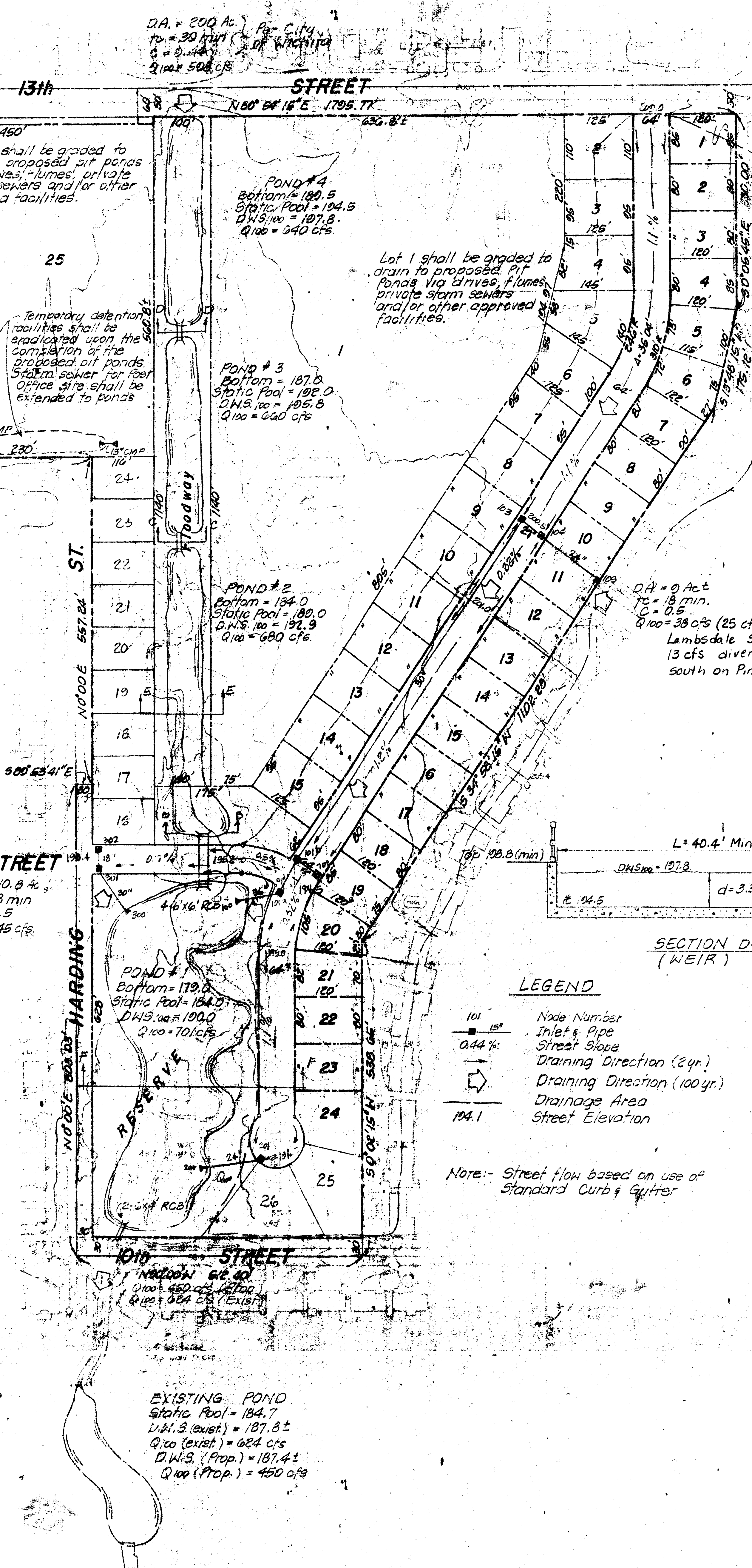
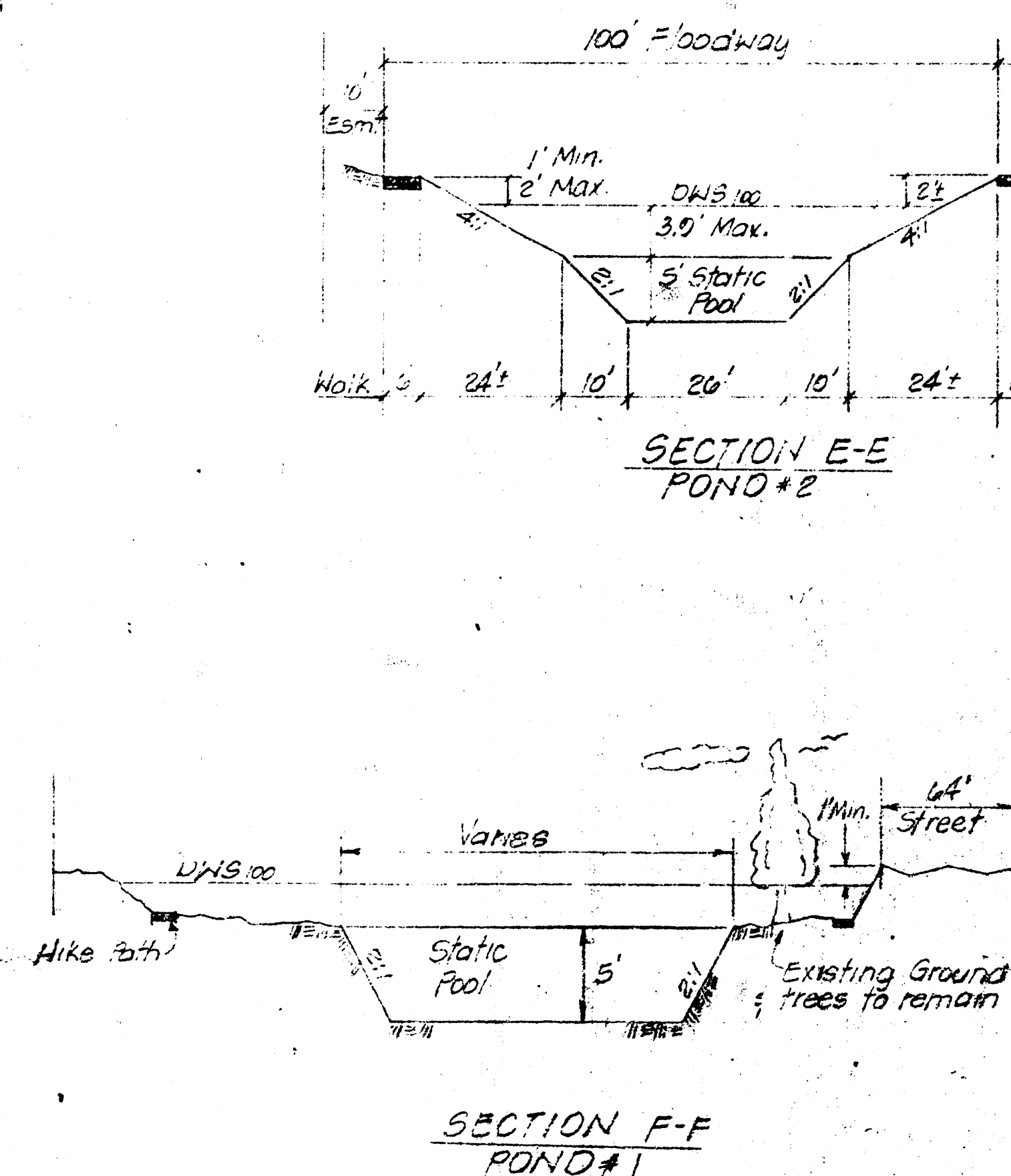


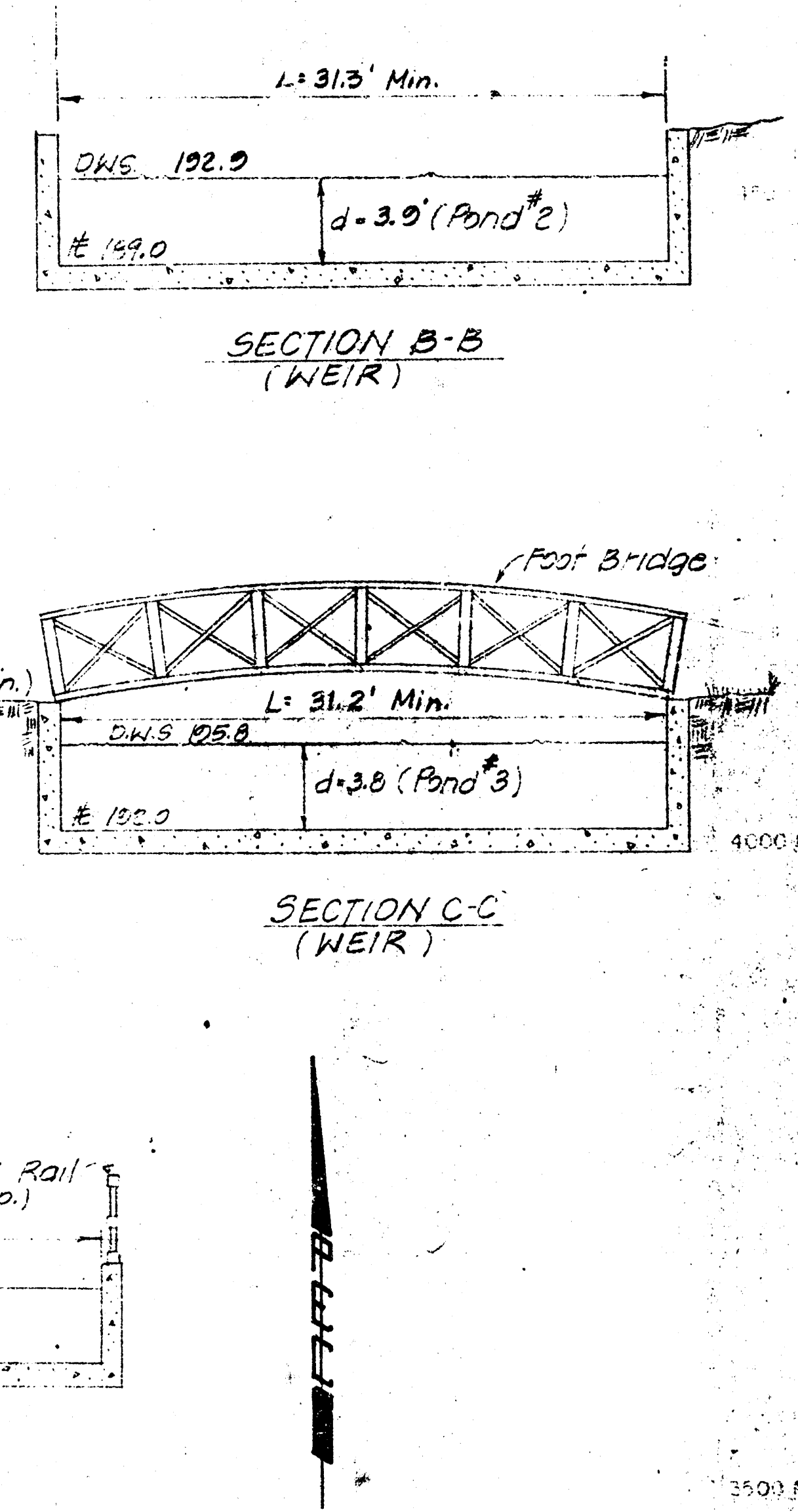
DRAINAGE PLAN WILLIAMSBURG ADDITION



LEGEND

- Node Number
- Street Slope
- Drainage Direction (2 yr)
- Drainage Direction (100 yr)
- Drainage Area
- Street Elevation

Note: Street flow based on use of Standard Curve Equations



N.W. 1/4 SECTION 13, 27S.1E.,
 SEDGWICK COUNTY, KANSAS

P.E.C. ALLIED LABORATORIES

Revised 10-18-84: a) Lowered Pond No. 1 Elev.
 b) Added 11 in St. Sewers
 c) Decreased Q₁₀₀ from Lambdale St.
 d) Widened Weirs

Revised 7-18-84 (Lambdale St Drainage) C&B

HYDROLOGY														
Node	Area	Length	TC(1)	TC(2)	TC(3)	TC(4)	TC(5)	TC(6)	TC(7)	TC(8)	TC(9)	TC(10)	TC(11)	TC(12)
101	107.050	0.10	0.00	0.0	15.00	4.06	0.20	20.05	3.62	0.18	41.00	30"	5.51	100.00
102	106.050	1.60	0.00	0.0	15.00	4.06	3.20	15.00	4.06	3.20	3.20	15"	2.61	99.60
103	104.050	1.80	0.00	0.0	15.00	4.06	1.60	19.84	3.64	1.43	20.75	30"	5.48	70.00
104	104.050	1.80	0.00	0.0	15.00	4.06	1.20	15.01	3.70	1.09	17.31	30"	7.40	280.00
105	104.050	4.40	0.00	0.0	15.00	4.06	0.90	18.28	3.76	8.24	26.22	30"	7.38	320.00
106	102.050	1.60	0.00	0.0	15.00	4.06	1.20	15.00	4.06	3.20	3.20	15"	1.11	35.00
107	102.050	0.00	0.00	0.0	15.00	4.06	0.00	18.00	3.78	25.00	25.00	24"	7.94	135.00

HYDROLOGY														
Node	Area	Length	TC(1)	TC(2)	TC(3)	TC(4)	TC(5)	TC(6)	TC(7)	TC(8)	TC(9)	TC(10)	TC(11)	TC(12)
101	107.050	0.10	0.00	0.0	15.00	4.06	0.20	20.05	3.62	0.18	41.00	30"	5.51	100.00
102	106.050	1.60	0.00	0.0	15.00	4.06	3.20	15.00	4.06	3.20	3.20	15"	2.61	99.60
103	104.050	1.80	0.00	0.0	15.00	4.06	1.60	19.84	3.64	1.43	20.75	30"	5.48	70.00
104	104.050	1.80	0.00	0.0	15.00	4.06	1.20	15.01	3.70	1.09	17.31	30"	7.40	280.00
105	104.050	4.40	0.00	0.0	15.00	4.06	0.90	18.28	3.76	8.24	26.22	30"	7.38	320.00
106	102.050	1.60	0.00	0.0	15.00	4.06	1.20	15.00	4.06	3.20	3.20	15"	1.11	35.00
107	102.050	0.00	0.00	0.0	15.00	4.06	0.00	18.00	3.78	25.00	25.00	24"	7.94	135.00

HYDROLOGY														
Node	Area	Length	TC(1)	TC(2)	TC(3)	TC(4)	TC(5)	TC(6)	TC(7)	TC(8)	TC(9)	TC(10)	TC(11)	TC(12)
101	107.050	0.10	0.00	0.0	15.00	4.06	0.20	20.05	3.62	0.18	41.00	30"	5.51	100.00
102	106.050	1.60	0.00	0.0	15.00	4.06	3.20	15.00	4.06	3.20	3.20	15"	2.61	99.60
103	104.050	1.80	0.00	0.0	15.00	4.06	1.60	19.84	3.64	1.43	20.75	30"	5.48	70.00
104	104.050	1.80	0.00	0.0	15.00	4.06	1.20	15.01	3.70	1.09	17.31	30"	7.40	280.00
105	104.050	4.40	0.00	0.0	15.00	4.06	0.90	18.28	3.76	8.24	26.22	30"	7.38	320.00
106	102.050	1.60	0.00	0.0	15.00	4.06	1.20	15.00	4.06	3.20	3.20	15"	1.11	35.00
107	102.050	0.00	0.00	0.0	15.00	4.06	0.00	18.00	3.78	25.00	25.00	24"	7.94	135.00



Date: 12-22-84 Page: 2 of 2
Project: Williamsburg C.U.P.
Item: Pond No. 1
Storage - Storage Curve

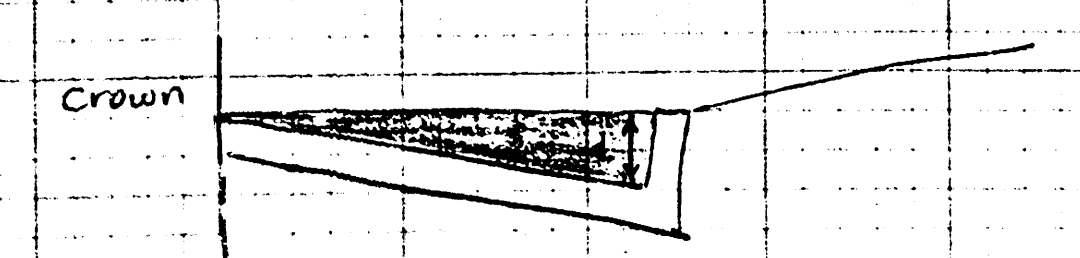
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163		1.0	0.00	0	163
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409		1.0	0.00	0	409
410		1.0	0.00	0	410
411		1.0	0.00	0	411
412		1.0	0.00	0	412
413		1.0			

Determine Street Flow on Lamsdale St during 100 year storm.

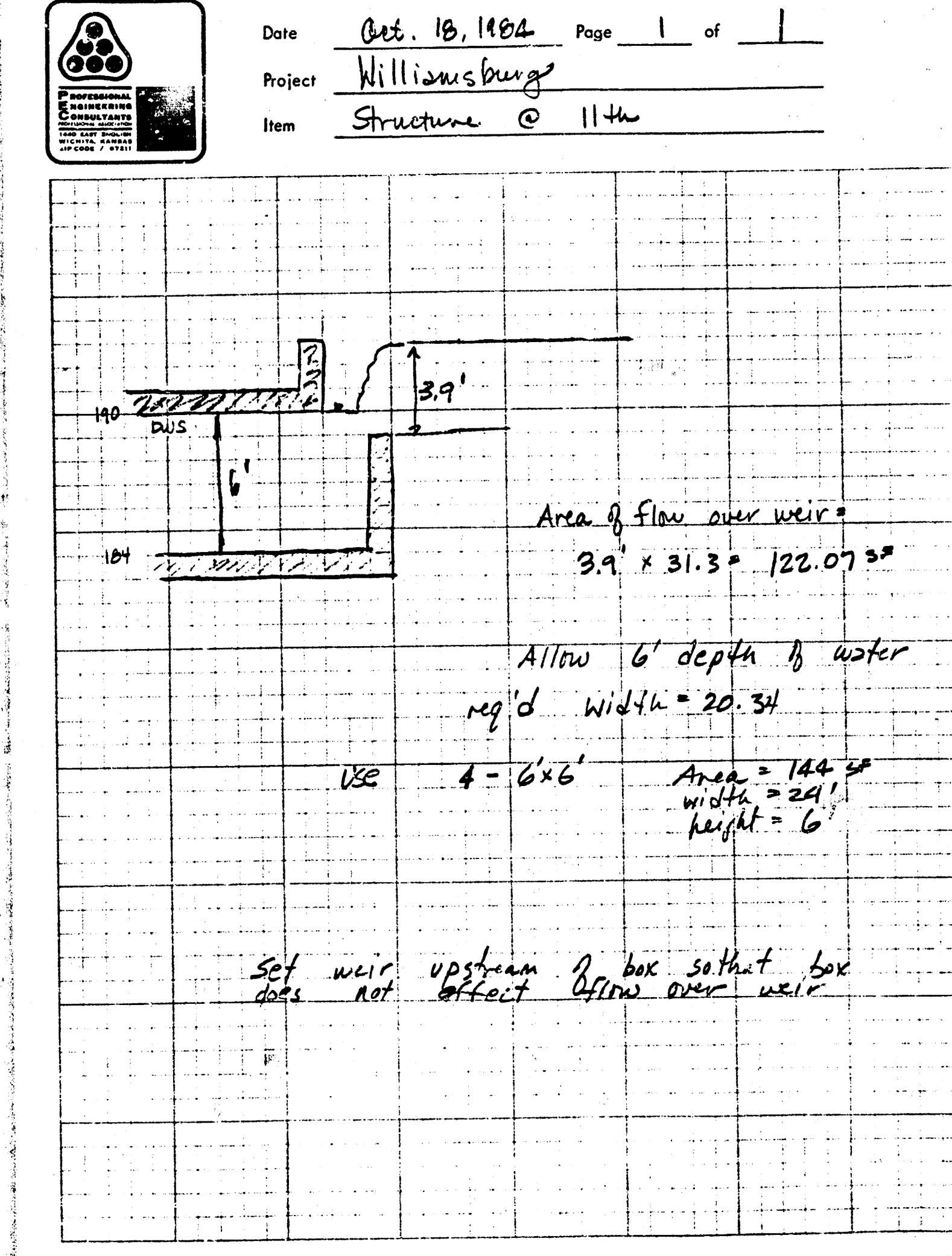
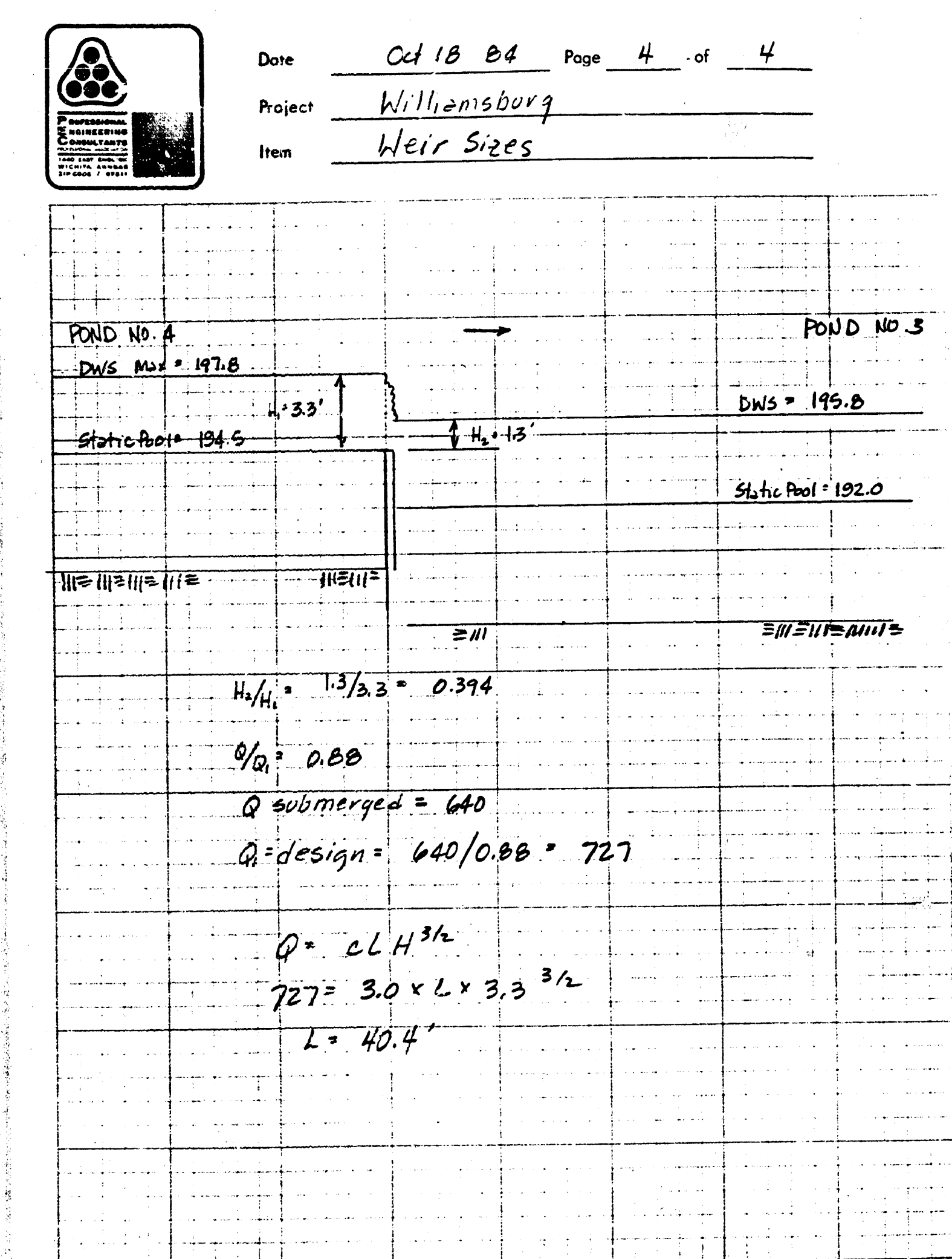
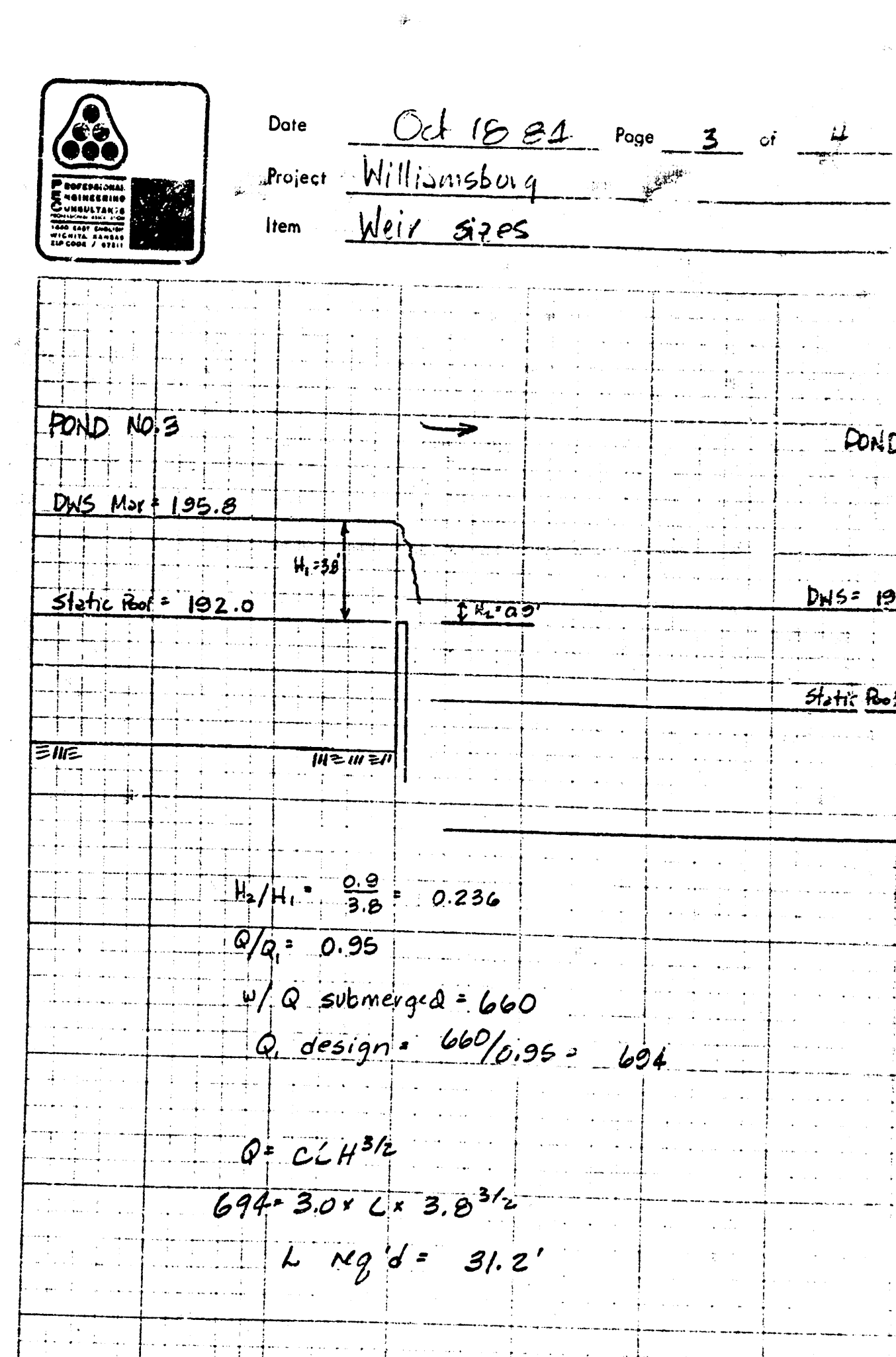
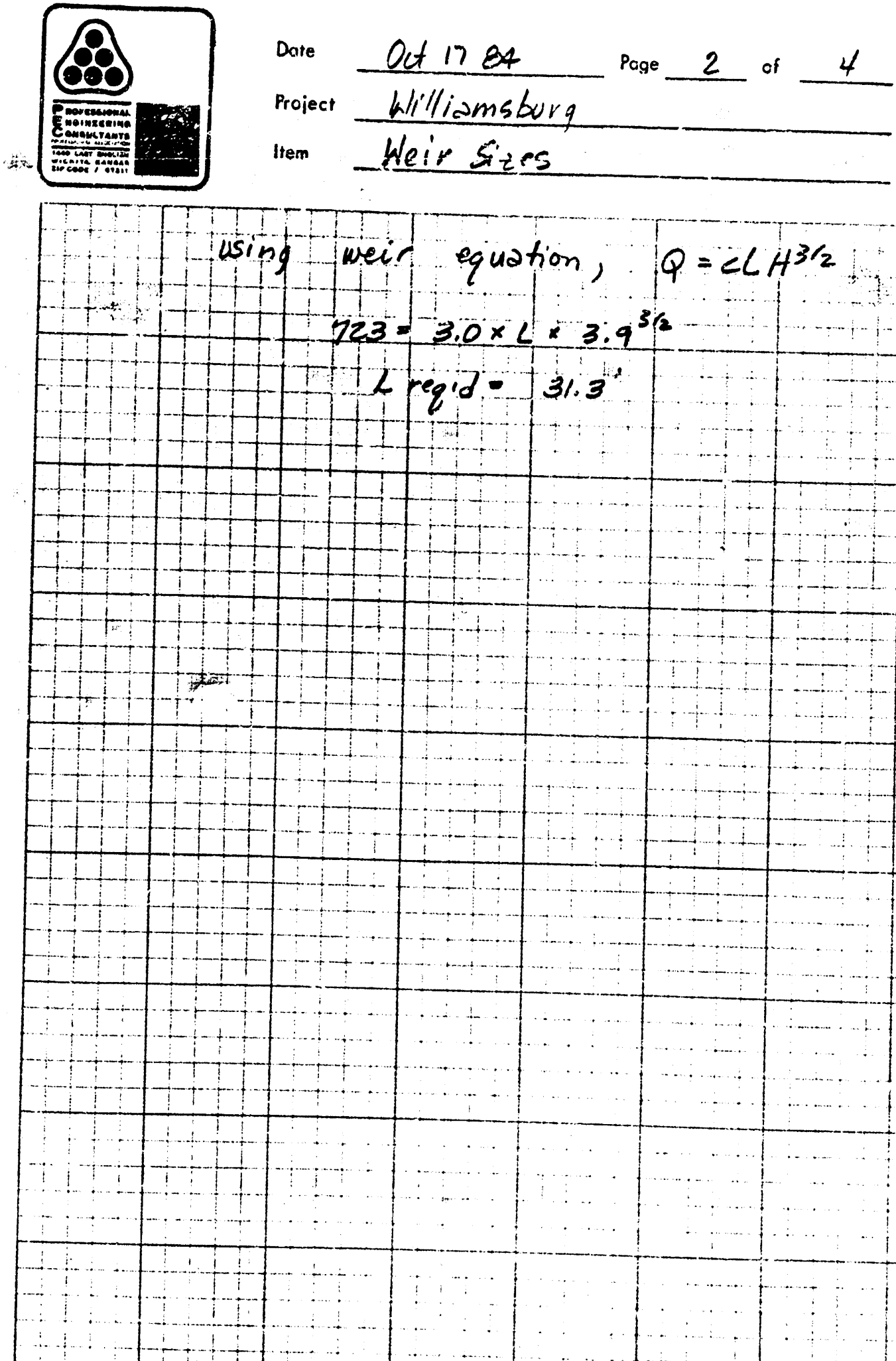
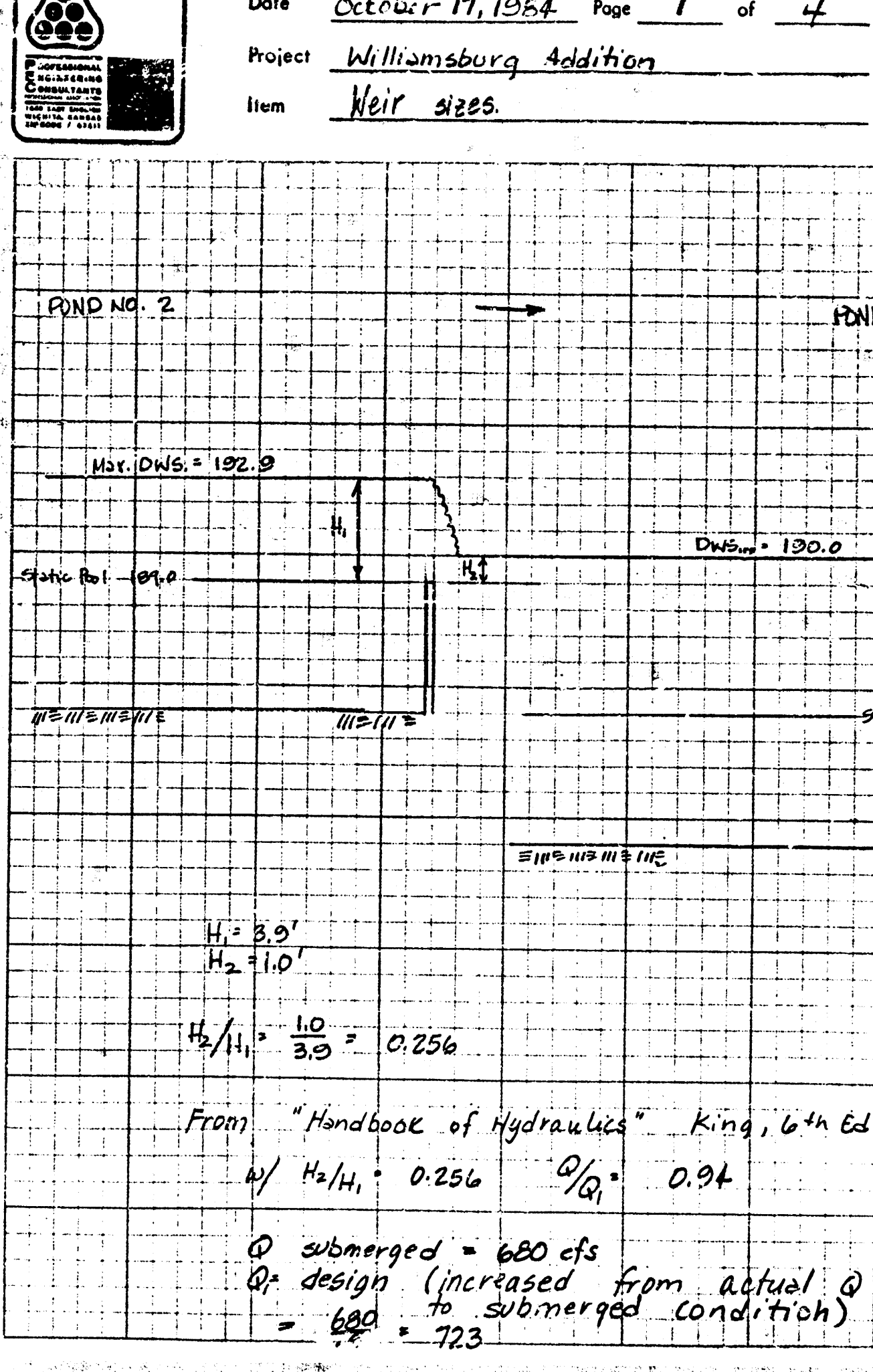
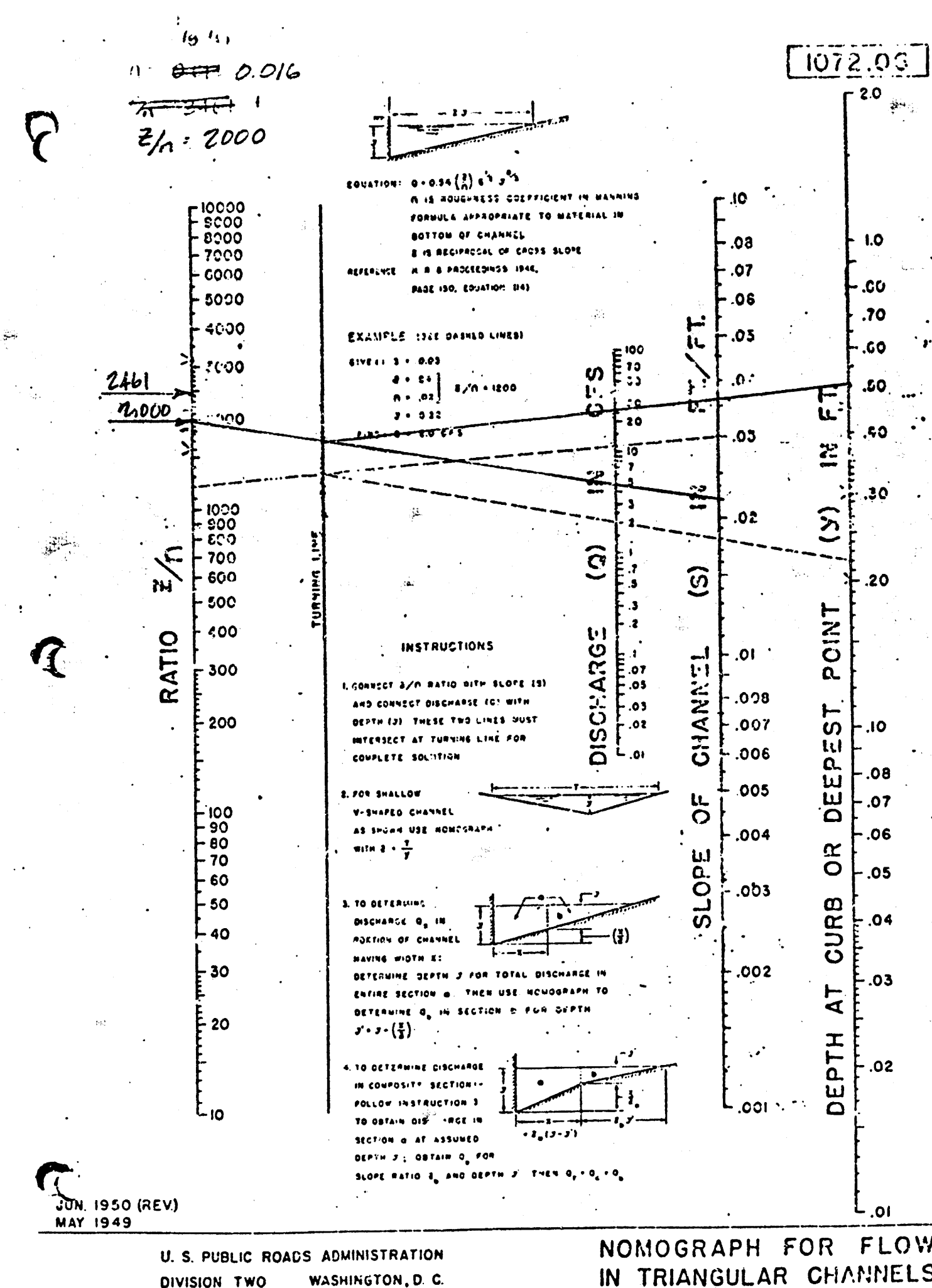
Previous calculations for this sub-basin indicate $Q_{sub} = 33$ cfs

During major storms, however, the water overtops crown on Lamsdale Street and flows southward on Pinecrest.

Q on Lamsdale street determined as follows:



- Crown & T.C. assumed same elev.
 - $n = 0.016$, cross-slope = $3/8$ "/ft.
 - $d = 0.5'$, Long. slope = 2.3%
- From attached graph $Q = 25$ cfs.



Given known inlet manograph, stage-storage, and stage-discharge relationships, determine the effect of detention pond no. 1 on the peak rate of flow and the time of travel to the outlet. No detention is assumed from pond no. 1 to pond no. 2.

The stage-storage relationship was developed using the plane area method. The stage-discharge relationship was developed using the velocity-area method. The stage-storage relationship was developed using the plane area method. The stage-discharge relationship was developed using the velocity-area method.

Select 2-6x4 RCB outlet, 45° Wings. Rounded top, $R_0 = 0.2$, $L = 15'$, $R = 15.40$

DEVELOPE UNIT CURVES:

REL. H	REL. Q	REL. V	REL. T	REL. S	REL. W
1.0	1.0	1.0	1.0	1.0	1.0
0.8	0.6	0.8	1.2	0.6	0.8
0.6	0.3	0.6	1.8	0.3	0.6
0.4	0.1	0.4	2.5	0.1	0.4
0.2	0.0	0.2	4.0	0.0	0.2

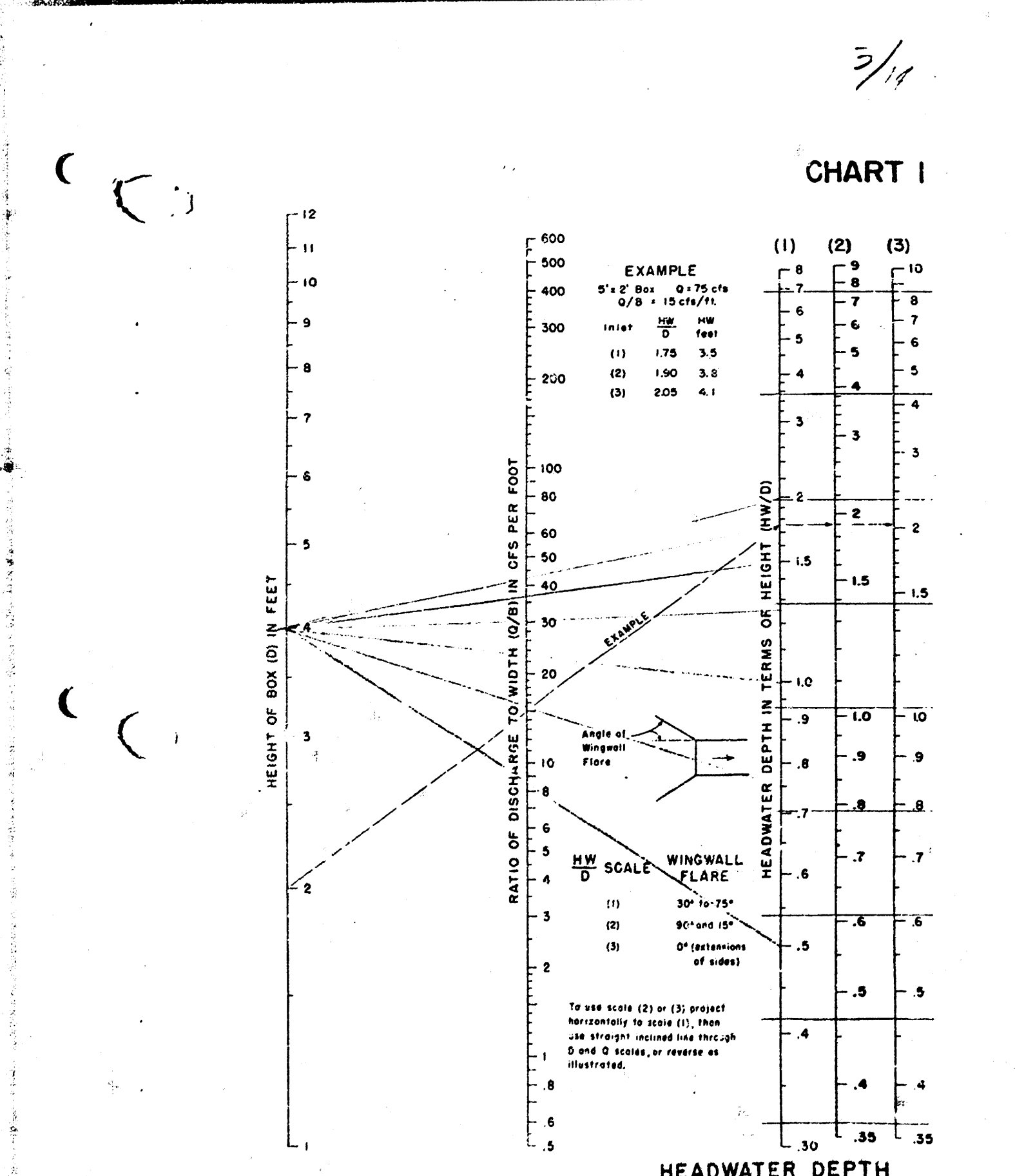
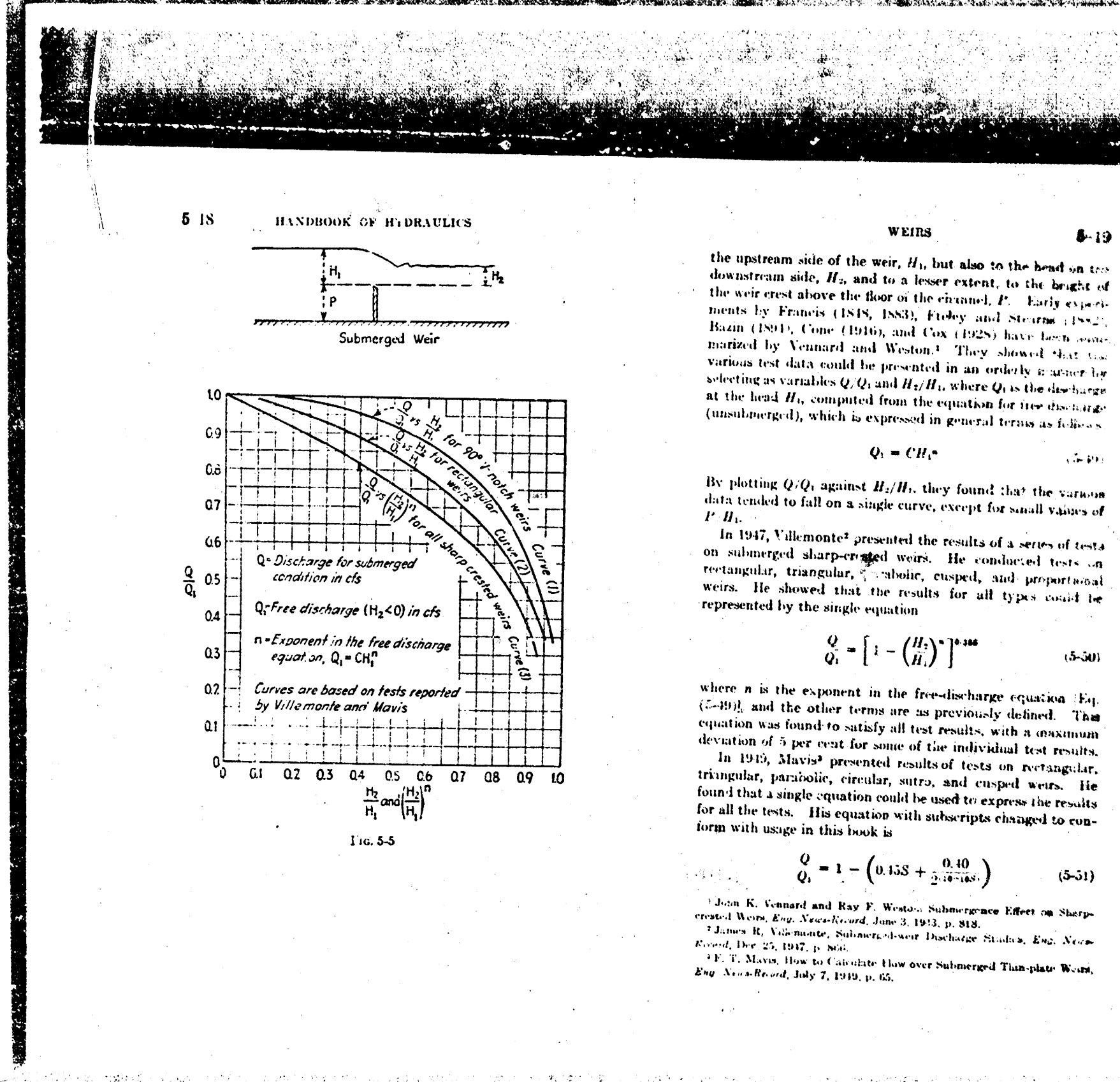
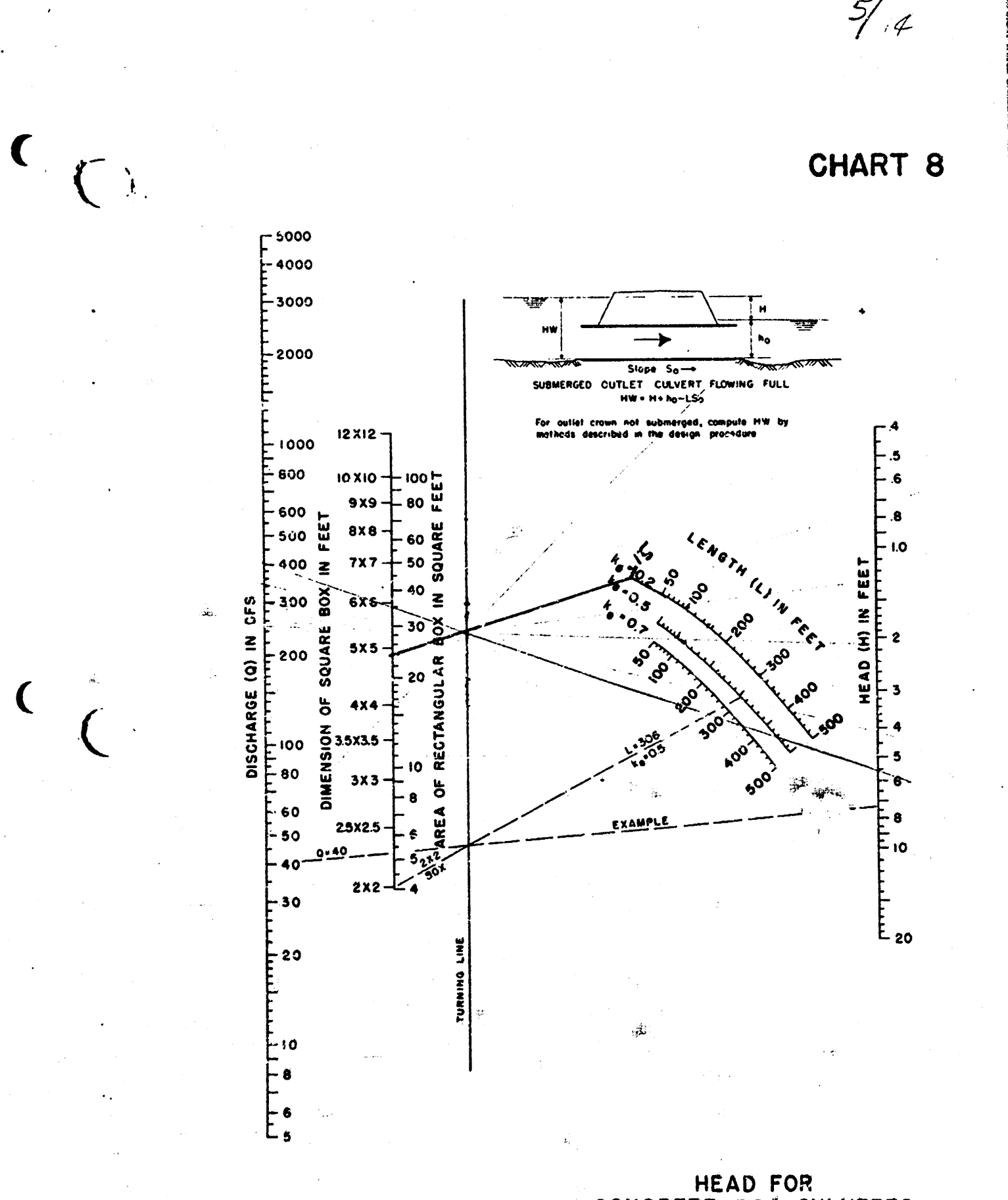


Chart 1: A graph showing the relationship between headwater depth and discharge for various weir shapes and dimensions.

REL. H	REL. Q	REL. V	REL. T	REL. S	REL. W
1.0	1.0	1.0	1.0	1.0	1.0
0.8	0.6	0.8	1.2	0.6	0.8
0.6	0.3	0.6	1.8	0.3	0.6
0.4	0.1	0.4	2.5	0.1	0.4
0.2	0.0	0.2	4.0	0.0	0.2



Approximate dam configuration determined from Pond No. 2

Use weir Equation $Q = CLH^{3/2}$

h (ft above spillway)	Q (cfs)	Q over dam	Q to 1
1'	60	0	60
1.7'	133	0	133
2.0'	133	49	182
2.5'	133	215	348
2.7'	133	300	433
2.8'	133	346	479
3.0'	133	445	578
3.2'	133	551	684

With Q_{sub} proposed = 450 cfs $h = 2.75$ Elev = 187'
 With Q_{sub} exist = 624 cfs $h = 3.1$ Elev = 187'

Therefore the Flood Elev. downstream pond will be lowered approx. 0.4'.

