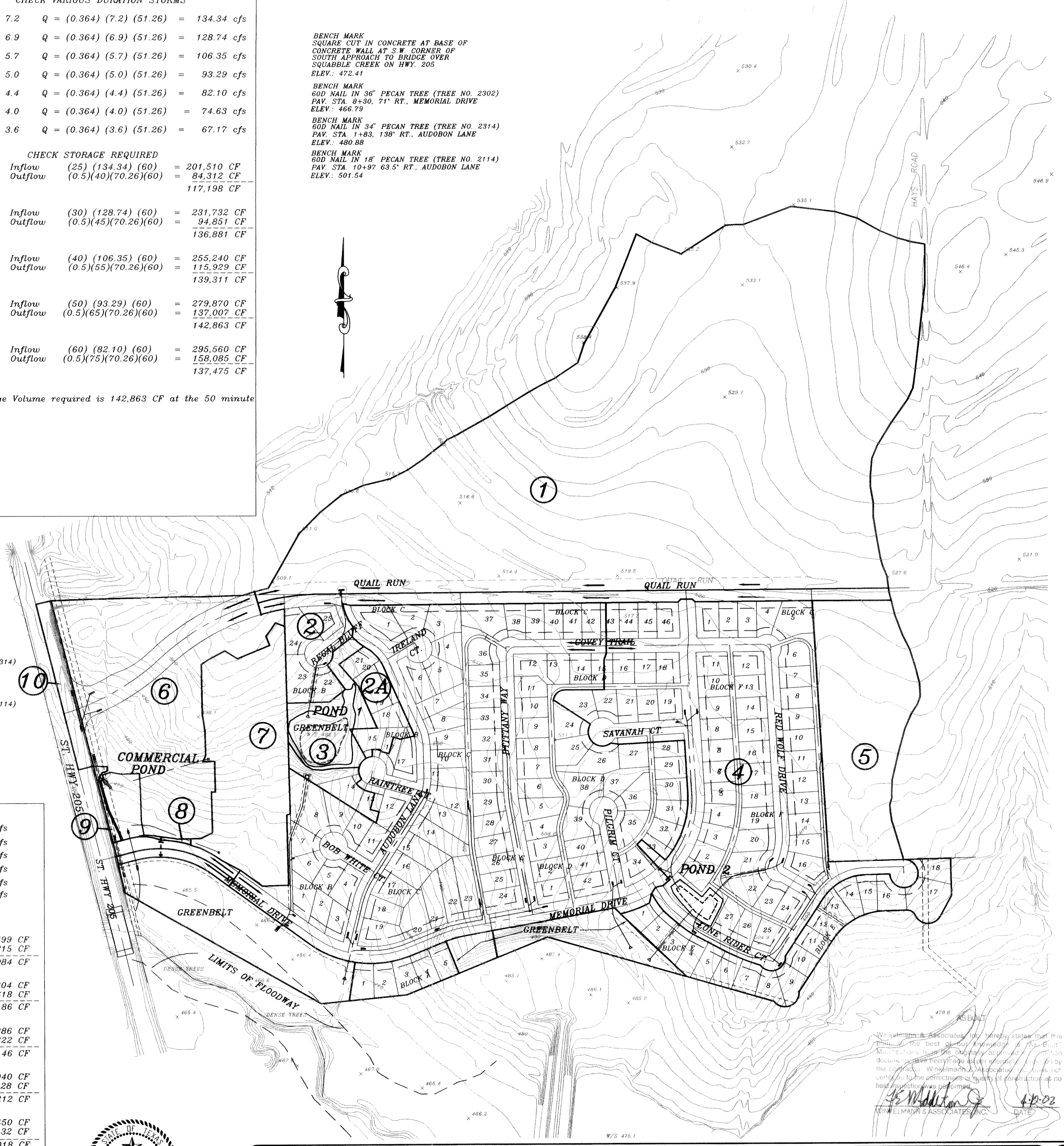
BENCH MARK 60D NAIL IN 3" PECAN TREE (TREE NO. 2314) PAV. STA. 1+83, 138' RT., AUDOBON LANE ELEV.: 480.88

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, 63.5' RT., AUDOBON LANE ELEV.: 501.54

QUAIL RUN COMMERCIAL RETENTION POND

Total Area Of Plat 15.61 acres		CHECK VARIOUS DURATION STORMS	
TOTAL COMMERCIAL AREA DEVELOPED 15.61 ACRES		15 min	I = 9.1 Q = (0.7598) (9.1) (16.37) = 113.11 cfs
Developed	(15.61) (0.80) (9.8) = 122.38 cfs	20 min	I = 8.3 Q = (0.7598) (8.3) (16.37) = 103.17 cfs
Undeveloped	(15.61) (0.35) (8.3) = 45.35 cfs	30 min	I = 6.9 Q = (0.7598) (6.9) (16.37) = 85.76 cfs
TOTAL TO BE RETAINED	78.77 cfs	40 min	I = 5.7 Q = (0.7598) (5.7) (16.37) = 70.85 cfs
ALLOWED RELEASE	45.35 cfs	50 min	I = 5.0 Q = (0.7598) (5.0) (16.37) = 62.15 cfs
Drainage Captured by the Pond:		60 min	I = 4.4 Q = (0.7598) (4.4) (16.37) = 54.69 cfs
Total Area Developed	14.89	CHECK STORAGE REQUIRED	
Plus Highway R.O.W.	0.76	15 min storm	Inflow (15) (113.11) (60) = 101,799 CF Outflow (0.5)(30)(45.35)(60) = 60,984 CF = 40,815 CF
Plus Pond	0.72	20 min storm	Inflow (20) (103.17) (60) = 123,804 CF Outflow (0.5)(35)(46.35)(60) = 47,618 CF = 76,186 CF
Total	16.37	30 min storm	Inflow (30) (85.76) (60) = 154,386 CF Outflow (0.5)(45)(46.35)(60) = 61,222 CF = 93,164 CF
Flow into Pond:		40 min storm	Inflow (40) (70.85) (60) = 170,040 CF Outflow (0.5)(55)(45.35)(60) = 74,828 CF = 95,212 CF
(14.89) (.80) (9.8)	= 116.74 cfs	50 min storm	Inflow (50) (62.15) (60) = 186,450 CF Outflow (0.5)(65)(45.35)(60) = 88,432 CF = 98,018 CF
(1.48) (.35) (8.3)	= 4.30 cfs	60 min storm	Inflow (60) (54.69) (60) = 196,884 CF Outflow (0.5)(75)(45.35)(60) = 102,038 CF = 94,846 CF
TOTAL	121.04 cfs	Maximum Storage Volume required is 98,018 CF at the 50 minute storm duration.	
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		



REVISION DESCRIPTION		DATE	SCALE	DESIGN	DRAWN	RETENTION POND DRAINAGE AREA MAP QUAIL RUN VALLEY NO. 1 AND NO. 2 QUAIL RUN VALLEY RETAIL CITY OF ROCKWALL	SHEET NO. 11 21 JOB NO. 0020
REV.		6/11/01	1" = 200'	H.L.E.			
REV.		6/11/01					
REV.		3/3/01					
REV.		2/21/15					

Windermere & Associates, Inc. hereby states that this plan is the best of its knowledge and belief and that it contains true and correct information. It is a condition of this agreement that the contractor shall certify to the engineer of quality of the product and no field inspection was performed.

Harold L. Evans
 HAROLD L. EVANS & ASSOCIATES, INC.
 DATE: 4-10-02