○ KEYED NOTES

1. EXISTING STD CURB & GUTTER
2. EXISTING 4' SIDEWALK
3. 6" CMU GARDEN WALL
4. CONSTRUCT 24' CONC. DRIVEPAD PER COA STD DWG 2425
5. MOUNTABLE CURB & GUTTER PER COA STD DWG 2415
6. CONCRETE GUTTER PER SECTION (E/3)
7. WOOD FENCE
8. 3' SIDEWALK
9. CONCRETE DRIVE
10. LANDSCAPING
11. DIRECTION OF ROOF DRAINAGE
12. POND OUTLET & OVERFLOW SPILLWAY SEE SECTION (C/4)
13. CONCRETE RUNDOWN SEE SECTION (B/3)
14. PERIMETER FENCE AROUND POND
15. CONCRETE VALLEY GUTTER PER COA STD DWG 2421
16. EXISTING SOLID WALL

COLLEGE HEIGHTS UNIT 4

VALLE VISTA, N.W.

CANADA VISTA PL. NW

1 inch = 20 ft.

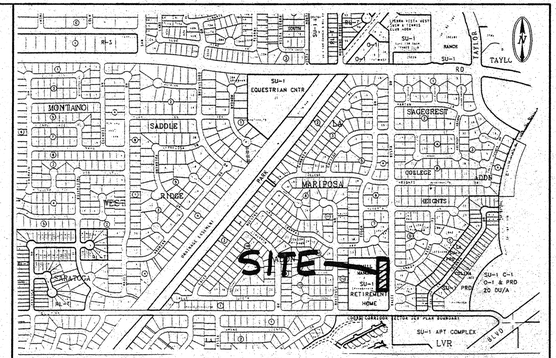
ENGINEER'S CERTIFICATION

I, the undersigned, being a Professional Engineer in the State of New Mexico, do hereby certify that this drawing was prepared by me or under my supervision, and that the as-built information shown hereon is based on actual field measurements and inspection performed by Brasher & Lorenz, Inc. I further certify that the as-built condition of the site is in substantial compliance with the approved Grading and Drainage Plan prepared by Brasher & Lorenz, Inc., dated April 30, 1997.

Dennis A. Lorenz, NMPE 9847 — Date 7.7.97

DENNIS A. LORENZ — NEW MEXICO — 9847 — REGISTERED PROFESSIONAL ENGINEER

FLOODWAY MAP 1"=500'



E-11 LOCATION MAP 1"=800'

CURVE DATA		
CURVE	RADIUS	LENGTH
C1	16.50'	25.89'
C2	11.50'	36.13'
C3	13.50'	42.41'
C4	14.50'	22.80'
C5	10.00'	15.72'
C6	12.00'	18.87'

HAMMERHEAD TOP OF CURB ELEVATIONS				
	NO.	ELEV	NO.	ELEV
14.56	①	~~13.94~~	⑦	~~13.32~~ FL 13.79
14.51	②	~~13.91~~	⑧	~~13.70~~ TA 13.95
14.16	③	~~13.71~~	⑨	~~14.00~~ TA 14.29
14.35	④	~~14.01~~	⑩	~~13.85~~ TA 14.23
14.81	⑤	~~14.23~~	⑪	~~13.50~~ FL 14.06
14.78	⑥	~~14.19~~	⑫	13.73 FL

LEGEND

- —— 6001 —— EXISTING CONTOUR ELEVATION
- 02.5 × EXISTING SPOT ELEVATION
- —— 01 —— PROPOSED CONTOUR ELEVATION
- — · · — PROPERTY LINE
- 01.5 ◆ PROPOSED SPOT ELEVATION
- ←—— DIRECTION OF FLOW
- ←—— DRAINAGE SWALE
- ····· DRAINAGE BASIN DIVIDE

PROPERTY ADDRESS

Valle Vista NW

LEGAL DESCRIPTION

Lots 1-3 Windmill Manor

PROJECT BENCHMARK

TBM: Top of existing concrete retaining wall at existing residence. Elev= 5110.74 ft

SURVEY

Topographic and Field Measurement by Precision Surveys Inc. Dated May, 1996

⚠ REMOVED BASIN B VALLEY GUTTER
REVISED DET POND VOLUME & WSE 4/30/97 D.A.L.

② AS-BUILT CERT DL 7-7-97

JUL 07 1997 HYDROLOGY SECTION

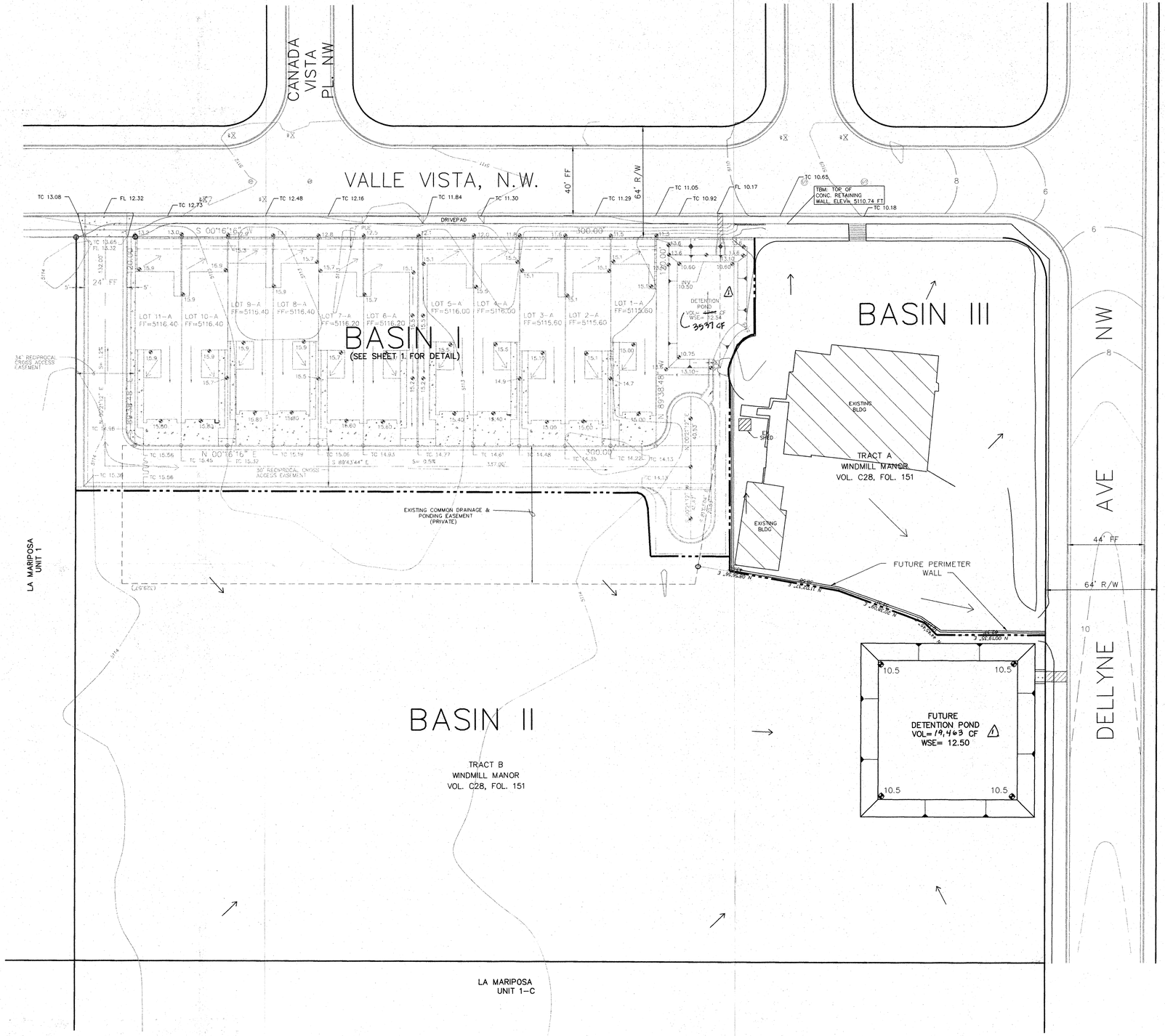
WINDMILL MANOR ESTATES

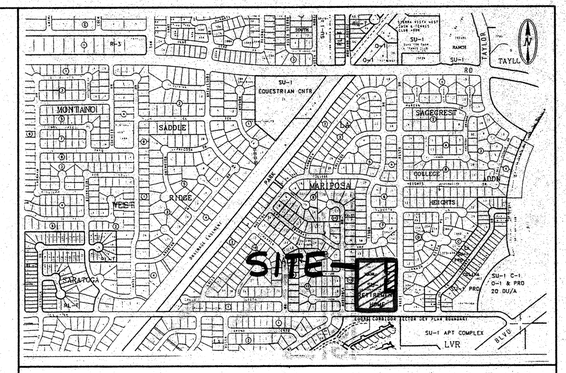
GRADING & DRAINAGE PLAN

DENNIS A. LORENZ — NEW MEXICO — 9847 — REGISTERED PROFESSIONAL ENGINEER — 7-7-97

BRASHER & LORENZ, INC.
Consulting Engineers
2201 San Pedro NE Building 1 Suite 210
Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

DRAWN BY: D.D.E.	DATE: APRIL, 1997
CHECKED BY: D.A.L.	
FILE: 6023G-D.DWG	SHEET 1 OF 4





E-11 LOCATION MAP 1"=800'

30 0 15 30

1 inch = 30 ft.

LEGEND

- 6001 — EXISTING CONTOUR ELEVATION
- 02.5 × EXISTING SPOT ELEVATION
- 01 — PROPOSED CONTOUR ELEVATION
- PROPERTY LINE
- 01.5 PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- DRAINAGE SWALE
- DRAINAGE BASIN DIVIDE

⚠1 REV POND VOLS. 7-7-97 DL

JUL 07 1997 HYDROLOGY SECTION

WINDMILL MANOR

DRAINAGE MASTERPLAN UPDATE

DENNIS A. LORENZ NEW MEXICO 9644 REGISTERED PROFESSIONAL ENGINEER 4/30/97 7-7-97

BRASHER & LORENZ, INC.
Consulting Engineers
2201 San Pedro NE Building 1 Suite 210
Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

DRAWN BY: D.D.E.	DATE: APRIL, 1997
CHECKED BY: D.A.L.	SHEET 4 OF 4
FILE: 6023-STE.DWG	

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LIST OF FIGURES AND EXHIBITS

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The property is to be developed as **Windmill Manor Estates**, an 11 lot residential subdivision, with associated paving, landscaping, utility, grading, and drainage improvements. The scope of this plan is to provide drainage criteria for the safe management of excess runoff, and design detail for the construction of the required grading, paving and drainage improvements.

EXISTING CONDITIONS

The project site is approximately 0.83 acres in size and is located on Valle Vista Drive NW, just north of Dellyne Avenue NW. Presently the site is undeveloped. Site topography slopes from north to south at approximately 2 percent. The site is covered with native grasses and vegetation. The site is classified as an infill project. The site is bounded by Valle Vista Drive on the east, developed residential (single family) on the north and south, and undeveloped residential on the west. No off-site flows impact the site. The undeveloped land to the west drains south to Dellyne Avenue. The existing residential properties located north and south drain to Valle Vista Drive.

All runoff from the area drains to Dellyne Avenue, then eastward to Coors. At Coors runoff is intercepted by an existing 36 inch storm drain which flows north and then east, at Montano, to the Rio Grande.

As shown by the attached Floodway Panel, this site does not lie within a designated flood hazard zone.

EXISTING DRAINAGE MASTERPLANS

The drainage criteria for this site was established by the "North Coors Drainage Management Plan" (NCDMP), prepared for AMAFCA by Scanlon & Associates. Per the DMP discharge from the project site is limited to 0.25 cfs per acre.

Subsequent drainage reports have been prepared for development projects in the area. The "Drainage Report for Taylor Ranch, Tract R-1", by Issacson & Arfman, PA outlines the drainage management criteria for approximately 62 acres of residential property along Coors between Dellyne and Montano. Taylor Ranch Tract R-1 improvements include storm drains and detention ponds located along Coors which drain to the existing storm drain system.

The original Drainage report for the Windmill Manor Subdivision, prepared by Gardner

LOCATION MAP
Figure 1

Mason & Associates (E11/D14A), recommended interim on-site retention ponding. As a result, an interim retention pond easement exists on Tract "B" immediately west of **Windmill Manor Estates.** Recently constructed downstream improvements made per the NCDMP make the retention pond concept unnecessary.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the property into an 11 lot residential subdivision. The Plan shows the elevations required to properly grade and construct the recommended improvements. The direction of drainage flows are given by flow arrows and on-site drainage basins are identified.

In accordance with the approved Drainage Masterplans all runoff generated by the project site will be routed through detention ponds to be located at the south end of the site. All flows are to be managed on-site by the improvements recommended by this plan. The On-site basins are managed as follows:

1. Basin "A" consists of the bulk of the project area which drains to the private road to be constructed along the west side of the project. The road will drain south to the detention pond.

2. Basin "B" consists of the front yard areas which will drain directly to Valle Vista.

3. Basin "C" consists of a portion of the private road, which by virtue of topography, drains to Valle Vista without being routed through the detention pond.

The Basin "A" detention pond is designed to drain at a controlled rate of 0.33 cfs, which results in a storage requirement of 0.1089 acre feet. An emergency spillway is provided in the event the pond drain clogs. The existing undeveloped flowrate is estimated at 1.70 cfs. Development of this project results in a flowrate of 1.47 cfs, which includes free discharge of Basins "B" and "C" and controlled release from the detention pond.

Per the Masterplans, discharge from the project is limited to 0.25 cfs/acre (0.25cfs/ac x 1.31 ac = 0.33 cfs). **Windmill Manor Estates** (Basin I) discharges 1.47 cfs, an excess of 1.14 cfs. To allow for this, the future development of Tract "B" (Basin II) will provide additional storage equal to the volume discharged by Basin "B" and "C". As shown by the Plan (sheet 3) the existing natural playa located on Tract "B" will remain in place to serve as an interim pond. The playa has capacity to store in excess of the undeveloped 100 year 6 hour volume. Future development of Tract "B" will relocate the pond to the south end of the parcel (see sheet 4).

DRAINAGE MASTERPLAN UPDATE

Since downstream improvements allow discharge from WIndmill Manor this report updates the original Drainage Report prepared by Gardner Mason & Associates, which recommended on-site retention ponding. Per the NCDMP the site may discharge at 0.25 cfs/acre. Sheet 3 is provided to outline ponding criteria for Tract "B", Windmill Manor. The Plan recommends a detention pond located at the west end of Tract "B", adjacent to Dellyne Avenue. The pond will drain to Dellyne at a controlled rate of 0.25 cfs/acre, per the NCDMP. Complete pond routing calculations are provided for review (See Appendix).

The Drainage Masterplan Update is provided to establish ponding criteria for **Windmill Manor Estates** and Windmill Manor, Tract "B". The update allows development of **Windmill Manor Estates** and provides drainage management criteria for Tract "B". A site specific drainage plan will be required for the development of Tract "B".

TEMPORARY EROSION CONTROL PLAN

1. The intent of this temporary erosion control plan is to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction.

2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.

3. After the initial site clearing, the detention ponding area should be rough graded to create a storage area for excess runoff and sediment.

4. Temporary erosion control berms should be constructed along the north, east and west project boundaries per Detail A/3 to direct excess runoff to the ponding area.

5. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

CALCULATIONS

The calculations shown herein define the 100 year/6 hour design storm falling with the project area under existing and developed conditions. The Hydrology is per "Section 22.2, Part A, DPM, Vol 2" Dated January 1993. Calculations are provided to demonstrate on-site improvement capacities and downstream capacity.

AS-BUILT CONDITIONS

As shown by the As-Built Plan (Pocket), the actual storage volume provided by Pond A is less than recommended by the Plan. A deficit of 1207 cubic feet of storage exists which will be handled by ponding off-site. An interim pond will be provided on Tract "B" to store the unponded portion on Basin I. Future development of Tract "B" will provide permanent storage for this volume.

INTERIM BASIN II (TRACT 'B') POND

Since Basin I exceeds the allowable discharge (per the Masterplan), provide an interim pond on Tract "B" to store volume from Basins A and B, plus the Basin A pond deficit:

Basin A: Vol = 880 cf

Basin B: Vol = 788 cf

Pond A deficit = 1207 cf

Total interim pond requirement = 2,895 cf

INTERIM POND DESIGN

Due to the existing site topography a natural playa exists in Tract "B". As shown by the Plan (sheet 3) the playa easily provides storage for Basin II undeveloped flow as well as the unponded portion of Basin I. The natural playa shall serve as the interim pond for Phase I. The undeveloped Basin II water surface is plotted on the Plan.

FUTURE TRACT 'B ' POND

As shown by the attached calculations and AHYMO output, the recommended storage volume for Tract "B" is 16,588 cubic feet. Additional storage will be provided to detain the Pond A deficit (1207 cf) and unponded Basins B and C (1668 cf) for a total future ponding requirement of 19,463 cubic feet.

AS-BUILT CONDITIONS

As shown by the As-Built Plan (Pocket), the actual storage volume provided by Pond A is less than recommended by the Plan. A deficit of 1207 cubic feet of storage exists which will be handled by ponding off-site. An interim pond will be provided on Tract "B" to store the unponded portion on Basin I. Future development of Tract "B" will provide permanent storage for this volume.

INTERIM BASIN II (TRACT 'B') POND

Since Basin I exceeds the allowable discharge (per the Masterplan), provide an interim pond on Tract "B" to store volume from Basins A and B, plus the Basin A pond deficit:

Basin A: Vol = 880 cf

Basin B: Vol = 788 cf

Pond A deficit = 1207 cf

Total interim pond requirement = 2,895 cf

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Due to the existing site topography a natural playa exists in Tract "B". As shown by the Plan (sheet 3) the playa easily provides storage for Basin II undeveloped flow as well as the unponded portion of Basin I. The natural playa shall serve as the interim pond for Phase I. The undeveloped Basin II water surface is plotted on the Plan.

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CITY OF
Albuquerque

P.O. Box 1293 Albuquerque, NM 87103

November 8, 1996

Martin J. Chávez, Mayor

Dennis A. Lorenz, PE
Brasher & Lorenz, Inc.
2201 San Pedro NE, Bldg 1, Suite 210
Albuquerque, NM 87110

RE: DRAINAGE REPORT FOR WINDMILL MANOR ESTATES (E-11/D14B)
RECEIVED OCTOBER 29, 1996 FOR SITE DEV PLAN & PRELIMINARY PLAT
ENGINEER'S STAMP DATED 10-25-96

Dear Mr. Lorenz:

Based on the information included in the submittal referenced above, City Hydrology accepts the drainage report for site development plan & preliminary plat. The following comments must be addressed before Final Plat & Work Order:

It is City Hydrology's understanding that Basin A includes the portion of the easements that drain to the pond. The outlet from the pond was analyzed as a 3" pipe instead of a 4" pipe. If the sidewalk culvert is constructed as part of a Work Order then a S.O.19 is not required. Execute a "Private Facility Drainage Covenant" (copy attached) for the detention pond and submit it to the City for processing & recording.

Indicate how the fence crosses the 2' valley gutter in sections F & G. Richard Dourte would like to discuss how you plan to fit a 24' F-F street section in a 24' easement.

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin

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

c: Andrew Garcia
Fred Aguirre, DRB 96-355
Joe Gamble, 2900 Broadway SE 87102

CITY OF
Albuquerque
P.O. Box 1293 Albuquerque, NM 87103

June 2, 1997

Martin J. Chávez, Mayor

Dennis A. Lorenz, PE
Brasher & Lorenz, Inc.
2201 San Pedro NE, Bldg 1, Suite 210
Albuquerque, NM 87110

RE: DRAINAGE REPORT FOR WINDMILL MANOR ESTATES (E-11/D14B)
RECEIVED MAY 6, 1997 FOR SITE DEV PLAN & FINAL PLAT
ENGINEER'S STAMP DATED 4-30-97

Dear Mr. Lorenz:

It is City Hydrology's understanding that this submittal contains construction revisions after the Site Plan & Final Plat were approved by DRB. Therefore, it is recommended that the following comments be addressed as part of the Engineer's Certification:

City Hydrology has not received a copy of the executed "Private Facility Drainage Covenant" for the detention pond. It must be processed by the City & recorded before the Financial Guaranty will be released.

Revise the AHYMO to indicate as-built conditions. Since Basins IB & IC peak before the ponds, the hydrograph must be added to determine the peak for Basins I & II.

Verify the grade change along Valle Vista. If it exceeds 18" (1.5'), Then the Grading Plan must be submitted to DRB for a public hearing.

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

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

c: Andrew Garcia

CITY OF
Albuquerque

July 30, 1997

Martin J. Chávez, Mayor

Dennis A. Lorenz, P.E.
Brasher & Lorenz
2201 San Pedro NE
Building 1, Suite 210
Albuquerque, NM 87110

RE: WINDMILL MANOR ESTATES (E11-D14B). AMENDED DRAINAGE PLAN AND ENGINEER'S CERTIFICATION FOR GRADING PLAN APPROVAL AND RELEASE OF FINANCIAL GUARANTY. ENGINEER'S STAMP DATED 7-7-97. ENGINEER'S CERTIFICATION DATED 7-7-97.

Dear Mr. Lorenz:

Based on the updated information provided on your July 7, 1997 submittal and your letter dated, July 28, 1997 the above referenced project is approved for grading plan.

Hydrology accepts the Engineer's Certification of grading and drainage for release of financial guarantees.

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

Sincerely,

Lisa Ann Manwill, P.E.
Engineering Assoc./Hyd.

c: Andrew Garcia
File

CITY OF ALBUQUERQUE

March 4, 2005

Mr. Fred C. Arfman, PE
ISAACSON & ARFMAN, PA
128 Monroe St. NE
Albuquerque, NM 87108

RE: WINDMILL MANOR PLACE SUBDIVISION (E-11/D14B)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 04/23/2004
Engineers Certification dated 03/03/2005

Dear Fred:

Based upon the information provided in your Engineer's Certification Submittal dated 03/03/2005, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V Portillo

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 732481
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 17, 2003

Genevieve Donart, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Windmill Manor Place Drainage Report
Engineer's Stamp dated 11-21-03, (B18/D7)

Dear Ms. Donart,

Based upon the information provided in your submittal dated 11-21-03, the above referenced report is approved for Preliminary Plat action by the DRB.

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

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

DRAINAGE REPORT

FOR

WINDMILL MANOR ESTATES

A 21-LOT SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
NOVEMBER, 2003

Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

Genevieve L. Donart 11/21/03

Genevieve L. Donart, PE **Date**

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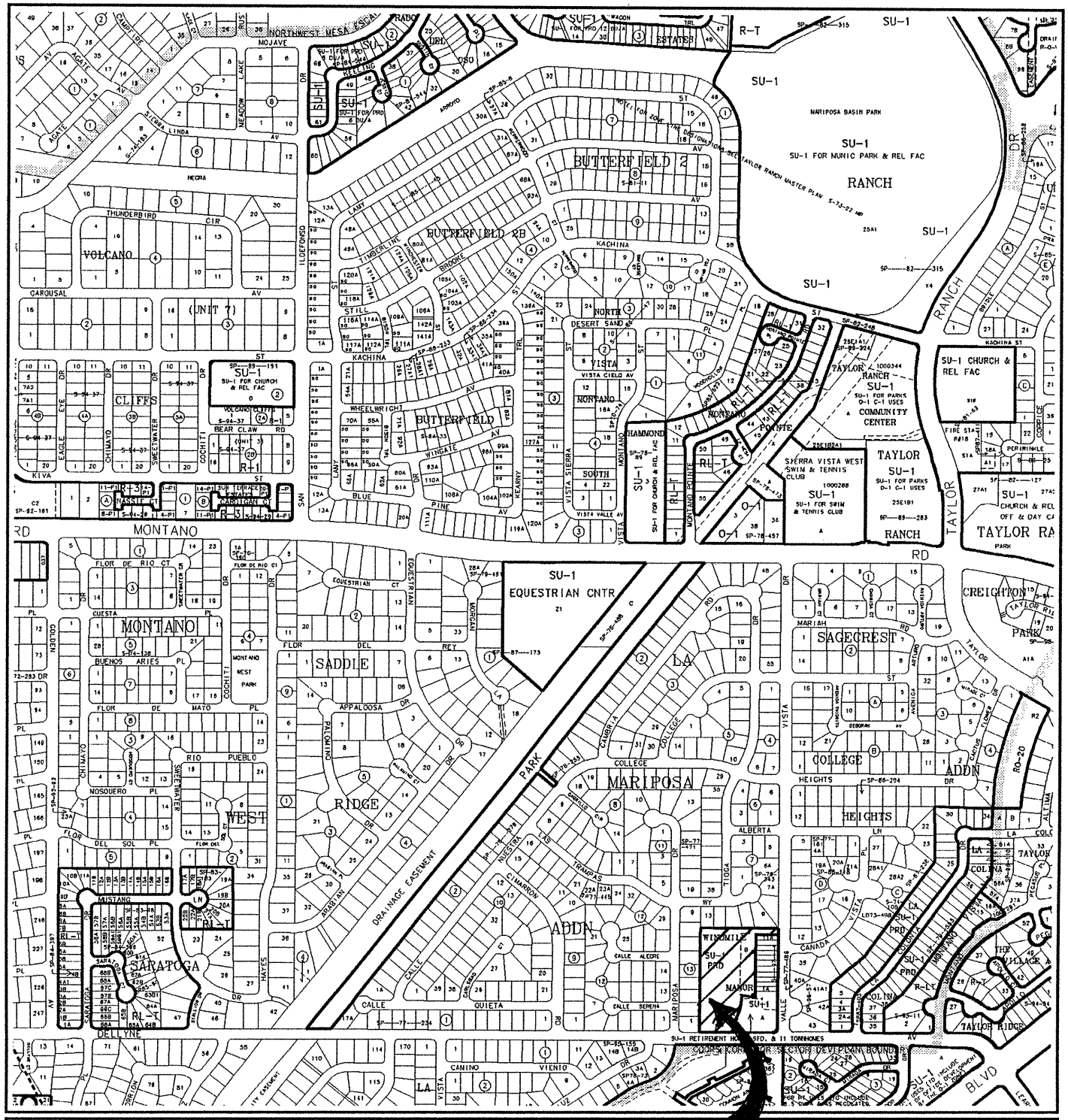

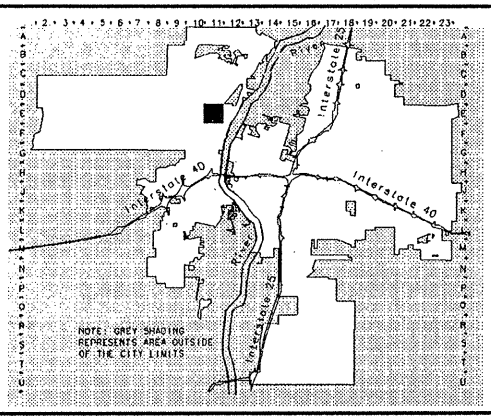

CITY OF
Albuquerque

A Albuquerque G Geographic I Information S System
PLANNING DEPARTMENT

Zone Atlas Page

E-11-Z

Map Amended through July 31, 2003

II. INTRODUCTION

Windmill Estates Manor is a proposed 3.1 acre subdivision in the Taylor Ranch area. It will create 21 single-family residential lots and two tracts for storm water detention. This site was previously part of a larger tract, the eastern part of which was developed in 1997 to create 11 townhouse lots.

This area is covered under the North Coors Drainage Management Plan (NCDMP) prepared in 1984 by Scanlon & Assoc., and falls within drainage basins 20.3W as defined in the NCDMP.

This report also references the Drainage Report for Windmill Manor Estates (WME report) dated July 7, 1997 prepared by Brasher & Lorenz, Inc. The WME report covered the previous development to the east, and affects the onsite ponding requirements. Some minor improvements to the adjacent private access road are required by this development.

III. EXISTING CONDITIONS

The existing site is an undeveloped 3.108 acre tract, with native grasses and scrub brush. The natural ground slopes downhill to the north at approximately a 1% grade. To the north and west is the La Mariposa Addition residential subdivision and to the east is Windmill Manor Subdivision with 11 townhouse lots. A retirement home is on Tract A south of Windmill Manor. Dellyne Ave bounds the property to the south.

The existing site does not generally slope south towards Dellyne Ave. There is a approximately 4'-6' high retaining wall behind the curb which elevates the south end of the site, and then the property drains 7559 cu. ft. (6.3 cfs) north to a natural depression on the east boundary. (See Appendix A for Runoff and Volume Calculations for Existing Conditions.) There is no significant historical flow that enters Dellyne Ave.

Tract B also accepts developed waters from Windmill Manor to the east. The WME report requires 1688 cu. ft., the equivalent of volumes freely discharged from its Basins B & C directly to Valle Vista Ave, be retained in a temporary pond on the east boundary of the site. Also, the As-built Conditions for that project states that the as-built detention basin did not meet the capacity the WME report required for Basin A, so an additional 1207 cu. ft. is retained in the temporary pond for a total of 2895 cu. ft. retention volume. (See Appendix C for excerpts from the WME report.)

IV. PROPOSED CONDITIONS

Windmill Manor Estates falls within the NCDMP, which limits projects within it to a 0.25 cfs/Ac discharge from the site. Since this site contains a total of 3.108 acres, it would normally be allowed to discharge only 0.78 cfs onto Dellyne Ave. (3.108 Ac x 0.25 cfs/Ac = 0.777 cfs) However, after conversations with Brad Bingham of the City Hydrology Department, it was decided that a permanent pond on this site is undesirable because of maintenance responsibility issues.

The site will freely discharge all flows from the developed lots and Tierra Amada St (Basin 101) to Dellyne Ave. (See the Grading & Drainage Plan in the Pockets at the end of this report.) All stormwater from Tract B2 (Basin 102) will be retained within the tract.

An analysis of the impact of the stormwater in Dellyne Ave shows that the site will add 10.6 cfs to a system that currently collects about 52.0 cfs. The Offsite Basin Map following reflects the area that drains to the affected portion of Dellyne Ave (Basin OFFSITE). A field inspection of the grade breaks in the existing roads determined the boundary lines shown on the map, which was then used to find an approximate acreage. As the map shows, Windmill Manor Estates is at the top of a long, narrow basin, so routing will reduce the peak flow.

At most, Tierra Amada St will carry 10.4 cfs of developed flows in a 100-year, 6-hour storm in Basin 101. The street has adequate capacity with mountable curb. (See Street Flow Capacity Calculation Sheets in Appendix B.)

V. SUMMARY & CONCLUSIONS

Based on information in previous sections, it is recommended that the following items be constructed for drainage considerations with this development:

1. Mountable curb on all interior streets

RUNOFF CALCULATIONS FOR EXISTING CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **Windmill Manor Estates**

JOB NUMBER: 1288

PRECIP ZONE	Q_{100} RUNOFF RATES (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

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0			
B	100			
C	0			
D	0			
Σ% =	100	0	0	0

PRECIPITATION ZONE: 1

TREATMENT TYPE 1							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
100	3.108	0	3.11	0	0	**6.3**	

VOLUME CALCULATIONS FOR EXISTING CONDITIONS (V_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **Windmill Manor Estates**

JOB NUMBER: 1288

PRECIP ZONE	E_{360} EXCESS PRECIPITATION (in.)			
	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	0	0	0
B	100	0	0	0
C	0	0	0	0
D	0	0	0	0
∑% =	100	0	0	0

PRECIPITATION ZONE: 1

TREATMENT TYPE 1								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
100	3.108	0	3.11	0	0	**0.1735**	**7559.0**	

LAND TREATMENT CALCULTIONS

(Per the City of Albuquerque DPM Section 22.2, Table A-5)

PROJECT NAME: **Windmill Manor, Tract B**

JOB NUMBER: 1288

ONSITE BASINS:

Total Area 3.108 Acres

# of Lots 21 lots

N = 6.76 D.U./Ac.

Percentage of Impervious Land (Type D)

$\%D = 7(N^2+5N)^{1/2}$

%D= 62.39 %

A+D= 62.39 %

B+C= 37.61 %

LAND TREATMENTS	
Type A=	**0 %**
Type B=	**18.81 %**
Type C=	**18.81 %**
Type D=	**62.39 %**
Σ=	100 %

OFFSITE BASINS:

Total Area 16.4 Acres

# of Lots 56 lots

N = 3.41 D.U./Ac.

Percentage of Impervious Land (Type D)

$\%D = 7(N^2+5N)^{1/2}$

%D= 37.52 %

A+D= 37.52 %

B+C= 62.48 %

LAND TREATMENTS	
Type A=	**0 %**
Type B=	**31.24 %**
Type C=	**31.24 %**
Type D=	**37.52 %**
Σ=	100 %

VOLUME CALCULATIONS FOR DEVELOPED CONDITIONS (V_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **Windmill Manor Estates**

JOB NUMBER: 1288

PRECIP ZONE	E_{360} EXCESS PRECIPITATION (in.)			
	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	0	0	0
B	18.8	90	31.3	0
C	18.8	0	31.2	0
D	62.4	10	37.5	0
Σ% =	100	100	100	0

PRECIPITATION ZONE: 1

TREATMENT TYPE 1								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
101	2.85	0	0.54	0.54	1.78	**0.3661**	**15946.1**	main development

TREATMENT TYPE 2								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
102	0.26	0	0.23	0	0.03	**0.0173**	**755.0**	Landscape tracts

TREATMENT TYPE 3								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
OFFSITE	16.4	0	5.13	5.12	6.15	**1.7184**	**74852.0**	

RUNOFF CALCULATIONS FOR DEVELOPED CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **Windmill Manor Estates**

JOB NUMBER: 1288

PRECIP ZONE	Q_{100} RUNOFF RATES (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

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	0	0	
B	18.8	90	31.3	
C	18.8	0	31.2	
D	62.4	10	37.5	
∑% =	100	100	100	0

PRECIPITATION ZONE: 1

TREATMENT TYPE 1							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
101	2.85	0	0.54	0.54	1.78	**10.4**	Main development

TREATMENT TYPE 2							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
102	0.26	0	0.23	0	0.03	**0.6**	Landscape tracts

TREATMENT TYPE 3							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
OFFSITE	16.4	0	5.13	5.12	6.15	**52.0**	La Mariposa South and Dellyne Ave

STREET FLOW CAPACITY CALCULATIONS

STREET NAME:	**Tierra Amada St**	1
LOCATION:	**Basin 101**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	14
Q_{100}	10.63	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.330
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	2.660
Manning's N	0.017	Discharge (1/2 Q)	5.320

Depth: 0.330

RESULTS

HGL

Q_{100} FLOW CAPACITY = 10.64 cfs OK
at an HGL Depth= 0.33 ft < Curb height = 0.33
OK

EGL

Velocity 2.00 fps
$V^2/2g$ 0.06 ft
EGL Depth = 0.39 ft < Right-of-way height = 0.50
OK

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STREET NAME:	**Tierra Amada St**	2
LOCATION:	**Basin 103**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.02	Road Width/2	14
Q_{100}	11.3	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	13.668
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.796
Manning's N	0.017	Discharge (1/2 Q)	5.698

Depth: 0.268

RESULTS

HGL

Q_{100} FLOW CAPACITY = 11.40 cfs OK
at an HGL Depth= 0.27 ft < Curb height = 0.33
OK

EGL

Velocity 3.17 fps
$V^2/2g$ 0.16 ft
EGL Depth = 0.42 ft < Right-of-way height = 0.50
OK
~~~~~~

Mason & Associates (E11/D14A), recommended interim on-site retention ponding. As a result, an interim retention pond easement exists on Tract "B" immediately west of **Windmill Manor Estates.** Recently constructed downstream improvements made per the NCDMP make the retention pond concept unnecessary.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the property into an 11 lot residential subdivision. The Plan shows the elevations required to properly grade and construct the recommended improvements. The direction of drainage flows are given by flow arrows and on-site drainage basins are identified.

In accordance with the approved Drainage Masterplans all runoff generated by the project site will be routed through detention ponds to be located at the south end of the site. All flows are to be managed on-site by the improvements recommended by this plan. The On-site basins are managed as follows:

1. Basin "A" consists of the bulk of the project area which drains to the private road to be constructed along the west side of the project. The road will drain south to the detention pond.

2. Basin "B" consists of the front yard areas which will drain directly to Valle Vista.

3. Basin "C" consists of a portion of the private road, which by virtue of topography, drains to Valle Vista without being routed through the detention pond.

The Basin "A" detention pond is designed to drain at a controlled rate of 0.33 cfs, which results in a storage requirement of 0.1089 acre feet. An emergency spillway is provided in the event the pond drain clogs. The existing undeveloped flowrate is estimated at 1.70 cfs. Development of this project results in a flowrate of 1.47 cfs, which includes free discharge of Basins "B" and "C" and controlled release from the detention pond.

Per the Masterplans, discharge from the project is limited to 0.25 cfs/acre (0.25cfs/ac x 1.31 ac = 0.33 cfs). **Windmill Manor Estates** (Basin I) discharges 1.47 cfs, an excess of 1.14 cfs. To allow for this, the future development of Tract "B" (Basin II) will provide additional storage equal to the volume discharged by Basin "B" and "C". As shown by the Plan (sheet 3) the existing natural playa located on Tract "B" will remain in place to serve as an interim pond. The playa has capacity to store in excess of the undeveloped 100 year 6 hour volume. Future development of Tract "B" will relocate the pond to the south end of the parcel (see sheet 4).

AS-BUILT CONDITIONS

As shown by the As-Built Plan (Pocket), the actual storage volume provided by Pond A is less than recommended by the Plan. A deficit of 1207 cubic feet of storage exists which will be handled by ponding off-site. An interim pond will be provided on Tract "B" to store the unponded portion on Basin I. Future development of Tract "B" will provide permanent storage for this volume.

INTERIM BASIN II (TRACT 'B') POND

Since Basin I exceeds the allowable discharge (per the Masterplan), provide an interim pond on Tract "B" to store volume from Basins A and B, plus the Basin A pond deficit:

Basin A: Vol = 880 cf

Basin B: Vol = 788 cf

Pond A deficit = 1207 cf

Total interim pond requirement = 2,895 cf

INTERIM POND DESIGN

Due to the existing site topography a natural playa exists in Tract "B". As shown by the Plan (sheet 3) the playa easily provides storage for Basin II undeveloped flow as well as the unponded portion of Basin I. The natural playa shall serve as the interim pond for Phase I. The undeveloped Basin II water surface is plotted on the Plan.

FUTURE TRACT 'B ' POND

As shown by the attached calculations and AHYMO output, the recommended storage volume for Tract "B" is 16,588 cubic feet. Additional storage will be provided to detain the Pond A deficit (1207 cf) and unponded Basins B and C (1668 cf) for a total future ponding requirement of 19,463 cubic feet.

DRAINAGE MASTERPLAN UPDATE

Since downstream improvements allow discharge from Windmill Manor this report updates the original Drainage Report prepared by Gardner Mason & Associates, which recommended on-site retention ponding. Per the NCDMP the site may discharge at 0.25 cfs/acre. Sheet 3 is provided to outline ponding criteria for Tract "B", Windmill Manor. The Plan recommends a detention pond located at the west end of Tract "B", adjacent to Dellyne Avenue. The pond will drain to Dellyne at a controlled rate of 0.25 cfs/acre, per the NCDMP. Complete pond routing calculations are provided for review (See Appendix).

The Drainage Masterplan Update is provided to establish ponding criteria for **Windmill Manor Estates** and Windmill Manor, Tract "B". The update allows development of **Windmill Manor Estates** and provides drainage management criteria for Tract "B". A site specific drainage plan will be required for the development of Tract "B".

TEMPORARY EROSION CONTROL PLAN

1. The intent of this temporary erosion control plan is to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction.

2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.

3. After the initial site clearing, the detention ponding area should be rough graded to create a storage area for excess runoff and sediment.

4. Temporary erosion control berms should be constructed along the north, east and west project boundaries per Detail A/3 to direct excess runoff to the ponding area.

5. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

CALCULATIONS

The calculations shown herein define the 100 year/6 hour design storm falling with the project area under existing and developed conditions. The Hydrology is per "Section 22.2, Part A, DPM, Vol 2" Dated January 1993. Calculations are provided to demonstrate on-site improvement capacities and downstream capacity.

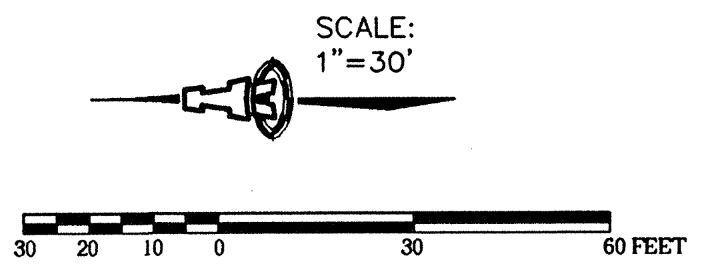
ENGINEER'S CERTIFICATION

I, FRED C. ARFMAN, LICENSED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THOSE GRADES AND IMPROVEMENTS SHOWN HEREON AS FIELD VERIFIED BY SURV-TEK, INC., NMLS 9750, ON DECEMBER 10, 2004, IN ACCORDANCE WITH THE "NEW MEXICO ENGINEERING AND SURVEYING ACT", SECTION 61-23-1 THROUGH 61-23-32 NMSD (1978).

RETAINING WALLS WERE REQUIRED AT DESIGNATED LOCATIONS ALONG THE PROJECT PERIMETER AND INTERIOR LOT LINES AS SHOWN ON THE APPROVED FINAL GRADING AND DRAINAGE PLAN, DATED APRIL 23, 2004, FOR THE SHADOW RIDGE SUBDIVISION, ON FILE WITH THE HYDROLOGY DIVISION, P.W.D., CITY OF ALBUQUERQUE (E11/D14B). SAID SURVEYOR FIELD VERIFIED WALL IMPROVEMENTS ON FEBRUARY 11, 2005.

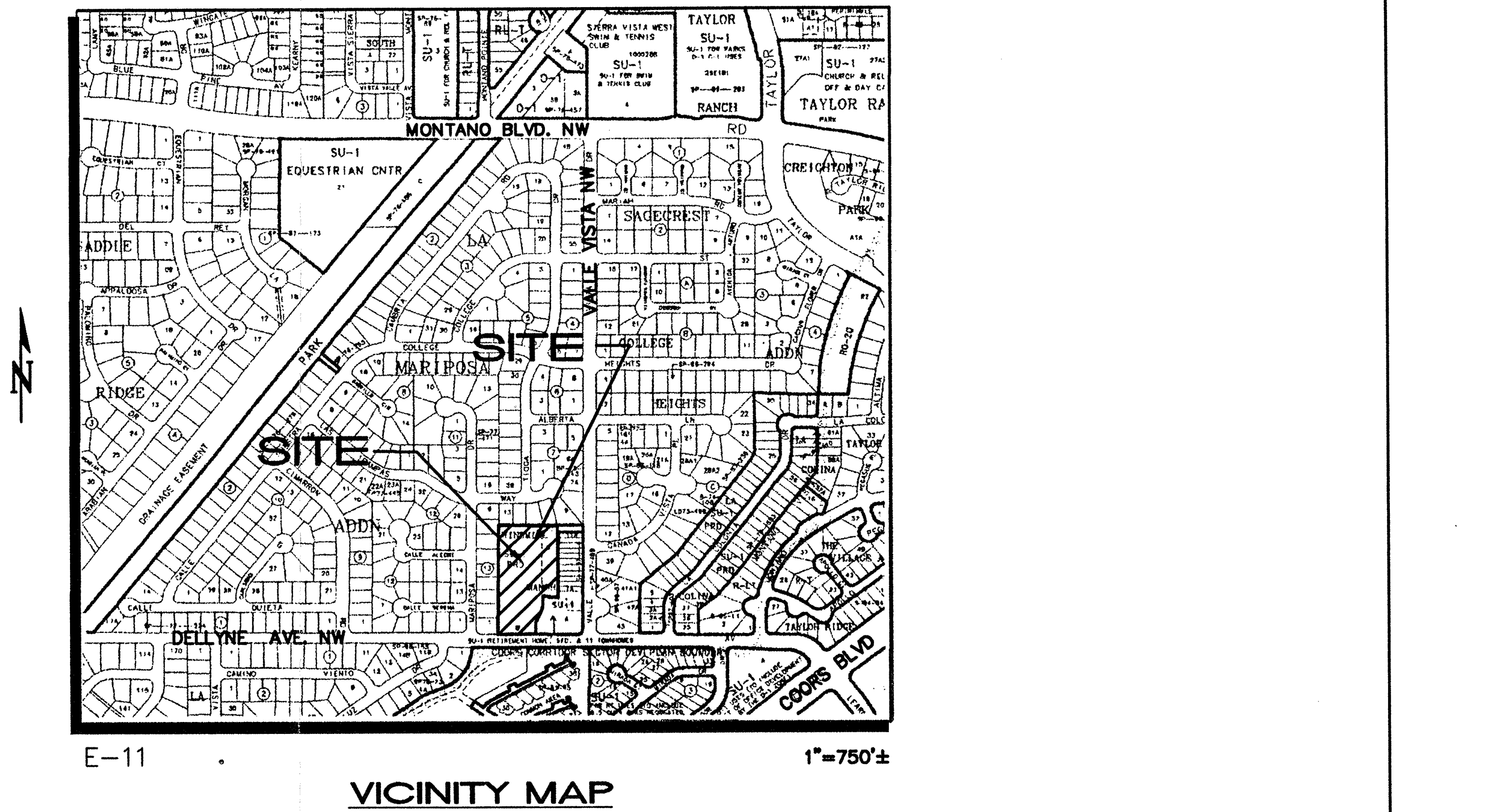
Fred C. Arfman
Fred C. Arfman, NMPE 7322

MAR 03, 2005
Date

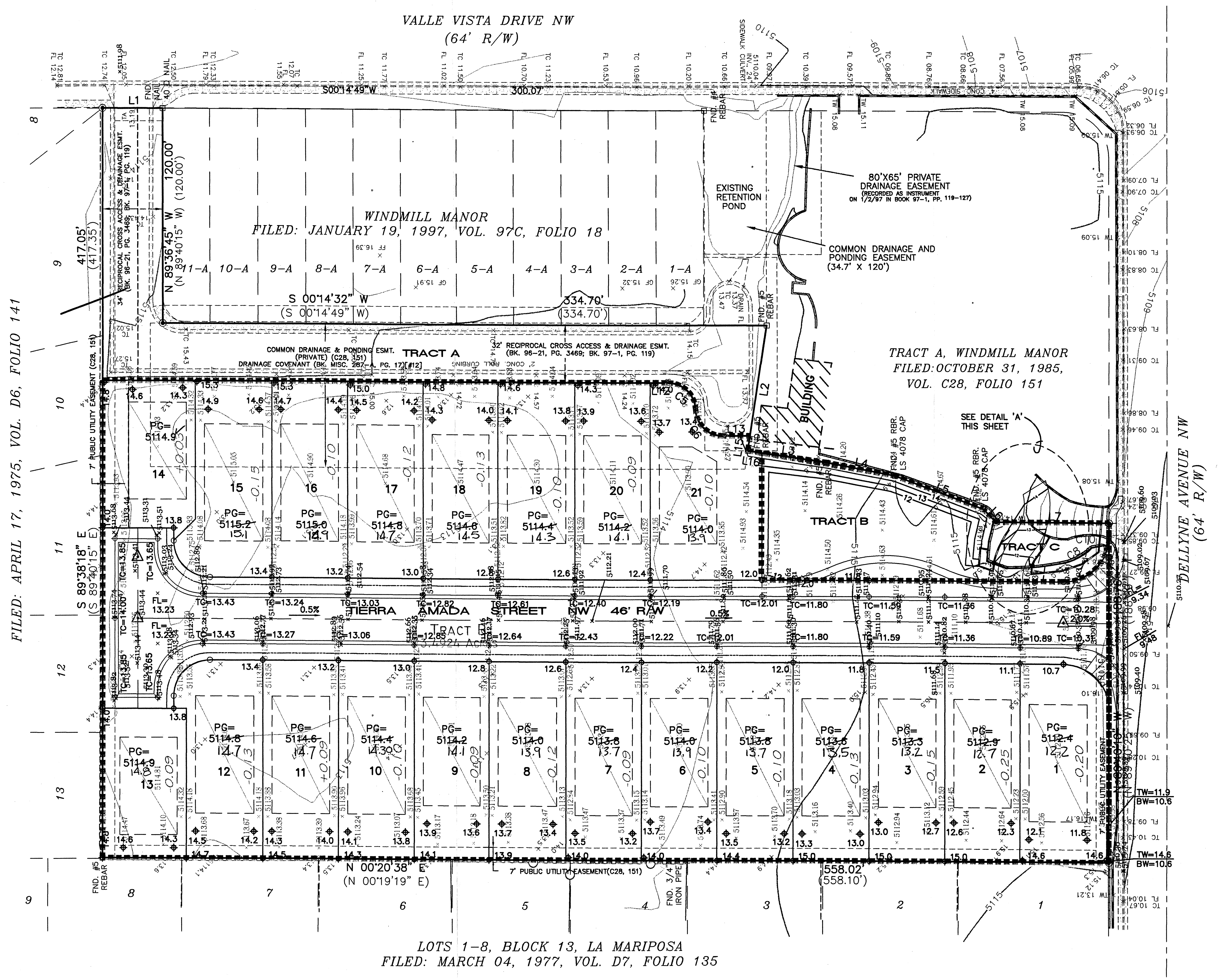


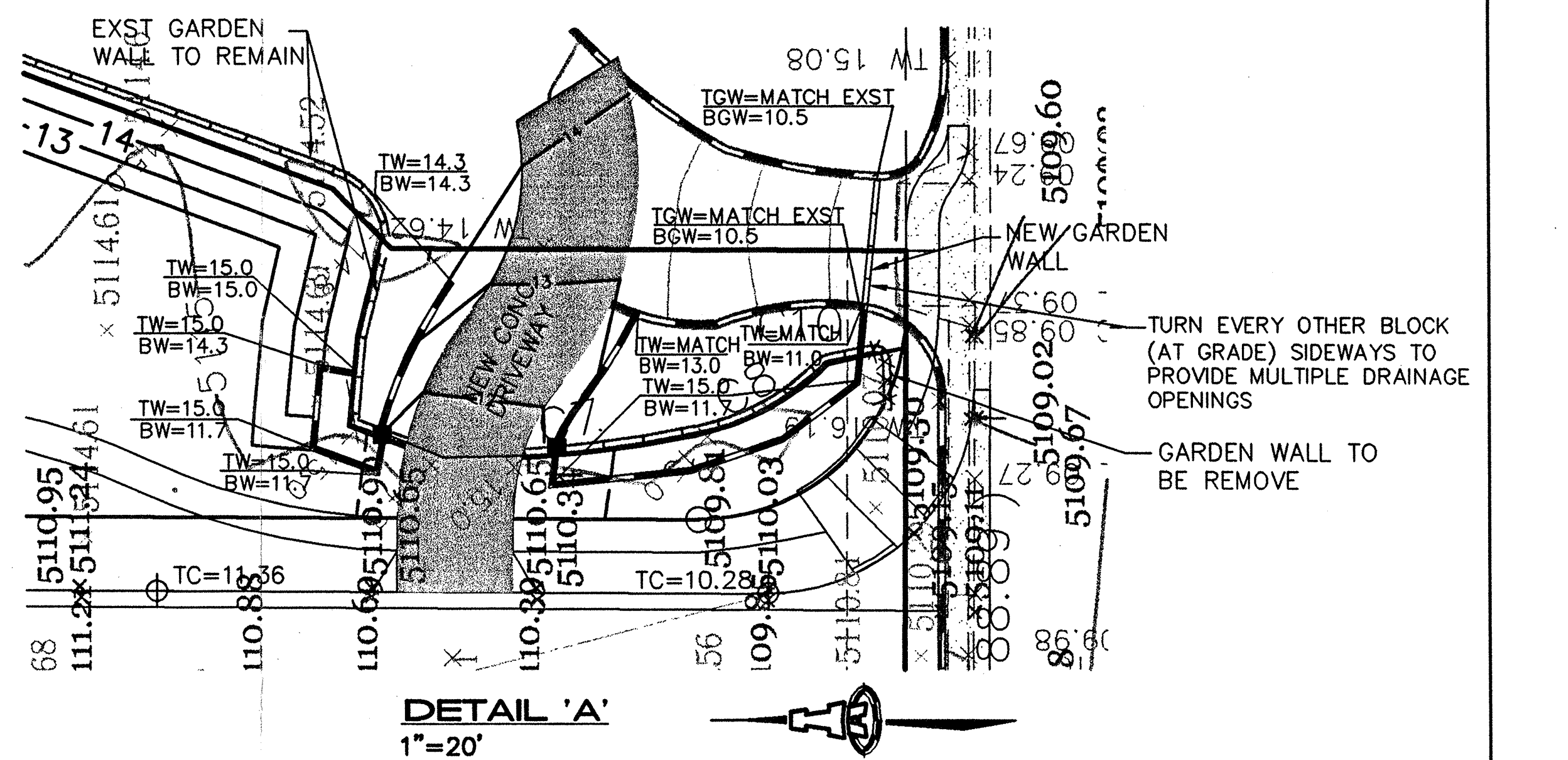
LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 00°15'04" E (N 00°14'49" E)	33.93 (34.00)
L2	N 81°07'41" W (N 81°03'04" W)	70.61 (70.53)
L3	S 08°46'02" W (S 08°56'56" W)	43.86 (43.80)
L4	S 11°15'35" W (S 11°02'37" W)	38.36 (38.58)
L5	S 20°38'18" W (S 20°38'09" W)	52.49 (52.51)
L6	N 45°45'00" E	10.15
L7	N 00°19'50" E	62.37

LIN
L1
L2
L3
L4
L5
L6
L7
L8
L9
L1(
L1
L1



VICINITY MAP





DETAIL 'A'
1"=20'

LEGEND

—5115—	EXISTING CONTOUR
x14.2	EXISTING SPOT ELEVATION
—09—	PROPOSED CONTOUR
◆78.3	PROPOSED SPOT ELEVATION
→	FLOW ARROW
PG=5113.4	PAD GRADE ELEVATION
TC 81.9 FL 81.4	TOP OF CURB FLOWLNE ELEVATION
—	RETAINING WALL
TW=14.5 BW=13.2	TOP OF RETAINING WALL BOTTOM OF RETAINING WALL ELEVATION
TGW=14.5 BGW=13.2	TOP OF GARDEN WALL BOTTOM OF GARDEN WALL ELEVATION
- - - -	BASIN BOUNDARY
BASIN 101	BASIN ID

LEGAL DESCRIPTION

TRACT B, WINDMILL MANOR (3/3/85, C28–151),
ALBUQUERQUE, NEW MEXICO

AREA

3.4924 ACRES

ACS BENCHMARK

ACS 1 3/4" ALUMINUM DISK STAMPED "ACS BM 11–E11" EPOXIED TO TOP OF CONCRETE CURB, ENE QUADRANT OF DELLYNE AVE & VALLE VISTA DR.

ELEV=5103.70

SURVEYOR

THOMAS D. JOHNSTON, NMPS 14269
TOPOGRAPHIC SURVEY PERFORMED NOVEMBER 2003.

WINDMILL MANOR PLACE

GRADING & DRAINAGE PLAN

FRED C. ARFMAN
7322
Fred C. Arfman
4-23-04

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico

1288GRD–asbuilt.DWGthor 08/10/04

SHEET 3 OF 9