CITY OF ALBUQUERQUE

November 10, 2005

Steve Salazar, P.E.
Wilson & Company
2600 The American Rd. SE, Suite 100
Rio Rancho, NM 87124

Re: Casita de la Mesa Unit 4, SIA/Financial Guarantee Release
Engineer's Stamp dated 6-18-04 (L9-D26)
Certification dated 8-10-04

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Dear Mr. Salazar,

Based upon the information provided in your submittal received 11-07-05, the above referenced certification is approved for release of SIA and Financial Guarantee.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: Marilyn Maldonado, COA# 656982
File

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003)

PROJECT TITLE: Casita de la Mesa (Sunrise Ranch 3) ZONE MAP/DRG. FILE#: L-9-Z

DRB#: 1000908 EPC#: _____ WORK ORDER #: 656982

LEGAL DESCRIPTION: Casita de la Mesa Unit 4.

CITY ADDRESS: N/A.

ENGINEERING FIRM: Wilson & Company, Inc. CONTACT: Steve Salazar, PE

ADDRESS: 2600 The American Rd. SE, Suite 100 PHONE: (505) 898-8021

CITY, STATE: Rio Rancho, NM ZIP CODE: 87124

OWNER: LONGFORD AT SUNRISE RANCH, LLC CONTACT: Robert Anderson

ADDRESS: 7007 Jefferson, Suite A PHONE: 761-9911

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: Wilson & Company, Inc. CONTACT: Scott Croshaw

ADDRESS: 4900 Lang Ave. NE PHONE: (505) 348-4000

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN 1st SUBMITTAL, REQUIRES TCL OR EQUAL

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

X ENGINEERS CERTIFICATION (HYDROLOGY)

___ CLOMR\LOMR

___ TRAFFIC CIRCULTAION LAYOUT (TCL)

___ ENGINEERS CERTIFICATION (TCL)

___ ENGINEERS CERTIFICATION (DRB, APPR. SITE PLAN)

___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

X SIA / FINANCIAL GUARANTEE RELEASE

___ PRELIMINARY PLAT APPROVAL

___ S. DEV. PLAN FOR SUB'D. APPROVAL

___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

___ SECTOR PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ BUILDING PERMIT APPROVAL

___ CERTIFICATION OF OCCUPANCY (PERM.)

___ CERTIFICATION OF OCCUPANCY (TEMP.)

___ GRADING PERMIT APPROVAL

___ PAVING PERMIT APPROVAL

___ WORK ORDER APPROVAL

___ OTHER (SPECIFY)

L-9/D26 - Designed by Isaacson & Arfman

RECEIVED
NOV 07 2005
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

_____ YES

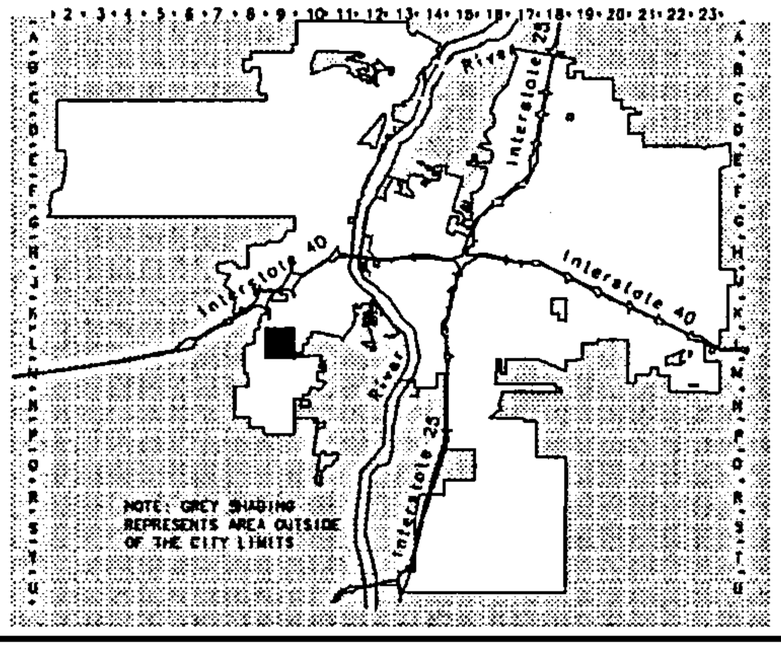
_____ NO

_____ COPY PROVIDED

Date Submitted: 10-07-05 By: Steve J. Salazar, PE

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.



Albuquerque Geographic Information System
PLANNING DEPARTMENT

GRAPHIC SCALE IN FEET
250 0 750 1000

Zone Atlas Page

L-9-Z

Map Amended through August 04, 2004

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 1, 2002

Scott McGee, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Casita de la Mesa, Unit 4 Drainage Report
Engineer's Stamp dated 6-10-02, (L9/D26)

Dear Mr. McGee,

Based upon the information provided in your submittal dated 6-12-02, 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

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

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

PROJECT TITLE: Casita de la Mesa 4 ZONE MAP/DRG. FILE #: L-9/D26
DRB #: 1000908 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Tract 439 Town of Atrisco Grant Unit 3
CITY ADDRESS:

ENGINEERING FIRM: Isaacson & Arfman, P.A. CONTACT: Scott McGee
ADDRESS: 128 Monroe Street NE PHONE: 268-8828
CITY, STATE: Albuquerque, NM ZIP CODE: 87108

OWNER: [redacted] Thomson Real Estate CONTACT: Greg Thomson
ADDRESS: 2534 Campbell Rd. NW PHONE: 344-8445
CITY, STATE: ABQ, NM ZIP CODE: 87104

ARCHITECT: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: ALS, Inc. CONTACT: Tim Aldrich
ADDRESS PHONE: 884-1990
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ____ DRAINAGE PLAN
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ____ EROSION CONTROL PLAN
- ____ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEERS CERTIFICATION (TCL)
- ____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ____ SIA / FINANCIAL GUARANTEE RELEASE
- X PRELIMINARY PLAT APPROVAL
- ____ S. DEV. PLAN FOR SUB'D. APPROVAL
- ____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ FOUNDATION PERMIT APPROVAL
- ____ BUILDING PERMIT APPROVAL
- ____ CERTIFICATE OF OCCUPANCY (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- X GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- ____ NO
- ____ COPY PROVIDED

RECEIVED
JUN 12 2002
HYDROLOGY SECTION

DATE SUBMITTED: 6/12/02 BY: Scott M McGee

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

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3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more

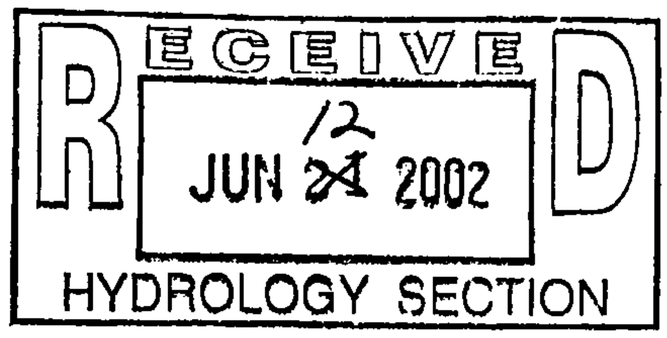
DRAINAGE REPORT

FOR

CASITA DE LA MESA, UNIT 4

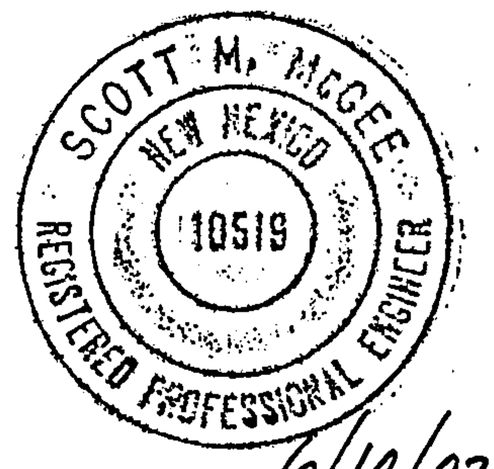
A 32-LOT SUBDIVISION

ALBUQUERQUE, NEW MEXICO
JUNE 2002



Prepared by:

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



Scott M McGee 6/10/02

Scott M. McGee, PE **Date**

TABLE OF CONTENTS

INTRODUCTION

Casita de la Mesa, Unit Four, will be developed as a 32-lot single-family subdivision. The site is bordered to the north by Tower Road, to the south by San Ygnacio Road and to the west by 94th Street. The land to the east has been developed as Sunset West Subdivision, Unit 4.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: Tract 439, Town of Atrisco Grant, Unit 3, as filed in the records of the County Clerk of Bernalillo on December 5, 1944, in Volume D, Folio 117 & 118

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Scott M. McGee, P.E.

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

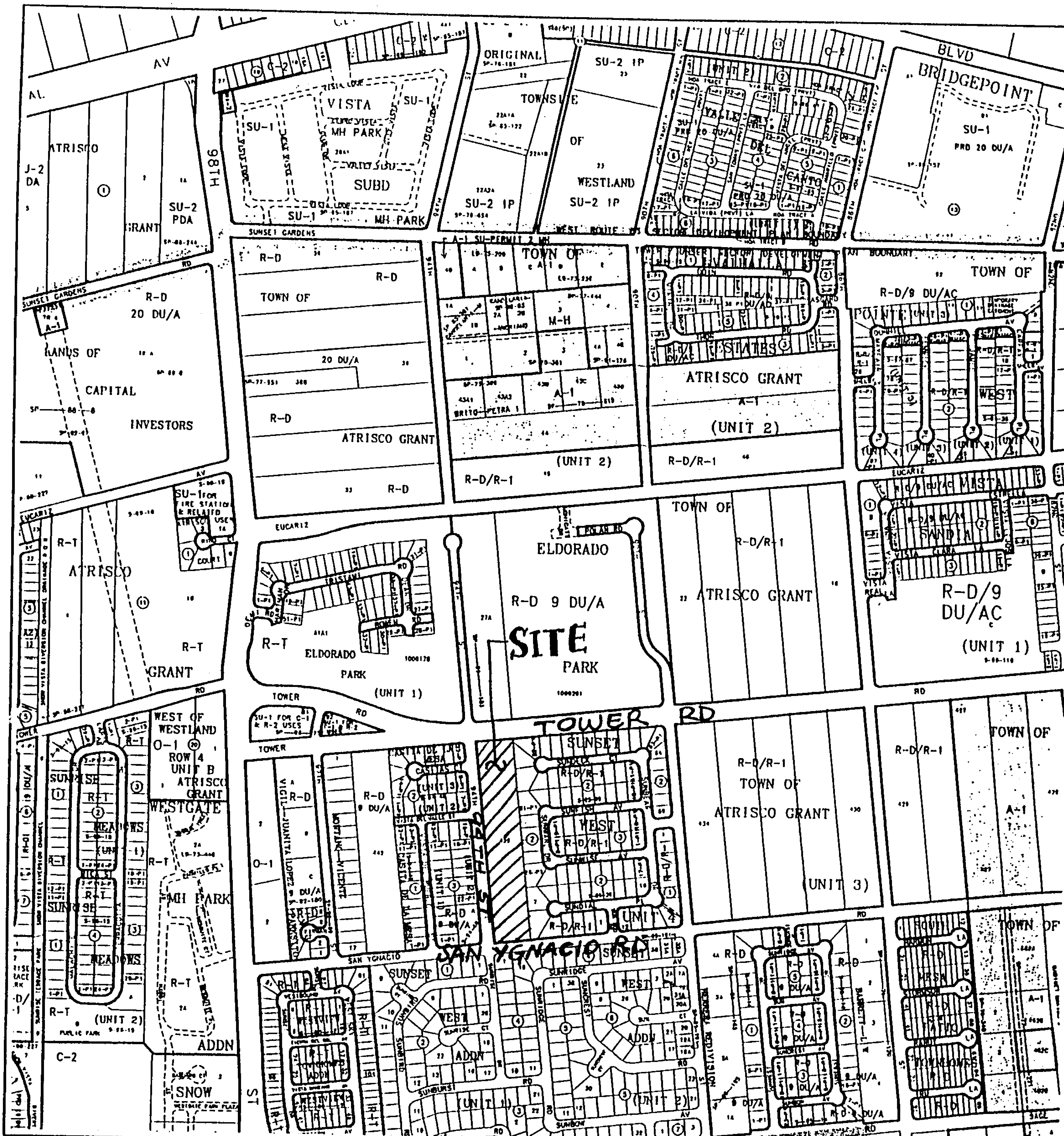
BENCHMARK: ACS Control Station "7-L9" located 39.2 feet west from the centerline of 98th Street and 31.0 feet south from the centerline of Tower Road.
Elevation: 5175.74

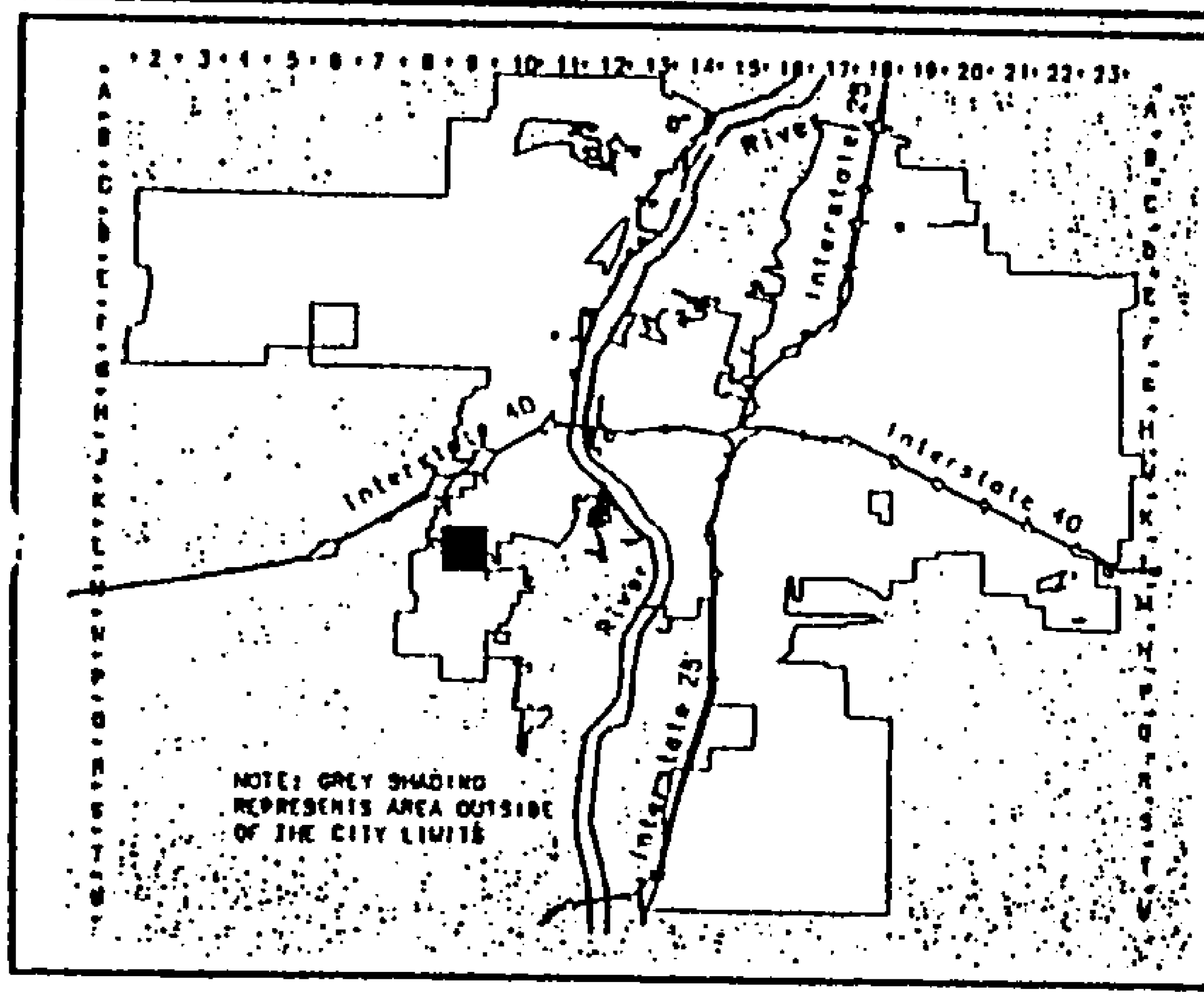
ZONING: R-D/R-1

NUMBER OF EXISTING TRACTS: 1

NUMBER OF PROPOSED LOTS: 32

TOTAL AREA: 5.0899 Ac. (221,716 SF)





CITY OF Albuquerque

Albuquerque Geographic Information System

PLANNING DEPARTMENT

GRAPHIC SCALE IN FEET

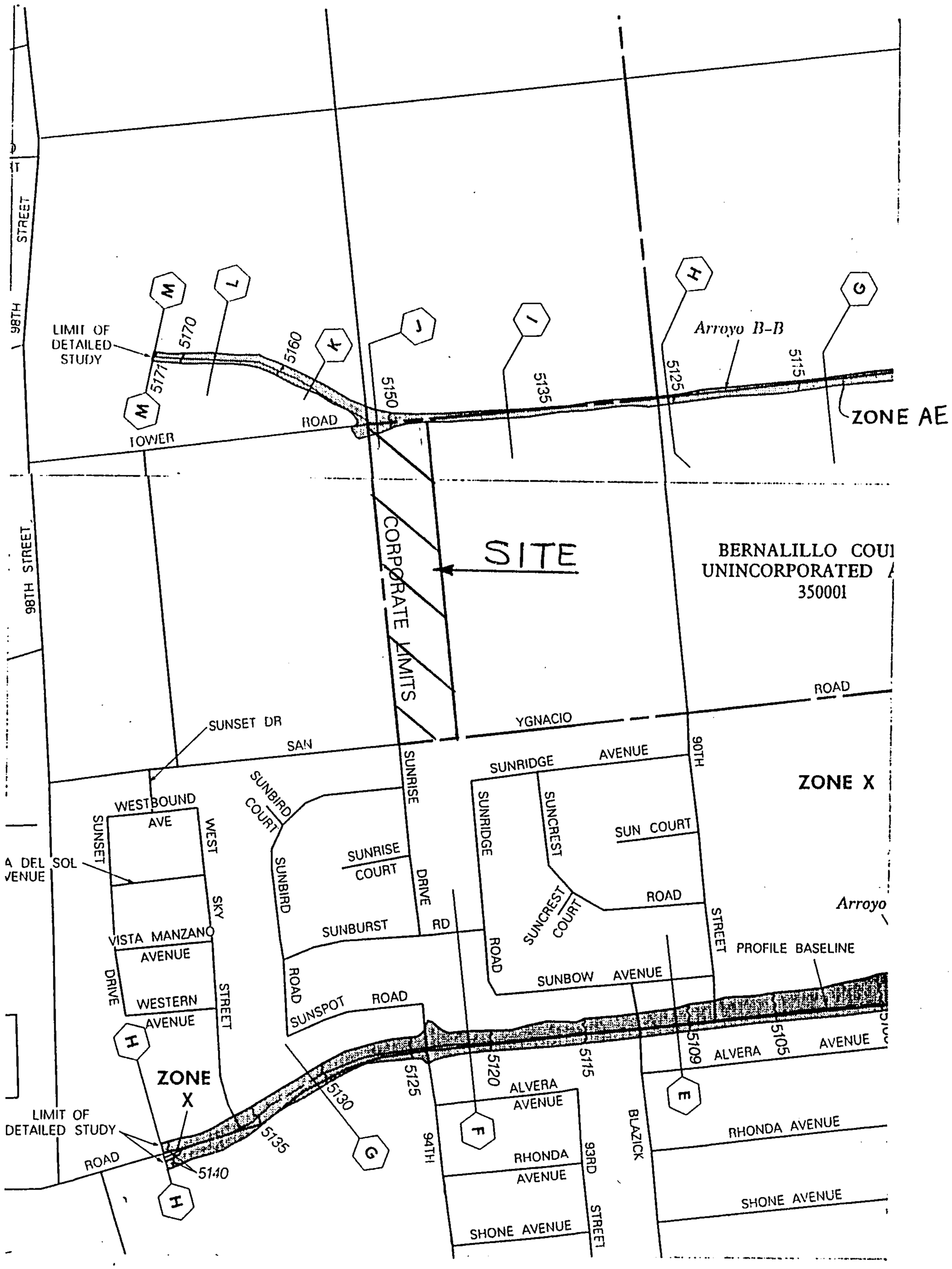
250 0 750 1000

Zone Atlas Page

L-9-Z

Map Amended through August 15, 2000

FEMA PANELS 328 & 336



II. SITE CHARACTERISTICS

FLOOD HAZARD: Tower Road falls within flood zone AE as determined by Panel Nos. 336 and 328 of the September 20, 1996 edition of the F.E.M.A. maps. (See attached copy.)

EXISTING CONDITIONS: The site is undeveloped with native vegetative cover typical of the City's west side. It slopes at approximately 2 to 4% from the northwest to the southeast. The undeveloped storm water (6.6 cfs) from the site flows onto San Ygnacio Road. No offsite flows enter the site. (See attached Runoff Calculations.)

94th Street has been improved with standard curb and gutter along the west side and 25 feet of permanent pavement. Tower Road has 24 feet of temporary paving along the north side of the site, and San Ygnacio Road has been improved with standard curb and gutter to the south and 25-35 feet of permanent paving.

PROPOSED CONDITIONS: Improvements in 94th Street include adding standard curb and gutter and 11 feet of permanent paving. Both San Ygnacio Road and Tower Road have been constructed with permanent paving, standard curb and gutter and a median as part of the SAD 222 improvements (City Project No. 4188.91). The site will be graded to direct the developed flows east to a 10-foot wide concrete-lined rundown in a 12-foot wide public storm drain easement running along the east property line. Vista Hermosa Court, Vista del Valle Court, and Verdad de Luz Court will discharge the flows through a 6-foot concrete rundown. Libro

Iluminado Court will discharge to the rundown through a Type D inlet and a 12" pipe. See Rundown Width and 12" Storm Drain Calculations.

The northerly lots bordering Tower Road were graded to elevate the finish floor elevations one-foot above the floodplain water surface elevation. This floodplain will be eliminated by storm drain improvements being built by the SAD.

The total developed flows (20.6 cfs) will be discharged to San Ygnacio Road through five 2-foot wide sidewalk culverts--see Rundown Width Calculations and Sidewalk Culvert Analysis. San Ygnacio Road will have adequate capacity to handle the developed flows from Casita de la Mesa, Unit 4, after SAD 222, City Project No. 4188.91, has been completed.

CONCLUSIONS & RECOMMENDATIONS

Developed flows will discharge to San Ygnacio as they have historically and as shown by SAD 222. San Ygnacio was shown to have capacity by the Master Drainage Plan (SAD 222).

CALCULATIONS

RUNOFF CALCULATIONS

Precipitation Zone: 1

EXISTING:

Land Treatment		Area (Ac.)
100 %	A	5.1218

Q_{100} = (5.1218)(1.29)
= **6.6 cfs**

PROPOSED:

Land Treatment--Ultimate

On-Site			94th Street			Total:	
Area:	5.1218 Ac.		Area:		0.4370 Ac.	5.5588 Ac.	
10 %	B	0.5122				B	0.5122
30 %	C	1.5365	25 %	C	0.109	C	1.6458
60 %	D	3.0731	75 %	D	0.328	D	3.4008

Ultimate Q_{100} **20.6 cfs**

Weighted E = ((0.5122*0.67)+(1.6458*0.99)+(3.4008*1.97))/(5.5588)
= **1.56 in.**

RUNDOWN-WIDTH CALCULATIONS

Rundown entrance at cul-de-sacs

Weir equation: $Q=CLH^{3/2}$

C=3.33 H=0.50'

$L= Q/CH^{3/2}$ L= Width, Q=(20.6/4) cfs = 5.15 cfs

L= 5.15/1.18 = 4.37 ft.

Use 6 ft.

Rundown exit at San Ygnacio St.

Orifice equation: $Q=CA(2gh)^{1/2}$

C=0.7 H=0.33'

A=1.33, Q=(0.7)(1.33)(4.63) cfs = 4.3 cfs

# of culverts = 20.6/4.3 = 4.8

Use five 2-foot wide sidewalk culverts

12-inch Storm Drain
Worksheet for Circular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\casitsas.fm2
Worksheet	Casita: de la Mesa--12" SD
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Diameter	12.00	in
Discharge	5.15	cfs

Results		
Depth	0.84	ft
Flow Area	0.71	ft^2
Wetted Perimeter	2.32	ft
Top Width	0.73	ft
Critical Depth	0.92	ft
Percent Full	84.11	
Critical Slope	0.018107	ft/ft
Velocity	7.30	ft/s
Velocity Head	0.83	ft
Specific Energy	1.67	ft
Froude Number	1.31	
Maximum Discharge	5.42	cfs
Full Flow Capacity	5.04	cfs
Full Flow Slope	0.020897	ft/ft
Flow is supercritical.		

Casita de La Mesa, Unit 4
Flow Depth Summary for Key Locations

Street	Location	Street Width	Curb Type	Slope (ft/ft)	Q100(cfs)	Depth (ft)
Rundown	@ south property line	10	--	0.0148	20.6	0.51
San Ygnacio Rd.	south of rundown	42	STD	0.0198	20.6	0.42
Sidewalk Culverts	in San Ygnacio Rd.	2	--	0.02	4.12	0.34

CASITA DE LA MESA-Rundown @ San Ygnacio
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	backyard rundown
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.014800	ft/ft

Elevation range: 0.00 ft to 1.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	1.00	0.00	10.00	0.013
0.01	0.33			
5.00	0.00			
9.99	0.33			
10.00	1.00			

SOUTH OF LIBRO ILUMINADO CT.

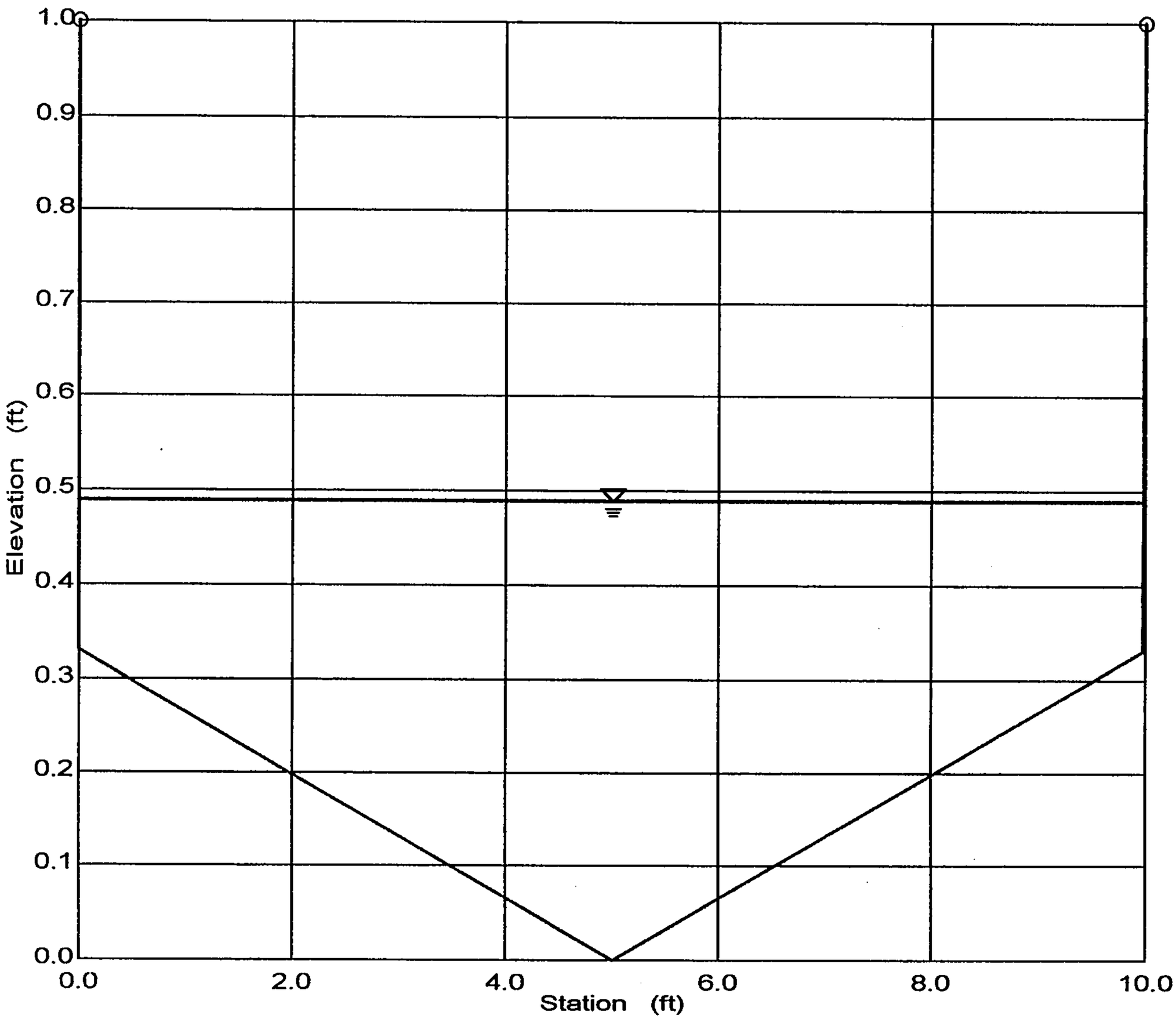
Discharge	20.60	cfs

Results		
Wtd. Mannings Coefficient	0.013	
Water Surface Elevation	0.49	ft
Flow Area	3.22	ft²
Wetted Perimeter	10.32	ft
Top Width	9.98	ft
Height	0.49	ft
Critical Depth	0.67	ft
Critical Slope	0.003375	ft/ft
Velocity	6.40	ft/s
Velocity Head	0.64	ft
Specific Energy	1.12	ft
Froude Number	1.99	
Flow is supercritical.		

Rundown along East Property Line Q=20.6 cfs
Cross Section for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	backyard rundown 1 - Q=20.6 cfs
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.013	
Channel Slope	0.014800	ft/ft
Water Surface Elevation	0.49	ft
Discharge	20.60	cfs



CASITA DE LA MESA-Rundown @ San Ygnacio
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	Sidewalk culverts in San Ygnacio Rd.
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

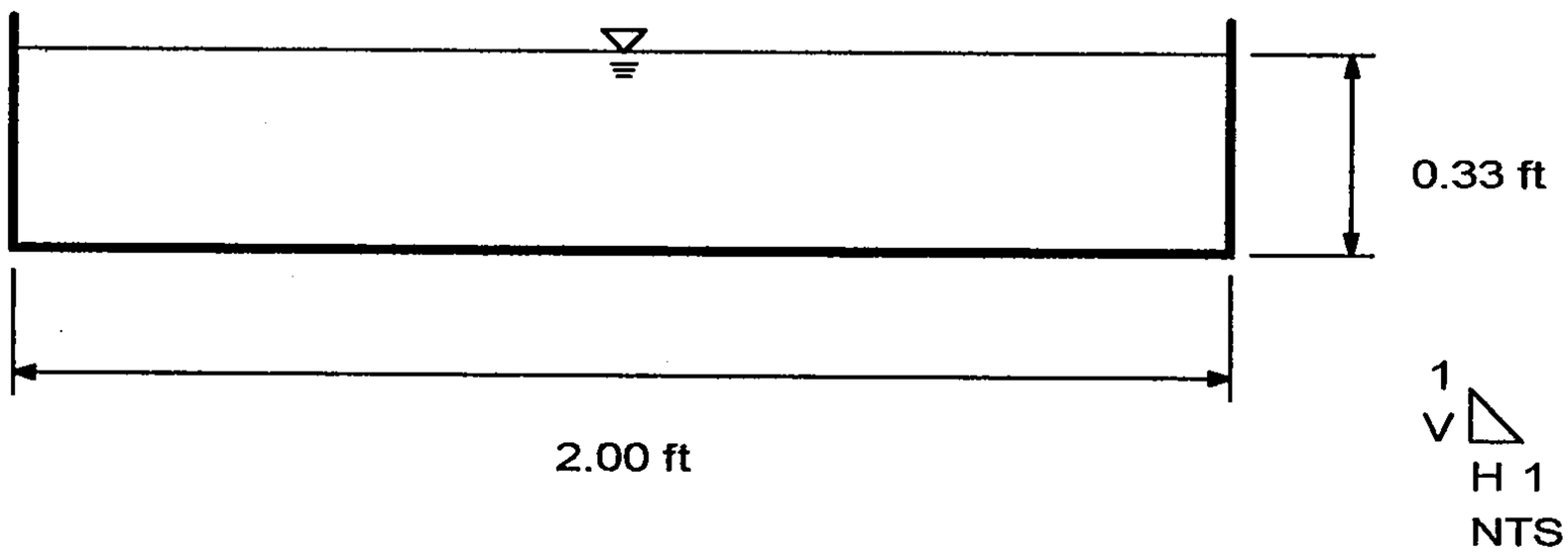
Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Bottom Width	2.00	ft
Discharge	4.12	cfs

Results		
Depth	0.33	ft
Flow Area	0.65	ft^2
Wetted Perimeter	2.65	ft
Top Width	2.00	ft
Critical Depth	0.51	ft
Critical Slope	0.005338	ft/ft
Velocity	6.34	ft/s
Velocity Head	0.62	ft
Specific Energy	0.95	ft
Froude Number	1.96	
Flow is supercritical.		

Sidewalk Culverts @ San Ygnacio Rd.
Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	Sidewalk culverts in San Ygnacio Rd.
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Depth	0.33	ft
Bottom Width	2.00	ft
Discharge	4.12	cfs



NTS

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 24, 2002

Scott McGee, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Casita de la Mesa, Unit 4 Drainage Report
Engineer's Stamp dated 5-10-02, (L9/D26)

Dear Mr. McGee,

Based upon the information provided in your submittal dated 5-10-02, the above referenced report is approved for Preliminary Plat action by the DRB. Since this plan creates sump conditions with no public outfall for overflow, your inlets will need to be designed for twice the 100-year flows. This must be addressed at Work Order or Final Plat.

The submittal dated 1-5-01 is now void.

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

Sincerely,

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

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/11/2002)

PROJECT TITLE: CASITA DE LA MESA 4 ZONE MAP/DRG. FILE #: L-9/D26
DRB #: 1000908 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: TRACT 439 TOWN OF ATRISCO GRANT UNIT 3
CITY ADDRESS:

ENGINEERING FIRM: I & A CONTACT: SCOTT MCGEE
ADDRESS: 128 MONROE PHONE: 268-8828
CITY, STATE: ABQ, NM ZIP CODE: 87108

OWNER: GREG THOMSON, THOMSON REAL ESTATE CONTACT: GREG THOMSON
ADDRESS: 2534 CAMPBELL RD NW PHONE: 344-8445
CITY, STATE: ABQ, NM ZIP CODE: 87104

ARCHITECT: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: ALS CONTACT: TIM ALDRICH
ADDRESS PHONE: 864-1990
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
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- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEERS CERTIFICATION (TCL)
- ___ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

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- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- X GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- ___ WORK ORDER APPROVAL
- ___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
- X YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED
MAY 10 2002
PWD/DESIGN REVIEW

DATE SUBMITTED: 5/10/02 BY: Scott M McGee

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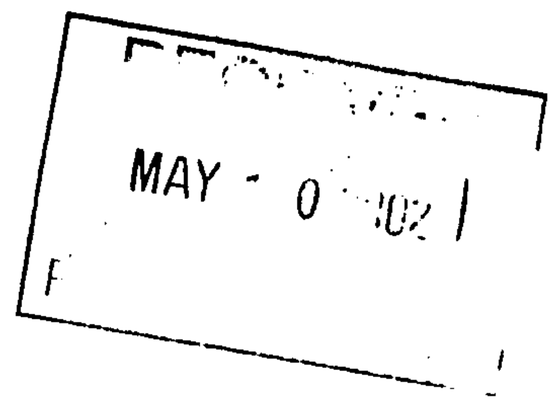
DRAINAGE REPORT

FOR

CASITA DE LA MESA, UNIT 4

A 40-LOT SUBDIVISION

ALBUQUERQUE, NEW MEXICO
MAY 2002

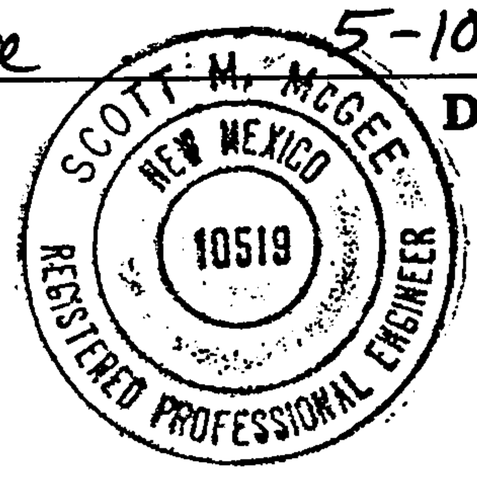


Prepared by:

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

Scott M McGee 5-10-02

Scott M. McGee, PE **Date**



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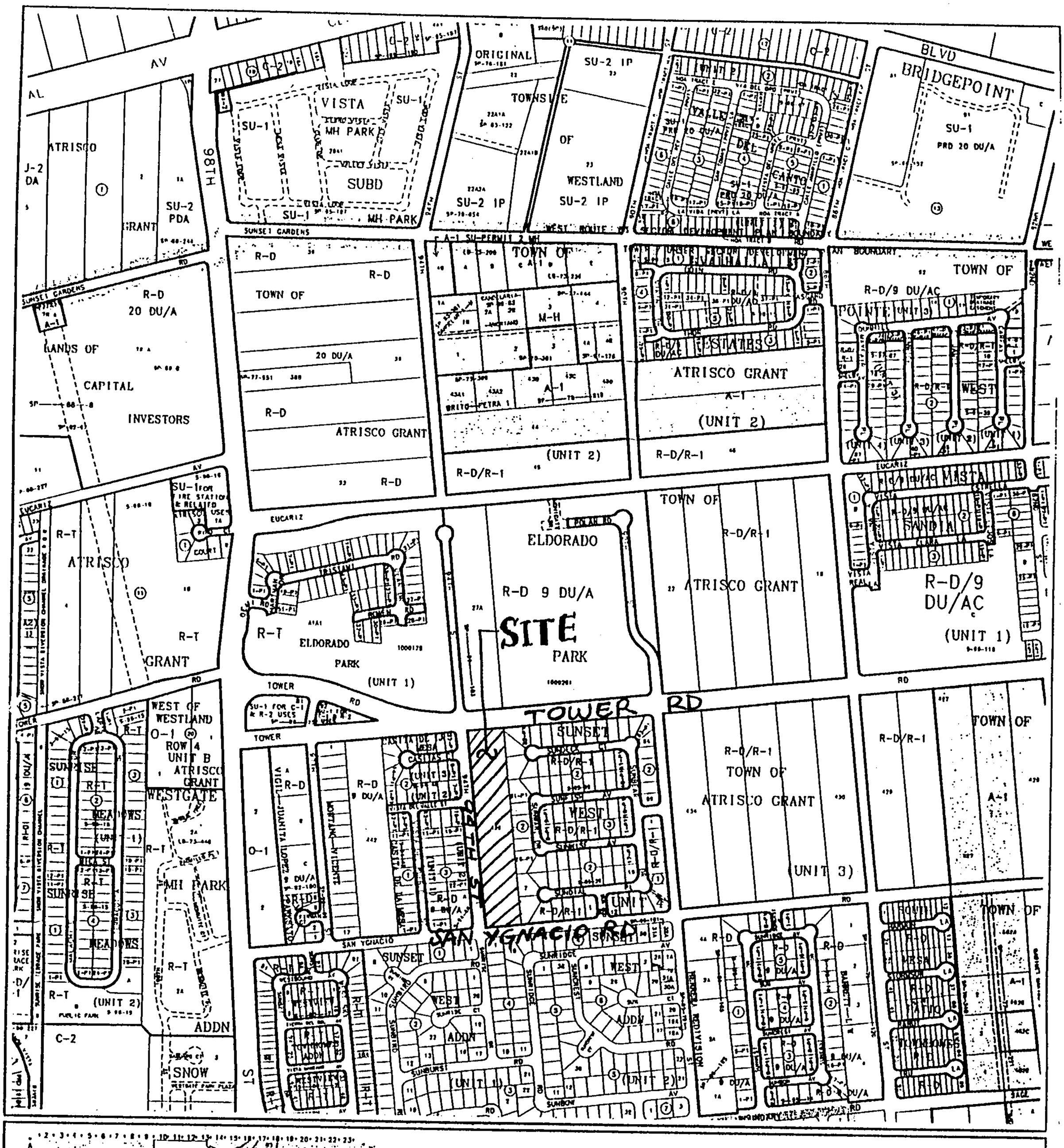
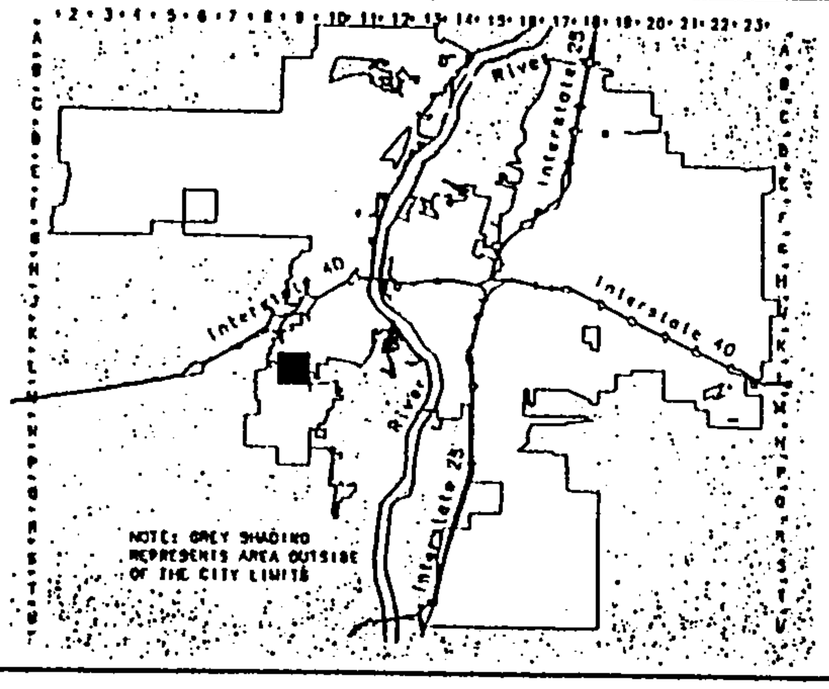




CITY OF
Albuquerque

AGIS Albuquerque Geographic Information System
PLANNING DEPARTMENT

GRAPHIC SCALE IN FEET

250 0 750 1000

Zone Atlas Page

L-9-Z

Map Amended through August 15, 2000

INTRODUCTION

Casita de La Mesa, Unit Four, will ultimately be developed as a 40-lot single-family subdivision. The site is bordered to the north by Tower Road, to the south by San Ygnacio Road and to the west by 94th Street. The land to the east has been developed as Sunset West Subdivision, Unit 4.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: Tract 439, Town of Atrisco Grant, Unit 3, as filed in the records of the County Clerk of Bernalillo on December 5, 1944, in Volume D, Folio 117 & 118

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Scott M. McGee, P.E.

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: ACS Control Station "7-L9" located 39.2 feet west from the centerline of 98th Street and 31.0 feet south from the centerline of Tower Road.
Elevation: 5175.74

ZONING: R-D/R-1

NUMBER OF EXISTING TRACTS: 1

NUMBER OF PROPOSED LOTS: 40

TOTAL AREA: 5.0899 Ac. (221,716 SF)

II. SITE CHARACTERISTICS

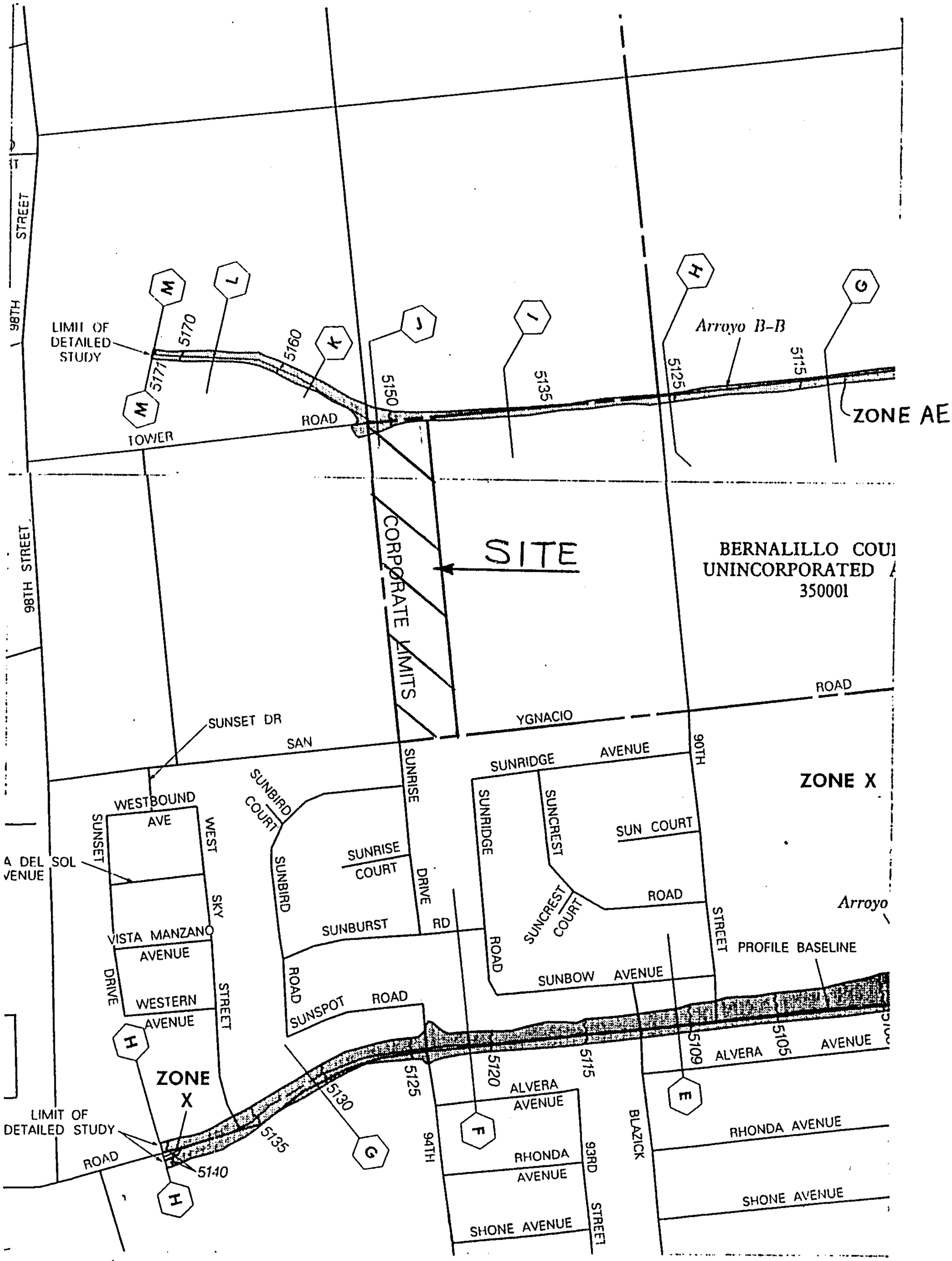
FLOOD HAZARD: Tower Road falls within flood zone AE as determined by Panel Nos. 336 and 328 of the September 20, 1996 edition of the F.E.M.A. maps. (See attached copy.)

EXISTING CONDITIONS: The site is undeveloped with native vegetative cover typical of the City's west side. It slopes at approximately 2 to 4% from the northwest to the southeast. The undeveloped storm water (6.6 cfs) from the site flows onto San Ygnacio Road. No offsite flows enter the site. (See attached Runoff Calculations.)

94th Street has been improved with standard curb and gutter along the west side and 25 feet of permanent pavement. Tower Road has 24 feet of temporary paving along the north side of the site, and San Ygnacio Road has been improved with standard curb and gutter to the south and 25-35 feet of permanent paving.

PROPOSED CONDITIONS: Improvements in 94th Street include adding standard curb and gutter and 11 feet of permanent paving. Both San Ygnacio Road and Tower Road will be constructed with permanent paving, standard curb and gutter and a median as part of the SAD 222 improvements (City Project No. 4188.91). When the site is developed, it will be graded to direct the developed flows east to a 10-foot wide public storm drain easement running along the east property line. Catch basins, proposed at the east end of each

FEMA PANELS 328 & 336



cul-de-sac, will be connected by a public storm drain running south to San Ygnacio Road SW.

The northerly lots bordering Tower Road were graded to elevate the finish floor elevations one foot above the floodplain water surface elevation. This floodplain will be eliminated by storm drain improvements being built by the SAD.

The total developed flows (20.6 cfs) will be discharged to San Ygnacio Road through five 2-foot wide sidewalk culverts--see Rundown Width Calculations and Sidewalk Culvert Analysis. San Ygnacio Road will have adequate capacity to handle the developed flows from Casita de La Mesa, Unit 4, after SAD 222, City Project No. 4188.91, has been completed.

CONCLUSIONS & RECOMMENDATIONS

Developed flows will discharge to San Ygnacio as they have historically and as shown by SAD 222. San Ygnacio was shown to have capacity by the Master Drainage Plan (SAD 222).

RUNOFF CALCULATIONS

Precipitation Zone: 1

EXISTING:

Land Treatment		Area (Ac.)
100 %	A	5.1218

Q_{100} = (5.1218)(1.29)
= **6.6 cfs**

PROPOSED:

Land Treatment--Ultimate

On-Site			94th Street			Total:	
Area:	5.1218 Ac.		Area:		0.4370 Ac.	5.5588 Ac.	
10 %	B	0.5122				B	0.5122
30 %	C	1.5365	25 %	C	0.109	C	1.6458
60 %	D	3.0731	75 %	D	0.328	D	3.4008

Ultimate Q_{100} **20.6 cfs**

Weighted E = ((0.5122*0.67)+(1.6458*0.99)+(3.4008*1.97))/(5.5588)
= **1.56 in.**

RUNDOWN-WIDTH CALCULATIONS

Rundown entrance at cul-de-sacs

Weir equation: $Q=CLH^{3/2}$

C=3.33 H=0.50'

$L= Q/CH^{3/2}$ L= Width, Q=(20.6/4) cfs = 5.15 cfs

L= 5.15/1.18 = 4.37 ft.

Use 6 ft.

Rundown exit at San Ygnacio St.

Orifice equation: $Q=CA(2gh)^{1/2}$

C=0.7 H=0.33'

A=1.33, Q=(0.7)(1.33)(4.63) cfs = 4.3 cfs

# of culverts = 20.6/4.3 = 4.8

Use five 2-foot wide sidewalk culverts

Casita de La Mesa, Unit 4
Flow Depth Summary for Key Locations

Street	Location	Street Width	Curb Type	Slope (ft/ft)	Q100(cfs)	Depth (ft)
Rundown	@ south property line	10	--	0.0148	20.6	0.51
San Ygnacio Rd.	south of rundown	42	STD	0.0198	20.6	0.42
Sidewalk Culverts	in San Ygnacio Rd.	2	--	0.02	4.12	0.34

Casitas de la Mesa
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	18in RCP
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.012300	ft/ft
Diameter	18.00	in
Discharge	5.20	cfs

Results		
Depth	8.4	in
Flow Area	0.81	ft^2
Wetted Perimeter	2.26	ft
Top Width	1.50	ft
Critical Depth	0.88	ft
Percent Full	46.81	
Critical Slope	0.005857	ft/ft
Velocity	6.41	ft/s
Velocity Head	0.64	ft
Specific Energy	1.34	ft
Froude Number	1.53	
Maximum Discharge	12.53	cfs
Full Flow Capacity	11.65	cfs
Full Flow Slope	0.002451	ft/ft
Flow is supercritical.		

Casitas de la Mesa
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	18in RCP 2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.016700	ft/ft
Diameter	18.00	in
Discharge	10.30	cfs

Results		
Depth	11.7	in
Flow Area	1.22	ft²
Wetted Perimeter	2.82	ft
Top Width	1.43	ft
Critical Depth	1.24	ft
Percent Full	65.14	
Critical Slope	0.009538	ft/ft
Velocity	8.45	ft/s
Velocity Head	1.11	ft
Specific Energy	2.09	ft
Froude Number	1.61	
Maximum Discharge	14.60	cfs
Full Flow Capacity	13.57	cfs
Full Flow Slope	0.009616	ft/ft
Flow is supercritical.		

Casitas de la Mesa
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	24in RCP 1
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.011300	ft/ft
Diameter	24.00	in
Discharge	15.50	cfs

Results		
Depth	14.0	in
Flow Area	1.91	ft^2
Wetted Perimeter	3.48	ft
Top Width	1.97	ft
Critical Depth	1.42	ft
Percent Full	58.41	
Critical Slope	0.006463	ft/ft
Velocity	8.13	ft/s
Velocity Head	1.03	ft
Specific Energy	2.20	ft
Froude Number	1.46	
Maximum Discharge	25.87	cfs
Full Flow Capacity	24.05	cfs
Full Flow Slope	0.004695	ft/ft
Flow is supercritical.		

Casitas de la Mesa
Worksheet for Circular Channel

Project Description	
Project File	untitled.fm2
Worksheet	24in RCP 2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Diameter	24.00	in
Discharge	20.60	cfs

Results		
Depth	18.0	in
Flow Area	2.52	ft^2
Wetted Perimeter	4.18	ft
Top Width	1.73	ft
Critical Depth	1.63	ft
Percent Full	74.91	
Critical Slope	0.008399	ft/ft
Velocity	8.16	ft/s
Velocity Head	1.03	ft
Specific Energy	2.53	ft
Froude Number	1.19	
Maximum Discharge	24.33	cfs
Full Flow Capacity	22.62	cfs
Full Flow Slope	0.008293	ft/ft
Flow is supercritical.		

CASITA DE LA MESA-Rundown @ San Ygnacio
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	backyard rundown
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.014800	ft/ft

Elevation range: 0.00 ft to 1.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	1.00	0.00	10.00	0.013
0.01	0.33			
5.00	0.00			
9.99	0.33			
10.00	1.00			

Discharge	20.60	cfs

SOUTH OF LIBRO ILUMINADO CT.

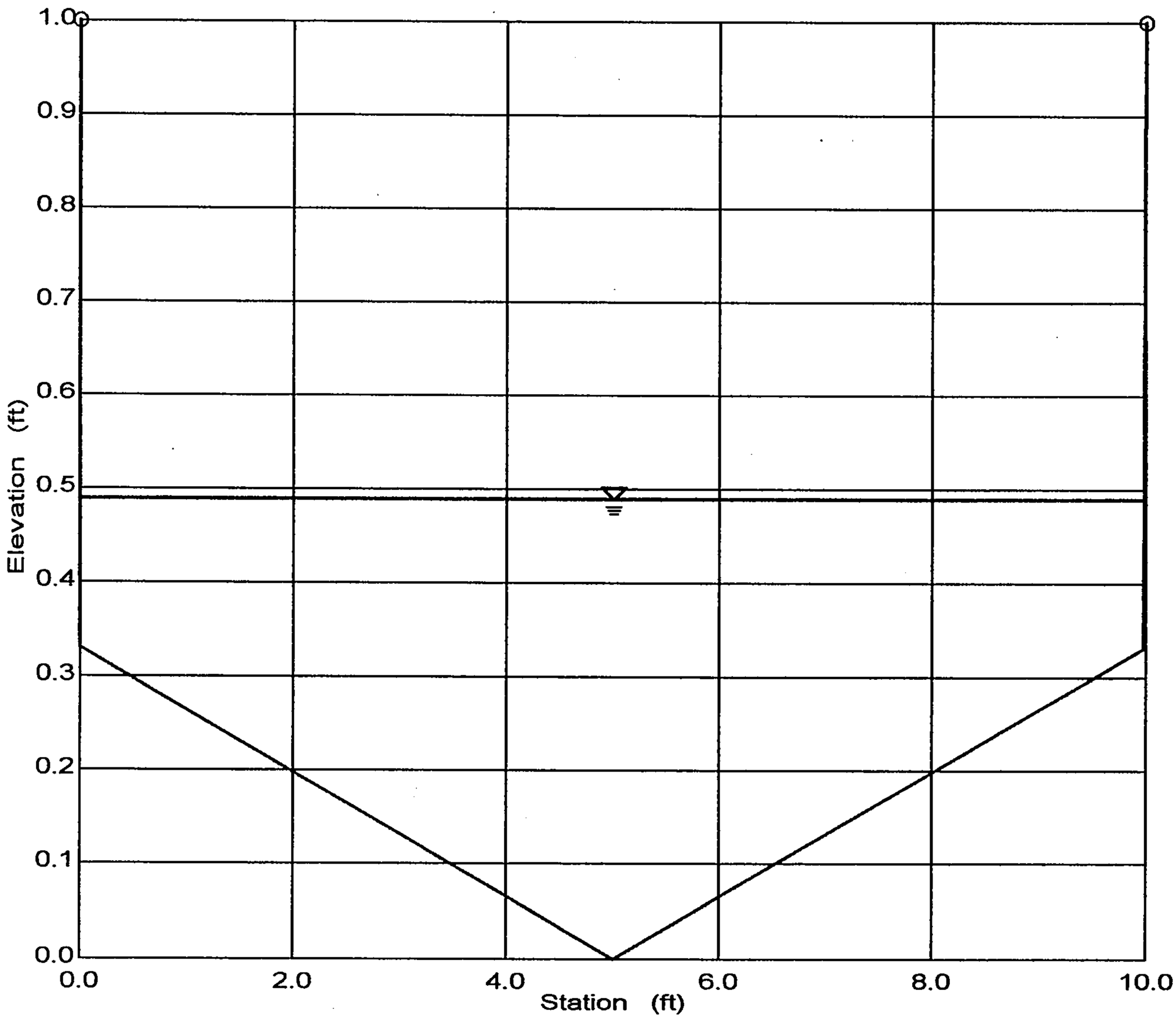
Results		
Wtd. Mannings Coefficient	0.013	
Water Surface Elevation	0.49	ft
Flow Area	3.22	ft²
Wetted Perimeter	10.32	ft
Top Width	9.98	ft
Height	0.49	ft
Critical Depth	0.67	ft
Critical Slope	0.003375	ft/ft
Velocity	6.40	ft/s
Velocity Head	0.64	ft
Specific Energy	1.12	ft
Froude Number	1.99	

Flow is supercritical.

Rundown along East Property Line Q=20.6 cfs
Cross Section for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	backyard rundown 1 - Q=20.6 cfs
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.013	
Channel Slope	0.014800	ft/ft
Water Surface Elevation	0.49	ft
Discharge	20.60	cfs



CASITA DE LA MESA-Rundown @ San Ygnacio
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	Sidewalk culverts in San Ygnacio Rd.
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

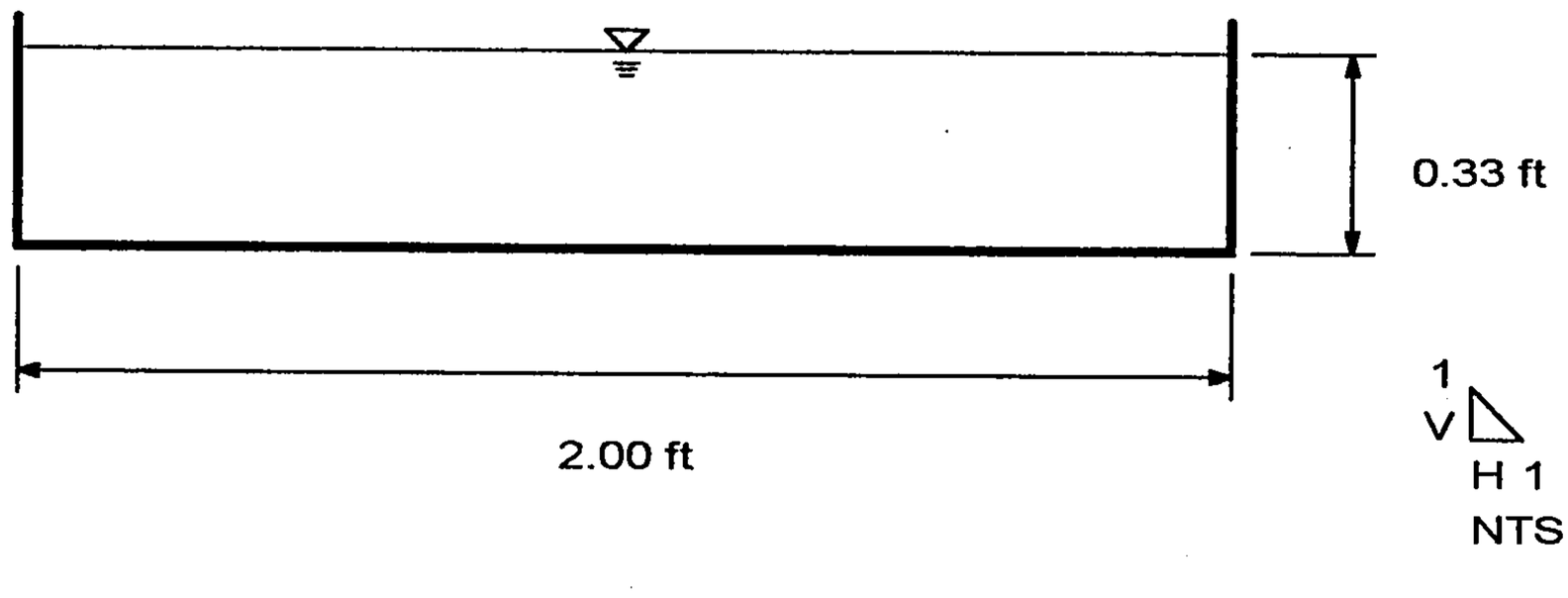
Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Bottom Width	2.00	ft
Discharge	4.12	cfs

Results		
Depth	0.33	ft
Flow Area	0.65	ft^2
Wetted Perimeter	2.65	ft
Top Width	2.00	ft
Critical Depth	0.51	ft
Critical Slope	0.005338	ft/ft
Velocity	6.34	ft/s
Velocity Head	0.62	ft
Specific Energy	0.95	ft
Froude Number	1.96	
Flow is supercritical.		

Sidewalk Culverts @ San Ygnacio Rd.
Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\1145.fm2
Worksheet	Sidewalk culverts in San Ygnacio Rd.
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Depth	0.33	ft
Bottom Width	2.00	ft
Discharge	4.12	cfs



NTS

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

Casitas de la Mesa Unit 4

L9/D26

March 5, 2001

Isaacson & Arfman
Constulting Engineering Assoc.
128 Monroe NE
Albuquerque, NM 87108

Mr. Scott McKenzee,

As we discussed Friday over the phone, the 10 foot wide face to face of header curb will be fine. Also discussed was the change from PVC 12" pipe to 12" ductile iron pipe for the culvert from type D inlet to drainage channel. I see no other changes that maintenance would like. The project looks good.

If I can be of further assistance, please contact me at 291-6214 or 235-8016.

Sincerely,

Glenn Jurgensen
Superintendent

Rec 2/22/01

CASITA DE LA MESA-Concrete Rundown
Worksheet for Irregular Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\1145.fm2
Worksheet	Asphalt Rundown 2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.019600	ft/ft

Elevation range: 0.00 ft to 0.83 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.83	0.00	10.00	0.017
0.01	0.33			
5.00	0.00			
9.99	0.33			
10.00	0.83			

Discharge	19.80	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.51	ft
Flow Area	3.40	ft²
Wetted Perimeter	10.35	ft
Top Width	9.99	ft
Height	0.51	ft
Critical Depth	0.66	ft
Critical Slope	0.005802	ft/ft
Velocity	5.82	ft/s
Velocity Head	0.53	ft
Specific Energy	1.03	ft
Froude Number	1.76	

Flow is supercritical.

IF HYDRAULIC JUMP OCCURRED:

SEQUENT DEPTH = y_2

$$\frac{y_2}{y_1} = \frac{1}{2}\left(\sqrt{1+8F_1^2} - 1\right)$$

APPROXIMATE AS RECTANGULAR CHANNEL

$$y_2 = \frac{y_1}{2}\left(\sqrt{1+(8)(1.76)^2} - 1\right)$$

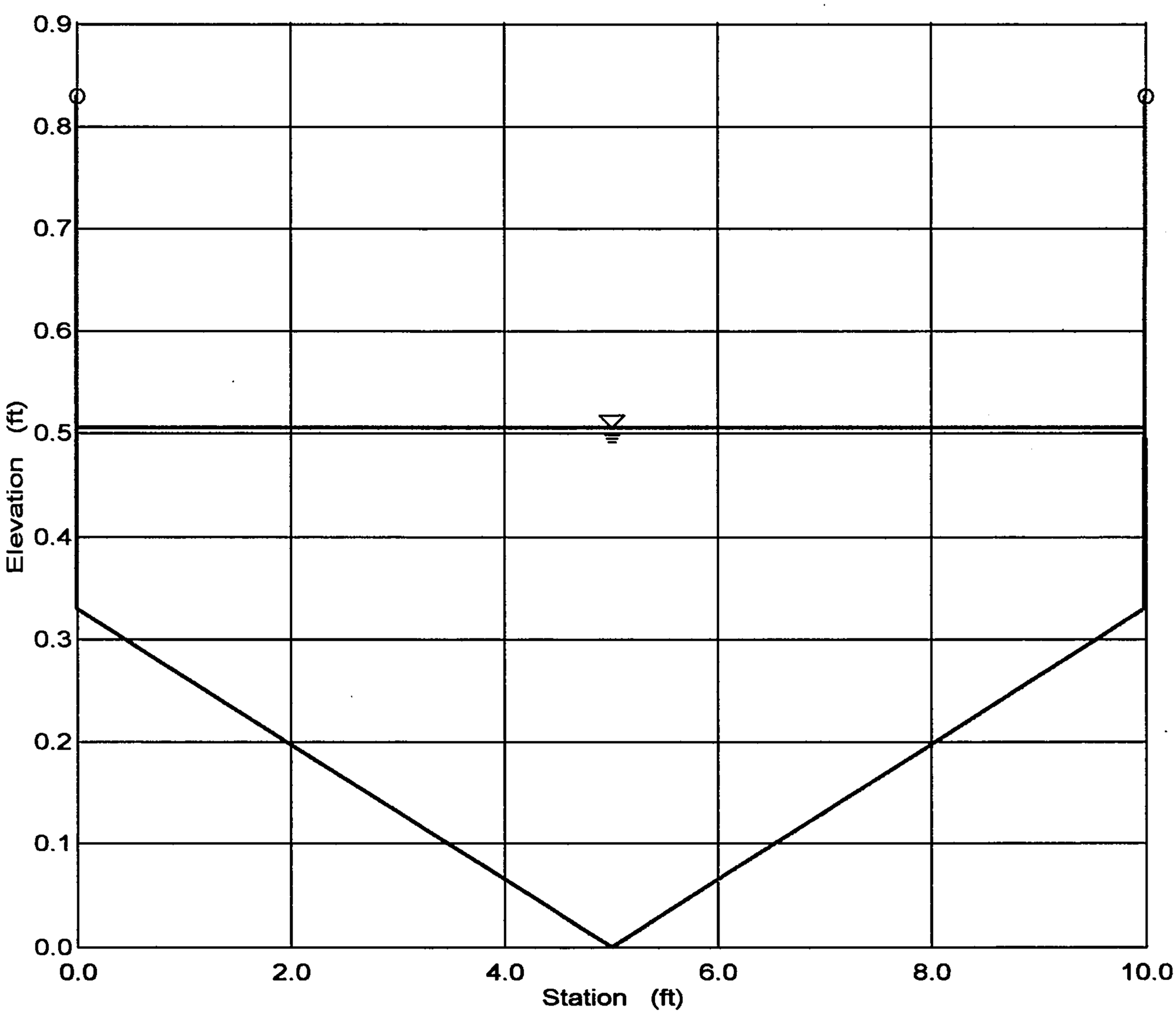
$$y_2 = \frac{0.51}{2}\left(\sqrt{25.78} - 1\right)$$

$\therefore$ SEQUENT DEPTH $\rightarrow y_2 = 1.04$ ft

CASITA DE LA MESA--Rundown @ San Ygnacio
Cross Section for Irregular Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\1145.fm2
Worksheet	Asphalt Rundown 2
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.019600	ft/ft
Water Surface Elevation	0.51	ft
Discharge	19.80	cfs



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 16, 2001

Scott McGee, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Casita de la Mesa, Unit 4 Drainage Report
Engineer's Stamp dated 1-5-01, (L9/D26)

Dear Mr. McGee,

Based upon the information provided in your submittal dated 1-10-01, the above referenced site is approved for Preliminary Plat action by the DRB.

The submittal dated 12-6-00 is now void.

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

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 12, 2000

Scott McGee, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Casita de la Mesa, Unit 4 Drainage Report
Engineer's Stamp dated 12-6-00, (L9/D26)

Dear Mr. McGee,

Based upon the information provided in your submittal dated 12-6-00, the above referenced site is approved for Preliminary Plat action by the DRB.

The submittal dated 11-3-00 is now void.

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

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file