City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 15, 2000

Tom Isaacson, P.E.
Isaacson & Arfman, P.A.
128 Monroe Street, NE
Albuquerque, NM 87108

RE: ENGINEER'S CERTIFICATION FOR THE LOUISIANA PURCHASE, FINAL CERTIFICATION(D-18/D036), ENGINEER'S STAMP DATED 07/19/99, CERTIFICATION DATED 06/08/2000.

Dear Mr. Isaacson,

Based upon the information provided in your submittal dated June 9, 2000, the Engineering Certification for Certificate of Occupancy for the project referred to above is approved.

If you have any questions, please call me at 924-3988.

Sincerely,

Stuart Reeder, P.E.

Stuart Reeder, P.E.
Hydrology Division

xc: Whitney Reierson
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 31, 2000

Tom Isaacson, P.E.
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

RE: LOUISIANA PURCHASE (D18-D36). ENGINEER'S CERTIFICATION FOR CERTIFICATE OF OCCUPANCY APPROVAL. ENGINEER'S STAMP DATED MARCH 29, 2000. Partial for Buildings 1 thru 4 which face Louisiana Blvd.

Dear Mr. Isaacson:

Based on the information provided on your March 29, 2000 submittal, the above referenced project is approved for Certificate of Occupancy (Partial for Bldg #1 to #4)..

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

John P. Murray, P.E.
Hydrology

c: Whitney Reierson
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 25, 2000

Tom Isaacson, P.E.
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

RE: LOUISIANA PURCHASE (D18-D36). ENGINEER'S CERTIFICATION FOR CERTIFICATE OF OCCUPANCY APPROVAL. ENGINEER'S STAMP DATED APRIL 18, 2000. Second Partial for Interrior Buildings 5 through 17, and 19.

Dear Mr. Isaacson:

Based on the information provided on your April 18, 2000 submittal, the above referenced project is approved for Certificate of Occupancy (2nd Partial for Bldg Nos. 5 through 17 and 19). The Building 18 area is being utilized for temporary parking.

The SO #19 Signature Block has been changed to require only the Inspector's sign-off when construction has been completed. It should be on the Final C.O,

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

John P. Murray, P.E.
Hydrology

c: Whitney Reierson
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 29, 1999

Tom Isaacson, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Louisiana Purchase Grading and Drainage Plan
Engineer's Stamp dated 7-19-99, (D18/D36)

Dear Mr. Isaacson,

Based upon the information provided in your submittal dated 9-8-99, the above referenced site is approved for Building Permit and SO#19 Permit.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

A separate permit is required for construction within City R/W. A copy of this approval letter must be on hand when applying for the excavation permit.

Also, prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3986

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Hydrology Review Engineer

C: Pam Lujan
file

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 19, 1999

Tom Isaacson, P.E.
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

RE: LOUISIANA PURCHASE (previously Louisiana Condos) (D18-D36). GRADING AND DRAINAGE PLAN FOR BUILDING PERMIT APPROVAL. ENGINEER'S STAMP DATED DECEMBER 7, 1998.

Dear Mr. Isaacson:

Based on the information provided on your December 7, 1998 submittal, the above referenced project is approved for Building Permit. See also C.O.A. letter of 11/13/98 subject as above.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Prior to Certificate of Occupancy approval, an Engineer's Certification per the DPM will be required.

If I can be of further assistance, please feel free to contact me at 924-3984.

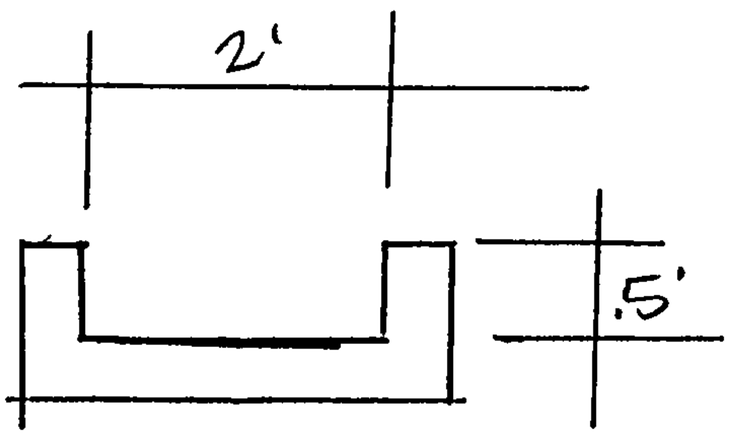
Sincerely,

John P. Murray, P.E.
Hydrology

c: Andrew Garcia
√File

Addad: Arlene Portillo
D. Salas, St. Maint.

COMPUTE CAPACITY OF TYPE '2' RUNDOWN



By Manning formula for

$n = .013$

$A = 2 \times .5 = 1.0$ ft

$S = .2/43 = .00465$

$R = A/WP = 1/3 = .33$

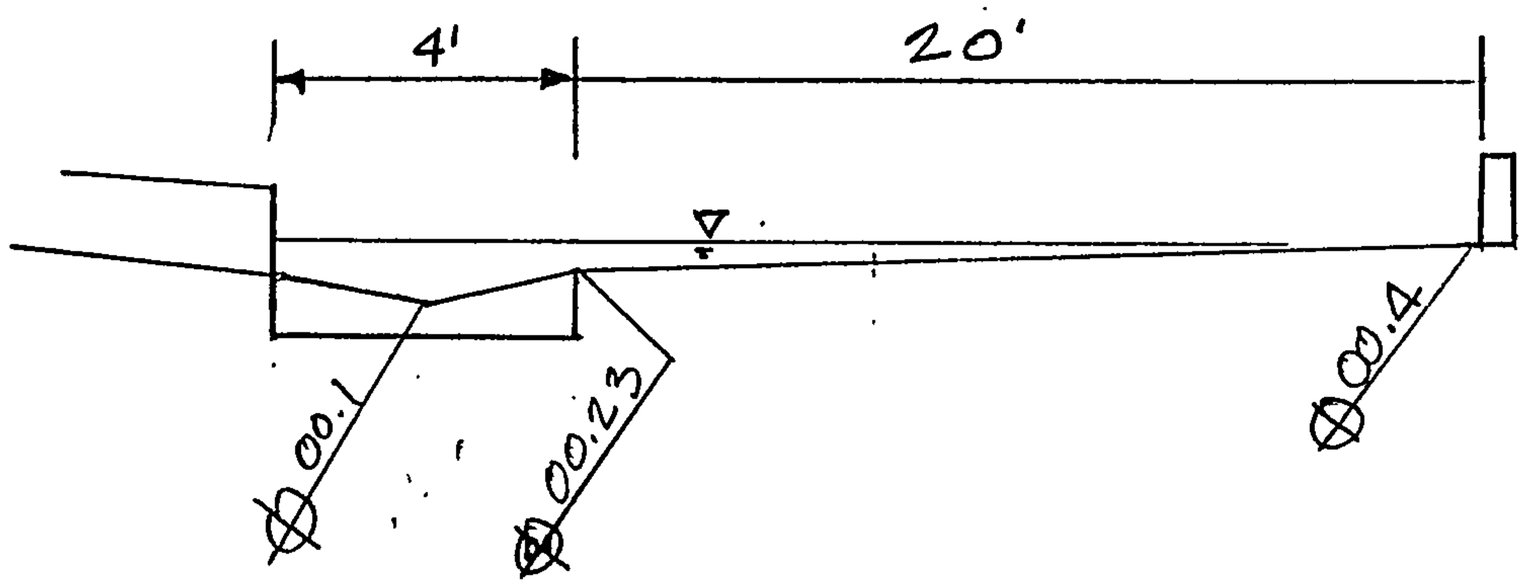
$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$$= \frac{1.486}{.013} (1.0)(.33)^{2/3} (.00465)^{1/2}$$

$= 3.7$ cfs, OK

CALCULATE FLOW DEPTH IN VALLEY GUTTER OPPOSITE UNIT 14

Q_{100} = 46 cfs (See Sh 3.)



S = 3.55%

n = .017

By Solution of Manning Formula:

Trial Depth above VG Invert	Q (cfs)
0.24'	4.41
0.25'	5.20

Therefore flow depth at Valley Gutter will be approximately 0.24', OK

RUNOFF CALCULATIONS FOR Q_{100}

Precip. Zone	Peak Discharge (cfs/ac)			
	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

Project: Louisiana Purchase
Valley Gutter Flow Depth
By: TDI Date: 9/3/99

Drainage Basin	Land Treatment Areas (ac)					Q_{100} (cf)	Remarks
	A_T	A_A	A_B	A_C	A_D		
VG-1	0.95			0.10	0.85	4.6	V. Gutter @ Unit 1A

Sheet 3/23

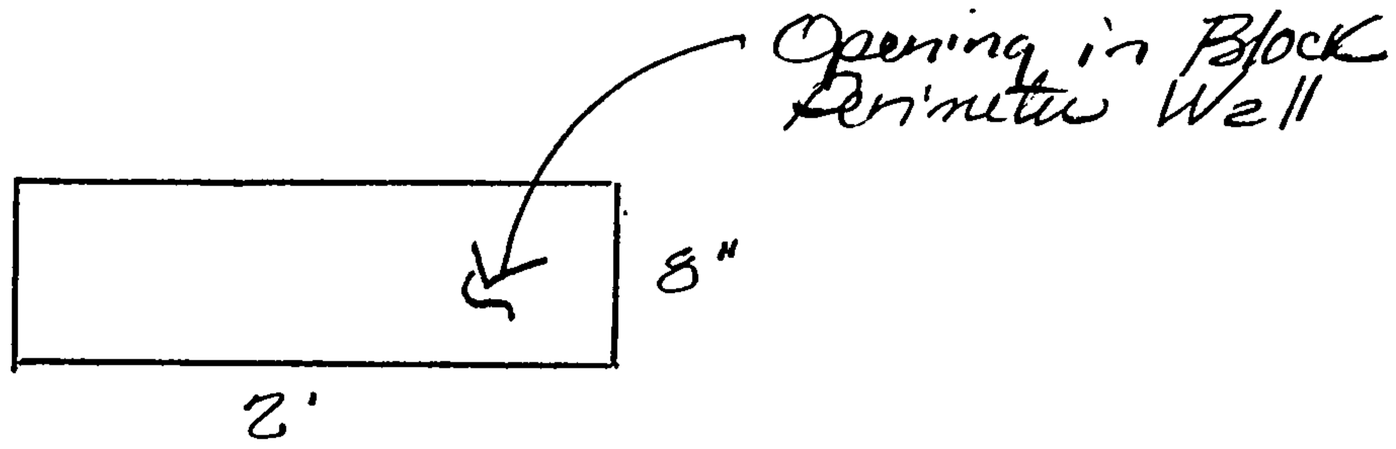
6900 x .015 x 20^2 ÷ 43,560 =

Analyze Drainage Culvert Capacity

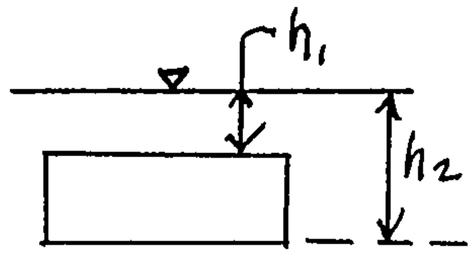
$Q_{100} = 14.1$ cfs

Q_{100} per Culvert $= 14.1 / 2 = 7.05$ cfs

Culvert Entrance Conditions



Use Orifice Conditions for Analysis. For rectangular Opening with a low head use formula (13), p 46, Handbook of Hydraulics.



$$Q = 2/3\, L \sqrt{2g}\, (h_2^{3/2} - h_1^{3/2})$$

Above formula is for theoretical discharge, Use $C = 0.62$ to correct for friction.

Try $h_2 = 1.5'$

$$Q = 2/3(2)\sqrt{64.4}\,(1.5^{3/2} - .83^{3/2})\,(.62)$$

$$= 7.17 \text{ cfs}, \text{ OK}$$

BASIN AREAS

BASIN 101 (MORTUARY):

250' x 400' = 100,000 s.f. = 2.296 Ac = 0.003587 mi^2

BASIN 102 (MICHAEL'S MANOR NORTH SUBD.):

(1620' x 300') - (250' x 400') = 386,000 s.f.
= 8.861 Ac = 0.013846 mi^2

BASIN 103 (NORTH HILLS M.H. PARK):

(1000' x 1620') - $\frac{1}{2}$ (300' x 300') - (500' x 250')
= 1,450,000 s.f. = 33.287 Ac = 0.052012 mi^2

BASIN 104 (COMMERCIAL SITE ON LOUISIANA):

(200' x 250') = 50,000 s.f. = 1.148 Ac = 0.001794 mi^2

PARK INSIDE BASIN 103:

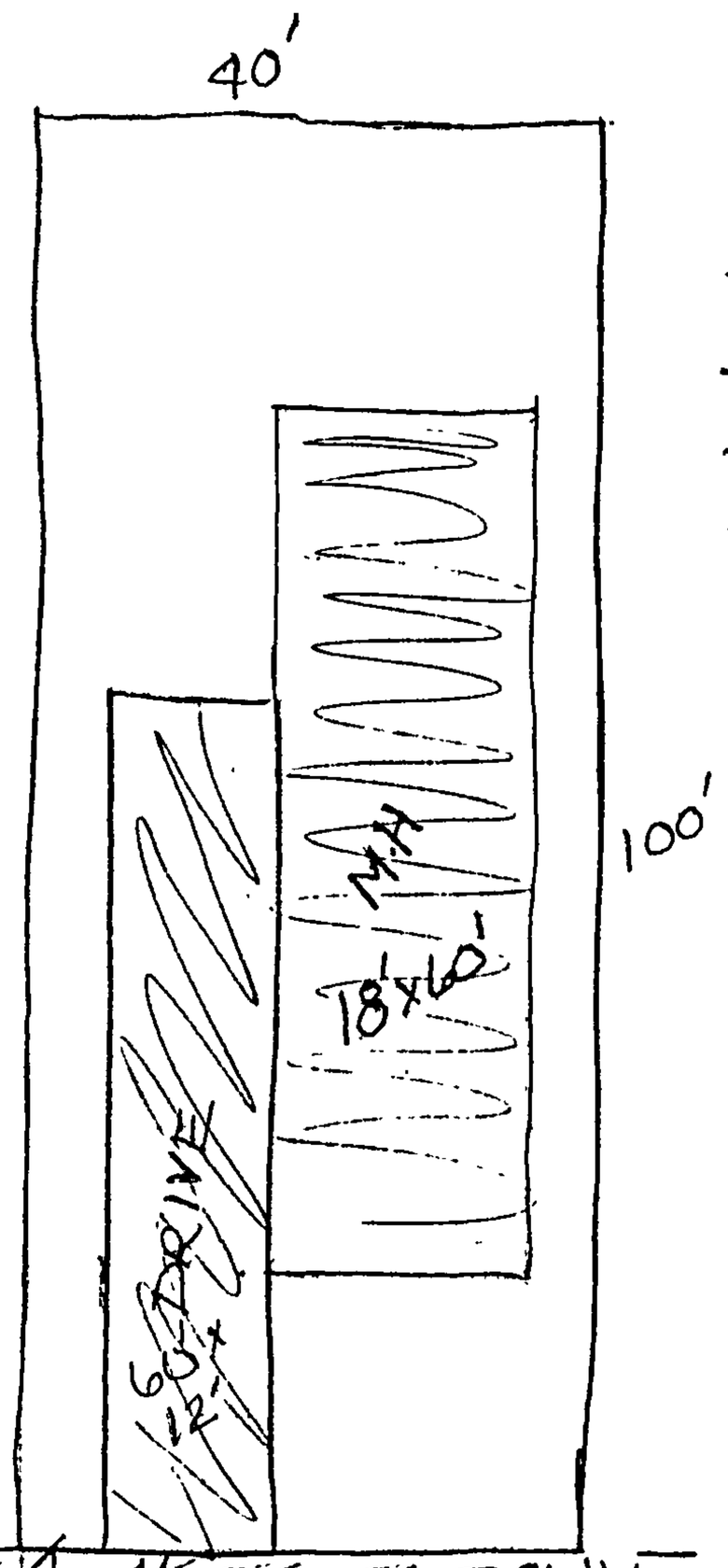
(300' x 300') + $\frac{1}{2}$ (300' x 190') = 118,500 s.f.
= 2.720 Ac = 0.004251 mi^2

BASIN 103 - PARK = 1,450,000 s.f. - 118,500 s.f.
= 1,331,500 s.f. = 30.567 Ac = 0.047761 mi^2

LOUISIANA SOUTH OF PASEO DEL NORTE
STORM FLOWS:

LAND TREATMENT FOR NORTH HILLS MOBILE HOME PARK (BASIN 103)

ASSUME LOT SIZE 40'X100'
ASSUME STREET 32' WIDE
ASSUME FOUNDATION 18'X60'



40'x125' = 5000 ft²
-18' x 60' = -1080 ft²
-12' x 64.5' = -774 ft²
-40' x 4' = -160 ft²
-40' x 16.5' = -660 ft²

2674 ft² IMPERV
OF 5000 ft² ⇒ 53.5%

LAND TREATMENTS

BASIN 103.

BASIN 103 - PARK = 30.567 Ac @ 53.5% IMPERV

= 16.35 Ac. IMPERVIOUS

∴ 100% - 53.5% = 46.5% PERMEABLE TOTAL

(SPLIT PERMEABLE BETWEEN TYPES B AND C.)

30.567 Ac x $\frac{1}{2}$ (46.5%) = 7.107 Ac @ TYPE B+C

PARK = 2.720 Ac (Assume 20% Imperv for clubhouse and parking)

= 0.544 Ac IMPERV

= 2.176 Ac Type B

TOTAL BASIN 103 = 33.287 Ac

TYPE A = ⌀ Ac		0%
TYPE B = 7.107 + 2.176 = 9.28	Ac	27.9%
TYPE C = 7.11	Ac	21.4%
TYPE D = 16.35 + 0.544 = 16.89	Ac	50.7%

BASINS 101 AND 104

COMMERCIAL SITES 90% IMPER, 5% TYPE B, 5% TYPE C

BASIN 102

AREA = 8.861 Ac 38 UNITS

$N = DU/Ac = \frac{38}{8.861} = 4.29 \leq 6$

∴ % IMPERV = $7\sqrt{N^2+5N}$ = 44.2 % IMPERV

100% - 44.2% = 55.8 % PERMEABLE TOTAL

(SPLIT PERMEABLE BETWEEN TYPES B AND C)

55.8 % ÷ 2 = 27.9% TYPE B

27.9 % TYPE C

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/03/1999
INPUT FILE = c:\ahymo\10061\lapurch.dat USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
START										
RAINFALL TYPE= 1										TIME= .00
										RAIN6= 2.500
COMPUTE NM HYD	101.00	-	1	.00359	10.94	.410	2.14137	1.500	4.766	PER IMP= 90.00
COMPUTE NM HYD	102.00	-	2	.01385	33.86	1.169	1.58330	1.500	3.821	PER IMP= 44.20
ADD HYD	102.10	1& 2	21	.01743	44.80	1.579	1.69810	1.500	4.016	
ROUTE	102.20	21	22	.01743	40.50	1.579	1.69813	1.533	3.630	
COMPUTE NM HYD	103.00	-	3	.05201	130.64	4.579	1.65087	1.500	3.925	PER IMP= 50.70
ADD HYD	103.10	3&22	31	.06945	166.45	6.158	1.66273	1.533	3.745	
ROUTE	103.20	31	32	.06945	147.83	6.158	1.66273	1.567	3.326	
COMPUTE NM HYD	104.00	-	4	.00179	5.48	.205	2.14137	1.500	4.775	PER IMP= 90.00
ROUTE	104.10	4	41	.00179	4.26	.205	2.14149	1.567	3.714	
ADD HYD	104.20	41&32	42	.07124	152.09	6.363	1.67477	1.567	3.336	
FINISH										

Shunt 18/23

STORM INLET CAPACITY

(PER C.O.A. STD. DWG. #2201, 2202, +2220)

TYPE 'A' INLET - SINGLE GRATE

GRATE OPEN AREA

GROSS: 25 in (40 in) = 2.08' (3.33') = 6.92 ft²

LESS BEARING BARS: $\left(\frac{0.5}{12}\right)(3.33')(13)$ = -1.80 ft²

LESS CROSS BARS: $\left(\frac{0.5}{12}\right)(7)\left[\frac{25}{12}-\left(13\left[\frac{0.5}{12}\right]\right)\right]$ = -0.45 ft²

NET AREA → 4.67 ft²

CALCULATE CAPACITY USING ORIFICE EQUATION

$$Q = CA\sqrt{2gH}$$

WHERE: $C = 0.67$

$A = 4.67\ ft^2\ (\frac{1}{2}) = 2.34\ ft^2$

(Assuming 50% clogging factor)

$$Q = 0.67\ (2.34)\sqrt{64.4\ H}$$

$$\boxed{Q = 12.5815\sqrt{H}\ \ cfs}$$

H = water depth above flowline in feet

SUMP INLET CAPACITIES

TYPE 'C' DOUBLE INLET

$$Q_C = 2Q_{SINGLE} = 2\left[12.5815\sqrt{.254}\right] = \boxed{12.68 \text{ cfs}}$$

(Assume depth at approx 3")

TYPE 'A' SINGLE INLET

$$Q_A = 12.5815\sqrt{.254} = \boxed{6.34 \text{ cfs}}$$

* SYSTEM HAS 10 TYPE 'C' DOUBLE INLETS AND 4 TYPE 'A' SINGLE INLETS

$10 \times 12.68 \text{ cfs} = 126.8 \text{ cfs}$

$4 \times 6.34 \text{ cfs} = 25.4 \text{ cfs}$

TOTAL = $\boxed{152.2 \text{ cfs}}$

$152.2 \text{ cfs} > 152.09 \text{ cfs}$ (From AHYMO run)

∴ OK

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	152.2	48 c	91.9	98.92	99.66	0.805	102.92*	103.95*	0.23	End
2	2	152.2	48 c	75.0	99.66	100.26	0.800	104.18*	105.02*	0.23	1
3	3	19.02	24 c	26.9	105.00	106.98	7.361	107.00	108.52	0.08	2
4	4	12.68	18 c	10.4	107.47	107.68	2.019	108.97	109.02	0.00	3
5	5	19.02	24 c	36.4	100.26	100.63	1.018	105.25*	105.51*	0.06	2
6	6	12.68	18 c	10.4	100.63	100.84	2.019	105.57*	105.72*	0.08	5
7	7	114.1	48 c	30.0	100.26	100.50	0.800	105.25*	105.44*	0.13	2
8	8	25.36	24 c	26.9	105.00	106.94	7.212	107.00	108.71	0.12	7
9	9	12.68	18 c	8.6	106.94	107.11	1.977	108.83*	108.95*	0.08	8
10	10	25.36	24 c	36.4	100.50	100.87	1.018	105.57*	106.03*	0.10	7
11	11	12.68	18 c	8.6	100.87	101.04	1.977	106.13*	106.25*	0.08	10
12	12	63.40	48 c	30.0	100.50	100.74	0.800	105.57*	105.63*	0.04	7
13	13	31.70	24 c	26.9	104.83	105.27	1.637	106.83*	107.36*	0.16	12
14	14	19.02	24 c	8.6	107.28	107.45	1.977	109.28	109.29	0.06	13
15	15	6.34	18 c	10.4	108.01	108.22	2.019	109.51	109.51	0.02	14
16	16	31.70	24 c	36.4	100.74	101.34	1.648	105.67*	106.38*	0.16	12
17	17	19.02	24 c	8.6	101.34	101.51	1.977	106.54*	106.60*	0.06	16
18	18	6.34	18 c	10.4	101.51	101.72	2.019	106.66*	106.70*	0.02	17

Project File: LAPurch.stm	I-D-F File: SAMPLE.IDF	Total No. Lines: 18	Run Date: 09-07-1999

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Sh 21/23

Hydraflow Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	48	152.2	98.92	102.92	4.00	12.56	12.11	2.28	105.20	1.123	91.9	99.66	103.95	4.00	12.57	12.11	2.28	106.23	1.122	1.122	1.031	0.10	0.23
2	48	152.2	99.66	104.18	4.00	12.56	12.11	2.28	106.46	1.123	75.0	100.26	105.02	4.00	12.57	12.11	2.28	107.30	1.122	1.122	0.842	0.10	0.23
3	24	19.02	105.00	107.00	2.00*	3.14	6.06	0.57	107.57	0.707	26.9	106.98	108.52	1.54**	2.60	7.31	0.83	109.35	0.796	0.752	N/A	0.10	0.08
4	18	12.68	107.47	108.97	1.50*	1.77	7.18	0.80	109.77	1.459	10.4	107.68	109.02	1.34	1.67	7.59	0.90	109.92	1.288	1.373	0.143	0.00	0.00
5	24	19.02	100.26	105.25	2.00	3.14	6.06	0.57	105.82	0.707	36.4	100.63	105.51	2.00	3.14	6.05	0.57	106.08	0.707	0.707	0.257	0.10	0.06
6	18	12.68	100.63	105.57	1.50	1.77	7.18	0.80	106.37	1.459	10.4	100.84	105.72	1.50	1.77	7.18	0.80	106.52	1.458	1.458	0.152	0.10	0.08
7	48	114.1	100.26	105.25	4.00	12.56	9.08	1.28	106.53	0.631	30.0	100.50	105.44	4.00	12.57	9.08	1.28	106.72	0.631	0.631	0.189	0.10	0.13
8	24	25.36	105.00	107.00	2.00*	3.14	8.07	1.01	108.01	1.258	26.9	106.94	108.71	1.77**	2.95	8.61	1.15	109.87	1.122	1.190	N/A	0.10	0.12
9	18	12.68	106.94	108.83	1.50	1.77	7.18	0.80	109.63	1.459	8.6	107.11	108.95	1.50	1.77	7.18	0.80	109.75	1.458	1.458	0.125	0.10	0.08
10	24	25.36	100.50	105.57	2.00	3.14	8.07	1.01	106.58	1.258	36.4	100.87	106.03	2.00	3.14	8.07	1.01	107.04	1.257	1.257	0.457	0.10	0.10
11	18	12.68	100.87	106.13	1.50	1.77	7.18	0.80	106.93	1.459	8.6	101.04	106.25	1.50	1.77	7.18	0.80	107.05	1.458	1.458	0.125	0.10	0.08
12	48	63.40	100.50	105.57	4.00	12.56	5.05	0.40	105.96	0.195	30.0	100.74	105.63	4.00	12.57	5.05	0.40	106.02	0.195	0.195	0.058	0.10	0.04
13	24	31.70	104.83	106.83	2.00*	3.14	10.09	1.58	108.41	1.965	26.9	105.27	107.36	2.00	3.14	10.09	1.58	108.94	1.964	1.965	0.528	0.10	0.16
14	24	19.02	107.28	109.28	2.00*	3.14	6.06	0.57	109.85	0.707	8.6	107.45	109.29	1.84	3.03	6.29	0.61	109.91	0.614	0.661	0.057	0.10	0.06
15	18	6.34	108.01	109.51	1.50*	1.77	3.59	0.20	109.71	0.365	10.4	108.22	109.51	1.29	1.61	3.93	0.24	109.75	0.339	0.352	0.037	0.10	0.02
16	24	31.70	100.74	105.67	2.00	3.14	10.09	1.58	107.25	1.965	36.4	101.34	106.38	2.00	3.14	10.09	1.58	107.97	1.964	1.965	0.715	0.10	0.16
17	24	19.02	101.34	106.54	2.00	3.14	6.06	0.57	107.11	0.707	8.6	101.51	106.60	2.00	3.14	6.05	0.57	107.17	0.707	0.707	0.061	0.10	0.06
18	18	6.34	101.51	106.66	1.50	1.77	3.59	0.20	106.86	0.365	10.4	101.72	106.70	1.50	1.77	3.59	0.20	106.90	0.365	0.365	0.038	0.10	0.02

Project File: LAPurch.stm	I-D-F File: SAMPLE.IDF	Total number of lines: 18	Run Date: 09-07-1999

NOTES: Initial tailwater elevation = 102.92 (ft) , * Crown depth assumed., ** Critical depth assumed.

Shut 22 /23