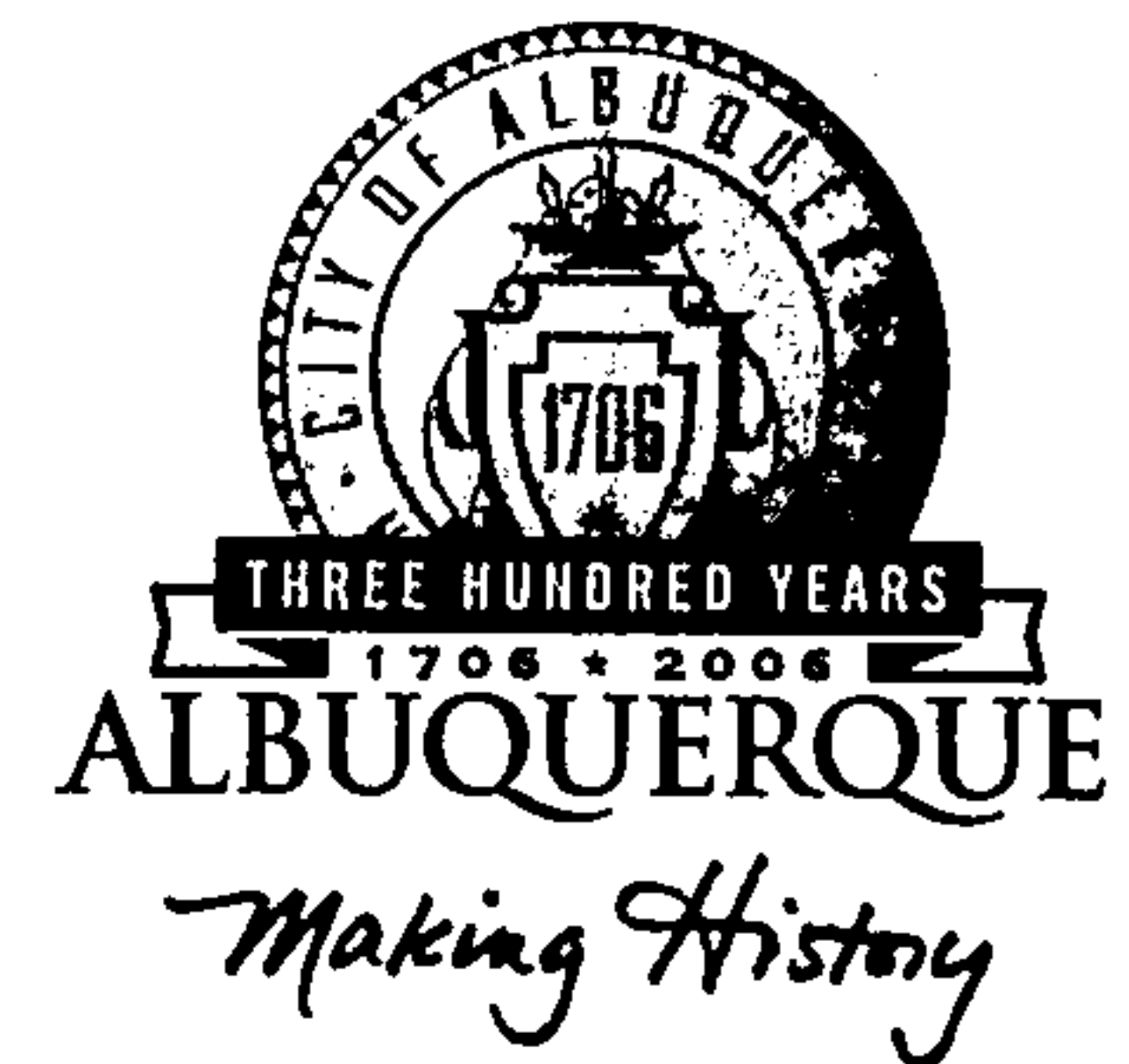


CITY OF ALBUQUERQUE



September 22, 2004

Ms. Genny Donart, PE
ISAACSON & ARFMAN, PA
128 Monroe St. NE
Albuquerque, NM 87108

RE: EL RANCHO GRANDE, UNIT 8A (M-09/D019B)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 08/06/2003
Engineers Certification dated 09/20/2004

Dear Genny:

P.O. Box 1293

Based upon the information provided in your Engineer's Certification Submittal dated 09/22/2004, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

Albuquerque

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

New Mexico 87103

Sincerely,

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

Bub

www.cabq.gov

C: Marilyn Maldonado, COA# 699384
File

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

M-9/D19B

PROJECT TITLE: El Rancho Grande Unit 8A ZONE MAP / DRG. FILE #: M-9/D19B
DRB #: 1001347 EPC #: _____ WORK ORDER #: 699384

LEGAL DESCRIPTION: Tract D1A, Albuquerque South, Unit 3
CITY ADDRESS: _____

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

OWNER: Curb, Inc CONTACT: Bo Johnson
ADDRESS: 5160 San Francisco NE PHONE: 899-9656
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: Albuquerque, New Mexico ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich
ADDRESS: _____ PHONE: 884-1990
CITY, STATE: Albuquerque, New Mexico ZIP CODE: _____

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

CHECK TYPE OF SUBMITTAL:

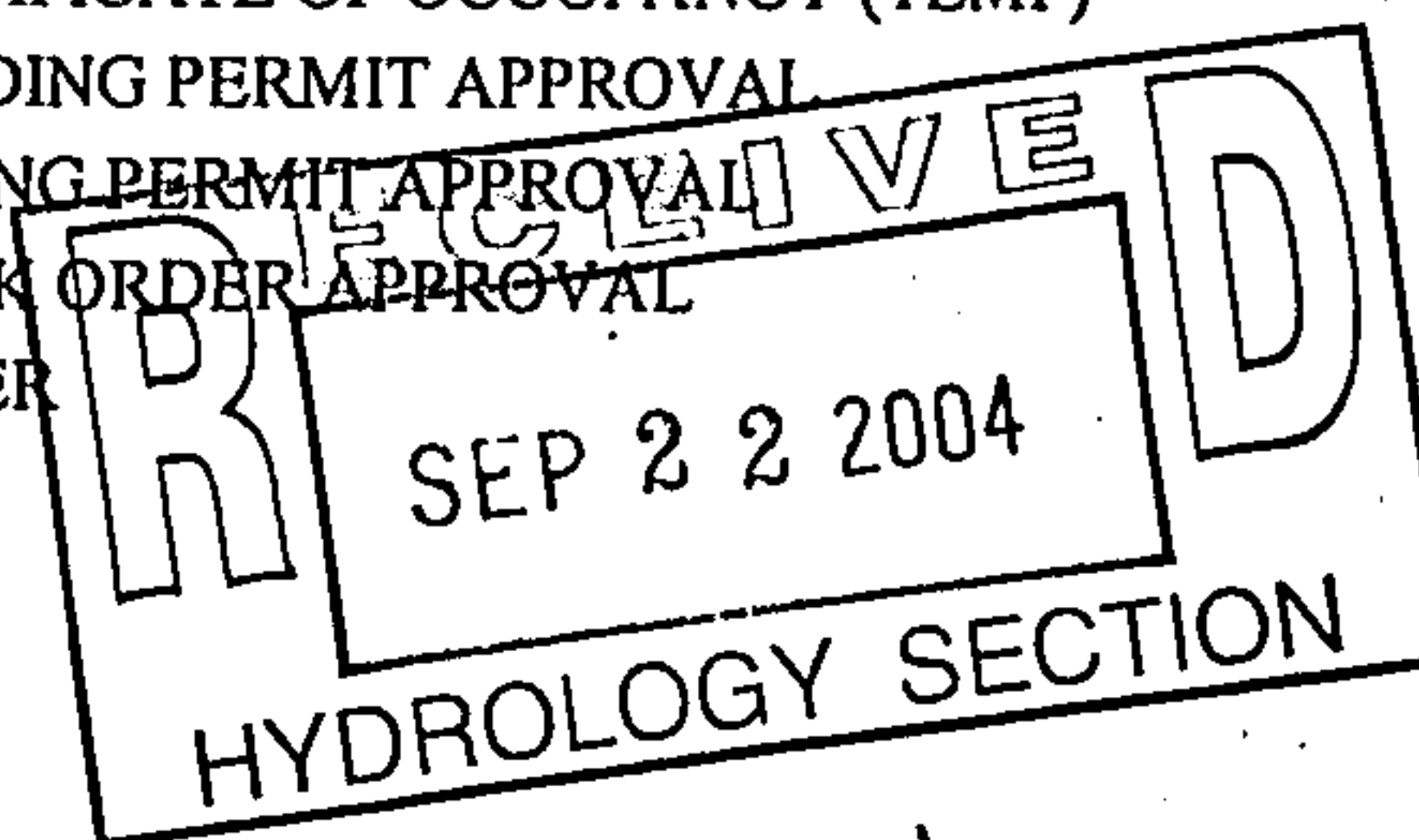
☐ DRAINAGE REPORT
☐ DRAINAGE PLAN 1ST *REQUIRES TCL or equal*
☐ DRAINAGE PLAN RESUBMITTAL
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR / LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEER'S CERTIFICATION (TCL)
☐ ENGINEER'S CERTIFICATION (DRB APPR, SITE PLAN)
☐ OTHER

WAS A PRE-DESIGN CONFERENCE ATTENDED:

☐ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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



DATE SUBMITTED: Monday, September 20, 2004

BY: Isaacson & Arfman, P.A.

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

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

Tim Eichenberg, Chair
Linda Stover, Vice-Chair /
Asst. Secretary-Treasurer
Ronald D. Brown, Secretary-Treasurer
Daniel Hernandez, Director
Daniel Lyon, Director

John P. Kelly, P.E.
Executive Engineer



Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

August 20, 2004

File M9/D19B

Mr. Lyle Losack
Quickdraw, LLC
PO Box 729
Corrales, NM 87048

Re: De Anza El Rancho 8A
Construction of Box Culvert at Gibson and Snow Vista Channel
CERTIFICATION OF COMPLETION AND ACCEPTANCE

Dear Lyle,

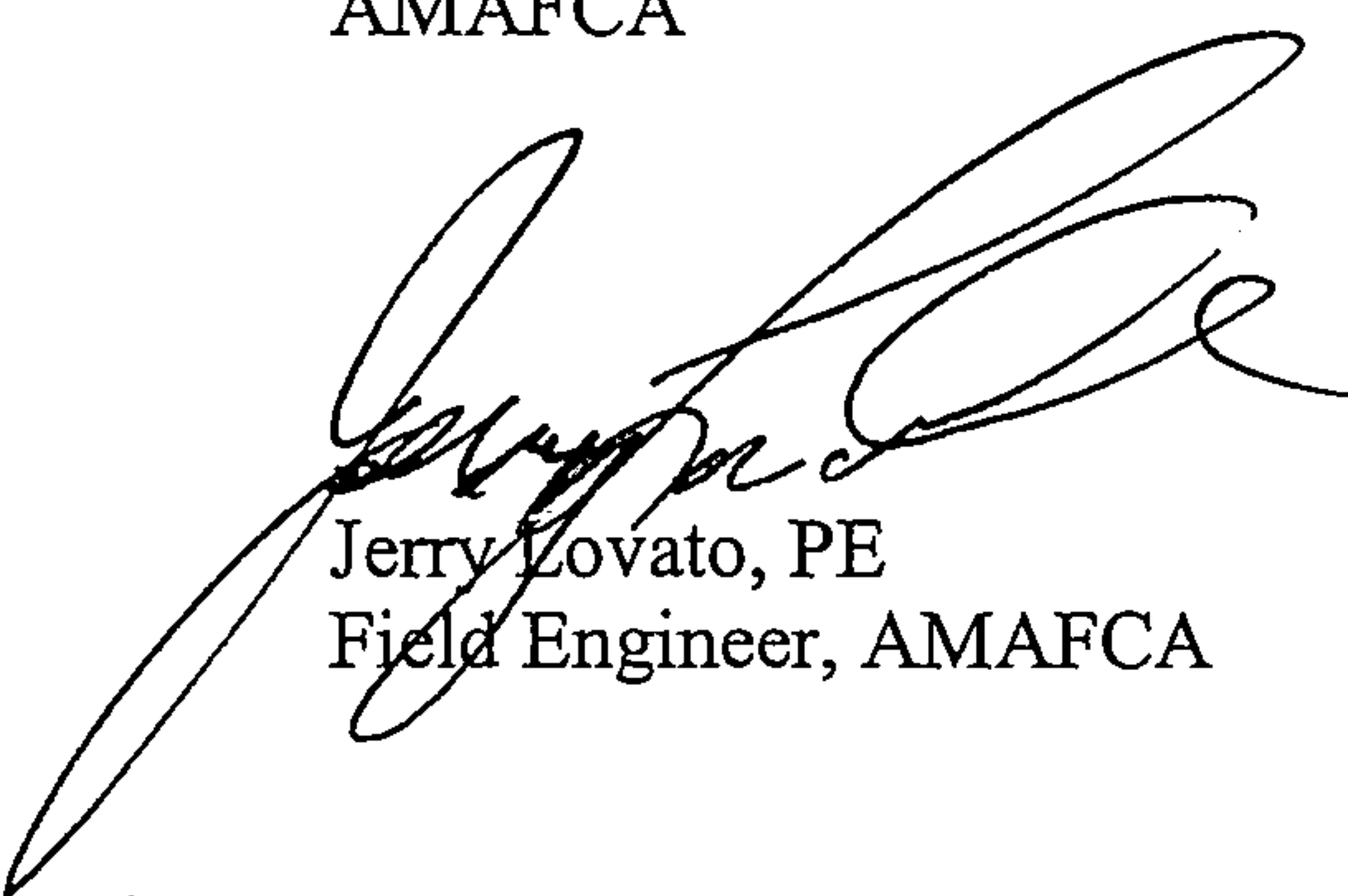
This letter shall serve as acceptance of the work done in and around the Snow Vista Channel at Gibson Boulevard. The installation of Gibson Boulevard and a new box culvert at the Snow Vista Channel is acceptable to AMAFCA. This portion of the project has been completed to the satisfaction of AMAFCA.

AMAFCA has reviewed the construction and has received as-built plans for the above referenced project.

The contractor's one-year warranty period started on this date, August 20, 2004.

If you have any questions or issues regarding this project please call me at 884-2215.

Sincerely,
AMAFCA


Jerry Lovato, PE
Field Engineer, AMAFCA

cc: Eddy Randall, New Concepts Inc.
Lynn Mazur, AMAFCA
Brad Bingham, City of Albuquerque

*Tim Arch.
HDR
684-5969*

Tim Eichenberg, Chair
Linda Slover, Vice-Chair /
Asst. Secretary-Treasurer
Ronald D. Brown, Secretary-Treasurer
Daniel Hernandez, Director
Daniel Lyon, Director

John P. Kelly, P.E.
Executive Engineer



Genny Donart, PE
Isaacson & Arfman, PA
128 Monroe Street, NE
Albuquerque, NM 87108

**Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority**

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

December 29, 2004

File M9/D19B

Re: El Rancho Grande 8A
AMAFCA Field Visit

AMAFCA made a field visit to the above referenced project on December 28, 2004. During the site visit the following items were observed.

1. Rundown at the east end of De Anza Drive has been undermined and destroyed.
 - a. Concrete section undermined
 - b. Riprap section from the concrete section into the Snow Vista channel as been destroyed due to excessive undermining.

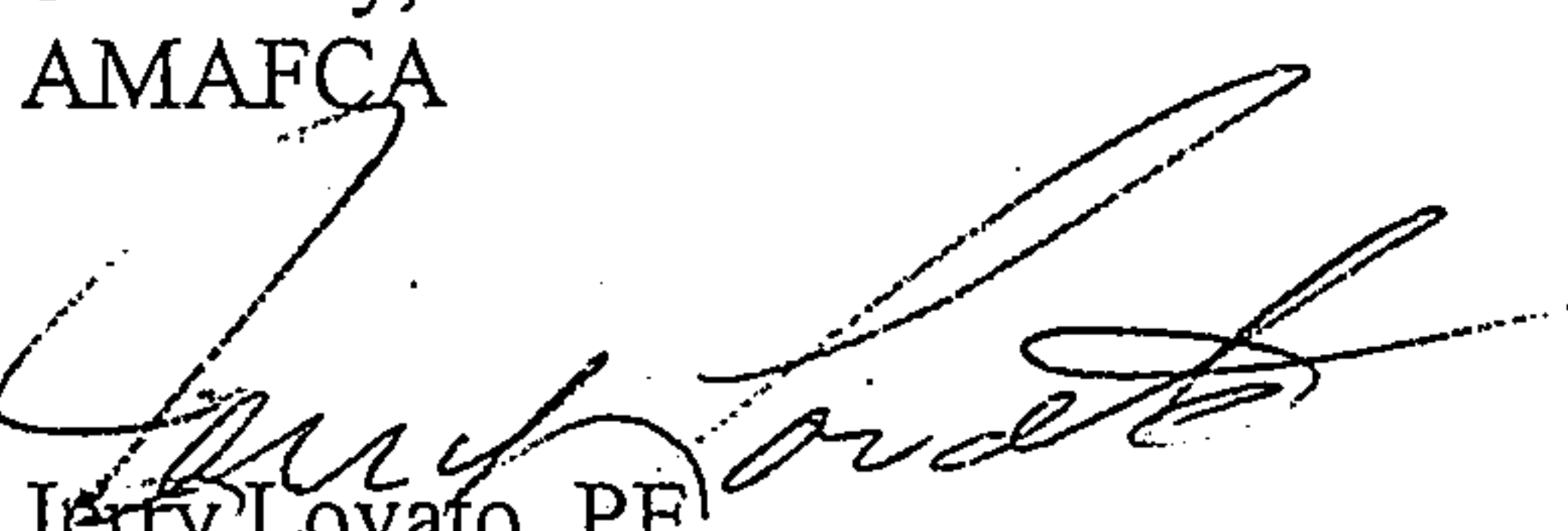
The conditions found above are disturbing in that the facility is less than a year old. Reviewing the project file, as-builts have not been forwarded to AMAFCA. It is unknown at this time if the rundown was built per the lines and grades shown on the plans.

Please review the design of the rundown to ensure that design was adequate for the location, soil conditions and flows anticipated.

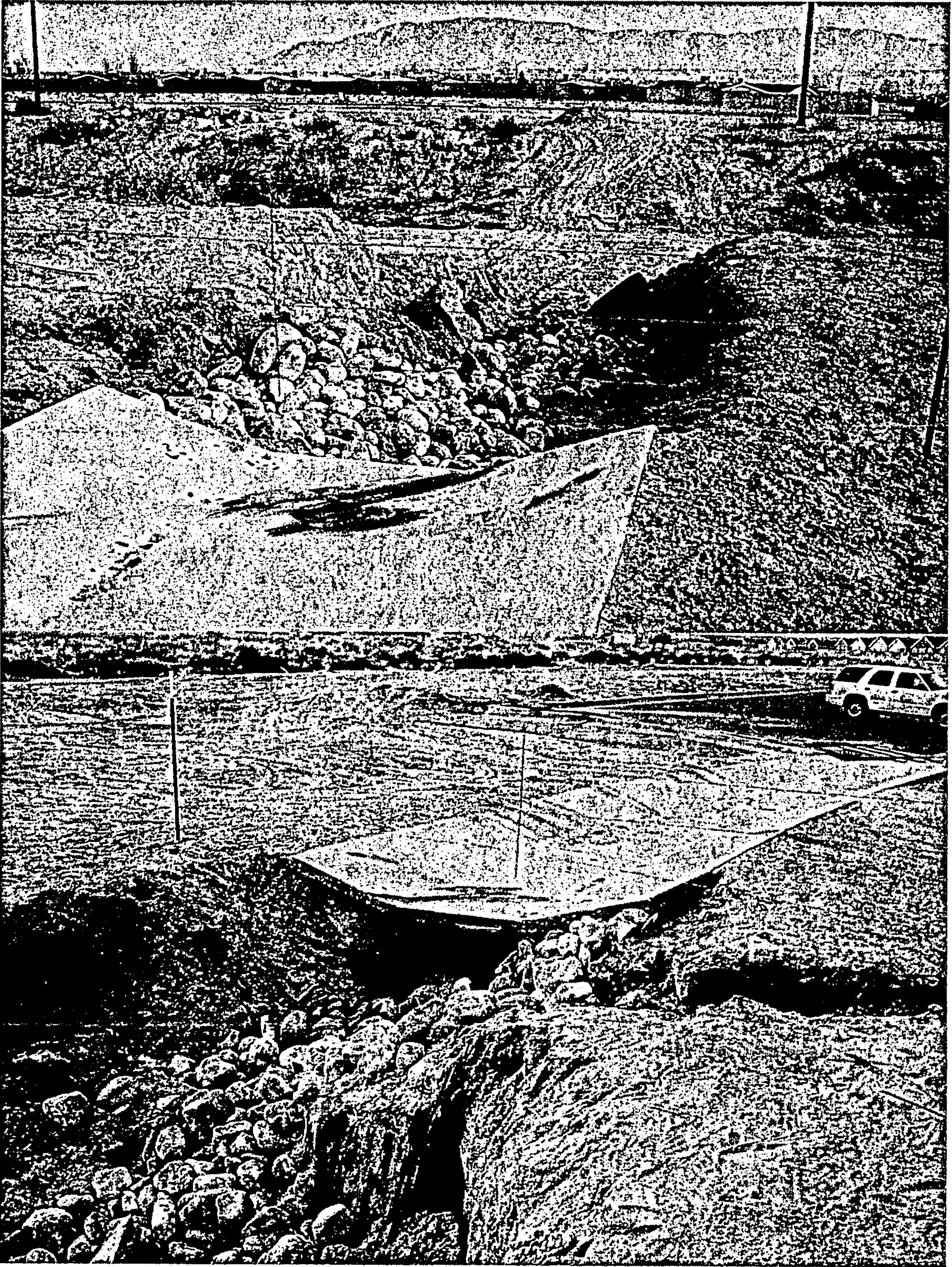
Please submit to AMAFCA, by January 11, 2005, a letter report detailing the cause of the damage to the rundown, verification that the design of the rundown is adequate and a work plan to remediate the rundown

If you have any questions please call me at 884-2215.

Sincerely,
AMAFCA


Jerry Lovato, PE
Field Engineer, AMAFCA

Cc: Lynn Mazur, PE, Development Review Engineer, AMAFCA
Brad Bingham, PE, City of Albuquerque
Eddy Randall, New Concepts Inc
Lyle Losack, Quickdraw, LLC
Richard J. Squires, Bokay Construction





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 7, 2004

Genevieve Donart, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, NM 87108

Re: El Rancho Grande Units 6 and 7, SIA/Financial Guarantee Release
Engineer's Stamp dated 9-04-01 (M9/D19B)
Certification dated 4-06-04

Dear Ms. Donart,

Based upon the information provided in your submittal received 4-06-04, the above referenced certification is approved for release of SIA and Financial Guarantee.

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

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Marilyn Maldonado, COA# 699382, 699383
file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Units 6 & 7 ZONE MAP / DRG. FILE #: M-9/D19B
DRB #: 1001347 EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: El Rancho Grande, Units 6 & 7
CITY ADDRESS: _____

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

OWNER: Curb, Inc. CONTACT: Rick Squires
ADDRESS: _____ PHONE: 440-2080
CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: Albuquerque, New Mexico ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich
ADDRESS: P.O. Box 30701 PHONE: 884-1990
CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87109

CONTRACTOR: New Concepts CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CoA#, 699383, 699382

CHECK TYPE OF SUBMITTAL:

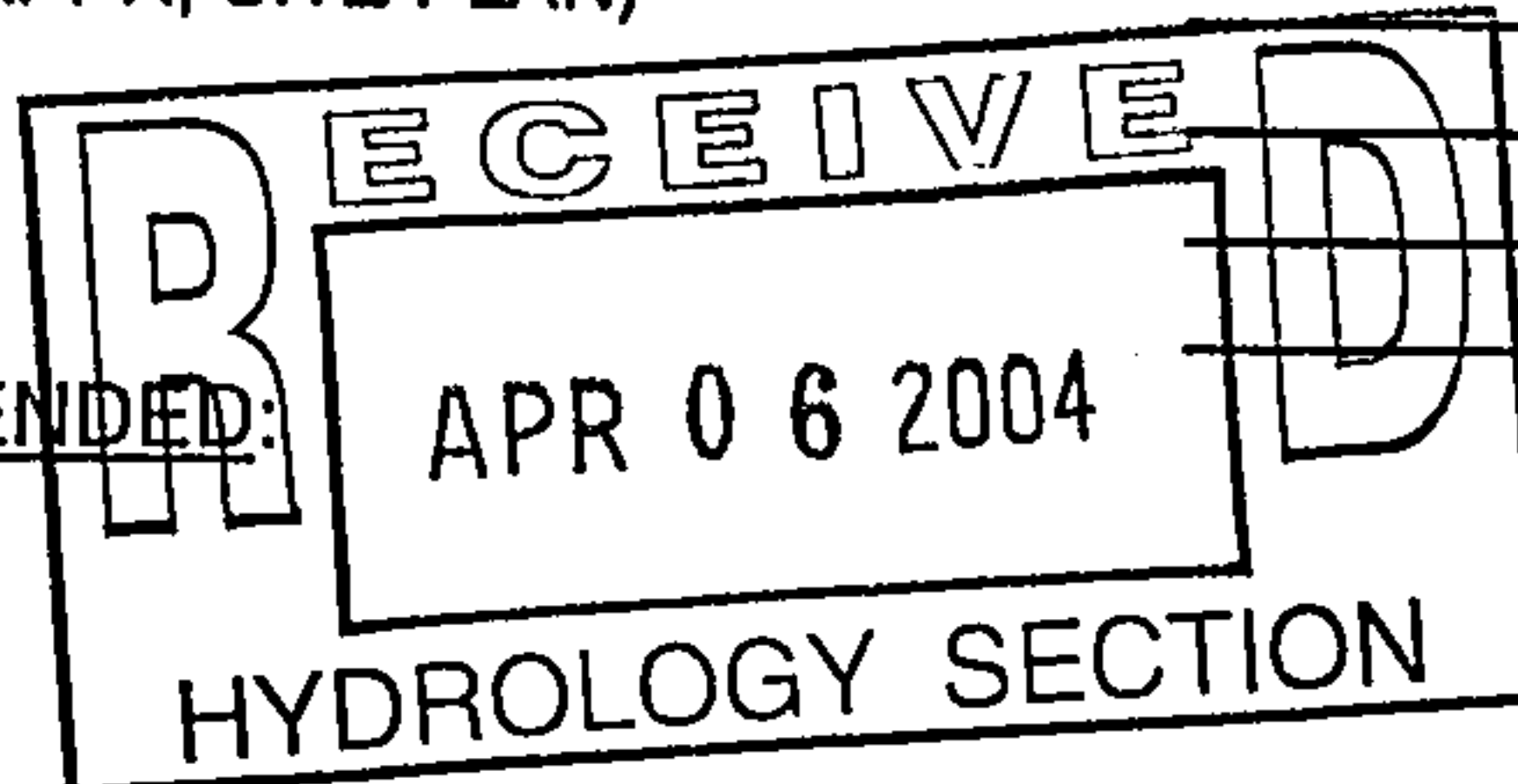
- ☐ DRAINAGE REPORT
☐ DRAINAGE PLAN 1ST *REQUIRES TCL or equal*
☐ DRAINAGE PLAN RESUBMITTAL
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR / LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEER'S CERTIFICATION (TCL)
☐ ENGINEER'S CERTIFICATION (DRB APPR, SITE PLAN)
☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED: _____

- ☐ YES
☐ NO
☐ COPY PROVIDED



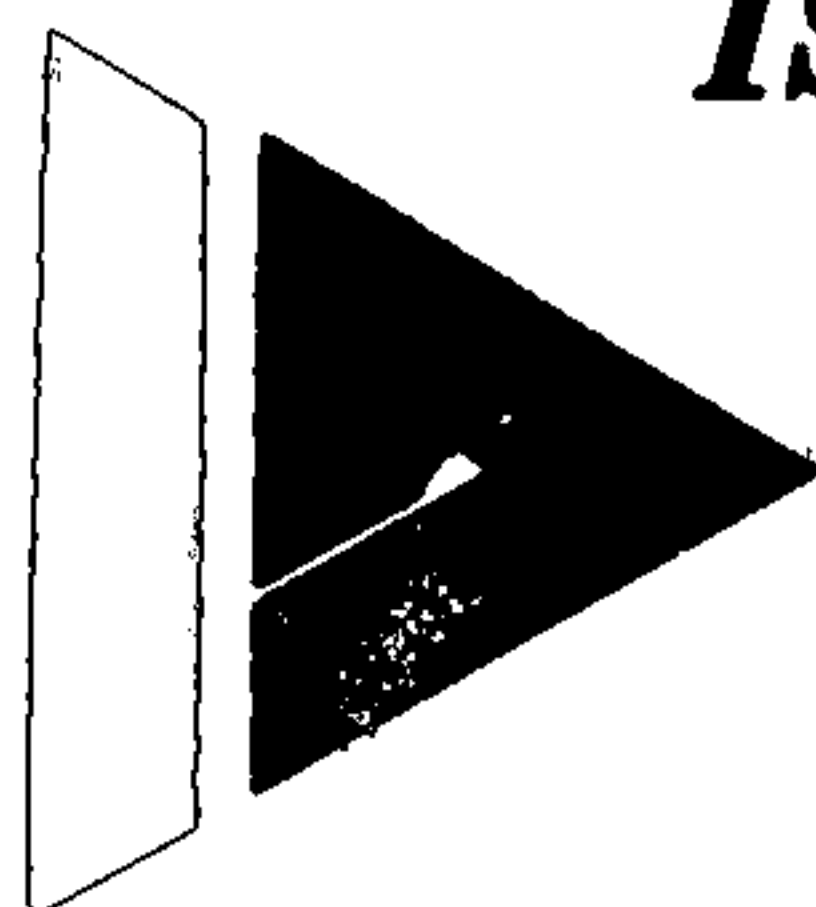
DATE SUBMITTED: Tuesday, April 06, 2004

BY: _____

Gennifer D. [Signature]
Isaacson & Arfman, P.A.

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

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



ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 11, 2001

Fred Arfman, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

**Re: El Rancho Grande, Units 6,7 & 8 Drainage Report
Engineer's Stamp dated 9-4-01, (M9/D19B)**

Dear Mr. Arfman,

Based upon the information provided in your submittal dated 9-4-01, the above referenced site is approved for Preliminary Plat action by the DRB. Prior to Final Plat or Work Order on Unit 6, a design of the Amole/Snow Vista confluence shall be performed to better define the amount of R/W needed. Until the Agreement with AMAFCA is signed, the construction of the reach of the Amole channel contained in your property (plus the transition from the existing alignment) must be on your Infrastructure List.

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

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 18, 2001

Fred Arfman, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

**Re: El Rancho Grande, Units 6,7 & 8 Drainage Report
Engineer's Stamp dated 7-6-01, (M9/D19B)**

Dear Mr. Arfman,

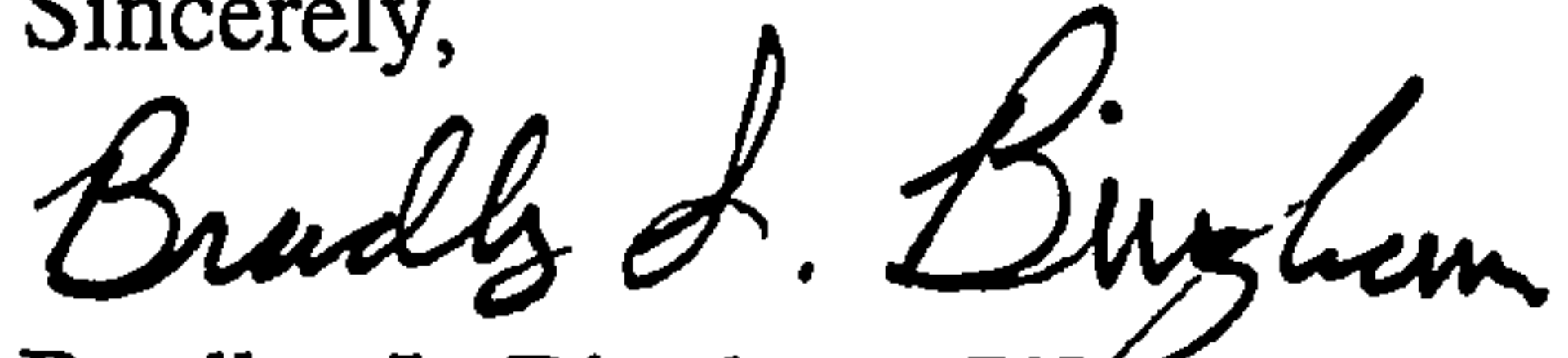
Based upon the information provided in your submittal dated 7-6-01, the above referenced site cannot be approved for Preliminary Plat until the following comments are addressed.

- For the offsite basin analysis, you will need to include the runoff from Timarron Unit 5 (M8/D5B), which was approved on 6/28/00. Basin B should include the 3 lots north of Benavides. Shouldn't the runoff from Carlos Rey Park combine at AP2?
- I think the land treatment used for all basins include too much 'A' and not enough 'D'. Please provide your calculations or adhere to Table A-5 of the DPM, ch. 22
- Tract C-1 (west of Camino San Martin) will need to be analyzed as well (as offsite) since that drainage may need to run to Cartagena.
- Is any of the storm drain proposed for the Westgate Heights addition planned to go through your project? Please provide excerpts from that report to support this project.
- Please show the storm drain and inlets on the grading plan and linework denoting retaining walls and/or slopes as necessary and include top and bottom-of-wall elevations. All four corners of each lot plus the flowline at the extension of the property lines will be required in order to approve the grading plan. Masonry garden walls will be necessary at lot lines where minor retaining is planned.

- Please incorporate the design of the new Amole channel and any improvements needed on the Snow Vista. You will also need to identify the crossing structure at Camino San Martin. AMAFCA concurrence will be required.
- Please provide grades of existing Valley View to verify that Basin 1 can drain to Benavides. A profile for De Anza will also be needed.

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

Sincerely,



Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file

Letter of Transmittal



ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108

To: COA
PLAZA DEL SOL

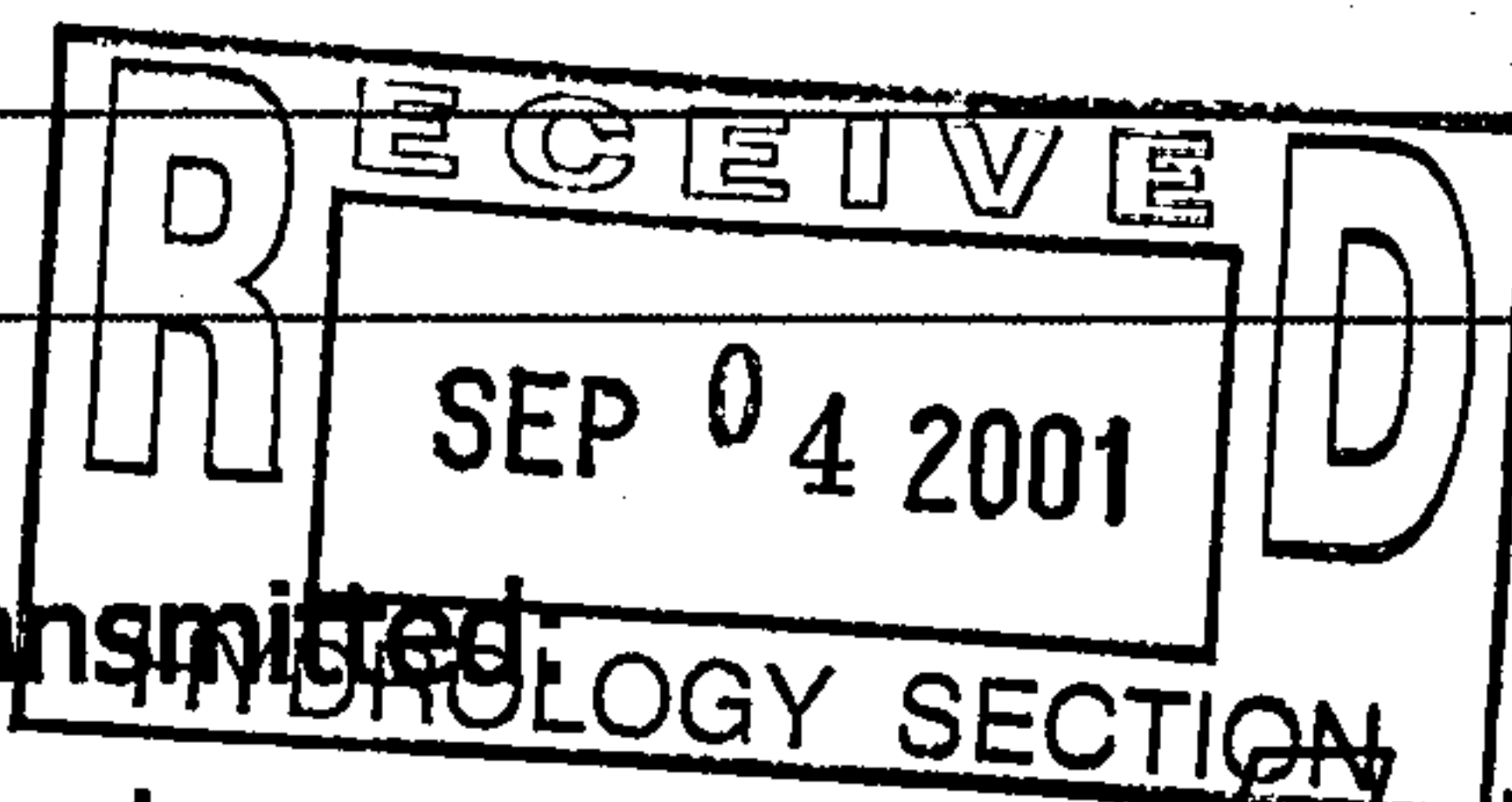
Date: 9/4/01
Job No. 1167

Attn: BRAD BUGHAM

Reference: EL RANCHO GRANDE UNITS 6-8

We transmit to you 1 copy(ies) of the following:

- | | |
|--|---|
| ☐ <u>Plats</u> | ☐ Specifications |
| ☒ <u>Revised G+D</u> Plans | ☐ Submittals |
| ☐ <u>Disks</u> | ☐ Shop Drawings |
| ☐ <u>Report</u> | ☐ Copy of Letter |
| ☐ | |
| ☐ | |



This information is transmitted:

- | | |
|--|---|
| ☐ As per your request | ☐ For your files |
| ☐ For your review & approval | ☐ For your use |
| ☐ For your information | ☐ Please review & return |
| ☐ For your attention | ☐ For return to your files |
| ☐ For your signature | ☐ Please advise |
| ☒ <u>FOR REPLACEMENT OF PLANS IN DRAINAGE REPORT</u> | |
| ☐ | |

Remarks: _____

By: GENNY DONATI

Copies to: _____

DRAINAGE INFORMATION SHEET

PROJECT TITLE: EL RANCHO GRANDE UNIT 6-8 ZONE MAP/DRG. FILE #: M9/D19B
DRB #: 1001347 EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: TRACTS A, B, & D, ABQ SOUTH UNIT 3
CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.
ADDRESS: 128 Monroe Street NE
CITY, STATE: Albuquerque, NM

CONTACT: GENNY DONART
PHONE: 268-8828
ZIP CODE: 87110

OWNER: CURB, Inc.
ADDRESS: 6301 INDIAN SCHOOL STE 680
CITY, STATE: ABQ, NM

CONTACT: BO JOHNSON
PHONE: 899-9656
ZIP CODE: 87110

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: ALDRICH LAND SURVEYING
ADDRESS: P.O. BOX 30701
CITY, STATE: ABQ, NM

CONTACT: TIM ALDRICH
PHONE: 884-1990
ZIP CODE: 87109

CONTRACTOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ OTHER

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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

R **RECEIVED** **D**
AUG 24 2001
HYDROLOGY SECTION

DATE SUBMITTED: 8/24/01 BY: Genevieve D...

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

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

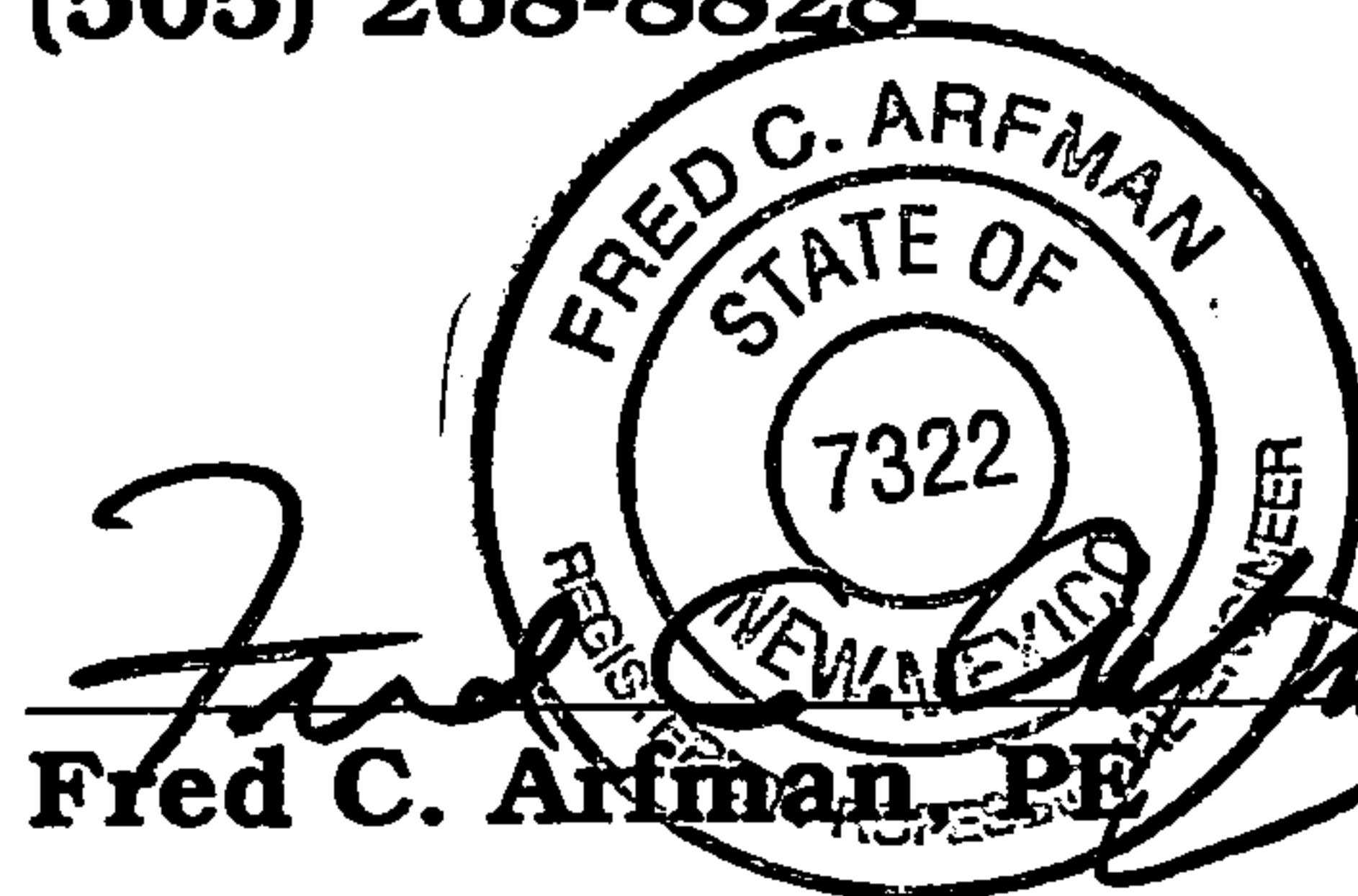
R **RECEIVED** **D**
AUG 24 2001
HYDROLOGY SECTION

DRAINAGE REPORT
FOR
EL RANCHO GRANDE
UNITS SIX, SEVEN, & EIGHT
A 349 LOT SINGLE FAMILY
RESIDENTIAL SUBDIVISION
ALBUQUERQUE, NEW MEXICO
AUGUST 2001

R **E** **C** **E** **I** **V** **E** **D**
AUG 24 2001
HYDROLOGY SECTION

Prepared by:

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



09-04-01
Date

TABLE OF CONTENTS

VICINITY MAP
FLOODPLAIN MAP

- I. PROJECT INFORMATION**
- II. INTRODUCTION**
- III. EXISTING CONDITIONS**
 - ONSITE
 - OFFSITE
- IV. PROPOSED CONDITIONS**
 - ONSITE
 - Table 1**
 - AMOLE ARROYO
 - SNOW VISTA CHANNEL
- V. SUMMARY & CONCLUSIONS**

APPENDICES

APPENDIX A: Existing Conditions

Offsite Basin Map
Existing Conditions AHYMO Calculations

APPENDIX B: Proposed Conditions

Proposed Onsite Basin Map
Land Treatment Calculations
Proposed Conditions AHYMO Calculations

APPENDIX C: Street Flow Capacity

Street Flow Capacity Calculations

APPENDIX D: Onsite Flowmaster Worksheets

Concrete Rundown Cross-Section & Calculations
Curb Cut Calculations
Side Swale Calculations

APPENDIX E: Storm Drain Calculations

Storm Drain Inlet Capacity Calculations

APPENDIX F: Amole Arroyo Analysis

Table III-1 (Excerpt from the Amole-Hubbell DMP)
Offsite Cross-Section
Onsite Cross-Section
Del Rey Rd Crossing FlowMaster Worksheet
Riprap Calculations

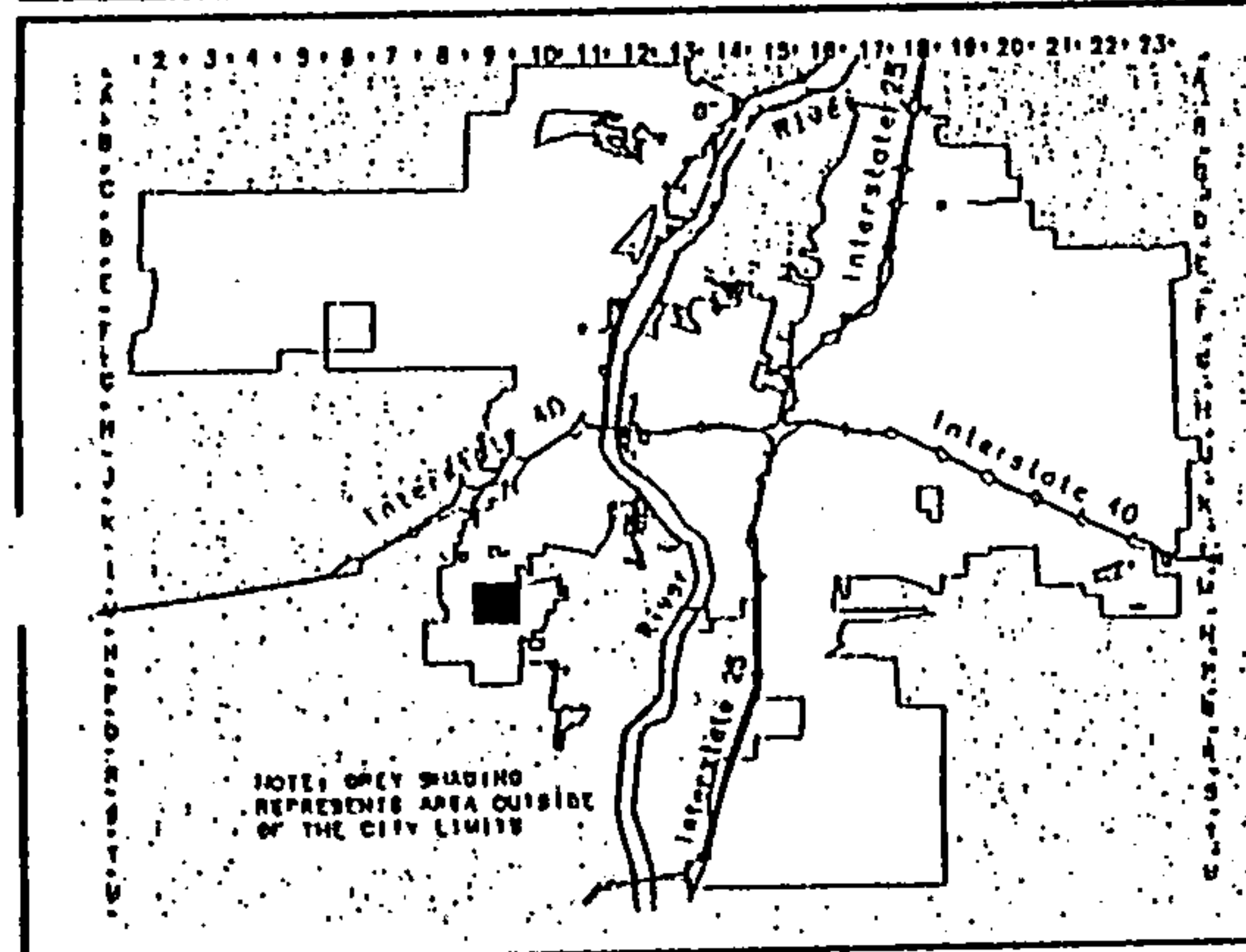
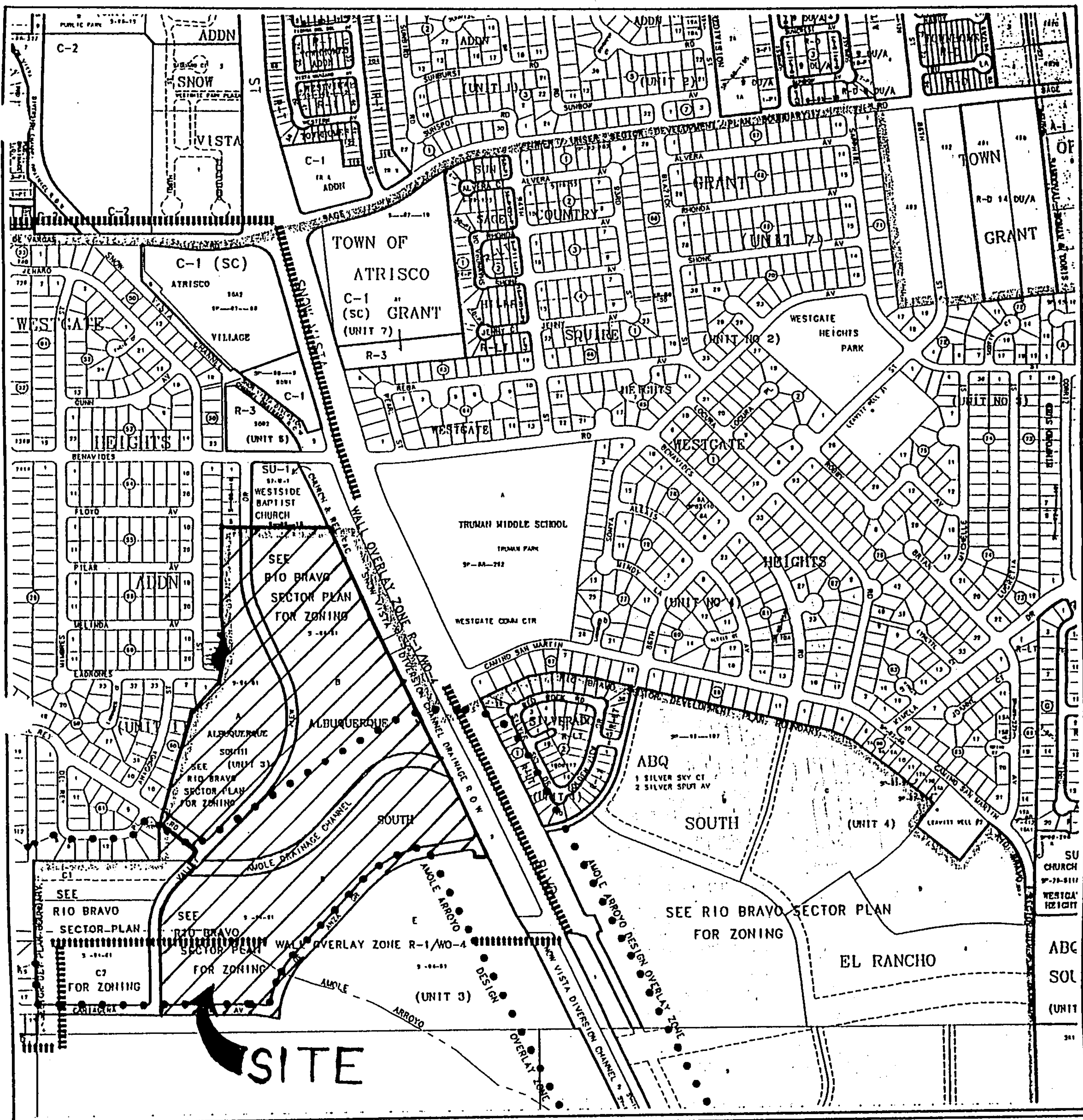
APPENDIX G: Snow Vista Channel Analysis

Table III-3 (Excerpt from the Amole-Hubbell DMP)
Snow Vista Cross-Sections & Calculations
De Anza Dr Crossing FlowMaster Worksheet

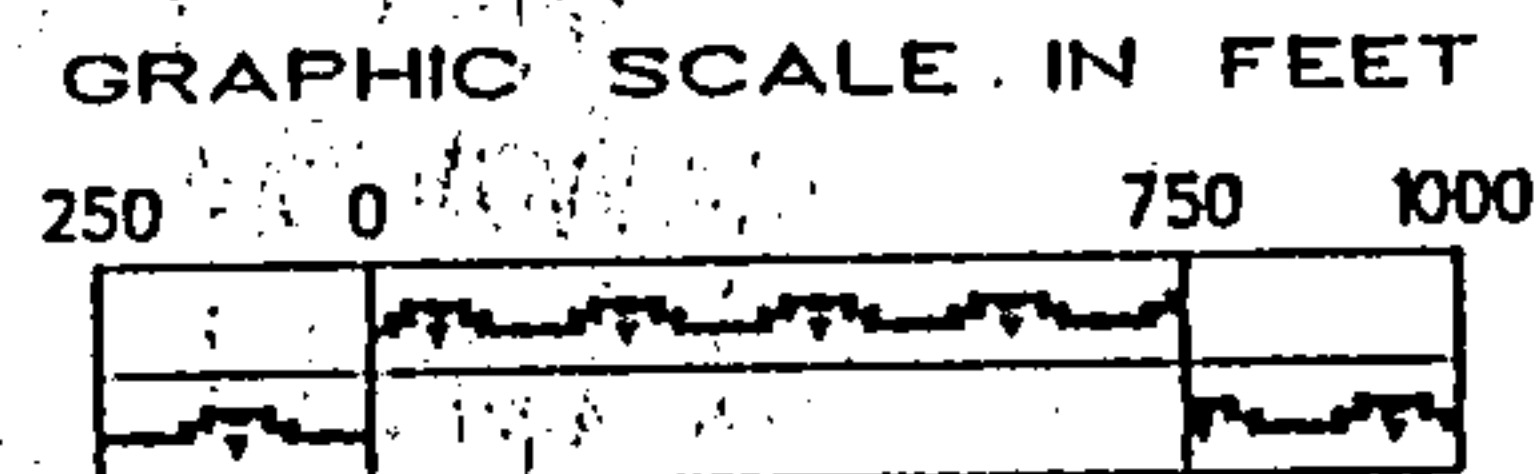
POCKETS

Grading & Drainage Plan

Amole Arroyo Plan & Profile



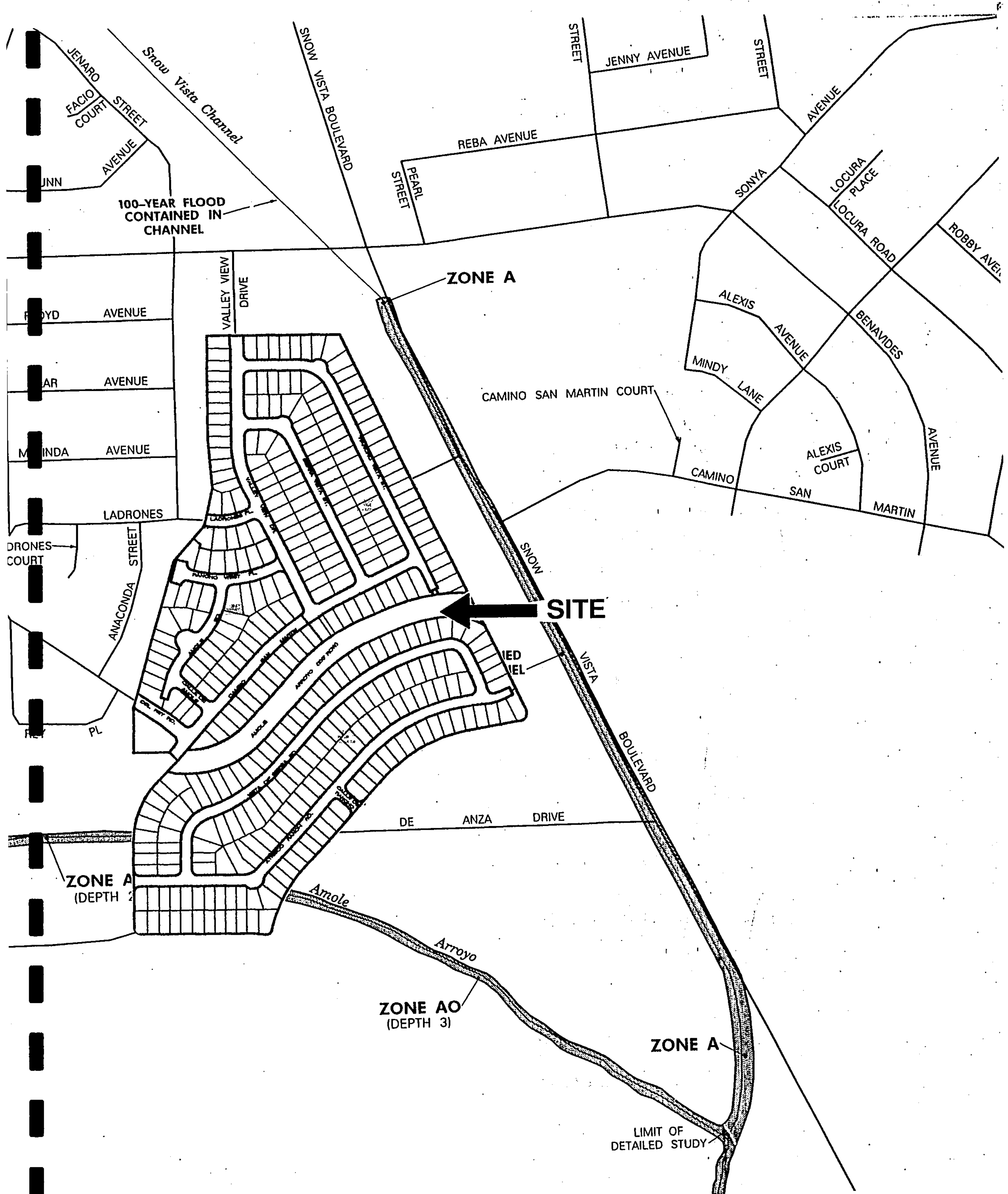
Abuquerque **G**eographic **I**nformation **S**ystems
PLANNING DEPARTMENT



Zone Atlas Page

M-9-Z

Map Amended through July 31, 2000



FLOOD PLAIN ZONE MAP
FROM FIRM MAP PANEL 337 OF 825
DATED SEPTEMBER 20, 1996.

I. PROJECT INFORMATION

PROPOSED LEGAL DESCRIPTION:

El Rancho Grande Subdivision, Units Six, Seven, and Eight

EXISTING LEGAL DESCRIPTION:

Tracts A, B, & D, Albuquerque South Unit 3
(Filed in Volume 94C, Folio 393, on 11/28/94)

ENGINEER:

Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Genevieve Donart

SURVEYOR:

Contour information obtained from AMAFCA (NAD 1982, NAVD 1988)
Converted to COA datum (NAD 1927 & NAVD 1929) with 1' contour
interval interpolations established by Aldrich Land Surveying, Inc.
(June, 2001)
(505) 884-1990
Attn: Tim Aldrich, NMPLS No. 7719

DEVELOPER:

Curb, Inc
c/o Bokay Construction
(505) 899-9656
Attn: Bo Johnson

NUMBER OF PROPOSED LOTS: 349

TOTAL AREA: 57.5076 Acres

FLOOD PLAIN: Zone X & Zone AO (3' Depth)
Portions of this site lie within the 100-year flood (Zone AO) based on
Firm Map #35001C0336 dated September 20, 1996

II. INTRODUCTION

The El Rancho Grande Subdivision, Units Six, Seven and Eight, is a 349 lot, single-family residential subdivision. The proposed site is east of the existing Westgate Heights Subdivision, south of Benavides Rd, and west of the Snow Vista Channel.

This report covers drainage requirements for all three units of this project, as well as any offsite drainage improvements needed for the development. The site falls within AMAFCA's Amole-Hubbell Drainage Management Plan (Amole-Hubbell DMP) prepared by Leedshill-Hirkenhoff, dated July 22, 1999. This report follows requirements outlined in that plan, and references some of the flow quantities it calculated for the Amole Arroyo and the Snow Vista Channel.

III. EXISTING CONDITIONS

ONSITE:

The proposed site is a 57.5 acre undeveloped tract of land, with native grasses and scrub brush. The Snow Vista Channel is an earth and riprap channel along the east border of the site. The Amole Arroyo is an unlined, natural arroyo that flows across the southwest corner of the property. It converges with the Snow Vista Channel to the southeast. A paved roadway, which is closed to the public and has essentially become an asphalt drainage channel, connects Del Rey Rd to Cartagena Ave and carries existing offsite flows from those roads to the Amole Arroyo.

An existing onsite peak discharge of 78.7 cfs flows through various tributaries to ultimately drain to the Snow Vista Channel. (See AHYMO calculations in Appendix A.)

OFFSITE:

The largest contributing watersheds of offsite storm water are the Amole Arroyo and the Snow Vista Channel. The Amole Arroyo runs through the existing Westgate Heights Park, enters the site at the lower southwest corner, and continues through to an offsite convergence with the Snow Vista Channel. Table III-1 of the Amole-Hubbell DMP shows the Amole Arroyo to carry 620 cfs at the east Westgate crossing (AP 2.2) in the existing condition. (See Table III-1 in Appendix F.) After the confluence with the Snow Vista Channel (AP 3), the existing flows within the Amole Arroyo increase to 1990 cfs. A 100' wide drainage right-of-way exists for the proposed realignment of the arroyo to the north, however this realignment is still imminent.

The Snow Vista Channel passes under Benavides Rd to the north, flows through a concrete lined portion, then transitions to an earthen channel with regularly spaced riprap drop structures. Table III-3 of the Amole-Hubbell DMP shows the Snow Vista Channel to carry 1864 cfs below the Benavides Inlet (AP 23) in the existing condition. (See Table III-3 in Appendix G.) The channel continues south of the project, and contributes to the Amole Arroyo.

Another significant source of offsite flows is the Westgate Heights Subdivision to the west. Del Rey Road and Ladrones Place dead end at the west boundary of El Rancho Grande. This large subdivision has existed for some time, and does not conform to current City DPM requirements. AMYMO calculations show the offsite flows generated by Westgate Heights at these two outlet points. (See AHYMO calculations in Appendix A.) A zone map and a site inspection determined the existing offsite basins. (See the Existing Offsite Basin Map in Appendix A.)

Del Rey Rd (AP11) discharges 214 cfs into the existing paved channel that connects Del Rey Rd and Cartagena Ave. Ladrones Pl (AP12) discharges 32 cfs to the site with no apparently defined drainageway beyond the end of the road.

The Amole-Hubbell DPM calls for a storm drain to be built by the city in Benavides Rd that would intercept as much as 47 cfs of the runoff in Del Rey Rd. However, this is an expensive improvement labeled as a "medium" priority, and is not likely to take place for quite some time. This report assumes Del Rey Rd outlets the entire 214 cfs.

Tracts C-1 and C-2 (Basin M), which lie west of El Rancho Grande and south of Westgate Heights, were previously dedicated as city park in a bulk land plat for this property. This park may discharge as much as 26 cfs to the Amole Arroyo. That quantity may be reduced if grassy areas are used as detention basins, but it is assumed that a fully landscaped park will have free discharge to the arroyo. The park should not discharge storm water to El Patron Rd unless measures are taken to redirect those waters to the Amole Arroyo before they enter El Rancho Grande.

Valley View Dr also dead ends at El Rancho Grande, however this road discharges to Benavides Rd to the north, so it does not contribute any offsite flows to this project.

IV. PROPOSED CONDITIONS

ONSITE:

A Grading & Drainage Plan for all three proposed units is in the pockets at the back of this report. Drainage basin boundaries were determined based on the conceptual grades established in this plan. (See the Proposed Onsite Basin Map in Appendix B.) Land treatments for the development are as follows:

Type A	0%	(Calculated per Sect. 22.2, Table A.5 of the City of Albuquerque DPM. See Appendix B.)
Type B	37.12%	
Type C	5%	
Type D	57.88%	

AHYMO was used to calculate the total 100-year, 6-hour storm water flows at street intersections and major outlet points. (See AHYMO calculations in Appendix B.) It also accounts for the offsite runoff entering the subdivision at Del Rey Rd and Ladrones Pl. The Proposed Onsite Basin Map shows the flows at analysis points (AP's), and in some places where they effect street flow capacity.

In Units Six and Seven, most basins eventually outlet to the Amole Arroyo through either concrete rundowns or storm drains. The exceptions are Basins 500 and 700. Basin 500 directs a total of 4.86 cfs of runoff from the rear half of lots 8 through 30, Block B to the Snow Vista Channel. These lots have backyards adjacent to the Snow Vista Channel, and water will be allowed to sheet flow through missing vertical grout joints in the bottom course of the rear walls to the channel. Basin 700 discharges 4.01 cfs north in Valley View Dr to Benavides Rd (AP28).

The major outlets for Unit Six occur at two locations. The first is at the south end of Valley View Dr (AP18). A 20' drainage easement between lots 39 and 40 of Block B allows a storm drain to discharge 80.47 cfs from the intersection of Camino San Martin and Valley View Dr to the Amole Arroyo. The second outlet is at the southern end of El Rancho Dr (AP21). At this location 39.40 cfs is collected by a 10' concrete rundown, and directed to the Amole Arroyo. (See Section B-B in Appendix D.)

Unit Seven directs a fair amount of the water it generates to streets in Unit Six, however there is a major outlet where Del Rey Rd crosses the Amole Arroyo. The 214.40 cfs of offsite flows from Del Rey Rd combine with minor flows generated onsite at AP21 to create a total outlet flow of 217.23 cfs. Flows in excess of the street capacity will be captured in a storm drain. The rest will exit Del Rey Rd through curb cuts, and be directed to the Amole Arroyo through tracts on either side of the road.

In Unit Eight all storm water outlets to the Snow Vista Channel. Most of this Unit converges at the east end of Atrisco Ranch Rd (AP25). At this location, 63.51 cfs enters a 10' wide concrete rundown and outlets to the Snow Vista Arroyo. (See Section B-B in Appendix D.) Cartagena Ave (Basin 530) and De Anza Dr (Basin 540) drain 12.69 cfs to the east end of De Anza Dr (AP27). Basin 510 allows 1.29 cfs of backyard flows to sheet to the Snow Vista Channel, as in Basin 500.

Street flow capacities for each street were calculated to determine if 4" high mountable curb could contain the flows as required by the City DPM. In areas where it is not contained with mountable curb, 8" standard curb is required. Table 1 is a Street Flow Depth Summary that shows which streets, or portions of streets, have mountable or standard curb. The worksheets used to calculate the street flow capacity are in Appendix C.

Valley View Dr, Camino San Martin, and Del Rey Rd require storm drain, because flows in parts of these streets overtop even standard curb. Valley View Dr collects offsite runoff from Ladrones Pl, as well as Basins 210, 220, 230, and 240. Valley View Dr exceeds its capacity at the intersection with Rancho West Pl, so two single-grate type "A" storm inlets are required before the intersection to collect 39.80 cfs of the flow. (See Storm Inlet Capacity Calculations in Appendix E.) Two additional single-grate type "A" storm inlets before the intersection with Camino San Martin (AP17) collect the remaining 28.43 cfs from Valley View Dr.

The stub end of El Rancho Dr (AP21) exceeds its carrying capacity, so two more single-grate type "A" storm inlets west of the Valley View Dr intersection collect the entire 12.71 cfs of runoff in that reach of Camino San Martin. This decreases combined flows in El Rancho Dr enough to contain flows within the road at AP21. These inlets drain to the storm drain from Valley View Dr, and outlet at AP18.

Del Rey Rd is the most complicated area for street capacity. Historical flows of 214.40 cfs already far exceed the existing street capacity of 130.82 cfs, and this problem is continued with the proposed extension of the road. The proposed street section can carry 139.19 cfs, therefore at least 78.1 cfs must be contained in a storm drain. Two single-grate type "A" and two double-grate type "C" storm inlets in Del Rey Rd collect a total of 99.6 cfs, thereby dropping runoff to acceptable quantities. A short section of storm drain collects the 99.6 cfs, and outlets the water to the Amole Arroyo at AP22.

The remaining 117.6 cfs of runoff must still leave Del Rey before it crosses the Amole Arroyo. To achieve this, 9' long curb cuts on either side of the road discharge 58.82 cfs each to 2' deep swales. (See Appendix D for curb cut and swale capacity calculations.) These swales

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q ₁₀₀ (cfs)	DEPTH (ft)	EGL DEPTH (ft)
Valley View Dr	@ AP28	32' F-F	mtbl	0.0209	4.01	0.20	0.29
Valley View Dr	between Amole Vista St & Ladrones Pl	32' F-F	mtbl	0.0208	11.52	0.28	0.44
Valley View Dr	between Ladrones & Rancho West Pl	32' F-F	std	0.0050	48.61	0.64	0.83
Valley View Dr	@ AP17	32' F-F	std	0.0050	49.73	0.65	0.84
Amole Vista St	Sta 1+00 to 7+50	28' F-F	mtbl	0.0063	10.69	0.33	0.40
Amole Vista St	@ AP19 (Sta 7+50 to end)	28' F-F	std	0.0063	15.42	0.41	0.50
El Rancho Dr	Sta 1+00 to 8+50	28' F-F	mtbl	0.0060	10.43	0.33	0.40
El Rancho Dr	@ AP20 (Sta 8+50 to Camino San Martin)	28' F-F	std	0.0060	17.21	0.42	0.53
El Rancho Dr (stub)	@ AP21 (South of Camino San Martin)	24' F-F	std	0.0060	39.40	0.60	0.82
Camino San Martin	between Amole Vista & El Rancho	32' F-F	std	0.0251	21.93	0.36	0.66
Camino San Martin	between Valley View & Amole Vista	32' F-F	mtbl	0.0143	7.13	0.26	0.35
Camino San Martin	@ AP18 (between Calle de Amole & Valley View)	32' F-F	mtbl	0.0270	12.71	0.28	0.48
Camino San Martin	between Del Rey & Calle de Amole	32' F-F	mtbl	0.0218	3.36	0.18	0.27
Ladrones Pl	@ AP16	32' F-F	mtbl	0.0208	9.94	0.27	0.41
Rancho West Pl	@ AP15	28' F-F	mtbl	0.0498	18.78	0.29	0.68
Amole Dr	@ AP14	28' F-F	mtbl	0.0125	9.74	0.29	0.39
Del Rey Rd	@ AP22 (Amole Arroyo)	40' F-F	std	0.0283	139.19	0.67	1.70
Del Rey Rd	Amole Arroyo to El Patron	40' F-F	std	0.0112	11.36	0.33	0.45
Del Rey Rd	@ AP23 (El Patron to Atrisco Ranch)	28' F-F	std	0.0334	3.58	0.20	0.36
El Patron Rd	Sta 2+50 to 5+68 (along park)	40' F-F	std	0.0089	11.36	0.35	0.44
El Patron Rd	Sta 1+00 to Del Rey	28' F-F	mtbl	0.0107	11.36	0.31	0.41
El Patron Rd	Del Rey to sta 10+30	28' F-F	mtbl	0.0100	13.47	0.33	0.44
El Patron Rd/Sauza Dr	Sta 10+30 to end	28' F-F	std	0.0100	26.29	0.45	0.64
Atrisco Ranch Rd	El Patron to Del Rey	28' F-F	mtbl	0.0149	16.25	0.33	0.50
Atrisco Ranch Rd	Del Rey to Sauza	28' F-F	std	0.0202	37.22	0.45	0.84
Atrisco Ranch Rd (stub)	@ AP25 (Sauza to end)	22' F-F	std	0.0175	63.51	0.60	1.25
Cartagena Ave	El Patron to Del Rey	40' F-F	mtbl	0.0208	9.18	0.26	0.40
De Anza Dr	Cartagena to Snow Vista	40' F-F	std	0.0248	12.69	0.30	0.53
De Anza Dr	Future Capacity - Cartagena to Snow Vista	40' F-F	std	0.0248	43.49	0.46	0.86
El Patron Rd	Split Flows across Del Rey	28' F-F	mtbl	0.0100	7.78	0.28	0.35
Existing Del Rey	Westgate Heights	40' F-F	std	0.0250	130.82	0.67	1.58

pass through Tract A-1 and a 20' drainage easement on Lot 53, Block B to the Amole Arroyo. Two bollards at each curb cut prevent traffic from entering the tracts.

AMOLE ARROYO:

A major portion of the drainage improvements for this project is the realignment of the Amole Arroyo. The existing arroyo has a more southerly alignment across the southwest corner of El Rancho Grande. The realigned arroyo travels through the site on the north side of Unit Eight, as shown in the Amole Arroyo Plan & Profile in the pockets at the back of this report. In order to connect the proposed alignment to the existing arroyo, part of the realignment must take place offsite in the Westgate Heights Park.

Approximately 1650' west of the Del Rey Rd crossing, the new alignment ties into the existing arroyo within Westgate Heights Park. A dirt channel per Section C-C will be graded through the park at the geometry shown in the Plan & Profile. The channel carries the 693 cfs called out as the future 100-year developed flows in the arroyo by the Amole-Hubbell DMP. (See Appendix F for Table III-1 and the channel capacity worksheets.)

At the Del Rey Rd crossing, 4-48" RCP culverts at a 2% slope carry the flow under the road. (See Appendix F for culvert capacities.) Runoff of 217.23 cfs enters the Amole at this point from Del Rey Rd. This water is historical runoff from Westgate Heights, and is included in the 693 cfs calculated by the Amole-Hubbell DMP for the Amole Arroyo at the east Westgate Crossing.

Within El Rancho Grande the arroyo is concrete lined per Section D-D. (See Appendix F.) Its capacity carries the 100-year storm, which includes the 693 cfs of existing flows within the arroyo, as well as the 80.47 cfs from the outlet at AP18, and the 39.40 cfs from the rundown at AP21. The Amole Arroyo right-of-way contains a minimum of 2' of landscape armored freeboard.

Type "M" riprap 2' thick lines Snow Vista Arroyo at the confluence of the Amole Arroyo and the Snow Vista Channel to prevent erosion. Calculations and a cross-section for the required riprap are found in Appendix F

SNOW VISTA CHANNEL:

The Snow Vista Channel along El Rancho Grande has an existing 100-year storm flow of 1,814 cfs. The Amole-Hubbell DMP calculates that future developed flows will reach 2,083 cfs upstream of the Amole Arroyo, and 2,825 cfs below the confluence. (See Table III-3 and Table III-1 in Appendices G & F respectively.) The Amole-Hubbell DMP also states that the Snow Vista has insufficient freeboard for these flows.

The approximate width, side slopes and invert slope of the existing channel section were measured from the topo provided in the Grading & Drainage Plan. This information was used to calculate the depth required for the flow. (See Appendix G.) Upstream of the proposed confluence, the channel needs a minimum of 6.5' of depth - including freeboard. Downstream of the confluence, the channel needs a minimum of 7.75' to achieve the freeboard

requirements. Dirt berms shall be added to either side of the channel with the adjacent Unit to create the depth needed. (See Snow Vista Diversion Channel Plan & Profiles in the pockets at the back of this report.)

Traffic generated by El Rancho Grande increases the traffic anticipated on existing and proposed roads. Decreasing this traffic requires a street connection across the channel. De Anza Dr connects to 98th Street across the Snow Vista Channel with Unit Eight development, and a concrete box culvert with 3 - 10' wide by 6' high boxes carries the 2,825 cfs of 100-year future flow under the crossing. (See Appendix G for calculations.) In the future, the city plans to realign Snow Vista Blvd to cross the channel at about this point. The length of the box culvert needs to be expanded by the city at that time. The design of the inlet and outlet ends of the culvert shall therefore allow for relatively easy future connections to the concrete.

Alternately, if the extension of Gibson Blvd precedes the development of Unit Eight, the De Anza connection to 98th Street is unnecessary. The developer will instead build a concrete box culvert at the Gibson Blvd crossing of the Snow Vista Channel.

V. SUMMARY & CONCLUSIONS

Based on information in previous sections, it is recommended that the following items be constructed:

Unit Six:

1. Mountable curb in the northern areas
2. Standard curb on the southern portions of Valley View Dr, Amole Vista St, and El Rancho Dr as indicated in Table 1. Also standard curb on Camino San Martin between Amole Vista St and El Rancho Dr.
3. Storm drain in Valley View Dr with 2 single-grate inlets north of the intersection with Rancho West Pl, and another 2 single-grate inlets north of the intersection with Camino San Martin. The storm drain outlets through a 20' wide storm drain easement on Lot 39, block B.
4. Concrete rundown per Section B-B from the stub end of El Rancho Dr to carry flows to the future Amole Arroyo alignment
5. Grade a retention pond in Amole Arroyo alignment to the Valley View Dr storm drain outlet.
6. Missing vertical grout joints in the ground level course of the rear lot wall for all lots backing up to the Snow Vista Channel to allow free discharge of backyard storm water.
7. Increase freeboard on both sides of the adjacent Snow Vista Channel to 6.5' of depth per the Snow Vista Diversion Channel Plan & Profile.

Unit Seven:

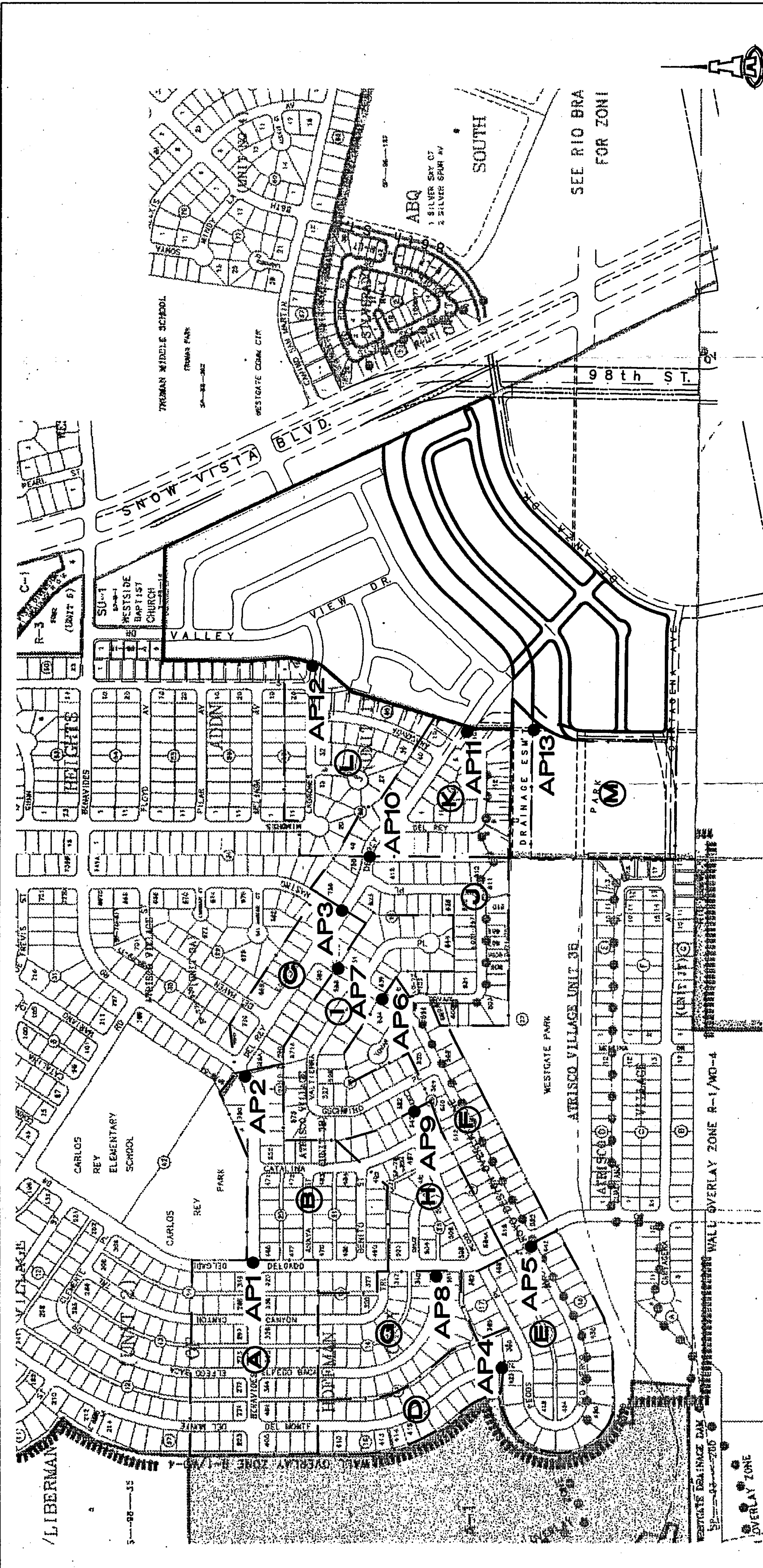
1. Mountable curb everywhere except Del Rey Rd
2. Del Rey Rd to have standard curb
3. 2 single-grate storm inlets in Camino San Martin connect to the Unit Six storm drain in Valley View Dr
4. 2 single-grate and 2 double-grate inlets in Del Rey Rd to pick up 99.6 cfs of offsite flows, direct them to a storm drain, and carry them to the Amole Arroyo.
5. 2 - 9' wide curb curbs that outlet the remaining 117.6 cfs of offsite flows from Del Rey Rd. Grade swales per Section G-G in Appendix D across Tract A-1 and a 20' drainage easement on Lot 53, Block B.
6. Grade a retention pond in the Amole Arroyo alignment to the Del Rey Rd storm drain outlet.

Unit Eight:

1. Mountable curb in western portions
2. Standard curb on east ends of El Patron Rd and Atrisco Rancho Dr as indicated in Table 1. Also on El Patron where it fronts to the Westgate Park, and the ½ streets of De Anza Dr and Cartagena Ave.
3. Concrete rundown per Section B-B from the stub end of Atrisco Ranch Dr to carry flows to the Snow Vista Channel.
4. Missing vertical grout joints in the ground level course of the rear lot wall for all lots backing up to the Snow Vista Channel to allow free discharge of backyard storm water.
5. Realign the Amole Arroyo from its existing flow pattern to the south, and direct it into the new Amole Arroyo right-of-way. The connection to the existing arroyo will begin within the eastern portions of Westgate Park. See cross-section C-C in Appendix F and the Amole Arroyo Plan & Profile.
6. Concrete line the Amole Arroyo per Section D-D in Appendix F from the west boundary of El Rancho Grande to the Snow Vista Channel confluence.
7. Riprap the confluence of the Amole Arroyo and the Snow Vista Channel with a, 50' long and 2' thick pad using type M riprap.
8. 4-48" RCP culverts under Del Rey Rd at the Amole Arroyo for 693 cfs of flows.
9. Concrete box culvert within the Snow Vista Channel under De Anza Dr for 2,825 cfs of flow. This culvert will be expanded north and south with the future realignment of Snow Vista Blvd (a.k.a. 98th St) over the channel. The design of the inlet and outlet ends of the culvert shall therefore allow for relatively easy future connections to the concrete. (Alternately, construct a portion of the concrete box culvert under Gibson Blvd if Gibson Blvd extension construction is scheduled.)
10. Increase freeboard on both sides of the adjacent Snow Vista Channel to 7.5' of depth per the Snow Vista Diversion Channel Plan & Profile.
11. Upon completion of the Amole Arroyo improvements, submit a LOMR to FEMA to remove the 100-year flood-plain from the southwest corner of the site, and add a flood-plain to the new alignment.

APPENDIX A

Existing Conditions



BASIN AREA TABLE			
BASIN	AC.	BASIN	AC.
A	14.14	H	8.44
B	12.32	I	11.89
C	5.95	J	10.63
D	6.33	K	9.80
E	12.65	L	10.30
F	9.66	M	11.00
G	8.80		

OFFSITE BASIN MAP

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
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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	PAGE = 1 NOTATION

*S***	EL RANCHO GRANDE SUBDIVISION				****					
*S***	UNITS SIX, SEVEN, & EIGHT				****					
*S***	EXISTING CONDITIONS				****					

START									TIME=	.00
RAINFALL TYPE= 1									RAIN6=	2.230
***** OFFSITE BASINS *****										
*S										
*S BASIN A (102)										
COMPUTE NM HYD	102.00	-	2	.02210	43.99	1.476	1.25234	1.500	3.110 PER IMP=	42.00
*S ~~~~~ AP1 ~~~~~										
ROUTE	102.20	3	2	.02210	41.10	1.476	1.25235	1.533	2.906	
*S BASIN B (103)										
COMPUTE NM HYD	103.00	-	3	.01926	38.34	1.286	1.25234	1.500	3.111 PER IMP=	42.00
ADD HYD	103.10	2& 3	1	.04136	78.32	2.762	1.25233	1.533	2.959	
*S ~~~~~ AP2 ~~~~~										
ROUTE	103.20	1	3	.04136	75.87	2.762	1.25234	1.567	2.866	
*S BASIN C (104)										
COMPUTE NM HYD	104.00	-	4	.00929	18.50	.620	1.25234	1.500	3.112 PER IMP=	42.00
ADD HYD	104.10	3& 4	1	.05065	91.76	3.383	1.25232	1.567	2.831	
*S ~~~~~ AP3 ~~~~~										
ROUTE	104.20	1	4	.05065	91.09	3.383	1.25233	1.567	2.810	
*S BASIN D (110)										
*S ~~~~~ AP4 ~~~~~										
COMPUTE NM HYD	110.00	-	5	.00989	19.70	.661	1.25234	1.500	3.112 PER IMP=	42.00
*S BASIN E (111)										
COMPUTE NM HYD	111.00	-	6	.01977	39.36	1.320	1.25234	1.500	3.111 PER IMP=	42.00
ADD HYD	111.10	5& 6	1	.02966	59.05	1.981	1.25232	1.500	3.111	
*S ~~~~~ AP5 ~~~~~										
ROUTE	111.20	1	6	.02966	51.99	1.981	1.25234	1.567	2.739	
*S BASIN F (112)										
COMPUTE NM HYD	112.00	-	7	.01510	30.06	1.009	1.25234	1.500	3.111 PER IMP=	42.00
ADD HYD	112.10	6& 7	1	.04476	79.71	2.990	1.25232	1.533	2.782	
*S ~~~~~ AP6 ~~~~~										
ROUTE	112.20	1	7	.04476	73.97	2.990	1.25233	1.600	2.582	
*S BASIN G (120)										
*S ~~~~~ AP8 ~~~~~										
COMPUTE NM HYD	120.00	-	8	.01375	27.38	.918	1.25234	1.500	3.111 PER IMP=	42.00
*S BASIN H (121)										
COMPUTE NM HYD	121.00	-	9	.01319	26.26	.881	1.25234	1.500	3.111 PER IMP=	42.00
ADD HYD	121.10	8& 9	1	.02694	53.64	1.799	1.25232	1.500	3.111	
*S ~~~~~ AP9 ~~~~~										
ROUTE	121.20	1	9	.02694	52.43	1.799	1.25236	1.533	3.041	

*S BASIN I (122)

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	PAGE = 2	NOTATION
COMPUTE NM HYD	122.00	-	10	.01858	36.99	1.241	1.25234	1.500	3.111	PER IMP=	42.00
ADD HYD	122.10	9&10	1	.04552	88.33	3.040	1.25233	1.533	3.032		
*S ~~~~~~ AP7 ~~~~~~											
ROUTE	122.20	1	10	.04552	82.05	3.040	1.25234	1.567	2.816		
ADD HYD	104.30	4&10	10	.09617	173.14	6.423	1.25232	1.567	2.813		
*S BASIN J (130)											
COMPUTE NM HYD	130.00	-	11	.01661	33.07	1.109	1.25234	1.500	3.111	PER IMP=	42.00
ADD HYD	130.10	10&11	1	.11278	201.55	7.533	1.25232	1.567	2.792		
*S ~~~~~~ AP10 ~~~~~~											
ROUTE	130.20	1	11	.11278	199.52	7.533	1.25233	1.567	2.764		
*S BASIN K (131)											
COMPUTE NM HYD	131.00	-	12	.01532	30.50	1.023	1.25234	1.500	3.111	PER IMP=	42.00
ADD HYD	131.10	11&12	1	.12810	225.72	8.556	1.25232	1.567	2.753		
*S ~~~~~~ AP11 ~~~~~~											
ROUTE	131.20	1	12	.12810	214.40	8.556	1.25233	1.600	2.615		
*S BASIN L (140)											
*S ~~~~~~ AP12 ~~~~~~											
COMPUTE NM HYD	140.00	-	13	.01609	32.03	1.075	1.25234	1.500	3.111	PER IMP=	42.00
*S BASIN M (150)											
*S ~~~~~~ AP13 ~~~~~~											
COMPUTE NM HYD	150.00	-	14	.01718	25.89	.765	.83441	1.500	2.354	PER IMP=	10.00
*S											
*S***** ONSITE BASINS *****											
*S											
COMPUTE NM HYD	200.00	-	30	.08986	78.73	2.194	.45776	1.533	1.369	PER IMP=	.00
FINISH											

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
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START TIME (HR:MIN:SEC) = 11:10:22 USER NO.= ISCARFNM.I01
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*S*****
*S*** EL RANCHO GRANDE SUBDIVISION *****
*S*** UNITS SIX, SEVEN, & EIGHT *****
*S*** EXISTING CONDITIONS *****
*S*****

*** 167EX.DAT *****
*** AUGUST 22, 2001 GLD *****

*** EXISTING OFFSITE CONDITIONS, AND 57.5 ACRES *****
*** OF EXISTING UNDEVELOPED LAND ONSITE. *****

START RAINFALL BEGINS AT 0.0 HRS
RAINFALL TYPE=1 RAIN QUARTER=0 RAIN ONE=1.90
RAIN SIX=2.23 RAIN DAY=2.67 DT=0.03333HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0032	.0049	.0066	.0084	.0101
.0120	.0138	.0158	.0177	.0198	.0218	.0240
.0262	.0284	.0308	.0332	.0356	.0382	.0409
.0436	.0465	.0495	.0526	.0558	.0592	.0628
.0665	.0705	.0747	.0799	.0855	.0915	.1044
.1332	.1776	.2413	.3283	.4426	.5884	.7699
.9914	1.1970	1.2829	1.3554	1.4199	1.4785	1.5325
1.5827	1.6295	1.6735	1.7148	1.7538	1.7906	1.8255
1.8585	1.8898	1.9195	1.9478	1.9745	1.9808	1.9866
1.9921	1.9974	2.0024	2.0072	2.0118	2.0162	2.0205
2.0246	2.0286	2.0325	2.0362	2.0399	2.0434	2.0469
2.0502	2.0535	2.0567	2.0598	2.0629	2.0658	2.0688
2.0716	2.0744	2.0772	2.0799	2.0825	2.0851	2.0877
2.0902	2.0926	2.0950	2.0974	2.0998	2.1021	2.1044
2.1066	2.1088	2.1110	2.1131	2.1153	2.1173	2.1194
2.1214	2.1235	2.1254	2.1274	2.1293	2.1312	2.1331
2.1350	2.1369	2.1387	2.1405	2.1423	2.1440	2.1458
2.1475	2.1492	2.1509	2.1526	2.1543	2.1559	2.1575
2.1592	2.1608	2.1623	2.1639	2.1655	2.1670	2.1685
2.1701	2.1716	2.1730	2.1745	2.1760	2.1774	2.1789
2.1803	2.1817	2.1831	2.1845	2.1859	2.1873	2.1887
2.1900	2.1914	2.1927	2.1940	2.1953	2.1966	2.1979
2.1992	2.2005	2.2018	2.2030	2.2043	2.2055	2.2068
2.2080	2.2092	2.2104	2.2116	2.2128	2.2140	2.2152
2.2164	2.2176	2.2187	2.2199	2.2210	2.2222	2.2233
2.2244	2.2256	2.2267	2.2278	2.2289	2.2300	

*S***** OFFSITE BASINS *****

*S

*S BASIN A (102)

COMPUTE NM HYD ID=2 HYD NO=102.00 AREA=0.02210 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 36.646 CFS UNIT VOLUME = .9999 B = 526.28 P60 = 1.9000
AREA = .009282 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 31.912 CFS UNIT VOLUME = .9999 B = 331.87 P60 = 1.9000
AREA = .012818 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = 1.25234 INCHES = 1.4761 ACRE-FEET
PEAK DISCHARGE RATE = 43.99 CFS AT 1.500 HOURS BASIN AREA = .0221 SQ. MI.

* ROUTE THE RUNOFF IN A 28' F-F RESIDENTIAL STREET, ASSUME S=2%
* ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=100.85
CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=46.0
DIST ELEV DIST ELEV DIST ELEV DIST ELEV

0 100.85 9.0 100.67 9.1 100.00 23.0 100.28
37.0 100.00 37.1 100.67 46.0 100.85

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.10	.10	4.47
100.09	.40	.62	8.94
100.13	.90	1.82	13.41
100.18	1.60	3.91	17.89
100.22	2.50	7.09	22.36
100.27	3.60	11.53	26.83
100.31	4.85	18.37	27.99
100.36	6.10	26.89	28.01
100.40	7.35	36.64	28.02
100.45	8.61	47.54	28.03
100.49	9.86	59.52	28.05
100.54	11.12	72.52	28.06
100.58	12.37	86.50	28.07
100.63	13.63	101.42	28.09
100.67	14.88	116.96	28.21
100.72	16.25	123.19	32.66
100.76	17.81	132.18	37.11
100.81	19.57	143.72	41.55
100.85	21.52	157.73	46.00

*S ~~~~~ AP1 ~~~~~
COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=1000 FT SLP=0.035

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2863
.089	.400	.62	.1804
.134	.900	1.82	.1376
.179	1.600	3.91	.1136
.224	2.500	7.09	.0979
.268	3.601	11.53	.0867
.313	4.846	18.37	.0733
.358	6.099	26.89	.0630
.403	7.352	36.64	.0557
.447	8.606	47.54	.0503
.492	9.860	59.52	.0460
.537	11.116	72.52	.0426
.582	12.371	86.50	.0397
.626	13.628	101.42	.0373
.671	14.884	116.96	.0353
.716	16.246	123.19	.0366
.761	17.807	132.18	.0374
.805	19.566	143.72	.0378
.850	21.525	157.73	.0379

ROUTE ID=2 HYD NO=102.2 INFLOW ID=2 DT=0.0
WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 3 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.20

RUNOFF VOLUME = 1.25235 INCHES = 1.4761 ACRE-FEET
PEAK DISCHARGE RATE = 41.10 CFS AT 1.533 HOURS BASIN AREA = .0221 SQ. MI.

*S BASIN B (103)
COMPUTE NM HYD ID=3 HYD NO=103.00 AREA=0.01926 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 31.937 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .008089 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 27.811 CFS UNIT VOLUME = .9998 B = 331.87 P60 = 1.9000
AREA = .011171 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.00

RUNOFF VOLUME = 1.25234 INCHES = 1.2864 ACRE-FEET
PEAK DISCHARGE RATE = 38.34 CFS AT 1.500 HOURS BASIN AREA = .0193 SQ. MI.

* COMBINE BASINS A & B
ADD HYD ID=1 HYD NO=103.1 ID=2 ID=3
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 103.10

RUNOFF VOLUME = 1.25233 INCHES = 2.7624 ACRE-FEET
PEAK DISCHARGE RATE = 78.32 CFS AT 1.533 HOURS BASIN AREA = .0414 SQ. MI.

*S ~~~~~ AP2 ~~~~~
COMPUTE TRAVEL TIME ID=3 REACH NO=1 NO VS=1 L=1000 FT SLP=0.032

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2863
.089	.400	.62	.1804
.134	.900	1.82	.1376
.179	1.600	3.91	.1136
.224	2.500	7.09	.0979
.268	3.601	11.53	.0867
.313	4.846	18.37	.0733
.358	6.099	26.89	.0630
.403	7.352	36.64	.0557
.447	8.606	47.54	.0503
.492	9.860	59.52	.0460
.537	11.116	72.52	.0426
.582	12.371	86.50	.0397
.626	13.628	101.42	.0373
.671	14.884	116.96	.0353
.716	16.246	123.19	.0366
.761	17.807	132.18	.0374
.805	19.566	143.72	.0378
.850	21.525	157.73	.0379

ROUTE ID=3 HYD NO=103.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.20

RUNOFF VOLUME = 1.25234 INCHES = 2.7625 ACRE-FEET
PEAK DISCHARGE RATE = 75.87 CFS AT 1.567 HOURS BASIN AREA = .0414 SQ. MI.

*S BASIN C (104)
COMPUTE NM HYD ID=4 HYD NO=104.00 AREA=0.00929 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 15.405 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.9000
AREA = .003902 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 13.415 CFS UNIT VOLUME = .9993 B = 331.87 P60 = 1.9000
AREA = .005388 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.00

RUNOFF VOLUME = 1.25234 INCHES = .6205 ACRE-FEET
PEAK DISCHARGE RATE = 18.50 CFS AT 1.500 HOURS BASIN AREA = .0093 SQ. MI.

* COMBINE BASINS B & C
ADD HYD ID=1 HYD NO=104.1 ID=3 ID=4
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 104.10

RUNOFF VOLUME = 1.25232 INCHES = 3.3829 ACRE-FEET
 PEAK DISCHARGE RATE = 91.76 CFS AT 1.567 HOURS BASIN AREA = .0507 SQ. MI.

*S ***** AP3 *****
 COMPUTE TRAVEL TIME ID=4 REACH NO=1 NO VS=1 L=900 FT SLP=0.032

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2577
.089	.400	.62	.1623
.134	.900	1.82	.1239
.179	1.600	3.91	.1023
.224	2.500	7.09	.0881
.268	3.601	11.53	.0780
.313	4.846	18.37	.0660
.358	6.099	26.89	.0567
.403	7.352	36.64	.0502
.447	8.606	47.54	.0453
.492	9.860	59.52	.0414
.537	11.116	72.52	.0383
.582	12.371	86.50	.0358
.626	13.628	101.42	.0336
.671	14.884	116.96	.0318
.716	16.246	123.19	.0330
.761	17.807	132.18	.0337
.805	19.566	143.72	.0340
.850	21.525	157.73	.0341

ROUTE ID=4 HYD NO=104.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.20

RUNOFF VOLUME = 1.25233 INCHES = 3.3829 ACRE-FEET
 PEAK DISCHARGE RATE = 91.09 CFS AT 1.567 HOURS BASIN AREA = .0507 SQ. MI.

*S BASIN D (110)
 *S ***** AP4 *****
 COMPUTE NM HYD ID=5 HYD NO=110.00 AREA=0.00989 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 16.399 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.9000
 AREA = .004154 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 14.281 CFS UNIT VOLUME = .9993 B = 331.87 P60 = 1.9000
 AREA = .005736 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 110.00

RUNOFF VOLUME = 1.25234 INCHES = .6606 ACRE-FEET
 PEAK DISCHARGE RATE = 19.70 CFS AT 1.500 HOURS BASIN AREA = .0099 SQ. MI.

*S BASIN E (111)
 COMPUTE NM HYD ID=6 HYD NO=111.00 AREA=0.01977 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 32.782 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
 AREA = .008303 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 28.548 CFS UNIT VOLUME = .9998 B = 331.87 P60 = 1.9000
 AREA = .011467 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 111.00

RUNOFF VOLUME = 1.25234 INCHES = 1.3205 ACRE-FEET
 PEAK DISCHARGE RATE = 39.36 CFS AT 1.500 HOURS BASIN AREA = .0198 SQ. MI.

* COMBINE BASINS D & E
 ADD HYD ID=1 HYD NO=111.1 ID=5 ID=6
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 111.10

RUNOFF VOLUME = 1.25232 INCHES = 1.9810 ACRE-FEET
 PEAK DISCHARGE RATE = 59.05 CFS AT 1.500 HOURS BASIN AREA = .0297 SQ. MI.

*S ~~~~~ AP5 ~~~~~
 COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=1550 FT SLP=0.015

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4438
.089	.400	.62	.2796
.134	.900	1.82	.2134
.179	1.600	3.91	.1761
.224	2.500	7.09	.1518
.268	3.601	11.53	.1344
.313	4.846	18.37	.1136
.358	6.099	26.89	.0976
.403	7.352	36.64	.0864
.447	8.606	47.54	.0779
.492	9.860	59.52	.0713
.537	11.116	72.52	.0660
.582	12.371	86.50	.0616
.626	13.628	101.42	.0579
.671	14.884	116.96	.0548
.716	16.246	123.19	.0568
.761	17.807	132.18	.0580
.805	19.566	143.72	.0586
.850	21.525	157.73	.0588

ROUTE ID=6 HYD NO=111.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 111.20

RUNOFF VOLUME = 1.25234 INCHES = 1.9810 ACRE-FEET
 PEAK DISCHARGE RATE = 51.99 CFS AT 1.567 HOURS BASIN AREA = .0297 SQ. MI.

*S BASIN F (112)
 COMPUTE NM HYD ID=7 HYD NO=112.00 AREA=0.01510 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 25.039 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
 AREA = .006342 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 21.804 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
 AREA = .008758 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 112.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0085 ACRE-FEET
PEAK DISCHARGE RATE = 30.06 CFS AT 1.500 HOURS BASIN AREA = .0151 SQ. MI.

* COMBINE BASINS E & F
ADD HYD ID=1 HYD NO=112.1 ID=6 ID=7
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 112.10

RUNOFF VOLUME = 1.25232 INCHES = 2.9895 ACRE-FEET
PEAK DISCHARGE RATE = 79.71 CFS AT 1.533 HOURS BASIN AREA = .0448 SQ. MI.

*S ***** AP6 *****
COMPUTE TRAVEL TIME ID=7 REACH NO=1 NO VS=1 L=1400 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4009
.089	.400	.62	.2525
.134	.900	1.82	.1927
.179	1.600	3.91	.1591
.224	2.500	7.09	.1371
.268	3.601	11.53	.1214
.313	4.846	18.37	.1026
.358	6.099	26.89	.0882
.403	7.352	36.64	.0780
.447	8.606	47.54	.0704
.492	9.860	59.52	.0644
.537	11.116	72.52	.0596
.582	12.371	86.50	.0556
.626	13.628	101.42	.0523
.671	14.884	116.96	.0495
.716	16.246	123.19	.0513
.761	17.807	132.18	.0524
.805	19.566	143.72	.0529
.850	21.525	157.73	.0531

ROUTE ID=7 HYD NO=112.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 112.20

RUNOFF VOLUME = 1.25233 INCHES = 2.9895 ACRE-FEET
PEAK DISCHARGE RATE = 73.97 CFS AT 1.600 HOURS BASIN AREA = .0448 SQ. MI.

*S BASIN G (120)

*S ***** AP8 *****

COMPUTE NM HYD ID=8 HYD NO=120.00 AREA=0.01375 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 22.800 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
AREA = .005775 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 19.855 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
AREA = .007975 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 120.00

RUNOFF VOLUME = 1.25234 INCHES = .9184 ACRE-FEET
PEAK DISCHARGE RATE = 27.38 CFS AT 1.500 HOURS BASIN AREA = .0138 SQ. MI.

*S BASIN H (121)

COMPUTE NM HYD ID=9 HYD NO=121.00 AREA=0.01319 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.871 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
AREA = .005540 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 19.046 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
AREA = .007650 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 121.00

RUNOFF VOLUME = 1.25234 INCHES = .8810 ACRE-FEET
PEAK DISCHARGE RATE = 26.26 CFS AT 1.500 HOURS BASIN AREA = .0132 SQ. MI.

* COMBINE BASINS G & H

ADD HYD ID=1 HYD NO=121.1 ID=8 ID=9
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 121.10

RUNOFF VOLUME = 1.25232 INCHES = 1.7993 ACRE-FEET
PEAK DISCHARGE RATE = 53.64 CFS AT 1.500 HOURS BASIN AREA = .0269 SQ. MI.

*S ~~~~~ AP9 ~~~~~

COMPUTE TRAVEL TIME ID=9 REACH NO=1 NO VS=1 L=800 FT SLP=0.032

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2291
.089	.400	.62	.1443
.134	.900	1.82	.1101
.179	1.600	3.91	.0909
.224	2.500	7.09	.0783
.268	3.601	11.53	.0694
.313	4.846	18.37	.0586
.358	6.099	26.89	.0504
.403	7.352	36.64	.0446
.447	8.606	47.54	.0402
.492	9.860	59.52	.0368
.537	11.116	72.52	.0341
.582	12.371	86.50	.0318
.626	13.628	101.42	.0299
.671	14.884	116.96	.0283
.716	16.246	123.19	.0293
.761	17.807	132.18	.0299
.805	19.566	143.72	.0303
.850	21.525	157.73	.0303

ROUTE ID=9 HYD NO=121.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=9 CODE=1

PARTIAL HYDROGRAPH 121.20

RUNOFF VOLUME = 1.25236 INCHES = 1.7994 ACRE-FEET
PEAK DISCHARGE RATE = 52.43 CFS AT 1.533 HOURS BASIN AREA = .0269 SQ. MI.

*S BASIN I (122)

COMPUTE NM HYD ID=10 HYD NO=122.00 AREA=0.01858 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 30.809 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .007804 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 26.829 CFS UNIT VOLUME = .9998 B = 331.87 P60' = 1.9000
 AREA = .010776 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 122.00

RUNOFF VOLUME = 1.25234 INCHES = 1.2410 ACRE-FEET
 PEAK DISCHARGE RATE = 36.99 CFS AT 1.500 HOURS BASIN AREA = .0186 SQ. MI.

* COMBINE BASINS H & I
 ADD HYD ID=1 HYD NO=122.1 ID=9 ID=10
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 122.10

RUNOFF VOLUME = 1.25233 INCHES = 3.0403 ACRE-FEET
 PEAK DISCHARGE RATE = 88.33 CFS AT 1.533 HOURS BASIN AREA = .0455 SQ. MI.

*S ~~~~~ AP7 ~~~~~
 COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=1450 FT SLP=0.025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4152
.089	.400	.62	.2615
.134	.900	1.82	.1996
.179	1.600	3.91	.1648
.224	2.500	7.09	.1420
.268	3.601	11.53	.1257
.313	4.846	18.37	.1063
.358	6.099	26.89	.0913
.403	7.352	36.64	.0808
.447	8.606	47.54	.0729
.492	9.860	59.52	.0667
.537	11.116	72.52	.0617
.582	12.371	86.50	.0576
.626	13.628	101.42	.0541
.671	14.884	116.96	.0513
.716	16.246	123.19	.0531
.761	17.807	132.18	.0543
.805	19.566	143.72	.0548
.850	21.525	157.73	.0550

ROUTE ID=10 HYD NO=122.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 122.20

RUNOFF VOLUME = 1.25234 INCHES = 3.0403 ACRE-FEET
 PEAK DISCHARGE RATE = 82.05 CFS AT 1.567 HOURS BASIN AREA = .0455 SQ. MI.

* COMBINE BASINS C & I
 ADD HYD ID=10 HYD NO=104.3 ID=4 ID=10
 PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 104.30

RUNOFF VOLUME = 1.25232 INCHES = 6.4232 ACRE-FEET
 PEAK DISCHARGE RATE = 173.14 CFS AT 1.567 HOURS BASIN AREA = .0962 SQ. MI.

*S BASIN J (130)
 COMPUTE NM HYD ID=11 HYD NO=130.00 AREA=0.01661 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420

UNIT PEAK = 27.542 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .006976 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 23.985 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
AREA = .009634 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.25234 INCHES = 1.1094 ACRE-FEET
PEAK DISCHARGE RATE = 33.07 CFS AT 1.500 HOURS BASIN AREA = .0166 SQ. MI.

* COMBINE BASINS C & J

ADD HYD ID=1 HYD NO=130.1 ID=10 ID=11
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.10

RUNOFF VOLUME = 1.25232 INCHES = 7.5326 ACRE-FEET
PEAK DISCHARGE RATE = 201.55 CFS AT 1.567 HOURS BASIN AREA = .1128 SQ. MI.

*S ~~~~~ AP10 ~~~~~
COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=300 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0859
.089	.400	.62	.0541
.134	.900	1.82	.0413
.179	1.600	3.91	.0341
.224	2.500	7.09	.0294
.268	3.601	11.53	.0260
.313	4.846	18.37	.0220
.358	6.099	26.89	.0189
.403	7.352	36.64	.0167
.447	8.606	47.54	.0151
.492	9.860	59.52	.0138
.537	11.116	72.52	.0128
.582	12.371	86.50	.0119
.626	13.628	101.42	.0112
.671	14.884	116.96	.0106
.716	16.246	123.19	.0110
.761	17.807	132.18	.0112
.805	19.566	143.72	.0113
.850	21.525	157.73	.0114

ROUTE ID=11 HYD NO=130.2 INFLOW ID=1 DT=0.0
TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.20

RUNOFF VOLUME = 1.25233 INCHES = 7.5326 ACRE-FEET
PEAK DISCHARGE RATE = 199.52 CFS AT 1.567 HOURS BASIN AREA = .1128 SQ. MI.

*S BASIN K (131)

COMPUTE NM HYD ID=12 HYD NO=131.00 AREA=0.01532 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 25.403 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
AREA = .006434 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 22.122 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
AREA = .008886 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0232 ACRE-FEET
PEAK DISCHARGE RATE = 30.50 CFS AT 1.500 HOURS BASIN AREA = .0153 SQ. MI.

* COMBINE BASINS J & K

ADD HYD ID=1 HYD NO=131.1 ID=11 ID=12
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 131.10

RUNOFF VOLUME = 1.25232 INCHES = 8.5558 ACRE-FEET
PEAK DISCHARGE RATE = 225.72 CFS AT 1.567 HOURS BASIN AREA = .1281 SQ. MI.

*DEL REY RD COMBINED OUTFALL

*S ~~~~~ AP11 ~~~~~

COMPUTE TRAVEL TIME ID=12 REACH NO=1 NO VS=1 L=850 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2434
.089	.400	.62	.1533
.134	.900	1.82	.1170
.179	1.600	3.91	.0966
.224	2.500	7.09	.0832
.268	3.601	11.53	.0737
.313	4.846	18.37	.0623
.358	6.099	26.89	.0535
.403	7.352	36.64	.0474
.447	8.606	47.54	.0427
.492	9.860	59.52	.0391
.537	11.116	72.52	.0362
.582	12.371	86.50	.0338
.626	13.628	101.42	.0317
.671	14.884	116.96	.0300
.716	16.246	123.19	.0311
.761	17.807	132.18	.0318
.805	19.566	143.72	.0321
.850	21.525	157.73	.0322

ROUTE ID=12 HYD NO=131.2 INFLOW ID=1 DT=0.0
TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 131.20

RUNOFF VOLUME = 1.25233 INCHES = 8.5559 ACRE-FEET
PEAK DISCHARGE RATE = 214.40 CFS AT 1.600 HOURS BASIN AREA = .1281 SQ. MI.

*S BASIN L (140)

* LADRONES PL OUTFALL

*S ~~~~~ AP12 ~~~~~

COMPUTE NM HYD ID=13 HYD NO=140.00 AREA=0.01609 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 26.680 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
AREA = .006758 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 23.234 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
AREA = .009332 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=13 CODE=1

PARTIAL HYDROGRAPH 140.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0747 ACRE-FEET
PEAK DISCHARGE RATE = 32.03 CFS AT 1.500 HOURS BASIN AREA = .0161 SQ. MI.

*S BASIN M (150)
* FUTURE USE TRACT C-1
* CAMINO SAN MARTIN OUTFALL FROM PARK
* FUTURE PARK DEVELOPED CONDITIONS
*S ~~~~~ AP13 ~~~~~

COMPUTE NM HYD ID=14 HYD NO=150.00 AREA=0.01718 SQ MI
PER A=0 PER B=85 PER C=5 PER D=10
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 6.7828 CFS UNIT VOLUME = .9976 B = 526.28 P60 = 1.9000
AREA = .001718 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .129396HR TP = .133300HR K/TP RATIO = .970716 SHAPE CONSTANT, N = 3.638762
UNIT PEAK = 38.315 CFS UNIT VOLUME = .9999 B = 330.32 P60 = 1.9000
AREA = .015462 SQ MI IA = .49167 INCHES INF = 1.22667 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 150.00

RUNOFF VOLUME = .83441 INCHES = .7645 ACRE-FEET
PEAK DISCHARGE RATE = 25.89 CFS AT 1.500 HOURS BASIN AREA = .0172 SQ. MI.

*S
*S***** ONSITE BASINS *****
*S

* BASIN 200
* EL RANCHO GRANDE UNITS 6, 7, & 8
* ENTIRE SITE UNDEVELOPED

COMPUTE NM HYD ID=30 HYD NO=200.00 AREA=0.089856 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=-0.1333 HR MASS RAIN=-1

K = .159638HR TP = .133300HR K/TP RATIO = 1.197581 SHAPE CONSTANT, N = 2.966694
UNIT PEAK = 188.13 CFS UNIT VOLUME = .9997 B = 279.10 P60 = 1.9000
AREA = .089856 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=30 CODE=1

PARTIAL HYDROGRAPH 200.00

RUNOFF VOLUME = .45776 INCHES = 2.1937 ACRE-FEET
PEAK DISCHARGE RATE = 78.73 CFS AT 1.533 HOURS BASIN AREA = .0899 SQ. MI.

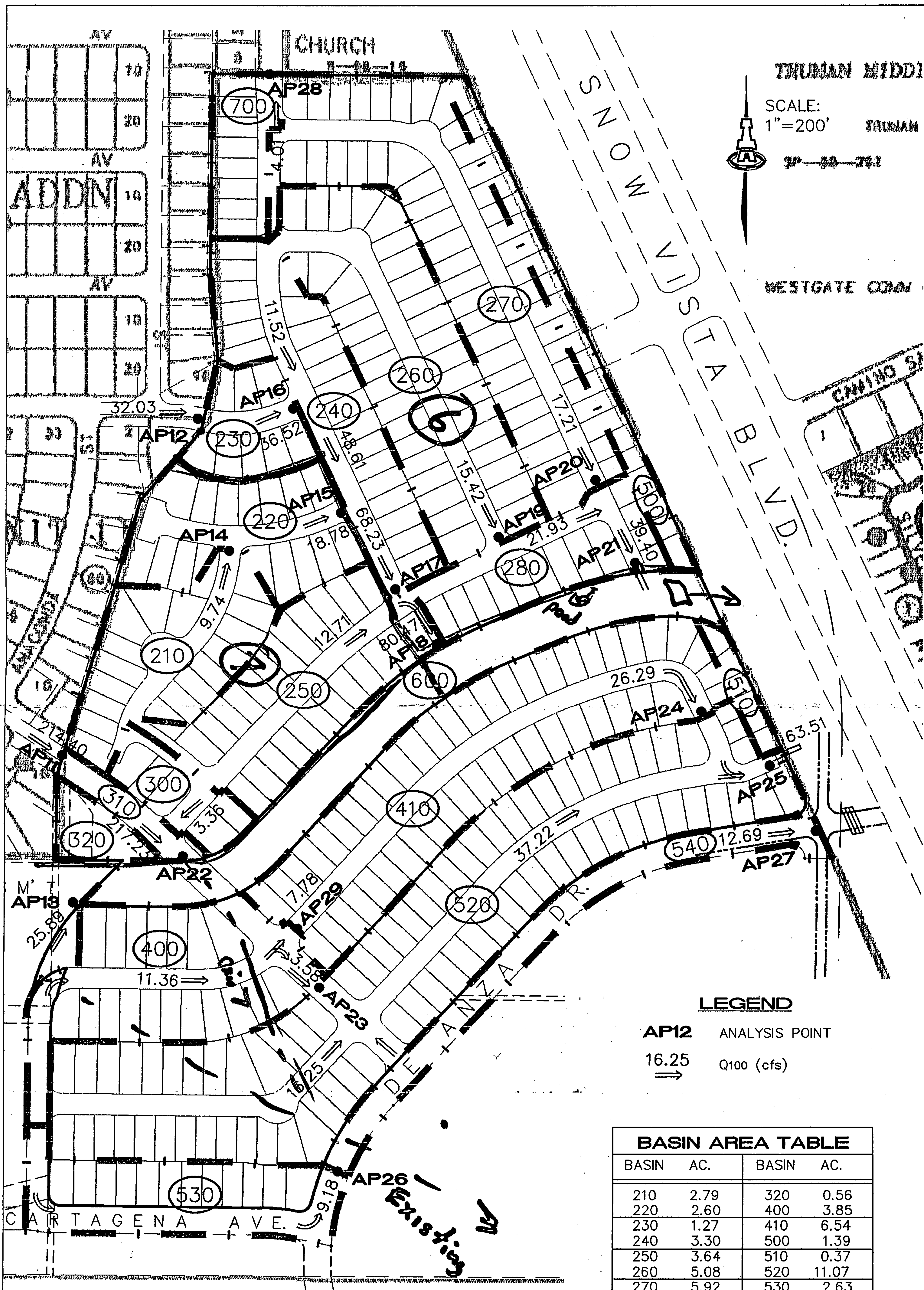
FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 11:10:22

APPENDIX B

Proposed Conditions



LAND TREATMENT CALCS:

TOTAL AREA = 57.5076 Ac

ONSITE

OF PROPOSED LOTS = 353

D.U./Ac.:

$$N = \frac{353}{57.5} = 6.138 \text{ D.U./Ac.}$$

%D:

$$\begin{aligned} \%D &= 7\sqrt{N^2 + 5N} = 7\sqrt{6.138^2 + 5(6.138)} \\ &= \underline{\underline{57.88\%}} \end{aligned}$$

$$100\% - 57.88\% = 42.12\% - \underline{\underline{5\% C}} = \underline{\underline{37.12\% B}}$$

<u>ONSITE</u>	
0% A	
37.12% B	$\Rightarrow 21.3468 \text{ Ac} \Rightarrow 0.03335 \text{ mi}^2$
5% C	$\Rightarrow 2.8754 \text{ Ac} \Rightarrow 0.00449 \text{ mi}^2$
57.88% D	$\Rightarrow 33.2854 \text{ Ac} \Rightarrow 0.05201 \text{ mi}^2$

OFFSITE

Ave D.U./Ac.

BASIN A $\approx 56 \text{ lots} / 14.2 \text{ Ac} = 3.94 \text{ D.U./Ac.}$ Use $N=4$

$$\%D = 7\sqrt{N^2 + 5N} = 7\sqrt{4^2 + 4(5)} = \underline{\underline{42\% D}}$$

$$100\% - 42\% D = 58\% - \underline{\underline{5\% C}} = \underline{\underline{53\% B}}$$

0% A	5% C
53% B	42% D

OFFSITE

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 INPUT FILE = C:\AHYMO\RANCHGR\167DEV-S.DAT

RUN DATE (MON/DAY/YR) =08/17/2001
 USER NO.= ISCARFNM.I01

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	PAGE = 1 NOTATION

*S***	EL RANCHO GRANDE SUBDIVISION				****					
*S***	UNITS SIX, SEVEN, & EIGHT				****					
*S***	DEVELOPED CONDITIONS				****					

START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.230
***** OFFSITE BASINS *****										
*S										
*S	BASIN A (102)									
COMPUTE NM HYD	102.00	-	2	.02210	43.99	1.476	1.25234	1.500	3.110	PER IMP= 42.00
*S	~~~~~ AP1 ~~~~~									
ROUTE	102.20	3	2	.02210	41.10	1.476	1.25235	1.533	2.906	
*S	BASIN B (103)									
COMPUTE NM HYD	103.00	-	3	.01926	38.34	1.286	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	103.10	2& 3	1	.04136	78.32	2.762	1.25233	1.533	2.959	
*S	~~~~~ AP2 ~~~~~									
ROUTE	103.20	1	3	.04136	75.87	2.762	1.25234	1.567	2.866	
*S	BASIN C (104)									
COMPUTE NM HYD	104.00	-	4	.00929	18.50	.620	1.25234	1.500	3.112	PER IMP= 42.00
ADD HYD	104.10	3& 4	1	.05065	91.76	3.383	1.25232	1.567	2.831	
*S	~~~~~ AP3 ~~~~~									
ROUTE	104.20	1	4	.05065	91.09	3.383	1.25233	1.567	2.810	
*S	BASIN D (110)									
*S	~~~~~ AP4 ~~~~~									
COMPUTE NM HYD	110.00	-	5	.00989	19.70	.661	1.25234	1.500	3.112	PER IMP= 42.00
*S	BASIN E (111)									
COMPUTE NM HYD	111.00	-	6	.01977	39.36	1.320	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	111.10	5& 6	1	.02966	59.05	1.981	1.25232	1.500	3.111	
*S	~~~~~ AP5 ~~~~~									
ROUTE	111.20	1	6	.02966	51.99	1.981	1.25234	1.567	2.739	
*S	BASIN F (112)									
COMPUTE NM HYD	112.00	-	7	.01510	30.06	1.009	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	112.10	6& 7	1	.04476	79.71	2.990	1.25232	1.533	2.782	
*S	~~~~~ AP6 ~~~~~									
ROUTE	112.20	1	7	.04476	73.97	2.990	1.25233	1.600	2.582	
*S	BASIN G (120)									
*S	~~~~~ AP8 ~~~~~									
COMPUTE NM HYD	120.00	-	8	.01375	27.38	.918	1.25234	1.500	3.111	PER IMP= 42.00
*S	BASIN H (121)									
COMPUTE NM HYD	121.00	-	9	.01319	26.26	.881	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	121.10	8& 9	1	.02694	53.64	1.799	1.25232	1.500	3.111	
*S	~~~~~ AP9 ~~~~~									
ROUTE	121.20	1	9	.02694	52.43	1.799	1.25236	1.533	3.041	

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	PAGE = 2 NOTATION
*S BASIN I (122)										
COMPUTE NM HYD	122.00	-	10	.01858	36.99	1.241	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	122.10	9&10	1	.04552	88.33	3.040	1.25233	1.533	3.032	
*S ~~~~~ AP7 ~~~~~										
ROUTE	122.20	1	10	.04552	82.05	3.040	1.25234	1.567	2.816	
ADD HYD	104.30	4&10	10	.09617	173.14	6.423	1.25232	1.567	2.813	
*S BASIN J (130)										
COMPUTE NM HYD	130.00	-	11	.01661	33.07	1.109	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	130.10	10&11	1	.11278	201.55	7.533	1.25232	1.567	2.792	
*S ~~~~~ AP10 ~~~~~										
ROUTE	130.20	1	11	.11278	199.52	7.533	1.25233	1.567	2.764	
*S BASIN K (131)										
COMPUTE NM HYD	131.00	-	12	.01532	30.50	1.023	1.25234	1.500	3.111	PER IMP= 42.00
ADD HYD	131.10	11&12	1	.12810	225.72	8.556	1.25232	1.567	2.753	
*S ~~~~~ AP11 ~~~~~										
ROUTE	131.20	1	12	.12810	214.40	8.556	1.25233	1.600	2.615	
*S BASIN L (140)										
*S ~~~~~ AP12 ~~~~~										
COMPUTE NM HYD	140.00	-	13	.01609	32.03	1.075	1.25234	1.500	3.111	PER IMP= 42.00
*S BASIN M (150)										
*S ~~~~~ AP13 ~~~~~										
COMPUTE NM HYD	150.00	-	14	.01718	25.89	.765	.83441	1.500	2.354	PER IMP= 10.00
*S ***** ONSITE BASINS *****										
*S										
*S ~~~~~ AP14 ~~~~~										
COMPUTE NM HYD	210.00	-	30	.00436	9.74	.339	1.45975	1.500	3.491	PER IMP= 57.88
COMPUTE NM HYD	220.00	-	31	.00408	9.12	.318	1.45975	1.500	3.491	PER IMP= 57.88
ADD HYD	220.10	30&31	1	.00844	18.86	.657	1.45968	1.500	3.491	
*S ~~~~~ AP15 ~~~~~										
ROUTE	220.20	1	31	.00844	18.78	.657	1.45974	1.533	3.477	
COMPUTE NM HYD	230.00	-	32	.00208	4.66	.162	1.45975	1.500	3.497	PER IMP= 57.88
ADD HYD	230.10	13&32	1	.01817	36.69	1.237	1.27605	1.500	3.155	
*S ~~~~~ AP16 ~~~~~										
ROUTE	230.20	1	32	.01817	36.52	1.237	1.27608	1.533	3.140	
COMPUTE NM HYD	240.00	-	33	.00516	11.52	.402	1.45975	1.500	3.490	PER IMP= 57.88
ADD HYD	240.10	32&33	1	.02333	47.98	1.638	1.31667	1.500	3.213	
ROUTE	240.20	1	33	.02333	48.61	1.638	1.31669	1.533	3.256	
ADD HYD	240.30	31&33	1	.03177	67.39	2.295	1.35467	1.533	3.314	
*S ~~~~~ AP17 ~~~~~										
ROUTE	240.40	1	33	.03177	68.23	2.295	1.35468	1.533	3.356	
COMPUTE NM HYD	250.00	-	34	.00569	12.71	.443	1.45975	1.500	3.489	PER IMP= 57.88
*S ~~~~~ AP 18 ~~~~~										
ADD HYD	250.10	33&34	34	.03746	80.47	2.738	1.37062	1.533	3.356	
COMPUTE NM HYD	260.00	-	35	.00793	17.70	.617	1.45975	1.500	3.488	PER IMP= 57.88
*S ~~~~~ AP19 ~~~~~										

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
ROUTE	260.10	36	35	.00793	15.42	.617	1.45978	1.567	3.038	
COMPUTE NM HYD	270.00	-	36	.00926	20.67	.721	1.45975	1.500	3.487	PER IMP= 57.88
*S	AP20									
ROUTE	270.10	37	36	.00926	17.21	.721	1.45977	1.567	2.903	
COMPUTE NM HYD	280.00	-	37	.00319	7.13	.248	1.45975	1.500	3.493	PER IMP= 57.88
ADD HYD	280.10	35&37	1	.01112	22.02	.866	1.45970	1.533	3.094	
ROUTE	280.20	1	37	.01112	21.93	.866	1.45975	1.567	3.081	
ADD HYD	280.30	36&37	1	.02038	39.14	1.587	1.45971	1.567	3.000	
*S	AP21									
ROUTE	280.40	1	37	.02038	39.40	1.587	1.45973	1.567	3.020	
COMPUTE NM HYD	300.00	-	38	.00150	3.36	.117	1.45975	1.500	3.501	PER IMP= 57.88
COMPUTE NM HYD	310.00	-	39	.00080	1.80	.062	1.45975	1.500	3.516	PER IMP= 57.88
COMPUTE NM HYD	320.00	-	40	.00087	1.96	.068	1.45975	1.500	3.515	PER IMP= 57.88
ADD HYD	310.10	12&39	15	.12890	215.69	8.618	1.25361	1.600	2.614	
ADD HYD	310.20	38&15	16	.13040	218.08	8.735	1.25598	1.600	2.613	
ADD HYD	310.30	40&16	1	.13127	219.48	8.803	1.25733	1.600	2.612	
*S	AP22									
ROUTE	310.40	1	39	.13127	217.23	8.803	1.25733	1.633	2.586	
COMPUTE NM HYD	400.00	-	41	.00602	13.44	.469	1.45975	1.500	3.489	PER IMP= 57.88
ROUTE	400.10	42	41	.00602	11.36	.469	1.45978	1.567	2.949	
*S	AP29									
*S	AP23									
DIVIDE HYD	400.20	41	17	.00549	7.78	.428	1.45971	1.500	2.213	
	400.30	AND	18	.00053	3.58	.041	1.45971	1.567	10.625	
COMPUTE NM HYD	410.00	-	43	.01022	22.81	.796	1.45975	1.500	3.487	PER IMP= 57.88
ADD HYD	410.10	17&43	1	.01571	30.59	1.223	1.45972	1.500	3.042	
*S	AP24									
ROUTE	410.20	1	43	.01571	26.29	1.223	1.45975	1.567	2.614	
COMPUTE NM HYD	500.00	-	44	.00217	4.86	.169	1.45975	1.500	3.497	PER IMP= 57.88
COMPUTE NM HYD	510.00	-	45	.00057	1.29	.044	1.45975	1.500	3.527	PER IMP= 57.88
COMPUTE NM HYD	520.00	-	46	.01730	38.60	1.347	1.45975	1.500	3.486	PER IMP= 57.88
ROUTE	520.10	47	46	.01730	37.24	1.347	1.45976	1.533	3.363	
ADD HYD	520.20	18&46	1	.01783	40.40	1.388	1.45974	1.533	3.541	
ROUTE	520.10	1	46	.01783	37.22	1.388	1.45976	1.567	3.262	
*S	AP25									
ADD HYD	520.20	43&46	46	.03354	63.51	2.611	1.45972	1.567	2.959	
*S	AP26									
COMPUTE NM HYD	530.00	-	47	.00411	9.18	.320	1.45975	1.500	3.491	PER IMP= 57.88
COMPUTE NM HYD	540.00	-	48	.00306	7.87	.285	1.74889	1.500	4.016	PER IMP= 80.00
ADD HYD	540.10	47&48	1	.00717	17.05	.605	1.58307	1.500	3.715	
*S	AP27									
ROUTE	540.20	1	48	.00717	12.69	.605	1.58321	1.567	2.766	
COMPUTE NM HYD	600.00	-	49	.00539	11.25	.386	1.34275	1.500	3.263	PER IMP= 50.00
*S	AP28									
COMPUTE NM HYD	700.00	-	49	.00179	4.01	.139	1.45975	1.500	3.499	PER IMP= 57.88
FINISH										

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 08/17/2001
START TIME (HR:MIN:SEC) = 14:42:54 USER NO.= ISCARFNM.I01
INPUT FILE = C:\AHYMO\RANCHGR\167DEV-S.DAT

*S*****
*S*** EL RANCHO GRANDE SUBDIVISION ****
*S*** UNITS SIX, SEVEN, & EIGHT ****
*S*** DEVELOPED CONDITIONS ****
*S*****
*** 167DEV.DAT ****
*** AUGUST 17, 2001 GLD ****
*** ****
*** A 54 ACRE, 347 LOT SUBDIVISION WEST OF THE SNOW ****
*** VISTA CHANNEL, WITH A 100' R.O.W FOR THE AMOLE ****
*** ARROYO RUNNING EAST TO WEST THROUGH THE SITE TO ****
*** THE CONFLUENCE WITH THE SNOW VISTA ARROYO. ****
*** ****

START RAINFALL BEGINS AT 0.0 HRS
RAINFALL TYPE=1 RAIN QUARTER=0 RAIN ONE=1.90
RAIN SIX=2.23 RAIN DAY=2.67 DT=0.03333HR

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0032	.0049	.0066	.0084	.0101
.0120	.0138	.0158	.0177	.0198	.0218	.0240
.0262	.0284	.0308	.0332	.0356	.0382	.0409
.0436	.0465	.0495	.0526	.0558	.0592	.0628
.0665	.0705	.0747	.0799	.0855	.0915	.1044
.1332	.1776	.2413	.3283	.4426	.5884	.7699
.9914	1.1970	1.2829	1.3554	1.4199	1.4785	1.5325
1.5827	1.6295	1.6735	1.7148	1.7538	1.7906	1.8255
1.8585	1.8898	1.9195	1.9478	1.9745	1.9808	1.9866
1.9921	1.9974	2.0024	2.0072	2.0118	2.0162	2.0205
2.0246	2.0286	2.0325	2.0362	2.0399	2.0434	2.0469
2.0502	2.0535	2.0567	2.0598	2.0629	2.0658	2.0688
2.0716	2.0744	2.0772	2.0799	2.0825	2.0851	2.0877
2.0902	2.0926	2.0950	2.0974	2.0998	2.1021	2.1044
2.1066	2.1088	2.1110	2.1131	2.1153	2.1173	2.1194
2.1214	2.1235	2.1254	2.1274	2.1293	2.1312	2.1331
2.1350	2.1369	2.1387	2.1405	2.1423	2.1440	2.1458
2.1475	2.1492	2.1509	2.1526	2.1543	2.1559	2.1575
2.1592	2.1608	2.1623	2.1639	2.1655	2.1670	2.1685
2.1701	2.1716	2.1730	2.1745	2.1760	2.1774	2.1789
2.1803	2.1817	2.1831	2.1845	2.1859	2.1873	2.1887
2.1900	2.1914	2.1927	2.1940	2.1953	2.1966	2.1979
2.1992	2.2005	2.2018	2.2030	2.2043	2.2055	2.2068
2.2080	2.2092	2.2104	2.2116	2.2128	2.2140	2.2152
2.2164	2.2176	2.2187	2.2199	2.2210	2.2222	2.2233
2.2244	2.2256	2.2267	2.2278	2.2289	2.2300	

*S***** OFFSITE BASINS *****

*S

*S BASIN A (102)

COMPUTE NM HYD ID=2 HYD NO=102.00 AREA=0.02210 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 36.646 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .009282 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 31.912 CFS UNIT VOLUME = .9990 B = 331.87 P60 = 1.9000
AREA = .012818 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = 1.25234 INCHES = 1.4761 ACRE-FEET
PEAK DISCHARGE RATE = 43.99 CFS AT 1.500 HOURS BASIN AREA = .0221 SQ. MI.

* ROUTE THE RUNOFF IN A 28' F-F RESIDENTIAL STREET, ASSUME S=2%
* ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=100.85

CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=46.0
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0 100.85 9.0 100.67 9.1 100.00 23.0 100.28
37.0 100.00 37.1 100.67 46.0 100.85

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.10	.10	4.47
100.09	.40	.62	8.94
100.13	.90	1.82	13.41
100.18	1.60	3.91	17.89
100.22	2.50	7.09	22.36
100.27	3.60	11.53	26.83
100.31	4.85	18.37	27.99
100.36	6.10	26.89	28.01
100.40	7.35	36.64	28.02
100.45	8.61	47.54	28.03
100.49	9.86	59.52	28.05
100.54	11.12	72.52	28.06
100.58	12.37	86.50	28.07
100.63	13.63	101.42	28.09
100.67	14.88	116.96	28.21
100.72	16.25	123.19	32.66
100.76	17.81	132.18	37.11
100.81	19.57	143.72	41.55
100.85	21.52	157.73	46.00

*S ~~~~~ AP1 ~~~~~

COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=1000 FT SLP=0.035

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2863
.089	.400	.62	.1804
.134	.900	1.82	.1376
.179	1.600	3.91	.1136
.224	2.500	7.09	.0979
.268	3.601	11.53	.0867
.313	4.846	18.37	.0733
.358	6.099	26.89	.0630
.403	7.352	36.64	.0557
.447	8.606	47.54	.0503
.492	9.860	59.52	.0460
.537	11.116	72.52	.0426
.582	12.371	86.50	.0397
.626	13.628	101.42	.0373
.671	14.884	116.96	.0353
.716	16.246	123.19	.0366
.761	17.807	132.18	.0374
.805	19.566	143.72	.0378
.850	21.525	157.73	.0379

ROUTE ID=2 HYD NO=102.2 INFLOW ID=2 DT=0.0

WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 3 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.20

RUNOFF VOLUME = 1.25235 INCHES = 1.4761 ACRE-FEET
PEAK DISCHARGE RATE = 41.10 CFS AT 1.533 HOURS BASIN AREA = .0221 SQ. MI.

*S BASIN B (103)

COMPUTE NM HYD ID=3 HYD NO=103.00 AREA=0.01926 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 31.937 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .008089 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 27.811 CFS UNIT VOLUME = .9998 B = 331.87 P60 = 1.9000
AREA = .011171 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.00

RUNOFF VOLUME = 1.25234 INCHES = 1.2864 ACRE-FEET
PEAK DISCHARGE RATE = 38.34 CFS AT 1.500 HOURS BASIN AREA = .0193 SQ. MI.

* COMBTNE BASINS A & B
ADD HYD ID=1 HYD NO=103.1 ID=2 ID=3
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 103.10

RUNOFF VOLUME = 1.25233 INCHES = 2.7624 ACRE-FEET
PEAK DISCHARGE RATE = 78.32 CFS AT 1.533 HOURS BASIN AREA = .0414 SQ. MI.

*S ----- AP2 -----
COMPUTE TRAVEL TIME ID=3 REACH NO=1 NO VS=1 L=1000 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2863
.089	.400	.62	.1804
.134	.900	1.82	.1376
.179	1.600	3.91	.1136
.224	2.500	7.09	.0979
.268	3.601	11.53	.0867
.313	4.846	18.37	.0733
.358	6.099	26.89	.0630
.403	7.352	36.64	.0557
.447	8.606	47.54	.0503
.492	9.860	59.52	.0460
.537	11.116	72.52	.0426
.582	12.371	86.50	.0397
.626	13.628	101.42	.0373
.671	14.884	116.96	.0353
.716	16.246	123.19	.0366
.761	17.807	132.18	.0374
.805	19.566	143.72	.0378
.850	21.525	157.73	.0379

ROUTE ID=3 HYD NO=103.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.20

RUNOFF VOLUME = 1.25234 INCHES = 2.7625 ACRE-FEET
PEAK DISCHARGE RATE = 75.87 CFS AT 1.567 HOURS BASIN AREA = .0414 SQ. MI.

*S BASIN C (104)
COMPUTE NM HYD ID=4 HYD NO=104.00 AREA=0.00929 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 15.405 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.9000
AREA = .003902 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 13.415 CFS UNIT VOLUME = .9993 B = 331.87 P60 = 1.9000
AREA = .005388 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.00

RUNOFF VOLUME = 1.25234 INCHES = .6205 ACRE-FEET
PEAK DISCHARGE RATE = 18.50 CFS AT 1.500 HOURS BASIN AREA = .0093 SQ. MI.

* COMBINE BASINS B & C

ADD HYD
PRINT HYD

ID=1 HYD NO=104.1 ID=3 ID=4
ID=1 CODE=1

PARTIAL HYDROGRAPH 104.10

RUNOFF VOLUME = 1.25232 INCHES = 3.3829 ACRE-FEET
PEAK DISCHARGE RATE = 91.76 CFS AT 1.567 HOURS BASIN AREA = .0507 SQ. MI.

*S ~~~~~ AP3 ~~~~~
COMPUTE TRAVEL TIME ID=4 REACH NO=1 NO VS=1 L=900 FT SLP=0.032

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2577
.089	.400	.62	.1623
.134	.900	1.82	.1239
.179	1.600	3.91	.1023
.224	2.500	7.09	.0881
.268	3.601	11.53	.0780
.313	4.846	18.37	.0660
.358	6.099	26.89	.0567
.403	7.352	36.64	.0502
.447	8.606	47.54	.0453
.492	9.860	59.52	.0414
.537	11.116	72.52	.0383
.582	12.371	86.50	.0358
.626	13.628	101.42	.0336
.671	14.884	116.96	.0318
.716	16.246	123.19	.0330
.761	17.807	132.18	.0337
.805	19.566	143.72	.0340
.850	21.525	157.73	.0341

ROUTE ID=4 HYD NO=104.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.20

RUNOFF VOLUME = 1.25233 INCHES = 3.3829 ACRE-FEET
PEAK DISCHARGE RATE = 91.09 CFS AT 1.567 HOURS BASIN AREA = .0507 SQ. MI.

*S BASIN D (110)
*S ~~~~~ AP4 ~~~~~
COMPUTE NM HYD ID=5 HYD NO=110.00 AREA=0.00989 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 16.399 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.9000
AREA = .004154 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 14.281 CFS UNIT VOLUME = .9993 B = 331.87 P60 = 1.9000
AREA = .005736 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 110.00

RUNOFF VOLUME = 1.25234 INCHES = .6606 ACRE-FEET
PEAK DISCHARGE RATE = 19.70 CFS AT 1.500 HOURS BASIN AREA = .0099 SQ. MI.

*S BASIN E (111)
COMPUTE NM HYD ID=6 HYD NO=111.00 AREA=0.01977 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 32.782 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .008303 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 28.548 CFS UNIT VOLUME = .9998 B = 331.87 P60 = 1.9000
 AREA = .011467 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 111.00

RUNOFF VOLUME = 1.25234 INCHES = 1.3205 ACRE-FEET
 PEAK DISCHARGE RATE = 39.36 CFS AT 1.500 HOURS BASIN AREA = .0198 SQ. MI.

* COMBINE BASINS D & E
 ADD HYD ID=1 HYD NO=111.1 ID=5 ID=6
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 111.10

RUNOFF VOLUME = 1.25232 INCHES = 1.9810 ACRE-FEET
 PEAK DISCHARGE RATE = 59.05 CFS AT 1.500 HOURS BASIN AREA = .0297 SQ. MI.

*S ***** AP5 *****
 COMPUTE TRAVEL TIME ID=6 REACH NO=1 NO VS=1 L=1550 FT SLP=0.015

TRAVEL TIME TABLE REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4438
.089	.400	.62	.2796
.134	.900	1.82	.2134
.179	1.600	3.91	.1761
.224	2.500	7.09	.1518
.268	3.601	11.53	.1344
.313	4.846	18.37	.1136
.358	6.099	26.89	.0976
.403	7.352	36.64	.0864
.447	8.606	47.54	.0779
.492	9.860	59.52	.0713
.537	11.116	72.52	.0660
.582	12.371	86.50	.0616
.626	13.628	101.42	.0579
.671	14.884	116.96	.0548
.716	16.246	123.19	.0568
.761	17.807	132.18	.0580
.805	19.566	143.72	.0586
.850	21.525	157.73	.0588

ROUTE ID=6 HYD NO=111.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 111.20

RUNOFF VOLUME = 1.25234 INCHES = 1.9810 ACRE-FEET
 PEAK DISCHARGE RATE = 51.99 CFS AT 1.567 HOURS BASIN AREA = .0297 SQ. MI.

*S BASIN F (112)
 COMPUTE NM HYD ID=7 HYD NO=112.00 AREA=0.01510 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 25.039 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
 AREA = .006342 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 21.804 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
 AREA = .008758 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 112.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0085 ACRE-FEET
 PEAK DISCHARGE RATE = 30.06 CFS AT 1.500 HOURS BASIN AREA = .0151 SQ. MI.

* COMBINE BASINS E & F
 ADD HYD ID=1 HYD NO=112.1 ID=6 ID=7
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 112.10

RUNOFF VOLUME = 1.25232 INCHES = 2.9895 ACRE-FEET
 PEAK DISCHARGE RATE = 79.71 CFS AT 1.533 HOURS BASIN AREA = .0448 SQ. MI.

*S ~~~~~ AP6 ~~~~~
 COMPUTE TRAVEL TIME ID=7 REACH NO=1 NO VS=1 L=1400 FT SLP=0.032

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4009
.089	.400	.62	.2525
.134	.900	1.82	.1927
.179	1.600	3.91	.1591
.224	2.500	7.09	.1371
.268	3.601	11.53	.1214
.313	4.846	18.37	.1026
.358	6.099	26.89	.0882
.403	7.352	36.64	.0780
.447	8.606	47.54	.0704
.492	9.860	59.52	.0644
.537	11.116	72.52	.0596
.582	12.371	86.50	.0556
.626	13.628	101.42	.0523
.671	14.884	116.96	.0495
.716	16.246	123.19	.0513
.761	17.807	132.18	.0524
.805	19.566	143.72	.0529
.850	21.525	157.73	.0531

ROUTE ID=7 HYD NO=112.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 112.20

RUNOFF VOLUME = 1.25233 INCHES = 2.9895 ACRE-FEET
 PEAK DISCHARGE RATE = 73.97 CFS AT 1.600 HOURS BASIN AREA = .0448 SQ. MI.

*S BASIN G (120)
 *S ~~~~~ AP8 ~~~~~
 COMPUTE NM HYD ID=8 HYD NO=120.00 AREA=0.01375 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 22.800 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
 AREA = .005775 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 19.855 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
 AREA = .007975 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=1

PARTIAL HYDROGRAPH 120.00

RUNOFF VOLUME = 1.25234 INCHES = .9184 ACRE-FEET
 PEAK DISCHARGE RATE = 27.38 CFS AT 1.500 HOURS BASIN AREA = .0138 SQ. MI.

*S BASIN H (121)

COMPUTE NM HYD

ID=9 HYD NO=121.00 AREA=0.01319 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.871 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
AREA = .005540 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 19.046 CFS UNIT VOLUME = .9996 B = 331.87 P60 = 1.9000
AREA = .007650 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=9 CODE=1

PARTIAL HYDROGRAPH 121.00

RUNOFF VOLUME = 1.25234 INCHES = .8810 ACRE-FEET
PEAK DISCHARGE RATE = 26.26 CFS AT 1.500 HOURS BASIN AREA = .0132 SQ. MI.

* COMBINE BASINS G & H

ADD HYD

ID=1 HYD NO=121.1 ID=8 ID=9

PRINT HYD

ID=1 CODE=1

PARTIAL HYDROGRAPH 121.10

RUNOFF VOLUME = 1.25232 INCHES = 1.7993 ACRE-FEET
PEAK DISCHARGE RATE = 53.64 CFS AT 1.500 HOURS BASIN AREA = .0269 SQ. MI.

*S ~~~~~ AP9 ~~~~~

COMPUTE TRAVEL TIME ID=9 REACH NO=1 NO VS=1 L=800 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2291
.089	.400	.62	.1443
.134	.900	1.82	.1101
.179	1.600	3.91	.0909
.224	2.500	7.09	.0783
.268	3.601	11.53	.0694
.313	4.846	18.37	.0586
.358	6.099	26.89	.0504
.403	7.352	36.64	.0446
.447	8.606	47.54	.0402
.492	9.860	59.52	.0368
.537	11.116	72.52	.0341
.582	12.371	86.50	.0318
.626	13.628	101.42	.0299
.671	14.884	116.96	.0283
.716	16.246	123.19	.0293
.761	17.807	132.18	.0299
.805	19.566	143.72	.0303
.850	21.525	157.73	.0303

ROUTE

ID=9 HYD NO=121.2 INFLOW ID=1 DT=0.0

PRINT HYD

ID=9 CODE=1

PARTIAL HYDROGRAPH 121.20

RUNOFF VOLUME = 1.25236 INCHES = 1.7994 ACRE-FEET
PEAK DISCHARGE RATE = 52.43 CFS AT 1.533 HOURS BASIN AREA = .0269 SQ. MI.

*S BASIN I (122)

COMPUTE NM HYD

ID=10 HYD NO=122.00 AREA=0.01858 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 30.809 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
AREA = .007804 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 26.829 CFS UNIT VOLUME = .9998 B = 331.87 P60 = 1.9000
AREA = .010776 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 122.00

RUNOFF VOLUME = 1.25234 INCHES = 1.2410 ACRE-FEET
PEAK DISCHARGE RATE = 36.99 CFS AT 1.500 HOURS BASIN AREA = .0186 SQ. MI.

* COMBINE BASINS H & I
ADD HYD ID=1 HYD NO=122.1 ID=9 ID=10
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 122.10

RUNOFF VOLUME = 1.25233 INCHES = 3.0403 ACRE-FEET
PEAK DISCHARGE RATE = 88.33 CFS AT 1.533 HOURS BASIN AREA = .0455 SQ. MI.

*S ~~~~~ AP7 ~~~~~
COMPUTE TRAVEL TIME ID=10 REACH NO=1 NO VS=1 L=1450 FT SLP=0.025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4152
.089	.400	.62	.2615
.134	.900	1.82	.1996
.179	1.600	3.91	.1648
.224	2.500	7.09	.1420
.268	3.601	11.53	.1257
.313	4.846	18.37	.1063
.358	6.099	26.89	.0913
.403	7.352	36.64	.0808
.447	8.606	47.54	.0729
.492	9.860	59.52	.0667
.537	11.116	72.52	.0617
.582	12.371	86.50	.0576
.626	13.628	101.42	.0541
.671	14.884	116.96	.0513
.716	16.246	123.19	.0531
.761	17.807	132.18	.0543
.805	19.566	143.72	.0548
.850	21.525	157.73	.0550

ROUTE ID=10 HYD NO=122.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 122.20

RUNOFF VOLUME = 1.25234 INCHES = 3.0403 ACRE-FEET
PEAK DISCHARGE RATE = 82.05 CFS AT 1.567 HOURS BASIN AREA = .0455 SQ. MI.

* COMBINE BASINS C & I
ADD HYD ID=10 HYD NO=104.3 ID=4 ID=10
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 104.30

RUNOFF VOLUME = 1.25232 INCHES = 6.4232 ACRE-FEET
PEAK DISCHARGE RATE = 173.14 CFS AT 1.567 HOURS BASIN AREA = .0962 SQ. MI.

*S BASIN J (130)
COMPUTE NM HYD ID=11 HYD NO=130.00 AREA=0.01661 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 27.542 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.9000
 AREA = .006976 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
 UNIT PEAK = 23.985 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
 AREA = .009634 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.00

RUNOFF VOLUME = 1.25234 INCHES = 1.1094 ACRE-FEET
 PEAK DISCHARGE RATE = 33.07 CFS AT 1.500 HOURS BASIN AREA = .0166 SQ. MI.

* COMBINE BASINS C & J
 ADD HYD ID=1 HYD NO=130.1 ID=10 ID=11
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.10

RUNOFF VOLUME = 1.25232 INCHES = 7.5326 ACRE-FEET
 PEAK DISCHARGE RATE = 201.55 CFS AT 1.567 HOURS BASIN AREA = .1128 SQ. MI.

*S ~~~~~ AP10 ~~~~~
 COMPUTE TRAVEL TIME ID=11 REACH NO=1 NO VS=1 L=300 FT SLP=0.032

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0859
.089	.400	.62	.0541
.134	.900	1.82	.0413
.179	1.600	3.91	.0341
.224	2.500	7.09	.0294
.268	3.601	11.53	.0260
.313	4.846	18.37	.0220
.358	6.099	26.89	.0189
.403	7.352	36.64	.0167
.447	8.606	47.54	.0151
.492	9.860	59.52	.0138
.537	11.116	72.52	.0128
.582	12.371	86.50	.0119
.626	13.628	101.42	.0112
.671	14.884	116.96	.0106
.716	16.246	123.19	.0110
.761	17.807	132.18	.0112
.805	19.566	143.72	.0113
.850	21.525	157.73	.0114

ROUTE ID=11 HYD NO=130.2 INFLOW ID=1 DT=0.0
 TRAVEL TIME TABLE EXCEEDED
 PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.20

RUNOFF VOLUME = 1.25233 INCHES = 7.5326 ACRE-FEET
 PEAK DISCHARGE RATE = 199.52 CFS AT 1.567 HOURS BASIN AREA = .1128 SQ. MI.

*S BASIN K (131)
 COMPUTE NM HYD ID=12 HYD NO=131.00 AREA=0.01532 SQ MI
 PER A=0 PER B=53 PER C=5 PER D=42
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 25.403 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
 AREA = .006434 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625

UNIT PEAK = 22.122 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
AREA = .008886 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 131.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0232 ACRE-FEET
PEAK DISCHARGE RATE = 30.50 CFS AT 1.500 HOURS BASIN AREA = .0153 SQ. MI.

* COMBINE BASINS J & K
ADD HYD ID=1 HYD NO=131.1 ID=11 ID=12
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 131.10

RUNOFF VOLUME = 1.25232 INCHES = 8.5558 ACRE-FEET
PEAK DISCHARGE RATE = 225.72 CFS AT 1.567 HOURS BASIN AREA = .1281 SQ. MI.

*DEL REY RD COMBINED OUTFALL
*S ----- AP11 -----
COMPUTE TRAVEL TIME ID=12 REACH NO=1 NO VS=1 L=850 FT SLP=0.032

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2434
.089	.400	.62	.1533
.134	.900	1.82	.1170
.179	1.600	3.91	.0966
.224	2.500	7.09	.0832
.268	3.601	11.53	.0737
.313	4.846	18.37	.0623
.358	6.099	26.89	.0535
.403	7.352	36.64	.0474
.447	8.606	47.54	.0427
.492	9.860	59.52	.0391
.537	11.116	72.52	.0362
.582	12.371	86.50	.0338
.626	13.628	101.42	.0317
.671	14.884	116.96	.0300
.716	16.246	123.19	.0311
.761	17.807	132.18	.0318
.805	19.566	143.72	.0321
.850	21.525	157.73	.0322

ROUTE ID=12 HYD NO=131.2 INFLOW ID=1 DT=0.0
TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 131.20

RUNOFF VOLUME = 1.25233 INCHES = 8.5559 ACRE-FEET
PEAK DISCHARGE RATE = 214.40 CFS AT 1.600 HOURS BASIN AREA = .1281 SQ. MI.

*S BASIN L (140)
* LADRONES PL OUTFALL
*S ----- AP12 -----
COMPUTE NM HYD ID=13 HYD NO=140.00 AREA=0.01609 SQ MI
PER A=0 PER B=53 PER C=5 PER D=42
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 26.680 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
AREA = .006758 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128644HR TP = .133300HR K/TP RATIO = .965070 SHAPE CONSTANT, N = 3.660625
UNIT PEAK = 23.234 CFS UNIT VOLUME = .9997 B = 331.87 P60 = 1.9000
AREA = .009332 SQ MI IA = .48707 INCHES INF = 1.21379 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=13 CODE=1

PARTIAL HYDROGRAPH 140.00

RUNOFF VOLUME = 1.25234 INCHES = 1.0747 ACRE-FEET
 PEAK DISCHARGE RATE = 32.03 CFS AT 1.500 HOURS BASIN AREA = .0161 SQ. MI.

*S BASIN M (150)
 * FUTURE USE TRACT C-1
 * CAMINO SAN MARTIN OUTFALL FROM PARK
 * FUTURE PARK DEVELOPED CONDITIONS

*S ~~~~~ AP13 ~~~~~
 COMPUTE NM HYD ID=14 HYD NO=150.00 AREA=0.01718 SQ MI
 PER A=0 PER B=85 PER C=5 PER D=10
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 6.7828 CFS UNIT VOLUME = .9976 B = 526.28 P60 = 1.9000
 AREA = .001718 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .129396HR TP = .133300HR K/TP RATIO = .970716 SHAPE CONSTANT, N = 3.638762
 UNIT PEAK = 38.315 CFS UNIT VOLUME = .9999 B = 330.32 P60 = 1.9000
 AREA = .015462 SQ MI IA = .49167 INCHES INF = 1.22667 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 150.00

RUNOFF VOLUME = .83441 INCHES = .7645 ACRE-FEET
 PEAK DISCHARGE RATE = 25.89 CFS AT 1.500 HOURS BASIN AREA = .0172 SQ. MI.

*S
 *S***** ONSITE BASINS *****

*S
 * BASIN 210
 * AMOLE DR - UNIT 7
 *S ~~~~~ AP14 ~~~~~

COMPUTE NM HYD ID=30 HYD NO=210.00 AREA=0.00436 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 9.9632 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.9000
 AREA = .002524 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 4.5950 CFS UNIT VOLUME = .9973 B = 333.53 P60 = 1.9000
 AREA = .001836 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=30 CODE=1

PARTIAL HYDROGRAPH 210.00

RUNOFF VOLUME = 1.45975 INCHES = .3394 ACRE-FEET
 PEAK DISCHARGE RATE = 9.74 CFS AT 1.500 HOURS BASIN AREA = .0044 SQ. MI.

* BASIN 220
 * RANCHO WEST PL - UNIT 7

COMPUTE NM HYD ID=31 HYD NO=220.00 AREA=0.00408 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 9.3233 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.9000
 AREA = .002362 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 4.2999 CFS UNIT VOLUME = .9970 B = 333.53 P60 = 1.9000
 AREA = .001718 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=31 CODE=1

PARTIAL HYDROGRAPH 220.00

RUNOFF VOLUME = 1.45975 INCHES = .3176 ACRE-FEET
PEAK DISCHARGE RATE = 9.12 CFS AT 1.500 HOURS BASIN AREA = .0041 SQ. MI.

* COMBINE BASINS 210 & 220

ADD HYD ID=1 HYD NO=220.1 ID=30 ID=31

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 220.10

RUNOFF VOLUME = 1.45968 INCHES = .6570 ACRE-FEET
PEAK DISCHARGE RATE = 18.86 CFS AT 1.500 HOURS BASIN AREA = .0084 SQ. MI.

*S ~~~~~ AP15 ~~~~~

COMPUTE TRAVEL TIME ID=31 REACH NO=1 NO VS=1 L=260 FT SLP=0.0478

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0744
.089	.400	.62	.0469
.134	.900	1.82	.0358
.179	1.600	3.91	.0295
.224	2.500	7.09	.0255
.268	3.601	11.53	.0225
.313	4.846	18.37	.0191
.358	6.099	26.89	.0164
.403	7.352	36.64	.0145
.447	8.606	47.54	.0131
.492	9.860	59.52	.0120
.537	11.116	72.52	.0111
.582	12.371	86.50	.0103
.626	13.628	101.42	.0097
.671	14.884	116.96	.0092
.716	16.246	123.19	.0095
.761	17.807	132.18	.0097
.805	19.566	143.72	.0098
.850	21.525	157.73	.0099

ROUTE
PRINT HYD

ID=31 HYD NO=220.2 INFLOW ID=1 DT=0.0
ID=31 CODE=1

PARTIAL HYDROGRAPH 220.20

RUNOFF VOLUME = 1.45974 INCHES = .6571 ACRE-FEET
PEAK DISCHARGE RATE = 18.78 CFS AT 1.533 HOURS BASIN AREA = .0084 SQ. MI.

* BASIN 230

* LADRONES PL - UNIT 6

COMPUTE NM HYD ID=32 HYD NO=230.00 AREA=0.00208 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 4.7531 CFS UNIT VOLUME = .9969 B = 526.28 P60 = 1.9000
AREA = .001204 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 2.1921 CFS UNIT VOLUME = .9937 B = 333.53 P60 = 1.9000
AREA = .000876 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=32 CODE=1

PARTIAL HYDROGRAPH 230.00

RUNOFF VOLUME = 1.45975 INCHES = .1619 ACRE-FEET
PEAK DISCHARGE RATE = 4.66 CFS AT 1.500 HOURS BASIN AREA = .0021 SQ. MI.

* COMBINE BASINS L & 230
 ADD HYD ID=1 HYD NO=230.1 ID=13 ID=32
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 230.10

RUNOFF VOLUME = 1.27605 INCHES = 1.2366 ACRE-FEET
 PEAK DISCHARGE RATE = 36.69 CFS AT 1.500 HOURS BASIN AREA = .0182 SQ. MI.

*S ~~~~~ AP16 ~~~~~
 COMPUTE TRAVEL TIME ID=32 REACH NO=1 NO VS=1 L=240 FT SLP=0.0222

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0687
.089	.400	.62	.0433
.134	.900	1.82	.0330
.179	1.600	3.91	.0273
.224	2.500	7.09	.0235
.268	3.601	11.53	.0208
.313	4.846	18.37	.0176
.358	6.099	26.89	.0151
.403	7.352	36.64	.0134
.447	8.606	47.54	.0121
.492	9.860	59.52	.0110
.537	11.116	72.52	.0102
.582	12.371	86.50	.0095
.626	13.628	101.42	.0090
.671	14.884	116.96	.0085
.716	16.246	123.19	.0088
.761	17.807	132.18	.0090
.805	19.566	143.72	.0091
.850	21.525	157.73	.0091

ROUTE ID=32 HYD NO=230.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=32 CODE=1

PARTIAL HYDROGRAPH 230.20

RUNOFF VOLUME = 1.27608 INCHES = 1.2366 ACRE-FEET
 PEAK DISCHARGE RATE = 36.52 CFS AT 1.533 HOURS BASIN AREA = .0182 SQ. MI.

* BASIN 240
 * VALLEY VIEW DR - UNIT 6
 COMPUTE NM HYD ID=33 HYD NO=240.00 AREA=0.00516 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 11.791 CFS UNIT VOLUME = .9984 B = 526.28 P60 = 1.9000
 AREA = .002987 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 5.4381 CFS UNIT VOLUME = .9977 B = 333.53 P60 = 1.9000
 AREA = .002173 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=33 CODE=1

PARTIAL HYDROGRAPH 240.00

RUNOFF VOLUME = 1.45975 INCHES = .4017 ACRE-FEET
 PEAK DISCHARGE RATE = 11.52 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

* COMBINE BASINS 230 & 240
 ADD HYD ID=1 HYD NO=240.1 ID=32 ID=33
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 240.10

RUNOFF VOLUME = 1.31667 INCHES = 1.6383 ACRE-FEET
 PEAK DISCHARGE RATE = 47.98 CFS AT 1.500 HOURS BASIN AREA = .0233 SQ. MI.

* ROUTE THE RUNOFF IN A 32' F-F RESIDENTIAL STREET, ASSUME S=0.5%
 * ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
 COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=100.85
 CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=50.0
 DIST ELEV DIST ELEV DIST ELEV DIST ELEV
 0 100.85 9.0 100.67 9.1 100.00 25.0 100.32
 41.0 100.00 41.1 100.67 50.0 100.85

RATING CURVE VALLEY SECTION 1.0			
WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.10	.10	4.47
100.09	.40	.62	8.95
100.13	.90	1.82	13.42
100.18	1.60	3.91	17.89
100.22	2.50	7.10	22.37
100.27	3.60	11.54	26.84
100.31	4.90	17.41	31.31
100.36	6.33	26.24	32.01
100.40	7.76	36.79	32.02
100.45	9.20	48.70	32.03
100.49	10.63	61.88	32.05
100.54	12.07	76.27	32.06
100.58	13.50	91.81	32.07
100.63	14.93	108.45	32.09
100.67	16.37	125.88	32.21
100.72	17.91	134.53	36.66
100.76	19.65	145.78	41.11
100.81	21.59	159.52	45.55
100.85	23.73	175.73	50.00

* ROUTE BASIN 230 THROUGH BASIN 240 TO RANCHO WEST PL
 COMPUTE TRAVEL TIME ID=33 REACH NO=1 NO VS=1 L=250 FT SLP=0.005

TRAVEL TIME TABLE
 REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0716
.089	.400	.62	.0451
.134	.901	1.82	.0344
.179	1.601	3.91	.0284
.224	2.502	7.10	.0245
.268	3.602	11.54	.0217
.313	4.903	17.41	.0196
.358	6.332	26.24	.0168
.403	7.765	36.79	.0147
.447	9.198	48.70	.0131
.492	10.631	61.88	.0119
.537	12.065	76.27	.0110
.582	13.500	91.81	.0102
.626	14.935	108.45	.0096
.671	16.371	125.88	.0090
.716	17.911	134.53	.0092
.761	19.651	145.78	.0094
.805	21.589	159.52	.0094
.850	23.727	175.73	.0094

ROUTE ID=33 HYD NO=240.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=33 CODE=1

PARTIAL HYDROGRAPH 240.20

RUNOFF VOLUME = 1.31669 INCHES = 1.6383 ACRE-FEET
 PEAK DISCHARGE RATE = 48.61 CFS AT 1.533 HOURS BASIN AREA = .0233 SQ. MI.

* COMBINE BASINS 220 & 240
 ADD HYD ID=1 HYD NO=240.3 ID=31 ID=33
 PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 240.30

RUNOFF VOLUME = 1.35467 INCHES = 2.2953 ACRE-FEET
PEAK DISCHARGE RATE = 67.39 CFS AT 1.533 HOURS BASIN AREA = .0318 SQ. MI.

AS ~~~~~ AP17 ~~~~~
COMPUTE TRAVEL TIME ID=33 REACH NO=1 NO VS=1 L=220 FT SLP=0.005

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0630
.089	.400	.62	.0397
.134	.901	1.82	.0303
.179	1.601	3.91	.0250
.224	2.502	7.10	.0215
.268	3.602	11.54	.0191
.313	4.903	17.41	.0172
.358	6.332	26.24	.0147
.403	7.765	36.79	.0129
.447	9.198	48.70	.0115
.492	10.631	61.88	.0105
.537	12.065	76.27	.0097
.582	13.500	91.81	.0090
.626	14.935	108.45	.0084
.671	16.371	125.88	.0079
.716	17.911	134.53	.0081
.761	19.651	145.78	.0082
.805	21.589	159.52	.0083
.850	23.727	175.73	.0083

ROUTE ID=33 HYD NO=240.4 INFLOW ID=1 DT=0.0
PRINT HYD ID=33 CODE=1

PARTIAL HYDROGRAPH 240.40

RUNOFF VOLUME = 1.35468 INCHES = 2.2954 ACRE-FEET
PEAK DISCHARGE RATE = 68.23 CFS AT 1.533 HOURS BASIN AREA = .0318 SQ. MI.

* BASIN 250
* CAMINO SAN MARTIN - UNIT 7
COMPUTE NM HYD ID=34 HYD NO=250.00 AREA=0.00569 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 13.002 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.9000
AREA = .003293 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 5.9967 CFS UNIT VOLUME = .9979 B = 333.53 P60 = 1.9000
AREA = .002397 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=34 CODE=1

PARTIAL HYDROGRAPH 250.00

RUNOFF VOLUME = 1.45975 INCHES = .4430 ACRE-FEET
PEAK DISCHARGE RATE = 12.71 CFS AT 1.500 HOURS BASIN AREA = .0057 SQ. MI.

* COMBINE BASINS 240 & 250
* OUTFALL AT AMOLE ARROYO
AS ~~~~~ AP 18 ~~~~~
ADD HYD ID=34 HYD NO=250.1 ID=33 ID=34
PRINT HYD ID=34 CODE=1

PARTIAL HYDROGRAPH 250.10

RUNOFF VOLUME = 1.37062 INCHES = 2.7383 ACRE-FEET
PEAK DISCHARGE RATE = 80.47 CFS AT 1.533 HOURS BASIN AREA = .0375 SQ. MI.

* BASIN 260
 * AMOLE VISTA ST - UNIT 6
 COMPUTE NM HYD ID=35 HYD NO=260.00 AREA=0.00793 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 18.121 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
 AREA = .004590 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 8.3574 CFS UNIT VOLUME = .9986 B = 333.53 P60 = 1.9000
 AREA = .003340 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=35 CODE=1

PARTIAL HYDROGRAPH 260.00

RUNOFF VOLUME = 1.45975 INCHES = .6174 ACRE-FEET
 PEAK DISCHARGE RATE = 17.70 CFS AT 1.500 HOURS BASIN AREA = .0079 SQ. MI.

* ROUTE THE RUNOFF IN A 28' F-F RESIDENTIAL STREET, ASSUME S=2%
 * ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
 COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=100.85
 CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=46.0
 DIST ELEV DIST ELEV DIST ELEV DIST ELEV
 0 100.85 9.0 100.67 9.1 100.00 23.0 100.28
 37.0 100.00 37.1 100.67 46.0 100.85

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.04	.10	.10	4.47
100.09	.40	.62	8.94
100.13	.90	1.82	13.41
100.18	1.60	3.91	17.89
100.22	2.50	7.09	22.36
100.27	3.60	11.53	26.83
100.31	4.85	18.37	27.99
100.36	6.10	26.89	28.01
100.40	7.35	36.64	28.02
100.45	8.61	47.54	28.03
100.49	9.86	59.52	28.05
100.54	11.12	72.52	28.06
100.58	12.37	86.50	28.07
100.63	13.63	101.42	28.09
100.67	14.88	116.96	28.21
100.72	16.25	123.19	32.66
100.76	17.81	132.18	37.11
100.81	19.57	143.72	41.55
100.85	21.52	157.73	46.00

*S ~~~~~ AP19 ~~~~~
 COMPUTE TRAVEL TIME ID=35 REACH NO=1 NO VS=1 L=920 FT SLP=0.0063

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2634
.089	.400	.62	.1659
.134	.900	1.82	.1266
.179	1.600	3.91	.1045
.224	2.500	7.09	.0901
.268	3.601	11.53	.0798
.313	4.846	18.37	.0674
.358	6.099	26.89	.0580
.403	7.352	36.64	.0513
.447	8.606	47.54	.0463
.492	9.860	59.52	.0423
.537	11.116	72.52	.0392
.582	12.371	86.50	.0365
.626	13.628	101.42	.0343
.671	14.884	116.96	.0325
.716	16.246	123.19	.0337
.761	17.807	132.18	.0344
.805	19.566	143.72	.0348
.850	21.525	157.73	.0349

ROUTE

ID=35 HYD NO=260.1 INFLOW ID=35 DT=0.0

WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 27 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
PRINT HYD ID=35 CODE=1

PARTIAL HYDROGRAPH 260.10

RUNOFF VOLUME = 1.45978 INCHES = .6174 ACRE-FEET
PEAK DISCHARGE RATE = 15.42 CFS AT 1.567 HOURS BASIN AREA = .0079 SQ. MI.

* BASIN 270
* EL RANCHO DR - UNIT 6
COMPUTE NM HYD ID=36 HYD NO=270.00 AREA=0.00926 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.160 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.9000
AREA = .005360 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 9.7591 CFS UNIT VOLUME = .9989 B = 333.53 P60 = 1.9000
AREA = .003900 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=36 CODE=1

PARTIAL HYDROGRAPH 270.00

RUNOFF VOLUME = 1.45975 INCHES = .7209 ACRE-FEET
PEAK DISCHARGE RATE = 20.67 CFS AT 1.500 HOURS BASIN AREA = .0093 SQ. MI.

*S ~~~~~ AP20 ~~~~~
COMPUTE TRAVEL TIME ID=36 REACH NO=1 NO VS=1 L=1200 FT SLP=0.006

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.3436
.089	.400	.62	.2164
.134	.900	1.82	.1652
.179	1.600	3.91	.1364
.224	2.500	7.09	.1175
.268	3.601	11.53	.1041
.313	4.846	18.37	.0879
.358	6.099	26.89	.0756
.403	7.352	36.64	.0669
.447	8.606	47.54	.0603
.492	9.860	59.52	.0552
.537	11.116	72.52	.0511
.582	12.371	86.50	.0477
.626	13.628	101.42	.0448
.671	14.884	116.96	.0424
.716	16.246	123.19	.0440
.761	17.807	132.18	.0449
.805	19.566	143.72	.0454
.850	21.525	157.73	.0455

ROUTE ID=36 HYD NO=270.1 INFLOW ID=36 DT=0.0
WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 28 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
PRINT HYD ID=36 CODE=1

PARTIAL HYDROGRAPH 270.10

RUNOFF VOLUME = 1.45977 INCHES = .7209 ACRE-FEET
PEAK DISCHARGE RATE = 17.21 CFS AT 1.567 HOURS BASIN AREA = .0093 SQ. MI.

* BASIN 280
* CAMINO SAN MARTIN - UNIT 6
COMPUTE NM HYD ID=37 HYD NO=280.00 AREA=0.00319 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.2896 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.9000

AREA = .001846 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 3.3619 CFS UNIT VOLUME = .9960 B = 333.53 P60 = 1.9000
AREA = .001344 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=37 CODE=1

PARTIAL HYDROGRAPH 280.00

RUNOFF VOLUME = 1.45975 INCHES = .2484 ACRE-FEET
PEAK DISCHARGE RATE = 7.13 CFS AT 1.500 HOURS BASIN AREA = .0032 SQ. MI.

* COMBINE BASINS 260 & 280
ADD HYD ID=1 HYD NO=280.1 ID=35 ID=37
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 280.10

RUNOFF VOLUME = 1.45970 INCHES = .8657 ACRE-FEET
PEAK DISCHARGE RATE = 22.02 CFS AT 1.533 HOURS BASIN AREA = .0111 SQ. MI.

* ROUTE BASIN 260 THROUGH BASIN 280 TO EL RANCHO DR
COMPUTE TRAVEL TIME ID=37 REACH NO=1 NO VS=1 L=250 FT SLP=0.0145

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.0716
.089	.400	.62	.0451
.134	.900	1.82	.0344
.179	1.600	3.91	.0284
.224	2.500	7.09	.0245
.268	3.601	11.53	.0217
.313	4.846	18.37	.0183
.358	6.099	26.89	.0157
.403	7.352	36.64	.0139
.447	8.606	47.54	.0126
.492	9.860	59.52	.0115
.537	11.116	72.52	.0106
.582	12.371	86.50	.0099
.626	13.628	101.42	.0093
.671	14.884	116.96	.0088
.716	16.246	123.19	.0092
.761	17.807	132.18	.0094
.805	19.566	143.72	.0095
.850	21.525	157.73	.0095

ROUTE ID=37 HYD NO=280.2 INFLOW ID=1 DT=0.0
PRINT HYD ID=37 CODE=1

PARTIAL HYDROGRAPH 280.20

RUNOFF VOLUME = 1.45975 INCHES = .8657 ACRE-FEET
PEAK DISCHARGE RATE = 21.93 CFS AT 1.567 HOURS BASIN AREA = .0111 SQ. MI.

* COMBINE BASINS 270 & 280
ADD HYD ID=1 HYD NO=280.3 ID=36 ID=37
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 280.30

RUNOFF VOLUME = 1.45971 INCHES = 1.5866 ACRE-FEET
PEAK DISCHARGE RATE = 39.14 CFS AT 1.567 HOURS BASIN AREA = .0204 SQ. MI.

*S ~~~~~ AP21 ~~~~~
COMPUTE TRAVEL TIME ID=37 REACH NO=1 NO VS=1 L=400 FT SLP=0.0251

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.1145
.089	.400	.62	.0721
.134	.900	1.82	.0551
.179	1.600	3.91	.0455
.224	2.500	7.09	.0392
.268	3.601	11.53	.0347
.313	4.846	18.37	.0293
.358	6.099	26.89	.0252
.403	7.352	36.64	.0223
.447	8.606	47.54	.0201
.492	9.860	59.52	.0184
.537	11.116	72.52	.0170
.582	12.371	86.50	.0159
.626	13.628	101.42	.0149
.671	14.884	116.96	.0141
.716	16.246	123.19	.0147
.761	17.807	132.18	.0150
.805	19.566	143.72	.0151
.850	21.525	157.73	.0152

ROUTE
PRINT HYDID=37 HYD NO=280.4 INFLOW ID=1 DT=0.0
ID=37 CODE=1

PARTIAL HYDROGRAPH 280.40

RUNOFF VOLUME = 1.45973 INCHES = 1.5866 ACRE-FEET
 PEAK DISCHARGE RATE = 39.40 CFS AT 1.567 HOURS BASIN AREA = .0204 SQ. MI.

* BASIN 300

* CALLE DE AMOLE - UNIT 7

COMPUTE NM HYD ID=38 HYD NO=300.00 AREA=0.00150 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 3.4277 CFS UNIT VOLUME = .9961 B = 526.28 P60 = 1.9000
 AREA = .000868 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 1.5808 CFS UNIT VOLUME = .9918 B = 333.53 P60 = 1.9000
 AREA = .000632 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=38 CODE=1

HYDROGRAPH FROM AREA 300.00

RUNOFF VOLUME = 1.45975 INCHES = .1168 ACRE-FEET
 PEAK DISCHARGE RATE = 3.36 CFS AT 1.500 HOURS BASIN AREA = .0015 SQ. MI.

* BASIN 310

* DEL REY RD - UNIT 7

COMPUTE NM HYD ID=39 HYD NO=310.00 AREA=0.00080 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.8281 CFS UNIT VOLUME = .9933 B = 526.28 P60 = 1.9000
 AREA = .000463 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = .84312 CFS UNIT VOLUME = .9834 B = 333.53 P60 = 1.9000
 AREA = .000337 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=39 CODE=1

HYDROGRAPH FROM AREA 310.00

RUNOFF VOLUME = 1.45975 INCHES = .0623 ACRE-FEET
 PEAK DISCHARGE RATE = 1.80 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

* BASIN 320
 * FAA LEASE LAND - UNIT 7
 COMPUTE NM HYD ID=40 HYD NO=320.00 AREA=0.00087 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.9881 CFS UNIT VOLUME = .9933 B = 526.28 P60 = 1.9000
 AREA = .000504 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = .91689 CFS UNIT VOLUME = .9848 B = 333.53 P60 = 1.9000
 AREA = .000366 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=40 CODE=1

HYDROGRAPH FROM AREA 320.00

RUNOFF VOLUME = 1.45975 INCHES = .0677 ACRE-FEET
 PEAK DISCHARGE RATE = 1.96 CFS AT 1.500 HOURS BASIN AREA = .0009 SQ. MI.

* COMBINE BASINS K & 310
 ADD HYD ID=15 HYD NO=310.1 ID=12 ID=39
 PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA 310.10

RUNOFF VOLUME = 1.25361 INCHES = 8.6181 ACRE-FEET
 PEAK DISCHARGE RATE = 215.69 CFS AT 1.600 HOURS BASIN AREA = .1289 SQ. MI.

* COMBINE BASINS 300 & 310
 ADD HYD ID=16 HYD NO=310.2 ID=38 ID=15
 PRINT HYD ID=16 CODE=1

HYDROGRAPH FROM AREA 310.20

RUNOFF VOLUME = 1.25598 INCHES = 8.7349 ACRE-FEET
 PEAK DISCHARGE RATE = 218.08 CFS AT 1.600 HOURS BASIN AREA = .1304 SQ. MI.

* COMBINE BASINS 320 & 310
 ADD HYD ID=1 HYD NO=310.3 ID=40 ID=16
 PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 310.30

RUNOFF VOLUME = 1.25733 INCHES = 8.8026 ACRE-FEET
 PEAK DISCHARGE RATE = 219.48 CFS AT 1.600 HOURS BASIN AREA = .1313 SQ. MI.

* DEL REY RD OUTFALL AT AMOLE ARROYO
 *S ~~~~~ AP22 ~~~~~
 COMPUTE TRAVEL TIME ID=39 REACH NO=1 NO VS=1 L=370 FT SLP=0.0281

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.1059
.089	.400	.62	.0667
.134	.900	1.82	.0509
.179	1.600	3.91	.0420
.224	2.500	7.09	.0362
.268	3.601	11.53	.0321
.313	4.846	18.37	.0271
.358	6.099	26.89	.0233

.403	7.352	36.64	.0206
.447	8.606	47.54	.0186
.492	9.860	59.52	.0170
.537	11.116	72.52	.0158
.582	12.371	86.50	.0147
.626	13.628	101.42	.0138
.671	14.884	116.96	.0131
.716	16.246	123.19	.0136
.761	17.807	132.18	.0138
.805	19.566	143.72	.0140
.850	21.525	157.73	.0140

ROUTE ID=39 HYD NO=310.4 INFLOW ID=1 DT=0.0
 TRAVEL TIME TABLE EXCEEDED
 PRINT HYD ID=39 CODE=1

HYDROGRAPH FROM AREA 310.40

RUNOFF VOLUME = 1.25733 INCHES = 8.8026 ACRE-FEET
 PEAK DISCHARGE RATE = 217.23 CFS AT 1.633 HOURS BASIN AREA = .1313 SQ. MI.

* BASIN 400
 * EL PATRON RD - UNIT 8
 * WEST PL TO DEL REY

COMPUTE NM HYD ID=41 HYD NO=400.00 AREA=0.00602 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 13.757 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.9000
 AREA = .003484 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 6.3444 CFS UNIT VOLUME = .9981 B = 333.53 P60 = 1.9000
 AREA = .002536 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=41 CODE=1

HYDROGRAPH FROM AREA 400.00

RUNOFF VOLUME = 1.45975 INCHES = .4687 ACRE-FEET
 PEAK DISCHARGE RATE = 13.44 CFS AT 1.500 HOURS BASIN AREA = .0060 SQ. MI.

COMPUTE TRAVEL TIME ID=41 REACH NO=1 NO VS=1 L=950 FT SLP=0.0138

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2720
.089	.400	.62	.1714
.134	.900	1.82	.1308
.179	1.600	3.91	.1079
.224	2.500	7.09	.0930
.268	3.601	11.53	.0824
.313	4.846	18.37	.0696
.358	6.099	26.89	.0598
.403	7.352	36.64	.0529
.447	8.606	47.54	.0478
.492	9.860	59.52	.0437
.537	11.116	72.52	.0404
.582	12.371	86.50	.0377
.626	13.628	101.42	.0355
.671	14.884	116.96	.0336
.716	16.246	123.19	.0348
.761	17.807	132.18	.0356
.805	19.566	143.72	.0359
.850	21.525	157.73	.0360

ROUTE ID=41 HYD NO=400.1 INFLOW ID=41 DT=0.0
 WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 22 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
 PRINT HYD ID=41 CODE=1

HYDROGRAPH FROM AREA 400.10

RUNOFF VOLUME = 1.45978 INCHES = .4687 ACRE-FEET
 PEAK DISCHARGE RATE = 11.36 CFS AT 1.567 HOURS BASIN AREA = .0060 SQ. MI.

* SPLIT FLOWS AT DEL REY INTERSECTION
 * 7.78 CFS CONTINUES EAST ON EL PATRON
 * ALL OTHER FLOWS GO SOUTH ON DEL REY
 *S ~~~~~ AP29 ~~~~~
 *S ~~~~~ AP23 ~~~~~
 DIVIDE HYD ID=41 Q=7.78 ID I=17 HYD NO=400.2
 ID II=18 HYD NO=400.3
 * SPLIT FLOWS THAT CONTINUE DOWN EL PATRON
 PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA 400.20

RUNOFF VOLUME = 1.45971 INCHES = .4277 ACRE-FEET
 PEAK DISCHARGE RATE = 7.78 CFS AT 1.500 HOURS BASIN AREA = .0055 SQ. MI.

* SPLIT FLOWS THAT TURN DOWN DEL REY
 PRINT HYD ID=18 CODE=1

HYDROGRAPH FROM AREA 400.30

RUNOFF VOLUME = 1.45971 INCHES = .0410 ACRE-FEET
 PEAK DISCHARGE RATE = 3.58 CFS AT 1.567 HOURS BASIN AREA = .0005 SQ. MI.

* BASIN 410
 * EL PATRON RD - UNIT 8
 * FROM DEL REY EAST
 COMPUTE NM HYD ID=43 HYD NO=410.00 AREA=0.01022 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 23.354 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.9000
 AREA = .005915 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 10.771 CFS UNIT VOLUME = .9990 B = 333.53 P60 = 1.9000
 AREA = .004305 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=43 CODE=1

HYDROGRAPH FROM AREA 410.00

RUNOFF VOLUME = 1.45975 INCHES = .7957 ACRE-FEET
 PEAK DISCHARGE RATE = 22.81 CFS AT 1.500 HOURS BASIN AREA = .0102 SQ. MI.

* COMBINE SPLIT FLOW FROM BASIN 400 TO BASIN 410
 ADD HYD ID=1 HYD NO=410.1 ID=17 ID=43
 PRINT HYD ID=1 CODE=1

HYDROGRAPH FROM AREA 410.10

RUNOFF VOLUME = 1.45972 INCHES = 1.2233 ACRE-FEET
 PEAK DISCHARGE RATE = 30.59 CFS AT 1.500 HOURS BASIN AREA = .0157 SQ. MI.

*S ~~~~~ AP24 ~~~~~
 COMPUTE TRAVEL TIME ID=43 REACH NO=1 NO VS=1 L=1350 FT SLP=0.020

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.3865
.089	.400	.62	.2435
.134	.900	1.82	.1858
.179	1.600	3.91	.1534

.224	2.500	7.09	.1322
.268	3.601	11.53	.1171
.313	4.846	18.37	.0989
.358	6.099	26.89	.0850
.403	7.352	36.64	.0752
.447	8.606	47.54	.0679
.492	9.860	59.52	.0621
.537	11.116	72.52	.0575
.582	12.371	86.50	.0536
.626	13.628	101.42	.0504
.671	14.884	116.96	.0477
.716	16.246	123.19	.0495
.761	17.807	132.18	.0505
.805	19.566	143.72	.0511
.850	21.525	157.73	.0512

ROUTE ID=43 HYD NO=410.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=43 CODE=1

HYDROGRAPH FROM AREA 410.20

RUNOFF VOLUME = 1.45975 INCHES = 1.2233 ACRE-FEET
 PEAK DISCHARGE RATE = 26.29 CFS AT 1.567 HOURS BASIN AREA = .0157 SQ. MI.

* BASIN 500
 * LOTS 8-30, BLOCK B - UNIT 6
 * BACKYARD DRAINAGE TO SNOW VISTA CHANNEL
 COMPUTE NM HYD ID=44 HYD NO=500.00 AREA=0.00217 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 4.9587 CFS UNIT VOLUME = .9969 B = 526.28 P60 = 1.9000
 AREA = .001256 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = 2.2869 CFS UNIT VOLUME = .9943 B = 333.53 P60 = 1.9000
 AREA = .000914 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=44 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 500.00

RUNOFF VOLUME = 1.45975 INCHES = .1689 ACRE-FEET
 PEAK DISCHARGE RATE = 4.86 CFS AT 1.500 HOURS BASIN AREA = .0022 SQ. MI.

* BASIN 510
 * LOTS 45-50, BLOCK H - UNIT 8
 * BACKYARD DRAINAGE TO SNOW VISTA CHANNEL
 COMPUTE NM HYD ID=45 HYD NO=510.00 AREA=0.00057 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 1.3025 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 1.9000
 AREA = .000330 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
 UNIT PEAK = .60072 CFS UNIT VOLUME = .9783 B = 333.53 P60 = 1.9000
 AREA = .000240 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=45 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 510.00

RUNOFF VOLUME = 1.45975 INCHES = .0444 ACRE-FEET
 PEAK DISCHARGE RATE = 1.29 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

* BASIN 520
 * ATRISCO RANCH RD - UNIT 8
 COMPUTE NM HYD ID=46 HYD NO=520.00 AREA=0.01730 SQ MI
 PER A=0 PER B=37.12 PER C=5 PER D=57.88

TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 39.533 CFS UNIT VOLUME = .9991 B = 526.28 P60 = 1.9000
AREA = .010013 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 18.232 CFS UNIT VOLUME = .9995 B = 333.53 P60 = 1.9000
AREA = .007287 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=46 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 520.00

RUNOFF VOLUME = 1.45975 INCHES = 1.3469 ACRE-FEET
PEAK DISCHARGE RATE = 38.60 CFS AT 1.500 HOURS BASIN AREA = .0173 SQ. MI.

COMPUTE TRAVEL TIME ID=46 REACH NO=1 NO VS=1 L=780 FT SLP=0.013

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2233
.089	.400	.62	.1407
.134	.900	1.82	.1074
.179	1.600	3.91	.0886
.224	2.500	7.09	.0764
.268	3.601	11.53	.0676
.313	4.846	18.37	.0572
.358	6.099	26.89	.0491
.403	7.352	36.64	.0435
.447	8.606	47.54	.0392
.492	9.860	59.52	.0359
.537	11.116	72.52	.0332
.582	12.371	86.50	.0310
.626	13.628	101.42	.0291
.671	14.884	116.96	.0276
.716	16.246	123.19	.0286
.761	17.807	132.18	.0292
.805	19.566	143.72	.0295
.850	21.525	157.73	.0296

ROUTE ID=46 HYD NO=520.1 INFLOW ID=46 DT=0.0
WARNING---INPUT AND OUTPUT ID NUMBERS ARE EQUAL, ID= 26 AND ITS HYDROGRAPH DATA IS OVERWRITTEN.
PRINT HYD ID=46 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 520.10

RUNOFF VOLUME = 1.45976 INCHES = 1.3469 ACRE-FEET
PEAK DISCHARGE RATE = 37.24 CFS AT 1.533 HOURS BASIN AREA = .0173 SQ. MI.

* COMBINE SPLIT FLOW FROM BASIN 400 TO BASIN 520
ADD HYD ID=1 HYD NO=520.2 ID=18 ID=46
PRINT HYD ID=1 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 520.20

RUNOFF VOLUME = 1.45974 INCHES = 1.3878 ACRE-FEET
PEAK DISCHARGE RATE = 40.40 CFS AT 1.533 HOURS BASIN AREA = .0178 SQ. MI.

COMPUTE TRAVEL TIME ID=46 REACH NO=1 NO VS=1 L=1000 FT SLP=0.0202

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.2863
.089	.400	.62	.1804
.134	.900	1.82	.1376
.179	1.600	3.91	.1136

.224	2.500	7.09	.0979
.268	3.601	11.53	.0867
.313	4.846	18.37	.0733
.358	6.099	26.89	.0630
.403	7.352	36.64	.0557
.447	8.606	47.54	.0503
.492	9.860	59.52	.0460
.537	11.116	72.52	.0426
.582	12.371	86.50	.0397
.626	13.628	101.42	.0373
.671	14.884	116.96	.0353
.716	16.246	123.19	.0366
.761	17.807	132.18	.0374
.805	19.566	143.72	.0378
.850	21.525	157.73	.0379

ROUTE
PRINT HYD

ID=46 HYD NO=520.1 INFLOW ID=1 DT=0.0
ID=46 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 520.10

RUNOFF VOLUME = 1.45976 INCHES = 1.3879 ACRE-FEET
PEAK DISCHARGE RATE = 37.22 CFS AT 1.567 HOURS BASIN AREA = .0178 SQ. MI.

* COMBINE BASINS 410 & 520

*S ***** AP25 *****

ADD HYD ID=46 HYD NO=520.2 ID=43 ID=46
PRINT HYD ID=46 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 520.20

RUNOFF VOLUME = 1.45972 INCHES = 2.6111 ACRE-FEET
PEAK DISCHARGE RATE = 63.51 CFS AT 1.567 HOURS BASIN AREA = .0335 SQ. MI.

* BASIN 530

* LOTS 1-12, BLOCK G - UNIT 8

* AND CARTAGENA AVE

*S ***** AP26 *****

COMPUTE NM HYD ID=47 HYD NO=530.00 AREA=0.00411 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.3919 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.9000
AREA = .002379 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 4.3315 CFS UNIT VOLUME = .9970 B = 333.53 P60 = 1.9000
AREA = .001731 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=47 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 530.00

RUNOFF VOLUME = 1.45975 INCHES = .3200 ACRE-FEET
PEAK DISCHARGE RATE = 9.18 CFS AT 1.500 HOURS BASIN AREA = .0041 SQ. MI.

* BASIN 540

* DE ANZA DR

COMPUTE NM HYD ID=48 HYD NO=540.00 AREA=0.00306 SQ MI
PER A=0 PER B=15 PER C=5 PER D=80
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.6648 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.9000
AREA = .002448 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .124622HR TP = .133300HR K/TP RATIO = .934897 SHAPE CONSTANT, N = 3.783137
UNIT PEAK = 1.5630 CFS UNIT VOLUME = .9920 B = 340.44 P60 = 1.9000
AREA = .000612 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=48 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 540.00

RUNOFF VOLUME = 1.74889 INCHES = .2854 ACRE-FEET
 PEAK DISCHARGE RATE = 7.87 CFS AT 1.500 HOURS BASIN AREA = .0031 SQ. MI.

* COMBINE BASINS 530 & 540
 ADD HYD ID=1 HYD NO=540.1 ID=47 ID=48
 PRINT HYD ID=1 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 540.10

RUNOFF VOLUME = 1.58307 INCHES = .6054 ACRE-FEET
 PEAK DISCHARGE RATE = 17.05 CFS AT 1.500 HOURS BASIN AREA = .0072 SQ. MI.

* OUTFALL AT SNOW VISTA CHANNEL
 *S ~~~~~ AP27 ~~~~~
 COMPUTE TRAVEL TIME ID=48 REACH NO=1 NO VS=1 L=1500 FT SLP=0.022

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.045	.100	.10	.4295
.089	.400	.62	.2706
.134	.900	1.82	.2065
.179	1.600	3.91	.1704
.224	2.500	7.09	.1469
.268	3.601	11.53	.1301
.313	4.846	18.37	.1099
.358	6.099	26.89	.0945
.403	7.352	36.64	.0836
.447	8.606	47.54	.0754
.492	9.860	59.52	.0690
.537	11.116	72.52	.0639
.582	12.371	86.50	.0596
.626	13.628	101.42	.0560
.671	14.884	116.96	.0530
.716	16.246	123.19	.0550
.761	17.807	132.18	.0561
.805	19.566	143.72	.0567
.850	21.525	157.73	.0569

ROUTE ID=48 HYD NO=540.2 INFLOW ID=1 DT=0.0
 PRINT HYD ID=48 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 540.20

RUNOFF VOLUME = 1.58321 INCHES = .6054 ACRE-FEET
 PEAK DISCHARGE RATE = 12.69 CFS AT 1.567 HOURS BASIN AREA = .0072 SQ. MI.

* BASIN 600
 * AMOLE ARROYO - UNIT 8
 COMPUTE NM HYD ID=49 HYD NO=600.00 AREA=0.00539 SQ MI
 PER A=0 PER B=50 PER C=0 PER D=50
 TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 10.640 CFS UNIT VOLUME = .9982 B = 526.28 P60 = 1.9000
 AREA = .002695 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .130761HR TP = .133300HR K/TP RATIO = .980950 SHAPE CONSTANT, N = 3.599930
 UNIT PEAK = 6.6223 CFS UNIT VOLUME = .9983 B = 327.55 P60 = 1.9000
 AREA = .002695 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=49 CODE=1

HYDROGRAPH FROM AREA 600.00

RUNOFF VOLUME = 1.34275 INCHES = .3860 ACRE-FEET
 PEAK DISCHARGE RATE = 11.25 CFS AT 1.500 HOURS BASIN AREA = .0054 SQ. MI.

* BASIN 700
* VALLEY VIEW RD - UNIT 6
* NORTH OF EL RANCHO DR
*S ~~~~~ AP28 ~~~~~

COMPUTE NM HYD ID=49 HYD NO=700.00 AREA=0.00179 SQ MI
PER A=0 PER B=37.12 PER C=5 PER D=57.88
TP=-0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 4.0904 CFS UNIT VOLUME = .9965 B = 526.28 P60 = 1.9000
AREA = .001036 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127846HR TP = .133300HR K/TP RATIO = .959082 SHAPE CONSTANT, N = 3.684167
UNIT PEAK = 1.8865 CFS UNIT VOLUME = .9932 B = 333.53 P60 = 1.9000
AREA = .000754 SQ MI IA = .48219 INCHES INF = 1.20014 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=49 CODE=1

HYDROGRAPH FROM AREA 700.00

RUNOFF VOLUME = 1.45975 INCHES = .1394 ACRE-FEET
PEAK DISCHARGE RATE = 4.01 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 14:42:56

APPENDIX C

Street Flows Capacity

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Valley View Dr	
LOCATION:		@ AP28	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0209	Road Width/2	16
Q ₁₀₀	4.01	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	9.996
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.838
Manning's N	0.017	Discharge (1/2 Q)	2.010
Depth		0.196	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		4.02 cfs	OK
at an HGL Depth=		0.20 ft	< Curb height = 0.33
			OK
EGL			
Velocity	2.40 fps		
V ² /2g	0.09 ft		
EGL Depth =	0.29 ft	<	Right-of-way height = 0.50
			OK

STREET NAME:		Valley View Dr	
LOCATION:		between Amole Vista St & Ladrones Pl	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0208	Road Width/2	16
Q ₁₀₀	11.52	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	14.433
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.831
Manning's N	0.017	Discharge (1/2 Q)	5.785
Depth		0.283	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		11.57 cfs	OK
at an HGL Depth=		0.28 ft	< Curb height = 0.33
			OK
EGL			
Velocity	3.16 fps		
V ² /2g	0.16 ft		
EGL Depth =	0.44 ft	<	Right-of-way height = 0.50
			OK

STREET NAME:		Valley View Dr	
LOCATION:		between Ladrones & Rancho West Pl	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	16
Q ₁₀₀	48.61	Curb Height	0.67
Right-of-way Width	50	1/2 Wetted Perimeter (P)	16.641
Road Width	32	1/2 Area(STD)	7.016
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	24.313
Depth		0.641	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		48.63 cfs	OK
at an HGL Depth=		0.64 ft	< Curb height = 0.67
			OK
EGL			
Velocity	3.47 fps		
V ² /2g	0.19 ft		
EGL Depth =	0.83 ft	<	Right-of-way height = 0.84
			OK

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Valley View Dr	
LOCATION:		@ AP17	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	16
Q ₁₀₀	49.73	Curb Height	0.67
Right-of-way Width	50	1/2 Wetted Perimeter (P)	16.647
Road Width	32	1/2 Area(STD)	7.112
Curb Type	std	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	---
Manning's N	0.017	Discharge (1/2 Q)	24.865
Depth		0.647	
NEEDS STORM DRAIN			
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		49.73 cfs	OK
at an HGL Depth=		0.65 ft	< Curb height = 0.67
OK			
<u>EGL</u>			
Velocity		3.50 fps	
V ² /2g		0.19 ft	
EGL Depth =		0.84 ft	< Right-of-way height = 0.84
OK			

STREET NAME:		Amole Vista St	
LOCATION:		Sta 1+00 to 7+50	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0063	Road Width/2	14
Q ₁₀₀	10.69	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.330
Road Width	28	1/2 Area(STD)	---
Curb Type	mtbl	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	2.490
Manning's N	0.017	Discharge (1/2 Q)	5.348
Depth		0.330	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		10.70 cfs	OK
at an HGL Depth=		0.33 ft	= Curb height = 0.33
OK			
<u>EGL</u>			
Velocity		2.15 fps	
V ² /2g		0.07 ft	
EGL Depth =		0.40 ft	< Right-of-way height = 0.50
OK			

STREET NAME:		Amole Vista St	
LOCATION:		@ AP19 (Sta 7+50 to end)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0063	Road Width/2	14
Q ₁₀₀	15.42	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.405
Road Width	28	1/2 Area(STD)	3.115
Curb Type	std	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	---
Manning's N	0.017	Discharge (1/2 Q)	7.747
Depth		0.405	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		15.49 cfs	OK
at an HGL Depth=		0.41 ft	< Curb height = 0.67
OK			
<u>EGL</u>			
Velocity		2.49 fps	
V ² /2g		0.10 ft	
EGL Depth =		0.50 ft	< Right-of-way height = 0.84
OK			

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		El Rancho Dr	
LOCATION:		Sta 1+00 to 8+50	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.006	Road Width/2	14
Q ₁₀₀	10.43	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.330
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	2.490
Manning's N	0.017	Discharge (1/2 Q)	5.219
Depth		0.330	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		10.44 cfs	OK
at an HGL Depth=		0.33 ft	= Curb height = 0.33
			OK
<u>EGL</u>			
Velocity	2.10 fps		
V ² /2g	0.07 ft		
EGL Depth =	0.40 ft	<	Right-of-way height = 0.50
		OK	

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		El Rancho Dr	
LOCATION:		@ AP20 (Sta 8+50 to Camino San Martin)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.006	Road Width/2	14
Q ₁₀₀	17.21	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.424
Road Width	28	1/2 Area(STD)	3.381
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	8.661
Depth		0.424	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		17.32 cfs	OK
at an HGL Depth=		0.42 ft	< Curb height = 0.67
			OK
<u>EGL</u>			
Velocity	2.56 fps		
V ² /2g	0.10 ft		
EGL Depth =	0.53 ft	<	Right-of-way height = 0.84
		OK	

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		El Rancho Dr (stub)	
LOCATION:		@ AP21 (South of Camino San Martin)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.006	Road Width/2	12
Q ₁₀₀	39.40	Curb Height	0.67
Right-of-way Width	36	1/2 Wetted Perimeter (P)	12.599
Road Width	24	1/2 Area(STD)	5.238
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	19.698
Depth		0.599	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		39.40 cfs	OK
at an HGL Depth=		0.60 ft	< Curb height = 0.67
			OK
<u>EGL</u>			
Velocity	3.76 fps		
V ² /2g	0.22 ft		
EGL Depth =	0.82 ft	>	Right-of-way height = 0.78
		not contained in right-of-way	

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Camino San Martin	
LOCATION:		between Amole Vista & El Rancho	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0251	Road Width/2	16
Q ₁₀₀	21.93	Curb Height	0.67
Right-of-way Width	50	1/2 Wetted Perimeter (P)	14.110
Road Width	32	1/2 Area(STD)	2.520
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	11.004
Depth		0.360	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		22.01 cfs	OK
at an HGL Depth=		0.36 ft	< Curb height = 0.67
			OK
EGL			
Velocity	4.37 fps		
V ² /2g	0.30 ft		
EGL Depth =	0.66 ft	<	Right-of-way height = 0.84
			OK

STREET NAME:		Camino San Martin	
LOCATION:		between Valley View & Amole Vista	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0143	Road Width/2	16
Q ₁₀₀	7.13	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	13.056
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.482
Manning's N	0.017	Discharge (1/2 Q)	3.605
Depth		0.256	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		7.21 cfs	OK
at an HGL Depth=		0.26 ft	< Curb height = 0.33
			OK
EGL			
Velocity	2.43 fps		
V ² /2g	0.09 ft		
EGL Depth =	0.35 ft	<	Right-of-way height = 0.50
			OK

STREET NAME:		Camino San Martin	
LOCATION:		@ AP18 (between Calle de Amole & Valley View)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.027	Road Width/2	16
Q ₁₀₀	12.71	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	14.280
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.790
Manning's N	0.017	Discharge (1/2 Q)	6.395
Depth		0.280	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		12.79 cfs	OK
at an HGL Depth=		0.28 ft	< Curb height = 0.33
			OK
EGL			
Velocity	3.57 fps		
V ² /2g	0.20 ft		
EGL Depth =	0.48 ft	<	Right-of-way height = 0.50
			OK

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Camino San Martin	
LOCATION:		between Del Rey & Calle de Amole	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0218	Road Width/2	16
Q ₁₀₀	3.36	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	9.384
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.730
Manning's N	0.017	Discharge (1/2 Q)	1.704
Depth		0.184	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		3.41 cfs	OK
at an HGL Depth=		0.18 ft	< Curb height = 0.33
			OK
<u>EGL</u>			
Velocity		2.33 fps	
V ² /2g		0.08 ft	
EGL Depth =		0.27 ft	< Right-of-way height = 0.50
			OK

STREET NAME:		Ladrones Pl	
LOCATION:		@ AP16	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0208	Road Width/2	16
Q ₁₀₀	9.94	Curb Height	0.33
Right-of-way Width	50	1/2 Wetted Perimeter (P)	13.719
Road Width	32	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.645
Manning's N	0.017	Discharge (1/2 Q)	5.008
Depth		0.269	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		10.02 cfs	OK
at an HGL Depth=		0.27 ft	< Curb height = 0.33
			OK
<u>EGL</u>			
Velocity		3.04 fps	
V ² /2g		0.14 ft	
EGL Depth =		0.41 ft	< Right-of-way height = 0.50
			OK

STREET NAME:		Rancho West Pl	
LOCATION:		@ AP15	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0498	Road Width/2	14
Q ₁₀₀	18.78	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.287
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.888
Manning's N	0.017	Discharge (1/2 Q)	9.491
Depth		0.287	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		18.98 cfs	OK
at an HGL Depth=		0.29 ft	< Curb height = 0.33
			OK
<u>EGL</u>			
Velocity		5.03 fps	
V ² /2g		0.39 ft	
EGL Depth =		0.68 ft	> Right-of-way height = 0.50
			not contained in right-of-way

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Amole Dr	
LOCATION:		@ AP14	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0125	Road Width/2	14
Q ₁₀₀	9.74	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.289
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.916
Manning's N	0.017	Discharge (1/2 Q)	4.873
Depth		0.289	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		9.75 cfs	OK
at an HGL Depth=		0.29 ft	< Curb height = 0.33
			OK
EGL			
Velocity	2.54 fps		
V ² /2g	0.10 ft		
EGL Depth =	0.39 ft	<	Right-of-way height = 0.50
			OK

STREET NAME:		Del Rey Rd	
LOCATION:		@ AP22 (Amole Arroyo)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0283	Road Width/2	20
Q ₁₀₀	139.19	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	20.670
Road Width	40	1/2 Area(STD)	8.550
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	69.593
Depth		0.670	
NEEDS STORM DRAIN FOR 78.1 cfs MIN			
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		139.19 cfs	OK
at an HGL Depth=		0.67 ft	= Curb height = 0.67
			OK
EGL			
Velocity	8.14 fps		
V ² /2g	1.03 ft		
EGL Depth =	1.70 ft	>	Right-of-way height = 0.86
			not contained in right-of-way

STREET NAME:		Del Rey Rd	
LOCATION:		Amole Arroyo to El Patron	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0112	Road Width/2	20
Q ₁₀₀	11.36	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	12.784
Road Width	40	1/2 Area(STD)	2.079
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	5.696
Depth		0.334	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		11.39 cfs	OK
at an HGL Depth=		0.33 ft	< Curb height = 0.67
			OK
EGL			
Velocity	2.74 fps		
V ² /2g	0.12 ft		
EGL Depth =	0.45 ft	<	Right-of-way height = 0.86
			OK

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Del Rey Rd	
LOCATION:		@AP23 (El Patron to Atrisco Ranch)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0334	Road Width/2	14
Q ₁₀₀	3.58	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	5.746
Road Width	28	1/2 Area(STD)	0.544
Curb Type	std	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	---
Manning's N	0.017	Discharge (1/2 Q)	1.791
Depth		0.196	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		3.58 cfs	OK
at an HGL Depth=		0.20 ft	< Curb height = 0.67
		OK	
<u>EGL</u>			
Velocity		3.29 fps	
V ² /2g		0.17 ft	
EGL Depth =		0.36 ft	< Right-of-way height = 0.84
		OK	

STREET NAME:		El Patron Rd	
LOCATION:		Sta 2+50 to 5+68 (along park)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0089	Road Width/2	20
Q ₁₀₀	11.36	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	13.447
Road Width	40	1/2 Area(STD)	2.273
Curb Type	std	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	---
Manning's N	0.017	Discharge (1/2 Q)	5.696
Depth		0.347	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		11.39 cfs	OK
at an HGL Depth=		0.35 ft	< Curb height = 0.67
		OK	
<u>EGL</u>			
Velocity		2.51 fps	
V ² /2g		0.10 ft	
EGL Depth =		0.44 ft	< Right-of-way height = 0.86
		OK	

STREET NAME:		El Patron Rd	
LOCATION:		Sta 1+00 to Del Rey	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0107	Road Width/2	14
Q ₁₀₀	11.36	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.310
Road Width	28	1/2 Area(STD)	---
Curb Type	mtbl	1/2 Area(MDN)	---
Road Cross Slope	0.02	1/2 Area(MTBL)	2.210
Manning's N	0.017	Discharge (1/2 Q)	5.716
Depth		0.310	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		11.43 cfs	OK
at an HGL Depth=		0.31 ft	< Curb height = 0.33
		OK	
<u>EGL</u>			
Velocity		2.59 fps	
V ² /2g		0.10 ft	
EGL Depth =		0.41 ft	< Right-of-way height = 0.50
		OK	

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		El Patron Rd 22	
LOCATION:		Del Rey to sta 10+30	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.01	Road Width/2	14
Q ₁₀₀	13.47	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.330
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	2.490
Manning's N	0.017	Discharge (1/2 Q)	6.738
Depth		0.330	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		13.48 cfs	OK
at an HGL Depth=		0.33 ft	= Curb height = 0.33
OK			
<u>EGL</u>			
Velocity		2.71 fps	
V ² /2g		0.11 ft	
EGL Depth =		0.44 ft	< Right-of-way height = 0.50
OK			

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		El Patron Rd/Sauza Dr 23	
LOCATION:		Sta 10+30 to end	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.01	Road Width/2	14
Q ₁₀₀	26.29	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.449
Road Width	28	1/2 Area(STD)	3.731
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	13.165
Depth		0.449	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		26.33 cfs	OK
at an HGL Depth=		0.45 ft	< Curb height = 0.67
OK			
<u>EGL</u>			
Velocity		3.53 fps	
V ² /2g		0.19 ft	
EGL Depth =		0.64 ft	< Right-of-way height = 0.84
OK			

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Atrisco Ranch Rd 24	
LOCATION:		El Patron to Del Rey	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0149	Road Width/2	14
Q ₁₀₀	16.25	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.329
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	2.476
Manning's N	0.017	Discharge (1/2 Q)	8.148
Depth		0.329	
RESULTS			
<u>HGL</u>			
Q ₁₀₀ FLOW CAPACITY =		16.30 cfs	OK
at an HGL Depth=		0.33 ft	< Curb height = 0.33
OK			
<u>EGL</u>			
Velocity		3.29 fps	
V ² /2g		0.17 ft	
EGL Depth =		0.50 ft	< Right-of-way height = 0.50
OK			

STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		Atrisco Ranch Rd	25
LOCATION:		Del Rey to Sauza	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0202	Road Width/2	14
Q ₁₀₀	37.22	Curb Height	0.67
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.448
Road Width	28	1/2 Area(STD)	3.720
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	18.618
Depth		0.448	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		37.24 cfs	OK
at an HGL Depth=		0.45 ft	< Curb height = 0.67
			OK
EGL			
Velocity	5.01 fps		
V ² /2g	0.39 ft		
EGL Depth =	0.84 ft	<	Right-of-way height = 0.84
			OK

STREET NAME:		Atrisco Ranch Rd (stub)	26
LOCATION:		@ AP25 (Sauza to end)	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0175	Road Width/2	11
Q ₁₀₀	63.51	Curb Height	0.67
Right-of-way Width	36	1/2 Wetted Perimeter (P)	11.598
Road Width	22	1/2 Area(STD)	4.901
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	31.817
Depth		0.598	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		63.63 cfs	OK
at an HGL Depth=		0.60 ft	< Curb height = 0.67
			OK
EGL			
Velocity	6.49 fps		
V ² /2g	0.65 ft		
EGL Depth =	1.25 ft	>	Right-of-way height = 0.80
			not contained in right-of-way

STREET NAME:		Cartagena Ave	27
LOCATION:		El Patron to Del Rey	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0208	Road Width/2	20
Q ₁₀₀	9.18	Curb Height	0.33
Right-of-way Width	60	1/2 Wetted Perimeter (P)	13.311
Road Width	40	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.544
Manning's N	0.017	Discharge (1/2 Q)	4.595
Depth		0.261	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		9.19 cfs	OK
at an HGL Depth=		0.26 ft	< Curb height = 0.33
			OK
EGL			
Velocity	2.98 fps		
V ² /2g	0.14 ft		
EGL Depth =	0.40 ft	<	Right-of-way height = 0.52
			OK

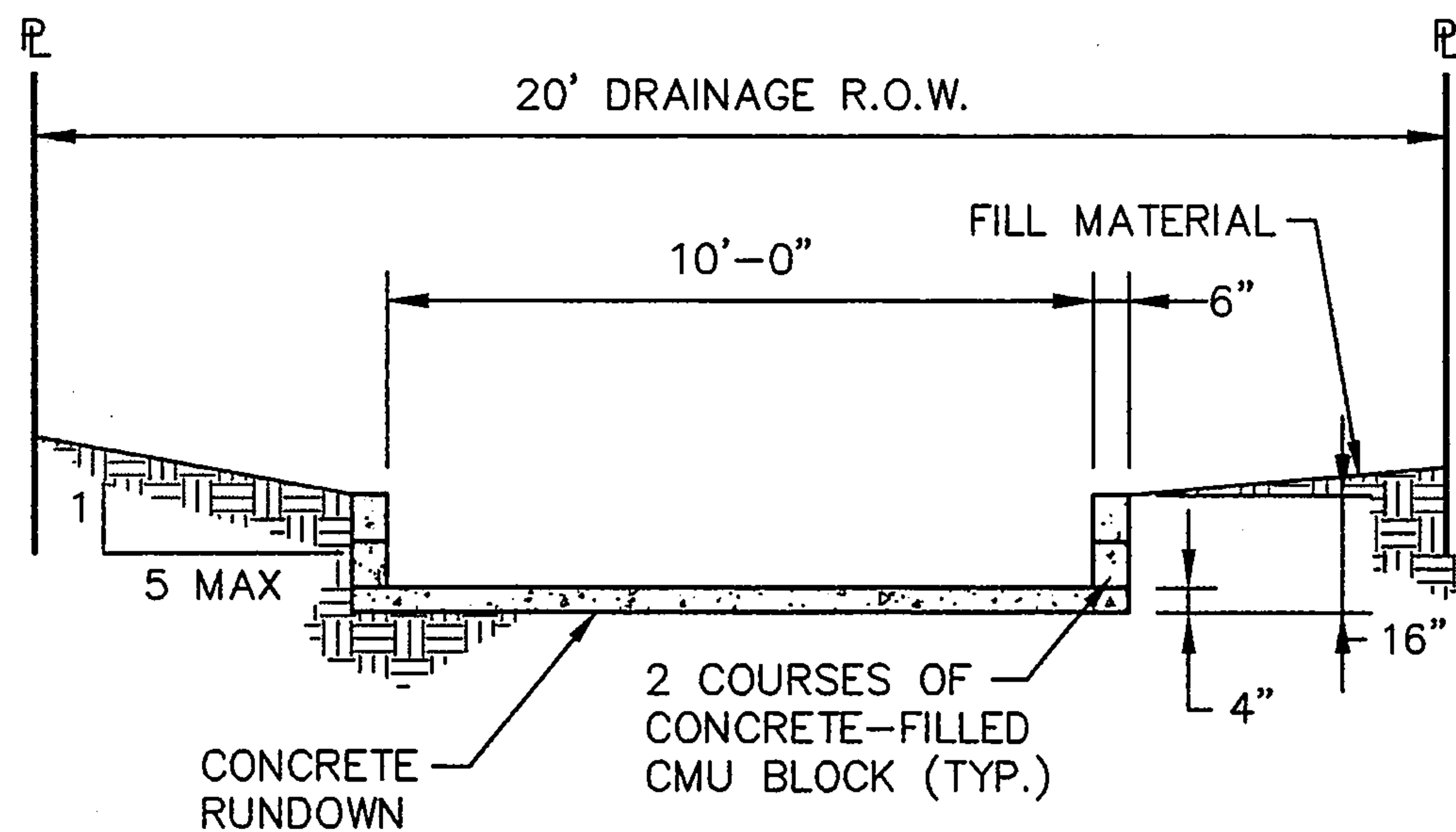
STREET FLOW CAPACITY CALCULATIONS			
STREET NAME:		De Anza Dr	
LOCATION:		Cartagena to Snow Vista	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0248	Road Width/2	20
Q ₁₀₀	12.69	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	11.254
Road Width	40	1/2 Area(STD)	1.684
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	6.367
Depth		0.304	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		12.73 cfs	OK
at an HGL Depth=		0.30 ft	< Curb height = 0.67
			OK
EGL			
Velocity	3.83 fps		
V ² /2g	0.23 ft		
EGL Depth =	0.53 ft	<	Right-of-way height = 0.86
		OK	

STREET NAME:		De Anza Dr	
LOCATION:		Future Capacity - Cartagena to Snow Vista	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0248	Road Width/2	20
Q ₁₀₀	43.49	Curb Height	0.67
Right-of-way Width	60	1/2 Wetted Perimeter (P)	19.057
Road Width	40	1/2 Area(STD)	4.290
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	21.745
Depth		0.457	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		43.49 cfs	OK
at an HGL Depth=		0.46 ft	< Curb height = 0.67
			OK
EGL			
Velocity	5.07 fps		
V ² /2g	0.40 ft		
EGL Depth =	0.86 ft	<	Right-of-way height = 0.86
		OK	

STREET NAME:		El Patron Rd	
LOCATION:		Split Flows across Del Rey	
STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.01	Road Width/2	14
Q ₁₀₀	7.78	Curb Height	0.33
Right-of-way Width	46	1/2 Wetted Perimeter (P)	14.280
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.790
Manning's N	0.017	Discharge (1/2 Q)	3.892
Depth		0.280	
		depth at centerline	
RESULTS			
HGL			
Q ₁₀₀ FLOW CAPACITY =		7.78 cfs	OK
at an HGL Depth=		0.28 ft	< Curb height = 0.33
			OK
EGL			
Velocity	2.17 fps		
V ² /2g	0.07 ft		
EGL Depth =	0.35 ft	<	Right-of-way height = 0.50
		OK	

APPENDIX D

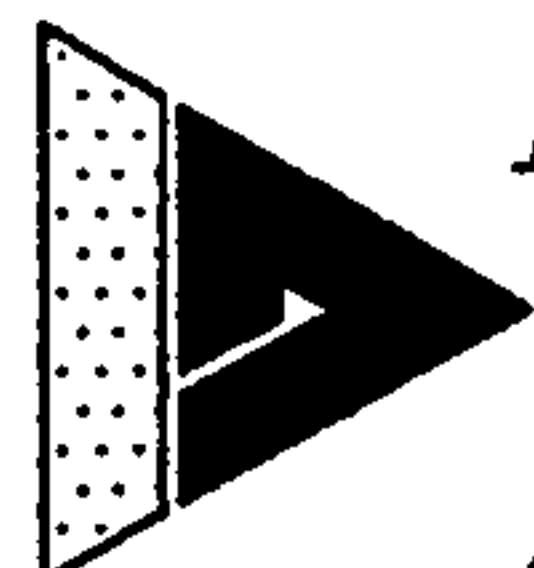
Onsite FlowMaster Worksheets



CONCRETE RUNDOWN SECTION B-B

1"=4'-0"

* FINAL DESIGN TO BE DETERMINED @ D.R.C.



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08/22/01*

EL RANCHO GRANDE - UNITS 6, 7, & 8
Worksheet for Rectangular Channel

Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Rundown @ Atrisco Ranch Rd
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.013
Channel Slope	0.017500 ft/ft
Bottom Width	10.00 ft
Discharge	63.51 cfs

Results

Depth	0.62 ft
Flow Area	6.23 ft ²
Wetted Perimeter	11.25 ft
Top Width	10.00 ft
Critical Depth	1.08 ft
Critical Slope	0.003116 ft/ft
Velocity	10.20 ft/s
Velocity Head	1.62 ft
Specific Energy	2.24 ft
Froude Number	2.28

Flow is supercritical.

EL RANCHO GRANDE - UNITS 6, 7, & 8
Worksheet for Rectangular Channel

Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Rundown @ El Rancho Dr
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.013
Channel Slope	0.006000 ft/ft
Bottom Width	10.00 ft
Discharge	39.40 cfs

Results

Depth	0.65 ft
Flow Area	6.46 ft ²
Wetted Perimeter	11.29 ft
Top Width	10.00 ft
Critical Depth	0.78 ft
Critical Slope	0.003243 ft/ft
Velocity	6.10 ft/s
Velocity Head	0.58 ft
Specific Energy	1.22 ft
Froude Number	1.34

Flow is supercritical.

EL RANCHO GRANDE - Del Rey Rd curb cuts
Worksheet for Rectangular Channel

Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey curb cuts
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Bottom Width

Input Data

Mannings Coefficient	0.017
Channel Slope	0.028300 ft/ft
Depth	0.67 ft
Discharge	58.82 cfs

Results

Bottom Width	8.59	ft
Flow Area	5.75	ft ²
Wetted Perimeter	9.93	ft
Top Width	8.59	ft
Critical Depth	1.13	ft
Critical Slope	0.005520	ft/ft
Velocity	10.22	ft/s
Velocity Head	1.62	ft
Specific Energy	2.29	ft
Froude Number	2.20	

Flow is supercritical.

EL RANCHO GRANDE - Del Rey Rd swales
Worksheet for Triangular Channel

Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey side street swales
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.035
Channel Slope	0.028300 ft/ft
Left Side Slope	6.000000 H : V
Right Side Slope	3.000000 H : V
Discharge	58.82 cfs

Results

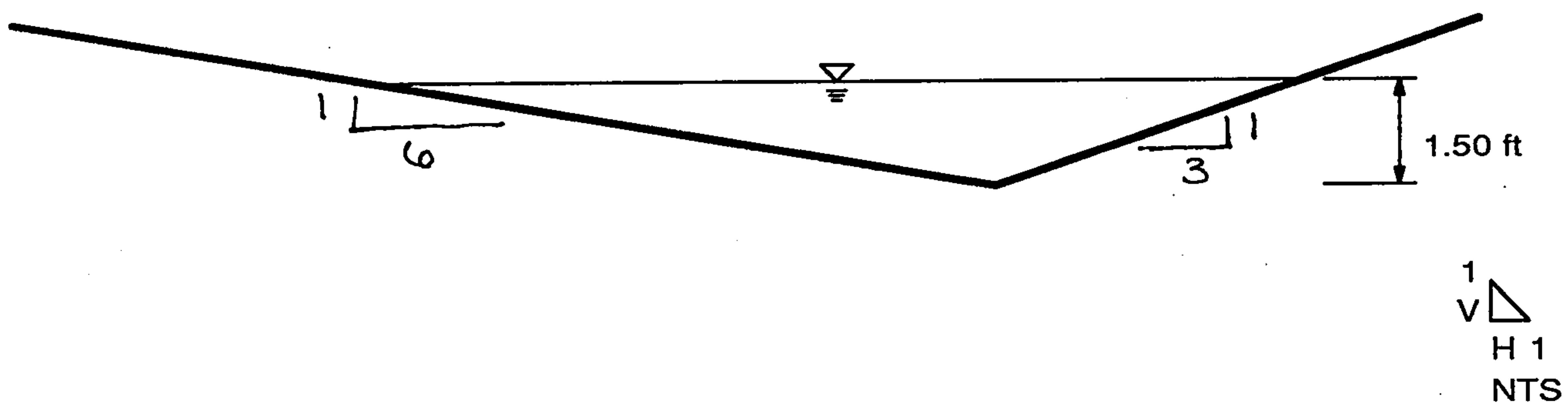
Depth	1.50	ft
Flow Area	10.15	ft ²
Wetted Perimeter	13.88	ft
Top Width	13.52	ft
Critical Depth	1.60	ft
Critical Slope	0.019913	ft/ft
Velocity	5.80	ft/s
Velocity Head	0.52	ft
Specific Energy	2.02	ft
Froude Number	1.18	

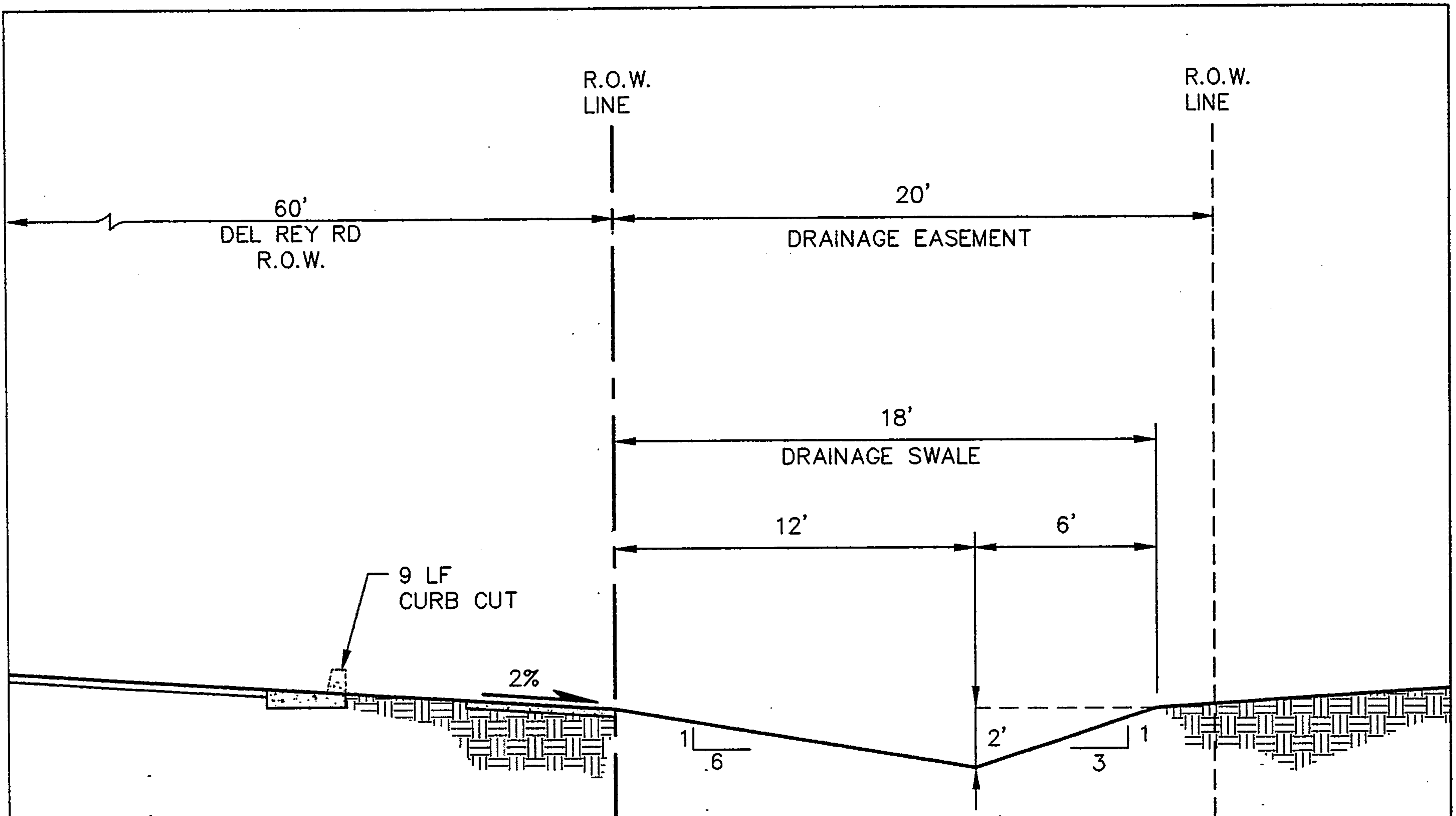
Flow is supercritical.

Cross Section
Cross Section for Triangular Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey side street swales
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

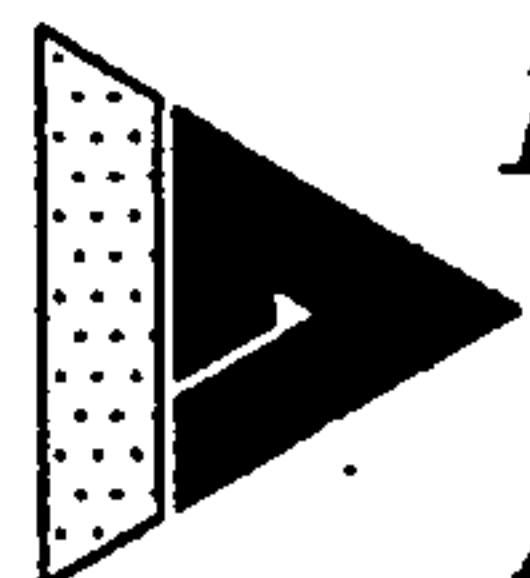
Section Data	
Mannings Coefficient	0.035
Channel Slope	0.028300 ft/ft
Depth	1.50 ft
Left Side Slope	6.000000 H : V
Right Side Slope	3.000000 H : V
Discharge	58.82 cfs





DEL REY RD. SIDE SWALE SECTION G-G

1"=5'-0"



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APPENDIX E

Storm Drain Calculations

STORM DRAIN INLET CAPACITIES

FROM PLATES 22.3 D-5 & D-6 OF THE
COA DPM

for Single Grate Type 'A':

@ 0.5% slope:

Grate capacity = 9.0 cfs

@ 2.7% slope:

Grate capacity = 13.0 cfs

for Double Grate Type 'C':

@ 0.5% slope:

Grate capacity = 10.2 cfs

@ 2.7% slope:

Grate capacity = 15.0 cfs

STORM DRAIN INLET CAPACITIES:

Double Throat Capacity:

(Types 'A' & 'C' Inlets)

$$Q = CLh^{3/2} \quad (\text{Weir Equation})$$

Where $C = 3.33$

$L = 6.40$

(COA std. d wgs. # 2201, # 2202, & # 2220)

h = Water depth above
flowline in feet

$$Q = 3.33(6.40)(h^{3/2})$$

$$\underline{Q = 21.312 h^{3/2}}$$

$$h = 0.25 \text{ ft}$$

$$Q = 21.312(.25)^{3/2} = 2.66 \text{ cfs}$$

$$h = 0.33 \text{ ft}$$

$$Q = 21.312(.33)^{3/2} = 4.04 \text{ cfs}$$

$$h = 0.5 \text{ ft}$$

$$Q = 21.312(.5)^{3/2} = 7.53 \text{ cfs}$$

$$h = 0.67 \text{ ft}$$

$$Q = 21.312(.67)^{3/2} = 9.52 \text{ cfs}$$

$$h = 0.9 \text{ ft}$$

$$Q = 21.312(.9)^{3/2} = 18.20 \text{ cfs}$$

STORM INLET CAPACITIES:

Valley View Dr (N. of Rancho West Pl):

$$Q_{100} = 48.6 \text{ cfs} \quad S = 0.5\% \quad h = 0.64$$

$$\text{Grate Capacity} = 9.0 \text{ cfs}$$

$$\text{Throat Capacity} = 10.9 \text{ cfs}$$

$$2 \text{ type 'A' Inlets} \quad \text{total } 59.8 \text{ cfs}$$

Valley View Dr (N. of Camino San Martin):

$$Q_{100} = 19.62 \text{ cfs}$$

$$2 \text{ type 'A' Inlets } \} \quad 19.9 \text{ cfs}$$

Camino San Martin:

$$Q_{100} = 12.71 \quad S = 2.7\%$$

$$\text{Grate Capacity} = 13.0 \text{ cfs}$$

$$\text{Throat Capacity} = 10.9 \text{ cfs}$$

$$1 \text{ type 'A' Inlet } \} \quad 23.9 \text{ cfs}$$

Del Rey:

$$S = 2.8\%$$

$$1 \text{ type 'A' } \Rightarrow 23.9$$

$$1 \text{ type 'C' } \Rightarrow 25.9$$

$$2 \text{ of each } \Rightarrow 99.6$$

APPENDIX F

Amole Arroyo Analysis



**TABLE III -1
HYDROLOGIC SUMMARY
AMOLE ARROYO BASIN**

AP NO	MAP NO	DESCRIPTION	VARIABLE	EXISTING FACILITIES			PROPOSED DMP FACILITIES	
				EXISTING	DEVEX	EXISTING CAPACITY	DMP	FUTURE CAPACITY
1	6	AMOLE ARROYO OUT @ WESTGATE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	73.2 418 0.17 0.01	73.5 449 0.62 0.02	74	73.5 449 0.62 0.02	74
2	6	AMOLE ARROYO BELOW POWERLINE JUNCTION	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	562 489 0.22 0.04	1161 558 0.81 0.28	N/A	255 556 0.64 0.06	N/A
2.1	6	AMOLE ARROYO AT CBC AT DELGADO	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	652 494 0.22 0.05	1525 577 0.84 0.36	1026 (bank full)	575 574 0.67 0.13	1026 (bank full)
2.2	6	AMOLE ARROYO AT EAST WESTGATE CROSSING	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	620 497 0.22 0.05	1535 582 0.84 0.36	N/A	693 580 0.68 0.16	N/A
3	7	AMOLE ARROYO AND SNOW VISTA CONFLUENCE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	1990 603 0.29 0.14	3463 769 1.06 0.63	N/A	2825 767 0.94 0.51	N/A
3.1	7	AMOLE ARROYO ABOVE SACATE BLANCO CONFLUENCE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2237 639 0.29 0.15	4016 814 1.11 0.68	N/A	3526 814 0.98 0.61	N/A
4	7	AMOLE ARROYO INTO AMOLE DETENTION FACILITY	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	3022 657 0.31 0.19	6089 950 1.18 0.89	1500 cfs channel 4235 cfs chute (bank full) 3000 cfs channel 7480 cfs chute	5293 925 1.08 0.81	4650

Notes/Legend

AP - Analysis Point - See Figures this report, maps in Volume II and detail hydrology in Volume III.
Q - Peak discharge rate
Tvol - Total runoff volume (includes truncated volumes)
Dvol - Maximum detained volume
Runoff - inches of runoff

cfs/ac - peak discharge rate per acre of contributing area.
Existing - Existing land use and existing drainage facilities.
DEVEX - Fully developed land use and existing drainage facilities.
Capacity - Design capacity.
DMP - Proposed improvements in place, fully developed land use.

EL RANCHO GRANDE-Amole Arroyo X-Section
Worksheet for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Amole Arroyo - 100-year unlined
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

OFFSITE

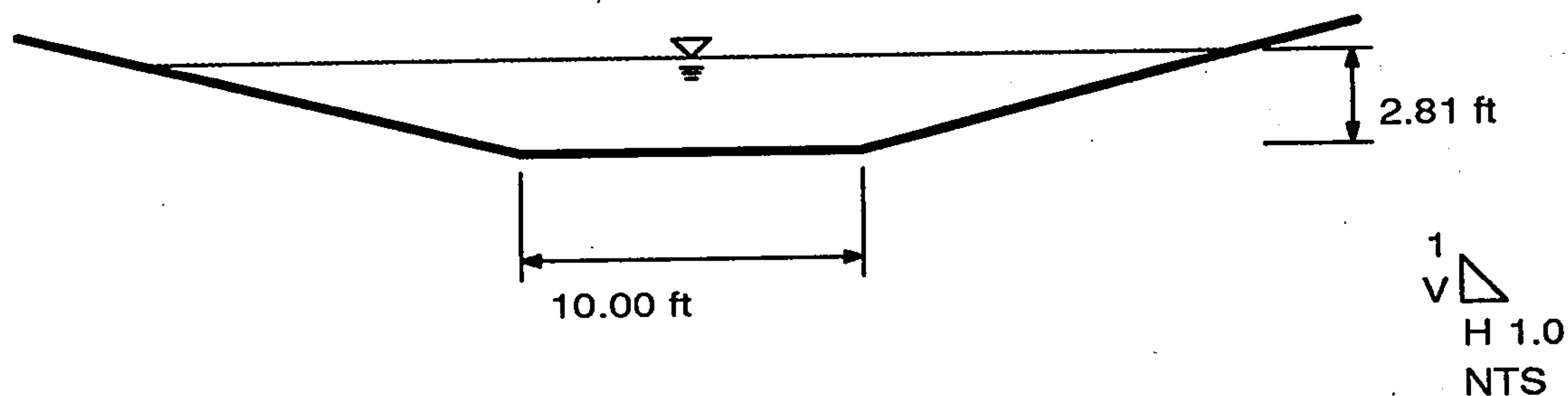
Input Data	
Mannings Coefficient	0.030
Channel Slope	0.025000 ft/ft
Left Side Slope	4.000000 H : V
Right Side Slope	4.000000 H : V
Bottom Width	10.00 ft
Discharge	693.00 cfs

Results	
Depth	2.81 ft
Flow Area	59.78 ft ²
Wetted Perimeter	33.20 ft
Top Width	32.50 ft
Critical Depth	3.46 ft
Critical Slope	0.010404 ft/ft
Velocity	11.59 ft/s
Velocity Head	2.09 ft
Specific Energy	4.90 ft
Froude Number	1.51
Flow is supercritical.	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Amole Arroyo - 100-year unlined
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.030
Channel Slope	0.025000 ft/ft
Depth	2.81 ft
Left Side Slope	4.000000 H : V
Right Side Slope	4.000000 H : V
Bottom Width	10.00 ft
Discharge	693.00 cfs



EL RANCHO GRANDE-Amole Arroyo X-Section
Worksheet for Trapezoidal Channel

ON SITE

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Amole Arroyo - 100-year
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.017	
Channel Slope	0.020000 ft/ft	
Left Side Slope	2.000000 H : V	
Right Side Slope	2.000000 H : V	
Bottom Width	10.00	ft
Discharge	812.80	cfs

Results		
Depth	2.75	ft
Flow Area	42.67	ft ²
Wetted Perimeter	22.31	ft
Top Width	21.01	ft
Critical Depth	4.40	ft
Critical Slope	0.003217 ft/ft	
Velocity	19.05	ft/s
Velocity Head	5.64	ft
Specific Energy	8.39	ft
Froude Number	2.36	
Flow is supercritical.		

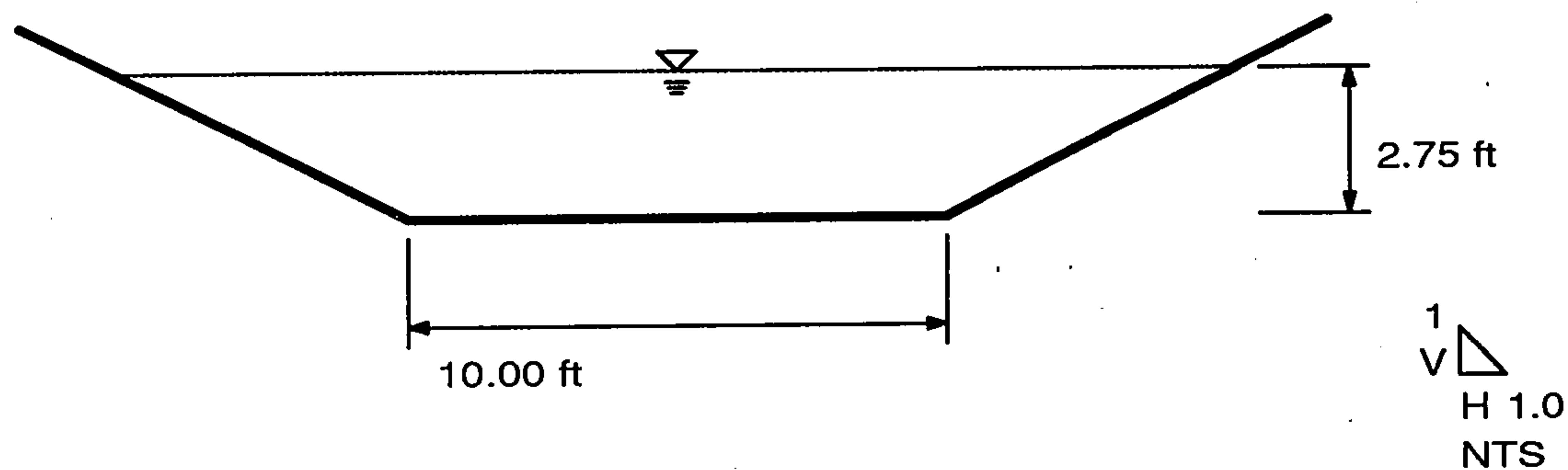
Cross Section
Cross Section for Trapezoidal Channel

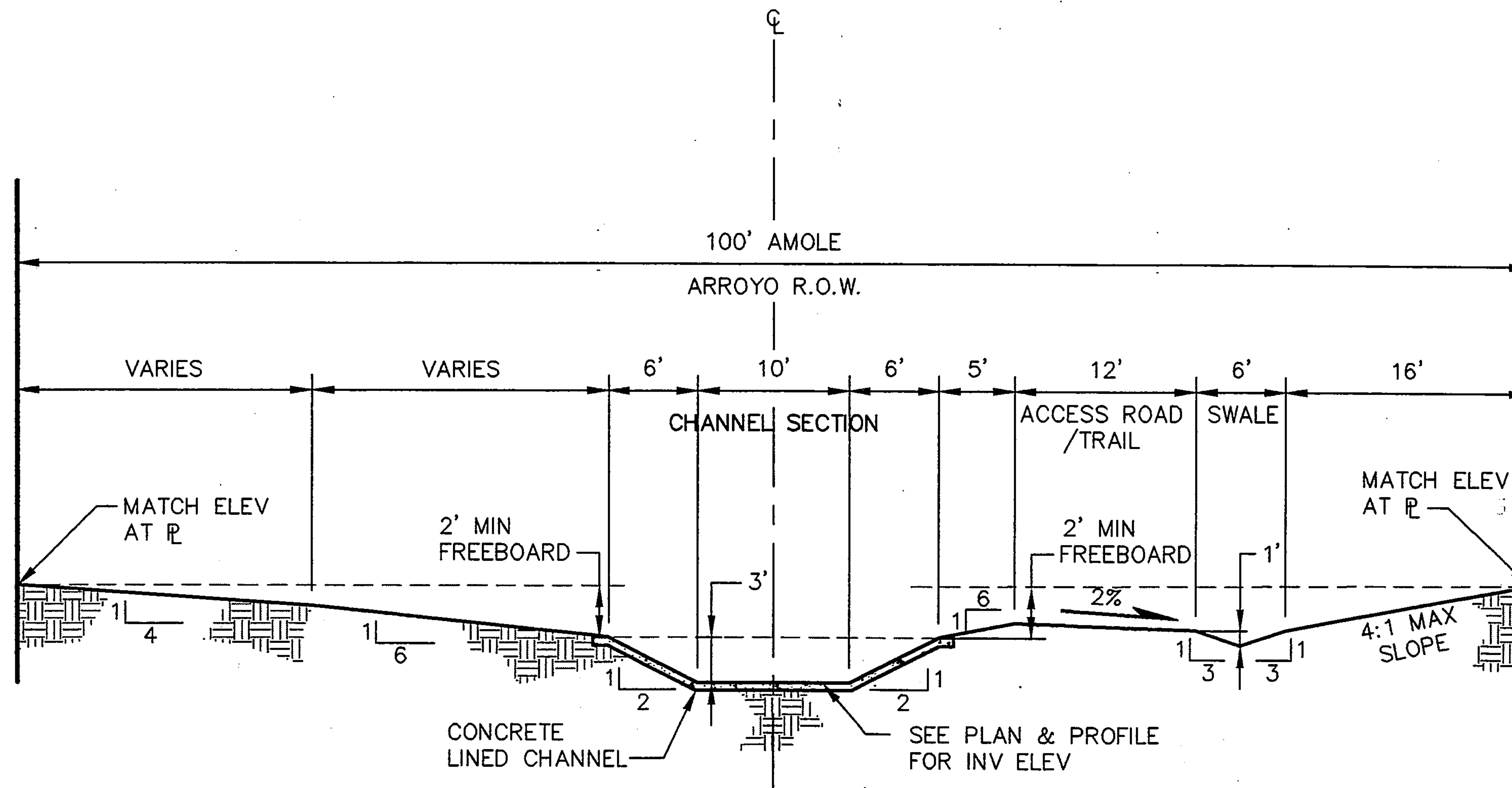
Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Amole Arroyo - 100-year
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data

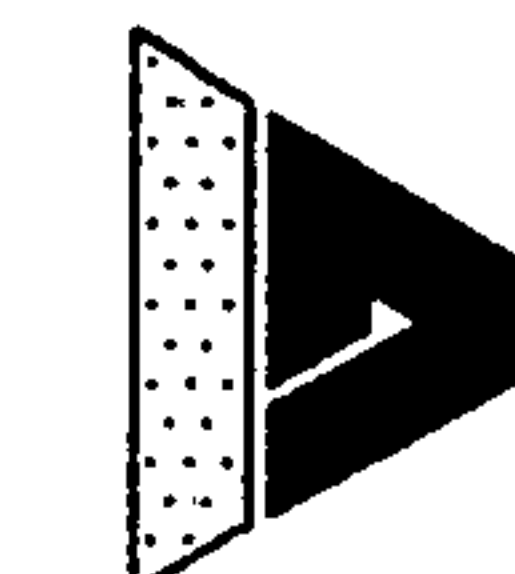
Mannings Coefficient	0.017
Channel Slope	0.020000 ft/ft
Depth	2.75 ft
Left Side Slope	2.000000 H : V
Right Side Slope	2.000000 H : V
Bottom Width	10.00 ft
Discharge	812.80 cfs





AMOLE ARROYO - CONCRETE LINED
DEL REY RD. TO SNOW VISTA CONFLUENCE
SECTION D-D

1"=10'-0"



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APPENDIX G

Snow Vista Channel Analysis



TABLE III-3
HYDROLOGIC SUMMARY
SNOW VISTA BASIN

AP NO	MAP NO	DESCRIPTION	VARIABLE	EXISTING FACILITIES			PROPOSED DMP FACILITIES	
				EXISTING	DEVEX	EXISTING CAPACITY	DMP	FUTURE CAPACITY
21.1	4	SNOW VISTA SEDIMENTATION BASIN	Q (cfs)	233	423	484	423	484
			Tvol (AF)	17.1	53.8		53.8	
			Dvol (AF)	4.0	6.4		6.4	
			Runoff (in)	0.76	2.07		2.07	
			cfs/ac	0.62	1.36		1.36	
21	4	SNOW VISTA CHANNEL AT HEAD	Q (cfs)	167	388	290	388	375
			Tvol (AF)	17.1	53.8	2530	53.18 *	
			Runoff (in)	0.76	2.07	(bank full)	2.07	
			cfs/ac	0.62	1.25		1.25	
22	4	SNOW VISTA BELOW SECTION LINE JUNCTION	Q (cfs)	407	747	810	747	810
			Tvol (AF)	41.5	95	4595	95 *	
			Runoff (in)	0.86	1.97	(bank full)	1.97	
			cfs/ac	0.70	1.29		1.29	
22.1	4	SNOW VISTA BELOW SAGE CROSSING	Q (cfs)	642	916	850	916	930
			Tvol (AF)	49.3	114.4	3850	114.4 *	
			Runoff (in)	0.83	1.93	(bank full)	1.93	
			cfs/ac	0.90	1.29		1.29	
22.2	4	SNOW VISTA BELOW INLET FROM WESTGATE	Q (cfs)	812	1031	990	1031	1050
			Tvol (AF)	57	121.7	3700	121.7 *	
			Runoff (in)	0.90	1.92	(bank full)	1.92	
			cfs/ac	1.07	1.36		1.36	
23	4	SNOW VISTA BELOW BENAVIDES INLET	Q (cfs)	1864	2050	1200	2050	2100
			Tvol (AF)	99	167.5	5230	167.5	
			Runoff (in)		1.88	(bank full)	1.88	
			cfs/ac		1.92		1.92	
24	7	SNOW VISTA AT ENTRANCE TO AMOLE ARROYO	Q (cfs)	1814	2083	1200	2083	2100
			Tvol (AF)	105.7	183.4	2600	183.4	
			Runoff (in)	1.10	1.87	(bank full)	1.87	
			cfs/ac	1.57	1.77		1.77	

Notes/Legend

AP - Analysis Point - See Figures this report, maps in Volume II and detail hydrology in Volume III.

Q - Peak discharge rate

Tvol - Total runoff volume

Dvol - Maximum detained volume

Runoff - inches of runoff

* Existing channel has excess capacity without additional freeboard. No improvements are necessary.

cfs/ac - peak discharge rate per acre of contributing area.

Existing - Existing land use and existing drainage facilities.

DEVEX - Fully developed land use and existing drainage facilities.

Capacity - Design capacity.

DMP - Proposed improvements in place, fully developed land use.

EL RANCHO GRANDE-Snow Vista freeboard

Worksheet for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Snow Vista Freeboard - north
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.035	
Channel Slope	0.006000	ft/ft
Left Side Slope	3.000000	H : V
Right Side Slope	4.000000	H : V
Bottom Width	50.00	ft
Discharge	2,083.00	cfs

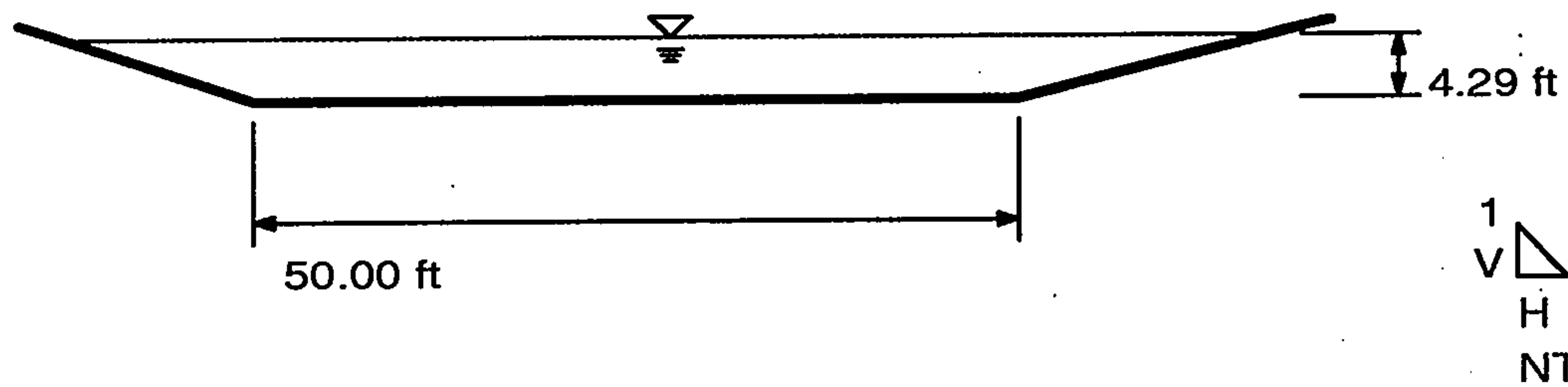
Results		
Depth	4.29	ft
Flow Area	278.53	ft ²
Wetted Perimeter	81.22	ft
Top Width	80.00	ft
Critical Depth	3.47	ft
Critical Slope	0.012737	ft/ft
Velocity	7.48	ft/s
Velocity Head	0.87	ft
Specific Energy	5.15	ft
Froude Number	0.71	
Flow is subcritical.		

Cross Section

Cross Section for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Snow Vista Freeboard - north
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.035
Channel Slope	0.006000 ft/ft
Depth	4.29 ft
Left Side Slope	3.000000 H : V
Right Side Slope	4.000000 H : V
Bottom Width	50.00 ft
Discharge	2,083.00 cfs



EL RANCHO GRANDE-Snow Vista freeboard
Worksheet for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Snow Vista Freeboard - south
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

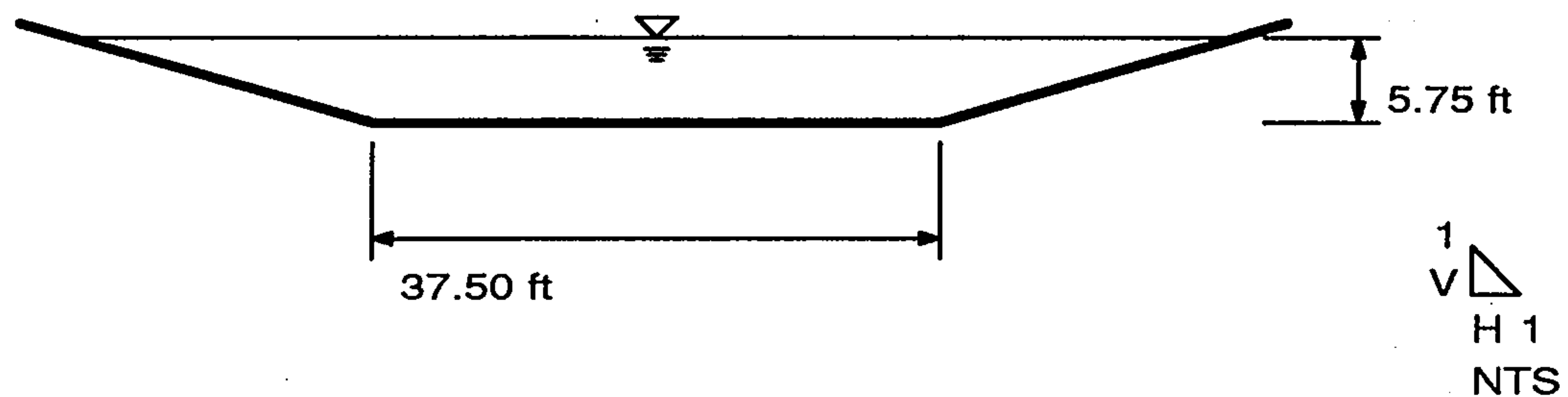
Input Data		
Mannings Coefficient	0.035	
Channel Slope	0.006000 ft/ft	
Left Side Slope	3.500000 H : V	
Right Side Slope	3.500000 H : V	
Bottom Width	37.50	ft
Discharge	2,825.00	cfs

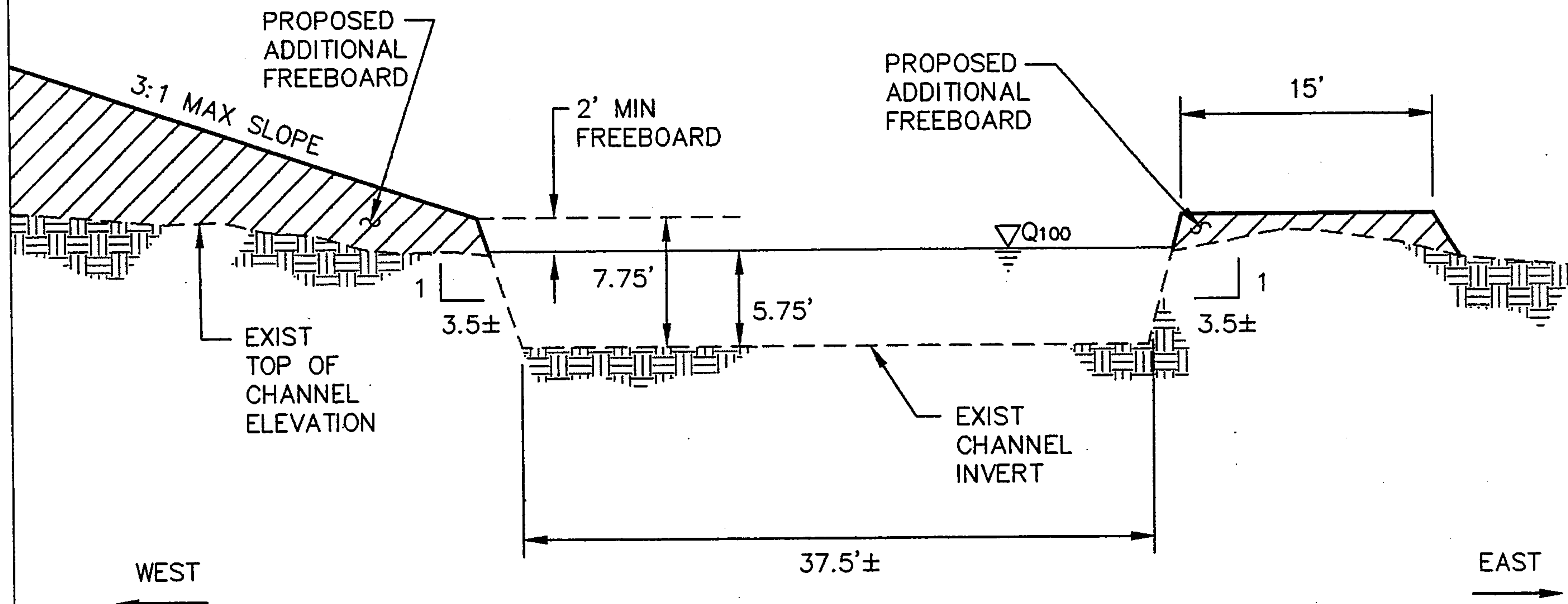
Results		
Depth	5.75	ft
Flow Area	331.32	ft ²
Wetted Perimeter	79.36	ft
Top Width	77.75	ft
Critical Depth	4.79	ft
Critical Slope	0.011873	ft/ft
Velocity	8.53	ft/s
Velocity Head	1.13	ft
Specific Energy	6.88	ft
Froude Number	0.73	
Flow is subcritical.		

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Snow Vista Freeboard - south
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

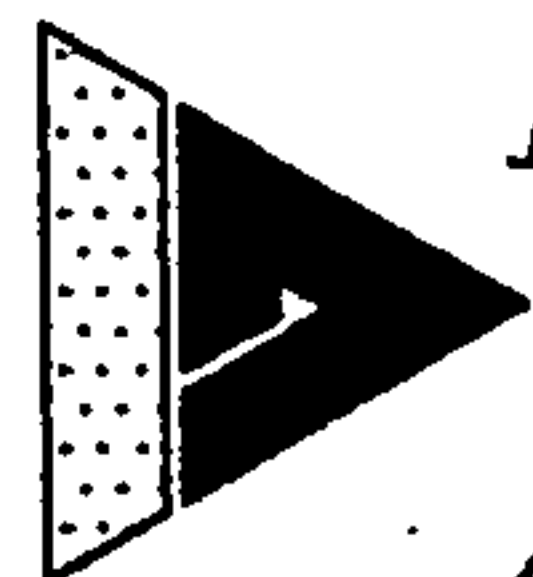
Section Data	
Mannings Coefficient	0.035
Channel Slope	0.006000 ft/ft
Depth	5.75 ft
Left Side Slope	3.500000 H : V
Right Side Slope	3.500000 H : V
Bottom Width	37.50 ft
Discharge	2,825.00 cfs





SNOW VISTA CHANNEL DOWNSTREAM OF AMOLE ARROYO CONFLUENCE SECTION F-F

1"=10'-0"



ISAACSON & ARFMAN, P.A.

*Consulting Engineering Associates
128 Monroe Street N.E.*

*Albuquerque
167DRDTL.DWGrfh*

*New Mexico
08/22/01*

EL RANCHO GRANDE - UNITS 6, 7, & 8
Worksheet for Rectangular Channel

Project Description

Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Snow Vista crossing @ De Anza - CBC
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Mannings Coefficient	0.013
Channel Slope	0.006000 ft/ft
Bottom Width	10.00 ft
Discharge	941.70 cfs

Results

Depth	5.57 ft
Flow Area	55.74 ft ²
Wetted Perimeter	21.15 ft
Top Width	10.00 ft
Critical Depth	6.51 ft
Critical Slope	0.004008 ft/ft
Velocity	16.89 ft/s
Velocity Head	4.44 ft
Specific Energy	10.01 ft
Froude Number	1.26

Flow is supercritical.

EL RANCHO GRANDE - CHANNEL CROSSING
Worksheet for Circular Channel

Project Description	
Project File	j:\c4-active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Amole Crossing @ Del Rey - RCP
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data	
Mannings Coefficient	0.013
Channel Slope	0.020000 ft/ft
Diameter	48.00 in

Results		
Depth	4.00	ft
Discharge	203.13	cfs
Flow Area	12.57	ft ²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.86	ft
Percent Full	100.00	
Critical Slope	0.017483	ft/ft
Velocity	16.16	ft/s
Velocity Head	4.06	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	218.51	cfs
Full Flow Capacity	203.13	cfs
Full Flow Slope	0.020000	ft/ft

CONVERGING CHANNELS

(DRAINAGE CRITERIA MANUAL SECT 5.4.5)

$$VS^{0.17} / (S_s - 1)^{0.66} \quad (\text{Eq. 5-4})$$

$V = 1.05$ times the channel velocity (fps)

S = longitudinal channel slope (ft/ft)

S_s = specific gravity of rock = 2.50

d_{50} = mean rock size (ft)

$$V_{\text{SNOW VISTA}} = 8.53 \text{ fps} \times (1.05) = 8.96 \text{ fps}$$

$$S = 0.006$$

$$\frac{8.96 (0.006)^{0.17}}{(2.5 - 1)^{0.66}} = \underline{\underline{2.87 \text{ fps}}}$$

from Table 5-5:

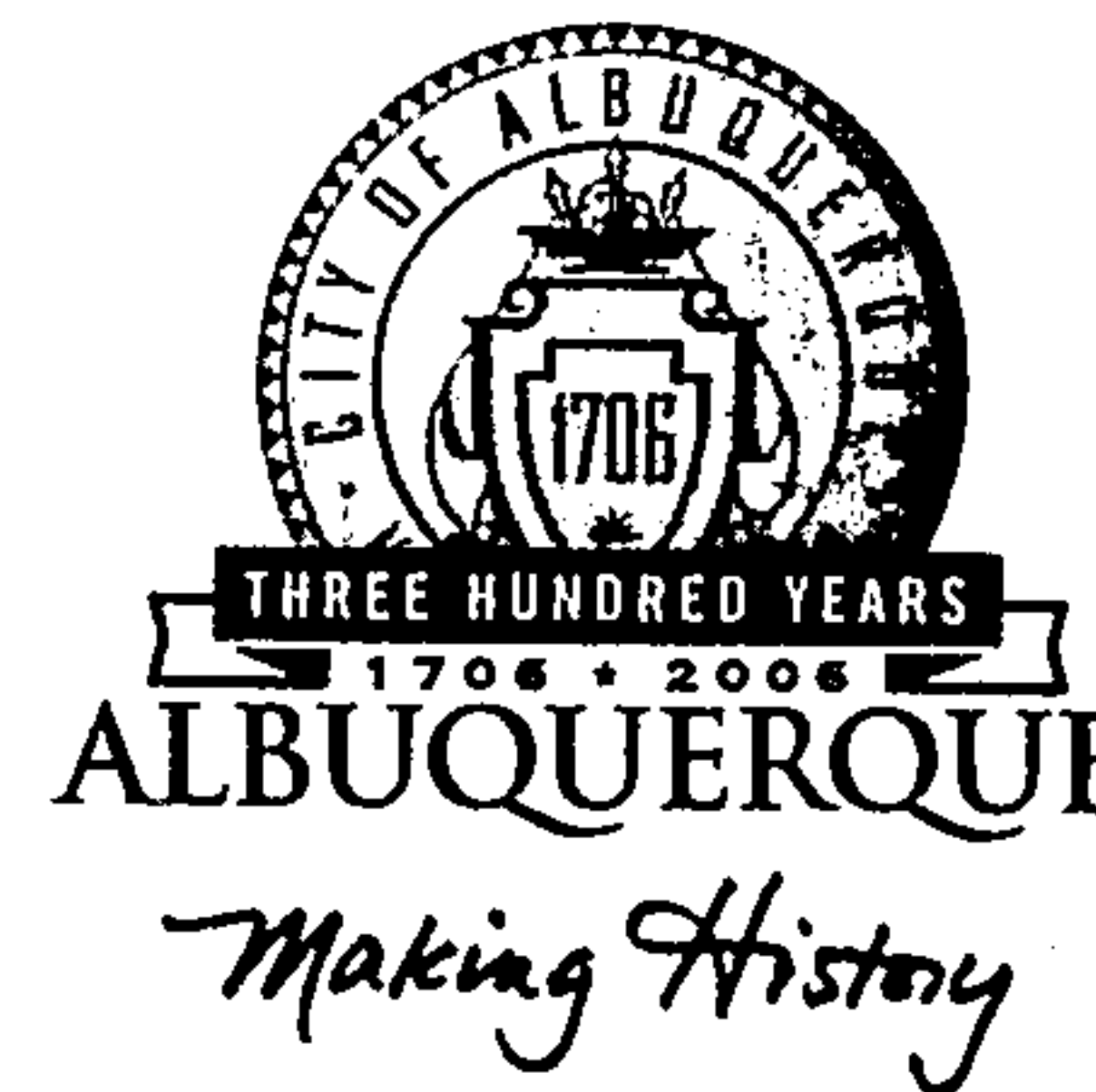
For $\frac{VS^{0.17}}{(S_s - 1)^{0.66}}$ between 1.5 fps to 4.0 fps:

Rip Rap size is Type "VL"

Upsize to Type "M" for safety factor

$$d_{50} = 12" \quad \text{thickness} = 2d_{50} = 2'$$

CITY OF ALBUQUERQUE



September 24, 2004

Ms. Genny Donart, PE
ISAACSON & ARFMAN, PA
128 Monroe St. NE
Albuquerque, NM 87108

RE: EL RANCHO GRANDE, UNIT 8B (M-09/D019B)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 12/11/2003
Engineers Certification dated 09/23/2004

Dear Genny:

Based upon the information provided in your Engineer's Certification Submittal dated 09/22/2004, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

P.O. Box 1293

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

Albuquerque

Sincerely,

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

New Mexico 87103

www.cabq.gov

C: Marilyn Maldonado, COA# 699390
File

M-9/D19B

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Unit 8B

DRB #: 1001347

EPC #: _____

ZONE MAP / DRG. FILE #: M-9/D19B

WORK ORDER #: 699390

LEGAL DESCRIPTION: Tract D1B, Albuquerque South, Unit 3

CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.

ADDRESS: 128 Monroe St. NE

CITY, STATE: Albuquerque, NM

CONTACT: Genny Donart

PHONE: 268-8828

ZIP CODE: 87108

OWNER: Curb, Inc

ADDRESS: 5160 San Francisco NE

CITY, STATE: Albuquerque, NM

CONTACT: Bo Johnson

PHONE: 899-9656

ZIP CODE: 87109

ARCHITECT: _____

ADDRESS: _____

CITY, STATE: Albuquerque, New Mexico

CONTACT: _____

PHONE: _____

ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying

ADDRESS: _____

CITY, STATE: Albuquerque, New Mexico

CONTACT: Tim Aldrich

PHONE: 884-1990

ZIP CODE: _____

CONTRACTOR: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

☐ DRAINAGE REPORT

☐ DRAINAGE PLAN 1ST *REQUIRES TCL or equal*

☐ DRAINAGE PLAN RESUBMITTAL

☐ CONCEPTUAL GRADING & DRAINAGE PLAN

☐ GRADING PLAN

☐ EROSION CONTROL PLAN

☒ ENGINEER'S CERTIFICATION (HYDROLOGY)

☐ CLOMR / LOMR

☐ TRAFFIC CIRCULATION LAYOUT (TCL)

☐ ENGINEER'S CERTIFICATION (TCL)

☐ ENGINEER'S CERTIFICATION (DRB APPR, SITE PLAN)

☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

☒ SIA / FINANCIAL GUARANTEE RELEASE

☐ PRELIMINARY PLAT APPROVAL

☐ S. DEV. PLAN FOR SUB'D APPROVAL

☐ S. DEV. PLAN FOR BLDG. PERMIT APPR.

☐ SECTOR PLAN APPROVAL

☐ FINAL PLAT APPROVAL

☐ FOUNDATION PERMIT APPROVAL

☐ BUILDING PERMIT APPROVAL

☐ CERTIFICATE OF OCCUPANCY (PERM)

☐ CERTIFICATE OF OCCUPANCY (TEMP)

☐ GRADING PERMIT APPROVAL

☐ PAVING PERMIT APPROVAL

☐ WORK ORDER APPROVAL

☐ OTHER

WAS A PRE-DESIGN CONFERENCE ATTENDED:

☐ YES

☐ NO

☐ COPY PROVIDED

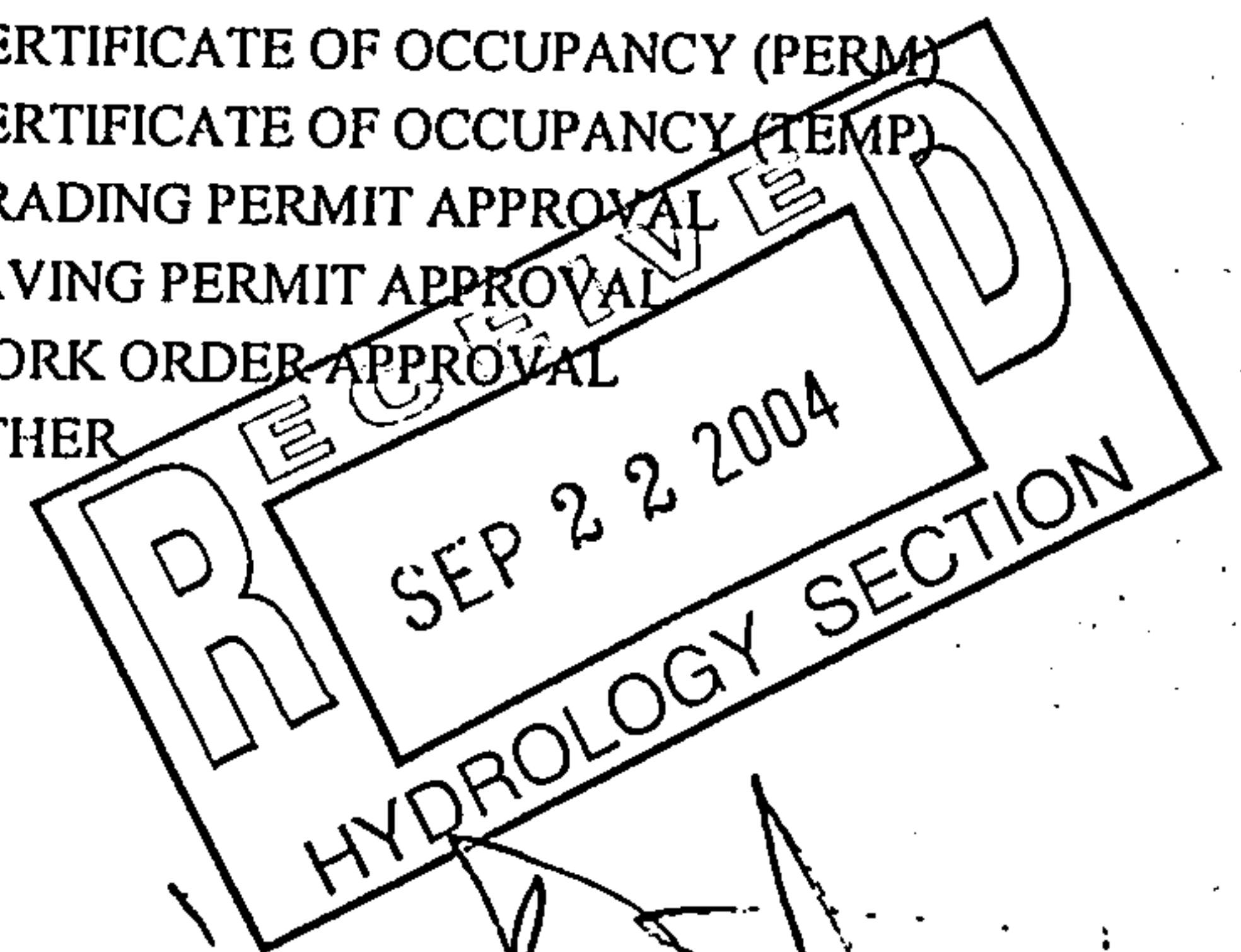
DATE SUBMITTED: Monday, September 20, 2004

BY: Genny Donart

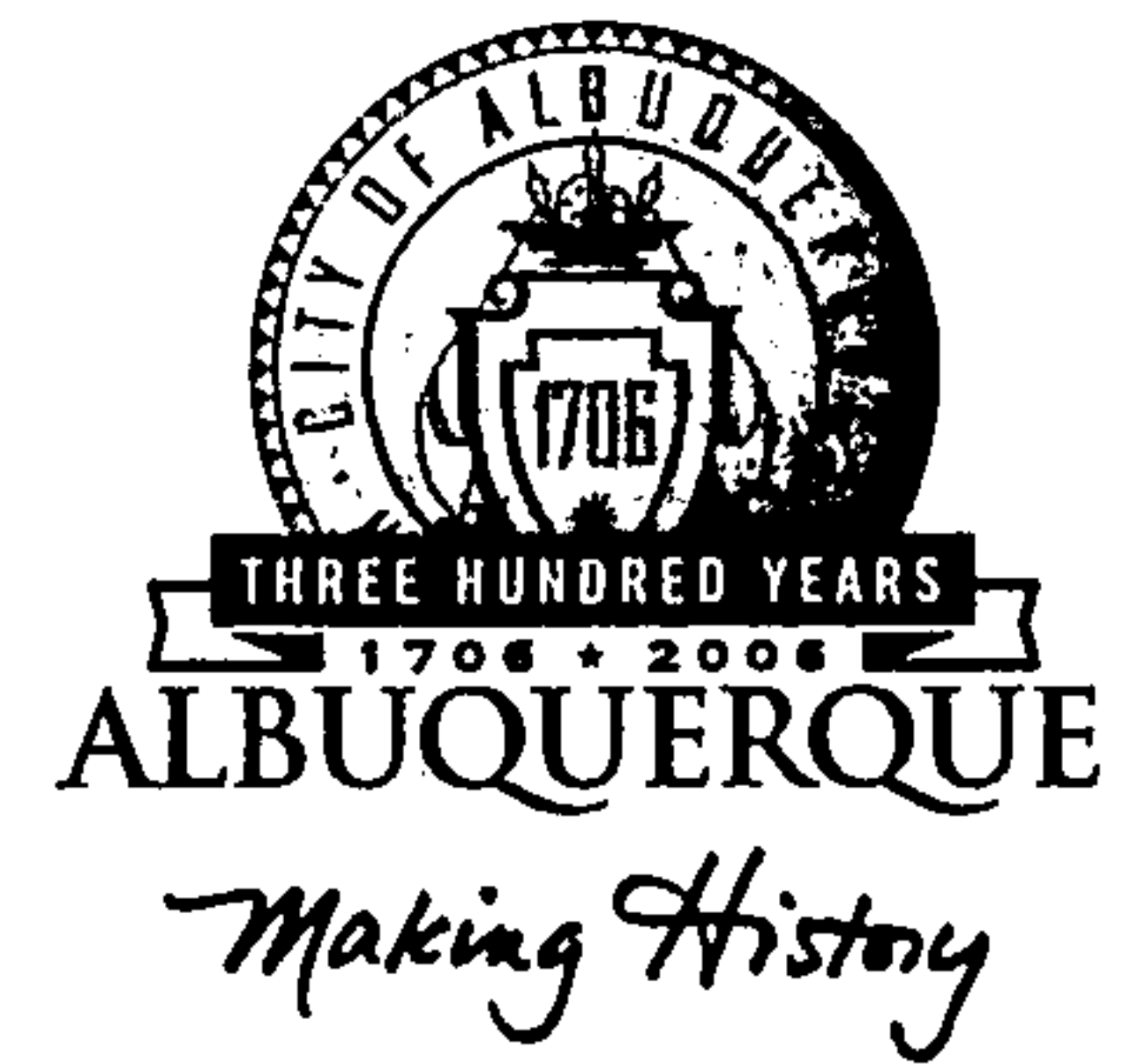
Isaacson & Arfman, P.A.

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

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



CITY OF ALBUQUERQUE



September 21, 2004

Genevieve Donart, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, NM 87108

Re: El Rancho Grande Unit 8B, SIA/Financial Guarantee Release
Engineer's Stamp dated 10-31-03 (M9-D19B)
Certification dated 9-20-04

Dear Ms. Donart,

Based upon the information provided in your submittal received 9-20-04, the above referenced certification cannot be approved for release of SIA and Financial Guarantee until the following comments are addressed:

P.O. Box 1293

Albuquerque

1. Please certify the hydrology-approved grading and drainage plan, with a stamp date of December 11, 2003.

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

New Mexico 87103

www.cabq.gov

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

M-9/D19B

PROJECT TITLE: El Rancho Grande Unit 8B ZONE MAP / DRG. FILE #: M9/D18B
DRB #: 1001347 EPC #: _____ WORK ORDER #: 699390

LEGAL DESCRIPTION: Tract D1B, Albuquerque South, Unit 3
CITY ADDRESS: _____

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

OWNER: Curb, Inc CONTACT: Bo Johnson
ADDRESS: 5160 San Francisco NE PHONE: 899-9656
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: Albuquerque, New Mexico ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich
ADDRESS: _____ PHONE: 884-1990
CITY, STATE: Albuquerque, New Mexico ZIP CODE: _____

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

CHECK TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN 1ST *REQUIRES TCL or equal*
____ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
____ CLOMR / LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERTIFICATION (TCL)
____ ENGINEER'S CERTIFICATION (DRB APPR, SITE PLAN)
____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

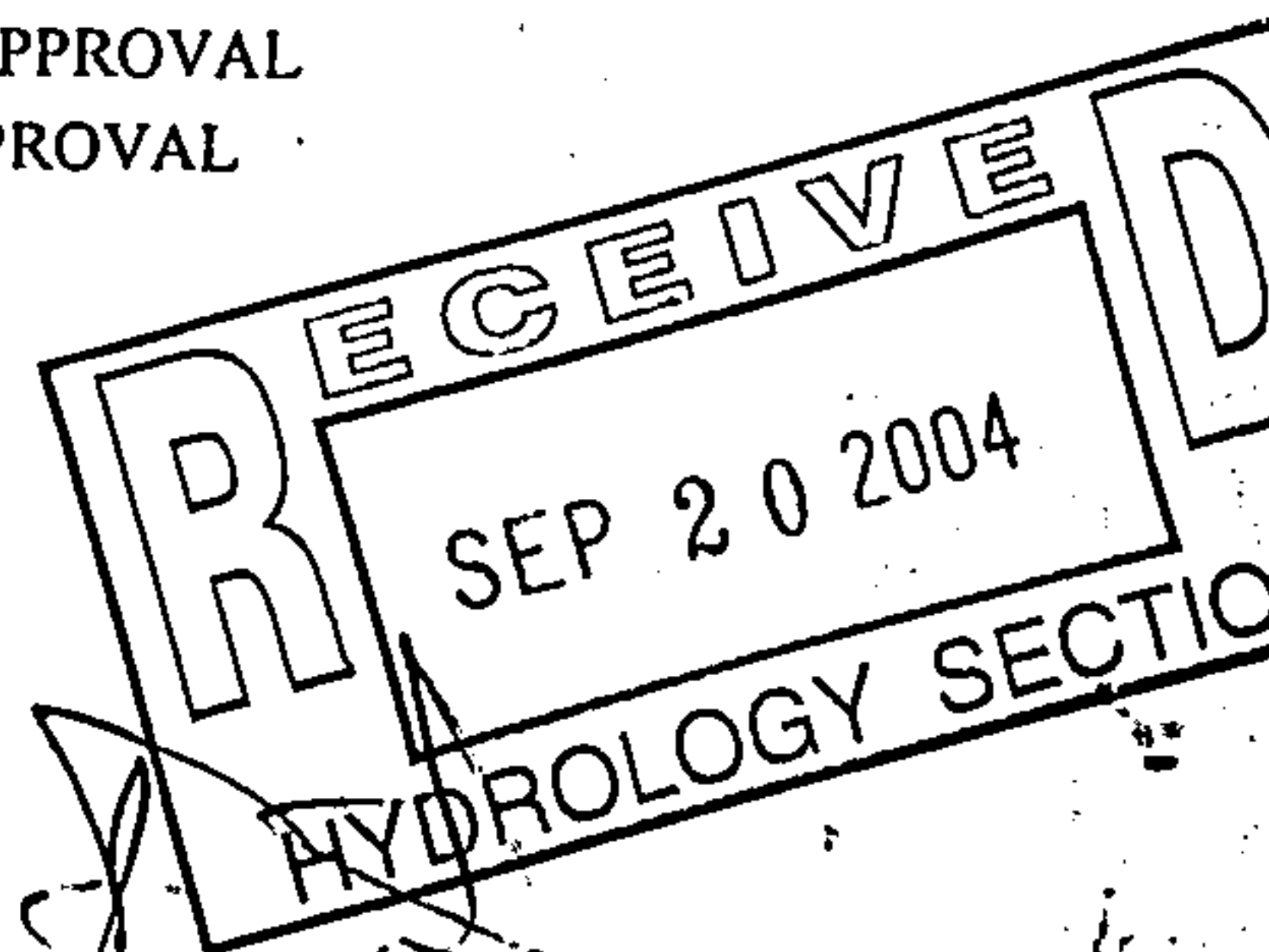
____ YES
____ NO
____ COPY PROVIDED

DATE SUBMITTED: Monday, September 20, 2004

BY: Gonzalez
Isaacson & Arfman, P.A.

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

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





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 28, 2004

Genevieve Donart, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, NM 87108

Re: El Rancho Grande Unit 8B, Grading Plan
Engineer's Stamp dated 12-11-03 (M9/D19B)

Dear Ms. Donart,

Based upon the information provided in your submittal received 12-19-03, the above referenced plan is approved for Work Order. This is now the plan that must be certified for release of SIA and Financial Guarantee.

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

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

BLB

C: file

M-9/D19B

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

Unit 8B

PROJECT TITLE: Elegante at El Rancho Grande, Unit 8B
DRB #: 1001347 EPC#: _____ ZONE MAP/DRG. FILE #: M-9/D19B
WORK ORDER#: 699390

LEGAL DESCRIPTION: Tr. D1B, Albug. South, Unit 3
CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.
ADDRESS: 128 Monroe Street NE
CITY, STATE: Albuquerque, NM

CONTACT: Asa Nilsson-Weber
PHONE: (505) 268-8828
ZIP CODE: 87108

OWNER: Curb Inc.
ADDRESS: 6301 Indian School Rd NE Ste 208
CITY, STATE: Albuquerque NM 87110

CONTACT: Bo Johnson
PHONE: 450 4616
ZIP CODE: _____

ARCHITECT: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying
ADDRESS: _____
CITY, STATE: _____

CONTACT: Tim Aldrich
PHONE: _____
ZIP CODE: _____

CONTRACTOR: _____
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

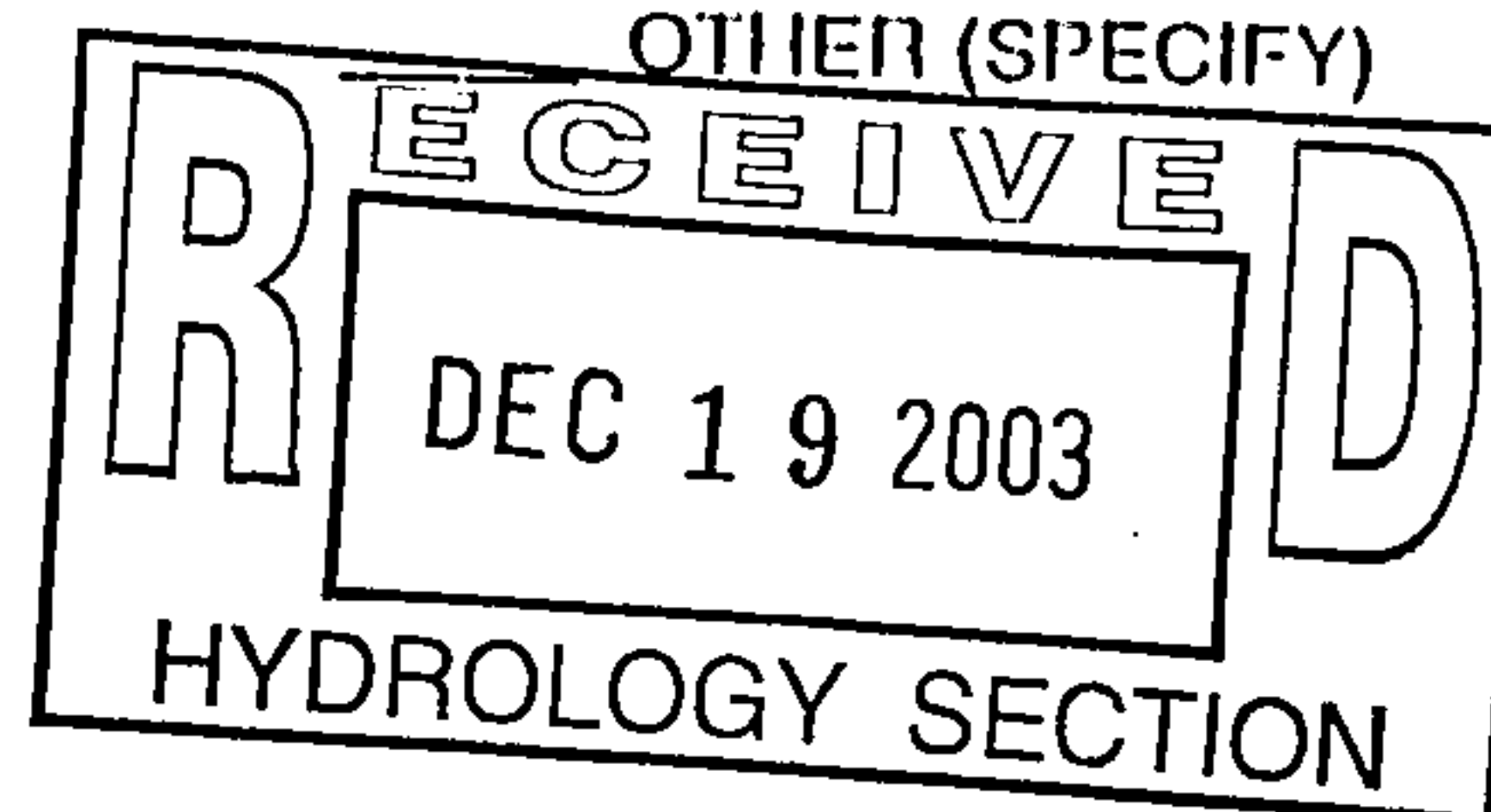
- ____ DRAINAGE REPORT
____ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
____ DRAINAGE PLAN RESUBMITTAL
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
____ ENGINEER'S CERTIFICATION (HYDROLOGY)
____ CLOM/LOM
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ ENGINEER'S CERTIFICATION (TCL)
____ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
☒ OTHER Revised grading plan

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
☒ NO
____ COPY PROVIDED



DATE SUBMITTED: 12/18/03 BY: Asa Nilsson-Weber

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

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



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 17, 2003

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

Re: El Rancho Grande Units 8A Revised Grading Plan
Engineer's Stamp dated 8-6-03, (M9/D19B)

Dear Ms. Donart,

Based upon the information provided in your submittal dated 10-31-03, the above referenced plan is approved for Work Order. This is now the plan that must be certified for release of SIA and Financial Guarantee.

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

Sincerely,

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

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Unit 8A

DRB #: 1001347

EPC#:

ZONE MAP/DRG. FILE #: M-9/D19B

WORK ORDER#: 699384

LEGAL DESCRIPTION: Tr. DIA, Albug. South, Unit 3

CITY ADDRESS:

ENGINEERING FIRM: Isaacson & Arfman, P.A.

ADDRESS: 128 Monroe Street NE

CITY, STATE: Albuquerque, NM

CONTACT: Asa Nilsson-Weber

PHONE: (505) 268-8828

ZIP CODE: 87108

OWNER:

Curb Inc.

ADDRESS: 6301 Indian School Rd NE Ste 208

CITY, STATE: Albuquerque NM 87110

CONTACT: Bo Johnson

PHONE: 450 4616

ZIP CODE:

ARCHITECT:

ADDRESS:

CITY, STATE:

CONTACT:

PHONE:

ZIP CODE:

SURVEYOR:

Aldrich Land Surveying

ADDRESS: PO Box 30701

CITY, STATE: Albug NM 87190

CONTACT: Tim Aldrich

PHONE: 884-1990

ZIP CODE:

CONTRACTOR:

ADDRESS:

CITY, STATE:

CONTACT:

PHONE:

ZIP CODE:

CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☒ OTHER Revised grading plan

CHECK TYPE OF APPROVAL SOUGHT:

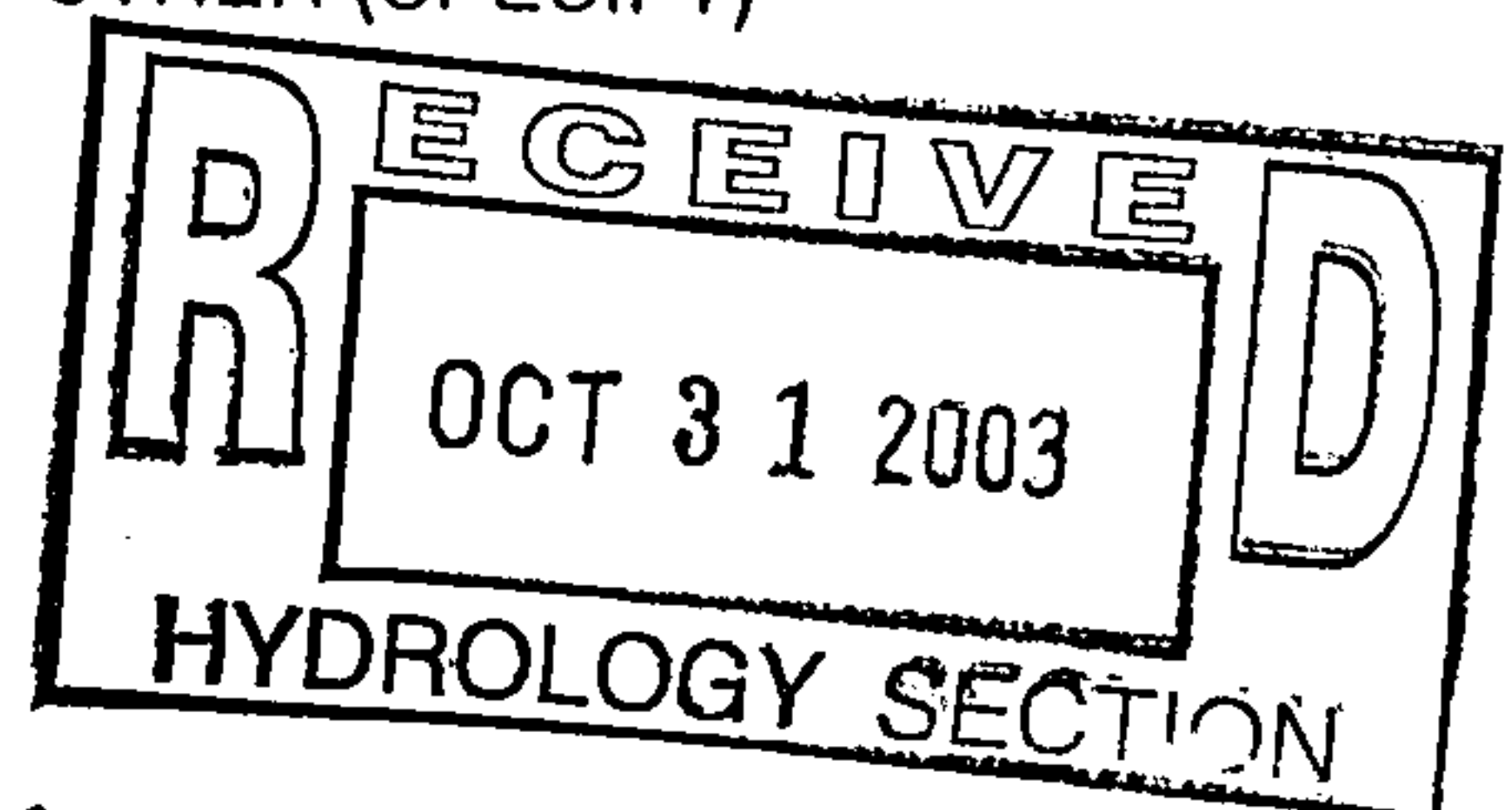
- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

☐ YES

☒ NO

☐ COPY PROVIDED



DATE SUBMITTED: 10/31/03

BY: Asa Nilsson-Weber

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

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

Letter of Transmittal



ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108

To: City of Albuquerque
Hydrology Division

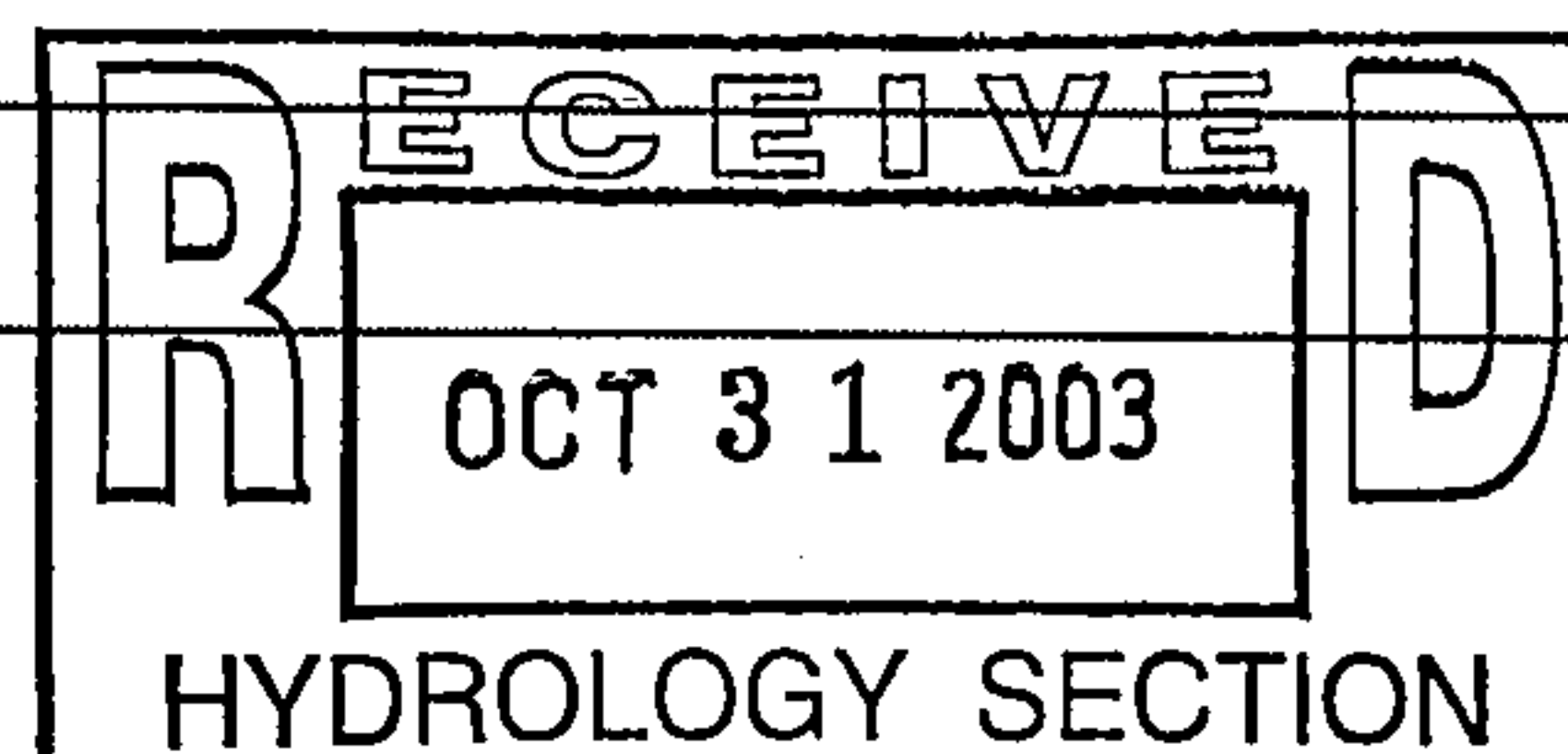
Date: 10/31/03
Job No. 1274

Attn: Brad Bingham

Reference: • El Rancho Grande Unit 8A
• Elegante at El Rancho Grande, Unit 2

We transmit to you 1 copy(ies) of the following:

- | | | |
|--|--------|---|
| ☐ _____ | Plats | ☐ Specifications |
| ☒ <u>Revised Grading</u> | Plans | ☐ Submittals |
| ☐ _____ | Disks | ☐ Shop Drawings |
| ☐ _____ | Report | ☐ Copy of Letter |
| ☐ _____ | | |
| ☐ _____ | | |



This information is transmitted:

- | | |
|--|---|
| ☐ As per your request | ☐ For your files |
| ☒ For your review & approval | ☐ For your use |
| ☐ For your information | ☐ Please review & return |
| ☐ For your attention | ☐ For return to your files |
| ☐ For your signature | ☐ Please advise |
| ☐ _____ | |
| ☐ _____ | |

Remarks: Reason for submittal:

- E.R.G-8A was regraded to eliminate some interior retaining walls
- Elegante @ E.R.G, Un. 2 was regraded because one lot was added.

By: Ana Weber

Copies to: file



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 17, 2003

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

Re: El Rancho Grande Units 8B Revised Grading Plan
Engineer's Stamp dated 10-30-03, (M9/D19B)

Dear Ms. Donart,

Based upon the information provided in your submittal dated 10-31-03, the above referenced plan is approved for Work Order. This is now the plan that must be certified for release of SIA and Financial Guarantee.

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

Sincerely,

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

C: file

M-9/D19B

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

B

Unit 2B

PROJECT TITLE: Elegante at El Rancho Grande, Un. 2 ZONE MAP/DRG. FILE #: M-9/D19B
 DRB #: 1001347 EPC#: _____ WORK ORDER#: 699390

LEGAL DESCRIPTION: Tr. DIB, Albug. South, Unit 3
 CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.
 ADDRESS: 128 Monroe Street NE
 CITY, STATE: Albuquerque, NM

CONTACT: Asa Nilsson-Weber
 PHONE: (505) 268-8828
 ZIP CODE: 87108

OWNER: Curb Inc.
 ADDRESS: 6301 Indian School Rd NE Ste 208
 CITY, STATE: Albuquerque NM 87110

CONTACT: Bo Johnson
 PHONE: 450 4616
 ZIP CODE: _____

ARCHITECT: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying
 ADDRESS: PO Box 30701
 CITY, STATE: Albug NM 87190

CONTACT: Tim Aldrich
 PHONE: 884-1990
 ZIP CODE: _____

CONTRACTOR: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

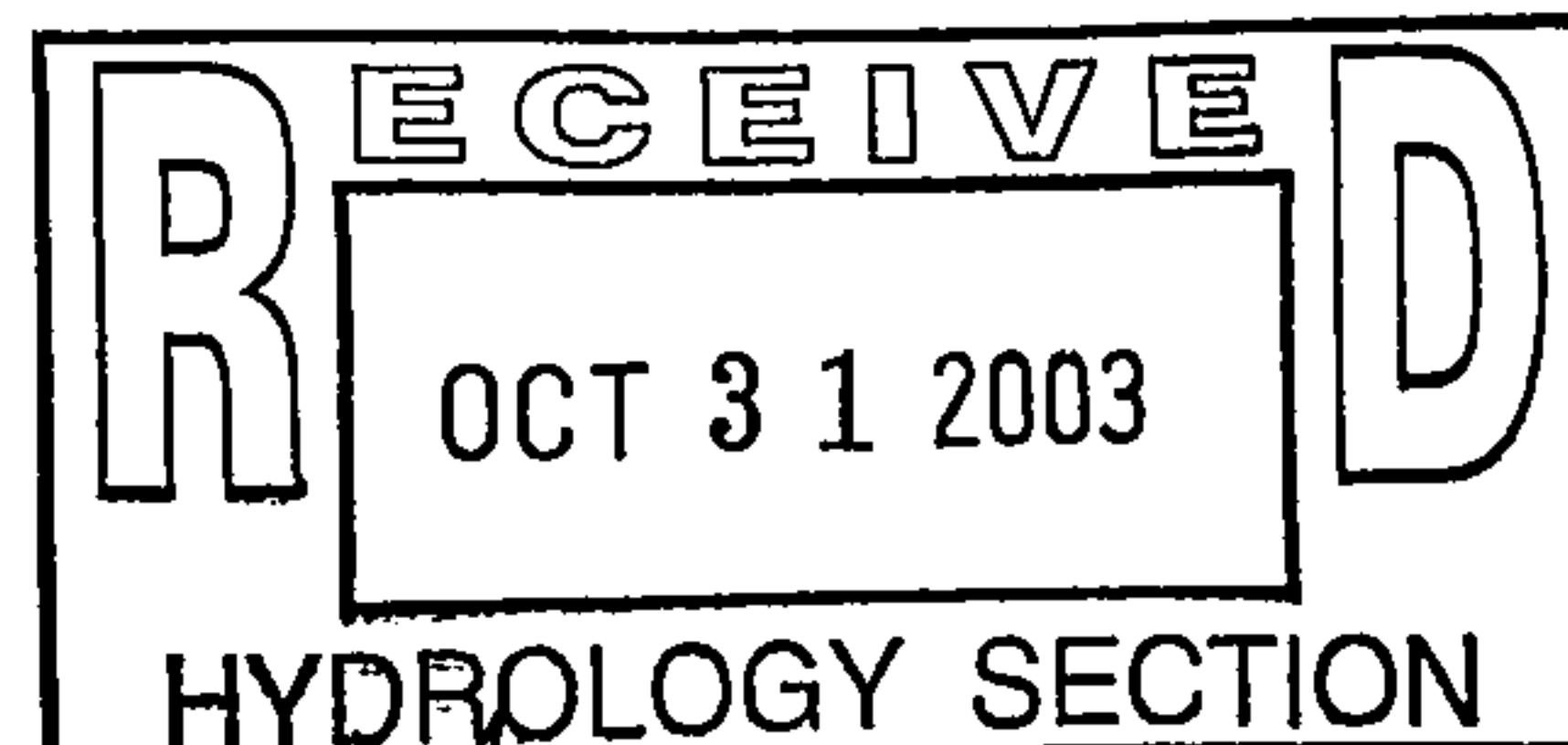
- _____ DRAINAGE REPORT
- _____ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- _____ DRAINAGE PLAN RESUBMITTAL
- _____ CONCEPTUAL GRADING & DRAINAGE PLAN
- _____ GRADING PLAN
- _____ EROSION CONTROL PLAN
- _____ ENGINEER'S CERTIFICATION (HYDROLOGY)
- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT (TCL)
- _____ ENGINEERS CERTIFICATION (TCL)
- _____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☒ OTHER Revised grading plan

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- _____ YES
- ☒ NO
- _____ COPY PROVIDED



DATE SUBMITTED: 10/31/03

BY: Asa Nilsson-Weber

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

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



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 17, 2003

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

**Re: El Rancho Grande Units 8 Revised Grading Plan
Engineer's Stamp dated 8-6-03, (M9/D19B)**

Dear Ms. Donart,

Based upon the information provided in your submittal dated 10-31-03, the above referenced plan is approved for Work Order. This is now the plan that must be certified for release of SIA and Financial Guarantee.

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

Sincerely,

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

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande, Units 6 & 7 ZONE MAP/DRG. FILE #: M9/D19B
 DRB #: _____ EPC#: _____ WORK ORDER#: 699382 & 699383

LEGAL DESCRIPTION: Tracts A & B, Albug. South Unit 3
 CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.
 ADDRESS: 128 Monroe Street NE
 CITY, STATE: Albuquerque, NM

CONTACT: _____
 PHONE: (505) 268-8828
 ZIP CODE: 87108

OWNER: Curb, Inc.
 ADDRESS: 6301 Indian School, Ste 680
 CITY, STATE: Abq, NM

CONTACT: Bo Johnson
 PHONE: 899-9656
 ZIP CODE: 87110

ARCHITECT: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

SURVEYOR: Aldrich Land Surveying
 ADDRESS: P.O. Box 30701
 CITY, STATE: Abq, NM

CONTACT: Tim Aldrich
 PHONE: 884-1990
 ZIP CODE: 87109

CONTRACTOR: _____
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☒ OTHER

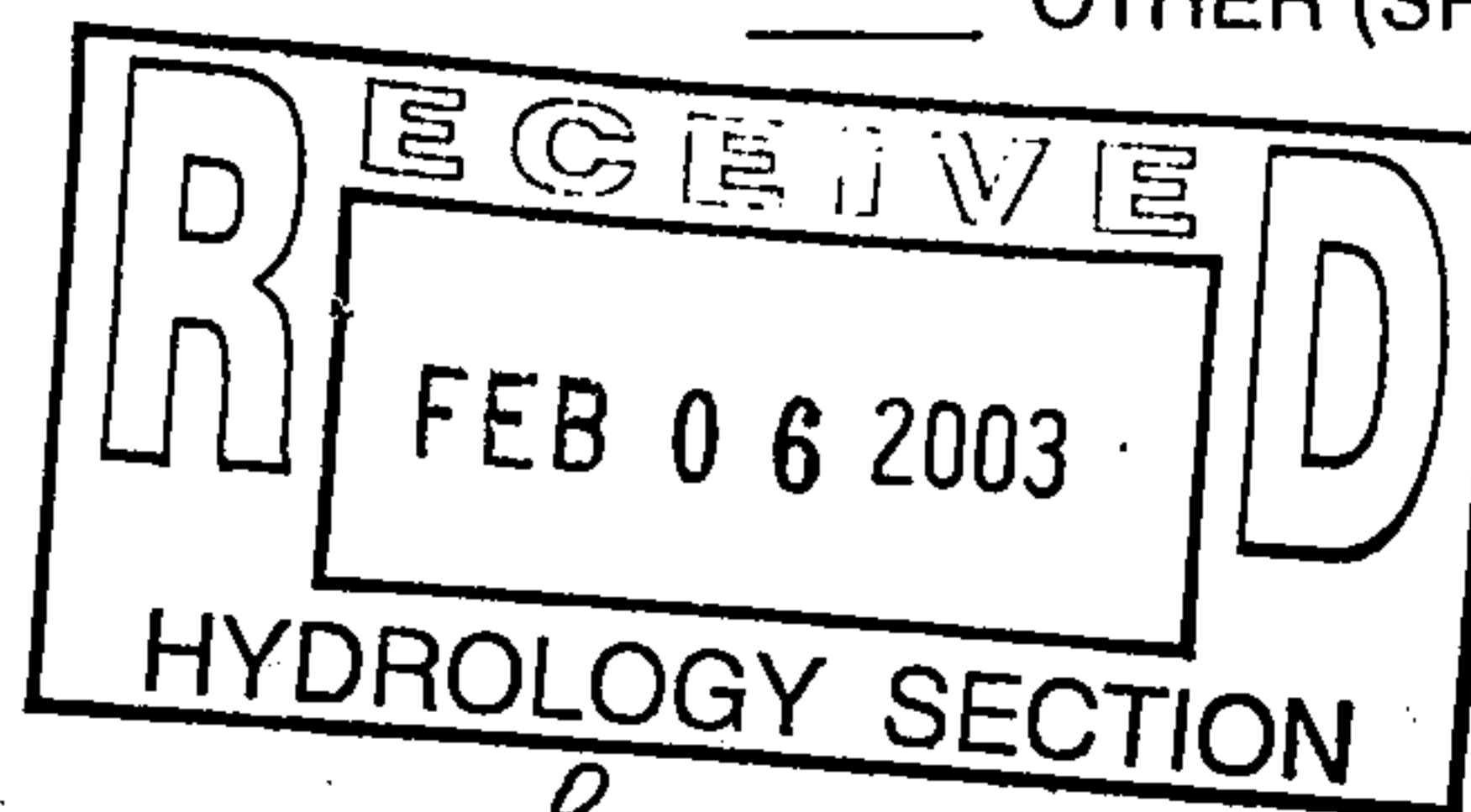
Amole Arroyo / Snow Vista Confluence

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
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- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☒ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☒ YES
- ☐ NO
- ☐ COPY PROVIDED



DATE SUBMITTED: 2-5-03 BY: Asa Nilsson-Weber

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

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2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

ALSO SEE

1/14
SUBMITTAL!



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 24, 2003

Asa Nilsson-Weber, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

**Re: El Rancho Grande, Units 6 & 7 Preliminary Confluence Design
Engineer's Stamp not dated, (M9/D19B)**

Dear Ms. Nilsson-Weber,

Based upon the information provided in your submittal dated 2-6-03, the above referenced design is approved as submitted. Prior to Final Plat or Work Order approval, AMAFCA concurrence is required.

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

Sincerely,

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

C: file



ISAACSON & ARFMAN, P.A.

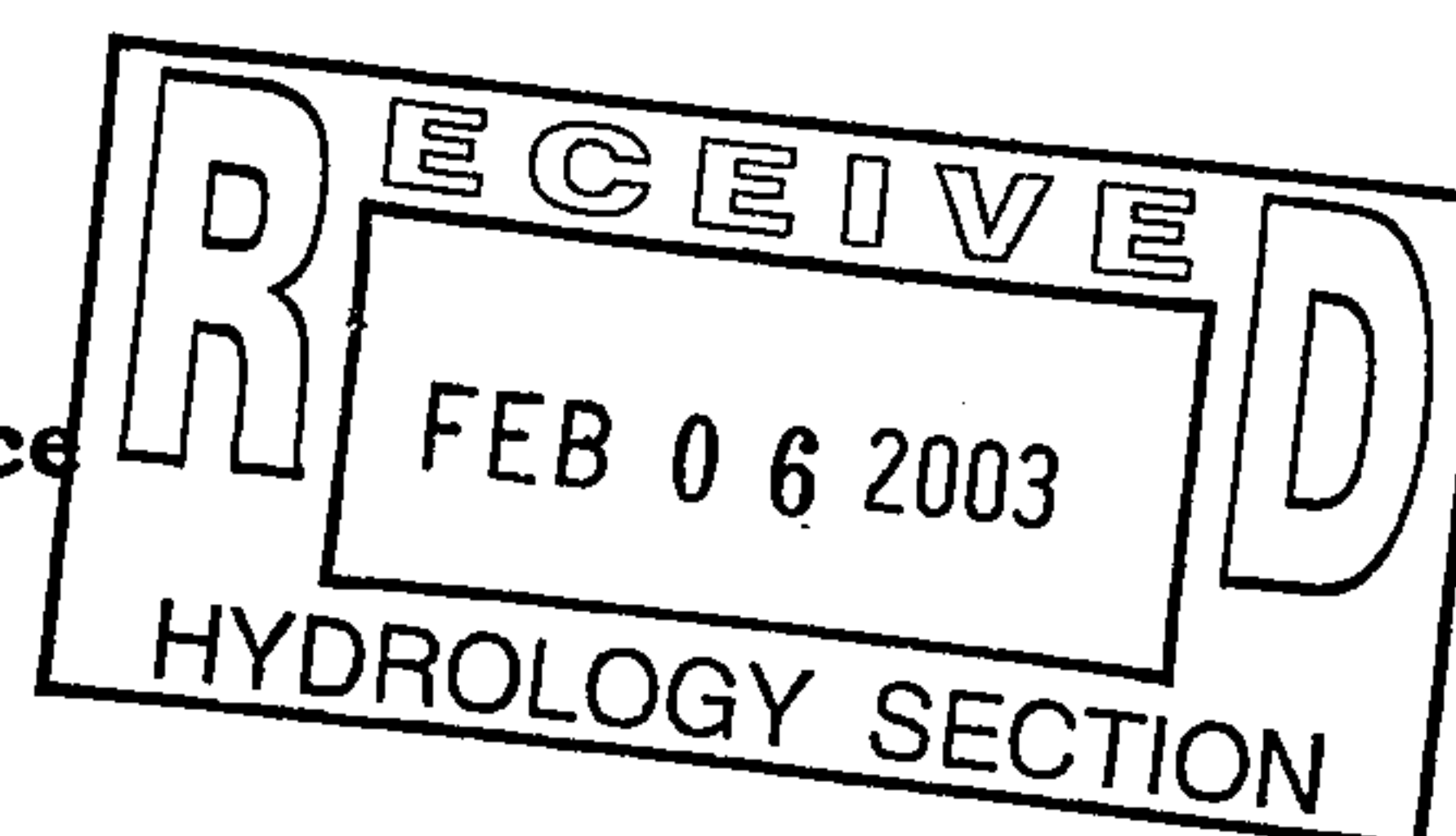
Consulting Engineering Associates

Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

February 3, 2003

Mr. Bradley L. Bingham, PE
Senior Engineer
Hydrology Division, PWD
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

**RE: El Rancho Grande, Units 6 & 7
Amole Arroyo/Snow Vista Confluence**



Dear Mr. Bingham:

As part of the El Rancho Grande, Units 6 & 7 project, you requested that we provide a study of the referenced confluence.

The flow rates from the Amole-Hubbell Drainage Management Plan (DMP) have been revised since the drainage basins were modified with the El Rancho Grande development. The DMP showed the proposed subdivision draining to the Snow Vista (Exhibit 'A'). However, with the proposed improvements, Unit 6 and an offsite portion of Westgate Heights will drain to the realigned Amole Arroyo (Exhibits 'B' & 'C').

Also, a 70-acre portion of DMP Basin 60104 is proposed to drain to the Amole Arroyo because of the location of the Gibson realignment. A separate drainage study will be provided for your approval of these added flows. For the purposes of the confluence study, the flow rates used in the HEC RAS included the additional flows from Basin 60104.

The AHYMO runs from the DMP were modified to include these additional areas in the Amole Basins and exclude them from the Snow Vista Basins. Exhibit 'A' shows the revised basin boundaries, and the table below lists the revised vs. the DMP flow rates.

Analysis Point (Exhibits A-B)	Flow Rate (cfs)	
	DMP	Revised
AP02.1 (Del Gado)	652	787
AP02.2A	693	896
AP22A	N/A	1113
AP18A	N/A	1179
AP21A	N/A	1220
AP 23 (Snow Vista north of subdivision)	2050	1617
AP24 (Snow Vista just north of confluence)	2083	1640
AP25 (Confluence)	N/A	2860

Mr. Bradley L. Bingham, PE
February 3, 2003
Page 2

HEC-RAS was used to model the channel. This analysis shows that the Snow Vista Channel does not have adequate freeboard on the east side downstream of the confluence. Therefore, a temporary earthen berm will be constructed as part of El Rancho Grande, Unit 8.

An overall alignment plan for the proposed channel and a preliminary design plan of the confluence are enclosed--the stationing on the Amole Arroyo and Snow Vista correspond to the stations in HEC-RAS. Exhibit 'D' shows a profile of the confluence (generated in HEC-RAS) and a summary output table for the entire stretch of the proposed channel. The preliminary HEC-RAS computer files are enclosed for your use.

Please call me at 268-8828 if you have questions.

Sincerely,

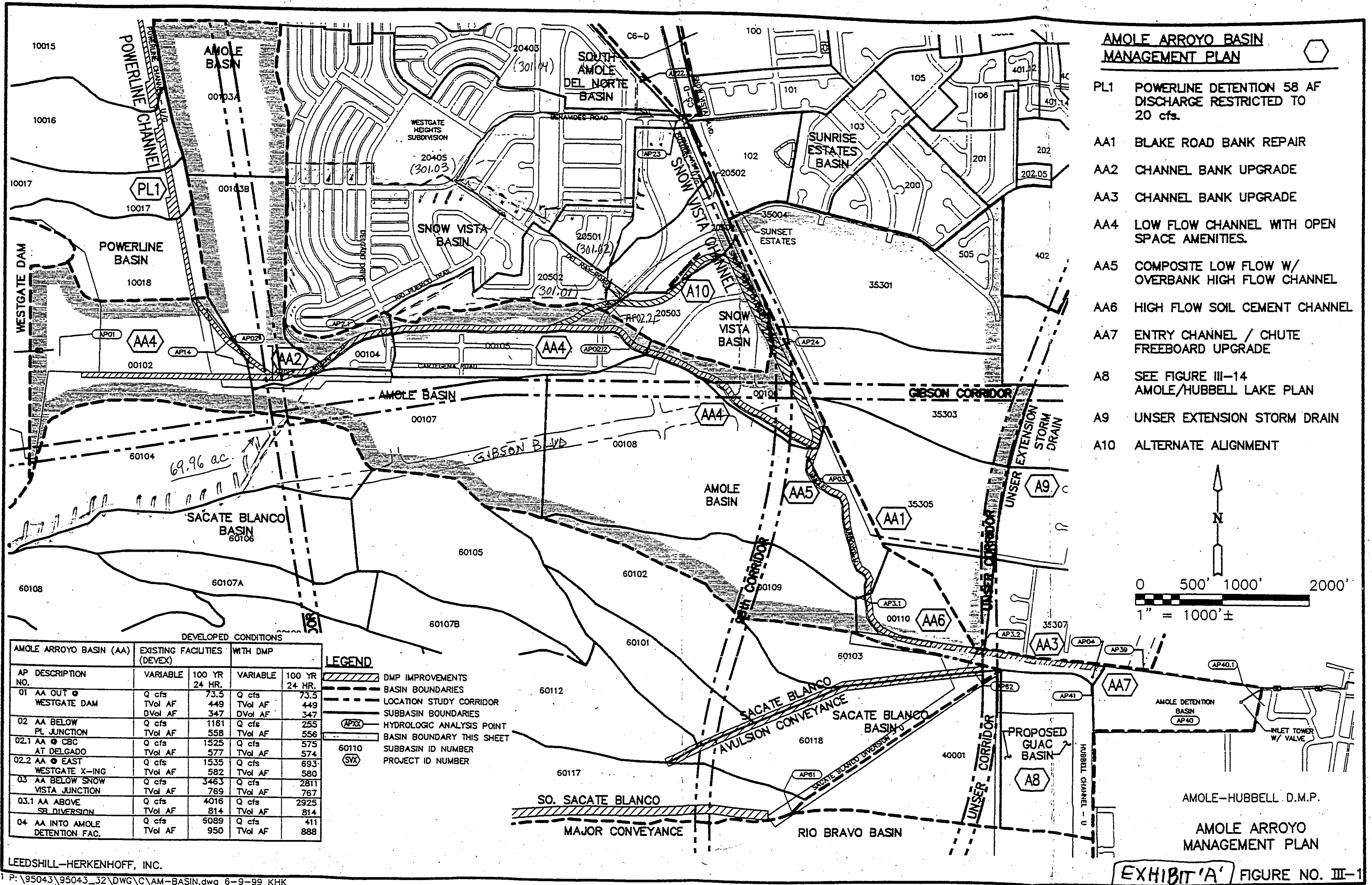
ISAACSON & ARFMAN, P.A.

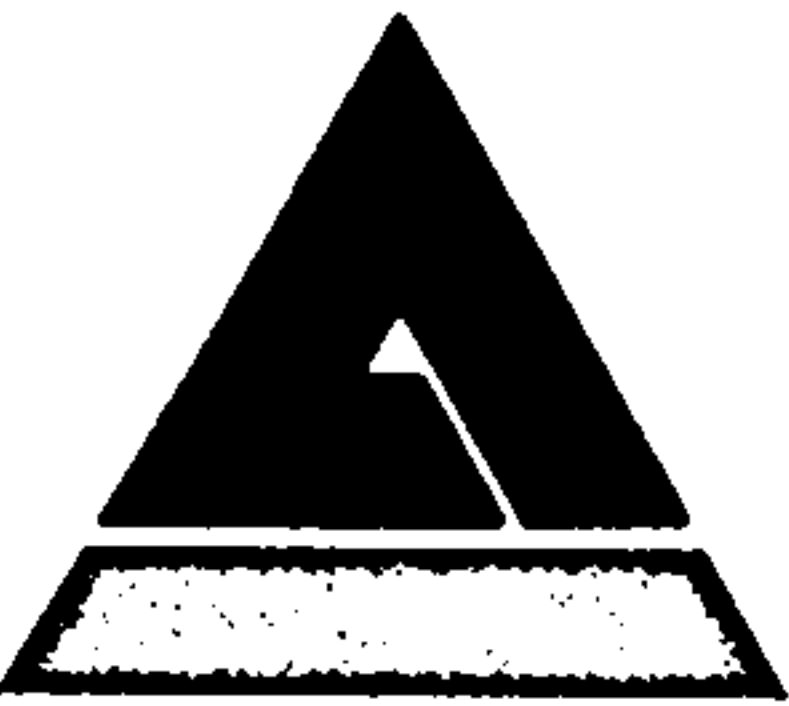
A handwritten signature in cursive script that reads "Åsa Nilsson-Weber".

Åsa Nilsson-Weber, EIT
ÅNW/ånw

Attachments

pc: Loren Meinz, AMAFCA
Dan Hogan, City Hydrology

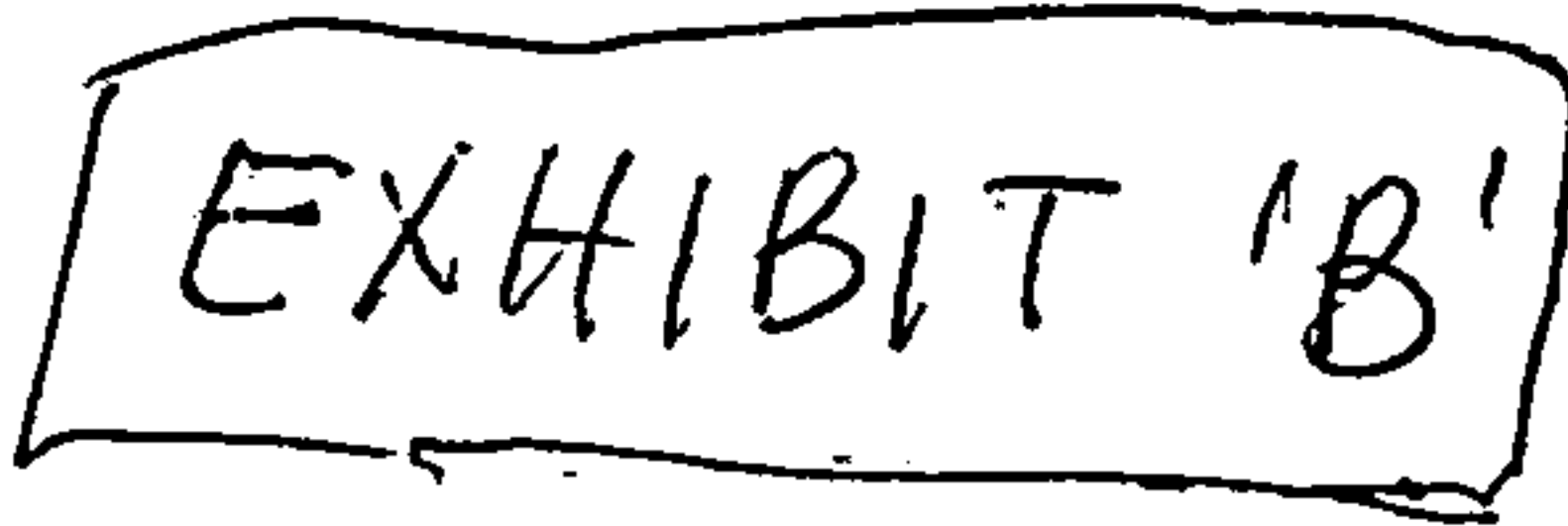




FMOLE ARROYO
~~PRELIMINARY~~
HEC-RAS FILES

ISAACSON & ARFMAN, P.A.

128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828



HEC-RAS PROFILE

Amole Arroyo/Snow Vista Channel

1/27/03

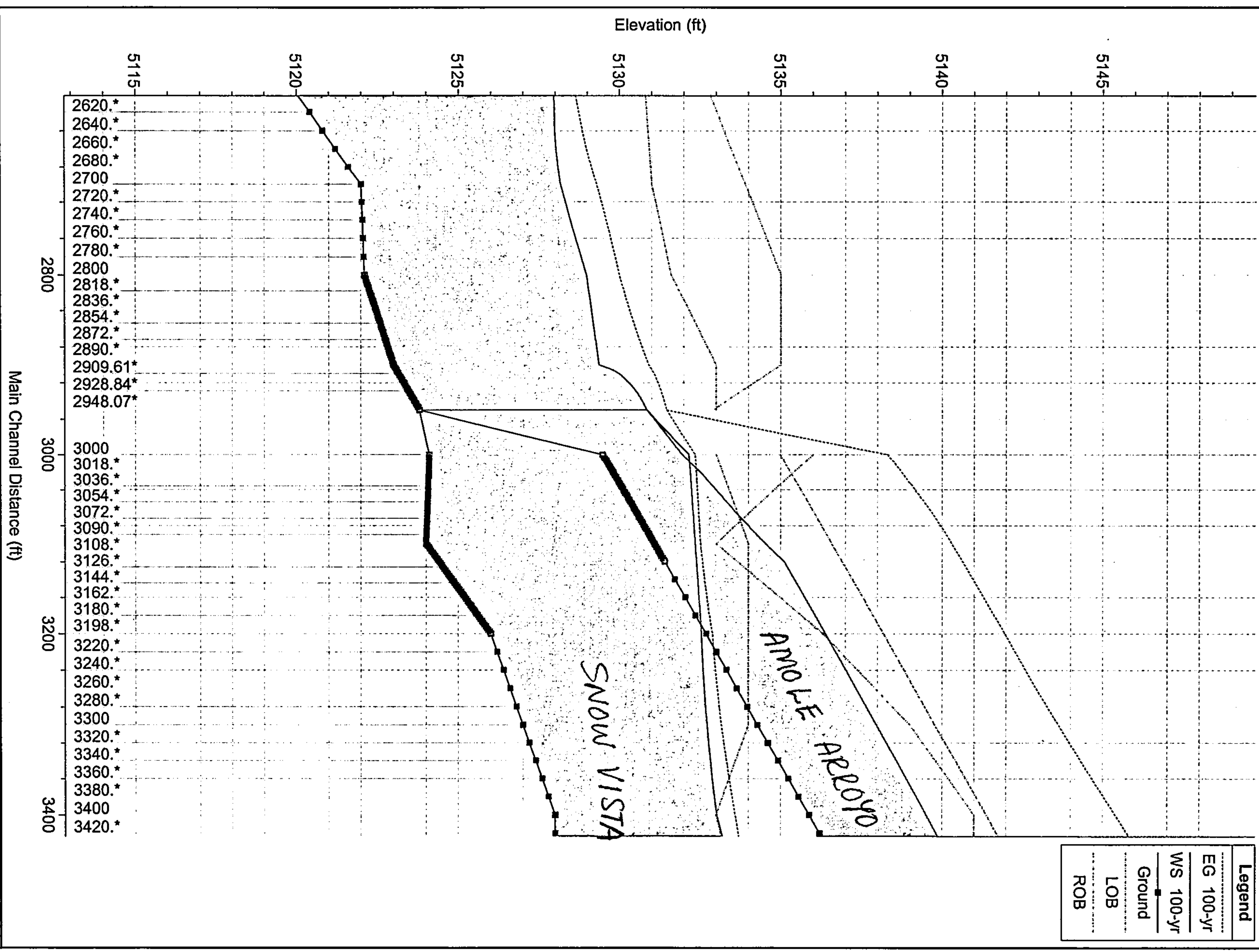


EXHIBIT 'D'

AMOLE ARROYO

HEC-RAS Plan: 1/27/03 River: Amole Arroyo Reach: Rancho Gr-lined Profile: 100-yr

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Rancho Gr-lined	6200	787.00	5263.49	5266.63	5265.69	5267.09	0.002584	5.41	145.43	52.57	0.57
Rancho Gr-lined	6100	787.00	5262.99	5265.70		5266.33	0.004321	6.41	122.81	50.82	0.73
Rancho Gr-lined	6068	787.00	5262.83	5265.02	5265.02	5266.04	0.003921	8.08	97.38	48.78	1.01
Rancho Gr-lined	6050	787.00	5256.83	5257.72	5259.03	5264.68	0.082331	21.17	37.17	43.56	4.04
Rancho Gr-lined	6000	787.00	5256.58	5259.72	5258.78	5260.18	0.002582	5.41	145.45	52.57	0.57
Rancho Gr-lined	5900	787.00	5256.08	5258.79		5259.43	0.004292	6.39	123.09	50.84	0.72
Rancho Gr-lined	5868	787.00	5255.92	5258.12	5258.12	5259.13	0.003891	8.06	97.62	48.79	1.00
Rancho Gr-lined	5850	787.00	5249.92	5250.81	5252.12	5257.77	0.082331	21.17	37.17	43.56	4.04
Rancho Gr-lined	5800	787.00	5249.67	5251.14	5251.87	5253.54	0.033898	12.43	63.31	45.90	1.87
Rancho Gr-lined	5700	787.00	5249.17	5251.88		5252.51	0.004311	6.40	122.91	50.83	0.73
Rancho Gr-lined	5668	787.00	5249.01	5251.20	5251.20	5252.22	0.003921	8.08	97.38	48.78	1.01
Rancho Gr-lined	5650	787.00	5243.01	5243.90	5245.21	5250.87	0.082482	21.19	37.15	43.56	4.04
Rancho Gr-lined	5600	787.00	5242.76	5244.24	5244.96	5246.63	0.033747	12.41	63.40	45.90	1.86
Rancho Gr-lined	5500	787.00	5242.26	5244.95		5245.60	0.004391	6.44	122.17	50.77	0.73
Rancho Gr-lined	5468	787.00	5242.10	5244.30	5244.30	5245.31	0.003891	8.06	97.62	48.79	1.00
Rancho Gr-lined	5450	787.00	5236.10	5236.99	5238.30	5243.95	0.082331	21.17	37.17	43.56	4.04
Rancho Gr-lined	5400	787.00	5235.35	5240.09		5240.31	0.000186	3.76	209.45	53.66	0.34
Rancho Gr-lined	5323	787.00	5234.20	5237.95	5237.95	5239.83	0.002466	11.00	71.53	19.13	1.00
Rancho Gr-lined	5261	896.00	5232.40	5237.35		5238.75	0.001421	9.49	94.43	19.18	0.75
Rancho Gr-lined	5200	896.00	5230.63	5233.98	5235.25	5237.97	0.012896	16.04	55.87	23.39	1.83
Rancho Gr-lined	5100	896.00	5227.74	5230.72	5232.36	5236.22	0.020044	18.81	47.65	21.94	2.25
Rancho Gr-lined	5000	896.00	5226.38	5229.55	5231.00	5234.19	0.015824	17.27	51.88	22.70	2.01
Rancho Gr-lined	4900	896.00	5225.02	5228.27	5229.64	5232.60	0.014401	16.69	53.68	23.01	1.93
Rancho Gr-lined	4800	896.00	5223.67	5226.96	5228.29	5231.14	0.013705	16.39	54.65	23.18	1.88
Rancho Gr-lined	4700	896.00	5220.67	5223.63	5225.29	5229.25	0.020709	19.03	47.09	21.83	2.28
Rancho Gr-lined	4600	896.00	5217.67	5220.49	5222.29	5226.88	0.024758	20.29	44.16	21.29	2.48
Rancho Gr-lined	4500	896.00	5214.67	5217.43	5219.29	5224.25	0.027112	20.96	42.75	21.02	2.59
Rancho Gr-lined	4400	896.00	5211.67	5214.39	5216.29	5221.46	0.028479	21.33	42.00	20.88	2.65
Rancho Gr-lined	4300	896.00	5208.67	5211.37	5213.29	5218.56	0.029165	21.52	41.65	20.81	2.68
Rancho Gr-lined	4200	896.00	5205.67	5208.36	5210.29	5215.62	0.029545	21.62	41.45	20.78	2.70
Rancho Gr-lined	4100	896.00	5202.67	5205.36	5207.29	5212.67	0.029871	21.70	41.29	20.74	2.71
Rancho Gr-lined	4000	896.00	5199.67	5202.36	5204.29	5209.67	0.029871	21.70	41.29	20.74	2.71
Rancho Gr-lined	3900	896.00	5196.67	5199.36	5201.29	5206.66	0.029789	21.68	41.33	20.75	2.71
Rancho Gr-lined	3800	896.00	5194.92	5197.83	5199.54	5203.71	0.022008	19.45	46.07	21.65	2.35
Rancho Gr-lined	3700	896.00	5193.17	5196.19	5197.79	5201.49	0.019085	18.48	48.50	22.09	2.20
Rancho Gr-lined	3600	896.00	5191.42	5194.49	5196.04	5199.56	0.017928	18.06	49.60	22.29	2.13
Rancho Gr-lined	3500	896.00	5189.67	5192.76	5194.29	5197.74	0.017519	17.91	50.01	22.36	2.11
Rancho Gr-lined	3400	896.00	5186.96	5189.88	5191.58	5195.69	0.021660	19.34	46.34	21.70	2.33

HEC-RAS SUMMARY

AMOLE ARROYO

HEC-RAS Plan: 1/27/03 River: Amole Arroyo Reach: Rancho Gr-lined Profile: 100-yr (Continued)

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Rancho Gr-lined	3300	896.00	5184.25	5187.10	5188.87	5193.35	0.024009	20.07	44.65	21.38	2.45
Rancho Gr-lined	3200	896.00	5181.54	5184.34	5186.16	5190.86	0.025452	20.49	43.73	21.21	2.51
Rancho Gr-lined	3100	896.00	5178.83	5181.61	5183.45	5188.28	0.026257	20.72	43.24	21.12	2.55
Rancho Gr-lined	3000	896.00	5176.12	5178.89	5180.74	5185.63	0.026698	20.84	42.98	21.07	2.57
Rancho Gr-lined	2900	896.00	5172.32	5174.96	5176.94	5182.60	0.031764	22.18	40.39	20.57	2.79
Rancho Gr-lined	2800	896.00	5168.52	5171.10	5173.14	5179.23	0.034655	22.88	39.15	20.33	2.91
Rancho Gr-lined	2700	896.00	5164.72	5167.27	5169.34	5175.67	0.036275	23.26	38.52	20.20	2.97
Rancho Gr-lined	2600	896.00	5160.92	5163.45	5165.54	5172.00	0.037174	23.46	38.19	20.14	3.00
Rancho Gr-lined	2500	1179.00	5157.12	5160.34	5162.45	5168.04	0.025895	22.27	52.95	22.88	2.58
Rancho Gr-lined	2400	1179.00	5155.82	5159.32	5161.16	5165.43	0.018837	19.84	59.42	23.99	2.22
Rancho Gr-lined	2300	1179.00	5154.52	5158.21	5159.86	5163.48	0.015354	18.42	64.00	24.74	2.02
Rancho Gr-lined	2200	1179.00	5153.22	5157.00	5158.56	5161.90	0.013863	17.75	66.42	25.13	1.92
Rancho Gr-lined	2100	1179.00	5150.45	5153.93	5155.79	5160.12	0.019127	19.95	59.09	23.93	2.24
Rancho Gr-lined	2000	1179.00	5147.69	5151.03	5153.03	5157.97	0.022405	21.13	55.80	23.38	2.41
Rancho Gr-lined	1900	1179.00	5144.93	5148.20	5150.27	5155.58	0.024421	21.80	54.09	23.08	2.51
Rancho Gr-lined	1800	1179.00	5142.16	5145.39	5147.50	5153.05	0.025729	22.21	53.08	22.90	2.57
Rancho Gr-lined	1700	1220.00	5139.40	5142.70	5144.82	5150.42	0.025336	22.30	54.71	23.19	2.56
Rancho Gr-lined	1600	1220.00	5137.80	5141.30	5143.22	5147.83	0.020083	20.50	59.51	24.00	2.29
Rancho Gr-lined	1500	1220.00	5136.20	5139.82	5141.62	5145.76	0.017625	19.55	62.40	24.48	2.16
Rancho Gr-lined	1400	1220.00	5134.60	5138.27	5140.02	5143.97	0.016638	19.15	63.72	24.69	2.10
Rancho Gr-lined	1300	1220.00	5133.00	5136.70	5138.42	5142.28	0.016170	18.95	64.38	24.80	2.07
Rancho Gr-lined	1200	1220.00	5131.40	5135.11	5136.82	5140.64	0.015987	18.87	64.65	24.84	2.06
Rancho Gr-lined	1100	1220.00	5129.80	5132.52	5134.30	5138.75	0.022049	20.04	60.89	27.86	2.39
Rancho Gr-lined	1080	1220.00	5129.48	5131.95	5133.72	5138.30	0.024227	20.23	60.32	29.37	2.49

SNOW VISTA

HEC-RAS Plan: 1/27/03 Profile: 100-yr

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Units 6&7-unline	4300	1640.00	5133.00	5137.16	5136.44	5137.94	0.008484	7.12	230.22	75.79	0.72
Units 6&7-unline	4200	1640.00	5133.00	5136.08		5136.99	0.012383	7.67	213.85	83.95	0.85
Units 6&7-unline	4100	1640.00	5131.00	5135.61		5136.12	0.004371	5.72	286.61	79.37	0.53
Units 6&7-unline	4000	1640.00	5131.00	5135.09		5135.62	0.005228	5.85	280.12	86.10	0.57
Units 6&7-unline	3900	1640.00	5129.00	5134.81		5135.20	0.002797	5.02	326.52	78.39	0.43
Units 6&7-unline	3800	1640.00	5129.00	5134.48		5134.88	0.003096	5.11	320.79	81.16	0.45
Units 6&7-unline	3700	1640.00	5129.00	5134.14		5134.56	0.003034	5.16	317.62	77.55	0.45
Units 6&7-unline	3600	1640.00	5128.10	5133.91		5134.25	0.002440	4.66	351.63	85.43	0.41
Units 6&7-unline	3500	1640.00	5128.00	5133.63		5134.00	0.002714	4.91	333.92	81.18	0.43
Units 6&7-unline	3400	1640.00	5128.00	5133.03		5133.60	0.004936	6.04	271.31	76.16	0.56
Units 6&7-unline	3300	1640.00	5127.00	5132.72		5133.17	0.003525	5.34	307.26	80.36	0.48
Units 6&7-unline	3200	1640.00	5126.00	5132.55		5132.88	0.002239	4.63	354.30	81.41	0.39
Units 6&7-unline	3100	1640.00	5124.00	5132.35		5132.52	0.000744	3.23	508.47	87.02	0.24
Units 6&7-unline	3000	1640.00	5124.10	5132.16		5132.35	0.001039	3.53	465.18	90.11	0.27
Unit 8-unlined	2950	2860.00	5123.80	5130.85		5131.46	0.003232	6.26	456.77	87.42	0.48
Unit 8-unlined	2900	2860.00	5123.00	5129.37		5130.91	0.011926	9.95	287.45	73.43	0.89
Unit 8-unlined	2800	2860.00	5122.10	5128.98		5130.00	0.006618	8.09	353.52	79.16	0.67
Unit 8-unlined	2700	2860.00	5122.00	5128.18		5129.29	0.007579	8.46	338.24	78.49	0.72
Unit 8-unlined	2600	2860.00	5120.00	5127.96		5128.63	0.003452	6.56	435.80	81.30	0.50
Unit 8-unlined	2500	2860.00	5120.00	5127.31		5128.18	0.005058	7.48	382.31	78.34	0.60
Unit 8-unlined	2400	2860.00	5119.80	5125.82		5127.36	0.011140	9.94	287.81	69.79	0.86
Unit 8-unlined	2300	2860.00	5117.00	5125.98		5126.46	0.002360	5.58	512.57	92.04	0.42
Unit 8-unlined	2200	2860.00	5118.10	5125.39		5126.10	0.004466	6.78	436.25	141.77	0.56
Unit 8-unlined	2100	2860.00	5118.00	5125.05		5125.65	0.004155	6.36	473.27	143.12	0.54
Unit 8-unlined	2000	2860.00	5118.00	5124.79	5123.32	5125.27	0.003004	5.72	529.80	144.00	0.46



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 24, 2003

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

**Re: El Rancho Grande, Units 7 Rundown Exhibit
Engineer's Stamp dated 1-14-03, (M9/D19B)**

Dear Ms. Donart,

Based upon the information provided in your submittal dated 1-14-03, the above referenced exhibit is approved for inclusion in your Work Order documents.

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

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: file

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

PROJECT TITLE: EL RANCHO GRANDE, UNIT # 7 ZONE MAP/DRG. FILE #: M9/D1913
DRB #: 1001347 EPC#: _____ WORK ORDER#: 699382 (?)

LEGAL DESCRIPTION: TRACTS A+B, ABQ SOUTH UNIT 3
CITY ADDRESS: _____

ENGINEERING FIRM: Isaacson & Arfman, P.A.
ADDRESS: 128 Monroe Street NE
CITY, STATE: Albuquerque, NM

CONTACT: GENNY DONART
PHONE: 268-8828
ZIP CODE: 87108

OWNER: CURB, Inc
ADDRESS: 6301 INDIAN SCHOOL STE 680
CITY, STATE: ABQ, NM

CONTACT: BO JOHNSON
PHONE: 899-9656
ZIP CODE: 87110

ARCHITECT: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

SURVEYOR: ALDRICH LAND SURVEYING
ADDRESS: P.O. BOX 30701
CITY, STATE: ABQ, NM

CONTACT: TIM ALDRICH
PHONE: 884-1990
ZIP CODE: 87109

CONTRACTOR: _____

ADDRESS: _____

CITY, STATE: _____

CONTACT: _____

PHONE: _____

ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

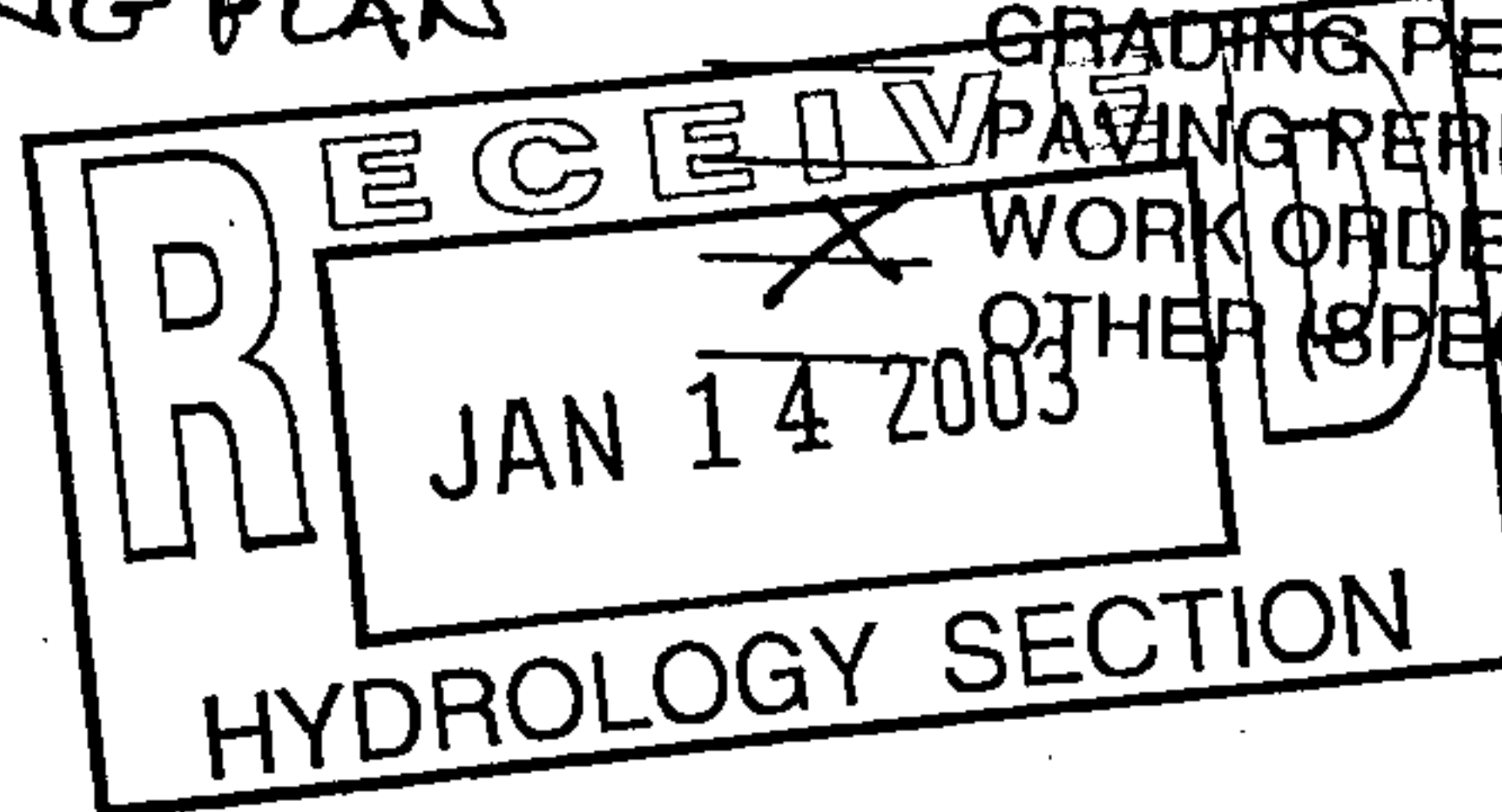
- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☒ OTHER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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED: _____

- ☒ YES
- ☐ NO
- ☐ COPY PROVIDED



DATE SUBMITTED: 1/14/03 BY: Gonervia D...

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

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

Also see

2/6

submitter!

Letter of Transmittal



ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108

To: COA Date: 1/14/03
PLAZA DEL SOL Job No. 1265
HYDROLOGY

Attn: BRAD BINGHAM

Reference: EL RANCHO GRANDE UNIT 7
CPN # ~~46~~ 699382

We transmit to you 1 copy(ies) of the following:

- | | |
|---------------------------------------|---|
| ☐ _____ Plats | ☐ Specifications |
| ☐ _____ Plans | ☐ Submittals |
| ☐ _____ Disks | ☐ Shop Drawings |
| ☐ _____ Report | ☐ Copy of Letter |

☒ REVISED GRADING PLAN

☐ _____

This information is transmitted:

- | | |
|--|---|
| ☐ As per your request | ☐ For your files |
| ☒ For your review & approval | ☐ For your use |
| ☐ For your information | ☐ Please review & return |
| ☐ For your attention | ☐ For return to your files |
| ☐ For your signature | ☐ Please advise |
| ☐ _____ | |
| ☐ _____ | |

Remarks: _____

By: GENNY DONATI

Copies to: _____



ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

January 14, 2003

Mr. Brad Bingham, P.E.
City of Albuquerque
600 2nd St NW
Albuquerque, NM 87102

RE: El Rancho Grande Unit 7 (CPN #399383)
Concrete rundown at Del Rey Rd

Dear Mr. Bingham:

Please find attached a submittal for a concrete drainage rundown at Del Rey Rd. It includes a detail and calculations for the drainage capacity of the rundown. This submittal replaces the proposed Del Rey storm drain shown in the approved Drainage Report for El Rancho Grande, Units 6, 7, & 8.

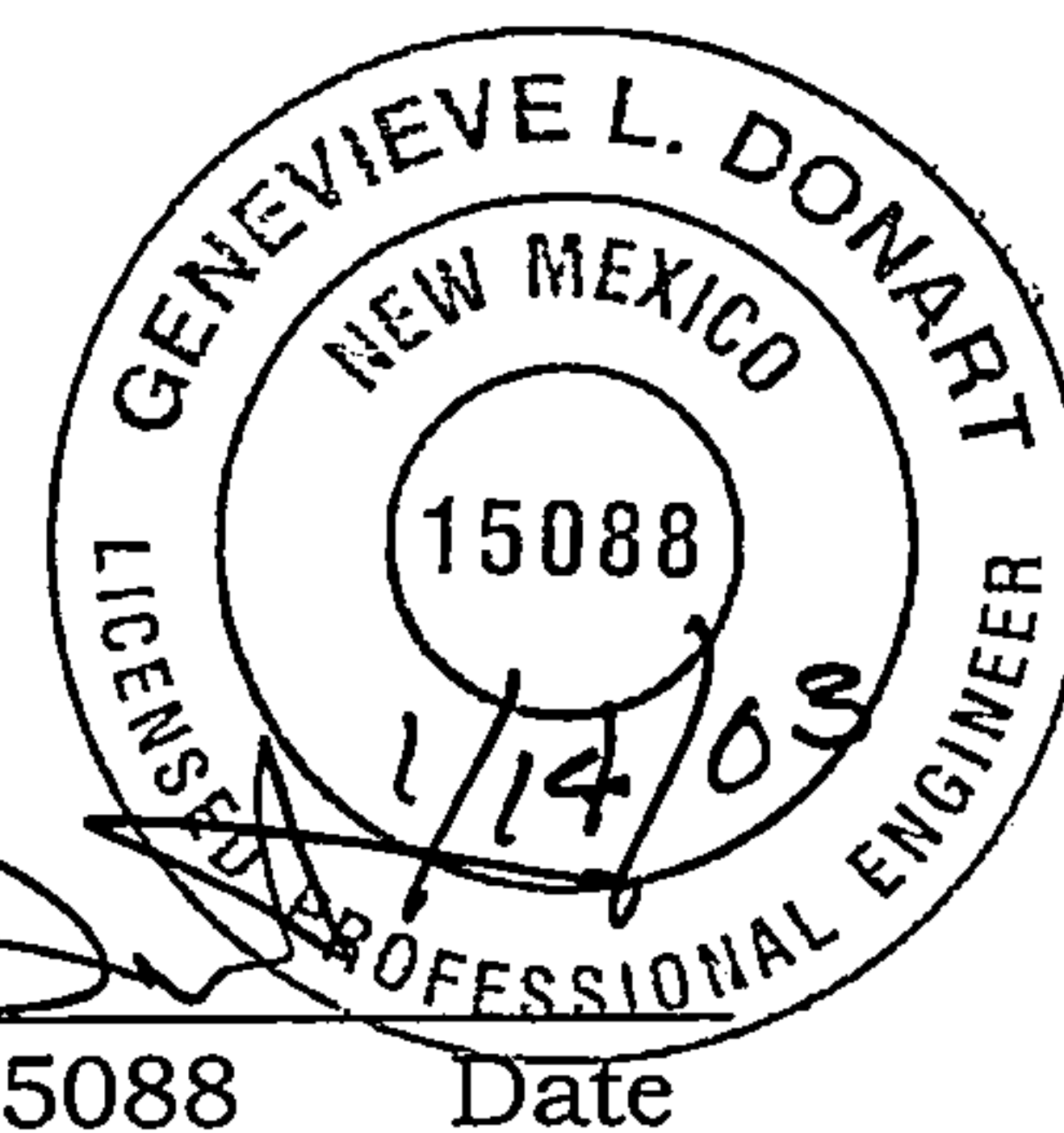
This change was proposed because, as designed, the 42" storm drain was only capturing approximately 90cfs of the 217 cfs that comes through Del Rey. We still needed a good method for removing the remaining flows. Also, in the design of the Amole Arroyo compared with the Del Rey road profile, we were encountering some difficulty in maintaining 1' above the bottom of the arroyo and still keeping a reasonable bury above the pipe.

In consideration of these issues, Del Rey has been superelevated to take storm flows to the southwest side of the road, and a rundown curb allows flows to cross into the rundown. A guardrail is designed between the road and the sidewalk to prevent traffic from entering the rundown, or encountering any pedestrians.

If you have any questions about this submittal, please call me at 268-8828.
Thanks for your help!

Sincerely,
Isaacson & Arfman, P.A.

Genevieve Donart, PE
GD/gld

Genevieve L. Donart, NMPE #15088

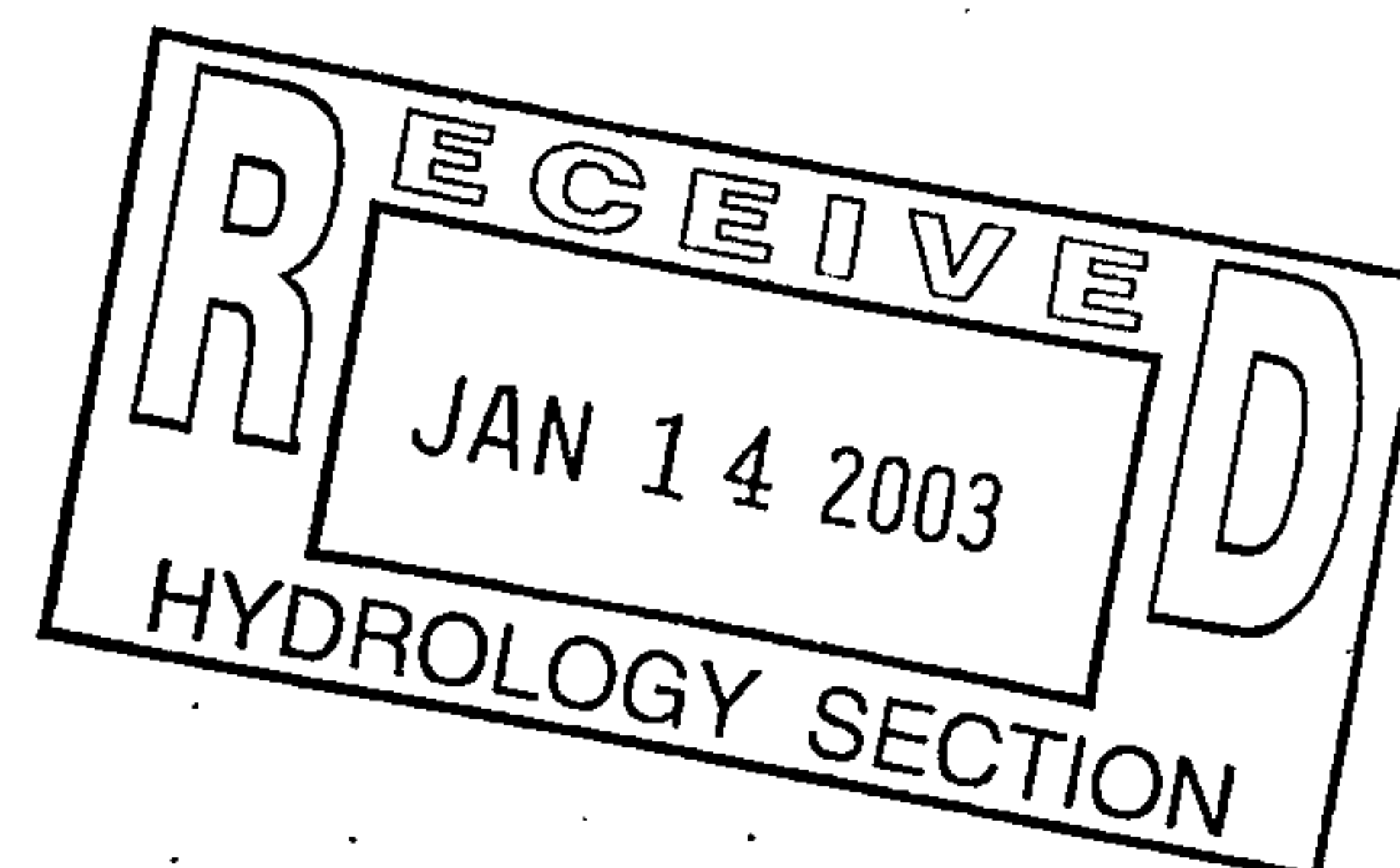
EL RANCHO GRANDE UNIT 7

Worksheet for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\lanchogr.fm2
Worksheet	Del Rey capacity w/ side rundown
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope		0.010800 ft/ft		
Elevation range: 0.00 ft to 2.17 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	1.17	0.00	40.00	0.013
0.01	0.50	40.00	80.00	0.017
15.00	0.00			
29.99	0.50			
30.00	0.50			
40.00	0.70			
60.00	1.10			
79.99	1.50			
80.00	2.17			
Discharge	217.43	cfs		

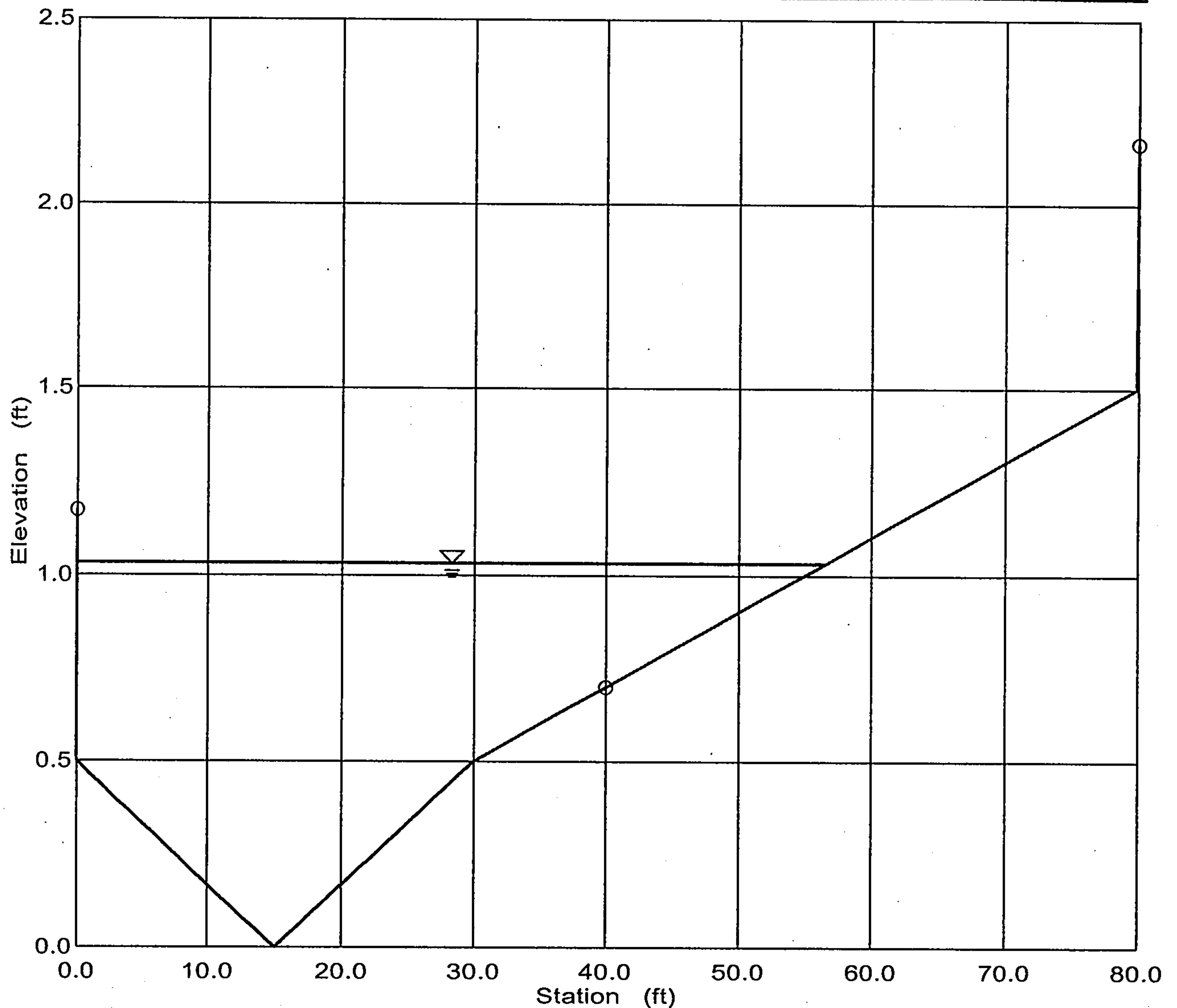
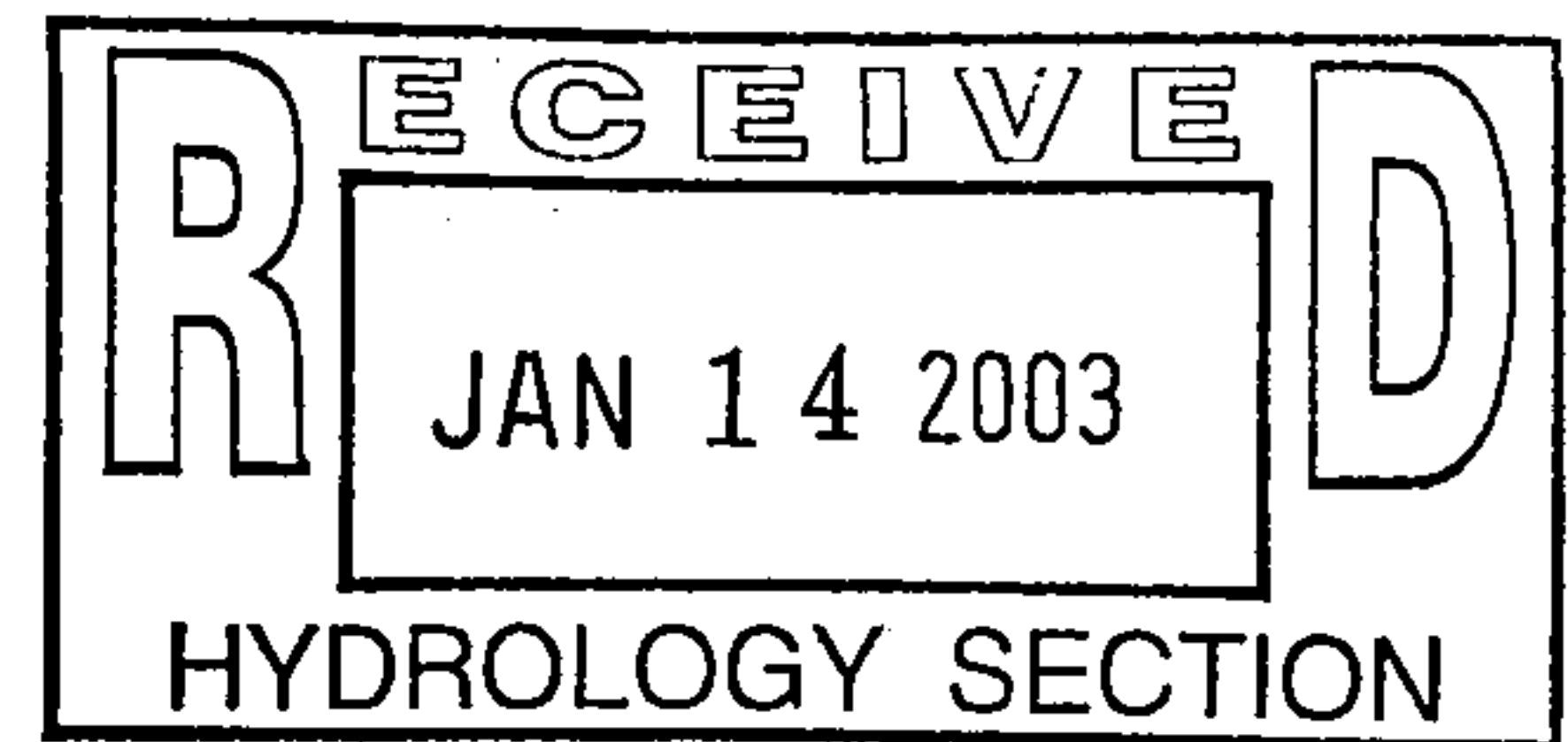
Results		
Wtd. Mannings Coefficient	0.014	
Water Surface Elevation	1.03	ft
Flow Area	30.43	ft ²
Wetted Perimeter	57.06	ft
Top Width	56.51	ft
Height	1.03	ft
Critical Depth	1.29	ft
Critical Slope	0.003670	ft/ft
Velocity	7.14	ft/s
Velocity Head	0.79	ft
Specific Energy	1.82	ft
Froude Number	1.72	
Flow is supercritical.		



Street Capacity with Rundown Cross Section for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\lanchogr.fm2
Worksheet	Del Rey capacity w/ side rundown
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.014
Channel Slope	0.010800 ft/ft
Water Surface Elevation	1.03 ft
Discharge	217.43 cfs



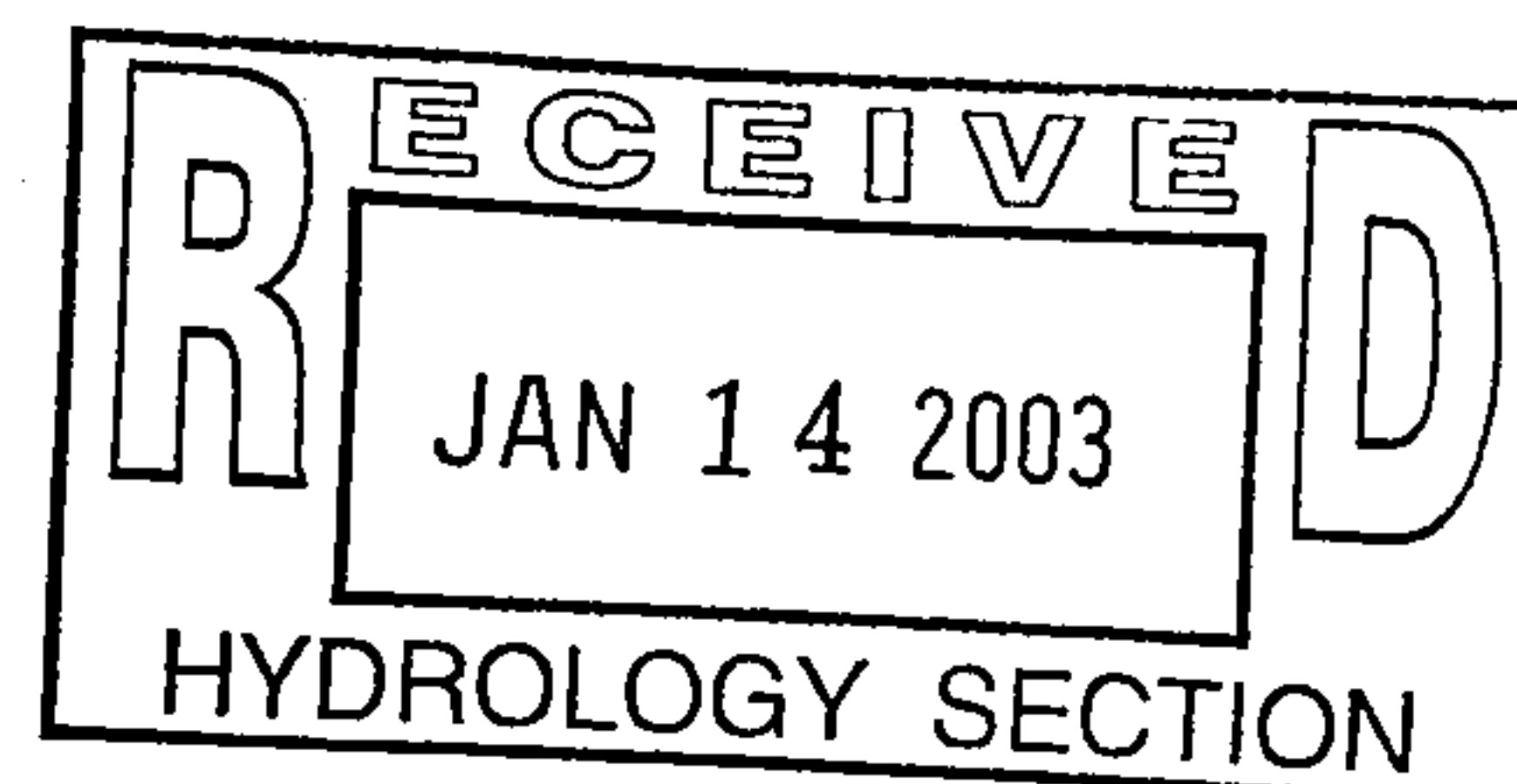
EL RANCHO GRANDE UNIT 7

Worksheet for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey capacity w/ side rundown@transit
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.010800 ft/ft			
Elevation range: 0.00 ft to 2.54 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	1.54	0.00	40.00	0.013
0.01	0.87	40.00	80.00	0.017
15.00	0.00			
29.99	0.87			
30.00	0.87			
40.00	1.07			
60.00	1.47			
79.99	1.87			
80.00	2.54			
Discharge	217.43	cfs		

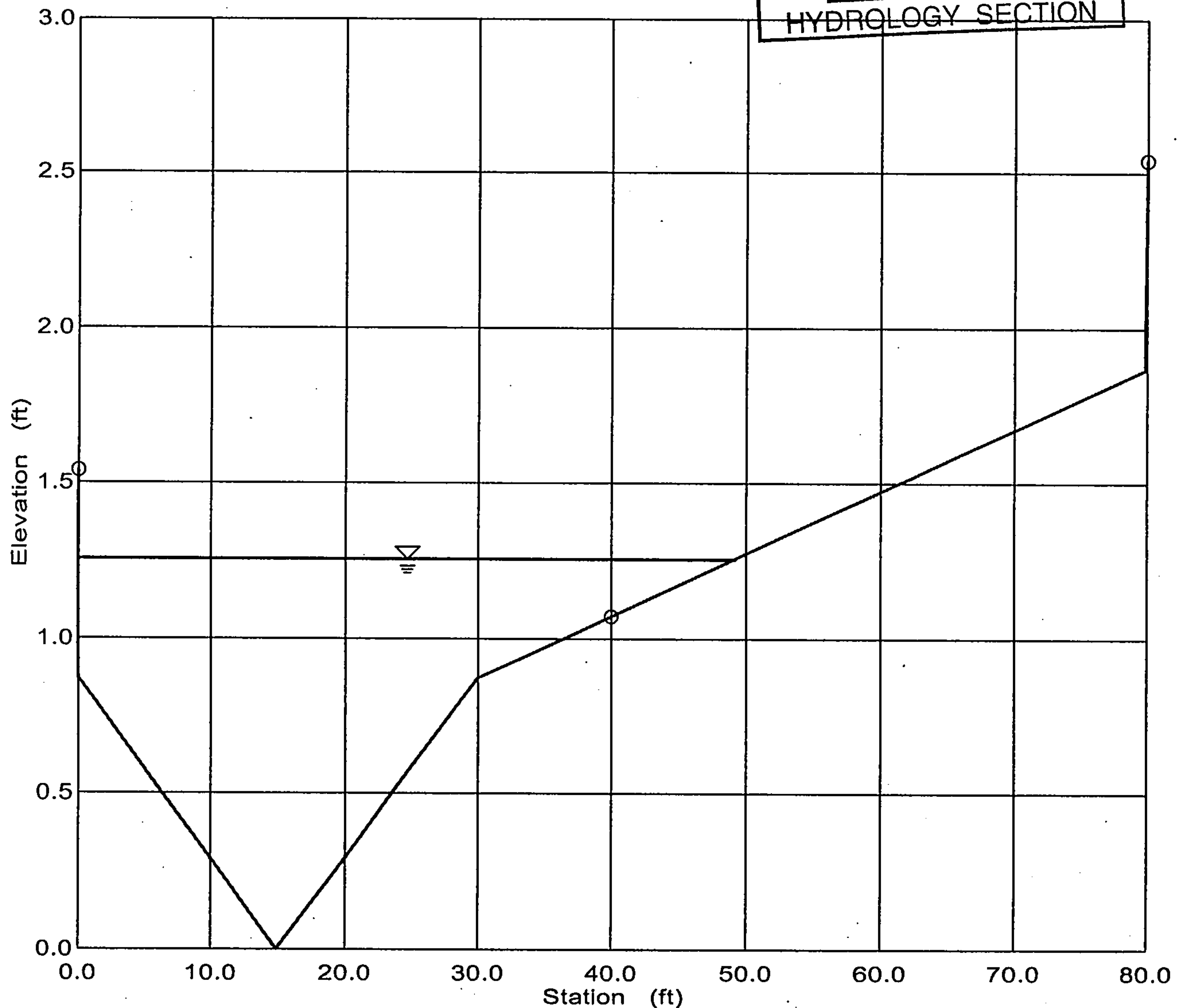
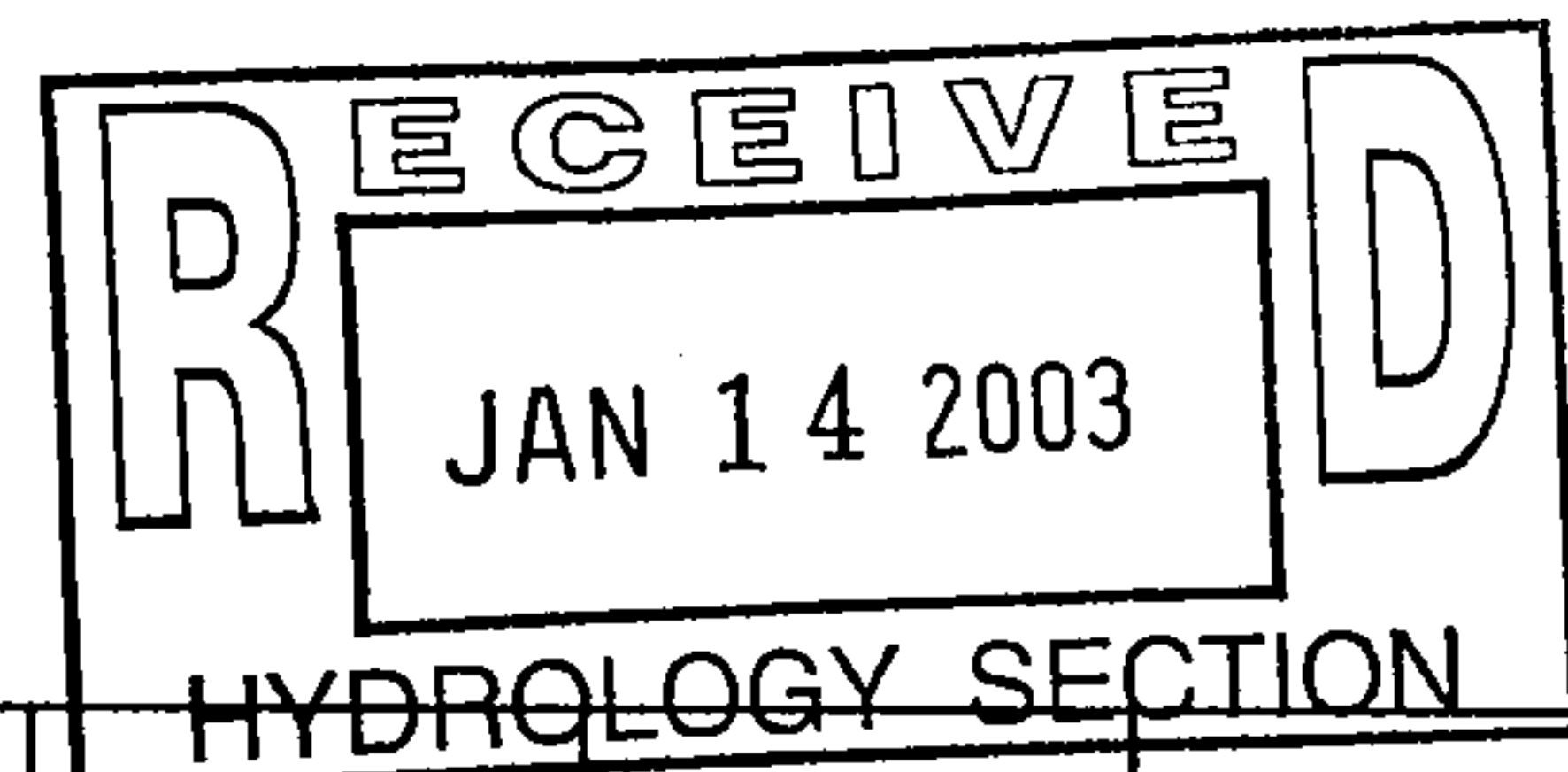
Results			
Wtd. Mannings Coefficient	0.014		
Water Surface Elevation	1.25	ft	
Flow Area	28.26	ft ²	
Wetted Perimeter	49.64	ft	
Top Width	49.21	ft	
Height	1.25	ft	
Critical Depth	1.56	ft	
Critical Slope	0.003522	ft/ft	
Velocity	7.69	ft/s	
Velocity Head	0.92	ft	
Specific Energy	2.17	ft	
Froude Number	1.79		
Flow is supercritical.			



Street Capacity with Rundown
Cross Section for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey capacity w/ side rundown@transit
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.014
Channel Slope	0.010800 ft/ft
Water Surface Elevation	1.25 ft
Discharge	217.43 cfs



EL RANCHO GRANDE UNIT 7

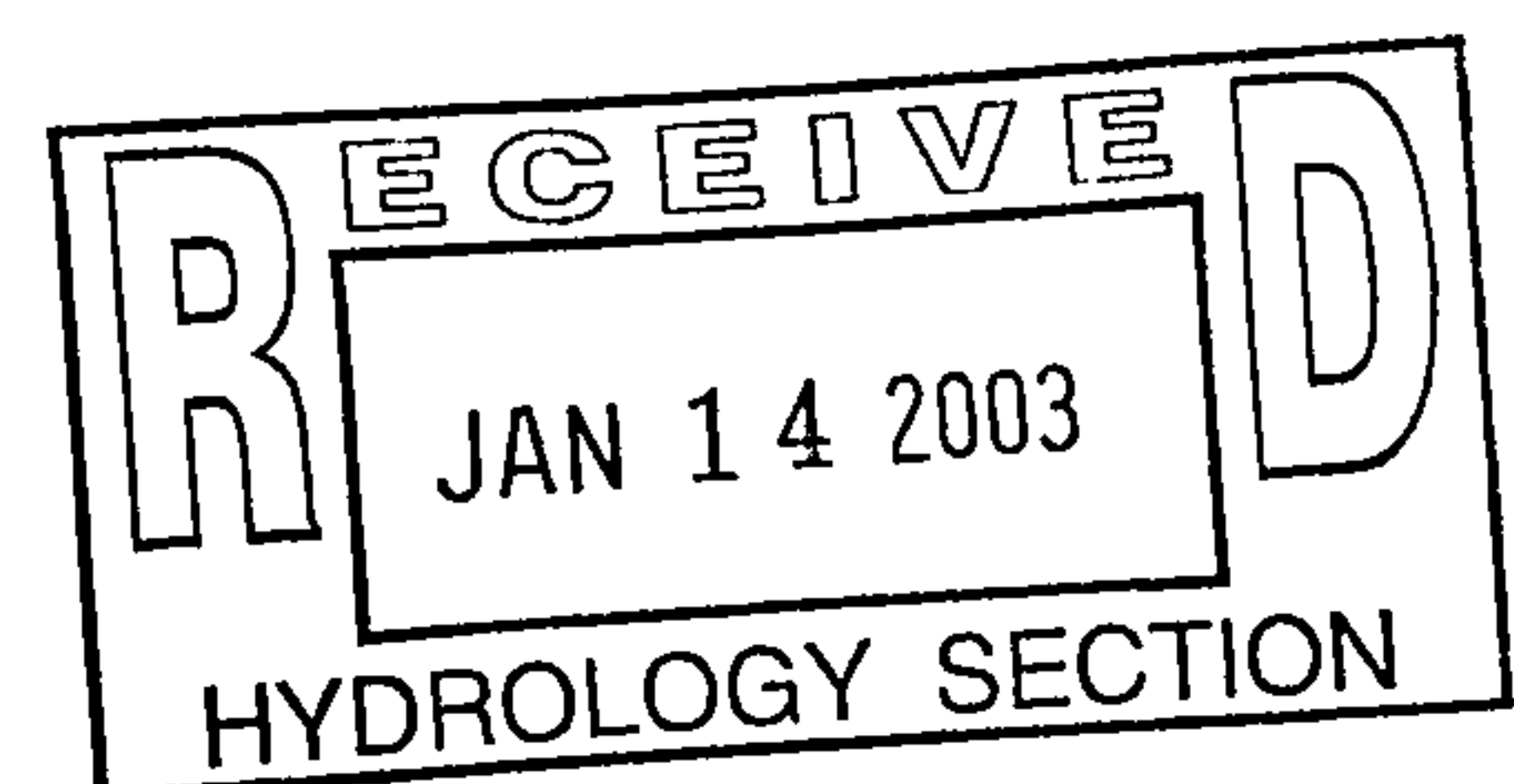
Worksheet for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey side rundown@Amole connection
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data	
Channel Slope	0.010800 ft/ft
Elevation range: 0.00 ft to 2.50 ft.	
Station (ft)	Elevation (ft)
0.00	2.50
6.00	0.50
21.00	0.00
36.00	0.50
42.00	2.50
Discharge	217.43 cfs

Start Station	End Station	Roughness
0.00	42.00	0.017

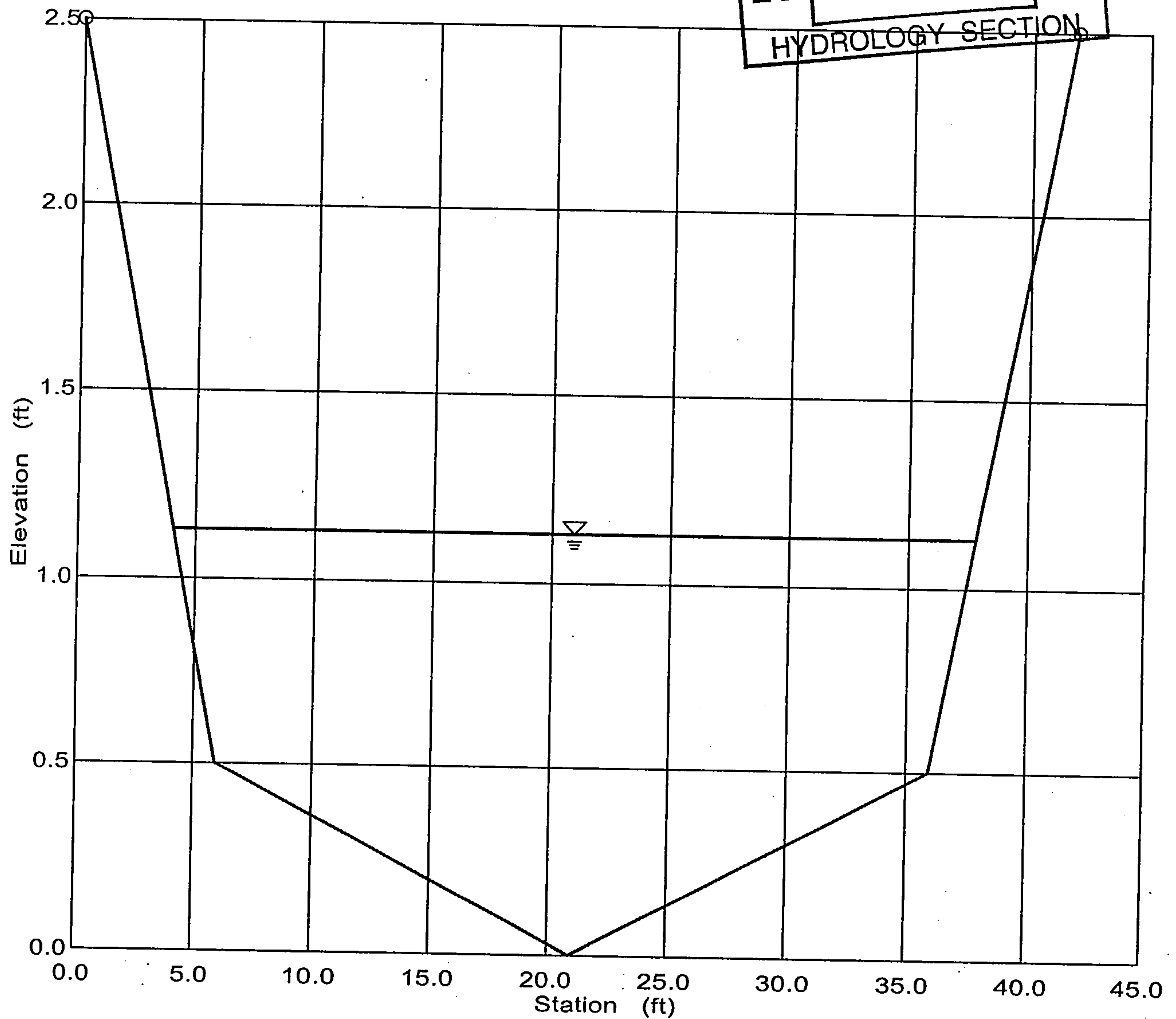
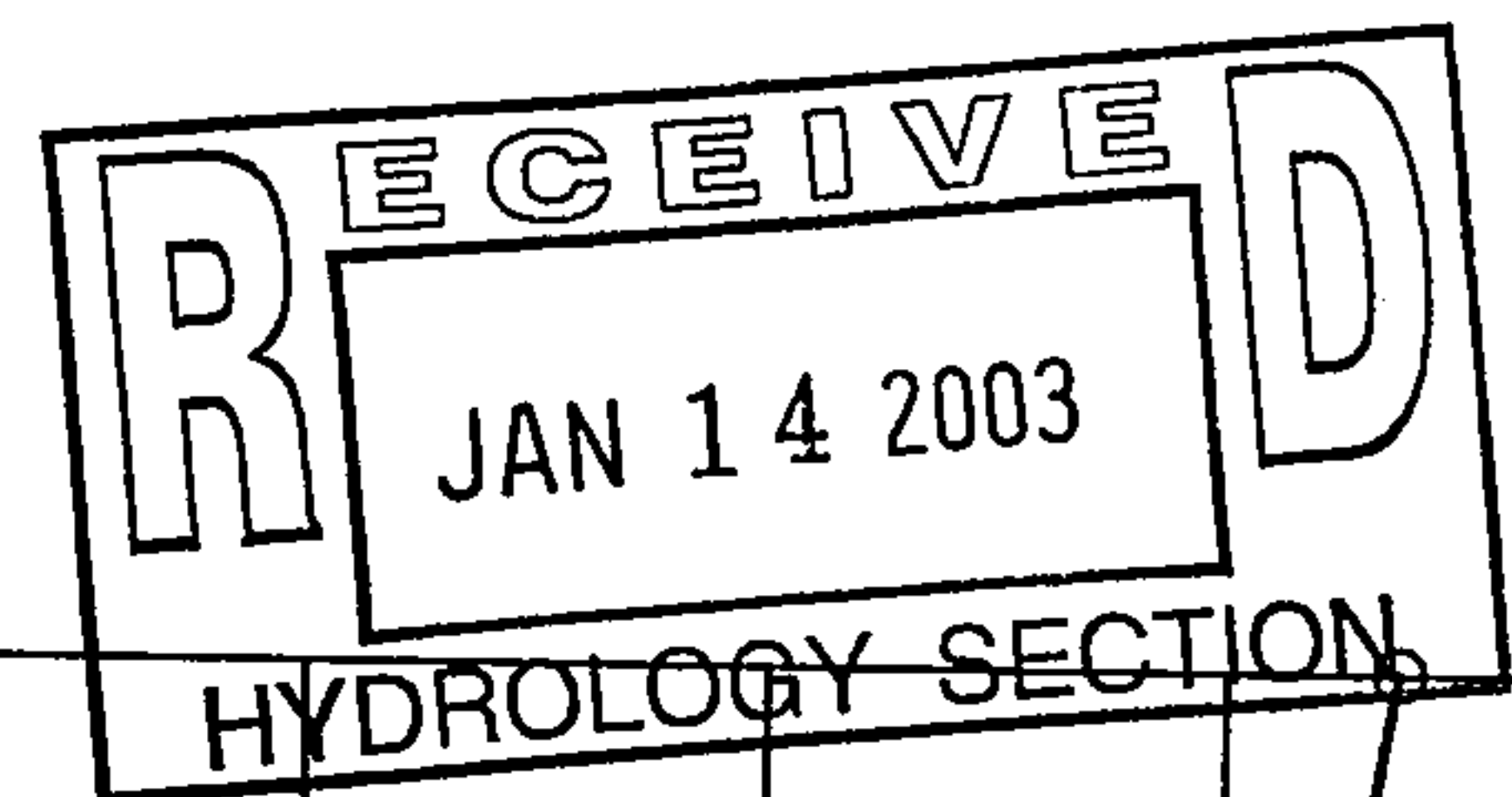
Results	
Wtd. Mannings Coefficient	0.017
Water Surface Elevation	1.13 ft
Flow Area	27.54 ft ²
Wetted Perimeter	33.99 ft
Top Width	33.77 ft
Height	1.13 ft
Critical Depth	1.41 ft
Critical Slope	0.004188 ft/ft
Velocity	7.89 ft/s
Velocity Head	0.97 ft
Specific Energy	2.10 ft
Froude Number	1.54
Flow is supercritical.	

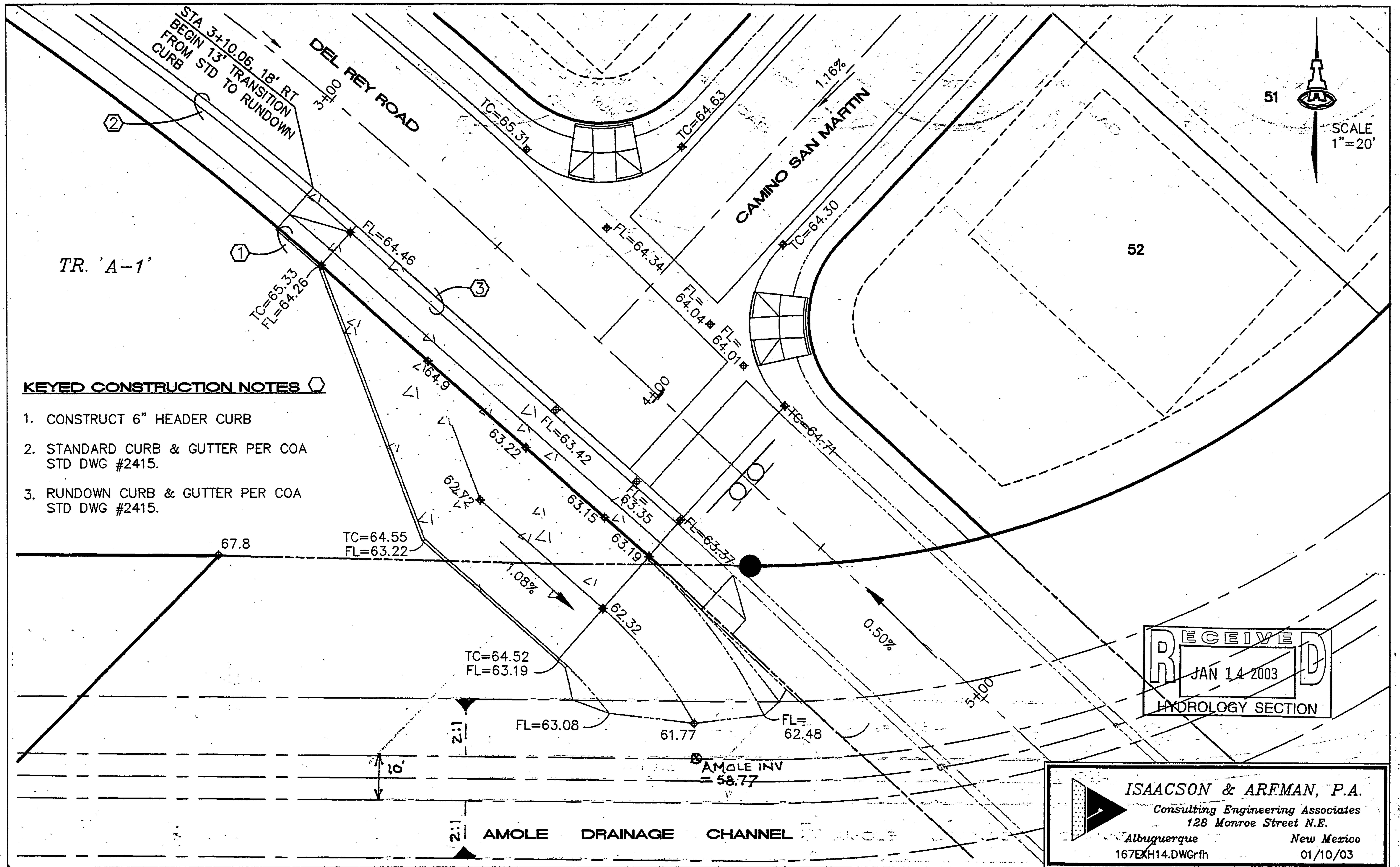


El Rancho Grande Unit 7
Cross Section for Irregular Channel

Project Description	
Project File	m:\active\genny\haestad\fmw\ranchogr.fm2
Worksheet	Del Rey side rundown@Amole connection
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.017
Channel Slope	0.010800 ft/ft
Water Surface Elevation	1.13 ft
Discharge	217.43 cfs





TIM EICHENBERG, CHAIR
DANIEL HERNANDEZ, VICE-CHAIR
RONALD O. BROWN, SECRETARY-TREASURER
LINDA STOVER, ASST. SECRETARY-TREASURER
DANIEL LYON, DIRECTOR

JOHN P. KELLY, P.E.
EXECUTIVE ENGINEER



**Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority**

2600 PROSPECT N.E. • ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-2215 FAX (505) 884-0214

Post-it® Fax Note 7671

Date	2-13	# of pages	3
To	BRAD BINGHAM		
Co./Dept.	HYDROLOGY		
From	LYNN MAZUR		
Co.	AMAFCA		
Phone #			
Fax #			

February 12, 2003

Ms. Genny Donart, P.E.
Isaacson & Arfman, P.A.
128 Monroc St. NE
Albuquerque, NM 87108

Re: Construction Plans for El Rancho Grande, Unit 6, ZAP M-9
Engineer's Stamp Dated February 5, 2003

Dear Ms. Donart:

AMAFCA has reviewed the referenced plans. Please see mark-ups on plan set. We have the following general comments:

Interim Arroyo Plan

Since the Agreement for construction of the improved Amole Arroyo has been executed, it does not seem necessary to construct the widened channel section and weirs for Unit 6. A grubbed out section similar to the section adjacent to Unit 7 with the riprap rundown at the Snow Vista Channel will be all that AMAFCA requires. The City must agree to the interim section.

Riprap at Outfalls

The 42-inch storm drain outfall from Valley View Drive and the concrete rundown from El Rancho Drive should have riprap at the outfalls to the interim arroyo section.

Confluence Analysis

We also reviewed the hydraulic analysis of the confluence of the Amole Arroyo and the Snow Vista Channel. The flow rates used are acceptable. Exhibit "D" shows a profile of the confluence of the two channels. How was this generated? Since the Amole is in supercritical regime and the Snow Vista is subcritical, AMAFCA requires a momentum balance analysis of the confluence. HEC-RAS now provides this function (see attached sheet from the Hydraulic Reference Manual). Please provide enough information in the Summary Table (or other data) to assure that a hydraulic jump will not occur. AMAFCA will evaluate the existing drop structure. Since it will most likely be disturbed during construction, we may require a gabion drop structure to replace it.

Chapter 4 Overview of Optional Capabilities

at which reaches are coming into or leaving the junction. To use the momentum based method, the user must supply the angle for any reach who's flow lines are not parallel to the main stem's flow lines. An example of a flow combining junction is shown below in Figure 4.9. In this example, angles for both reaches 1 and 2 could be entered. Each angle is taken from a line that is perpendicular to cross section 3.0 of reach 3.

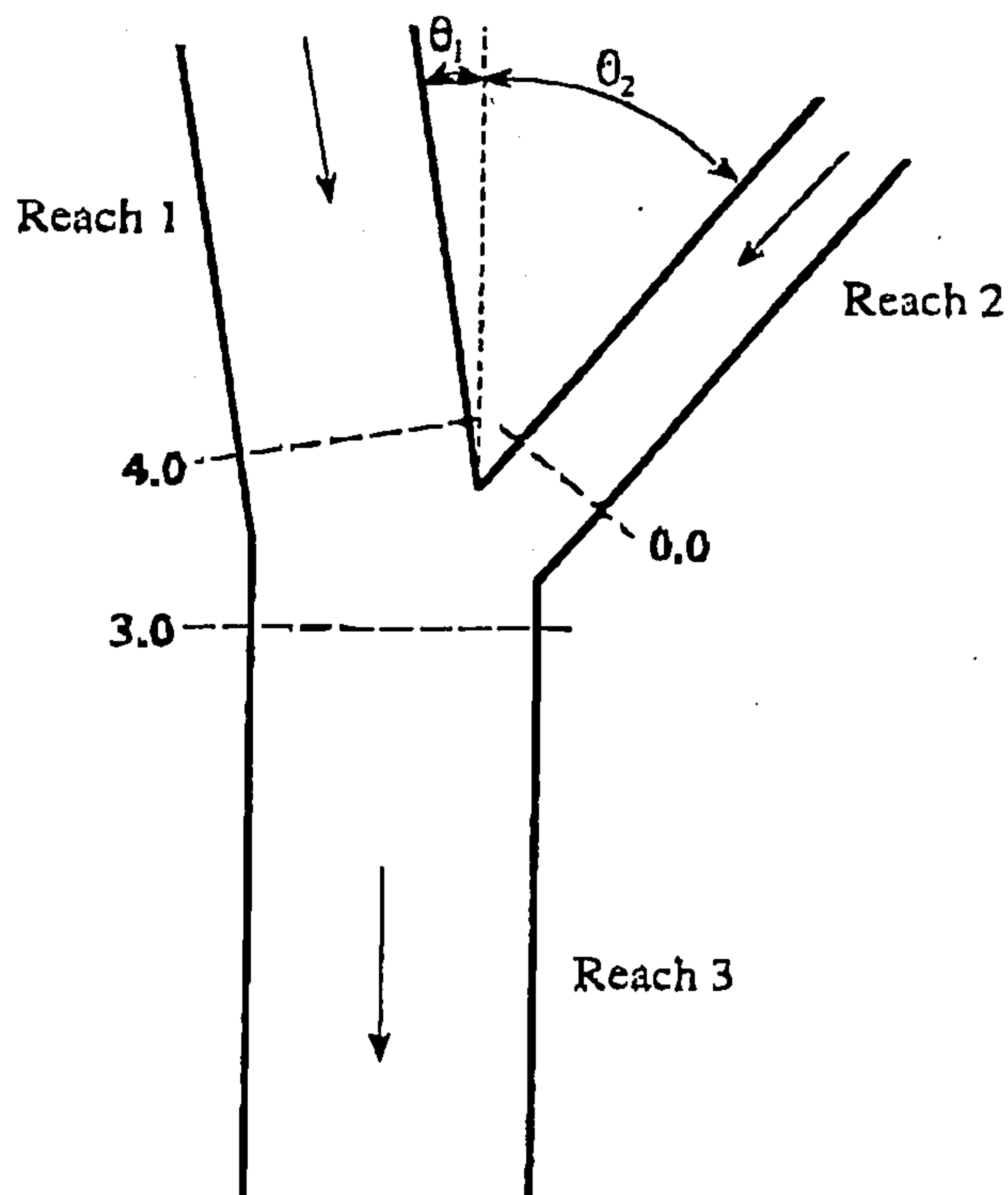


Figure 4.9 Example Geometry for Applying the Momentum Equation to a Flow Combining Junction

For subcritical flow, the water surface is computed up to section 3.0 of reach 3 by normal standard step backwater calculations. If the momentum equation is selected, the program solves for the water surfaces at sections 4.0 and 0.0 by performing a momentum balance across the junction. The momentum balance is written to only evaluate the forces in the X direction (the direction of flow based on cross section 3.0 of reach 3). For this example the equation is as follows:

$$SF_3 = SF_4 \cos(\theta_1) - F_{f_{4-3}} + W_{x_{4-3}} + SF_0 \cos(\theta_2) - F_{f_{0-3}} + W_{x_{0-3}} \quad (4-5)$$

where: SF = Specific Force (as define in Equation 4.3)