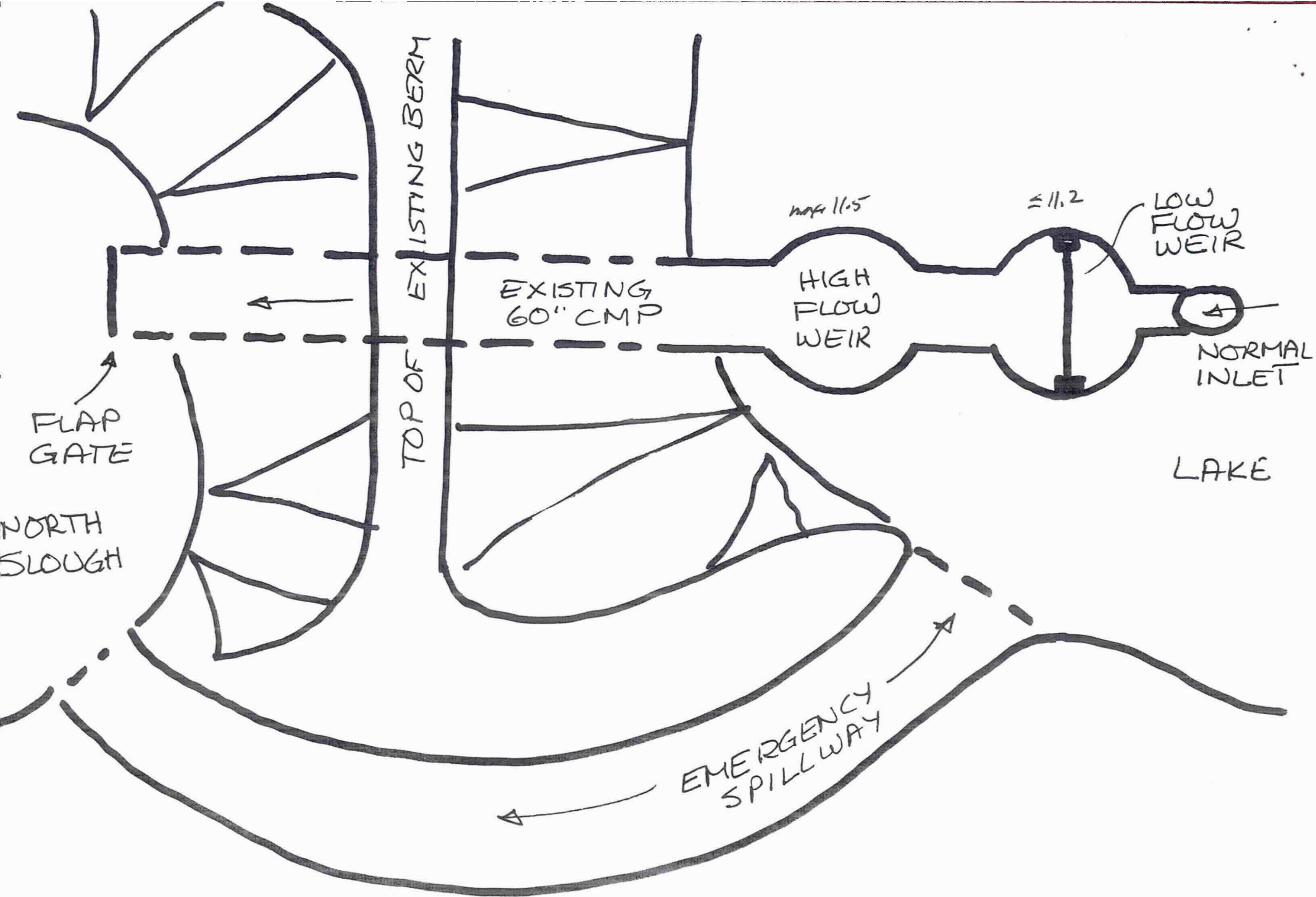




OAKLEY ENGINEERING
2/19/92

Smith and Bybee Lakes
September 6, 1990

LAKE ELEV, MSL	TOTAL LAKE SURFACE AREA ACRES	LAKE VOLUME ACRE-FEET
6.0	521	125
6.2	570	270
6.4	620	390
6.6	665	510
6.8	708	660
7.0	742	800
7.2	768	930
7.4	803	1080
7.6	832	1230
7.8	854	1380
8.0	868	1513
8.2	895	1720
8.4	932	1900
8.6	958	2080
8.8	967	2235
9.0	973	2480
9.2	978	2635
9.4	985	2820
9.6	997	3030
9.8	1007	3215
10.0	1017	3398
10.2	1028	3605
10.4	1049	3800
10.6	1060	4010

NOTE: DATA EXTRACTED FROM INFORMATION PRESENTED IN
"SMITH & BYBEE LAKES ENVIRONMENTAL STUDIES", BY
FISHMAN ENVIRONMENTAL SERVICES, 1987.

ELEVATION/AREA/VOLUME RELATIONSHIPS

FIGURE 2

WEIR ANALYSIS - 12' High Flow Weir

Smith and Bybee Lakes
WEIR ANALYSIS
September 6, 1990

FIGURE 4B

INPUTS		
WEIR ELEV	9.4	FEET
BOTTOM ELEV	6.0	FEET
WIDTH	12.0	FEET
# CONTRACTIONS	2	
WATER INPUT	800	AC-FT
START WS ELEV	10.4	FEET

NOTES

1. Coefficient by Rehbock
2. Rectangular weir assumed.
3. Bernoulli Eq for Flow.

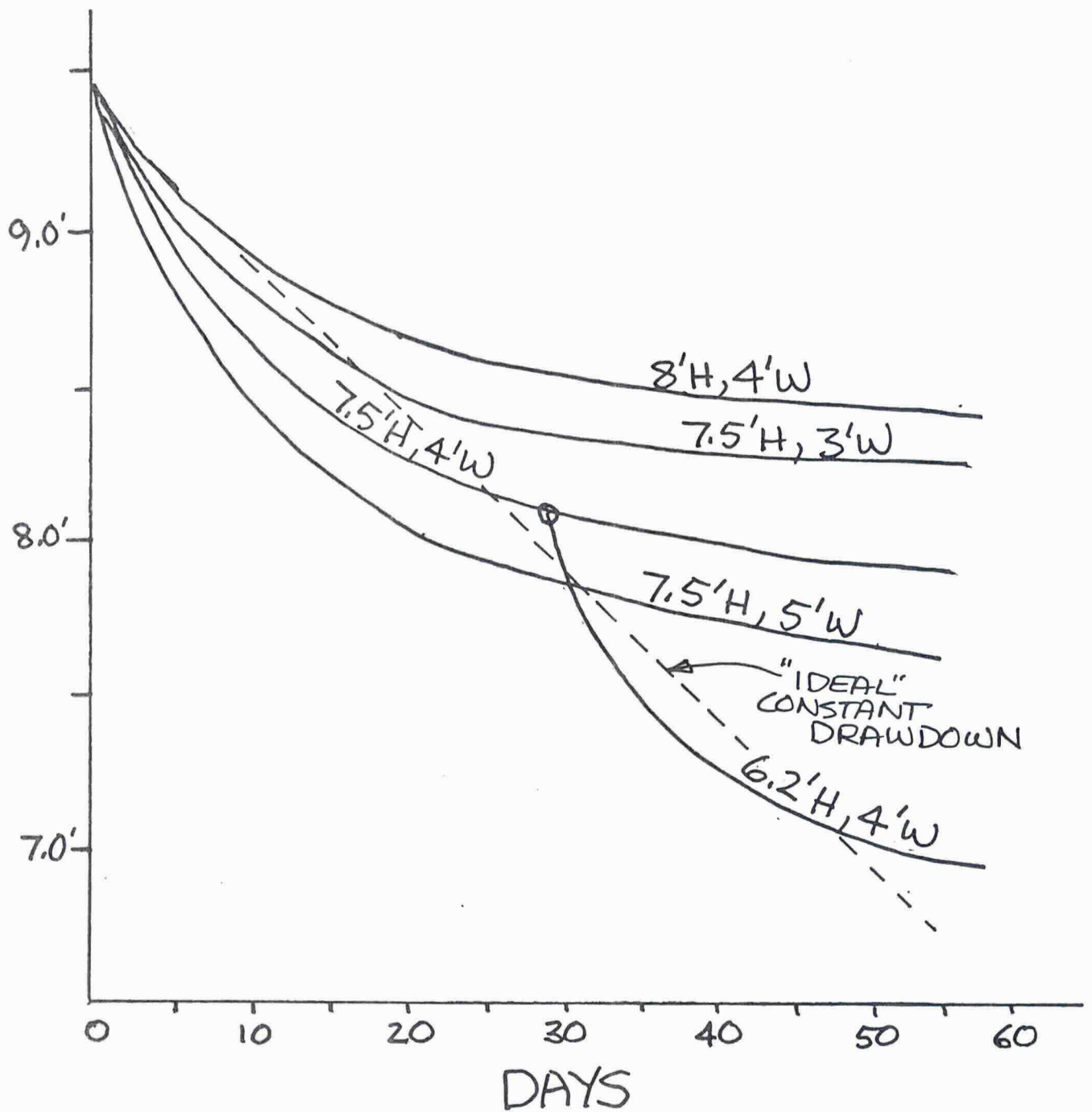
RESULTS

SUBMERGED

3.4 FEET DEEP

HOUR	DAY	WATER SURFACE	HEIGHT OVER WEIR	COEFF C(1)	EFF WIDTH	Q OUT CFS	Q OUT AF/DAY	VOLUME REMAININ AC-FT
0	0	10.4	1.0	0.631	11.8	39.85	79.0	3721.0
12	1	10.2	0.8	0.627	11.84	28.43	56.4	3664.6
24	1	10.2	0.8	0.627	11.84	28.43	56.4	3608.2
36	2	10.2	0.8	0.627	11.84	28.43	56.4	3551.8
48	2	10.0	0.6	0.624	11.88	18.43	36.6	3515.2
60	3	10.0	0.6	0.624	11.88	18.43	36.6	3478.7
72	3	10.0	0.6	0.624	11.88	18.43	36.6	3442.1
84	4	10.0	0.6	0.624	11.88	18.43	36.6	3405.6
96	4	10.0	0.6	0.624	11.88	18.43	36.6	3369.0
108	5	9.8	0.4	0.621	11.92	10.03	19.9	3349.1
120	5	9.8	0.4	0.621	11.92	10.03	19.9	3329.2
132	6	9.8	0.4	0.621	11.92	10.03	19.9	3309.4
144	6	9.8	0.4	0.621	11.92	10.03	19.9	3289.5
156	7	9.8	0.4	0.621	11.92	10.03	19.9	3269.6
168	7	9.8	0.4	0.621	11.92	10.03	19.9	3249.7
180	8	9.8	0.4	0.621	11.92	10.03	19.9	3229.8
192	8	9.8	0.4	0.621	11.92	10.03	19.9	3209.9
204	9	9.6	0.2	0.625	11.96	3.58	7.1	3202.8
216	9	9.6	0.2	0.625	11.96	3.58	7.1	3195.7
228	10	9.6	0.2	0.625	11.96	3.58	7.1	3188.6
240	10	9.6	0.2	0.625	11.96	3.58	7.1	3181.5
252	11	9.6	0.2	0.625	11.96	3.58	7.1	3174.4
264	11	9.6	0.2	0.625	11.96	3.58	7.1	3167.3
276	12	9.6	0.2	0.625	11.96	3.58	7.1	3160.2
288	12	9.6	0.2	0.625	11.96	3.58	7.1	3153.1
300	13	9.6	0.2	0.625	11.96	3.58	7.1	3146.0
312	13	9.6	0.2	0.625	11.96	3.58	7.1	3138.9
324	14	9.6	0.2	0.625	11.96	3.58	7.1	3131.8
336	14	9.6	0.2	0.625	11.96	3.58	7.1	3124.7

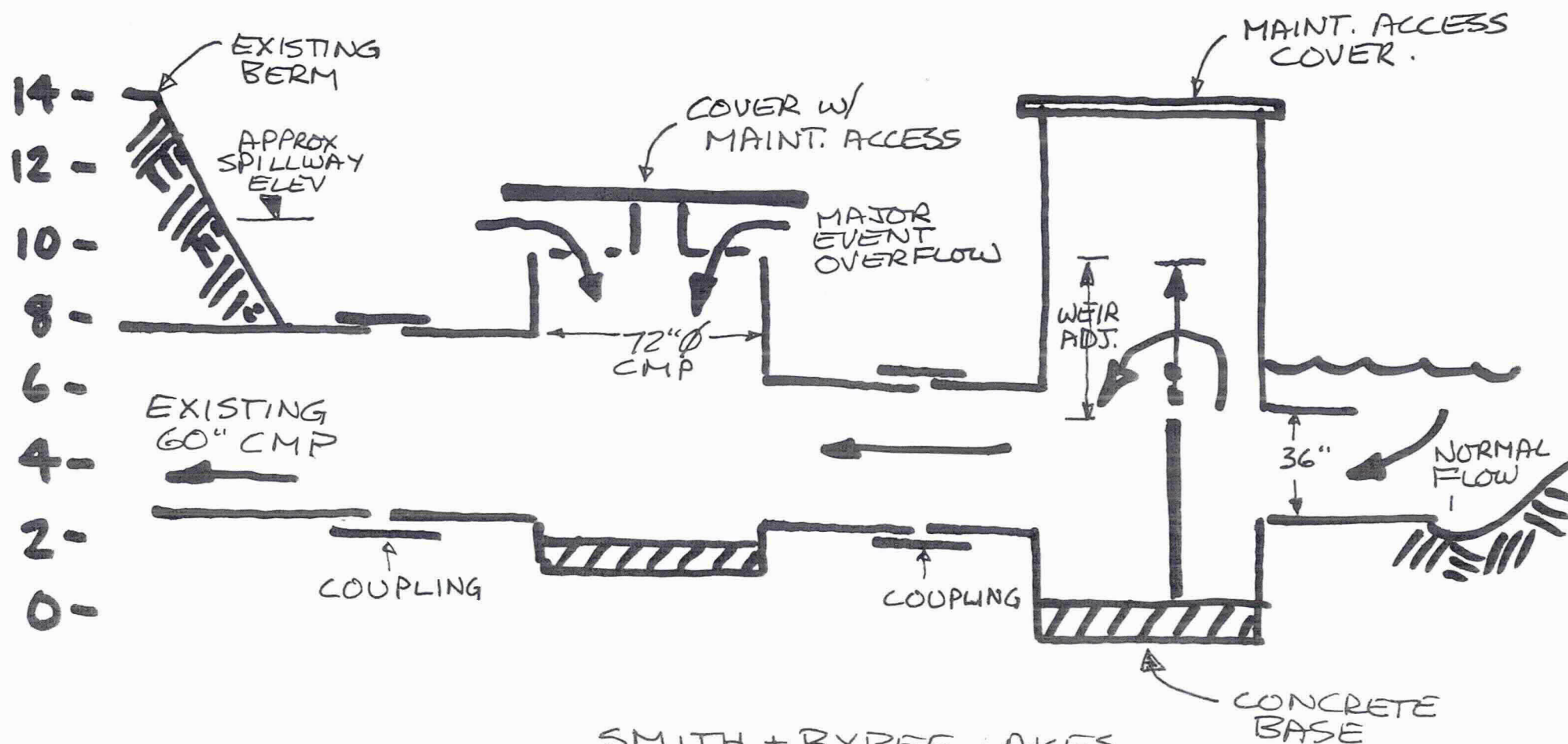
Smith and Bybee Lakes
September 6, 1990



SUMMER DRAWDOWN

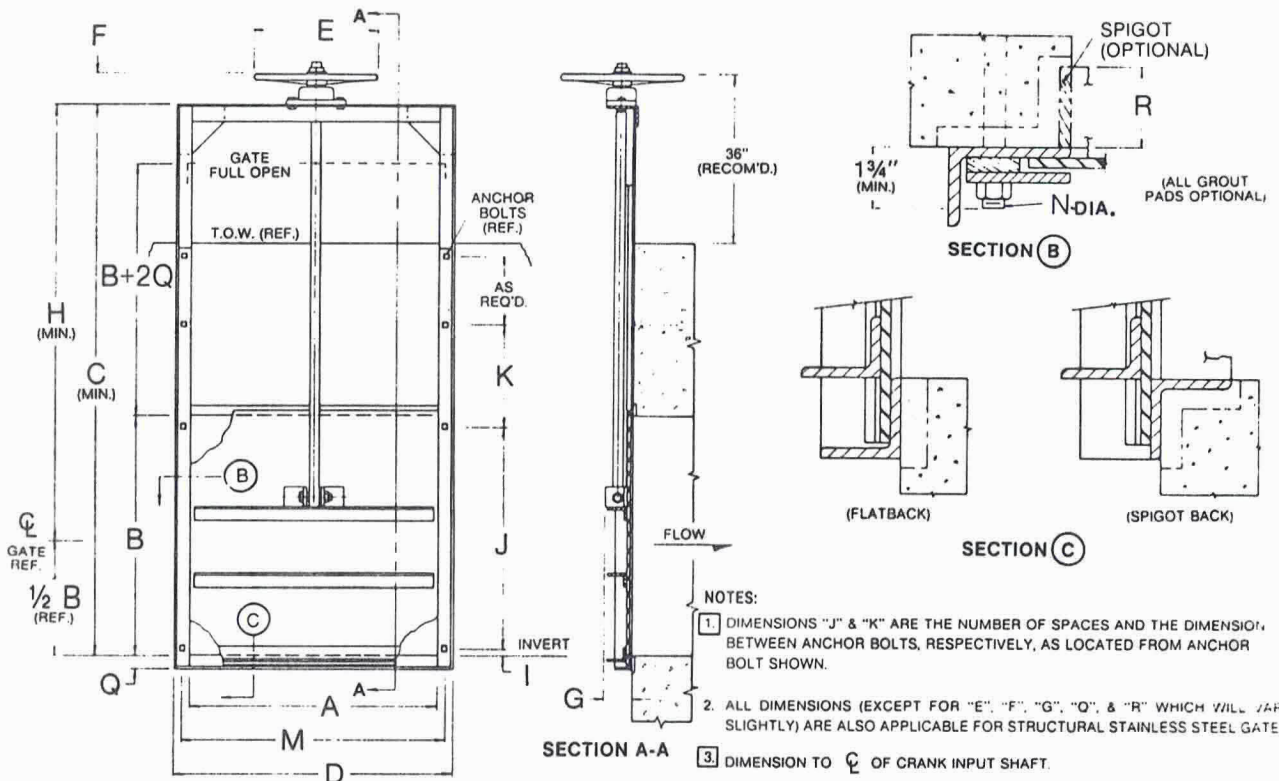
FIGURE 7

ELEV



SMITH + BYBEE LAKES
OUTFLOW CONTROL
STRUCTURE

OAKLEY ENGR.
2/19/92



GATE DIMENSIONS IN INCHES

A × B	C	D	E	F	G	H	I	J 1	K 1	M	N	Q	R
48 × 48	H + 24	55	24	4½	3½	78	1½	3 @ 15	2 @ 16	52½	⅝	3½	2¾
48 × 54	H + 27	55	30	4½	3½	90	1	4 @ 13	2 @ 18	52½	⅝	3½	2¾
48 × 60	H + 30	55	30	4½	3½	100	2	4 @ 14	2 @ 21	52½	⅝	3½	2¾
48 × 72	H + 36	55	30B	5½	3½	120	2	4 @ 17	2 @ 24	52½	⅝	3½	2¾
54 × 30	H + 15	60	24	4½	3½	54	1	2 @ 14	1 @ 20	58	⅝	3	2¾
54 × 36	H + 18	60	24	4½	3½	66	1	2 @ 17	2 @ 14	58	⅝	3	2¾
54 × 42	H + 21	61	24	4½	3½	72	1½	3 @ 13	2 @ 15	58½	⅝	3½	2¾
54 × 48	H + 24	61	30	4½	3½	84	1½	3 @ 15	2 @ 16	58½	⅝	3½	2¾
54 × 54	H + 27	61	30	4½	3½	96	1	4 @ 13	2 @ 18	58½	⅝	3½	2¾
54 × 60	H + 30	61	24B	5½	3½	100	2	4 @ 14	2 @ 21	58½	⅝	3½	2¾
54 × 72	H + 36	61	3E-2:1	3 6	3½	120	2	4 @ 17	2 @ 24	58½	⅝	3½	2¾
60 × 30	H + 15	67	24	4½	3½	54	1	4 @ 14	1 @ 20	64½	⅝	3½	2¾
60 × 36	H + 18	67	24	4½	3½	66	1	2 @ 17	2 @ 14	64½	⅝	3½	2¾
60 × 42	H + 21	67	30	4½	3½	72	1½	3 @ 13	2 @ 15	64½	⅝	3½	2¾
60 × 48	H + 24	67	15	4	3	54	1	2 @ 14	1 @ 20	45	½	2½	1¾
60 × 54	H + 27	67	24B	5½	3½	96	1	4 @ 13	2 @ 18	64½	⅝	3½	2¾
60 × 60	H + 30	67	24B	5½	3½	100	3	4 @ 14	2 @ 21	64½	⅝	3½	2¾
60 × 72	H + 36	67	3E-2:1	3 6	3½	120	2	4 @ 17	2 @ 24	64½	⅝	3	2¾
72 × 36	H + 18	79	30	4½	3½	66	1	2 @ 17	2 @ 14	76½	⅝	3½	3
72 × 42	H + 21	79	24B	5½	3½	72	1½	3 @ 13	2 @ 15	76½	⅝	3½	3
72 × 48	H + 24	79	24B	5½	3½	84	1½	3 @ 15	2 @ 16	76½	⅝	3½	3
72 × 54	H + 27	79	30B	5½	3½	96	1	4 @ 13	2 @ 18	76½	⅝	3½	3
72 × 60	H + 30	79	30B	5½	3½	100	2	4 @ 14	2 @ 21	76½	⅝	3½	3
72 × 72	H + 36	79	3E-2:1	3 6	3½	120	2	4 @ 17	2 @ 24	76½	⅝	3½	3

Waterman INDUSTRIES, INC.

EXETER, CA • LUBBOCK, TX • GARDEN CITY, KS • BOISE, ID
MEMPHIS, TN • GRAND ISLAND, NB • INDIANAPOLIS, IN
RED TOP WATER CONTROL GATES, VALVES and EQUIPMENT

MODEL R-5f-Y & R-5sb-Y FABRICATED STEEL SLIDE GATES		
SCALE NONE	CATALOG DWG. NO. 0001	REVISION NO. 1
	3 of 5	

NOTE: FOR PRELIMINARY DESIGN PURPOSES ONLY
DO NOT USE FOR INSTALLATION
UNLESS PART OF CERTIFIED & APPROVED SUBMITTAL

CAST IRON • AUTOMATIC

Drainage Gate

The Waterman Model F-25 Drainage Gate features a high strength, fully adjustable linkage, providing for sensitive adjustment of the flap cover after installation.

The design of this gate prevents jamming and assures proper seating through the use of built-in safety stops and a 2½° to 5° seating angle.

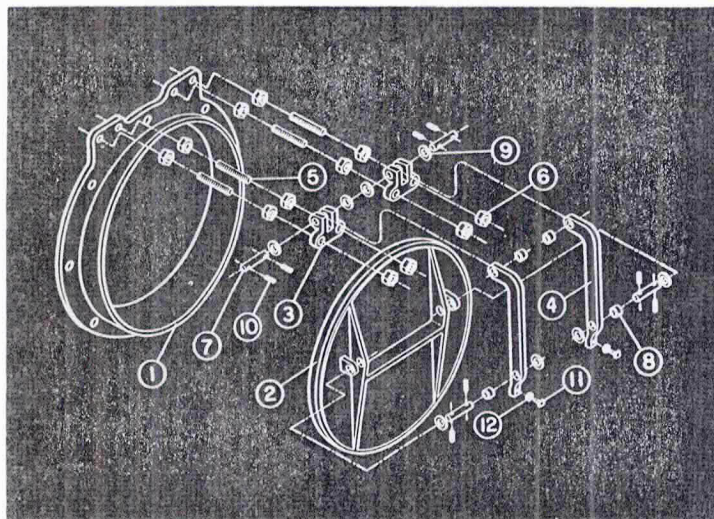
Flat back and Spigot back models are available.

A choice of seat facings is available and includes machined or ground iron, bronze or neoprene cover gasket which is available with either iron or bronze mating frame seats.

The use of the Waterman neoprene cover seal provides a long life tight seal, which can be easily renewed. The heavy seal also provides a moderate cushioning of shock loads where some slamming may occur.

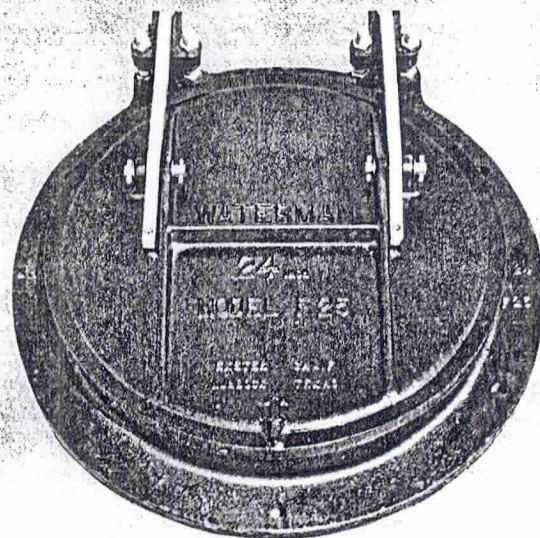
This model is not, however, recommended for pump discharges where violent slamming can occur.

No.	Name	Qty.	No.	Name	Qty.
1	FRAME	1	7	HINGE PIN	4
2	COVER	1	8	HINGE BUSHING	4
3	PIVOT LUG	2	9	WASHER	8
4	HINGE LINK	2	10	SPRING PIN	8
5	HINGE STUD	4	11	SET SCREW	2
6	HINGE NUT	12	12	JAM NUT	2



To order parts, give quantity, valve size and name of parts as shown above. [If bronze or neoprene seat, specify].

MODEL **F-25**



**FULLY ADJUSTABLE LINKAGE
25 FOOT SEATING HEAD**

Model F-25f - Flat Back
Model F-25sb - Spigot Back

- Cast Iron Frame and Cover
- Highly Strength Malleable Iron or Steel Links
- Stainless Steel Studs, Bolts and Pins, Standard, Brass or Monel, Optional
- Bronze Bushings, Standard. Permanently Lubricated Bronze or Teflon, Optional
- Minimum 2½° Seating Angle. 24" Diameter and over.
- Minimum 5° Seating Angle. 21" Diameter and smaller.

• Optional 25 lb. and 125 lb. ANSI Flange Drilling
CAST IRON SEAT - Standard. Used for moderate conditions where costs must be minimized.

BRASS SEAT - Optional. Used for corrosive conditions where long service is important.

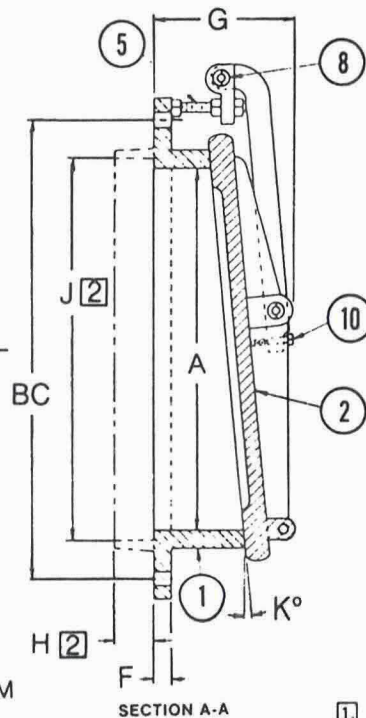
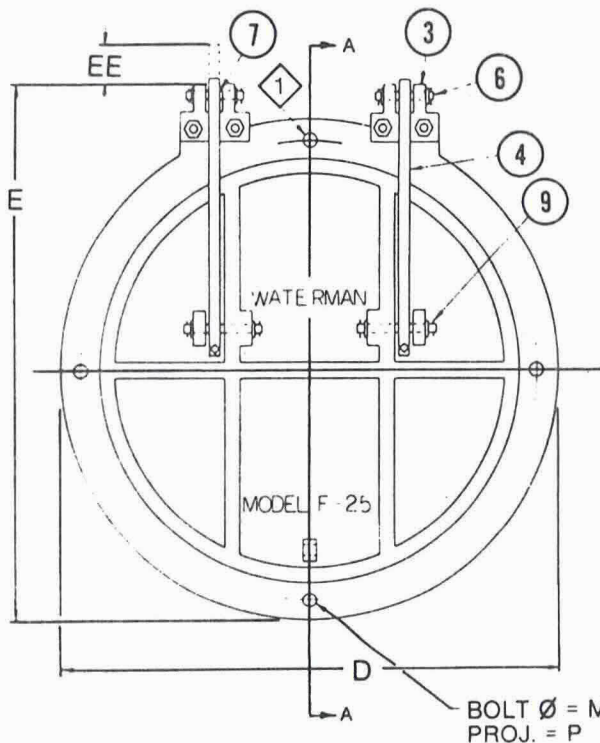
NEOPRENE SEAT (with iron or bronze) - Optional. Replaceable in flap cover. Cushions "slam" on closing.

See price list for weights and sizes available.

Waterman INDUSTRIES, INC.

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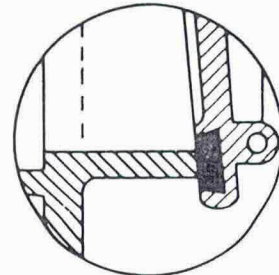
RED TOP WATER CONTROL GATES, VALVES and EQUIPMENT



PARTS LIST

- ① FRAME
- ② COVER
- ③ PIVOT LUG
- ④ HINGE LINK
- ⑤ HINGE STUDS & NUTS
- ⑥ HINGE PIN
- ⑦ HINGE BUSHING
- ⑧ WASHERS
- ⑨ SPRING PIN
- ⑩ SET SCREW ④
- ⑪ LUBE FITTING (OPTIONAL)

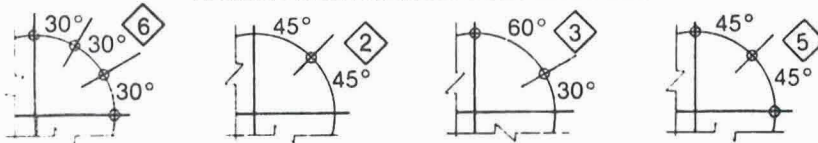
NEOPRENE SEATS
OPTIONAL



NOTES

- ① 12 BOLT PATTERN PER ⑥ AVAILABLE ON REQUEST.
- ② APPLIES TO SPIGOT BACK GATE ONLY, OPTIONAL SPIGOT, SHOWN IN PHANTOM.
3. 25 LB & 125 LB STD. DRILLING AVAILABLE, ON REQUEST, FOR ALL GATES EXCEPT 15" & 21".
- ④ EXCEPT 4" & 6" GATES

ADDITIONAL ANCHOR BOLT LAYOUTS



GATE DIMENSIONS IN INCHES

GATE SIZE A	4	6	8	10	12	14	15	16	18	20	21	24	30	36	42	48	54	60
BC	7½	9½	11¼	14¼	17	18¾	20	21¼	22¾	25	25	29½	36	42¾	49½	56	62¾	69¼
D	9	11	13½	16	19	22½	22½	23½	25	27½	27½	32	38¾	46	53	59¾	66½	73
E	9¾	12	14½	16	19	22	25	24	28½	28	30	35	40½	46½	54¾	66	72	75
EE	1½	2	2½	2½	3	3½	3½	3	3½	3½	2½	3	3½	3½	4½	4½	6	6½
F	½	¾	¾	¾	¾	1	1	¾	¾	¾	¾	¾	1½	1½	1½	1½	1½	1½
G	3 9/16	5	5	6	5½	6	6½	6½	7	7	7½	8	8	9	8½	10	10	10 1/16
H ②	2	2	2½	2¼	2½	2½	2½	2¼	2½	2½	2½	2½	2¾	2½	2¾	2½	3	3¼
J ②	5	7	9	11	13	15	16	17	19	21	22	25	31	37	43 9/16	49½	55½	61½
K	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	2½°	2½°	2½°	2½°	2½°	2½°	2½°
M	½	½	½	½	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	1	1½
P	1½	1½	1½	1½	1½	1½	1½	1½	1½	1¾	1¾	1¾	2¼	2¼	2¼	2¾	2¾	3
NO OF BOLTS	4	4	4	6	6	6	6	6	6	8	8	6	8	8	6 ①	6 ①	12	12
◇	2	1	1	3	3	3	3	3	3	5	5	3	5	5	3	3	6	6

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MEMPHIS, TN • GRAND ISLAND, NB • INDIANAPOLIS, IN
RED TOP WATER CONTROL GATES, VALVES and EQUIPMENT

MODEL

F-25-f & F-25-sb
DRAINAGE GATE

SCALE

NONE

CATALOG DWG. NO.

0002

REVISION NO.

4

NOTE: FOR PRELIMINARY DESIGN PURPOSES ONLY
DO NOT USE FOR INSTALLATION
UNLESS PART OF CERTIFIED & APPROVED SUBMITTAL