City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 23, 1995

Ronald R. Bohannan, P.E.
Tierra West Dev Mgt Ser
4600 Montgomery NE Suite #3
Albuquerque, N.M. 87109

RE: ENGINEER'S CERTIFICATION FOR VILLA CANELA (F-14/D37)
RECEIVED JANUARY 23, 1995 FOR FINANCIAL GUARANTY RELEASE
ENGINEER'S STAMP DATED 1-23-95

Dear Mr. Bohannan:

Based on the information included in the submittal referenced above, City Hydrology accepts the Engineer's Certification of grading & drainage. Contact the DRC Chairman, Billy Goolsby, to request the Financial Guaranty Release for City Project Number 4897.90.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Andrew Garcia
Billy Goolsby, CPN 4897.90
David Gonzales; 5925 Edith NE; 87107

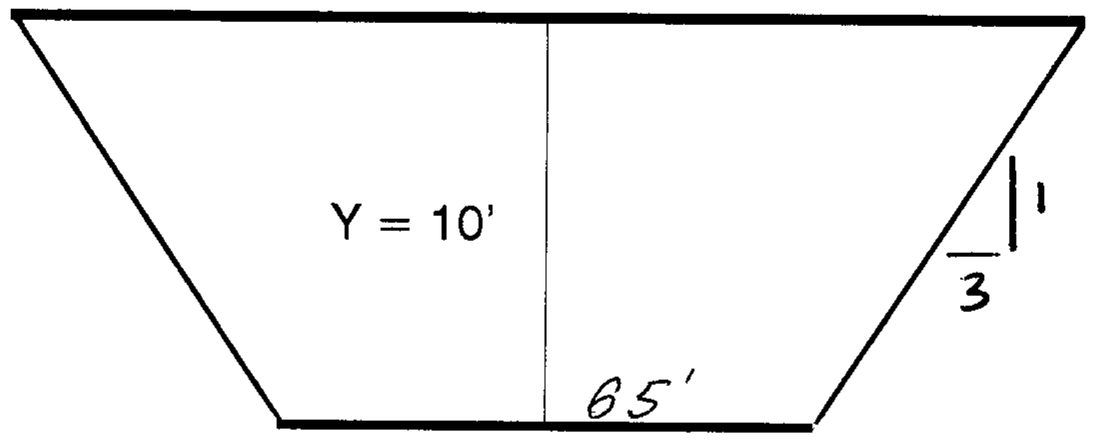
AHYMO SUMMARY TABLE

TABLE 1

AHYMO ID NO.	PROPOSED Q–100YR	PROPOSED V–100YR	AHYMO ID NO.	EXISTING Q–100YR	EXISTING V–100YR
101.10	7.12	0.274	101.20	4.64	0.132
	Q–10YR	V–10YR		Q–10YR	V–10YR
102.10	4.09	0.155	102.20	1.91	0.047

VOLUME OF THE POND.

80 x 82 = 6560



20 x 22 = 440

[6560 – 440] / 10 = 612.00 SF / FT

FOR EXAMPLE:

@ Y = 3

Cross–sectional Area = 440 + 612 * 3 = 2276.00 SF
Volume = [(2276 + 440) / 2] * 2 = 4074.00 CF

TABLE 2

depth	area SF	volume CF	volume AC–FT	
1	1052.00	746.00	0.01713	
2	1664.00	2104.00	0.04830	
3	2276.00	4074.00	0.09353	
4	2888.00	6656.00	0.15280	
5	3500.00	9850.00	0.22612	
6	4112.00	13656.00	0.31350	
6.5	4418.00	15788.50	0.36245	
71.8	6.8	4601.60	17141.44	**0.39351** Volume Needed
	7	4724.00	18074.00	0.41492
73.0	8	5336.00	23104.00	0.53039
74.	9	5948.00	28746.00	0.65991
	10	6560.00	35000.00	**0.80349**

"VOLUME OF THE POND = 0.489 > V 10 DAY = 0.39 AC–FT"

Minimum Catch Basin Depth:

$$V_R = C.F. + 0.5 + 1.2\,\frac{V^2}{2g} + d$$

(West)

$$= 0.83 + 1.2\,\frac{6.80^2}{64.4} + 1.5$$

$= 3.19'$ to The Right Side of The ST.

Std 8" Curb

$$V_L = 0.83 + 1.2\,\frac{6.67^2}{64.4} + 1.5$$

(East)

$= 3.16'$ to The Left side of the ST.

Analyse Catch Basins in series @ DPM Pp 82 & 83

Input File


```
START                TIME=0.0
***** Tract 7A (100-YR).
*****
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                     RAIN DAY=2.75 IN DT=0.03333 HR
COMPUTE NM HYD       ID=1 HYD NO=101.1 AREA=0.003181 SQ MI
                     PER A=0.00 PER B=50.00 PER C=0.00 PER D=50.00
                     TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
*****
*****
*****
ROUTE RESERVOIR      ID=2 HYD NO=501.1 INFLOW ID=1 CODE=24
                     OUTFLOW(CFS)     STORAGE(AC-FT)  ELEVATION(FT)
                          0.0              0.0            67.00
                          0.01             0.01535        68.00
                          0.02             0.03786        69.00
                          0.03             0.06865        70.00
                          0.04             0.10885        71.00
                          0.05             0.15958        72.00
                          0.06             0.22196        73.00
                          0.07             0.29713        74.00
PRINT HYD            ID=2 CODE=1
*****
FINISH
```

Submit Calcs for storage

The Site is a Zone 2 From Fig A-1

And From Table A-2:

$P_{60} = 2.01$, $P_{360} = 2.35$, $P_{1440} = 2.75$

$T_c = 12$ min for Small watershed

$T_p = 2/3\ T_c$

$= 2/3\ (12)$

$= 8\ min = 0.1333$ hr.

Treatment:

$D = 50\ \%$, $B = 50\ \%$

"For the Route Reservoir a Small outflow was put in Order to Run the Program to get Ponding Calculation."

Output File


```
 AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
      RUN DATE (MON/DAY/YR) = 03/30/1994
      START TIME (HR:MIN:SEC) = 09:03:52     USER NO.= R_BOHANN.S92
      INPUT FILE = d.dat

START                 TIME=0.0
***** Tract 7A (100-YR).
*****
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                      RAIN DAY=2.75 IN DT=0.03333 HR

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                 DT =    .033330 HOURS        END TIME =     5.999400 HOURS
                    .0000  .0016   .0033   .0049   .0066   .0084   .0102
                    .0120  .0139   .0158   .0178   .0199   .0219   .0241
                    .0263  .0286   .0309   .0333   .0358   .0384   .0411
                    .0439  .0467   .0497   .0529   .0561   .0596   .0631
                    .0669  .0709   .0751   .0807   .0866   .0930   .1066
                    .1371  .1840   .2514   .3434   .4644   .6186   .8106
                   1.0449 1.2624  1.3533  1.4300  1.4982  1.5602  1.6174
                   1.6704 1.7200  1.7664  1.8102  1.8514  1.8904  1.9273
                   1.9622 1.9953  2.0268  2.0566  2.0850  2.0915  2.0976
                   2.1033 2.1088  2.1140  2.1191  2.1239  2.1285  2.1329
                   2.1373 2.1414  2.1454  2.1494  2.1531  2.1568  2.1604
                   2.1639 2.1673  2.1706  2.1739  2.1771  2.1802  2.1832
                   2.1862 2.1891  2.1919  2.1947  2.1975  2.2002  2.2028
                   2.2054 2.2080  2.2105  2.2130  2.2154  2.2178  2.2202
                   2.2225 2.2248  2.2270  2.2293  2.2315  2.2336  2.2358
                   2.2379 2.2399  2.2420  2.2440  2.2460  2.2480  2.2500
                   2.2519 2.2538  2.2557  2.2576  2.2594  2.2612  2.2631
                   2.2648 2.2666  2.2684  2.2701  2.2718  2.2735  2.2752
                   2.2769 2.2785  2.2802  2.2818  2.2834  2.2850  2.2866
                   2.2881 2.2897  2.2912  2.2928  2.2943  2.2958  2.2973
                   2.2987 2.3002  2.3017  2.3031  2.3045  2.3060  2.3074
                   2.3088 2.3102  2.3115  2.3129  2.3143  2.3156  2.3169
                   2.3183 2.3196  2.3209  2.3222  2.3235  2.3248  2.3261
                   2.3273 2.3286  2.3298  2.3311  2.3323  2.3335  2.3348
                   2.3360 2.3372  2.3384  2.3396  2.3408  2.3419  2.3431
                   2.3443 2.3454  2.3466  2.3477  2.3488  2.3500

COMPUTE NM HYD        ID=1 HYD NO=101.1 AREA=0.003181 SQ MI
                      PER A=0.00 PER B=50.00 PER C=0.00 PER D=50.00
                      TP=-0.1333 HR MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.2794    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 2.0100
    AREA =      .001591 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .132088HR    TP =   .133300HR    K/TP RATIO =   .990905     SHAPE CONSTANT, N =  3.563124
    UNIT PEAK =   3.8767    CFS   UNIT VOLUME =    .9969       B =   324.91      P60 = 2.0100
    AREA =      .001591 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=1 CODE=1

                              PARTIAL HYDROGRAPH   101.10

    RUNOFF VOLUME =     1.44679 INCHES      =        .2455 ACRE-FEET
    PEAK DISCHARGE RATE =       7.12 CFS  AT   1.500 HOURS   BASIN AREA =    .0032 SQ. MI.

*****
*****
*****
ROUTE RESERVOIR       ID=2 HYD NO=501.1 INFLOW ID=1 CODE=24
                      OUTFLOW(CFS)      STORAGE(AC-FT)  ELEVATION(FT)
                           0.0               0.0            67.00
                           0.01              0.01535        68.00
                           0.02              0.03786        69.00
                           0.03              0.06865        70.00
                           0.04              0.10885        71.00
                           0.05              0.15958        72.00
                           0.06              0.22196        73.00
                           0.07              0.29713        74.00
```

6 hr storm not 24 hr

MAR 31

Output File

* * * * * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	67.00	.000	.00
.80	.00	67.00	.000	.00
1.60	5.15	71.21	.120	.04
2.40	.28	73.05	.226	.06
3.20	.05	73.10	.230	.06
4.00	.03	73.08	.228	.06
4.80	.03	73.05	.226	.06
5.60	.03	73.02	.224	.06
6.40	.00	72.99	.221	.06
7.20	.00	72.92	.217	.06
8.00	.00	72.86	.213	.06
8.80	.00	72.80	.210	.06
9.60	.00	72.74	.206	.06
10.40	.00	72.68	.202	.06
11.20	.00	72.62	.198	.06
12.00	.00	72.56	.194	.06
12.80	.00	72.50	.191	.06
13.60	.00	72.44	.187	.05
14.40	.00	72.39	.184	.05
15.20	.00	72.33	.180	.05
16.00	.00	72.27	.177	.05
16.80	.00	72.22	.173	.05
17.60	.00	72.16	.170	.05
18.40	.00	72.11	.166	.05
19.20	.00	72.05	.163	.05

PEAK DISCHARGE = .061 CFS - PEAK OCCURS AT HOUR 3.07
MAXIMUM WATER SURFACE ELEVATION = 73.103
MAXIMUM STORAGE = .2297 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=2 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 501.10

RUNOFF VOLUME = .50542 INCHES = .0857 ACRE-FEET
PEAK DISCHARGE RATE = .06 CFS AT 3.066 HOURS BASIN AREA = .0032 SQ. MI.

*****
FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 09:03:52

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment:

Solve For Actual Depth

18"

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.0100 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.86 ft
Velocity.....	6.80 fps
Flow Area.....	1.05 sf
Critical Depth....	1.03 ft
Critical Slope....	0.0058 ft/ft
Percent Full.....	57.32 %
Full Capacity.....	11.38 cfs
QMAX @.94D.....	12.24 cfs
Froude Number.....	1.43 (flow is Supercritical)

$$0.86 + \frac{V^2}{2g} = 0.86 + \frac{6.80^2}{64.4}$$

$$= 1.58'$$

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Not a Valid HGL Calculation

MAR 31

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment:

Solve For Actual Depth

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.0040 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	1.22 ft
Velocity.....	4.64 fps
Flow Area.....	1.53 sf
Critical Depth....	1.03 ft
Critical Slope....	0.0058 ft/ft
Percent Full.....	81.01 %
Full Capacity.....	7.20 cfs
QMAX @.94D.....	7.74 cfs
Froude Number.....	0.72 (flow is Subcritical)

$$1.22' + \frac{V^2}{2g} = 1.22 \frac{4.64^2}{64.4}$$

$$= 1.56'$$

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

M-31

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment:

Solve For Actual Depth

24"

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0100 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.74 ft
Velocity.....	6.76 fps
Flow Area.....	1.05 sf
Critical Depth....	0.95 ft
Critical Slope....	0.0041 ft/ft
Percent Full.....	36.91 %
Full Capacity.....	24.51 cfs
QMAX @.94D.....	26.36 cfs
Froude Number.....	1.61 (flow is Supercritical)

$$0.74 + \frac{V^2}{2g} = 0.74 + \frac{6.76^2}{64.4}$$

$$= 1.45'$$

Open Channel Flow Module, Version 3.12 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment:

Solve For Actual Depth

24"

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0700 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.45 ft
Velocity.....	13.56 fps
Flow Area.....	0.52 sf
Critical Depth....	0.95 ft
Critical Slope....	0.0041 ft/ft
Percent Full.....	22.38 %
Full Capacity.....	64.84 cfs
QMAX @.94D.....	69.75 cfs
Froude Number.....	4.26 (flow is Supercritical)

$$0.45 + \frac{V^2}{2g} = 0.45 + \frac{13.56^2}{64.4}$$

$$= 3.31'$$

DRAINAGE REPORT FOR

VILLA CANELA

Prepared for:

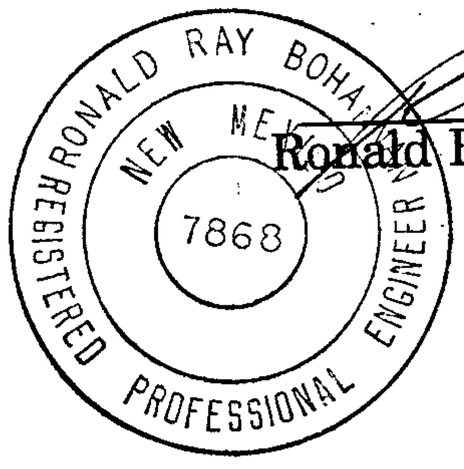
Gonzales Properties, Inc.
5925 Edith NE
Albuquerque, New Mexico 87107

Prepared by:

Tierra West Development Management Services
4600 Montgomery Boulevard, NE, Suite 3
Albuquerque, New Mexico 87109
(505) 883-7592

May 2, 1994

I certify this report was prepared under my supervision,
and I am a registered professional engineer in
the State of New Mexico in good standing.



Ronald R. Bohannan, P. E. No 7868

DRAINAGE REPORT

LEGAL DESCRIPTION

The project will consist of subdividing Lot 7A into ten parcels. The parcel is currently Lot 7A of the North Fourth Street Homesites Addition as filed in the office of the County Clerks on February 26, 1993, Book 93-C, Page 51, located on the south side of Montano Road between 4th Street and Guadalupe Trail.

SURVEY AND TOPOGRAPHY

A survey was performed in conjunction with this project and was prepared by Marquez Surveying Company on February 9, 1994, and elevations are based upon A.C.S. Monument Marked 14-F14 with a mean elevation of 4974.58. All elevations are to add 4900 on the grading plan. A temporary benchmark was set on the top of pipe at the southwestern property corner at 4974.58.

PROJECT DESCRIPTION AND METHOD

The site consists of 2.0357 acres located between 4th Street and Guadalupe Trail on the south side of Montano Road, located on zone atlas sheet F-14. The proposed project will consist of ten single family residential lots with a single public cul-de-sac running down the middle.

EXISTING CONDITIONS

The site is enclosed inside a fence that effectively eliminates any off-site flows entering and also captures the internal flows. The site is a typical North Valley lot that is very flat with little, if any, movement of storm water. The site lies on FEMA Panel 350002-0015 and lies within the 500 year flood plain, but outside any 100 year flood plain.

DESIGN METHOD

The method used will be and designated in Part A for smaller water sheds under 40 acres as described in the Design Procedures Manual. Also AMAFCA's AHYMO program according was used to calculate the 100-year, 24 hour storm for pond capacity. The site lies within Zone 2 for determination of precipitation. The design storm for Zone 2 is based upon the proposed solution.

PROPOSED CONDITION

The storm waters are being proposed to drain all lots to the public street. The street will be graded to drain in such a manner as to collect the flows in two drop inlets located in the middle of the project. The flows will then be routed in a storm sewer to a future 60 inch storm sewer being built by the City in Montano Road. In the interim, these flows will be routed to a temporary pond on Lot 1. Upon completion of the storm sewer in Montano, the pond in Lot 1 can be removed and the lot used for a residential residence.

SAMPLE CALCULATIONS

Land Treatments:

D = 50 %, & B = 50 %

Weighted E for the runoff.

$$\frac{50(0.78)}{100} + \frac{50(2.12)}{100}$$

= 1.45 inches

$\frac{1.45}{12}$ x 2.0357 x 43560 = 10,714.95 cubic feet = V_{360} = .25 Ac-Ft

Ten Day Storm

$$V_{10\ day} = 0.25 + A_D \times \frac{(P_{10} - P_{360})}{12}$$

$$= 0.25 + \frac{1.01785 \times (3.95 - 2.35)}{12}$$

= 0.39 Acre Feet = 16,989 cubic feet

Peak Discharge

$$Q_P = Q_{PB}A_B + Q_{PD}A_D$$

$$= 1.01785(2.28) + 1.01785(4.70)$$

= 7.11 cfs

AHYMO INFORMATION FOR INPUT FILE

The site is @ Zone 2, Area 2.0464 acres.

DEPTH (INCHES) @ 100-YEAR STORM:

P_{60} = 2.01 inches, P_{360} = 2.35 inches, P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM:

P_{60} = 2.01 x 0.667 = 1.34 inches

P_{360} = 1.57, P_{1140} = 1.83

Time of concentration:

T_c = 12 min,

$T_p = \frac{2}{3}T_c = \frac{2}{3}*12$ = 8 min = 0.1333 hr

$Q_{p\text{-}100yr}$ = 7.12 cfs, Vol. = 0.274 AC-FT

See Table 1 for drainage summary of the proposed and exiting runoffs.

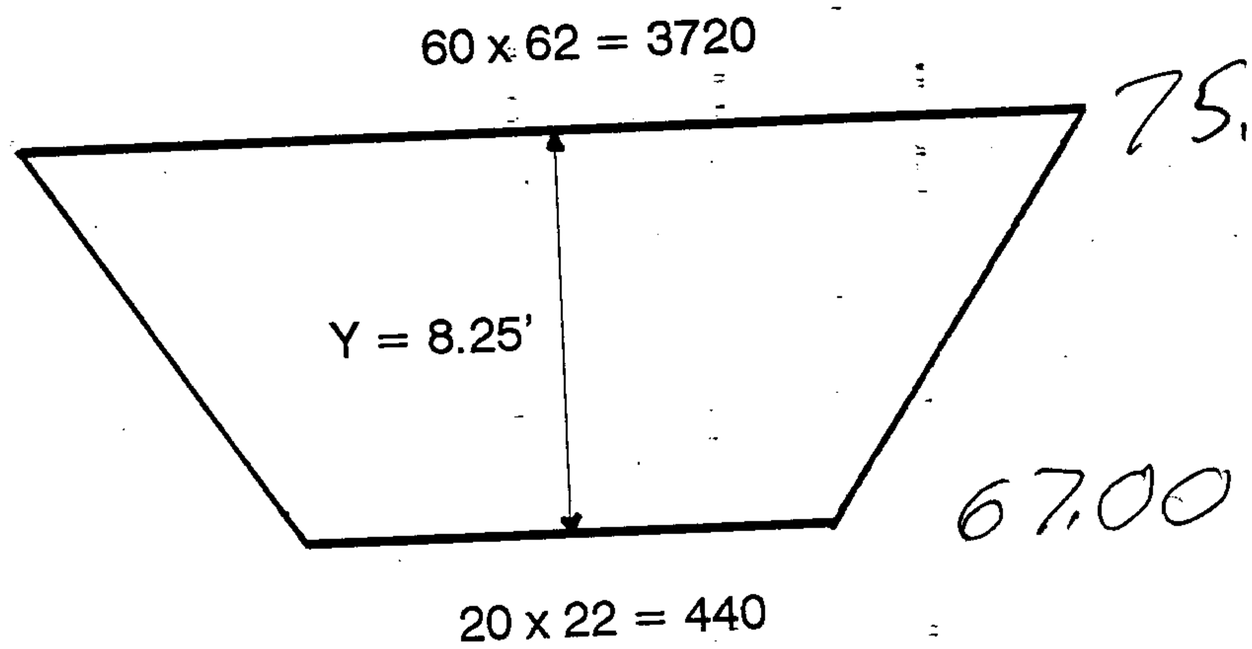
AHYMO SUMMARY TABLE

10 day not 24 hr

TABLE 1

AHYMO ID NO.	PROPOSED Q-100YR	PROPOSED V-100YR	AHYMO ID NO.	EXISTING Q-100YR	EXISTING V-100YR
101.10	7.12	0.274	101.20	4.64	0.132
	Q-10YR	V-10YR		Q-10YR	V-10YR
102.10	4.09	0.155	102.20	1.91	0.047

VOLUME OF THE POND



[3720 – 440] / 8.25 = 397.58 SF / FT

FOR EXAMPLE:

@ Y = 3

Cross-sectional Area = 440 + 397.58 * 3 = 1632.73 SF
Volume = [(1235.15 + 440) / 2] * 3 = 3109.09 CF

TABLE 2

depth	area SF	volume CF	volume AC-FT
1	837.58	638.79	0.01466
2	1235.15	1675.15	0.03846
3	1632.73	3109.09	0.07137
4	2030.30	4940.61	0.11342
5	2427.88	7169.70	0.16459
6	2825.45	9796.36	0.22489
7	3223.03	12820.61	0.29432
8	3620.61	16242.42	0.37287
8.25	3720.00	17160.00	**0.39394**

"VOLUME OF THE POND = 0.394 > V-10 DAY = 0.39 AC-FT"

Assume Inlet Submerged

$A_{net} = 4.2\ sf/grate$

$Q = .6(4.2)\sqrt{64.4(.33)} = 11.60\ cfs/grate$

4 grates Provided

Check Street Capacity & Grate Capacity.

MINIMUM CATCH BASIN DEPTH

(Catch Basins in Series)

First catch basin on the west side of the street:

$V_w = C.F. + 0.5 + 1.2\, V_1^2 / 2g + d_1$

$= \cancel{0.83}\ .56 + 1.2\,(4.06^2/64.4) + 1.5 = 2.64'$

Second catch basin on the east side of the street:

$V_e = C.F. + 0.5 + H_1 + 1.2\, V_2^2 / 2g + d_2$

$H_1 = 1.2/2g\,(V_1 + V_2) + (d_1 + d_2) < 0 \quad \therefore$ set $H_1 = 0$

$V_e = \cancel{0.83}\ .56 + 0 + 1.2\,(4.83^2/64.4) + 1.5 = 2.77'$

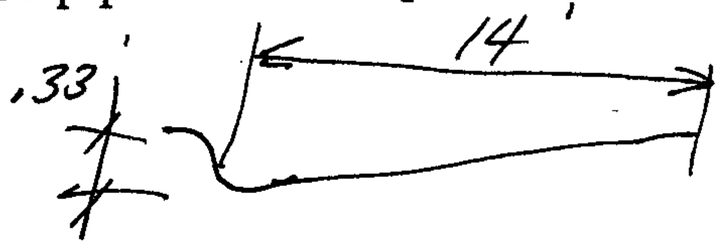
CHECKING PIPE AND EMERGENCY SPILLWAY CAPACITY

To check the pipe and emergency spillway capacity a computer program is run using Manning's Equation:

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

See the following sheet for pipe and emergency spillway calculations.

Also see Storm Sewer Plan and Profile Design Sheet for pipe sizes and ponding area.



$Q_{st} = 2(7.12)/3 = 4.75$ cfs

$A = 2(.33')14'/2 = 4.67$ sf

$P = (14 + .33)2 = 28.7'$

$Q = \frac{1.486}{.0017} \frac{(4.67)^{5/3}}{(28.7)^{2/3}} (.006)^{\frac{1}{2}} = 9.41$ cfs

13.05 .0775 9.37

$d = .28 \quad A = 3.92 \quad P = 28.6' \quad tw = 28'$

9.75

$Q = \frac{1.486}{.017} \frac{(3.92)^{5/3}}{(28.6)^{2/3}} (.006)^{1/2} = 7.08$ cfs

9.35

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN A TO B W/ 7.12/2 = 3.56 CFS

Solve For Actual Depth

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.0040 ft/ft
Manning's n.....	0.012
Discharge.....	3.56 cfs

Computed Results:

Depth.....	0.75 ft
Velocity.....	4.06 fps
Flow Area.....	0.88 sf
Critical Depth....	0.72 ft
Critical Slope....	0.0045 ft/ft
Percent Full.....	49.68 %
Full Capacity.....	7.20 cfs
QMAX @.94D.....	7.74 cfs
Froude Number.....	0.94 (flow is Subcritical)

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: CATCH BASIN B TO MH 1 W/ 7.12 CFS

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0040 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.95 ft
Velocity.....	4.83 fps
Flow Area.....	1.47 sf
Critical Depth....	0.95 ft
Critical Slope....	0.0041 ft/ft
Percent Full.....	47.59 %
Full Capacity.....	15.50 cfs
QMAX @.94D.....	16.67 cfs
Froude Number.....	0.99 (flow is-Subcritical)

Pipe Size & Slope is The Same For:

MH 1 To MH2 & MH 2 To The Ponding Area

Open Channel Flow Module, Version 3.12 (c) 1990
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Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name:

Comment: MH 2 TO EXISTING MH W/ 7.12 CFS

Solve For Actual Depth

Given Input Data:

Diameter.....	2.00 ft
Slope.....	0.0520 ft/ft
Manning's n.....	0.012
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.48 ft
Velocity.....	12.21 fps
Flow Area.....	0.58 sf
Critical Depth....	0.95 ft
Critical Slope....	0.0041 ft/ft
Percent Full.....	24.10 %
Full Capacity.....	55.89 cfs
QMAX @.94D.....	60.12 cfs
Froude Number.....	3.68 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name:

Comment: TRAPEZOIDAL EMERGENCY SPILLWAY @ THE POND

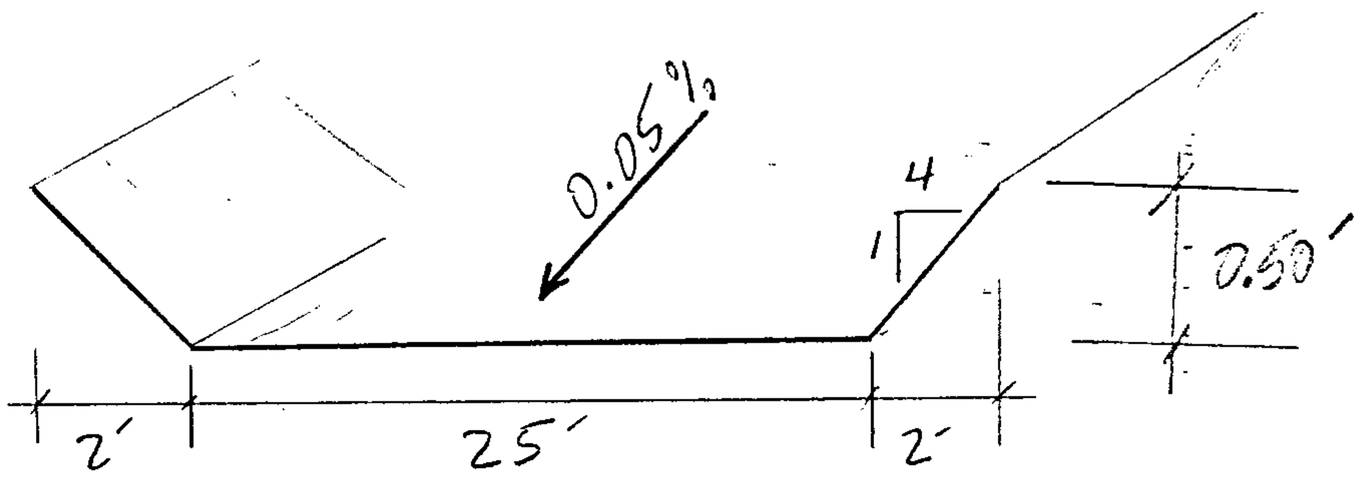
Solve For Depth

Given Input Data:

Bottom Width.....	25.00 ft
Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	4.00:1 (H:V)
Manning's n.....	0.030
Channel Slope....	0.0005 ft/ft
Discharge.....	7.12 cfs

Computed Results:

Depth.....	0.44 ft
Velocity.....	0.61 fps
Flow Area.....	11.68 sf
Flow Top Width...	28.49 ft
Wetted Perimeter.	28.60 ft
Critical Depth...	0.14 ft
Critical Slope...	0.0258 ft/ft
Froude Number....	0.17 (flow is Subcritical)



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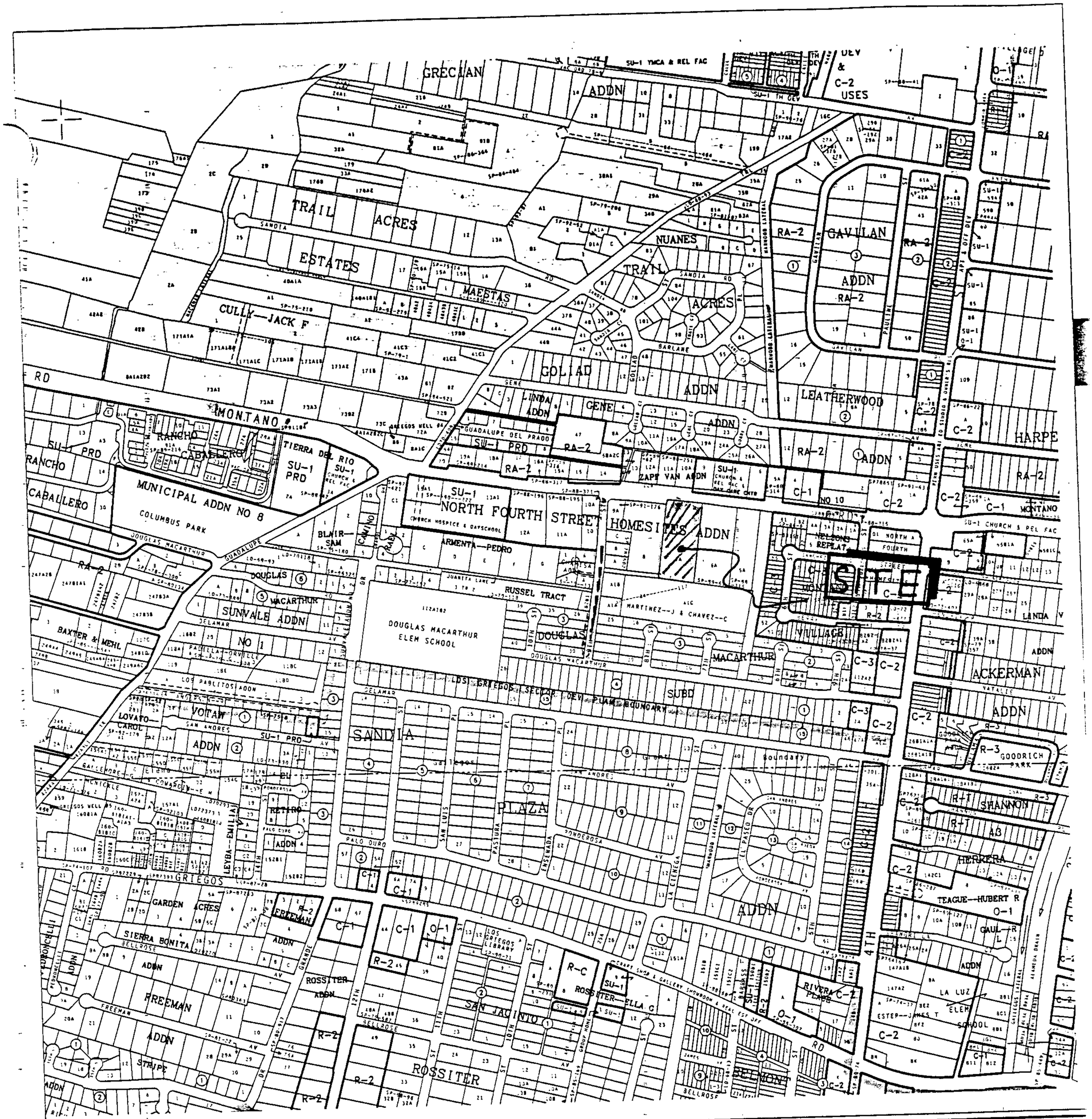
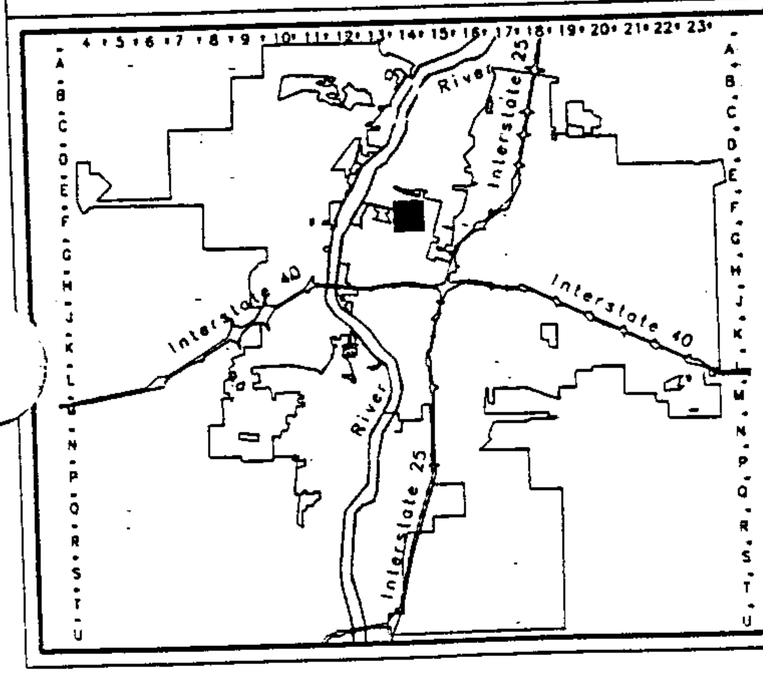
Check Weir

$Q = 2.7\ (25')(.4')^{3/2} = 17.1\ cfs$





North

750 375 0 750

Scale: 1" = 750'

Albuquerque Geographic Information System

City of Albuquerque

LEGAL DESCRIPTION

T11N

R3E

SEC 32

UNIFORM PROPERTY CODE

1-014-061

F-14-Z