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July 17, 1985

Sedgwick County Department of Public Works
 1250 South Seneca
 Wichita, Kansas 67213-4498

Attention: Mr. Jim Weber

Reference: Pine Bay Estates
 Drainage Plan
 PEC File No: 36-84032-959

Dear Mr. Weber:

As requested, we are transmitting herewith two (2) sets of calculations for the 100-year storm within the Wichita-Valley Center Floodway's Ponding Area "C".

As you can see, if the entire 100-year storm would be diverted from Ponding Area "C" to the existing lake in Pine Bay Estates, the Design Water Surface (DWS) would be approximately 1249.3 (MSL). This is about 0.8' higher than that calculated for the 25-year storm.

Also, the water depth in the control section of the overflow channel would be approximately 3.4'. This is 0.4' higher than the 25-year storm. Assuming the same section is used, the freeboard would be reduced from 3.0' to 2.6'.

If you have any questions or need any additional information, please call at your convenience.

Very truly yours,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

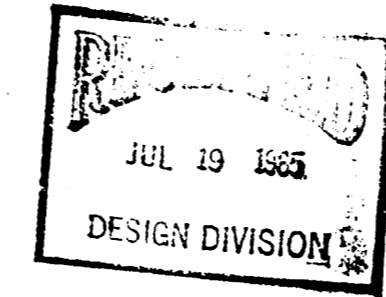
Charles S. Brown
 Charles S. Brown, P.E.
 Project Engineer

cc: Chris Breitenstein, P.E., Flood Control Engineer
 Gerald Blood

CSB:kas



PROFESSIONAL
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Date July 17, 1985 Page 1 of 4

Project Pine Bay Estates

Item Inflow to Big Ditch Ponding Area "C" (100 yr)

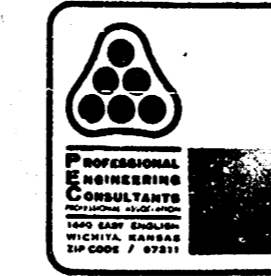
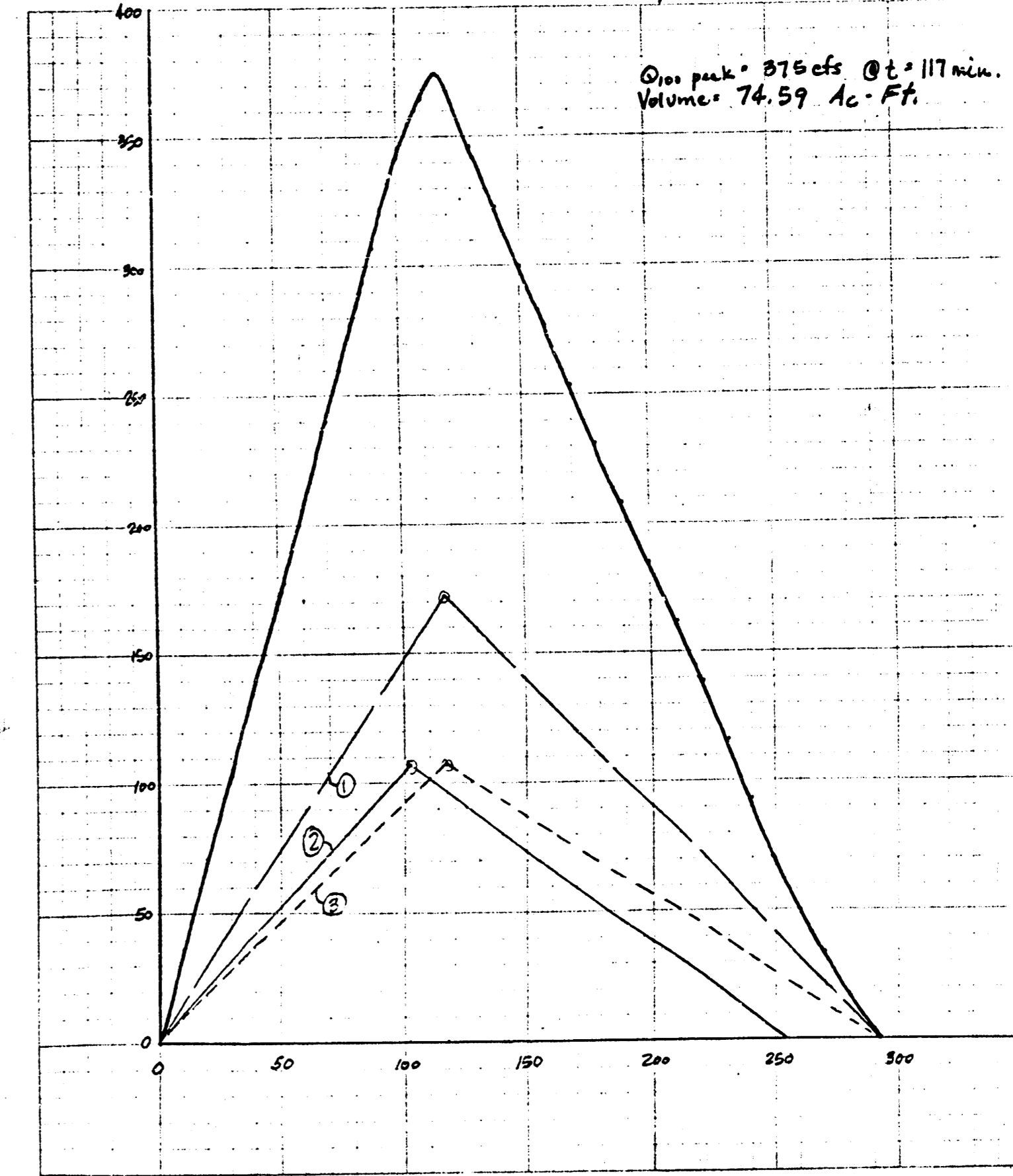
DA #1	A = 209 Ac. C = 0.35 I ₁₀₀ = 2.00 @ 1.75 (Avg) = 177 min. I ₂₅ = 2.35 Q ₁₀₀ = 0.35 * 2.35 * 209 = 172 cfs
DA #2	DA = 211 Ac. C = (49.4 Ac @ 0.35) + (216 Ac @ 0.3) = 0.34 I ₁₀₀ = 2.61 I ₂₅ = 2.61 Q ₁₀₀ = 0.34 * 2.61 * 211 = 187 cfs
DA #3	DA = 130 Ac. C = 0.35 I ₁₀₀ = 1.7 min. I ₂₅ = 2.35 Q ₁₀₀ = 0.35 * 2.35 * 130 = 107 cfs



Date 7-17-85 Page 2 of 4

Project Pine Bay Estates

Item Inflow Hydrograph to Free-way Ponding Area "C" (100 yr)



Date July 17, 1985 Page 3 of 4

Project Pine Bay Estates

Item Inflow Hydrograph Ponding Area "C" (100 yr)

Time At	DA #1	DA #2	DA #3	Total
0	0	0	0	0
10	11	11	10	36
20	22	22	19	71
30	33	33	27	103
40	44	44	37	139
50	55	55	46	171
60	66	66	55	206
70	77	77	64	239
80	88	88	73	273
90	99	99	82	307
100	110	110	92	342
110	121	121	101	374
120	132	132	110	406
130	143	143	119	438
140	154	154	128	469
150	165	165	137	500
160	176	176	146	531
170	187	187	155	562
180	198	198	164	593
190	209	209	173	624
200	220	220	182	655
210	231	231	191	686
220	242	242	200	717
230	253	253	209	748
240	264	264	218	779
250	275	275	227	810
260	286	286	236	841
270	297	297	245	872
280	308	308	254	903
290	319	319	263	934
300	330	330	272	965
310	341	341	281	996
320	352	352	290	1027
330	363	363	299	1058
340	374	374	308	1089
350	385	385	317	1120
360	396	396	326	1151
370	407	407	335	1182
380	418	418	344	1213
390	429	429	353	1244
400	440	440	362	1275
410	451	451	371	1306
420	462	462	380	1337
430	473	473	389	1368
440	484	484	398	1399
450	495	495	407	1430
460	506	506	416	1461
470	517	517	425	1492
480	528	528	434	1523
490	539	539	443	1554
500	550	550	452	1585
510	561	561	461	1616
520	572	572	470	1647
530	583	583	479	1678
540	594	594	488	1709
550	605	605	497	1740
560	616	616	506	1771
570	627	627	515	1802
580	638	638	524	1833
590	649	649	533	1864
600	660	660	542	1895
610	671	671	551	1926
620	682	682	560	1957
630	693	693	569	1988
640	704	704	578	2019
650	715	715	587	2050
660	726	726	596	2081
670	737	737	605	2112
680	748	748	614	2143
690	759	759	623	2174
700	770	770	632	2205
710	781	781	641	2236
720	792	792	650	2267
730	803	803	659	2298
740	814	814	668	2329
750	825	825	677	2360
760	836	836	686	2391
770	847	847	695	2422
780	858	858	704	2453
790	869	869	713	2484
800	880	880	722	2515
810	891	891	731	2546
820	902	902	740	2577
830	913	913	749	2608
840	924	924	758	2639
850	935	935	767	2670
860	946	946	776	2701
870	957	957	785	2732
880	968	968	794	2763
890	979	979	803	2794
900	990	990	812	2825
910	1001	1001	821	2856
920	1012	1012	830	2887
930	1023	1023	839	2918
940	1034	1034	848	2949
950	1045	1045	857	2980
960	1056	1056	866	3011
970	1067	1067	875	3042
980	1078	1078	884	3073
990	1089	1089	893	3104
1000	1100	1100	902	3135



Date July 17, 1985 Page 4 of 4

Project Pine Bay Estates

Item Design Water Surfaces (100-yr)

1. Check DWS₁₀₀ in lake

Static Pool = 1246.20 MSL
 Internal Drainage = 0.28'
 100-yr Rainfall Directly on Lake = 0.66'
 Drainage from Ponding Area "C" = 2.10'
 (External Drainage)

DWS₁₀₀ = 1249.30 MSL

2. Check DWS₁₀₀ in channel (emptying into lake)

Trapezoidal Shaped Weir

$Q = CLH^{3/2} + CZH^{5/2}$ where $Q = 375$ cfs
 $375 = (30 \times 16^{3/2}) + (8.0 \times 40 \times H^{5/2})$
 $375 = 48 H^{3/2} + 12 H^{5/2}$
 $375 = 60 H^{3/2}$
 $H^{3/2} = 375/60 = 6.25$
 $H = 6.25^{2/3}$
 $H = 3.39'$

Channel Provides 3' Freeboard - 25'
 " 2.61' " - 100-yr