#181

Federal Emergency Management Agency

Washington, D.C. 20472

February 23, 2010

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Richard J. Berry
Mayor, City of Albuquerque
Post Office Box 1293
Albuquerque, NM 87103

IN REPLY REFER TO:
Case No.: 09-06-2899P
Community Name: City of Albuquerque, NM
Community No.: 350002
Effective Date of
This Revision: **March 25, 2010**

Dear Mayor Berry:

The Flood Insurance Study report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Denton, Texas, at (940) 898-5127, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

For: Kevin C. Long, Acting Chief
Engineering Management Branch
Mitigation Directorate

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Mr. Bradley L. Bingham, P.E., CFM
Floodplain Administrator
City of Albuquerque

Mr. Daniel Aguirre, P.E.
Wilson & Company, Inc.

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Albuquerque Bernalillo County New Mexico	CHANNELIZATION STORM DRAIN	HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 350002		
IDENTIFIER	Vista Vieja Subdivision And Sad 227	APPROXIMATE LATITUDE & LONGITUDE: 35.158, -106.726 SOURCE: Other DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 35001C0111 G DATE: September 26, 2008 TYPE: FIRM* NO.: 35001C0113 G DATE: September 26, 2008	DATE OF EFFECTIVE FLOOD INSURANCE STUDY REPORT: September 26, 2008 PROFILE(S): 36P AND 37P FLOODWAY DATA TABLE: 13

losures reflect changes to flooding sources affected by this revision.
RM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES) See Page 2 for Additional Flooding Sources

Boca Negra Arroyo Overflows - from approximately 500 feet northwest of the intersection of 81st NW and Amethyst Drive to approximately 400 feet west of that intersection

Middle Tributary of the Boca Negra Arroyo - from approximately 50 feet upstream of Rim Rock drive to approximately 3,800 feet upstream of 81st NW

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Boca Negra Arroyo Overflows	Zone X (unshaded)	Zone A	YES	NONE
	Zone X (unshaded)	Zone A	YES	NONE
Middle Tributary of the Boca Negra Arroyo	Zone AE	Contained	NONE	YES
	Zone X (unshaded)	Zone A	YES	NONE

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the ...MC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.09092899 102-I-C

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE(S) & REVISED REACH(ES)

Southern Tributary of Boca Negra Arroyo - from just upstream of the confluence with Middle Tributary of the Boca Negra Arroyo to approximately 1,500 feet upstream

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Southern Tributary of Boca Negra Arroyo	Zone A	Zone A	YES	YES
	Zone A	Contained	NONE	YES

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the 1C Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

)MMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the ·MC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Frank Pagano
Director, Mitigation Division
Federal Emergency Management Agency, Region VI
Federal Regional Center, Room 206
800 North Loop 288
Denton, TX 76209
(940) 898-5127

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the MC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

This revision will become effective 30 days from the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the MC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Michael J. McGinn, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.09092899 102-I-C

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION (NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY[2]	WITHOUT FLOODWAY[2]	WITH FLOODWAY[2]	INCREASE[2]
MIDDLE TRIBUTARY OF THE BOCA NEGRA ARROYO								
A	1,680	23.5	71.4	10.0	5,295.3	5,295.3	5,295.3	0.0
B	1,903	111.5	107.1	5.6	5,312.0	5,312.0	5,312.0	0.0
~~C~~	~~2,496~~	~~129.2~~	~~143.5~~	~~4.2~~	~~5,319.0~~	~~5,319.0~~	~~5,319.0~~	~~0.0~~
~~D~~	~~3,001~~	~~268.0~~	~~153.5~~	~~3.9~~	~~5,325.1~~	~~5,325.1~~	~~5,325.1~~	~~0.0~~
~~E~~	~~3,481~~	~~340.1~~	~~169.3~~	~~3.6~~	~~5,333.7~~	~~5,333.7~~	~~5,333.7~~	~~0.0~~
~~F~~	~~3,974~~	~~270.7~~	~~157.0~~	~~3.9~~	~~5,341.7~~	~~5,341.7~~	~~5,341.7~~	~~0.0~~
~~G~~	~~4,452~~	~~346.2~~	~~156.5~~	~~3.9~~	~~5,351.4~~	~~5,351.4~~	~~5,351.4~~	~~0.0~~
~~H~~	~~4,993~~	~~465.1~~	~~183.5~~	~~3.3~~	~~5,363.2~~	~~5,363.2~~	~~5,363.2~~	~~0.0~~
~~I~~	~~5,591~~	~~503.8~~	~~211.5~~	~~2.9~~	~~5,372.1~~	~~5,372.1~~	~~5,372.1~~	~~0.0~~
~~J~~	~~5,928~~	~~182.8~~	~~125.2~~	~~4.8~~	~~5,378.4~~	~~5,378.4~~	~~5,378.4~~	~~0.0~~
~~K~~	~~6,374~~	~~325.0~~	~~177.4~~	~~3.4~~	~~5,385.3~~	~~5,385.3~~	~~5,385.3~~	~~0.0~~
~~L~~	~~6,748~~	~~96.3~~	~~102.2~~	~~5.9~~	~~5,392.1~~	~~5,392.1~~	~~5,392.1~~	~~0.0~~
M	7,165	53.9	84.2	7.2	5,399.0	5,399.0	5,399.0	0.0
N	7,681	113.6	106.4	5.7	5,414.5	5,414.5	5,414.5	0.0
O	8,206	47.1	80.3	7.5	5,427.5	5,427.5	5,427.5	0.0
P	8,461	94.8	109.1	5.5	5,439.5	5,439.5	5,439.5	0.0
Q	8,944	57.0	86.3	7.0	5,455.4	5,455.4	5,455.4	0.0

REVISED AREA

REVISED TO REFLECT LOMR EFFECTIVE: March 25, 2010

[1] Feet above confluence with Boca Negra Arroyo

[2] Floodway coincident with floodplain

TABLE 13

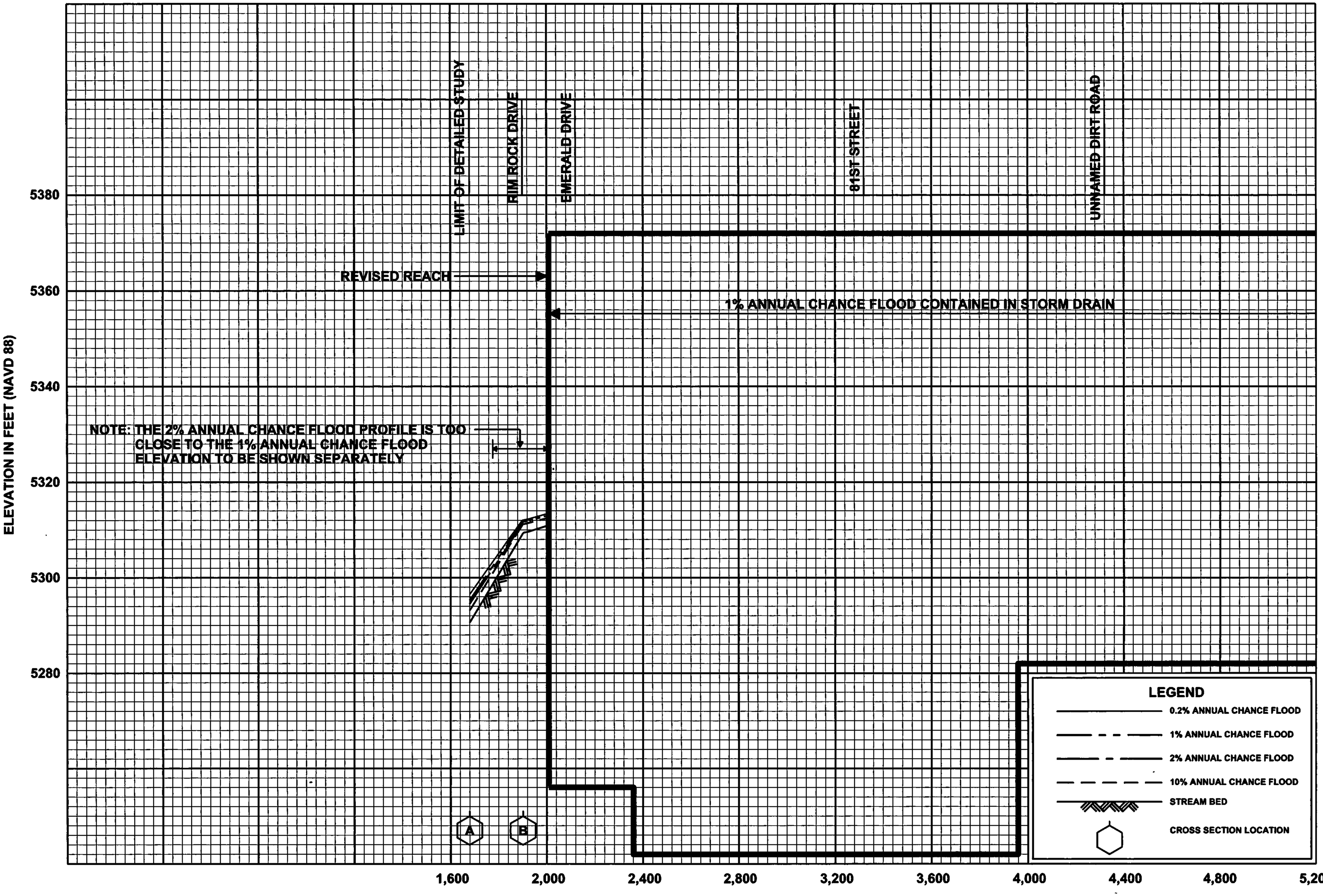
FEDERAL EMERGENCY MANAGEMENT AGENCY

BERNALILLO COUNTY, NM

AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE TRIBUTARY OF THE BOCA NEGRA ARROYO



REVISED TO REFLECT LOMR
EFFECTIVE: March 25, 2010

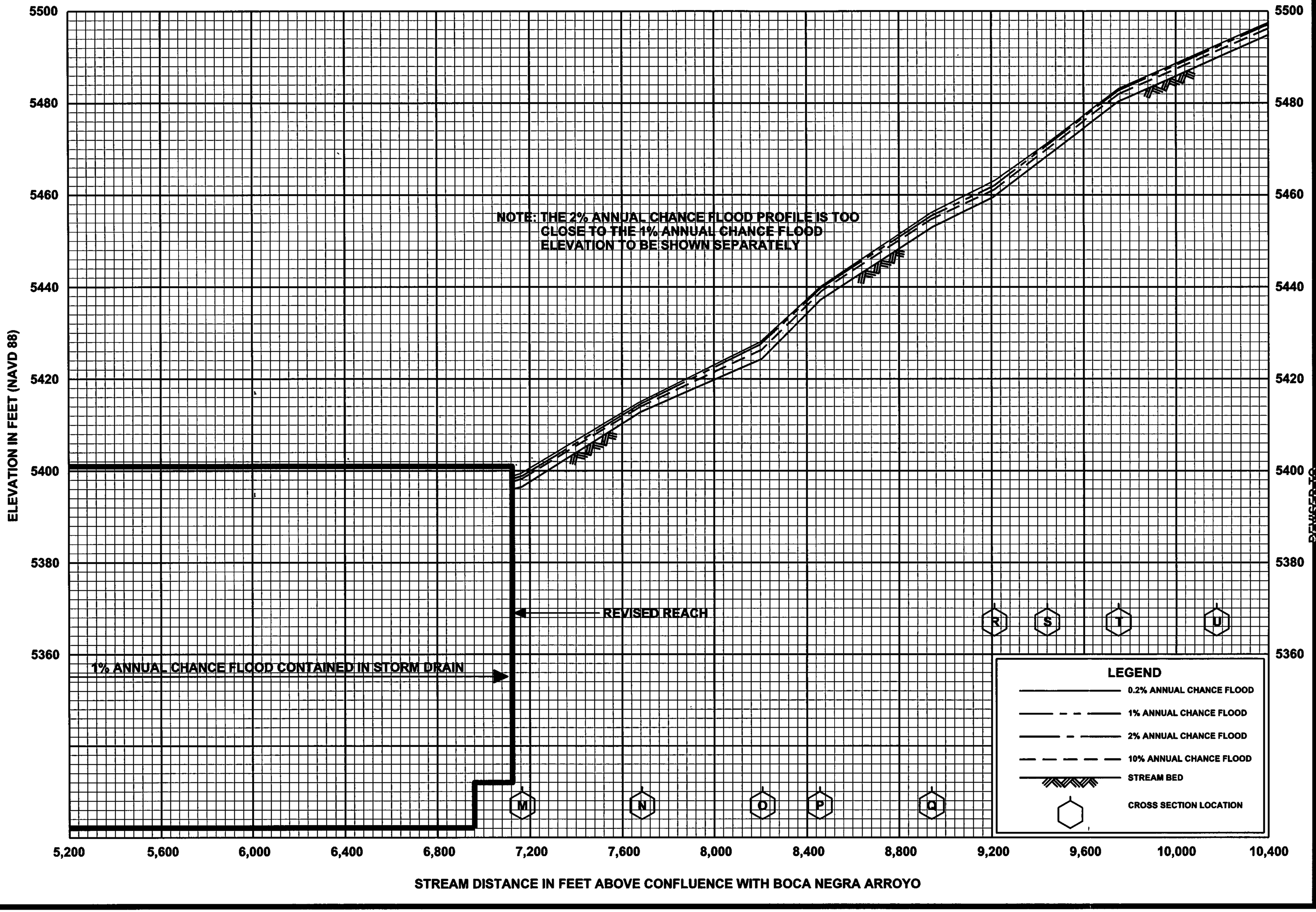
FLOOD PROFILES

MIDDLE TRIBUTARY OF THE BOCA NEGRA ARROYO

FEDERAL EMERGENCY MANAGEMENT AGENCY

BERNALILLO COUNTY, NM

AND INCORPORATED AREAS



FLOOD PROFILES

REVISED TO REFLECT LOMR EFFECTIVE: March 25, 2010

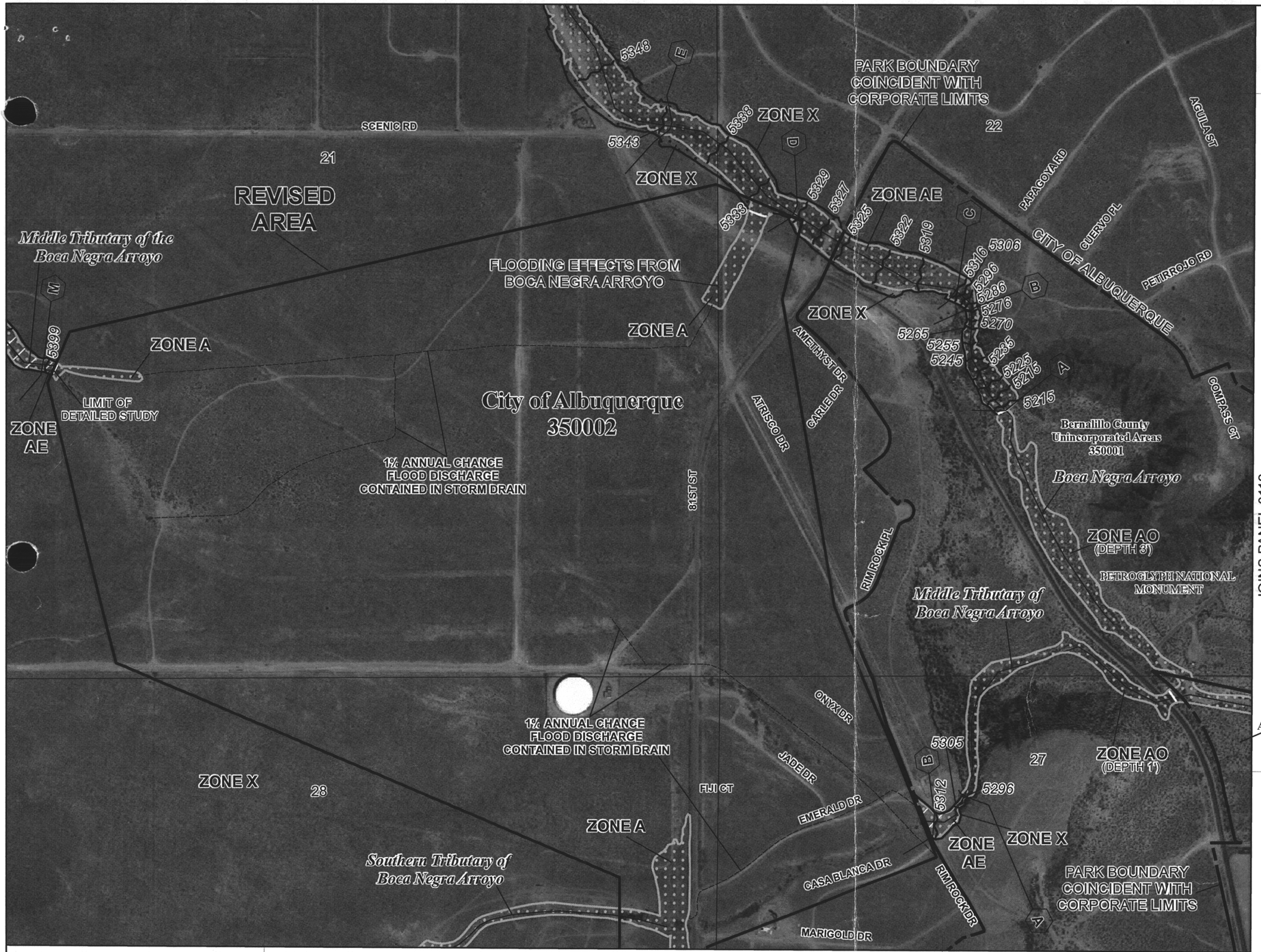
MIDDLE TRIBUTARY OF THE BOCA NEGRA ARROYO

FEDERAL EMERGENCY MANAGEMENT AGENCY

BERNALILLO COUNTY, NM

AND INCORPORATED AREAS

37P



Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

MAP SCALE 1" = 500'

250 0 500 FEET

150 0 150 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0111G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY,
NEW MEXICO
AND INCORPORATED AREAS

PANEL 111 OF 825
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BERNALILLO COUNTY	350001	0111	G
ALBUQUERQUE, CITY OF	350002	0111	G

REVISED TO REFLECT LOMR EFFECTIVE: **March 25, 2010**

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0111G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

Legend

1% annual chance (100-Year) Floodplain

1% annual chance (100-Year) Floodway

0.2% annual chance (500-Year) Floodplain

MAP SCALE 1" = 500'

250 0 500 FEET

150 0 150 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0113G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 113 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0113	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0113	G

REVISED TO REFLECT LOMR EFFECTIVE: March 25, 2010

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 35001C0113G

MAP REVISED SEPTEMBER 26, 2008

Federal Emergency Management Agency

1500000 FT

JOINS PANEL 0111

181

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Contractor

January 18, 2010

Mr. Daniel S. Aguirre, P.E.
Wilson & Company
4900 Lang Avenue Northeast
Albuquerque, NM 87109

IN REPLY REFER TO:
Case No.: 09-06-2899P
Community: City of Albuquerque, NM
Community No.: 350002

316-AD

Dear Mr. Aguirre:

This is in regard to your request dated July 20, 2009, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Bernalillo County, New Mexico and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Vista Vieja Subdivision and SAD 227
Flooding Sources:	Boca Negra Arroyo South
FIRM Panel(s) Affected:	35001C0111 E and 0113 E

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the current fee schedule. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is enclosed for your information.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data **must** be submitted within 90 days of the date of the letter.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program,

please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Mr. Dhananjay Sharma, CFM, by e-mail at dsharma@mbakercorp.com or by telephone at (571) 357-6020, or the Revisions Coordinator for this request, Ms. Shilpa Mulik, CFM, at smulik@mbakercorp.com or at (703) 317-6255.

Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

Enclosures

cc: Mr. Bradley L. Bingham, P.E., CFM
Floodplain Administrator
City of Albuquerque

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Provider

Summary of Additional Data Required to Support a
Letter of Map Revision

Case No.: 09-06-2899P

Requester: Mr. Daniel S. Aguirre, P.E.

Community: City of Albuquerque, NM

Community No.: 350002

The issue below must be addressed before we can continue the review of your request.

Please submit documentation of the individual legal notice sent to property owners who are affected by any increases in width and/or shifting of the base (1-percent-annual-chance) floodplain and/or increases/establishment of Base Flood Elevations. Legal notice may take the form of certified mailing receipts or certification that all property owners have been notified, with an accompanying mailing list and a copy of the letter sent. Examples of legal notice can be found on Pages 12 through 17 of the MT-2 application/certification form instructions, which may be accessed at http://www.fema.gov/pdf/fhm/mt2_inst.pdf.

Please send the required data directly to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Contractor

November 5, 2009

Mr. Daniel S. Aguirre, P.E.
Wilson & Company
4900 Lang Avenue Northeast
Albuquerque, NM 87109

IN REPLY REFER TO:
Case No.: 09-06-2899P
Community: City of Albuquerque, NM
Community No.: 350002

316-AD

Dear Mr. Aguirre:

This is in regard to your request dated July 20, 2009, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Bernalillo County, New Mexico and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Vista Vieja Subdivision and SAD 227
Flooding Sources:	Boca Negra Arroyo South
FIRM Panel(s) Affected:	35001C0111 E and 0113 E

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

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If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer,

Mr. Dhananjay Sharma, CFM, by e-mail at dsharma@mbakercorp.com or by telephone at (571) 357-6020, or the Revisions Coordinator for this request, Ms. Shilpa Mulik, CFM, at smulik@mbakercorp.com or at (703) 317-6255.

Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

Enclosure

cc: Mr. Bradley L. Bingham, P.E., CFM
Floodplain Administrator
City of Albuquerque

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Provider

Summary of Additional Data Required to Support a
Letter of Map Revision

Case No.: 09-06-2899P

Requester: Mr. Daniel S. Aguirre, P.E.

Community: City of Albuquerque, NM

Community No.: 350002

The issue below must be addressed before we can continue the review of your request.

Please submit digital copies of the HEC-RAS hydraulic computer model for the channel leading into the Vista Vieja north culvert entrance.

Please send the required data directly to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

D-9/15/2003 181

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Contractor

August 24, 2009

Mr. Daniel S. Aguirre, P.E.
Wilson & Company
4900 Lang Avenue N.E.
Albuquerque, NM 87109

IN REPLY REFER TO:
Case No.: 09-06-2899P
Community: City of Albuquerque, NM
Community No.: 350002
316-AD

Dear Mr. Aguirre:

This responds to your request dated July 20, 2009, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for Bernalillo County, New Mexico and Incorporated Areas. Pertinent information about the request is listed below.

Identifier:	Vista Vieja Subdivision and SAD 227
Flooding Sources:	Boca Negra Arroyo South
FIRM Panel(s) Affected:	35001C0111 E and 0113 E

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Sincerely,

Syed Qayum

Syed Qayum, CFM
LOMR Technical Manager
BakerAECOM

Enclosure

cc: Mr. Bradley L. Bingham, P.E., CFM
City Floodplain Administrator
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

bcc: Regional Administrator R6-MT
State Coordinator
PTS Case File/MBJ/SBM/DS/09-06-2899P-350002-AD.doc

NATIONAL FLOOD INSURANCE PROGRAM

FEMA Production and Technical Services Provider

Summary of Additional Data Required to Support a
Letter of Map Revision

Case No.: 09-06-2899P

Requester: Mr. Daniel S. Aguirre, P.E.

Community: City of Albuquerque, NM

Community No.: 350002

The issues listed below must be addressed before we can continue the review of your request.

1. Please submit certified drainage area maps, to the proper scale, that include the following information:

   a. The topographic contour information used for the boundary delineations of the drainage area;
   b. Locations and alignments of all cross sections used in the hydraulic model; and
   c. The flow line used in the hydraulic model.

2. Please submit a topographic work map that includes the following information:

   a. The boundary delineations of the effective and revised conditions base floodplains and the tie-ins between them;
   b. The topographic contour information used for the boundary delineations of the base flood;
   c. Reference to the vertical datum used for the topographic and/or surveyed information;
   d. Locations and alignments of all cross sections;
   e. The flow line used in the hydraulic model; and
   f. Reference to a datum, such as the National Geodetic Vertical Datum of 1929.

3. Please submit an annotated Flood Insurance Rate Map (FIRM), at the scale of the effective FIRM, that shows the revised floodplain boundary delineations and how they smoothly and graphically tie into the floodplain boundary delineations shown on the effective FIRM at the upstream and downstream ends of the project reach.

Please send the required data directly to us at the address shown at the bottom of this page. For identification purposes, please include the case number referenced above on all correspondence.

CITY OF ALBUQUERQUE

July 20, 2009

FEMA Depot
3601 Eisenhower Ave
Alexandria VA, 22304

Re: Request for a Letter of Map Revision for the Volcano Heights area of the City of Albuquerque, New Mexico, Community No. 350002, FIRM Panels 35001C0111F and 35001C0113F

Dear FEMA review engineer,

The purpose of this submittal is to convey the documents in order to request a Letter of Map Revision for the Volcano Heights area of Albuquerque, NM.

Enclosed with this letter are the Application and analysis of the project and as-built construction drawings for requesting revisions to the National Flood Insurance Program map. The fee of $4800.00 is also enclosed.

As the Community official, I have reviewed the application and endorse this revision request. Our Community would greatly appreciate your prompt response and approval.

If you have any questions, you can contact me at (505) 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE, CFM
City Floodplain Administrator

C: Dan Aguirre, P.E., Wilson & Co.
Bill Blanton, FEMA Headquarters
Jack Quarles, FEMA Region VI
file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

Account Number: 05183 131998 400021 131998

WILSON&COMPANY P.O. Box 94000 Albuquerque, NM 87199-4000 505-348-4000

INVOICE NUMBER	DATE		VOUCHER NO.	AMOUNT
062509	6/25/2009		179799	4,800.00
VOLCANO HEIGHTS LOMR SUBMITTAL FEE				
			TOTAL:	4,800.00

WILSON
&COMPANY
P.O. Box 94000
Albuquerque, NM 87199-4000
505-348-4000

SUNFLOWER BANK
Salina, KS

83-62
1011

131998
131998

VOID AFTER 90 DAYS

6/26/2009

PAY**********4,800 DOLLARS AND**********00 CENTS $**********4,800.00

TWO SIGNATURES REQUIRED OVER $50,000

James A. Gibbs MP

MP

TO THE ORDER OF
NATIONAL FLOOD INSURANCE PROGRAM
P O BOX 22787
ALEXANDRIA, VA 22304 US

ABC DocuCheck™ SECURITY PAPERS • MicroPrinting SIGNATURE LINE • Copy Void PANTOGRAPH

⑈131998⑈ ⑆101100621⑆0109146348⑈

Bingham, Brad L.

From: Becky Winebrenner [rwinebren@msn.com]
Sent: Tuesday, March 02, 2010 8:51 AM
Bingham, Brad L.
Subject: RE: 8312 Wild Dunes Flood Determination

AVENW
87120

MAILED
3-3-10

Thank you so much! I appreciate your help.
Becky

Subject: RE: 8312 Wild Dunes Flood Determination
Date: Fri, 26 Feb 2010 10:34:14 -0700
From: BBingham@cabq.gov
To: rwinebren@msn.com

I just got word that the LOMR was approved. I should be getting my copy soon and will forward you a copy to do battle with your mortgage co.
Thanks for being patient with me.

From: Becky Winebrenner [mailto:rwinebren@msn.com]
Sent: Monday, January 25, 2010 8:21 AM
To: Bingham, Brad L.
Subject: RE: 8312 Wild Dunes Flood Determination

Hi Brad,

C···'d you please let me know if there is another person or number I should be calling to check on the LOMR for n ɔuse. I want to see if it has already been processed or is still in the process.

Thanks for your help,
Becky Winebrenner

From: rwinebren@msn.com
To: bbingham@cabq.gov
Subject: RE: 8312 Wild Dunes Flood Determination
Date: Tue, 5 Jan 2010 16:14:59 +0000

Hi Brad,

Just trying to get an update on the LOMR for our neighborhood...more info below.

Thanks,
Becky Winebrenner

From: rwinebren@msn.com
To: bbingham@cabq.gov
Subject: RE: 8312 Wild Dunes Flood Determination
Date: Mon, 30 Nov 2009 15:44:32 +0000

H· ad,

I am just checking in to inquire about the LOMR for our address. Wondering if it was sent to FEMA & if you have heard anything on it.

TABLE OF CONTENTS

INTRODUCTORY MATERIAL
Introduction
Project Overview
Conclusion
Figure 1: Vicinity Map
Exhibit 1: Existing Floodplain
Exhibit 2: Proposed Floodplain
Exhibit 3: Storm Drain Systems

MT-2 FORM 1: OVERVIEW & CONCURRENCE FORM
APPENDIX 1
Copy of FIRM Panel, Map number 35001C0111E and 35001C0113E

MT-2 FORM 2: RIVERINE HYDROLOGY & HYDRAULICS FORM
Comments to MT-2 Form 2: Riverine Hydrology & Hydraulics Form

APPENDIX 2: Hydrology
Hydrologic Modeling – Historic and Current Models

APPENDIX 3: Hydraulics
Computer Models for Storm Drain Systems

MT-2 FORM 3: RIVERINE STRUCTURES FORM
Comments to MT-2 Form 3: Riverine Structures Form

APPENDIX 4: SUPPLEMENTAL INFORMATION
Construction Drawings

INTRODUCTION

The purpose of this Letter of Map Revision (LOMR) is to request a revision to Flood Insurance Rate Map (FIRM) Numbers 35001C0111E and 35001C0113E within Bernalillo County, New Mexico and unincorporated areas.

A portion of Zone A is to be eliminated from the floodplain along the north branch of Boca Negra Arroyo South due to construction of the Vista Vieja subdivision storm sewer and a second portion of Zone A is to be eliminated from the floodplain along the south branch of Boca Negra Arroyo South due to construction of the Special Assessment District Number 227 (SAD 227) storm sewer both located in City of Albuquerque. The area to be removed is hatched in Exhibit 1. Floodplains are expanded at two locations lying within City of Albuquerque owned open space and are shown on Exhibit 1. The area is developed and the storm drain installed will convey flows that were carried by the Boca Negra Arroyo South to the Boca Negra Arroyo. There is no detailed modeling available for this area and no data is available for the study area.

This document contains the required forms for the completion of this LOMR. The forms follow this introduction. Supplemental data, such as modeling output and construction as-built drawings, are provided in the appendices that follow each respective form.

PROJECT OVERVIEW

The project site is included in two developed areas. The first area is the Vista Vieja Subdivision, a residential subdivision which is bounded by 81st Street to the east, Albericoque Place to the west, open space to the south, and Scenic Road to the north. The second area is in Special Assessment District 227 (SAD 227) also a residential subdivision which is bounded by 81st Street to the west and Petroglyph National Monument on all other sides. (See Fig. 1 for vicinity map).

The LOMR is for a floodplain located in the lower half of Vista Vieja and upper third of SAD 227 (Exhibit 1). The FEMA flood insurance rate map for this area was published on November 19, 2003. This LOMR is for a 4100 foot segment of the north branch of the Boca Negra Arroyo South and an 1100 foot segment of the south branch of the Boca Negra Arroyo South.

Two models are submitted with this LOMR. An historic conditions model and a post development (current) conditions model were developed to calculate historic and current peak flows. Modeling is consistent with guidelines set forth in Section 22.2, Hydrology, of the development process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 (COA DPM). Three separate storm drain systems were constructed to convey flows from Boca Negra Arroyo South: the Emerald Drive Storm Drain System, the Onyx Drive Storm Drain System and the Vista Vieja Storm Drain System. Exhibit 3 shows the locations of the separate systems. System information was taken from construction as-built drawings included in Appendix 4.

Emerald Drive Storm Drain System

The south branch of Boca Negra Arroyo South is conveyed into a 72" RCP pipe under 81st Street and continues in Emerald Drive through SAD 227. The existing floodplain at the entrance to the pipe will be expanded due to ponding at the entrance of the pipe. The land where water ponds is owned by the City of Albuquerque and is designated as open space. The storm drain system then continues east under Unser Blvd where flows discharge to the existing south branch of Boca Negra Arroyo South at the Petroglyph Park Boundary.

The existing 100 year-24 hour storm peak flow from the south branch of Boca Negra Arroyo South flowing into the 72" pipe is 379 cfs. The Emerald Drive storm drain system safely conveys this flow.

Onyx Drive Storm Drain Sytem

The Onyx Drive storm drain system collects flows from Vista Vieja Subdivision Units 1 and 4 through a series of inlets within the subdivision that connects to a 60" pipe. The pipe exits the subdivision at the southeast corner where it connects to the Onyx Drive system. Flows from the north branch of Boca Negra Arroyo South (located to the south of the Vista Vieja Subdivision) are routed through a pond then into a 48" pipe that connects to the Onyx Drive storm drain system. The system was constructed with the SAD 227 improvements and the alignment travels from the Vista Vieja Subdivision east across 81st Street then southeast in Onyx Drive until Unser Boulevard, then southeast in Unser Boulevard to the outlet at the intersection of Montano Road and Unser Boulevard.

The existing 100 year-24 hour storm peak flow from the north branch of Boca Negra Arroyo South flowing into the 48" pipe is 91 cfs. The peak flow from Vista Vieja Subdivision Units 1 and 4 that enters into the system is 154 cfs. The Onyx Drive storm drain system safely conveys flows from the Vista Vieja Subdivision and flows from the north branch of Boca Negra Arroyo South.

Vista Vieja Storm Drain System

The Vista Vieja Storm Drain System collects flows from the north branch of Boca Negra Arroyo South in two locations (north and south) at the east side of the Vista Vieja Subdivision. The north location collects flows in a constructed channel that flows to a 72" RCP at the intersection of Groundsel Road NW and Albericoque Place NW. The 72" RCP connects to an underground storm drain system that is located within the Vista Vieja subdivision. The storm drain system alignment continues in the open space along Groundsel Road, where it intercepts flows from Units 2 and 3 of the subdivision and the lower north fork of the South Branch of the Boca Negra Arroyo.

The south location captures flows in a 5 foot by 10 foot drop inlet located to the south of the intersection of Hawk Eye Road NW and Albericoque Place NW. The inlet connects to an underground storm drain system that is located in Hawk Eye Road NW and Vista Antigua Drive NW. This system collects onsite flows from Vista Vieja Subdivision Unit 4 and connects to the north system located in Groundsel Road at the intersection of

Groundsel Road NW and Vista Antigua Drive NW. All flows in this system ultimately drain to the Boca Negra Detention Dam, a flood control facility maintained by the Albuquerque Metropolitan Arroyo Flood Control Authority to be constructed on the northeast corner of the Vista Vieja subdivision. Until the construction of the Boca Negra Detention Dam a temporary flood plain is created at the downstream end of the above mentioned storm drain which will need to be removed after the dam is constructed.

The existing 100 year-24 hour storm peak flow for the north branch of Boca Negra Arroyo South flowing into the 72" RCP at Goundsel Road NW and Albericoque Place NW is 159 cfs. The existing 100 year-24 hour peak flow for the north branch of Boca Negra Arroyo South flowing into the drop inlet at Hawk Eye Road NW and Albericoque Place NW is 67 cfs. The peak flow from Vista Vieja Subdivision Unit 3 that enters into the system is 60 cfs. The Vista Vieja storm drain system safely conveys flows from the Vista Vieja Subdivision and flows from north branch of the Boca Negra Arroyo South.

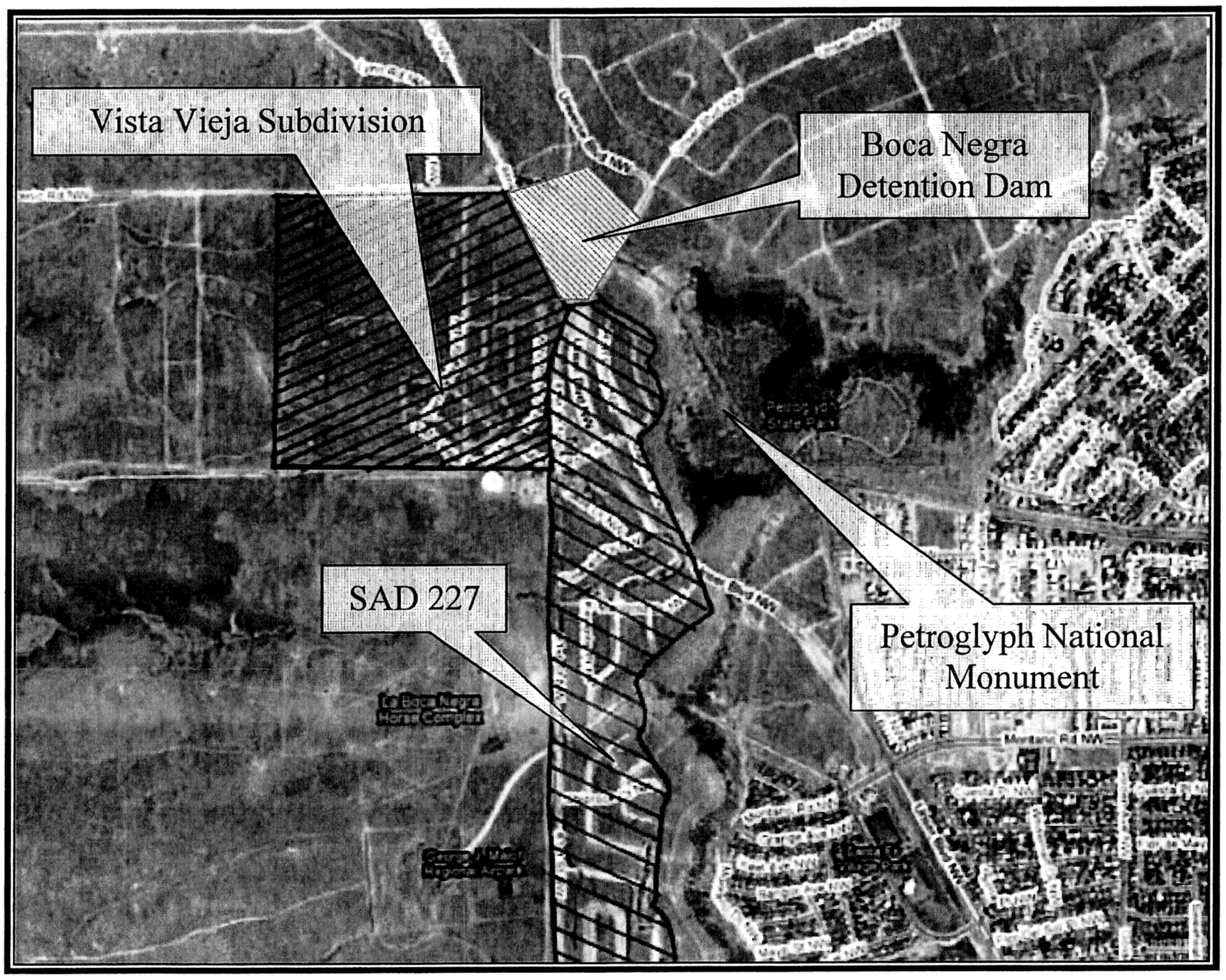
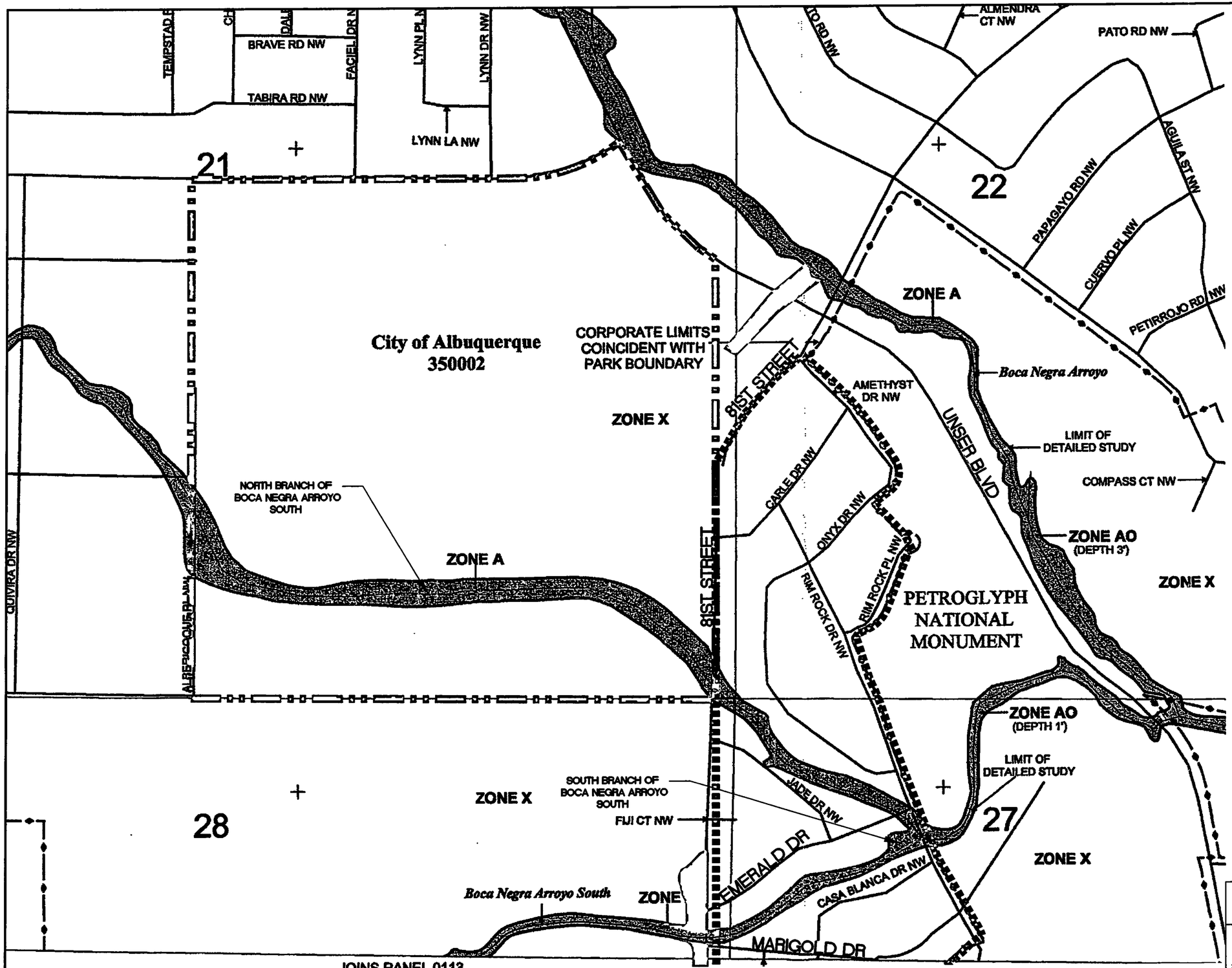


Figure 1: Vicinity Map

Conclusion

Three storm drain systems have been constructed to convey the flow from the historic Boca Negra Arroyo South which effectively removes the part of the floodplain contained in FEMA Flood Insurance Rate Map 35001C0111E. Two systems, the Vista Vieja storm drain and the Onyx Drive storm drain convey flows from the north branch of Boca Negra Arroyo South, and the third system, the Emerald Drive storm drain, conveys flows from the south branch of Boca Negra Arroyo South. Floodplains are expanded at two locations--at

the exit of the Vista Vieja storm drain and at the entrance to the Emerald Drive storm drain. Hydrologic models were developed for historic and current conditions, and hydraulic models were used to verify that the storm drains could convey the flows. The storm drain systems can safely convey all flows.



PANEL 0111E

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 111 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0111	E
BERNALILLO COUNTY	350001	0111	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0111E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

VISTA VIEJA BOUNDARY

FLOODPLAIN TO BE REMOVED BY VISTA VIEJA

SAD 227 BOUNDARY

FLOODPLAIN TO BE REMOVED BY SAD 227/ CITY OF ALBUQUERQUE

FLOODPLAIN CREATED WITH IMPROVEMENTS

N

GRAPHIC SCALE

500 0 250 500

(IN FEET)
1 inch = 500 ft.

CITY OF ALBUQUERQUE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

BOCA NEGRA ARROYO SOUTH LOMR

EXISTING FLOODPLAIN EXHIBIT 1A

28

27

SHIPROCK DR NW

MONTANO RD NW

GRANGE AVE NW

KEEL AVE NW

CREGGS ST NW

MAUNA LOA DR NW

BANGOR AVE NW

MINEHEAD ST NW

CARRICK ST NW

MAYO ST NW

FOXFORD AVE NW

MONTANO DR NW

CINDER CONE DR NW

KIMBERLITE DR NW

POPO DR NW

CLIFF RD NW

CLIFF CT

ZONE A

ORPORATE LIMITS
OINCIDENT WITH
'ARK BOUNDARY

Arroyo De San Antonio North

LAVA PL NW

CIENEGA RD NW

ZONE AO
(DEPTH 2')

LAMAR AVE NW

ROCKCRESS CT NW

SWEETBRIER AVE NW

SEDGE AVE NW

ROCKCRESS DR NW

PARK BOUNDARY

ZONE A

Arroyo De San Antonio Middle

ZONE X

CORPORATE LIMITS
COINCIDENT WITH
PARK BOUNDARY

SNAPDRAGON RD

LIMIT OF
DETAILED STUDY

JOINS PANEL 0114

ZONE A

Arroyo De San Antonio South

33

PANEL 0113E

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 113 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0113	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0113E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

VISTA VIEJA BOUNDARY

FLOODPLAIN TO BE REMOVED BY VISTA VIEJA

SAD 227 BOUNDARY

FLOODPLAIN TO BE REMOVED BY SAD 227/ CITY OF ALBUQUERQUE

FLOODPLAIN CREATED WITH IMPROVEMENTS

N

GRAPHIC SCALE

500 0 250 500

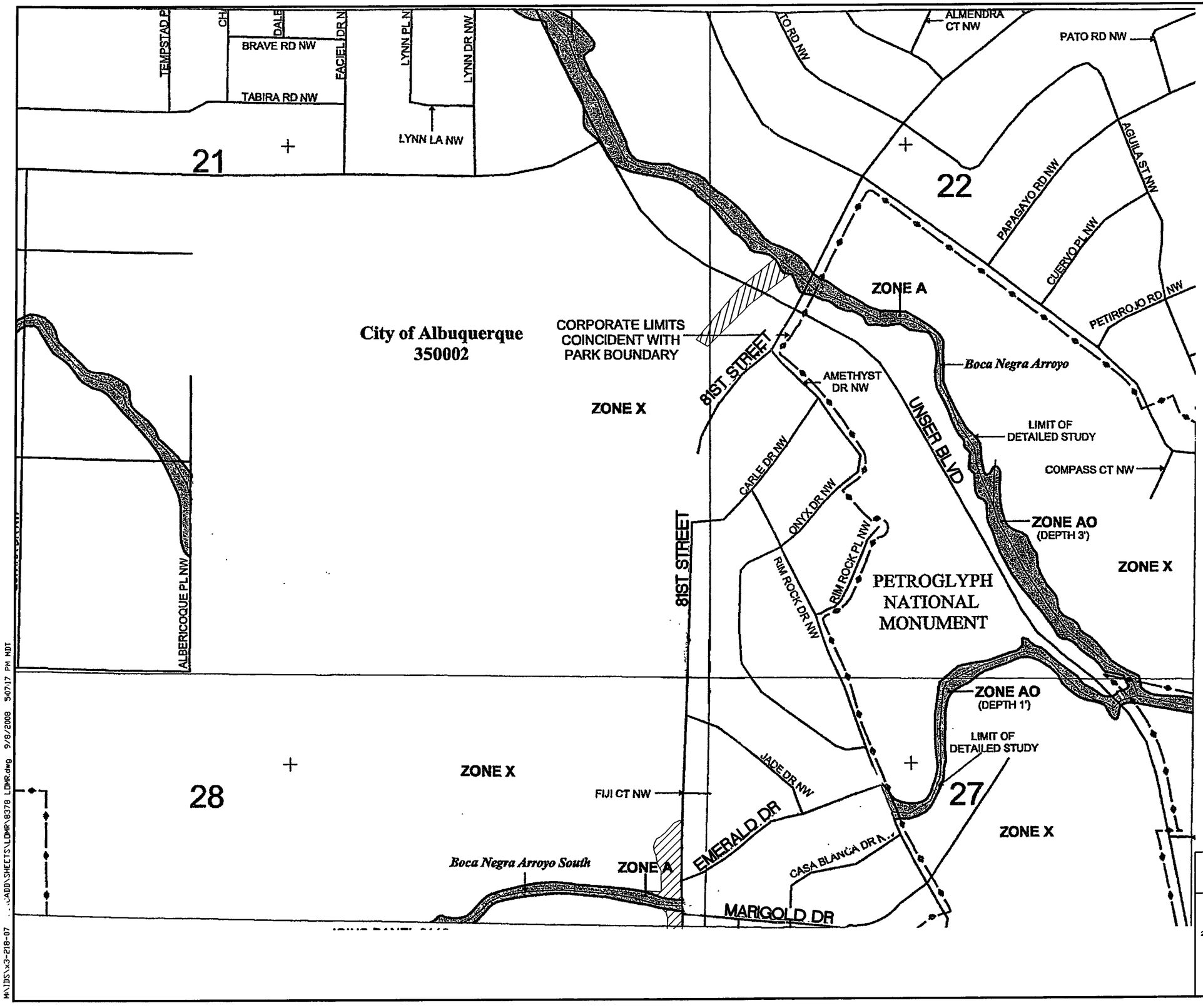
(IN FEET)
1 inch = 500 ft.

CITY OF ALBUQUERQUE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

BOCA NEGRA ARROYO SOUTH LOMR

EXISTING FLOODPLAIN
EXHIBIT 1B



PANEL 0111E

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 111 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0111	E
BERNALILLO COUNTY	350001	0111	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0111E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

FLOODPLAIN CREATED WITH IMPROVEMENTS

N

GRAPHIC SCALE

500 0 250 500

(IN FEET)
1 inch = 500 ft.

CITY OF ALBUQUERQUE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 896-8021

BOCA NEGRA ARROYO SOUTH LOMR

PROPOSED FLOODPLAIN EXHIBIT 2A

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28

27

33

34

ZONE A

CORPORATE LIMITS COINCIDENT WITH PARK BOUNDARY

Arroyo De San Antonio North

ZONE X

ZONE A

Arroyo De San Antonio Middle

ZONE X

CORPORATE LIMITS COINCIDENT WITH PARK BOUNDARY

ZONE A

Arroyo De San Antonio South

LIMIT OF DETAILED STUDY

ZONE AO
(DEPTH 2')

SHIPROCK DR NW

MONTANO RD NW

GRANGE AVE NW

KEEL AVE NW

CREGGS ST NW

MAUNA LOA DR NW

BANGOR AVE NW

CINDER CONE DR NW

KIMBERLITE DR NW

POPO DR NW

CLIFF CT

CLIFF RD NW

MINEHEAD ST NW

CARRICK ST NW

MONTANO DR NW

MAYO ST NW

FOXFORD AVE NW

LAVA PL NW

CIENEGA RD NW

LAMAR AVE NW

ROCKCRESS CT NW

SWEETBRIER AVE NW

SEDGE AVE NW

ROCKCRESS DR NW

PARK BOUNDARY

SNAPDRAGON RD

PANEL 0113E

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 113 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0113	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0113E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

FLOODPLAIN CREATED WITH IMPROVEMENTS

N

GRAPHIC SCALE

500 0 250 500

(IN FEET)
1 inch = 500 ft.

CITY OF ALBUQUERQUE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

BOCA NEGRA ARROYO SOUTH LOMR

PROPOSED FLOODPLAIN EXHIBIT 2B

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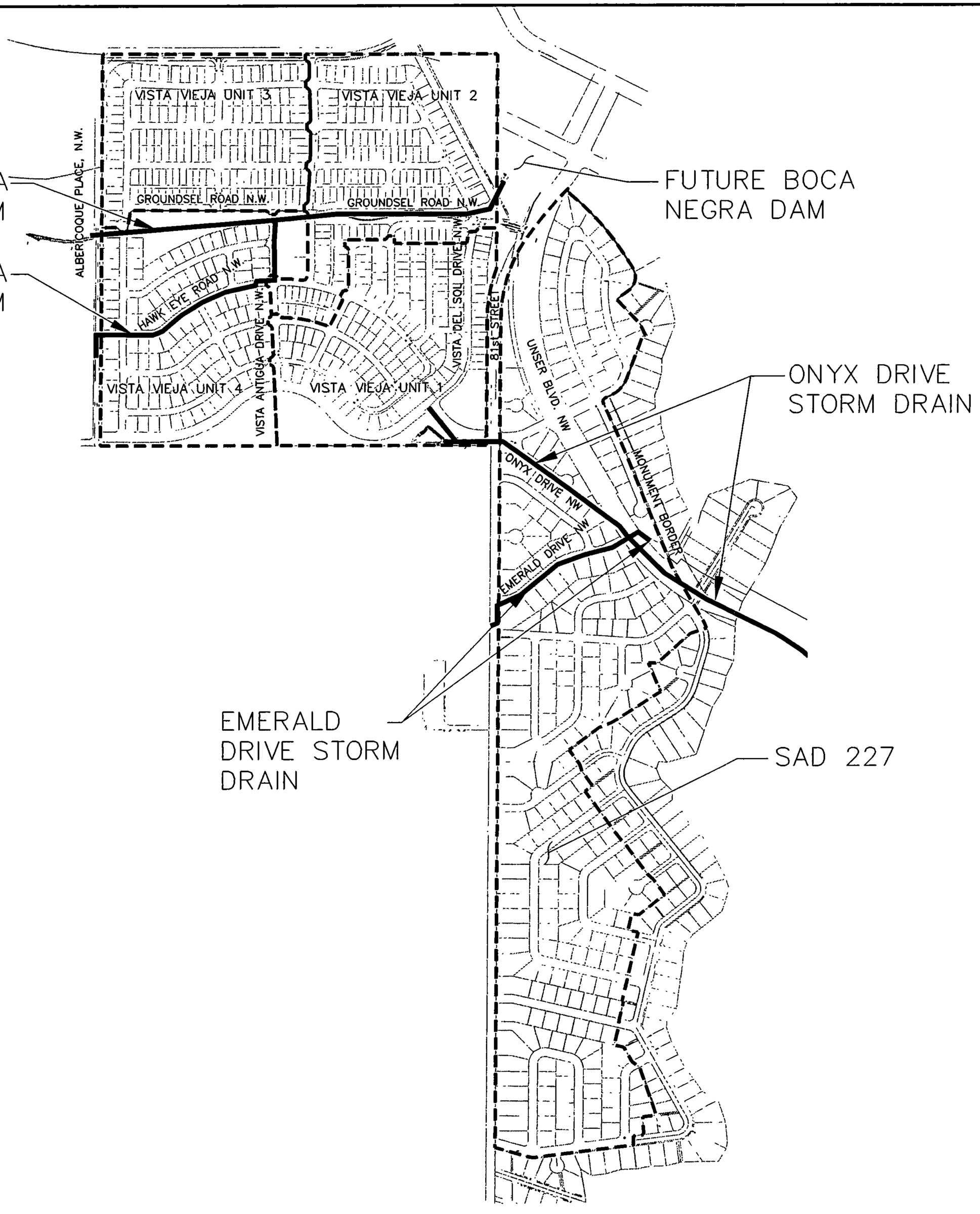


N

GRAPHIC SCALE

800 0 400 800

(IN FEET)
1 inch = 800 ft.

CITY OF ALBUQUERQUE

WILSON & COMPANY
2600 THE AMERICAN ROAD S.E.
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 898-8021

BOCA NEGRA ARROYO SOUTH LOMR

STORM DRAIN SYSTEMS
EXHIBIT 3

M:\DS\x3-218-01\CADD\SHEETS\LOMR\Exhibit 3.dwg 1/16/2009 1:55:22 PM MST

MT-2 (FORM 1)
OVERVIEW & CONCURRENCE FORM

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
0001	City of Albuquerque, Bernalillo County	NM	35001C	0111E	11/19/03
002	City of Albuquerque, Bernalillo County	NM	35001C	0111E/0113E	11/19/03

2. a. Flooding Source: Boca Negra Arroyo South

b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)

☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Vista Vieja Subdivision and SAD 227

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes

☐ Coastal Analysis ☐ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections

☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes

☐ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

as the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4800

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Tony S.	Company:	
Mailing Address:	Daytime Telephone No.:	Fax No.:
	E-Mail Address:	
Signature of Requester (required):	Date:	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Bradley L Bingham, City Floodplain Administrator	Community Name: City of Alb	
Mailing Address: poBox 1293 Alb, NM 87102	Daytime Telephone No.: (505) 924-3986	Fax No.: (505) 924-3988
	E-Mail Address: bbingham@cabq.gov	
Community Official's Signature (required): Bradley L. Bingham	Date: 7/20/09	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Daniel S. Aguirre, PE	License No.: 11955	Expiration Date:
Company Name: Wilson & Company	Telephone No.: 505-898-8021	Fax No.: 505-898-8501
Signature:		Date: 6/25/09

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

DANIEL S. AGUIRRE NEW MEXICO 11955 PROFESSIONAL ENGINEER

Seal (Optional)

APPENDIX 1
FIRM PANEL

APPENDIX 1
FIRM PANEL/MAP NUMBER

PANEL 0111E

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 111 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0111	E
BERNALILLO COUNTY	350001	0111	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0111E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

PANEL 0113E

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 113 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0113	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0113E
MAP REVISED
NOVEMBER 19, 2003

Federal Emergency Management Agency

MT-2 (FORM 2)

RIVERINE HYDROLOGY & HYDRAULICS FORM

COMMENTS TO MT-2, FORM 2 (HYDROLOGY & HYDRAULICS)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Boca Negra Arroyo South
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section B) ☒ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☒ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model AHYMO_97
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Water-Surface Elevations (ft.) Proposed/Revised
Downstream Limit				
Upstream Limit				

Hydraulic Method/Model Used

StormCAD

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	_____
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	_____
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	_____
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	_____
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	_____

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☐ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
      - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No
      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☒ Yes ☐ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.

   For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

Comments to MT-2, Form 2: Riverine Hydrology and Hydraulics Form
South Branch of Boca Negra Arroyo South

Section A: Hydrology

1. Historic flows into the north branch of Boca Negra Arroyo South have been redirected into underground storm drain systems that empty into either the proposed Boca Negra Dam or the San Antonio Arroyo 1 mile southeast of the Vista Vieja Subdivision. Historic flows into the south branch of Boca Negra Arroyo South are collected into an underground storm drain system on the west side of the SAD 227 improvements that empties into the historic Boca Negra Arroyo South on the east side of the SAD 227 improvements.

2. No existing Flood Insurance Detail Study has been done for the area. Drainage reports exist for the subdivisions within the study area and were used as a reference in the analysis, however, methodology in the reports was done using the modified rational method. In order to provide a more accurate hydrologic analysis, the data from the reports was entered into the Arid-lands Hydrologic Model to obtain flows and volumes. By using the computer model, peak flows and runoff volumes were decreased overall, accounting for the discrepancy in values found in the provided as-built drawings in Appendix 4 when compared to the results of this analysis.

Subdivision Drainage Report References:
Wilson & Company, Inc (2003), *SAD 227 Drainage Report.*
Wilson & Company, Inc (2005), *Vista Vieja-Phase I Drainage Report.*
Wilson & Company, Inc (2007), *Vista Vieja-Phase II, III, IV Drainage Report..*

3. The Arid-lands Hydrologic Model (AHYMO) distributed by Anderson-Hydro was used in the hydrologic analysis. The following parameters were used in the program:

- A 24-hour rainfall distribution per FEMA criteria;
- Rainfall data from NOAA Atlas 14;
- Time interval of 3 minutes;
- AHYMO "COMPUTE LT TP" command to calculate time to peak based on the Upland/Lag Time method;
- Basin areas, slopes and lengths from existing topographic maps;
- AHYMO "COMPUTE NM HYD" command to develop hydrographs based on land treatment;
- Land treatment from the City of Albuquerque Devlopment Process Manual, 1997 Revision, Section 22.2, with impervious area calculated assuming 6 dwelling units per acre for residential subdivisions.

The following tables contain the historic and current basin summaries. Historic and current basin boundary maps are included at the end of this section.

Historic Basin Summary								
Basin	Area (acres)	Time to Peak (min)	Land Treatment (%)				Qpeak (cfs)	Volume (ac-ft)
			A	B	C	D		
45A	336	108	89	0	10	1	159	12.38
45B	72.32	93	99	0	1	0	67	2.35
45C	54.4	96	90	0	10	0	44	1.92
45D	97.28	96	90	0	10	0	81	3.43
51A	159.36	99	90	0	10	0	117	5.62
51B	141.44	99	90	0	10	0	92	4.99
51C	288	102	100	0	0	0	150	9.28
51D	563.2	111	100	0	0	0	219	18.15
51E	198.4	102	100	0	0	0	119	6.39

Current Basin Summary								
Basin	Area (acres)	Time to Peak (min)	Land Treatment (%)				Qpeak (cfs)	Volume (ac-ft)
			A	B	C	D		
45A	336	108	89	0	10	1	159	12.38
45B	72.32	93	99	0	1	0	67	2.35
45C	54.4	93	0	20	20	60	155	7.6
45D	97.28	96	0	20	20	60	240	13.59
51A	159.36	99	90	0	10	0	117	5.62
51B	141.44	99	90	0	10	0	92	4.99
51C	288	102	100	0	0	0	150	9.28
51D	563.2	111	100	0	0	0	219	18.15
51E	198.4	102	100	0	0	0	119	6.39

4. A copy of this report has been submitted to the City of Albuquerque for approval.

5. Sediment transport was not included in the analysis because the BFE and no structures are affected in this analysis

Section B: Hydraulics

2. A portion of Zone A is to be eliminated from the floodplain along the north branch of Boca Negra Arroyo South due to construction of the Vista Vieja subdivision storm sewer and a second portion of Zone A is to be eliminated from the floodplain along the south branch of Boca Negra Arroyo South due to construction of the Special Assessment District Number 227 (SAD 227) storm sewer both located in City of Albuquerque. The area to be removed is hatched in Exhibit 1 located in the Introductory Material at the beginning of this report. There is no detailed modeling available for this area and no data is available for the study area.

To verify that the storm drain systems could convey the flow of the historic Boca Negra Arroyo South, the StormCAD program was used. As-built information for the storm drain systems was entered into the program and flows calculated in this report were input into the systems to verify the current system could handle the calculated flows. Culverts were analyzed using Bentley's Culvertmaster program to ensure all flows could enter the pipes as shown in the plans.

The analysis was done for three separate storm drain systems: the Emerald Drive Storm Drain System constructed with SAD 227 that conveys flows from the south branch of Boca Negra Arroyo South, the Onyx Drive Storm Drain System constructed with SAD 227 that conveys flows from the north branch of Boca Negra Arroyo South and the Vista Vieja Storm Drain System constructed with the Vista Vieja Subdivision that conveys flows from the north branch of Boca Negra Arroyo South. All systems can safely convey the calculated flows. The systems are identified in Exhibit 3 located in the Introductory Material at the beginning of this report.

The Emerald Drive Storm Drain System has 379 cfs flowing to the 72" culvert that connects to the system. This flow is less than the original design flow of 400 cfs shown in the as-built drawings and the system can safely convey both the original design flow and the flow calculated in this report.

The Onyx Drive Storm Drain System has 92 cfs flowing into the system from the 48" culvert at the pond south of the Vista Vieja subdivision and 155 cfs from the Vista Vieja subdivision. This totals a combined flow of 175 cfs to the Onyx Drive storm drain system. This flow is less than the original design flow of 250 cfs shown in the as-built drawings for this system. The SAD 227 subdivision contributes 149 cfs to the system with an ultimate outflow of 324 cfs. This outflow is less than the designed 399 cfs shown in the as-built drawings. The system can handle both the flows calculated in this study and the original flows as shown in the as-built drawings.

The Vista Vieja Storm Drain System collects flows from the north branch of Boca Negra Arroyo South in two locations. The north location is a 72" culvert pipe that can safely convey the existing 145 cfs flowing to it. The south location is a drop inlet that collects and safely conveys the 67 cfs flowing to it. The Vista Vieja Subdivision contributes 60 cfs to the system. The system empties into the proposed Boca Negra Dam located to the northeast of the subdivision.

StormCAD plan, profiles and pipe data and Culvertmaster reports for entrance pipes are located in Appendix 3. As-built drawings for all systems are located in Appendix 4.

APPENDIX 2
HYDROLOGY

APPENDIX 2
HYDROLOGY

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

New Mexico 35.16 N 106.73 W 5324 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Thu Feb 19 2009

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Docs | Return to State Map

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.16	0.24	0.30	0.41	0.50	0.59	0.63	0.72	0.81	0.93	0.96	1.29	1.48	1.65	2.07	2.48	3.03	3.48
2	0.21	0.32	0.39	0.53	0.65	0.76	0.80	0.92	1.02	1.17	1.21	1.61	1.84	2.04	2.57	3.07	3.75	4.31
5	0.28	0.42	0.53	0.71	0.88	1.00	1.05	1.19	1.30	1.47	1.53	1.98	2.25	2.51	3.12	3.70	4.48	5.14
10	0.34	0.51	0.64	0.86	1.06	1.20	1.26	1.41	1.53	1.71	1.77	2.27	2.56	2.87	3.54	4.17	4.99	5.73
25	0.41	0.63	0.78	1.05	1.30	1.48	1.53	1.70	1.82	2.04	2.11	2.65	2.97	3.35	4.07	4.75	5.62	6.45
50	0.47	0.72	0.89	1.20	1.49	1.70	1.76	1.93	2.06	2.29	2.37	2.95	3.28	3.70	4.46	5.16	6.05	6.93
100	0.54	0.82	1.01	1.37	1.69	1.94	2.00	2.17	2.29	2.56	2.64	3.25	3.58	4.07	4.83	5.55	6.44	7.38
200	0.61	0.92	1.14	1.54	1.91	2.19	2.26	2.42	2.55	2.82	2.92	3.54	3.88	4.42	5.18	5.92	6.78	7.78
500	0.70	1.06	1.32	1.77	2.19	2.54	2.62	2.78	2.89	3.19	3.29	3.94	4.26	4.88	5.62	6.36	7.18	8.23
1000	0.77	1.18	1.46	1.96	2.43	2.83	2.91	3.07	3.16	3.47	3.59	4.24	4.55	5.22	5.94	6.67	7.42	8.53

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.19	0.28	0.35	0.47	0.59	0.68	0.72	0.82	0.91	1.06	1.07	1.42	1.62	1.79	2.26	2.69	3.28	3.77
2	0.24	0.37	0.46	0.62	0.76	0.86	0.92	1.04	1.15	1.33	1.36	1.76	2.01	2.22	2.80	3.33	4.06	4.67
5	0.33	0.50	0.62	0.83	1.03	1.15	1.20	1.34	1.46	1.67	1.70	2.16	2.44	2.72	3.40	4.01	4.83	5.56
10	0.39	0.60	0.74	1.00	1.23	1.36	1.43	1.58	1.71	1.93	1.98	2.47	2.78	3.11	3.85	4.50	5.38	6.20
25	0.48	0.73	0.91	1.22	1.51	1.67	1.74	1.91	2.03	2.30	2.35	2.90	3.23	3.62	4.42	5.12	6.06	6.96
50	0.55	0.84	1.04	1.40	1.73	1.92	1.99	2.16	2.29	2.58	2.63	3.22	3.56	4.00	4.84	5.57	6.52	7.49
100	0.62	0.95	1.17	1.58	1.96	2.19	2.26	2.44	2.56	2.88	2.93	3.54	3.90	4.40	5.24	5.99	6.93	7.97
200	0.70	1.07	1.32	1.78	2.21	2.47	2.55	2.71	2.84	3.16	3.23	3.87	4.22	4.78	5.62	6.38	7.30	8.41
500	0.81	1.23	1.53	2.06	2.55	2.86	2.96	3.11	3.22	3.57	3.66	4.31	4.64	5.29	6.10	6.87	7.73	8.91
1000	0.90	1.36	1.69	2.28	2.82	3.19	3.30	3.44	3.54	3.89	3.99	4.64	4.96	5.67	6.45	7.21	7.99	9.22

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

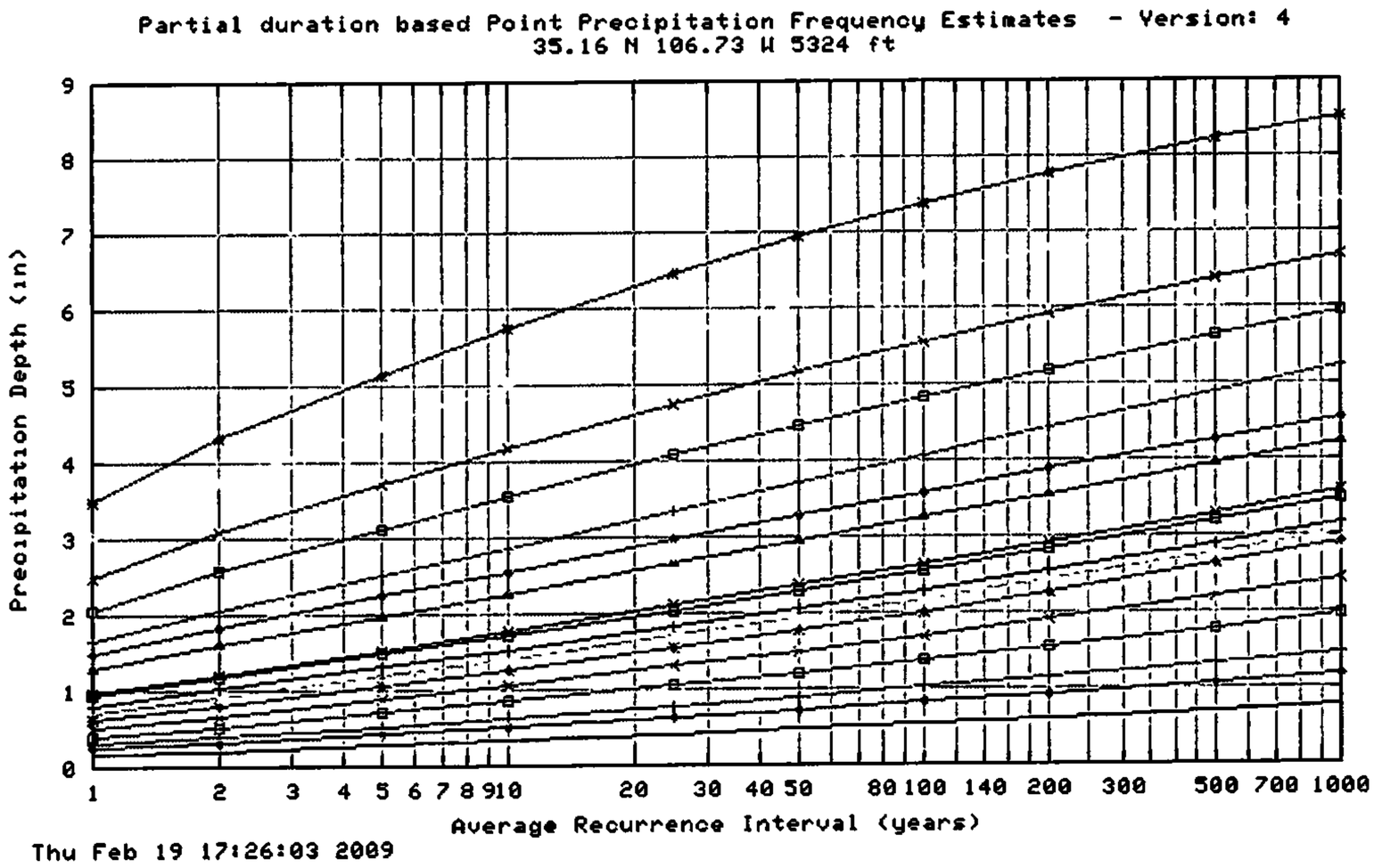
* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

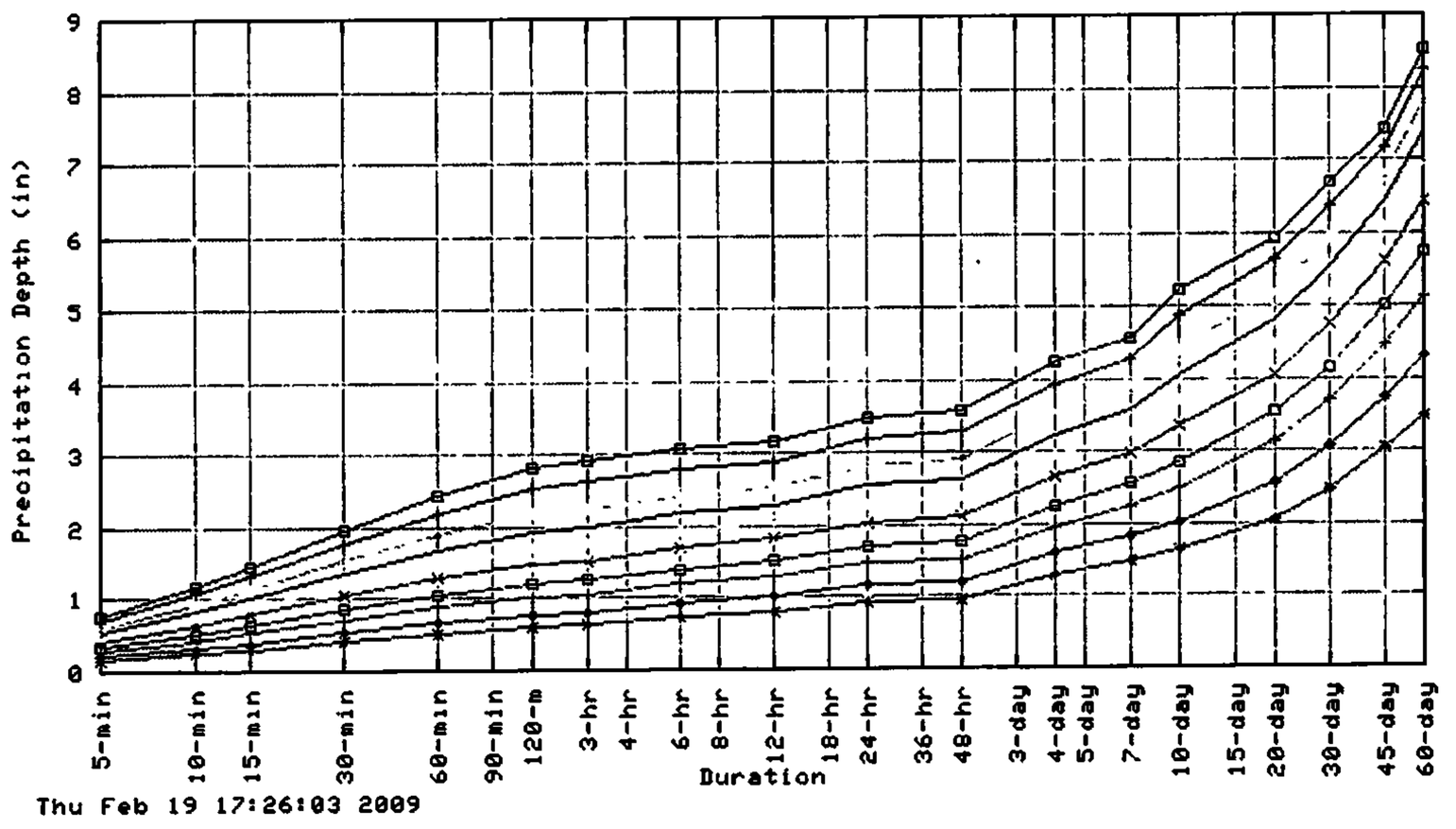
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.14	0.21	0.26	0.35	0.43	0.51	0.56	0.64	0.72	0.82	0.86	1.18	1.36	1.51	1.90	2.27	2.79	3.21
2	0.18	0.27	0.33	0.45	0.56	0.65	0.71	0.82	0.91	1.03	1.09	1.47	1.69	1.88	2.36	2.82	3.46	3.98
5	0.24	0.36	0.45	0.60	0.74	0.86	0.93	1.06	1.15	1.30	1.37	1.80	2.06	2.30	2.87	3.40	4.12	4.75
10	0.29	0.44	0.54	0.73	0.90	1.03	1.11	1.25	1.35	1.51	1.58	2.07	2.34	2.63	3.25	3.82	4.60	5.29
25	0.35	0.53	0.66	0.89	1.10	1.26	1.33	1.50	1.60	1.79	1.88	2.42	2.72	3.06	3.73	4.35	5.17	5.95
50	0.40	0.61	0.75	1.01	1.26	1.44	1.53	1.70	1.80	2.00	2.10	2.68	2.99	3.38	4.08	4.72	5.57	6.40
100	0.45	0.69	0.85	1.15	1.42	1.64	1.73	1.90	2.00	2.23	2.33	2.94	3.27	3.70	4.41	5.08	5.92	6.82
200	0.50	0.77	0.95	1.28	1.58	1.83	1.93	2.10	2.20	2.45	2.56	3.20	3.53	4.01	4.72	5.41	6.24	7.18
500	0.57	0.88	1.08	1.46	1.81	2.11	2.21	2.38	2.48	2.74	2.87	3.54	3.87	4.41	5.12	5.80	6.61	7.61
1000	0.63	0.96	1.19	1.60	1.98	2.32	2.42	2.61	2.69	2.97	3.11	3.79	4.12	4.71	5.39	6.08	6.83	7.88

* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.

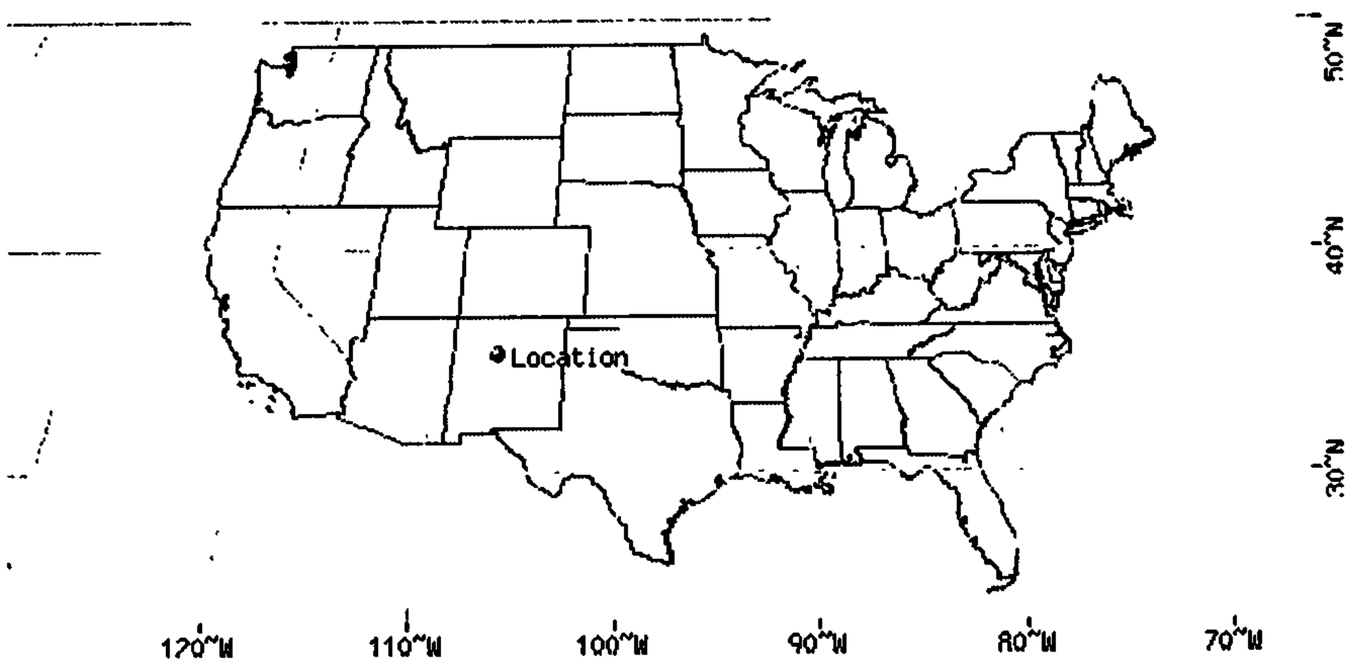
** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

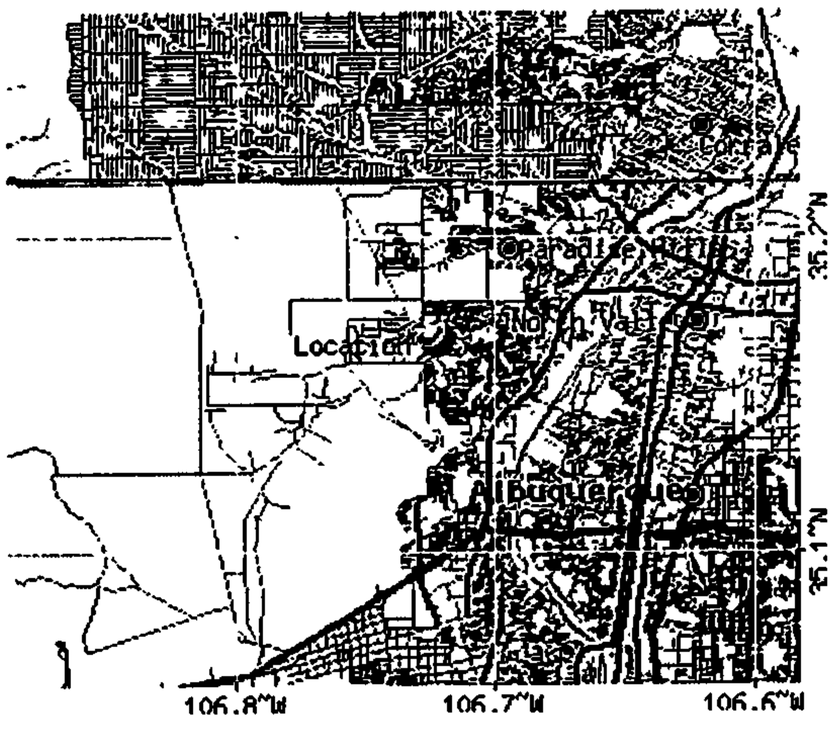
Text version of tables





Maps -





These maps were produced using a direct map request from the
U.S. Census Bureau Mapping and Cartographic Resources
Tiger Map Server.

Please read disclaimer for more information.

LEGEND

- State
- County
- Indian Resv
- Lake/Pond/Ocean
- Street
- Expressway
- Highway
- Connector
- Stream
- Military Area
- National Park
- Other Park
- City
- County

Scale 1:228583
0 2 4 6 8 mi
0 2 4 6 8 10 km
*average--true scale depends on monitor resolution

Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to NOAA Atlas 14 Document.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (35.16/-106.73). Digital ASCII data can be obtained directly from **NCDC**.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the
Western Regional Climate Center's state-specific SNOTEL station maps.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?. HDSC.Questions@noaa.gov

Disclaimer

HISTORIC BASIN BOUNDARY MAP

LEGEND

EXISTING INTERMEDIATE CONTOUR — 5070
EXISTING INDEX CONTOUR — 5075
BASIN BOUNDARY
EFFECTIVE FLOOD PLAIN (FHM)
(51A) BASIN ID

GRAPHIC SCALE
(IN FEET)
1 inch = 600 ft.
0 300 600 1200 2400

N

5D
AREA = 0.88 SQ MI
Q_{100} = 219 CFS

5E
AREA = 0.31 SQ MI
Q_{100} = 79 CFS

SOUTH BRANCH OF BOCA NEGRA ARROYO SOUTH

NORTH BRANCH OF BOCA NEGRA ARROYO SOUTH

5B
AREA = 0.22 SQ MI
Q_{100} = 92 CFS

5C
AREA = 0.45 SQ MI
Q_{100} = 150 CFS

4B
AREA = 0.11 SQ MI
Q_{100} = 67 CFS

4C
AREA = 0.08 SQ MI
Q_{100} = 44 CFS

4A
AREA = 0.52 SQ MI
Q_{100} = 159 CFS

4D
AREA = 0.15 SQ MI
Q_{100} = 81 CFS

5A
AREA = 0.25 SQ MI
Q_{100} = 117 CFS

BOCA NEGRA ARROYO

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

WILSON & COMPANY
4900 LANG AVENUE, NE
ALBUQUERQUE, NEW MEXICO 87109
(505) 348-4000

VISTA VELA
HISTORIC BASIN BOUNDARY MAP

Design Review Committee | City Engineer Approval

Date	Description	Drawn	Job
DRT 2005	Approved	RAH	

City Project No. 7633812.3.4 | Zone Map No. D-9-Z

Plat No.

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =06/24/2009
INPUT FILE = M:\IDS\X3-218~2\AE_DATA\CALCS\AHYMO\MODIFI~1\VOLCAN~2.WPD USER NO.= AHYMO-C-9803c01UNMLIB-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
*S**********											
*S VOLCANO HEIGHTS LOMR STUDY											
*S PROPOSED CONDITIONS MODEL											
*S 100 YR 24 HR STORM EVENT											
*S DATE: FEBRUARY 2009											
*S**********											
START										TIME=	.00
LOCATION	BERNALILLO COUNTY										
*S 100 YEAR 24HR STORM											
RAINFALL TYPE= 2										RAIN24=	2.560
*S Basin Contributing to upper north fork of Boca Negra Arroyo South											
*S on the west side of Vista Vieja to Groundsel Road											
*S**** SUB-BASIN 45A ****											
COMPUTE NM HYD	45A	-	1	.52500	158.56	12.382	.44221	1.800	.472	PER IMP=	1.00
*S Basin Contributing to lower north fork of Boca Negra arroyo South											
*S on the west side of Vista Vieja to Hawk Eye Road											
*S**** SUB-BASIN 45B***											
COMPUTE NM HYD	45B	-	2	.11300	66.61	2.352	.39020	1.550	.921	PER IMP=	.00
*S ADD BASINS 45A AND 45B FOR FLOW INTO 72" PIPE AT GROUNDSEL											
ADD HYD	UPPER.VV	1& 2	4	.63800	187.89	14.733	.43300	1.750	.460		
*S Basin Contributing to lower half of Vista Vieja											
*S Land treatments based on Vista Vieja Phases 1-4											
*S**** SUB-BASIN 45C***											
COMPUTE NM HYD	45C	-	3	.08500	154.69	7.602	1.67694	1.550	2.844	PER IMP=	60.00
*S Basin Contributing to upper half of Vista Vieja											
*S**** SUB-BASIN 45D***											
COMPUTE NM HYD	45D	-	2	.15200	239.87	13.594	1.67694	1.600	2.466	PER IMP=	60.00
*S ADD BASINS 45A 45B 45D FOR TOTAL OUTFLOW TO DAM											
ADD HYD	BND.OUT	2& 4	1	.79000	404.60	28.328	.67234	1.600	.800		
*S Basin discharging to Scenic Road											
*S**** SUB-BASIN 51A***											
COMPUTE NM HYD	51A	-	2	.24900	116.61	5.617	.42296	1.650	.732	PER IMP=	.00
*S Basin discharging to Onyx Drive											
*S**** SUB-BASIN 51B***											
COMPUTE NM HYD	51B	-	2	.22100	91.91	4.985	.42296	1.650	.650	PER IMP=	.00
*S ROUTE BASIN 51 B THROUGH POND AT VV SOUTH											
ROUTE RESERVOIR	VV.POND	2	6	.22100	80.94	4.332	.36754	1.800	.572	AC-FT=	1.082
*S ADD BASINS 51B AND 45C FOR TOTAL FLOW AT JUNCTION OF VV AND SAD											
ADD HYD	ONYX.JNC	6& 3	6	.30600	175.09	11.934	.73126	1.650	.894		
*S Basin Contributing to upper south fork of Boca Negra arroyo South											
*S SAD 227 - EMERALD DRIVE											
*S**** SUB-BASIN 51C***											
COMPUTE NM HYD	51C	-	2	.45000	150.35	9.279	.38662	1.700	.522	PER IMP=	.00
*S Basin Contributing to upper south fork of Boca Negra arroyo South											
*S SAD 227 - EMERALD DRIVE											
*S**** SUB-BASIN 51D***											
COMPUTE NM HYD	51D	-	3	.88000	218.75	18.145	.38662	1.850	.388	PER IMP=	.00
*S Basin Contributing to upper south fork of Boca Negra arroyo South											
*S SAD 227 - EMERALD DRIVE											
*S**** SUB-BASIN 51E***											

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION

```
COMPUTE NM HYD          51E    -     4        .31000       119.11        6.392       .38662    1.700     .600 PER IMP=     .00
*S ADD BASINS 51C AND 51D
ADD HYD               106.00  2& 3   6       1.33000       360.01       27.424       .38662    1.800     .423
*S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E
ROUTE MCUNGE            6.10    6    7       1.33000       353.02       27.254       .38422    2.300     .415 CCODE =      .1
*S ADD BASINS 51C AND 51D TO BASIN 51E- All basins to EMERALD DRIVE
ADD HYD               102.00  7& 4   2       1.64000       378.54       33.646       .38467    2.250     .361
*S ROUTE BASIN 51 C, D, E THROUGH PONDING AREA AT EMERALD DR
ROUTE RESERVOIR       VV.POND   2    5       1.64000       313.80       33.646       .38467    2.450     .299 AC-FT=    2.149
FINISH
```

```
*S*************************************************************************
*S VOLCANO HEIGHTS LOMR STUDY
*S PROPOSED CONDITIONS MODEL
*S 100 YR 24 HR STORM EVENT
*S DATE: FEBRUARY 2009
* FILE: M:\IDS\X3-218-078-02\AE_DATA\CALCS\AHYMO\Modified Models\VOLCANO HEIGHTS PROP.wpd
*
*S*************************************************************************
START                TIME=0.0  PUNCH CODE=0 PRINT CODE=0
LOCATION             BERNALILLO COUNTY
*S 100 YEAR 24HR STORM
RAINFALL               TYPE=2  RAIN QUARTER=0   RAIN ONE=1.69
                     RAIN SIX=2.17  RAIN DAY=2.56  DT=0.05

**************************************************************************
*S Basin Contributing to upper north fork of Boca Negra Arroyo South
*S on the west side of Vista Vieja to Groundsel Road
**************************************************************************
*S**** SUB-BASIN 45A ****
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=0
                       LENGTH=400 FT   SLOPE=0.099 K=0.7
                       LENGTH=1600 FT  SLOPE=0.065 K=2.0
                       LENGTH=2320 FT  SLOPE=0.052 K=3.0
                       LENGTH=7296 FT  SLOPE=0.027 K=3.0
                       Kn=.033  CR=.6

COMPUTE NM HYD         ID=1   HYD NO=45A   DA= 0.525 SQ MI
                       PER A=89 PER B=0  PER C=10  PER D=1
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=1   CODE=1
**************************************************************************
*S Basin Contributing to lower north fork of Boca Negra arroyo South
*S on the west side of Vista Vieja to Hawk Eye Road
**************************************************************************
*S**** SUB-BASIN 45B***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.040  K=0.7
                       LENGTH=1600 FT  SLOPE=0.050  K=2.0
                       LENGTH=1155 FT   SLOPE=0.016  K=2.0

COMPUTE NM HYD         ID=2   HYD NO=45B   DA= 0.113 SQ MI
                       PER A=99 PER B=0  PER C=1  PER D=0
                      TP=0.0   MASSRAIN=-1
*PRINT HYD              ID=2   CODE=1
**************************************************************************
*S ADD BASINS 45A AND 45B FOR FLOW INTO 72" PIPE AT GROUNDSEL

ADD HYD              ID=4  HYD=UPPER.VV    ID I=1  ID II=2
PRINT HYD              ID=4   CODE=1
**************************************************************************
*S Basin Contributing to lower half of Vista Vieja
*S Land treatments based on Vista Vieja Phases 1-4
**************************************************************************
*S**** SUB-BASIN 45C***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=1  ISLOPE=-1
                       LENGTH=2700 FT  SLOPE=0.01  K=3.0

COMPUTE NM HYD         ID=3   HYD NO=45C   DA= 0.085 SQ MI
                       PER A=0 PER B=20  PER C=20  PER D=60

                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=3   CODE=1
**************************************************************************
*S Basin Contributing to upper half of Vista Vieja
**************************************************************************
*S**** SUB-BASIN 45D***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=800 FT   SLOPE=0.015  K=1.0
                       LENGTH=1200 FT  SLOPE=0.015  K=2.0
                       LENGTH=700 FT  SLOPE=0.015  K=3.0


COMPUTE NM HYD         ID=2   HYD NO=45D   DA= 0.152 SQ MI
                       PER A=0 PER B=20  PER C=20  PER D=60
                       TP=0.0   MASSRAIN=-1
```

```
PRINT HYD              ID=2   CODE=1
**********************************************************************
*S ADD BASINS 45A 45B 45D FOR TOTAL OUTFLOW TO DAM

ADD HYD            ID=1  HYD=BND.OUT     ID I=2  ID II=4
PRINT HYD              ID=1   CODE=1
**********************************************************************
*S Basin discharging to Scenic Road
**********************************************************************
*S**** SUB-BASIN 51A***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.075  K=0.7
                       LENGTH=1600 FT   SLOPE=0.037  K=2.0
                       LENGTH=3850 FT   SLOPE=0.031  K=2.0
                       LENGTH=985 FT   SLOPE=0.022  K=3.0
                           Kn=.033  CR=0.50

COMPUTE NM HYD         ID=2   HYD NO=51A   DA= 0.249 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=2   CODE=1pl
**********************************************************************
*S Basin discharging to Onyx Drive
**********************************************************************
*S**** SUB-BASIN 51B***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=5  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.031  K=0.7
                       LENGTH=1600 FT  SLOPE=0.031  K=2.0
                       LENGTH=700 FT   SLOPE=0.031  K=3.0
                       LENGTH=3030 FT  SLOPE=0.040  K=3.0
                       LENGTH=1941 FT   SLOPE=0.029  K=3.0
                           Kn=.033  CR=0.50

COMPUTE NM HYD         ID=2   HYD NO=51B   DA= 0.221 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=2   CODE=1

**********************************************************************
*S ROUTE BASIN 51 B THROUGH POND AT VV SOUTH
ROUTE RESERVOIR         ID=6  HYD=VV.POND  INFLOW ID= 2 CODE= 5
                        OUTFLOW (CFS)    STORAGE (AC-FT)  ELEV (FT)
                                0              0.00            24.10
                             0.01              0.13            25
                             0.01              0.42            26
                             0.01              0.67            26.96
                            15.11              0.68            27
                            72.04              0.98            28
                           101.76              1.32            29
                           124.97              1.70            30
                           144.51              2.11            31


PRINT HYD                  ID=6  CODE=1
**********************************************************************
*S ADD BASINS 51B AND 45C FOR TOTAL FLOW AT JUNCTION OF VV AND SAD

ADD HYD            ID=6  HYD=ONYX.JNC     ID I=6  ID II=3
PRINT HYD              ID=6   CODE=1
**********************************************************************
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51C***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.098  K=0.7
                       LENGTH=1600 FT  SLOPE=0.054  K=1.0
                       LENGTH=7235 FT   SLOPE=0.036  K=3.0
                           Kn=.033  CR=0.65

COMPUTE NM HYD         ID=2   HYD NO=51C  DA= 0.45 SQ MI
                       PER A=100 PER B=0  PER C=0  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=2   CODE=1
**********************************************************************
```

```
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51D***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=5  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.037  K=0.7
                       LENGTH=1600 FT  SLOPE=0.037  K=1.0
                       LENGTH=2810 FT  SLOPE=0.023  K=1.0
                       LENGTH=3790 FT   SLOPE=0.040  K=3.0
                       LENGTH=3330 FT   SLOPE=0.037  K=3.0
                           Kn=.033  CR=0.65

COMPUTE NM HYD         ID=3   HYD NO=51D  DA= 0.88 SQ MI
                       PER A=100 PER B=0  PER C=0  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=3   CODE=1
**********************************************************************
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51E***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.035  K=0.7
                       LENGTH=1600 FT  SLOPE=0.035  K=1.0
                       LENGTH=1065 FT   SLOPE=0.074  K=3.0
                       LENGTH=4140 FT   SLOPE=0.018  K=3.0
                           Kn=.033  CR=0.65

COMPUTE NM HYD         ID=4   HYD NO=51E  DA= 0.31 SQ MI
                       PER A=100 PER B=0  PER C=0  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=4   CODE=1
**********************************************************************
*S ADD BASINS 51C AND 51D

ADD HYD            ID=6  HYD=106 ID I=2  ID II=3
PRINT HYD             ID=6   CODE=1
**********************************************************************
*S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E
COMPUTE RATING CURVE   CID=1   VS NO=1   NO SEGS=1
                       MIN ELEV=5394     MAX ELEV=5400
                       CH SLOPE=0.0202    FP SLOPE=0.0202
                       N=0.035    DIST=225.0
                       DIST  ELEV        DIST  ELEV
                         0       5400    23      5398
                         48      5396    77      5394
                         140     5394    150     5396
                         166     5398    225     5400
ROUTE MCUNGE           ID=7   HYD NO=6.1  INFLOW ID=6
                       DT=0.0   L=5360 FT
                       NS=0   SLOPE=0.0202
                       MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0
PRINT HYD              ID=7   CODE=1
**********************************************************************
*S ADD BASINS 51C AND 51D TO BASIN 51E- All basins to EMERALD DRIVE

ADD HYD              ID=2        HYD=102 ID I=7  ID II=4
PRINT HYD            ID=2   CODE=1

**********************************************************************
*S ROUTE BASIN 51 C, D, E THROUGH PONDING AREA AT EMERALD DR
ROUTE RESERVOIR       ID=5  HYD=VV.POND  INFLOW ID=2    CODE=5
                      OUTFLOW (CFS)    STORAGE (AC-FT)  ELEV (FT)
                              0          0.0000           5326
                           8.00          0.0001           5327
                          30.00          0.002            5328
                          63.00          0.006            5329
                         106.00          0.014            5330
                         156.00          0.063            5331
                         210.00          0.210            5332
                         266.00          0.540            5333
                         294.00          1.130            5333.5
                         321.00          2.520            5334
                         369.00          2.600            5335

PRINT HYD                ID=6  CODE=1
**********************************************************************
```

FINISH

```
    AHYMO PROGRAM (AHYMO_97) -                              - Version:  1997.02c
         RUN DATE (MON/DAY/YR) = 06/24/2009
         START TIME (HR:MIN:SEC) = 14:13:55     USER NO.= AHYMO-C-9803c01UNMLIB-AH
         INPUT FILE = M:\IDS\X3-218~2\AE_DATA\CALCS\AHYMO\MODIFI~1\VOLCAN~2.WPD


*S*************************************************************************
*S VOLCANO HEIGHTS LOMR STUDY
*S PROPOSED CONDITIONS MODEL
*S 100 YR 24 HR STORM EVENT
*S DATE: FEBRUARY 2009
* FILE: M:\IDS\X3-218-078-02\AE_DATA\CALCS\AHYMO\Modified Models\VOLCANO HEIGHTS
*
*S*************************************************************************
START                TIME=0.0  PUNCH CODE=0 PRINT CODE=0
LOCATION             BERNALILLO COUNTY
     Bernalillo County soil infiltration values (LAND FACTORS) used for computations.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
           A            0.65                  1.67
           B            0.50                  1.25
           C            0.35                  0.83
           D            0.10                  0.04

*S 100 YEAR 24HR STORM
RAINFALL                  TYPE=2  RAIN QUARTER=0   RAIN ONE=1.69
                       RAIN SIX=2.17  RAIN DAY=2.56  DT=0.05


     COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
     DT =     .050000 HOURS          END TIME =    24.000000 HOURS
        .0000   .0056   .0114   .0173   .0234   .0298   .0363
        .0431   .0502   .0576   .0652   .0732   .0816   .0903
        .0996   .1093   .1196   .1306   .1423   .1549   .1685
        .1756   .1835   .2063   .2602   .3529   .4962   .7026
        .9848  1.2074  1.3079  1.3919  1.4654  1.5312  1.5907
       1.6451  1.6949  1.7408  1.7831  1.8223  1.8585  1.8676
       1.8761  1.8842  1.8918  1.8991  1.9061  1.9127  1.9192
       1.9253  1.9313  1.9371  1.9427  1.9482  1.9535  1.9587
       1.9637  1.9686  1.9734  1.9781  1.9827  1.9872  1.9917
       1.9960  2.0002  2.0044  2.0085  2.0126  2.0165  2.0204
       2.0243  2.0280  2.0318  2.0354  2.0391  2.0426  2.0462
       2.0496  2.0531  2.0565  2.0598  2.0631  2.0664  2.0696
       2.0728  2.0760  2.0791  2.0822  2.0852  2.0883  2.0913
       2.0942  2.0972  2.1001  2.1029  2.1058  2.1086  2.1114
       2.1142  2.1170  2.1197  2.1224  2.1251  2.1277  2.1304
       2.1330  2.1356  2.1382  2.1407  2.1433  2.1458  2.1483
       2.1508  2.1532  2.1557  2.1581  2.1605  2.1629  2.1653
       2.1677  2.1700  2.1717  2.1733  2.1750  2.1767  2.1783
       2.1800  2.1816  2.1832  2.1849  2.1865  2.1881  2.1897
       2.1913  2.1929  2.1945  2.1961  2.1977  2.1993  2.2008
       2.2024  2.2040  2.2055  2.2071  2.2086  2.2102  2.2117
       2.2132  2.2147  2.2163  2.2178  2.2193  2.2208  2.2223
       2.2238  2.2253  2.2268  2.2282  2.2297  2.2312  2.2327
       2.2341  2.2356  2.2370  2.2385  2.2399  2.2414  2.2428
       2.2442  2.2457  2.2471  2.2485  2.2499  2.2513  2.2527
       2.2541  2.2555  2.2569  2.2583  2.2597  2.2611  2.2625
       2.2638  2.2652  2.2666  2.2679  2.2693  2.2706  2.2720
       2.2733  2.2747  2.2760  2.2774  2.2787  2.2800  2.2813
       2.2826  2.2840  2.2853  2.2866  2.2879  2.2892  2.2905
       2.2918  2.2931  2.2944  2.2956  2.2969  2.2982  2.2995
       2.3007  2.3020  2.3033  2.3045  2.3058  2.3070  2.3083
       2.3095  2.3108  2.3120  2.3133  2.3145  2.3157  2.3169
       2.3182  2.3194  2.3206  2.3218  2.3230  2.3242  2.3254
       2.3266  2.3278  2.3290  2.3302  2.3314  2.3326  2.3338
       2.3350  2.3362  2.3373  2.3385  2.3397  2.3408  2.3420
       2.3432  2.3443  2.3455  2.3466  2.3478  2.3489  2.3501
       2.3512  2.3524  2.3535  2.3546  2.3558  2.3569  2.3580
       2.3591  2.3603  2.3614  2.3625  2.3636  2.3647  2.3658
       2.3669  2.3680  2.3691  2.3702  2.3713  2.3724  2.3735
       2.3746  2.3757  2.3768  2.3779  2.3789  2.3800  2.3811
       2.3822  2.3832  2.3843  2.3854  2.3864  2.3875  2.3885
       2.3896  2.3906  2.3917  2.3927  2.3938  2.3948  2.3959
       2.3969  2.3980  2.3990  2.4000  2.4011  2.4021  2.4031
       2.4041  2.4052  2.4062  2.4072  2.4082  2.4092  2.4102
       2.4112  2.4122  2.4133  2.4143  2.4153  2.4163  2.4173
       2.4182  2.4192  2.4202  2.4212  2.4222  2.4232  2.4242
       2.4252  2.4261  2.4271  2.4281  2.4291  2.4300  2.4310
       2.4320  2.4329  2.4339  2.4349  2.4358  2.4368  2.4377
```

2.4387	2.4396	2.4406	2.4415	2.4425	2.4434	2.4444
2.4453	2.4463	2.4472	2.4481	2.4491	2.4500	2.4509
2.4519	2.4528	2.4537	2.4546	2.4556	2.4565	2.4574
2.4583	2.4592	2.4602	2.4611	2.4620	2.4629	2.4638
2.4647	2.4656	2.4665	2.4674	2.4683	2.4692	2.4701
2.4710	2.4719	2.4728	2.4737	2.4746	2.4754	2.4763
2.4772	2.4781	2.4790	2.4798	2.4807	2.4816	2.4825
2.4833	2.4842	2.4851	2.4860	2.4868	2.4877	2.4885
2.4894	2.4903	2.4911	2.4920	2.4928	2.4937	2.4945
2.4954	2.4962	2.4971	2.4979	2.4988	2.4996	2.5005
2.5013	2.5022	2.5030	2.5038	2.5047	2.5055	2.5063
2.5072	2.5080	2.5088	2.5097	2.5105	2.5113	2.5121
2.5130	2.5138	2.5146	2.5154	2.5162	2.5170	2.5179
2.5187	2.5195	2.5203	2.5211	2.5219	2.5227	2.5235
2.5243	2.5251	2.5259	2.5267	2.5275	2.5283	2.5291
2.5299	2.5307	2.5315	2.5323	2.5331	2.5339	2.5347
2.5355	2.5362	2.5370	2.5378	2.5386	2.5394	2.5401
2.5409	2.5417	2.5425	2.5433	2.5440	2.5448	2.5456
2.5463	2.5471	2.5479	2.5486	2.5494	2.5502	2.5509
2.5517	2.5525	2.5532	2.5540	2.5547	2.5555	2.5562
2.5570	2.5577	2.5585	2.5593	2.5600		

```
**********************************************************************
*S Basin Contributing to upper north fork of Boca Negra Arroyo South
*S on the west side of Vista Vieja to Groundsel Road
**********************************************************************
*S**** SUB-BASIN 45A ****
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=0
                       LENGTH=400 FT   SLOPE=0.099 K=0.7
                       LENGTH=1600 FT  SLOPE=0.065 K=2.0
                       LENGTH=2320 FT  SLOPE=0.052 K=3.0
                       LENGTH=7296 FT  SLOPE=0.027 K=3.0
                       Kn=.033  CR=.6


     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
                                LENGTH (FT)    ADJUSTED SLOPE (FT/FT)COMPOSITE K
     SHEET FLOW PORTION           400.0            .058387              .7000
     SHALLOW FLOW PORTION        1600.0            .053446             2.0000
     CHANNEL FLOW PORTION        9616.0            .032229             2.9260
     TOTAL BASIN                11616.0            .036052             2.5352


     LAG EQUATION FACTORS:      Kn=   .0330     TOTAL BASIN LENGTH (FT)=     11616.0
     TOTAL BASIN SLOPE (FT/FT)=    .036052     CENTROUD LENGTH (FT)=         6969.6


     TIME OF CONCENTRATION (HRS)=   .6764     TIME TO PEAK (HRS)=   .4509     LAG TIME (HRS)=
.5073

COMPUTE NM HYD         ID=1   HYD NO=45A   DA= 0.525 SQ MI
                       PER A=89 PER B=0  PER C=10  PER D=1
                       TP=0.0   MASSRAIN=-1
     TIME TO PEAK (hrs)=   .4509

     K =   .267246HR    TP =   .450943HR    K/TP RATIO =   .592638     SHAPE CONSTANT, N =  6.391033
     UNIT PEAK =   5.7240    CFS   UNIT VOLUME =    .9979       B =   491.65      P60 = 1.6900
     AREA =      .005250 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


     K =   .463612HR    TP =   .450943HR    K/TP RATIO =  1.028094     SHAPE CONSTANT, N =  3.433486
     UNIT PEAK =   363.57    CFS   UNIT VOLUME =    1.000       B =   315.44      P60 = 1.6900
     AREA =      .519750 SQ MI    IA =    .61970 INCHES    INF =   1.58515 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=1   CODE=1

                                HYDROGRAPH FROM AREA 45A


     RUNOFF VOLUME =      .44221 INCHES     =      12.3818 ACRE-FEET
     PEAK DISCHARGE RATE =     158.56 CFS  AT   1.800 HOURS   BASIN AREA =   .5250 SQ. MI.
```

```
**********************************************************************
*S Basin Contributing to lower north fork of Boca Negra arroyo South
*S on the west side of Vista Vieja to Hawk Eye Road
**********************************************************************
*S**** SUB-BASIN 45B***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.040  K=0.7
                       LENGTH=1600 FT  SLOPE=0.050  K=2.0
                       LENGTH=1155 FT   SLOPE=0.016  K=2.0


     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
          NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.
                                  LENGTH (FT)      SLOPE (FT/FT)       COMPOSITE K
     SHEET FLOW PORTION             400.0            .040000             .7000
     SHALLOW FLOW PORTION          1600.0            .050000            2.0000
     CHANNEL FLOW PORTION          1155.0            .016000            3.0000
     TOTAL BASIN                   3155.0            .036285            1.7474

          TIME OF CONCENTRATION (HRS)=   .2633     TIME TO PEAK (HRS)=   .1755     LAG TIME (HRS)=
.1975

     COMPUTE NM HYD       ID=2   HYD NO=45B   DA= 0.113 SQ MI
                          PER A=99 PER B=0  PER C=1  PER D=0
                         TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .1755

          K =   .213308HR    TP =   .175529HR    K/TP RATIO =  1.215230     SHAPE CONSTANT, N =  2.927273
          UNIT PEAK =   177.58    CFS   UNIT VOLUME =    .9995       B =   275.84       P60 = 1.6900
          AREA =      .113000 SQ MI    IA =    .64700 INCHES    INF =   1.66160 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     *PRINT HYD             ID=2   CODE=1
     **********************************************************************
     *S ADD BASINS 45A AND 45B FOR FLOW INTO 72" PIPE AT GROUNDSEL

     ADD HYD                      ID=4  HYD=UPPER.VV    ID I=1  ID II=2
     PRINT HYD           ID=4   CODE=1

                                          HYDROGRAPH FROM AREA UPPER.VV


          RUNOFF VOLUME =      .43300 INCHES     =      14.7334 ACRE-FEET
          PEAK DISCHARGE RATE =     187.89 CFS  AT   1.750 HOURS   BASIN AREA =   .6380 SQ. MI.


     **********************************************************************
     *S Basin Contributing to lower half of Vista Vieja
     *S Land treatments based on Vista Vieja Phases 1-4
     **********************************************************************
     *S**** SUB-BASIN 45C***
     COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                            NK=1  ISLOPE=-1
                                  LENGTH=2700 FT  SLOPE=0.01  K=3.0


          Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

          SCS UPLAND METHOD FACTORS
                                  LENGTH (FT)      SLOPE (FT/FT)       COMPOSITE K
          SHEET FLOW PORTION              .0            .000000              .0000
          SHALLOW FLOW PORTION            .0            .000000              .0000
          CHANNEL FLOW PORTION         2700.0            .010000             3.0000
          TOTAL BASIN                  2700.0            .010000             3.0000


          TIME OF CONCENTRATION (HRS)=   .2500     TIME TO PEAK (HRS)=   .1667     LAG TIME (HRS)=
.1875

     COMPUTE NM HYD       ID=3   HYD NO=45C   DA= 0.085 SQ MI
                          PER A=0 PER B=20  PER C=20  PER D=60

                          TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .1667
```

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      K =    .091548HR     TP =    .166667HR     K/TP RATIO =    .549287      SHAPE CONSTANT, N =  7.035508
      UNIT PEAK =   160.02     CFS   UNIT VOLUME =     .9996        B =   522.94       P60 = 1.6900
      AREA =       .051000 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


      K =    .148511HR     TP =    .166667HR     K/TP RATIO =    .891064      SHAPE CONSTANT, N =  3.979924
      UNIT PEAK =   72.181     CFS   UNIT VOLUME =     1.001        B =   353.83       P60 = 1.6900
      AREA =       .034000 SQ MI     IA =     .42500 INCHES     INF =   1.04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD             ID=3   CODE=1

                                  HYDROGRAPH FROM AREA 45C


    RUNOFF VOLUME =      1.67694 INCHES      =        7.6021 ACRE-FEET
    PEAK DISCHARGE RATE =     154.69 CFS  AT   1.550 HOURS   BASIN AREA =    .0850 SQ. MI.


**********************************************************************
*S Basin Contributing to upper half of Vista Vieja
**********************************************************************
*S**** SUB-BASIN 45D***
COMPUTE LT TP         LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                      NK=3  ISLOPE=-1
                      LENGTH=800 FT   SLOPE=0.015  K=1.0
                      LENGTH=1200 FT  SLOPE=0.015  K=2.0
                                LENGTH=700 FT  SLOPE=0.015  K=3.0



      Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

      SCS UPLAND METHOD FACTORS
           NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.
                                LENGTH (FT)      SLOPE (FT/FT)       COMPOSITE K
      SHEET FLOW PORTION          400.0            .015000             1.0000
      SHALLOW FLOW PORTION       1600.0            .015000             2.0000
      CHANNEL FLOW PORTION        700.0            .015000             3.0000
      TOTAL BASIN                2700.0            .015000             1.8837


      TIME OF CONCENTRATION (HRS)=    .3251     TIME TO PEAK (HRS)=    .2167     LAG TIME (HRS)=
.2438

   COMPUTE NM HYD         ID=2   HYD NO=45D   DA= 0.152 SQ MI
                          PER A=0 PER B=20  PER C=20  PER D=60
                          TP=0.0   MASSRAIN=-1
      TIME TO PEAK (hrs)=    .2167

      K =    .121811HR     TP =    .216724HR     K/TP RATIO =    .562055      SHAPE CONSTANT, N =  6.832516
      UNIT PEAK =   215.99     CFS   UNIT VOLUME =     .9997        B =   513.26       P60 = 1.6900
      AREA =       .091200 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


      K =    .192055HR     TP =    .216724HR     K/TP RATIO =    .886174      SHAPE CONSTANT, N =  4.003414
      UNIT PEAK =   99.703     CFS   UNIT VOLUME =     1.000        B =   355.40       P60 = 1.6900
      AREA =       .060800 SQ MI     IA =     .42500 INCHES     INF =   1.04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD             ID=2   CODE=1

                                  HYDROGRAPH FROM AREA 45D


    RUNOFF VOLUME =      1.67694 INCHES      =        13.5943 ACRE-FEET
    PEAK DISCHARGE RATE =     239.87 CFS  AT   1.600 HOURS   BASIN AREA =    .1520 SQ. MI.


**********************************************************************
*S ADD BASINS 45A 45B 45D FOR TOTAL OUTFLOW TO DAM

ADD HYD                    ID=1  HYD=BND.OUT     ID I=2  ID II=4
PRINT HYD             ID=1   CODE=1
```

HYDROGRAPH FROM AREA BND.OUT

RUNOFF VOLUME = .67234 INCHES = 28.3277 ACRE-FEET
PEAK DISCHARGE RATE = 404.60 CFS AT 1.600 HOURS BASIN AREA = .7900 SQ. MI.

****
*S Basin discharging to Scenic Road
****
*S**** SUB-BASIN 51A***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=4 ISLOPE=-1
LENGTH=400 FT SLOPE=0.075 K=0.7
LENGTH=1600 FT SLOPE=0.037 K=2.0
LENGTH=3850 FT SLOPE=0.031 K=2.0
LENGTH=985 FT SLOPE=0.022 K=3.0
Kn=.033 CR=0.50

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS
NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.075000	.7000
SHALLOW FLOW PORTION	1600.0	.037000	2.0000
CHANNEL FLOW PORTION	4835.0	.029166	2.9793
TOTAL BASIN	6835.0	.033683	2.3649

LAG EQUATION FACTORS: Kn= .0330 TOTAL BASIN LENGTH (FT)= 6835.0
TOTAL BASIN SLOPE (FT/FT)= .033683 CENTROUD LENGTH (FT)= 3417.5

TIME OF CONCENTRATION (HRS)= .4011 TIME TO PEAK (HRS)= .2674 LAG TIME (HRS)= .3008

COMPUTE NM HYD ID=2 HYD NO=51A DA= 0.249 SQ MI
PER A=90 PER B=0 PER C=10 PER D=0
TP=0.0 MASSRAIN=-1
TIME TO PEAK (hrs)= .2674

K = .287577HR TP = .267412HR K/TP RATIO = 1.075410 SHAPE CONSTANT, N = 3.284598
UNIT PEAK = 283.31 CFS UNIT VOLUME = 1.000 B = 304.26 P60 = 1.6900
AREA = .249000 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1pl

HYDROGRAPH FROM AREA 51A

RUNOFF VOLUME = .42296 INCHES = 5.6169 ACRE-FEET
PEAK DISCHARGE RATE = 116.61 CFS AT 1.650 HOURS BASIN AREA = .2490 SQ. MI.

****
*S Basin discharging to Onyx Drive
****
*S**** SUB-BASIN 51B***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=5 ISLOPE=-1
LENGTH=400 FT SLOPE=0.031 K=0.7
LENGTH=1600 FT SLOPE=0.031 K=2.0
LENGTH=700 FT SLOPE=0.031 K=3.0
LENGTH=3030 FT SLOPE=0.040 K=3.0
LENGTH=1941 FT SLOPE=0.029 K=3.0
Kn=.033 CR=0.50

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.031000	.7000

SHALLOW FLOW PORTION	1600.0	.031000	2.0000
CHANNEL FLOW PORTION	5671.0	.035124	2.9740
TOTAL BASIN	7671.0	.034049	2.3142

LAG EQUATION FACTORS: Kn= .0330 TOTAL BASIN LENGTH (FT)= 7671.0
TOTAL BASIN SLOPE (FT/FT)= .034049 CENTROUD LENGTH (FT)= 3835.5

TIME OF CONCENTRATION (HRS)= .4456 TIME TO PEAK (HRS)= .2971 LAG TIME (HRS)= .3342

COMPUTE NM HYD ID=2 HYD NO=51B DA= 0.221 SQ MI
PER A=90 PER B=0 PER C=10 PER D=0
TP=0.0 MASSRAIN=-1
TIME TO PEAK (hrs)= .2971

K = .325660HR TP = .297090HR K/TP RATIO = 1.096168 SHAPE CONSTANT, N = 3.224313
UNIT PEAK = 222.89 CFS UNIT VOLUME = .9999 B = 299.63 P60 = 1.6900
AREA = .221000 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA 51B

RUNOFF VOLUME = .42296 INCHES = 4.9853 ACRE-FEET
PEAK DISCHARGE RATE = 91.91 CFS AT 1.650 HOURS BASIN AREA = .2210 SQ. MI.

****

*S ROUTE BASIN 51 B THROUGH POND AT VV SOUTH
ROUTE RESERVOIR ID=6 HYD=VV.POND INFLOW ID= 2 CODE= 5

OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0.00	24.10
0.01	0.13	25
0.01	0.42	26
0.01	0.67	26.96
15.11	0.68	27
72.04	0.98	28
101.76	1.32	29
124.97	1.70	30
144.51	2.11	31

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	24.10	.000	.00
.25	.00	24.10	.000	.00
.50	.00	24.10	.000	.00
.75	.00	24.10	.000	.00
1.00	.00	24.10	.000	.00
1.25	.00	24.10	.000	.00
1.50	52.45	26.96	.670	.01
1.75	86.34	28.28	1.075	80.30
2.00	44.07	27.71	.893	55.60
2.25	20.45	27.18	.734	25.44
2.50	9.62	26.99	.676	9.76
2.75	7.08	26.98	.675	7.14
3.00	5.48	26.97	.674	5.52
3.25	4.24	26.97	.673	4.28
3.50	3.28	26.97	.672	3.31
3.75	2.54	26.97	.672	2.56
4.00	1.97	26.97	.671	1.98
4.25	1.52	26.96	.671	1.54
4.50	1.18	26.96	.671	1.19
4.75	.91	26.96	.671	.92
5.00	.71	26.96	.670	.71
5.25	.55	26.96	.670	.55
5.50	.42	26.96	.670	.43
5.75	.33	26.96	.670	.33
6.00	.25	26.96	.670	.26

6.25	.20	26.96	.670	.20
6.50	.15	26.96	.670	.15
6.75	.12	26.96	.670	.12
7.00	.09	26.96	.670	.09
7.25	.07	26.96	.670	.07
7.50	.05	26.96	.670	.06
7.75	.04	26.96	.670	.04
8.00	.03	26.96	.670	.03
8.25	.03	26.96	.670	.03
8.50	.02	26.96	.670	.02
8.75	.02	26.96	.670	.02
9.00	.01	26.96	.670	.01
9.25	.01	26.96	.670	.01
9.50	.01	26.96	.670	.01
9.75	.01	26.96	.670	.01
10.00	.00	26.96	.670	.01
10.25	.00	26.96	.670	.01
10.50	.00	26.96	.670	.01
10.75	.00	26.96	.670	.01
11.00	.00	26.96	.670	.01
11.25	.00	26.96	.670	.01
11.50	.00	26.96	.670	.01
11.75	.00	26.96	.670	.01
12.00	.00	26.96	.670	.01
12.25	.00	26.96	.670	.01
12.50	.00	26.96	.670	.01
12.75	.00	26.96	.670	.01
13.00	.00	26.96	.670	.01
13.25	.00	26.96	.670	.01
13.50	.00	26.96	.670	.01
13.75	.00	26.96	.670	.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	.00	26.96	.670	.01
14.25	.00	26.96	.670	.01
14.50	.00	26.96	.670	.01
14.75	.00	26.96	.670	.01
15.00	.00	26.96	.670	.01
15.25	.00	26.96	.670	.01
15.50	.00	26.96	.670	.01
15.75	.00	26.96	.670	.01
16.00	.00	26.96	.670	.01
16.25	.00	26.96	.670	.01
16.50	.00	26.96	.670	.01
16.75	.00	26.96	.670	.01
17.00	.00	26.96	.670	.01
17.25	.00	26.96	.670	.01
17.50	.00	26.96	.670	.01
17.75	.00	26.96	.670	.01
18.00	.00	26.96	.670	.01
18.25	.00	26.96	.670	.01
18.50	.00	26.96	.670	.01
18.75	.00	26.96	.670	.01
19.00	.00	26.96	.670	.01
19.25	.00	26.96	.670	.01
19.50	.00	26.96	.670	.01
19.75	.00	26.96	.670	.01
20.00	.00	26.96	.670	.01
20.25	.00	26.96	.670	.01
20.50	.00	26.96	.670	.01
20.75	.00	26.96	.670	.01
21.00	.00	26.96	.670	.01
21.25	.00	26.96	.670	.01
21.50	.00	26.96	.670	.01
21.75	.00	26.96	.670	.01
22.00	.00	26.96	.670	.01
22.25	.00	26.96	.670	.01
22.50	.00	26.96	.670	.01
22.75	.00	26.96	.670	.01
23.00	.00	26.96	.670	.01
23.25	.00	26.96	.670	.01
23.50	.00	26.96	.670	.01
23.75	.00	26.96	.670	.01
24.00	.00	26.96	.670	.01
24.25	.00	26.96	.670	.01
24.50	.00	26.96	.670	.01
24.75	.00	26.96	.670	.01

25.00	.00	26.96	.670	.01
25.25	.00	26.96	.670	.01
25.50	.00	26.96	.670	.01
25.75	.00	26.96	.670	.01
26.00	.00	26.96	.670	.01
26.25	.00	26.96	.670	.01
26.50	.00	26.96	.670	.01
26.75	.00	26.96	.670	.01
27.00	.00	26.96	.670	.01
27.25	.00	26.96	.670	.01
27.50	.00	26.96	.670	.01
27.75	.00	26.96	.670	.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
28.00	.00	26.96	.670	.01
28.25	.00	26.96	.670	.01
28.50	.00	26.96	.670	.01
28.75	.00	26.96	.670	.01
29.00	.00	26.96	.670	.01
29.25	.00	26.96	.670	.01
29.50	.00	26.96	.670	.01
29.75	.00	26.96	.670	.01

PEAK DISCHARGE = 80.937 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 28.299
MAXIMUM STORAGE = 1.0818 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA VV.POND

RUNOFF VOLUME = .36754 INCHES = 4.3321 ACRE-FEET
PEAK DISCHARGE RATE = 80.94 CFS AT 1.800 HOURS BASIN AREA = .2210 SQ. MI.

****
*S ADD BASINS 51B AND 45C FOR TOTAL FLOW AT JUNCTION OF VV AND SAD

ADD HYD ID=6 HYD=ONYX.JNC ID I=6 ID II=3
PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA ONYX.JNC

RUNOFF VOLUME = .73126 INCHES = 11.9341 ACRE-FEET
PEAK DISCHARGE RATE = 175.09 CFS AT 1.650 HOURS BASIN AREA = .3060 SQ. MI.

****
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
****
*S**** SUB-BASIN 51C***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=3 ISLOPE=-1
LENGTH=400 FT SLOPE=0.098 K=0.7
LENGTH=1600 FT SLOPE=0.054 K=1.0
LENGTH=7235 FT SLOPE=0.036 K=3.0
Kn=.033 CR=0.65

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS
NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.098000	.7000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	8835.0	.039260	2.9715
TOTAL BASIN	9235.0	.041804	2.6836

LAG EQUATION FACTORS: Kn= .0330 TOTAL BASIN LENGTH (FT)= 9235.0
TOTAL BASIN SLOPE (FT/FT)= .041804 CENTROUD LENGTH (FT)= 6002.8

```
        TIME OF CONCENTRATION (HRS)=   .5282     TIME TO PEAK (HRS)=   .3522     LAG TIME (HRS)=
.3962

     COMPUTE NM HYD       ID=2   HYD NO=51C  DA= 0.45 SQ MI
                          PER A=100 PER B=0   PER C=0   PER D=0
                          TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .3522

          K =   .370469HR    TP =   .352155HR    K/TP RATIO =  1.052006     SHAPE CONSTANT, N =  3.356146
          UNIT PEAK =   395.72    CFS   UNIT VOLUME =    1.000       B =   309.68      P60 = 1.6900
          AREA =      .450000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD            ID=2   CODE=1

                                        HYDROGRAPH FROM AREA 51C


          RUNOFF VOLUME =      .38662 INCHES     =       9.2788 ACRE-FEET
          PEAK DISCHARGE RATE =     150.35 CFS  AT   1.700 HOURS   BASIN AREA =   .4500 SQ. MI.

**********************************************************************
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51D***
COMPUTE LT TP         LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                      NK=5  ISLOPE=-1
                      LENGTH=400 FT   SLOPE=0.037  K=0.7
                      LENGTH=1600 FT  SLOPE=0.037  K=1.0
                                LENGTH=2810 FT  SLOPE=0.023  K=1.0
                      LENGTH=3790 FT   SLOPE=0.040  K=3.0
                      LENGTH=3330 FT   SLOPE=0.037  K=3.0
                                 Kn=.033  CR=0.65


     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
          NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.
                              LENGTH (FT)      SLOPE (FT/FT)       COMPOSITE K
     SHEET FLOW PORTION          400.0           .037000             .7000
     SHALLOW FLOW PORTION          .0            .000000             .0000
     CHANNEL FLOW PORTION      11530.0           .034574            2.9477
     TOTAL BASIN               11930.0           .034655            2.6694


     LAG EQUATION FACTORS:     Kn=   .0330     TOTAL BASIN LENGTH (FT)=     11930.0
     TOTAL BASIN SLOPE (FT/FT)=    .034655     CENTROUD LENGTH (FT)=         7754.5


     TIME OF CONCENTRATION (HRS)=   .7179     TIME TO PEAK (HRS)=   .4786     LAG TIME (HRS)=
.5384

     COMPUTE NM HYD       ID=3   HYD NO=51D  DA= 0.88 SQ MI
                          PER A=100 PER B=0   PER C=0   PER D=0
                          TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .4786

          K =   .503503HR    TP =   .478612HR    K/TP RATIO =  1.052006     SHAPE CONSTANT, N =  3.356146
          UNIT PEAK =   569.39    CFS   UNIT VOLUME =    1.000       B =   309.68      P60 = 1.6900
          AREA =      .880000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD            ID=3   CODE=1

                                        HYDROGRAPH FROM AREA 51D


          RUNOFF VOLUME =      .38662 INCHES     =      18.1453 ACRE-FEET
          PEAK DISCHARGE RATE =     218.75 CFS  AT   1.850 HOURS   BASIN AREA =   .8800 SQ. MI.

**********************************************************************
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```
*S Basin Contributing to upper south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51E***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.035  K=0.7
                       LENGTH=1600 FT  SLOPE=0.035  K=1.0
                       LENGTH=1065 FT   SLOPE=0.074  K=3.0
                       LENGTH=4140 FT   SLOPE=0.018  K=3.0
                                  Kn=.033  CR=0.65


     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
          NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.
                                LENGTH (FT)      SLOPE (FT/FT)       COMPOSITE K
     SHEET FLOW PORTION            400.0            .035000             .7000
     SHALLOW FLOW PORTION            .0             .000000             .0000
     CHANNEL FLOW PORTION         6805.0            .030761            2.6866
     TOTAL BASIN                  7205.0            .030997            2.3390

          LAG EQUATION FACTORS:      Kn=    .0330     TOTAL BASIN LENGTH (FT)=      7205.0
          TOTAL BASIN SLOPE (FT/FT)=     .030997     CENTROUD LENGTH (FT)=         4683.3

          TIME OF CONCENTRATION (HRS)=    .4565     TIME TO PEAK (HRS)=    .3043     LAG TIME (HRS)=
.3423

     COMPUTE NM HYD         ID=4   HYD NO=51E  DA= 0.31 SQ MI
                            PER A=100 PER B=0  PER C=0  PER D=0
                            TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .3043

          K =   .320772HR    TP =   .304307HR    K/TP RATIO =  1.054105     SHAPE CONSTANT, N =  3.349564
          UNIT PEAK =   314.97    CFS   UNIT VOLUME =    1.000       B =   309.18      P60 = 1.6900
          AREA =      .310000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD              ID=4   CODE=1

                                        HYDROGRAPH FROM AREA 51E


          RUNOFF VOLUME =      .38662 INCHES     =       6.3921 ACRE-FEET
          PEAK DISCHARGE RATE =     119.11 CFS  AT   1.700 HOURS   BASIN AREA =    .3100 SQ. MI.


     **********************************************************************
     *S ADD BASINS 51C AND 51D

     ADD HYD                      ID=6  HYD=106 ID I=2  ID II=3
     PRINT HYD              ID=6   CODE=1

                              PARTIAL HYDROGRAPH   106.00


          RUNOFF VOLUME =      .38662 INCHES     =      27.4241 ACRE-FEET
          PEAK DISCHARGE RATE =     360.01 CFS  AT   1.800 HOURS   BASIN AREA =  1.3300 SQ. MI.


     **********************************************************************
     *S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E
     COMPUTE RATING CURVE  CID=1   VS NO=1   NO SEGS=1
                           MIN ELEV=5394         MAX ELEV=5400
                           CH SLOPE=0.0202    FP SLOPE=0.0202
                           N=0.035    DIST=225.0
                           DIST  ELEV          DIST  ELEV
                             0                 23      5398
                                 48            77      5394
                                               140     5394    150     5396

                                               166     5398    225     5400
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Volcano Heights Proposed.OUT

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
5394.00	.00	.00	.00
5394.32	20.88	56.66	69.16
5394.63	43.70	183.29	75.32
5394.95	68.47	367.51	81.48
5395.26	95.18	606.05	87.64
5395.58	123.84	898.01	93.80
5395.90	154.45	1243.49	99.96
5396.21	187.02	1641.43	106.33
5396.53	221.64	2094.04	112.81
5396.84	258.30	2603.68	119.29
5397.16	297.01	3171.92	125.76
5397.48	337.76	3800.39	132.24
5397.79	380.56	4490.73	138.72
5398.11	425.53	5195.18	147.38
5398.42	474.13	5882.26	160.34
5398.74	526.83	6658.45	173.29
5399.05	583.62	7527.21	186.24
5399.37	644.51	8492.16	199.19
5399.69	709.48	9557.06	212.15
5400.00	778.55	10728.92	225.00

ROUTE MCUNGE ID=7 HYD NO=6.1 INFLOW ID=6
DT=0.0 L=5360 FT
NS=0 SLOPE=0.0202
MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0

INFLOW END= 325 TABLE PTS= 20
DT= .050000 QMED= 180.01 CKMED= 5.5483
WIDTH MED= 75.16 NREACH= 11 DX= 487.27

DEPTH (FT)	AREA (SQ FT)	Q (CFS)	TRAVEL TIME(HR)	WIDTH (FT)	ck (FPS)	VEL (FPS)	C	D	C1	C2	C3	Q-M (CFS)
.00	.0	.0	.742	.0	2.71	1.30	1.000	.000	1.000	.000	.000	
.0 1.000	.000	.000										
.32	20.9	56.7	.549	69.2	5.55	2.71	2.049	.015	.990	.347	-.338	
8.9 .995	.236	-.232										
.63	43.7	183.3	.355	75.3	6.61	4.19	2.441	.037	.978	.425	-.404	
112.4 .982	.351	-.332										
.95	68.5	367.5	.277	81.5	8.26	5.37	3.051	.055	.973	.513	-.486	
268.8 .975	.473	-.448										
1.26	95.2	606.1	.234	87.6	9.61	6.37	3.552	.073	.968	.568	-.536	
480.7 .970	.541	-.512										
1.58	123.8	898.0	.205	93.8	10.78	7.25	3.983	.090	.964	.606	-.570	
746.3 .966	.587	-.553										
1.90	154.4	1243.5	.185	100.0	11.80	8.05	4.358	.107	.961	.634	-.595	
1065.3 .962	.620	-.583										
2.21	187.0	1641.4	.170	106.3	12.68	8.78	4.684	.124	.957	.656	-.613	
1437.2 .959	.644	-.603										
2.53	221.6	2094.0	.158	112.8	13.52	9.45	4.993	.140	.954	.674	-.628	
1862.5 .956	.664	-.620										
2.84	258.3	2603.7	.148	119.3	14.32	10.08	5.288	.155	.952	.690	-.642	
2343.7 .953	.682	-.635										
3.16	297.0	3171.9	.139	125.8	15.07	10.68	5.568	.170	.950	.703	-.653	
2882.7 .951	.696	-.647										
3.48	337.8	3800.4	.132	132.2	15.80	11.25	5.835	.185	.947	.715	-.662	
3481.1 .948	.709	-.657										
3.79	380.6	4490.7	.126	138.7	15.97	11.80	5.898	.206	.942	.718	-.660	
4140.5 .946	.720	-.666										
4.11	425.5	5195.2	.122	147.4	15.00	12.21	5.543	.239	.930	.705	-.635	
4838.7 .937	.713	-.650										
4.42	474.1	5882.3	.120	160.3	14.45	12.41	5.339	.258	.922	.697	-.619	
5535.5 .920	.691	-.611										
4.74	526.8	6658.5	.118	173.3	15.03	12.64	5.553	.260	.924	.706	-.630	
6266.7 .923	.701	-.624										
5.05	583.6	7527.2	.115	186.2	15.59	12.90	5.759	.263	.925	.715	-.640	
7088.8 .924	.711	-.635										
5.37	644.5	8492.2	.113	199.2	16.14	13.18	5.960	.268	.926	.723	-.649	
8005.3 .925	.719	-.644										
5.69	709.5	9557.1	.111	212.1	16.69	13.47	6.166	.274	.926	.731	-.658	
9019.9 .926	.727	-.653										
6.00	778.5	10728.9	.108	225.0	16.80	13.78	6.205	.288	.923	.733	-.656	
10137.9 .926	.735	-.661										

MAXIMUM NO. ITERATIONS FOR SOLUTION (KKMAX) = 7 OCCURRED 2 TIMES. AVERAGE NUMBER ITERATIONS = 1.2316

DEPTH	AREA	Q	TRAVEL	WIDTH	ck	VEL	C	D	C1	C2	C3	Q-M

C1-M	C2-M (FT)	C3-M (SQ FT)	(CFS)	TIME(HR)	(FT)	(FPS)	(FPS)					(CFS)
	.00	.0	.0	.742	.0	2.71	1.30	1.000	.000	1.000	.000	.000
.0	1.000	.000	.000									
	.32	20.9	56.7	.549	69.2	2.79	2.71	1.030	.030	.971	.029	.000
8.9	.990	.010	.000									
	.63	43.7	183.3	.355	75.3	2.94	4.19	1.084	.084	.922	.078	.000
112.4	.948	.052	.000									
	.95	68.5	367.5	.277	81.5	3.11	5.37	1.148	.148	.871	.129	.000
268.8	.897	.103	.000									
	1.26	95.2	606.1	.234	87.6	3.29	6.37	1.214	.214	.824	.176	.000
480.7	.847	.153	.000									
	1.58	123.8	898.0	.205	93.8	3.47	7.25	1.281	.281	.781	.219	.000
746.3	.802	.198	.000									
	1.90	154.4	1243.5	.185	100.0	3.65	8.05	1.347	.347	.743	.257	.000
1065.3	.761	.239	.000									
	2.21	187.0	1641.4	.170	106.3	3.82	8.78	1.411	.411	.709	.291	.000
1437.2	.725	.275	.000									
	2.53	221.6	2094.0	.158	112.8	3.99	9.45	1.473	.473	.679	.321	.000
1862.5	.693	.307	.000									
	2.84	258.3	2603.7	.148	119.3	4.15	10.08	1.534	.534	.652	.348	.000
2343.7	.665	.335	.000									
	3.16	297.0	3171.9	.139	125.8	4.31	10.68	1.594	.594	.627	.373	.000
2882.7	.639	.361	.000									
	3.48	337.8	3800.4	.132	132.2	4.47	11.25	1.653	.653	.605	.395	.000
3481.1	.616	.384	.000									
	3.79	380.6	4490.7	.126	138.7	4.63	11.80	1.710	.710	.585	.415	.000
4140.5	.595	.405	.000									
	4.11	425.5	5195.2	.122	147.4	4.75	12.21	1.754	.754	.570	.430	.000
4838.7	.577	.423	.000									
	4.42	474.1	5882.3	.120	160.3	4.81	12.41	1.775	.775	.563	.437	.000
5535.5	.567	.433	.000									
	4.74	526.8	6658.5	.118	173.3	4.87	12.64	1.801	.801	.555	.445	.000
6266.7	.559	.441	.000									
	5.05	583.6	7527.2	.115	186.2	4.95	12.90	1.829	.829	.547	.453	.000
7088.8	.551	.449	.000									
	5.37	644.5	8492.2	.113	199.2	5.04	13.18	1.860	.860	.538	.462	.000
8005.3	.542	.458	.000									
	5.69	709.5	9557.1	.111	212.1	5.12	13.47	1.893	.893	.528	.472	.000
9019.9	.533	.467	.000									
	6.00	778.5	10728.9	.108	225.0	5.22	13.78	1.928	.928	.519	.481	.000
10137.9	.523	.477	.000									

MAXIMUM NO. ITERATIONS FOR SOLUTION (KKMAX) = 3 OCCURRED 73 TIMES. AVERAGE NUMBER ITERATIONS = 1.1165

Equations solved with two passes: first using the Ponce correction to C1, second using the Fread correction to C1, C2 and C3

PRINT HYD ID=7 CODE=1

OUTFLOW HYDROGRAPH REACH 6.10

RUNOFF VOLUME = .38422 INCHES = 27.2537 ACRE-FEET
PEAK DISCHARGE RATE = 353.02 CFS AT 2.300 HOURS BASIN AREA = 1.3300 SQ. MI.

****

*S ADD BASINS 51C AND 51D TO BASIN 51E- All basins to EMERALD DRIVE

ADD HYD ID=2 HYD=102 ID I=7 ID II=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .38467 INCHES = 33.6457 ACRE-FEET
PEAK DISCHARGE RATE = 378.54 CFS AT 2.250 HOURS BASIN AREA = 1.6400 SQ. MI.

****

*S ROUTE BASIN 51 C, D, E THROUGH PONDING AREA AT EMERALD DR
ROUTE RESERVOIR ID=5 HYD=VV.POND INFLOW ID=2 CODE=5

OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0.0000	5326
8.00	0.0001	5327
30.00	0.002	5328
63.00	0.006	5329

106.00	0.014		5330
156.00	0.063		5331
210.00	0.210		5332
266.00	0.540		5333
294.00	1.130		5333.5
321.00		2.520	5334
369.00		2.600	5335

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5326.00	.000	.00
.25	.00	5326.00	.000	.00
.50	.00	5326.00	.000	.00
.75	.00	5326.00	.000	.00
1.00	.00	5326.00	.000	.00
1.25	.00	5326.00	.000	.00
1.50	63.40	5328.98	.006	62.46
1.75	113.13	5330.18	.023	114.79
2.00	149.94	5330.62	.044	137.00
2.25	378.54	5333.56	1.295	297.20
2.50	300.29	5333.86	2.143	313.67
2.75	190.20	5333.30	.898	282.99
3.00	115.52	5330.27	.027	119.64
3.25	70.97	5329.21	.008	71.89
3.50	46.80	5328.50	.004	46.59
3.75	32.65	5328.09	.002	32.86
4.00	26.96	5327.86	.002	26.87
4.25	22.33	5327.66	.001	22.42
4.50	18.51	5327.48	.001	18.47
4.75	15.36	5327.34	.001	15.40
5.00	12.76	5327.22	.001	12.74
5.25	10.61	5327.12	.000	10.63
5.50	8.82	5327.04	.000	8.82
5.75	7.35	5326.92	.000	7.36
6.00	6.13	5326.76	.000	6.12
6.25	5.11	5326.64	.000	5.12
6.50	4.27	5326.53	.000	4.26
6.75	3.57	5326.45	.000	3.57
7.00	2.98	5326.37	.000	2.97
7.25	2.49	5326.31	.000	2.50
7.50	2.09	5326.26	.000	2.08
7.75	1.75	5326.22	.000	1.76
8.00	1.47	5326.18	.000	1.46
8.25	1.23	5326.15	.000	1.24
8.50	1.03	5326.13	.000	1.03
8.75	.87	5326.11	.000	.87
9.00	.73	5326.09	.000	.72
9.25	.61	5326.08	.000	.62
9.50	.52	5326.06	.000	.51
9.75	.43	5326.05	.000	.44
10.00	.36	5326.05	.000	.36
10.25	.30	5326.04	.000	.31
10.50	.26	5326.03	.000	.25
10.75	.22	5326.03	.000	.22
11.00	.18	5326.02	.000	.18
11.25	.15	5326.02	.000	.16
11.50	.13	5326.02	.000	.13
11.75	.11	5326.01	.000	.11
12.00	.09	5326.01	.000	.09
12.25	.08	5326.01	.000	.08
12.50	.06	5326.01	.000	.06
12.75	.05	5326.01	.000	.05
13.00	.04	5326.01	.000	.04
13.25	.04	5326.00	.000	.04
13.50	.03	5326.00	.000	.03
13.75	.03	5326.00	.000	.03

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.00	.02	5326.00	.000	.02
14.25	.02	5326.00	.000	.02
14.50	.02	5326.00	.000	.02
14.75	.01	5326.00	.000	.02
15.00	.01	5326.00	.000	.01

```
    15.25        .01   5326.00        .000        .01
    15.50        .01   5326.00        .000        .01
    15.75        .01   5326.00        .000        .01
    16.00        .01   5326.00        .000        .01
    16.25        .01   5326.00        .000        .01
    16.50        .00   5326.00        .000        .00
 PEAK DISCHARGE =       313.803 CFS - PEAK OCCURS AT HOUR    2.45
 MAXIMUM WATER SURFACE ELEVATION =     5333.867
 MAXIMUM STORAGE =        2.1495 AC-FT      INCREMENTAL TIME=     .050000HRS

PRINT HYD                ID=6  CODE=1

                                PARTIAL HYDROGRAPH   106.00


    RUNOFF VOLUME =       .38662 INCHES     =      27.4241 ACRE-FEET
    PEAK DISCHARGE RATE =     360.01 CFS  AT   1.800 HOURS   BASIN AREA =  1.3300 SQ. MI.


**********************************************************************
FINISH

NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:13:55
```

CURRENT BASIN
BOUNDARY MAP

VISTA VIEJA SUBDIVISION

BOCA NEGRA DAM

TEMPORARY FLOOD PLAIN

51A
AREA = 0.25 SQ MI
Q_{100} = 117 CFS

45A
AREA = 0.52 SQ MI
Q_{100} = 159 CFS

45D
AREA = 0.15 SQ MI
Q_{100} = 80 CFS

AP 1

45B
AREA = 0.11 SQ MI
Q_{100} = 67 CFS

45C
AREA = 0.08 SQ MI
Q_{100} = 155 CFS

AP 2

51C
AREA = 0.45 SQ MI
Q_{100} = 150 CFS

51B
AREA = 0.22 SQ MI
Q_{100} = 92 CFS

NORTH BRANCH OF BOCA NEGRA ARROYO SOUTH

AP 3

SOUTH BRANCH OF BOCA NEGRA ARROYO SOUTH

AP 4

51E
AREA = 0.31 SQ MI
Q_{100} = 119 CFS

51D
AREA = 0.56 SQ MI
Q_{100} = 219 CFS

SAD 227

TO MONTANO RD

ANALYSIS POINT	DESCRIPTION	Q MAX (CFS)	RUNOFF VOLUME (AC-FT)
1	OFFSITE FLOW FROM BASIN 45A INTO 72" PIPE AT GROUNDSEL ROAD AND ALBERICOQUE PLACE	159	12.4
2	OFFSITE FLOW FROM BASIN 45B INTO DROP INLET AT HAWK EYE ROAD AND ALBERICOQUE PLACE	67	2.4
3	OFFSITE FLOW FROM BASIN 51B AND FLOW FROM VISTA VIEJA SUBDIVISION INTO 60" PIPE IN ONYX ROAD	175	11.9
4	OFFSITE FLOW FROM BASIN 51C, 51D AND 51E INTO 72" PIPE IN EMERALD DRIVE	379	33.6

NOTE:
1. TEMPORARY FLOOD PLAIN WILL BE REMOVED AFTER CONSTRUCTION OF THE BOCA NEGRA DAM.

LEGEND

- 5070 — EXISTING INTERMEDIATE CONTOUR
- 5075 — EXISTING INDEX CONTOUR
- BASIN BOUNDARY
- (51A) BASIN ID
- (APX) ANALYSIS POINT
- EFFECTIVE FLOOD PLAIN (FIRM)

GRAPHIC SCALE

600 0 300 600 1200 2400

(IN FEET)
1 inch = 600 ft.

N

WILSON & COMPANY
4900 LAND AVENUE, NE
ALBUQUERQUE, NEW MEXICO
87109
(505) 348-4000

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA
CURRENT BASIN BOUNDARY MAP

Design Review Committee | City Engineer Approval

DATE SEPT 2000 | DESIGN RSM | DRAWN AJB

File No. [illegible]

City Project No. 783381,2,3,4

Zone Map No. D-9-Z

N:\MISC\DRAINAGE\VISTA VIEJA\CURRENT BASIN\VISTA VIEJA CURRENT.dwg 9/29/2000 10:24:46 MST

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =06/24/2009
INPUT FILE = M:\IDS\X3-218~2\AE_DATA\CALCS\AHYMO\MODIFI~1\VOLCAN~1.WPD USER NO.= AHYMO-C-9803c01UNMLIB-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S**********										
*S VOLCANO HEIGHTS LOMR STUDY										
*S EXISTING CONDITIONS MODEL										
*S 100 YR 24 HR STORM EVENT										
*S DATE: FEBRUARY 2009										
*S**********										
START										TIME= .00
LOCATION	BERNALILLO COUNTY									
*S 100 YEAR 24HR STORM										
RAINFALL TYPE= 2										RAIN24= 2.560
*S Basin Contributing to upper north fork of Boca Negra Arroyo South										
*S on the west side of Vista Vieja to Groundsel Road										
*S**** SUB-BASIN 45A ****										
COMPUTE NM HYD	45A	-	1	.52500	158.56	12.382	.44221	1.800	.472	PER IMP= 1.00
*S Basin Contributing to lower north fork of Boca Negra arroyo South										
*S on the west side of Vista Vieja to Hawk Eye Road										
*S**** SUB-BASIN 45B***										
COMPUTE NM HYD	45B	-	2	.11300	66.61	2.352	.39020	1.550	.921	PER IMP= .00
*S Basin Contributing to lower half of Vista Vieja										
*S**** SUB-BASIN 45C***										
COMPUTE NM HYD	45C	-	2	.08500	44.40	1.917	.42296	1.600	.816	PER IMP= .00
*S Basin Contributing to upper half of Vista Vieja										
*S**** SUB-BASIN 45D***										
COMPUTE NM HYD	45D	-	2	.15200	80.57	3.429	.42296	1.600	.828	PER IMP= .00
*S Basin discharging to Scenic Road										
*S**** SUB-BASIN 51A***										
COMPUTE NM HYD	51A	-	2	.24900	116.61	5.617	.42296	1.650	.732	PER IMP= .00
*S Basin discharging to Onyx Drive										
*S**** SUB-BASIN 51B***										
COMPUTE NM HYD	51B	-	2	.22100	91.91	4.985	.42296	1.650	.650	PER IMP= .00
*S Basin Contributing to lower south fork of Boca Negra arroyo South										
*S SAD 227 - EMERALD DRIVE										
*S**** SUB-BASIN 51C***										
COMPUTE NM HYD	51C	-	2	.45000	150.35	9.279	.38662	1.700	.522	PER IMP= .00
*S Basin Contributing to lower south fork of Boca Negra arroyo South										
*S SAD 227 - EMERALD DRIVE										
*S**** SUB-BASIN 51D***										
COMPUTE NM HYD	51D	-	3	.88000	218.75	18.145	.38662	1.850	.388	PER IMP= .00
*S Basin Contributing to lower south fork of Boca Negra arroyo South										
*S SAD 227 - EMERALD DRIVE										
*S**** SUB-BASIN 51E***										
COMPUTE NM HYD	51E	-	4	.31000	119.11	6.392	.38662	1.700	.600	PER IMP= .00
*S ADD BASINS 51C AND 51D										
ADD HYD	106.00	2& 3	6	1.33000	360.01	27.424	.38662	1.800	.423	
*S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E										
ROUTE MCUNGE	6.10	6	7	1.33000	353.02	27.254	.38422	2.300	.415	CCODE = .1
*S ADD BASINS 51C AND 51D TO BASIN 51E										
ADD HYD	102.00	7& 4	2	1.64000	378.54	33.646	.38467	2.250	.361	
FINISH										

```
*S*************************************************************
*S VOLCANO HEIGHTS LOMR STUDY
*S EXISTING CONDITIONS MODEL
*S 100 YR 24 HR STORM EVENT
*S DATE: FEBRUARY 2009
* FILE: M:\IDS\x3-218-078-02\AE_DATA\CALCS\AHYMO\Modified Models\VOLCANO HEIGHTS EXIST.wpd
*
*S*************************************************************
START                TIME=0.0  PUNCH CODE=0 PRINT CODE=0
LOCATION             BERNALILLO COUNTY
*S 100 YEAR 24HR STORM
RAINFALL               TYPE=2  RAIN QUARTER=0   RAIN ONE=1.69
                     RAIN SIX=2.17  RAIN DAY=2.56  DT=0.05

**************************************************************
*S Basin Contributing to upper north fork of Boca Negra Arroyo South
*S on the west side of Vista Vieja to Groundsel Road
**************************************************************
*S**** SUB-BASIN 45A ****
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=0
                       LENGTH=400 FT   SLOPE=0.099 K=0.7
                       LENGTH=1600 FT  SLOPE=0.065 K=2.0
                       LENGTH=2320 FT  SLOPE=0.052 K=3.0
                       LENGTH=7296 FT  SLOPE=0.027 K=3.0
                       Kn=.033  CR=.6

COMPUTE NM HYD         ID=1   HYD NO=45A   DA= 0.525 SQ MI
                       PER A=89 PER B=0  PER C=10  PER D=1
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=1   CODE=1
**************************************************************
*S Basin Contributing to lower north fork of Boca Negra arroyo South
*S on the west side of Vista Vieja to Hawk Eye Road
**************************************************************
*S**** SUB-BASIN 45B***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.040  K=0.7
                       LENGTH=1600 FT  SLOPE=0.050  K=2.0
                       LENGTH=1155 FT   SLOPE=0.016  K=2.0

COMPUTE NM HYD         ID=2   HYD NO=45B   DA= 0.113 SQ MI
                       PER A=99 PER B=0  PER C=1  PER D=0
                       TP=0.0   MASSRAIN=-1
*PRINT HYD              ID=2   CODE=1

**************************************************************
*S Basin Contributing to lower half of Vista Vieja
**************************************************************
*S**** SUB-BASIN 45C***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.0185  K=0.7
                       LENGTH=1600 FT  SLOPE=0.0185  K=2.0
                       LENGTH=700 FT   SLOPE=0.0185  K=3.0

COMPUTE NM HYD         ID=2   HYD NO=45C   DA= 0.085 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=2   CODE=1

**************************************************************
*S Basin Contributing to upper half of Vista Vieja
**************************************************************
*S**** SUB-BASIN 45D***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.0178  K=0.7
                       LENGTH=1600 FT  SLOPE=0.0178  K=2.0
                       LENGTH=700 FT   SLOPE=0.0178  K=3.0


COMPUTE NM HYD         ID=2   HYD NO=45D   DA= 0.152 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
PRINT HYD              ID=2   CODE=1
**************************************************************
*S Basin discharging to Scenic Road
**************************************************************
*S**** SUB-BASIN 51A***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.075  K=0.7
```

```
                    LENGTH=1600 FT   SLOPE=0.037  K=2.0
                    LENGTH=3850 FT   SLOPE=0.031  K=2.0
                    LENGTH=985 FT   SLOPE=0.022  K=3.0
                        Kn=.033  CR=0.50

COMPUTE NM HYD      ID=2   HYD NO=51A   DA= 0.249 SQ MI
                    PER A=90 PER B=0  PER C=10  PER D=0
                    TP=0.0   MASSRAIN=-1
PRINT HYD           ID=2   CODE=1

**********************************************************************
*S Basin discharging to Onyx Drive
**********************************************************************
*S**** SUB-BASIN 51B***
COMPUTE LT TP       LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                    NK=5  ISLOPE=-1
                    LENGTH=400 FT   SLOPE=0.031  K=0.7
                    LENGTH=1600 FT  SLOPE=0.031  K=2.0
                    LENGTH=700 FT   SLOPE=0.031  K=3.0
                    LENGTH=3030 FT  SLOPE=0.040  K=3.0
                    LENGTH=1941 FT   SLOPE=0.029  K=3.0
                        Kn=.033  CR=0.50

COMPUTE NM HYD      ID=2   HYD NO=51B   DA= 0.221 SQ MI
                    PER A=90 PER B=0  PER C=10  PER D=0
                    TP=0.0   MASSRAIN=-1
PRINT HYD           ID=2   CODE=1

**********************************************************************
*S Basin Contributing to lower south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51C***
COMPUTE LT TP       LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                    NK=3  ISLOPE=-1
                    LENGTH=400 FT   SLOPE=0.098  K=0.7
                    LENGTH=1600 FT  SLOPE=0.054  K=1.0
                    LENGTH=7235 FT   SLOPE=0.036  K=3.0
                        Kn=.033  CR=0.65

COMPUTE NM HYD      ID=2   HYD NO=51C  DA= 0.45 SQ MI
                    PER A=100 PER B=0  PER C=0  PER D=0
                    TP=0.0   MASSRAIN=-1
PRINT HYD           ID=2   CODE=1
**********************************************************************
*S Basin Contributing to lower south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51D***
COMPUTE LT TP       LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                    NK=5  ISLOPE=-1
                    LENGTH=400 FT   SLOPE=0.037  K=0.7
                    LENGTH=1600 FT  SLOPE=0.037  K=1.0
                    LENGTH=2810 FT  SLOPE=0.023  K=1.0
                    LENGTH=3790 FT   SLOPE=0.040  K=3.0
                    LENGTH=3330 FT   SLOPE=0.037  K=3.0
                        Kn=.033  CR=0.65

COMPUTE NM HYD      ID=3   HYD NO=51D  DA= 0.88 SQ MI
                    PER A=100 PER B=0  PER C=0  PER D=0
                    TP=0.0   MASSRAIN=-1
PRINT HYD           ID=3   CODE=1
**********************************************************************
*S Basin Contributing to lower south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
**********************************************************************
*S**** SUB-BASIN 51E***
COMPUTE LT TP       LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                    NK=4  ISLOPE=-1
                    LENGTH=400 FT   SLOPE=0.035  K=0.7
                    LENGTH=1600 FT  SLOPE=0.035  K=1.0
                    LENGTH=1065 FT   SLOPE=0.074  K=3.0
                    LENGTH=4140 FT   SLOPE=0.018  K=3.0
                        Kn=.033  CR=0.65

COMPUTE NM HYD      ID=4   HYD NO=51E  DA= 0.31 SQ MI
                    PER A=100 PER B=0  PER C=0  PER D=0
                    TP=0.0   MASSRAIN=-1
PRINT HYD           ID=4   CODE=1
**********************************************************************
*S ADD BASINS 51C AND 51D

ADD HYD          ID=6  HYD=106 ID I=2  ID II=3
PRINT HYD           ID=6   CODE=1
```

```
**********************************************************************
*S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E
COMPUTE RATING CURVE  CID=1   VS NO=1   NO SEGS=1
                      MIN ELEV=5394     MAX ELEV=5400
                      CH SLOPE=0.0202    FP SLOPE=0.0202
                      N=0.035    DIST=225.0
                      DIST  ELEV        DIST  ELEV
                        0       5400    23      5398
                        48      5396    77      5394
                        140     5394    150     5396
                        166     5398    225     5400
ROUTE MCUNGE          ID=7   HYD NO=6.1  INFLOW ID=6
                      DT=0.0   L=5360 FT
                      NS=0   SLOPE=0.0202
                      MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0
PRINT HYD             ID=7   CODE=1
**********************************************************************
*S ADD BASINS 51C AND 51D TO BASIN 51E

ADD HYD            ID=2  HYD=102 ID I=7  ID II=4
PRINT HYD            ID=2   CODE=1
**********************************************************************
FINISH
```

```
    AHYMO PROGRAM (AHYMO_97) -                              - Version:  1997.02c
         RUN DATE (MON/DAY/YR) = 06/24/2009
         START TIME (HR:MIN:SEC) = 14:13:33     USER NO.= AHYMO-C-9803c01UNMLIB-AH
         INPUT FILE = M:\IDS\X3-218~2\AE_DATA\CALCS\AHYMO\MODIFI~1\VOLCAN~1.WPD


*S*****************************************************************
*S VOLCANO HEIGHTS LOMR STUDY
*S EXISTING CONDITIONS MODEL
*S 100 YR 24 HR STORM EVENT
*S DATE: FEBRUARY 2009
* FILE: M:\IDS\x3-218-078-02\AE_DATA\CALCS\AHYMO\Modified Models\VOLCANO HEIGHTS
*
*S*****************************************************************
START                TIME=0.0  PUNCH CODE=0 PRINT CODE=0
LOCATION             BERNALILLO COUNTY
     Bernalillo County soil infiltration values (LAND FACTORS) used for computations.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
           A            0.65                  1.67
           B            0.50                  1.25
           C            0.35                  0.83
           D            0.10                  0.04

     *S 100 YEAR 24HR STORM
     RAINFALL               TYPE=2  RAIN QUARTER=0   RAIN ONE=1.69
                         RAIN SIX=2.17  RAIN DAY=2.56  DT=0.05

                         COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
                         DT =     .050000 HOURS        END TIME =    24.000000 HOURS
                            .0000   .0056   .0114   .0173   .0234   .0298   .0363
                            .0431   .0502   .0576   .0652   .0732   .0816   .0903
                            .0996   .1093   .1196   .1306   .1423   .1549   .1685
                            .1756   .1835   .2063   .2602   .3529   .4962   .7026
                            .9848  1.2074  1.3079  1.3919  1.4654  1.5312  1.5907
                           1.6451  1.6949  1.7408  1.7831  1.8223  1.8585  1.8676
                           1.8761  1.8842  1.8918  1.8991  1.9061  1.9127  1.9192
                           1.9253  1.9313  1.9371  1.9427  1.9482  1.9535  1.9587
                           1.9637  1.9686  1.9734  1.9781  1.9827  1.9872  1.9917
                           1.9960  2.0002  2.0044  2.0085  2.0126  2.0165  2.0204
                           2.0243  2.0280  2.0318  2.0354  2.0391  2.0426  2.0462
                           2.0496  2.0531  2.0565  2.0598  2.0631  2.0664  2.0696
                           2.0728  2.0760  2.0791  2.0822  2.0852  2.0883  2.0913
                           2.0942  2.0972  2.1001  2.1029  2.1058  2.1086  2.1114
                           2.1142  2.1170  2.1197  2.1224  2.1251  2.1277  2.1304
                           2.1330  2.1356  2.1382  2.1407  2.1433  2.1458  2.1483
                           2.1508  2.1532  2.1557  2.1581  2.1605  2.1629  2.1653
                           2.1677  2.1700  2.1717  2.1733  2.1750  2.1767  2.1783
                           2.1800  2.1816  2.1832  2.1849  2.1865  2.1881  2.1897
                           2.1913  2.1929  2.1945  2.1961  2.1977  2.1993  2.2008
                           2.2024  2.2040  2.2055  2.2071  2.2086  2.2102  2.2117
                           2.2132  2.2147  2.2163  2.2178  2.2193  2.2208  2.2223
                           2.2238  2.2253  2.2268  2.2282  2.2297  2.2312  2.2327
                           2.2341  2.2356  2.2370  2.2385  2.2399  2.2414  2.2428
                           2.2442  2.2457  2.2471  2.2485  2.2499  2.2513  2.2527
                           2.2541  2.2555  2.2569  2.2583  2.2597  2.2611  2.2625
                           2.2638  2.2652  2.2666  2.2679  2.2693  2.2706  2.2720
                           2.2733  2.2747  2.2760  2.2774  2.2787  2.2800  2.2813
                           2.2826  2.2840  2.2853  2.2866  2.2879  2.2892  2.2905
                           2.2918  2.2931  2.2944  2.2956  2.2969  2.2982  2.2995
                           2.3007  2.3020  2.3033  2.3045  2.3058  2.3070  2.3083
                           2.3095  2.3108  2.3120  2.3133  2.3145  2.3157  2.3169
                           2.3182  2.3194  2.3206  2.3218  2.3230  2.3242  2.3254
                           2.3266  2.3278  2.3290  2.3302  2.3314  2.3326  2.3338
                           2.3350  2.3362  2.3373  2.3385  2.3397  2.3408  2.3420
                           2.3432  2.3443  2.3455  2.3466  2.3478  2.3489  2.3501
                           2.3512  2.3524  2.3535  2.3546  2.3558  2.3569  2.3580
                           2.3591  2.3603  2.3614  2.3625  2.3636  2.3647  2.3658
                           2.3669  2.3680  2.3691  2.3702  2.3713  2.3724  2.3735
                           2.3746  2.3757  2.3768  2.3779  2.3789  2.3800  2.3811
                           2.3822  2.3832  2.3843  2.3854  2.3864  2.3875  2.3885
                           2.3896  2.3906  2.3917  2.3927  2.3938  2.3948  2.3959
                           2.3969  2.3980  2.3990  2.4000  2.4011  2.4021  2.4031
                           2.4041  2.4052  2.4062  2.4072  2.4082  2.4092  2.4102
                           2.4112  2.4122  2.4133  2.4143  2.4153  2.4163  2.4173
                           2.4182  2.4192  2.4202  2.4212  2.4222  2.4232  2.4242
                           2.4252  2.4261  2.4271  2.4281  2.4291  2.4300  2.4310
                           2.4320  2.4329  2.4339  2.4349  2.4358  2.4368  2.4377
                           2.4387  2.4396  2.4406  2.4415  2.4425  2.4434  2.4444
                           2.4453  2.4463  2.4472  2.4481  2.4491  2.4500  2.4509
                           2.4519  2.4528  2.4537  2.4546  2.4556  2.4565  2.4574
                           2.4583  2.4592  2.4602  2.4611  2.4620  2.4629  2.4638
```

2.4647	2.4656	2.4665	2.4674	2.4683	2.4692	2.4701
2.4710	2.4719	2.4728	2.4737	2.4746	2.4754	2.4763
2.4772	2.4781	2.4790	2.4798	2.4807	2.4816	2.4825
2.4833	2.4842	2.4851	2.4860	2.4868	2.4877	2.4885
2.4894	2.4903	2.4911	2.4920	2.4928	2.4937	2.4945
2.4954	2.4962	2.4971	2.4979	2.4988	2.4996	2.5005
2.5013	2.5022	2.5030	2.5038	2.5047	2.5055	2.5063
2.5072	2.5080	2.5088	2.5097	2.5105	2.5113	2.5121
2.5130	2.5138	2.5146	2.5154	2.5162	2.5170	2.5179
2.5187	2.5195	2.5203	2.5211	2.5219	2.5227	2.5235
2.5243	2.5251	2.5259	2.5267	2.5275	2.5283	2.5291
2.5299	2.5307	2.5315	2.5323	2.5331	2.5339	2.5347
2.5355	2.5362	2.5370	2.5378	2.5386	2.5394	2.5401
2.5409	2.5417	2.5425	2.5433	2.5440	2.5448	2.5456
2.5463	2.5471	2.5479	2.5486	2.5494	2.5502	2.5509
2.5517	2.5525	2.5532	2.5540	2.5547	2.5555	2.5562
2.5570	2.5577	2.5585	2.5593	2.5600		

```
**********************************************************************
*S Basin Contributing to upper north fork of Boca Negra Arroyo South
*S on the west side of Vista Vieja to Groundsel Road
**********************************************************************
*S**** SUB-BASIN 45A ****
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=0
                       LENGTH=400 FT   SLOPE=0.099 K=0.7
                       LENGTH=1600 FT  SLOPE=0.065 K=2.0
                       LENGTH=2320 FT  SLOPE=0.052 K=3.0
                       LENGTH=7296 FT  SLOPE=0.027 K=3.0
                       Kn=.033  CR=.6

     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
                                LENGTH (FT)    ADJUSTED SLOPE (FT/FT)COMPOSITE K
     SHEET FLOW PORTION            400.0            .058387             .7000
     SHALLOW FLOW PORTION         1600.0            .053446            2.0000
     CHANNEL FLOW PORTION         9616.0            .032229            2.9260
     TOTAL BASIN                 11616.0            .036052            2.5352

     LAG EQUATION FACTORS:     Kn=   .0330     TOTAL BASIN LENGTH (FT)=     11616.0
     TOTAL BASIN SLOPE (FT/FT)=    .036052     CENTROUD LENGTH (FT)=         6969.6

     TIME OF CONCENTRATION (HRS)=   .6764     TIME TO PEAK (HRS)=   .4509     LAG TIME
(HRS)=   .5073

COMPUTE NM HYD         ID=1   HYD NO=45A   DA= 0.525 SQ MI
                       PER A=89 PER B=0  PER C=10  PER D=1
                       TP=0.0   MASSRAIN=-1
     TIME TO PEAK (hrs)=   .4509

     K =   .267246HR    TP =   .450943HR    K/TP RATIO =   .592638     SHAPE CONSTANT, N =
6.391033
     UNIT PEAK =   5.7240    CFS   UNIT VOLUME =    .9979       B =   491.65      P60 =
1.6900
     AREA =      .005250 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     K =   .463612HR    TP =   .450943HR    K/TP RATIO =  1.028094     SHAPE CONSTANT, N =
3.433486
     UNIT PEAK =   363.57    CFS   UNIT VOLUME =    1.000       B =   315.44      P60 =
1.6900
     AREA =      .519750 SQ MI    IA =    .61970 INCHES    INF =   1.58515 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=1   CODE=1

                                   HYDROGRAPH FROM AREA 45A

     RUNOFF VOLUME =      .44221 INCHES     =      12.3818 ACRE-FEET
     PEAK DISCHARGE RATE =     158.56 CFS  AT   1.800 HOURS   BASIN AREA =   .5250 SQ. MI.

**********************************************************************
*S Basin Contributing to lower north fork of Boca Negra arroyo South
*S on the west side of Vista Vieja to Hawk Eye Road
**********************************************************************
*S**** SUB-BASIN 45B***
```

```
     COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                            NK=3  ISLOPE=-1
                            LENGTH=400 FT   SLOPE=0.040  K=0.7
                            LENGTH=1600 FT  SLOPE=0.050  K=2.0
                            LENGTH=1155 FT   SLOPE=0.016  K=2.0


          Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

          SCS UPLAND METHOD FACTORS
               NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time
requirements.
                                    LENGTH (FT)       SLOPE (FT/FT)        COMPOSITE K
          SHEET FLOW PORTION           400.0             .040000              .7000
          SHALLOW FLOW PORTION        1600.0             .050000             2.0000
          CHANNEL FLOW PORTION        1155.0             .016000             3.0000
          TOTAL BASIN                 3155.0             .036285             1.7474


          TIME OF CONCENTRATION (HRS)=   .2633     TIME TO PEAK (HRS)=   .1755     LAG TIME
(HRS)=   .1975

     COMPUTE NM HYD         ID=2   HYD NO=45B   DA= 0.113 SQ MI
                            PER A=99 PER B=0  PER C=1  PER D=0
                            TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .1755

          K =   .213308HR    TP =   .175529HR    K/TP RATIO =  1.215230     SHAPE CONSTANT, N =
2.927273
          UNIT PEAK =   177.58    CFS   UNIT VOLUME =    .9995       B =   275.84      P60 =
1.6900
          AREA =      .113000 SQ MI    IA =    .64700 INCHES    INF =   1.66160 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     *PRINT HYD             ID=2   CODE=1

     ************************************************************************
     *S Basin Contributing to lower half of Vista Vieja
     ************************************************************************
     *S**** SUB-BASIN 45C***
     COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                            NK=3  ISLOPE=-1
                            LENGTH=400 FT   SLOPE=0.0185  K=0.7
                            LENGTH=1600 FT  SLOPE=0.0185  K=2.0
                                 LENGTH=700 FT   SLOPE=0.0185  K=3.0


          Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

          SCS UPLAND METHOD FACTORS
                                    LENGTH (FT)       SLOPE (FT/FT)        COMPOSITE K
          SHEET FLOW PORTION           400.0             .018500              .7000
          SHALLOW FLOW PORTION        1600.0             .018500             2.0000
          CHANNEL FLOW PORTION         700.0             .018500             3.0000
          TOTAL BASIN                 2700.0             .018500             1.6825


          TIME OF CONCENTRATION (HRS)=   .3277     TIME TO PEAK (HRS)=   .2185     LAG TIME
(HRS)=   .2458

     COMPUTE NM HYD         ID=2   HYD NO=45C   DA= 0.085 SQ MI
                            PER A=90 PER B=0  PER C=10  PER D=0
                            TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .2185

          K =   .261531HR    TP =   .218490HR    K/TP RATIO =  1.196995     SHAPE CONSTANT, N =
2.968028
          UNIT PEAK =   108.62    CFS   UNIT VOLUME =    .9996       B =   279.20      P60 =
1.6900
          AREA =      .085000 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD              ID=2   CODE=1

                                        HYDROGRAPH FROM AREA 45C


          RUNOFF VOLUME =      .42296 INCHES     =       1.9174 ACRE-FEET
          PEAK DISCHARGE RATE =      44.40 CFS  AT   1.600 HOURS   BASIN AREA =   .0850 SQ. MI.


     ************************************************************************
```

```
*S Basin Contributing to upper half of Vista Vieja
*****************************************************************
*S**** SUB-BASIN 45D***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=3  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.0178  K=0.7
                       LENGTH=1600 FT  SLOPE=0.0178  K=2.0
                                 LENGTH=700 FT   SLOPE=0.0178  K=3.0


     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
                                LENGTH (FT)       SLOPE (FT/FT)       COMPOSITE K
     SHEET FLOW PORTION            400.0             .017800             .7000
     SHALLOW FLOW PORTION         1600.0             .017800            2.0000
     CHANNEL FLOW PORTION          700.0             .017800            3.0000
     TOTAL BASIN                  2700.0             .017800            1.6825

     TIME OF CONCENTRATION (HRS)=   .3341     TIME TO PEAK (HRS)=   .2227     LAG TIME
(HRS)=   .2506

COMPUTE NM HYD         ID=2   HYD NO=45D   DA= 0.152 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
     TIME TO PEAK (hrs)=   .2227

     K =   .255560HR    TP =   .222744HR    K/TP RATIO =  1.147323     SHAPE CONSTANT, N =
3.087280
     UNIT PEAK =   197.12    CFS   UNIT VOLUME =    .9999      B =   288.86      P60 =
1.6900
     AREA =      .152000 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD              ID=2   CODE=1

                                HYDROGRAPH FROM AREA 45D


     RUNOFF VOLUME =      .42296 INCHES     =       3.4288 ACRE-FEET
     PEAK DISCHARGE RATE =      80.57 CFS  AT   1.600 HOURS   BASIN AREA =   .1520 SQ. MI.


*****************************************************************
*S Basin discharging to Scenic Road
*****************************************************************
*S**** SUB-BASIN 51A***
COMPUTE LT TP          LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                       NK=4  ISLOPE=-1
                       LENGTH=400 FT   SLOPE=0.075  K=0.7
                       LENGTH=1600 FT   SLOPE=0.037  K=2.0
                       LENGTH=3850 FT   SLOPE=0.031  K=2.0
                       LENGTH=985 FT   SLOPE=0.022  K=3.0
                                 Kn=.033  CR=0.50

     Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

     SCS UPLAND METHOD FACTORS
          NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time
requirements.
                                LENGTH (FT)       SLOPE (FT/FT)       COMPOSITE K
     SHEET FLOW PORTION            400.0             .075000             .7000
     SHALLOW FLOW PORTION         1600.0             .037000            2.0000
     CHANNEL FLOW PORTION         4835.0             .029166            2.9793
     TOTAL BASIN                  6835.0             .033683            2.3649

     LAG EQUATION FACTORS:     Kn=   .0330     TOTAL BASIN LENGTH (FT)=      6835.0
     TOTAL BASIN SLOPE (FT/FT)=    .033683     CENTROUD LENGTH (FT)=         3417.5

     TIME OF CONCENTRATION (HRS)=   .4011     TIME TO PEAK (HRS)=   .2674     LAG TIME
(HRS)=   .3008

COMPUTE NM HYD         ID=2   HYD NO=51A   DA= 0.249 SQ MI
                       PER A=90 PER B=0  PER C=10  PER D=0
                       TP=0.0   MASSRAIN=-1
     TIME TO PEAK (hrs)=   .2674

     K =   .287577HR    TP =   .267412HR    K/TP RATIO =  1.075410     SHAPE CONSTANT, N =
```

3.284598
UNIT PEAK = 283.31 CFS UNIT VOLUME = 1.000 B = 304.26 P60 =
1.6900
AREA = .249000 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA 51A

RUNOFF VOLUME = .42296 INCHES = 5.6169 ACRE-FEET
PEAK DISCHARGE RATE = 116.61 CFS AT 1.650 HOURS BASIN AREA = .2490 SQ. MI.

****
*S Basin discharging to Onyx Drive
****
*S**** SUB-BASIN 51B***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=5 ISLOPE=-1
LENGTH=400 FT SLOPE=0.031 K=0.7
LENGTH=1600 FT SLOPE=0.031 K=2.0
LENGTH=700 FT SLOPE=0.031 K=3.0
LENGTH=3030 FT SLOPE=0.040 K=3.0
LENGTH=1941 FT SLOPE=0.029 K=3.0
Kn=.033 CR=0.50

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.031000	.7000
SHALLOW FLOW PORTION	1600.0	.031000	2.0000
CHANNEL FLOW PORTION	5671.0	.035124	2.9740
TOTAL BASIN	7671.0	.034049	2.3142

LAG EQUATION FACTORS: Kn= .0330 TOTAL BASIN LENGTH (FT)= 7671.0
TOTAL BASIN SLOPE (FT/FT)= .034049 CENTROUD LENGTH (FT)= 3835.5

TIME OF CONCENTRATION (HRS)= .4456 TIME TO PEAK (HRS)= .2971 LAG TIME
(HRS)= .3342

COMPUTE NM HYD ID=2 HYD NO=51B DA= 0.221 SQ MI
PER A=90 PER B=0 PER C=10 PER D=0
TP=0.0 MASSRAIN=-1
TIME TO PEAK (hrs)= .2971

K = .325660HR TP = .297090HR K/TP RATIO = 1.096168 SHAPE CONSTANT, N =
3.224313
UNIT PEAK = 222.89 CFS UNIT VOLUME = .9999 B = 299.63 P60 =
1.6900
AREA = .221000 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA 51B

RUNOFF VOLUME = .42296 INCHES = 4.9853 ACRE-FEET
PEAK DISCHARGE RATE = 91.91 CFS AT 1.650 HOURS BASIN AREA = .2210 SQ. MI.

****
*S Basin Contributing to lower south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
****
*S**** SUB-BASIN 51C***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=3 ISLOPE=-1
LENGTH=400 FT SLOPE=0.098 K=0.7
LENGTH=1600 FT SLOPE=0.054 K=1.0
LENGTH=7235 FT SLOPE=0.036 K=3.0

Kn=.033 CR=0.65

```
          Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

          SCS UPLAND METHOD FACTORS
               NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time
requirements.
                                        LENGTH (FT)       SLOPE (FT/FT)       COMPOSITE K
          SHEET FLOW PORTION              400.0             .098000             .7000
          SHALLOW FLOW PORTION              .0              .000000             .0000
          CHANNEL FLOW PORTION           8835.0             .039260            2.9715
          TOTAL BASIN                    9235.0             .041804            2.6836


          LAG EQUATION FACTORS:     Kn=   .0330     TOTAL BASIN LENGTH (FT)=      9235.0
          TOTAL BASIN SLOPE (FT/FT)=    .041804     CENTROUD LENGTH (FT)=         6002.8


          TIME OF CONCENTRATION (HRS)=   .5282     TIME TO PEAK (HRS)=   .3522     LAG TIME
(HRS)=    .3962

     COMPUTE NM HYD       ID=2   HYD NO=51C  DA= 0.45 SQ MI
                          PER A=100 PER B=0  PER C=0  PER D=0
                          TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .3522

          K =   .370469HR    TP =   .352155HR    K/TP RATIO =  1.052006     SHAPE CONSTANT, N =
3.356146
          UNIT PEAK =   395.72    CFS   UNIT VOLUME =    1.000       B =   309.68      P60 =
1.6900
          AREA =      .450000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

     PRINT HYD            ID=2   CODE=1

                                        HYDROGRAPH FROM AREA 51C


          RUNOFF VOLUME =      .38662 INCHES     =       9.2788 ACRE-FEET
          PEAK DISCHARGE RATE =    150.35 CFS  AT   1.700 HOURS   BASIN AREA =   .4500 SQ. MI.


     **********************************************************************
     *S Basin Contributing to lower south fork of Boca Negra arroyo South
     *S SAD 227 - EMERALD DRIVE
     **********************************************************************
     *S**** SUB-BASIN 51D***
     COMPUTE LT TP        LCODE=1  UPLAND/LAG TIME TRANSITION METHOD
                          NK=5  ISLOPE=-1
                          LENGTH=400 FT   SLOPE=0.037  K=0.7
                          LENGTH=1600 FT  SLOPE=0.037  K=1.0
                                LENGTH=2810 FT  SLOPE=0.023  K=1.0
                          LENGTH=3790 FT   SLOPE=0.040  K=3.0
                          LENGTH=3330 FT   SLOPE=0.037  K=3.0

                                     Kn=.033  CR=0.65


          Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

          SCS UPLAND METHOD FACTORS
               NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time
requirements.
                                        LENGTH (FT)       SLOPE (FT/FT)       COMPOSITE K
          SHEET FLOW PORTION              400.0             .037000             .7000
          SHALLOW FLOW PORTION              .0              .000000             .0000
          CHANNEL FLOW PORTION          11530.0             .034574            2.9477
          TOTAL BASIN                   11930.0             .034655            2.6694


          LAG EQUATION FACTORS:     Kn=   .0330     TOTAL BASIN LENGTH (FT)=     11930.0
          TOTAL BASIN SLOPE (FT/FT)=    .034655     CENTROUD LENGTH (FT)=         7754.5


          TIME OF CONCENTRATION (HRS)=   .7179     TIME TO PEAK (HRS)=   .4786     LAG TIME
(HRS)=    .5384

     COMPUTE NM HYD       ID=3   HYD NO=51D  DA= 0.88 SQ MI
                          PER A=100 PER B=0  PER C=0  PER D=0
                          TP=0.0   MASSRAIN=-1
          TIME TO PEAK (hrs)=   .4786

          K =   .503503HR    TP =   .478612HR    K/TP RATIO =  1.052006     SHAPE CONSTANT, N =
3.356146
```

UNIT PEAK = 569.39 CFS UNIT VOLUME = 1.000 B = 309.68 P60 = 1.6900
AREA = .880000 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA 51D

RUNOFF VOLUME = .38662 INCHES = 18.1453 ACRE-FEET
PEAK DISCHARGE RATE = 218.75 CFS AT 1.850 HOURS BASIN AREA = .8800 SQ. MI.

****
*S Basin Contributing to lower south fork of Boca Negra arroyo South
*S SAD 227 - EMERALD DRIVE
****
*S**** SUB-BASIN 51E***
COMPUTE LT TP LCODE=1 UPLAND/LAG TIME TRANSITION METHOD
NK=4 ISLOPE=-1
LENGTH=400 FT SLOPE=0.035 K=0.7
LENGTH=1600 FT SLOPE=0.035 K=1.0
LENGTH=1065 FT SLOPE=0.074 K=3.0
LENGTH=4140 FT SLOPE=0.018 K=3.0
Kn=.033 CR=0.65

Tc AND Tp COMPUTED BY UPLAND/LAG TIME PROCEDURE

SCS UPLAND METHOD FACTORS
NOTE: Upland factor input values have been adjusted to meet Upland/Lag Time requirements.

	LENGTH (FT)	SLOPE (FT/FT)	COMPOSITE K
SHEET FLOW PORTION	400.0	.035000	.7000
SHALLOW FLOW PORTION	.0	.000000	.0000
CHANNEL FLOW PORTION	6805.0	.030761	2.6866
TOTAL BASIN	7205.0	.030997	2.3390

LAG EQUATION FACTORS: Kn= .0330 TOTAL BASIN LENGTH (FT)= 7205.0
TOTAL BASIN SLOPE (FT/FT)= .030997 CENTROUD LENGTH (FT)= 4683.3

TIME OF CONCENTRATION (HRS)= .4565 TIME TO PEAK (HRS)= .3043 LAG TIME (HRS)= .3423

COMPUTE NM HYD ID=4 HYD NO=51E DA= 0.31 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.0 MASSRAIN=-1
TIME TO PEAK (hrs)= .3043

K = .320772HR TP = .304307HR K/TP RATIO = 1.054105 SHAPE CONSTANT, N = 3.349564
UNIT PEAK = 314.97 CFS UNIT VOLUME = 1.000 B = 309.18 P60 = 1.6900
AREA = .310000 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA 51E

RUNOFF VOLUME = .38662 INCHES = 6.3921 ACRE-FEET
PEAK DISCHARGE RATE = 119.11 CFS AT 1.700 HOURS BASIN AREA = .3100 SQ. MI.

****
*S ADD BASINS 51C AND 51D

ADD HYD ID=6 HYD=106 ID I=2 ID II=3
PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 106.00

RUNOFF VOLUME = .38662 INCHES = 27.4241 ACRE-FEET
PEAK DISCHARGE RATE = 360.01 CFS AT 1.800 HOURS BASIN AREA = 1.3300 SQ. MI.

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**********************************************************************
*S ROUTE BASINS 51C AND 51D IN NATURAL ARROYO THROUGH BASIN 51E
COMPUTE RATING CURVE  CID=1   VS NO=1   NO SEGS=1
                      MIN ELEV=5394        MAX ELEV=5400
                      CH SLOPE=0.0202    FP SLOPE=0.0202
                      N=0.035    DIST=225.0
                      DIST  ELEV          DIST  ELEV
                        0          5400    23      5398

                           48      5396    77      5394

                                   140     5394    150     5396

                                   166     5398    225     5400

                       RATING CURVE VALLEY SECTION  1.0
                          WATER        FLOW         FLOW         TOP
                        SURFACE        AREA         RATE        WIDTH
                          ELEV        SQ FT         CFS          FT
                       5394.00          .00          .00          .00
                       5394.32        20.88        56.66        69.16
                       5394.63        43.70       183.29        75.32
                       5394.95        68.47       367.51        81.48
                       5395.26        95.18       606.05        87.64
                       5395.58       123.84       898.01        93.80
                       5395.90       154.45      1243.49        99.96
                       5396.21       187.02      1641.43       106.33
                       5396.53       221.64      2094.04       112.81
                       5396.84       258.30      2603.68       119.29
                       5397.16       297.01      3171.92       125.76
                       5397.48       337.76      3800.39       132.24
                       5397.79       380.56      4490.73       138.72
                       5398.11       425.53      5195.18       147.38
                       5398.42       474.13      5882.26       160.34
                       5398.74       526.83      6658.45       173.29
                       5399.05       583.62      7527.21       186.24
                       5399.37       644.51      8492.16       199.19
                       5399.69       709.48      9557.06       212.15
                       5400.00       778.55     10728.92       225.00

  ROUTE MCUNGE         ID=7   HYD NO=6.1  INFLOW ID=6
                       DT=0.0   L=5360 FT
                       NS=0   SLOPE=0.0202
                       MATCODE=0 REGCODE=0 CCODE=0 MM CODE=0

       INFLOW END= 325              TABLE PTS= 20
       DT=  .050000                 QMED=      180.01  CKMED=      5.5483
       WIDTH MED=       75.16       NREACH= 11         DX=       487.27

    DEPTH   AREA      Q    TRAVEL  WIDTH      ck      VEL      C       D       C1      C2      C3
Q-M       C1-M   C2-M   C3-M
     (FT)  (SQ FT)  (CFS)  TIME(HR) (FT)     (FPS)   (FPS)
(CFS)
       .00     .0       .0    .742      .0      2.71    1.30    1.000   .000    1.000   .000    .000
   .0   1.000   .000   .000
       .32   20.9     56.7    .549    69.2      5.55    2.71    2.049   .015    .990    .347    -.338
  8.9    .995   .236  -.232
       .63   43.7    183.3    .355    75.3      6.61    4.19    2.441   .037    .978    .425    -.404
 112.4    .982   .351  -.332
       .95   68.5    367.5    .277    81.5      8.26    5.37    3.051   .055    .973    .513    -.486
 268.8    .975   .473  -.448
      1.26   95.2    606.1    .234    87.6      9.61    6.37    3.552   .073    .968    .568    -.536
 480.7    .970   .541  -.512
      1.58  123.8    898.0    .205    93.8     10.78    7.25    3.983   .090    .964    .606    -.570
 746.3    .966   .587  -.553
      1.90  154.4   1243.5    .185   100.0     11.80    8.05    4.358   .107    .961    .634    -.595
1065.3    .962   .620  -.583
      2.21  187.0   1641.4    .170   106.3     12.68    8.78    4.684   .124    .957    .656    -.613
1437.2    .959   .644  -.603
      2.53  221.6   2094.0    .158   112.8     13.52    9.45    4.993   .140    .954    .674    -.628
1862.5    .956   .664  -.620
      2.84  258.3   2603.7    .148   119.3     14.32   10.08    5.288   .155    .952    .690    -.642
2343.7    .953   .682  -.635
      3.16  297.0   3171.9    .139   125.8     15.07   10.68    5.568   .170    .950    .703    -.653
2882.7    .951   .696  -.647
      3.48  337.8   3800.4    .132   132.2     15.80   11.25    5.835   .185    .947    .715    -.662
3481.1    .948   .709  -.657
      3.79  380.6   4490.7    .126   138.7     15.97   11.80    5.898   .206    .942    .718    -.660
4140.5    .946   .720  -.666
      4.11  425.5   5195.2    .122   147.4     15.00   12.21    5.543   .239    .930    .705    -.635
4838.7    .937   .713  -.650
      4.42  474.1   5882.3    .120   160.3     14.45   12.41    5.339   .258    .922    .697    -.619
5535.5    .920   .691  -.611
      4.74  526.8   6658.5    .118   173.3     15.03   12.64    5.553   .260    .924    .706    -.630
```

6266.7	.923	.701	-.624	.115	186.2	15.59	12.90	5.759	.263	.925	.715	-.640
	5.05	583.6	7527.2									
7088.8	.924	.711	-.635	.113	199.2	16.14	13.18	5.960	.268	.926	.723	-.649
	5.37	644.5	8492.2									
8005.3	.925	.719	-.644	.111	212.1	16.69	13.47	6.166	.274	.926	.731	-.658
	5.69	709.5	9557.1									
9019.9	.926	.727	-.653	.108	225.0	16.80	13.78	6.205	.288	.923	.733	-.656
	6.00	778.5	10728.9									
10137.9	.926	.735	-.661									

MAXIMUM NO. ITERATIONS FOR SOLUTION (KKMAX) = 7 OCCURRED 2 TIMES. AVERAGE NUMBER ITERATIONS = 1.2316

Q-M (CFS)	DEPTH (FT)	AREA C1-M (SQ FT)	Q C2-M (CFS)	C3-M	TRAVEL TIME(HR)	WIDTH (FT)	ck (FPS)	VEL (FPS)	C	D	C1	C2	C3
.0	.00	.0	.0	.000	.742	.0	2.71	1.30	1.000	.000	1.000	.000	.000
	1.000												
8.9	.32	20.9	56.7	.000	.549	69.2	2.79	2.71	1.030	.030	.971	.029	.000
	.990	.010											
112.4	.63	43.7	183.3	.000	.355	75.3	2.94	4.19	1.084	.084	.922	.078	.000
	.948	.052											
268.8	.95	68.5	367.5	.000	.277	81.5	3.11	5.37	1.148	.148	.871	.129	.000
	.897	.103											
480.7	1.26	95.2	606.1	.000	.234	87.6	3.29	6.37	1.214	.214	.824	.176	.000
	.847	.153											
746.3	1.58	123.8	898.0	.000	.205	93.8	3.47	7.25	1.281	.281	.781	.219	.000
	.802	.198											
1065.3	1.90	154.4	1243.5	.000	.185	100.0	3.65	8.05	1.347	.347	.743	.257	.000
	.761	.239											
1437.2	2.21	187.0	1641.4	.000	.170	106.3	3.82	8.78	1.411	.411	.709	.291	.000
	.725	.275											
1862.5	2.53	221.6	2094.0	.000	.158	112.8	3.99	9.45	1.473	.473	.679	.321	.000
	.693	.307											
2343.7	2.84	258.3	2603.7	.000	.148	119.3	4.15	10.08	1.534	.534	.652	.348	.000
	.665	.335											
2882.7	3.16	297.0	3171.9	.000	.139	125.8	4.31	10.68	1.594	.594	.627	.373	.000
	.639	.361											
3481.1	3.48	337.8	3800.4	.000	.132	132.2	4.47	11.25	1.653	.653	.605	.395	.000
	.616	.384											
4140.5	3.79	380.6	4490.7	.000	.126	138.7	4.63	11.80	1.710	.710	.585	.415	.000
	.595	.405											
4838.7	4.11	425.5	5195.2	.000	.122	147.4	4.75	12.21	1.754	.754	.570	.430	.000
	.577	.423											
5535.5	4.42	474.1	5882.3	.000	.120	160.3	4.81	12.41	1.775	.775	.563	.437	.000
	.567	.433											
6266.7	4.74	526.8	6658.5	.000	.118	173.3	4.87	12.64	1.801	.801	.555	.445	.000
	.559	.441											
7088.8	5.05	583.6	7527.2	.000	.115	186.2	4.95	12.90	1.829	.829	.547	.453	.000
	.551	.449											
8005.3	5.37	644.5	8492.2	.000	.113	199.2	5.04	13.18	1.860	.860	.538	.462	.000
	.542	.458											
9019.9	5.69	709.5	9557.1	.000	.111	212.1	5.12	13.47	1.893	.893	.528	.472	.000
	.533	.467											
10137.9	6.00	778.5	10728.9	.000	.108	225.0	5.22	13.78	1.928	.928	.519	.481	.000
	.523	.477											

MAXIMUM NO. ITERATIONS FOR SOLUTION (KKMAX) = 3 OCCURRED 73 TIMES. AVERAGE NUMBER ITERATIONS = 1.1165

Equations solved with two passes: first using the Ponce correction to C1, second using the Fread correction to C1, C2 and C3

PRINT HYD ID=7 CODE=1

OUTFLOW HYDROGRAPH REACH 6.10

RUNOFF VOLUME = .38422 INCHES = 27.2537 ACRE-FEET
PEAK DISCHARGE RATE = 353.02 CFS AT 2.300 HOURS BASIN AREA = 1.3300 SQ. MI.

****

*S ADD BASINS 51C AND 51D TO BASIN 51E

ADD HYD ID=2 HYD=102 ID I=7 ID II=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .38467 INCHES = 33.6457 ACRE-FEET
PEAK DISCHARGE RATE = 378.54 CFS AT 2.250 HOURS BASIN AREA = 1.6400 SQ. MI.

****

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FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 14:13:34
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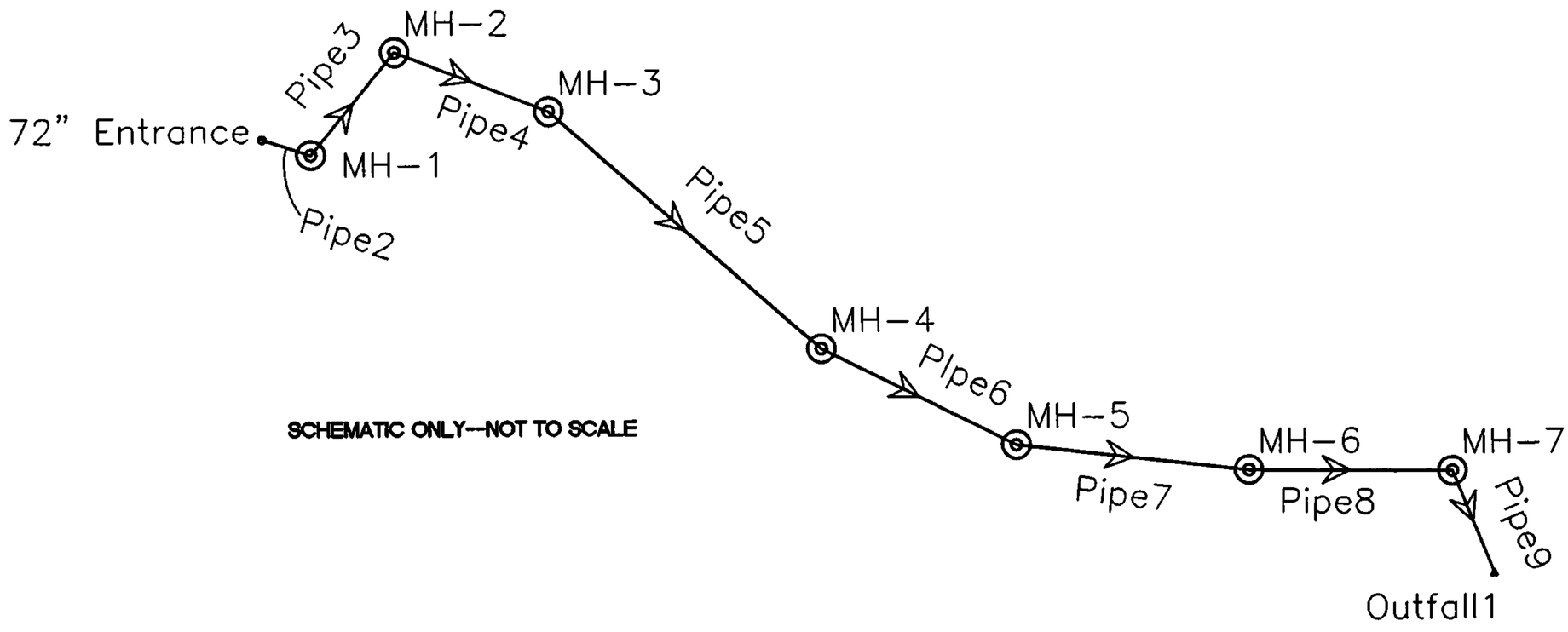
APPENDIX 3
HYDRAULICS



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(505) 348-4000

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

EMERALD DRIVE STORM DRAIN
PLAN

Design Review Committee | City Engineer Approval

DATE FEBRUARY 2009
FILE NO. X08007002

City Project No. | Zone Map

EMERALD DRIVE
STORM DRAIN
SYSTEM

Label	Start Node	Stop Node	Section Size	Flow (ft³/s)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Elevation Ground (Stop) (ft)	Elevation Ground (Start) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Velocity (In) (ft/s)	Velocity (Out) (ft/s)
Pipe2	CB-5	MH-1	56	400	46	0.02	5,325.94	5,325.00	5,333.50	5,332.50	5,325.94	5,325.00	0	0
Pipe3	MH-1	MH-2	56	400	120	0.028	5,325.00	5,321 60	5,332.50	5,333.36	5,325.00	5,321.60	0	0
Pipe4	MH-2	MH-3	56	400	148	0 026	5,321.60	5,317.80	5,333.36	5,328.50	5,321 60	5,317 80	0	0
Pipe5	MH-3	MH-4	56	400	324	0.021	5,317.80	5,310 95	5,328.50	5,321.01	5,317.80	5,310.95	0	0
Pipe6	MH-4	MH-5	56	400	195	0.011	5,310.95	5,308.75	5,321.01	5,318.17	5,310 95	5,308 75	0	0
Pipe7	MH-5	MH-6	56	400	210	0.01	5,308 75	5,306.55	5,318.17	5,314.50	5,308.75	5,306.55	0	0
Pipe8	MH-6	MH-7	56	400	185	0.008	5,306 55	5,305 06	5,314 50	5,313.40	5,306.55	5,305.06	0	0
Pipe9	MH-7	Outfall	56	400	99	0.003	5,305.06	5,304.72	5,313.40	5,311.00	5,305.06	5,304.72	0	0

Culvert Calculator Report
SAD 227 - 72" RCP EMERALD DRIVE

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,335.00	ft	Headwater Depth/Height	1.51	
Computed Headwater Elev	5,335.00	ft	Discharge	368.82	cfs
Inlet Control HW Elev.	5,335.00	ft	Tailwater Elevation	0.00	ft
Outlet Control HW Elev.	5,334.89	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	5,325.94	ft	Downstream Invert	5,325.10	ft
Length	46.00	ft	Constructed Slope	0.018261	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	4.33	ft
Slope Type	Steep		Normal Depth	3.50	ft
Flow Regime	Supercritical		Critical Depth	5.18	ft
Velocity Downstream	16.87	ft/s	Critical Slope	0.006993	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	6.00	ft
Section Size	72 inch		Rise	6.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,334.89	ft	Upstream Velocity Head	3.14	ft
Ke	0.20		Entrance Loss	0.63	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,335.00	ft	Flow Control	N/A	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	28.3	ft2
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

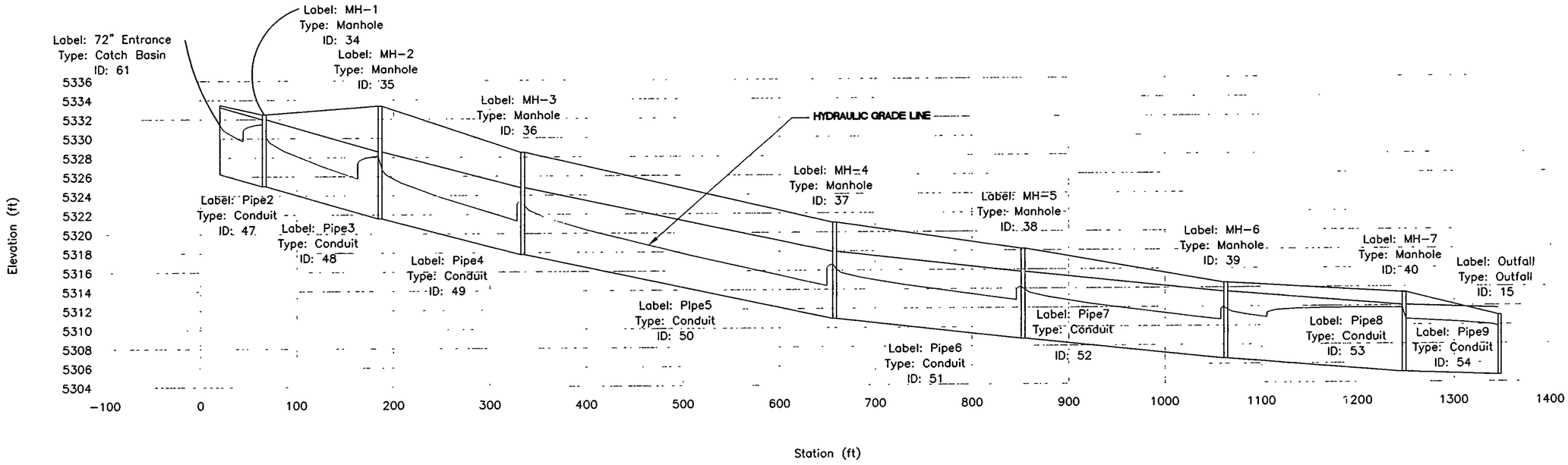
Rating Table Report
SAD 227 - 72" RCP EMERALD DRIVE

Range Data:

	Minimum	Maximum	Increment	
Allowable HW E	5,326.00	5,335.00	1.00	ft

HW Elev. (ft)	Discharge (cfs)
5,326.00	0.03
5,327.00	8.32
5,328.00	30.12
5,329.00	63.45
5,330.00	106.17
5,331.00	155.91
5,332.00	210.14
5,333.00	266.22
5,334.00	321.14
5,335.00	368.82

Profile – 1 – Base



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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

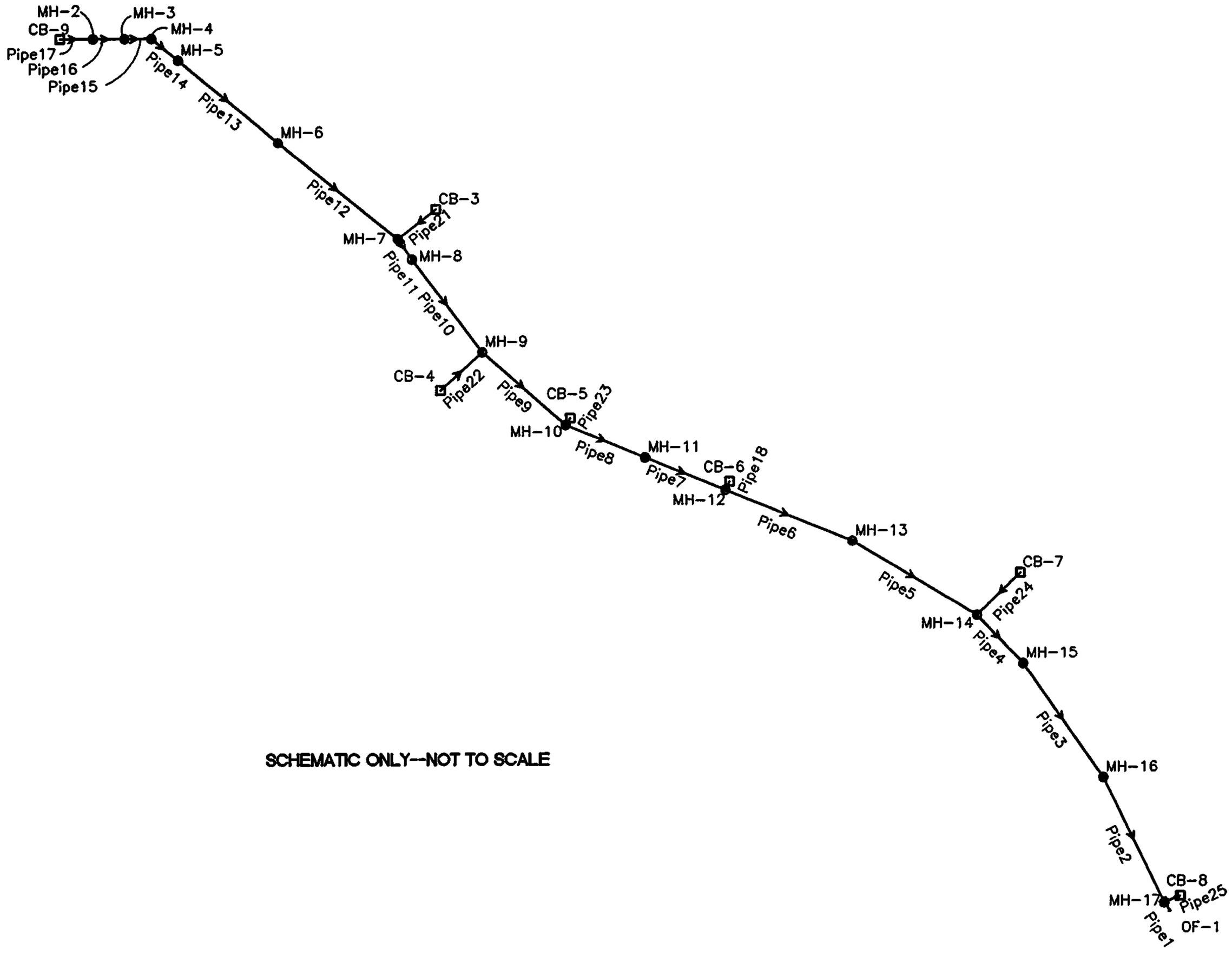
EMERALD DRIVE STORM DRAIN
PROFILE

Design Review Committee | City Engineer Approved

DATE FEBRUARY 2009
FILE NO. X08507002

City Project No. | Zone Map No.

ONYX DRIVE
STORM DRAIN
SYSTEM



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DATE FEBRUARY 2009

FILE NO. X32807002

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ONYX DRIVE STORM DRAIN
PLAN

Design Review Committee	City Engineer Approval	

City Project No.	Zone Map No.

ONYX DRIVE ..RM DRAIN
SYSTEM

PIPE/NOD ..T
FEBRUAR. 2009

Label	Start Node	Stop Node	Section Size	Flow (ft³/s)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Invert (Downstream) (ft)	Invert (Upstream) (ft)	Elevation Ground (Stop) (ft)	Elevation Ground (Start) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Velocity (In) (ft/s)	Velocity (Out) (ft/s)
Pipe1	MH-17	OF-1	Concrete 72"	324.09	28	0.005	5,155.36	5,155.49	5,160.97	5,172.50	5,160.26	5,160.65	12.54	13.1
Pipe2	MH-16	MH-17	Concrete 72"	264.09	425	0.008	5,155.49	5,158.77	5,172.50	5,172.50	5,161.11	5,163.22	11.74	9.6
Pipe3	MH-15	MH-16	Concrete 60"	264.09	425	0.034	5,158.77	5,173.29	5,172.50	5,185.00	5,163.63	5,177.80	14.17	13.56
Pipe4	MH-14	MH-15	Concrete 60"	264.09	204	0.062	5,173.29	5,185.85	5,185.00	5,202.97	5,178.39	5,190.36	14.17	13.45
Pipe5	MH-13	MH-14	Concrete 60"	262.09	443	0.074	5,185.85	5,218.42	5,202.97	5,228.14	5,193.48	5,222.92	14.09	13.35
Pipe6	MH-12	MH-13	Concrete 60"	262.09	417	0.059	5,218.42	5,242.85	5,228.14	5,253.18	5,223.50	5,247.34	14.09	13.35
Pipe7	MH-11	MH-12	Concrete 60"	257.09	262	0.058	5,242.85	5,258.00	5,253.18	5,269.55	5,250.43	5,262.47	13.89	13.09
Pipe8	MH-10	MH-11	Concrete 60"	257.09	262	0.06	5,258.00	5,273.63	5,269.55	5,283.32	5,262.92	5,278.10	13.89	13.14
Pipe9	MH-9	MH-10	Concrete 60"	252.09	337	0.053	5,273.63	5,291.50	5,283.32	5,302.90	5,281.09	5,295.94	13.69	12.84
Pipe10	MH-8	MH-9	Concrete 60"	177.09	354	0.014	5,291.50	5,296.61	5,302.90	5,314.31	5,298.82	5,300.42	11.02	9.02
Pipe11	MH-7	MH-8	Concrete 60"	177.09	75	0.016	5,296.61	5,297.83	5,314.31	5,314.31	5,300.71	5,301.64	11.02	10.29
Pipe12	MH-6	MH-7	Concrete 60"	175.09	468	0.03	5,297.83	5,311.89	5,314.31	5,318.95	5,303.53	5,315.68	10.96	8.92
Pipe13	MH-5	MH-6	Concrete 60"	175.09	396	0.012	5,311.89	5,316.48	5,318.95	5,323.90	5,314.76	5,320.27	10.96	15.02
Pipe14	MH-4	MH-5	Concrete 60"	175.09	105	0.017	5,316.48	5,318.30	5,323.90	5,327.66	5,320.55	5,322.09	10.96	10.23
Pipe15	MH-3	MH-4	Concrete 60"	175.09	83	0.043	5,318.30	5,321.83	5,327.66	5,327.50	5,323.36	5,325.62	10.96	8.92
Pipe16	MH-2	MH-3	Concrete 60"	175.09	98	0.005	5,321.83	5,322.30	5,327.50	5,329.30	5,325.90	5,326.31	10.37	10.23
Pipe17	CB-9	MH-2	Concrete 60"	175.09	102	0.005	5,322.30	5,322.86	5,329.30	5,329.30	5,326.56	5,326.76	10.65	9.82
Pipe18	CB-6	MH-12	Concrete 24"	5	28	0.223	5,242.85	5,249.10	5,253.18	5,253.18	5,250.43	5,250.40	2.31	1.6
Pipe21	CB-3	MH-7	Concrete 36"	2	147	0.06	5,297.83	5,306.65	5,314.31	5,312.26	5,303.53	5,307.09	3.12	0.31
Pipe22	CB-4	MH-9	Concrete 60"	75	173	0.035	5,291.50	5,297.58	5,302.90	5,315.69	5,298.82	5,300.03	7.84	3.82
Pipe23	CB-5	MH-10	Concrete 24"	5	25	0.009	5,273.63	5,273.86	5,283.32	5,284.23	5,281.09	5,281.11	1.59	1.59
Pipe24	CB-7	MH-14	Concrete 18"	2	186	0.041	5,185.85	5,193.50	5,202.97	5,202.97	5,193.48	5,194.03	3.55	1.13
Pipe25	CB-8	MH-17	Concrete 36"	60	53	0.019	5,155.49	5,156.52	5,172.50	5,172.50	5,161.11	5,161.54	8.49	8.49

Culvert Calculator Report
48" Culvert from Pond

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	5,331.00	ft	Headwater Depth/Height	1.73	
Computed Headwater Elevation	5,331.00	ft	Discharge	144.51	cfs
Inlet Control HW Elev.	5,331.00	ft	Tailwater Elevation	5,326.96	ft
Outlet Control HW Elev.	5,330.45	ft	Control Type	Inlet Control	

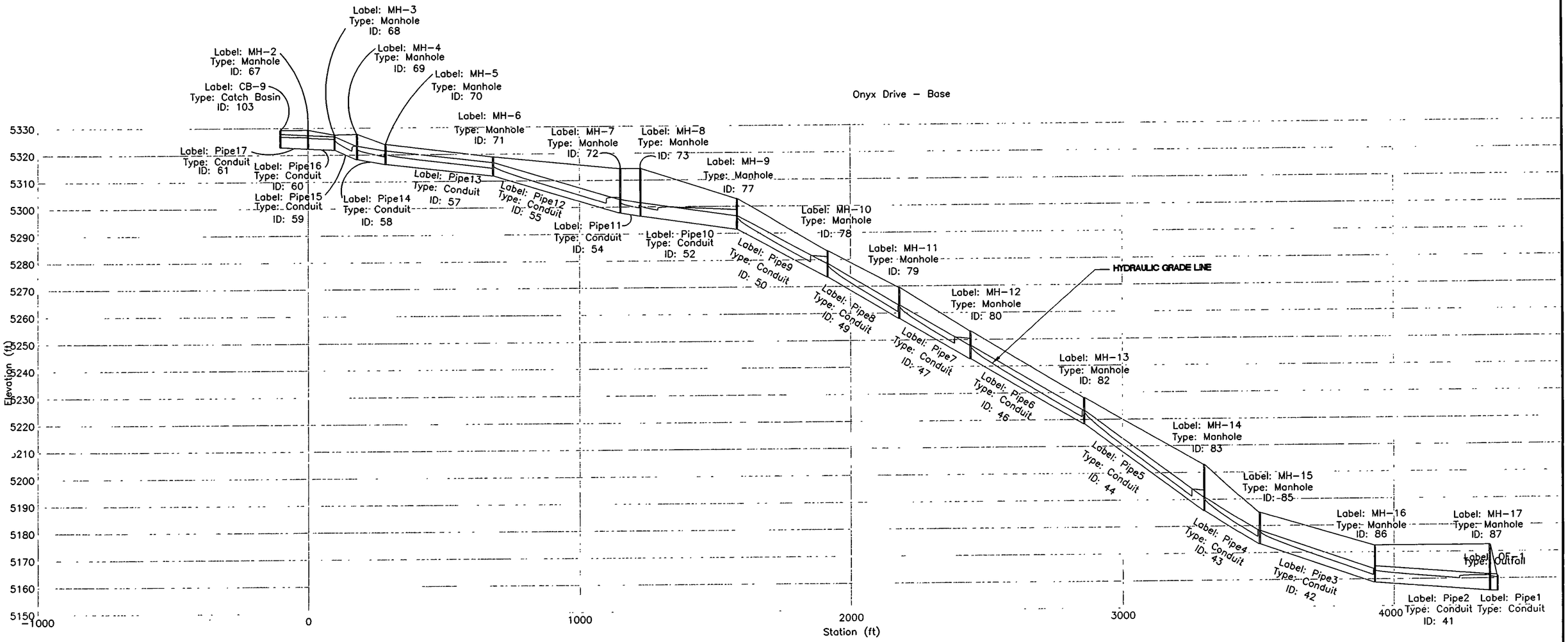
Grades					
Upstream Invert	5,324.10	ft	Downstream Invert	5,322.96	ft
Length	84.00	ft	Constructed Slope	0.013571	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	3.05	ft
Slope Type	Steep		Normal Depth	2.87	ft
Flow Regime	N/A		Critical Depth	3.55	ft
Velocity Downstream	14.06	ft/s	Critical Slope	0.009024	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	4.00	ft
Section Size	48 inch		Rise	4.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,330.45	ft	Upstream Velocity Head	2.33	ft
Ke	0.20		Entrance Loss	0.47	ft

Inlet Control Properties				
Inlet Control HW Elev.	5,331.00 ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 45° bevels	Area Full	12.6	ft2
K	0.00180	HDS 5 Chart	3	
M	2.50000	HDS 5 Scale	A	
C	0.03000	Equation Form	1	
Y	0.74000			



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ENGINEERING GROUP

ONYX DRIVE STORM DRAIN
PROFILE

Design Review Committee	City Engineer Approval	

DATE FEBRUARY 2020
FILE NO. XXXXXXXXX

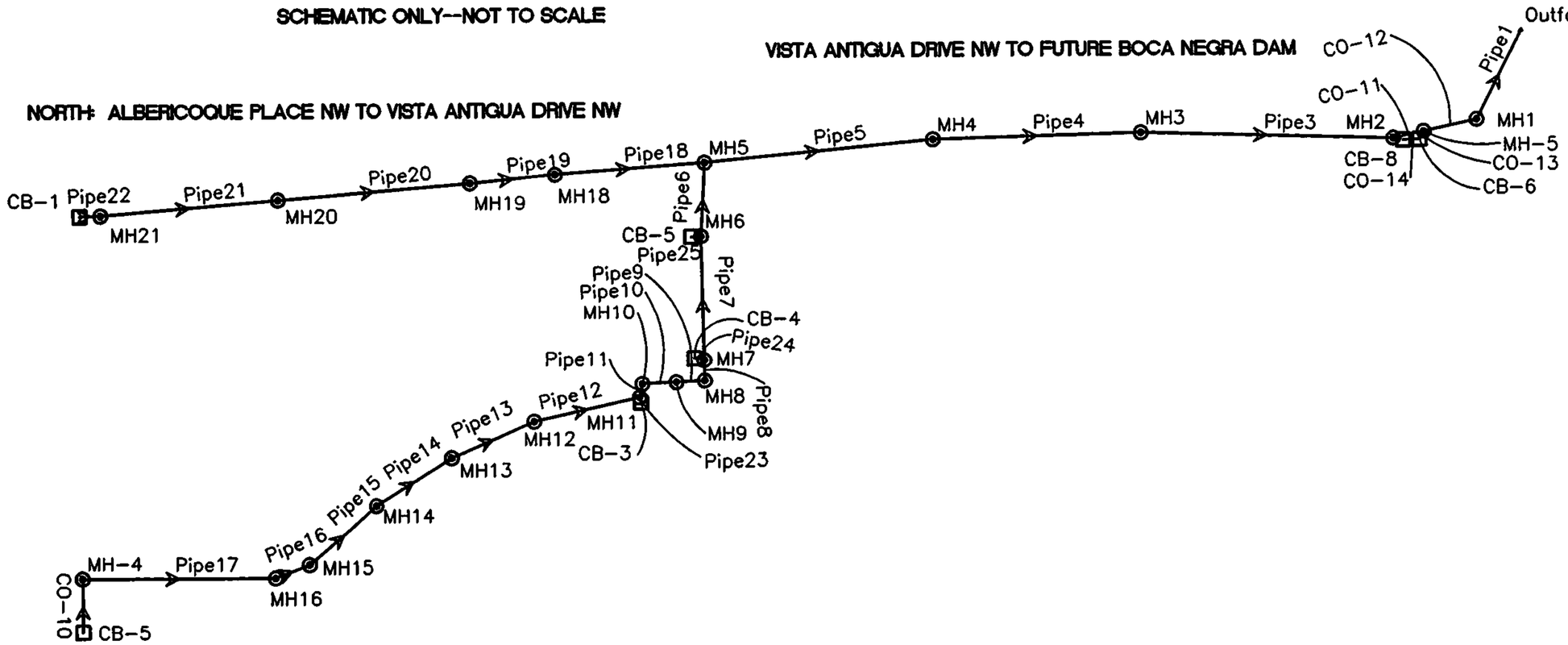
City Project No.

Zone Map No.

SCHEMATIC ONLY--NOT TO SCALE

VISTA ANTIGUA DRIVE NW TO FUTURE BOCA NEGRA DAM

NORTH: ALBERICOQUE PLACE NW TO VISTA ANTIGUA DRIVE NW



SOUTH: ALBERICOQUE PLACE NW TO VISTA ANTIGUA DRIVE NW

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA STORM DRAIN PLAN

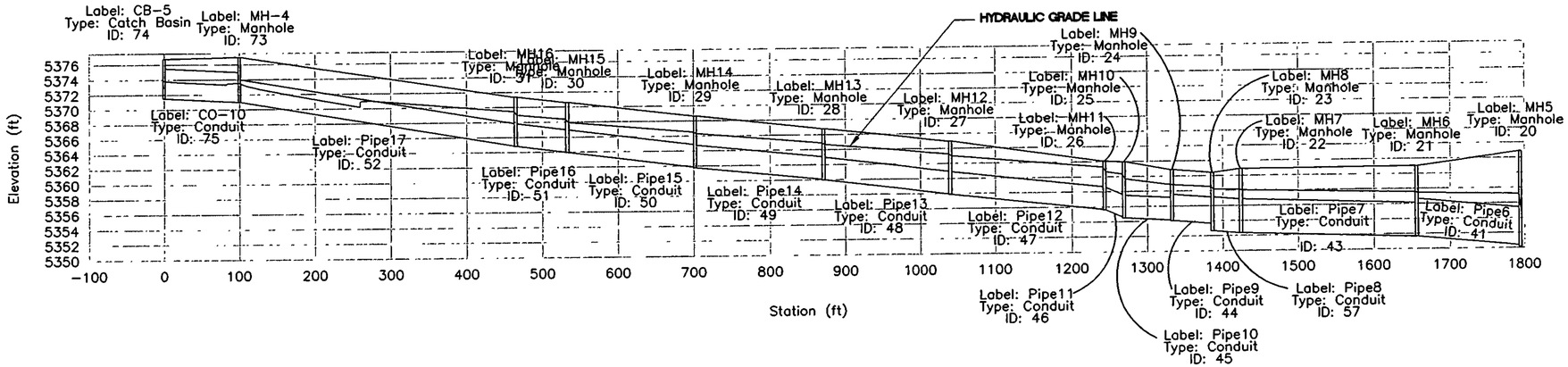
Design Review Committee	City Engineer Approval	

DATE FEBRUARY 2009
FILE NO. XXXXXXXX

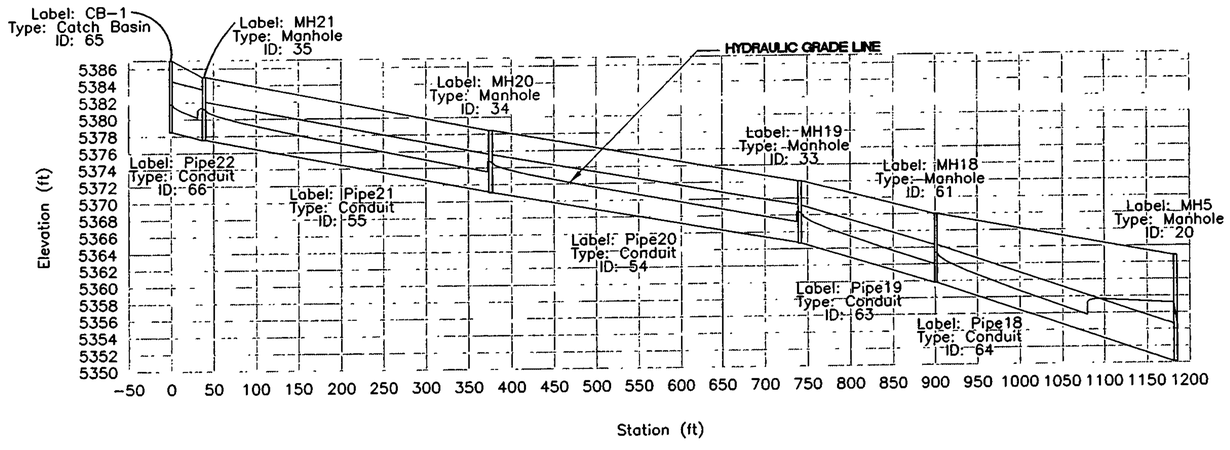
City Project No.

Zone Map No.

SOUTH: ALBERICOQUE PLACE NW TO VISTA ANTIGUA DRIVE NW



NORTH: ALBERICOQUE PLACE NW TO VISTA ANTIGUA DRIVE NW



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87109
(505) 348-4000

DATE FEBRUARY 2020

FILE NO. 2020070102

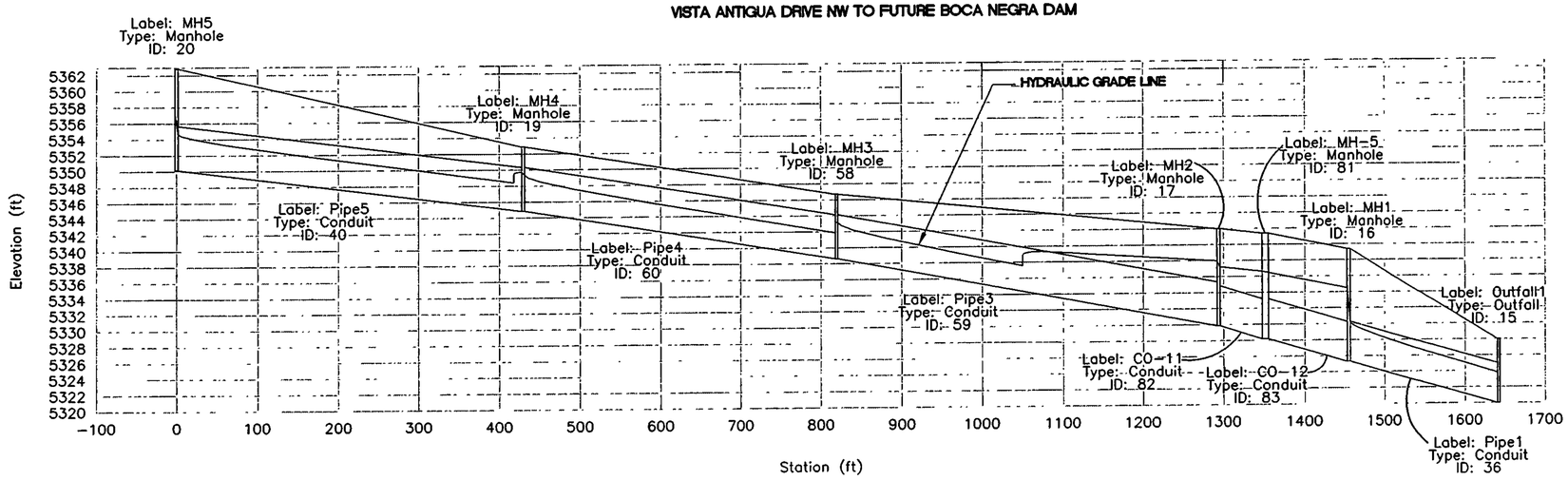
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA STORM DRAIN
PROFILE 1 OF 2

Design Review Committee | City Engineer Approval

City Project No. | Zone Map No.

VISTA ANTIGUA DRIVE NW TO FUTURE BOCA NEGRA DAM



WILSON & COMPANY
4900 LANG AVENUE, NE
ALBUQUERQUE, NEW MEXICO
87109
(505) 348-4000

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA STORM DRAIN
PROFILE 2 OF 2

Design Review Committee	City Engineer Approval	

DATE FEBRUARY 2009
FILE NO. X08E045B

City Project No.

Zone Map No.

VISTA VIEJA STORM DRAIN SYSTEM

PIPE/NODE REPORT
FEBRUARY 2009

Label	Start Node	Stop Node	Section Size	Flow (ft³/s)	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Elevation Ground (Stop) (ft)	Elevation Ground (Start) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Velocity (In) (ft/s)	Velocity (Out) (ft/s)
Pipe1	MH1	Outfall1		382	188	0.028	5,325.30	5,320.00	5,328.00	5,339.40	5,323.93	5,330.16	19.6	23.06
Pipe5	MH5	MH4		286	430	0.012	5,350.17	5,344.84	5,352.90	5,362.86	5,349.93	5,354.85	13.28	12.46
Pipe6	MH6	MH5		127	138	0.009	5,351.65	5,350.40	5,362.86	5,361.03	5,357.56	5,357.89	6.47	6.47
Pipe7	MH7	MH6		97	232	0.003	5,352.38	5,351.65	5,361.03	5,360.90	5,357.99	5,358.55	6.1	6.1
Pipe9	MH9	MH8		82	53	0.008	5,354.07	5,353.67	5,360.43	5,360.87	5,358.87	5,359.22	8.52	8.52
Pipe10	MH10	MH9		82	64	0.005	5,354.50	5,354.17	5,360.87	5,361.98	5,359.22	5,360.19	11.6	11.6
Pipe11	MH11	MH10		82	26	0.036	5,355.60	5,354.66	5,361.98	5,362.09	5,360.94	5,361.33	11.6	11.6
Pipe12	MH12	MH11		67	203	0.011	5,357.88	5,355.69	5,362.09	5,364.98	5,362.06	5,364.11	9.48	9.48
Pipe13	MH13	MH12		67	169	0.012	5,359.99	5,357.98	5,364.98	5,366.79	5,364.43	5,366.14	9.48	9.48
Pipe14	MH14	MH13		67	169	0.01	5,361.77	5,360.09	5,366.79	5,368.67	5,366.39	5,368.10	9.48	9.48
Pipe15	MH15	MH14		67	169	0.012	5,363.95	5,361.87	5,368.67	5,370.61	5,368.35	5,370.05	9.48	9.48
Pipe16	MH16	MH15		67	68	0.012	5,364.82	5,364.01	5,370.61	5,371.37	5,370.26	5,370.95	9.48	9.48
Pipe17	MH-4	MH16		67	365	0.017	5,371.00	5,364.89	5,371.37	5,377.00	5,371.20	5,374.88	9.48	9.48
Pipe20	MH20	MH19		159	365	0.017	5,371.06	5,364.78	5,372.10	5,378.46	5,368.67	5,374.75	11.39	10.88
Pipe21	MH21	MH20		159	337	0.019	5,377.58	5,371.16	5,378.46	5,385.00	5,375.05	5,381.27	11.39	10.88
Pipe8	MH7	MH8		82	38	-0.008	5,352.38	5,352.67	5,360.43	5,360.90	5,358.64	5,358.70	5.16	5.16
Pipe3	MH2	MH3		286	474	-0.019	5,329.87	5,338.65	5,346.70	5,342.00	5,338.90	5,343.33	13.28	12.04
Pipe4	MH3	MH4		286	390	-0.016	5,338.65	5,344.84	5,352.90	5,346.70	5,342.03	5,349.52	13.28	18.65
Pipe19	MH19	MH18		159	160	0.03	5,364.68	5,359.82	5,368.00	5,372.10	5,362.17	5,368.37	11.39	18.94
Pipe18	MH18	MH5		159	282	0.034	5,359.82	5,350.17	5,362.86	5,368.00	5,357.56	5,363.51	11.39	10
Pipe22	CB-1	MH21		159	39	0.024	5,378.53	5,377.58	5,385.00	5,387.00	5,381.57	5,381.96	9.51	7.96
Pipe23	CB-3	MH11		15	10	0.018	5,355.78	5,355.60	5,362.09	5,362.00	5,362.06	5,362.27	8.49	8.49
Pipe24	MH7	CB-4		15	18	-0.021	5,352.38	5,352.75	5,360.00	5,360.90	5,358.64	5,359.01	8.49	8.49
Pipe25	MH6	CB-5		30	18	-0.02	5,351.65	5,352.01	5,361.00	5,361.03	5,357.99	5,359.46	16.98	16.98
CO-10	CB-5	MH-4		67	100	0.005	5,371.50	5,371.00	5,377.00	5,376.80	5,374.88	5,375.01	5.73	5.38
CO-11	MH2	MH-5		286	58	0.029	5,329.87	5,328.20	5,341.40	5,342.00	5,337.35	5,338.05	14.57	14.57
CO-12	MH-5	MH1		382	102	0.028	5,328.20	5,325.30	5,339.40	5,341.40	5,335.00	5,337.20	19.45	19.46
CO-13	CB-6	MH-5		96	17	0.079	5,332.90	5,331.55	5,341.40	5,340.41	5,337.35	5,340.41	30.56	30.56
CO-14	CB-8	CB-6		96	31	-0.007	5,332.68	5,332.90	5,340.41	5,340.41	5,340.41	5,366.30	54.33	54.32

Culvert Calculator Report
72" Culvert entrance

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,387.00 ft	Headwater Depth/Height	1.41
Computed Headwater Elevation	5,387.00 ft	Discharge	342.34 cfs
Inlet Control HW Elev.	5,387.00 ft	Tailwater Elevation	82.34 ft
Outlet Control HW Elev.	5,386.97 ft	Control Type	Inlet Control

Grades			
Upstream Invert	5,378.53 ft	Downstream Invert	5,377.58 ft
Length	39.40 ft	Constructed Slope	0.024112 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	4.04 ft
Slope Type	Steep	Normal Depth	3.07 ft
Flow Regime	Supercritical	Critical Depth	5.02 ft
Velocity Downstream	16.90 ft/s	Critical Slope	0.006304 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	6.00 ft
Section Size	72 inch	Rise	6.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,386.97 ft	Upstream Velocity Head	2.85 ft
Ke	0.20	Entrance Loss	0.57 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,387.00 ft	Flow Control	Submerged
Inlet Type	Beveled ring, 33.7° bevels	Area Full	28.3 ft2
K	0.00180	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

MT-2 (FORM 3)
RIVERINE STRUCTURES FORM

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Boca Negra Arroyo South
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization ..... complete Section B
Bridge/Culvert ..... complete Section C
Dam/Basin ..... complete Section D
Levee/Floodwall ..... complete Section E
Sediment Transport ..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Vista Vieja Storm Drain

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: Groundsel Road

Downstream Limit/Cross Section: North east boundary of Vista Vieja Subdivision

Upstream Limit/Cross Section: West boundary of Vista Vieja Subdivision

2. Name of Structure: Onyx Drive Storm Drain

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: 81st Street and Onyx Drive

Downstream Limit/Cross Section: San Antonio Arroyo

Upstream Limit/Cross Section: Southeast boundary of Vista Vieja Subdivision

3. Name of Structure: Emerald Drive Storm Drain

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

Location of Structure: 81st Street and Emerald Drive, NW

Downstream Limit/Cross Section: Boca Negra Arroyo South at east boundary of SAD 227 subdivision

Upstream Limit/Cross Section: 81st Street and Emarld Drive, NW

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- ☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
- ☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Boca Negra Arroyo South

Name of Structure: Vista Vieja Storm Drain, Onyx Drive Storm Drain, Emerald Drive Storm Drain

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): StormCAD, Culvertmaster
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☐ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☐ Wing Wall Angle
- ☐ Skew Angle
- ☐ Distances Between Cross Sections
- ☒ Erosion Protection
- ☐ Low Chord Elevations – Upstream and Downstream
- ☐ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☐ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source:

ame of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam
2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:
3. The Dam was permitted as (check one):

   a. ☐ Federal Dam ☐ State Dam

   Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

   Permit or ID number Permitting Agency or Organization

   b. ☐ Local Government Dam ☐ Private Dam

   Provided related drawings, specification and supporting design information.
4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm?

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.
5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.
6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

   Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
ead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

7. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

clude a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all
nterior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

ediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

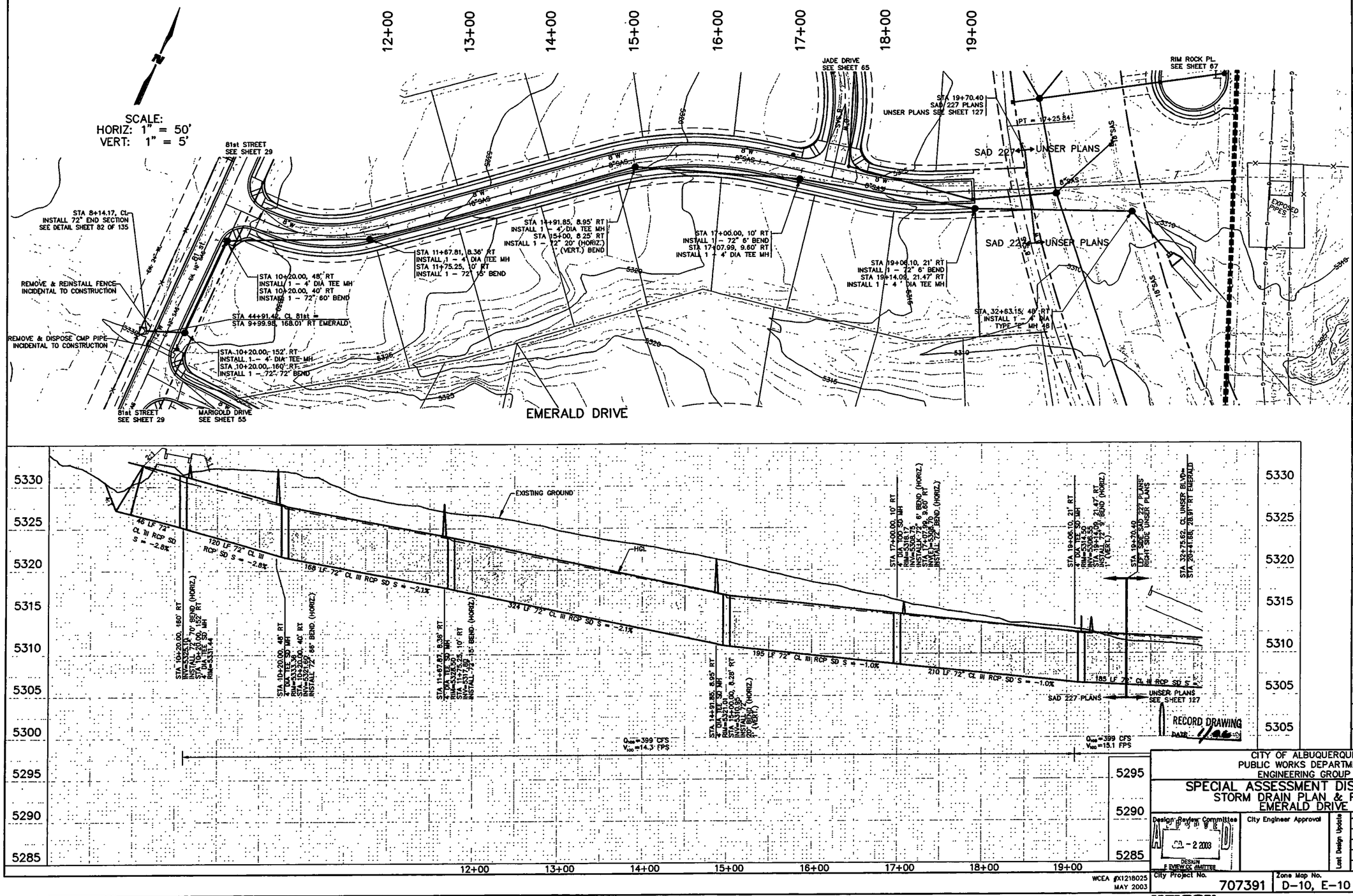
If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

Comments to MT-2, Form 3: Riverine Structures Form

C.4. Sediment transport was not included in the analysis because the BFE and no structures are affected in this analysis

APPENDIX 4
SUPPLEMENTARY INFORMATION

EMERALD DRIVE
STORM DRAIN
SYSTEM



AS-BUILT INFORMATION
CONTRACTOR SALLS BROTHERS
SURVEYED BY WILSON & CO. DATE 7/03
PHOTOGRAPHED BY WILSON & CO. DATE 11/05
FIELD VERIFICATION BY WILSON & CO. DATE 11/05
CORRECTED BY WILSON & CO. DATE 01/06
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
ACS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING 0.30 FT. ABOVE GROUND. LOCATED APPROX. 178' SE. OF THE INTERSECTION OF RIM ROCK DR. NW AND MARIGOLD DR. NW (NAD 1927), X 358813.84, Y 1512565.54
ELEVATION = 5316.12 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE
	WILSON & CO. THRU	6/03
	WILSON & CO.	11/05

ENGINEER'S SEAL
ROBERT S. MALONE NEW MEXICO 15985 REGISTERED PROFESSIONAL ENGINEER
6-30-03

NO.	BY	REMARKS	DATE
		REVISIONS	
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		DESIGNED BY SJM	DATE MAY 03
		DRAWN BY STAFF	DATE MAY 03
		CHECKED BY SJM	DATE MAY 03

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
STORM DRAIN PLAN & PROFILE
EMERALD DRIVE

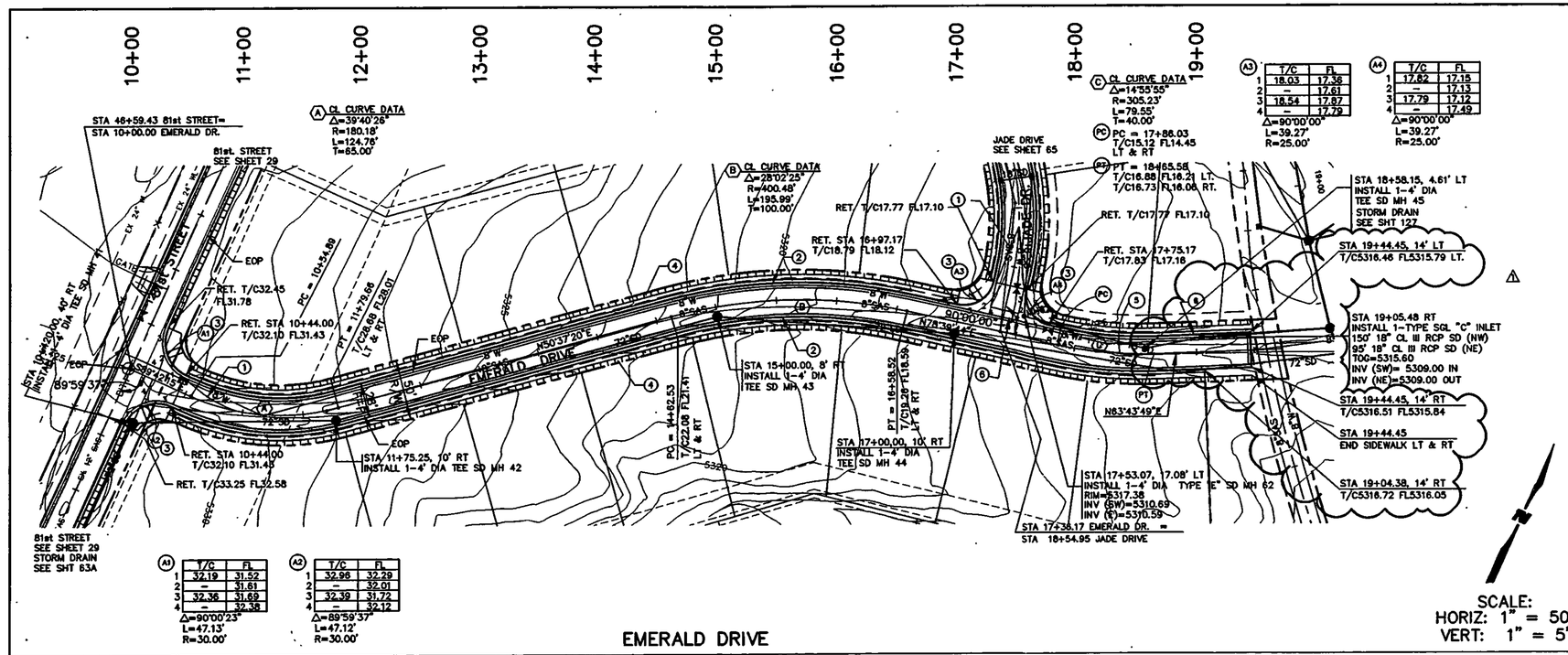
Design Review Committee: JUL - 2 2003 DESIGN REVIEW COMMITTEE
City Engineer Approval
Last Design Update: Mo./Day/Yr.
Mo./Day/Yr.

WCEA #X1218025
MAY 2003

City Project No. 707391
Zone Map No. D-10, E-10
Sheet 63A Of 135

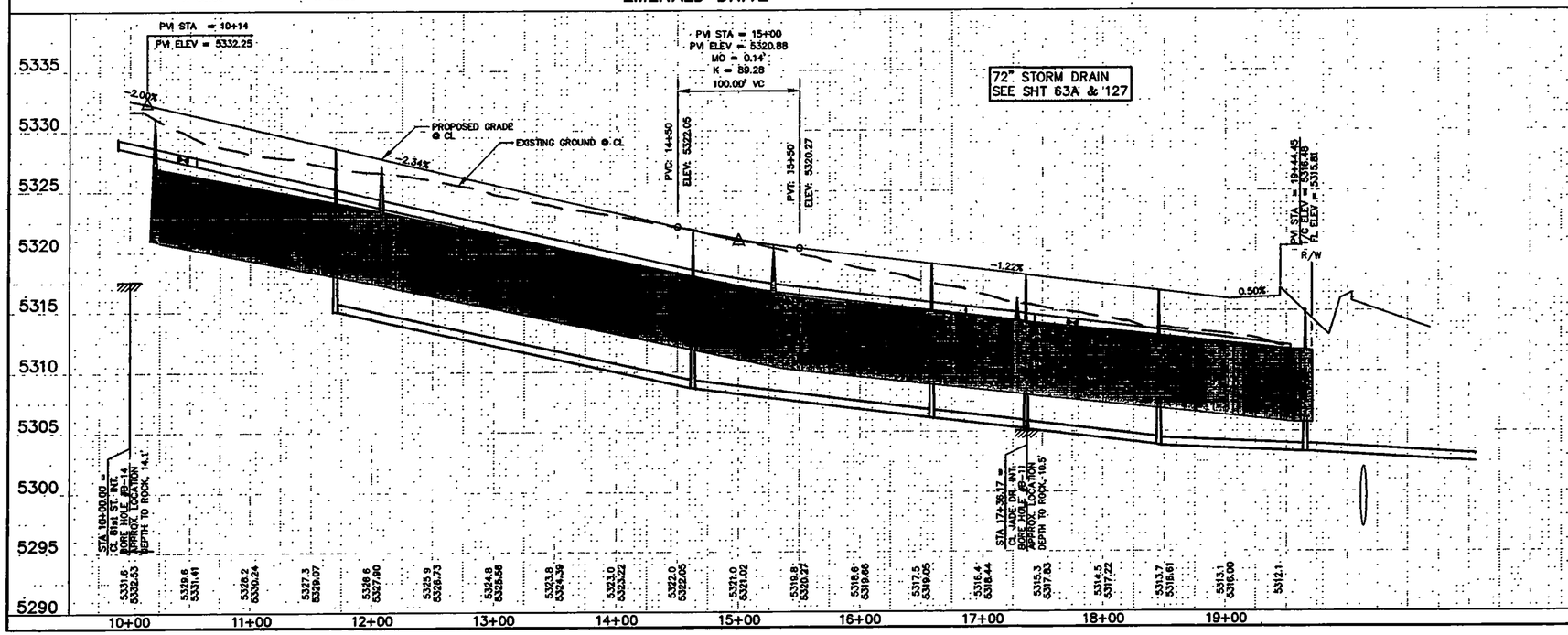
WILSON & COMPANY

X \Public\PROJECTS\X1218025\M\SHEETS\Pnpsd\8125pnpsd10.dwg 6/29/2003 11:39:01 AM MDT



EMERALD DRIVE

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 5'



WCEA #X1218025
JUNE 03

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NOTES

1. SEE 50' R/W TYPICAL ROADWAY SECTION, SEE SHT. 7
2. FOR STORM DRAIN INFORMATION SEE SHEET 63A.

(1) 50' CROWN REDUCTION PER STD DWG 2401.

(2) CONSTRUCT STANDARD TYPE CURB PER STD DWG 2415.

(3) CONSTRUCT WHEEL CHAIR RAMP PER STD DWG 2440, 2441.

(4) CONSTRUCT 4' OFFSET TYPE SIDEWALK PER STD DWG 2430.

(5) STA 18+00.00 TO STA 19+00.00 TRANSITION ROADWAY CROSS SLOPE FROM −2.00% TO 0.20% LEFT SIDE ONLY

(6) STA 18+95.00 LT TO STA 19+00.00 LT TRANSITION FROM STD TYPE CURB TO DEPRESSED GUTTER TYPE CURB, B=0.04' PER STD DWG 2415

(7) CONSTRUCT CONC. VALLEY GUTTER PER STD DWG 2420

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE
WILSON & CO. THRU

AS-BUILT INFORMATION
CONTRACTOR: SALLS BROTHERS
STAKED BY: WILSON & CO. DATE 7/03
FIELD BOOK BY: WILSON & CO. DATE 11/05
ACCEPTANCE BY: WILSON & CO. DATE 11/05
DRAWING BY: WILSON & CO. DATE 01/06
MICRO-FILM INFORMATION
DATE
RECORDED BY
NO.

BENCH MARKS
A CS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING 0.30 FT. ABOVE GROUND, LOCATED APPROX. 178' SE. OF THE INTERSECTION OF RIM ROCK DR. NW AND MARIGOLD DR. NW
(NAD 1927), X 356813.84, Y 1512565.54
ELEVATION = 5316.12 FT. (SLD 1929)

ENGINEER'S SEAL
NEW MEXICO 15079 REGISTERED PROFESSIONAL ENGINEER S. MACLAVE

RECORD DRAWING
DATE 1/06

NO.	DATE	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY
			WC		
1	2/05	EXTENDED PAVING AND SIDEWALK	BY		
		REMARKS	ESC	STAFF	RSM
			DATE JUNE 03	DATE JUNE 03	DATE JUNE 03

WILSON & COMPANY, ENGINEERS & ARCHITECTS

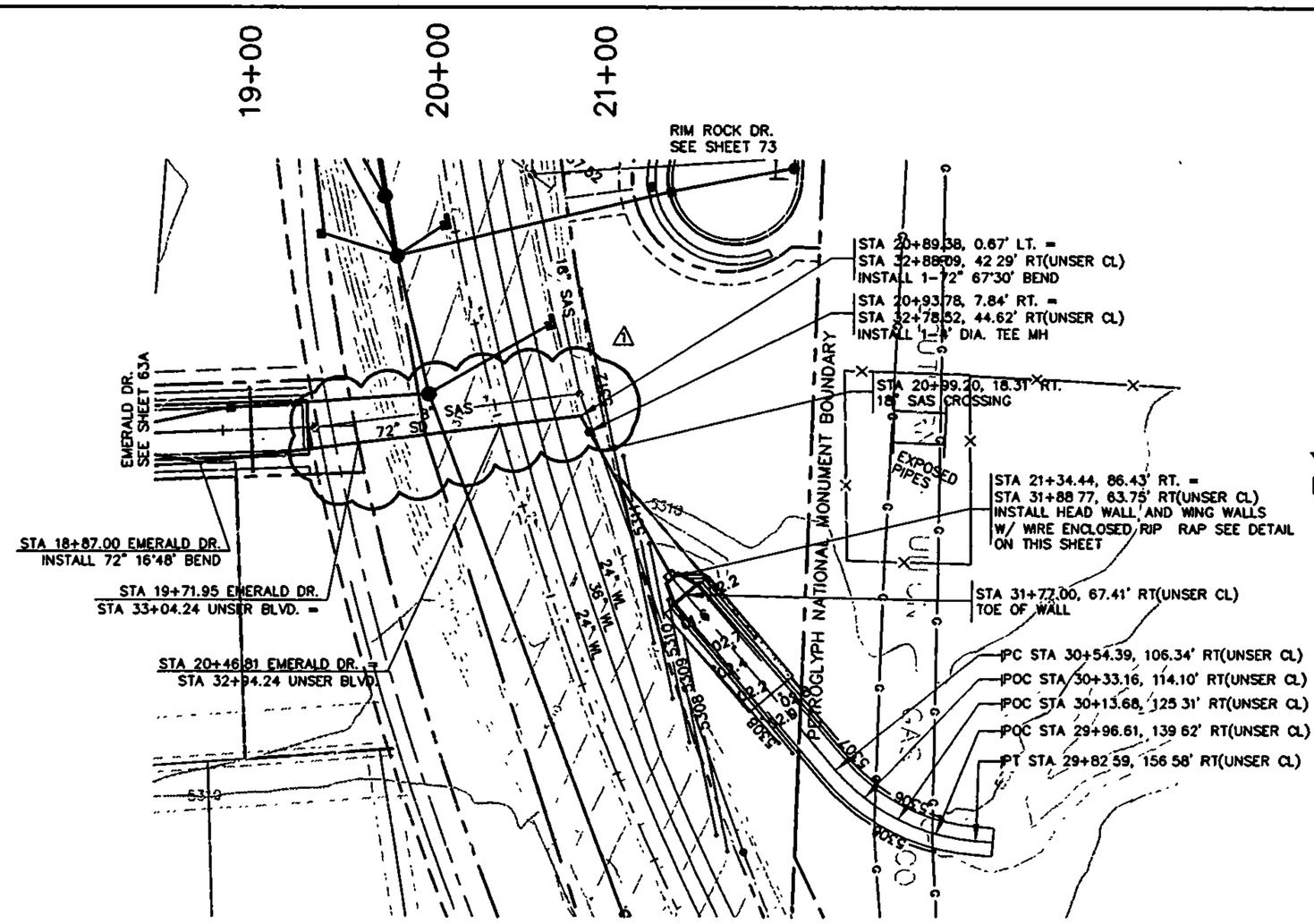
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
PAVING PLAN & PROFILE
EMERALD DRIVE N.W.

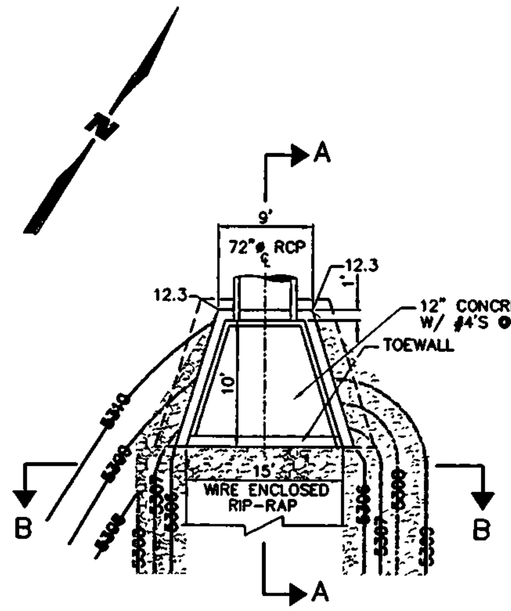
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
707391	D-10, E-10	63	135

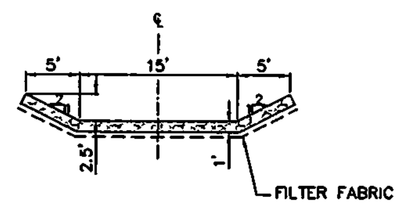
WILSON & COMPANY



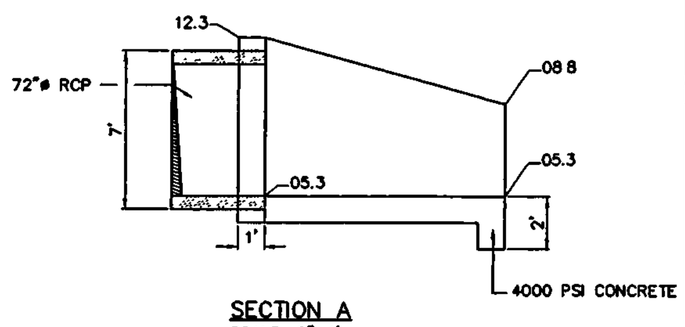
ALL STATIONING IS EMERALD DR. STATIONING



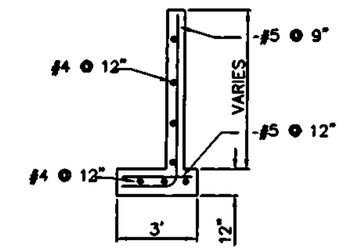
CONCRETE APRON
SCALE: 5"=1'



CHANNEL SECTION B
SCALE: 5"=1'



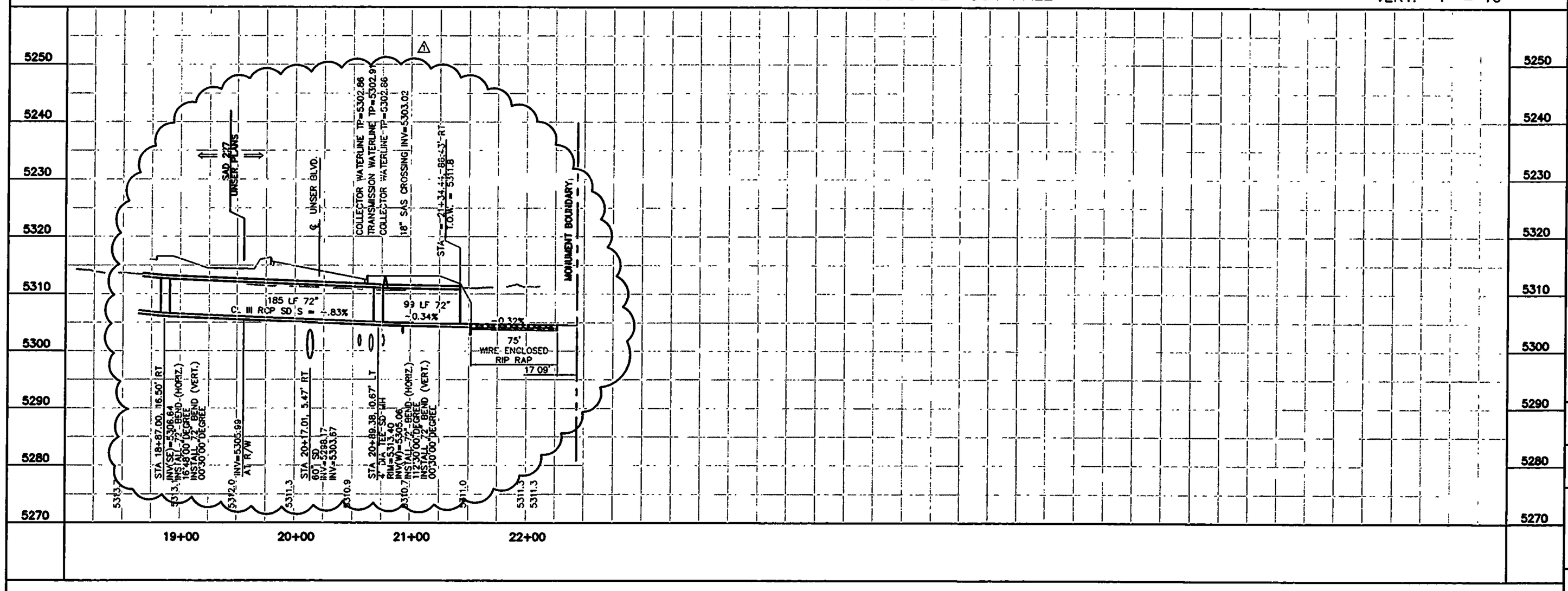
SECTION A
SCALE: 2"=1'



WINGWALL SECTION
SCALE: 2"=1'

S.FORK OF S.BRANCH BOCA NEGRA ARROYO 72" OUT FALL

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 10'



PLANS PREPARED BY WILSON & CO.
TO BE INCLUDED IN THE UNSER
BOULEVARD-MIDDLE SECTION PLANS

AS BUILT INFORMATION
CONTRACTOR SALLS BROTHERS
STAKED BY WILSON & CO. 7/03
INSPECTED BY WILSON & CO 11/05
FIELD VERIFICATION WILSON & CO. 11/05
CORRECTED BY WILSON & CO. 01/06

BENCH MARKS
BENCHMARK: CITY OF ALBUQUERQUE STANDARD BRASS CAP STAMPED 3-E10 1969, SET IN TOP OF CONCRETE POST PROJECTING 0.30' ABOVE GROUND, LOCATED 45° NORTHEAST OF THE CENTERLINE OF MARIGOLD DR. AND RIM ROCK RD. EL=5316.12 - NGVD 29

MICRO-FILM INFORMATION
RECORDED BY
DATE
NO.

SURVEY INFORMATION
FIELD NOTES

NO.		DATE
	WILSON & CO.	6/03
	THRU	
	WILSON & CO.	1/05

ENGINEERS SEAL
S. AGUIRRE NEW MEXICO (1935) NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	WC	REMARKS
1	2/05		STORM DRAIN CROSSING

REVISIONS
DESIGN
DESIGNED BY RSM DATE JUNE 03
DRAWN BY STAFF DATE JUNE 03
CHECKED BY SJM DATE JUNE 03

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

TITLE: PUBLIC UTILITY & STORM DRAIN IMPROVEMENTS
S. FORK OF S. BRANCH
BOCA NEGRA ARROYO 72" OUTFALL

Design Review Committee	City Engineer Approval	Last Design Update	Mo /Day/Yr.	Mo /Day/Yr.

City Project No. 707392 | Zone Map No. D10,E10 | Sheet 128A | Of 159

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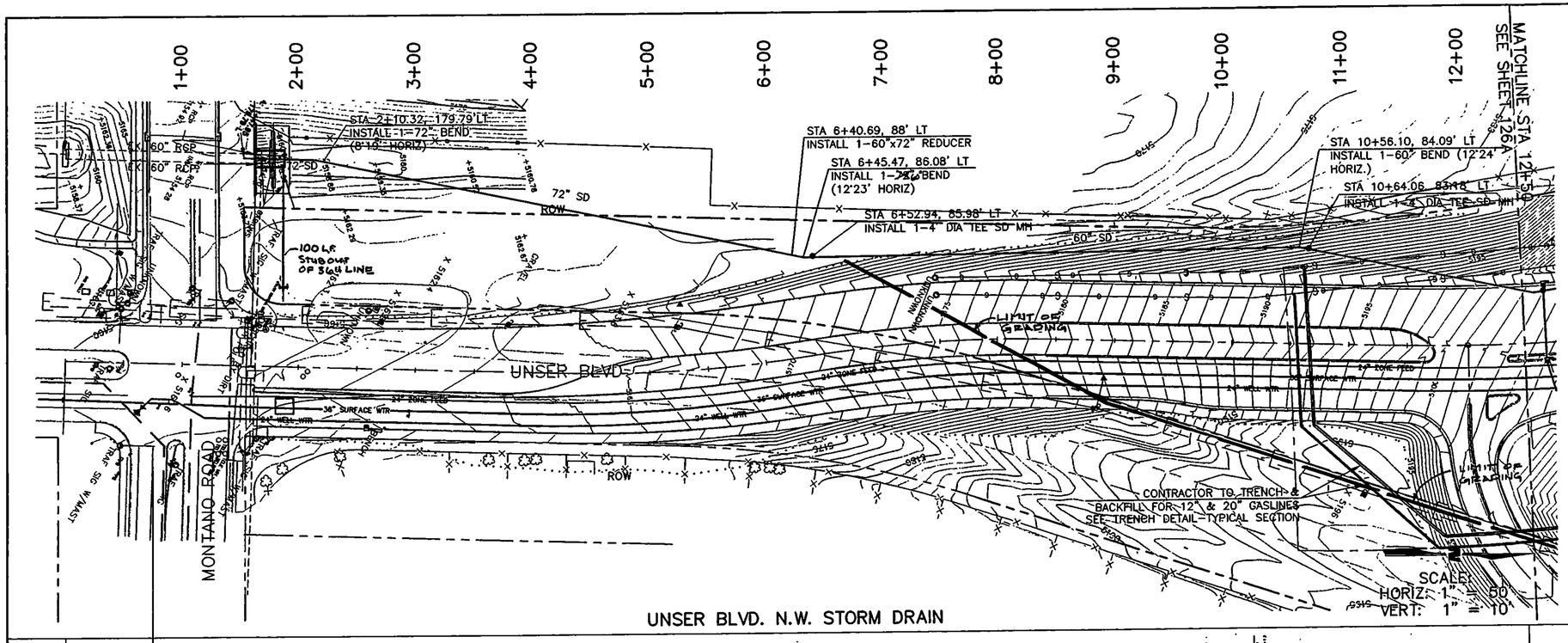
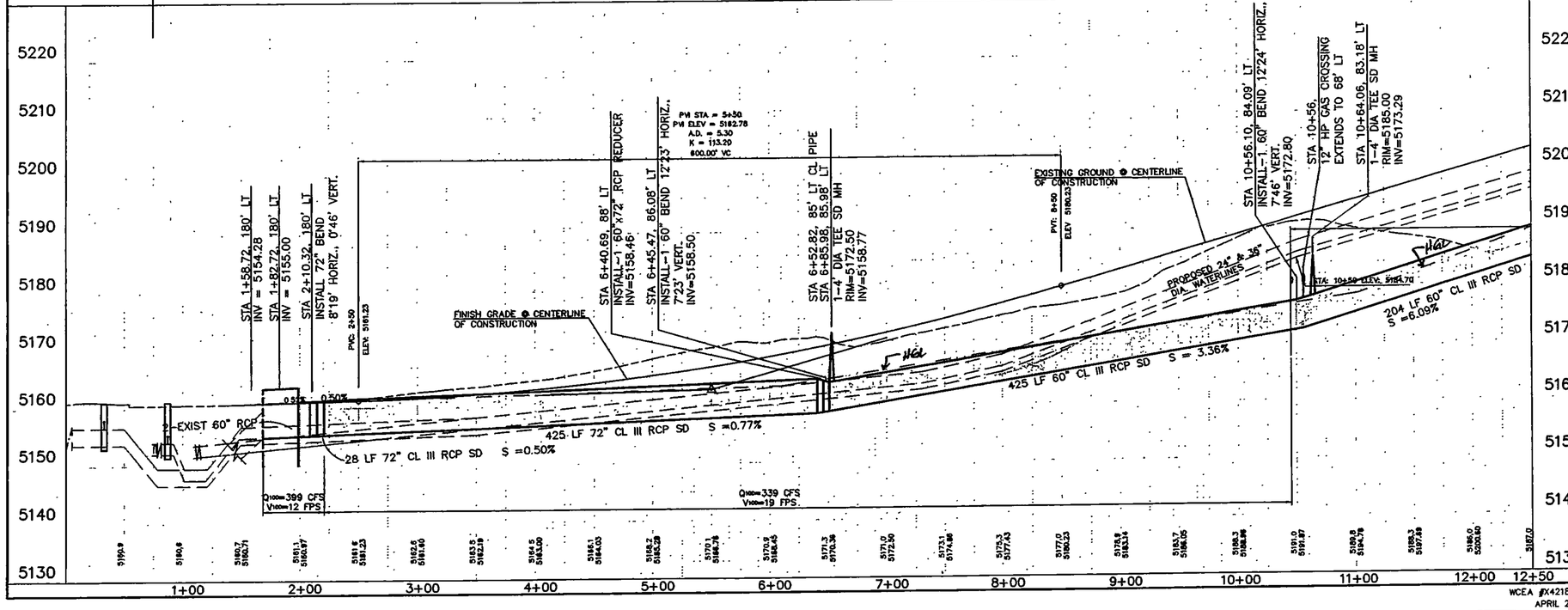


UNSER BLVD. N.W. STORM DRAIN



WCEA #X421BXXX
APRIL 2004

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AS-BUILT INFORMATION
CONTRACTOR - SALLS BROTHERS
WORK STARTED BY WILSON & CO. DATE 7/03
FIELD ACCEPTANCE BY WILSON & CO. DATE 11/05
FINAL ACCEPTANCE BY WILSON & CO. DATE 11/05
DRAWING PREPARED BY WILSON & CO. DATE 01/06

MICRO-FILM INFORMATION
RECORDED BY
DATE
NO

BENCH MARKS
ACS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING
0.30 FT. ABOVE GROUND. LOCATED
APPROX. 178' SE OF THE INTERSECTION OF
RIM ROCK DR. NW AND MARIGOLD DR. NW
(NAD 1927), X 358813.84, Y 1512565.54
ELEVATION = 5316.12 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE
	WILSON & CO.	6/03
	THRU	
	WILSON & CO.	11/05

ENGINEER'S SEAL
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
1955

NO.	DATE	REMARKS	BY
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		REVISIONS	
		DESIGNED BY	
		DRAWN BY	
		CHECKED BY	

DATE APRIL 04
DATE APRIL 04
DATE APRIL 04
RSM
STAFF
RSM

RECORD DRAWING
DATE 1/06

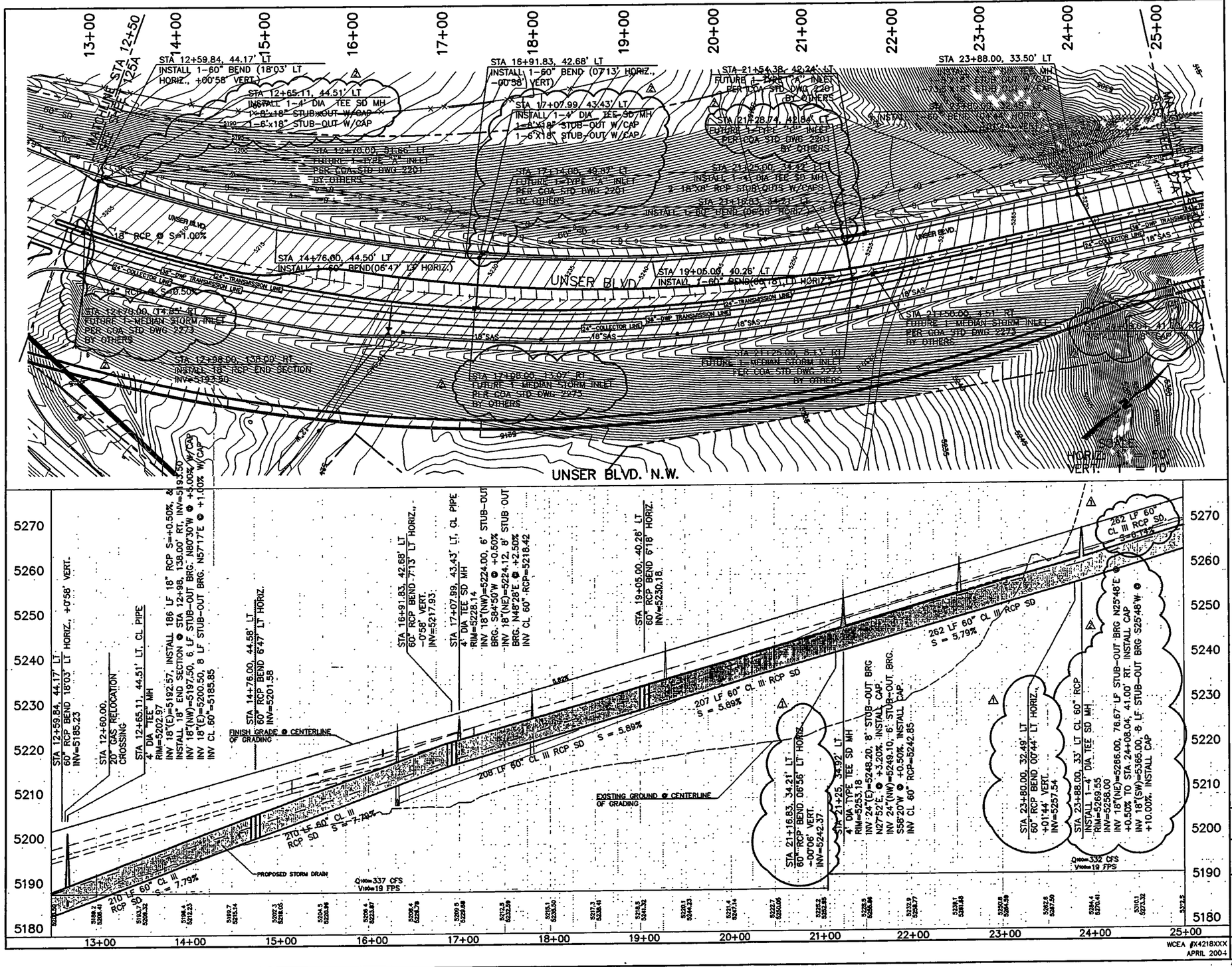
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
GRADING AND STORM DRAIN PLAN & PROFILE
PUBLIC UTILITY & STORM DRAIN IMPROVEMENTS

Design Review Committee — 9 2003
City Engineer Approval — 9-9-03
Last Design Update — Mo /Day/Yr — Mo /Day/Yr

City Project No. 707391 | Zone Map No. D-10, E-10 | Sheet 125A | Of 159

WILSON & COMPANY



AS-BUILT INFORMATION		
CONTRACTOR	SALLS BROTHERS	
SURVEYED BY	WILSON & CO.	DATE 7/03
ACCEPTANCE BY	WILSON & CO.	DATE 11/05
FIELD REVISION BY	WILSON & CO.	DATE 11/05
DRAWINGS BY	WILSON & CO.	DATE 01/06
MICRO-FILM INFORMATION		
RECORDED BY		DATE
NO.		

BENCH MARKS

ACS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING 0.30 FT. ABOVE GROUND. LOCATED APPROX. 178' SE. OF THE INTERSECTION OF RIM ROCK DR. NW AND MARIGOLD DR. NW
(NAD 1927), X 350813.84, Y 1512565.54

ELEVATION = 5316.12 FT. (SLD 1929)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE
	WILSON & CO.	6/03
	THRU	
	WILSON & CO.	11/05

ENGINEER'S SEAL

REVISIONS			
NO.	DATE	REMARKS	BY
1	04/05	REVISED STORM DRAIN INLETS	WC
2	03/05	REVISED STORM DRAIN	WC

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY	RSM	DATE	APRIL 04
DRAWN BY	STAFF	DATE	APRIL 04
CHECKED BY	RSM	DATE	APRIL 04

RECORD DRAWING
DATE 1/26/06

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
GRADING AND STORM DRAIN PLAN & PROFILE
PUBLIC UTILITY & STORM DRAIN IMPROVEMENTS

Design Review Committee	City Engineer Approval	Last Design Update	No. /Dev/Yr.	No. /Dev/Yr.

City Project No.	Zone Map No.	Sheet	Of
707391	D-10, E-10	126A	159

WCEA #X4218XXX
APRIL 2004

WILSON & COMPANY

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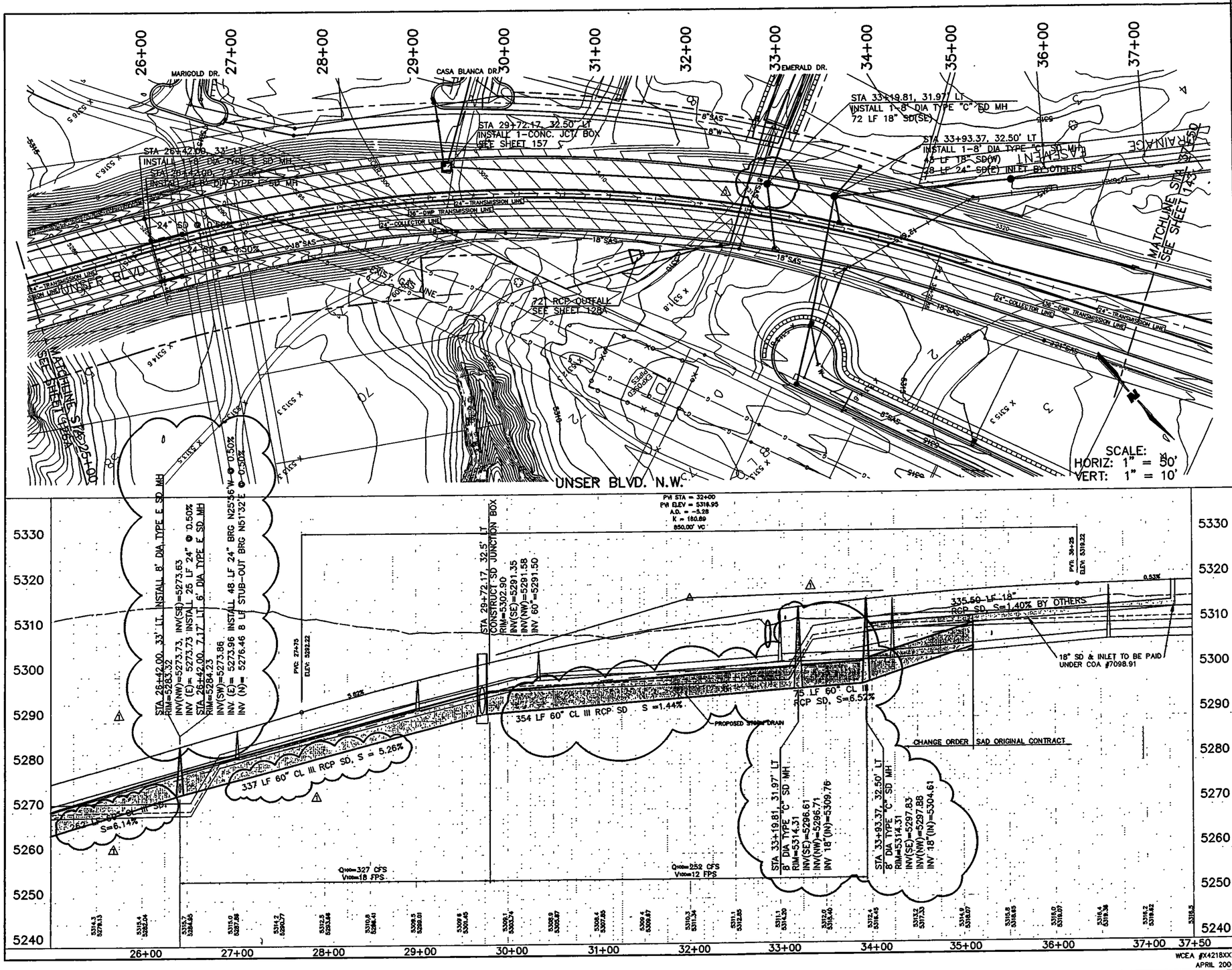


WCEA #X4218XXX
APRIL 2004

AS-BUILT INFORMATION

CONTRACTOR: SALLS BROTHERS

WORK STAKED BY:	WILSON & CO.	DATE 7/03
ACCEPTANCE BY:	WILSON & CO.	DATE 11/05
VERIFICATION BY:	WILSON & CO.	DATE 11/05
CORRECTED BY:	WILSON & CO.	DATE 01/06

MICRO-FILM INFORMATION

RECORDED BY: DATE:

NO.:

ELEVATION = 5316.12 FT. (SLD 1929)

BENCH MARKS

ACS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING 0.30 FT. ABOVE GROUND. LOCATED APPROX. 178' SE. OF THE INTERSECTION OF RIM ROCK DR. NW AND MARIGOLD DR. NW
(NAD 1927), X 358813.84, Y 1512565.54

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE
	WILSON & CO.	6/03
	THRU	
	WILSON & CO.	11/05

ENGINEER'S SEAL

DAVID R. WILSON, NEW MEXICO 9750, REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISIONS	BY
1	3/05	REVISED STORM DRAIN	WC

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY	RSM	DATE APRIL 04
DRAWN BY	STAFF	DATE APRIL 04
CHECKED BY	RSM	DATE APRIL 04

RECORD DRAWING
DATE 1/06

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
GRADING AND STORM DRAIN PLAN & PROFILE
PUBLIC UTILITY & STORM DRAIN IMPROVEMENTS

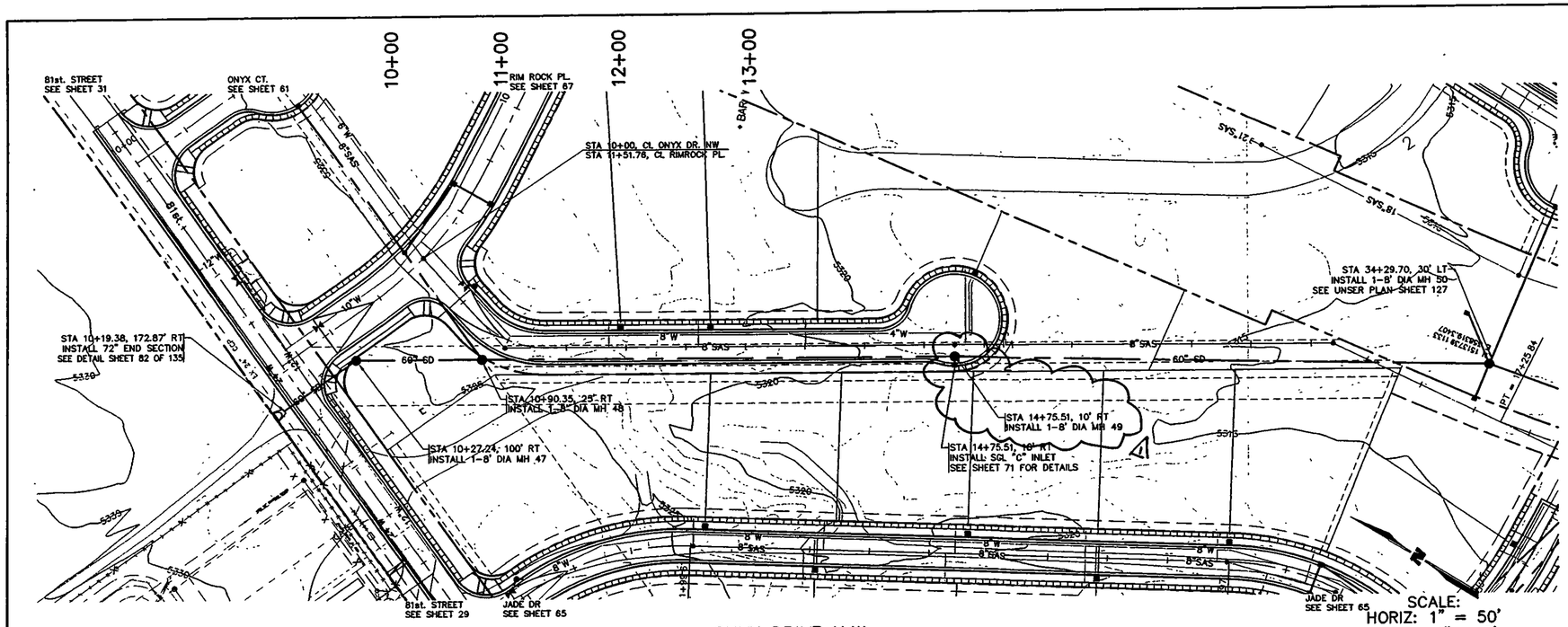
Design Review Committee	City Engineer Approval	Last Design Update	Mo /Day/Yr	Mo /Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
707391	D-10, E-10	127A	159

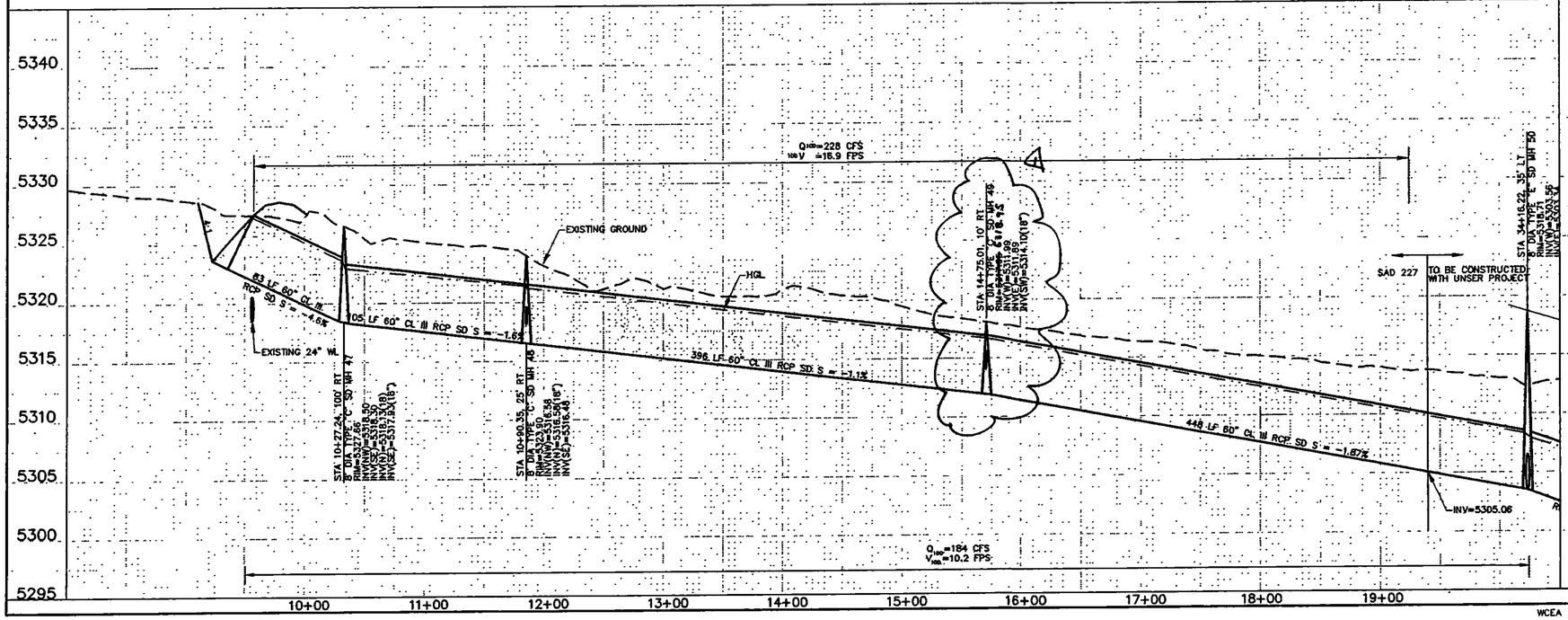
WILSON & COMPANY

X:\Public\PROJECTS\X1218025\M\SHEETS\ASCG-pnp\Storm-realign\8125pnp-raSD03.dwg 3/25/2005 7:57:52 AM MST

ONYX DRIVE
STORM DRAIN
SYSTEM



ONYX DRIVE N.W.



WCEA #X1218025
APRIL 2003

RECORD DRAWING
DATE 1/06

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

SPECIAL ASSESSMENT DISTRICT 227
STORM DRAIN PLAN & PROFILE
ONYX DRIVE N.W.

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.
APPROVED JUN - 2 2003 DESIGN REVIEW COMMITTEE				

City Project No.	Zone Map No.	Sheet	Of
707391	D-10, E-10	71A	135

WILSON & COMPANY

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

BENCH MARKS
A'CS BRASS CAP, STAMPED "3-E10 1969"
SET IN TOP OF CONCRETE POST PROJECTING 0.30 FT. ABOVE GROUND, LOCATED APPROX. 178' SE. OF THE INTERSECTION OF RIM ROCK DR. NW AND MARIGOLD DR. NW
(NAD 1927), X 358813.84, Y 1512565.54
ELEVATION = 5316.12 FT. (SLD 1929)

AS-BUILT INFORMATION
CONTRACTOR
STAKED BY — DATE
INSPECTED BY — DATE
FIELD VERIFICATION BY — DATE
DRAWING CORRECTED BY — DATE
RECORDED BY — DATE

MICRO-FILM INFORMATION

ENGINEER'S SEAL
ROBERT S. MACLANE NEW MEXICO 15985 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
A	1/05	Revised Rim SD MH 49	

WILSON & COMPANY, ENGINEERS & ARCHITECTS

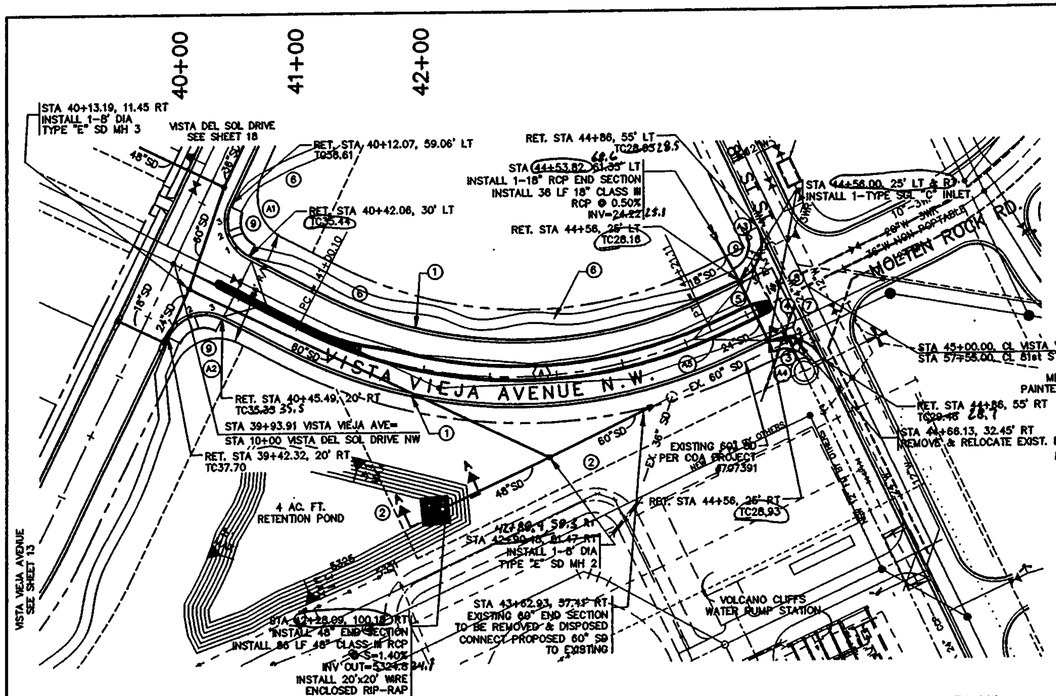
DESIGNED BY	SJM	DATE MAY 03
DRAWN BY	STAFF	DATE MAY 03
CHECKED BY	SJM	DATE MAY 03

REVISIONS

X:\Public\PROJECTS\X1218025\M\SHEETS\Pnpsd\8125pnpsd22.dwg 06/11/03 11:50.47 AM MDT

VISTA VIEJA
STORM DRAIN
SYSTEM

RECORD DRAWINGS



	T/C	FL
1	28.51	27.84
2	–	27.72
3	28.27	27.60
4	–	28.11

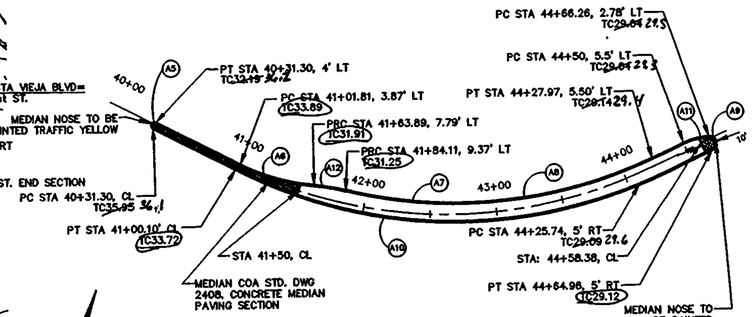
Δ=90°00'00"
L=47.12'
R=30.00'

	T/C	FL
1	29.06	28.39
2	–	28.52
3	28.80	28.13
4	–	28.36

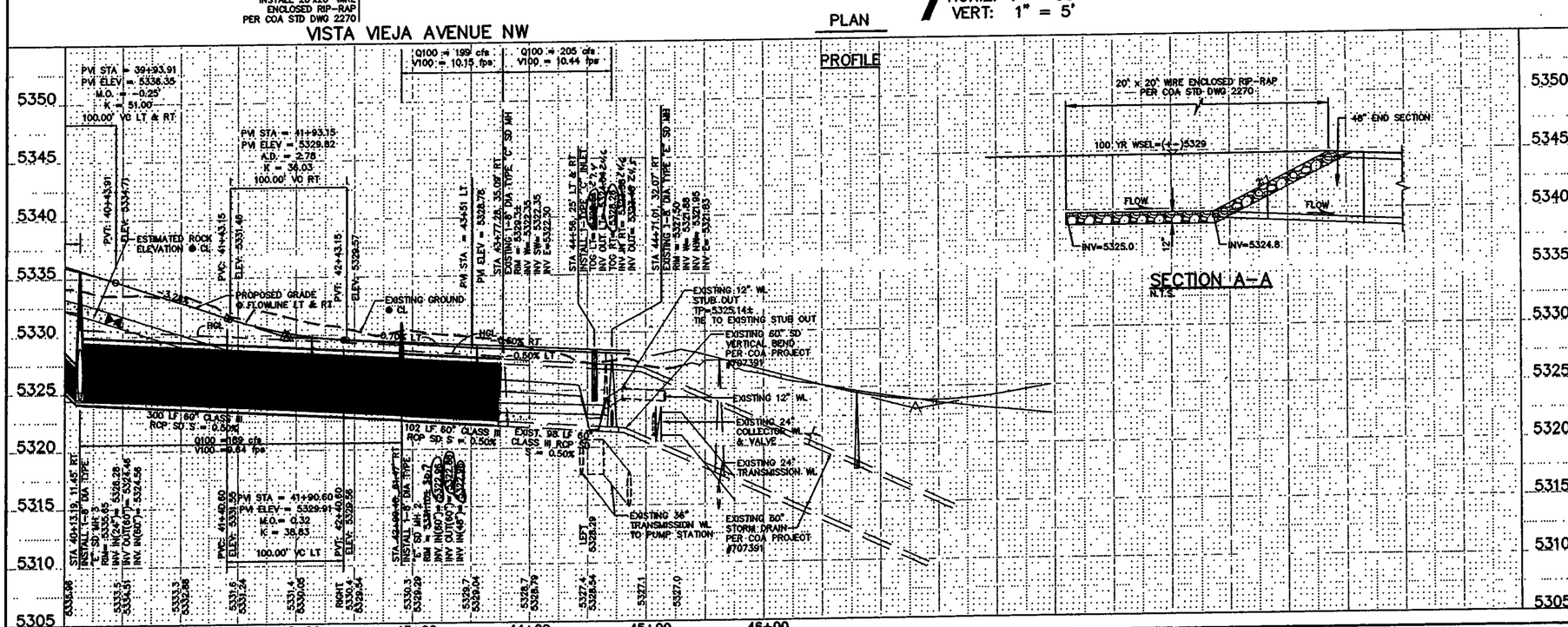
Δ=90°00'00"
L=47.12'
R=30.00'

CL CURVE DATA
Δ=52°32'59"
R=350.00
L=321.01
T=172.79

Δ=180°00'00" L=6.28' R=2.00'
Δ=20°27'25" L=53.56' R=150.00'
Δ=39°50'22" L=238.81' R=150.00'
NOT USED
Δ=161°01'25" L=11.24' R=4.00'
Δ=53°02'58" L=327.72' R=353.95'
Δ=18°58'35" L=16.56' R=50.00'
Δ=07°33'43" L=19.80' R=150.00'



MEDIAN GEOMETRIC LAYOUT

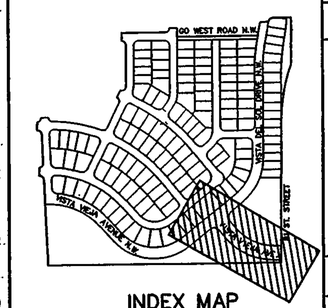


NOTES

SEE TYPICAL ROADWAY SECTION D
SEE SHEET 10

1. CONSTRUCT STANDARD CURB & GUTTER PER STD DWG 2415A
2. BLANKET STORM DRAIN EASEMENT
3. CONSTRUCT WHEELCHAIR RAMP PER STD DWG 2441 CASE II
4. CONSTRUCT 6' VALLEY GUTTER PER STD DWG 2420
5. 50' CROWN REDUCTION PER STD DWG 2401
6. CONSTRUCT 8' WIDE TRAIL -- ALIGNMENT TO REMAIN WITHIN 25' OF ROW AND BE DETERMINED IN FIELD BY LANDSCAPE ARCHITECT
7. STA 44+89, 55' LT TO STA 44+89, 55' RT REMOVE 110' LF EXISTING CURB & GUTTER. SAW AT EXISTING PAVEMENT.
8. SAW CUT EXISTING 81 ST. STREET PAVEMENT 1'. PER COA DWG #2465
9. BIKE TRAIL RAMP SEE SHEET #10

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.



INDEX MAP

AS-BUILT INFORMATION
CONTRACTOR SIGNS & DATES
DRAWN BY
CORRECTIONS BY
FIELD VERIFICATION BY
CORRECTED BY
MICRO-FILM INFORMATION
RECORDED BY
DATE

BENCH MARKS
THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS 8-C10, 1986". (NAD 1927).
X= 361860.83, Y= 1521476.37

ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

REMARKS
REVISIONS
NO. | BY | DATE

WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY RSW DATE AUGUST 05
DRAWN BY STAFF DATE AUGUST 05
CHECKED BY DSA DATE AUGUST 05

ENGINEER'S SEAL
STEVEN R. MACLANE
NEW MEXICO 15058
REGISTERED PROFESSIONAL ENGINEER
LICENSED

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA PHASE I
PAVING AND STORM DRAIN PLAN &PROFILE
VISTA VIEJA AVENUE N.W.

Design Review Committee
APPROVED
DEC 08 2005
DESIGN REVIEW COMMITTEE

City Engineer
APPROVED
JAN 27 2006
CITY ENGINEER

Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No. 7633.81
Zone Map No. D-9
Sheet 14 Of 35

WCEA #X3218078
AUGUST 2005

WILSON & COMPANY

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RECORD DRAWINGS

CITY OF ALBUQUERQUE, NEW MEXICO
PUBLIC WORKS DEPARTMENT

CONSTRUCTION PLANS
FOR

VISTA VIEJA PHASE I

PUBLIC INFRASTRUCTURE IMPROVEMENTS

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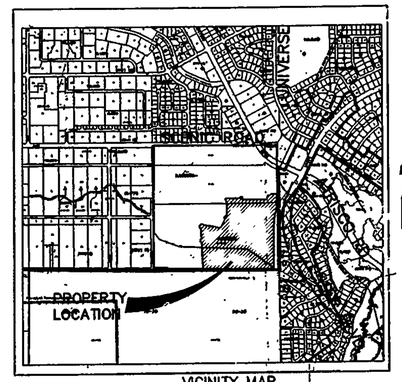

VICINITY MAP
ZONE ATLAS MAP NO. D-9

LEGEND

EXISTING		PROPOSED	
SAS	SANITARY SEWER	SAS	SANITARY SEWER
WL	WATER LINE	W	WATER LINE
G	GAS LINE	G	GAS LINE
SD	STORM DRAIN	SD	STORM DRAIN
T	TELEPHONE LINE	.....	ELECTRICAL CONDUIT
UT	UNDERGROUND TELEPHONE LINE		WHEELCHAIR RAMP
UE	UNDERGROUND ELECTRICAL LINE		CROWN, REDUCTION
TC	TRAFFIC SIGNAL CONDUIT		SIDEWALK
	CURB & GUTTER	FOC / EOP	FACE OF CURB / EDGE OF PAVEMENT
	TELEPHONE BOX		CENTER LINE
	MANHOLE		MANHOLE
	WATER VALVE		WATER VALVE
WM	WATER METER		WATER SERVICE
	SAS SERVICE W/ CAP		SAS SERVICE W/ CAP
	STORM INLET		STORM INLET
	FIRE HYDRANT		FIRE HYDRANT
PP	POWER POLE		LIGHT POLE
PB	PULL BOX		
	LIGHT POLE		
	TREE/SHRUB		
5094	INTERMEDIATE CONTOUR		
5095	INDEX CONTOUR		
	PAVEMENT REMOVAL		

SURVEYOR'S CERTIFICATION

I, WILL PLOTNER JR., A DULY QUALIFIED, REGISTERED, PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE 'AS-BUILT' INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM FIELD CONSTRUCTION AND 'AS-BUILT' SURVEYS PERFORMED BY ME OR UNDER MY SUPERVISION, THAT THE 'AS-BUILT' INFORMATION SHOWN ON THESE DRAWNINGS WAS ADDED BY ME OR UNDER MY SUPERVISION, AND THAT THIS 'AS-BUILT' INFORMATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. CARTESIAN SURVEYS IS NOT RESPONSIBLE FOR ANY OF THE DESIGN CONCEPTS, CALCULATIONS, ENGINEERING, OR INTENT OF THE RECORD DRAWINGS.

WILL PLOTNER JR, NMPS 14271

CERTIFICATE OF SUBSTANTIAL COMPLIANCE OF PLANS

I, Robert S. MacLake of the firm Wilson & Company, a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, has been constructed in accordance with the plans and specifications approved by the city engineer, and the original design intent of the approved plans has been met, except as noted by me on the asbuilt construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by Will Plotner Jr., NMPS number 14271.

Robert S. MacLake, P.E. NM 15565 — Date 8-31-06

WILSON & COMPANY
4900 LANG AVENUE N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 348-4000

DRB CASE No. 1003470

REV	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE

ENGINEERS STAMP & SIGNATURE

ROBERT S. MACLAKE — NEW MEXICO — 15565 — REGISTERED PROFESSIONAL ENGINEER — 8-31-06

APPROVALS	ENGINEER	DATE
DRC Chairman		12-8-05
Transportation		12-7-05
Water/Wastewater		10-7-05
Hydrology		10/5/05
Parks		
Constr. Mngmt.		
Constr. Coord.		12-8-05

****
APPROVED FOR CONSTRUCTION

1-27-06
City Engineer — Date

City Project No. 7633.81

Sheet 1 Of 35

WCEA FILE NO. X3218078

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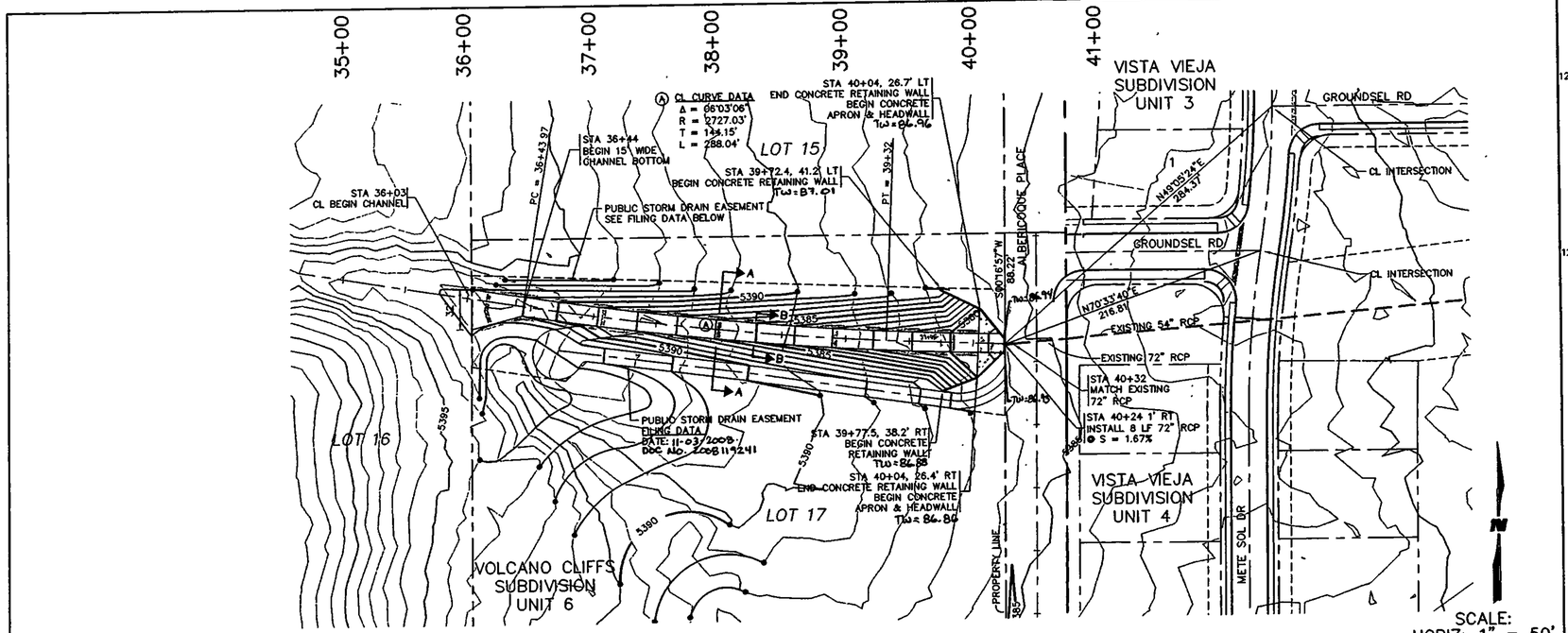
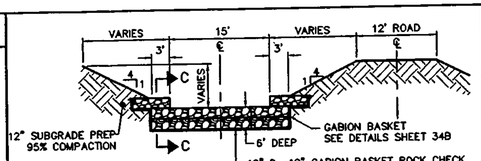
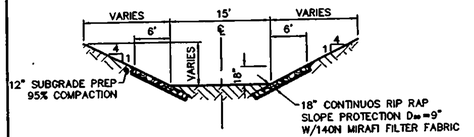
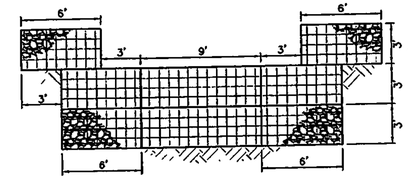




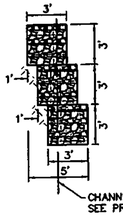
CHANNEL @ ROCK CHECK SECTION A–A
NTS



CHANNEL @ ROCK B–B
NTS



GABION BASKET PLACEMENT DETAIL
NTS

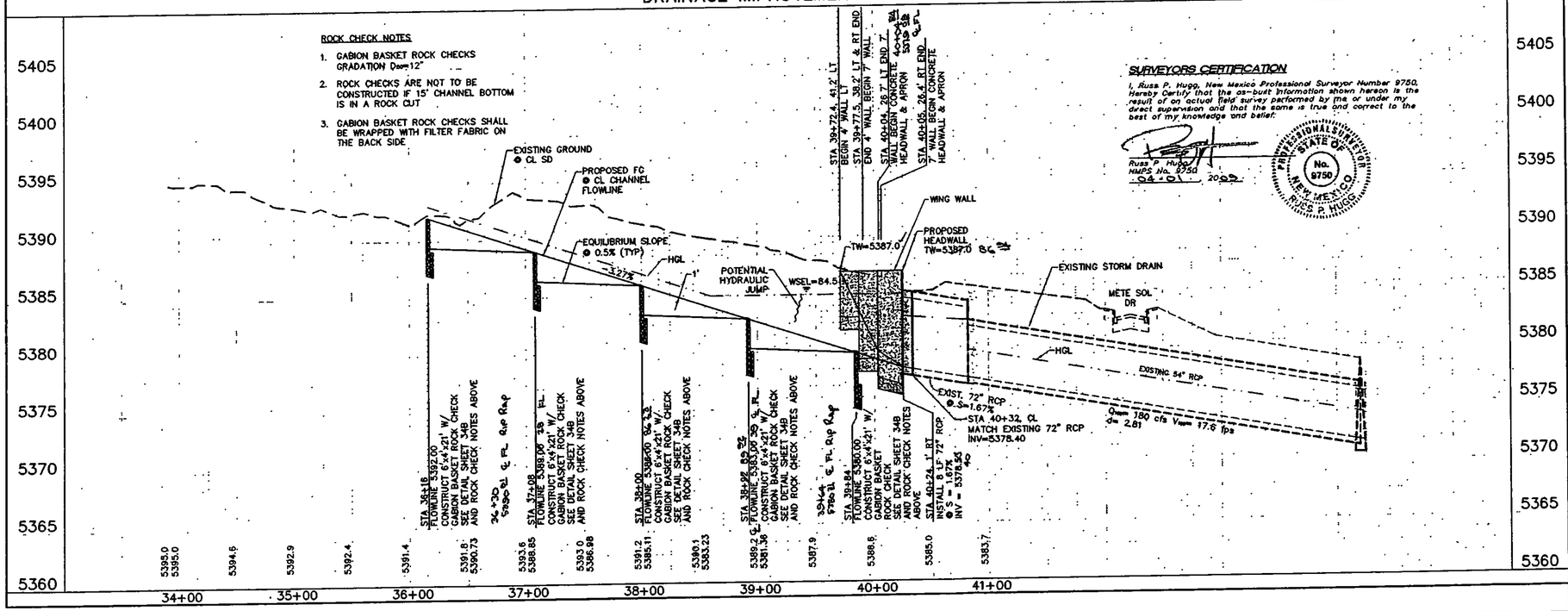


SECTION C–C
GABION BASKET PLACEMENT
NTS

DRAINAGE IMPROVEMENTS

ROCK CHECK NOTES

1. GABION BASKET ROCK CHECKS GRADATION D50=12"
2. ROCK CHECKS ARE NOT TO BE CONSTRUCTED IF 15' CHANNEL BOTTOM IS IN A ROCK CUT
3. GABION BASKET ROCK CHECKS SHALL BE WRAPPED WITH FILTER FABRIC ON THE BACK SIDE



SURVEYORS CERTIFICATION

I, Russ P. Hugo, New Mexico Professional Surveyor Number 9750, Hereby Certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugo NMPS No. 9750 04-07 2008

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. HUGO

AS-BUILT INFORMATION

CONTRACTOR [illegible] DATE 4-07

STATE ENGINEER'S ACCEPTANCE [illegible] DATE 4-08-09

CONSTRUCTION SECTION [illegible] DATE 4-08-09

DRAWING FILED BY [illegible] DATE 4-10-09

MICRO-FILM INFORMATION

DATE

RELEASED BY

NO

BENCH MARKS

ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION

FIELD NOTES

NO.	DATE	BY

THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS 8-C10, 1986". (NAD 1927). X= 361860.83, Y= 1521476.37

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
1	1/18	ADD 72" RCP & 15' CHANNEL/GRADING	RM
2	2/07	REVISED LOT 17 DRAINAGE EASEMENT	RS
		VOLCANO CLIFFS SUBDIVION UNIT 6	

REVISIONS

WILSON & COMPANY, ENGINEERS & ARCHITECTS
4900 LANG AVENUE NE
ALBUQUERQUE, NM 87110
(505) 348-4000

DESIGNED BY DSA DATE JANUARY 2008
DRAWN BY JMB DATE JANUARY 2008
CHECKED BY DSA DATE JANUARY 2008

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA SUBDIVISION
OFFSITE DRAINAGE IMPROVEMENTS

Design Review Committee: APPROVED DEC 22 2008 DESIGN REVIEW COMMITTEE

City Engineer Approval: APPROVED DEC 22 2008 CITY ENGINEER

Last Design Update: Mo /Day/Yr

Mo /Day/Yr

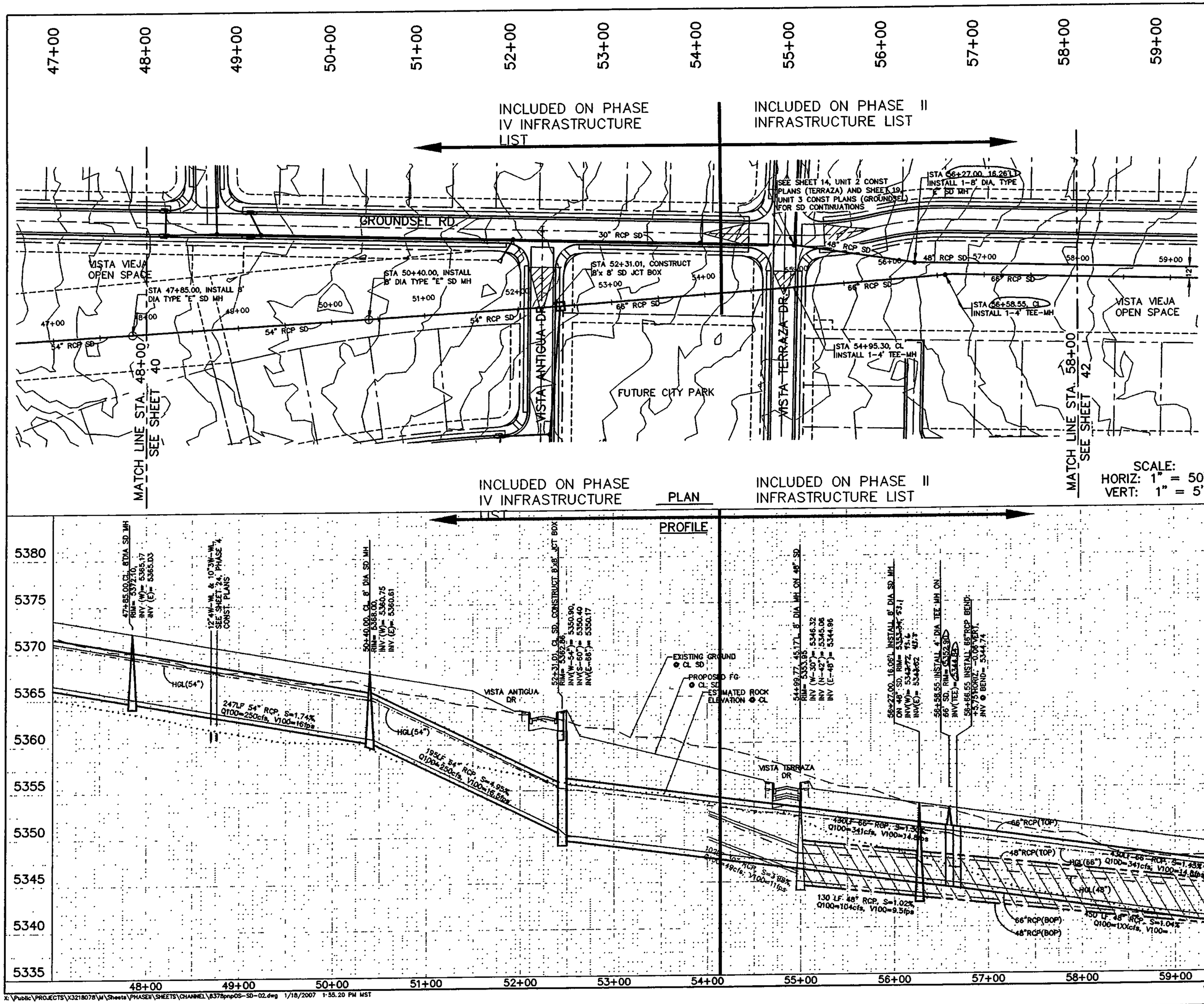
C.I.y Project No. 7633.84

Zone Map No. D-9

Sheet 34A Of 35

RECORD DRAWING
DATE 4-10-09

RECORD DRAWINGS



SURVEY INFORMATION

BENCH MARKS

STD. XXX

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X. 361860.83, Y. 1521476.37

ELEVATION = 5390.130 FT. (SLD 1929)

AS-BUILT INFORMATION

CONTRACTOR

WORK STAKED BY: Cardenas Surveys Inc. DATE 2-07

AS-BUILTED BY: WILSON & Co. DATE 11/07

ACCEPTANCE

VERIFICATION BY: Cardenas Surveys Inc. DATE 2-07

COMMENTS

MICRO-FILM INFORMATION

RECORDED BY

DATE

NO.

NO.	DATE	FIELD NOTES BY

ENGINEER'S SEAL

ROBERT S. MACLANE 12185 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS: REVISIONS BY
		WILSON & COMPANY, ENGINEERS & ARCHITECTS
		DESIGNED BY RSM DATE OCTOBER 2006
		DRAWN BY RKS DATE OCTOBER 2006
		CHECKED BY RSM DATE OCTOBER 2006

Certification

THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA PHASE 2
OPEN SPACE STORM DRAIN

Design Review Committee: APPROVED FEB 19 2007 DESIGN REVIEW COMMITTEE

City Engineer Approval: APPROVED FEB 23 2007 CITY ENGINEER

Last Design Update: Mo./Day/Yr

Mo./Day/Yr

City Project No. 763382

Zone Map No. D-9

Sheet 41 Of 44

WCEA #X3218078
OCTOBER 2006

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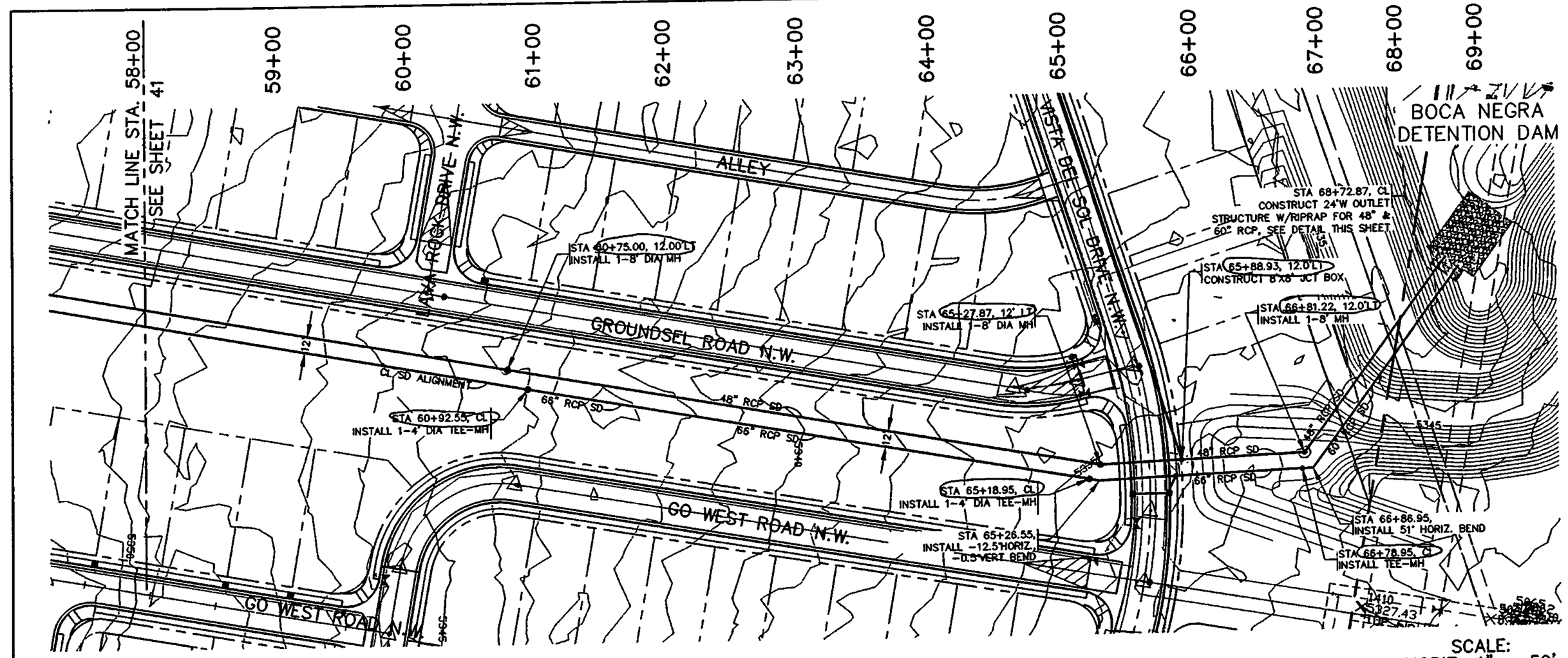
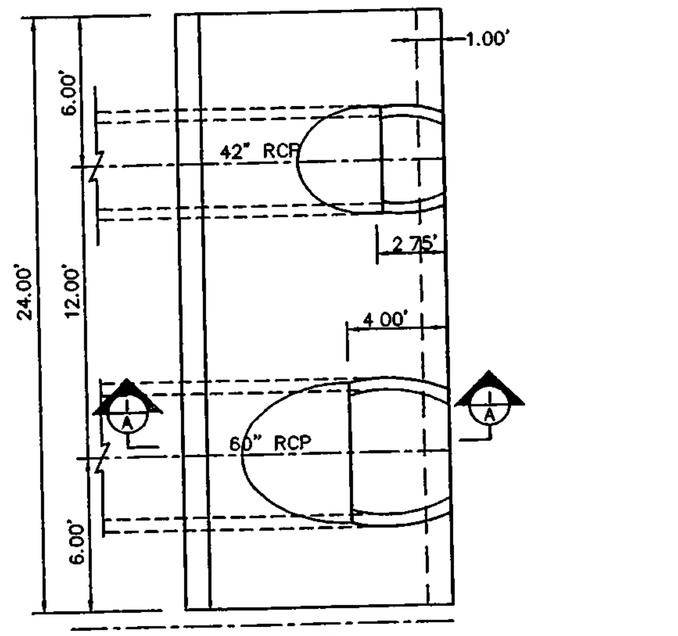
WILSON & COMPANY

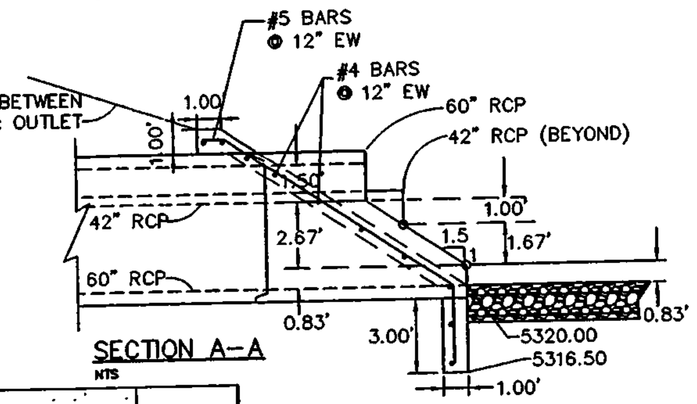
RECORD DRAWING
DATE 11/07

RECORD DRAWINGS



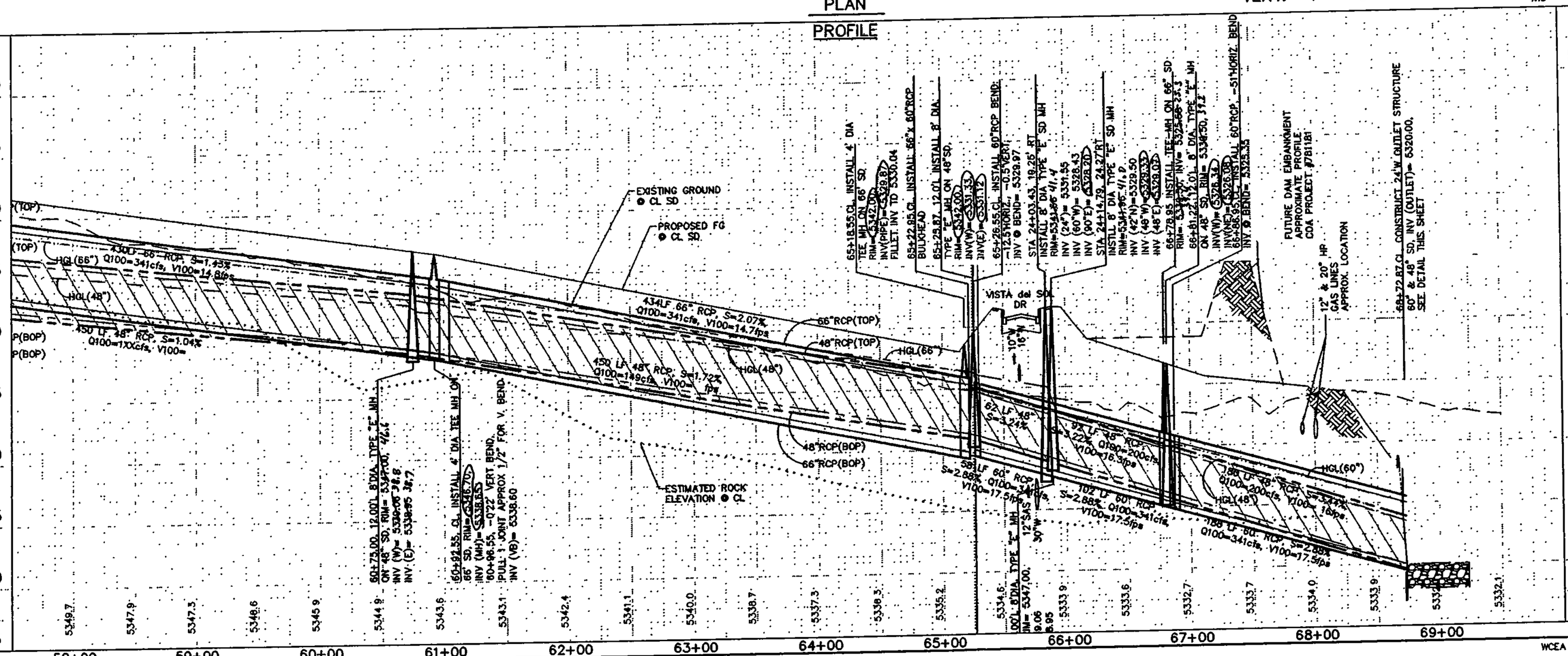


OUTLET STRUCTURE



SECTION A-A
NTS

PROFILE



GENERAL NOTES

CONCRETE FOR STRUCTURAL CAST-IN-PLACE CONCRETE SHALL BE 4000 PSI. CHAMFER ALL EXPOSED EDGES OF CONCRETE STRUCTURES 3/4 INCH UNLESS OTHERWISE NOTED ON THE DETAILS.

REINFORCING BARS SHALL CONFORM TO AASHTO SPECIFICATIONS M-31, GRADE 60 UNLESS NOTED OTHERWISE ON THE DETAILS. DIMENSIONS REFER TO THE CENTERLINE OF BARS UNLESS NOTED OTHERWISE.

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

AS-BUILT INFORMATION
CONTRACTOR — DATE
VERIFIED BY: Cartesian Surveys Inc — DATE 2007
ESTABLISHED BY: — DATE
ACCEPTANCE BY: — DATE 2007
PREPARED BY: Cartesian Surveys Inc.
DRAWINGS BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
STD. XXX
THE STATION IS A 3 1/2" ALUMINIUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS 8-C10, 1986". (NAD 1927).
X 361860.83, Y 1521476.37
ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
ROBERT S. MALLARD
NEW MEXICO
10207
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS
		REVISIONS
		WILSON & COMPANY, ENGINEERS & ARCHITECTS
		DESIGNED BY — DATE OCTOBER 06
		DRAWN BY RKS — DATE OCTOBER 06
		CHECKED BY RSM — DATE OCTOBER 06

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA PHASE 2
OPEN SPACE STORM DRAIN

Design Review Committee: APPROVED FEB 19 2007
City Engineer Approval: FEB 23 2007 CITY ENGINEER
Last Design Update: Mo./Day/Yr.
City Project No. 763382
Zone Map No. D-9
Sheet 42 Of 44

WCEA #X3218078
OCT 2008

WILSON & COMPANY

RECORD DRAWING
DATE 11/07

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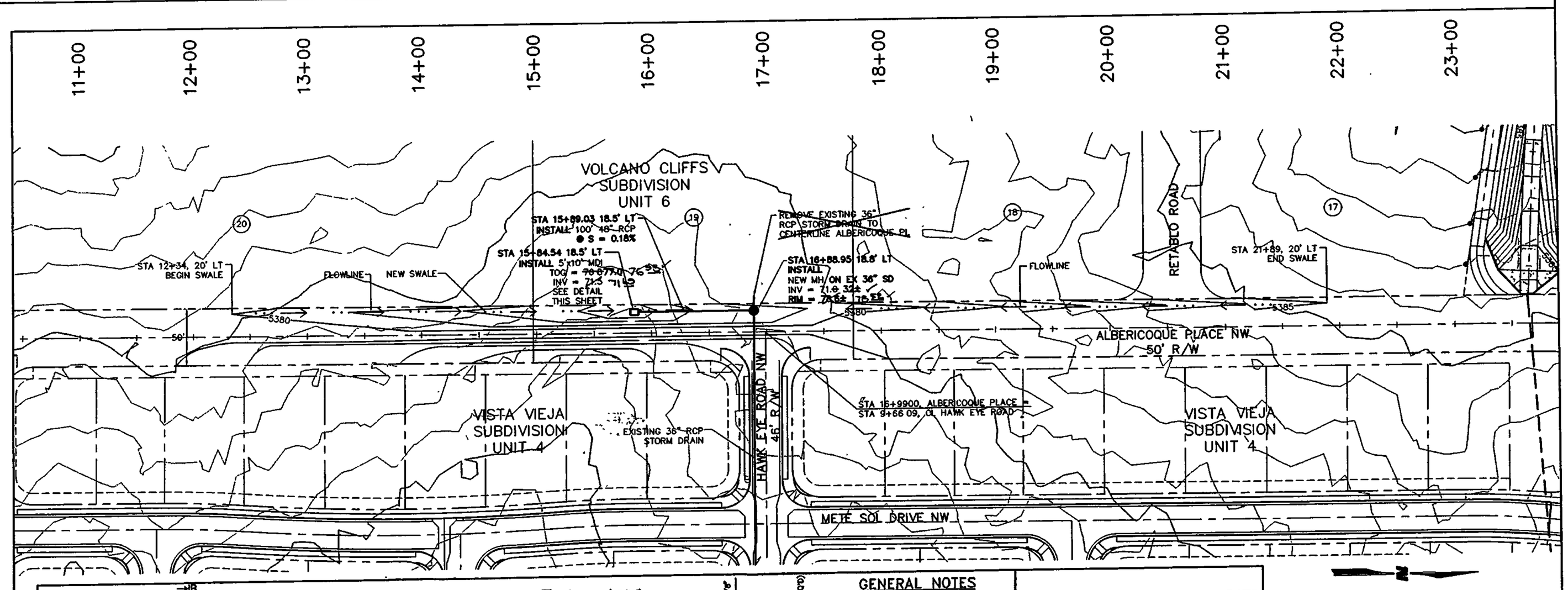
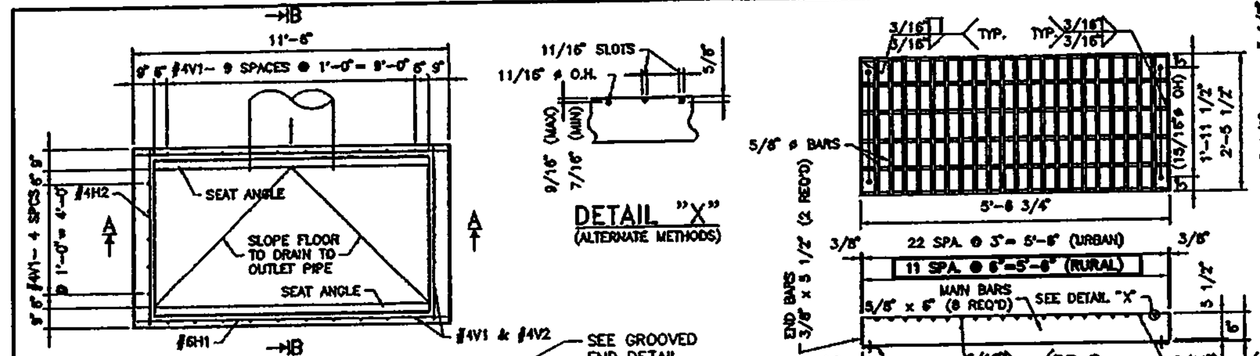


GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.



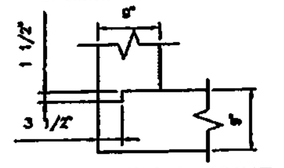
NOTE: FIELD CUT AND BEND REBAR AS REQUIRED TO CLEAR SEAT ANGLES AND PIPE OPENINGS (2" MINIMUM CLEARANCE).

* AVERAGE BOTTOM THICKNESS USE 8 ½" AT OUTLET AND 8½" AT HIGH SIDE.

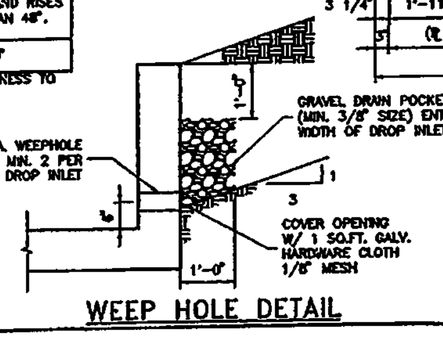
"H" = DIA. OR RISE OF PIPE + "Y" MINIMUM, AND 15'-0" MAXIMUM.

"Y"	DIAMETERS AND RISES UP TO AND INCLUDING 48".	DIAMETERS AND RISES GREATER THAN 48".
	1'-3"	2'-0"

NOTE: IF R.C.P. IS USED, ADD WALL THICKNESS TO DIMENSION "Y".



CONSTRUCTION JOINT DETAIL



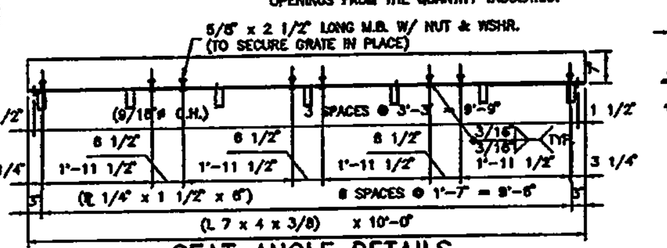
WEEP HOLE DETAIL

GRATE DETAILS
(4 REQUIRED)

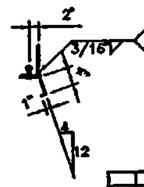
ESTIMATED QUANTITIES
(FOR CONTRACTOR'S INFORMATION ONLY, NOT A BID ITEM)

CLASS "A" CONCRETE	1.832 + 0.917"H" CU.YDS.
REINFORCING STEEL	151.33 + 70.61"H" LBS.
STRUCTURAL STEEL (URBAN)	2320 LBS.
STRUCTURAL STEEL (RURAL)	2220 LBS.

NOTE: TO OBTAIN CLASS "A" CONCRETE QUANTITY, USE VALUE TABULATED ABOVE AND DEDUCT THE VOLUME ON THE PIPE OPENINGS FROM THE QUANTITY TABULATED.



SEAT ANGLE DETAILS
(2 REQUIRED)



MARK	LENGTH	NO REQ'D
*#6H1	11'-3"	2+2.4"H"
*#4H2	8'-3"	2+2.4"H"
#4V1	1'-9"	30
#4V2	"H"-3"	30
#4F1	11'-3"	5
#4F2	8'-3"	10

REINFORCING BAR SCHEDULE
*NOTE: ROUND OFF NUMBER REQUIRED TO THE NEAREST EVEN NUMBER.

GENERAL NOTES

1. WORKMANSHIP AND MATERIALS SHALL CONFORM TO NEW MEXICO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, CURRENT EDITION.
2. ALL CONCRETE SHALL BE CLASS "A". CHAMFER EXPOSED EDGES OF CONCRETE ¾" UNLESS OTHERWISE NOTED ON THE DETAILS.
3. REINFORCING BARS SHALL CONFORM TO AASHTO SPECIFICATION M 31, GRADE 60. DIMENSIONS REFER TO THE CENTERLINE OF BAR UNLESS OTHERWISE NOTED ON THE DETAILS.
4. STRUCTURAL STEEL SHALL CONFORM TO AASHTO SPECIFICATION M 183 AND SHALL BE GIVEN A PROTECTIVE COATING IN CONFORMANCE WITH THE SPECIFICATIONS.
5. DROP INLETS MAY BE USED WITH EITHER R.C.P. OR C.M.P. C.M.P. IS SHOWN IN THE DETAILS.
6. PIPES MAY BE LOCATED ON ANY WALL AND MAY BE ANY SHAPE. DIAMETER OR SPAN OF THE PIPES WILL BE DETERMINED BY THE SKEW ANGLE AND A REQUIRED MINIMUM CLEARANCE OF 6" TO THE OUTSIDE FACE OF WALLS.
7. THE URBAN GRATING DETAIL SHALL BE USED IN ALL CASES UNLESS CALLED OUT ON THE PLANS.

DRAWINGS REQUIRED

ROADWAY DESIGN DRAWINGS: FOR PIPE TYPE, LOCATION, HEIGHT, SKEW ANGLE, AND NUMBER REQUIRED.

DESIGN DATA

DESIGN ACCORDING TO AASHTO SPECIFICATIONS CURRENT EDITION.
DESIGN STRESSES:
REINFORCED CONCRETE: f'c= 1200 psi, Fy= 60,000 psi, n= 10.
STRUCTURAL STEEL: fs= 20,000 psi, Fy= 36,000 psi.
EARTH PRESSURE: 38 lbs/cu.ft. EQUIV. FLUID PRESSURE 2'-0" SURCHARGE.
LIVE LOAD ON STANDARD GRATING: ONE 16,000 lb. WHEEL PLUS 30 % IMPACT, 15 % OVERSTRESS.

NOTE: MEDIAN DROP INLETS, COMPLETE IN PLACE, WILL BE PAID FOR AT THE UNIT PRICE BID PER EACH.

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS (OR CHANGE NOTICES)

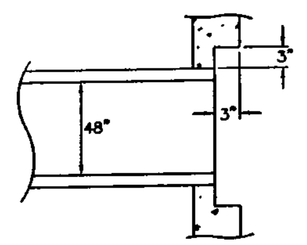
NEW MEXICO DEPARTMENT OF TRANSPORTATION STANDARD DRAWING

MEDIAN DROP INLET 10'-0" X 5'-0" DETAILS AND QUANTITIES

APPROVED: [illegible] A-1-PC
DESIGNER ENGINEER DATE
DESIGNED BY ____ DRAWN BY ____ CHECKED BY ____

523-05-1/1

1. ALL WORK DETAILED ON THESE PLANS SHALL, EXCEPT OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1996 EDITION AS AMENDED THROUGH UPDATE 7 INCLUDING AMENDMENT 1



GROOVED END FOR 48" PIPE CONNECTION @ MDI DETAIL
NTS

SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, Hereby Certify that the as-built information shown here is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

Russ P. Hugg NMPS No. 9750 20[illegible]

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. HUGG

AS-BUILT INFORMATION
CONTRACTOR [illegible]
STAKED BY [illegible]
INSPECTORS [illegible]
FIELD [illegible]
DRAWINGS [illegible]
COMPUTED BY [illegible]
MICRO-FILM INFORMATION
RECORDED BY
DATE
NO.

BENCH MARKS
THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS 8-C10, 1996". (NAD 1927). X= 361860.83, Y= 1521476.37
ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	DESIGNED BY	DRAWN BY	CHECKED BY
			WCI		
1	1/18	ADD INTAKE STRUCTURE	DSA	JMB	DSA

REVISIONS
WILSON & COMPANY, ENGINEERS & ARCHITECTS
DATE JANUARY 2008
DATE JANUARY 2008
DATE JANUARY 2008

WILSON & COMPANY
4900 LANG AVENUE NE
ALBUQUERQUE, NM 87110
(505) 348-4000

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA SUBDIVISION 36" INTAKE STRUCTURE

Design Review Committee	City Engineer Approval	Last Design Update	No /Day/Yr	No /Day/Yr
APPROVED DEC 23 2008 DESIGN REVIEW COMMITTEE	APPROVED DEC 23 2008 CITY ENGINEER			

City Project No. 7633.84. | Zone Map No. D-9 | Sheet 19A of 35

RECORD DRAWING
DATE 4-10-09

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CITY OF ALBUQUERQUE, NEW MEXICO
PUBLIC WORKS DEPARTMENT

CONSTRUCTION PLANS
FOR

VISTA VIEJA PHASE IV

PUBLIC INFRASTRUCTURE IMPROVEMENTS

INDEX

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GENERAL NOTES	2	
PLATS and SURVEY CONTROL	3–5	
OVERALL VISTA VIEJA DRAINAGE PLAN	6	
GRADING & DRAINAGE PLAN– PHASE 4	7–8	
OVERALL STORM DRAIN PLAN– PHASE 4	9	
OVERALL PAVING PLAN– PHASE 4	10	
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OVERALL WATER and SANITARY SEWER PLAN– PHASE 4	12	
OVERALL DRY UTILITY & STREET LIGHTING PLAN– PHASE 4	13	
PAVING & STORM DRAIN PLAN & PROFILE		
METE SOL DRIVE, N.W.	14	
METE SOL DRIVE, N.W./ BUTEOS DRIVE N.W.	15	
VISTA ANTIGUA DRIVE, N.W./ALLEY	16	
PICTOR DRIVE N.W.	17	
SILK TASSEL ROAD, N.W.	18	
HAWK EYE ROAD, N.W.	19	19A 36" INTAKE STRUCTURE
WILD DUNES ROAD, N.W.	20	
MESA TOP ROAD, N.W.	21	
VISTA VIEJA AVENUE, N.W.	22	
WATER & SANITARY SEWER PLAN & PROFILE		
METE SOL DRIVE, N.W.	23	
METE SOL DRIVE, N.W./ BUTEOS DRIVE, N.W.	24	
VISTA ANTIGUA DRIVE, N.W.	25	
PICTOR DRIVE N.W.	26	
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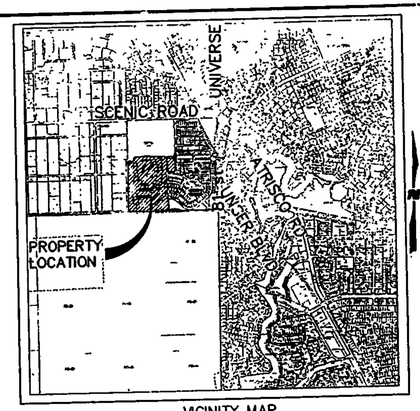
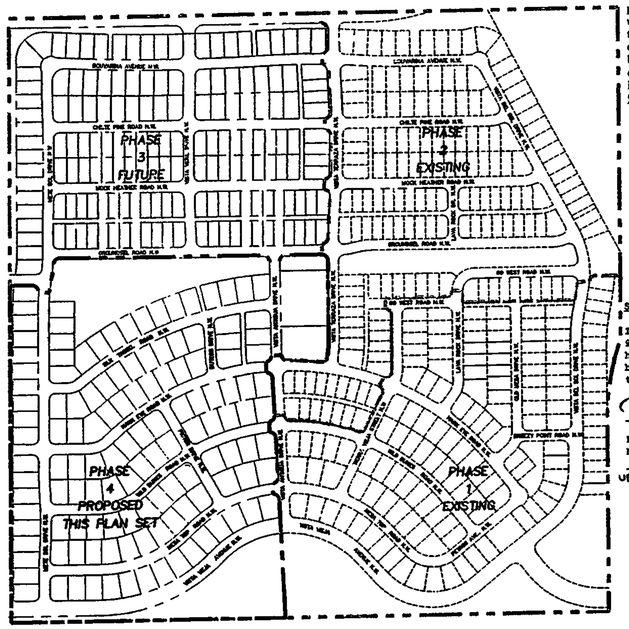
STORM DRAINAGE		
OPEN SPACE STORM DRAIN PLAN & PROFILE	34–35	
OFFSITE DRAINAGE IMPROVEMENTS	34A, 34B	



VICINITY MAP
ZONE ATLAS MAP NO. D-9

LEGEND

EXISTING		PROPOSED	
SAS	SANITARY SEWER	SAS	SANITARY SEWER
WL	WATER LINE	W	WATER LINE
G	GAS LINE	G	GAS LINE
SD	STORM DRAIN	SD	STORM DRAIN
T	TELEPHONE LINE		ELECTRICAL CONDUIT
UT	UNDERGROUND TELEPHONE LINE		WHEELCHAIR RAMP
UE	UNDERGROUND ELECTRICAL LINE		CROWN REDUCTION
TC	TRAFFIC SIGNAL CONDUIT		SIDEWALK
	CURB & GUTTER	FOC / EOP	FACE OF CURB / EDGE OF PAVEMENT
	TELEPHONE BOX		CENTER LINE
	MANHOLE		MANHOLE
	WATER VALVE		WATER VALVE
WM	WATER METER		WATER SERVICE
	SAS SERVICE W/ CAP		SAS SERVICE W/ CAP
	STORM INLET		STORM INLET
	FIRE HYDRANT		FIRE HYDRANT
PP / PB	POWER POLE		LIGHT POLE
	PULL BOX		AIR RELEASE VALVE
	LIGHT POLE		
	TREE/SHRUB		
5094	INTERMEDIATE CONTOUR		
5095	INDEX CONTOUR		
	PAVEMENT REMOVAL		



VISTA VIEJA SUBDIVISION
INDEX MAP

CERTIFICATE OF SUBSTANTIAL COMPLIANCE OF PLANS

I, Christopher A. Perea of the firm Wilson & Company, a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision and has been constructed in accordance with the plans and specifications approved by the City Engineer and the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under by direction and survey information provided by Russ P. Hugg, NMPS Number 9750.

CHRISTOPHER A. PEREA NEW MEXICO 13686 REGISTERED PROFESSIONAL ENGINEER 4-10-9

SURVEYORS CERTIFICATION

I, Russ P. Hugg, New Mexico Professional Surveyor Number 9750, hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief;

Russ P. Hugg
NMPS No. 9750
2-28, 2008
UPDATED- 4-01-09

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. HUGG

RECORD DRAWING
DATE 4-10-09

WCEA FILE NO. X3218078

WILSON & COMPANY
4900 LANG AVENUE N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 348-4000

DRB CASE No. 1004607

REV	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE
1	19A, 34A, 34B		12-22-08		12/23/08		

ENGINEERS STAMP & SIGNATURE

ROBERT S. MACLANE NEW MEXICO 13583 REGISTERED PROFESSIONAL ENGINEER 4-2-07

APPROVALS	ENGINEER	DATE
DRC Chairman		3-21-07
Transportation		2/26/07
Water/Wastewater		3/2/07
Hydrology		2/26/07

APPROVED FOR CONSTRUCTION

City Engineer — Date 3-28-07

Project No. 763384

Sheet 1 of 35

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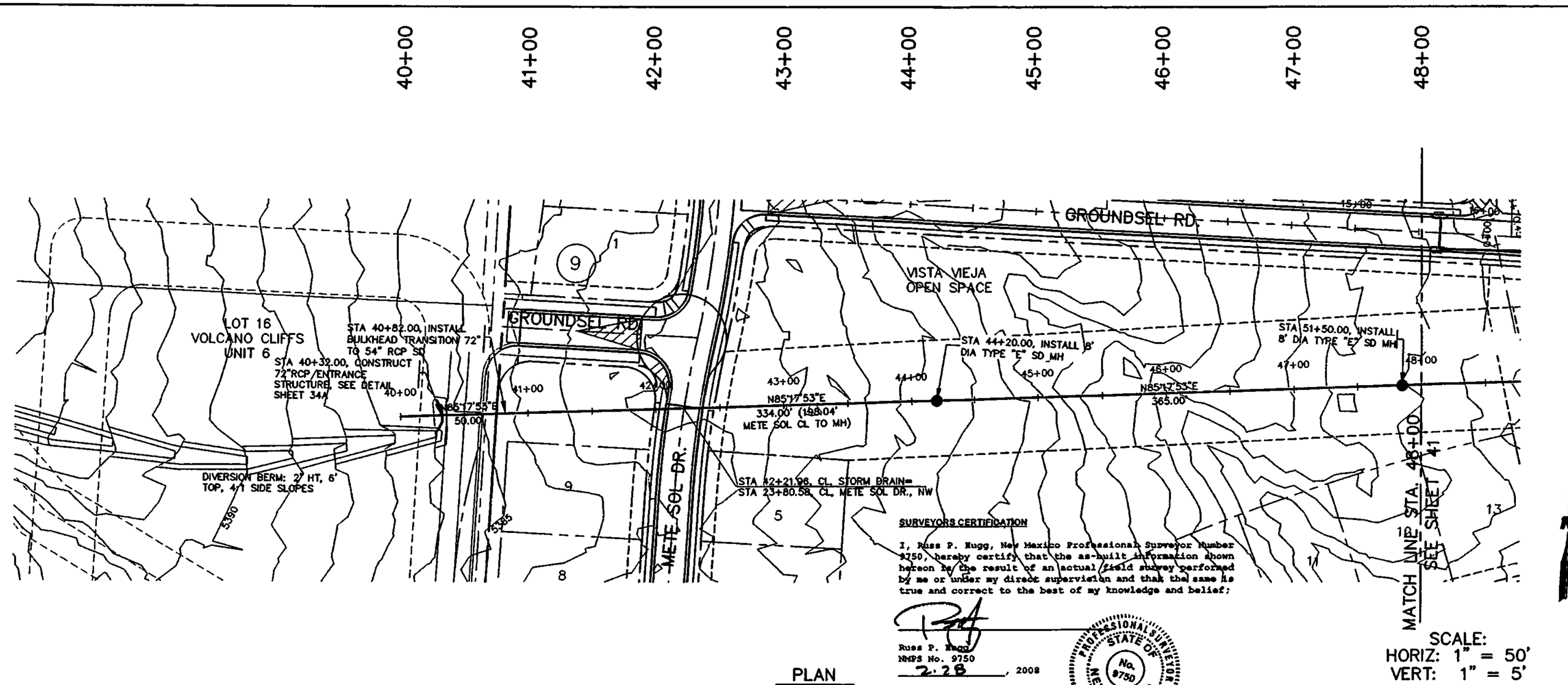

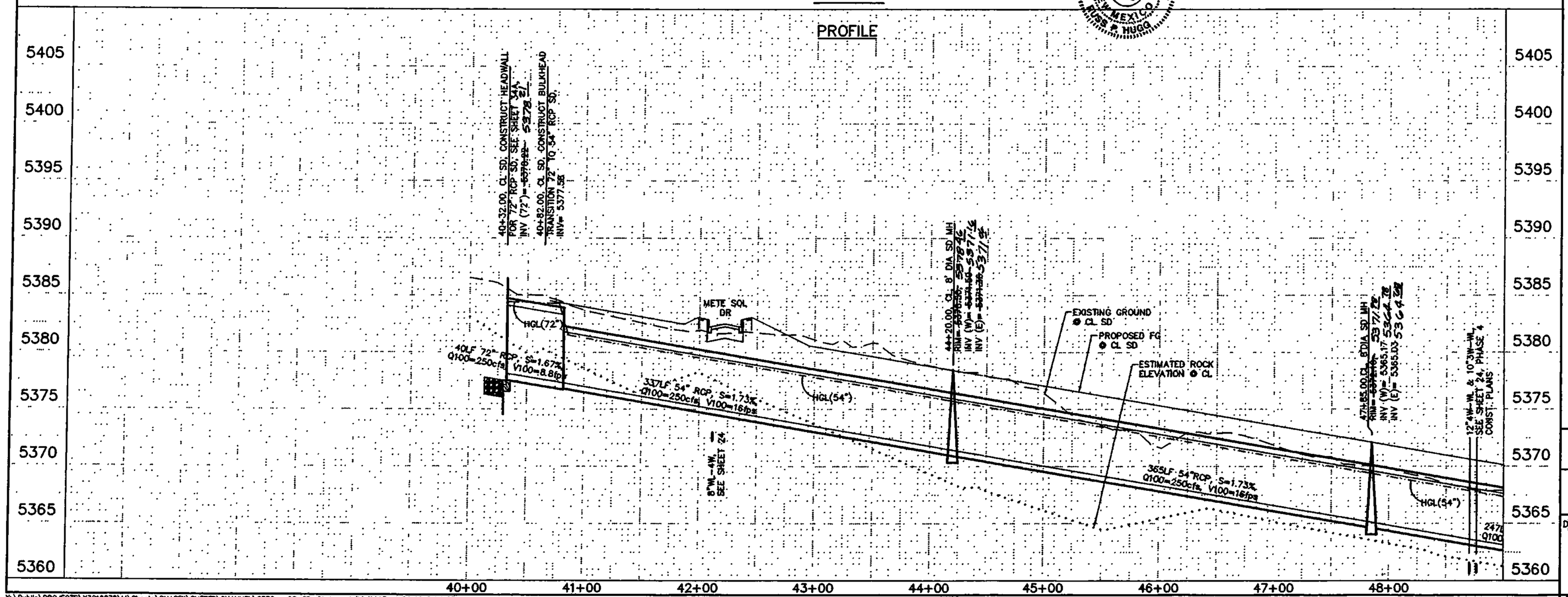

AS-BUILT INFORMATION		
CONTRACTOR		DATE
WORK ORDERED BY		DATE
INSPECTED & ACCEPTANCE BY		DATE
VERIFICATION BY		DATE
CORRECTED BY		DATE
RECORDED BY		DATE

BENCH MARKS

STD. XXX

THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS 8-C10, 1986". (NAD 1927).

X 361860.83, Y 1521476.37

ELEVATION = 5390.130 FT. (SLD 1929)

MICRO-FILM INFORMATION

NO.	DATE	REMARKS

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

ROBERT S. MACLAKE, NEW MEXICO, 15269, REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	

WILSON & COMPANY, ENGINEERS & ARCHITECTS

DESIGNED BY RSM — DATE OCTOBER 2006

DRAWN BY RKS — DATE OCTOBER 2006

CHECKED BY RSM — DATE OCTOBER 2006

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA PHASE 4
OPEN SPACE STORM DRAIN

Design Review Committee: APPROVED MAR 21 2007 DESIGN REVIEW COMMITTEE

City Engineer Approval: APPROVED MAR 28 2007 CITY ENGINEER

Last Design Update: Mo./Day/Yr.

Last Plan Update: Mo./Day/Yr.

City Project No. 763384 | Zone Map No. D-9 | Sheet 34 Of 35

WCEA #X3218078
OCTOBER 2006

WILSON & COMPANY

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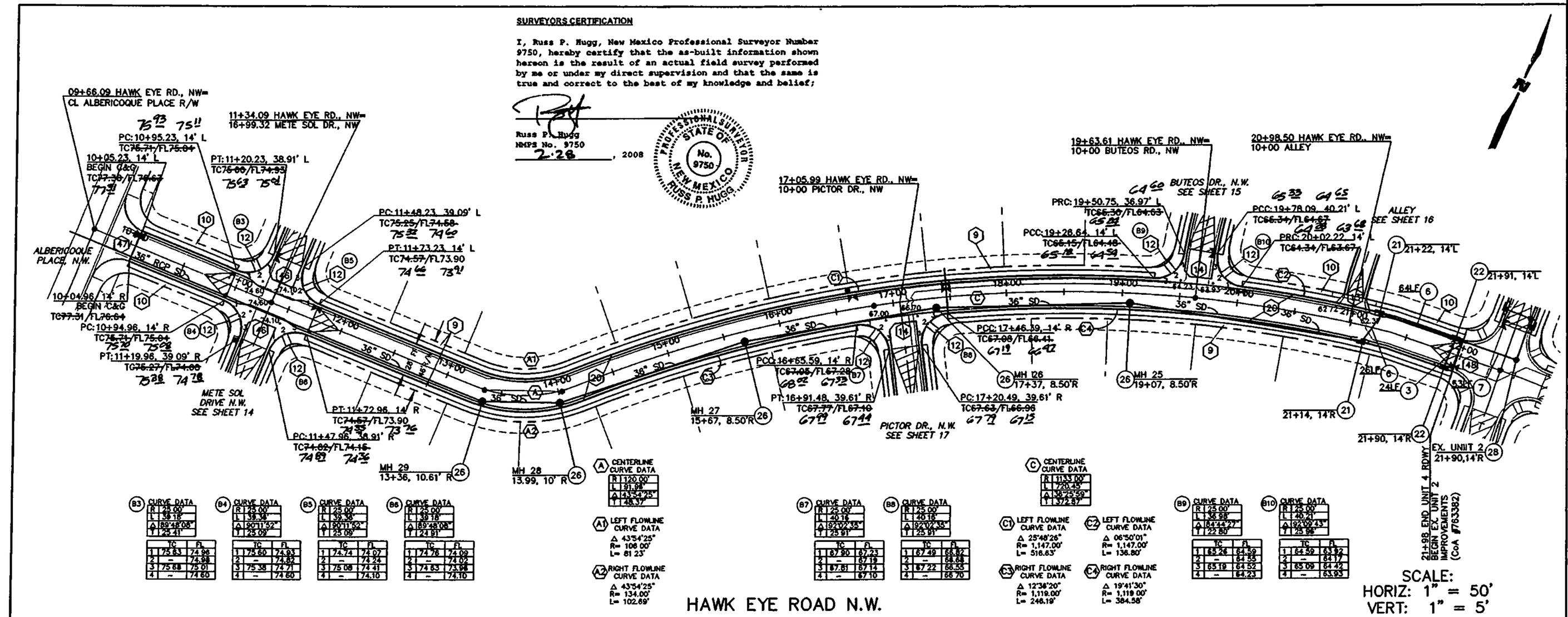
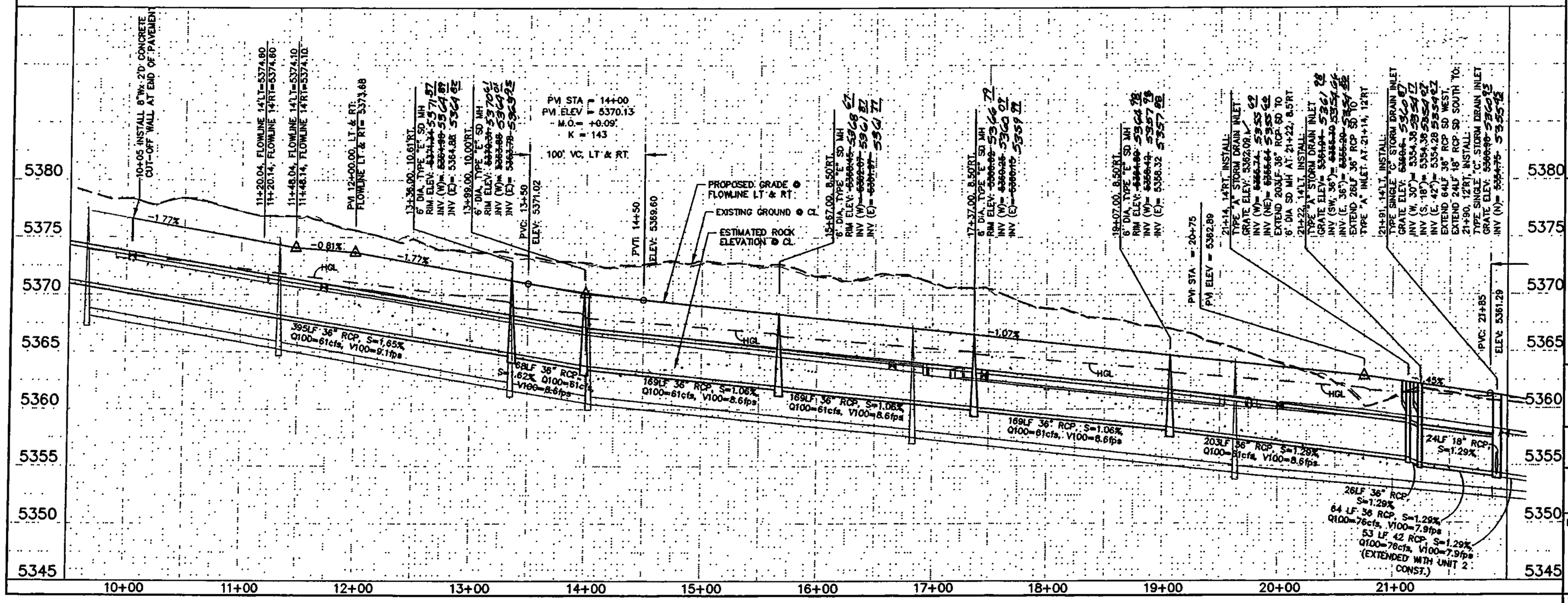


PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
9	4' PCC SIDEWALK, PER COA STD. DWG. 2430 (DEFERRED)
10	BUILD 4' PCC SIDEWALK, PER COA STD. DWG. 2430
12	BUILD PCC WHEELCHAIR RAMP W/ TRUNCATED DOMES PER COA STD. DWG. 2441 (SEE DETAIL, SHEET 11)
13	BUILD DRIVEPAD 20' NOMINAL, PER COA STD. DWG. 2425
14	BUILD PCC 6" VALLEY GUTTER, PER COA STD. DWG. 2420
20	BUILD PCC STD. CURB AND GUTTER, PER COA STD. DWG. 2415A
46	BUILD PCC 10' VALLEY GUTTER, PER COA STD. DWG. 2422
47	INSTALL CUT-OFF WALL PER CoA STD DWG 2415A. INSTALL TYPE III BARRICADES
48	REMOVE EX. CUT-OFF WALL AND BARRICADES. MATCH NEW ASPHALT PAVEMENT TO EXISTING.

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
3	INSTALL 18" CL III, RCP STORM DRAIN PER CoA STD. SPEC. 901
6	INSTALL 36" CL III, RCP STORM DRAIN PER CoA STD. SPEC. 901
7	INSTALL 42" CL III, RCP STORM DRAIN PER CoA STD. SPEC. 901
21	INSTALL TYPE "A" STORM INLET PER CoA STD. DWG #2201 & #2202
22	INSTALL TYPE "C" STORM INLET PER CoA STD. DWG #2205. SEE PLAN FOR "SINGLE" OR "DOUBLE"
26	INSTALL 6' DIA SD MANHOLE PER CoA STD. DWG. #2101
28	INSTALL 8' DIA SD MANHOLE PER CoA STD. DWG. #2101



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AS-BUILT INFORMATION
CONTRACTOR — DATE
ENGR'S. BY — DATE
SURVEYOR'S BY
FIELD — DATE
CALCULATION BY
DRAWING CORRECTION BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE — NO

BENCH MARKS
THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS B-C10, 1986". (NAD 1927)
X= 361860.83, Y= 1521476.37
ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. — BY — DATE

ENGINEER'S SEAL
PROFESSIONAL ENGINEER STATE OF NEW MEXICO No. 12079 ROBERT S. MACLAM

NO.	DATE	REMARKS
		REVISIONS
	BY	WILSON & COMPANY, ENGINEERS & ARCHITECTS
DESIGNED BY	RSM	DATE JANUARY 2007
DRAWN BY	STAFF	DATE JANUARY 2007
CHECKED BY	RSM	DATE JANUARY 2007

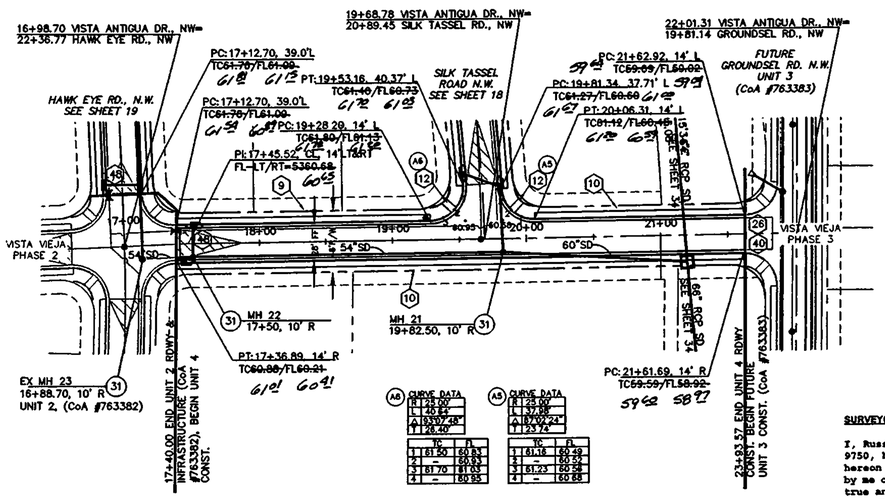
WILSON & COMPANY
4900 LANG AVENUE NE
ALBUQUERQUE, NM 87110
(505) 348-4000

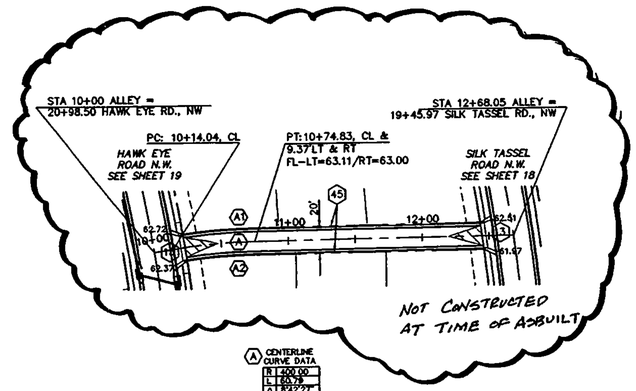
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

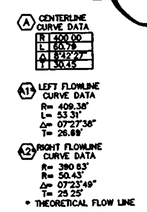
VISTA VIEJA PHASE 4
PAVING AND STORM DRAIN PLAN & PROFILE
HAWK EYE ROAD N.W.

Design Review Committee: APPROVED MAR 21 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED MAR 28 2007 DESIGN REVIEW COMMITTEE
Last Design Update: Mo /Day/Yr — Mo /Day/Yr

City Project No. 763384
Zone Map No. D-9
Sheet 19 Of 35







SURVEYORS CERTIFICATION

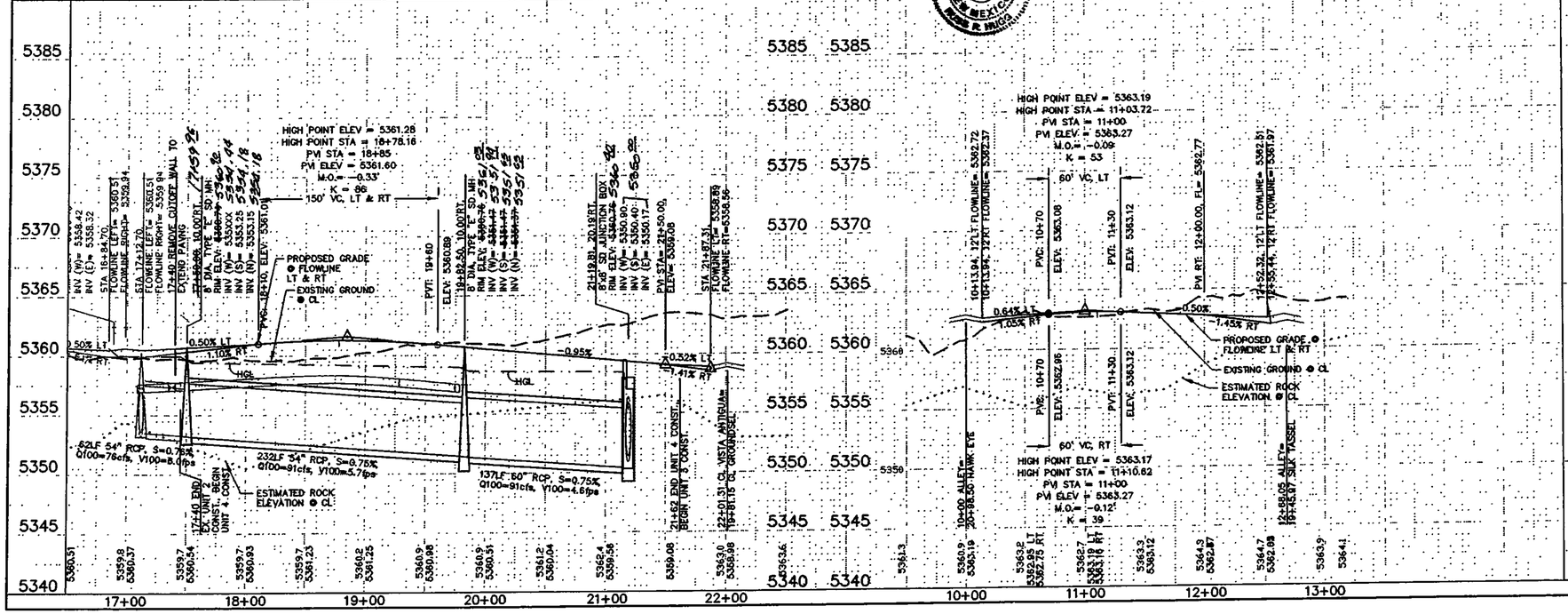
I, Russ P. Rugg, New Mexico Professional Surveyor Number 9750, hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief;

Russ P. Rugg
NMPS No. 9750
2-28, 2008

PROFESSIONAL SURVEYOR STATE OF NEW MEXICO No. 9750 RUSS P. RUGG

ALLEY

SCALE:
HORIZ: 1" = 50'
VERT: 1" = 5'



PAVING CONSTRUCTION NOTES

I.D.#	DESCRIPTION
9	4' PCC SIDEWALK, PER COA STD. DWG. 2430 (DEFERRED)
10	BUILD 4' PCC SIDEWALK, PER COA STD. DWG. 2430
12	BUILD PCC WHEELCHAIR RAMP W/ TRUNCATED DOMES PER COA STD. DWG. 2441 (SEE DETAIL, SHEET 11)
13	BUILD DRIVEPAD 20' NOMINAL, PER COA STD. DWG. 2425
20	BUILD PCC STD. CURB AND GUTTER, PER COA STD. DWG. 2415A
26	BUILD PCC CUT-OFF WALL, PER COA STD. DWG. 2415
40	INSTALL TYPE III BARRICADES
45	BUILD MOUNTABLE CURB, ROLL TYPE , PER COA STD. DWG.2415A
48	REMOVE EX. CUT-OFF WALL AND BARRICADES. MATCH NEW ASPHALT PAVEMENT TO EXISTING.

STORM DRAIN CONSTRUCTION NOTES

I.D.#	DESCRIPTION
31	INSTALL 6' DIA. MANHOLE PER COA STD. DTL. 2101

LEGEND

- TC — TOP OF CURB
- FL — FLOWLINE
- 38.85 — FLOWLINE ELEVATION AT INTERSECTION OF PROJECTED FACE OF CURB.
- TRANSITION CROWN PER COA STD DWG 2401

GENERAL NOTES

1. ALL CURB RETURNS HAVE 25' RADIUS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHERWISE INDICATED
2. ALL STATIONS AND OFFSETS ARE TO THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHERWISE INDICATED
3. ALL CURB LAYOUT DATA IS AT THEORETICAL FACE OF CURB (FLOWLINE) PER COA STD DWG 2415A, UNLESS OTHERWISE INDICATED. CURB LAYOUT THAT IS A DIRECT OFFSET OF PLATTED BASELINE IS NOT SHOWN
4. ADJUST ALL MANHOLE RIMS AND VALVE COVERS PER COA STD. DWG. 2460

AS-BUILT INFORMATION
CONTRACTOR — DATE
STAKED BY — DATE
INSPECTED BY
FIELD VERIFICATION BY — DATE
DELINEATED BY
CONNECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
THE STATION IS A 3 1/2" ALUMINUM CAP SET FLUSH IN THE LAVA OUTCROP, AND IS STAMPED "ACS B-C10, 1986". (NAD 1927). X= 361860.83, Y= 1521476.37
ELEVATION = 5390.130 FT. (SLD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
ROBERT S. MACLANE NEW MEXICO 15269 REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY
		REVISIONS	
		WILSON & COMPANY, ENGINEERS & ARCHITECTS	
		DESIGNED BY RSM	DATE JANUARY 2007
		DRAWN BY STAFF	DATE JANUARY 2007
		CHECKED BY RSM	DATE JANUARY 2007

WILSON & COMPANY
4900 LANG AVENUE NE
ALBUQUERQUE, NM 87110
(505) 348-4000

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

VISTA VIEJA PHASE 4
PAVING AND STORM DRAIN PLAN & PROFILE
VISTA ANTIGUA DRIVE N.W./ALLEY

Design Review Committee: APPROVED MAR 21 200/ DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED MAR 28 200/ DESIGN REVIEW COMMITTEE

Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No. 763384 | Zone Map No. D-9 | Sheet 16 Of 35

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APPENDIX 5
FACILITY MAINTENANCE

FACILITY MAINTENANCE

All facilities in this LOMR will be maintained and operated by the City of Albuquerque (COA). The COA maintains all drainage facilities on a routine schedule to ensure facilities are operating as intended.