



March 4, 1998

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

**RE: TIERRA VIVA SUBDIVISION (F14-D41). ENGINEER'S CERTIFICATION FOR
RELEASE OF FINANCIAL GUARANTEE. ENGINEER'S CERTIFICATION
DATED FEBRUARY 6, 1998.**

Dear Ms Hoelzer:

Based on the information provided on your February 9, 1998 submittal, City Hydrology accepts the Engineer's Certification of grading and drainage for Work Order number 556981.

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

Sincerely,



Lisa Ann Manwill, P.E.
Hydrology

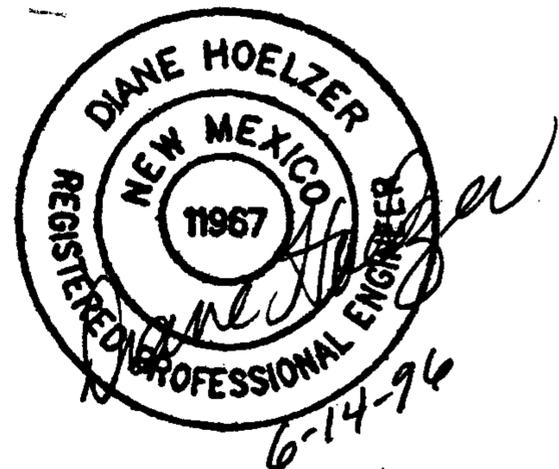
c: Terri Martin
Andrew Garcia
File



DRAINAGE REPORT
for
TIERRA VIVA SUBDIVISION

ZONE ATLAS MAP F-14

RECEIVED
JUN 17 1996



JUNE 1996

LOCATION AND DESCRIPTION

The proposed Tierra Viva subdivision is comprised of approximately 12 acres and is located north of Montano Road and west of Guadalupe Trail at the end of the Sandia Road cul-de-sac in the North Valley. The site is bounded by several residential homes on the east property line and undeveloped agricultural lands everywhere else. The topography of the project site and the general area is basically flat (2 foot relief in 3500 feet in a general southwest direction). The Hackman Lateral borders the east boundary of the site.

The FEMA map indicates that the site is not within a 100-year floodplain. Soils on site consists primarily of gila loam/gila clay loam with a Hydrologic Soil group Classification B.

DRAINAGE DESIGN CRITERIA AND ASSUMPTIONS

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 AHYMO model was used to analyze the 100-year 24-hour storm event for developed conditions using a Type 2 rainfall distribution in order to determine the required on site retention volume. Since the site lies within ZONE 2 (between Rio Grande and San Mateo), the following precipitation depths were used: P60=2.01" and P360=2.35".

The percent land treatment D was determined for impervious areas for roads, sidewalk, home pads and driveways from the total site area. The remaining pervious areas were split equally between land treatment B and C.

EXISTING DRAINAGE CONDITIONS

Under existing drainage conditions, runoff reaching the site basically ponds and infiltrates into the ground. The topography slopes at about 0.05% in the southwest direction.

PROPOSED DRAINAGE CONDITIONS

ON-SITE FLOWS

The drainage management plan for this project site is to retain 100% of the runoff volume generated on site for the 100-year 24-hour storm event. The volume will be ponded in the open space areas located in the individual lot backyards, sideyards and front yards. A maximum of a 4:1 slope will be allowed from the back yard property line to the pond bottom and from the lot pad to the pond bottom. A maximum slope of 5:1 will be allowed from the front yard sidewalk or curb to the pond bottom, depending on which condition applies. There will be no pond retainage slopes between adjacent property owner side yards and flow across side yard property line will not be restricted. Block walls constructed along the side yard property line will be with openings at grade to allow runoff to flow freely between lots to allow a shared and mutual peak water surface elevation among the lots.

The AHYMO analysis computed a peak 100-year 24-hour retainage volume of 1.61 acre-feet. The total available on site ponding area is 3.77 acres which results in a required ponding depth of 0.427 feet (5.1"). The design ponding depth used is 6 inches.

Each of the 36 lot pads will be graded to the same elevation at 4974.50 feet, MSL. This elevation will be 1.0 foot above the 100-year maximum ponded water surface elevation at 4973.50 feet. With a 6" ponding depth, the pond bottom elevation will be 4973.0 feet.



HYDROLOGIC DESIGN CRITERIA

+ RETENTION POND VOLUME FOR 100-YR 24-HR STORM

+ PRECIPITATION FOR ZONE 2 \Rightarrow $P_{60} = 2.01"$
 $P_{360} = 2.35"$
 $P_{1440} = 2.75"$

+ LAND TREATMENT VALUE CALCS.

Total Area of Project Site = 522,729.41 SF = 12 ACRES

Total Impervious Areas = 233,376.57

OTHER 289,352.84

Impervious Calcs.

Roads = 49,219.85

Sidewalks = 6226.72 (155668 x 4)

Homes = 3500 (10) = 35000

4000 (26) = 104,000

Driveway = 40 x 20W = 800

1271 x 30W = 38,130

233,376.57

\therefore LAND TREATMENT % D = 44.6%

C = 27.7%

B = 27.7%

A = 0

AHYMO RESULTS REQUIRED RETENTION VOLUME = 1.6098 AF

= 70,123 CF

$\frac{1.6098 \text{ AF} (43560 \text{ SF/AC})}{522,729.41 \text{ SF}} = \frac{0.134 \text{ Ft. Precip.}}{\text{Lot}}$

OFF-SITE FLOWS

Offsite flows will be prevented from entering the project site in several ways. Along the west boundary, extending from the southwest entrance road to the Hackman Lateral at the north end, a one course, 8" high concrete block wall will be constructed at existing grade to separate on-site and off-site flows. A water block will be created in the southwest entrance road to separate flows. The Hackman Lateral along the east property line has created a natural separation barrier between the on-site and off-site flows. The existing water block in Los Poblanos Road in this same area will be maintained.



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

PROJECT Tierra Viva Sub.
SUBJECT Hydrology Calcs
BY DLH DATE 6-13-96
CHECKED _____ DATE _____
SHEET 2 OF 2

TOTAL PONDING AREA AVAILABLE = 164,426.03 SF

$$\text{REQUIRED POND DEPTH} = \frac{70,123 \text{ CF}}{164,426.5 \text{ SF}} = 0.426' = 5.1''$$

USE DESIGN POND DEPTH = 0.50 FT = 6.0''

REQUIRED PAD ELEVATION = 1.0' ABOVE MAX WSEL.

$$\begin{array}{r} \text{POND BOTTOM ELEVATION} = 4974.50 \\ - 1.50 \\ \hline \underline{\underline{4973.00}} \end{array}$$

VIVADEV.OUT

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 06/11/1996
START TIME (HR:MIN:SEC) = 17:32:49 USER NO.= M_GOODWN.I01
INPUT FILE = VIVADEV.DAT

START TIME=0.0

***** TIERRA VIVA SUBDIVISION

***** 100-YEAR 24-HOUR STORM EVENT ZONE 2

***** JUNE 1996

***** FILE VIVADEV.DAT BY:DHOELZER

RAINFALL TYPE=2 RAIN QUARTER=0.0 IN

RAIN ONE=2.01 IN RAIN SIX=2.35 IN

RAIN DAY=2.75 IN DT=0.0333 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS
2 - PEAK AT 1.40 HR.

DT =	.033300 HOURS						END TIME =	19.946700 HOURS					
.0000	.0016	.0033	.0049	.0066	.0084	.0102							
.0120	.0139	.0158	.0178	.0198	.0219	.0241							
.0263	.0285	.0309	.0333	.0358	.0384	.0410							
.0438	.0467	.0497	.0528	.0561	.0595	.0630							
.0668	.0708	.0750	.0805	.0864	.0928	.1059							
.1359	.1822	.2488	.3398	.4596	.6124	.8028							
1.0352	1.2584	1.3500	1.4271	1.4955	1.5577	1.6150							
1.6682	1.7178	1.7644	1.8082	1.8495	1.8885	1.9255							
1.9605	1.9937	2.0252	2.0551	2.0835	2.0912	2.0972							
2.1030	2.1085	2.1137	2.1188	2.1236	2.1282	2.1327							
2.1370	2.1412	2.1452	2.1491	2.1529	2.1566	2.1602							

VIVADEV.OUT

2.1637	2.1671	2.1704	2.1737	2.1768	2.1799	2.1830
2.1859	2.1889	2.1917	2.1945	2.1973	2.2000	2.2026
2.2052	2.2078	2.2103	2.2128	2.2152	2.2176	2.2200
2.2223	2.2246	2.2268	2.2291	2.2313	2.2334	2.2356
2.2377	2.2397	2.2418	2.2438	2.2458	2.2478	2.2498
2.2517	2.2536	2.2555	2.2574	2.2592	2.2611	2.2629
2.2647	2.2664	2.2682	2.2699	2.2716	2.2733	2.2750
2.2767	2.2784	2.2800	2.2816	2.2832	2.2848	2.2864
2.2880	2.2895	2.2911	2.2926	2.2941	2.2956	2.2971
2.2986	2.3000	2.3015	2.3029	2.3044	2.3058	2.3072
2.3086	2.3100	2.3113	2.3127	2.3141	2.3154	2.3168
2.3181	2.3194	2.3207	2.3220	2.3233	2.3246	2.3259
2.3271	2.3284	2.3297	2.3309	2.3321	2.3334	2.3346
2.3358	2.3370	2.3382	2.3394	2.3406	2.3418	2.3429
2.3441	2.3452	2.3464	2.3475	2.3487	2.3498	2.3509
2.3521	2.3532	2.3544	2.3555	2.3566	2.3578	2.3589
2.3600	2.3612	2.3623	2.3634	2.3645	2.3656	2.3667
2.3678	2.3689	2.3700	2.3711	2.3722	2.3733	2.3744
2.3755	2.3766	2.3777	2.3788	2.3799	2.3809	2.3820
2.3831	2.3842	2.3852	2.3863	2.3874	2.3884	2.3895
2.3905	2.3916	2.3926	2.3937	2.3947	2.3958	2.3968
2.3978	2.3989	2.3999	2.4010	2.4020	2.4030	2.4040
2.4051	2.4061	2.4071	2.4081	2.4091	2.4101	2.4112
2.4122	2.4132	2.4142	2.4152	2.4162	2.4172	2.4182
2.4192	2.4202	2.4211	2.4221	2.4231	2.4241	2.4251
2.4261	2.4270	2.4280	2.4290	2.4300	2.4309	2.4319
2.4329	2.4338	2.4348	2.4358	2.4367	2.4377	2.4386
2.4396	2.4405	2.4415	2.4424	2.4434	2.4443	2.4452
2.4462	2.4471	2.4481	2.4490	2.4499	2.4509	2.4518
2.4527	2.4536	2.4546	2.4555	2.4564	2.4573	2.4582
2.4591	2.4601	2.4610	2.4619	2.4628	2.4637	2.4646
2.4655	2.4664	2.4673	2.4682	2.4691	2.4700	2.4709
2.4718	2.4727	2.4735	2.4744	2.4753	2.4762	2.4771
2.4779	2.4788	2.4797	2.4806	2.4815	2.4823	2.4832
2.4841	2.4849	2.4858	2.4867	2.4875	2.4884	2.4892
2.4901	2.4909	2.4918	2.4927	2.4935	2.4944	2.4952
2.4961	2.4969	2.4977	2.4986	2.4994	2.5003	2.5011
2.5019	2.5028	2.5036	2.5044	2.5053	2.5061	2.5069

VIVADEV.OUT

2.5078	2.5086	2.5094	2.5102	2.5110	2.5119	2.5127
2.5135	2.5143	2.5151	2.5159	2.5168	2.5176	2.5184
2.5192	2.5200	2.5208	2.5216	2.5224	2.5232	2.5240
2.5248	2.5256	2.5264	2.5272	2.5280	2.5288	2.5296
2.5304	2.5311	2.5319	2.5327	2.5335	2.5343	2.5351
2.5358	2.5366	2.5374	2.5382	2.5390	2.5397	2.5405
2.5413	2.5420	2.5428	2.5436	2.5443	2.5451	2.5459
2.5466	2.5474	2.5482	2.5489	2.5497	2.5504	2.5512
2.5520	2.5527	2.5535	2.5542	2.5550	2.5557	2.5565
2.5572	2.5580	2.5587	2.5594	2.5602	2.5609	2.5617
2.5624	2.5631	2.5639	2.5646	2.5654	2.5661	2.5668
2.5676	2.5683	2.5690	2.5697	2.5705	2.5712	2.5719
2.5726	2.5734	2.5741	2.5748	2.5755	2.5763	2.5770
2.5777	2.5784	2.5791	2.5798	2.5805	2.5813	2.5820
2.5827	2.5834	2.5841	2.5848	2.5855	2.5862	2.5869
2.5876	2.5883	2.5890	2.5897	2.5904	2.5911	2.5918
2.5925	2.5932	2.5939	2.5946	2.5953	2.5960	2.5967
2.5974	2.5980	2.5987	2.5994	2.6001	2.6008	2.6015
2.6022	2.6028	2.6035	2.6042	2.6049	2.6056	2.6062
2.6069	2.6076	2.6083	2.6089	2.6096	2.6103	2.6109
2.6116	2.6123	2.6130	2.6136	2.6143	2.6150	2.6156
2.6163	2.6169	2.6176	2.6183	2.6189	2.6196	2.6202
2.6209	2.6216	2.6222	2.6229	2.6235	2.6242	2.6248
2.6255	2.6261	2.6268	2.6274	2.6281	2.6287	2.6294
2.6300	2.6307	2.6313	2.6319	2.6326	2.6332	2.6339
2.6345	2.6352	2.6358	2.6364	2.6371	2.6377	2.6383
2.6390	2.6396	2.6402	2.6409	2.6415	2.6421	2.6428
2.6434	2.6440	2.6446	2.6453	2.6459	2.6465	2.6471
2.6478	2.6484	2.6490	2.6496	2.6503	2.6509	2.6515
2.6521	2.6527	2.6533	2.6540	2.6546	2.6552	2.6558
2.6564	2.6570	2.6576	2.6582	2.6589	2.6595	2.6601
2.6607	2.6613	2.6619	2.6625	2.6631	2.6637	2.6643
2.6649	2.6655	2.6661	2.6667	2.6673	2.6679	2.6685
2.6691	2.6697	2.6703	2.6709	2.6715	2.6721	2.6727
2.6733	2.6739	2.6745	2.6751	2.6756	2.6762	2.6768
2.6774	2.6780	2.6786	2.6792	2.6798	2.6803	2.6809
2.6815	2.6821	2.6827	2.6833	2.6838		

VIVADEV.OUT

***** EXISTING CONDITIONS

COMPUTE NM HYD ID=1 HYD NO=100.0 AREA=0.01875 SQ MI

PER A=100 PER B=0 PER C=0 PER D=0

TP=0.1333 HR MASS RAINFALL=-1

K = .160154HR TP = .133300HR K/TP RATIO = 1.201459 SHA
PE CONSTANT, N = 2.957910

UNIT PEAK = 39.156 CFS UNIT VOLUME = .9994 B = 278.
37 P60 = 2.0100

AREA = .018750 SQ MI IA = .65000 INCHES INF = 1.67000
INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 100.00

RUNOFF VOLUME = .53109 INCHES = .5311 ACRE-FEET
PEAK DISCHARGE RATE = 18.69 CFS AT 1.532 HOURS BASIN AREA =
.0188 SQ. MI.

***** PROPOSED CONDITIONS

COMPUTE NM HYD ID=1 HYD NO=100.0 AREA=0.01875 SQ MI

PER A=0 PER B=27.7 PER C=27.7 PER D=44.6

TP=0.1333 HR MASS RAINFALL=-1

VIVADEV.OUT

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHA
PE CONSTANT, N = 7.106420
UNIT PEAK = 33.016 CFS UNIT VOLUME = .9990 B = 526.
28 P60 = 2.0100
AREA = .008362 SQ MI IA = .10000 INCHES INF = .04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

K = .119767HR TP = .133300HR K/TP RATIO = .898476 SHA
PE CONSTANT, N = 3.944947
UNIT PEAK = 27.390 CFS UNIT VOLUME = 1.000 B = 351.
48 P60 = 2.0100
AREA = .010388 SQ MI IA = .42500 INCHES INF = 1.04000
INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - D
T = .033300

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 100.00

RUNOFF VOLUME = 1.60984 INCHES = 1.6098 ACRE-FEET
PEAK DISCHARGE RATE = 43.05 CFS AT 1.499 HOURS BASIN AREA =
.0188 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 17:32:54



D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS & SURVEYORS

PROJECT Tierra Viva Subd.
SUBJECT Drainage
BY AMM DATE 4-19-96
CHECKED _____ DATE _____
SHEET _____ OF _____

Per the pre-design meeting for this site, we are ponding developed runoff on individual lots in between bldgs. Ponding in these areas total the following:

Site Area	12 Ac (522,710 SF)
- Building Pads	- 139,400 SF
- Driveways	- 21,600 SF
- Streets	- 61,800 SF
- Ditch/Trail	- 13,440 SF

215,260 SF (Area @ Pond Top)

149,560 SF (Area @ Pond Bottom)

182,410 SF Avg Pond Area

Ponding area is proposed to be 0.33 ft deep. This provides for a volume of 60,195 CF. From AHJMO, this is compared to an anticipated volume generated of 59,959 CF. As shown by detail on the plan, flat grading will be employed to accommodate the runoff. Pads are to be set 12 inches above the maximum anticipated water surface. In lieu of a ditch along the west property line we have placed curb to contain on-site and block off site flow. Proposed ditch along interior road has been removed. Covenants will be addressed later.

APR 22 1996

9/24/91

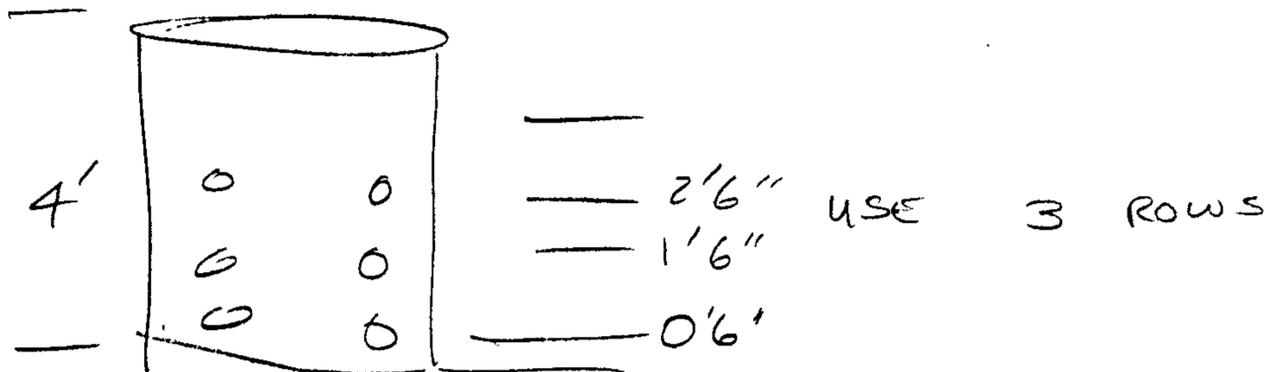
243-02-034

32-08-134

MTY

SKETCH OUT ARRANGEMENT OF HOLES FOR CMA
RISER

$$Q_{TOT} = 3 \text{ CFS}$$



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

$$\text{USE } C = 0.65$$

$$Q = CA\sqrt{2g \cdot 2.5} + CA\sqrt{2g \cdot 1.5} + CA\sqrt{2g \cdot 0.5}$$

SOLVE FOR A

$$A = 0.164 \text{ ft}^2 \text{ (PER ROW)}$$

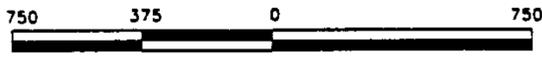
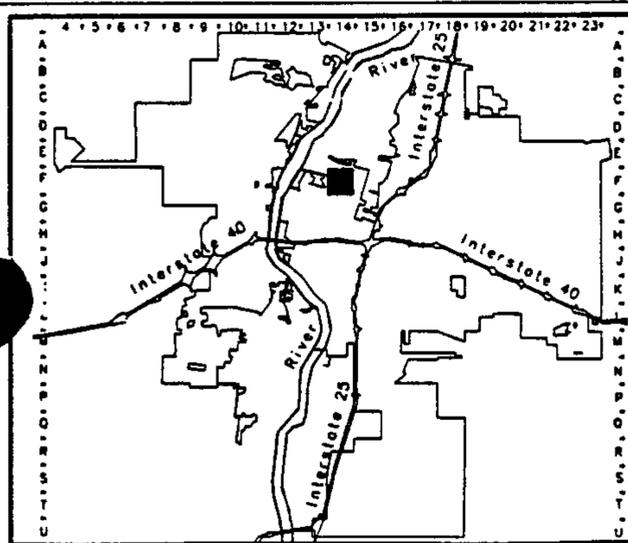
$$\text{SAY 4 HOLES, EACH HOLE} = \frac{0.164}{4} = .041 \text{ ft}^2 \\ = 5.894 \text{ in}^2$$

$$5.894 = \pi R^2$$

$$R = \left(\frac{5.894}{\pi} \right)^{1/2} = 1.370", \text{ say } 1.5" \text{ RADIUS} \\ \text{(3" DIAMETER)}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS





Scale: 1" = 750'

A G I S
 Albuquerque Geographic Information System
 City of Albuquerque

© Planning Department July 02, 1993

FIGURE 1

LEGAL DESCRIPTION

T11N

R3E

SEC 32

UNIFORM PROPERTY CODE

1-014-061

F-14-Z

Cherne, Curtis

From: Cherne, Curtis
Sent: Thursday, December 15, 2011 11:22 AM
To: Connor, Francis J.; Biazar, Shahab; Sims, Timothy E.
Subject: 5920 Tierra Viva PI NW

Francis,
I performed a site visit today at the above address as well as looked at the most of the subdivision. There is a general non-compliance throughout the entire subdivision. Some folks have been in "pocket" ponds, but the volume is far below what is required.

I see no reason to hold the CO on the above mentioned address. The home was not built high enough, so it would be in the homeowners best interest to provide some water harvesting areas when the property is landscaped.

The lot to the south of this one appears to be high. There was evidence of "crust" near the south edge at the high elevation, which leaves me to believe the area was not recently filled.

Curtis Cherne, P.E., CFM
Principal Engineer
Hydrology Section
Planning Dept.
City of Albuquerque
505-924-3986

