COWSKIN CREEK - 119th to 13th
Section Properties - Encroachment Plan 4A Correction

Section ID	W.S. Elev.	Area	W.P.	R	$R^{2/3}$	$K \times 10^{-3}$	%KT	φ_{us}	φ_{ds}	$\bar{\varphi}$	l	$l\bar{\varphi}$	$\Sigma \frac{l\bar{\varphi}}{\varphi} = L$
From Encroachment Plan 4A													
G	1336.5												
Lob		175	50	3.5	2.31	17.2	3	462	1695	1079	170	183,356	
Ch		1548	162	9.55	4.54	298.4	53	8034	8976	8505	190	1,615,959	199
Rob		1950	390	5	2.94	243.4	44	6554	4379	5466	220	1,202,606	
		3673				559.0						3,001,921	
Corrected X-Section													
H	1337.0												
Lob		37.5	15	2.5	1.85	2.9	0.3	46	462	254	760	193,079	
Ch		1436	142	10.11	4.71	287.2	30	4495	8036	6264	840	5,262,055	674
Rob		5168	975	5.3	3.06	671.4	69.7	10,509	6554	8532	550	4,692,379	
						961.5						10,147,513	
I	1337.1	0	0	0	0	0	0	0	46	23	270	6210	
		1598	198	8.07	4.05	274.8	45	6761	4495	5628	260	1,463,280	254
		3450	995	3.47	2.30	336.9	55	8289	10,509	9398	250	2,349,750	
												3,819,240	
Encroachment Plan 5													
H	1337.0												
Lob		0	0	0	0	0	0	0	462	231	760	175,560	
Ch		1666	177	9.41	4.49	317.6	39	5901	8034	6968	840	5.852.730	687
Rob		3790	715	5.3	3.06	492.4	61	9149	6554	7851	550	4,318,365	
												10,346,595	
Plan 4A Section													
I	1337.1												
Ch		1598	198	8.07	4.05	274.8	45	6761	5901	6331	260	1,646,060	254
Rob		3450	995	3.47	2.30	336.9	55	8289	9149	8919	250	2,179,750	
												3,825,810	

Walnut Valley & Whistling Walk Estates 4th. Additions

Encroachment Plan 4A & Natural Sections

CORRECTION FOR LOCATION OF CHANNEL ON SECTION H

SECTION H

Left overbank

	1.
	37.
	37.
	10180.
	37.
	10195.
	35.5
	10195.
	35.5
	10180.
	0.
	2.
Lob Area	37.5
	37.5
	15. WP
	2.5
	2.5
	0.67
1.847650423	R2/3

CLR ÷ = Y% =

SECTION H

Channel

	1.
	37.
	37.
	10195.
	37.
	10335.
	31.5
	10335.
	23.5
	10270.
	21.
	10265.
	21.
	10255.
	33.5
	10195.
	0.
	2.
Ch Area	1426.35
	142. WP
	10.11443662
	10.11443662
	0.67
4.713146478	R2/3

= Y% =

SECTION H

Right overbank

	1.
	37.
	37.
	10335.
	37.
	11310.
	31.5
	11310.
	31.5
	10335.
	0.
	2.
Rob Area	5167.5
	5167.5
	975. WP
	5.3
	5.3
	0.67
3.056784571	R2/3

÷ = Y% =

Walnut Valley & Whistling Walk Estates 4th Additions
Encroachment Plan 5 for Tennis Courts and Swimming Pool

Section H

No left overbank subsection

Channel

	1.	
	37.	
	37.	
	10160.	
	37.	
	10370.	
	31.5	
	10370.	
	31.5	
	10335.	
	22.5	
	10270.	
	21.	
	10265.	
	21.	
	10255.	
	33.5	
	10195.	
	35.5	
	10160.	
	0.	
	2.	
Ch Area	1666.25	
		CLP
	1666.	÷
	177. WP	=
	9.412429379	
	9.412429379	Y%
	0.67	=
	4.491388711 R2/3	
		CLP

Right overbank

	1.	
	37.	
	37.	
	10595.	
	37.	
	11310.	
	31.9	
	11310.	
	31.5	
	10595.	
	0.	
	2.	
Rob Area	3789.5	
	3789.5	÷
	715. WP	=
	5.3	
	5.3	Y%
	0.67	=
	3.056784571 R2/3	
		CLP

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HEC-2 WATER SURFACE PROFILE CALCULATIONS

DISCHARGE 10 YR 6570 cfs STREAM Cowskin Creek PROJECT Walnut Valley Tennis Courts & Swimming Pool Encroachment Plan 5

RM / X-SEC	1 Reach Length	2 Flowline Elev.	3 Trial W.S. Elev.	4 Area 'A'	5 $R^{2/3}$	6 'n'	7 K x10	8 Kr x10	9 'Sf'	10 'hf'	11 K^2/A_{10}	12 'α'	13 'V'	14 $V^2/2g$	15 $\alpha(V^2/2g)$	16 Δhv	17 h_o	18 H	19 Final W.S. Elev.	20 Remarks
1	HNTB FIS Pg 3-30																		1332.8	
20.97A				382.6			318,162					1	1.72	.05	.05					
3																				
A 4			1332.8																	
5	Lob			67.2	1.99	.035	54,777				405									
6	Ch			1400	4.61	.035	274,018				10,497									
7	Rob			581	1.71	.035	42,182				222									
8	80			2653			372,977	345,570	.00036	.03	11,125	1.51	2.48	.10	.14	-.09	.03	-.03	1332.77	OK
9																				
B 10			1332.8																	
11	Lob			390	1.38	.035	22,850				78									
12	Ch			1194	3.80	.035	192,637				5014									
13	Rob			353	1.23	.035	18,434				50									
14	139			1937			233,921	203,449	.00047	.07	5142	1.51	3.39	.18	.27	-.13	.04	-.02	1332.75	OK
15																				
C 16			1332.9																	
17	Lob			112	1.25	.035	5944				17									
18	Ch			1311	4.22	.035	234,891				7540									
19	Rob			582	1.58	.035	39,042				176									
20	296			2005			279,877	256,899	.00065	.19	7733	1.42	3.28	.17	.24	.03	0	.22	1332.97	OK
21																				
D 22			1333.1																	
23	Lob			272	1.37	.035	15,821				54									
24	Ch			1194	4.05	.035	205,310				6070									
25	Rob			300	1.80	.035	22,927				134									
26	159			1766			244,058	261,968	.00063	.10	6258	1.34	3.72	.21	.29	.05	.01	.16	1333.13	OK
27																				
28																				
29																				
30																				
31																				

$K = \frac{C_m}{n} A R^{2/3}$ $C_m = 1.486$ $R_T = \frac{1}{2}(K_{us} + K_{ds})$ $S_f = (Q/K_T)^2$ $h_f = L S_f$ $\alpha = (A_T)^2 \Sigma (K^3/A^2) \div (K_T)^3$ $V = Q/A$ $\Delta h_v = \alpha(V^2/2g)_{ds} - \alpha(V^2/2g)_{us}$ $h_o = C_e(-\Delta h_v)$ or $C_c(+\Delta h_v)$ $H = h_f + \Delta h_v + h_o$

EFFICIENCY LINE AMPAD 22-211

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Pg 2 of 2

HEC-2 WATER SURFACE PROFILE CALCULATIONS

DISCHARGE 10yr 6570 STREAM Cowskin Creek PROJECT Walnut Valley Encroachment Plan 5

RM / X-SEC	1 Reach Length	2 Flowline Elev.	3 Trial W.S. Elev.	4 Area 'A'	5 $R^{2/3}$	6 'n'	7 K	8 K_T	9 'Sf'	10 'hf'	11 K^2/A_{x10}	12 'α'	13 'V'	14 $V^2/2g$	15 $\alpha(V^2/2g)$	16 Δh_v	17 h_o	18 H	19 Final W.S. Elev.	20 Remark
D 1	159		1333.1	1766		.035	244,058	261,968	.00063	.10	6258	1.34	3.72	.21	.29	.05	.01	.16	1333.13	
2																				
E 3			1333.4																	
4	Lob			114	1.54	.035	7454				32									
5	Chan			1072	4.39	.035	199,807				6941									
6	Rob			666	2.20	.035	62,208				543									
7	397			1852			269,469	256,763	.00065	.26	7516	1.32	3.55	.20	.26	.03	0	.29	1333.42	OK
8																				
F 9			1333.7																	
10	Lob			208	1.69	.035	14,925				77									
11	Chan			1023	4.38	.035	190,239				6579									
12	Rob			540	1.70	.035	38,976				203									
13	393			1771			244,140	256,802	.00065	.26	6859	1.48	3.71	.21	.32	.06	.01	.33	1333.75	OK
14																				
G 15																				
16			1333.9																	
17	Lob			45	0.93	.035	1777				3									
18	Chan			1132	3.72	.035	178,789				4460									
19	Rob			936	1.80	.035	71,532				418									
20	199			2113			252,097	248,118	.00070	.14	4880	1.36	3.11	.15	.20	.12	.01	.27	1334.02	OK
21																				
H 22			1334.4																	
23	Lob			0	0	.035	0				0									
24	Chan			1076	3.74	.035	170,858				4308									
25	Rob			2633	1.95	.035	217,990				1494									
26	687			3709			388,848	320,472	.00042	.29	5802	1.36	1.77	.05	.07	.13	.01	.43	1334.45	OK
27																				
28																				
29																				
30																				
31																				

$K = \frac{C_m}{n} A R^{2/3}$ $C_m = 1.486$ $R_T = 1/2(K_{us} + K_{ds})$ $S_f = (Q/K_T)^2$ $h_f = L S_f$ $\alpha = (A_T)^2 \Sigma (K^3/A^2) \div (K_T)^3$ $V = Q/A$ $\Delta h_v = \alpha(V^2/2g)_{ds} - \alpha(V^2/2g)_{us}$ $h_o = C_e(-\Delta h_v)$ or $C_c(+\Delta h_v)$ $H = h_f + \Delta h_v + h_o$

EFFICIENCY LINE 22-21

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HEC-2 WATER SURFACE PROFILE CALCULATIONS

DISCHARGE 100 YR 15050 cfs STREAM CONSKIN CREEK PROJECT Walnut Valley Addition Correction for Cross-Section H of Encroachment Plan 4A and Encroachment Plan 5 for Tennis Courts & Swimming Pool.

RM/ X-SEC		1 Reach Length	2 Flowline Elev.	3 Trial W.S. Elev.	4 Area 'A'	5 $R^{2/3}$	6 n	7 K x10	8 Kr x10	9 Sf	10 hf	11 $K^2/A_R x10^6$	12 α	13 V	14 $V^2/2g$	15 $\alpha(V^2/2g)$	16 Δhv	17 ho	18 H	Final W.S. Elev.	20 Remarks
	1	Begin @ Section G of Encroachment Plan 4A dated March 1983																			
G	2		1320	1336.5																	
	3	Lt overbank	—		175	2.31	.035	17,163				165									
	4	Chan			1548	4.54	.035	298,325				11,086									
	5	Rob			1950	2.94	.035	243,407				3793									
	6	199			3673			558,956	516,500	.00085	.17	15,044	1.16	4.10	.26	.30	.23	.02	.42	1336.55	ΔH = +.05 OK
	7																				
H	8		1321	1337.0																	
	9	Lob			37.5	1.85	.035	2945				18									
	10	ch			1436	4.71	.035	287,161				11,483									
	11	Rob			5168	3.06	.035	671,421				11,333									
	12	674			6641.5			961,528	760,242	.00039	.26	22,834	1.13	2.27	.08	.09	.21	.02	.49	1337.04	ΔH = +.04 OK
	13																				
I	14		1321	1337.1																	
	15	Lob			0	0	0	0				0									
	16	ch			1598	4.05	.035	274,800				8124									
	17	Rob			3450	2.30	.035	336,900				3212									
	18	254			5048			611,700	786,614	.00037	.09	11,337	1.26	2.98	.13	.17	-.08	.02	.63	1337.07	ΔH = -.03 OK
	19																				
	20	New X-Section H - Encroachment Plan 5																			
	21																				
H	22		1321	1337.0																	
	23	Lob			0	0	0	0				0									
	24	ch			1666	4.49	.035	317,594				11,542									
	25	Rob			3790	3.06	.035	492,392				8,311									
	26	687			5456			809,986	684,471	.00048	.33	19,853	1.11	2.76	.12	.13	.17	.02	.52	1337.07	ΔH = +.07 OK
I	27																				
	28	ch			1598	4.05	.035	274,800													
	29	Rob			3450	2.30	.035	336,900													
	30	254						611,700	710,843	.00045	.11		1.26	2.98	.13	.17	-.04	.01	.08	1337.15	ΔH = +.05 OK
	31																				

$K = \frac{C_m}{n} A R^{2/3}$ $C_m = 1.486$ $R_T = \frac{1}{2}(K_{us} + K_{ds})$ $S_f = (Q/K_T)^2$ $h_f = L S_f$ $\alpha = (A_T)^2 \Sigma (K^3/A^2) \div (K_T)^3$ $V = Q/A$ $\Delta h_v = \alpha(V^2/2g)_{ds} - \alpha(V^2/2g)_{us}$ $h_o = C_e(-\Delta h_v)$ or $C_c(+\Delta h_v)$ $H = h_f + \alpha h_v + h_o$