



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 Reiersen
✓ 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

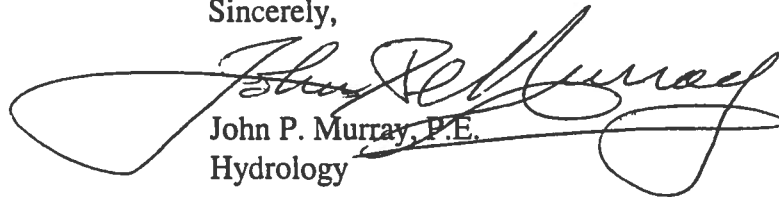
***RE: LOUISIANA PURCHASE (D18-D36). ENGINEER'S CERTIFICATION FOR
CERTIFICATE OF OCCUPANCY APPROVAL. ENGINEER'S STAMP DATED
MARCH 29, 2000. Partial for Buildings 1 thru 4 which face Louisiana Blvd.***

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 Reiersen
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 Interior Buildings 5 through 17, and 19.***

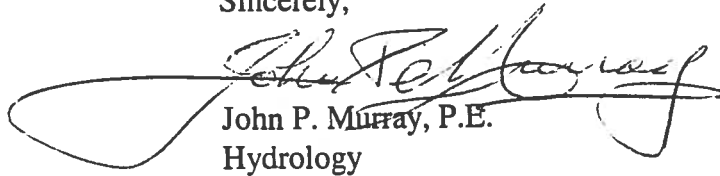
Dear Mr. Isaacson:

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 Reiersen
✓ 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:

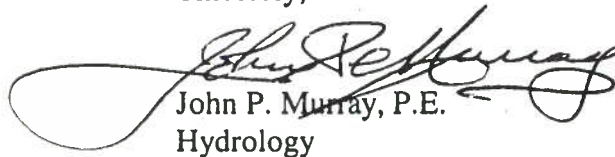
Based on the information provided on your December 7, 1998 submittal, the above referenced project is approved for Building Permit. See also C.O.A. letter of 11/13/98 subject as above.

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.

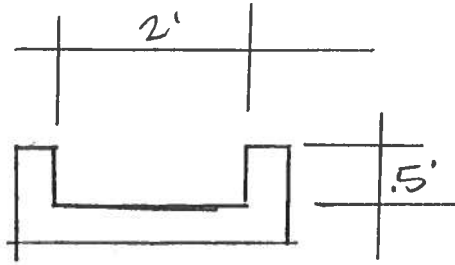
Sincerely,


John P. Murray, P.E.
Hydrology

c: ✓ Andrew Garcia
File

Added: Arlene Portillo
D. Salas, St. Moint.

COMPUTE CAPACITY OF TYPE 'Z' RUNDOWN



By Manning formula for

$$n = .013$$

$$A = 2 \times .5 = 1.0 \text{ ft}^2$$

$$S = .2/43 = .00465$$

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

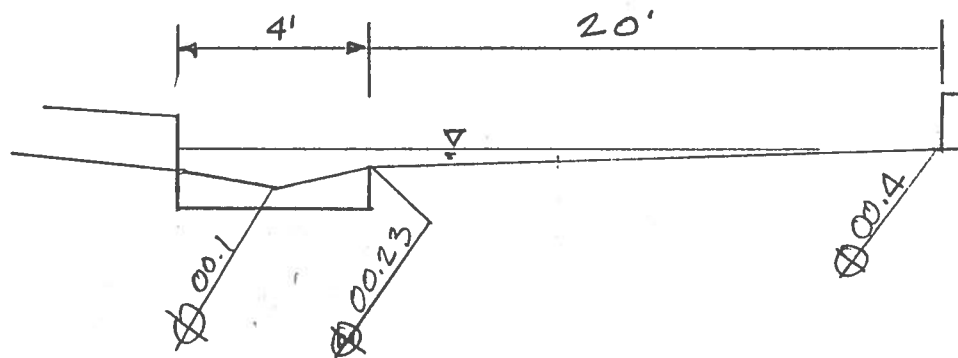
$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

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

$$= 3.7 \text{ cfs, OK}$$

CALCULATE FLOW DEPTH IN VALLEY GUTTER
OPPOSITE UNIT 14

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



$$S = 3.55\%$$

$$n = .017$$

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

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 Center Flow Depth
 By: TD Date: 9/3/99

[illegible]

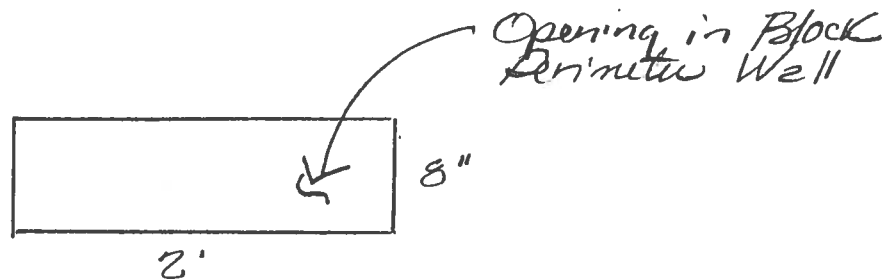
$$6900 \times .015 \times 20^2 \div 43560 =$$

ANALYZE DRAINAGE CULVERT CAPACITY

$$Q_{150} = 14.1 \text{ cfs}$$

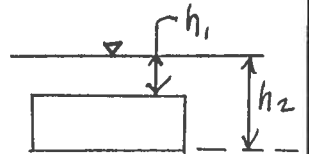
$$Q_{100} \text{ per Culvert} = 14.1 / 2 = 7.05 \text{ cfs}$$

Culvert Entrance Conditions



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

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



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

$$\text{Try } h_2 = 1.5'$$

$$\begin{aligned} Q &= \frac{2}{3}(2) \sqrt{64.4} (1.5^{3/2} - .83^{3/2}) (.62) \\ &= 7.17 \text{ cfs, OK} \end{aligned}$$

BASIN AREAS

BASIN 101 (MORTUARY):

$$250' \times 400' = 100,000 \text{ s.f.} = 2.296 \text{ Ac} = 0.003587 \text{ mi}^2$$

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

$$\begin{aligned} (1620' \times 300') - (250' \times 400') &= 386,000 \text{ s.f.} \\ &= 8.861 \text{ Ac} = 0.013846 \text{ mi}^2 \end{aligned}$$

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

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

BASIN 104 (COMMERCIAL SITE ON LOUISIANA):

$$(200' \times 250') = 50,000 \text{ s.f.} = 1.148 \text{ Ac} = 0.001794 \text{ mi}^2$$

PARK INSIDE BASIN 103:

$$\begin{aligned} (300' \times 300') + \frac{1}{2}(300' \times 190') &= 118,500 \text{ s.f.} \\ &= 2.720 \text{ Ac} = 0.004251 \text{ mi}^2 \end{aligned}$$

$$\begin{aligned} \text{BASIN 103} - \text{PARK} &= 1,450,000 \text{ s.f.} - 118,500 \text{ s.f.} \\ &= 1,331,500 \text{ s.f.} = 30.567 \text{ Ac} = 0.047761 \text{ mi}^2 \end{aligned}$$

LOUISIANA SOUTH OF PASEO DEL NORTE

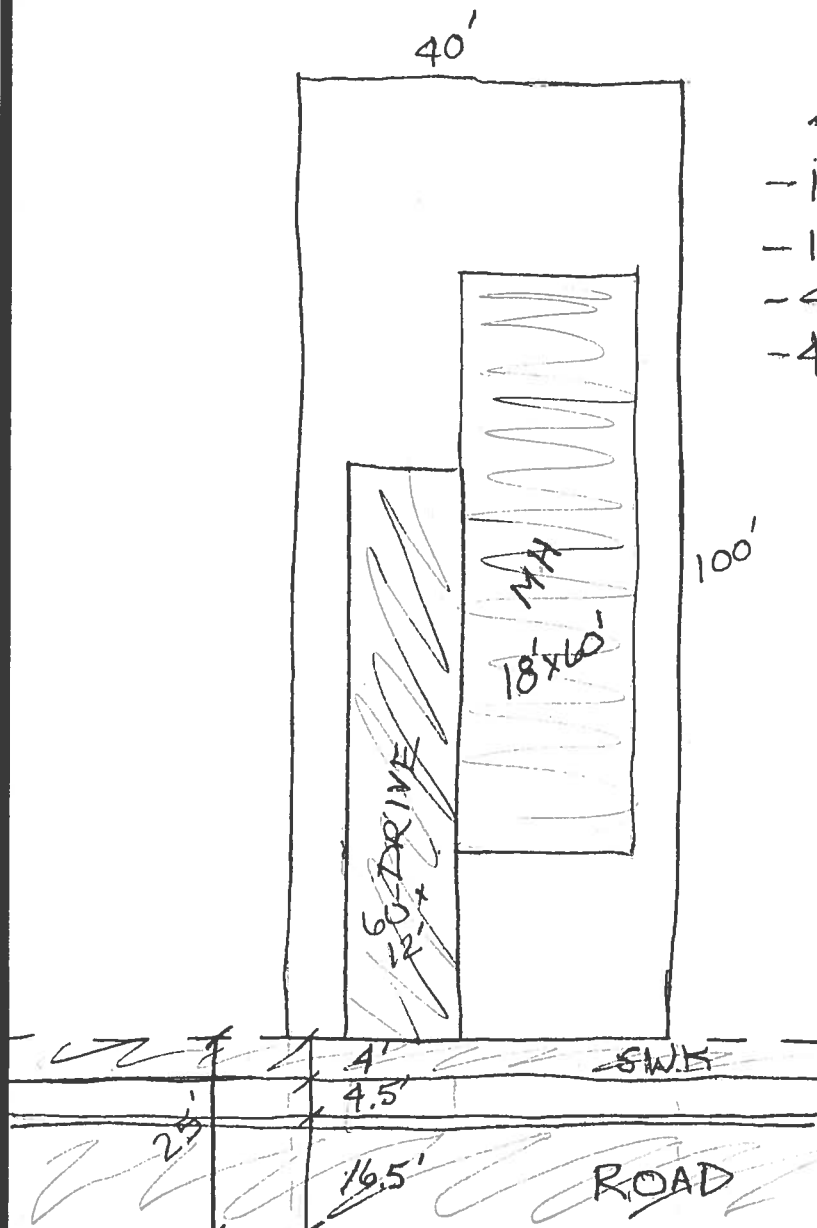
STORM FLOWS:

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

ASSUME LOT SIZE 40' X 100'

ASSUME STREET 32' WIDE

ASSUME FOUNDATION 18' X 60'



$$\begin{aligned} 40' \times 125' &= 5000 \text{ ft}^2 \\ - 18' \times 60' &= -1080 \text{ ft}^2 \\ - 12' \times 64.5' &= -774 \text{ ft}^2 \\ - 40' \times 4' &= -160 \text{ ft}^2 \\ - 40' \times 16.5' &= -660 \text{ ft}^2 \end{aligned}$$

2674 ft² IMPERV
OF 5000 ft² $\Rightarrow$ 53.5%

LAND TREATMENTS

BASIN 103

$$\text{BASIN 103 - PARK} = 30.567 \text{ Ac @ } 53.5\% \text{ IMPERV} \\ = 16.35 \text{ Ac IMPERVIOUS}$$

$$100\% - 53.5\% = 46.5\% \text{ PERMEABLE TOTAL} \\ (\text{SPLIT PERMEABLE BETWEEN TYPES B AND C})$$

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

$$\text{PARK} = 2.720 \text{ Ac} \quad (\text{Assume } 20\% \text{ Imperv for } \\ \text{Clubhouse and parking})$$

$$= 0.544 \text{ Ac IMPERV}$$

$$= 2.176 \text{ Ac Type B}$$

$$\text{TOTAL BASIN 103} = 33.287 \text{ Ac}$$

$$\text{TYPE A} = \cancel{0} \text{ Ac}$$

$$\text{TYPE B} = 7.107 + 2.176 = 9.28 \text{ Ac}$$

$$0\% \\ 27.9\%$$

$$\text{TYPE C} = 7.11 \text{ Ac}$$

$$21.4\%$$

$$\text{TYPE D} = 16.35 + 0.544 = 16.89 \text{ Ac}$$

$$50.7\%$$

BASINS 101 AND 104

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

BASIN 102

$$\text{AREA} = 8.861 \text{ Ac}$$

38 UNITS

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

$$\therefore \% \text{ IMPERV} = 7\sqrt{N^2 + 5N} = \underline{44.2\% \text{ IMPERV}}$$

$$100\% - 44.2\% = 55.8\% \text{ PERMEABLE TOTAL}$$

(SPLIT PERMEABLE BETWEEN TYPES B AND C)

$$55.8\% \div 2 = 27.9\% \text{ TYPE B}$$

$$27.9\% \text{ TYPE C}$$

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 INPUT FILE = c:\ahymo\10061\lapurch.dat

RUN DATE (MON/DAY/YR) = 09/03/1999
 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	PAGE = 1	NOTATION
START											
RAINFALL	TYPE= 1										
COMPUTE NM HYD	101.00	-	1	.00359	10.94	.410	2.14137	1.500	4.766	RAIN6=	.00
COMPUTE NM HYD	102.00	-	2	.01385	33.86	1.169	1.58330	1.500	3.821	PER IMP=	2.500
ADD HYD	102.10	1& 2	21	.01743	44.80	1.579	1.69810	1.500	4.016	PER IMP=	44.20
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											

Skut 18/23

STORM INLET CAPACITY
(PER C.O.A. STB. LING. #2201, 2202, +2220)
TYPE 'A' INLET - SINGLE GRATE

GRATE OPEN AREA

$$\text{GROSS: } 25\text{ in } (40\text{ in}) = 2.08' (3.33') = 6.92 \text{ ft}^2$$

$$\text{LESS BEARING BARS: } \left(\frac{0.5}{12}\right) (3.33') (13) = 1.80 \text{ ft}^2$$

$$\text{LESS CROSS BARS: } \left(\frac{0.5}{12}\right) (7) \left[\frac{25}{12} - \left(13 \left(\frac{0.5}{12}\right)\right)\right] = 0.45 \text{ ft}^2$$

$$\text{NET AREA} \rightarrow \underline{\underline{4.67 \text{ ft}^2}}$$

CALCULATE CAPACITY USING ORIFICE EQUATION

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

WHERE: $C = 0.67$

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

(Assuming 50% clogging factor)

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

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

H = water depth above
flowline in feet

SUMP INLET CAPACITIES

TYPE 'C' DOUBLE INLET

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

(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

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

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

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

$$152.2 \text{ cfs} > 152.07 \text{ cfs}$$

(From
AHYMO
run)

∴ OK

Hydraflow Summary Report

Page 1

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 (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Energy loss (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.