



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 13, 2000

Diane Hoelzer, P.E.
Mark Goodwin & Associates, PA
P.O. Box 90606
Albuquerque, NM 87199

RE: ENGINEER'S CERTIFICATION FOR PASEO COMMONS, (C-17/D007)¹⁰,
ENGINEER'S STAMP DATED 10/20/99, CERTIFICATION DATED 4/5/00.

Dear Ms. Hoelzer,

Based upon the information provided in your submittal dated April 6, 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

October 8, 1998

Diane Holzer, P.E.
Mark Goodwin & Associates
P.O. Box 90606
Albuquerque, NM 87199

**RE: PASEO COMMONS (C17-D7). DRAINAGE REPORT AND GRADING PLAN FOR
FOUNDATION PERMIT AND BUILDING PERMIT APPROVALS. ENGINEER'S
STAMP DATED AUGUST 18, 1999.**

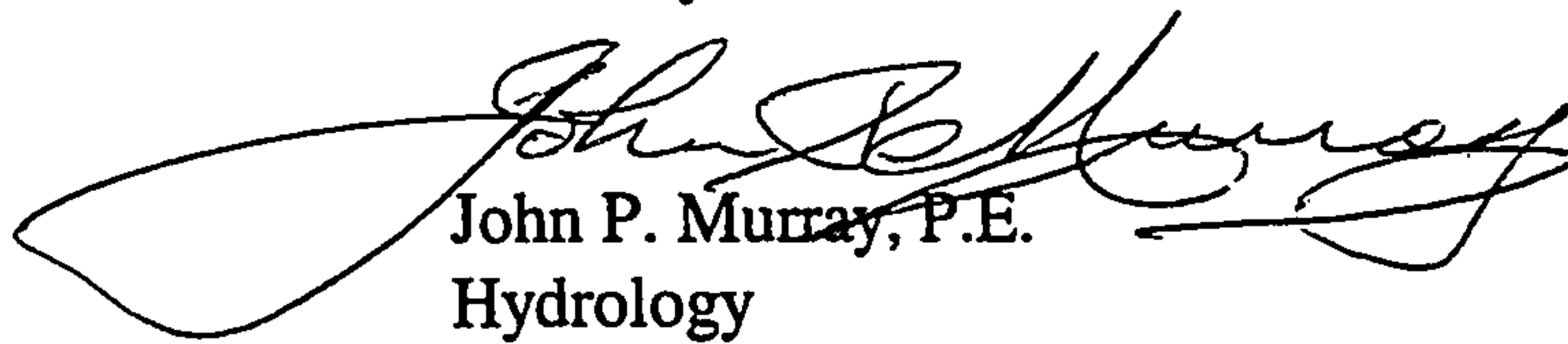
Dear Ms. Holzer:

Based on the information provided on your August 18, 1999 submittal, the above referenced project is approved for Foundation Permit. Building Permit approval is being held in abeyance pending response to City Consultant's comments which are enclosed for your information and action.

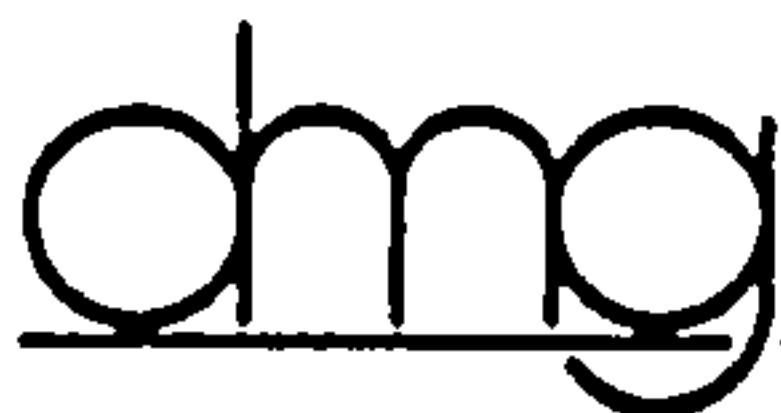
Please attach a copy of this approved plan (for Foundation) to the construction sets prior to sign-off by Hydrology.

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

Sincerely,


John P. Murray, P.E.
Hydrology

c: ☒ WR
☒ File



D. Mark Goodwin & Associates, P.A.
Consulting Engineers

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PROJECT Paseo Commons.
SUBJECT Inlet Capacity Calcs.
BY DLH DATE 10-13-99
CHECKED _____ DATE _____
SHEET _____ OF _____

Three sump inlets Use Weir Eqn.

$$Q_i = C_w \cdot P \cdot H^{1.5}$$

From AH4MO results, maximum WSEL = 35.945'

$$\text{Inlet \#1 Grate} = 35.32' \Rightarrow H = 0.625'$$

$$Q_{\text{design}} = 3(8.48)(.625)^{1.5} = 13.31 \text{ cfs}$$

$$\text{Inlet \#2 Grate} = 34.81' \Rightarrow H = 1.135'$$

$$Q_{\text{design}} = 3(6.03)(1.135)^{1.5} = 21.7 \text{ cfs}$$

$$\text{Inlet \#3 Grate} = 35.02' \Rightarrow H = 0.925'$$

$$Q_{\text{design}} = 3(6.03)(0.925)^{1.5} = 16.09 \text{ cfs}$$

$$Q_{\text{TOTAL}} = 51.1 \text{ cfs}$$

DESIGN

$$Q_{\text{ACTUAL}} = 3.15 \text{ cfs}$$

ALLOWABLE

CONCLUDE: Orifice Plate is limiting hydraulic control.

DRAINAGE REPORT
FOR
PASEO COMMONS
(West of I-25 on Paseo Del Norte)



AUGUST 1999

I. PROJECT DESCRIPTION

This drainage plan is for an office building to be constructed on the west side of existing culdesac just north of the Paseo Del Norte north frontage road. The site covers an approximate area of 1.9 acres.

II. DRAINAGE DESIGN CRITERIA AND PREVIOUS REPORTS

The design criteria used in this report was in accordance with Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993 edition. The 100-year 6-hour storm event was analyzed for sizing the internal storm drain system using $P(1 \text{ hr}) = 2.05"$, $P(6 \text{ hr}) = 2.40"$. The Land Treatment values used for developed conditions are Treatment D=86.8, Treatment C=6.6 and Treatment B=6.6.

III. EXISTING DRAINAGE CONDITIONS

Under existing drainage conditions, runoff from the project site flows in a general westerly direction at a slope of 2.0 percent. The "existing conditions" peak discharge was determined to be 3.15 cfs.

IV. DEVELOPED DRAINAGE CONDITIONS

The 100 year "developed conditions" peak discharge from the site is 8.62 cfs. The onsite flows will be collected in an internal storm drain from three sump inlets and conveyed to the existing inlet located in the Paseo Del Norte frontage road at the southwest property corner. The allowable discharge to the inlet will be the "existing conditions" discharge of 3.15 cfs. The "developed conditions" peak discharge will be throttled through a 7.7 inch diameter orifice plate located on the south wall of the southwest inlet as shown on the grading and drainage plan. New Mexico State Highway and Transportation Department construction plans indicate that there is an existing 30" storm drain in the Paseo Del Norte frontage road (refer to "FHWA Region 6, NMP SP-(M)-4054(204) sheets 3-4 and 3-5).

Ahymo printouts and land treatment value determination can be found in Appendix A. Storm drain, volume determination and orifice calculations can be found in Appendix B.


```

START                TIME=0.0
***** PASEO COMMONS
***** 100-YEAR 6-HOUR STORM EVENT
***** FILE: PASEOCOM.DAT  AUGUST 1999 BY:DLH
***** ZONE ATLAS C-17
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.05 IN RAIN SIX=2.40 IN
                     RAIN DAY=0.00 IN DT=0.033 HR

*****
***** EXISTING CONDITONS
*****
COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.002995 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD             ID=1 CODE=1
*****
***** PROPOSED CONDITIONS
*****
COMPUTE NM HYD        ID=2 HYD NO=100.1 AREA=0.002995 SQ MI
                     PER A=0 PER B=6.6 PER C=6.6 PER D=86.8
                     TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD             ID=2 CODE=1
*****
***** MAXIMUM ALLOWABLE FLOW TO INLET 3.15 CFS
*****
***** ORIFICE OPENING DIAMETER = 7.7 inches
*****
ROUTE RESERVOIR      ID=5 HYD=POND100.3 INFLOW=2 CODE=10
                     OUTFLOW(CFS)    STORAGE(AC FT)    ELEV(FT)
                     0                0                31.60
                     0.670            .004              32.23
                     2.020            .013              33.60
                     2.730            .014              35.00
                     3.140            .113              36.00
                     3.330            .289              36.50
PRINT HYD             ID=5 CODE=1
FINISH

```

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 08/17/1999
START TIME (HR:MIN:SEC) = 14:45:13 USER NO.= M_GOODWN.I01
INPUT FILE = PASEOCOM.DAT

START TIME=0.0
***** PASEO COMMONS
***** 100-YEAR 6-HOUR STORM EVENT
***** FILE: PASEOCOM.DAT AUGUST 1999 BY:DLH
***** ZONE ATLAS C-17
RAINFALL TYPE=1 RAIN QUARTER=0.0 IN
 RAIN ONE=2.05 IN RAIN SIX=2.40 IN
 RAIN DAY=0.00 IN DT=0.033 HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033000 HOURS	END TIME =	5.973000 HOURS
.0000	.0017	.0033	.0051
.0068	.0086	.0105	
.0124	.0143	.0163	.0183
.0204	.0225	.0247	
.0270	.0293	.0317	.0342
.0367	.0394	.0421	
.0449	.0479	.0509	.0541
.0574	.0609	.0645	
.0684	.0724	.0767	.0819
.0877	.0940	.1027	
.1287	.1698	.2299	.3131
.4236	.5656	.7436	
.9622	1.2257	1.3436	1.4262
1.4986	1.5639	1.6238	
1.6793	1.7310	1.7794	1.8249
1.8679	1.9084	1.9468	
1.9831	2.0176	2.0503	2.0813
2.1108	2.1306	2.1370	
2.1430	2.1487	2.1542	2.1594
2.1644	2.1692	2.1739	
2.1784	2.1827	2.1869	2.1909
2.1949	2.1987	2.2024	
2.2060	2.2095	2.2130	2.2164
2.2196	2.2228	2.2260	
2.2291	2.2321	2.2350	2.2379
2.2407	2.2435	2.2463	
2.2489	2.2516	2.2542	2.2567
2.2592	2.2617	2.2642	
2.2666	2.2689	2.2712	2.2735
2.2758	2.2780	2.2802	
2.2824	2.2846	2.2867	2.2888
2.2908	2.2929	2.2949	
2.2969	2.2989	2.3008	2.3027
2.3046	2.3065	2.3084	
2.3102	2.3121	2.3139	2.3157
2.3174	2.3192	2.3209	
2.3226	2.3243	2.3260	2.3277
2.3294	2.3310	2.3326	
2.3342	2.3358	2.3374	2.3390
2.3406	2.3421	2.3436	
2.3452	2.3467	2.3482	2.3496
2.3511	2.3526	2.3540	
2.3555	2.3569	2.3583	2.3597
2.3611	2.3625	2.3639	
2.3653	2.3666	2.3680	2.3693
2.3706	2.3720	2.3733	
2.3746	2.3759	2.3772	2.3784
2.3797	2.3810	2.3822	
2.3835	2.3847	2.3860	2.3872
2.3884	2.3896	2.3908	
2.3920	2.3932	2.3944	2.3956
2.3967	2.3979	2.3991	

***** EXISTING CONDTIONS

COMPUTE NM HYD ID=1 HYD NO=100.0 AREA=0.002995 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAINFALL=-1

K = .159146HR TP = .133300HR K/TP RATIO = 1.193894 SHAPE CONSTANT, N = 2.975114
UNIT PEAK = 6.2863 CFS UNIT VOLUME = .9975 B = 279.79 P60 = 2.0500
AREA = .002995 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033000

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 100.00

RUNOFF VOLUME = .55944 INCHES = .0894 ACRE-FEET
PEAK DISCHARGE RATE = 3.15 CFS AT 1.518 HOURS BASIN AREA = .0030 SQ. MI.

***** PROPOSED CONDITIONS

COMPUTE NM HYD ID=2 HYD NO=100.1 AREA=0.002995 SQ MI
 PER A=0 PER B=6.6 PER C=6.6 PER D=86.8
 TP=0.1333 HR MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 10.264 CFS UNIT VOLUME = .9984 B = 526.28 P60 = 2.0500
AREA = .002600 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033000

K = .120234HR TP = .133300HR K/TP RATIO = .901978 SHAPE CONSTANT, N = 3.928677
UNIT PEAK = 1.0392 CFS UNIT VOLUME = .9874 B = 350.39 P60 = 2.0500
AREA = .000395 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 100.10

RUNOFF VOLUME = 2.00826 INCHES = .3208 ACRE-FEET
PEAK DISCHARGE RATE = 8.62 CFS AT 1.518 HOURS BASIN AREA = .0030 SQ. MI.

***** MAXIMUM ALLOWABLE FLOW TO INLET 3.15 CFS

***** ORIFICE OPENING DIAMETER = 7.7 inches

ROUTE RESERVOIR ID=5 HYD=POND100.3 INFLOW=2 CODE=10
OUTFLOW(CFS) STORAGE(AC FT) ELEV(FT)
0 0 31.60
0.670 .004 32.23
2.020 .013 33.60
2.730 .014 35.00
3.140 .113 36.00
3.330 .289 36.50

PRINT HYD ID=5 CODE=1

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	31.60	.000	.00
.33	.00	31.60	.000	.00
.66	.00	31.60	.000	.00
.99	.00	31.60	.000	.00
1.32	2.15	32.56	.006	.99
1.65	4.73	35.87	.100	3.08
1.98	2.15	35.86	.100	3.08
2.31	.48	35.37	.051	2.88
2.64	.19	32.09	.003	.52
2.97	.10	31.71	.001	.11
3.30	.07	31.67	.000	.07
3.63	.06	31.65	.000	.06
3.96	.05	31.65	.000	.05
4.29	.05	31.64	.000	.05
4.62	.05	31.64	.000	.05
4.95	.05	31.64	.000	.05
5.28	.05	31.65	.000	.05
5.61	.05	31.65	.000	.05
5.94	.06	31.65	.000	.06
6.27	.01	31.61	.000	.02
6.60	.00	31.60	.000	.00

PEAK DISCHARGE = 3.117 CFS - PEAK OCCURS AT HOUR 1.78
MAXIMUM WATER SURFACE ELEVATION = 35.945
MAXIMUM STORAGE = .1076 AC-FT INCREMENTAL TIME= .033000HRS

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 14:45:13



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PROJECT Jefferson Commons
SUBJECT Hydrology
BY DLH DATE 7.16.99
CHECKED _____ DATE _____
SHEET _____ OF _____

Total Area = 83490.87 sq. ft. = 1.917 acres

Pervious Areas

340(7)	=	2380
40(37)	=	1480
184(10)	=	1840
270(5)	=	1350
17(6)	=	102
17(6)	=	102
13(10)	=	130
25(20)	=	500
145(10)	=	1450
15(12)	=	180
15(12)	=	180
10(10)	=	100
12(12)	=	144
62(10)	=	620
22(13)	=	286
20(8)	=	160

11004 SF 13.2% B/C

86.8% D

Allowable Discharge = Existing Flows = 3.15 cfs (maximum)

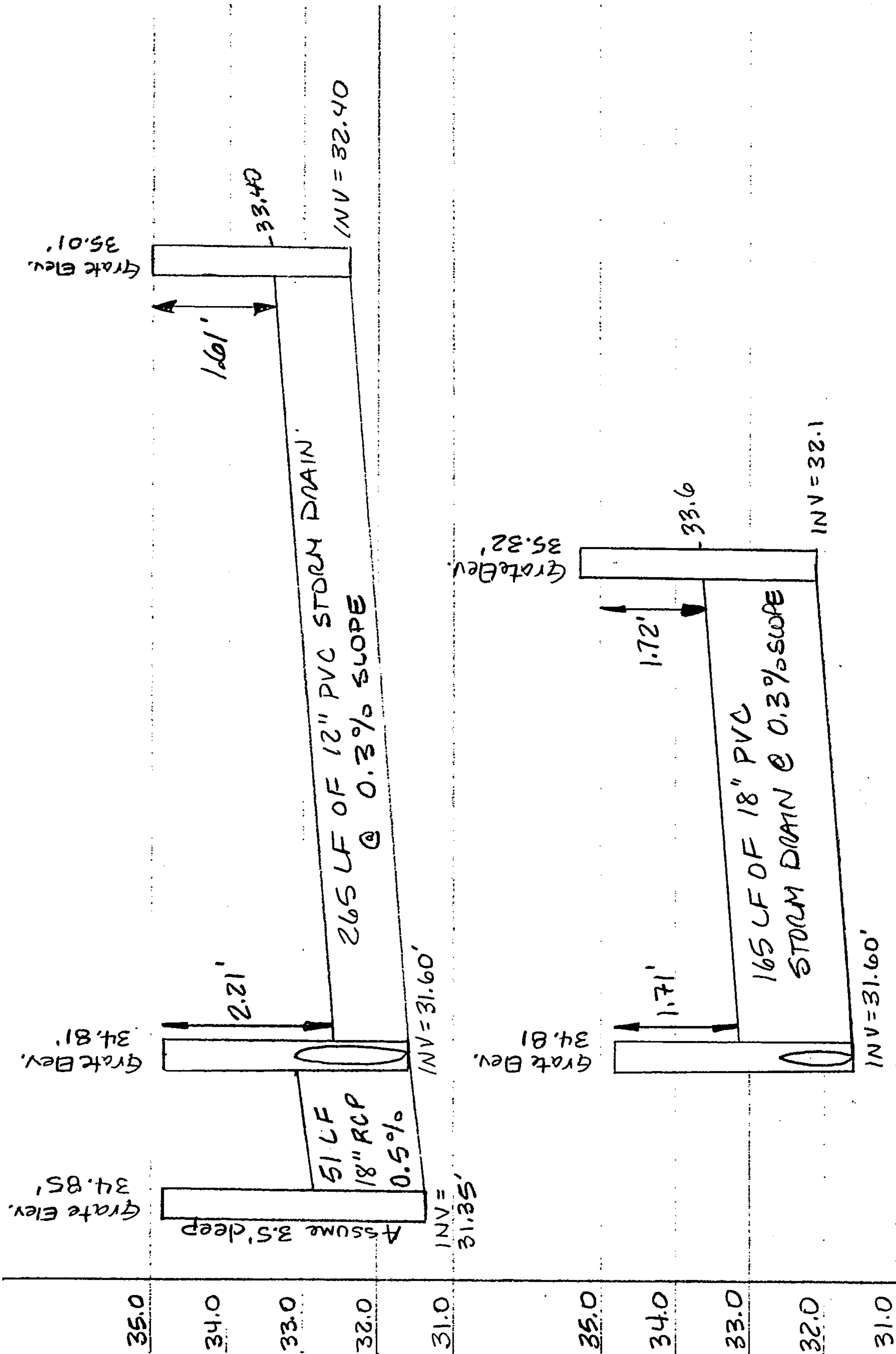
Proposed Q = 8.62 cfs



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PROJECT PASEO COMMONS
SUBJECT STORM DRAIN SCHEMATIC
BY DLH DATE 8-17-99
CHECKED _____ DATE _____
SHEET _____ OF _____





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PROJECT PASEO COMMONS
SUBJECT HYDROLOGY CALCS
BY DLH DATE 8-17-99
CHECKED _____ DATE _____
SHEET _____ OF _____

$$Q_{EXIST} = 3.15 \text{ cfs}$$

$$Q_{DEV} = 8.62 \text{ cfs}$$

SUBASIN 1	28457 SF	35.8%	3.08 cfs
SUBASIN 2	36582 SF	46.1%	3.97 cfs
SUBASIN 3	14388 SF	18.1%	1.56 cfs

STORM DRAIN CAPACITY CALCS

$$12" @ 0.3\% \quad \text{Area} = .785 \text{ SF} \quad \text{WP} = .2499$$
$$P = 3.1416$$

$$Q = \frac{1.49}{.015} (.785) (.2499)^{.666} \sqrt{.003}$$

$$Q = 1.69 \text{ cfs (Design)}$$

$$Q = 1.56 \text{ cfs (actual)}$$

$$18" @ 0.3\% \quad \text{Area} = 1.767 \text{ SF} \quad \text{WP} = .375$$
$$P = 4.712$$

$$Q = \frac{1.49}{.015} (1.767) (.375)^{.666} \sqrt{.003}$$

$$Q = 5.0 \text{ cfs (Design)}$$

$$Q = 3.97 \text{ cfs (actual)}$$

$$18" @ 0.5\%$$

$$Q = \frac{1.49}{.015} (1.767) (.375)^{.666} \sqrt{.005}$$

$$Q = 6.45 \text{ cfs (Design)}$$

$$Q = 3.15 \text{ cfs (Orifice Design Maximum)}$$



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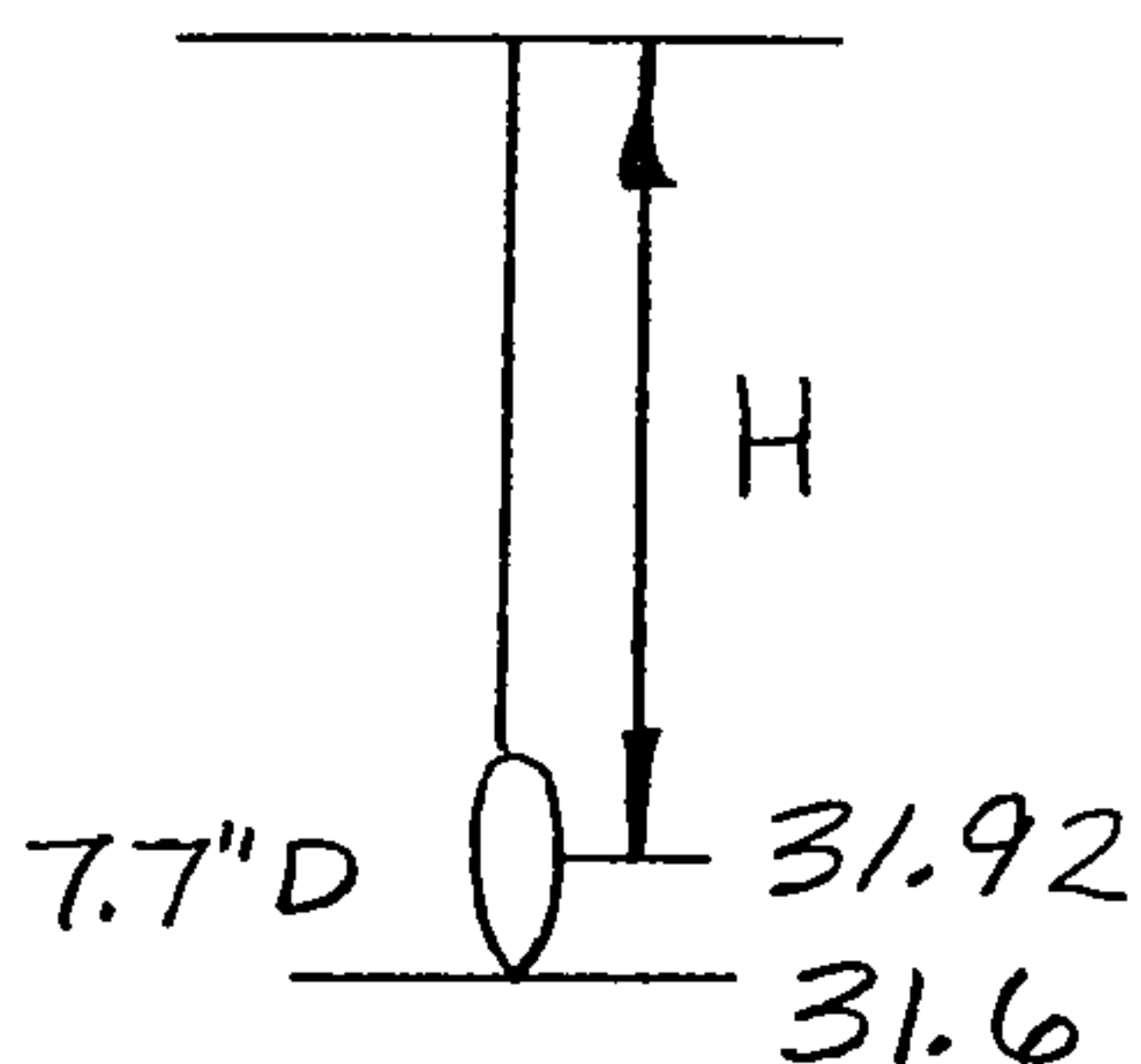
PROJECT PASEO COMMONS
SUBJECT ORIFICE CALCS
BY DLH DATE 8-17-99
CHECKED _____ DATE _____
SHEET _____ OF _____

$$Q = 0.6 A \sqrt{2gH}$$

$$\text{Radius} = .3208'$$

$$A = \pi (.3208)^2 = .3233 \text{ SF}$$

$$Q = 0.6 (.3233) \sqrt{64.4 (H)}$$



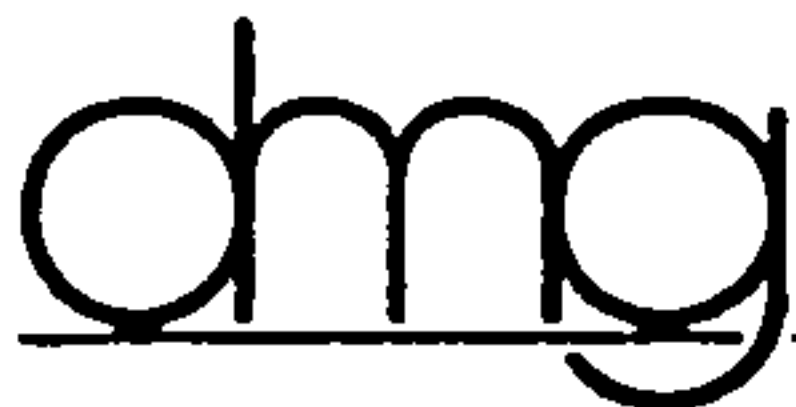
WSEL	H	Q
33.60	1.68	2.02
35.00	3.08	2.73
36.00	4.08	3.14
36.50	4.58	3.33

$$Q = \frac{1.49}{.015} (.3233) (.1604)^{.66} \sqrt{.005} = .67 \text{ cfs}$$

$$A = .3233$$

$$P = 2.016$$

$$WP = .1604$$



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PROJECT PASEO COMMONS
SUBJECT ORIFILE CALCS
BY DLH DATE 8-17-99
CHECKED _____ DATE _____
SHEET _____ OF _____

Elev. (Ft)	Volume (AF)	Outflow (cfs)
31.6	0	0
32.23	.003987	.67
33.60	.012656	2.02
35.00	.013717	2.73
36.00	.11247	3.14
36.50	.2892	3.33

Volume Calcs. (33.60)

$$265 \text{ LF } (\pi (.5)^2) = 208 \text{ CF}$$

$$165 \text{ LF } (\pi (.75)^2) = 291.6 \text{ CF}$$

$$11 \text{ SF } (33.6 - 31.6) = 22 \text{ CF}$$

$$11 \text{ SF } (33.6 - 32.4) = 13.2 \text{ CF}$$

$$11 \text{ SF } (33.6 - 32.1) = 16.5 \text{ CF}$$

$$\underline{551.3 \text{ CF}} = .012656 \text{ Ac Ft}$$

Volume Calcs (35.00)

$$11 \text{ SF } (35 - 33.6)(3) = 46.2 + 551.3 = 597.5 \text{ CF}$$

$$= .013717 \text{ Ac Ft}$$

Volume Calcs (36.00)

$$\frac{33 + 8570.55}{2} (1.0') = \frac{4301.78 \text{ CF}}{597.50 \text{ CF}}$$

$$\underline{4899.28 \text{ CF}} = 0.11247 \text{ Ac Ft}$$

Volume Calcs (36.5)

$$\frac{8570.55 + 22225.53}{2} (.5) = \frac{7699.02 \text{ CF}}{4899.28 \text{ CF}}$$

$$\underline{12598.3 \text{ CF}} = .2892 \text{ Ac Ft}$$