

RONALD D. BROWN, CHAIR
DANIEL W. COOK, VICE-CHAIR
CLIFFORD E. ANDERSON, P.E., SECRETARY-TREASURER
LINDA STOVER, ASST. SECRETARY-TREASURER
DANIEL HERNANDEZ, DIRECTOR

JOHN P. KELLY, P.E.
EXECUTIVE ENGINEER



**Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority**

2800 PROSPECT N.E. • ALBUQUERQUE, NM 87107

PHONE: (505) 884-2215
FAX: (505) 884-0214

To: Brad
Bingham

July 5, 2000

Diane Hoelzer, PE
D. Mark Goodwin & Assoc.
PO Box 90606
Albuquerque, NM 87199

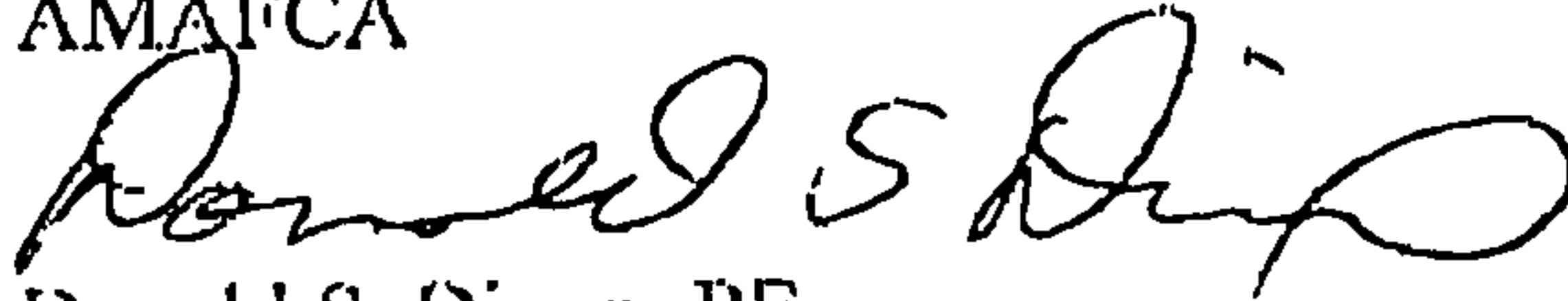
Re: Sunrise Ranch Drainage Report (revised), 6/23/00
(L9/D6)

1. Revised Report did not address written comments and subsequent verbal comments made both by L. Manwill and myself.
2. The proposed revision to the Amole Hubbell DMP adopted by the AMAFCA Board is not acceptable. The grades for intercepting sub-basin 190 north of Sunset Gardens will work for an underground system.
3. There is an error in your erosion setback calculations. I get something on the order of 65-feet for a Centerline Setback..
4. A revised floodplain easement to the HGL will be required prior to AMAFCA sign-off on plat.
5. Show proposed AMAFCA floodplain easement (to HGL) on figure with contours.
6. Sub-basin 200 is clearly in the 1.29 cfs/acre constraint area shown in Figure I-2 (your figure 3) of the Amole-Hubbell DMP.
7. Your inlet calculations are overly optimistic. No allowance has been made for any clogging for inlet at sump.
8. What is the interim plan for picking up drainage on Sunset Gardens? Some inlets should be located on the north side of the road as part of this project.
9. It is unclear where the "temporary" asphalt swale is to be located. Is it the same one shown in section on sheet 1 of 2 of the G&D Plan (which shows no asphalt)?

to direct
discharge

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

AMAFCA


Donald S. Dixon, PE
Drainage Engineer

Cc: B. Bingham, COA

June 22, 2000

Mr. Bradley Bingham
Plaza del Sol
Hydrology Dept.
P.O. Box 1293
Albuquerque, NM 87103

**Re: Revised Drainage Plan for Sunrise Ranch
Engineer's stamp 6-21-00 (J22/D68)**

Dear Mr. Bingham,

I am submitting a revised Drainage Report and Grading and Drainage Plan for the above referenced project. In response to you comment letter dated May 25, 2000:

1. A preliminary plat has been provided with this submittal.
2. The limits of the existing 100 year floodplain and the calculated 14.5 foot erosion setback have been added to the grading and drainage plan. An existing public drainage easement encompasses a majority of the floodplain limits as shown on the revised G&D plan. Since no development or grading is allowed or being proposed within the limits of the existing floodplain in Tract A it does not seem necessary to dedicate a drainage easement to AMAFCA at this time. When Tract A is proposed to be subdivided for development the limits of the drainage easement can be clearly defined and dedicated to AMAFCA.

A HEC-2 analysis has been provided in Appendix B - Hydraulics with this resubmittal for the upstream 'developed conditions' flow reaching the arroyo which according to the Amole-Hubbell Drainage Management Plan is 241.75 cfs.

Since the erosion setback is outside the limits of proposed development, no scour walls are required.

3. Runoff from Subbasin 190 north of Sunset Gardens Road under 'existing conditions' flows to the east. It appears that runoff from the vacant land to the west of the mobile home park flows toward the center of the mobile home park from a naturally occurring low spot. Drainage from the existing mobile home park flows to a retention pond located on the east side of their project site approximately 400 feet north of Sunset Gardens Road. Just east of this pond is a low spot in 102 street. There is an approximate rise 2-4' in grade from this low spot in 102 street south to Sunset Gardens Road. Under these existing conditions it is not physically possible for runoff to surface flow south to Sunset Gardens Road and then through our site to the Snow Vista Sedimentation Pond. In addition there is an existing berm along the south side of Sunset Gardens Road at the intersection with 102nd street that prevents any offsite flow from coming on our site.

Given these existing physical constraints, it is recommended that drainage from subbasin 190 be included in the SAD 222 storm drain system in 98th street. 'Developed flows' from this subbasin could be conveyed eastward to 98th street in Sunset Gardens Road. Under present 'developed conditions' in the mobile home park it is not possible to rectify their drainage situation to convey their runoff to Sunset Gardens Road. However, if the site is ever redeveloped, the drainage can be redirected toward the southeast to Sunset Gardens Road. The existing approved flow restriction of '1.29 cfs per acre' should remain in effect for subbasin 190. This restriction results in a maximum discharge of 25.8 cfs from subbasin 190 into the 98th street SAD 222 storm drain system.

According to the Amole -Hubbell Drainage Management Plan there is no discharge constraint to the Snow Vista Sedimentation Pond for Subasin 200 of which the western most portion of our site is a part.

- 4. The lines in Mountain Dew are overhead electrical distribution and transmission power lines. I am presently coordinating with PNM and our client on relocating some of these lines underground.**
- 5. A storm drain and inlets in Eucariz road were constructed as part of the adjacent Fire Station 14 development. 'Inlets and appurtances' on the south side of Sunset Gardens at 98 th street will be added to the infrastructure list and coordinated with SAD 222 construction efforts.**
- 6. Retaining walls have been added to Lot 48, Blk 7 and Lot 13, Blk 6 and between Lots 18-20, Blk 3 as requested. Retaining walls are not necessary on lots 5-17, Block 7.**
- 7. The valley gutter has been removed.**
- 8. The offsite contributing subasin 900 has been added to the temporary diversion swale discharge. Refer to the exhibit in report and the revised grading and drainage plan.**
- 9. The FHWA nomograph for concrete culverts has been used in this resubmittal.**
- 10. Note 2 on the grading and drainage plan has been revised accordingly.**

If you have any questions, please call me.

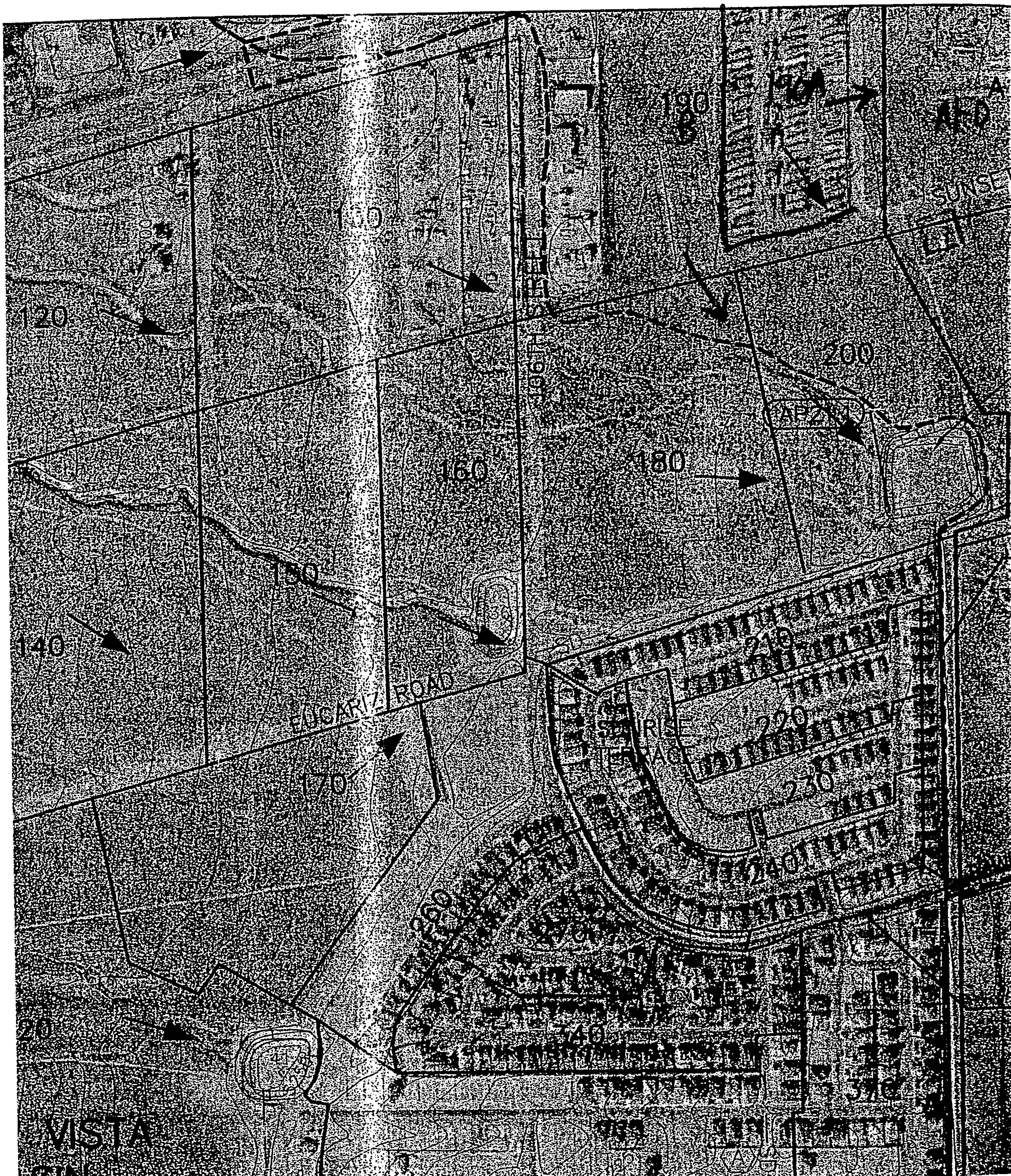
Sincerely,

MARK GOODWIN AND ASSOCIATES, P.A.

Diane Hoelzer, P.E.

file: sunrise.rar/drainage.ltr

11
3



RECEIVED
JUN 28 2000
HYDROLOGY SECTION

SPECIAL ASSESSMENT DISTRICT 222 PORTION OF INFRASTRUCTURE LIST

98th Street Portion Only (items marked #2)

The Special Assessment District 222 infrastructure in 98th Street will have a Procedure "B" Modified Agreement. The cost of the 98th Street improvements for the Procedure "B" Modified Agreement will be determined by the Project Engineer's Estimate as approved by the DRC Chairman. Construction under the Procedure "B" Modified Agreement shall be deferred pending City Council approval of Resolution 5, but in no event shall construction be deferred more than 2 years unless extended by Development Review Board approval. If the Special Assessment District passes Resolution 5 then the Procedure "B" Modified Agreement will be converted to cash in the amount of the assessment levied against the property and a cashier's check will be remitted by Developer to the Special Assessment District account and the Procedure "B" Modified Agreement and related financial guarantee released. If the Special Assessment District Resolution 5 is not passed then the Developer shall construct the required improvements in 98th Street pursuant to the Procedure "B" Modified Agreement.

<u>SIZE</u>	<u>PAVING IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
29' F-F (#2)	Arterial paving	N. bound 98 th Street	N. line of Unit 1	S line Unit 1
(#2)	Standard Curb & Gutter (east side)	In 98 th Street	N. line of Unit 1	S line Unit 1
6' (#2)	Sidewalks (east side)	In 98 th Street	N. line of Unit 1	S line Unit 1
(#2)	Median Curb asphalt concrete (west side)	N. bound 98 th Street	N. line of Unit 1	S line Unit 1
(#2)	Median Opening & Holding Lane	98 th Street	@ Demi Road	

<u>SIZE</u>	<u>WATER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
(#2)	Fire Hydrant	In 98 th Street		

<u>SIZE</u>	<u>SANITARY SEWER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
(#2)	NO SEWER REQUIRED			

<u>SIZE</u>	<u>STORM SEWER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
54 inch(#2)	RCP	In 98 th Street	N. line of Unit 1	S line Unit 1

SPECIAL ASSESSMENT DISTRICT 222 STORM DRAINAGE SYSTEM

Assessments based on Area (item marked #3)

The developer is guaranteeing its proportional SAD 222 Storm Drainage Assessment by placing a separate Procedure "B" Modified Agreement for the remote offsite improvements including the pond right-of-way and major storm sewer trunk lines. The assessment is calculated based on proportionate acreage of the entire drainage basin. The amount of the financial guarantee for the Storm Drainage System Assessment for the Procedure "B" Modified Agreement will be provided by the Special Assessment District Engineer. The form of Financial Guarantee shall be a Irrevocable Letter of Credit in the form that allows the City to call on the Irrevocable Letter of Credit in the event Resolution 5 is passed. If the Special Assessment District Passes Resolution 5 then the Procedure "B" Modified Agreement will be converted to cash in the amount of the assessment levied against the property and a cashier's check will be remitted by Developer to the Special Assessment District account and this Procedure "B" Modified Agreement and related financial guarantee

released. If the Special Assessment District 222 Resolution 5 is not passed then the Procedure "B" Modified Agreement and related financial guaranty will be released.

ORIGINAL
STORM DRAINAGE SYSTEM IMPROVEMENTS
(#3) 3.0734 ACRES being all of Unit I. The value of the assessment will be determined by the Special Assessment District Engineer and submitted to the DRC Chairman prior to final plat approval.

Agent/Owner Name: Frank E. White Ten West LLC
Tower West Limited Partnership
Firm: Southwest Surveying Co. PC

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

[Signature] 12-08-99 Transportation Dev. Date
Roger Allen 12/8/99 Utility Dev. Date
Edward A. Hays 12-8-99 Parks & Recreation Date
Bradley L. Bingham 12/8/99 City Engineer Date
AMAFCA Date
[Signature] 12/8/99 DRB Chair Date

DRC REVISIONS

REVISIONS	DATE	DRC CHAIR	USER DEPT.	AGENT/OWNER
1				
2				

c:\myfiles\miscellaneous\tower infrastructure list.wpd

ORIGINAL

<u>SIZE</u>	<u>SANITARY SEWER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
<u>8 inch</u>	<u>***</u>	<u>Hartman Dr.</u>	<u>Demi Rd</u>	<u>Tristani Road</u>
<u>8 inch</u>	<u>***</u>	<u>Tristani Road</u>	<u>Hartman Dr.</u>	<u>Dean Dr.</u>
<u>8 inch</u>	<u>***</u>	<u>Dean Dr.</u>	<u>Tristani Rd</u>	<u>Unit I S. Limit</u>
<u>8 inch</u>	<u>***</u>	<u>Rowen Rd.</u>	<u>Unit I W.Limit</u>	<u>94 Street</u>
<u>8 inch</u>	<u>***</u>	<u>94th Street</u>	<u>Rowen Rd.</u>	<u>Tower Road</u>
<u>8 inch (#1)</u>	<u>***</u>	<u>94th Street</u>	<u>Rowen Road</u>	<u>Eucariz Road</u>

#1 These items are to be deferred until construction of Unit 2, Eldorado Park Subdivision.

STORM SEWER IMPROVEMENT
Temp. Retention Pond w/ emergency spillway,
agreement & covenant for public drainage easement

LOCATION
Drainage Easement and Temporary Ponding Easement
within, Tracts 27A, Tower West and Tracts 23, 24 25 and 26,
Unit 2, Town of Atrisco Grant

<u>SIZE</u>	<u>STORM SEWER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
SAD Storm <u>Sewer 42" - 54"</u>	<u>RCP, including MH and Inlets</u>	<u>94th Street</u>	<u>Rowen Rd</u>	<u>Tower Road</u>
<u>21" - 42"</u>	<u>RCP, including MH and Inlets and appurtenances</u>	<u>Rowen Road</u>	<u>Dean Drive</u>	<u>94th Street</u>
<u>48 inch</u>	<u>CMP Temp Pipe</u>	<u>Ten West</u>	<u>94th Street</u>	<u>Retention Pond</u>
SAD Storm Drain (#1) <u>36"</u>	<u>RCP, including Manholes</u>	<u>94th Street</u>	<u>Rowan Road</u>	<u>Eucariz Road</u>

*** Sewer includes trunkline with lot service, manholes, and appurtenances.

SAD Storm Drain (#1) Item deferred until construction of Unit 2.

SAD Storm Sewer The storm sewer within 94th Street is an integral part of Special Assessment District 222 which is being built by the Developer as part of the subdivision. The Developer will provide a regular Procedure “B” Agreement for the Special Assessment District Storm Drain Improvements to be built in 94th Street. When the Storm Drain Improvements in 94th Street are constructed, the Developer will receive a reduction of the Special Assessment District Storm Drainage Assessment upon written authorization from the Special Assessment District Engineer.

Grading and Drainage Plan Certification for each Unit shall be obtained prior to release of financial guarantees.

ORIGINAL

12/8/99 *plc*

**EXHIBIT A (REVISED 11/30/99)
TO SUBDIVISION IMPROVEMENTS AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LISTING
ELDORADO PARK SUBDIVISION**

DRB Case No.: 99-210 / S-99-91

DRC Project No.: _____

Prelim. Plat Approved: 9-22-99

Prelim Plat Expires: 9-22-00

Site Plan Approved: _____

Date Submitted: _____

This infrastructure list supercedes infrast. list signed 9-22-99

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and Agent/Owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

<u>SIZE</u>	<u>PAVING IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
<u>36' f-f</u>	<u>Coll. Pvmt, std. C & G & 4' Sdwk, Both sides</u>	<u>Demi Road</u>	<u>98th Street</u>	<u>Hartman Dr.</u>
<u>27' f-f</u>	<u>Res. Pvmt, roll C & G & *4' Sdwk, Both sides</u>	<u>Hartman Drive</u>	<u>Demi Road</u>	<u>Tristani Road</u>
<u>27' f-f</u>	<u>Res. Pvmt, roll C & G & *4' Sdwk, Both sides</u>	<u>Tristani Road</u>	<u>Hartman Dr</u>	<u>Dean Drive</u>
<u>28' f-f</u>	<u>Res. Pvmt, std. C & G & *4' Sdwk, Both sides</u>	<u>Dean Drive</u>	<u>Tristani Rd.</u>	<u>S. line Lot 29</u>
<u>27' f-f</u>	<u>Res. Pvmt, roll C & G & *4' Sdwk, Both sides</u>	<u>Rowen Rd.</u>	<u>Dean Drive</u>	<u>W. line Lot 33</u>
<u>27' f-f</u>	<u>Res. Pvmt, std. C & G & *4' Sdwk, Both sides</u>	<u>Rowen Rd</u>	<u>Dean Drive</u>	<u>E. line Lot 27</u>
<u>N/A D</u>	<u>Res. Street lights per dpm, Temp turn lane</u>			

- Sidewalk Deferral

<u>SIZE</u>	<u>WATER IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
<u>6 inch</u>	<u>**</u>	<u>Demi Rd.</u>	<u>98th Street</u>	<u>Hartman Dr.</u>
<u>6 inch</u>	<u>**</u>	<u>Tristani Road</u>	<u>Hartman Dr.</u>	<u>Dean Dr.</u>
<u>6 inch</u>	<u>**</u>	<u>Hartman Dr.</u>	<u>Demi Road</u>	<u>Tristani Rd</u>
<u>6 inch</u>	<u>**</u>	<u>Dean Dr.</u>	<u>Tristani Rd.</u>	<u>Unit I S. Limit</u>
<u>6 inch</u>	<u>**</u>	<u>Rowen Rd</u>	<u>Unit I W. Limits</u>	<u>94th Street</u>
<u>8 inch</u>	<u>**</u>	<u>94th Street</u>	<u>Rowen Road</u>	<u>Tower Road</u>
<u>8 inch(#1)</u>	<u>**</u>	<u>94th Street</u>	<u>Rowen Road</u>	<u>Eucariz Road</u>

** Water includes distribution main with lot service, hydrants, and appurtenances.

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
 (NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
 D.R.B. Project No.: _____
 Prelim. Plat Approved: _____
 Prelim. Plat Expires: _____
 Site Plan Approved: _____

Date Submitted: June 23, 2000

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of the project acceptance and close out by the City.

<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
PHASE I				

PAVING				
24' 4'	Perm Pvmt Sidewalk (south side) C & G (south side)	Sunset Gardens Rd	98th Street	Tact A, West Central Substation
28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Sunrise Ranch St	Sunset Gardens Rd	Lauren Ave
28' FF 4'(*)	Res Pvmt Sidewalk (both sides)** C & G (both sides) **no sdwk south side on Lauren stub street	Lauren Ave	Evening Fire St	Lot 1, Blk 2
28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Evening Fire St	Lauren Ave	Lot 17, Blk1 (Phase 3 bndry)
26' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Lone Mountain Ave	Evening Fire St	Sharp Spur St

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
(NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
D.R.B. Project No.: _____
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Prelim. Plat Expires: _____
Site Plan Approved: _____

Date Submitted: June 23, 2000

<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
26' FF 4' (*)	Res Pvmnt Sidewalk (both sides) C & G (both sides)	Sharp Spur St	Lauren Ave	Lot 2, Blk 4 (Phase 3 Bndry)
100' FF (Note 2)	½ Arterial Pvmnt 42' Median 8' bike path (west) C&G (west side)	98 th St	Sunset Gardens Rd	Lot 17, Blk 1
N/A (*)	Street Lights Per DPM Sidewalks to be deferred			
WATER				
8"	Waterline	Sunset Gardens Rd	98th St Exist WL	Tract A, West Central Substation
6"	Waterline	Sunrise Ranch St	Sunset Gardens Rd	Lauren Ave
6"	Waterline	Lauren Ave	Evening Fire St	Lot 1, Blk 2
6"	Waterline	Evening Fire St	Lauren Ave	Lot 17, Blk1 (Phase 3 Bndry)
6"	Waterline	Lone Mountain Ave	Evening Fire St	Sharp Spur St
6"	Waterline	Sharp Spur St	Lauren Ave	Lot 2, Blk 4 (Phase 3 bndry)
8"(Note 2)	Waterline	98 th St	Sunset Gardens Rd	Lot17, Blk 1
SANITARY SEWER				
8"	Sanitary sewer	Sunset Gardens Rd	98th St R/W	Tract A, West Central Substation
8"(Note 1)	Sanitary sewer	98th Street	Tower Road (Exist. MH)	Eucariz Ave

EXHIBIT A (REVISED 5/10/99)
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<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
8"	Sanitary sewer	25' Public SAS/SD Easement	98th St	Evening Fire St
8"	Sanitary sewer	Evening Fire St	25' Public SAS/SD Easement	Lauren Ave
8"(Note 2)	Sanitary Sewer	98 th St	Sunset Gardens Rd	Lot17, Blk 1
8"	Sanitary sewer	Lauren Ave	Evening Fire St	Lot 1, Blk 2
8"	Sanitary sewer	Lone Mountain Ave	Evening Fire St	Sharp Spur St
8"	Sanitary sewer	Sharp Spur St	Lone Mountain Ave	Lot1, Blk 6

STORM DRAIN

Per Design	Temporary Asphalt Swale	Evening Fire R/W	Lone Mountain Ave	Temporary Retention Pond
Per Design	Temporary Retention Pond	Tract B		
Per Design	Storm Drain, Inlets and appurtenances	Sunset Gardens	@ 98th Street	
Per Design (Note 2)	30"-60" SD	98th St	Sunset Gardens Road	Lot 17, Blk 2

PHASE II

PAVING

24' 4'	Perm Pvmt Sidewalk (south side) C & G (south side)	Sunset Gardens Rd	Lot 1, Blk 2	West PL, Lot 5, Blk 7
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EXHIBIT A (REVISED 5/10/99)
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(LEGAL DESCRIPTION OF SUBDIVISION)

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<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
34' FF 4'(*)	Res Pvmnt Sidewalk (both sides) C & G (both sides)	Lasso St	Sunset Gardens Rd	Round Up Place
28' FF 4'(*)	Res Pvmnt Sidewalk (both sides) C & G (both sides)	Morning Dew St	Lot 16, Blk 5 (Phase 4 bndry)	Round Up Place
28' FF 4'(*)	Res Pvmnt Sidewalk (both sides) C & G (both sides)	Round Up Place	Morning Dew St	Lot 30, Blk 7
26' FF 4'(*)	Res Pvmnt Sidewalk (both sides) C & G (both sides)	Round Up Place	Lot 30, Blk 7	End Culdesac
24' FF 4'(*)	Res Pvmnt Sidewalk (north side) C & G (both sides)	Stub Street	Round Up Place	End Stub street
12'	Gravel Access Road	25' Public WL/SAS/SD Easement	Round Up Lane	AMAFCA Snow Vista Sedimentation Pond
N/A (*)	Street Lights Per DPM Sidewalks to be deferred			
WATER				
10"	Waterline	Eucariz Ave	Exist 10" WL Lot 33, Blk 1	Morning Dew St
8"	Waterline	Sunset Gardens Rd	Lot 1, Blk 2	West PL, Lot 5, Blk 7
6"	Waterline	Lasso St	Sunset Gardens Rd	Round Up Lane
6"	Waterline	Morning Dew St	Eucariz Ave	Round Up Lane
6"	Waterline	Rawhide Ave	Morning Dew St	Stubout East 60' (Phase 3 bndry)

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
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(LEGAL DESCRIPTION OF SUBDIVISION)

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(NAME and UNIT OF SUBDIVISION)

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<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
6"	Waterline	Bridle Falls	Morning Dew St	Stubout East 60'
6"	Waterline	Round Up Lane	Morning Dew St	25' Public WL/SAS/SD Easement
6"	Waterline	25' Public WL/SAS/SD Easement	Round Up Lane	Morning Dew St
4"	Waterline	Stub Street	Round Up Place	End Stub street

SANITARY SEWER

8"	Sanitary sewer	Sunset Gardens Rd	Lot 1, Blk 2	West PL, Lot 5, Blk 7
8"	Sanitary sewer	Eucariz Ave	Exist 8" SAS MH (Lot 33, Blk 1)	Morningn Dew St
8"	Sanitary sewer	Morning Dew St	Eucariz Ave	Round Up Lane
8"	Sanitary sewer	Round Up Lane	Morning Dew St	25' Public WL/SAS/SD Easement
8"	Sanitary sewer	25' Public WL/SAS/SD Easement	Round Up Lane	Morning Dew St
8"	Sanitary Sewer	Stub Street	Round Up Place	End stub street

STORM DRAIN

Per Design	Temporary Asphalt Swale	Rawhide R/W	Morning Dew St	Temporary Retention Pond
Per Design	18" RCP	25' Public WL/SAS/SD Easement	End Round Up Culdesac	AMAFCA Snow Vista Sedimentation Pond

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
(NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
D.R.B. Project No.: _____
Prelim. Plat Approved: _____
Prelim. Plat Expires: _____
Site Plan Approved: _____

Date Submitted: June 23, 2000

<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>To</u>
PHASE III				

PAVING				
26' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Sharp Spur St	Lot 7, Blk 6	Rawhide Ave
26' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Rawhide Ave	Morning Dew St	Evening Fire St
28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Evening Fire St	Lot 16, Blk 1	Lot 2, Blk 5
N/A (*)	Street Lights Per DPM Sidewalks to be deferred			
WATER				
6"	Waterline	Evening Fire St	Lot 16, Blk 1 (Phase 1 bndry)	Lot 2, Blk 5 (Phase 4 bndry)
6"	Waterline	Rawhide Ave	Evening Fire St	Morning Dew St (Phase 2 stubout)
6"	Waterline	Sharp Spur St	Lot 1, Blk 4 (Phase 1 bndry)	Rawhide Ave
SANITARY SEWER				
8"	Sanitary sewer	Rawhide Ave	Evening Fire St	Lot 17, Blk 5
8"	Sanitary sewer	Sharp Spur St	Rawhide Ave	Lot 1, Blk 4

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
 (NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
 D.R.B. Project No.: _____
 Prelim. Plat Approved: _____
 Prelim. Plat Expires: _____
 Site Plan Approved: _____

Date Submitted: June 23, 2000

<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>To</u>
STORM DRAIN				
Per Design	18" SD	Rawhide Ave	Eveningn Fire St	Lot 11, Blk 4
Per Design	18"-24" SD	Evening Fire St	Lot 18, Blk 1	Lot 2, Blk 5 (Phase 4 bndry)
Per Design	18" SD	Temporary Connection	Evening Fire St	Temp. Ret. Pond

PHASE IV

PAVING

28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Evening Fire St	Lot 1, Blk 5 (Phase 3 bndry)	Bridle Falls Ave
28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Bridle Falls Ave	Evening Fire St	Morning Dew St
28' FF 4'(*)	Res Pvmt Sidewalk (both sides) C & G (both sides)	Morning Dew St	Eucariz Ave	Lot 17, Blk 5 (Phase 2 bndry)
24' FF 4'	Res Pvmt Sidewalk (north side) C & G (north sides)	Eucariz Ave	Lot 33, Blk 1	Morning Dew St
100' FF (Note 2)	½ Arterial Pvmt 42' Median 8' bike path (west) C&G (west side)	98 th St	Eucariz Road	Lot 16, Blk 1

WATER

6"	Waterline	Evening Fire St	Bridle Falls Ave	Lot1, Blk 5
----	-----------	-----------------	------------------	-------------

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
 (NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
 D.R.B. Project No.: _____
 Prelim. Plat Approved: _____
 Prelim. Plat Expires: _____
 Site Plan Approved: _____

Date Submitted: June 23, 2000

(Phase 3 bndry)

<u>SIZE</u>	<u>TYPE IMPROVEMENT</u>	<u>LOCATION</u>	<u>FROM</u>	<u>TO</u>
6"	Waterline	Bridle Falls Ave	Evening Fire St	Morning Dew St
8"(Note 2)	Waterline	98 th St	Eucariz Road	Lot16, Blk 1

SANITARY SEWER

8"	Sanitary sewer	Bridle Falls Ave	Evening Fire St	Lot 16, Blk 5
8"(Note 2)	Sanitary Sewer	98 th St	Eucariz Road	Lot16, Blk 1

STORM DRAIN

Per Design	18"-36" SD	Evening Fire St	25' Public Easement	Lot 1, Blk 5 (Phase 3 bndry)
Per Design	Temp. Connection	25' Public Easement	Evening Fire St	Temporary Retention Pond
Per Design	36" SD	25' Public Easement	Property Line	Evening Fire St knuckle
Per Design (Note 2)	30"- 60" SD	98th St	Eucariz Road	Lot 16, Blk2

NOTES:

1. The sanitary sewer in 98th street is part of the Special Assessment District (SAD) 222 and will be built by the Developer as part of the Sunrise Ranch Subdivision Phase 1 construction. The developer will provide a Procedure B Agreement for the Special Assessment District Sanitary Sewer Improvements to be built in 98th St. When the sanitary sewer improvements are completed, the Developer will receive a reduction of the Special Assessment District Sanitary Sewer Assessment upon written authorization from the Special Assessment District Engineer and pro rata will be prepared for those properties adjacent to the Sanitary Sewer between Eucariz Road and Tower Road.

2. The SAD 222 infrastructure in 98th street will have a Procedure B Modified Agreement. The cost of the 98th street improvements for the Procedure B Modified Agreement will be determined by the Engineer's Estimate as approved by the DRC chairman. Construction under the Procedure B Modified Agreement shall be deferred pending City Council approval of Resolution 5, but in no event shall construction be deferred more than 2 years unless extended by the Development Review Board approval. If the Special Assessment District passes Resolution 5 then the Procedure B

EXHIBIT A (REVISED 5/10/99)
TO SUBDIVISION IMPROVEMENT AGREEMENT
DEVELOPMENT REVIEW BOARD
REQUIRED INFRASTRUCTURE LIST
(LEGAL DESCRIPTION OF SUBDIVISION)

SUNRISE RANCH SUBDIVISION
 (NAME and UNIT OF SUBDIVISION)

Project No.: 1000301
 D.R.B. Project No.: _____
 Prelim. Plat Approved: _____
 Prelim. Plat Expires: _____
 Site Plan Approved: _____

Date Submitted: June 23, 2000

Modified Agreement will be converted to cash in the amount of the assessment levied against the property and a cashier's check will be remitted by the Developer to the Special Assessment District account and the Procedure B Modified Agreement and related financial guarantee released. If the Assessment District Resolution 5 is not passed then the Developer shall construct the required improvements in 98th street to the Procedure B Modified Agreement.

Stormdrain to include manholes, inlets, riprap and outfall.

Grading and Drainage Certification per DPM including Perimeter Walls as shown on the Grading Plan for Release of SIA and Financial Guarantees. Financial Guarantee is not required for this item.

Water infrastructure to include valves, fittings, valveboxes and fire hydrants.

Sanitary sewer to include manholes and service connections.

Signature: *Diane Hoelzer*

Agent/Owner Print Name: Diane Hoelzer, PE

Firm: Mark Goodwin & Associates, PA

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

_____ Transportation Dev.	_____ Date	_____ Utility Dev.	_____ Date	_____ Parks & Recreation	_____ Date
_____ Date	_____ Date	_____ Engineer/AMAFCA	_____ Date	_____ DRB Chairman	_____ Date

DRC REVISIONS

REVISIONS	DATE	DRC CHAIR	USER DEPT	AGENT/OWNER
①				
②				



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 6, 2002

Amy Driscoll, P.E.
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: SUNRISE RANCH UNIT 4 POND RECLAMATION (L-9/D6)
(For 8 New Lots on Vacated Ponding Area)
ENGINEERS CERTIFICATION
ENGINEERS STAMP DATED 5/15/2002
ENGINEERS CERTIFICATION DATED 8/2/2002

Dear Ms. Driscoll:

Based upon the information provided on your August 2, 2002 submittal, the above referenced project is approved for Engineers Certification acceptance.

If you have any questions, please call me at 924-3986.

Sincerely,


Bradley Bingham
Senior Civil Engineer
COA, Hydrology Division
BLB

C: Arlene Portillo #654381
File

V
Vinyard & Associates, Inc.
A

8916-A Adams Street, NE
Albuquerque, New Mexico 87113
(505) 797-9743 • Fax: (505) 797-9749

Geotechnical Engineering • Materials Testing • Environmental Engineering

May 15, 2002

Longford Homes of New Mexico, Inc.
7301 Jefferson NE
Suite G-H
Albuquerque, NM 87109

Subject: Sunrise Ranch – Unit 4 – Pond Reclamation
V & A Project No.: 02-2-207

Gentlemen:

This office provided construction materials testing during and following earthwork for Sunrise Ranch Unit 4, Block 1, Lots 20 thru 27. Results of our testing were presented in Daily Report Nos. 1 through 15 (previously reported). Based upon our observations and testing the fill was placed and compacted in accordance with generally accepted construction standards. Our testing indicates the fill was compacted to a minimum of 95% of maximum density as determined by ASTM D1557.

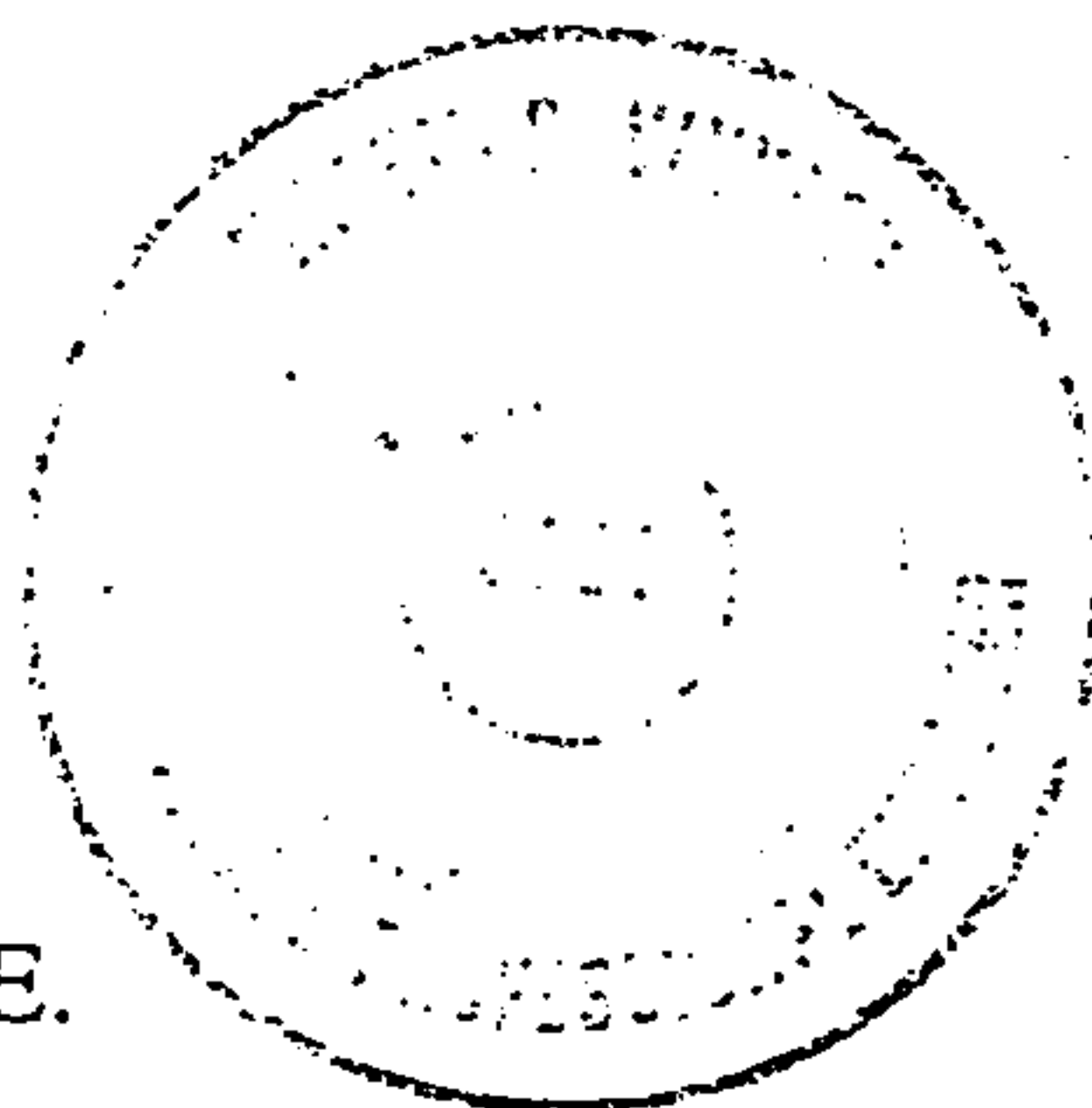
The fill in these lots was tested from the bottom of the pond to Finished Subgrade. The depth of the pond was approximately 15 feet.

Should you have any questions regarding this letter or if we may be of further service, please call.

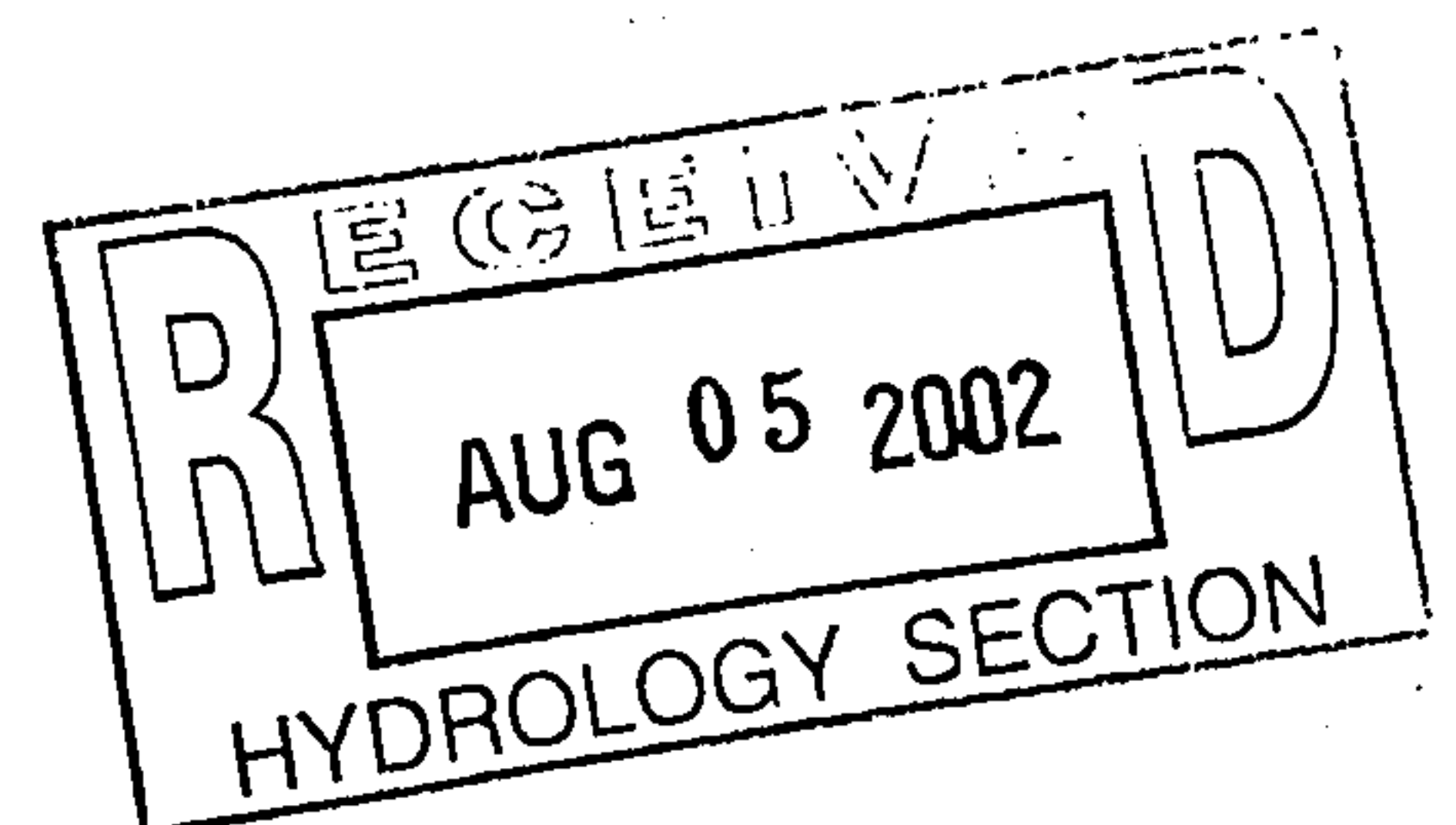
Sincerely,



Martin D. Vinyard, P. E.



File: 02-2-207.cert.rka





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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

November 7, 2000

Mr. Don Dixon
AMAFCA
2600 Prospect NE
Albuquerque, NM 87107

**Re: Revised Grading and Drainage Plan for Sunrise Ranch Unit 2
Engineer's stamp 11-7-00 (L9/D6)**

Dear Mr. Dixon,

This letter is in response to your letter dated October 18, 2000 and our subsequent meeting on November 1, 2000 with regard to the above referenced project:

1. The City of Albuquerque Hydrology Department has approved the proposed drainage plan to allow discharge from the mobile home park (revised subasin 190 B) to enter the 98th street storm drain system. Under current conditions the mobile home park has a retention pond that was designed to contains "developed" flows. If and when the land use changes for this site (redefined as subasin 190B), the site will be restricted to the 1.29 cfs/acre as defined in the Amole-Hubbell Drainage Plan. As requested a brief explanation of this drainage basin change along with an exhibit has been prepared to give to the AMAFCA board members and can be found in Appendix D. A concurrence letter from the City Hydrology Dept. will be provided to you with regard to this issue.
2. Per discussion at our meeting on November 1, Sunrise Ranch Unit 2 has been regraded to convey the allowable discharge for 'developed flows' from subasin 190A via Sunset Gardens Road to Roundup Road and then outfall to the Snow Vista Sedimentation Pond. (Refer to Appendix A)
3. A reproducible mylar of Figure N-4 with revised subasin boundaries for subasin 190A and 190 B is being provided. The flows into the Snow Vista Sedimentation pond have been reduced and a table showing these changes at critical points has been prepared. (Refer to Appendix A)
4. A temporary swale within the 98th street right-of-way will pick up 'developed' flows from Sunset Gardens and temporarily retain them within the 98th street right of way until the SAD 222 storm sewer is constructed to intercept these flows early next year. A concurrence letter from City Hydrology will be provided. (Refer to Appendix B)

With regard to offsite flows along lot 5, Block 7, a temporary drainage swale will be provided along the west property boundary within the existing temporary drainage easement to convey these flows to the Snow Vista Sedimentation pond as shown on the revised grading and drainage plan.

5. The FEMA floodplain was shown on the grading and drainage plan dated 8-8-00 revised 10-6-00. The FEMA floodplain is not part of the Sunrise Ranch Unit 2 plat or any of the remaining Tracts currently shown on the Unit 2 plat.
6. Scour depth calculations have been submitted with this letter. A detail of the proposed scour wall is shown on the revised G&D plan. Scour calculations can be found in Appendix C).

RECEIVED

NOV 8 7 2000

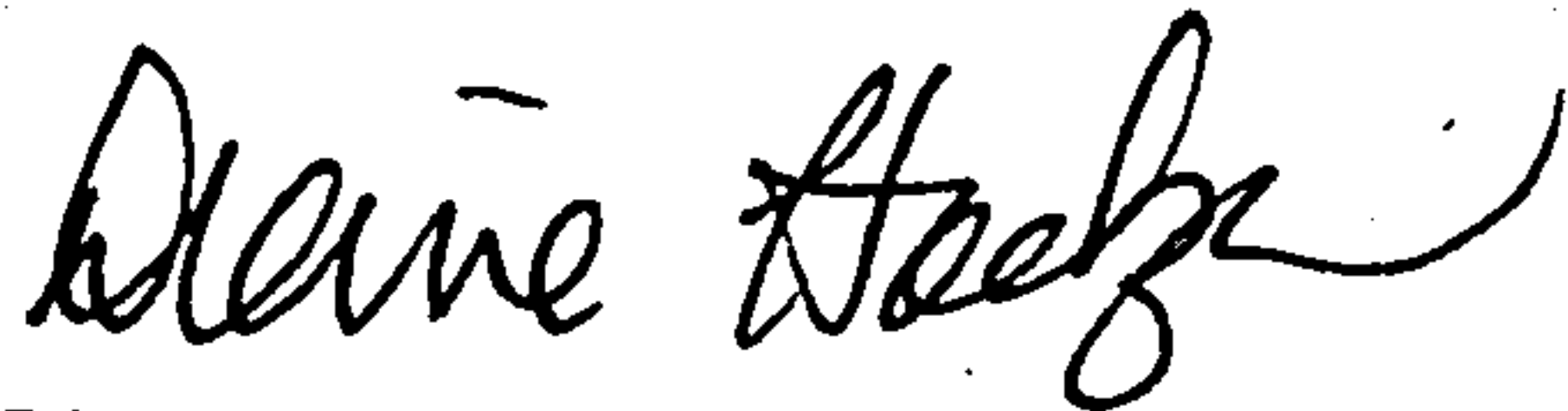
PWD/DESIGN REVIEW

7. The 25' public water and sewer easement has been removed from the AMAFCA property as is now reflected on the plat, grading and drainage plan and construction plans.
8. As requested in your letter, I am in the process of coordinating the easement for the storm drain connection to the Snow Vista basin with Martin Eckert.

If you have any additional questions, please call me.

Sincerely,

MARK GOODWIN AND ASSOCIATES, P.A.



Diane Hoelzer, P.E.

cc. Brad Bingham, COA-Hydrology

file: sunrise.ran/draindx.ltr

RONALD D. BROWN, CHAIR
DANIEL W. COOK, VICE-CHAIR
CLIFFORD E. ANDERSON, P.E., SECRETARY-TREASURER
LINDA STOVER, ASST. SECRETARY-TREASURER
DANNY HERNANDEZ, DIRECTOR

JOHN P. KELLY, P.E.
EXECUTIVE ENGINEER



Albuquerque Metropolitan Arroyo Flood Control Authority

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107

PHONE: (505) 884-2215
FAX: (505) 884-0214

October 18, 2000

Diane Hoelzer, PE
D. Mark Goodwin & Assoc.
PO Box 90606
Albuquerque, NM 87199

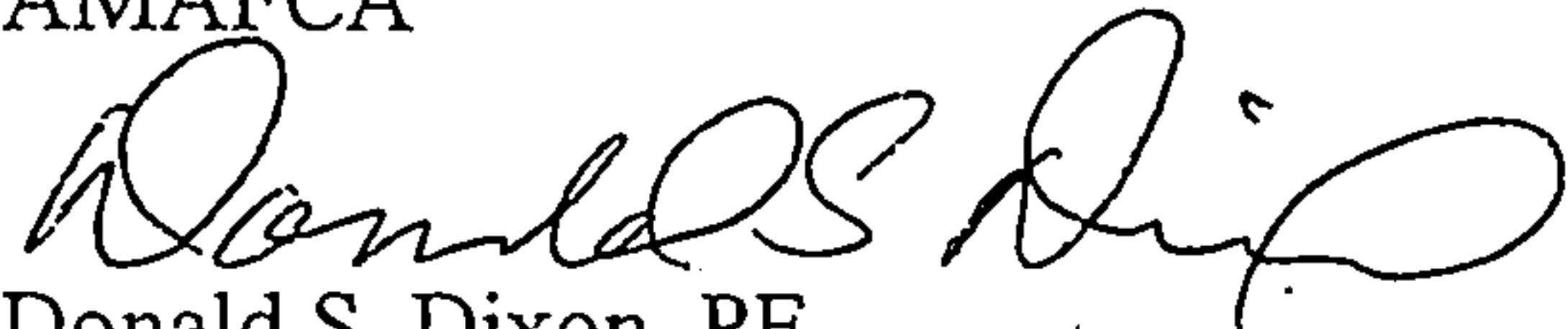
Re: Amendment Report for A-H DMP for Sunrise Ranch Unit 2 dated 8-9-00
(L9/D6) Submitted to AMAFCA 10-9-00

1. Provide documentation and/or calculations demonstrating that the SAD 222 system in 98th Street has capacity for the additional flow you propose.
2. Provide a preliminary construction plan with P & P sheet showing size, horizontal and vertical alignment of proposed drainage facility along the west property line from basin 190A. This must be capable of conveying future condition flow rates from basin 190A per the A-H DMP and meet DPM criteria. A permanent public drainage easement of sufficient size to allow for the construction, operation and maintenance of the proposed facility will be required.
3. Please provide an Exhibit suitable for reproduction showing the revised drainage basins, facilities, etc. for the changes you are proposing to the A-H DMP. Also, provide table showing the revised flow rates at critical points for the above changes. AMAFCA can supply a copy of the DMP hydrology in digital format to assist you.
4. I repeat my comment from 7-5-00, what is the interim plan for picking up drainage on Sunset Gardens? Off-site flows are currently entering Unit 2 just south of Sunset Gardens (at lot 5, Block 7). If you plan to divert these flow to Sunset Gardens, does it have the capacity? What is the flow rate? If you plan to divert to the arroyo to the south you will need to build the facility you propose in 2 above.
5. Show FEMA floodplain on plat as well as G & D Plan.
6. Are fences proposed at the property line for lots 17 and 18, Block 7? If the fence is within the erosion setback it will have to be extended down past scour depth.
7. Plat incorrectly states that AMAFCA has granted a 25' public water and sewer easement to COA. This has not been done. A detailed plan for both the water and sewer must be submitted to AMAFCA for review prior to any easement being considered. This must include profile as well as sections clearly showing utilities in relation to adjacent AMAFCA Snow Vista basin. Water and/or sewer lines may require a steel sleeve.
8. Easement for the storm drain connection to Snow Vista basin should be coordinated with Martin Eckert.

You may obtain a digital copy from AMAFCA of an orthophoto topographic map (flown in 1999) of the general area which may be of help with your design for 2 above. Contact me for details. Future bound submittals should be stamped by the Engineer and contain a unifying discussion so that the reviewer can figure out what the submitted data is in support of. When information is submitted piecemeal it adds to the review time.

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

AMAFCA

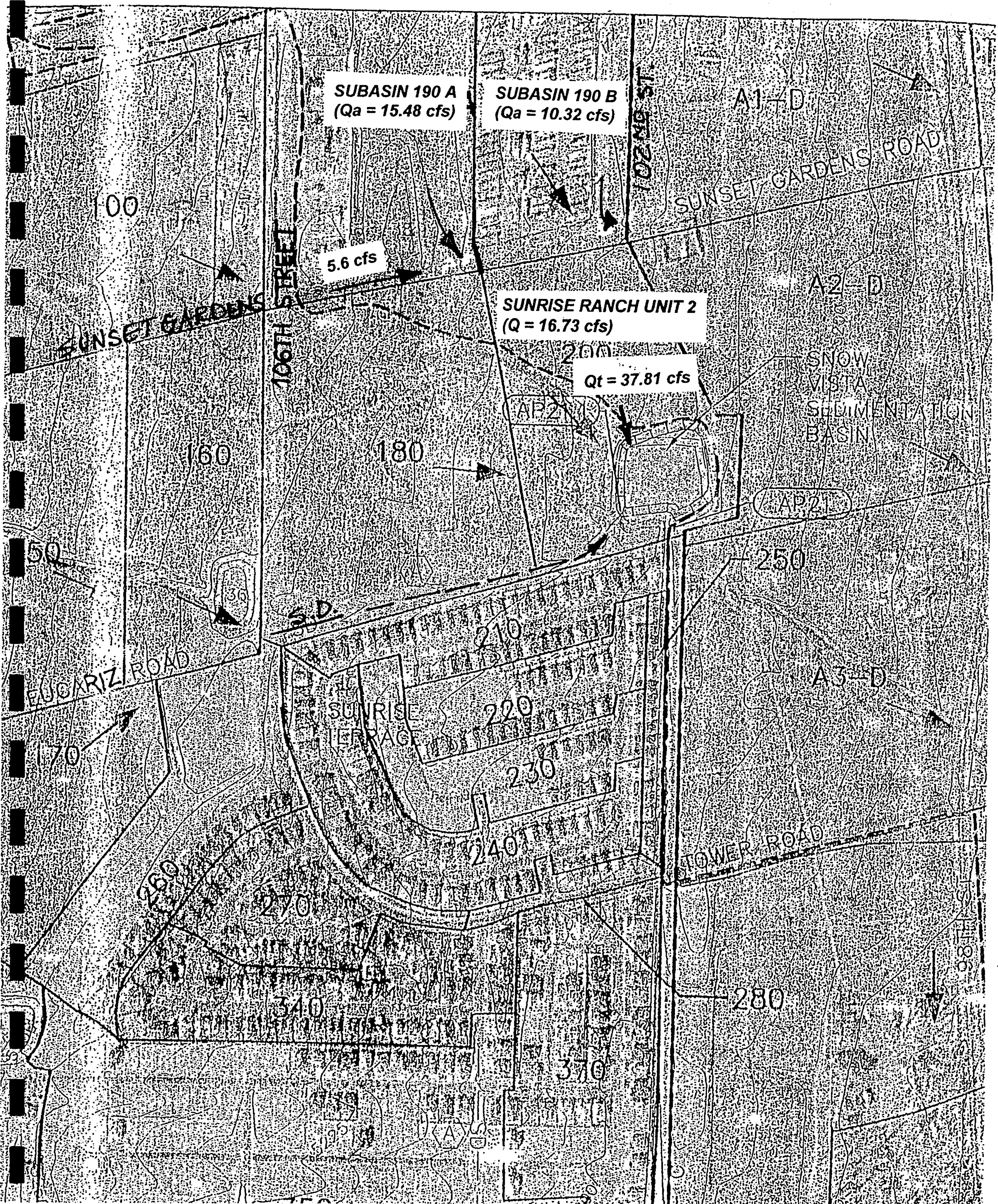
A handwritten signature in black ink, appearing to read "Donald S. Dixon". The signature is fluid and cursive, with the first name "Donald" being the most prominent part.

Donald S. Dixon, PE
Drainage Engineer

Cc: B. Bingham, COA

Appendix A

**SUNRISE RANCH UNIT 2
STORM DRAIN TO SNOW VISTA SEDIMENTATION POND**



SUBBASIN 190 A
($Q_a = 15.48$ cfs)

SUBBASIN 190 B
($Q_a = 10.32$ cfs)

SUNRISE RANCH UNIT 2
($Q = 16.73$ cfs)

$Q_t = 37.81$ cfs

5.6 cfs

SUNRISE TERRACE

SNOW VISTA
SEDIMENTATION
BASIN

A1-D

A2-D

A3-D

106TH STREET

102ND ST

100

160

180

200

210

220

230

240

250

270

340

370

280

EUGARIZ ROAD

TOWER ROAD

S.D.



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch Unit 2

SUBJECT SB 190 A Calcs

BY DLH DATE 11-6-00

CHECKED _____ DATE _____

SHEET _____ OF _____

Flows to Snow Vista Sedimentation Pond via Roundup

SB 190 A = 15.48 cfs (allowable)

* Sunset Gardens = 5.6 cfs
* (106th St - Lasso)

Sunrise Ranch Unit 2 = 16.73 cfs

$Q = 37.81 \text{ cfs}$ (Design Flow to Snow
Vista Sedimentation Pond)

* Sunset Gardens (106th St - Lasso)

1080 LF (60' R/W) = 64,800 SF = .002324 sq. mi

Land Treat D = 75%

Land Treat B = 25%

STREET CAPACITY Q TO DBL 'A' INLETS

15.48 cfs

5.60 cfs

13.50 cfs

34.58 cfs

- 16.60 cfs (INTERCEPTED (2) DBL 'A' INLETS)

17.98 cfs

+ 3.23 cfs

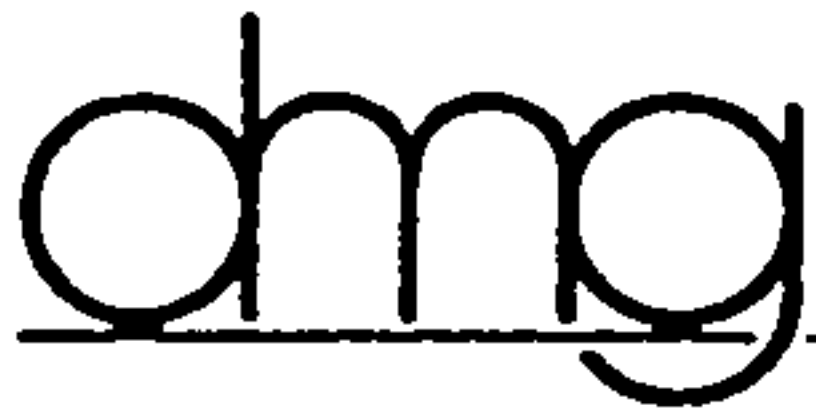
21.21 cfs (TO SUMP INLETS)

TABLE III-3
HYDROLOGIC SUMMARY
SNOW VISTA BASIN
(REVISED 11-6-00)

AP NO.	MAP NO.	DESCRIPTION	VARIABLE	PROPOSED DMP FACILITIES	
				DMP	FUTURE CAPACITY
21.1	4	SNOW VISTA SEDIMENTATION BASIN	Q (cfs) Tvol (AF) Dvol (AF) Runoff (in) cfs/ac	400 51.5 6.3 2.07 1.36	484
21	4	SNOW VISTA CHANNEL AT HEAD	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	372 51.5 2.07 1.25	375
22	4	SNOW VISTA BELOW SECTION LINE JUNCTION	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	726 93 1.97 1.29	810
22.1	4	SNOW VISTA BELOW SAGE CROSSING	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	895 112.1 1.92 1.28	930
22.2	4	SNOW VISTA BELOW INLET FROM WESTGATE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	1012 119.4 1.92 1.36	1050
23	4	SNOW VISTA BELOW BENAVIDES INLET	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2045 165.1 1.88 1.92	2100
24	7	SNOW VISTA AT ENTRANCE TO AMOLE ARROYO	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2065 181.1 1.87 1.77	2100

Appendix B

TEMPORARY 98TH STREET SWALE



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

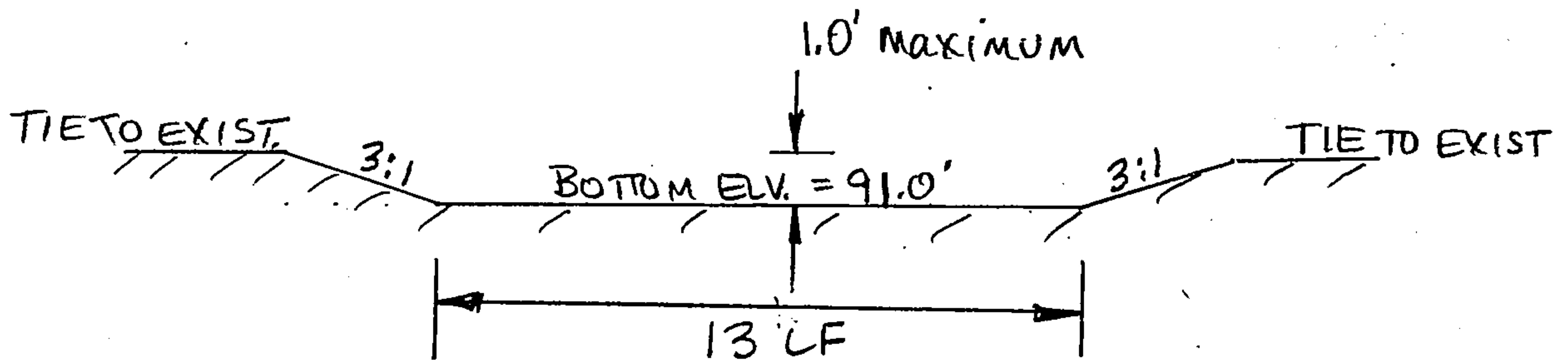
PROJECT Sunrise Ranch
SUBJECT Temporary Swale 98th
BY DLH DATE 11-5-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Sunset Gardens 36' (1420 CF) = 51,120 SF = .00183 sq.mi

AHYMO @ (100) = 4.15 cfs

Volume = .180 Ac Ft (43560) = 7840 CF

$$\frac{7840 \text{ CF}}{500 \text{ LF}} = 15.68 \text{ SF}$$



AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = sun98sw.dat

RUN DATE (MON/DAY/YR) =11/06/2000
USER NO.= M_GOODWN.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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 2.660
COMPUTE NM HYD	101.00	-	1	.00183	4.15	.180	1.84028	1.500	3.547	PER IMP= 66.67
FINISH										

START TIME=0.0
***** SUNRISE RANCH LONGFORD HOMES (L-9)
***** 100-YEAR 24-HOUR STORM EVENT
***** FILE: SUN98SW.DAT APR 2000 BY:DLH
RAINFALL TYPE=2 RAIN QUARTER=0.0 IN
RAIN ONE=1.87 IN RAIN SIX=2.20 IN
RAIN DAY=2.66 IN DT=0.05 HR

***** DEVELOPED CONDITIONS

***** SUBBASIN 1 SUNSET GARDENS TEMPORARY SWALE IN 98TH STREET

COMPUTE NM HYD ID=1 HYD NO=101 AREA=0.00183 SQ MI
PER A=0 PER B=33 PER C=0 PER D=66
TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD ID=1 CODE=1
FINISH

Appendix C
Scour Calculations



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch
SUBJECT Scour Well Calcs
BY DLH DATE 11-6-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Scour Wall Calculations (Q100) (Eqn 3.88 SEDIMENT'S EROSION DESIGN GUIDE)

$$\frac{Y_s}{Y_1} = 4 Fr^{0.33}$$

Fr = upstream Froude No = 1.06

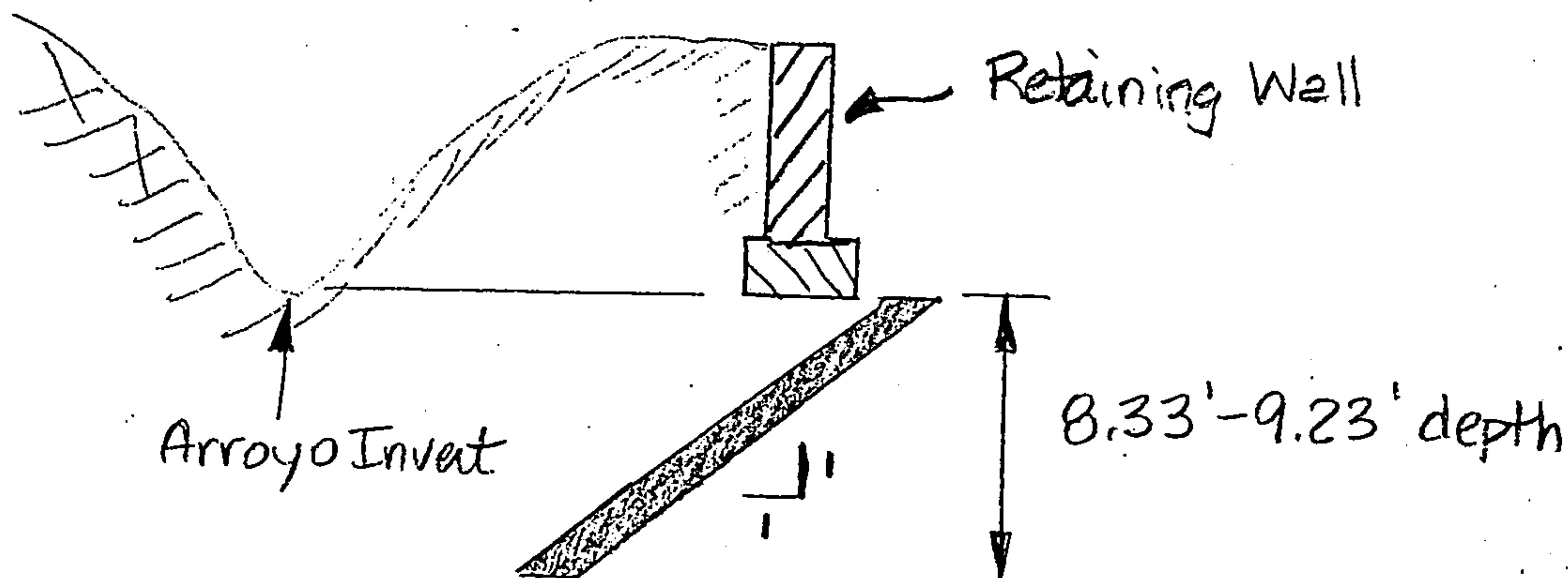
Y₁ = avg. upstr. flow depth = 1.75'

$$Y_s = (1.75) 4 (1.06)^{0.33} = 7.13'$$

	INVERT - Y _s	Scour Well Inv.
CS 1030	121.03 - 7.13'	113.90
CS 1046	121.40 - 7.13' =	114.27
CS 1076	121.80 - 7.13' =	114.67
CS 1102	122.30 - 7.13' =	115.17
CS 1130	122.65 - 7.13' =	115.52

Bkvd Elev - Scour Well Invert = Scour Wall Δ Depth.

CS 1046	123.5 - 114.27 =	9.23'
CS 1076	123.6 - 114.67 =	8.93'
CS 1102	123.5 - 115.17 =	8.33'
CS 1130	123.5 - 115.52 =	7.98'
CS 1030	123.5 - 113.90 =	9.60



Location	Scour Wall Elev.
	TOP BOTTOM
XS 1030	123.5 113.9
XS 1046	123.5 114.27
XS 1076	123.5 114.67
XS 1102	123.5 115.17
XS 1130	123.5 115.52

HEC-RAS Plan: Plan 01 Reach: SUNRISE

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1375	212.00	28.60	31.35	31.91	33.04	0.040021	10.43	20.32	13.47	1.50
1356.75*	212.00	28.20	31.14	31.42	32.29	0.025720	8.61	24.62	15.98	1.22
1338.5*	212.00	27.80	30.62	30.91	31.78	0.026818	8.63	24.56	16.60	1.25
1320.25*	212.00	27.40	30.11	30.39	31.26	0.027243	8.60	24.66	17.13	1.26
1302	212.00	27.00	29.63	29.89	30.74	0.025954	8.43	25.15	17.44	1.24
1285.33*	212.00	26.30	28.61	29.09	30.15	0.040352	9.97	21.27	16.04	1.52
1268.66*	212.00	25.60	27.77	28.29	29.43	0.044626	10.33	20.52	15.85	1.60
1252	212.00	24.90	26.96	27.50	28.69	0.047123	10.53	20.14	15.79	1.64
1235.33*	212.00	24.57	26.78	27.08	27.85	0.032603	8.30	25.55	22.07	1.36
1218.66*	212.00	24.23	26.95		27.39	0.013228	5.35	39.66	33.87	0.87
1202	212.00	23.90	26.61	26.61	27.13	0.018782	5.74	36.95	36.89	1.01
1185.66*	212.00	23.55	25.69	26.01	26.70	0.028494	8.05	26.33	21.49	1.28
1169.33*	212.00	23.20	25.09	25.43	26.20	0.032019	8.44	25.11	20.91	1.36
1153	212.00	22.85	24.58	24.90	25.69	0.032076	8.45	25.10	20.98	1.36
1141.5*	212.00	22.75	24.66	24.79	25.44	0.022620	7.09	29.89	25.09	1.14
1130	212.00	22.65	24.56	24.65	25.26	0.021592	6.73	31.50	27.69	1.11
1116*	212.00	22.47	24.38	24.44	25.00	0.019718	6.32	33.54	30.36	1.06
1102	212.00	22.30	24.18	24.19	24.73	0.018074	5.91	35.89	33.80	1.01
1089*	212.00	22.05	23.71	23.87	24.43	0.027025	6.82	31.08	31.94	1.22
1076	212.00	21.80	23.46	23.54	24.07	0.021752	6.25	33.92	33.80	1.10
1061*	212.00	21.60	23.20	23.24	23.74	0.020291	5.92	35.82	36.79	1.06
1048	212.00	21.40	22.94	22.95	23.46	0.019144	5.82	36.41	36.66	1.03
1030.66*	212.00	21.03	22.74	22.69	23.20	0.015885	5.45	38.89	37.60	0.94
1015.33*	212.00	20.67	22.56		22.97	0.012726	5.17	41.03	36.37	0.86
1000	212.00	20.30	22.15	22.15	22.73	0.017591	6.10	34.75	30.52	1.01

MEMORANDUM

To: AMAFCA Board Members
From: Diane Hoelzer, P.E.
Mark Goodwin & Associates, PA
Subject: Amole-Hubbell Drainage Management Plan
Revised Drainage Subasin 190
Date: November 7, 2000

Under existing conditions, Subasin 190 is part of the Tower-Sage Drainage Basin. (Refer to attached Exhibit). Under developed conditions, subasin 190 was placed in the Snow Vista Basin according to the Amole-Hubbell Drainage Management Plan.

As a result of the existing grades in the area and more specifically the existing low lying area east of the present mobile home park in 102nd street midway between Central Avenue and Sunset Gardens Road, it has been proposed to remove approximately 40 percent of the eastern portion of subasin 190 (subasin 190 B) and make it part of the Tower-Sage Basin 98th street storm drain system. The remaining 60 percent of subasin 190 will remain in the Snow Vista Drainage Basin as shown on the attached exhibit (Subasin 190 A) and will be allowed to drain to the Snow Vista Sedimentation Pond through the currently developing Sunrise Ranch Unit 2 subdivision. The mobile home park site will still be restricted to an allowable discharge rate of 1.29 cfs/acre (10.32 cfs) as was previously determined for subasin 190 as part of the Snow Vista Drainage Basin. This increase in discharge to the Tower-Sage 98th street storm drain system equates to approximately 5.7 cfs at the Eucariz-98th street intersection, an overall increase of approximately 3 percent.

Existing
Basin Boundary

NEW SUBASIN DIVIDE

SUBASIN 190 A

SUBASIN 190 B

Sunrise Ranch Unit 2

SUNRISE RANCH SUBDIVISION

**SNOW VISTA
BASIN**

**TIERRA BAYITA
BASIN**

**TOWER/SAC
BASIN**

114TH STREET

106TH STREET

98TH ST

106 ST

102 ST

**CUERPO
DE**

P1

AP12

110

120

130

150

160

180

200

250

A3-D

A4-D

A2-D

A8-D

A1-D

A1-D

16D

AP3-D

59

A

210

220

230

240

TOWER ROAD

EUCALYPTUS ROAD

CENTRAL AVE

SUNSET GARDENS ROAD

300

170

210

220

230

240

250

260

270

280

290

300

310

320

330

340

350

360

370

380

390

400

410

420

430

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990

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1010

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1030

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1080

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1190

1200

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1220

1230

1240

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2100

2110

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2140

2150

2160

2170

2180

2190

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2210

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2230

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2990

3000

3010

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3040

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3060

3070

3080

3090

3100

3110

1
HYDRAULIC REPORT FOR
0

SUNRISE RANCH

STORM DRAIN ANALYSIS

OUTFALL TO SNOW VISTA

SEDIMENTATION POND

INITIAL HGL =114.6

NOVEMBER 2000

MARK GOODWIN & ASSOCIATES

DLH

LINE 1 / Q = 37.8 / HT = 30 / WID = 30 / N = .013 / L = 42 / JLC = .1

OUTFALL-MH43 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	114.60	30.00	111.00	7.70	115.52	0.00	6.5	4.91
UPSTRM	114.96	30.00	111.81	7.70	115.88	0.00	4.88	4.91

Drainage area (ac)	=	0	Slope of invert (%)	=	1.929
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.850
Time of conc (min)	=	1	Critical depth (in)	=	24.65
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	37.8	Confluence angle (deg)	=	0
Default Q (cfs)	=	37.81	Natural ground elev (ft)	=	119.2
Line capac. (cfs)	=	57.0	Line storage (cuft)	=	206

LINE 2 / Q = 37.8 / HT = 30 / WID = 30 / N = .013 / L = 176.04 / JLC = .1

MH43-MH44 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	115.05	30.00	111.81	7.70	115.97	0.00	4.88	4.91
UPSTRM	116.55	30.00	113.02	7.70	117.47	0.00	2.63	4.91

Drainage area (ac)	=	0	Slope of invert (%)	=	0.687
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.850
Time of conc (min)	=	0	Critical depth (in)	=	24.65
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	37.8	Confluence angle (deg)	=	20
Default Q (cfs)	=	37.81	Natural ground elev (ft)	=	118.15
Line capac. (cfs)	=	34.0	Line storage (cuft)	=	864

LINE 3 / Q = 21.2 / HT = 24 / WID = 24 / N = .013 / L = 9.422 / JLC = .1

 MH44-INL11 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.64	24.00	113.52	6.75	117.35	0.00	2.63	3.14
UPSTRM	116.72	24.00	113.66	6.75	117.43	0.00	2.1	3.14

Drainage area (ac)	=	0	Slope of invert (%)	=	1.486
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.880
Time of conc (min)	=	0	Critical depth (in)	=	19.57
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	21.2	Confluence angle (deg)	=	40
Default Q (cfs)	=	21.21	Natural ground elev (ft)	=	117.77
Line capac. (cfs)	=	27.6	Line storage (cuft)	=	30

LINE 4 / Q = 21.2 / HT = 18 / WID = 18 / N = .013 / L = 7 / JLC = .1

INL#11-INL#12 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.79	18.00	114.16	12.00	119.03	0.00	2.1	1.77
UPSTRM	117.30	18.00	114.27	12.00	119.54	0.00	2.25	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.571
Runoff coefficient	=	0	Slope energy grade line (%)	=	7.276
Time of conc (min)	=	0	Critical depth (in)	=	17.84
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	21.2	Confluence angle (deg)	=	-45
Default Q (cfs)	=	21.21	Natural ground elev (ft)	=	118.02
Line capac. (cfs)	=	13.2	Line storage (cuft)	=	12

LINE 5 / Q = 16.6 / HT = 18 / WID = 18 / N = .013 / L = 48.57 / JLC = .1

MH#44-MH#45 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.64	18.00	114.02	9.40	118.01	0.00	2.63	1.77
UPSTRM	117.85	18.00	114.90	9.39	119.22	0.00	2.54	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.812
Runoff coefficient	=	0	Slope energy grade line (%)	=	2.499
Time of conc (min)	=	0	Critical depth (in)	=	17.32
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	16.6	Confluence angle (deg)	=	-15
Default Q (cfs)	=	16.6	Natural ground elev (ft)	=	118.95
Line capac. (cfs)	=	14.1	Line storage (cuft)	=	86

LINE 6 / Q = 8.3 / HT = 18 / WID = 18 / N = .013 / L = 19.71 / JLC = .1

MH#45-INL#14 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	117.99	18.00	114.90	4.70	118.33	0.00	2.54	1.77
UPSTRM	118.15	18.00	115.26	4.70	118.49	0.00	2.5	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.826
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.799
Time of conc (min)	=	0	Critical depth (in)	=	13.19
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	8.3	Confluence angle (deg)	=	-15
Default Q (cfs)	=	8.3	Natural ground elev (ft)	=	119.26
Line capac. (cfs)	=	14.2	Line storage (cuft)	=	35

LINE 7 / Q = 8.3 / HT = 18 / WID = 18 / N = .013 / L = 16.64 / JLC = 0

MH#45-INL#13 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	117.99	18.00	114.90	4.70	118.33	0.00	2.54	1.77
UPSTRM	118.09	18.00	115.12	4.70	118.44	0.00	2.5	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.322
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.625
Time of conc (min)	=	0	Critical depth (in)	=	13.19
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	8.3	Confluence angle (deg)	=	75
Default Q (cfs)	=	8.3	Natural ground elev (ft)	=	119.12
Line capac. (cfs)	=	12.1	Line storage (cuft)	=	29

```

1*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 11/ 6/ 0 TIME 17:31:24
*****

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*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748
*****

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      X   X  XXXXXXX  XXXXX
      X   X  X      X   X
      X   X  X      X
      XXXXXX XXXX   X   XXXXX XXXXX
      X   X  X      X
      X   X  X      X   X
      X   X  XXXXXXX  XXXXX

```

END OF BANNER

THIS RUN EXECUTED 11/ 6/ 0 17:31:24

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

T1 SUNRISE RANCH UNIT 2 STREET CAPACITY (44' ROW)
T2 26'FF W/ STANDARD CURB (Roundup)
T3 Double Type 'A' Inlet

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.03464	0	0	0	0	0

J3	VARIABLE CODES FOR SUMMARY PRINTOUT									
	38	43	1	2	26	4	68	3		

NC	.017	.017	.017	.1	.3					
QT	1	34.58								
X1	1	9	0	44	0	0	0	0	0	0
GR	.85	0	.67	8.9	0	9	.125	11	.345	23
GR	.125	33	0	35	.67	35.1	.85	44		

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.43	.43	.59	.00	.97	.54	.00	.00	.85
35.	0.	35.	0.	0.	6.	0.	0.	0.	.85
.00	.00	5.89	.00	.000	.017	.000	.000	.00	8.94
.034618	0.	0.	0.	0	11	5	.00	26.13	35.06

THIS RUN EXECUTED 11/ 6/ 0 17:31:24

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Double Type 'A' Inlet

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	34.58	.43	.59	5.89	26.13	2.19	.97

11/ 6/ 0 17:31:24

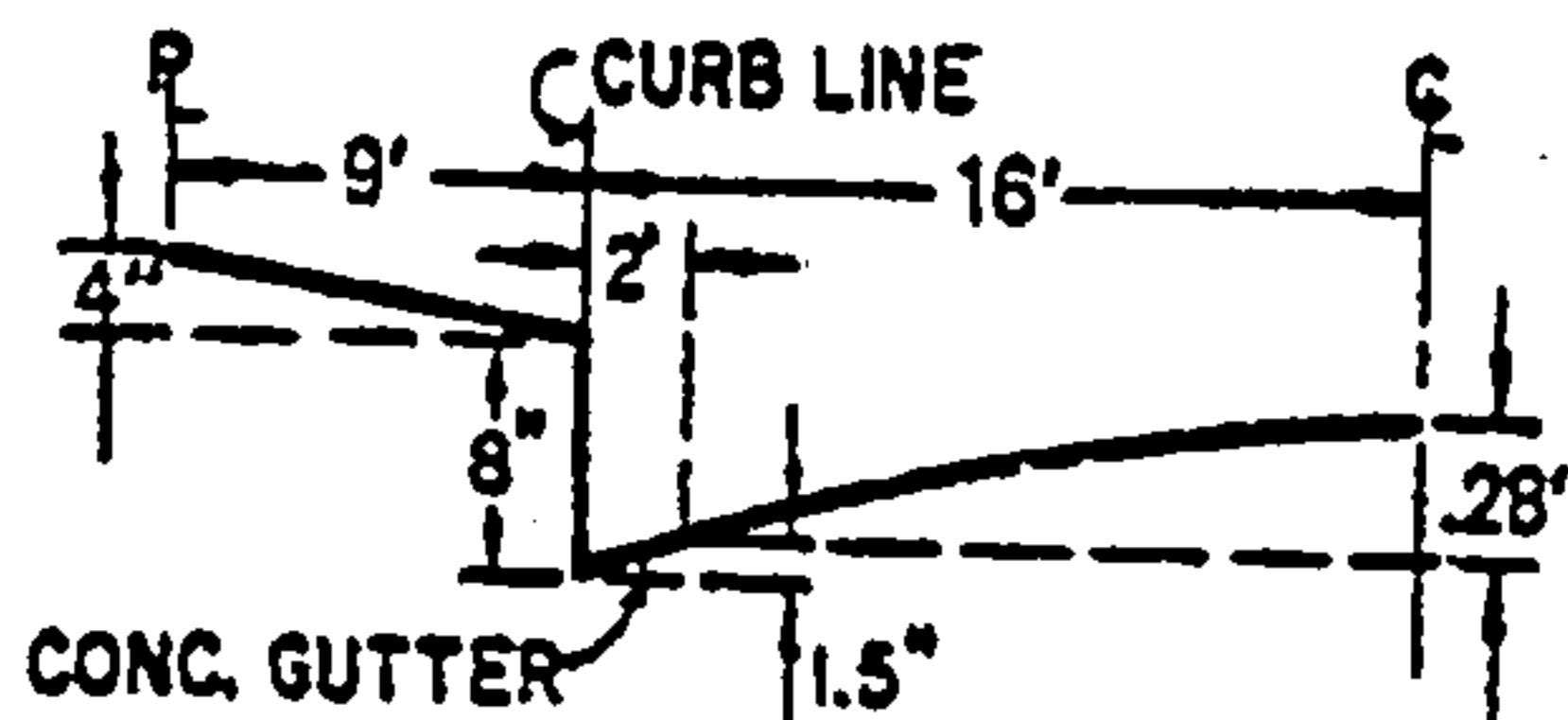
PAGE 4

SUMMARY OF ERRORS AND SPECIAL NOTES

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION (ABOVE BASIN)

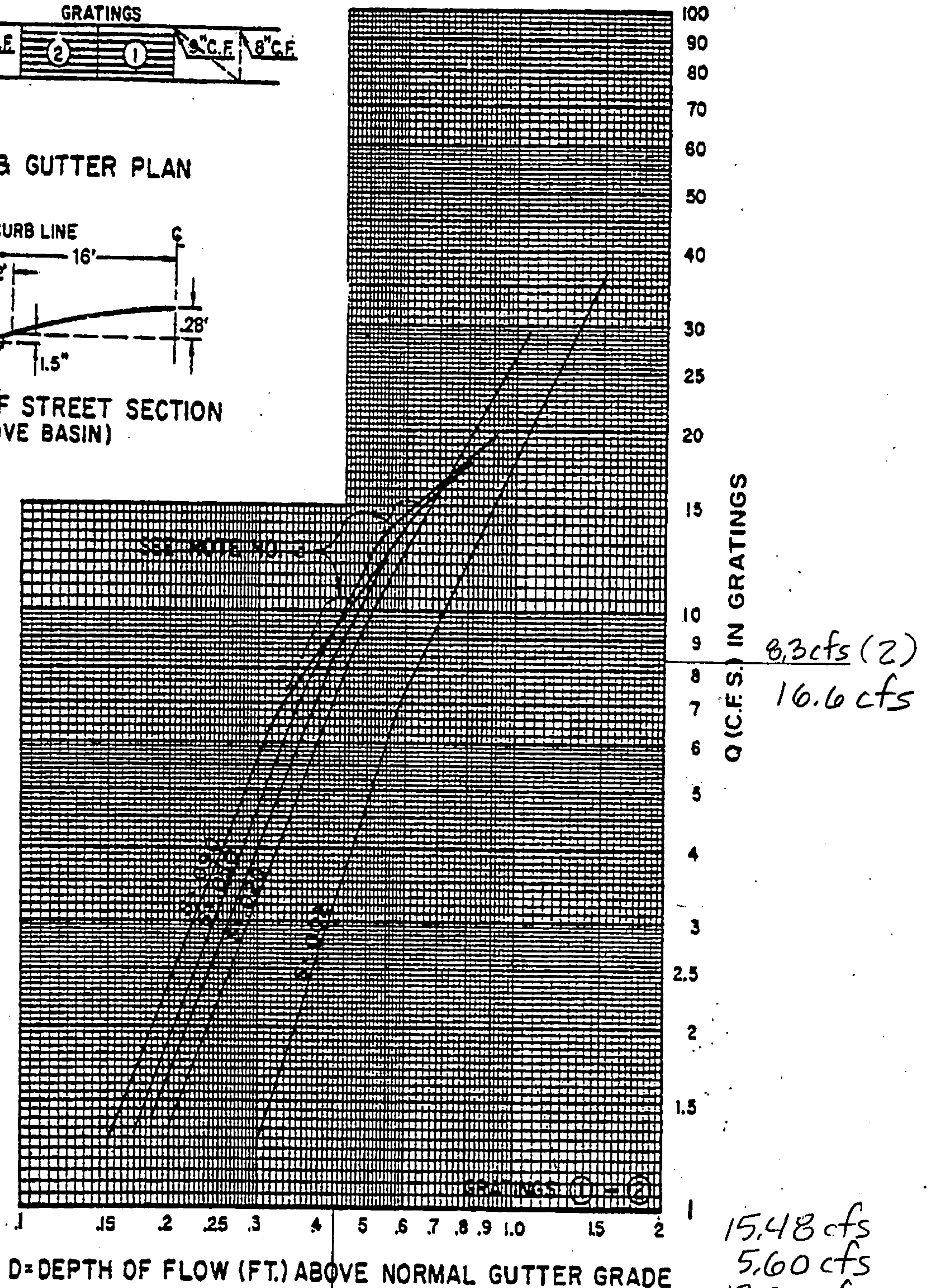


PLATE 22.3 D-6

Q = 34.58
0.43'

TO SUMP
INLETS

21.21 cfs

CALCULATIONS FOR SUMP INLETS
for
Sunrise Ranch Unit 2

Capacity is measured by the weir equation at the lip of the gutter assuming an allowable ponding elevation equal to the lowest adjacent right of way elevation. The length of the double grate facing the street is 6.5' and the maximum depth is 0.725' at the lip of the gutter. The sides are each 2' long and the average depth is 0.892'. These depths assume an 8" curb with right of way 9' behind the curb for an additional depth of 0.18' above the top of curb. From the weir equation:

Roundup Culdesac sump inlets:

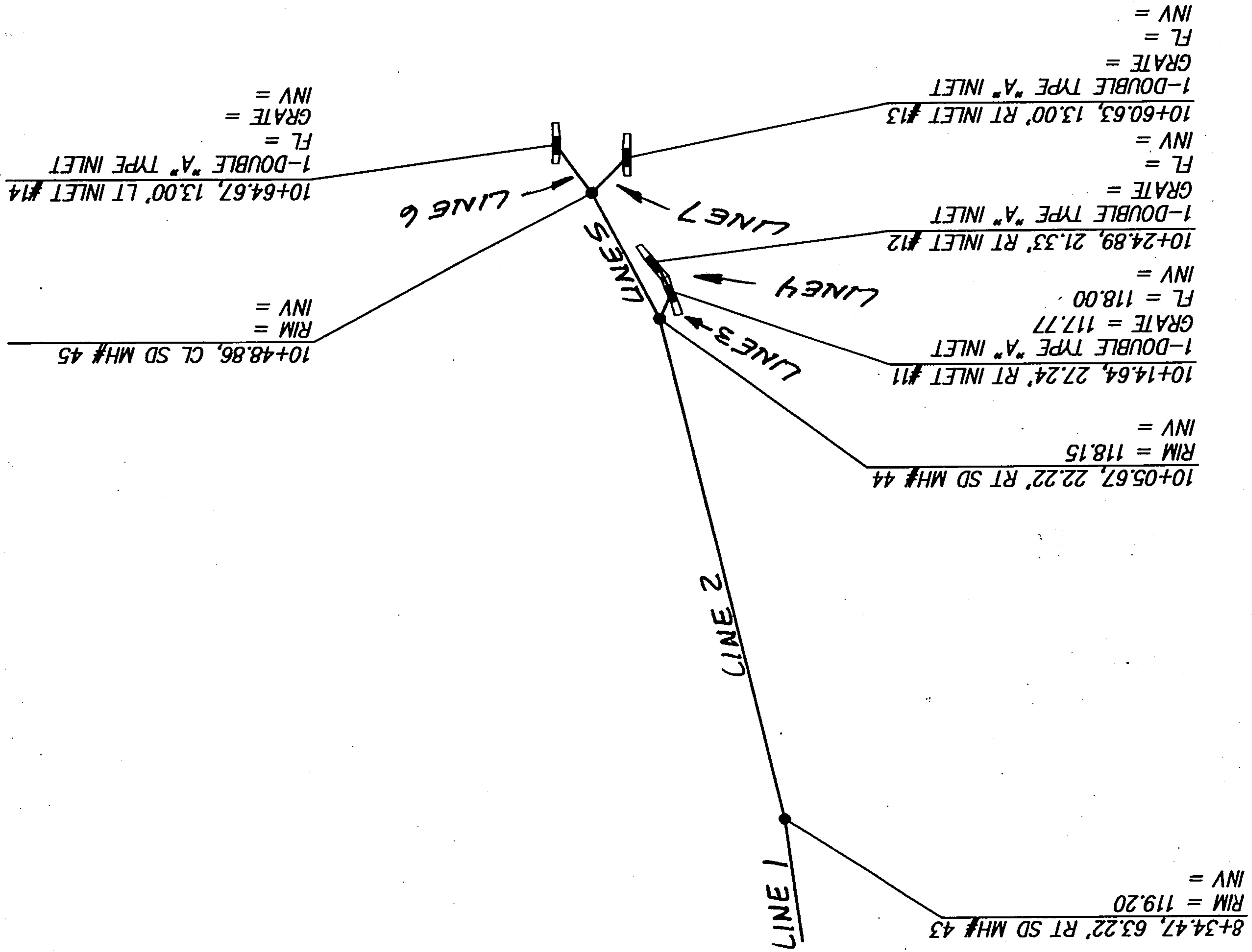
For a double 'C' type inlet

Front Q cap = $(3.0) \times (6.5') \times (0.725) **1.5 = 12.04 \text{ cfs}$

Sides Q cap = $(3.0) \times (4.0') \times (0.892) **1.5 = 10.11 \text{ cfs}$

Total Q cap = $12.04 \text{ cfs} + 10.11 \text{ cfs} = 22.15 \text{ cfs}$

The 100 year flow to the sump 21.21 cfs. Since no overflow is provided to the Snow Vista Pond the sump inlets are designed for at minimum 2 times the flow or 42.42 cfs. Two double 'C' type inlet has a capacity of 44.30 cfs.





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 24, 2001

Diane Holzer, P.E.
Mark Goodwin & Associates
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: **Grading and Drainage Certification**
Sunrise Ranch Subdivision Unit 1 (L-9/D6)
Submitted for Release of Financial Guaranty
Engineers Stamp dated 6/23/2000
Engineer's Certification dated 5/17/2001

Dear Ms. Holzer:

Based upon the information provided in your submittal dated May 17, 2001, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for Release of Financial Guaranty.

If you have any questions, please call me at 924-3981.

Sincerely,

Bradley L. Brigham
For Teresa A. Martin
Hydrology Plan Checker
Public Works Department

C: Arlene Portillo, PWD -- #645181
✓ File



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 16, 2002

Diane Hoelzer, P.E.
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: **SUNRISE RANCH UNIT 2 (L-9/D6)**
Engineers Certification For Release of Financial Guaranty
Engineers Stamp dated 11/16/2000
Engineer's Certification dated 1/14/2002

Dear Ms. Hoelzer:

Based upon the information provided in your submittal dated 1/14/2002, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for release of financial guaranty for the above mentioned project.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin

Hydrology Plan Checker

Public Works Department

BUB

C: Arlene Portillo, PWD - #645281
File

190
Sunrise Ranch, Unit 1

AGREEMENT AND COVENANT

(8/25/00)

#645181

L-09/D006

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and 98th Street Ltd., Co., ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at west of 98th St., north of Eucariz Road, in Albuquerque, New Mexico, and more particularly described as: (give legal description and filing information)

Tract A, Lands of Capital Investors, recorded in the office of the County Clerk of Bernalillo County, New Mexico on January 7, 1988, Volume C35, Folio 117.

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as:

Tract B, Temporary Public Drainage Easement, recorded in the office of the County Clerk of Bernalillo County, New Mexico on 1/7/88, Vol C35 Folio 117.

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

Temporary retention pond with temporary asphalt rundown and storm drain

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

Exhibit B is the plat with legal description of temporary public drainage easement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.



3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in accordance with standards required by the City as per the approved Grading and Drainage Plan L9/D6 on file at the City Engineer's office. The User will be solely responsible for paying all related costs. The User will be solely responsible for paying all related costs. The User will not permit the Improvement to constitute a hazard to the health or safety of the general public or to interfere with the City's use of the City's Property. The User will conform with all applicable laws, ordinances and regulations.

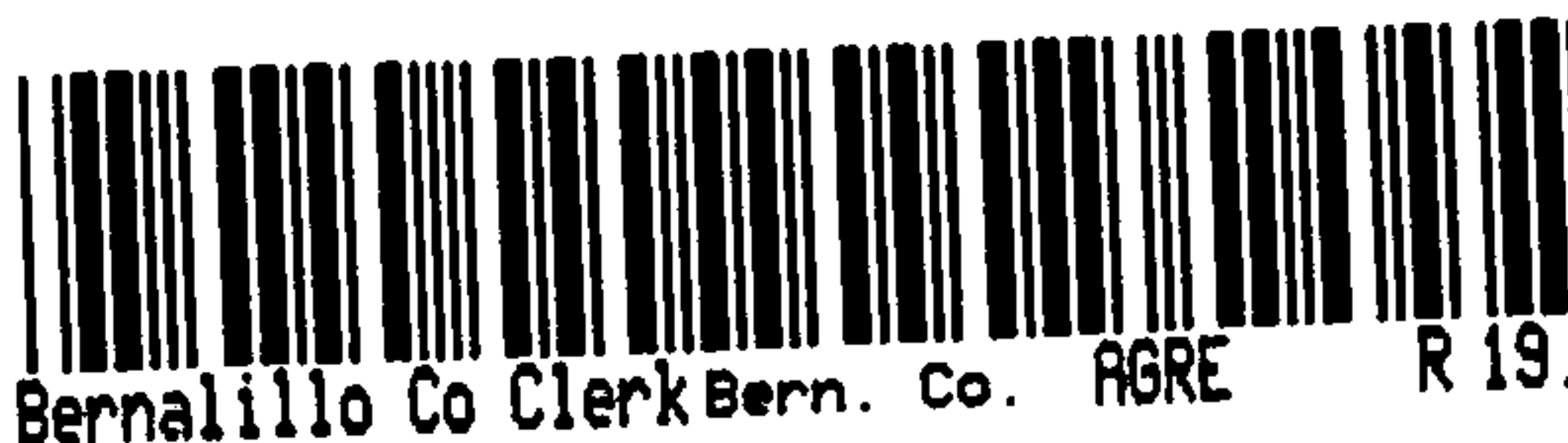
4. Use of the Improvement. If the City's Property is a public right-of-way, it shall be open to the use of the general public at all times, subject to reasonable curtailment during periods of construction, maintenance or repair.

5. Demand for Repair, Modification or Removal. The City may send written notice ("Notice") to the User requiring the User to repair, modify or remove the Improvement within 30 days ("Deadline") and the User will comply promptly with the requirements of the Notice. If removal is demanded, the City also may require the User to return the City's Property to its original condition by the Deadline. The User will perform all required work by the Deadline, at User's sole expense.

6. Failure to Perform by User and Emergency Work by City. If the User fails to comply with the terms of the Notice by the Deadline stated, or, if the City determines that an emergency condition exists, the City may perform the work itself. The City then may assess the User for the cost of the work and for any other expenses or damages which result from User's failure to perform. The User agrees promptly to pay the City the amount assessed. If the User fails to pay the City within thirty (30) days after the City gives the User written notice of the amount due, the City may impose a lien against User's Property for the total resulting amount.

7. Cancellation of Agreement and Release of Covenant. This Agreement may be canceled, and User's covenants released by the City at will by the City's mailing to the User notice of the City's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release will be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or the Cancellation and Release. After the effective date, the City will record the Cancellation and Release with the Bernalillo County Clerk.

8. Condemnation. If any part of the User's Property is ever condemned by the City, the User will forego all claims to compensation for any portion of User's structure which encroaches on City Property and for severance damage to the remaining portion of User's structure on User's Property.



9. Assessment. Nothing in this Agreement shall be construed to relieve the User, his heirs, assigns and successors from an assessment against User's Property for improvements to the City Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Improvement will not reduce the amount assessed by the City.

10. Notice. For purposes of giving formal written notice to the User, User's address is:

98th Street Ltd., Co. LLC
7301 Jefferson NE, Suite H
Albuquerque, NM 87190-0647

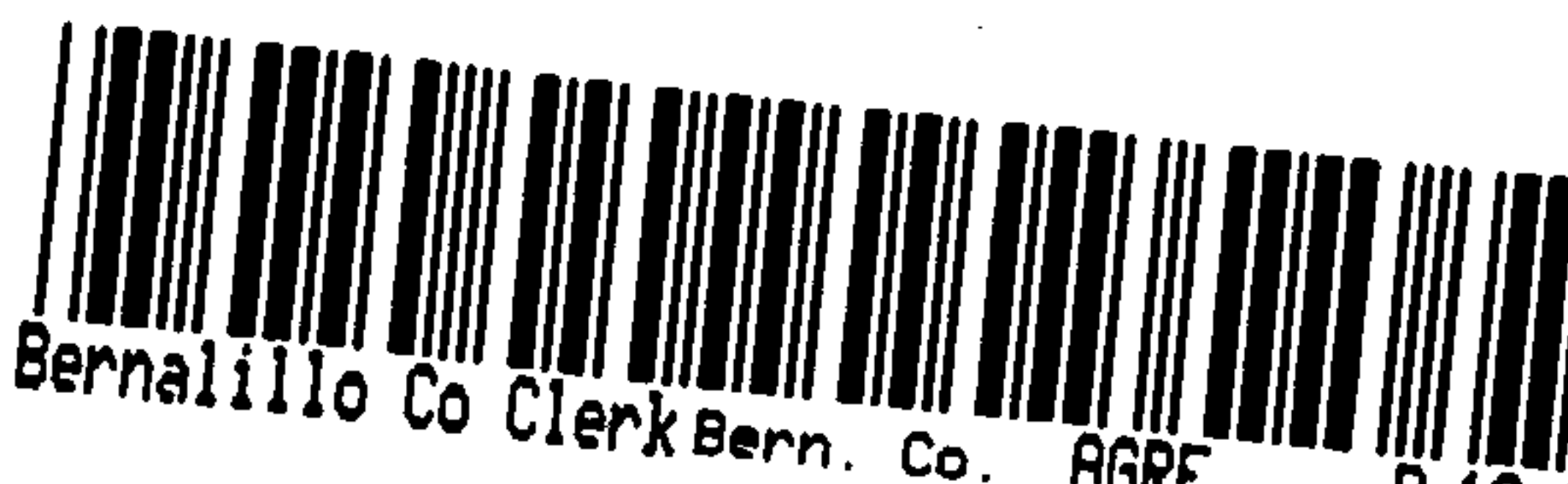
Notice may be given to the User either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the User within 3 days after the notice is mailed if there is no actual evidence of receipt. The User may change User's address by giving written notice of the change by certified mail, return receipt requested, to the City Engineer at P.O. Box 1293, Albuquerque, New Mexico 87103.

11. Indemnification. The User agrees to defend, indemnify and hold harmless the City, its officials, agents and employees from and against any and all claims, actions, suits or proceedings of any kind brought against said parties as a result of User's use of the City's Property. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

12. Term. This Agreement shall continue until revoked by the City pursuant to Section 7 above.

13. Binding on User's Property. The covenants and obligations of the User set forth herein shall be binding on User, his heirs assigns and successors and on User's Property and constitute covenants running with User's Property until released by the City.

14. Entire Agreement. This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.



15. Changes of Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder of the Agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

CITY OF ALBUQUERQUE:

USER: 98th Street Ltd., Co. LLC

By: [Signature]
Chief Administrative Officer

By: [Signature]
Title: Vice President

Dated: 8-25-00

Dated: 8/8/00

APPROVED:

[Signature] 8/25/00
Director, Public Works Dept.

Reviewed by:

[Signature] 8/25/00
City Engineer
8-14-00
KLE 8/23/00

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)

) ss

COUNTY OF BERNALILLO)

This instrument was acknowledged before me on August 25, ~~1999~~ 2000, by Fred J. Aguirre for Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

[Signature]
Notary Public

My Commission Expires:

11-15-2003



USER'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on AUGUST 8,
~~20~~ 2000, by Paul White Jr., Vice President, on behalf of 98th Street Ltd., Co., LLC

Susan Barror

Notary Public

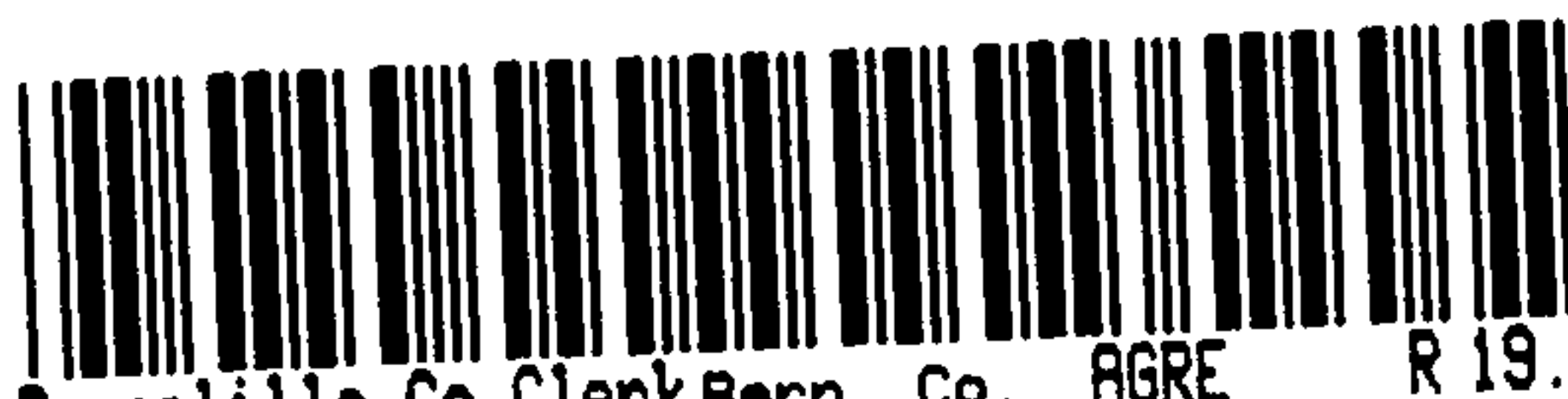
My Commission Expires:

9-3-2000



OFFICIAL SEAL
SUSAN BARROR
NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 9-3-00



Bernalillo Co Clerk Bern. Co. AGRE

R 19.00

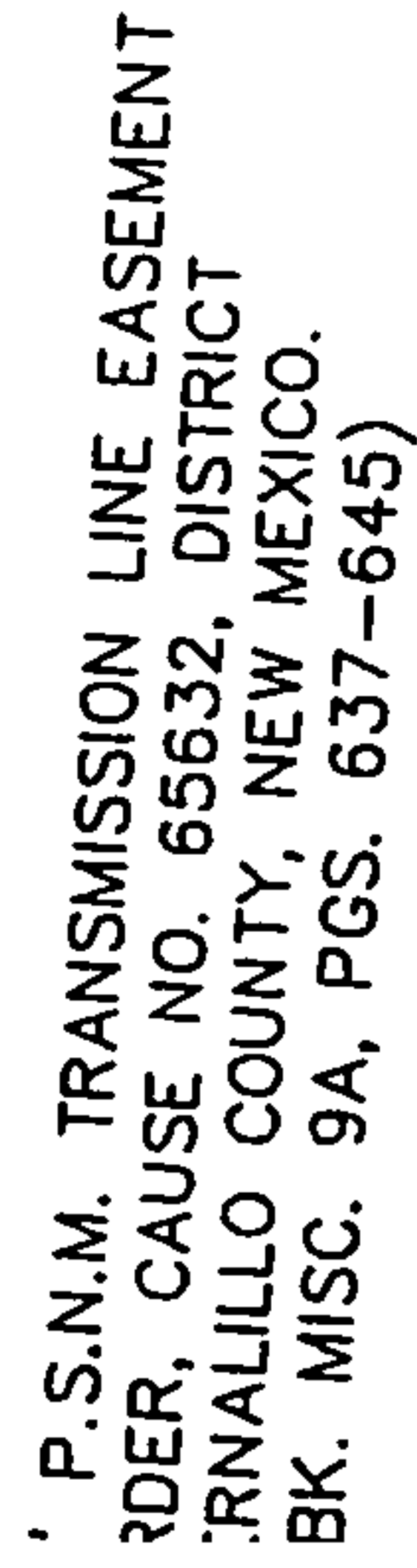
2000084971
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Page: 5 of 7
08/29/2000 11:34A
Bk-A9 Pg-4635



Bernalillo Co Clerk Bern. Co. AGRE R 19.00 Bk-A9 Pg-4635

RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR

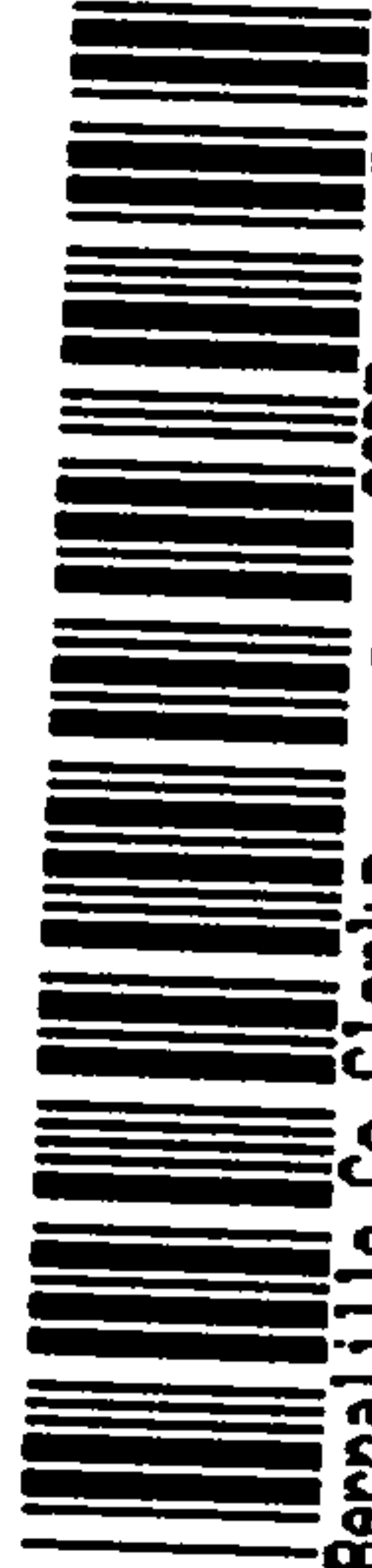
5TH STREET S.W.



71992 SF
4112 AC

49"W (60' R/W)

EUCARIZ



5406389

08/29/2000 11:34A

Bk-A9 Pg-4635

Bernalillo Co Clerk Born. Co. AGRE

R 19.00

ר' יצחק יצחקי

CONTRACT CONTROL FORM

PRELIMINARY REVIEW

Contact Person Tammi
Phone No. 924-3997

Project # 645181
CCN# 200 100279
~~New~~ or Ext. #

Type of Agreement: ANCEMENT + COVENANT

Description/Project Name: SUNRISE ROAD UNIT 1
Public Works Dept./Div.: Project Review Section
Developer: 98th STREET LTD. CO.

Contract Amount \$ 0
Contract Amount \$
Contract Amount \$

SIA Contract Period: 8-25-00 Perman.
SIA Contract Period: -
S/W Contract Period: -

DRAFT CONTRACT:

Rec'd by Legal: Rejected/Returned to Dept.: 8/15/00, WJE
Returned to Legal: 8/16/00 WJE Approved: Initials:

FINANCIAL GUARANTY:

Letter of Credit No.: Date: Attached: Yes No Initial
Other: Type Date: Attached: Yes No Initial

FINAL CONTRACT REVIEW

APPROVALS REQUIRED:

	<u>Date Delivered</u>	<u>Returned to Dept.</u>	<u>Approved By</u>	<u>Approval Date</u>
Utility Div				
Hydrology Div	<u>8-10-00</u> <u>WJE</u>		<u>BLB</u>	<u>8/10/00</u>
Transportation Div				
DRC Chairman				
Legal Dept	<u>8-15-00</u> <u>WJE</u>		<u>WJE</u>	<u>8/23/00</u>
City Engineer				
PWD Director				
Finance				
City Clerk				
CAO				

DISTRIBUTION:

	<u>Date:</u>	<u>By:</u>
User Department.	<u>8-28-00</u>	<u>WJE</u>
Vendor		
City Clerk	<u>9-7-00</u>	<u>film</u>
Treasury		
Other: <u></u>		

900
645781
TEMPORARY PUBLIC DRAINAGE EASEMENT

(8-31-00) 106TH STREET PARTNERS, LTD.
THIS GRANT OF TEMPORARY EASEMENT, by and between ~~Joseph Badet~~
("Grantor"), whose address is PO Box 1669, Cedar Crest, NM 87008, and the City of
Albuquerque, a New Mexico Municipal Corporation ("City"), whose address is P.O. Box 1293,
Albuquerque, NM 87103.

as shown on exhibit 'A' 8/30/00
1. **Grant of Temporary Public Drainage Easement.** The Grantor grants to the City an
exclusive, temporary public drainage easement ("Easement"), for a storm drain system
("Public Improvement"), on, over, across, and through the property described below ("Property"),
together with the right of the City to operate, maintain, repair, replace and construct the Public
Improvement and the right to remove trees, bushes, undergrowth and any other obstacles upon the
Property if the City determines they interfere with the appropriate use of this Easement. The Property
is described as follows:

Lot 2, Block 9, The Lands of Atrisco Grant
Filed in Bernalillo County Clerk's office 3/26/62, Book D3, Folio 26

2. **Warranties.** Grantor covenants and warrants that it is the owner in fee simple of the
Property and that it has a good lawful right to convey the Property or any part thereof and that Grantor
will forever warrant and defend the title to the Property against all claims from all persons or entities.

3. **Binding on Grantor's Property.** The grant and other provisions of this Easement
constitute covenants running with title to the Property for the benefit of the City and its successors and
assigns until terminated.

4. **Temporary.** This easement will be released by the City when the City Engineer
determines that the Easement is no longer required.

WITNESS my hand and seal this 30th day of August, 2000.

GRANTOR: [Signature]

BY: 106TH STREET PARTNERS, LTD

ITS: [Signature]

STATE OF NEW MEXICO)
) SS
COUNTY OF BERNALILLO)

This instrument was acknowledged before me this 30th day of AUGUST, 2000
by JOSEPH L. BADET, its GENERAL PARTNER,
on behalf of 106TH STREET PARTNERS, LTD.

BY: [Signature]

NOTARY PUBLIC

My Commission Expires:

6-19-04



2000088526
5409969
Page: 1 of 2
09/07/2000 10:07R
Bk-A9 Pg-8172

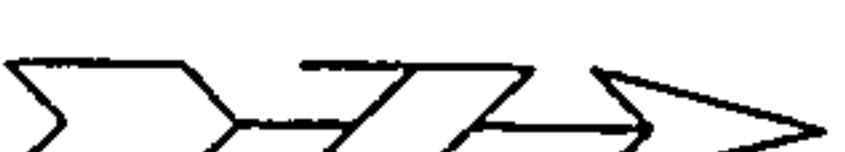
EXHIBIT FOR

20' TEMPORARY PUBLIC DRAINAGE EASEMENT



2000088526
548869
Page: 2 of 2
09/07/2009 10:07A
Bk-A9 Pg-8172

LINE	DIRECTION	DISTANCE
L1	S00°17'50"W	285.00'
L2	N48°34'02"W	26.55'
L3	N00°17'50"E	262.06'
L4	N75°00'30"E	20.73'



SCALE: 1" = 50'

DESCRIPTION

A 20' Temporary Public Drainage Easement within the Town of Atrisco Grant, projected Section 29, Township 10 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being within LOT 2, BLOCK 9, THE LANDS OF ATRISCO GRANT as the same is shown and designated on said plat filed for record in the office of the County Clerk of Bernalillo County, New Mexico on March 26, 1962 in Volume D3, Folio 26 and being more particularly described as follows:

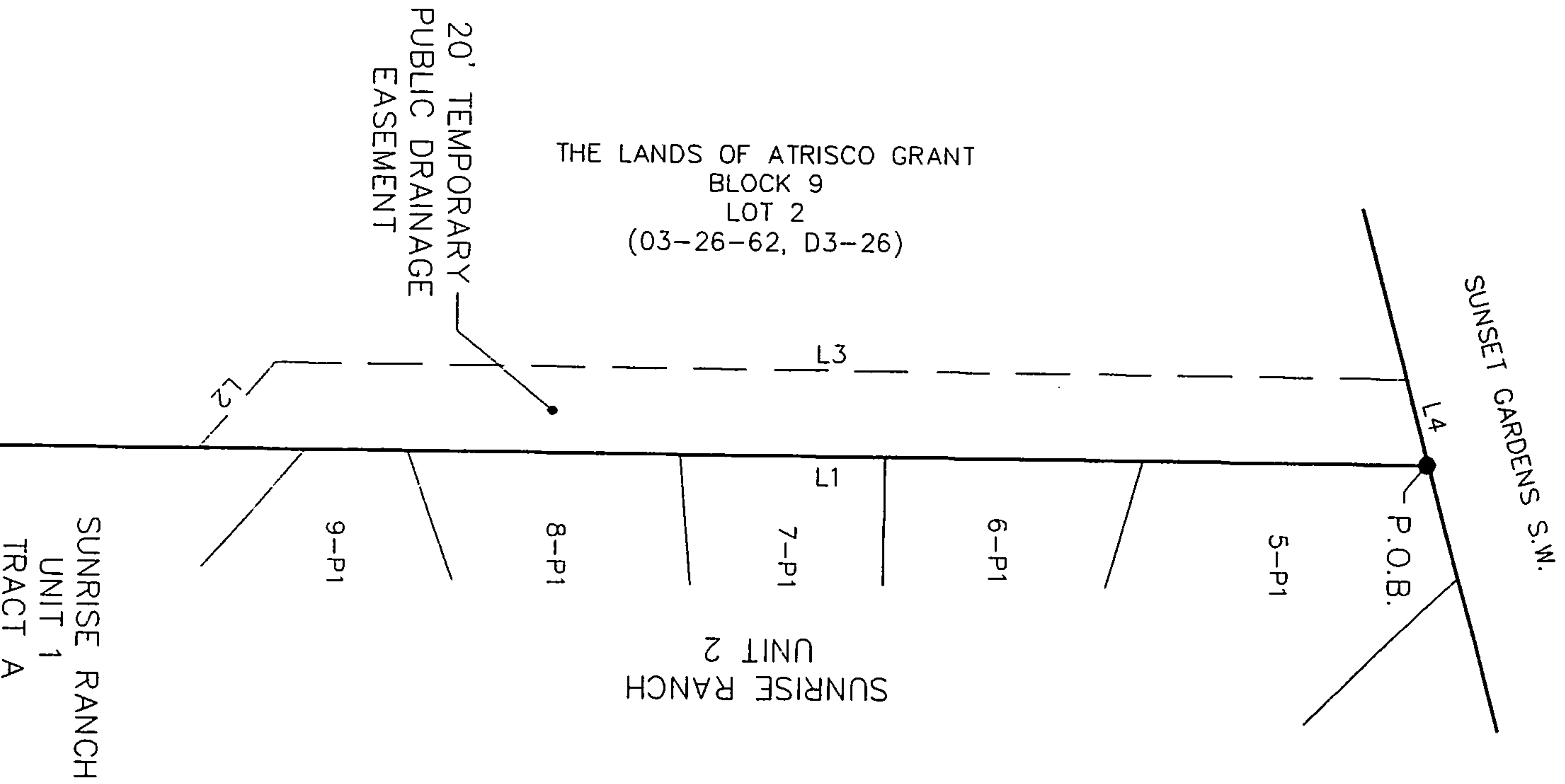
BEGINNING at the northeast corner of the herein described easement, said point being on the southerly right-of-way line of Sunset Gardens S.W. from whence the Albuquerque Control Survey Monument "9-L9" bears S 74°26'26" E, 1613.33 feet;

THENCE leaving said southerly right-of-way line S 00°17'50" W, 285.00 feet to the southeast corner;

THENCE N 48°34'02" W, 26.55 feet to the southwest corner;

THENCE N 00°17'50" E, 262.06 feet to the northwest corner, said point being on said southerly right-of-way line of Sunset Gardens S.W.;

THENCE along said southerly right-of-way line N 75°00'30" E, 20.73 feet to the point of beginning and containing 0.1256 acres more or less.



Timothy Allen

08-18-00

1716

EXHIBIT "A"

5/30/00
J.V.B.

CONTRACT CONTROL FORM

PRELIMINARY REVIEW

Contact Person Tetuli
Phone No. 924-3997

Project # 645181
CCN# 200100279
~~New or~~ Ext. #

Type of Agreement: Temporary Public Drainage easement

Description/Project Name: SUNRISE RANCH UNIT 1
Public Works Dept./Div.: Project Review Section
Developer: 106TH STREET AND PARTNERS LTD.
Contract Amount \$ 0 SIA Contract Period: 8-31-00 - Perm
Contract Amount \$ SIA Contract Period: -
Contract Amount \$ S/W Contract Period: -

DRAFT CONTRACT:

Rec'd by Legal: Rejected/Returned to Dept.: /
Returned to Legal: / Approved: Initials:

FINANCIAL GUARANTY:

Letter of Credit No.: Date: Attached: Yes No Initial
Other: Type Date: Attached: Yes No Initial

FINAL CONTRACT REVIEW

APPROVALS REQUIRED:

	Date Delivered	Returned to Dept.	Approved By	Approval Date
Utility Div	<u>8-30-00</u>	<u></u>	<u>BLB</u>	<u>8/31/00</u>
Hydrology Div	<u>8-31-00</u>	<u></u>	<u></u>	<u>8/31/00</u>
Transportation Div	<u>8-31-00</u>	<u></u>	<u></u>	<u>8/31/00</u>
DRC Chairman	<u>8-31-00</u>	<u></u>	<u></u>	<u>8/31/00</u>
Legal Dept	<u>8-31-00</u>	<u></u>	<u></u>	<u>8/31/00</u>
City Engineer	<u>8-31-00</u>	<u></u>	<u></u>	<u>8/31/00</u>
PWD Director	<u></u>	<u></u>	<u></u>	<u></u>
Finance	<u></u>	<u></u>	<u></u>	<u></u>
City Clerk	<u></u>	<u></u>	<u></u>	<u></u>
CAO	<u></u>	<u></u>	<u></u>	<u></u>

DISTRIBUTION:

	Date:	By:
User Department.	<u>9-1-00</u>	<u></u>
Vendor	<u></u>	<u></u>
City Clerk	<u>9/15/00</u>	<u></u>
Treasury	<u></u>	<u></u>
Other: <u></u>	<u></u>	<u></u>



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 4, 2001

Diane Hoelzer, P.E.
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: **SUNRISE RANCH UNIT 4** (L-9/D6)
Engineers Certification For Release of Financial Guaranty
Engineers Stamp dated 2/27/2001
Engineer's Certification dated 11/20/2001

Dear Ms. Hoelzer:

Based upon the information provided in your submittal dated 11/20/2001, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for release of financial guaranty for the above mentioned project.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Public Works Department
BWB

C: Arlene Portillo, PWD - #654381
File



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 5, 2002

Amy Driscoll, PE
Mark Goodwin & Associates
PO Box 90606
Albuquerque, NM 87199

**Re: Sunrise Ranch Subdivision, Pond Reclamation Grading Plan
Engineer's Stamp date 5-15-02 (L9/D6)**

Dear Ms. Driscoll,

Based on information received in your submittal dated 5-16-02, the above referenced Grading Plan is approved for Final Plat. Once I get word that the storm drain in 98th is complete and functioning, I can sign the mylar in order for you to obtain the Grading Permit. I can sign the Final Plat once you have submitted the grading certification of this plan.

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

Sincerely

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

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

dmg

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

May 15, 2002

Mr. Brad Bingham
City of Albuquerque
600 2nd Street SW
Albuquerque, NM 87103

Re: **Sunrise Ranch Unit 4 Pond Reclamation (L9/D6)**

Dear Mr. Bingham:

This letter is in response to your March 25, 2002 comments. A vacation was approved for this project on April 17, 2002 (DRB #1000301).

The rundown has been removed. The removal of rip-rap and the scale and north arrow have been added to the plans. More detail has been added for clarification.

The SAD 222 storm sewer is functioning, but the contractor is completing 98th Street. We will certify the grading plan once it is approved and the improvements are constructed. The receipt of the assessment payment is attached.

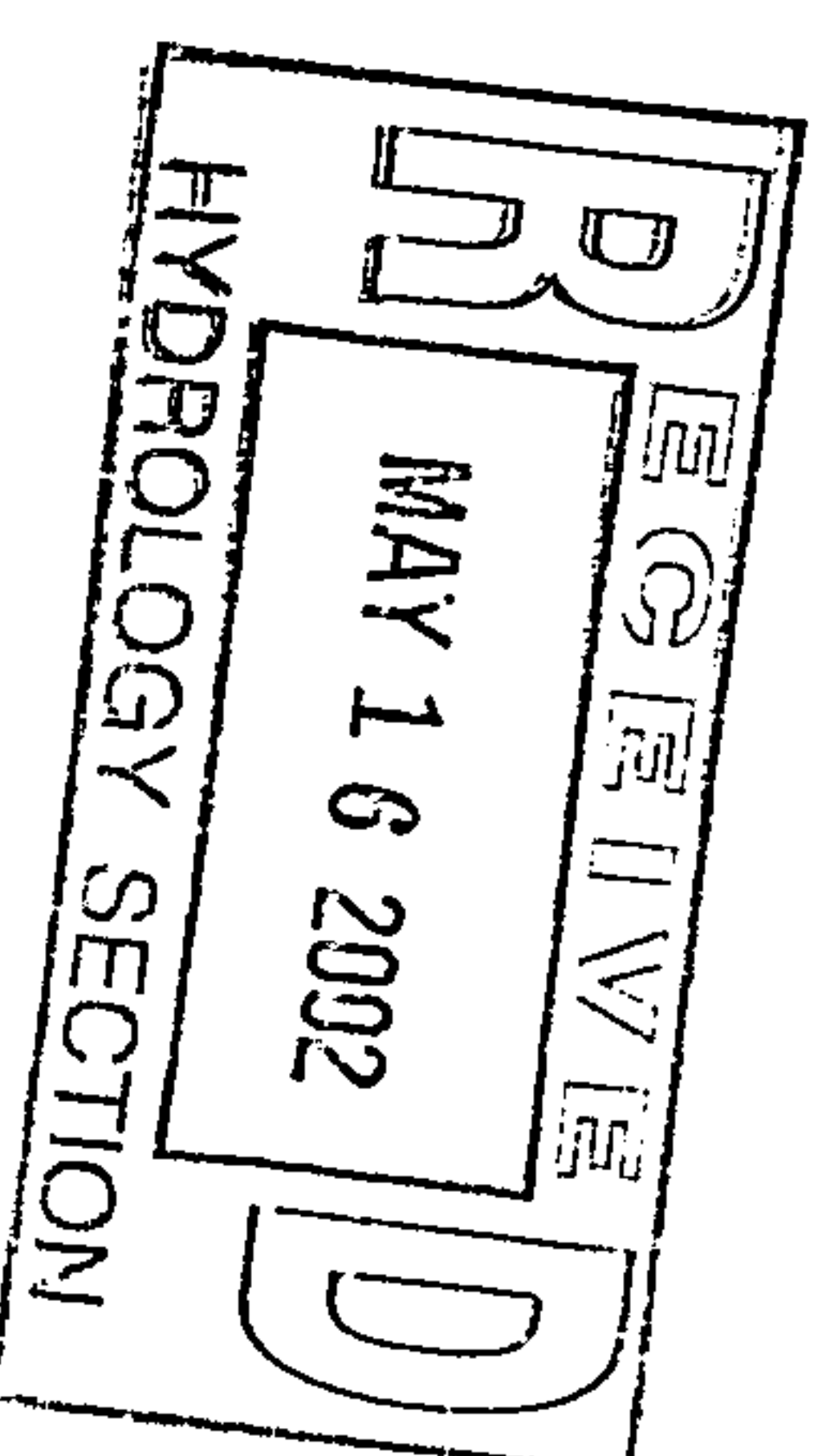
Please contact me if I can be of further assistance.

Sincerely,

MARK GOODWIN & ASSOCIATES, P.A.

My
Amy L. Driscoll, PE
Project Engineer

F:\sunrseranch\Brad





City of Albuquerque

Page 1 of 1
Date: 3/14/2002

Special Assessments

Bill Type:

Semi-Annual

Payment Must
Be Received By: 4/5/2002

98th St Ltd
7301 Jefferson NE Suite G H
Albuquerque NM 87109

Account ID: 222 9B 220025

Remittance ID: 02222200256

Property:

UPC: T-220-025- - -

Legal: Unit 2 Sunrise Ranch Subdivision

Address: P O Box 1560

District: 222 98th Street

Improvement	Prin Bal / Interest	Current Principal	Current Interest	Delinquent Principal	Delinquent Interest	Penalty / Other	Total Due	Payoff Amount
Storm Sewer	003	\$45,223.67	\$2,261.19	\$2,024.40			\$4,285.59	\$47,248.07

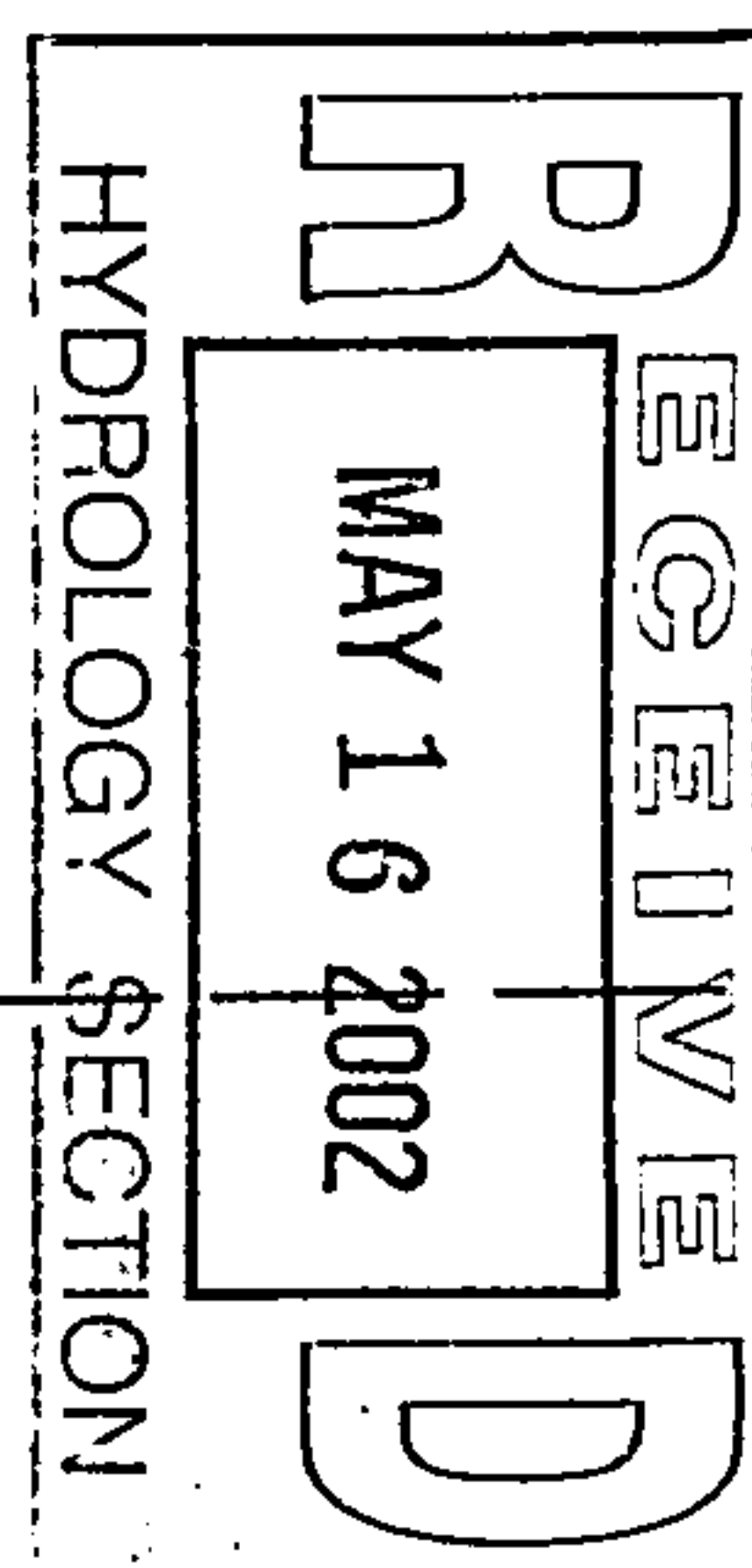
City Of Albuquerque
Treasury Division
Total \$4,285.59 \$47,248.07

RECEIVED

MAR 15 2002

4/15/2002 12:26PM 121 477
RECEIPT# 00036564 WSH 003 TRANS# 0064
Account# 02222200272 *TRSKAL
Trans Amt \$16,433.03
Special Assessments \$7,625.82

Thank You





City of Albuquerque

Page 1 of 1
Date: 3/14/2002

Special

Assessments

Bill Type:

Semi-Annual

Payment Must
Be Received By: 4/5/2002

98th St Ltd
7301 Jefferson NE Suite G H
Albuquerque NM 87109

Account ID: 222 9C 220026

Remittance ID: 02222200264

Property:

UPC: T-220-026- - -

Legal: Unit 3 Sunrise Ranch Subdivision

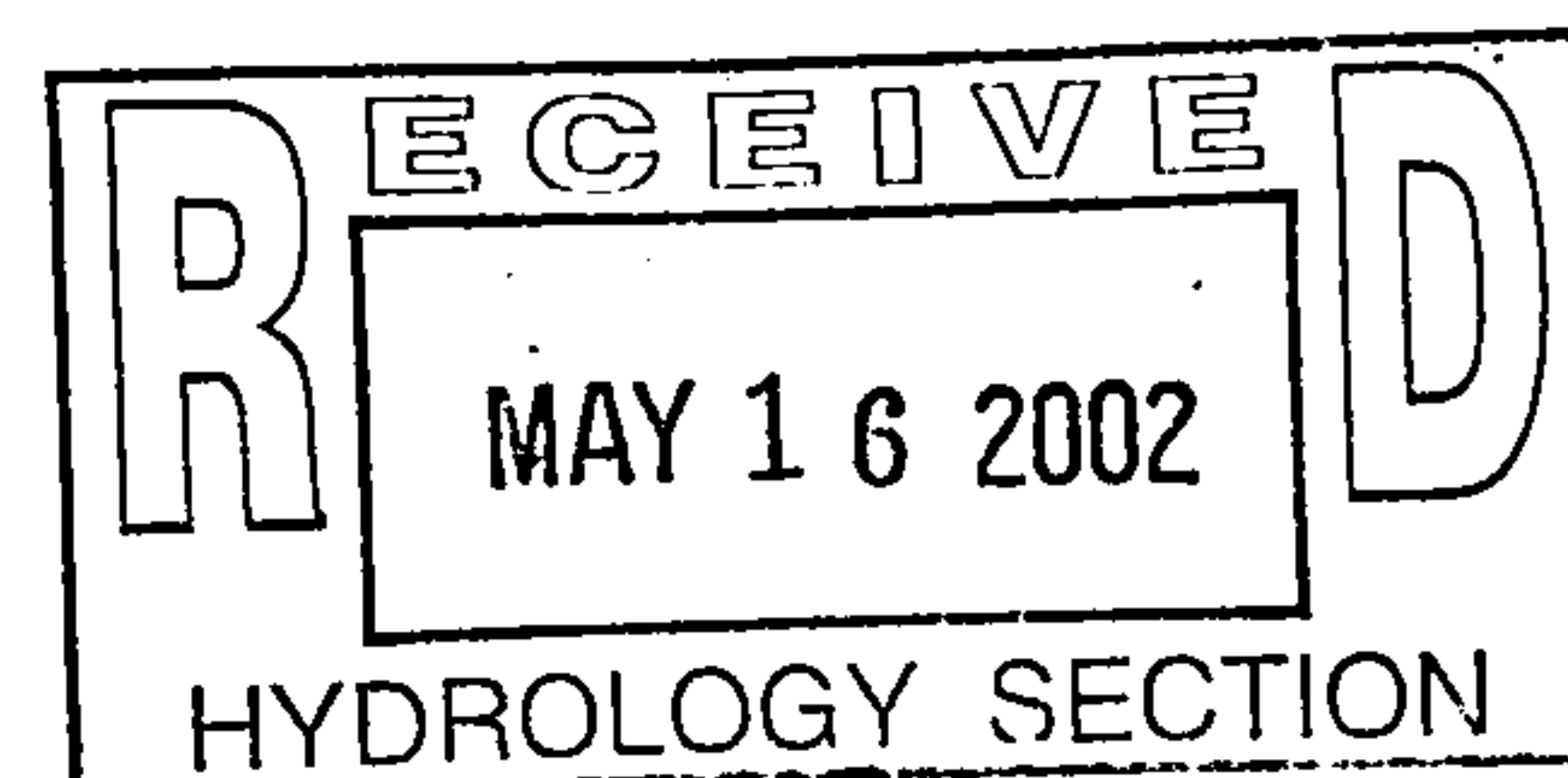
Address: P O Box 1560

District: 222 98th Street

Improvement		Prin Bal / Interest	Current Principal	Current Interest	Delinquent Principal	Delinquent Interest	Penalty / Other	Total Due	Payoff Amount
Sanitary Sewer	002	\$4,753.08	\$237.66	\$212.77				\$450.43	\$4,965.85
Paving	004	\$2,840.40	\$142.03	\$127.15				\$269.18	\$2,967.55
Storm Sewer	003	\$40,120.65	\$2,006.04	\$1,795.97				\$3,802.01	\$41,916.62

4/15/2002 12:26PM LOC: MAIN
RECEIPT# 00033035 DSH# 003 TRANS# 0064
Account# 02222200264 TRSKAL
Total: \$4,521.62 \$49,850.02
Trans Amt \$16,433.03
Special Assessments 1204891.62

Thank You





City of Albuquerque

Page 1 of 1

Date: 3/14/2002

Special

Assessments

Bill Type:

Semi-Annual

Payment Must
Be Received By: 4/5/2002

98th St Ltd

7301 Jefferson NE Suite G H

Albuquerque NM 87109

Account ID: 222 9D 220027

Remittance ID: 02222200272

Property:

UPC: T-220-027- - -

Legal: Unit 4 Sunrise Ranch Subdivision

Address: P O Box 1560

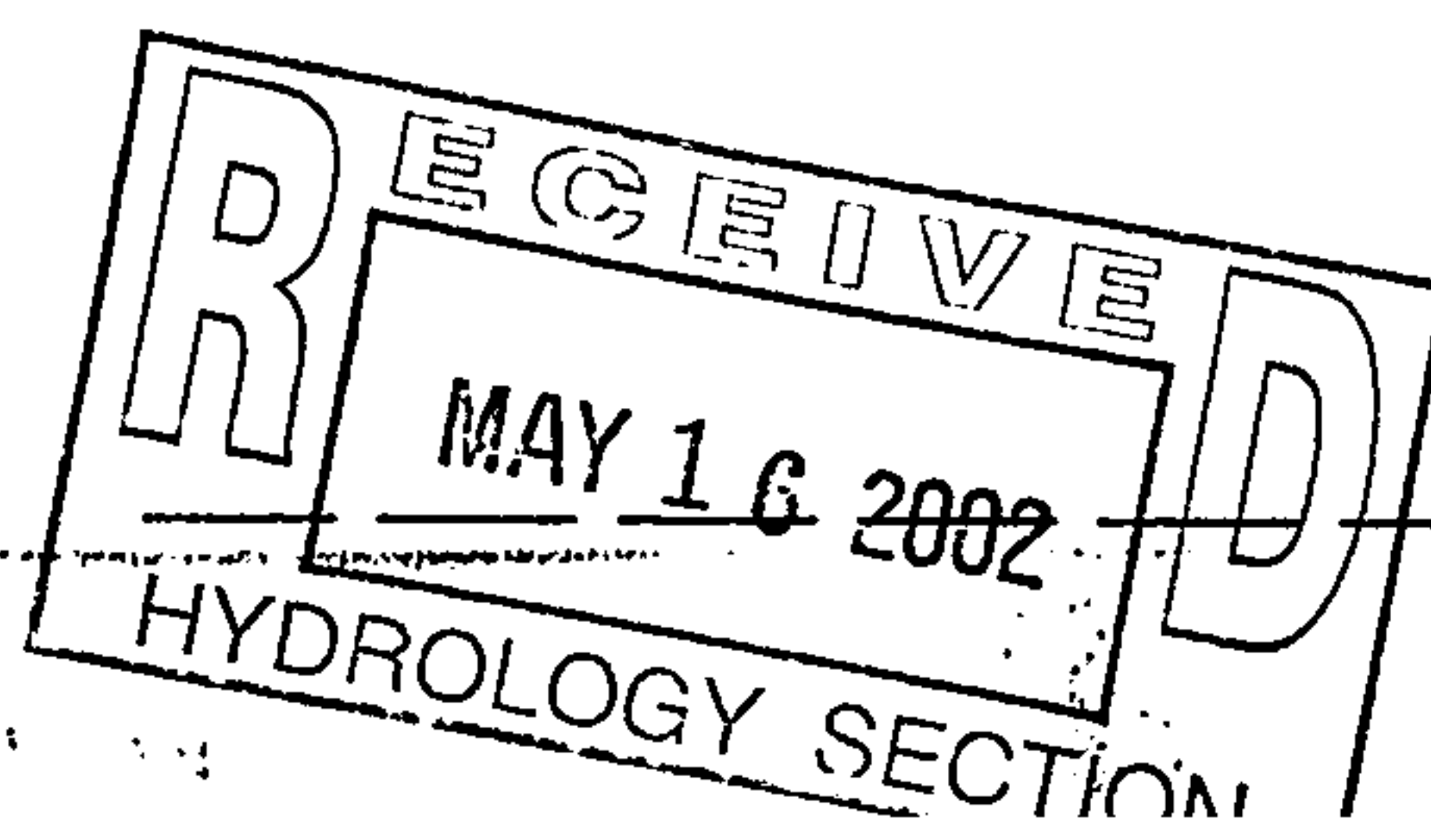
District: 222 98th Street

Improvement		Prin Bal / Interest	Current Principal	Current Interest	Delinquent Principal	Delinquent Interest	Penalty / Other	Total Due	Payoff Amount
Sanitary Sewer	002	\$15,913.70	\$795.69	\$712.36				\$1,508.05	\$16,626.06
Paving	004	\$9,509.90	\$475.50	\$425.70				\$9,911.20	\$9,935.60
Storm Sewer	003	\$55,047.90	\$2,752.40	\$2,464.17				\$5,216.57	\$57,512.07

City Of Albuquerque
Treasury Division
\$5,216.57 \$57,512.07

4/15/2002 12:26PM LOC: MAIN
RECEIPT# 00034544 WSH# 8736250256 \$84,073.73
Account# 02222200256 TRSKAL
Trans Amt \$12,180.67
Special Assessments \$4,285.59
CK \$15,964.13
CK \$468.90
CHANGE \$0.00

Thank You





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 25, 2002

Amy Driscoll, PE
Mark Goodwin & Associates, PA
PO Box 90606
Albuquerque, NM 87119

**Re: Sunrise Ranch-Unit 4 Pond Reclamation Grading and Drainage Plan
Engineer's Stamp Dated 2-13-02, (L9/D6)**

Dear Ms. Driscoll,

This letter supercedes the letter dated 3-19-02. It has been decided that a Work Order is not required and only a Grading Permit is needed for this project. However, the DRB process will be required for the vacation of the public easement for the pond and for subdividing the tract into lots.

The asphalt rundown was already removed during Unit 3 Work Order and is no longer part of your plan. Before I can approve your plan for Building Permit, it should be very specific on what you are removing, what you are installing (to what standards) and what exists. The contractor will have to build it from this plan. You will need to remove existing pipe up to the right of way. Then grout and cap the remainder of the pipe. Also, remove riprap. Please put a north arrow and a scale on your plan as well.

Prior to Final Plat signoff by the City Engineer, the following items must be submitted to my office:

- Letter of Acceptance of the public SD line (this can be from the SAD engineer)
- Engineer's Certification of your new grading plan
- Receipt of assessment payment or readjustment.

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

Sincerely,

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

C: Terri Martin, Hydrology

File (2)



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 19, 2002

Amy Driscoll, PE
Mark Goodwin & Associates, PA
PO Box 90606
Albuquerque, NM 87119

**Re: Sunrise Ranch-Unit 4 Pond Reclamation Grading and Drainage Plan
Engineer's Stamp Dated 2-13-02, (L9/D6)**

Dear Ms. Driscoll,

Based on the information contained in your submittal dated 3-13-02, the above referenced plan is approved for Work Order on condition of receipt of a letter of partial acceptance of the storm drain itself. The DRB process will be required for the vacation of the public easement for the pond and for subdividing the tract into lots.

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

Sincerely,

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

c: Terri Martin, Hydrology
File (2)

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

L-9/D6

PROJECT TITLE: Sunrise Ranch Pond Reclamation

ZONE MAP/DRB.FILE#: L-9

DRB#: 100301 EPC#

WORK ORDER#:

LEGAL DESCRIPTION: Tract B-1-A-1

CITY ADDRESS: NW Corner of Eucariz & 98th St.

ENGINEERING FIRM: Mark Goodwin & Associates, PA

CONTACT: Amy L. Driscoll, PE

ADDRESS: P.O. Box 90606 Albuquerque NM 87119

PHONE: 828-2200

CITY, STATE: Albuquerque NM

ZIP CODE: 87119

OWNER: 98th St. LTD

CONTACT:

ADDRESS: 7301 Jefferson St, Suite G & H

PHONE: 761-9911

CITY, STATE: Albuquerque NM

ZIP CODE: 87107

ARCHITECT:

CONTACT:

ADDRESS:

PHONE:

CITY, STATE:

ZIP CODE:

SURVEYOR:

CONTACT:

ADDRESS:

PHONE:

CITY, STATE:

ZIP CODE:

CONTRACTOR:

CONTACT:

ADDRESS:

PHONE:

CITY, STATE:

ZIP CODE:

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)
- ☐ ENGINEER'S CERTIFICATION (TCL)
- ☐ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

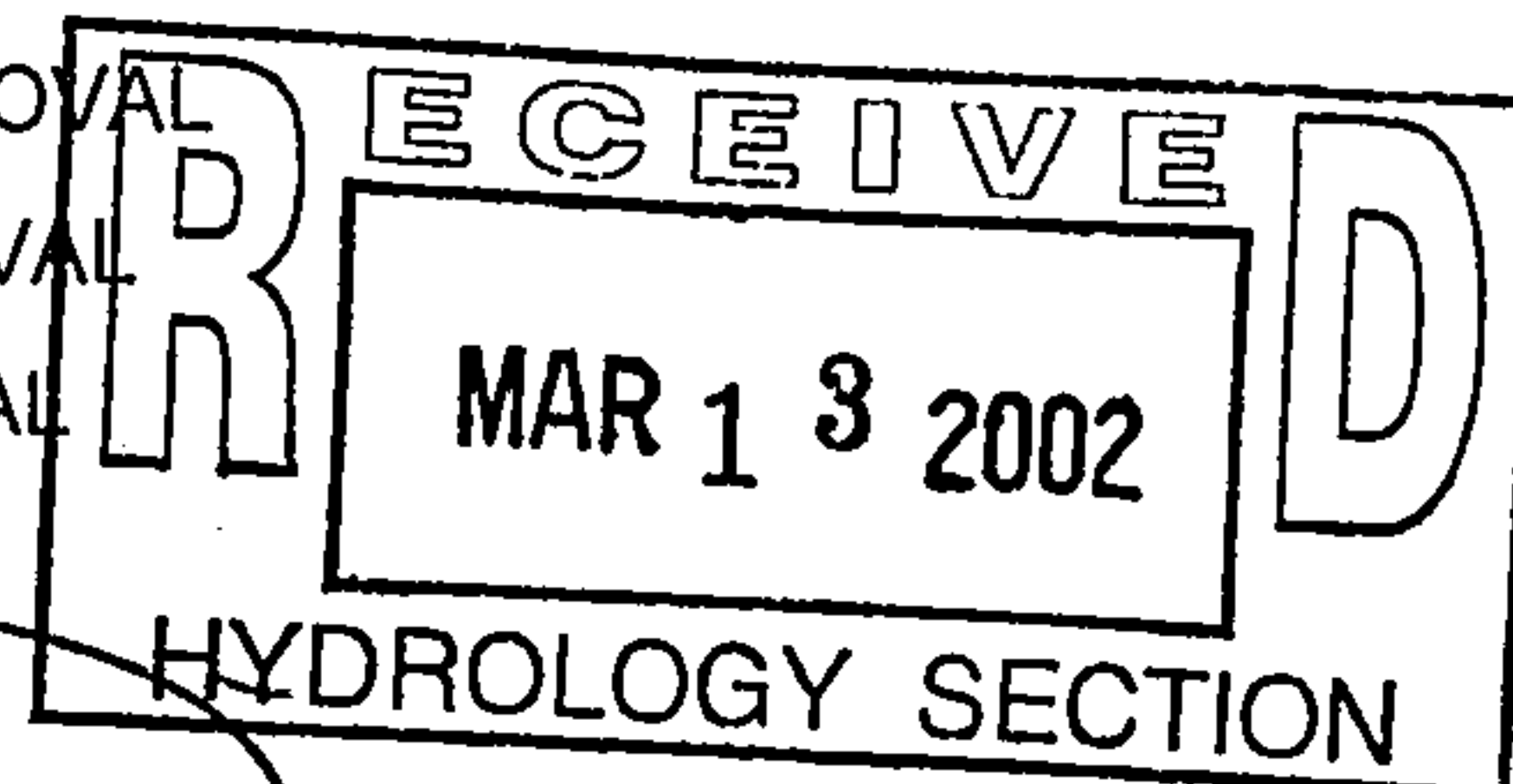
WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED

DATE SUBMITTED: 4/13/02

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTY 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) WO



BY: [Signature]

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).
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.

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

P.O. Box 90606 ❖ Albuquerque, NM 87199
(505) 828-2200 ❖ (505) 797-9539 fax
e-mail: dmg@swcp.com

LETTER OF TRANSMITTAL

To: City Hydrology - One Stop

Date: March 13, 2002

Re: Sunrise Ranch

Pond Reclamation

We are sending:

No. Copies	Date	Item Description
1		Approved G&D Report Excerpts
1		Grading and Drainage Plan
1		Drainage Info Sheet

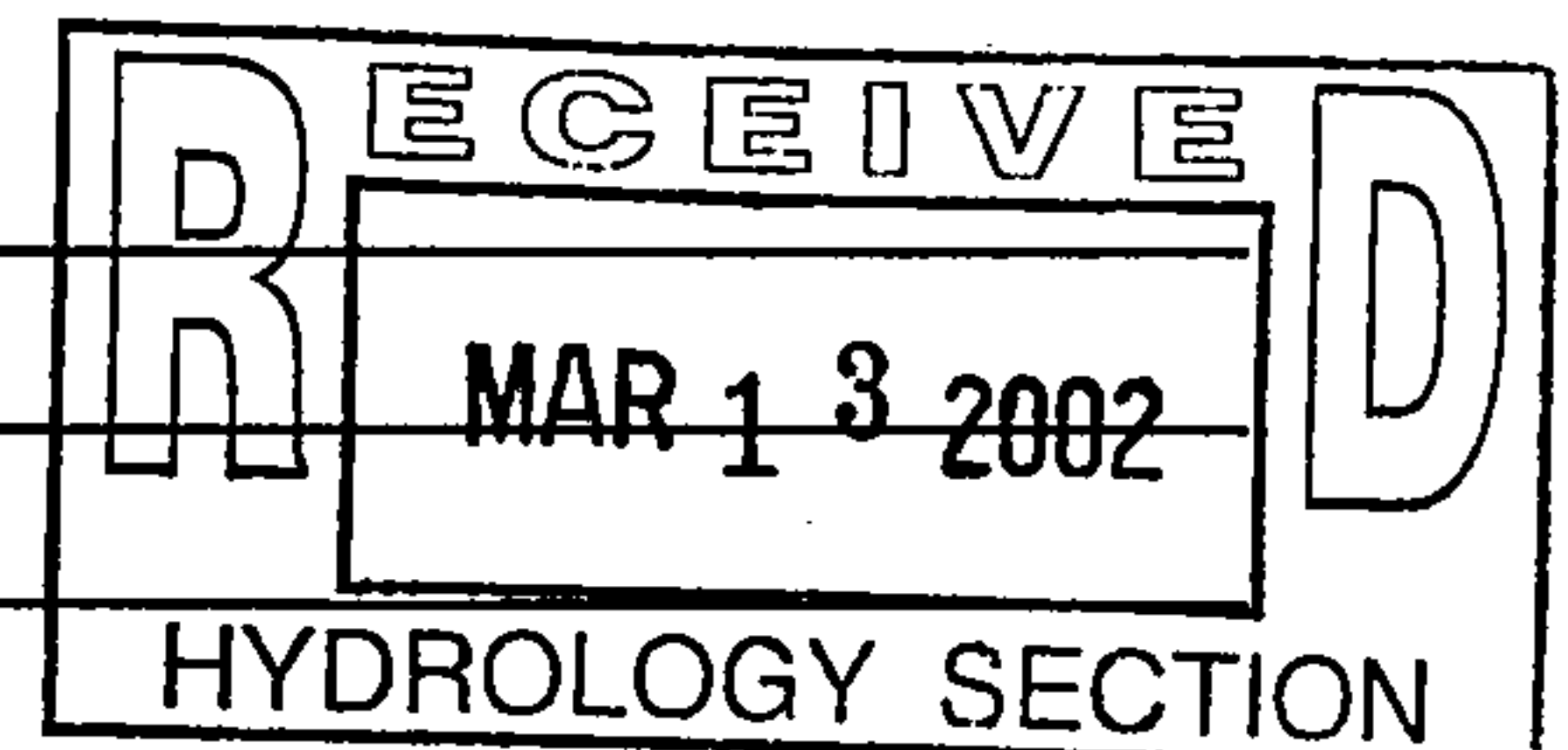
☒ For your approval

☐ For your information

☐ As you requested

☐ For your comments

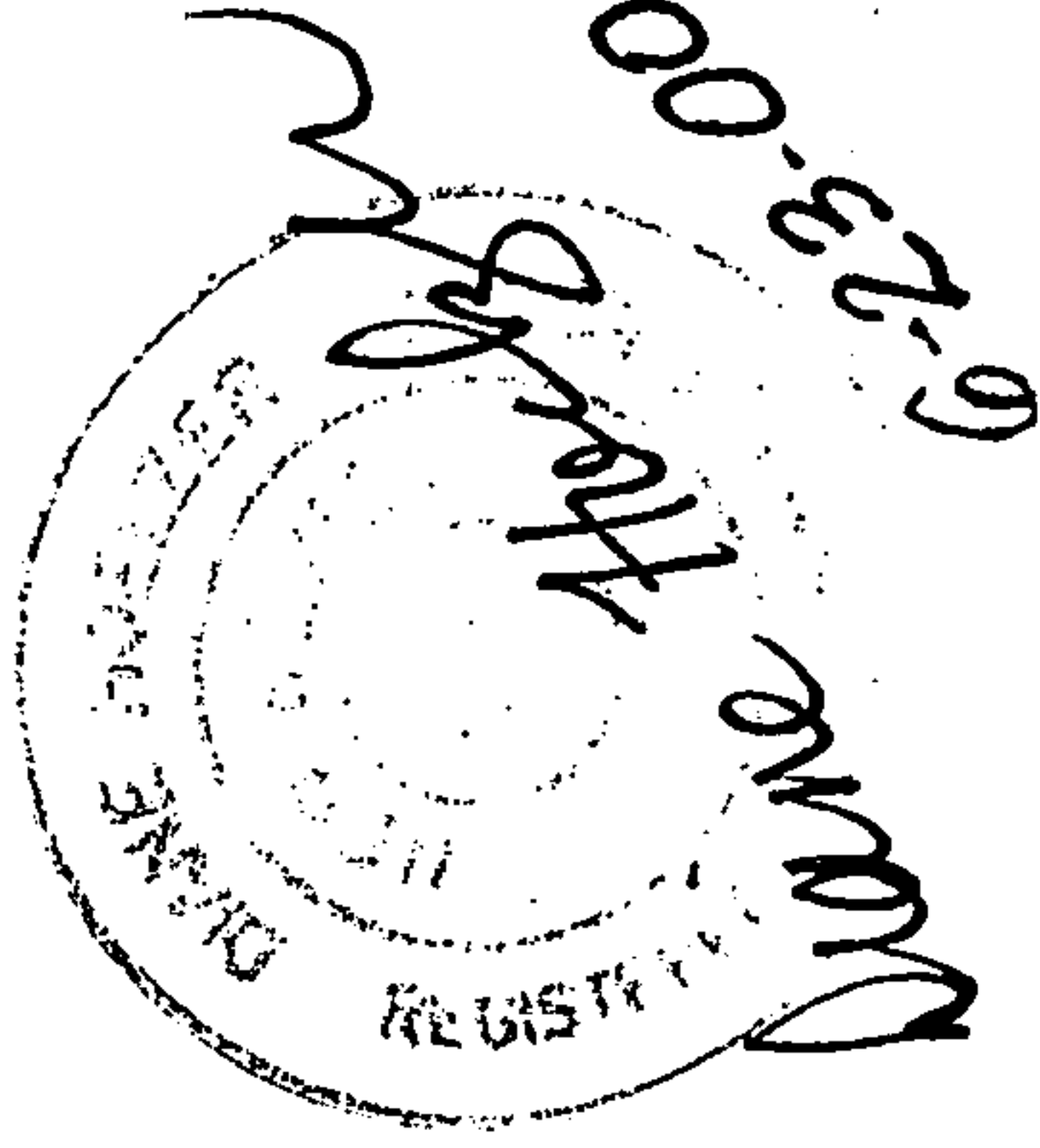
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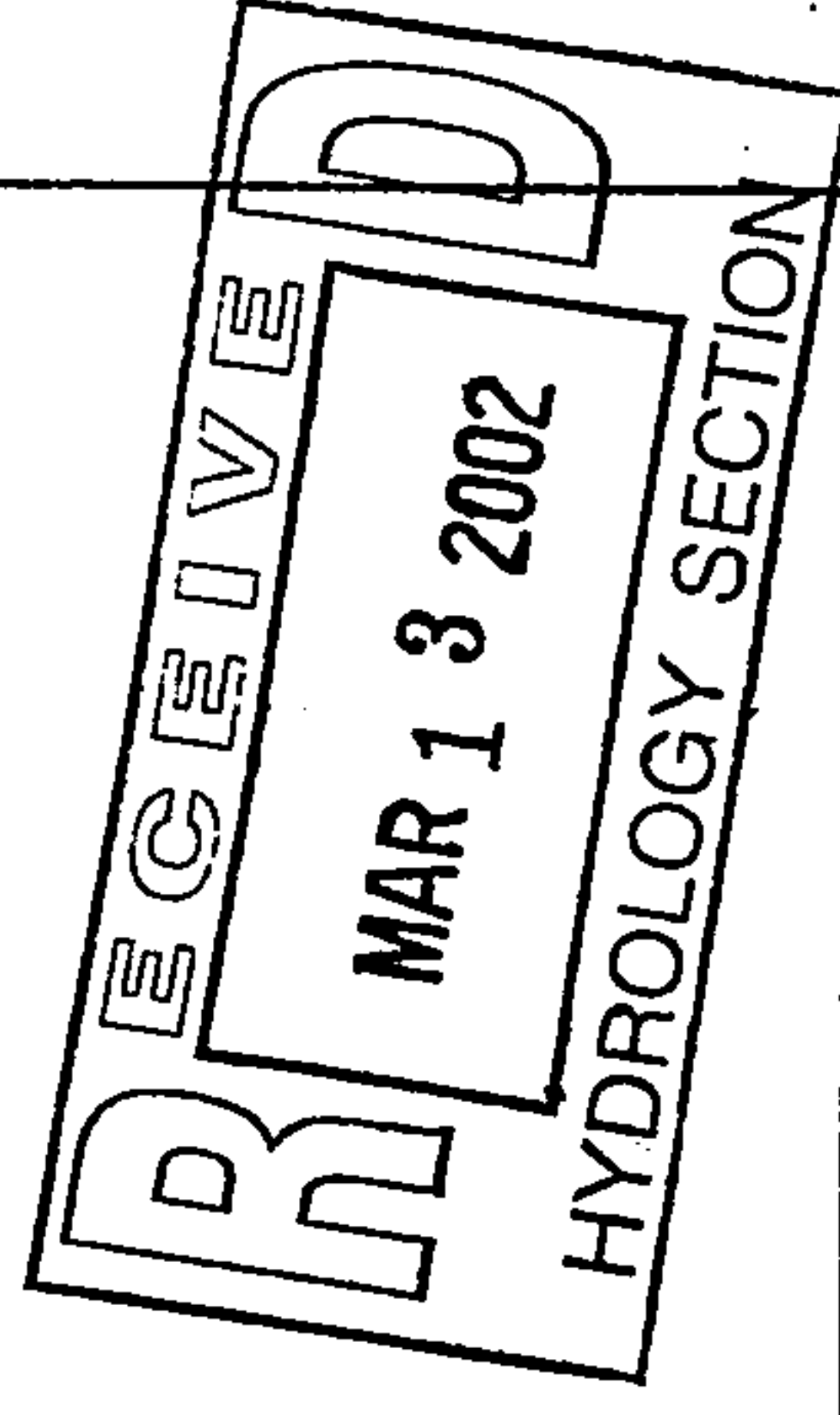
SIGNED:

Amy L. Driscoll, PE

DRAINAGE REPORT
For
Sunrise Ranch Subdivision



June 2000



D. MARK GOODWIN & ASSOCIATES

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I. PROJECT DESCRIPTION

The proposed Sunrise Ranch Subdivision located southwest of Sunset Gardens and 98th street covers an area of approximately 26.7 acres. (Refer to the Vicinity Map). The site is to be developed into 184 single family residences in four phases. The southwest corner of the site lies within a Zone AO floodplain as shown on FEMA Panel 35001 C 0328.

II. DRAINAGE DESIGN CRITERIA AND PREVIOUS REPORTS

The design criteria used in this report was in accordance with Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993 edition. The 100-year 6-hour storm event was analyzed to determine street capacities using $P(1 \text{ hr}) = 1.90"$, $P(6 \text{ hr}) = 2.22"$ and $P(24 \text{ hr}) = 2.67"$. The onsite Land Treatment values used were Treatment D=60, Treatment C=20 and Treatment B=20 as determined using "Table A-5 Percent Treatment D" in the DPM. AHYMO printouts are provided in Appendix A.

This project site lies within the Amole-Hubbell Drainage Management Plan. In the Final Facilities Plan Report prepared by Leedshill-Herkenhoff, Inc. (July 99), the allowable peak discharge from this project into the 98th street storm drain is 89.28 cfs which is close to the calculated peak discharge of 83.51 cfs as determined in this report's hydrology analysis. An allowable discharge of 20.1 cfs from subbasin 100 located at the western portion of the project site as determined in the Amole-Hubbell Drainage Management Plan. The actual peak discharge from this subbasin into the Snow Vista Sedimentation Pond is 12.93 cfs.

III. EXISTING DRAINAGE CONDITIONS

Runoff from the project site flows in an eastward direction at an approximate slope of 3.0 percent. An existing arroyo originating to the west of the project site flows in a southeasterly direction, ultimately discharging into the Snow Vista Sedimentation pond. Runoff from the unimproved Sunset Gardens Road flows eastward in roadside swales to 98th street. Runoff from Eucariz Road flows in an eastward direction to 98th street.

IV. DEVELOPED DRAINAGE CONDITIONS

The total "developed conditions" peak discharge from the site is 96.44 cfs. Runoff from subbasin 1 (12.93 cfs) discharges to the Snow Vista Sedimentation Pond. This concept has been discussed and approved by Lisa Manwill at AMAFCA. The remaining runoff from the site, subbasins 2 through 13 (83.5 cfs) is conveyed as street flow to the southeast corner of the property before being intercepted by a series of inlets that convey the stormwater runoff to a temporary retention pond facility. Ultimately runoff from this site will be intercepted by a storm drain system being built as part of SAD 222. I am currently coordinating our internal storm drain design connection to the SAD 222 master storm drain manhole at Eucariz Road and 98th street with John Andrews at the Larkin Group. Their projected schedule to begin the infrastructure construction is January 2001. At the time the SAS 222 storm drain is constructed the temporary retention pond facility will disappear.

This project is going to be developed in 4 phases as shown in Figure 5. Runoff from Phase 1 will be conveyed southward to the retention pond through a temporary asphalt swale in Evening Fire street. A portion of the runoff from Phase 2 will be conveyed to the Snow Vista Sedimentation Pond through a storm drain culvert and the remainder will be conveyed to the temporary retention pond through Rawhide Street in a temporary asphalt swale. When Phase 3 is built, a portion of the temporary drainage swale in Rawhide street will be eliminated. In Phase 4 the storm drain and inlets to the pond will be constructed. Refer to Figure 5 for Construction Phase Boundaries and Figure 6 for Onsite Subbasin Boundaries.

Existing inlets in Eucariz Road at 98th street intercept street flows. Proposed inlets in Sunset Gardens at 98th street will intercept Sunset Gardens street flow and flows from subbasin 190 for a total of 33.44 cfs (25.8 cfs restricted flow of 1.29 cfs/acre from subbasin 190 plus developed street flows from Sunset Gardens Road of 7.64 cfs)



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 15, 2000

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

**Re: Sunrise Ranch Unit 2 Grading Plan submitted for Final Plat
Engineer's Stamp dated 8-8-00 (L9/D6)**

Dear Ms. Hoelzer,

Based upon the information provided in your submittal dated 8-18-00, the above referenced plan cannot be approved for Final Plat until the comments in AMAFCA's letter dated 7-5-00 are addressed.

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

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Hydrology

C: Don Dixon, AMAFCA
file

File: L9/D6

facsimile
TRANSMITTAL

to: BRAD BINGHAM
fax #: 924-3864
re: SUNRISE RANCH UNIT 2
date: November 7, 2000
pages: 5, including this cover sheet.

PER YOUR REQUEST THE STREET CAPACITY HEC-2 FOR FLOW IN SUNSET
GARDENS ROAD WITH 1.6 PERCENT AND 0.6 PERCENT CROSS SLOPE.

CALL ME IF YOU NEED ANYTHING ELSE.

THANKS,

DIANE HOELZER

From the desk of...

Diane Hoelzer, P.E.
Civil Engineer
D.Mark Goodwin & Associates, PA
P.O.BOX 80808
Albuquerque, NM 87199

(505) 828-2200
Fax: 797-9539

 * WATER SURFACE PROFILES *
 * VERSION OF SEPTEMBER 1988 *
 * ERROR: 01,02 *
 * UPDATED: 4 APRIL 1989 *
 * RUN DATE 11/ 7/ 0 TIME 15:49:15 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * THE HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET, SUITE D *
 * DAVIS, CALIFORNIA 95616-4687 *
 * (916) 756-1104, (916) 551-1748 *

```

      X   X  XXXXXXX  XXXXX
      X   X  X      X   X
      X   X  X      X
      XXXXXX XXXX  X   XXXXX  XXXXX
      X   X  X      X
      X   X  X      X   X
      X   X  XXXXXXX  XXXXX
  
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END OF BANNER

THIS RUN EXECUTED 11/ 7/ 0 15:49:15

 HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
 ERROR CORR - 01,02
 MODIFICATION -

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 T2 36' FT 8" STD CURB NO CROWN
 T3 1.6 PERCENT CROSS SLOPE

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Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTH	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

OCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

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.00	.00	3.56	.00	.000	.017	.000	.000	.00	.03
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T1 36' FT
T2
T3

J1	ICHECK	IBQ	RIHV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
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SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XHL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

OCHV= .100 CEHV= .300

*SECHO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3720 CRITICAL DEPTH ASSUMED

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HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

1.6 PRECENT CROSS SL

SUMMARY PRINTOUT

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* 1.000	15.48	.52	.52	2.67	26.74	1.01	.63

* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *

```
*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 11/ 7/ 0 TIME 15:49:38
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HRC2 RELEASE DATED SEP 08 UPDATED APR 1989
ERRATA CORR - 01,02
MODIFICATION -

11	VILLA DEL NORTE STREET CAPACITY CALCULATIONS
12	36 FT 8" STD CURB NO CROWN
13	0.6 PERCENT CROSS SLOPE

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HJHS	0	
MSLT	0	
ED	0	

[illegible]

COPIES	100 CENTS	1.00 CENTS	*SECHS 1.000	2096 WSET NOT GIVEN, AVG OF MAX, MIN USED
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.00	.00	.00		
.000	.00	.00		
.017	.50	.14		
.000	.00	.00		
.00	.00	.00		
.05	.67			

015298 0. 0. 0. 0. 11 5 .00 35.96 36.01

11 36' FT

12

13

J1 ICHCK INQ NIBV IDIR STR METRIC HVHS 0 WSEL EQ

0 3 0 0 01558

J2 NPROF IPLOT PRVS XSECV XSECH EH ALDLC ISW CHNIM ITRCE

2 0 -1 0 0 0 0 0

SECTO DEPTH CWSLT CRWS ALOB WSELK EG HV BL QLOSS BANK ELEV
Q QOB QCB QROB AROB ACH ARAB VOL WLN CORAN
TIME VLOB VCH VROB NMT NCH NCHN
SLOPE XLOB XCH XROB XROB XCH XCHN

*PROF 2

CCEV= .100 CEBV= .300

*SECTO 1.000

2096 WSEL NOT GIVEN, AVG OF MAR, MIN USED

3720 CRITICAL DEPTH ASSUMED

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THIS RUN EXECUTED 11/ 7/ 0 15:49:38

RECZ RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01'02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

0.6 PERCENT CROSS SL

SUMMARY PRINTOUT

SECTO 0 CWSLT CRWS VCH TOPWID RICH EG
1.000 15.48 .36 .39 2.97 35.96 1.37 .50
* 1.000 15.48 .39 .39 2.45 35.97 1.03 .49



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 7, 2001

Diane Hoelzer, P.E.
Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: SUNRISE RANCH UNIT 3 (L-9/D6)
Engineers Certification For Release of Financial Guaranty
Engineers Stamp dated 2/27/2001
Engineer's Certification dated 12/5/2001

Dear Ms. Hoelzer:

Based upon the information provided in your submittal dated 12/5/2001, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for release of financial guaranty for the above mentioned project.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Public Works Department

C: Arlene Portillo, PWD - #654281
File

SUNRISE RANCH UNIT 2
SUPPLEMENTAL INFORMATION

EXHIBIT 1: EXISTING DEVELOPED DRAINAGE BASINS - SNOW VISTA BASIN

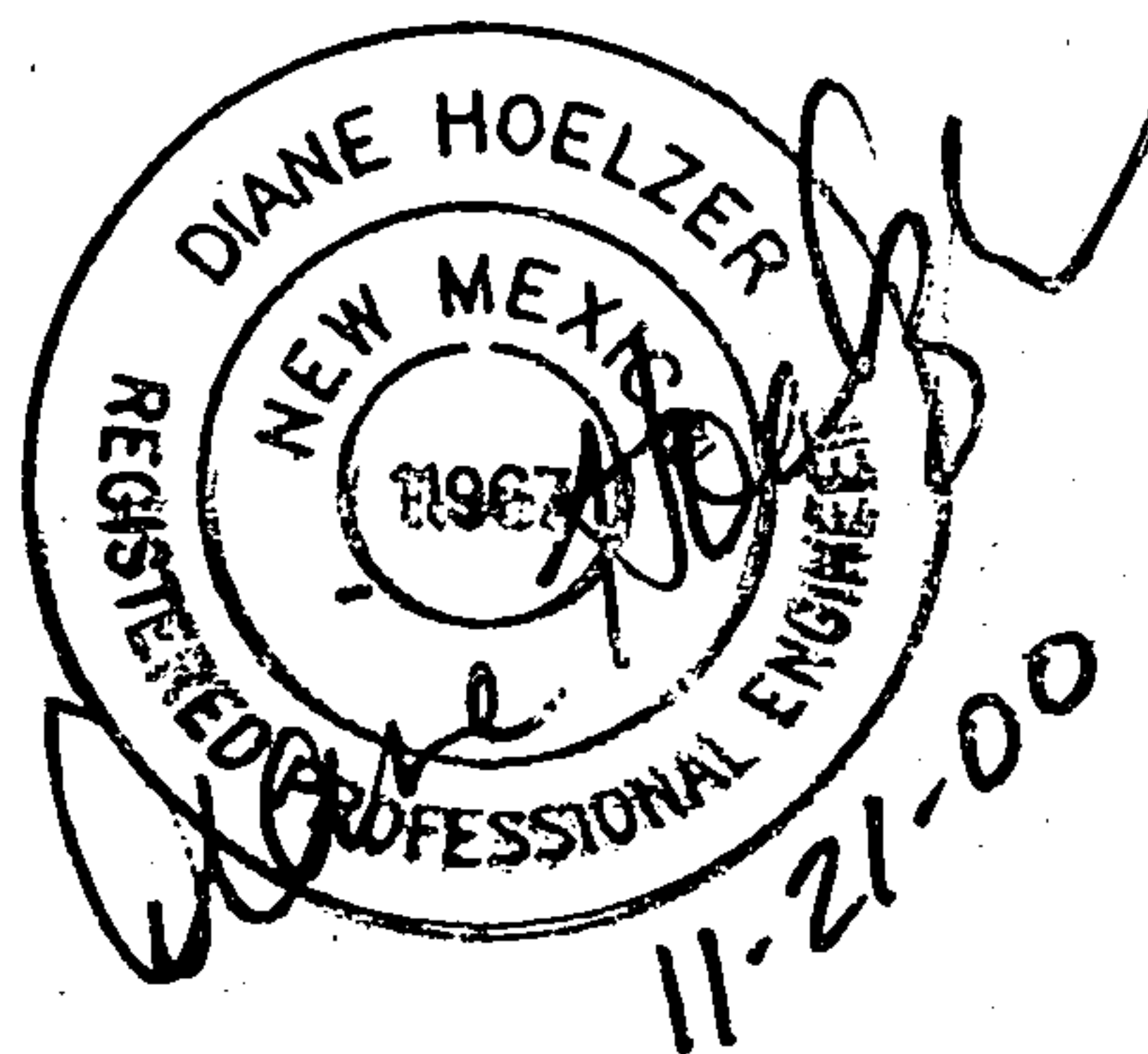
EXHIBIT 2: PROPOSED DEVELOPED DRAINAGE BASINS - SNOW VISTA BASIN

APPENDIX A - SUNRISE RANCH UNIT 2 STORM DRAIN TO SNOW VISTA SED. POND

APPENDIX B - TEMPORARY 98TH STREET SWALE

APPENDIX C - SCOUR CALCULATIONS

APPENDIX D - GRADING AND DRAINAGE PLAN, REVISED 11-16-00



L-09/D006



ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY

AMOLE — HUBBELL
DRAINAGE MANAGEMENT PLAN

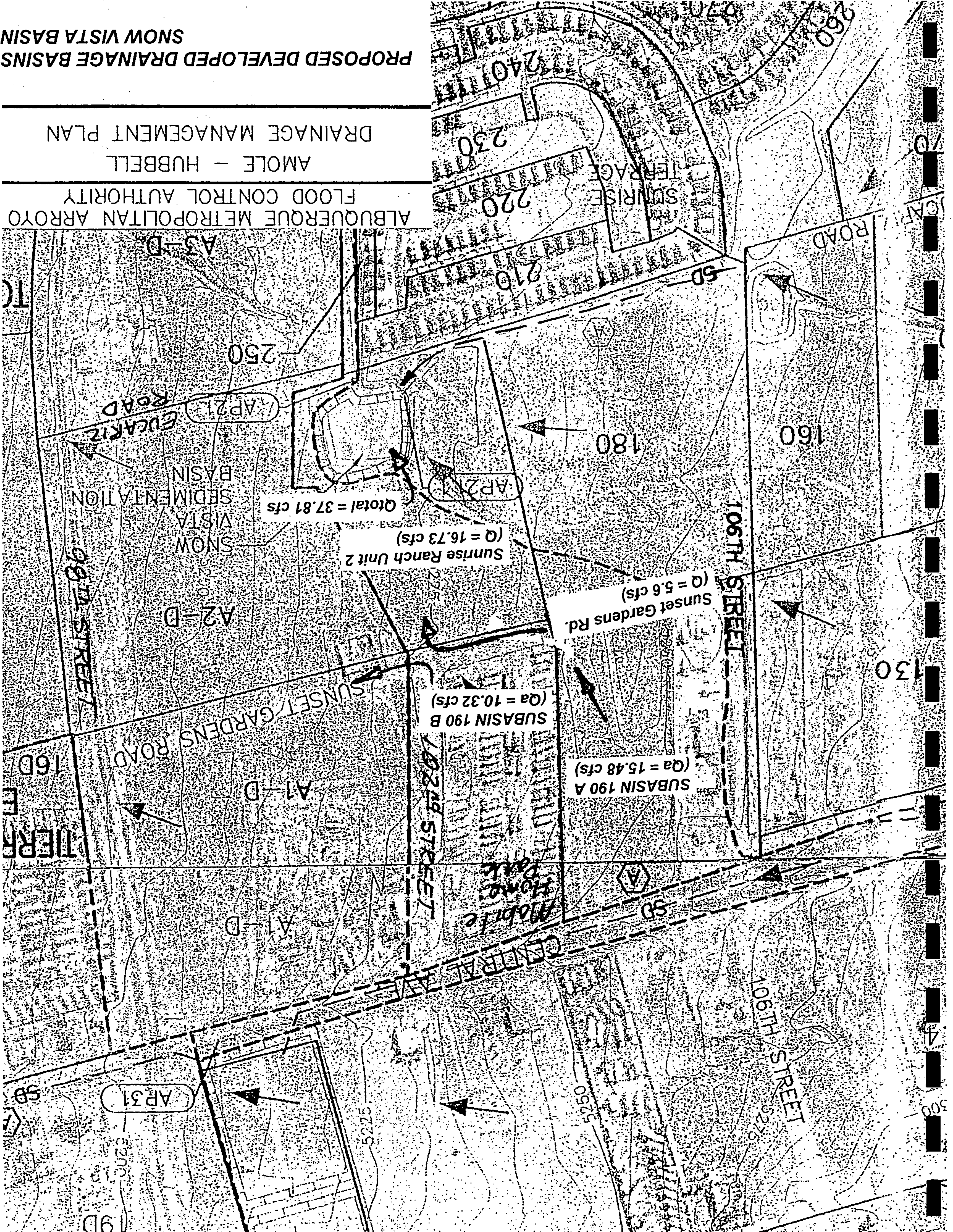
**EXISTING DEVELOPED DRAINAGE BASINS
SNOW VISTA BASIN**

Source: Amole-Hubbell Drainage Management Plan,
July 1999

PROPOSED DEVELOPED DRAINAGE BASINS
SNOW VISTA BASIN

ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY

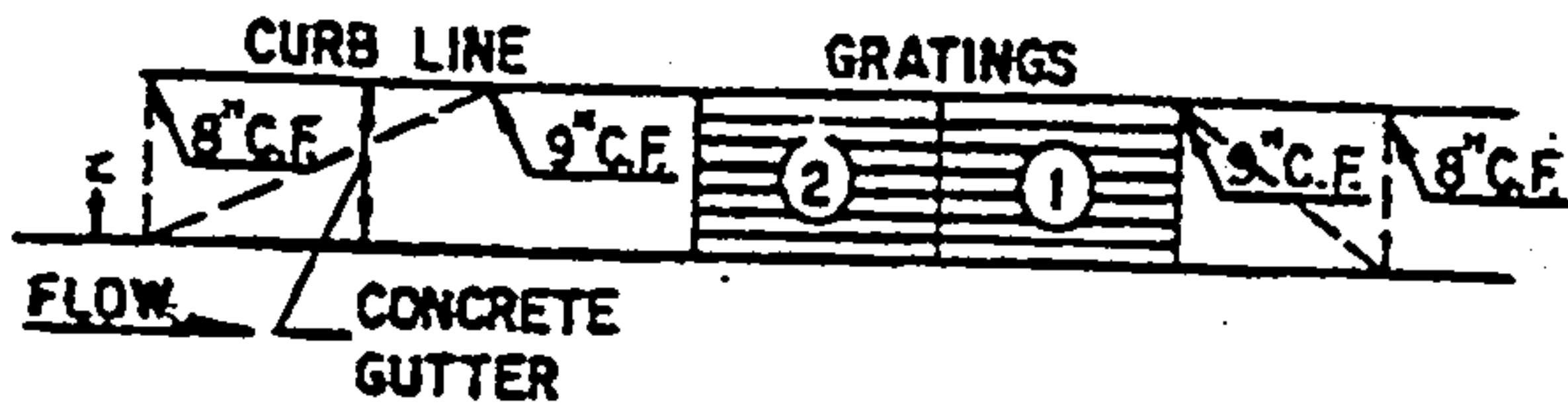
AMOLE - HUBBELL
DRAINAGE MANAGEMENT PLAN



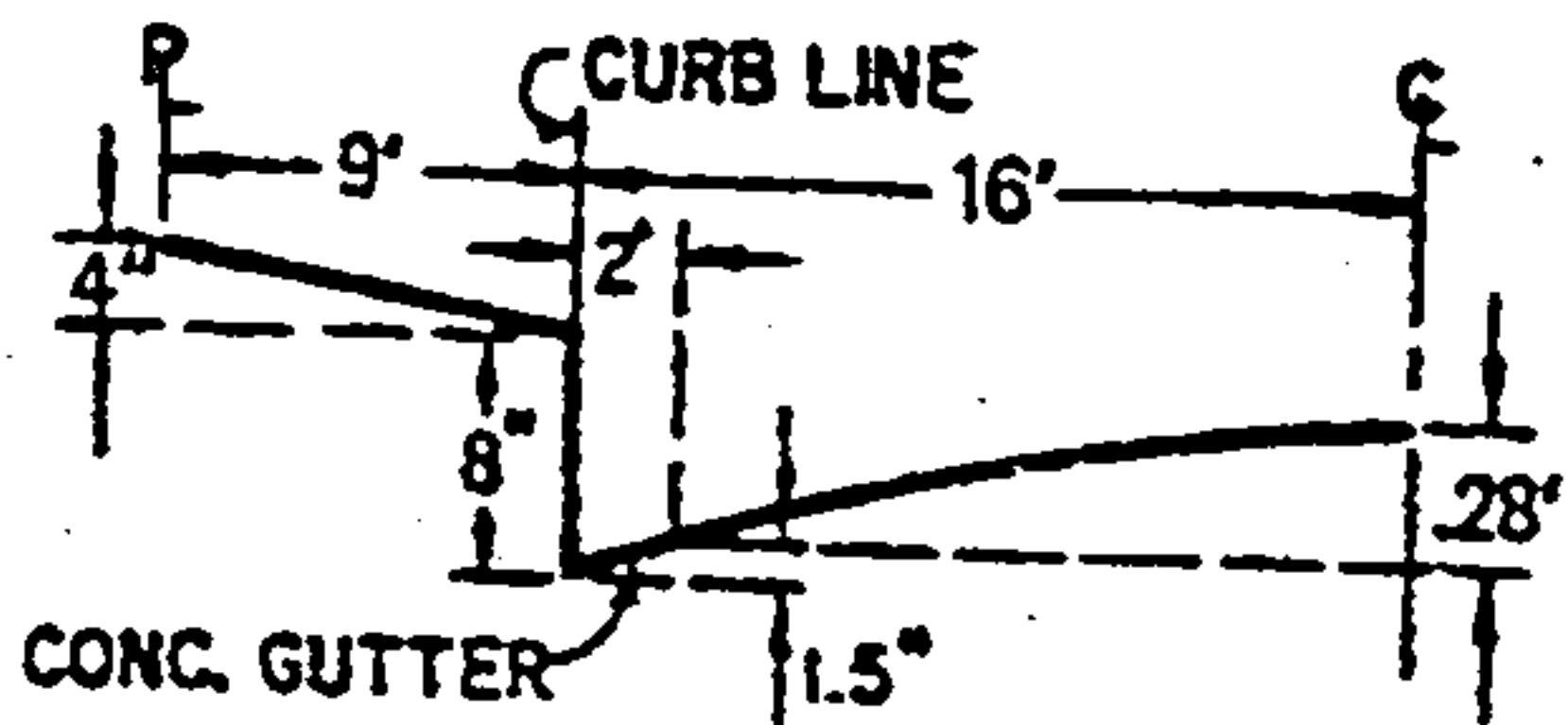
Appendix A

**SUNRISE RANCH UNIT 2
STORM DRAIN TO SNOW VISTA SEDIMENTATION POND**

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION (ABOVE BASIN)

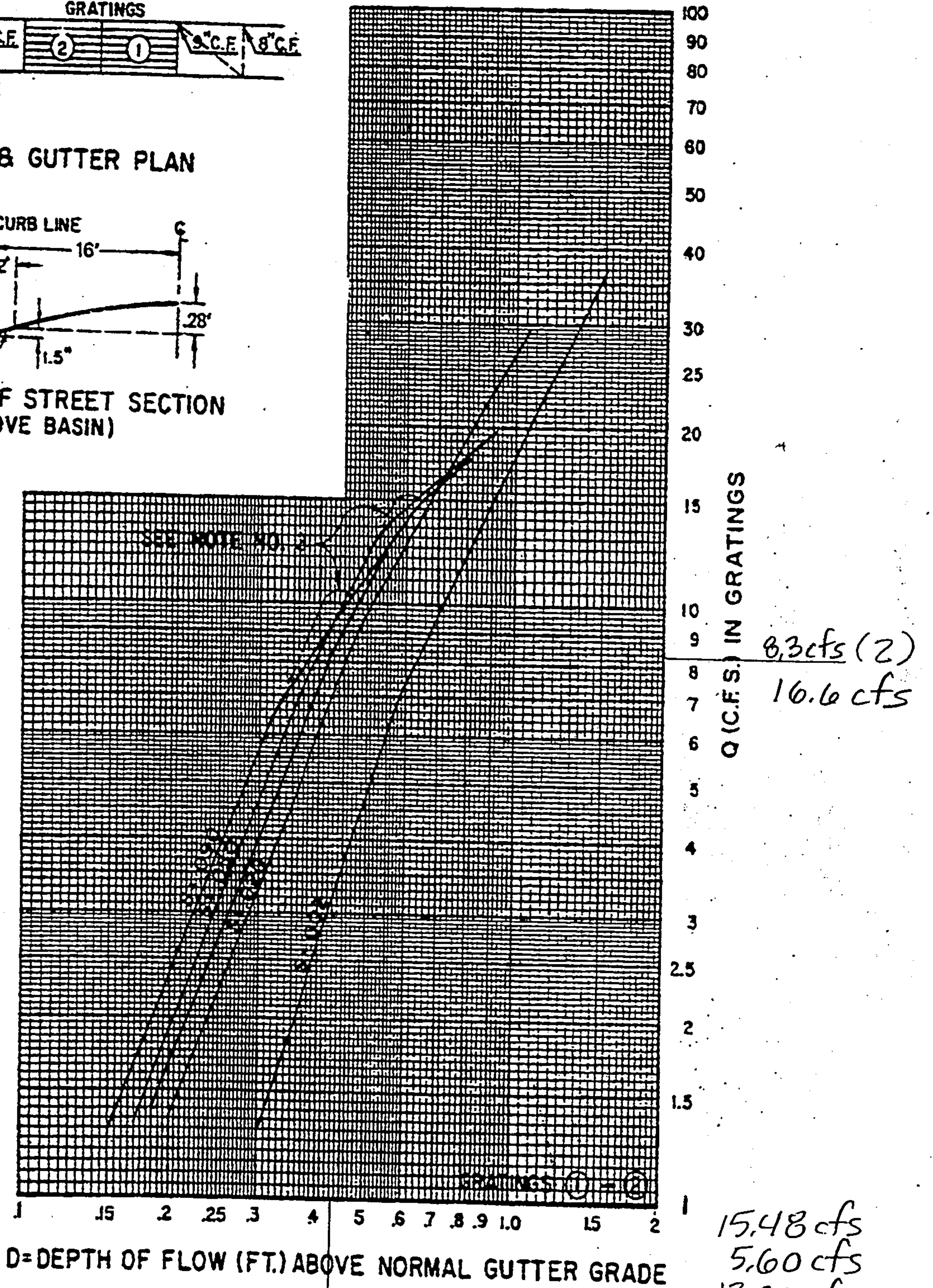


PLATE 22.3 D-6

$D = 34.58$
 $0.43'$

TO SUMP
INLETS

→ 21.21 cfs



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch Unit 2
SUBJECT SB 190 A calcs
BY DLH DATE 11-6-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Flows to Snow Vista Sedimentation Pond via Roundup

SB 190 A = 15.48 cfs (allowable)

Sunset Gardens = 5.6 cfs
* (106th St - Lasso)

Sunrise Ranch Unit 2 = 16.73 cfs

Q = 37.81 cfs (Design Flow to Snow
Vista Sedimentation Pond)

* Sunset Gardens (106th St - Lasso)

1080 LF (60' R/W) = 64,800 SF = .002324 sq. mi

Land Treat D = 75%

Land Treat B = 25%

STREET CAPACITY Q TO DBL 'A' INLETS

15.48 cfs
5.60 cfs
13.50 cfs
34.58 cfs
- 16.60 cfs (INTERCEPTED (2) DBL 'A' INLETS)
17.98 cfs
+ 3.23 cfs
21.21 cfs (TO SUM P INLETS)

Appendix B

TEMPORARY 98TH STREET SWALE



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

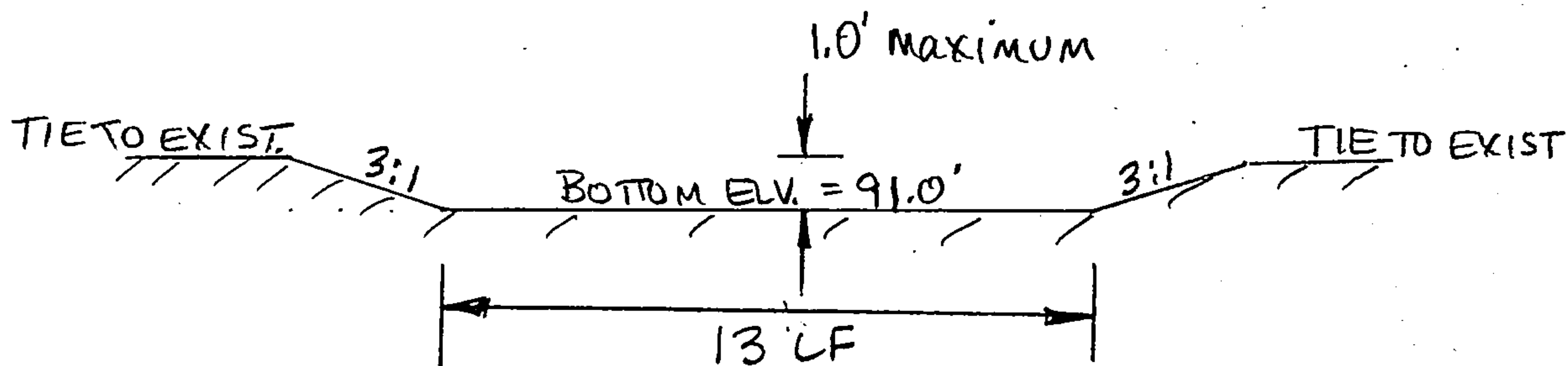
PROJECT Sunrise Ranch
SUBJECT Temporary Swale 98th
BY DLH DATE 11-5-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Sunset Gardens 36' (1420 CF) = 51,120 SF = .00183 sq.mi

AHYMO @ (100) = 4.15 cfs

Volume = .180 Ac Ft (43560) = 7840 CF

$$\frac{7840 \text{ CF}}{500 \text{ LF}} = 15.68 \text{ SF}$$



Runoff from Sunset Gardens Rd (98th st. to Sunrise Ranch Unit 2 West Prop. Line)

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = sun98sw.dat

RUN DATE (MON/DAY/YR) =11/06/2000
USER NO.= M_GOODWN.I01

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START											TIME= .00
RAINFALL TYPE= 2											RAIN24= 2.660
COMPUTE NM HYD	101.00	-	1	.00183	4.15	.180	1.84028	1.500	3.547		PER IMP= 66.67
FINISH											

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START          TIME=0.0
*****
*****  SUNRISE RANCH LONGFORD HOMES (L-9)
*****  100-YEAR 24-HOUR STORM EVENT
*****  FILE: SUN98SW.DAT  APR 2000 BY:DLH
RAINFALL      TYPE=2 RAIN QUARTER=0.0 IN
              RAIN ONE=1.87 IN RAIN SIX=2.20 IN
              RAIN DAY=2.66 IN DT=0.05 HR
*****
*****  DEVELOPED CONDITIONS
*****
*****  SUBASIN 1 SUNSET GARDENS TEMPORARY SWALE IN 98TH STREET
*****
COMPUTE NM HYD  ID=1 HYD NO=101 AREA=0.00183 SQ MI
                PER A=0 PER B=33 PER C=0 PER D=66
                TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD      ID=1 CODE=1
FINISH
    
```

Appendix C
Scour Calculations



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch
SUBJECT Scour Well Calcs
BY DLH DATE 11-6-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Scour Wall Calculations (Q100) (Eqn 3.88 SEDIMENT & EROSION DESIGN GUIDE)

$$\frac{Y_s}{Y_1} = 4 Fr^{0.33}$$

Fr = upstream Froude No = 1.06

Y₁ = avg. upstr. flow depth = 1.75'

$$Y_s = (1.75) 4 (1.06)^{0.33} = 7.13'$$

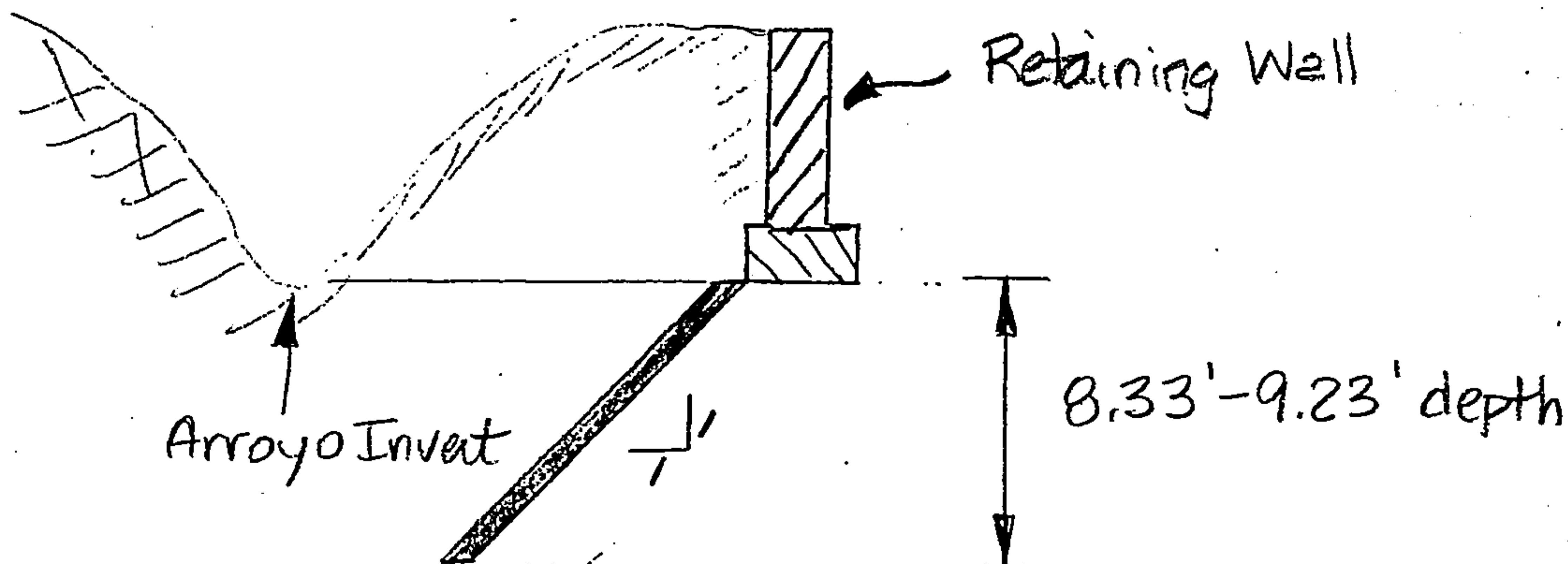
INVERT - Y_s

Scour Well Inv.

CS 1030	121.03 - 7.13' =	113.90
CS 1046	121.40 - 7.13' =	114.27
CS 1076	121.80 - 7.13' =	114.67
CS 1102	122.30 - 7.13' =	115.17
CS 1130	122.65 - 7.13' =	115.52

Bkvd Elev - Scour Well Invert = Scour Wall Δ Depth.

CS 1046	123.5 - 114.27 =	9.23'
CS 1076	123.6 - 114.67 =	8.93'
CS 1102	123.5 - 115.17 =	8.33'
CS 1130	123.5 - 115.52 =	7.98'
CS 1030	123.5 - 113.90 =	9.60



Location		Scour Wall Elev.	
		TOP	BOTTOM
XS	1030	123.5	113.9
XS	1046	123.5	114.27
XS	1076	123.5	114.67
XS	1102	123.5	115.17
XS	1130	123.5	115.52

Offsite Arroyo - HEC-2 Analysis (cross sections on grading plan)

HEC-RAS Plan: Plan 01 Reach: SUNRISE

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1375	212.00	28.60	31.35	31.91	33.04	0.040021	10.43	20.32	13.47	1.50
1356.75*	212.00	28.20	31.14	31.42	32.29	0.025720	8.61	24.62	15.98	1.22
1338.5*	212.00	27.80	30.62	30.91	31.78	0.026818	8.63	24.56	16.60	1.25
1320.25*	212.00	27.40	30.11	30.39	31.26	0.027243	8.60	24.66	17.13	1.26
1302	212.00	27.00	29.63	29.89	30.74	0.025954	8.43	25.15	17.44	1.24
1285.33*	212.00	26.30	28.61	29.09	30.15	0.040352	9.97	21.27	16.04	1.52
1268.66*	212.00	25.60	27.77	28.29	29.43	0.044626	10.33	20.52	15.85	1.60
1262	212.00	24.90	26.96	27.50	28.69	0.047123	10.53	20.14	15.79	1.64
1235.33*	212.00	24.57	26.78	27.08	27.85	0.032603	8.30	25.55	22.07	1.36
1218.66*	212.00	24.23	26.95		27.39	0.013228	5.35	39.66	33.87	0.87
1202	212.00	23.90	26.61	26.61	27.13	0.018782	5.74	36.95	36.89	1.01
1185.66*	212.00	23.55	25.69	26.01	26.70	0.028494	8.05	26.33	21.49	1.28
1169.33*	212.00	23.20	25.09	25.43	26.20	0.032019	8.44	25.11	20.91	1.36
1153	212.00	22.85	24.58	24.90	25.69	0.032076	8.45	25.10	20.98	1.36
1141.5*	212.00	22.75	24.66	24.79	25.44	0.022620	7.09	29.89	25.09	1.14
* 1130	212.00	22.65	24.56	24.65	25.26	0.021592	6.73	31.50	27.69	1.11
1116*	212.00	22.47	24.38	24.44	25.00	0.019718	6.32	33.54	30.36	1.06
* 1102	212.00	22.30	24.18	24.19	24.73	0.018074	5.91	35.89	33.80	1.01
1088*	212.00	22.05	23.71	23.87	24.43	0.027025	6.82	31.08	31.94	1.22
* 1076	212.00	21.80	23.46	23.54	24.07	0.021752	6.25	33.92	33.80	1.10
1061*	212.00	21.60	23.20	23.24	23.74	0.020291	5.92	35.82	36.79	1.06
* 1046	212.00	21.40	22.94	22.95	23.46	0.019144	5.82	36.41	36.66	1.03
1030.66*	212.00	21.03	22.74	22.69	23.20	0.015885	5.45	38.89	37.60	0.94
1015.33*	212.00	20.67	22.56		22.97	0.012726	5.17	41.03	36.37	0.86
* 1000	212.00	20.30	22.15	22.15	22.73	0.017591	6.10	34.75	30.52	1.01

* Cross Sections used in scour calculations

MARK GOODWIN

& ASSOCIATES
CONSULTING ENGINEERS

dmg

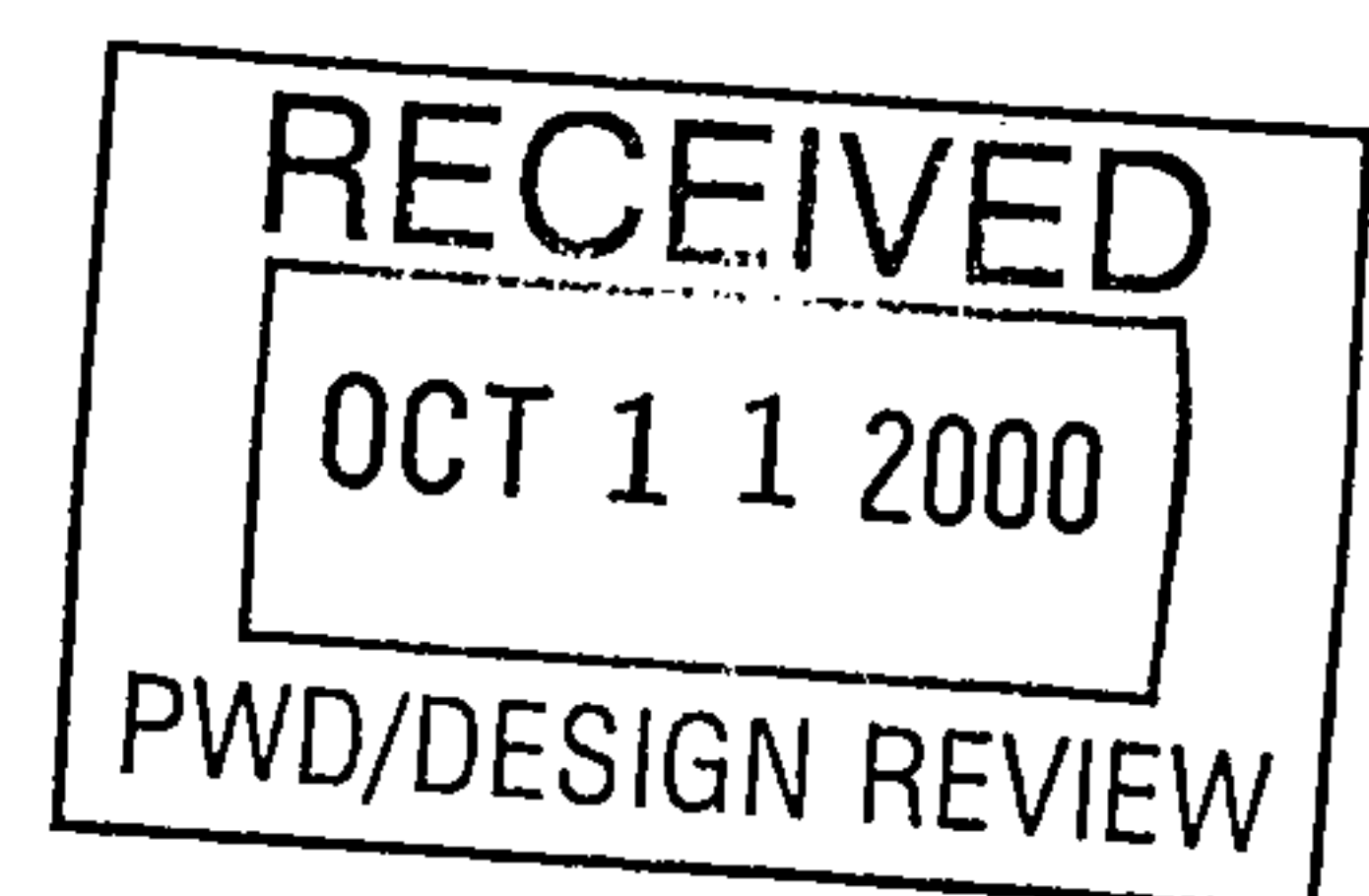
Supplemental Information

for

Sunrise Ranch Unit 2

File

L9 / 06



645781

TEMPORARY PUBLIC DRAINAGE EASEMENT

(8-31-00)

106TH STREET PARTNERS, LTD.
~~Joseph Bedat~~

THIS GRANT OF TEMPORARY EASEMENT, by and between
("Grantor"), whose address is PO Box 1669, Cedar Crest, NM 87008, and the City of
Albuquerque, a New Mexico Municipal Corporation ("City"), whose address is P.O. Box 1293,
Albuquerque, NM 87103.

as shown on exhibit 'A' JAB
8/30/00

1. **Grant of Temporary Public Drainage Easement.** The Grantor grants to the City an
exclusive, temporary public drainage easement ("Easement"), for a storm drain system
("Public Improvement"), on, over, across, and through the property described below ("Property"),
together with the right of the City to operate, maintain, repair, replace and construct the Public
Improvement and the right to remove trees, bushes, undergrowth and any other obstacles upon the
Property if the City determines they interfere with the appropriate use of this Easement. The Property
is described as follows:

Lot 2, Block 9, The Lands of Atrisco Grant
Filed in Bernalillo County Clerk's office 3/26/62, Book D3, Folio 26

2. **Warranties.** Grantor covenants and warrants that it is the owner in fee simple of the
Property and that it has a good lawful right to convey the Property or any part thereof and that Grantor
will forever warrant and defend the title to the Property against all claims from all persons or entities.

3. **Binding on Grantor's Property.** The grant and other provisions of this Easement
constitute covenants running with title to the Property for the benefit of the City and its successors and
assigns until terminated.

4. **Temporary.** This easement will be released by the City when the City Engineer
determines that the Easement is no longer required.

WITNESS my hand and seal this 30th day of August, 2000.

GRANTOR:

General Partner

BY:

106TH STREET PARTNERS, LTD

ITS:

General Partner

STATE OF NEW MEXICO)

) SS

COUNTY OF BERNALILLO)

This instrument was acknowledged before me this 30th day of AUGUST, 2000
by JOSEPH A. BEDAT, its GENERAL PARTNER
on behalf of 106TH STREET PARTNERS, LTD.

BY:

Susan Kucia

NOTARY PUBLIC

My Commission Expires:

6-19-04



Bernalillo Co Clerk Bern. Co. ERSE

R 9.00

2000088526

5489969

Page: 1 of 2

09/07/2000 10:07A

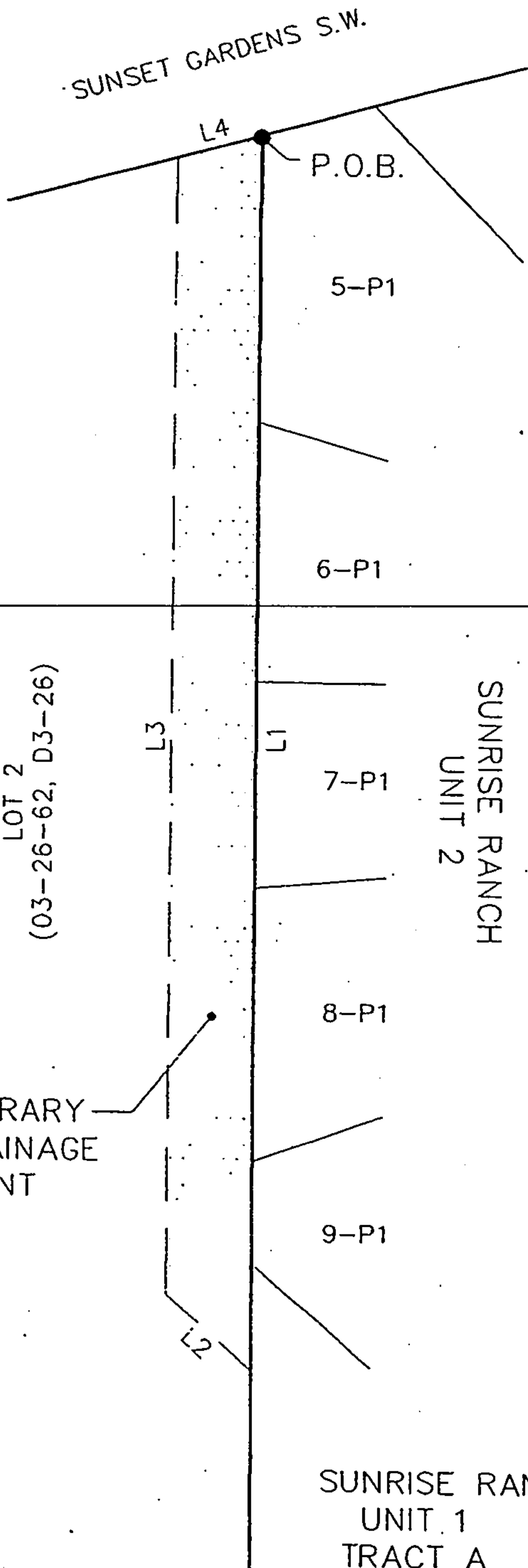
Bk-A9 Pg-8172

EXHIBIT FOR 20' TEMPORARY PUBLIC DRAINAGE EASEMENT



2000088526
5489969
Page: 2 of 2
89/87/2000 10:07A
Bk-A9 Pg-8172

LINE	DIRECTION	DISTANCE
L1	S00°17'50"W	285.00'
L2	N48°34'02"W	26.55'
L3	N00°17'50"E	262.06'
L4	N75°00'30"E	20.73'



SCALE: 1" = 50'

DESCRIPTION

A 20' Temporary Public Drainage Easement within the Town of Atrisco Grant, projected Section 29, Township 10 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico being within LOT 2, BLOCK 9, THE LANDS OF ATRISCO GRANT as the same is shown and designated on said plat filed for record in the office of the County Clerk of Bernalillo County, New Mexico on March 26, 1962 in Volume D3, Folio 26 and being more particularly described as follows:

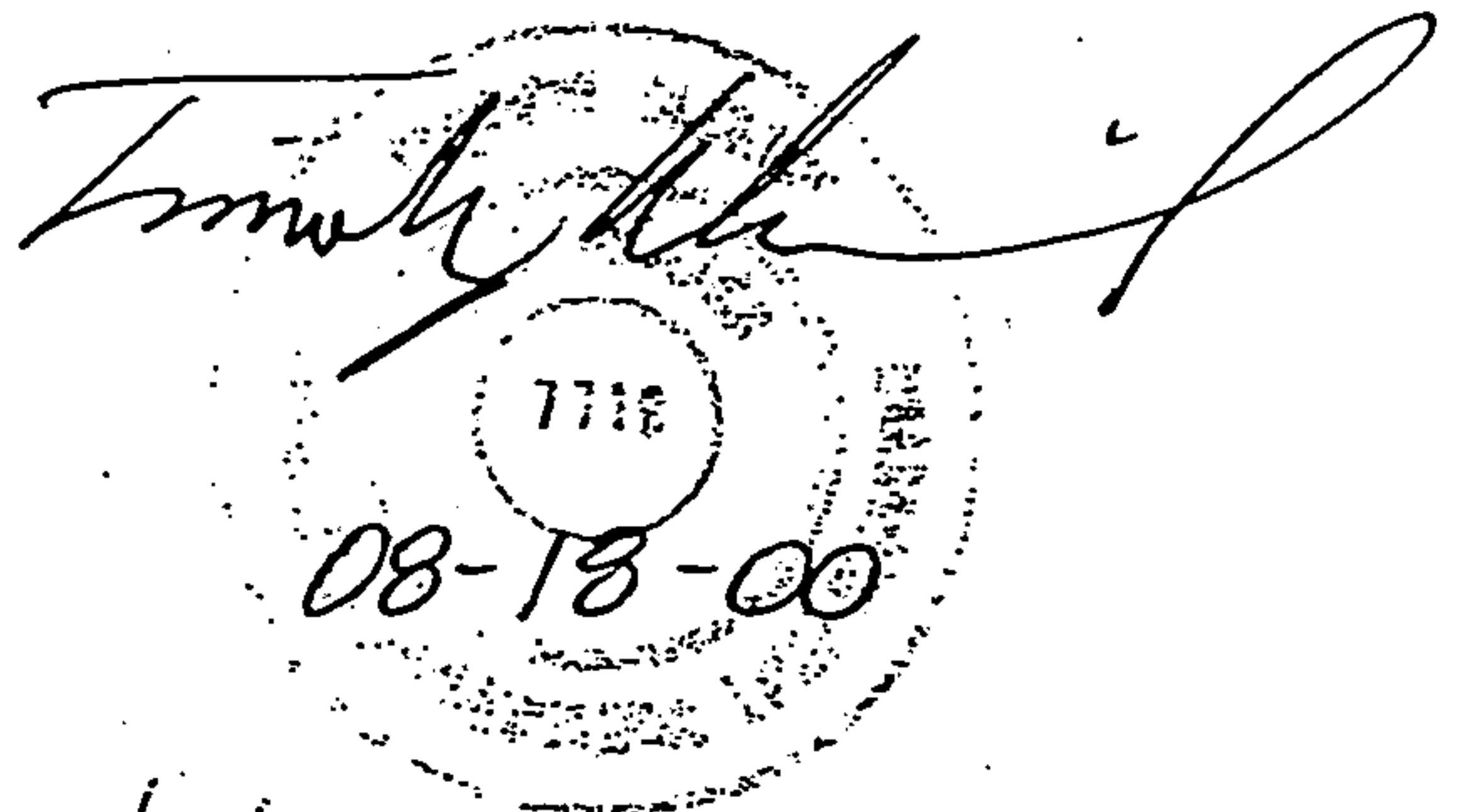
BEGINNING at the northeast corner of the herein described easement, said point being on the southerly right-of-way line of Sunset Gardens S.W. from whence the Albuquerque Control Survey Monument "9-L9" bears S 74°26'26" E, 1613.33 feet;

THENCE leaving said southerly right-of-way line S 00°17'50" W, 285.00 feet to the southeast corner;

THENCE N 48°34'02" W, 26.55 feet to the southwest corner;

THENCE N 00°17'50" E, 262.06 feet to the northwest corner, said point being on said southerly right-of-way line of Sunset Gardens S.W.;

THENCE along said southerly right-of-way line N 75°00'30" E, 20.73 feet to the point of beginning and containing 0.1256 acres more or less.



SUNRISE RANCH
UNIT 1
TRACT A

EXHIBIT "A"

8/30/00

D.V.D.



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

PROJECT Sunrise Ranch Unit 2
SUBJECT Erosion Setback Calcs.
BY DLH DATE 10-4-00
CHECKED _____ DATE _____
SHEET _____ OF _____

SB 20101 (upstream subbasin, source: Amole Hubbell Drainage Management Plan.)

$$100\text{yr}-24\text{hr } Q_{\text{peak}} = 212 \text{ cfs}$$

$$\text{Dominant Discharge } Q_d = 0.2 Q_{100} \text{ (Eqn 3.77)*}$$

$$Q_d = 0.2(212 \text{ cfs}) = 42.4 \text{ cfs}$$

$$S_c = 0.037 Q_d^{-.133} = .02248 \quad S = \frac{28.6 - 20.3}{375} = .02213$$

$$\text{For } Q_d = 42.4 \text{ cfs}$$

$$\Rightarrow \Delta_{\text{max}} = 11.5 Q_d^{0.4} \quad \text{WHEN } S \geq S_c \text{ and } Q_d \leq 200 \text{ cfs}$$

$$\Delta_{\text{max}} = 11.5(42.4)^{0.4} \text{ (Eqn. 3.81a)*}$$

$$\Delta_{\text{max}} = 51.5'$$

$$\Rightarrow \Delta_{\text{max}} = 6.2 Q_d^{0.375} S^{-.188} \quad \text{WHEN } S < S_c \text{ and } Q_d \leq 200 \text{ cfs}$$

$$\Delta_{\text{max}} = 6.2(42.4)^{.375} (.02213)^{-.188} \text{ (Eqn. 3.82a)*}$$

$$= 6.2(4.076)(2.047)$$

$$\Delta_{\text{max}} = 51.7'$$

SOURCE: SEDIMENT AND EROSION DESIGN GUIDE,
AMAFCA, MARCH 1994.



```

START                TIME=0.0
*****              SUNRISE RANCH LONGFORD HOMES (L-9)
*****              100-YEAR 24-HOUR STORM EVENT
*****              FILE: SR_AROYO.DAT  AUGUST 2000 BY:DLH
RAINFALL              TYPE=2 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                      RAIN DAY=2.66 IN DT=0.0500 HR
*****
*****              EXISTING CONDITIONS
*****              SB 20101 AREA = .2923 ACRES = 187.1 SQMI
*****              Tp=2/3tP=2/3(0.46)=0.31
*****
*****              OFFSITE SUBBASIN 20101 (AMOLE HUBBELL DRAINAGE MANAGE. PLAN)
*****
SEDIMENT BULK        CODE=1    BF=1.16
COMPUTE NM HYD        ID=1 HYD NO=201.01 AREA=0.2923 SQ MI
                      PER A=86 PER B=0 PER C=0 PER D=14
                      TP=0.31 HR MASS RAINFALL=-1
PRINT HYD            ID=1 CODE=1
FINISH

```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = SR AROYO.DAT

RUN DATE (MON/DAY/YR) =08/09/2000
USER NO.= M GOODWN.I01

[illegible]

AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN

START 0.0 HOURS PC=0 PL=-1

SOURCE: AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN
VOLUME III
APPENDIX III-E (PART 1 of 2)
AHYMO INPUT FILES
JULY 1999

*S
*S SNOW VISTA WATERSHED
*S
*S
*S 100-YR, 24-HR STORM WITH SEDIMENT. SNOW VISTA WATERSHED
*S FILE NAME : SV100E1B.DAT
*S BY: RICHARD STOCKTON AND TOM BLAINE PEER REVIEWED BY: CLINT DODGE
*S LAST REVISION: 05-15-96

* THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF TO THE SNOW VISTA POND
* AND THE CHANNEL FOR THE EXISTING CONDITIONS AMAFCA IS CONCERNED
* WITH THE CAPACITY OF BOTH THE POND AND THE CHANNEL. MODELS BY
* EASTERLING AND ASSOCIATES AND RYLES AND ASSOCIATES WERE USED IN THE
* CONSTRUCTION OF THIS MODEL.

***** ANALYSIS ASSUMPTIONS:*****

* BASINS THAT CONTRIBUTE FLOW TO THE SNOW VISTA CHANNEL ARE ASSUMED TO BE IN
* THE EXISTING CONDITION BASED ON THE AERIAL PHOTO DATED NOVEMBER 07, 1995.

* SUBSEQUENT USERS OF THIS MODEL ASSUME FULL RESPONSIBILITY TO VERIFY THE
* VALIDITY, CURRENCY, AND PROPRIETY OF THE ASSUMPTIONS UPON WHICH THIS MODEL
* WAS CONSTRUCTED.

*S 100 YEAR 24 HR STORM, EXISTING CONDITIONS
RAINFALL TYPE=2 0.0 1.87 2.20 2.66 DT=0.0500
* 10 YEAR 24 HR STORM, EXISTING CONDITIONS
**RAINFALL TYPE=2 0.0 1.25 1.47 1.77 DT=0.0500
* 2 YEAR 24 HR STORM, EXISTING CONDITIONS
**RAINFALL TYPE=2 0.0 0.74 0.95 1.15 DT=0.0500
*

AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN

* THE RUNOFF FOR BASIN 20101 IS CALCULATED ASSUMING THAT THERE IS ONE BASIN
* AND NO SUB-BASINS. TIME OF CONCENTRATION IS CALCULATED USING THE SCS
* UPLAND METHOD.
* $T_p = 2/3 T_c = 2/3 (0.46) = 0.31$
* THERE ARE SEVERAL SMALL AREAS THAT ARE DEVELOPED. THE AREA WAS CALCULATED USING
* AREIAL PHOTOGRAPHS. THE TOTAL AREA OF LAND TREATMENT "D" IS 34.9 ACRES.
* THE TOTAL AREA OF THE BASIN IS 187.1 ACRES (0.2923 SQ MI).
* BULKING FACTORS WERE CALCULATED FROM BASINS 20102 AND 20103. THE CALCULATED
* BULKING FACTOR WAS THEN DISTRIBUTED THROUGH OUT THE WATERSHED TO APPLICABLE
* BASINS.

*
*S COMPUTE HYD FOR BASIN 20101, FLOW INTO SNOW VISTA POND,
*S THAT WAS NOT MODELED BY EASTERLING.

*
SEDIMENT BULK CODE=1 BF=1.16
COMPUTE NM HYD ID=50 HYD=E20101 DA=0.2923 SQ MI
%A=86 %B=0 %C=0 %D=14 TP=0.31
MASS RAINFALL=-1
PRINT HYD ID=50 CODE=1

*S BEGIN EASTERLING OFFSITE WATERSHED

COMPUTE NM HYD ID=2 HYD=E20102 DA=0.0451
A=77 B=0 C=17 D=6 TP=0.1333
MASS RAIN=-1
PRINT HYD ID=2 CODE=1
SED WASH LOAD ID=2 K=0.17 C=0.20 P=1.0 LS=0.87
IMPERV=6.0 WASH LF=3.0

** ROUTE THE FLOW FROM BASIN 20102 DOWN THE EXISTING ARROYO FROM THE WEST LINE
** OF BASIN 20103 TO A POINT 500' WEST OF 106TH STREET
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100 FT MAXIMUM ELEV=107.0 FT

AMOLE-HUBBELL DRAINAGE MANAG.

ANYMO SUMMARY TABLE (AMYMO194) - AMAFCA Hydrologic Model - January, 191
INPUT FILE = SV100E1B.DAT

Post-it® Fax Note	7671	Date	9/5	# of pages	1
To	DIANNE HOLTZMAN		From	DIXON	
Co./Dept.			Co.		
Phone #			Phone #		
Fax #	787-9539		Fax #		

USER NO. = STOCKTON.S94

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
---------	---------------------------	-------------	-----------	--------------	----------------------	-----------------------	-----------------	----------------------	--------------	----------

START

*S

TIME=.00

*S SNOW VISTA WATERSHED

*S

*S

*S 100-YR, 24-HR STORM WITH SEDIMENT. SNOW VISTA WATERSHED

*S FILE NAME : SV100E1B.DAT

*S BY: RICHARD STOCKTON AND TOM BLAINE

PEER REVIEWED BY: CLINT DODGE

*S LAST REVISION: 05-15-96

*S 100 YEAR 24 HR STORM, EXISTING CONDITIONS

RAINFALL TYPE= 2

*S COMPUTE HYD FOR BASIN 20101, FLOW INTO SNOW VISTA POND,

RAIN24=2.660

*S THAT WAS NOT MODELED BY EASTERLING.

SEDIMENT BULK

COMPUTE NM HYD E20101 - 50 .29230

212.20

12.978

.83249

1.700

1.134 PER IMP=14.00

PK BF =1.16

*S BEGIN EASTERLING OFFSITE WATERSHED

COMPUTE NM HYD E20102 - 2 .04510

56.15

1.749

.72724

1.500

1.945 PER IMP=6.00

SED WASH LOAD E20102 2

ROUTE E20102.1 2 10 .04510

47.65

1.749

.72725

1.600

1.651

WASH CONC. (PPM-w) =41687

*S COMPUTE SEDIMENT WASH LOAD FOR BASIN 20103

SED WASH LOAD E20103 3 .04940

50.00

1.448

.54959

1.500

1.581 PER IMP=1.00

ADD HYD E20103.1 3&10 11 .09450

94.70

3.197

.63437

1.550

1.566

WASH CONC. (PPM-w) =50848

ROUTE E20103.2 11 10 .09450

84.91

3.197

.63438

1.600

1.404

SEDIMENT TRANSP E20103.1 11

SED ID = 1

ROUTE RESERVOIR E20103.3 10 5 .09450

2.64

3.197

.63437

2.850

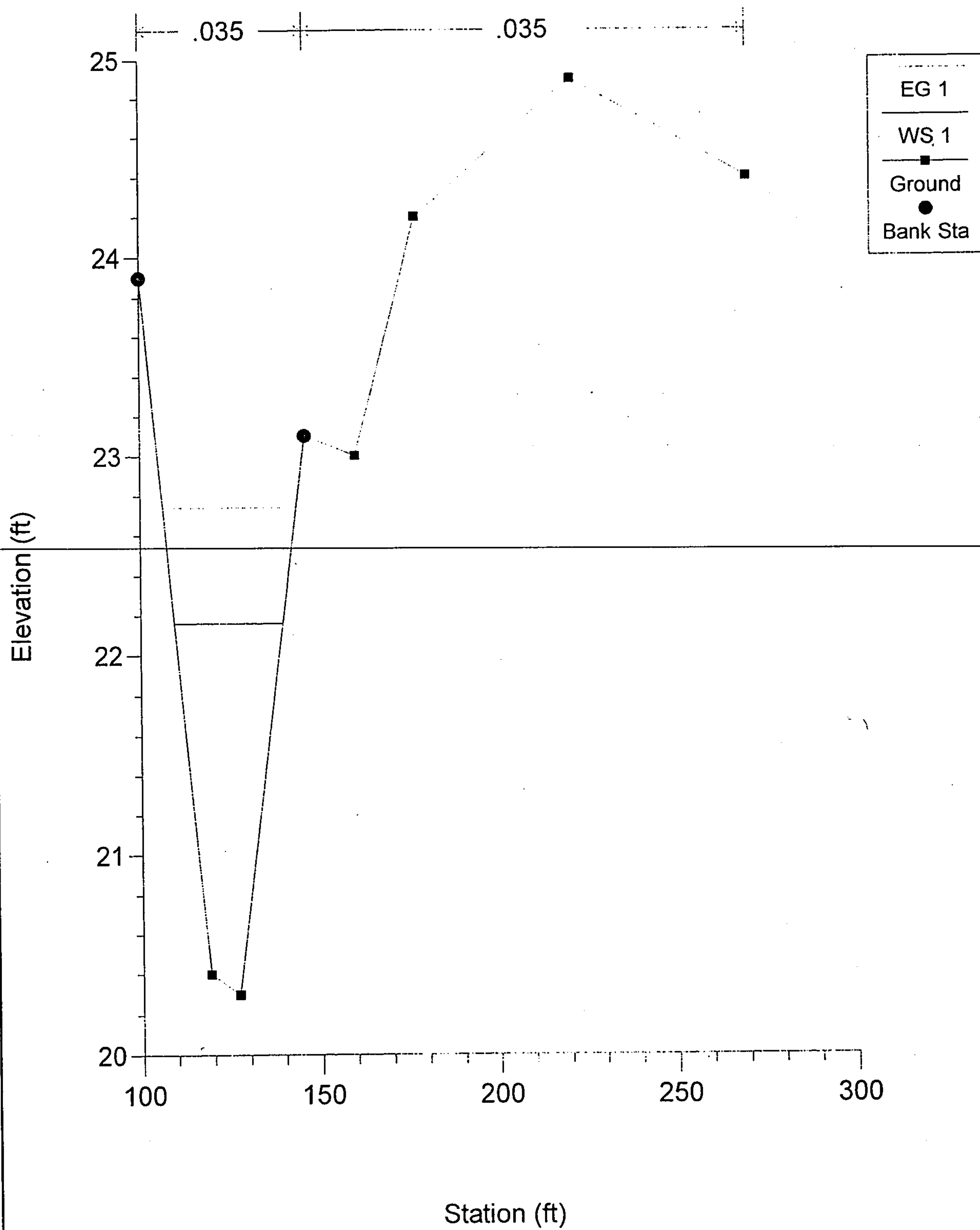
.044 AC-FT=2.698

PEAK CONC. (PPM-w) = 413317 TOTAL SED. (TONS) =1994.42

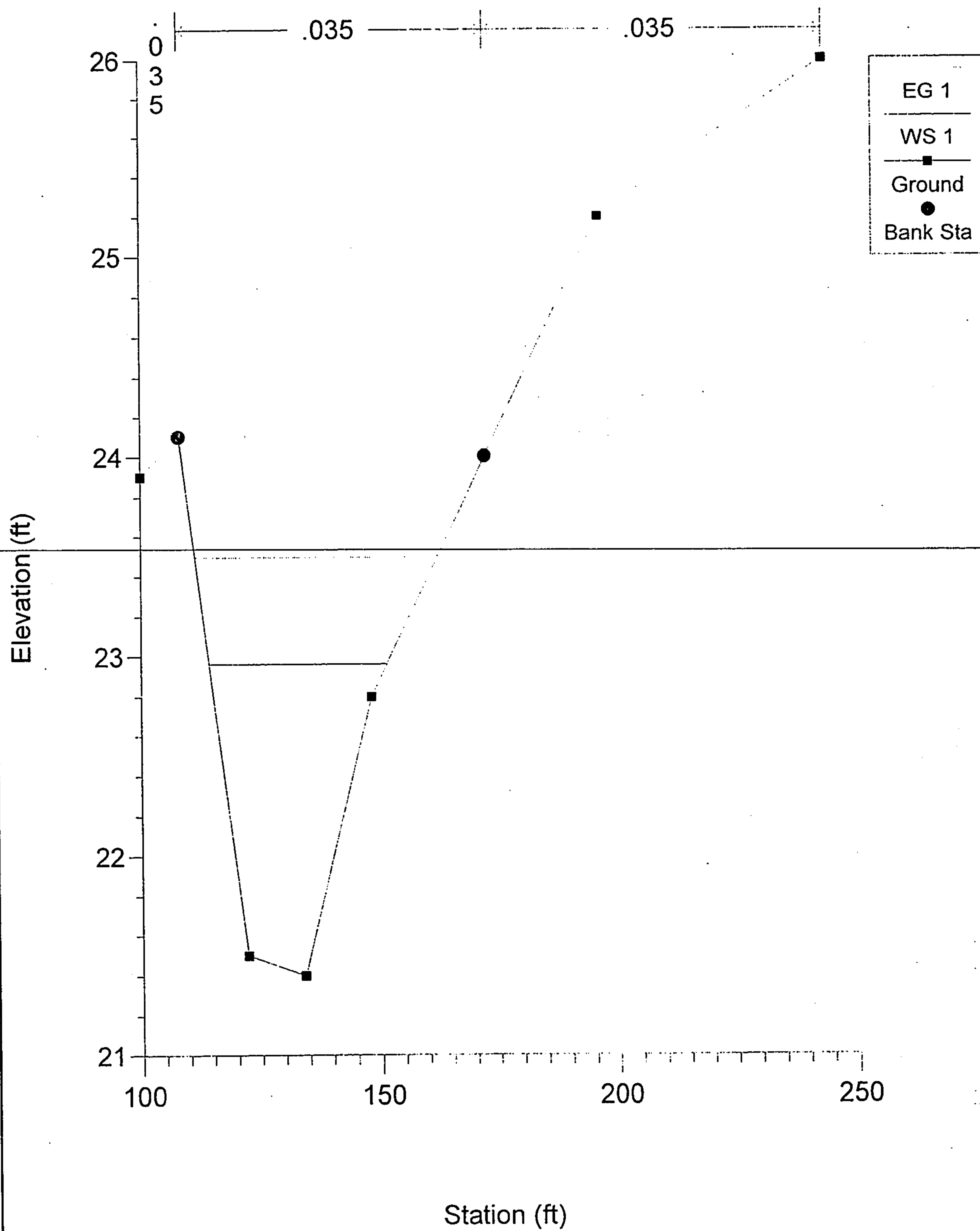
HEC-RAS Plan: Plan 01 Reach: SUNRISE

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
1375	212.00	28.60	31.35	31.91	33.04	0.040021	10.43	20.32	13.47	1.50
1356.75*	212.00	28.20	31.14	31.42	32.29	0.025720	8.61	24.62	15.98	1.22
1338.5*	212.00	27.80	30.62	30.91	31.78	0.026818	8.63	24.56	16.60	1.25
1320.25*	212.00	27.40	30.11	30.39	31.26	0.027243	8.60	24.66	17.13	1.26
1302	212.00	27.00	29.63	29.89	30.74	0.025954	8.43	25.15	17.44	1.24
1285.33*	212.00	26.30	28.61	29.09	30.15	0.040352	9.97	21.27	16.04	1.52
1268.66*	212.00	25.60	27.77	28.29	29.43	0.044626	10.33	20.52	15.85	1.60
1252	212.00	24.90	26.96	27.50	28.69	0.047123	10.53	20.14	15.79	1.64
1235.33*	212.00	24.57	26.78	27.08	27.85	0.032603	8.30	25.55	22.07	1.36
1218.66*	212.00	24.23	26.95		27.39	0.013202	5.34	39.69	33.89	0.87
1202	212.00	23.90	26.62	26.62	27.13	0.018552	5.70	37.16	37.09	1.00
1185.66*	212.00	23.53	25.82	26.07	26.72	0.027726	7.63	27.77	24.11	1.25
1169.33*	212.00	23.17	25.17	25.51	26.24	0.029921	8.30	25.54	20.72	1.32
1153	212.00	22.80	25.35		25.70	0.008203	4.75	44.64	31.94	0.71
1141.5*	212.00	22.70	24.94	24.94	25.54	0.017170	6.20	34.21	28.69	1.00
1130	212.00	22.60	24.85		25.28	0.011510	5.27	40.26	31.90	0.83
1116*	212.00	22.40	24.53	24.53	25.07	0.017665	5.92	35.84	33.07	1.00
1102	212.00	22.20	24.04	24.20	24.77	0.026589	6.88	30.83	30.87	1.21
1089*	212.00	22.00	23.77	23.87	24.41	0.023479	6.45	32.85	33.03	1.14
1076	212.00	21.80	23.39	23.53	24.09	0.026774	6.75	31.40	32.58	1.21
1061*	212.00	21.60	23.21	23.30	23.80	0.024060	6.21	34.11	37.04	1.14
1046	212.00	21.40	22.96	22.99	23.49	0.019812	5.86	36.19	37.09	1.04
1030.66*	212.00	21.03	22.68	22.71	23.22	0.019457	5.89	35.99	36.07	1.04
1016.33*	212.00	20.67	22.57		22.99	0.012508	5.15	41.13	36.11	0.85
1000	212.00	20.30	22.16	22.16	22.74	0.017537	6.12	34.63	30.18	1.01

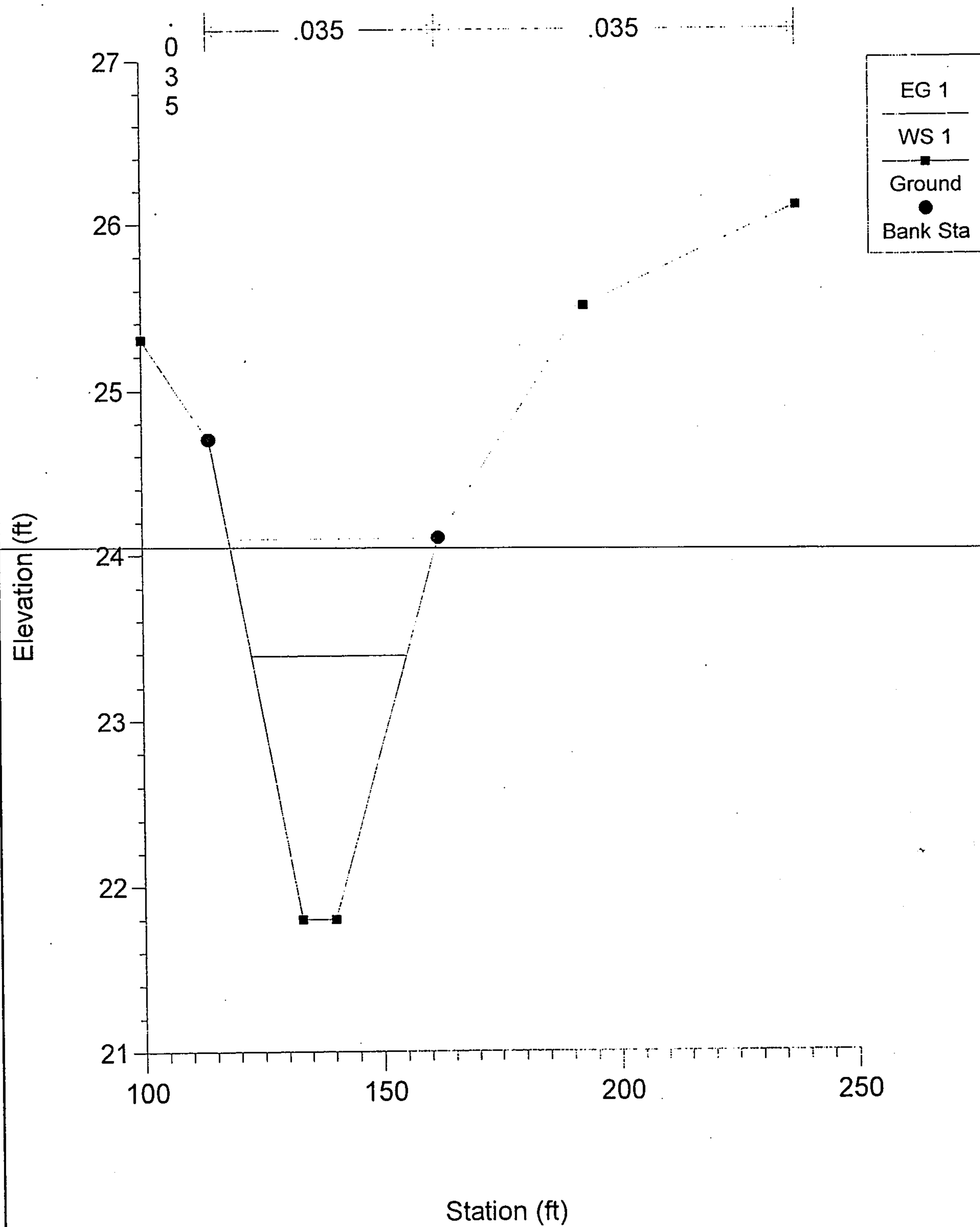
SUNRISE ARROYO Plan: Plan 01
Geom: SUNRISE
SUNRISE Riv Sta = 1000



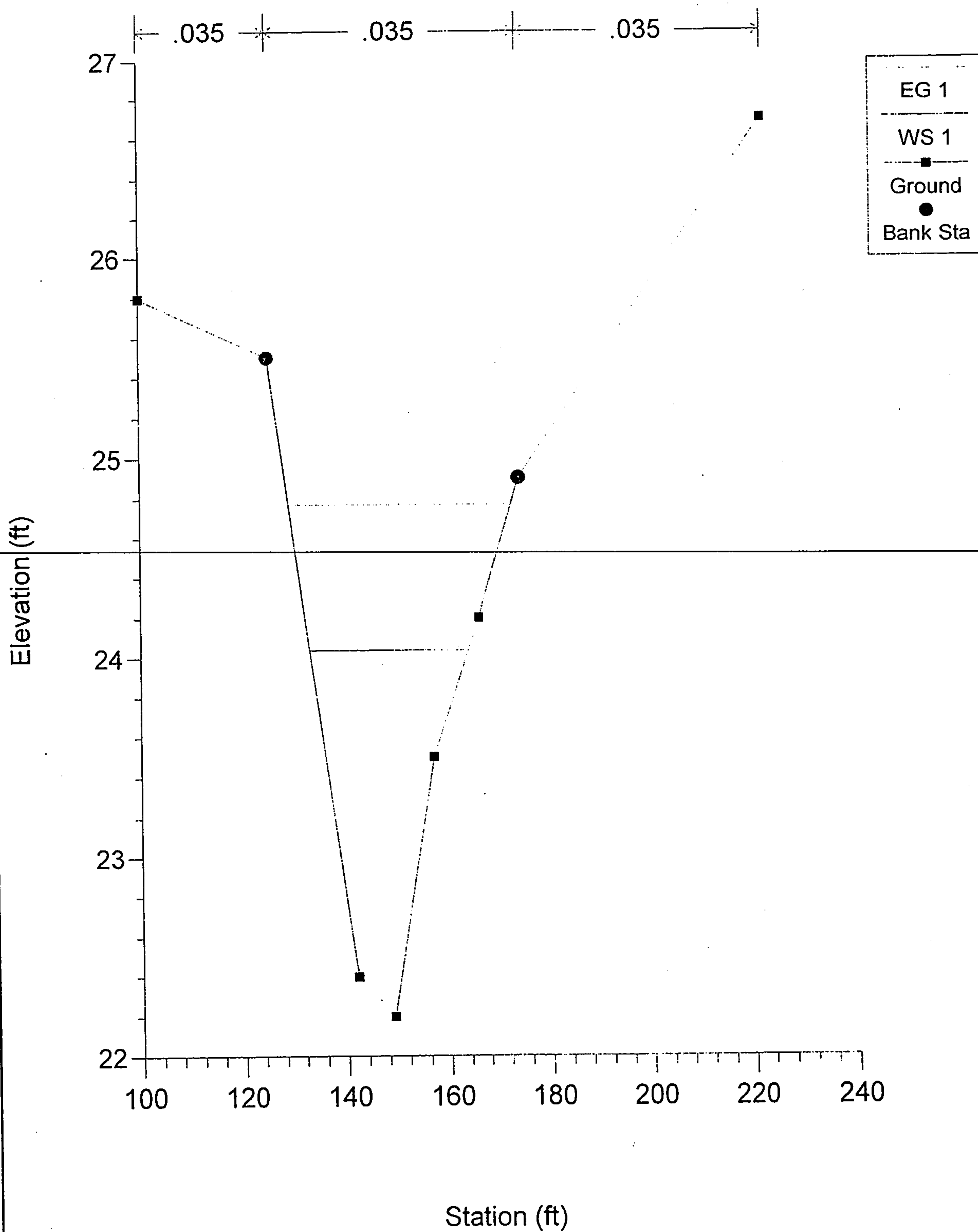
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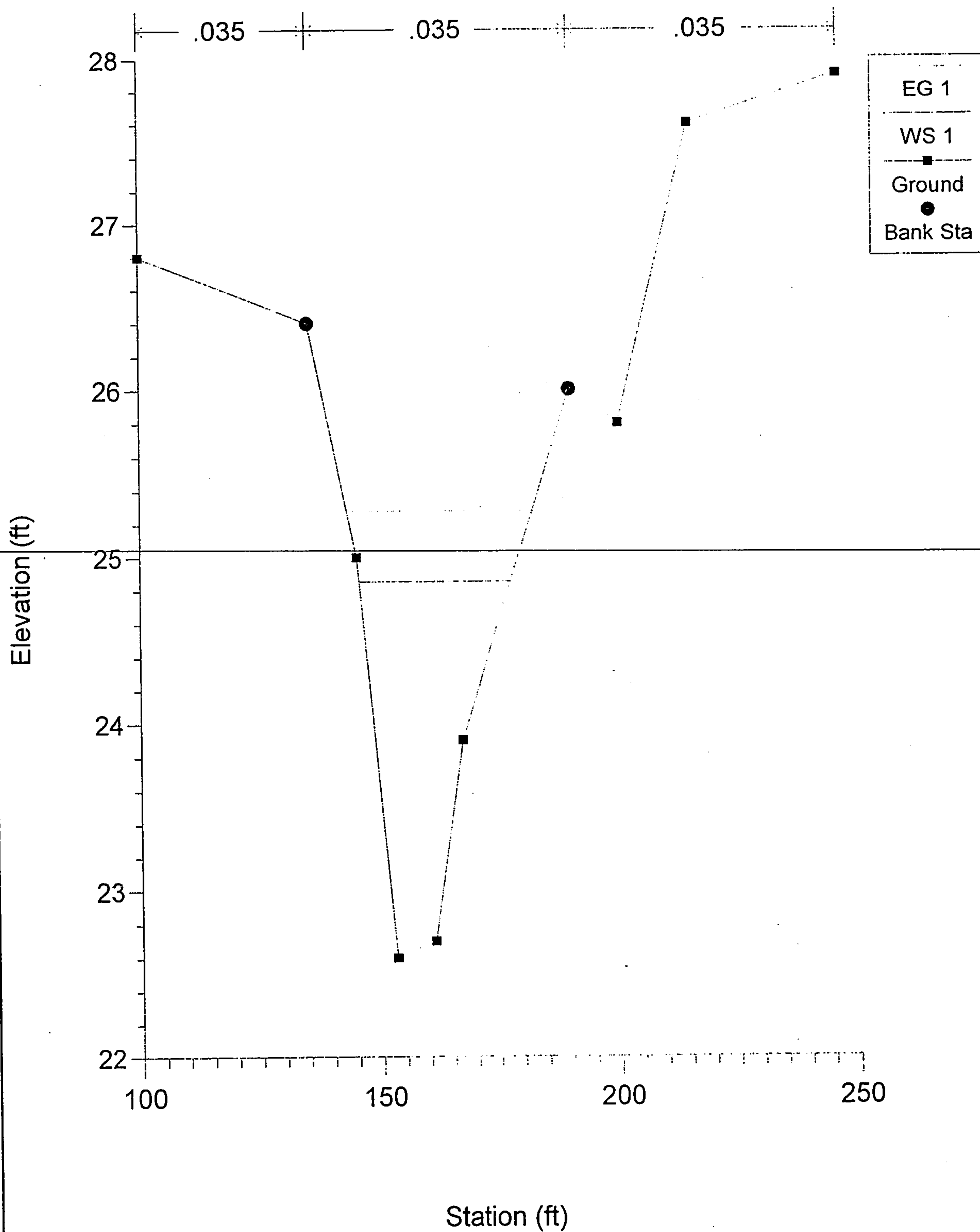
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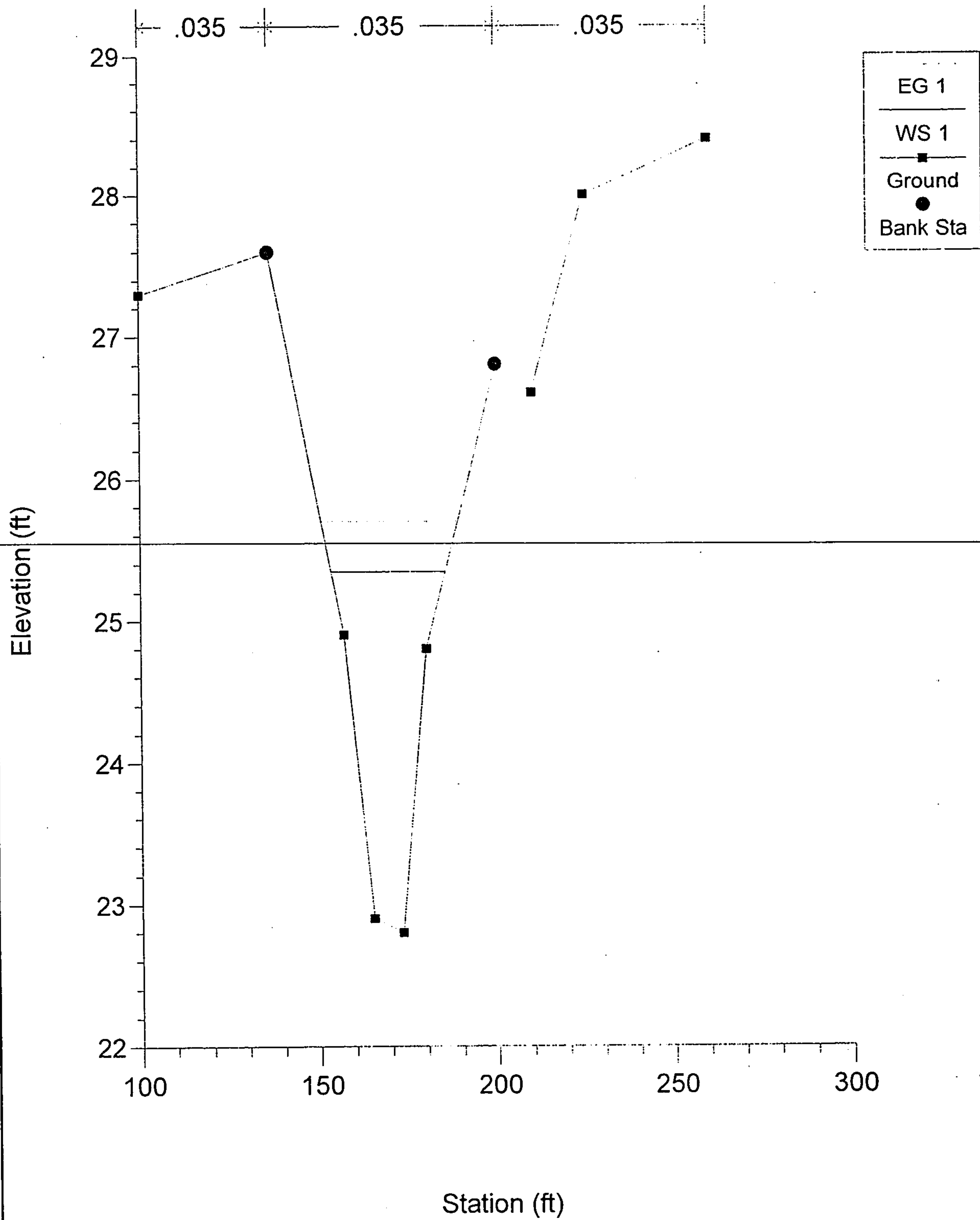
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Geom: SUNRISE
SUNRISE Riv Sta = 1102



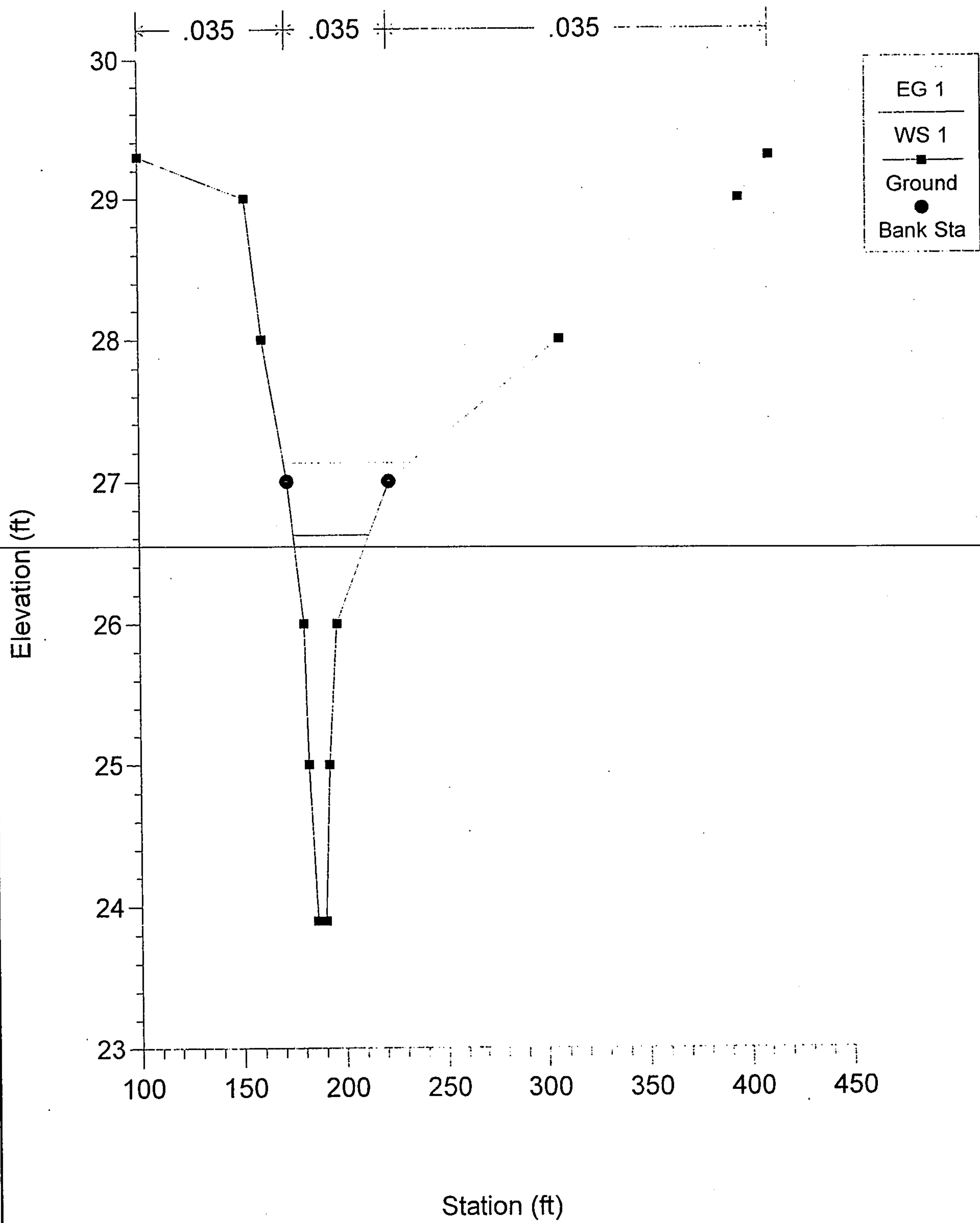
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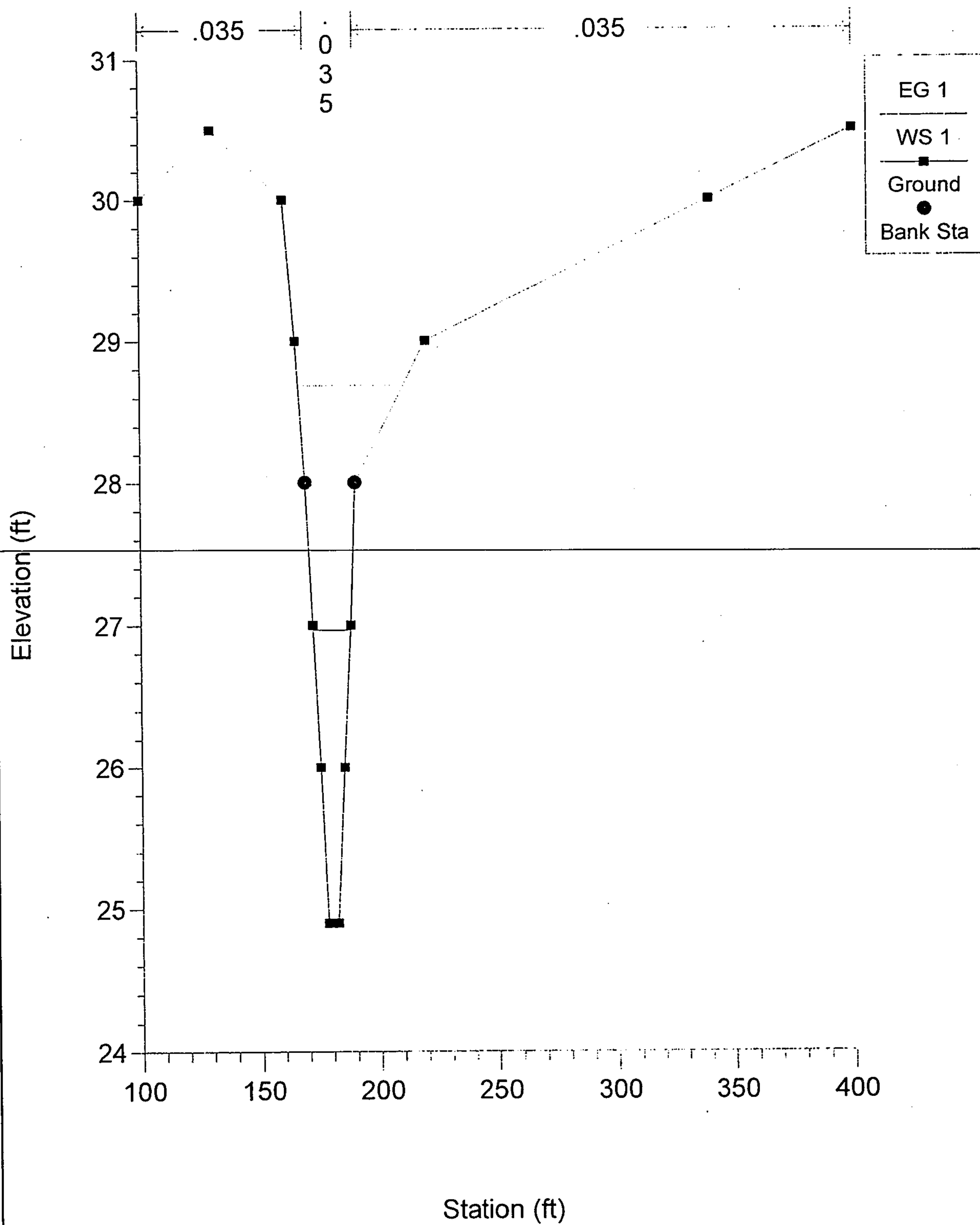
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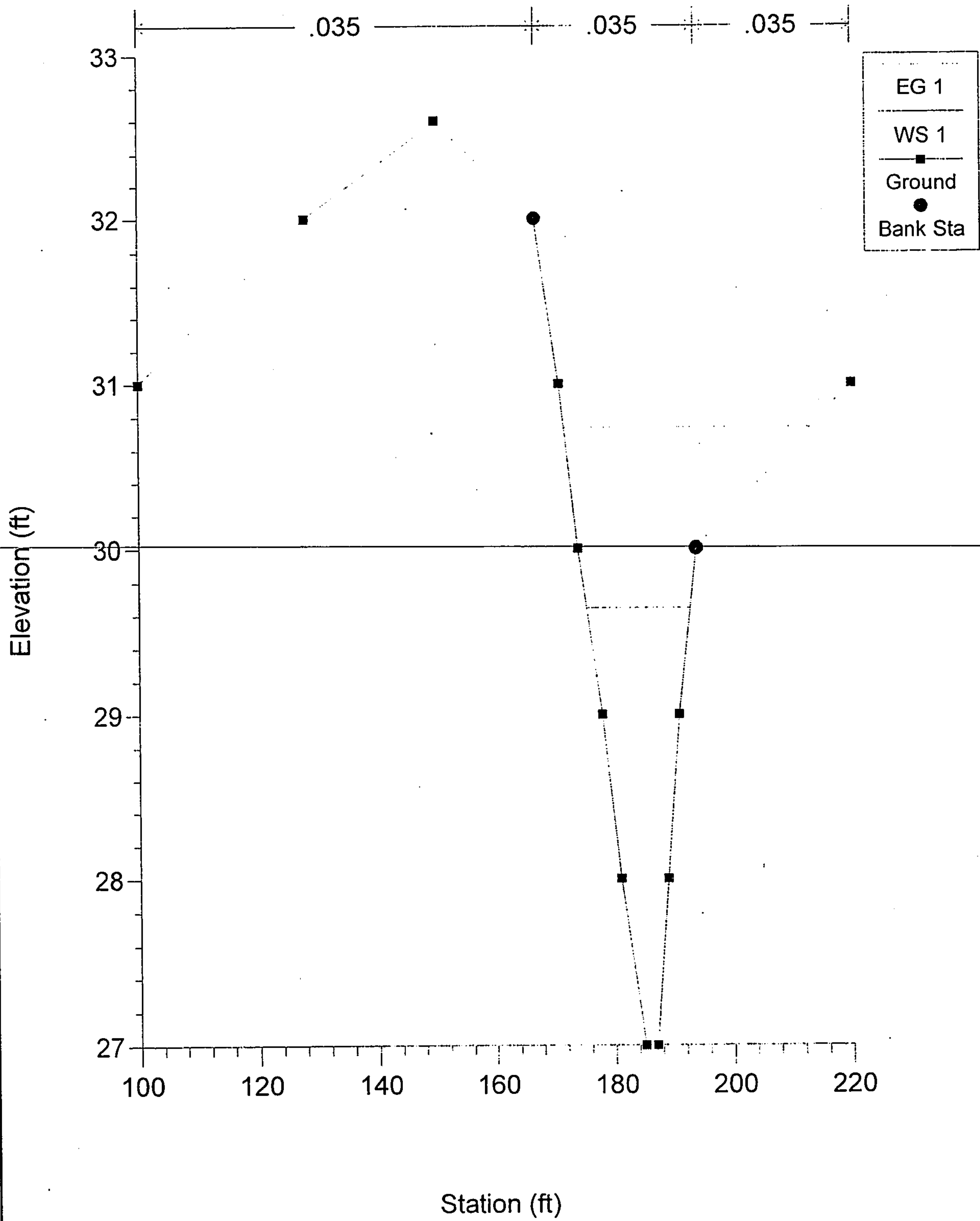
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SUNRISE Riv Sta = 1202



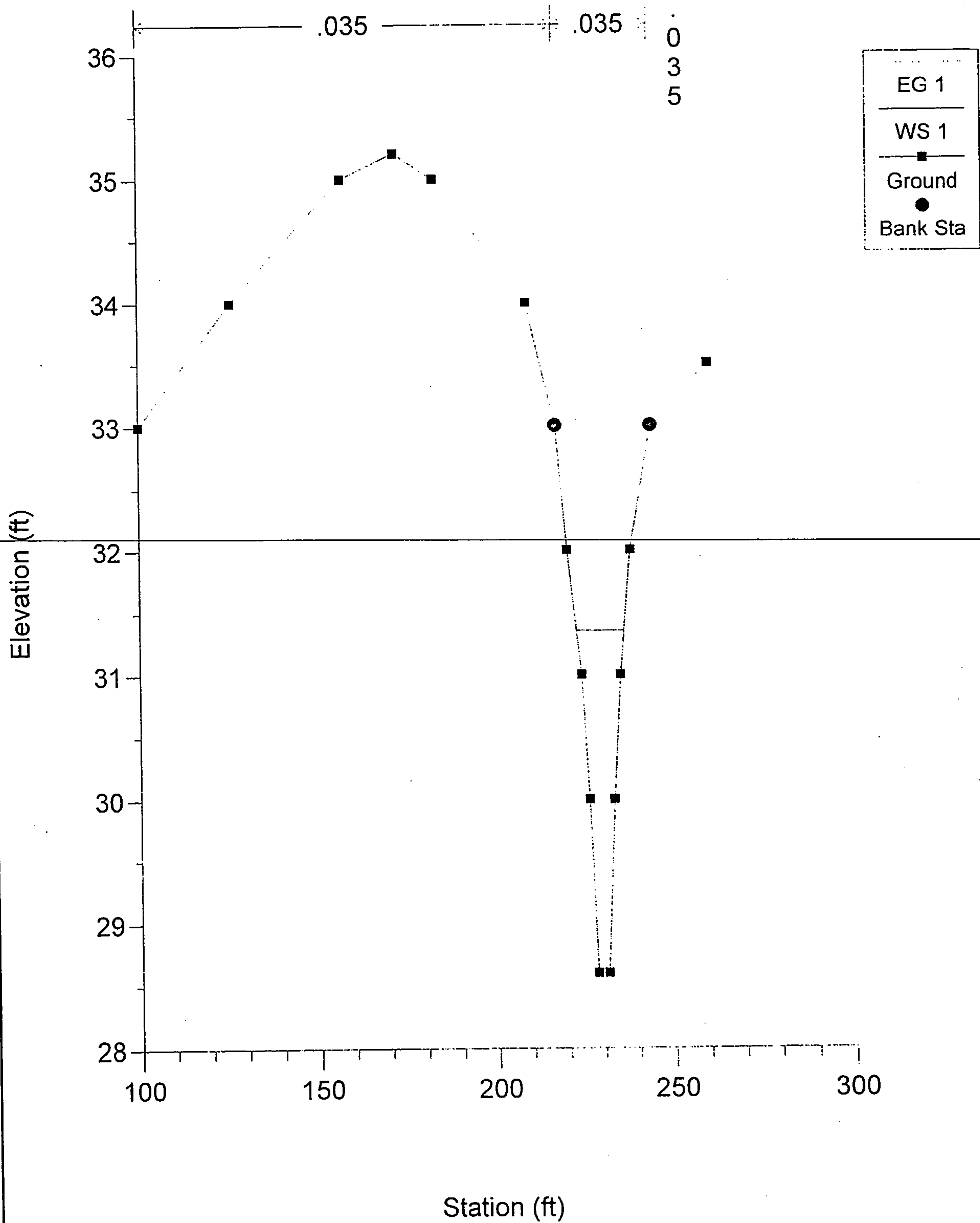
SUNRISE ARROYO Plan: Plan 01
Geom: SUNRISE
SUNRISE Riv Sta = 1252



SUNRISE ARROYO Plan: Plan 01
Geom: SUNRISE
SUNRISE Riv Sta = 1302



SUNRISE ARROYO Plan: Plan 01
Geom: SUNRISE
SUNRISE Riv Sta = 1375

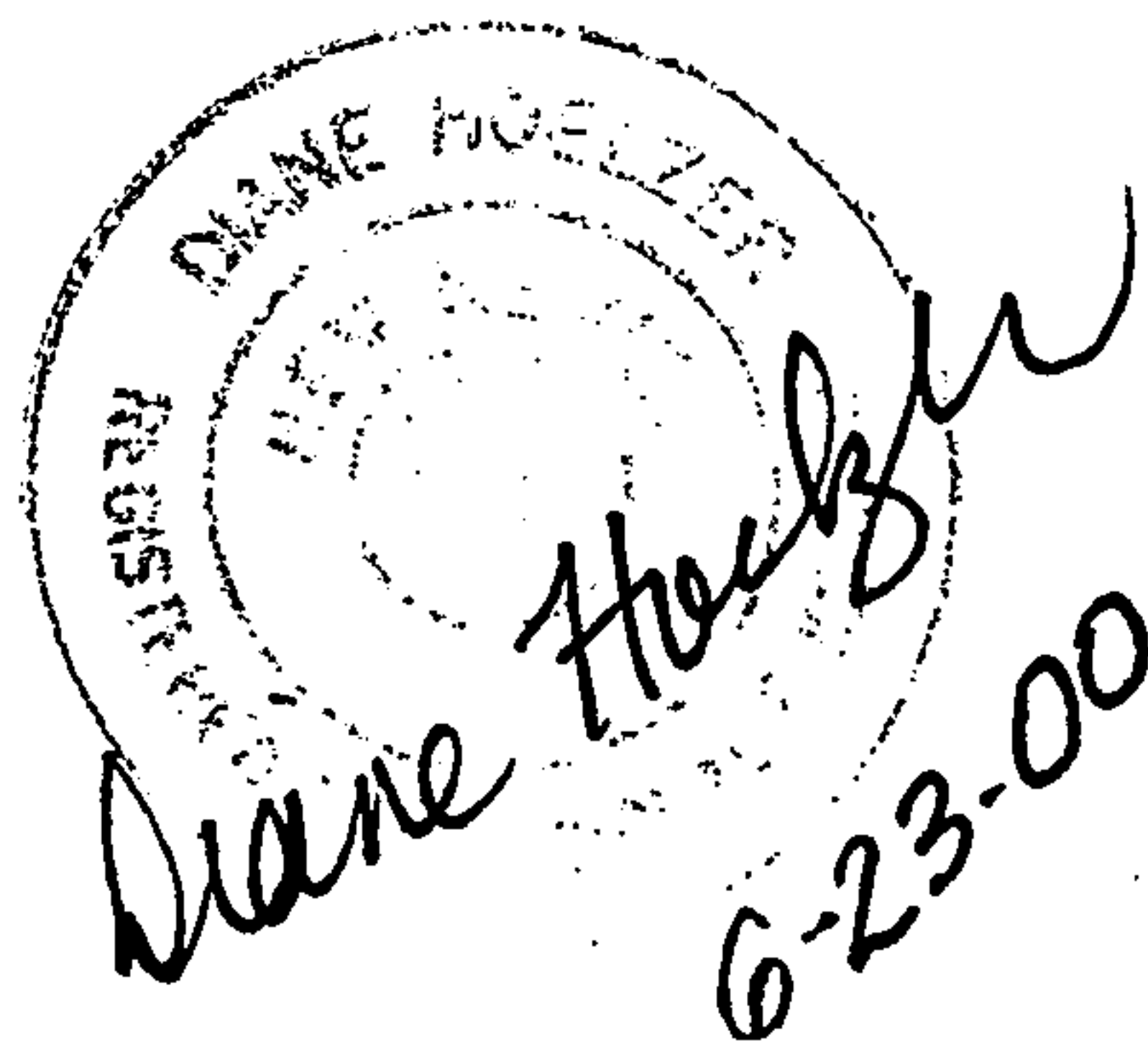


MARK GOODWIN

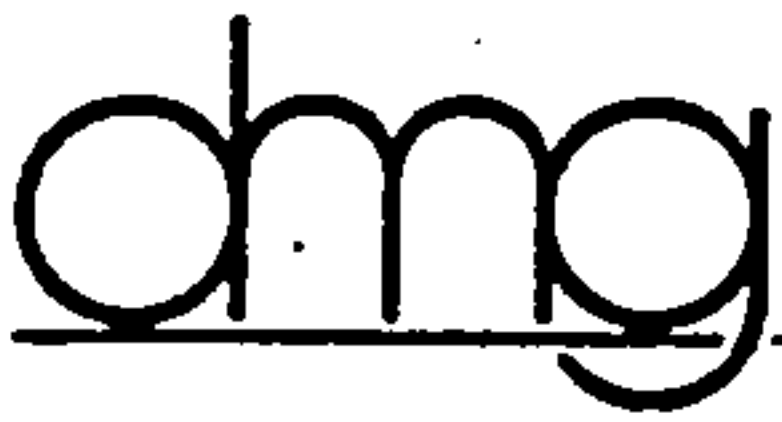
& ASSOCIATES
CONSULTING ENGINEERS

dmg

DRAINAGE REPORT
For
Sunrise Ranch Subdivision



June 2000



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

June 23, 2000

Mr. Bradley Bingham
Plaza del Sol
Hydrology Dept.
P.O. Box 1293
Albuquerque, NM 87103

**Re: Revised Drainage Plan for Sunrise Ranch
Engineer's stamp 6-23-00 (J22/D66)**

Dear Mr. Bingham,

I am submitting a revised Drainage Report and Grading and Drainage Plan for the above referenced project. In response to your comment letter dated May 25, 2000:

1. A preliminary plat has been provided with this submittal.
2. The limits of the existing 100 year floodplain and the calculated 14.5 foot erosion setback have been added to the grading and drainage plan. An existing public drainage easement encompasses a majority of the floodplain limits as shown on the revised G&D plan. Since no development or grading is allowed or being proposed within the limits of the existing floodplain in Tract A it does not seem necessary to dedicate a drainage easement to AMAFCA at this time. When Tract A is proposed to be subdivided for development the limits of the drainage easement can be clearly defined and dedicated to AMAFCA.

A HEC-2 analysis has been provided in Appendix B - Hydraulics for the upstream 'developed conditions' flow reaching the arroyo which according to the Amole-Hubbell Drainage Management Plan is 241.75 cfs.

Since the erosion setback is outside the limits of proposed development, no scour walls are required.

3. Runoff from Subbasin 190 north of Sunset Gardens Road under 'existing conditions' flows to the east. It appears that runoff from the vacant land to the west of the mobile home park flows toward the center of the mobile home park from a naturally occurring low spot. Drainage from the existing mobile home park flows to a retention pond located on the east side of their project site approximately 400 feet north of Sunset Gardens Road. Just east of this pond is a low spot in 102 street. There is an approximate rise 2-4' in grade from this low spot in 102 street south to Sunset Gardens Road. Under these existing conditions it is not physically possible for runoff to surface flow south to Sunset Gardens Road and then through our site to the Snow Vista Sedimentation Pond. In addition there is an existing berm along the south side of Sunset Gardens Road at the intersection with 102nd street that prevents any offsite flow from coming on our site.

Given these existing physical constraints, it is recommended that drainage from subbasin 190 be included in the SAD 222 storm drain system in 98th street. 'Developed flows' from this subbasin could be conveyed eastward to 98th street in Sunset Gardens Road. Under present 'developed conditions' in the mobile home park it is not possible to rectify their drainage situation to convey their runoff to Sunset Gardens Road. However, if the site is ever redeveloped, the drainage can be redirected toward the southeast to Sunset Gardens Road. The existing approved flow restriction of '1.29 cfs per acre' should remain in effect for subbasin 190. This restriction results in a maximum discharge of 25.8 cfs from subbasin 190 plus 7.64 cfs from Sunset Gardens Road runoff for a total additional runoff of 33.44 cfs into the 98th street SAD 222 storm drain system.

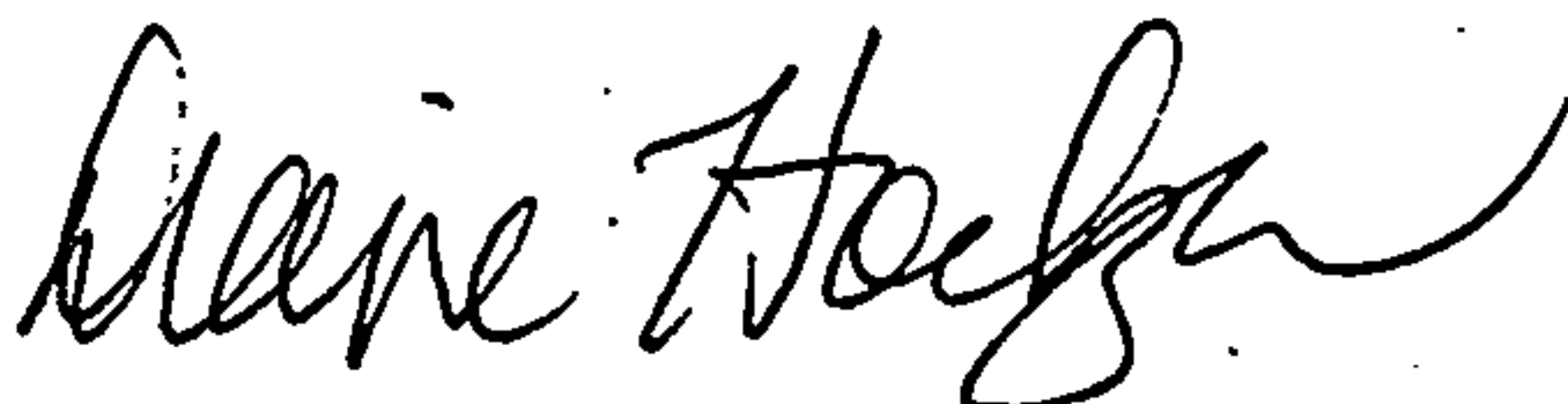
According to the Amole -Hubbell Drainage Management Plan there is no discharge constraint to the Snow Vista Sedimentation Pond for Subasin 200 of which the western most portion of our site is a part. Refer to Appendix D Supplemental Information.

4. The lines in Mountain Dew are overhead electrical distribution and transmission power lines. I am presently coordinating with PNM and our client on relocating some of these lines underground.
5. Inlets and appurtenances in Eucariz road were constructed as part of the adjacent Fire Station 14 development. 'Inlets and appurtenances' on the south side of Sunset Gardens at 98th street will be added to the infrastructure list and coordinated with SAD 222 construction efforts.
6. Retaining walls have been added to Lot 48, Blk 7 and Lot 13, Blk 6 and between Lots 18-20, Blk 3 as requested. Retaining walls are not necessary on lots 5-17, Block 7.
7. The valley gutter has been removed.
8. The offsite contributing subbasin 900 and 901 has been added to the temporary diversion swale discharge as part of the Phase I construction. Refer to the exhibit in report and the revised grading and drainage plan.
9. The FHWA nomograph for concrete culverts has been used.
10. Note 2 on the grading and drainage plan has been revised accordingly.

If you have any questions, please call me.

Sincerely,

MARK GOODWIN AND ASSOCIATES, P.A.



Diane Hoelzer, P.E.

file: sunrise.ran/drainage.ltr



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 25, 2000

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

Re: Sunrise Ranch Drainage Report
Engineer's Stamp dated 5-3-00 (L9/D6)

Dear Ms. Hoelzer,

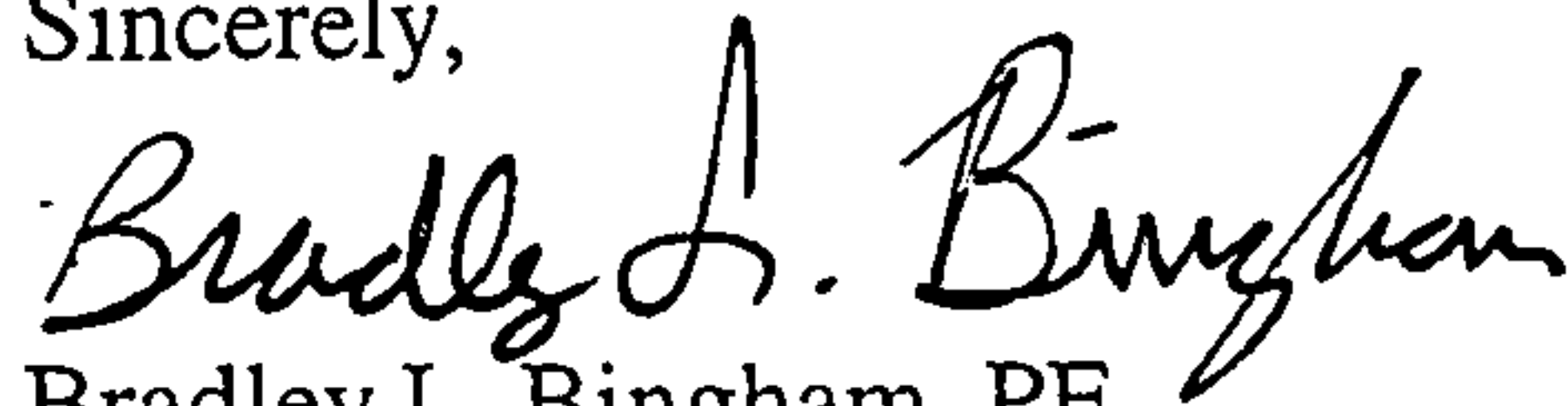
Based upon the information provided in your submittal dated 5-3-00, the above referenced plan cannot be approved for Preliminary Plat until the following comments are addressed:

- Please provide a copy of the Preliminary Plat for comment.
- Please indicate on the grading plan the erosion setback and the limits of the floodplain. A drainage easement, dedicated to AMAFCA, should encompass the erosion setback area. Please provide a HEC analysis of the incoming arroyo and provide scour depths for the floodwall footing (as you know, the top of footing must be below scour depth).
- Because part of your project drains to the Snow Vista channel, AMAFCA review and concurrence will be required. North of Sunset Gardens is part of the Snow Vista Basin (from the Amole DMP) that appears to be cutoff from the sedimentation basin. There is an existing 60' easement that crosses Phase 2 from 102nd and is present for this drainage but there is no mention of what you are doing for this drainage. This basin has a constraint of 1.29 cfs/acre, not 2.9 as you have stated in your calculations.
- What do the extra lines in Morning Dew denote? If they are electric lines, please do not show them on the grading plan. Is it permissible to encroach on the easement?
- Please provide preliminary profiles for Sunset Gardens, Eucariz and 98th. Storm drain, if needed, will need to be identified and bonded for Sunset Gardens and Eucariz.

- Please show retaining wall along the back of lots 5-17, Block 7. It also appears that a retaining wall will be needed south of lot 48, Block 7 (this may be lot 47 since there is a discrepancy with the phase plan); south side lot 13, Block 6; between lots 18-20, Block 3.
- Please remove the valley gutter from the knuckle @ Bridle Falls and Evening Fire.
- With respect to the temporary diversion swale, please show the contributing basin, pertinent spot elevations, typical section, runoff and add this runoff to your calculation for your asphalt rundown.
- Please use the FHWA nomograph for concrete culverts, not corrugated metal.
- Please modify Note 2 to include "...unless masonry walls are indicated."

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

Sincerely,



Bradley L. Bingham, PE
Hydrology Review Engineer

C: file

RONALD D. BROWN, CHAIR
DANIEL W. COOK, VICE-CHAIR
CLIFFORD E. ANDERSON, P.E., SECRETARY-TREASURER
LINDA STOVER, ASST. SECRETARY-TREASURER
DANIEL HERNANDEZ, DIRECTOR

JOHN P. KELLY, P.E.
EXECUTIVE ENGINEER



**Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority**

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107

PHONE: (505) 884-2215
FAX: (505) 884-0214

May 24, 2000

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

RE: SUNRISE RANCH (ZAP L8)

Dear Diane:

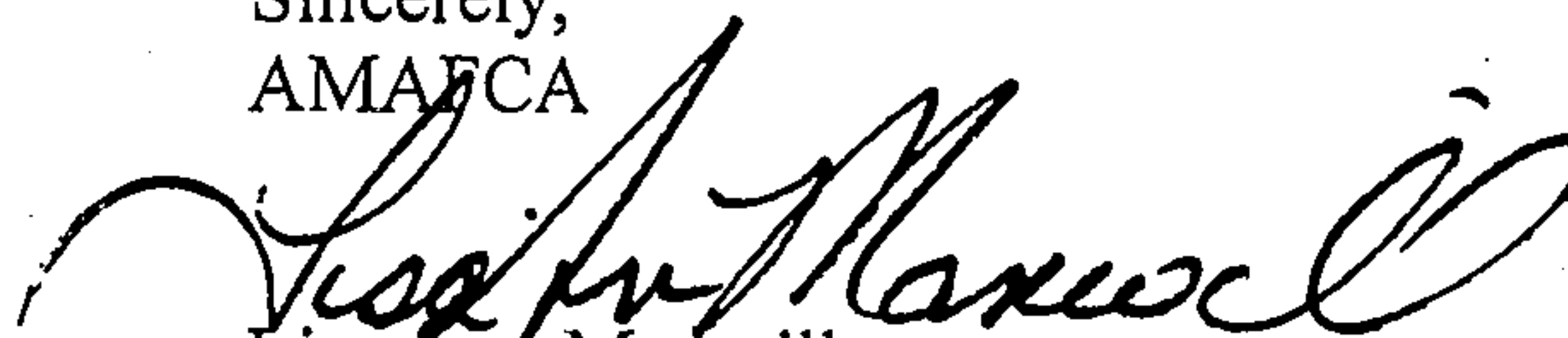
Based on your submittal dated May 3, 2000, AMAFCA has the following comments:

1. Please provide details for the outfall structure in AMAFCA's pond.
2. A manhole must be placed just inside AMAFCA's right-of-way for O&M purposes.
3. Use a minimum 24-inch RCP w/ orifice plate to penetrate the pond. The 18-inch is difficult to maintain.

The drainage concept (allowable discharge) appears to be consistent with the Amole-Hubble DMP and is acceptable to AMAFCA. Please address the above comments prior to work order approval.

If I can be of further assistance, please call me at 884-2215

Sincerely,
AMAFCA


Lisa Ann Manwill

Development Review Engineer

c: File

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I. PROJECT DESCRIPTION

The proposed Sunrise Ranch Subdivision located southwest of Sunset Gardens and 98th street covers an area of approximately 26.7 acres. (Refer to the Vicinity Map). The site is to be developed into 184 single family residences in four phases. The southwest corner of the site lies within a Zone AO floodplain as shown on FEMA Panel 35001 C 0328.

II. DRAINAGE DESIGN CRITERIA AND PREVIOUS REPORTS

The design criteria used in this report was in accordance with Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993 edition. The 100-year 6-hour storm event was analyzed to determine street capacities using $P(1 \text{ hr}) = 1.90"$, $P(6 \text{ hr}) = 2.22"$ and $P(24 \text{ hr}) = 2.67"$. The onsite Land Treatment values used were Treatment D=60, Treatment C=20 and Treatment B=20 as determined using "Table A-5 Percent Treatment D" in the DPM. AHYMO printouts are provided in Appendix A.

This project site lies within the Amole-Hubbell Drainage Management Plan. In the Final Facilities Plan Report prepared by Leedshill-Herkenhoff, Inc. (July 99), the allowable peak discharge from this project into the 98th street storm drain is 89.28 cfs which is close to the calculated peak discharge of 83.51 cfs as determined in this report's hydrology analysis. An allowable discharge of 20.1 cfs from subbasin 100 located at the western portion of the project site as determined in the Amole-Hubbell Drainage Management Plan. The actual peak discharge from this subbasin into the Snow Vista Sedimentation Pond is 12.93 cfs.

III. EXISTING DRAINAGE CONDITIONS

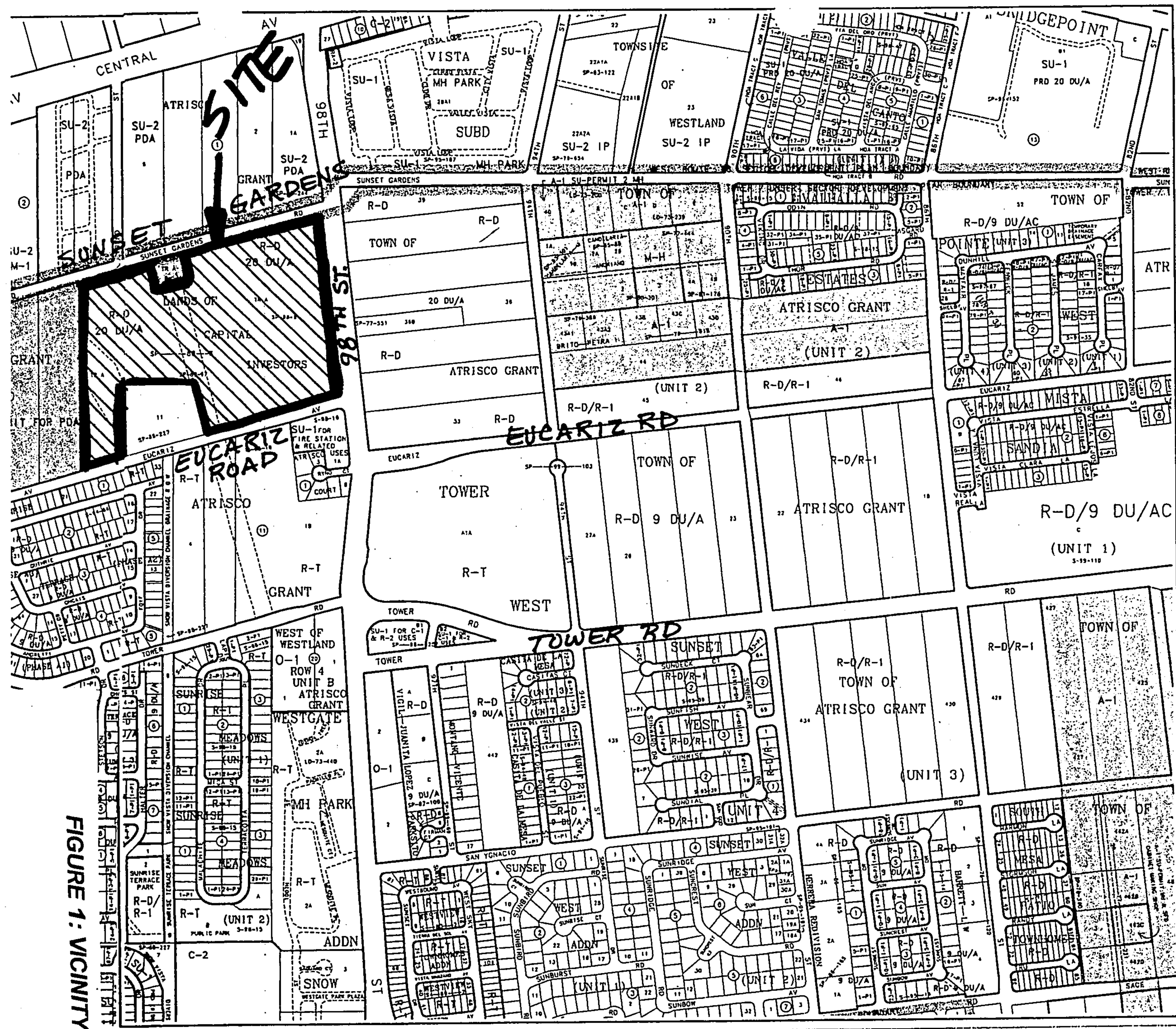
Runoff from the project site flows in an eastward direction at an approximate slope of 3.0 percent. An existing arroyo originating to the west of the project site flows in a southeastward direction, ultimately discharging into the Snow Vista Sedimentation pond. Runoff from the unimproved Sunset Gardens Road flows eastward in roadside swales to 98th street. Runoff from Eucariz Road flows in an eastward direction to 98th street.

IV. DEVELOPED DRAINAGE CONDITIONS

The total "developed conditions" peak discharge from the site is 96.44 cfs. Runoff from subbasin 1 (12.93 cfs) discharges to the Snow Vista Sedimentation Pond. This concept has been discussed and approved by Lisa Manwill at AMAFCA. The remaining runoff from the site, subbasins 2 through 13 (83.5 cfs) is conveyed as street flow to the southeast corner of the property before being intercepted by a series of inlets that convey the stormwater runoff to a temporary retention pond facility. Ultimately runoff from this site will be intercepted by a storm drain system being built as part of SAD 222. I am currently coordinating our internal storm drain design connection to the SAD 222 master storm drain manhole at Eucariz Road and 98th street with John Andrews at the Larkin Group. Their projected schedule to begin the infrastructure construction is January 2001. At the time the SAS 222 storm drain is constructed the temporary retention pond facility will disappear.

This project is going to be developed in 4 phases as shown in Figure 5. Runoff from Phase 1 will be conveyed southward to the retention pond through a temporary asphalt swale in Evening Fire street. A portion of the runoff from Phase 2 will be conveyed to the Snow Vista Sedimentation Pond through a storm drain culvert and the remainder will be conveyed to the temporary retention pond through Rawhide Street in a temporary asphalt swale. When Phase 3 is built, a portion of the temporary drainage swale in Rawhide street will be eliminated. In Phase 4 the storm drain and inlets to the pond will be constructed. Refer to Figure 5 for Construction Phase Boundaries and Figure 6 for Onsite Subasin Boundaries.

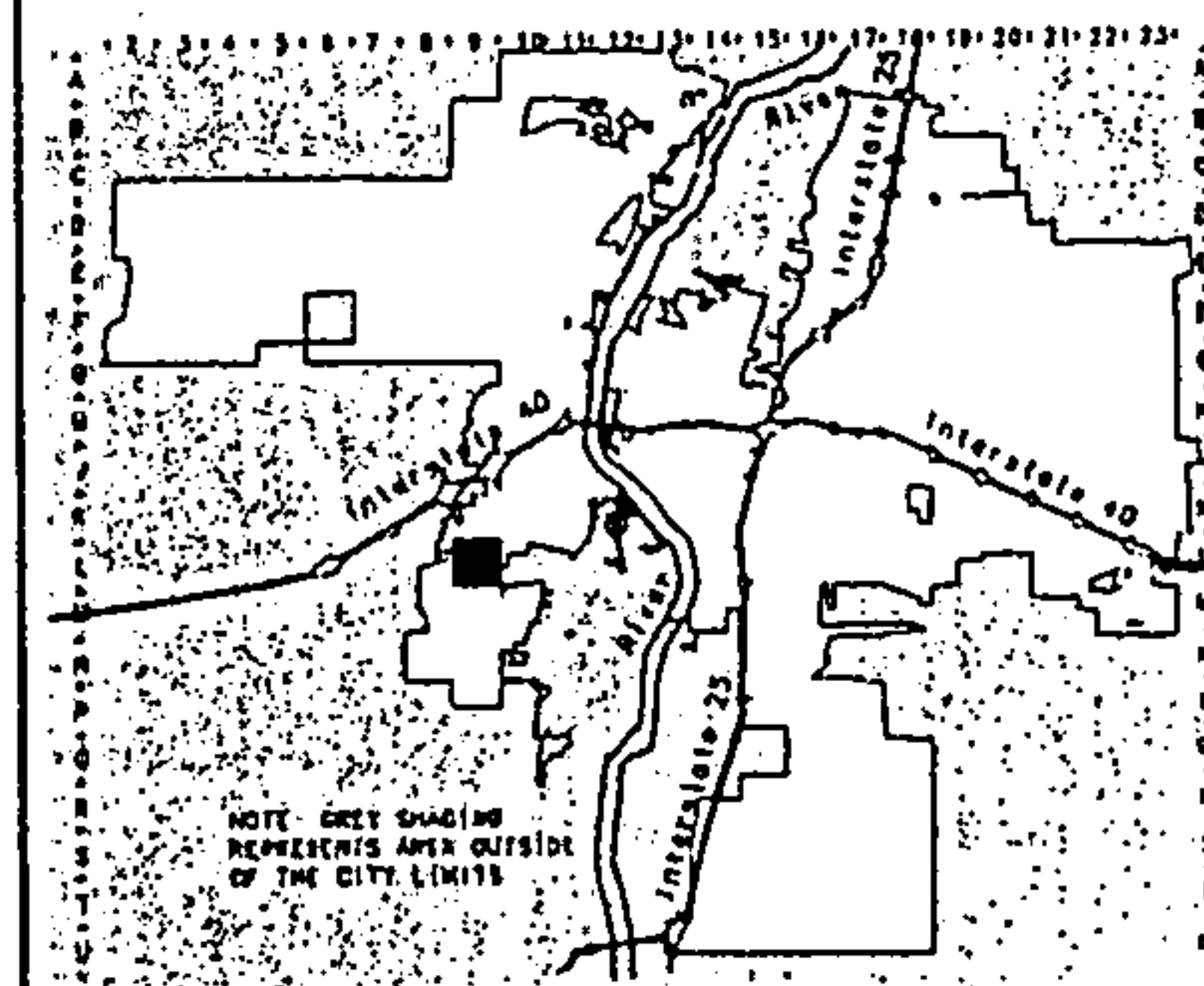
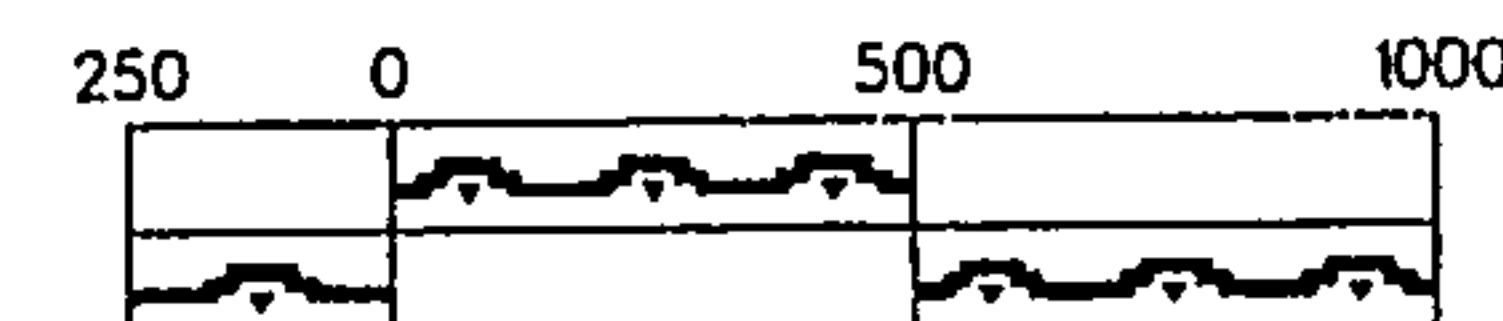
Existing inlets in Eucariz Road at 98th street intercept street flows. Proposed inlets in Sunset Gardens at 98th street will intercept Sunset Gardens street flow and flows from subbasin 190 for a total of 33.44 cfs (25.8 cfs restricted flow of 1.29 cfs/acre from subbasin 190 plus 'developed street flows from Sunset Gardens Road of 7.64 cfs)



**CITY OF
Albuquerque**
Albuquerque **G**eographic **I**nformation **S**ystems
PLANNING DEPARTMENT
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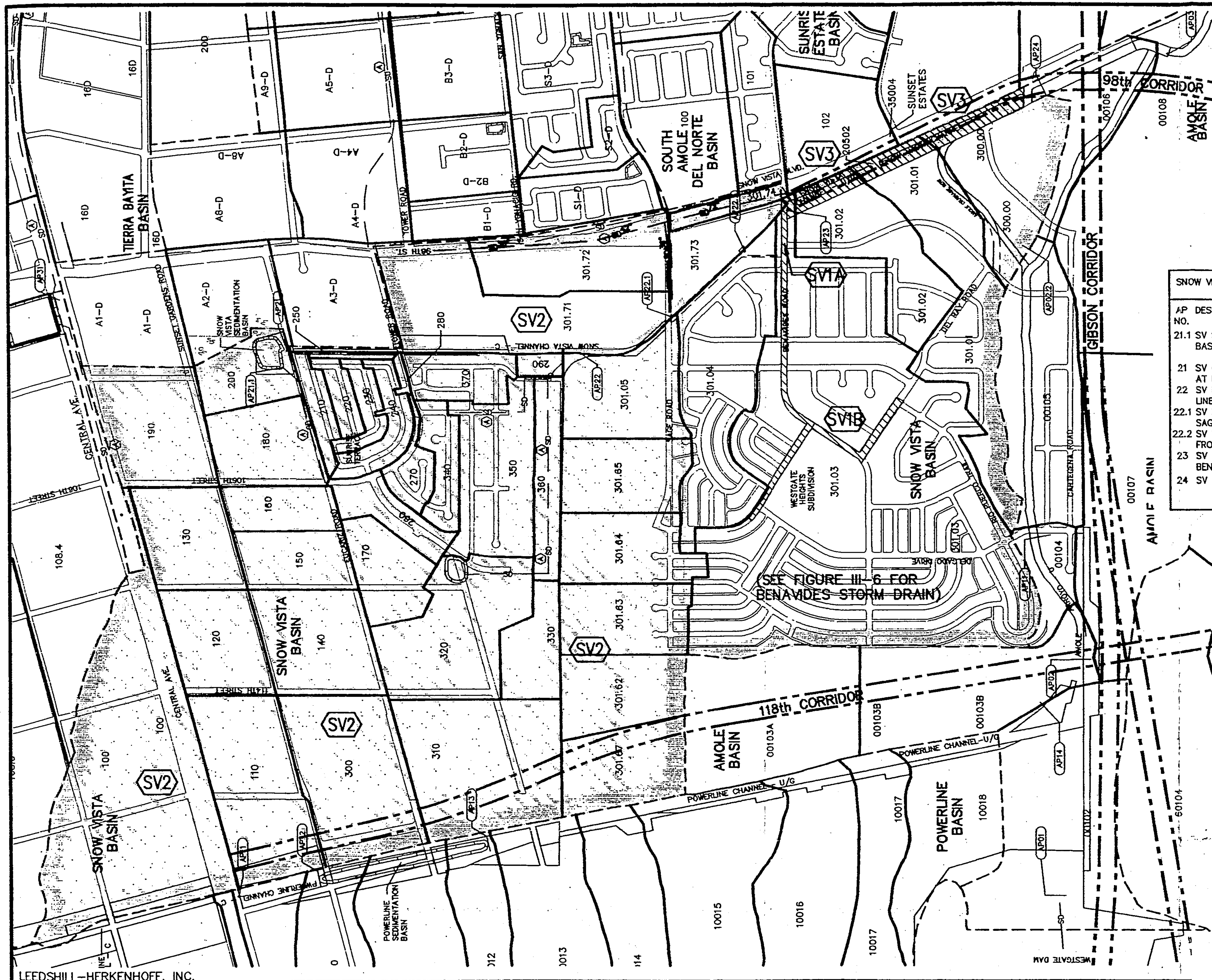


GRAPHIC SCALE IN FEET



Zone Atlas Page
L-9-Z

Map Amended through
September 17, 1999

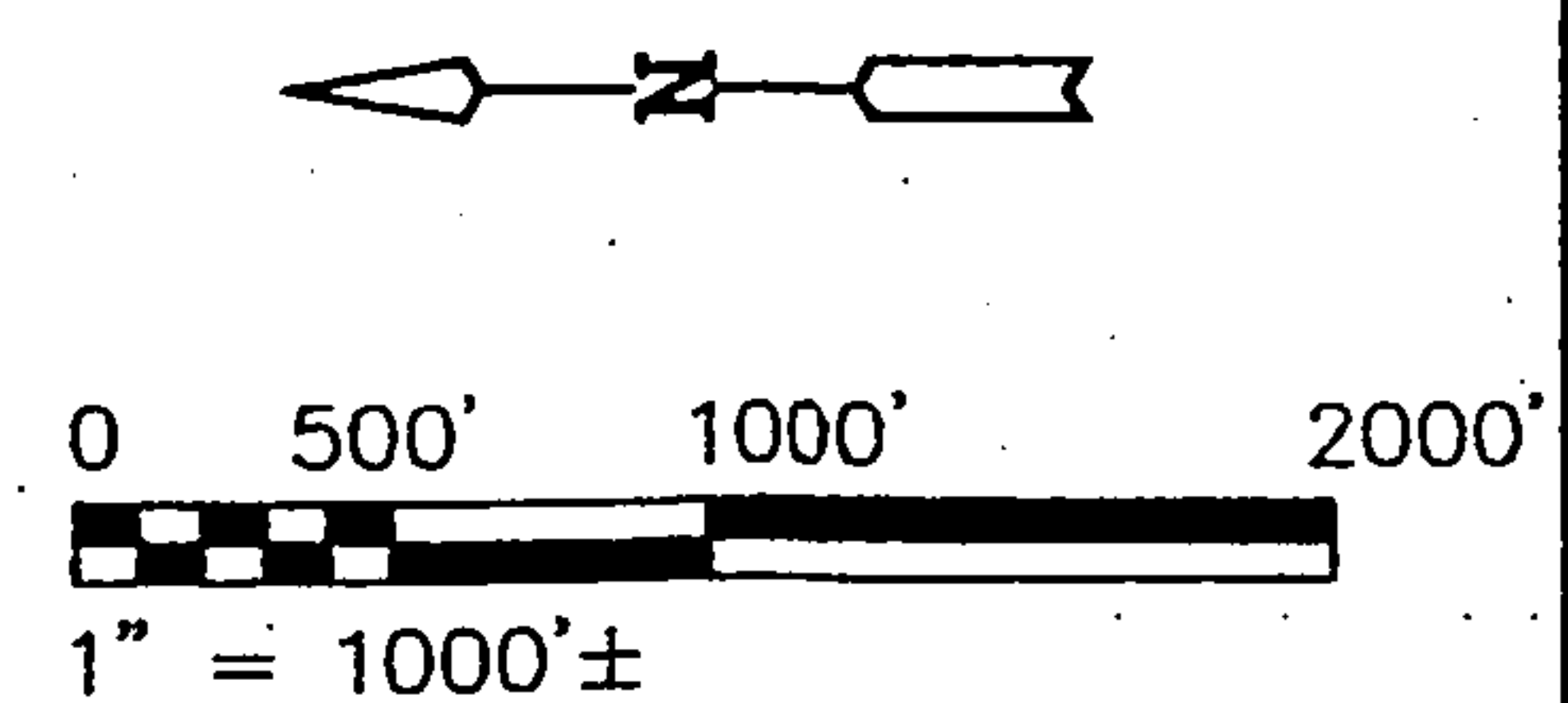


SNOW VISTA BASIN MANAGEMENT PLAN

- SV1A BENAVIDES INLET / RUNDOWN UPGRADE
- SV1B BENAVIDES STORM DRAIN-SEE FIGURE III-6
- SV2 SNOW VISTA BASIN RUNOFF CONSTRAINT-1.29cfs / ACRE.
- SV3 CHANNEL FREEBOARD UPGRADE

SNOW VISTA BASIN (SV)		EXISTING FACILITIES (DEVEX)		WITH DMP	
AP NO.	DESCRIPTION	VARIABLE	100 YR 24 HR.	VARIABLE	100 YR 24 HR.
21.1	SV SED. BASIN	Q cfs (in)	423	Q cfs (in)	423
		TVol AF	53.8	TVol AF	53.8
		DVol AF	6.4	DVol AF	6.4
21	SV CHANNEL AT HEAD	Q cfs	388	Q cfs	388
		TVol AF	53.8	TVol AF	53.8
22	SV BELOW SECTION LINE JUNCTION	Q cfs	747	Q cfs	747
		TVol AF	95	TVol AF	95
22.1	SV BELOW SAGE X-ING	Q cfs	916	Q cfs	916
		TVol AF	114.4	TVol AF	114.4
22.2	SV BELOW INLET FROM WESTGATE	Q cfs	1031	Q cfs	1031
		TVol AF	121.7	TVol AF	121.7
23	SV BELOW BENAVIDES INLET	Q cfs	2050	Q cfs	2050
		TVol AF	167.5	TVol AF	167.5
24	SV • AMOLE ARROYO	Q cfs	2083	Q cfs	2083
		TVol AF	183.4	TVol AF	183.4

- LEGEND**
- DMP IMPROVEMENTS
 - BASIN BOUNDARIES
 - LOCATION STUDY CORRIDOR
 - SUBBASIN BOUNDARIES
 - HYDROLOGIC ANALYSIS POINT (APX)
 - BASIN BOUNDARY THIS SHEET
 - SUBBASIN ID NUMBER (60110)
 - PROJECT ID NUMBER (SVX)



AMOLE-HUBBELL.
SNOW VISTA BASIN
MANAGEMENT PLAN

**FIGURE 3: SNOW VISTA BASIN
MANAGEMENT PLAN**

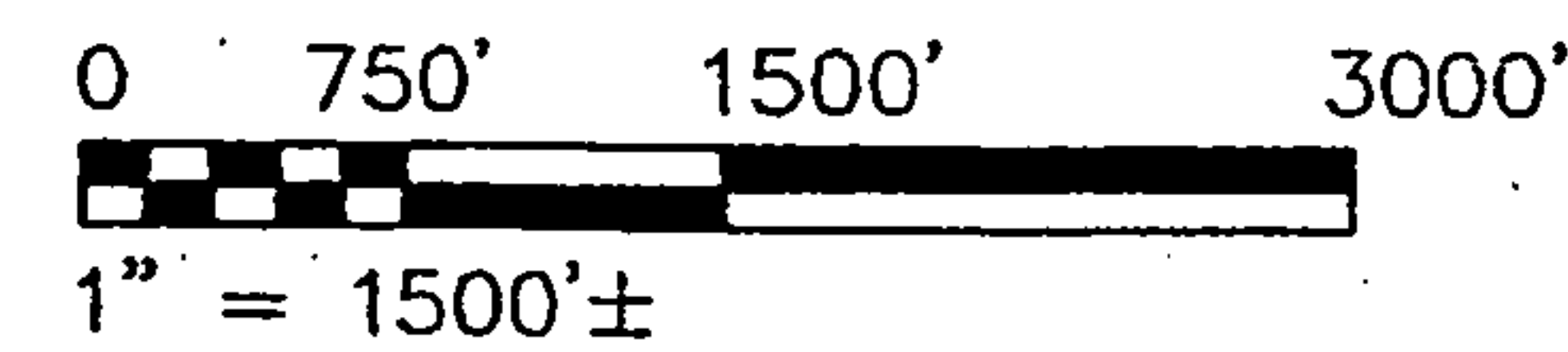
Tower Sage AD1
 RD# 25 SPS 200 9/08
 C.A. Project 200 North Tower Sage
 Tower Sage Storm Drainage Plan



AMOLE DEL NORTE BASIN (ADN) DMP FACILITIES			
AP NO.	DESCRIPTION	VARIABLE	100 YR 24 HR.
36.1	N-S COORS POND	Q cfs (in)	1442
	OUTFALL	TVol AF	379
		DVol AF	68.3
	N-S COORS POND	Q cfs	0
	OVERTOPPING	TVol AF	0
36	ADN CHANNEL	Q cfs	1623
	● HEAD	TVol AF	403
36.2	ADN BELOW	Q cfs	1802
	SAN YGNACIO	TVol AF	483
37	ADN BELOW	Q cfs	1982
	SAGE ROAD	TVol AF	505
38	ADN BELOW	Q cfs	1993
	ARENAL ROAD	TVol AF	508
38.1	OVERLAND FLOW	Q cfs	190
	SUNRISE EST. AREA	TVol AF	36.4
39	ADN ● ENTR. TO	Q cfs	2347
	AMOLE DET. BASIN	TVol AF	601

IDENTIFIED MANAGEMENT PLAN FACILITIES
 AD1 SAD 222 TOWER-SAGE DETENTION
 BASIN AND OUTFALL

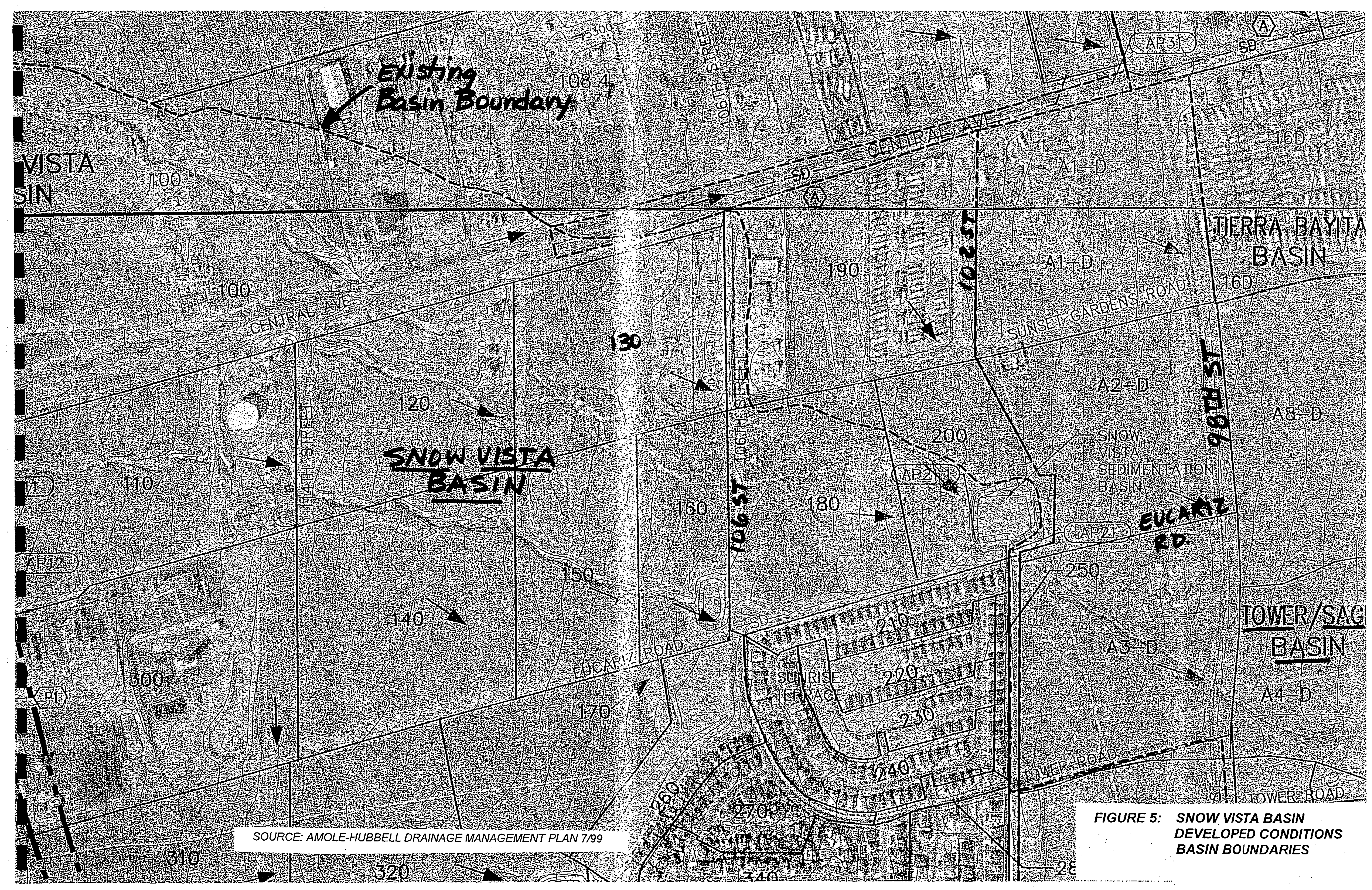
- LEGEND**
- DMP IMPROVEMENTS
 - BASIN BOUNDARIES
 - PLATTED EASEMENT/ROW
 - SUBBASIN BOUNDARIES
 - HYDROLOGIC ANALYSIS POINT
 - BASIN BOUNDARY THIS SHEET
 - SUBBASIN ID NUMBER
 - PROJECT ID NUMBER



AMOLE-HUBBELL D.M.P.
 AMOLE DEL NORTE BASIN
 MANAGEMENT PLAN

SEE FIGURE NO. III-13b FOR CONTINUATION

FIGURE 4



SOURCE: AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN 7/99

FIGURE 5: SNOW VISTA BASIN
DEVELOPED CONDITIONS
BASIN BOUNDARIES

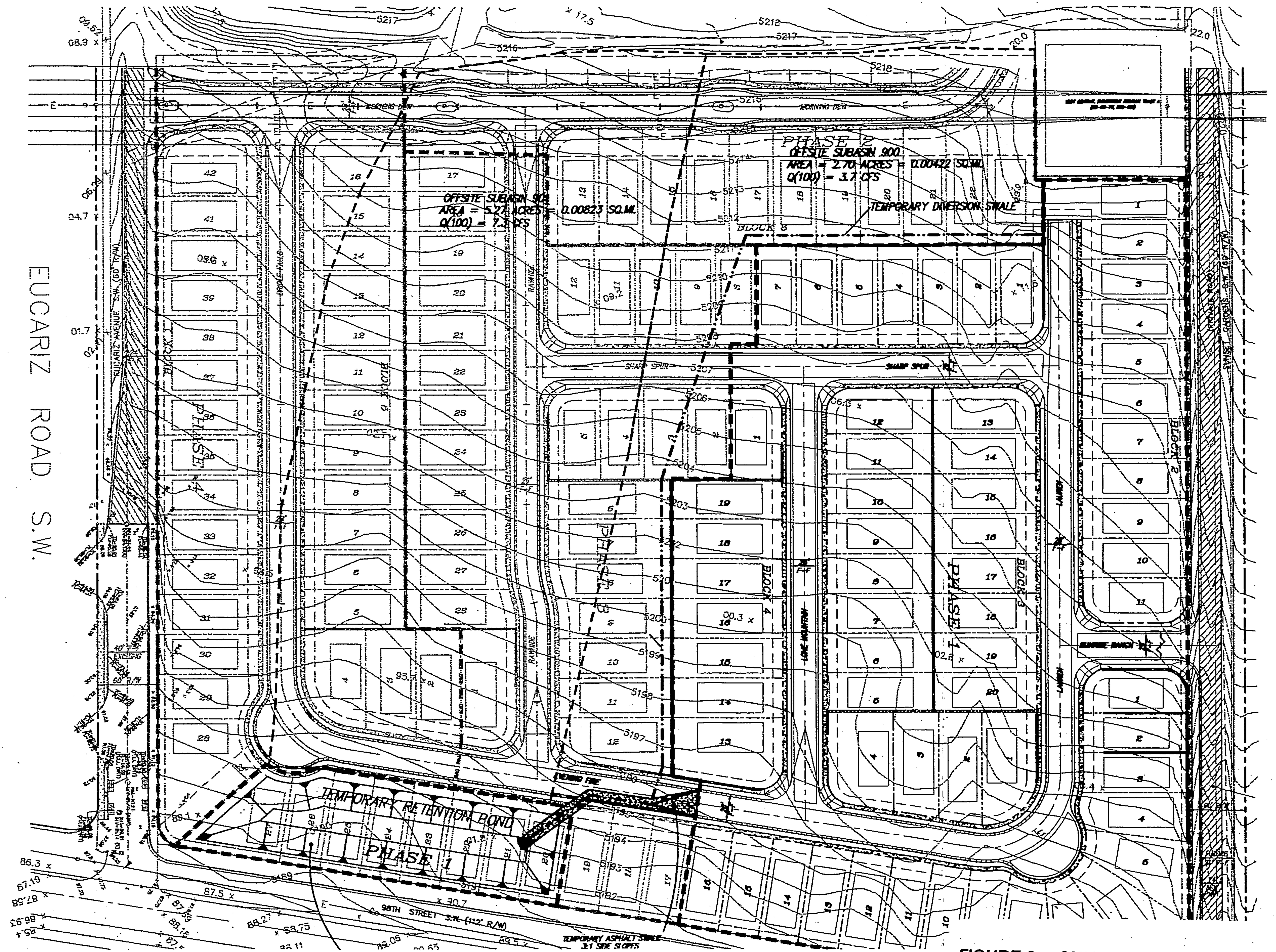


FIGURE 6: SUNRISE RANCH PHASE 1
TEMPORARY DRAINAGE SUBBASINS

SUNRISE RANCH SUBDIVISION

TABLE 1 SUMMARY OF STREET CAPACITIES

LOCATION	CURB	CROWN	WIDTH ft.	SLOPE %	Q cfs	DEPTH ft	EG ft.	Q inlet cfs	#/Type inlet	Q remain
Lone Mountain Street	MTB	Y	26' FF	3.724	10.43	0.23	0.47			
Round Up Street	MTB	N/2%	26' FF	2.735	12.00	0.33	0.62			
Sharp Spur Street	MTB	N/2%	26' FF	1.760	3.22	0.22	0.33			
Sharp Spur Stret	MTB	N/2%	26' FF	1.760	4.57	0.29	0.38			
Morning Dew Street	MTB	Y	28' FF	3.819	7.30	0.20	0.40			
Bridle Falls Street	MTB	Y	28' FF	3.038	7.47	0.21	0.38			
Bridle Falls Street	MTB	Y	28' FF	3.038	13.80(b)	0.26	0.50			
Lauren Street	MTB	Y	28' FF	3.036	10.50	0.24	0.45			
Morning Dew Street	MTB	N/2%	28' FF	1.500	9.00	0.33	0.49			
Rawhide Street	STD	Y	26' FF	3.252	32.48	0.43	0.92	9.4	2/DBL'A'	23.08(a)
Evening Fire Street	STD	Y	28' FF	0.600	17.50	0.46	0.56			
Evening Fire Street	STD	Y	28' FF	0.600	27.93	0.54	0.69			
Evening Fire Street	STD	Y	28' FF	0.600	31.33	0.56	0.73	16.0	2/DBL'A'	15.33(a)
Evening Fire Street	STD	Y	28' FF	0.600	38.41(a)	0.61	0.80	19.8	2/DBL'A'	18.61
Evening Fire Street	STD	Y	28' FF	0.600	18.61	0.47	0.58	9.4	2/SGL'A'	9.21(b)
Evening Fire Street	STD	Y	28' FF	0.600	28.91(b)			4.28	1/DBL'A'	24.63
Evening Fire knuckle SUMP**					24.63			28.17	TRP'C'	0
** Double Capacity=49.26 cfs								22.15	DBL'C'	0

(a) 23.08 cfs + 15.33 cfs = 38.41 cfs

(b) 23.01 cfs + 5.90 cfs(SB 11) = 28.91 cfs

MTB = Mountable Curb, STD = Standard Curb, File: f:\sunrise.ran \strcap.sri 4-28-00

APPENDIX A
HYDROLOGY

RUN DATE (MON/DAY/YR) =06/22/2000
USER NO.= M GOODWN.I01

[illegible]

```

START                TIME=0.0
*****  SUNRISE RANCH LONGFORD HOMES (L-9)
*****  100-YEAR 6-HOUR STORM EVENT
*****  FILE: SUNRISE.DAT  APR 2000 BY:DLH
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=1.90 IN RAIN SIX=2.22 IN
                     RAIN DAY=2.66 IN DT=0.033 HR
*****  *****
*****  DEVELOPED CONDITIONS
*****  *****
*****  SUBBASIN 1
*****
COMPUTE NM HYD        ID=1 HYD NO=101 AREA=0.005548 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 2
*****
COMPUTE NM HYD        ID=1 HYD NO=102 AREA=0.003130 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 3
*****
COMPUTE NM HYD        ID=1 HYD NO=103 AREA=0.004913 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 4
*****
COMPUTE NM HYD        ID=1 HYD NO=104 AREA=0.001955 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 5
*****
COMPUTE NM HYD        ID=1 HYD NO=105 AREA=0.003927 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 6
*****
COMPUTE NM HYD        ID=1 HYD NO=106 AREA=0.001377 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 7
*****
COMPUTE NM HYD        ID=1 HYD NO=107 AREA=0.003089 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 8
*****
COMPUTE NM HYD        ID=1 HYD NO=108 AREA=0.004506 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1
PRINT HYD             ID=1 CODE=1
*****
*****  SUBBASIN 9
*****
COMPUTE NM HYD        ID=1 HYD NO=109 AREA=0.003000 SQ MI
                     PER A=0 PER B=20 PER C=20 PER D=60
                     TP=0.1333 HR MASS RAINFALL=-1

```

```

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 10
*****
COMPUTE NM HYD      ID=1 HYD NO=110 AREA=0.001455 SQ MI
                    PER A=0 PER B=20 PER C=20 PER D=60
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 11
*****
COMPUTE NM HYD      ID=1 HYD NO=111 AREA=0.002530 SQ MI
                    PER A=0 PER B=20 PER C=20 PER D=60
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 12
*****
COMPUTE NM HYD      ID=1 HYD NO=112 AREA=0.003203 SQ MI
                    PER A=0 PER B=20 PER C=20 PER D=60
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 13
*****
COMPUTE NM HYD      ID=1 HYD NO=113 AREA=0.002713 SQ MI
                    PER A=0 PER B=20 PER C=20 PER D=60
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 14 (SUNSET GARDENS ROAD EXISTING)
*****
COMPUTE NM HYD      ID=1 HYD NO=114 AREA=0.0017756 SQ MI
                    PER A=100 PER B=0 PER C=0 PER D=0
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 14 (SUNSET GARDENS ROAD 36' DEVELOPED)
*****
COMPUTE NM HYD      ID=1 HYD NO=114 AREA=0.0017756 SQ MI
                    PER A=0 PER B=0 PER C=20.5 PER D=79.5
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 14 (SUNSET GARDENS ROAD ULTIMATE 60' R/W)
*****
COMPUTE NM HYD      ID=1 HYD NO=114 AREA=0.002959 SQ MI
                    PER A=0 PER B=0 PER C=25 PER D=75
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 15 (EUCARIZ ROAD EXISTING)
*****
COMPUTE NM HYD      ID=1 HYD NO=115 AREA=0.0006069 SQ MI
                    PER A=100 PER B=0 PER C=0 PER D=0
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 15 (EUCARIZ ROAD DEVELOPED)
*****
COMPUTE NM HYD      ID=1 HYD NO=115 AREA=0.0006069 SQ MI
                    PER A=0 PER B=0 PER C=20.5 PER D=79.5
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1
*****
***** SUBASIN 900 (PHASE 1 OFFSITE SUBASIN TO DIVERSION SWALE)
*****
COMPUTE NM HYD      ID=1 HYD NO=900 AREA=0.00422 SQ MI
                    PER A=95 PER B=5 PER C=0 PER D=0
                    TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD          ID=1 CODE=1

```

***** SUBASIN 901 (PHASE 1 OFFSITE SUBASIN TO RUNDOWN)

COMPUTE NM HYD ID=1 HYD NO=901 AREA=0.00823 SQ MI
PER A=95 PER B=5 PER C=0 PER D=0

TP=0.1333 HR MASS RAINFALL=-1

PRINT HYD

ID=1 CODE=1

FINISH



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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch
SUBJECT Hydrology Calcs
BY DLH DATE 6-22-00
CHECKED _____ DATE _____
SHEET 1 OF 2

Retention Pond Calcs.

$$P(1\text{hr.}) = 1.90''$$

$$P(6\text{hr.}) = 2.20''$$

$$P(24\text{hr.}) = 2.67''$$

$$P_{10\text{DAY}} = 10 - (24.9 \div (P_{1440})^{1.4})$$

$$P_{10\text{DAY}} = 3.70''$$

$$A_D = 22.918 \text{ acres}$$

$$V_{10\text{DAY}} = V_{360} + A_D \left(\frac{P_{10\text{DAY}} - P_{360}}{12} \right)$$

$$= 2.915 \text{ AF} + 22.918 \text{ acres} (.60) \left(\frac{3.70'' - 2.20''}{12} \right)$$

$$V_{10\text{DAY}} = 4.63 \text{ AF} = 201,682.8 \text{ CF (Req'd Volume)}$$

Design Volume Calcs

$$A_1 = 25407 \text{ SF}$$

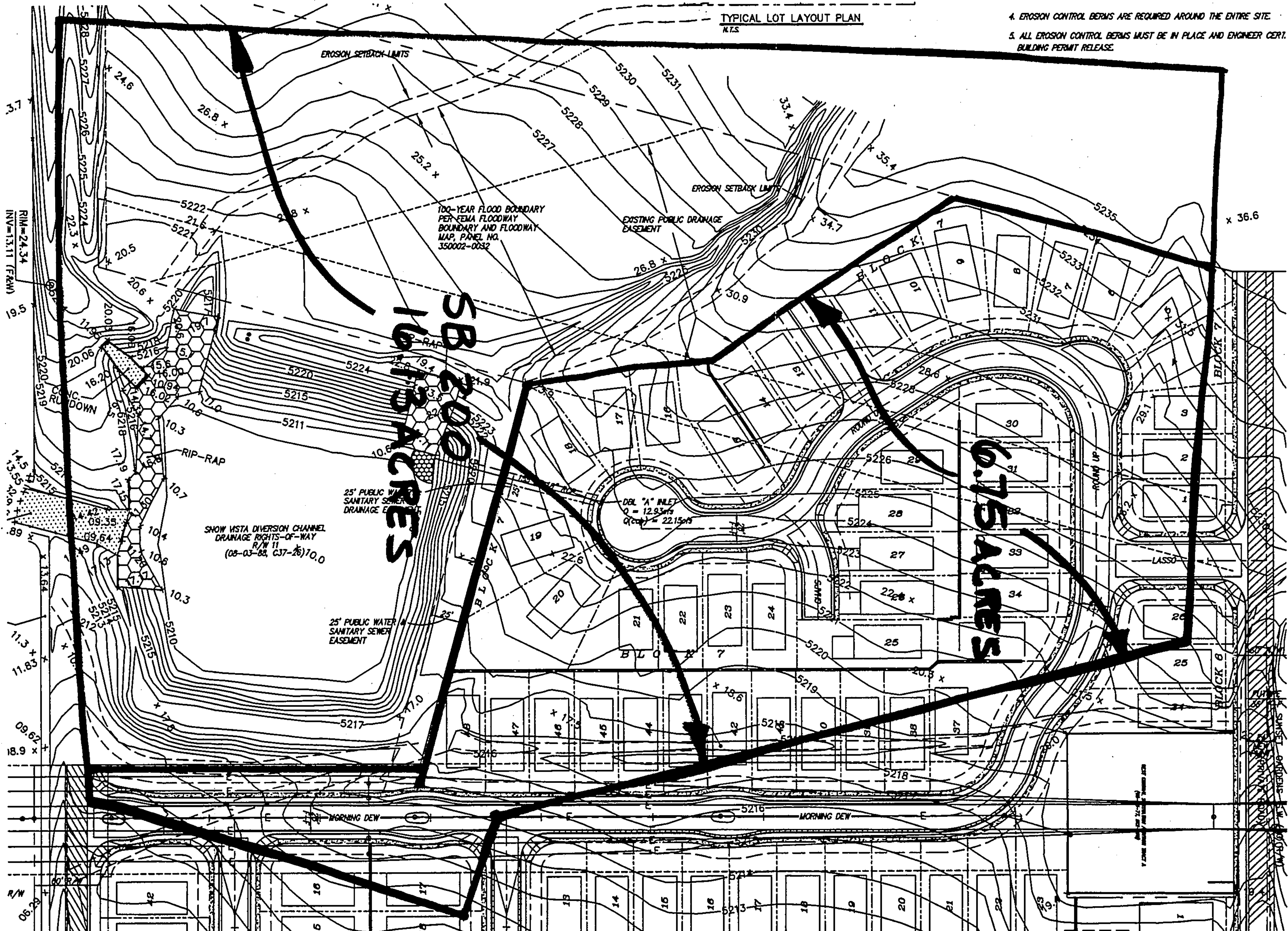
$$A_2 = 5891 \text{ SF}$$

$$\text{Volume} = \frac{1}{3} (14) (25407 + 5891 + \sqrt{25407(5891)})$$

$$= 203,149 \text{ CF} = 4.66 \text{ AF}$$

N.T.S.

5. ALL EROSION CONTROL BERMS MUST BE IN PLACE AND ENGINEER CERT.
BUILDING PERMIT RELEASE.





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

P.O. BOX 90606, ALBUQUERQUE, NM 87199
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e-mail: dmg@swcp.com

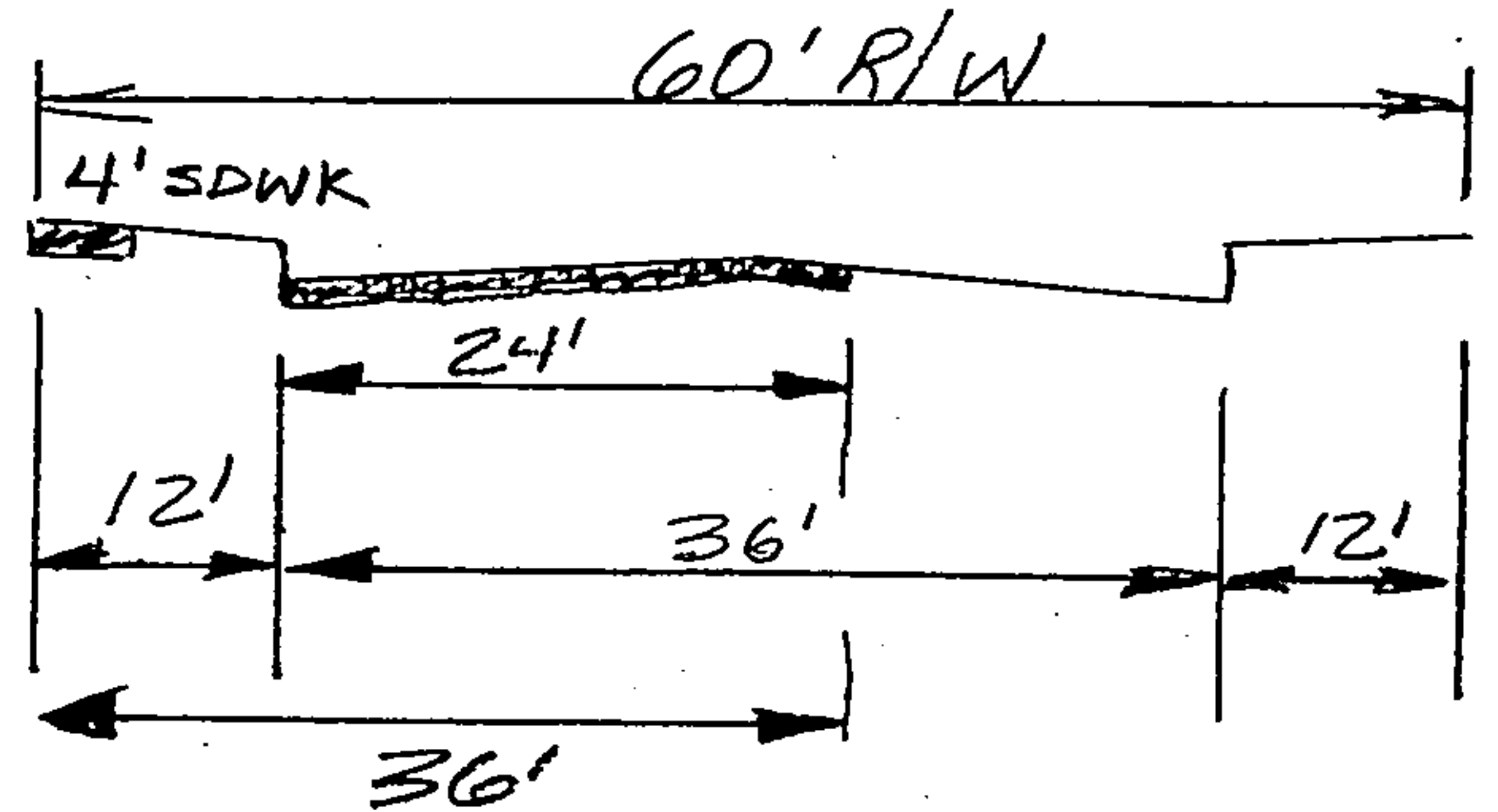
PROJECT Sunrise Ranch
SUBJECT Hydrology Calcs
BY DLH DATE 6-22-00
CHECKED _____ DATE _____
SHEET 2 OF 2

Sunset Gardens Road.

1375 LF OF PUMT

Treatment D = 79.5%

Treatment C = 20.5%



$$\text{Area} = 1375 (36) = 49,500 \text{ SF}$$

$$= 0.0017756 \text{ sq. mi}$$

$$\text{Ultimate Area} = 1375 (60) = 82500 \text{ SF} = .002959 \text{ sq. mi} \quad \begin{matrix} 75\% \text{ D} \\ 25\% \text{ C} \end{matrix}$$

Eucariz Road

$$\text{Area} = 470 \text{ LF} (36) = 16920 \text{ SF} = 0.0006069 \text{ sq. mi}$$

Snow Viste Subasin 200

$$Q = \frac{49.6 \text{ cfs}}{16.128 \text{ acres}} = 3.075 \text{ cfs/acre}^* (\text{allowable rate})$$

*source: Amole - Hubbell Drainage Management Plan

Area of Sunrise Ranch Subasin 1 + 2 within SB 200.

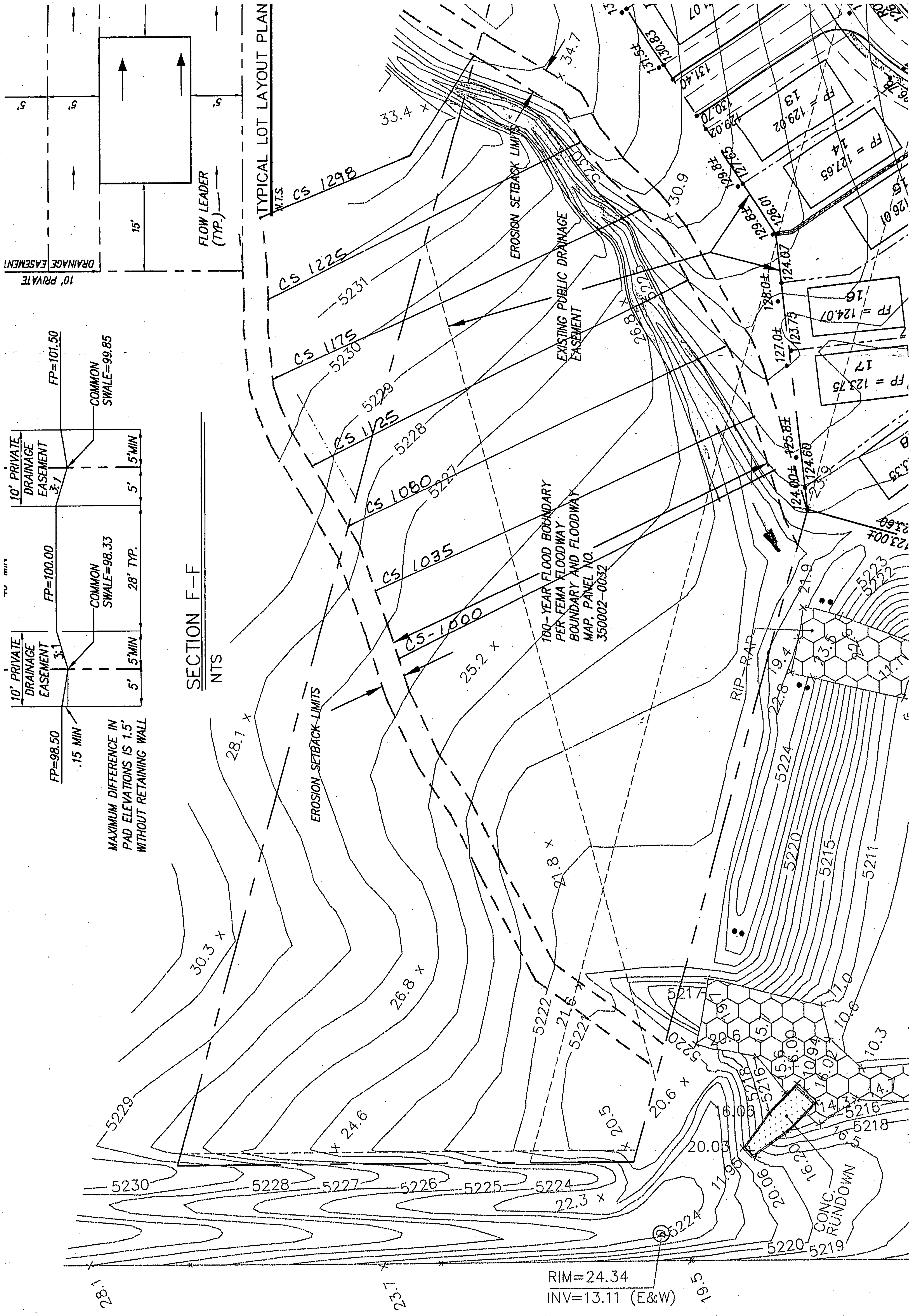
$$A = 6.75 \text{ acres}$$

$$Q (\text{allowable}) = 3.075 \text{ cfs/ac} (6.75 \text{ ac}) = 20.8 \text{ cfs.}$$

$$Q (\text{actual}) = 12.93 \text{ cfs} \quad (\text{SB 1})$$

APPENDIX B
HYDRAULICS

A. DRAINAGE EASEMENT
5, BK. 95-15, PGS. 3251-3254
1/2 ROAD S.W. (60' R/W)
(PRIVATE ROAD)



RIM=24.34
INV=13.11 (E&W)

HEC-RAS Plan: Plan 01 Reach: ARROYO

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1298	241.75	29.00	31.25	32.19	34.17	0.040006	13.72	17.62	13.23	2.10
1225	241.75	27.00	29.31	30.03	31.50	0.028620	11.86	20.39	14.89	1.79
1175	241.75	25.00	26.95	27.78	29.70	0.043197	13.31	18.16	15.68	2.18
1125	241.75	24.00	26.16	26.85	27.93	0.021720	10.69	22.98	21.41	1.59
1080	241.75	23.00	24.88	25.50	26.76	0.030960	11.01	21.95	19.88	1.85
1035	241.75	22.00	24.04	24.48	25.38	0.024189	9.26	26.10	25.65	1.62
1000	241.75	21.80	23.73	23.94	24.59	0.014317	7.42	32.57	30.24	1.26

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1000 Profile: 1

W.S. Elev (ft)	23.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.86	Wt n-Val.		0.025	
E.G. Elev (ft)	24.59	Reach Len. (ft)			
E.G. Slope (ft/ft)	0.014317	Flow Area (sq ft)		32.57	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	30.24	Top Width (ft)		30.24	
Vel Total (ft/s)	7.42	Avg. Vel. (ft/s)		7.42	
Max Chl Dpth (ft)	1.93	Hydr. Depth (ft)		1.08	
Crit W.S. (ft)	23.94	Wetted Per. (ft)		30.56	
Conv. Total (cfs)	2020.4	Conv. (cfs)		2020.4	

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1125 Profile: 1

W.S. Elev (ft)	26.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.77	Wt. n-Val.	0.025	0.025	0.025
E.G. Elev (ft)	27.93	Reach Len. (ft)	45.00	45.00	45.00
E.G. Slope (ft/ft)	0.021720	Flow Area (sq ft)	0.10	22.55	0.33
Q Total (cfs)	241.75	Flow (cfs)	0.16	241.05	0.53
Top Width (ft)	21.41	Top Width (ft)	1.27	16.00	4.14
Vel Total (ft/s)	10.52	Avg. Vel. (ft/s)	1.61	10.69	1.62
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)	0.08	1.41	0.08
Crit W.S. (ft)	26.85	Wetted Per. (ft)	1.28	16.72	4.14
Conv. Total (cfs)	1640.3	Conv. (cfs)	1.1	1635.6	3.6

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1080 Profile: 1

W.S. Elev (ft)	24.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.		0.025	
E.G. Elev (ft)	26.76	Reach Len. (ft)	45.00	45.00	45.00
E.G. Slope (ft/ft)	0.030960	Flow Area (sq ft)		21.95	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	19.88	Top Width (ft)		19.88	
Vel Total (ft/s)	11.01	Avg. Vel. (ft/s)		11.01	
Max Chl Dpth (ft)	1.88	Hydr. Depth (ft)		1.10	
Crit W.S. (ft)	25.50	Wetted Per. (ft)		20.32	
Conv. Total (cfs)	1373.9	Conv. (cfs)		1373.9	

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1035 Profile: 1

W.S. Elev (ft)	24.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.		0.025	
E.G. Elev (ft)	25.38	Reach Len. (ft)	35.00	35.00	35.00
E.G. Slope (ft/ft)	0.024189	Flow Area (sq ft)		26.10	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	25.65	Top Width (ft)		25.65	
Vel Total (ft/s)	9.26	Avg. Vel. (ft/s)		9.26	
Max Chl Dpth (ft)	2.04	Hydr. Depth (ft)		1.02	
Crit W.S. (ft)	24.48	Wetted Per. (ft)		26.02	
Conv. Total (cfs)	1554.4	Conv. (cfs)		1554.4	

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1298 Profile: 1

W.S. Elev (ft)	31.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.92	Wt. n-Val.		0.025	
E.G. Elev (ft)	34.17	Reach Len. (ft)	85.00	73.00	70.00
E.G. Slope (ft/ft)	0.040006	Flow Area (sq ft)		17.62	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	13.23	Top Width (ft)		13.23	
Vel Total (ft/s)	13.72	Avg. Vel. (ft/s)		13.72	
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)		1.33	
Crit W.S. (ft)	32.19	Wetted Per. (ft)		14.20	
Conv. Total (cfs)	1208.7	Conv. (cfs)		1208.7	

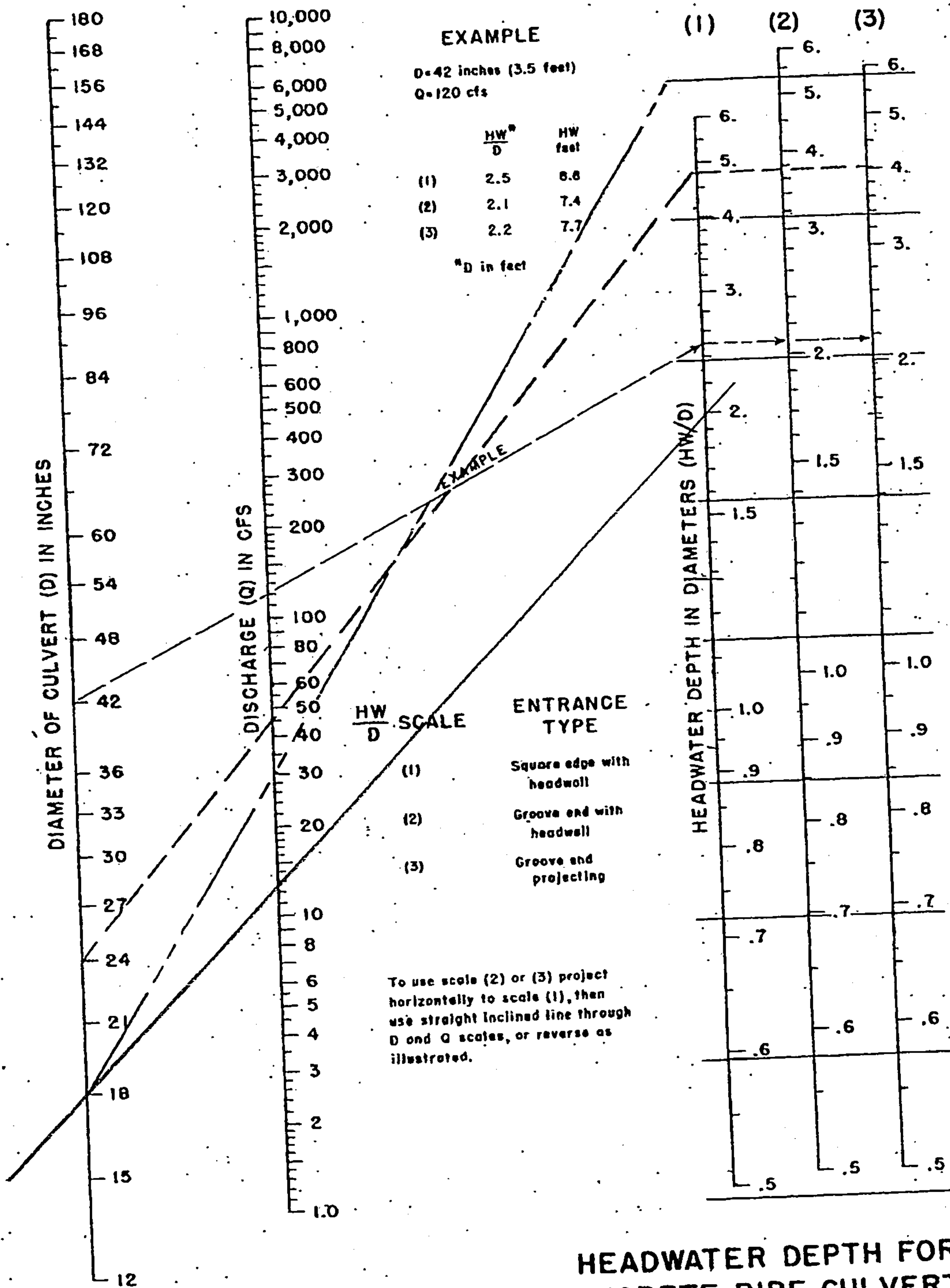
HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1225 Profile: 1

W.S. Elev (ft)	29.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.18	Wt. n-Val.		0.025	
E.G. Elev (ft)	31.50	Reach Len. (ft)	50.00	50.00	50.00
E.G. Slope (ft/ft)	0.028620	Flow Area (sq ft)		20.39	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	14.89	Top Width (ft)		14.89	
Vel Total (ft/s)	11.86	Avg. Vel. (ft/s)		11.86	
Max Chl Dpth (ft)	2.31	Hydr. Depth (ft)		1.37	
Crit W.S. (ft)	30.03	Wetted Per. (ft)		15.93	
Conv. Total (cfs)	1429.0	Conv. (cfs)		1429.0	

HEC-RAS Plan: Plan 01 Reach: ARROYO Riv Sta: 1175 Profile: 1

W.S. Elev (ft)	26.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.75	Wt. n-Val.		0.025	
E.G. Elev (ft)	29.70	Reach Len. (ft)	50.00	50.00	50.00
E.G. Slope (ft/ft)	0.043197	Flow Area (sq ft)		18.16	
Q Total (cfs)	241.75	Flow (cfs)		241.75	
Top Width (ft)	15.68	Top Width (ft)		15.68	
Vel Total (ft/s)	13.31	Avg. Vel. (ft/s)		13.31	
Max Chl Dpth (ft)	1.95	Hydr. Depth (ft)		1.16	
Crit W.S. (ft)	27.78	Wetted Per. (ft)		16.24	
Conv. Total (cfs)	1163.2	Conv. (cfs)		1163.2	

Culvert into Snow Vista Sediment Pond CHART 2



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

```

1*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 4/26/ 0 TIME 13: 9:25
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748
*****

```

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X X XXXXXXX XXXXX
X X X X X
X X X X
XXXXXXX XXXX X XXXXX XXXXX
X X X X X
X X X X X
X X XXXXXXX XXXXX XXXXXXX

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END OF BANNER

THIS RUN EXECUTED 4/26/ 0 13: 9:25

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

T1 SUNRISE RANCH STREET CAPACITY (44' ROW)
T2 26'FF W/ MOUNTABLE CURB - CROWN
T3 LONE MOUNTAIN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.03724	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	1	10.43						
X1	1	7	0	44	0	0	0	0
GR	.51	0	.33	8.9	0	9	.26	22
GR	.33	35.1	.51	44				35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.23	.23	.30	.00	.47	.24	.00	.00	.51
10.	0.	10.	0.	0.	3.	0.	0.	0.	.51
.00	.00	3.94	.00	.000	.017	.000	.000	.00	8.93
.037193	0.	0.	0.	0	11	6	.00	23.08	35.07

THIS RUN EXECUTED 4/26/ 0 13: 9:25

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

LONE MOUNTAIN

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	10.43	.23	.30	3.94	23.08	2.18	.47

SUMMARY OF ERRORS AND SPECIAL NOTES

```

1*****
* WATER SURFACE PROFILES *
* VERSION OF SEPTEMBER 1988 *
* ERROR: 01,02 *
* UPDATED: 4 APRIL 1989 *
* RUN DATE 4/26/ 0 TIME 8:19:30 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *
*****

```

```

      X   X XXXXXXXX XXXXX
      X   X X       X   X
      X   X X       X   X
      XXXXXXX XXXX   X   XXXXX XXXXX
      X   X X       X   X
      X   X X       X   X
      X   X XXXXXXXX XXXXX

```

END OF BANNER

THIS RUN EXECUTED 4/26/ 0 8:19:30

```

*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -
*****

```

```

T1      SUNRISE RANCH - STREET CAPACITY (44' ROW)
T2      26'FF MOUNTABLE C&G - NO CROWN 2.0% cross slope
T3      ROUND UP

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.02735	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	4	12.00	3.22	4.57	18.75			
X1	1	6	0	44	0	0	0	0
GR	.51	0	.33	8.9	0	9	.52	35
GR	1.03	44						.85 35.1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.33	.33	.43	.00	.62	.29	.00	.00	.51
12.	0.	12.	0.	0.	3.	0.	0.	0.	1.03
.00	.00	4.30	.00	.000	.017	.000	.000	.00	8.75
.027292	0.	0.	0.	0	14	6	.00	16.89	25.65

T1 SHARP SPUR

T2 1.760% SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	1	.01760					

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.22	.22	.25	.00	.33	.11	.00	.00	.51
3.	0.	3.	0.	0.	1.	0.	0.	0.	1.03
.00	.00	2.63	.00	.000	.017	.000	.000	.00	8.93
.017517	0.	0.	0.	0	5	6	.00	11.09	20.02

T1 SHARP SPUR

T2 1.76% SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	1	.0176					

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*PROF 3

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.25	.25	.29	.00	.38	.13	.00	.00	.51
5.	0.	5.	0.	0.	2.	0.	0.	0.	1.03
.00	.00	2.88	.00	.000	.017	.000	.000	.00	8.92
.017590	0.	0.	0.	0	8	5	.00	12.64	21.56

T1

T2 3.252 % SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	5	0	1	.03252					

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*PROF 4

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.39	.39	.50	.00	.76	.37	.00	.00	.51
19.	0.	19.	0.	0.	4.	0.	0.	0.	1.03
.00	.00	4.88	.00	.000	.017	.000	.000	.00	6.09
.032873	0.	0.	0.	0	17	7	.00	22.25	28.34

THIS RUN EXECUTED 4/26/ 0 8:19:30

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ROUND UP

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	12.00	.33	.43	4.30	16.89	1.87	.62
1.000	3.22	.22	.25	2.63	11.09	1.40	.33
1.000	4.57	.25	.29	2.88	12.64	1.43	.38
1.000	18.75	.39	.50	4.88	22.25	2.07	.76

1

4/26/ 0 8:19:30

PAGE 10

SUMMARY OF ERRORS AND SPECIAL NOTES

```

1*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 4/26/ 0 TIME 8:15:47
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748
*****

```

```

X X XXXXXXX XXXXX
X X X X X
X X X X X
XXXXXXX XXXX X XXXXX XXXXX
X X X X X
X X X X X
X X XXXXXXX XXXXX XXXXXXX

```

END OF BANNER

```

THIS RUN EXECUTED 4/26/ 0 8:15:47
*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -
*****

```

```

T1 SUNRISE RANCH STREET CAPACITY
T2 28'FF W/ MOUNTABLE CURB SUB-CRITICAL FLOW
T3 MORNING DEW

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.03819	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	4	7.3	7.47	13.80	10.5			
X1	1	7	0	48	0	0	0	0
GR	.67	0	.33	9.9	0	10	.28	24
GR	.33	38.1	.67	48				38

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

```

CCHV= .100 CEHV= .300
*SECNO 1.000

```

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.20	.20	.26	.00	.40	.20	.00	.00	.67
7.	0.	7.	0.	0.	2.	0.	0.	0.	.67
.00	.00	3.61	.00	.000	.017	.000	.000	.00	9.94
.037476	0.	0.	0.	0	15	7	.00	20.16	38.06

T1
T2 BRIDLE FALLS
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
0	3	0	1	.03038						
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
2	0	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.21	.21	.27	.00	.38	.17	.00	.00	.67
7.	0.	7.	0.	0.	2.	0.	0.	0.	.67
.00	.00	3.34	.00	.000	.017	.000	.000	.00	9.94
.030023	0.	0.	0.	0	15	7	.00	21.20	38.06

T1
T2 BRIDLE FALLS
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
0	4	0	1	.03038						
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
3	0	0	-1	0	0	0	0	0	0	0

*PROF 3

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.26	.33	.00	.50	.24	.00	.67
14.	0.	0.	0.	4.	0.	0.	.67
.00	.00	.00	.000	.017	.000	.000	9.92
.030367	0.	0.	0	5	7	.00	38.08

T1
T2 LAUREN
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	5	0	1	.03036					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

PROF 4

CEHV= .100 CEHV= .300

SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.24	.24	.30	.00	.45	.21	.00	.00	.67
11.	0.	10.	0.	0.	3.	0.	0.	0.	.67
.00	.00	3.65	.00	.000	.017	.000	.000	.00	9.93
.030276	0.	0.	0.	0	15	7	.00	24.05	38.07

THIS RUN EXECUTED 4/26/ 0 8:15:47

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MORNING DEW

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	7.30	.20	.26	3.61	20.16	2.38	.40
1.000	7.47	.21	.27	3.34	21.20	2.09	.38
1.000	13.80	.26	.33	3.92	26.63	1.95	.50
1.000	10.50	.24	.30	3.65	24.05	2.02	.45

SUMMARY OF ERRORS AND SPECIAL NOTES

```

1*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 4/26/ 0 TIME 8:20:38
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748
*****

```

```

      X   X XXXXXXX XXXXX
      X   X X   X   X   X
      X   X X   X   X   X
      XXXXXX XXXX X   XXXXX XXXXX
      X   X X   X   X   X
      X   X X   X   X   X
      X   X XXXXXXX XXXXX XXXXXXX

```

END OF BANNER

```

      THIS RUN EXECUTED 4/26/ 0 8:20:38
*****
      HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
      ERROR CORR - 01,02
      MODIFICATION -
*****

```

```

T1      SUNRISE RANCH - STREET CAPACITY (44' ROW)
T2      28'FF MOUNTABLE C&G - NO CROWN 2.0% cross slope
T3      MORNING DEW

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.0150	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	1	9.00						
X1	1	6	0	46	0	0	0	0
GR	.51	0	.33	8.9	0	9	.56	37
GR	1.07	46						.89 37.1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

```

CCHV= .100 CEHV= .300
*SECNO 1.000

```

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.33	.33	.38	.00	.49	.16	.00	.00	.51
9.	0.	9.	0.	0.	3.	0.	0.	0.	1.07
.00	.00	3.19	.00	.000	.017	.000	.000	.00	8.67
.015016	0.	0.	0.	0	14	6	.00	17.07	25.74

THIS RUN EXECUTED 4/26/ 0 8:20:38

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MORNING DEW

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	9.00	.33	.38	3.19	17.07	1.38	.49

SUMMARY OF ERRORS AND SPECIAL NOTES

```

1*****
* WATER SURFACE PROFILES *
* VERSION OF SEPTEMBER 1988 *
* ERROR: 01,02 *
* UPDATED: 4 APRIL 1989 *
* RUN DATE 4/26/ 0 TIME 8:21:49 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *
*****

```

```

      X   X XXXXXXXX XXXXX      XXXXX
      X   X X      X   X      X   X
      X   X X      X      X      X
      XXXXXXX XXXX   X      XXXXX XXXXX
      X   X X      X      X      X
      X   X X      X   X      X
      X   X XXXXXXXX XXXXX      XXXXXXXX

```

END OF BANNER

```

THIS RUN EXECUTED 4/26/ 0 8:21:49
*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -
*****

```

```

T1      SUNRISE RANCH STREET CAPACITY (44' ROW)
T2      26'FF W/ STANDARD CURB SUB-CRITICAL FLOW - 8" CURB
T3      RAWHIDE

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.03252	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	2	26.32	32.48					
X1	1	9	0	44	0	0	0	0
GR	.85	0	.67	8.9	0	9	.125	11
GR	.125	33	0	35	.67	35.1	.85	44

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

```

CCHV= .100 CEHV= .300
*SECNO 1.000

```

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.40	.40	.52	.00	.82	.42	.00	.00	.85
26.	0.	26.	0.	0.	5.	0.	0.	0.	.85
.00	.00	5.19	.00	.000	.017	.000	.000	.00	8.94
.032485	0.	0.	0.	0	11	5	.00	26.12	35.06

T1 26' FF
T2 RAWHIDE
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	1	.03252					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.43	.43	.57	.00	.92	.49	.00	.00	.85
32.	0.	32.	0.	0.	6.	0.	0.	0.	.85
.00	.00	5.64	.00	.000	.017	.000	.000	.00	8.94
.032515	0.	0.	0.	0	11	5	.00	26.13	35.06

THIS RUN EXECUTED 4/26/ 0 8:21:49

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

RAWHIDE

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	26.32	.40	.52	5.19	26.12	2.08	.82
1.000	32.48	.43	.57	5.64	26.13	2.12	.92

```

1*****
* WATER SURFACE PROFILES *
* VERSION OF SEPTEMBER 1988 *
* ERROR: 01,02 *
* UPDATED: 4 APRIL 1989 *
* RUN DATE 4/26/ 0 TIME 8:47:53 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *
*****

```

```

X X XXXXXXX XXXXX
X X X X X
X X X X X
XXXXXXX XXXX X XXXXX XXXXX
X X X X X
X X X X X
X X XXXXXXX XXXXX

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END OF BANNER

1
4/26/ 0 8:47:53

PAGE 1

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*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

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THIS RUN EXECUTED 4/26/ 0 8:47:53

```

ERROR CORR - 01,02
MODIFICATION -
*****

```

```

T1 SUNRISE RANCH STREET CAPACITY CALCULATIONS
T2 28' FF W/ 8" STD CURB SUB-CRITICAL FLOW
T3 EVENING FIRE

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	.006	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			

QT 6 17.5 27.93 31.33 38.41 18.61 32.4
X1 1 9 0 48 0 0 0
GR 1.0 0 .67 9.9 0 10 .125 12 .365 24
GR .125 36 0 38 .67 38.1 1.0 48
1
4/26/ 0 8:47:53 PAGE 2

SECNO DEPTH CWSEL CRIWS WSELK EG HV HL OLOSS BANK ELEV
Q QLOB QCH QROB ALOB ACH AROB VOL TWA LEFT/RIGHT
TIME VLOB VCH VROB XNL XNCH XNR WTN ELMIN SSTA
SLOPE XLOBL XLCH XLOBR ITRIAL IDC ICONT CORAR TOPWID ENDST

*PROF 1

CCHV= .100 CEHV= .300
*SECNO 1.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
1.00 .46 .46 .00 .00 .56 .10 .00 .00 1.00
18. 0. 17. 0. 0. 7. 0. 0. 0. 1.00
.00 .00 2.58 .00 .000 .017 .000 .000 .00 9.93
.005996 0. 0. 0. 0 0 5 .00 28.14 38.07

0
1
4/26/ 0 8:47:53 PAGE 3

T1 EVENING FIRE
T2 0.60 * SLOPE
T3

J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ
0 3 0 0 .006
J2 NPROF IPLOT PRFVS XSECV XSECH FN ALLDC IBW CHNIM ITRACE
2 0 -1 0 0 0 0 0 0 0

1
4/26/ 0 8:47:53 PAGE 4

SECNO DEPTH CWSEL CRIWS WSELK EG HV HL OLOSS BANK ELEV
Q QLOB QCH QROB ALOB ACH AROB VOL TWA LEFT/RIGHT
TIME VLOB VCH VROB XNL XNCH XNR WTN ELMIN SSTA
SLOPE XLOBL XLCH XLOBR ITRIAL IDC ICONT CORAR TOPWID ENDST

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.54	.54	.00	.00	.69	.15	.00	.00	1.00
28.	0.	28.	0.	0.	9.	0.	0.	0.	1.00
.00	.00	3.09	.00	.000	.017	.000	.000	.00	9.92
.005961	0.	0.	0.	0	0	5	.00	28.16	38.08

0

1

4/26/ 0 8:47:53

PAGE 5

T1 EVENING FIRE

T2 0.60 % SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	.006					
J2	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3	0	-1	0	0	0	0	0	0	0

1

4/26/ 0 8:47:53

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SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.56	.56	.00	.00	.73	.16	.00	.00	1.00
31.	0.	31.	0.	0.	10.	0.	0.	0.	1.00
.00	.00	3.23	.00	.000	.017	.000	.000	.00	9.92
.005916	0.	0.	0.	0	0	5	.00	28.17	38.08

0

1

4/26/ 0 8:47:53

PAGE 7

T1 EVENING FIRE

T2 0.60 % SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	5	0	0	.006					
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4	0	-1	0	0	0	0	0	0	0

1

4/26/ 0 8:47:53

PAGE 8

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 4

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.61	.61	.60	.00	.80	.19	.00	.00	1.00
38.	0.	38.	0.	0.	11.	0.	0.	0.	1.00
.00	.00	3.52	.00	.000	.017	.000	.000	.00	9.91
.006009	0.	0.	0.	0	11	0	.00	28.18	38.09

0

1

4/26/ 0 8:47:53

PAGE 9

T1 EVENING FIRE

T2 0.60 % SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	6	0	0	.006					
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	5	0	-1	0	0	0	0	0	0	0

1

4/26/ 0 8:47:53

PAGE 10

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
-------	-------	-------	-------	-------	----	----	----	-------	-----------

Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 5

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.47	.47	.00	.00	.58	.11	.00	.00	1.00
19.	0.	19.	0.	0.	7.	0.	0.	0.	1.00
.00	.00	2.64	.00	.000	.017	.000	.000	.00	9.93
.005998	0.	0.	0.	0	0	5	.00	28.14	38.07

0

1

4/26/ 0 8:47:53

PAGE 11

T1 EVENING FIRE

T2 0.60 % SLOPE

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	7	0	0	.006					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	6	0	-1	0	0	0	0	0	0	0

1

4/26/ 0 8:47:53

PAGE 12

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 6

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.57	.57	.56	.00	.74	.17	.00	.00	1.00
32.	0.	32.	0.	0.	10.	0.	0.	0.	1.00
.00	.00	3.27	.00	.000	.017	.000	.000	.00	9.91
.005900	0.	0.	0.	0	8	0	.00	28.17	38.09

THIS RUN EXECUTED 4/26/ 0 8:47:53

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EVENING FIRE

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
1.000	17.50	.46	.00	2.58	28.14	.92	.56
1.000	27.93	.54	.00	3.09	28.16	.96	.69
1.000	31.33	.56	.00	3.23	28.17	.97	.73
1.000	38.41	.61	.60	3.52	28.18	.99	.80
1.000	18.61	.47	.00	2.64	28.14	.93	.58
1.000	32.40	.57	.56	3.27	28.17	.97	.74

SUMMARY OF ERRORS AND SPECIAL NOTES

```

1*****
* WATER SURFACE PROFILES *
* VERSION OF SEPTEMBER 1988 *
* ERROR: 01,02 *
* UPDATED: 4 APRIL 1989 *
* RUN DATE 6/22/ 0 TIME 14:44:32 *
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *
*****

```

```

      X   X  XXXXXX  XXXXX
      X   X  X      X   X
      X   X  X      X
      XXXXXX XXXX  X      XXXXX
      X   X  X      X
      X   X  X      X   X
      X   X  XXXXXX  XXXXX

```

END OF BANNER

```

THIS RUN EXECUTED 6/22/ 0 14:44:32
*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -
*****

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```

T1      SUNSET GARDENS ROAD CAPACITY CALCULATIONS
T2      36'FF R/W ULTIMATE CONDITION
T3      FULLY DEVELOPED FLOW 25.8 CFS + 7.64 CFS

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.0287	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3		
QT	1	33.44					
X1	1	9	0	56	0	0	0
GR	.87	0	.67	11.9	0	12	.125
GR	.125	46	0	48	.67	48.1	.87

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*PROF 1

```

CCHV= .100 CEHV= .300
*SECNO 1.000

```

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.45	.45	.56	.00	.82	.36	.00	.00	.87
33.	0.	33.	0.	0.	7.	0.	0.	0.	.67
.00	.00	4.85	.00	.000	.017	.000	.000	.00	11.93
.028792	0.	0.	0.	0	11	6	.00	36.13	48.07

THIS RUN EXECUTED 6/22/ 0 14:44:32

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FULLY DEVELOPED FLOW

SUMMARY PRINTOUT

Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
33.440	.45	.56	4.85	36.13	1.95	.82

SUMMARY OF ERRORS AND SPECIAL NOTES

1*****
* WATER SURFACE PROFILES *
* VERSION OF SEPTEMBER 1988 *
* ERROR: 01,02 *
* UPDATED: 4 APRIL 1989 *
* RUN DATE 6/22/ 0 TIME 12:17:45 *

* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616-4687 *
* (916) 756-1104, (916) 551-1748 *

```

      X      X  XXXXXXXX  XXXXX
      X      X  X      X  X
      X      X  X      X
      XXXXXXXX  XXXX  X      XXXXX
      X      X  X      X
      X      X  X      X  X
      X      X  XXXXXXXX  XXXXX

```

END OF BANNER

THIS RUN EXECUTED 6/22/ 0 12:17:45

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -

PHASE 1 TEMPORARY DRAINAGE SWALE

T1 SUNRISE RANCH ESTATES
T2 DRAINAGE SWALE 2.0' DEEP 12.0' WIDE 3:1 SIDE SLOPES
T3 1.35% SLOPE

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.0135	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
--	----	----	---	---	----	---	----	---

NC	.015	.015	.015	.1	.3					
QT	1	30.6								
X1	1	3	0	12.	0	0	0	0	0	0
GR	2.0	0	0	6.	2.0	12.				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300
*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
1.00 1.15 1.15 1.44 .00 2.07 .92 .00 2.00
31. 0. 31. 0. 0. 4. 0. 0. 2.00
.00 .00 7.70 .00 .000 .015 .000 .00 2.55
.013517 0. 0. 0. 0 14 6 6.91 9.45

THIS RUN EXECUTED 6/22/ 0 12:17:45

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

% SLOPE

SUMMARY PRINTOUT

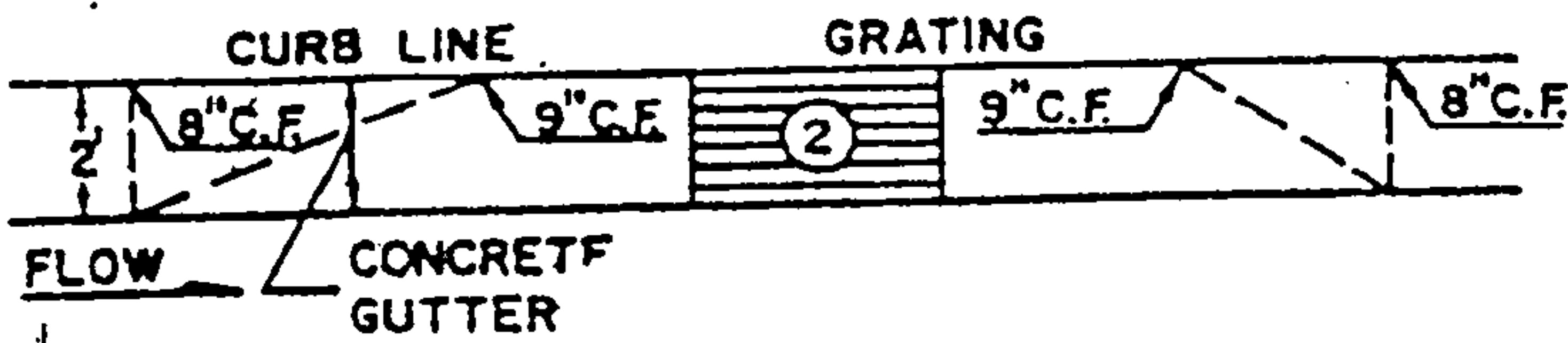
SECNO	Q	CWSEL	CRWS	VCH	TOPWID	FRCH	EG
1.000	30.60	1.15	1.44	7.70	6.91	1.79	2.07

SUMMARY OF ERRORS AND SPECIAL NOTES

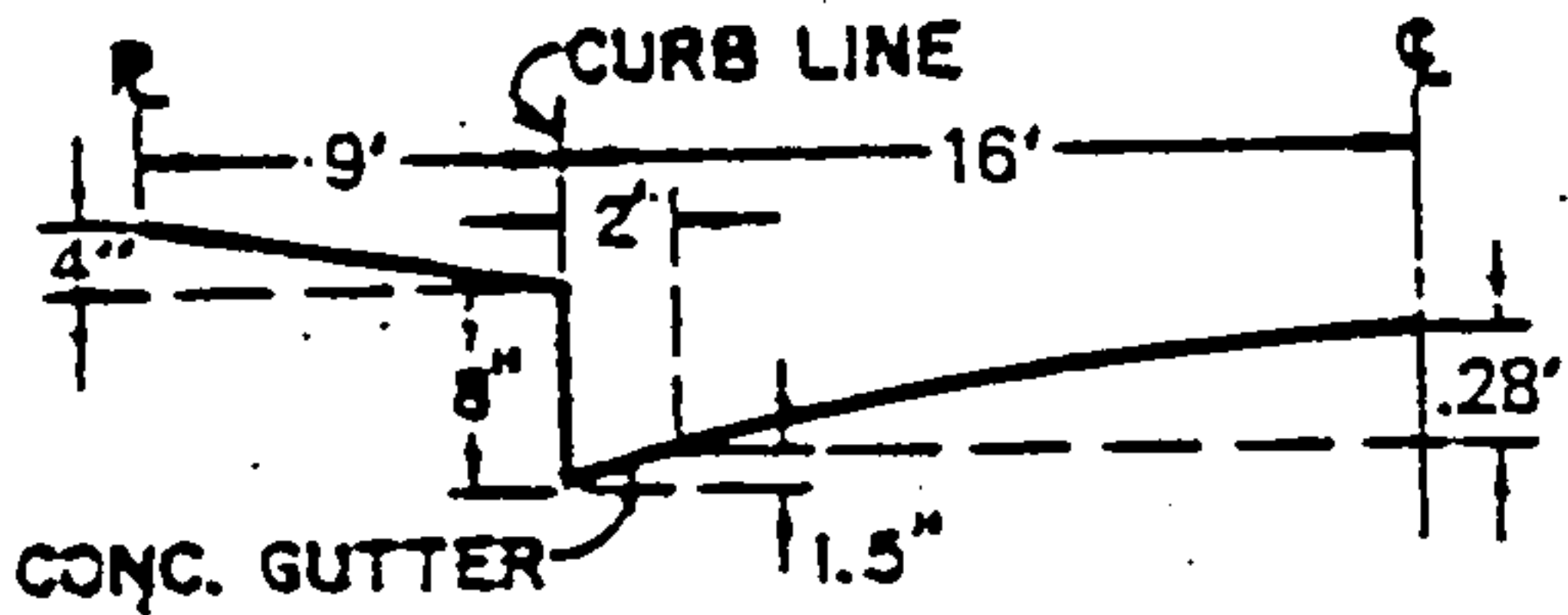
APPENDIX C
STORM DRAIN

SUNSET GARDENS ROAD INLETS

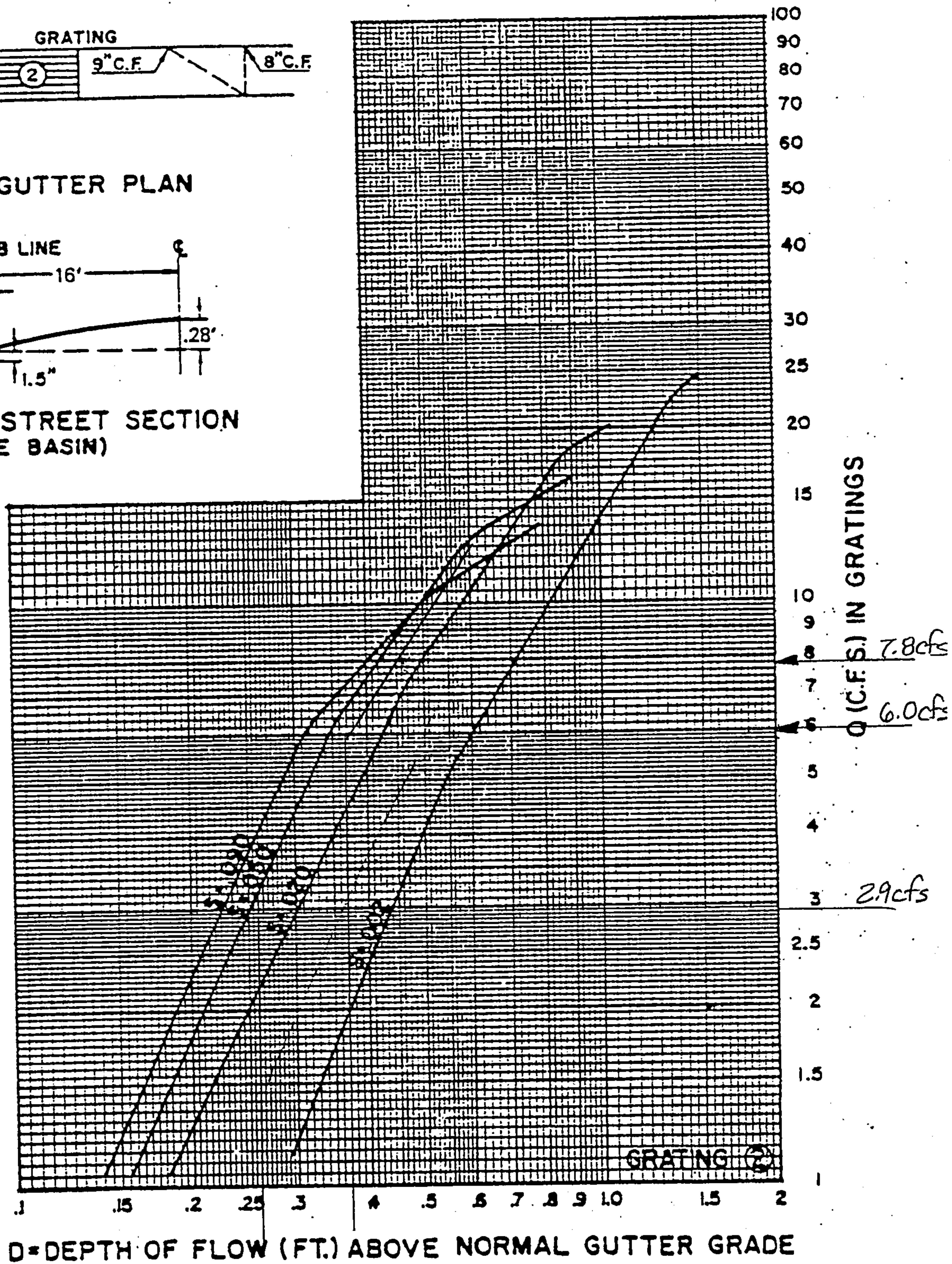
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



```

1*****
* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01,02
* UPDATED: 4 APRIL 1989
* RUN DATE 6/23/ 0 TIME 7:42:17
*****

```

```

*****
* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748
*****

```

```

X X XXXXXXX XXXXX
X X X X X
X X X X
XXXXXXX XXXX X XXXXX
X X X X X
X X X X X
X X XXXXXXX XXXXX

```

END OF BANNER

```

THIS RUN EXECUTED 6/23/ 0 7:42:17
*****
HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
ERROR CORR - 01,02
MODIFICATION -
*****

```

SUNSET GARDENS ROAD INLETS AT 98 th STREET

```

T1 SUNSET GARDENS ROAD CAPACITY CALCULATIONS
T2 36'FF R/W ULTIMATE CONDITION
T3 FULLY DEVELOPED FLOW 25.8 CFS + 7.64 CFS

```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	1	.0287	0	0	0	0	0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3		
QT	3	33.44	17.84	5.84			
X1	1	9	0	56	0	0	0
GR	.87	0	.67	11.9	0	12	.125
GR	.125	46	0	48	.67	48.1	.87

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.45	.45	.56	.00	.82	.36	.00	.00	.87
33.	0.	33.	0.	0.	7.	0.	0.	0.	.67
.00	.00	4.85	.00	.000	.017	.000	.000	.00	11.93
.028792	0.	0.	0.	0	11	6	.00	36.13	48.07

T1 SUNSET GARDENS

T2

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	1	.0287					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.37	.37	.45	.00	.64	.26	.00	.00	.87
18.	0.	18.	0.	0.	4.	0.	0.	0.	.67
.00	.00	4.11	.00	.000	.017	.000	.000	.00	11.94
.028607	0.	0.	0.	0	8	6	.00	28.91	48.06

T1 SUNSET GARDENS

T2

T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	1	.0287					
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3	0	-1	0	0	0	0	0	0	0

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

3265 DIVIDED FLOW

1.00	.27	.27	.32	.00	.42	.15	.00	.00	.87
6.	0.	6.	0.	0.	2.	0.	0.	0.	.67
.00	.00	3.15	.00	.000	.017	.000	.000	.00	11.96
.028675	0.	0.	0.	0	19	8	.00	18.36	48.04

THIS RUN EXECUTED 6/23/ 0 7:42:17

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01,02

MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FULLY DEVELOPED FLOW

SUMMARY PRINTOUT

Q	CWSEL	CRIWS	VCH	TOPWID	FRCH	EG
33.440	.45	.56	4.85	36.13	1.95	.82
17.840	.37	.45	4.11	28.91	2.09	.64
5.840	.27	.32	3.15	18.36	2.45	.42

SUMMARY OF ERRORS AND SPECIAL NOTES

CALCULATIONS FOR INLETS AT SUMP
for
Sunrise Ranch Estates

Capacity is measured by the weir equation at the lip of the gutter assuming an allowable ponding elevation equal to the lowest adjacent right of way elevation. The length of the double grate facing the street is 6.5' and the maximum depth is 0.725' at the lip of the gutter. The sides are each 2' long and the average depth is 0.892'. These depths assume an 8" curb with right of way 9' behind the curb for an additional depth of 0.18' above the top of curb. From the weir equation:

Evening Fire Knuckle sump inlets:

FOR DOUBLE 'C' INLET

$$\text{Front } Q \text{ cap} = (3.0) \times (6.5') \times (0.725) **1.5 = 12.04 \text{ cfs}$$

$$\text{Sides } Q \text{ cap} = (3.0) \times (4.0') \times (0.892) **1.5 = 10.11 \text{ cfs}$$

$$\text{Total } Q \text{ cap} = 12.04 \text{ cfs} + 10.11 \text{ cfs} = 22.15 \text{ cfs}$$

FOR TRIPLE 'C' INLET

$$\text{Front } Q \text{ cap} = (3.0) \times (9.75') \times (0.725) **1.5 = 18.06 \text{ cfs}$$

$$\text{Sides } Q \text{ cap} = (3.0) \times (4.0') \times (0.892) **1.5 = 10.11 \text{ cfs}$$

$$\text{Total } Q \text{ cap} = 12.04 \text{ cfs} + 10.11 \text{ cfs} = 28.17 \text{ cfs}$$

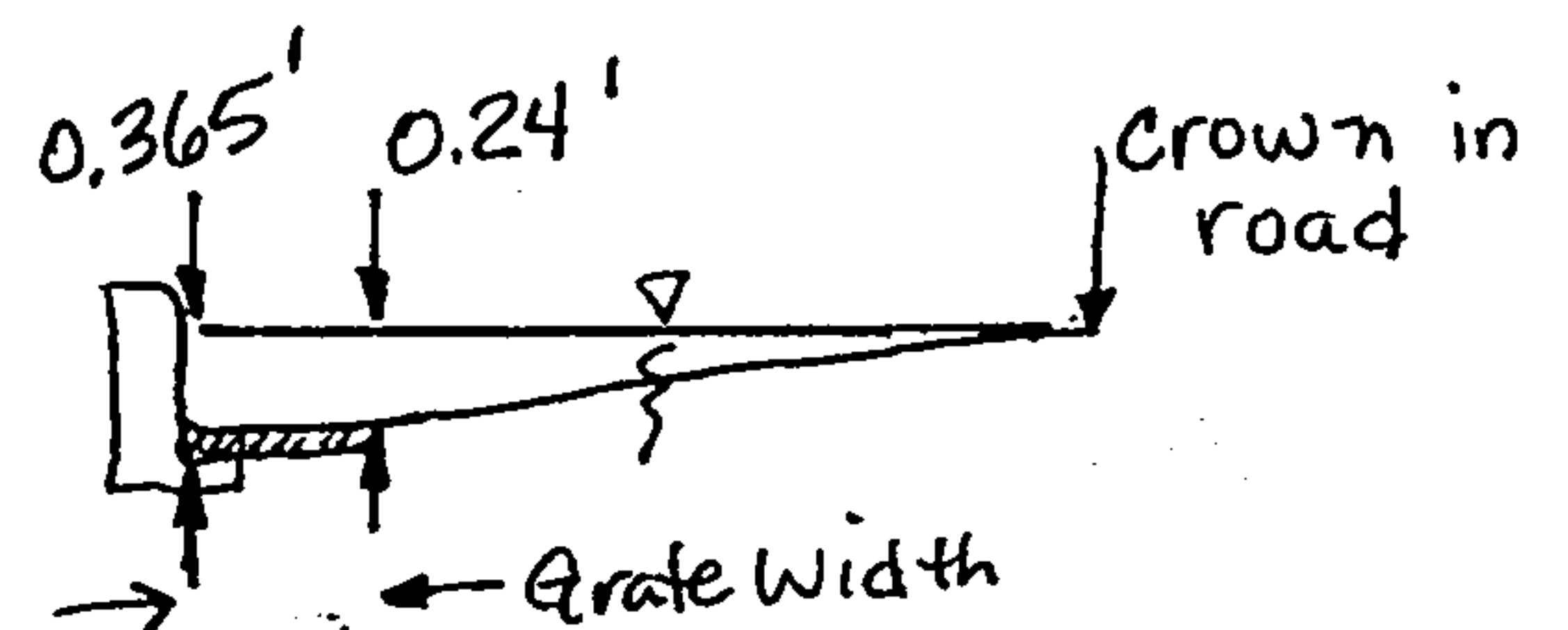
The 100 year flow to the sump for this project is 24.63cfs. Since there is no overflow to the onsite retention pond the sump inlets are designed for 2 times the flow rate of 49.26 cfs. A Triple 'C' and Double 'C' inlet will have a combined capacity of 50.32 cfs which is double the actual 100 year flow rate.

Double 'A' sump Inlet on Evening Fire Street:

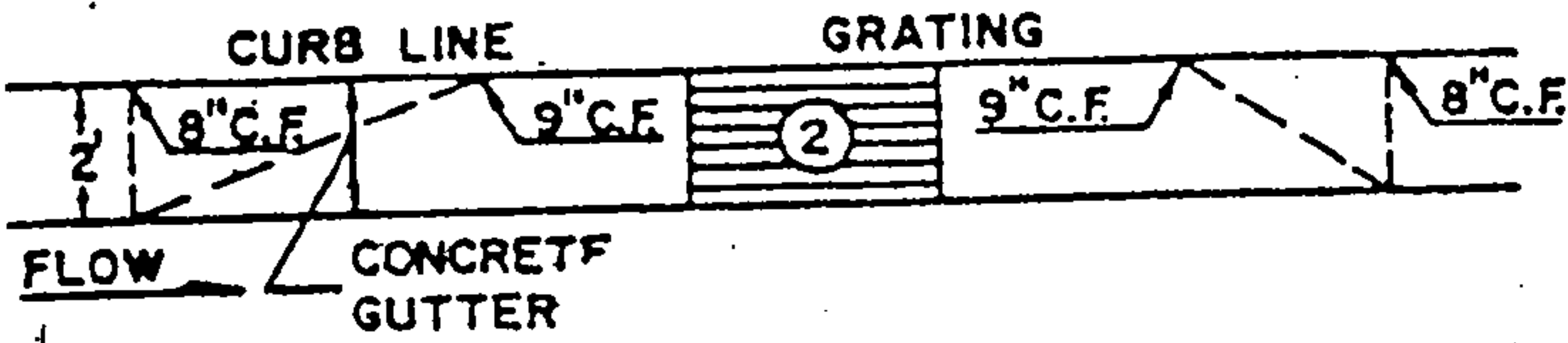
$$\text{Front } Q \text{ cap} = (3.0) \times (6.5') \times (0.24) **1.5 = 2.29 \text{ cfs}$$

$$\text{Sides } Q \text{ cap} = (3.0) \times (4.0') \times (0.3025) **1.5 = 1.99 \text{ cfs}$$

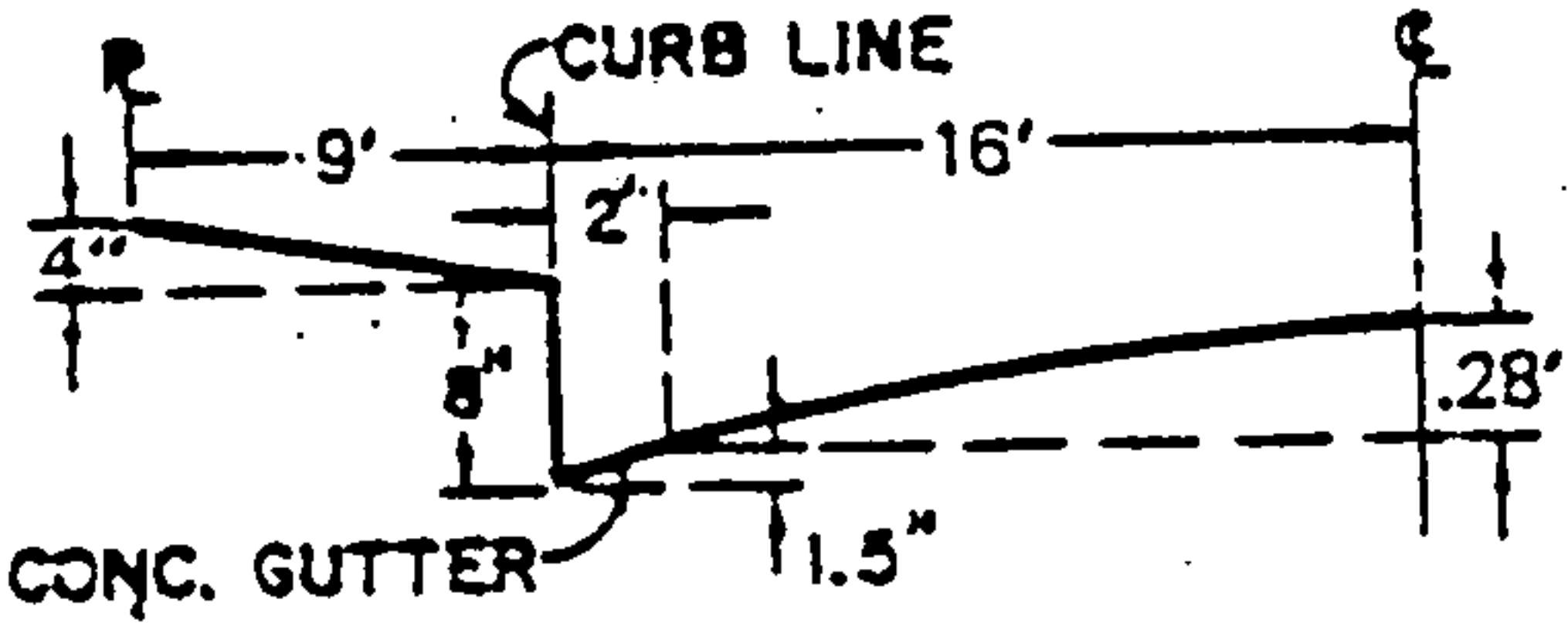
$$\text{Total } Q \text{ intercepted} = 2.29 \text{ cfs} + 1.99 \text{ cfs} = 4.28 \text{ cfs}$$



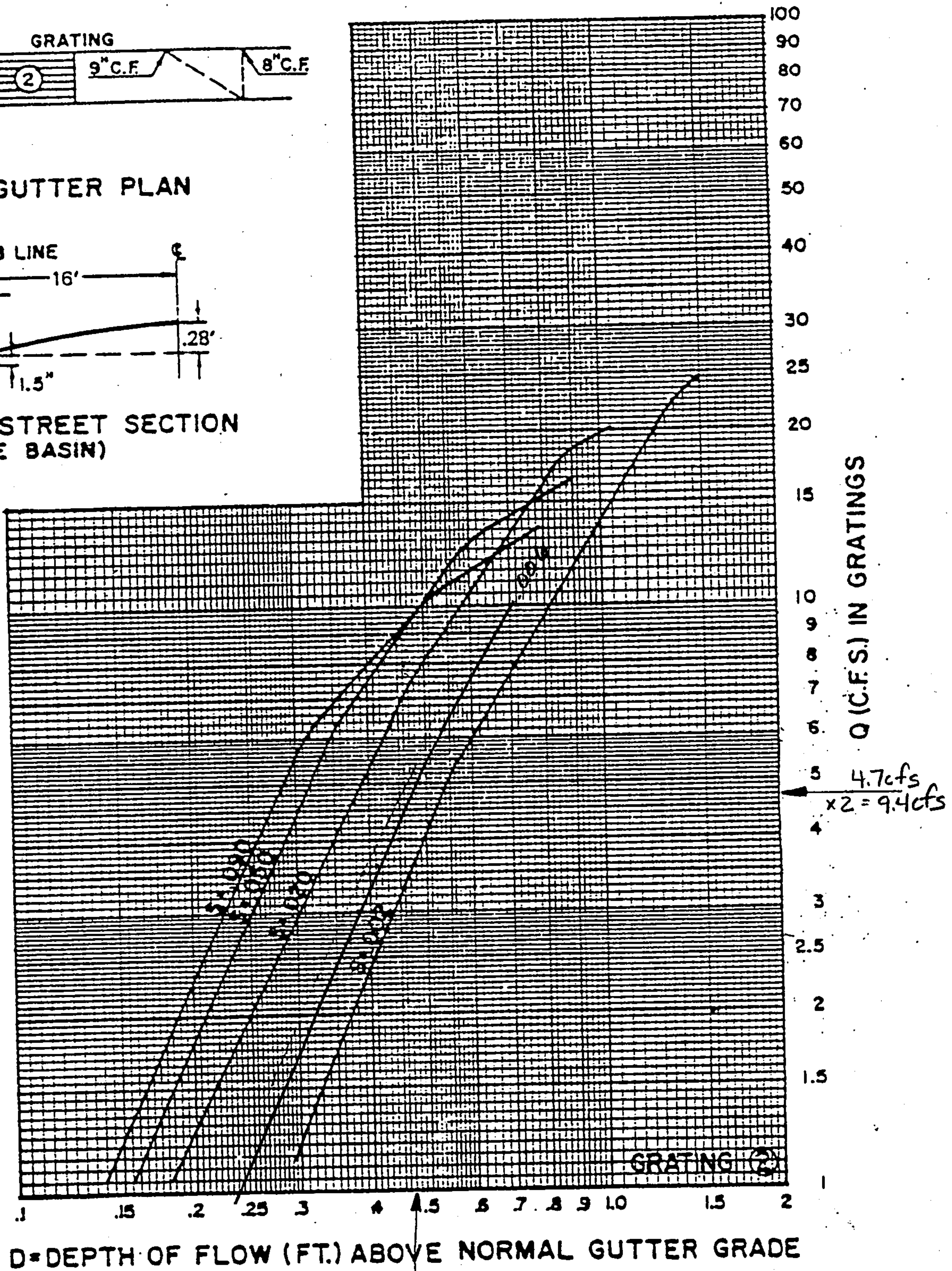
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

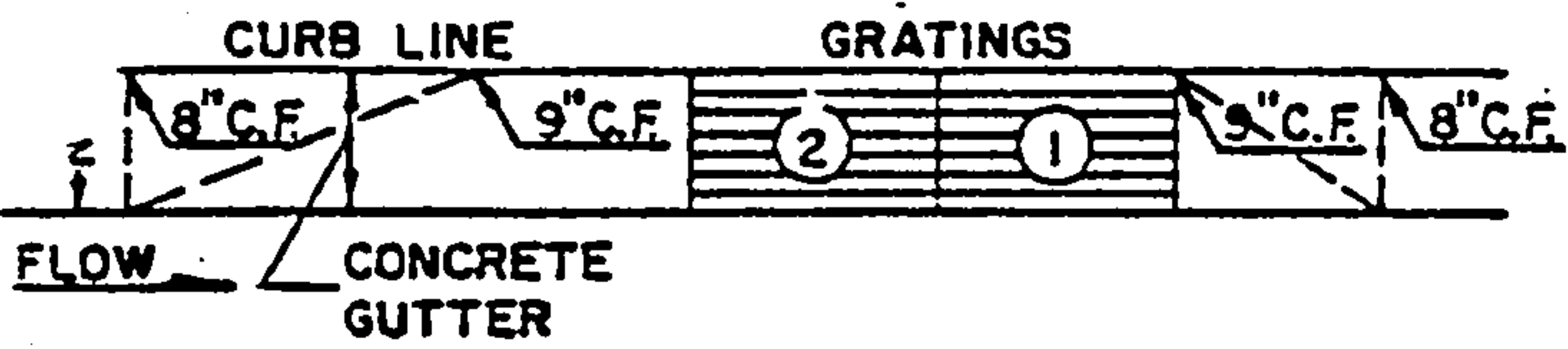


D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

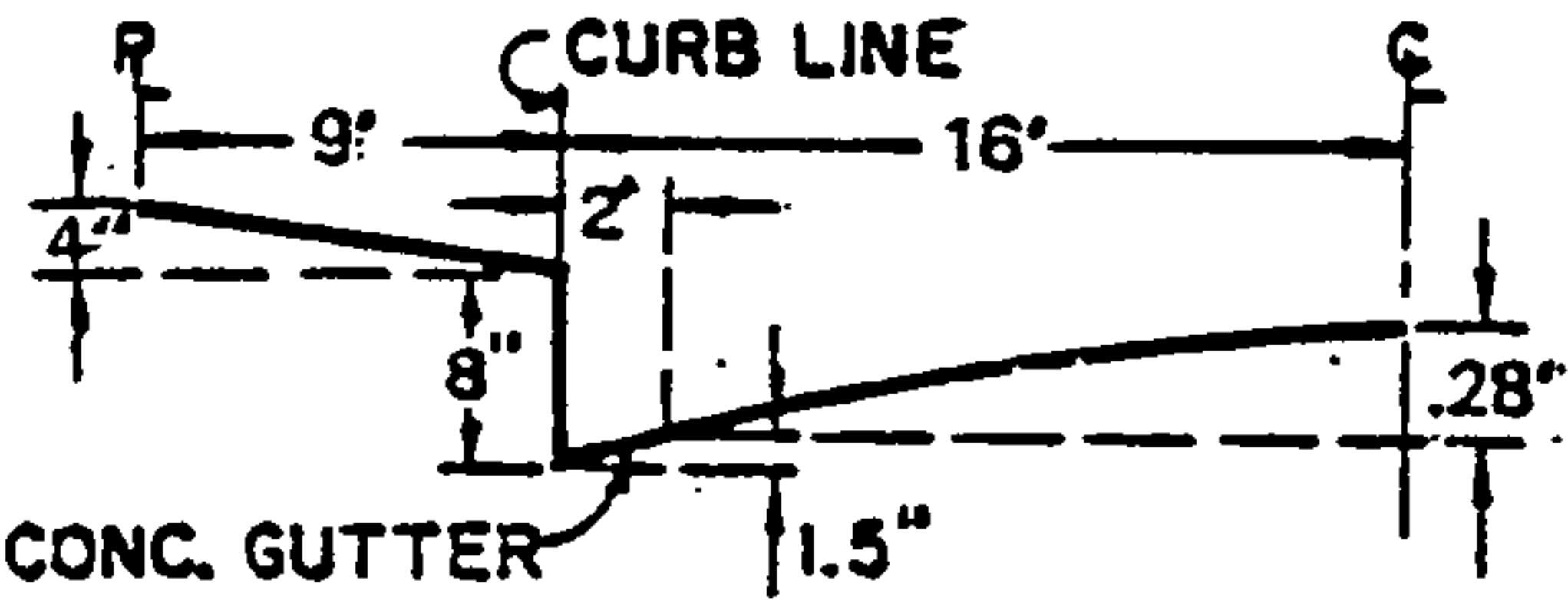
.47'

GRATING CAPACITIES FOR TYPE DOUBLE

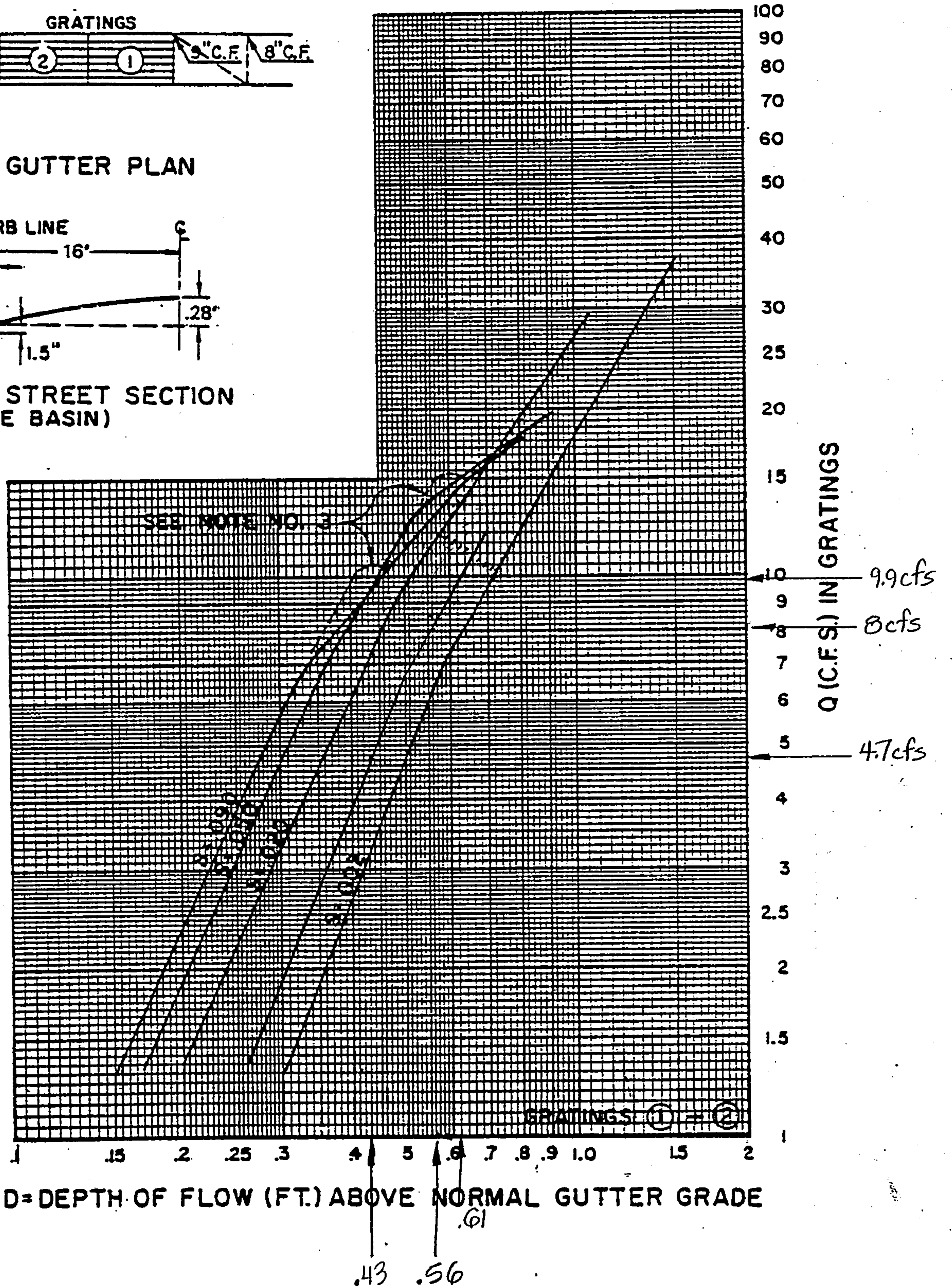
"C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

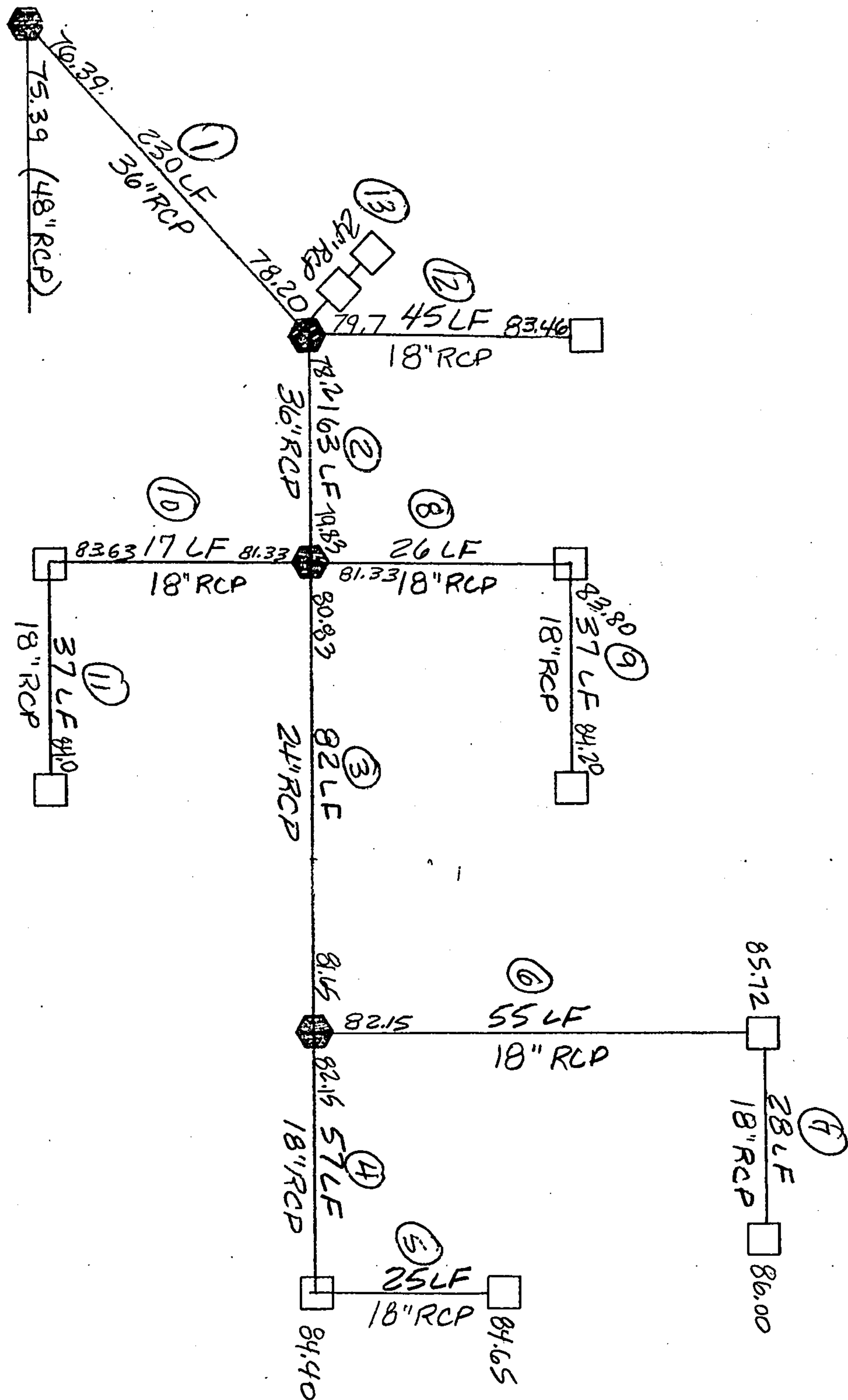


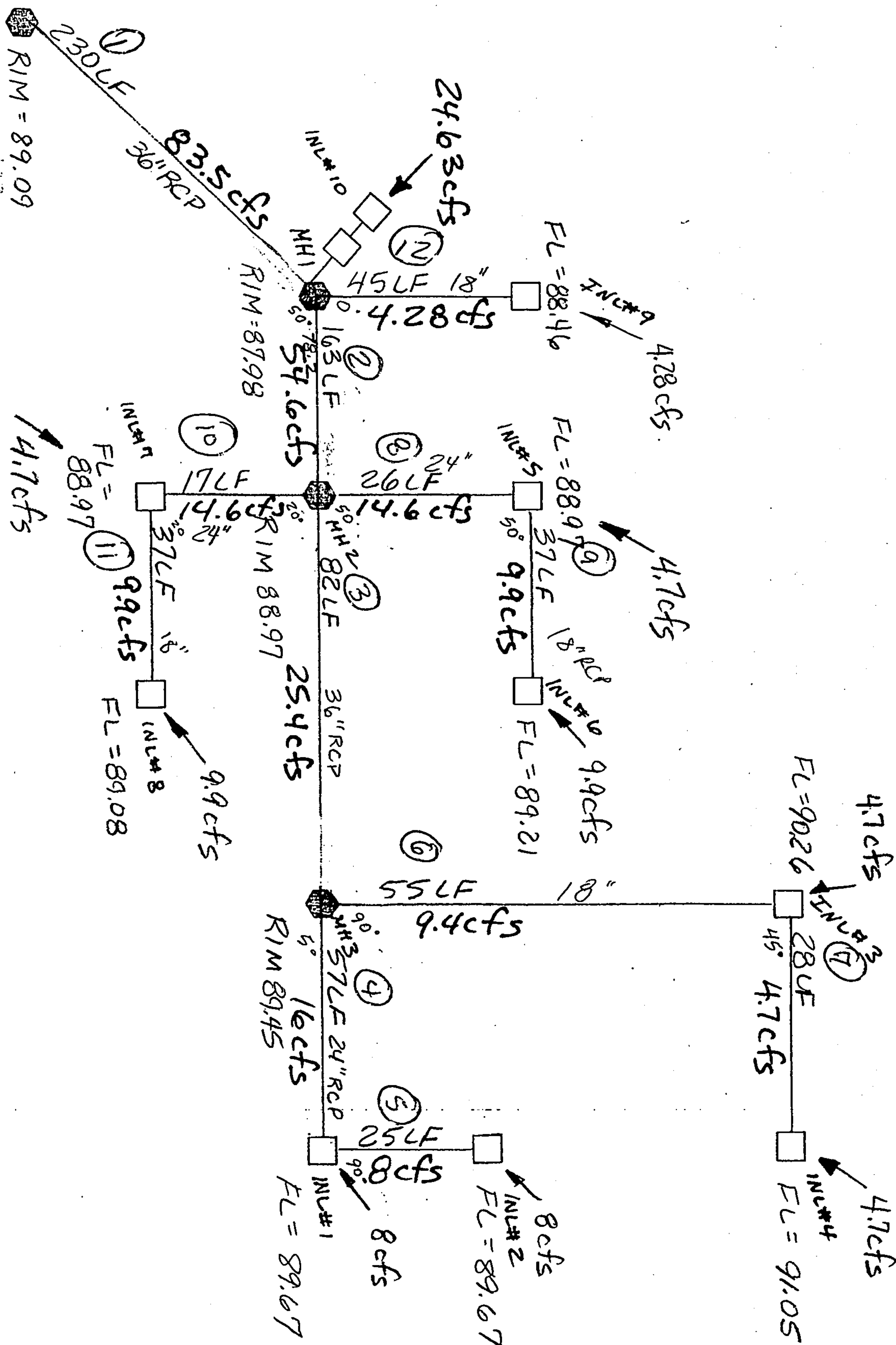


D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch
SUBJECT Storm Drain Schematic
BY DLH DATE 5-1-00
CHECKED _____ DATE _____
SHEET _____ OF _____





TOTAL Q = 83.545

1
0
HYDRAULIC REPORT FOR

PRELIMINARY

STORM DRAIN DESIGN

FOR

SUNRISE RANCH ESTATES

MAY 2000

MARK GOODWIN & ASSOCIATES

DLH

Run date: 05-01-2000
File:

Return Period = 5 Yrs
Rainfall file: Your_County

LINE 1 / Q = 83.5 / HT = 36 / WID = 36 / N = .013 / L = 230 / JLC = .1

EX.MH-MH1 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	80.00	36.00	76.39	11.82	82.17	0.00	9.69	7.07
UPSTRM	83.61	36.00	78.20	11.81	85.77	0.00	6.78	7.07

Drainage area (ac)	=	0	Slope of invert (%)	=	0.787
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.568
Time of conc (min)	=	2	Critical depth (in)	=	33.87
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	83.5	Confluence angle (deg)	=	45
Default Q (cfs)	=	83.5	Natural ground elev (ft)	=	87.98
Line capac. (cfs)	=	59.2	Line storage (cuft)	=	1626

LINE 2 / Q = 54.6 / HT = 36 / WID = 36 / N = .013 / L = 163 / JLC = .1

MH1-MH2 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	83.82	36.00	78.20	7.73	84.75	0.00	6.78	7.07
UPSTRM	84.92	36.00	79.83	7.72	85.84	0.00	6.13	7.07

Drainage area (ac)	=	0	Slope of invert (%)	=	1.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.670
Time of conc (min)	=	1	Critical depth (in)	=	28.25
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	54.5	Confluence angle (deg)	=	50
Default Q (cfs)	=	54.6	Natural ground elev (ft)	=	88.97
Line capac. (cfs)	=	66.7	Line storage (cuft)	=	1152

LINE 3 / Q = 25.4 / HT = 24 / WID = 24 / N = .013 / L = 82 / JLC = .1

MH2-MH3 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.01	24.00	80.83	8.09	86.02	0.00	6.13	3.14
UPSTRM	86.04	24.00	81.65	8.09	87.06	0.00	5.79	3.14

Drainage area (ac)	=	0	Slope of invert (%)	=	1.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.261
Time of conc (min)	=	0	Critical depth (in)	=	21.61
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	25.3	Confluence angle (deg)	=	0
Default Q (cfs)	=	25.4	Natural ground elev (ft)	=	89.45
Line capac. (cfs)	=	22.6	Line storage (cuft)	=	258

LINE 4 / Q = 16.0 / HT = 18 / WID = 18 / N = .013 / L = 57 / JLC = .1

MH3-INL#1 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	86.15	18.00	82.15	9.06	87.42	0.00	5.79	1.77
UPSTRM	87.47	18.00	84.40	9.05	88.74	0.00	3.76	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	3.947
Runoff coefficient	=	0	Slope energy grade line (%)	=	2.322
Time of conc (min)	=	0	Critical depth (in)	=	17.32
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	16	Confluence angle (deg)	=	5
Default Q (cfs)	=	16	Natural ground elev (ft)	=	89.67
Line capac. (cfs)	=	20.9	Line storage (cuft)	=	101

LINE 5 / Q = 8.0 / HT = 18 / WID = 18 / N = .013 / L = 25 / JLC = .1

INL#1-INL#2 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	87.60	18.00	84.40	4.53	87.92	0.00	3.76	1.77
UPSTRM	87.77	18.00	84.65	4.53	88.09	0.00	3.51	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.708
Time of conc (min)	=	0	Critical depth (in)	=	12.95
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	8	Confluence angle (deg)	=	90
Default Q (cfs)	=	8	Natural ground elev (ft)	=	89.67
Line capac. (cfs)	=	10.5	Line storage (cuft)	=	44

LINE 6 / Q = 9.4 / HT = 18 / WID = 18 / N = .013 / L = 55 / JLC = .1

MH#3-INL#3 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	86.15	18.00	82.15	5.32	86.58	0.00	5.79	1.77
UPSTRM	86.89	14.04	85.72	6.36	87.52	14.91	3.04	1.48

Drainage area (ac)	=	0	Slope of invert (%)	=	6.491
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.695
Time of conc (min)	=	0	Critical depth (in)	=	14.04
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	9.3	Confluence angle (deg)	=	90
Default Q (cfs)	=	9.4	Natural ground elev (ft)	=	90.26
Line capac. (cfs)	=	26.8	Line storage (cuft)	=	89

LINE 7 / Q = 4.7 / HT = 18 / WID = 18 / N = .013 / L = 28 / JLC = .1

INL#3-INL#4 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	86.95	14.79	85.72	2.99	87.09	13.42	3.04	1.57
UPSTRM	86.92	10.74	86.00	4.28	87.21	17.66	3.55	1.10

Drainage area (ac)	=	0	Slope of invert (%)	=	1.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.413
Time of conc (min)	=	0	Critical depth (in)	=	9.93
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	4.6	Confluence angle (deg)	=	45
Default Q (cfs)	=	4.7	Natural ground elev (ft)	=	91.05
Line capac. (cfs)	=	10.5	Line storage (cuft)	=	37

LINE 8 / Q = 14.6 / HT = 18 / WID = 18 / N = .013 / L = 26 / JLC = .1

MH#2-INL#5 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.01	18.00	81.33	8.26	86.07	0.00	6.13	1.77
UPSTRM	85.51	18.00	83.80	8.26	86.57	0.00	3.66	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	9.500
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.933
Time of conc (min)	=	0	Critical depth (in)	=	16.93
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	14.6	Confluence angle (deg)	=	50
Default Q (cfs)	=	14.6	Natural ground elev (ft)	=	88.97
Line capac. (cfs)	=	32.4	Line storage (cuft)	=	46

LINE 9 / Q = 9.9 / HT = 18 / WID = 18 / N = .013 / L = 37 / JLC = .1

INL#5-INL#6 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.62	18.00	83.80	5.60	86.11	0.00	3.66	1.77
UPSTRM	86.00	18.00	84.20	5.60	86.48	0.00	3.51	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.081
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.021
Time of conc (min)	=	0	Critical depth (in)	=	14.41
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	9.8	Confluence angle (deg)	=	50
Default Q (cfs)	=	9.9	Natural ground elev (ft)	=	89.21
Line capac. (cfs)	=	10.9	Line storage (cuft)	=	65

LINE 10 / Q = 14.6 / HT = 18 / WID = 18 / N = .013 / L = 17 / JLC = .1

MH#2-INL#7 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.01	18.00	81.33	8.26	86.07	0.00	6.13	1.77
UPSTRM	85.34	18.00	83.63	8.26	86.40	0.00	3.84	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	13.529
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.933
Time of conc (min)	=	0	Critical depth (in)	=	16.93
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	14.6	Confluence angle (deg)	=	20
Default Q (cfs)	=	14.6	Natural ground elev (ft)	=	88.97
Line capac. (cfs)	=	38.6	Line storage (cuft)	=	30

LINE 11 / Q = 9.9 / HT = 18 / WID = 18 / N = .013 / L = 37 / JLC = .1

INL#7-INL#8 / DNLN = 10

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.44	18.00	83.63	5.60	85.93	0.00	3.84	1.77
UPSTRM	85.82	18.00	84.00	5.60	86.31	0.00	3.58	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.021
Time of conc (min)	=	0	Critical depth (in)	=	14.41
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	9.8	Confluence angle (deg)	=	20
Default Q (cfs)	=	9.9	Natural ground elev (ft)	=	89.08
Line capac. (cfs)	=	10.5	Line storage (cuft)	=	65

LINE 12 / Q = 4.3 / HT = 18 / WID = 18 / N = .013 / L = 45 / JLC = .1

MH#1-INL#9 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	83.82	18.00	79.70	2.42	83.91	0.00	6.78	1.77
UPSTRM	84.28	9.49	83.46	4.53	84.60	17.97	3.5	0.94

Drainage area (ac)	=	0	Slope of invert (%)	=	8.356
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.526
Time of conc (min)	=	0	Critical depth (in)	=	9.47
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	4.2	Confluence angle (deg)	=	0
Default Q (cfs)	=	4.28	Natural ground elev (ft)	=	88.46
Line capac. (cfs)	=	30.4	Line storage (cuft)	=	61

LINE 13 / Q = 24.6 / HT = 24 / WID = 24 / N = .013 / L = 10 / JLC = .1

MH#1-INL#10 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	83.82	24.00	79.20	7.84	84.78	0.00	6.78	3.14
UPSTRM	84.04	24.00	79.40	7.84	84.99	0.00	6.45	3.14

Drainage area (ac)	=	0	Slope of invert (%)	=	2.000
Runoff coefficient	=	0	Slope energy grade line (%)	=	1.186
Time of conc (min)	=	0	Critical depth (in)	=	21.24
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	24.6	Confluence angle (deg)	=	90
Default Q (cfs)	=	24.63	Natural ground elev (ft)	=	87.86
Line capac. (cfs)	=	32.0	Line storage (cuft)	=	31

APPENDIX D
SUPPLEMENTAL INFORMATION
· AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN

AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN

VOLUME I

FINAL FACILITIES PLAN REPORT

Prepared for



ALBUQUERQUE METROPOLITAN
ARROYO FLOOD
CONTROL AUTHORITY

July 22, 1999



LEEDSHILL-HERKENHOFF, INC.

an ASCG Company

500 Copper Ave. N.W.

Albuquerque, New Mexico

(505) 247-0294

LH Project No. 95043

AMOLE-HUBBELL DRAINAGE MANAGEMENT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 INPUT FILE = SV_DMP.DAT

RUN DATE (MON/DAY/YR) =06/08/1999
 USE NO.= STOCTON.S94

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

$P(6)=2.2$
 $P(24)=2.66$

START TIME=.00

*S
 *S SNOW VISTA
 *S WITH MANAGEMENT PLAN IN PLACE
 *S
 *S
 *S 100-YR, 24-HR STORM WITH NO SEDIMENT**
 *S FILE NAME : SV_DMP1.DAT
 *S BY: TOM BLAINE AND RICHARD STOCKTON/K. JACOBSEN
 *S LAST REVISION: 06-08-99 (PIPE FOR POND.71 CHANGED AND HYD=400)
 *S100 YEAR 24HR STORM DEVELOPED CONDITION

RAINFALL TYPE= 2	COMPUTE NM HYD	ROUTE RESERVOIR	ROUTE	COMPUTE NM HYD	ROUTE RESERVOIR	ROUTE	COMPUTE NM HYD	ROUTE RESERVOIR	ADD HYD	ROUTE	COMPUTE NM HYD	
	100.00 - 2	100.10 2 5	100.20 5 3	100.30 3 10	110.00 - 2	110.10 2 5	110.20 5 11	120.00 - 2	120.10 2 5	120.20 11& 5 12	120.30 12 11	130.00 - 2
	.13520	.13520	.13520	.13520	.07170	.07170	.07170	.04030	.04030	.11200	.11200	.03770
	340.82	111.60	112.75	114.14	181.36	59.19	61.29	101.99	33.30	94.58	95.88	95.41
	15.597	15.611	15.611	15.611	8.272	8.377	8.377	4.649	4.654	13.031	13.031	4.349
	2.16311	2.16501	2.16502	2.16502	2.16311	2.19060	2.19061	2.16311	2.16525	2.18148	2.18148	2.16311
	1.500	1.850	1.400	1.450	1.500	2.600	1.400	1.500	1.850	1.400	1.400	1.500
	3.939 PER IMP=85.00	1.290 AC-FT=4.075	1.303	1.319	3.952 PER IMP=85.00	1.290 AC-FT=.001	1.336	3.954 PER IMP=85.00	1.291 AC-FT= 1.219	1.319	1.338	3.954 PER IMP=85.00

AMOLE-HUBBELL DRAINAGE MANAGEMENT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994

RUN DATE (MON/DAY/YR) =06/08/1999

INPUT FILE = SV_DMP.DAT

USE NO.= STOCTON.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID	TO ID	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE
ROUTE RESERVOIR	130.10	2	5	.03770	31.10	4.349	2.16310	1.850	1.289 AC-FT=1.142
ADD HYD	130.20	11&	5 12	.14970	126.97	17.380	2.17685	1.400	1.325
ADD HYD	130.30	10&12	12	.28490	238.38	32.991	2.17123	1.450	1.307
ROUTE	130.40	12	90	.28490	241.75	32.991	2.17124	1.450	1.326
COMPUTE NM HYD	140.00	-	2	.04300	105.07	4.718	2.05746	1.500	3.818 PER IMP=79.00
ROUTE RESERVOIR	140.10	2	5	.04300	35.50	4.739	2.06628	1.800	1.290 AC-FT=1.198
ROUTE	140.20	5	11	.04300	36.97	4.739	2.06630	1.400	1.343
COMPUTE NM HYD	150.00	-	2	.02420	55.95	2.451	1.89898	1.500	3.612 PER IMP= 70.00
ROUTE RESERVOIR	150.10	2	5	.02420	19.99	2.456	1.90318	1.800	1.291 AC-FT=.589
ADD HYD	150.20	11&	5 12	.06720	56.96	7.195	2.00755	1.400	1.324
COMPUTE NM HYD	170.00	-	70	.02853	65.96	2.889	1.89898	1.500	3.612 PER IMP=70.00
ROUTE RESERVOIR	150.10	70	5	.02853	23.61	2.893	1.90140	1.800	1.293 AC-FT=.693
ADD HYD	170.20	12&	5 12	.09573	80.56	10.088	1.97591	1.400	1.315
ROUTE	150.30	12	11	.09573	83.24	10.088	1.97592	1.400	1.359
COMPUTE NM HYD	160.00	-	2	.02170	50.17	2.198	1.89898	1.500	3.612 PER IMP=70.00
ROUTE RESERVOIR	160.10	2	5	.02170	15.89	2.198	1.89896	1.850	1.144 AC-FT=.888
ADD HYD	160.20	11&	5 12	.11743	94.99	12.286	1.96168	1.850	1.264
ROUTE	170.40	12	11	.11743	94.99	12.286	1.96169	1.850	1.264
COMPUTE NM HYD	180.00	-	2	.02810	64.96	2.846	1.89898	1.500	3.612 PER IMP=70.00
ROUTE RESERVOIR	180.10	2	5	.02810	23.20	2.854	1.90432	1.800	1.290 AC-FT=.684
ADD HYD	180.20	11&	5 10	.14553	118.19	15.140	1.95061	1.850	1.269
ROUTE	180.30	10	11	.14553	118.20	15.140	1.95061	1.850	1.269
COMPUTE NM HYD	190.00	-	2	.03130	79.22	3.611	2.16311	1.500	3.955 PER IMP=85.00
ROUTE RESERVOIR	190.10	2	5	.03130	25.80	3.611	2.16310	1.850	1.288 AC-FT=.950

AMOLE-HUBBELL DRAINAGE MANAGEMENT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = SV_DMP.DAT

RUN DATE (MON/DAY/YR) =06/08/1999
USE NO.= STOCTON.S94

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
ADD HYD	190.00	90& 5	1	.31620	267.54	36.602	2.17043	1.450	1.322
ROUTE	190.20	1	10	.31620	271.17	36.602	2.17043	1.450	1.340
ADD HYD	190.30	11&10	12	.46173	380.80	51.742	2.10114	1.450	1.289
COMPUTE NM HYD	200.00	-	2	.02520	49.60	2.074	1.54349	1.500	3.075 PER IMP=52.00
*S THE VOLUME FROM 200.1 IS THE SNOW VISTA POND VOLUME UNDER DEV. COND.									
*S HYD=200.1 IS *****AP 21.1*****									
ADD HYD	200.10	2&12	10	.48693	423.42	53.816	2.07228	1.450	1.359
ROUTE RESERVOIR	200.20	10	3	.48693	387.71	53.814	2.07218	2.000	1.244 AC-FT=6.455
*S HYD=200.2 IS *****AP 21*****									
MODIFY TIME	200.20	3	3	.48693	388.53	53.814	2.07218	1.950	1.247
*S BEGIN ONSITE WATERSHED									
COMPUTE NM HYD	210.00	-	2	.00920	20.66	.871	1.77514	1.500	3.509 PER IMP=61.00
ADD HYD	210.10	3& 2	10	.49613	393.57	54.685	2.06667	1.900	1.239
ROUTE	210.20	10	11	.49613	393.76	54.684	2.06663	1.950	1.240
COMPUTE NM HYD	220.00	-	2	.00800	17.97	.757	1.77514	1.500	3.510 PER IMP=61.00
ADD HYD	220.10	11& 2	10	.50413	397.90	55.441	2.06200	1.950	1.233
ROUTE	220.20	10	11	.50413	397.80	55.440	2.06198	1.900	1.233
COMPUTE NM HYD	230.00	-	2	.00940	21.11	.890	1.77514	1.500	3.509 PER IMP=61.00
ADD HYD	230.10	11& 2	10	.51353	403.48	56.330	2.05673	1.850	1.228
ROUTE	230.20	10	11	.51353	404.02	56.330	2.05670	1.900	1.229
COMPUTE NM HYD	240.00	-	2	.01450	32.56	1.373	1.77514	1.500	3.509 PER IMP=61.00
*S END ONSITE WATERSHED									
ADD HYD	240.10	11& 2	10	.52803	412.58	57.702	2.04897	1.800	1.221
COMPUTE NM HYD	250.00	-	2	.00220	5.04	.201	1.71016	1.500	3.582 PER IMP=50.00

Refer to Figure 3 (no restriction of flow)

2. Westgate Dam Basin (WG)

The Westgate Dam AHYMO model developed for the Amole Westgate DMP (RD-61) for developed conditions with the East and West Amole Dams and outfall facility in place is utilized. (See Figure III-1). The output hydrograph is imported into the Amole Arroyo model. The AHYMO model from RD-61 contained several warning messages. Conveyance facilities were modified in the Westgate DMP and PMP models to provide adequate conveyance to ensure all runoff is accounted for. These revisions are not based on field or design data but are just pipe size or channel size increases to provide adequate conveyance.

3. Powerline Basin (PL)

The Powerline Basin AHYMO model for developed conditions utilizes existing drainage divides with the I-40 channel in place. (See Figure III-4). The output hydrograph at the Amole Arroyo is imported into the Amole Arroyo model.

4. Snow Vista Basin (SV)

The Snow Vista AHYMO model for developed conditions utilizes existing drainage divides, the I-40 Channel in place and a runoff constraint for undeveloped areas north of Sage Rd. and west of the channel of 1.29 cfs/acre. (See Figure III-5). The drainage area east of the Snow Vista Channel, west of 98th Street (Snow Vista Blvd.) and south of Tower Rd. is diverted by storm drain into the Snow Vista Channel south of Benavides Rd. as part of SAD 222 and the Tower/Sage Drainage Plan. This area is not included in the runoff restrictions in accordance with the City approved Tower/Sage Drainage Master Plan. The output hydrograph at the Amole Arroyo is imported into the Amole Arroyo model.

5. South Powerline Channel Basin (SP)

The South Powerline Channel Basin is developed only for the DMP model. The South Powerline Channel intercepts flows from the western portions of the Sacate Blanco, Rio Bravo and a portion of the Borrega Basin. The South Powerline Channel AHYMO model is incorporated in the Rio Bravo model since the outfall is into the Rio Bravo Channel.

6. Sacate Blanco Basin (SB)

The Sacate Blanco AHYMO model for developed conditions utilizes existing drainage divides. The current flow path of the South Sacate Blanco Arroyo, which has avulsed down an existing roadway, is incorporated in the model. The output hydrograph at the Amole Arroyo is imported into the Amole Arroyo model.

D. SNOW VISTA BASIN

1. EVALUATION

a. Situation

Location: The Snow Vista Basin is the drainage area which drains into the Snow Vista Diversion Channel. This area is located east of the Powerline Channel, north of the Amole Arroyo and west of the Snow Vista Channel. This basin is shown on Figure III-5.

Development: A large percentage of this basin is developed. Westgate Heights, Sunrise Terrace and other developments are already constructed.

b. Problem Description

The Snow Vista Basin has a significant amount of existing development. The channel that drains this area is concrete lined for approximately the first 60 percent of its length, and the remaining channel is earthen with riprap drop structures. The lower portion of the channel just upstream from the confluence with Amole Arroyo is riprap lined. Under existing conditions, runoff constraints have been imposed by the City on tributary areas upstream of the Sage bridge over the Snow Vista Channel. The runoff constraint of 1.29 cfs/ac is based on the existing channel capacity (See RD 44). In developed conditions, the flow in portion of the Snow Vista Channel below Sage Rd. exceeds the minimum freeboard requirements.

Downstream of the Sage crossing, the existing Westgate Heights neighborhood generates a large portion of the basin's runoff. Channel capacity in this area is exceeded and will require remedial work to increase channel freeboard. Runoff from Westgate Heights along Benavides Road exceeds the capacity of the inlets and rundown into the Snow Vista Channel. Additionally, Westgate Heights does not have a conveyance system to convey runoff from the 100 year event to the Snow Vista Channel. Therefore, localized flooding could occur.

c. Existing Facility Data

The existing development, including Westgate Heights and other existing developments currently free discharge. New developments in the Snow Vista Basin are constrained to 1.29 cfs per acre to avoid exceeding the capacity of the existing Snow Vista Channel.

The Snow Vista Diversion channel was constructed in 1986 to divert the runoff from Westgate Heights and developments north of Westgate Heights into the Amole Arroyo. This system consists of a sedimentation basin at the head of a concrete lined channel which transitions to an earthen channel with riprap grade control structures below Benavides Road. Existing conditions runoff in this channel encroaches on the freeboard.

d. Existing Right-of-Way

AMAFCA owns ROW or has drainage easements for the existing AMAFCA facilities within the Snow Vista Basin. (See ROW maps in Volume II.)

e. Developed Conditions Data

As a result of this DMP, areas of hydraulic deficiencies have been identified. The Snow Vista Channel does not have adequate freeboard to meet the design requirements of the City DPM below Sage Road. Additionally, the street capacity of Benavides Road will be exceeded during the design event.

f. Criteria

Provide modifications and improvements which:

- ◆ Identify and resolve capacity deficiencies on the existing channel and collection systems leading to the channel.
- ◆ Provide a solution commensurate with the option presented in the Amole Arroyo Basin section.

g. Alternative Evaluation

Peak Flow Reduction: One alternative identified for the Snow Vista Basin to reduce the peak flow at the entrance to the Amole Arroyo is to detain the runoff in one or more basins. Applying runoff constraints to limit the flows is not feasible due to the large percentage of the basin which is currently developed. Utilizing the existing ROW and modifying the existing channel to provide "in-line" detention is not a feasible alternate for Snow Vista due to the volume required to be stored and the limited ROW. Providing a regional detention basin located in the vicinity of the Snow Vista Channel confluence with the Amole Arroyo is one practical alternative to reduce flow rates. Therefore, included in the alternatives for the Amole Arroyo is a 166 ac-ft detention pond (See Amole Arroyo Basin for alternative specifics).

Rio Bravo Sector Plan: The Rio Bravo Sector Plan identifies the area at the confluence of the Snow Vista Channel and Amole Arroyo as an urban center. This plan also shows a realigned Amole Arroyo through this area and ROW for a portion of this realignment has been dedicated as part of a bulk land transfer. The land use categories used in the Developed Conditions AHYMO analysis conform to this Sector Plan. The proposed management plan for Snow Vista conforms to the alignment shown in the Sector Plan.

AHYMO Analysis: The Developed Conditions AHYMO model was not modified as a result of the alternatives analysis. Runoff constraints were applied to undeveloped areas in the entire Snow Vista Basin west of the Snow Vista Channel at a rate of 1.29 cfs/ac for developed conditions.

Runoff Constraints: The basin area which drains into Snow Vista above Sage Road is being developed with a runoff constraint of 1.29 cfs/ac (see RD 44). This constraint is based on the channel capacity above Sage Road. The undeveloped drainage areas along Sage Road west of the channel (301.61, 301.62, 301.63, 301.64, 301.65 and 301.05) are also assumed to be constrained to 1.29 cfs/ac for developed conditions. This is based on available capacity of the Snow Vista Channel at Sage Rd. The ponds constructed to retain public water will be owned and maintained by the City of Albuquerque.

The drainage area east of the Snow Vista Channel between the Channel and 98th Street south of Tower Rd. (Basins 301.71, 301.72, 301.73 and 301.74 Figure III-5) enters the Snow Vista Channel below the Benavides crossing. Runoff from this area is unrestrained as presented in the Tower/Sage Drainage Study (RD-25) which has been approved by the City. A storm drain along 98th Street is included in the Tower/Sage SAD 222 and this area free discharges to the Snow Vista Channel.

Developed conditions runoff is 2083 cfs at the Amole Arroyo confluence compared to the existing channel design capacity of approximately 1200 cfs and estimated bank full capacity of 2600 cfs.

2. PROPOSED MANAGEMENT PLAN

The proposed management plan is schematically shown on Figure III-5. The hydrologic results for the Snow Vista Basin with the proposed plan in place are contained in Table III-3.

The proposed management plan is:

a. Channel Improvements

Existing Channel Freeboard - Project SV3: Provide freeboard for segments along the concrete channel which do not meet current criteria. Pinned curb wall extensions or similar minimal improvements are envisioned.

Provide freeboard meeting current criteria by increasing the height of the riprap banks and/or improve hydraulic capacity of the riprap channel section below the energy dissipator south of Benavides Road. Increasing the east bank height, upgrading channel stability and providing new channel rundowns with increased west bank heights should be designed and constructed.

Priority - High - Existing capacity exceeded.

Benavides Rd./Snow Vista Inlet - Project SVIA: Provide additional inlet in Benavides and piping to convey the runoff to the Snow Vista Channel beyond the jump structure. Additional freeboard (0.5') is required for a short section of the side channel, this is envisioned as Pinned curb wall extensions or similar minimal improvements.

Benavides Storm Drain - Project SV1B: The runoff from a significant area of Westgate Heights which is currently developed collects and flows down Benavides Road and adjacent roadways. The predicted 100 year flow in Benavides Road is approximately 800 cfs and the estimated street capacity to meet COA DPM criteria is approximately 70 cfs. Construct a storm drain in Benavides Road and some tributary roads to bring these streets in compliance with the City drainage criteria. The system consists of approximately 4,700 ft of storm drain pipe ranging from 24" to 72" diameter and associated inlets, manholes, etc. (see Figure III-6).

Priority - Medium

b. Land Use Issues - Project SV2

Runoff Constraint: Continue to restrict all new development in the Snow Vista Basin north of Sage Road west of the Snow Vista Channel to the existing runoff constraint of 1.29 cfs/ac. This will avoid overloading the existing Snow Vista Channel above Benavides and reduce the freeboard requirements and minimize the impacts of additional runoff resulting from future development.

Priority - On-Going

Snow Vista/Amole Confluence: Realignment of the Amole Arroyo as proposed in the Rio Bravo Sector Plan or as development in the area occurs may require reconstruction of the lower portion of Snow Vista. The final alignment for the Amole Arroyo and the impact on the Snow Vista Channel will be established when development occurs in this area.

c. Crossing Structures

Crossing Structures for this area of the Amole-Hubbell DMP have been added only for Amole Arroyo Alternatives. The 98th and Gibson Corridor crossings of the Snow Vista Channel are assumed to be located upstream of the confluence with the Amole Arroyo. For all other alternatives it was assumed that the corridors would cross after that confluence and are included in the Amole Arroyo Alternative Costs.

d. Budget

Budget Estimate: The estimated project budget for the proposed facilities is:

Benavides Inlet Upgrades - \$152,000

Benavides Storm Drain - \$1,600,000

Snow Vista Channel Freeboard improvements - \$104,000

Crossing Structures

Snow Vista Channel Freeboard Upgrade

(Amole Alternative 5 only) - \$1,818,000

AMOLE-HUBBELL DRAINAGE MANAGEMENT PLAN

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = TS_DMP.DAT

RUN DATE (MON/DAY/YR) =06/08/1999
USER NO.= STOCKTON.S94

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	
START										TIME=
.00										
*S										
*S	TOWER/SAGE WATERSHED SAD 222									
*S										
*S										
*S	100-YR, 24-HR STORM WITH SEDIMENT									
*S	FILE NAME: TS_DMP.DAT									
*S	BY: RICHARD STOCKTON									
	PEER REVIEWED BY: DEBORAH DIXON									
*S	LAST REVISION: 06-8-99 (kmj HYD=AP#22R)									
RAINFALL	TYPE= 2									RAIN24=2.660
COMPUTE NM HYD	A1-D&AP#1	-	3	.04580	103.28	4.897	2.00463	1.500	3.523	PER IMP=76.00
ROUTE	AP-1R	3	2	.04580	101.55	4.897	2.00464	1.550	3.464	
COMPUTE NM HYD	A2-D	-	3	.03950	89.28	4.001	1.89898	1.500	3.532	PER IMP=70.00
ADD HYD	AP#2	2& 3	10	.08530	185.32	8.897	1.95570	1.500	3.395	
ROUTE	AP#2R	10	2	.08530	184.43	8.897	1.95571	1.550	3.378	
COMPUTE NM HYD	A3-D	-	3	.04190	94.80	4.047	1.81093	1.500	3.535	PER IMP=65.00
ADD HYD	AP#3	2& 3	10	.12720	266.97	12.944	1.90801	1.550	3.279	
ROUTE	AP#3R	10	2	.12720	271.22	12.944	1.90801	1.550	3.332	
COMPUTE NM HYD	A4-D	-	3	.04390	101.56	4.858	2.07506	1.500	3.615	PER IMP=80.00
ADD HYD	AP#4	2& 3	10	.17110	368.16	17.802	1.95087	1.550	3.362	
ROUTE	AP#4R	10	2	.17110	371.05	17.802	1.95087	1.550	3.388	
COMPUTE NM HYD	A5-D	-	3	.04520	95.53	4.153	1.72289	1.500	3.302	PER IMP=60.00
ADD HYD	AP#5	2& 3	10	.21630	458.83	21.956	1.90323	1.550	3.314	
ROUTE	AP#5R	10	2	.21630	460.09	21.956	1.90323	1.550	3.324	

Refer to Figure 4

I. AMOLE DEL NORTE BASIN

1. EVALUATION

a. Situation

Location: The Amole del Norte basin is a large watershed south of I-40 and east of the Snow Vista Diversion Channel, which is collected in the Amole del Norte Diversion Channel. This watershed is approximately 6.5 square miles of the 16.1 square mile Amole watershed below Westgate Dam. This basin includes several subbasins which have been analyzed by others as part of on-going development in this area. These Subbasins and the analysis reports are as follows:

- ✧ 98th & Central Basin - Drainage between I-40 and Central Ave. West of 98th St. which is detained in a basin at the intersection of 98th St. and Central Ave. (Prepared by Griener for COA, RD #34).
- ✧ Tierra Bayita Basin - drainage which flows to the Tierra Bayita Channel along Bridge St. and into the N-S Coors Pond. (Prepared by Griener for COA, RDs # 6,32,33,34).
- ✧ Unser/214 Basin - The drainage area north of Tierra Bayita and west of Unser Blvd which is collected in the Unser Pond system. (Prepared by Easterling for Sunwest Bank, COA, AMAFCA, RD #29 and by Scanlon for COA, RD #23, included in SAD 214).
- ✧ Atrisco Business Park Basin - The drainage area east of Unser Blvd. and north of Bridge St. which drains to the N-S Coors Pond. (Prepared by Easterling for Sunwest Bank, COA, AMAFCA, RD #28).
- ✧ Tower/Sage Basin - The drainage area north of Sage Road and east of the Snow Vista Channel which drains into the proposed Tower Pond and to the Amole del Norte Channel. (Prepared by Andrews, Asbury and Robert for COA, RD #25, included in SAD 222).
- ✧ Sunrise Estates Basin - The drainage area south of Sage Road incorporating the Sunrise Estates Subdivision. (Prepared by Isaacson & Arfman, RD #59).
- ✧ South Amole del Norte Basin - The drainage area east of the Snow Vista Channel and Amole Arroyo and south and east of Sunrise Estates.

The Amole del Norte watershed and subbasins are shown on Figure III-13. See existing and developed conditions mapping in Volume II for more detail. The AHYMO model for the Amole del Norte Basin was constructed from the AHYMO models developed for each of these subbasins.

Modifications to the models included revising ID numbers, exporting hydrographs, revising sediment bulking and boundaries to construct a homogeneous AHYMO analysis. A revised rating curve was developed for the N-S Coors Pond based on COA provided survey data. (See detailed hydrologic data in Volume III).

The main trunk facilities are already in place in this basin. This area was included because all of the runoff from the Amole del Norte Diversion Channel drains to the Amole and Hubbell Lake Detention Basins impacting storage volumes and spillway requirements.

b. DRAINAGE MANAGEMENT PLAN

The facilities within the Amole del Norte watershed are controlled and maintained by the City of Albuquerque. The City is considering several independent studies, evaluations and design solutions for improvements within this watershed, many in conjunction with Special Assessment Districts and with proposed developments and COA studies.

It is intended that these independent design solutions will address the potential deficiencies with existing facilities identified in Volume III, Developed Conditions - Existing Facilities (DEVEX). Due to the evolving nature of these City and private development plans, studies and proposals, a detailed management plan for the Amole del Norte watershed has not been included in this DMP.

The Tower/Sage 60 AF Detention Pond and outfall storm drain is a programmed facility proposed as part of COA SAD 222. AMAFCA has been requested to participate in construction funding for this regional facility. The Tower/Sage Pond has been identified as Project AD1 in this report.

Conveyance Facilities: Conveyance (flow rate) issues for these existing facilities is deferred to the City. *The detention basins and ponds in the Amole del Norte watershed are required to mitigate the future conditions peak runoff rates which minimizes overloading of existing channels, storm drains and streets.*

Existing, proposed and potential future detention basins/ponds in the Amole del Norte watershed include:

- 98th & Central
- Unser Diversion
- 214 Basin
- Atrisco business Park
- N/S Coors Pond
- Sunrise Estates
- Tower/Sage (Programmed)
- 90th & Central (Potential Future)
- South Amole del Norte (Potential Future)

These and similar detention facilities are necessary to avoid exceeding the capacity of the existing Amole del Norte Channel as well as other existing streets, storm drains and channels.

Runoff Volume Storage: *The detention facilities which presently exist and are proposed for the areas draining to the Amole del Norte Diversion Channel do not reduce the Amole Dam and Hubbell Lake Dam volume requirements.*

The detention facilities controlling runoff rates to the Amole del Norte Channel are designed to detain a portion of the runoff and release it at a reduced rate. All of these facilities are essentially drained within 30 hours after the start of the storm. Drainage out of the Amole and Hubbell Lake facilities may not have started by the time these upstream basins have evacuated.

AHYMO Analysis: The hydrograph from the Developed Conditions - Existing Facilities (DEVEX) AHYMO analysis is incorporated in the total runoff entering the Amole Detention Basin to determine impacts to the Amole/Hubbell Dam system. Revised conveyance and detention facilities in the Amole del Norte watershed as a result of on-going improvements may alter the timing of the runoff entering the Amole Basin, but these differences are not anticipated to effect the total storage volume requirements for the Amole and Hubbell Lake Facilities.

The DEVEX AHYMO analysis indicated 13.7 AF of flow over the emergency spillway at the N/S Coors pond for fully developed conditions with existing facilities.

The DMP AHYMO which is summarized in this volume does not include any spillage out of the system. The DMP run routes all of the inflow hydrograph through N/S Coors to the Amole Dam so all of the volume is accounted for. The inflow hydrograph into the pond is the same as the DEVEX runs.

For the DMP analysis, in order to capture all of the volume, the pond is modeled as essentially having raised sides which raises the peak Q in the Amole del Norte Channel. This is conservative for the timing of this flow reaching the Amole Dam which was the intent. However, this overestimates the channel Q if the long term solution of N/S is to widen the pond or install detention upstream.

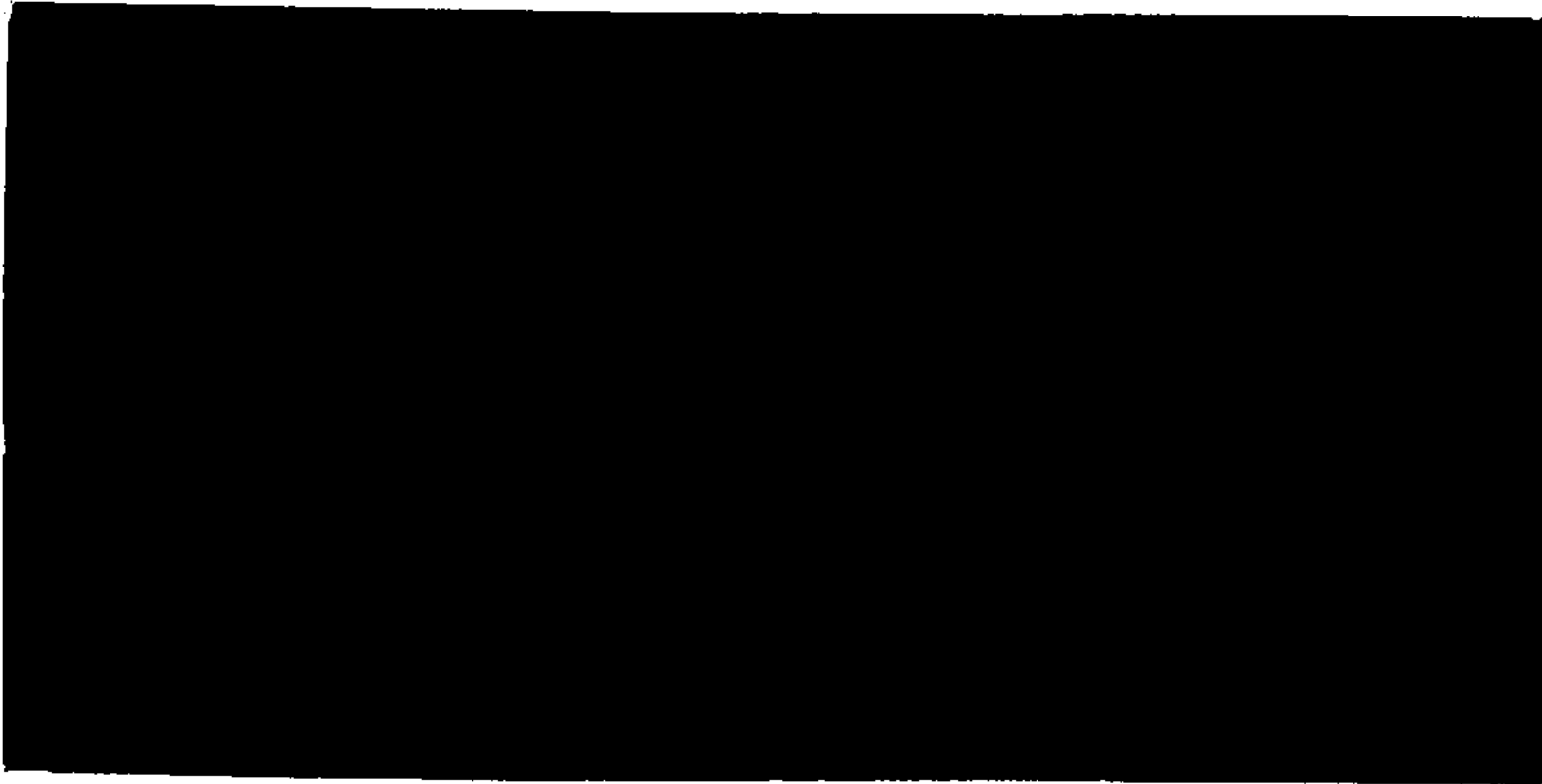
The truncated volume of 3.2 AF on Table II-3 is the sum of the truncations from all the ponding in the Amole del Norte watershed including 1.6 AF at N/S Coors.

47 0344

100

100





MARK GOODWIN

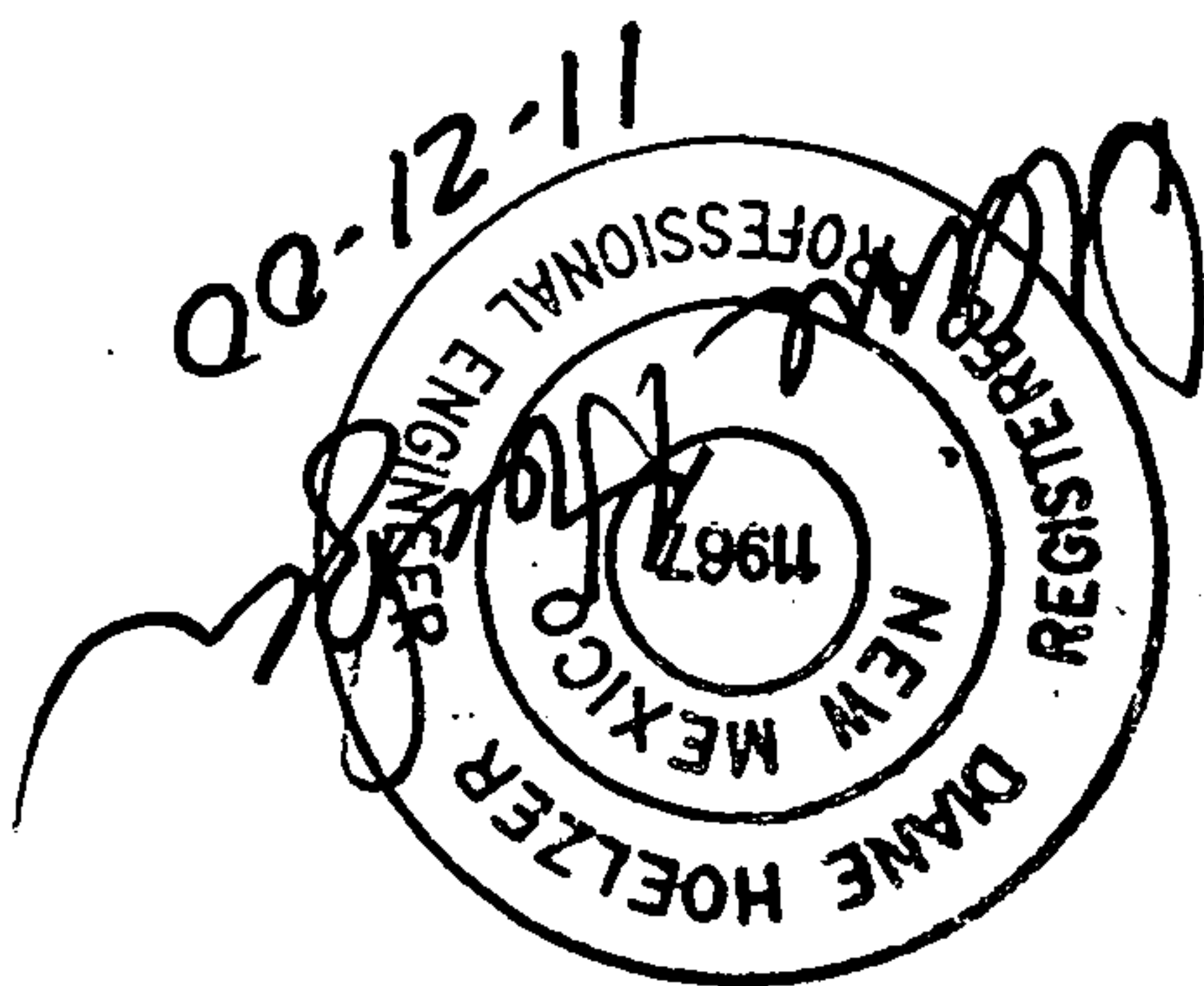
& ASSOCIATES
CONSULTING ENGINEERS

L-09/DOOLE

dmg

MARK GOODWIN & ASSOCIATES, PA

NOVEMBER 2000



(SNOW VISTA BASIN & TOWER SAGE BASIN)

DRAINAGE MANAGEMENT PLAN

AMOLE-HUBBELL

FOR

AMENDMENT REPORT

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SUMMARY

Under "existing drainage conditions", Subasin 190 is part of the Tower-Sage Drainage Basin. (Figure 4). Under "developed drainage conditions", subasin 190 was placed in the Snow Vista Basin according to the Amole-Hubbell Drainage Management Plan (Figure 5).

As a result of the existing grades in the area and more specifically the existing low lying area east of the present mobile home park in 102nd street midway between Central Avenue and Sunset Gardens Road, it has been proposed to split Subasin 190 into two subasins and remove approximately 40 percent of the eastern portion of subasin 190 (revised subasin 190B) from the Snow Vista Basin and make it part of the Tower-Sage Basin. The remaining 60 percent of subasin 190 (revised subasin 190A) will remain in the Snow Vista Basin as shown and will be allowed to drain to the Snow Vista Sedimentation Pond through the currently developing Sunrise Ranch Unit 2 subdivision (Figure 6). The mobile home park site will still be restricted to an allowable discharge rate of 1.29 cfs/acre (10.32 cfs) as was previously determined for subasin 190 as part of the Snow Vista Drainage Basin.

This change will result in an overall decrease in discharge to the Snow Vista Basin and, in the future, to a small increase in runoff to the Tower Sage Basin. At the present time, all runoff from Subasin 190 B (mobile home park) is contained within an onsite retention pond. In the future if the mobile home park is redeveloped, the increase in discharge from subasin 190B will increase the discharge at the Eucariz / 98th street intersection from an estimated 185.2 cfs to 196.4 cfs. (This increase includes an adjustment to the total area and land treatment value for Subasin A2-D) This results in a total volume increase to the Tower Detention Pond of 1.07 acre feet with an accompanying minimal increase in the outflow rate from 24.77 cfs to 24.89 cfs. This translates to a rise in the maximum water surface elevation by 0.138 feet (2 inches), from 87.73' to 87.868'.

I. PURPOSE FOR AMENDMENT

The proposed Sunrise Ranch Subdivision located in the southwest quadrant of the Sunset Gardens-98th street intersection covers an area of approximately 30.58 acres (Figure 1: Vicinity Map). The site is to be developed into a 184 single family residential community. The southwest corner of the site lies within a Zone AO floodplain as shown on FEMA Panel 35001 C 0328. The eastern portion of the site between the PNM substation and 98th street lies within the Tower Sage Basin and the western portion lies within the Snow Vista Basin (Figure 4). The purpose of this report is to amend the Tower Sage Basin and Snow Vista Basin boundary line as it relates to subbasin 190, as defined in AMAFCA's Amole-Hubbell Drainage Management Plan dated July 22, 1999.

II. EXISTING DRAINAGE CONDITIONS

Under existing conditions runoff from sub basin 190 is in a general eastward direction toward 98th street which is part of the Tower Sage Basin (Figure 4). Field observation verified this fact and that there is an existing low lying area east of the mobile home park in 102nd street midway between Sunset Gardens Road and Central Avenue. In addition there is an existing berm along the south side of the Sunset Gardens right-of-way that prevents runoff from entering the Snow Vista Basin for the eastern half of subbasin 190, which includes the existing mobile home park. The existing boundary line in Figure 4 shows that Sub Basin 190 is more clearly a part of the Tower Sage Basin instead of the Snow Vista Basin. Further research into the City SAD 222 file found an exhibit with reference to subbasin 190 that stated, "Design Analysis Report for Snow Vista channel indicated some flows from this area could be directed to Snow Vista channel. Sub basin 190 represents this 20 +/- acres. Exact basin boundaries or conveyance route unknown" (Figure 3). This indicates the uncertain nature of the final basin boundary line.

III. REVISED DRAINAGE CONDITIONS SUBBASIN 190

Most of the Sunrise Ranch Unit 2 subdivision lies within the Snow Vista Basin 200. Unit 2 was graded to minimize retaining walls and to match the existing grade along the property boundaries as much as possible. Given this design criteria it is not physically possible to grade that portion of Sunrise Ranch that lies within Subbasin 200 to allow for surface drainage from sub basin 190 through our site to the Snow Vista Sedimentation Pond (Figure 5). As an alternative to an expensive storm drain system through Unit 2 which would have to extend north to the low spot in 102nd street, runoff from the existing mobile home park should be diverted to the Tower Sage Basin in 98th street. This concept has City approval and the SAD 222 Engineers.

Under existing conditions runoff from mobile home park (Sub Basin 190B) is conveyed to a retention pond located within the site midway along the east property line. If this site were to redevelop into a different use, the developed flows should still be restricted to the allowable discharge rate of 1.29 cfs/acre as determined in the approved Amole-Hubbell Drainage Plan. The western portion of subbasin 190 (revised subbasin 190A, see Figure 6) will remain in the Snow Vista Basin. A "temporary drainage easement" along the western property line of Sunrise Ranch within sub basin 180 has been acquired to provide a conveyance path for developed runoff from sub basin 190A as well as the Sunrise Ranch Unit 2 site has been graded to allow offsite flows from Subbasin 190A to be conveyed as street flow through the site to inlets that discharge into the Snow Vista Pond. The allowable flow rate of 1.29 cfs per acre as determined in the approved Amole-Hubbell Drainage Plan will remain in effect.

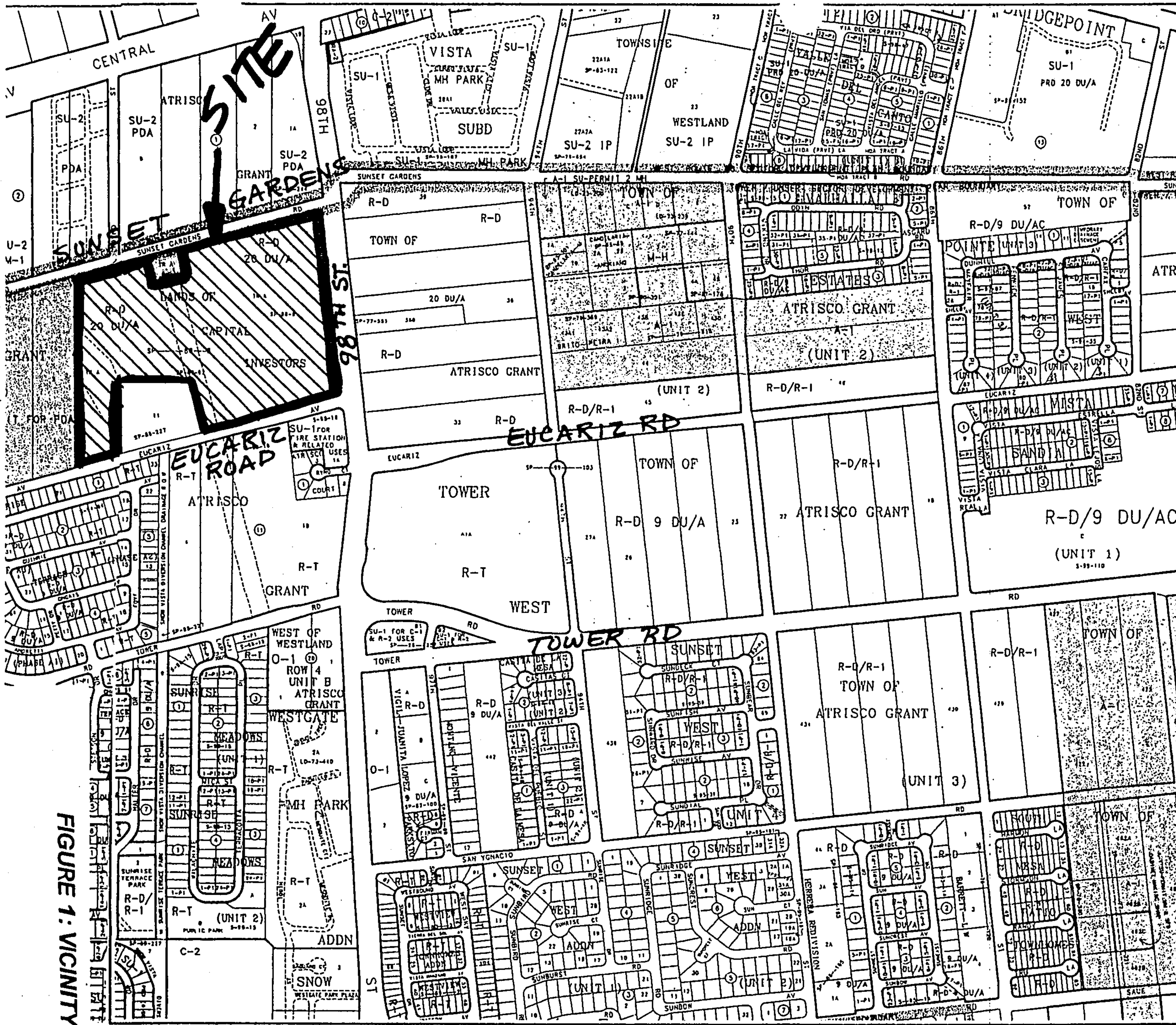


FIGURE 1: VICINITY MAP



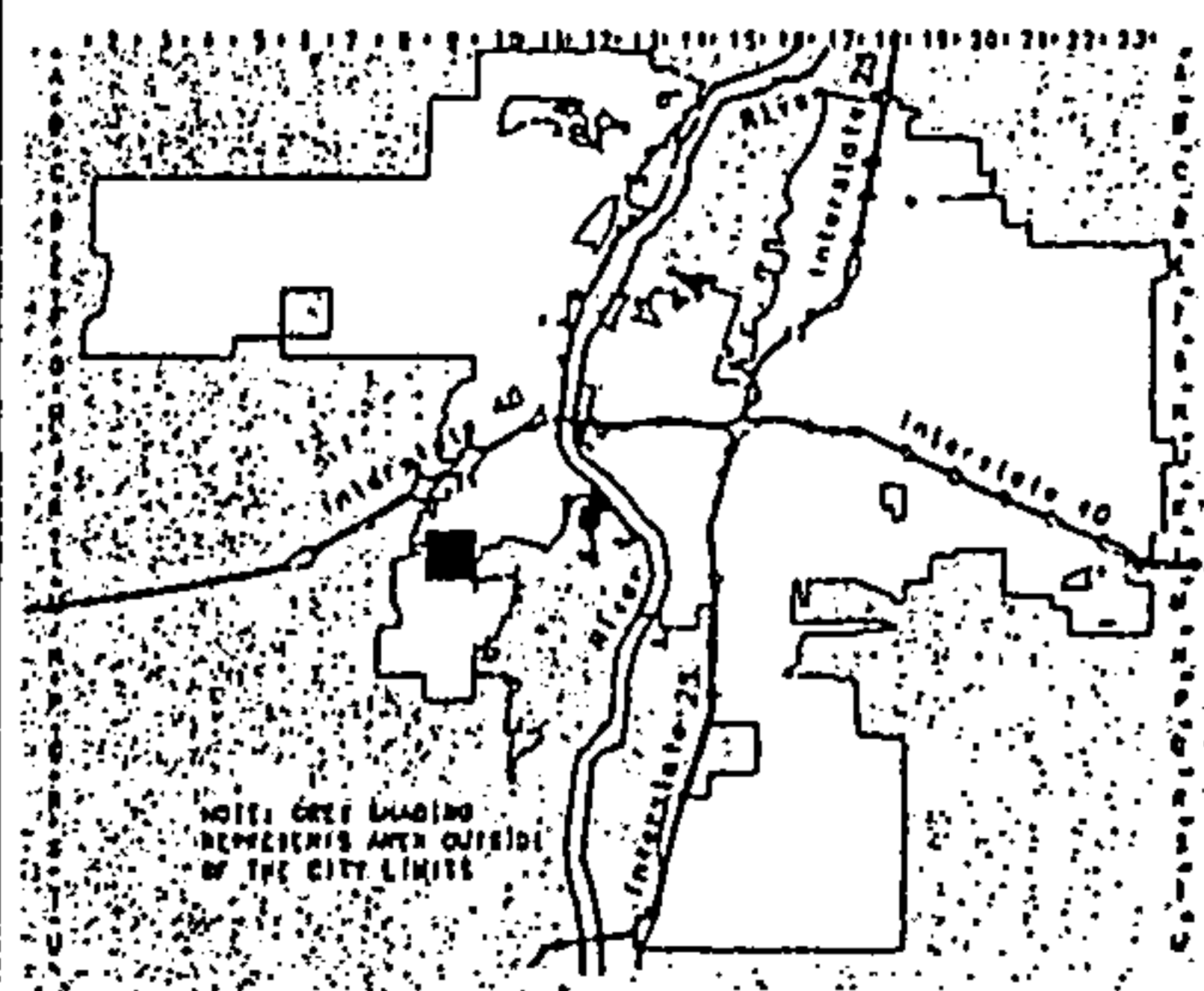
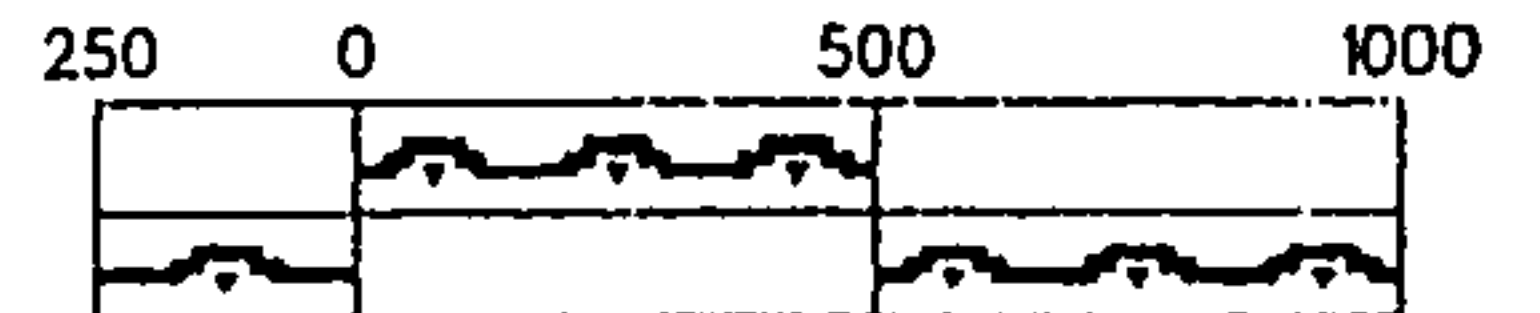
CITY OF
Albuquerque

Albuquerque Geographic Information System
PLANNING DEPARTMENT

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GRAPHIC SCALE IN FEET



Zone Atlas Page
L-9-Z

Map Amended through
September 17, 1999

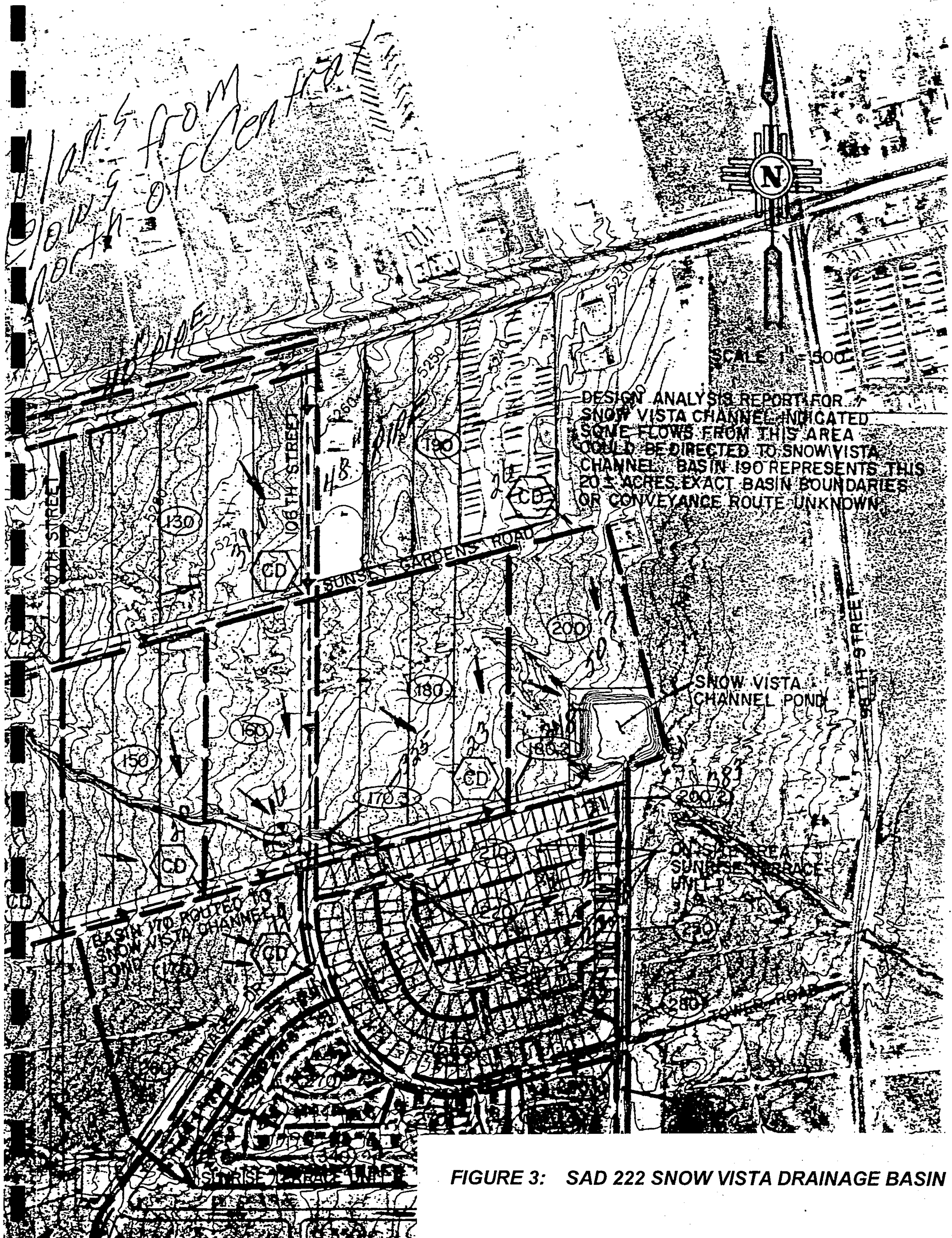
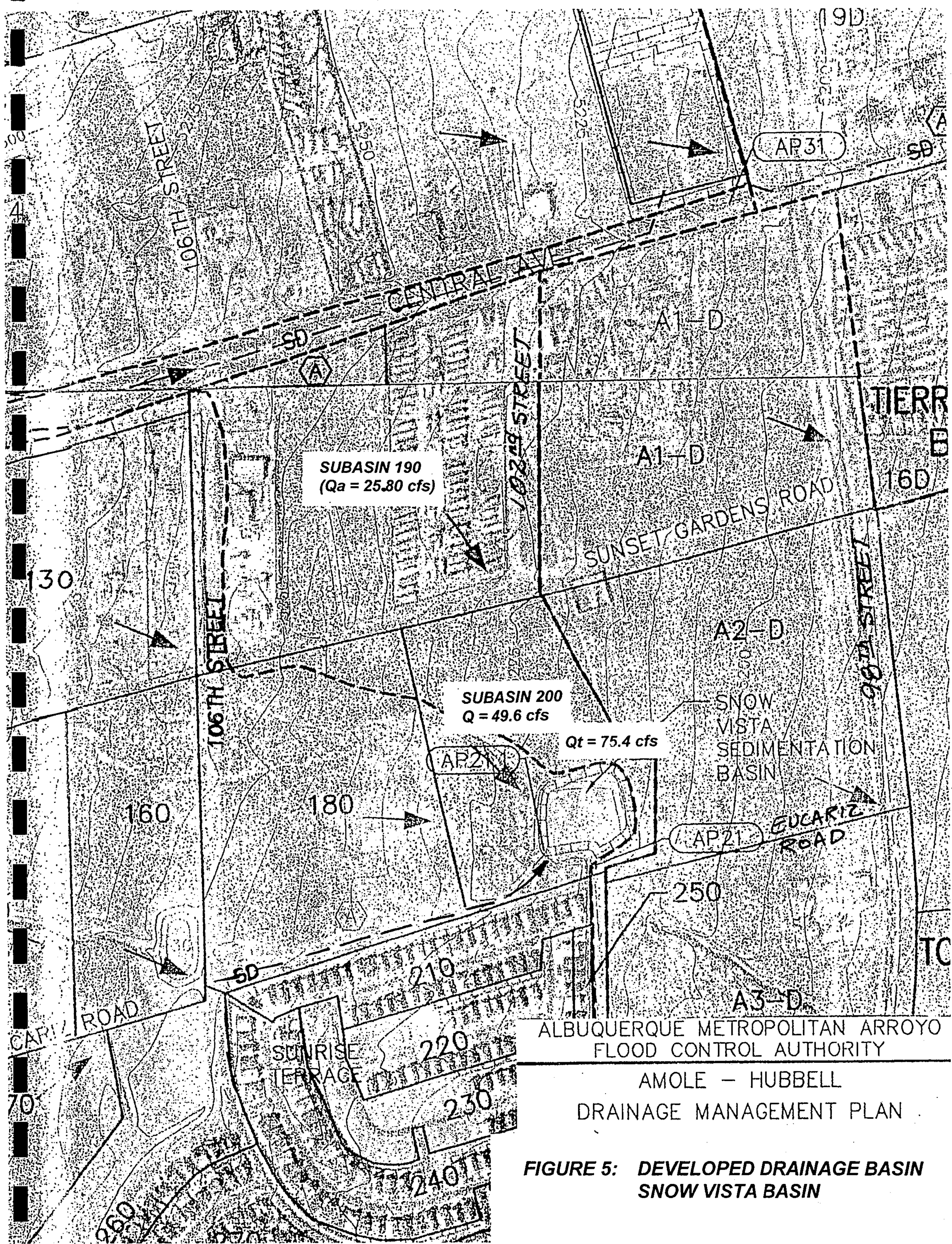


FIGURE 3: SAD 222 SNOW VISTA DRAINAGE BASIN

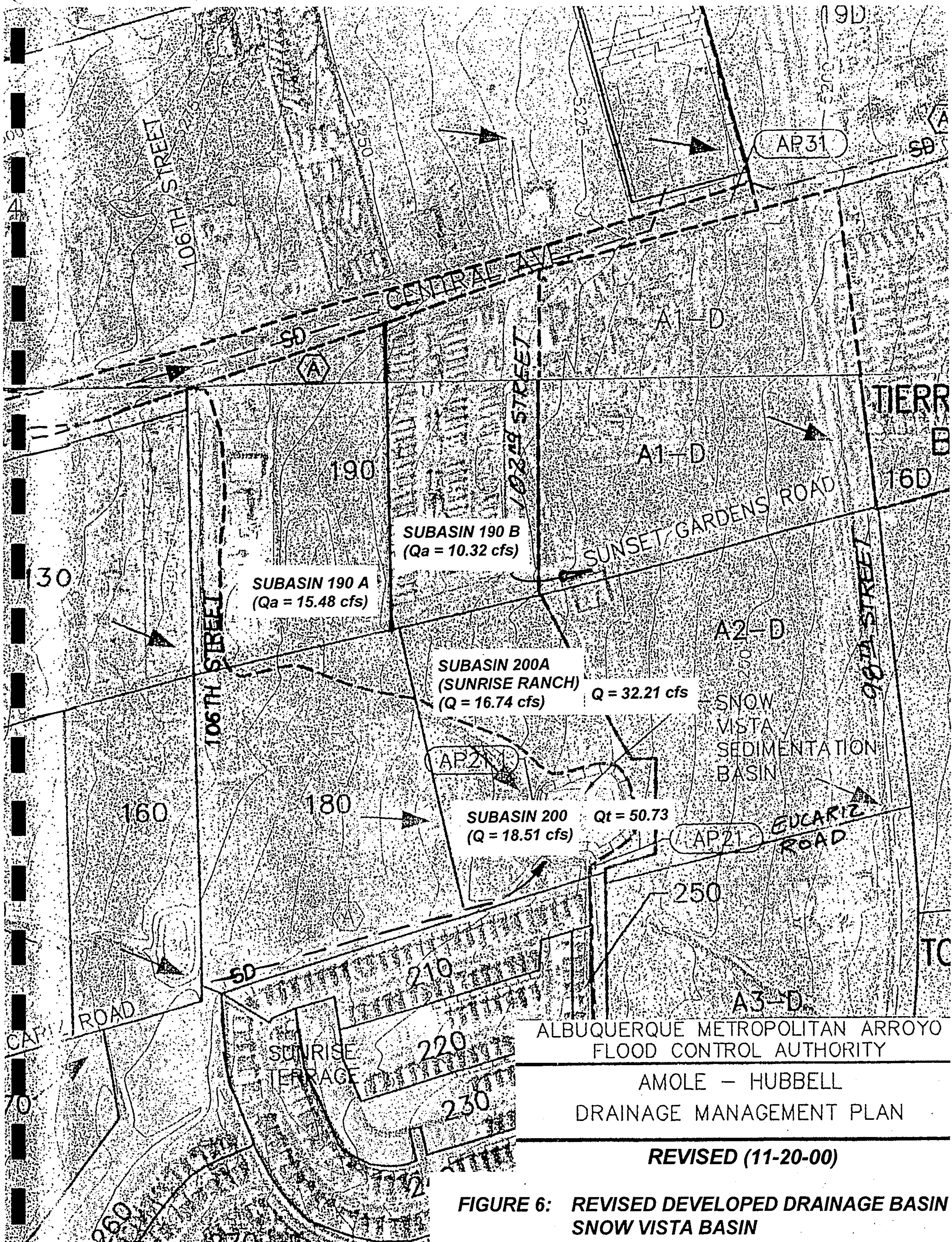




ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY

AMOLE - HUBBELL
DRAINAGE MANAGEMENT PLAN

**FIGURE 5: DEVELOPED DRAINAGE BASIN
SNOW VISTA BASIN**



APPENDIX A
SNOW VISTA BASIN
AHYMO PRINTOUTS

TABLE III-3
HYDROLOGIC SUMMARY
SNOW VISTA BASIN

AP NO.	MAP NO.	DESCRIPTION	VARIABLE	PROPOSED DMP FACILITIES		REVISED PROPOSED DMP FACILITIES	
				DMP	FUTURE CAPACITY	DMP	FUTURE CAPACITY
21.1	4	SNOW VISTA SEDIMENTATION BASIN	Q (cfs) Tvol (AF) Dvol (AF) Runoff (in) cfs/ac	423 53.8 6.4 2.07 1.36	484	400 51.5 6.3 2.05 1.33	484
21	4	SNOW VISTA CHANNEL AT HEAD	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	388 53.18 2.07 1.25	375	372 51.5 2.05 1.24	375
22	4	SNOW VISTA BELOW SECTION LINE JUNCTION	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	747 95 1.97 1.29	810	726 93 1.96 1.28	810
22.1	4	SNOW VISTA BELOW SAGE CROSSING	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	916 114.4 1.93 1.29	930	895 112.1 1.92 1.28	930
22.2	4	SNOW VISTA BELOW INLET FROM WESTGATE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	1031 121.7 1.92 1.36	1050	1012 119.4 1.91 1.35	1050
23	4	SNOW VISTA BELOW BENAVIDES INLET	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2058 167.5 1.88 1.93	2100	2045 165.2 1.87 1.93	2100
24	7	SNOW VISTA AT ENTRANCE TO AMOLE ARROYO	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2081 183.4 1.87 1.77	2100	2065 181.1 1.86 1.77	2100

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Revised 11-20-00

Summary Table w/ Revisions

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = sv_dmpr.dat

RUN DATE (MON/DAY/YR) =11/21/2000
USER NO. = M_GOODWN.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
START											TIME= .00
*S											
*S	SNOW VISTA										
*S	WITH MANAGEMENT PLAN IN PLACE										
*S											
*S											
*S	100-YR, 24-HR STORM WITH NO SEDIMENT**										
*S	FILE NAME : SV_DMPR.DAT										
*S	BY: TOM BLAINE AND RICHARD STOCKTON/K. JACOBSEN										
*S	LAST REVISION: 06-08-99 (PIPE FOR POND.71 CHANGED AND HYD=400)										
S	DMG LAST REVISION: 11-20-00 (REVISED SUBASIN 190 TO 190A & 190B,										
S	DMG ROUTED 190A THROUGH SNOW VISTA POND; REVISED SUBASIN 200 TO 200 & 200A,										
S	DMG ROUTED THROUGH SNOW VISTA POND)										
*S	100 YEAR 24HR STORM DEVELOPED CONDITION										
RAINFALL TYPE= 2											RAIN24= 2.660
COMPUTE NM HYD	100.00	-	2	.13520	340.82	15.597	2.16311	1.500	3.939	PER IMP=	85.00
ROUTE RESERVOIR	100.10	2	5	.13520	111.60	15.611	2.16501	1.850	1.290	AC-FT=	4.075
ROUTE	100.20	5	3	.13520	112.75	15.611	2.16502	1.400	1.303		
ROUTE	100.30	3	10	.13520	114.14	15.611	2.16502	1.450	1.319		
COMPUTE NM HYD	110.00	-	2	.07170	181.36	8.272	2.16311	1.500	3.952	PER IMP=	85.00
ROUTE RESERVOIR	110.10	2	5	.07170	59.19	8.377	2.19060	2.600	1.290	AC-FT=	.001
ROUTE	110.20	5	11	.07170	61.29	8.377	2.19061	1.400	1.336		
COMPUTE NM HYD	120.00	-	2	.04030	101.99	4.649	2.16311	1.500	3.954	PER IMP=	85.00
ROUTE RESERVOIR	120.10	2	5	.04030	33.30	4.654	2.16525	1.850	1.291	AC-FT=	1.219
ADD HYD	120.20	11& 5	12	.11200	94.58	13.031	2.18148	1.400	1.319		
ROUTE	120.30	12	11	.11200	95.88	13.031	2.18148	1.400	1.338		
COMPUTE NM HYD	130.00	-	2	.03770	95.41	4.349	2.16311	1.500	3.954	PER IMP=	85.00
ROUTE RESERVOIR	130.10	2	5	.03770	31.10	4.349	2.16310	1.850	1.289	AC-FT=	1.142
ADD HYD	130.20	11& 5	12	.14970	126.97	17.380	2.17685	1.400	1.325		
ADD HYD	130.30	10&12	12	.28490	238.38	32.991	2.17123	1.450	1.307		
ROUTE	130.40	12	90	.28490	241.75	32.991	2.17124	1.450	1.326		
COMPUTE NM HYD	140.00	-	2	.04300	105.07	4.718	2.05746	1.500	3.818	PER IMP=	79.00
ROUTE RESERVOIR	140.10	2	5	.04300	35.50	4.739	2.06628	1.800	1.290	AC-FT=	1.198
ROUTE	140.20	5	11	.04300	36.97	4.739	2.06630	1.400	1.343		
COMPUTE NM HYD	150.00	-	2	.02420	55.95	2.451	1.89898	1.500	3.612	PER IMP=	70.00
ROUTE RESERVOIR	150.10	2	5	.02420	19.99	2.456	1.90318	1.800	1.291	AC-FT=	.589
ADD HYD	150.20	11& 5	12	.06720	56.96	7.195	2.00755	1.400	1.324		
COMPUTE NM HYD	170.00	-	70	.02853	65.96	2.889	1.89898	1.500	3.612	PER IMP=	70.00
ROUTE RESERVOIR	150.10	70	5	.02853	23.61	2.893	1.90140	1.800	1.293	AC-FT=	.693
ADD HYD	170.20	12& 5	12	.09573	80.56	10.088	1.97591	1.400	1.315		
ROUTE	150.30	12	11	.09573	83.24	10.088	1.97592	1.400	1.359		
COMPUTE NM HYD	160.00	-	2	.02170	50.17	2.198	1.89898	1.500	3.612	PER IMP=	70.00
ROUTE RESERVOIR	160.10	2	5	.02170	15.89	2.198	1.89896	1.850	1.144	AC-FT=	.888
ADD HYD	160.20	11& 5	12	.11743	94.99	12.286	1.96168	1.850	1.264		

ROUTE	170.40	12	11	.11743	94.99	12.286	1.96169	1.850	1.264	
COMPUTE NM HYD	180.00	-	2	.02810	64.96	2.846	1.89898	1.500	3.612 PER IMP=	70.00
ROUTE RESERVOIR	180.10	2	5	.02810	23.20	2.854	1.90432	1.800	1.290 AC-FT=	.684
ADD HYD	180.20	11& 5	10	.14553	118.19	15.140	1.95061	1.850	1.269	
ROUTE	180.30	10	11	.14553	118.20	15.140	1.95061	1.850	1.269	
COMPUTE NM HYD	190A	-	2	.01878	47.54	2.167	2.16311	1.500	3.955 PER IMP=	85.00
ROUTE RESERVOIR	190.10	2	5	.01878	15.47	2.167	2.16309	1.850	1.287 AC-FT=	.571
ROUTE	190.20	90	10	.28490	246.00	32.991	2.17124	1.450	1.349	
ADD HYD	190.30	11&10	12	.43043	355.63	48.131	2.09664	1.450	1.291	
COMPUTE NM HYD	200.00	-	1	.01436	18.51	.510	.66636	1.500	2.014 PER IMP=	.00
COMPUTE NM HYD	200A	-	3	.00736	16.74	.700	1.78251	1.500	3.554 PER IMP=	60.00
ADD HYD	200.A	5& 3	4	.02614	32.21	2.866	2.05592	1.500	1.926	
ADD HYD	200.A	1& 4	2	.04050	50.73	3.377	1.56322	1.500	1.957	
*S THE VOLUME FROM 200.1 IS THE SNOW VISTA POND VOLUME UNDER DEV. COND.										
*S HYD=200.1 IS *****AP 21.1*****										
ADD HYD	200.10	2&12	10	.47093	400.36	51.508	2.05076	1.450	1.328	
ROUTE RESERVOIR	200.20	10	3	.47093	371.31	51.520	2.05127	2.000	1.232 AC-FT=	6.285
*S HYD=200.2 IS *****AP 21*****										
MODIFY TIME	200.20	3	3	.47093	372.16	51.520	2.05127	2.050	1.235	
*s BEGIN ONSITE WATERSHED										
COMPUTE NM HYD	210.00	-	2	.00920	20.66	.871	1.77514	1.500	3.509 PER IMP=	61.00
ADD HYD	210.10	3& 2	10	.48013	376.49	52.391	2.04598	1.950	1.225	
ROUTE	210.20	10	11	.48013	376.91	52.390	2.04593	1.950	1.227	
COMPUTE NM HYD	220.00	-	2	.00800	17.97	.757	1.77514	1.500	3.510 PER IMP=	61.00
ADD HYD	220.10	11& 2	10	.48813	381.05	53.147	2.04149	1.950	1.220	
ROUTE	220.20	10	11	.48813	380.71	53.147	2.04147	1.950	1.219	
COMPUTE NM HYD	230.00	-	2	.00940	21.11	.890	1.77514	1.500	3.509 PER IMP=	61.00
ADD HYD	230.10	11& 2	10	.49753	385.90	54.037	2.03644	1.900	1.212	
ROUTE	230.20	10	11	.49753	386.65	54.036	2.03641	1.900	1.214	
COMPUTE NM HYD	240.00	-	2	.01450	32.56	1.373	1.77514	1.500	3.509 PER IMP=	61.00
*s END ONSITE WATERSHED										
ADD HYD	240.10	11& 2	10	.51203	395.00	55.409	2.02901	1.900	1.205	
COMPUTE NM HYD	250.00	-	2	.00220	5.04	.201	1.71016	1.500	3.582 PER IMP=	50.00
ADD HYD	250.10	10& 2	11	.51423	396.28	55.609	2.02764	1.900	1.204	
COMPUTE NM HYD	260.00	-	2	.01570	34.01	1.443	1.72289	1.500	3.385 PER IMP=	60.00
ROUTE	260.10	2	15	.01570	32.36	1.443	1.72292	1.550	3.221	
COMPUTE NM HYD	270.00	-	2	.01020	20.61	.841	1.54680	1.500	3.157 PER IMP=	50.00
ADD HYD	270.10	15& 2	16	.02590	52.62	2.284	1.65352	1.500	3.175	
DIVIDE HYD	270.20	16	15	.02035	25.79	1.795	1.65352	1.500	1.980	
	270.30	AND	3	.00555	26.84	.489	1.65352	1.500	7.556	
ROUTE	270.40	3	16	.00555	24.11	.489	1.65360	1.550	6.788	
COMPUTE NM HYD	280.00	-	2	.00220	5.42	.243	2.07506	1.500	3.850 PER IMP=	80.00
ADD HYD	280.10	16& 2	17	.00775	28.88	.733	1.77310	1.550	5.821	
ADD HYD	280.20	17&11	10	.52198	400.20	56.342	2.02387	1.800	1.198	
ROUTE	280.30	10	11	.52198	400.31	56.338	2.02373	1.800	1.198	
COMPUTE NM HYD	290.00	-	2	.00670	12.00	.421	1.17900	1.500	2.799 PER IMP=	25.00
ADD HYD	290.10	11& 2	10	.52868	403.71	56.760	2.01302	1.800	1.193	
COMPUTE NM HYD	300.00	-	2	.07090	179.34	8.179	2.16311	1.500	3.952 PER IMP=	85.00
ROUTE RESERVOIR	300.10	2	5	.07090	58.60	8.192	2.16634	1.850	1.291 AC-FT=	2.142
ROUTE	300.20	5	11	.07090	58.59	8.192	2.16636	2.350	1.291	
COMPUTE NM HYD	310.00	-	2	.08640	214.61	9.724	2.11028	1.500	3.881 PER IMP=	82.00

ROUTE RESERVOIR	310.10	2	5	.08640	71.30	9.826	2.13237	1.800	1.289 AC-FT=	2.505
ADD HYD	310.20	11& 5	12	.15730	129.89	18.018	2.14769	2.300	1.290	
ROUTE	310.30	12	11	.15730	129.89	18.018	2.14769	2.300	1.290	
ROUTE	310.40	11	13	.15730	129.89	18.018	2.14769	2.350	1.290	
COMPUTE NM HYD	320.00	-	2	.05470	122.45	5.283	1.81093	1.500	3.498 PER IMP=	65.00
ROUTE RESERVOIR	320.10	2	5	.05470	16.32	5.206	1.78457	2.100	.466 AC-FT=	3.035
ROUTE	320.20	5	11	.05470	16.32	5.205	1.78432	2.150	.466	
COMPUTE NM HYD	330.00	-	2	.02380	53.29	2.299	1.81093	1.500	3.498 PER IMP=	65.00
ADD HYD	330.10	11& 2	12	.07850	63.27	7.504	1.79239	1.500	1.259	
ADD HYD	330.20	12&13	14	.23580	190.99	25.522	2.02940	1.500	1.266	
ROUTE	330.30	14	12	.23580	189.79	25.521	2.02938	1.550	1.258	
ROUTE	330.40	12	11	.23580	190.04	25.521	2.02933	1.550	1.259	
ROUTE	330.50	15	17	.02035	25.49	1.795	1.65356	1.550	1.957	
ROUTE	330.60	17	16	.02035	25.11	1.795	1.65356	1.550	1.928	
COMPUTE NM HYD	340.00	-	2	.01550	31.31	1.279	1.54680	1.500	3.156 PER IMP=	50.00
ADD HYD	340.10	16& 2	15	.03585	55.01	3.073	1.60737	1.500	2.398	
ROUTE	340.20	15	16	.03585	54.76	3.073	1.60739	1.500	2.387	
ROUTE	340.30	16	15	.03585	54.42	3.073	1.60739	1.500	2.372	
COMPUTE NM HYD	350.00	-	2	.04830	97.54	3.985	1.54680	1.500	3.155 PER IMP=	50.00
ADD HYD	350.10	15& 2	16	.08415	151.96	7.058	1.57260	1.500	2.822	
ROUTE	350.20	16	15	.08415	151.86	7.058	1.57261	1.500	2.820	
ROUTE	350.30	15	16	.08415	150.38	7.058	1.57261	1.500	2.792	
COMPUTE NM HYD	360.00	-	2	.02080	42.01	1.716	1.54680	1.500	3.156 PER IMP=	50.00
ADD HYD	360.10	16& 2	15	.10495	192.40	8.774	1.56748	1.500	2.864	
ADD HYD	360.20	15&11	17	.34075	379.27	34.295	1.88709	1.500	1.739	
ROUTE	360.30	17	16	.34075	377.82	34.295	1.88708	1.500	1.732	
ADD HYD	360.40	16&10	15	.86943	719.82	91.054	1.96366	1.600	1.294	
COMPUTE NM HYD	370.00	-	2	.01830	36.97	1.510	1.54680	1.500	3.156 PER IMP=	50.00
ROUTE RESERVOIR	370.10	2	5	.01830	6.64	1.510	1.54678	2.050	.567 AC-FT=	.768
*S HYD=AP22 IS *****AP 22*****										
ADD HYD	AP22	5&15	22	.88773	725.91	92.564	1.95507	1.600	1.278	
ROUTE	100.00	22	88	.88773	731.89	92.563	1.95504	1.600	1.288	
*S COMPUTE HYD FOR BASIN 301.61										
COMPUTE NM HYD	301.61	-	61	.03590	84.71	3.399	1.77514	1.500	3.687 PER IMP=	61.00
*S ROUTE ID=61 THROUGH POND.61										
ROUTE RESERVOIR	.61	61	1	.03590	26.35	3.411	1.78163	1.750	1.147 AC-FT=	1.154
*S ROUTE THIS FLOW DOWN THE 24" STORM DRAIN PIPE TO POND.62										
ROUTE	.61	1	11	.03590	26.36	3.411	1.78166	1.800	1.147	
*S HYDROGRAPH ID = 11 IS THE ROUTED FLOW OUT OF POND.61										
*S COMPUTE HYD FOR BASIN 301.62										
COMPUTE NM HYD	301.62	-	62	.03440	81.18	3.257	1.77514	1.500	3.687 PER IMP=	61.00
*S ROUTE ID=62 THROUGH POND.62										
ROUTE RESERVOIR	.62	62	1	.03440	25.02	3.267	1.78046	1.800	1.136 AC-FT=	1.098
*S ROUTED FLOW OUT OF POND.62										
*S ADD HYD ID=11 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 30" STORM DRAIN										
*S TO POND.63										
ADD HYD	POND.62	1&11	1	.07030	51.38	6.678	1.78106	1.800	1.142	
ROUTE	.62	1	12	.07030	51.40	6.678	1.78107	1.800	1.142	
*S HYDROGRAPH ID = 12 IS THE ROUTED FLOW DOWN THE 30" STORM DRAIN PIPE										
*S COMPUTE HYD FOR BASIN 301.63										
COMPUTE NM HYD	301.63	-	63	.03440	81.18	3.257	1.77514	1.500	3.687 PER IMP=	61.00

*S ROUTE ID=63 THROUGH POND.63
 ROUTE RESERVOIR .63 63 1 .03440 25.02 3.267 1.78046 1.800 1.136 AC-FT= 1.098
 *S ROUTED FLOW OUT OF POND.63
 *S ADD HYD ID=12 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 36" STORM DRAIN
 *S TO POND.64
 ADD HYD POND.63 1&12 1 .10470 76.42 9.944 1.78086 1.800 1.140
 ROUTE .63 1 13 .10470 76.44 9.944 1.78087 1.800 1.141
 *S HYDROGRAPH ID = 13 IS THE ROUTED FLOW DOWN THE 36" STORM DRAIN PIPE
 *S TO THE INLET OF POND.64 TO THIS STORM DRAIN PIPE
 *S COMPUTE HYD FOR BASIN 301.64
 COMPUTE NM HYD 301.64 - 64 .03440 81.18 3.257 1.77514 1.500 3.687 PER IMP= 61.00
 *S ROUTE ID=64 THROUGH POND.64
 ROUTE RESERVOIR .64 64 1 .03440 25.02 3.267 1.78046 1.800 1.136 AC-FT= 1.098
 *S ROUTED FLOW OUT OF POND.64
 *S ADD HYD ID=13 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 36" STORM DRAIN
 *S TO POND.65
 ADD HYD POND.64 1&13 1 .13910 101.46 13.211 1.78076 1.800 1.140
 ROUTE .64 1 14 .13910 101.46 13.211 1.78077 1.800 1.140
 *S HYDROGRAPH ID = 14 IS THE ROUTED FLOW DOWN THE 36" STORM DRAIN PIPE
 *S TO THE INLET OF POND.64 TO THIS STORM DRAIN PIPE
 *S COMPUTE HYD FOR BASIN 301.65
 COMPUTE NM HYD 301.65 - 65 .03440 81.18 3.257 1.77514 1.500 3.687 PER IMP= 61.00
 *S ROUTE ID=65 THROUGH POND.65
 ROUTE RESERVOIR .65 65 1 .03440 25.02 3.267 1.78046 1.800 1.136 AC-FT= 1.098
 *S ROUTED FLOW OUT OF POND.65
 *S ADD HYD ID=14 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 36" STORM DRAIN
 *S TO SNOW VISTA CHANNEL
 ADD HYD POND.65 1&14 1 .17350 126.48 16.477 1.78070 1.800 1.139
 *S COMPUTE HYD FOR BASIN 301.05
 COMPUTE NM HYD 301.05 - 5 .03280 77.40 3.105 1.77514 1.500 3.687 PER IMP= 61.00
 *S TOTAL FLOW AT AP-22.1 IN SNOW VISTA CHANNEL
 ADD HYD 301.00 88& 1 3 1.06123 849.94 109.040 1.92654 1.600 1.251
 *S HYD=AP22.1 IS *****AP 22.1*****
 ADD HYD AP22.1 3& 5 2 1.09403 895.37 112.145 1.92200 1.600 1.279
 ROUTE 301.60 2 1 1.09403 904.78 112.143 1.92195 1.600 1.292
 *S COMPUTE HYD FOR BASIN 301.04
 COMPUTE NM HYD 301.04 - 4 .07660 180.72 7.252 1.77515 1.500 3.686 PER IMP= 61.00
 *S HYD=AP22.2 IS *****AP 22.2*****
 ADD HYD AP22.2 1& 4 1 1.17063 1012.17 119.395 1.91234 1.550 1.351
 ROUTE 300.00 1 9 1.17063 1016.62 119.393 1.91232 1.600 1.357
 *S COMPUTE HYD FOR BASIN 301.71
 COMPUTE NM HYD 301.71 - 71 .06940 163.75 6.570 1.77514 1.500 3.687 PER IMP= 61.00
 *S ROUTE THIS FLOW DOWN THE 60" STORM DRAIN PIPE LINE TO 301.72
 ROUTE .71 71 11 .06940 167.38 6.570 1.77515 1.500 3.769
 *S COMPUTE HYD FOR BASIN 301.72
 COMPUTE NM HYD 301.72 - 72 .04220 99.58 3.995 1.77514 1.500 3.687 PER IMP= 61.00
 *S ADD BASIN 301.71 AND ROUTE THIS FLOW DOWN THE 60" STORM DRAIN PIPE LINE TO 3
 ADD HYD 301.72 72&11 2 .11160 266.96 10.566 1.77514 1.500 3.738
 ROUTE .71 2 11 .11160 269.93 10.566 1.77515 1.500 3.779
 *S COMPUTE HYD FOR BASIN 301.74
 COMPUTE NM HYD 301.74 - 74 .00910 21.88 .830 1.71015 1.500 3.757 PER IMP= 50.00

*S ADD BASIN 301.72 AND BASIN 301.74										
ADD HYD	301.74	74&11	11	.12070	291.81	11.396	1.77024	1.500	3.778	
COMPUTE NM HYD	301.73	-	73	.01940	45.78	1.837	1.77514	1.500	3.688	PER IMP= 61.00
*S ADD HYDGRAPHS FROM										
ADD HYD	301.73	73&11	4	.14010	337.60	13.232	1.77092	1.500	3.765	
*S COMPUTE HYD FOR BASIN 301.03										
COMPUTE NM HYD	301.03	-	3	.34380	810.21	32.549	1.77514	1.500	3.682	PER IMP= 61.00
*S HYDROGRAPH ID 73 IS THE INFLOW TO THE SNOW VISTA CHANNEL AT AP-23										
ADD HYD	301.03	3& 4	73	.48390	1147.81	45.781	1.77392	1.500	3.706	
*S HYD=AP23 IS *****AP 23*****										
ADD HYD	AP23	9&73	1	1.65453	2044.94	165.175	1.87185	1.500	1.931	
ROUTE	400.00	1	2	1.65453	2052.35	165.174	1.87184	1.500	1.938	
ROUTE	500.00	2	3	1.65453	2011.26	165.170	1.87180	1.500	1.899	
ROUTE	600.00	3	4	1.65453	1991.56	165.169	1.87178	1.550	1.881	
*S COMPUTE HYD FOR BASIN 301.02										
COMPUTE NM HYD	301.02	-	2	.03910	92.26	3.702	1.77514	1.500	3.687	PER IMP= 61.00
ROUTE RESERVOIR	.02	2	1	.03910	44.19	3.702	1.77514	1.650	1.766	AC-FT= 1.152
ADD HYD	AP23.1	4& 1	3	1.69363	2031.58	168.870	1.86955	1.550	1.874	
ROUTE	700.00	3	2	1.69363	2025.39	168.862	1.86945	1.550	1.869	
*S COMPUTE HYD FOR BASIN 301.01										
COMPUTE NM HYD	301.01	-	1	.07810	184.26	7.394	1.77514	1.500	3.686	PER IMP= 61.00
ROUTE RESERVOIR	.01	1	5	.07810	102.50	7.394	1.77514	1.600	2.051	AC-FT= 1.789
ADD HYD	AP23.2	5& 2	6	1.77173	2127.85	176.256	1.86530	1.550	1.877	
ROUTE	800.00	6	4	1.77173	2022.41	176.243	1.86516	1.600	1.784	
*S COMPUTE HYD FOR BASIN 301.00										
COMPUTE NM HYD	300.00	-	1	.05156	121.66	4.881	1.77514	1.500	3.687	PER IMP= 61.00
ROUTE RESERVOIR	.01	1	5	.05156	42.85	4.881	1.77514	1.750	1.298	AC-FT= 1.790
*S HYD=AP24 IS *****AP 24*****										
ADD HYD	AP24	5& 4	2	1.82329	2065.13	181.124	1.86261	1.600	1.770	
ROUTE	SV_DMP2.HYD	2	66	1.82329	2048.99	181.115	1.86252	1.600	1.756	
FINISH										

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
 INPUT FILE = SV_DMP.DAT

RUN DATE (MON/DAY/YR) =11/21/2000
 USER NO.= M_GOODWN.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
START										TIME= .00
*S										
*S	SNOW VISTA									
*S	WITH MANAGEMENT PLAN IN PLACE									
*S										
*S										
*S	100-YR, 24-HR STORM WITH NO SEDIMENT**									
*S	FILE NAME : SV_DMP1.DAT									
*S	BY: TOM BLAINE AND RICHARD STOCKTON/K. JACOBSEN									
*S	LAST REVISION: 06-08-99 (PIPE FOR POND.71 CHANGED AND HYD=400)									
*S	100 YEAR 24HR STORM DEVELOPED CONDITION									
RAINFALL TYPE= 2										RAIN24= 2.660
COMPUTE NM HYD	100.00	-	2	.13520	340.82	15.597	2.16311	1.500	3.939	PER IMP= 85.00
ROUTE RESERVOIR	100.10	2	5	.13520	111.60	15.611	2.16501	1.850	1.290	AC-FT= 4.075
ROUTE	100.20	5	3	.13520	112.75	15.611	2.16502	1.400	1.303	
ROUTE	100.30	3	10	.13520	114.14	15.611	2.16502	1.450	1.319	
COMPUTE NM HYD	110.00	-	2	.07170	181.36	8.272	2.16311	1.500	3.952	PER IMP= 85.00
ROUTE RESERVOIR	110.10	2	5	.07170	59.19	8.377	2.19060	2.600	1.290	AC-FT= .001
ROUTE	110.20	5	11	.07170	61.29	8.377	2.19061	1.400	1.336	
COMPUTE NM HYD	120.00	-	2	.04030	101.99	4.649	2.16311	1.500	3.954	PER IMP= 85.00
ROUTE RESERVOIR	120.10	2	5	.04030	33.30	4.654	2.16525	1.850	1.291	AC-FT= 1.219
ADD HYD	120.20	11& 5	12	.11200	94.58	13.031	2.18148	1.400	1.319	
ROUTE	120.30	12	11	.11200	95.88	13.031	2.18148	1.400	1.338	
COMPUTE NM HYD	130.00	-	2	.03770	95.41	4.349	2.16311	1.500	3.954	PER IMP= 85.00
ROUTE RESERVOIR	130.10	2	5	.03770	31.10	4.349	2.16310	1.850	1.289	AC-FT= 1.142
ADD HYD	130.20	11& 5	12	.14970	126.97	17.380	2.17685	1.400	1.325	
ADD HYD	130.30	10&12	12	.28490	238.38	32.991	2.17123	1.450	1.307	
ROUTE	130.40	12	90	.28490	241.75	32.991	2.17124	1.450	1.326	
COMPUTE NM HYD	140.00	-	2	.04300	105.07	4.718	2.05746	1.500	3.818	PER IMP= 79.00
ROUTE RESERVOIR	140.10	2	5	.04300	35.50	4.739	2.06628	1.800	1.290	AC-FT= 1.198
ROUTE	140.20	5	11	.04300	36.97	4.739	2.06630	1.400	1.343	
COMPUTE NM HYD	150.00	-	2	.02420	55.95	2.451	1.89898	1.500	3.612	PER IMP= 70.00
ROUTE RESERVOIR	150.10	2	5	.02420	19.99	2.456	1.90318	1.800	1.291	AC-FT= .589
ADD HYD	150.20	11& 5	12	.06720	56.96	7.195	2.00755	1.400	1.324	
COMPUTE NM HYD	170.00	-	70	.02853	65.96	2.889	1.89898	1.500	3.612	PER IMP= 70.00
ROUTE RESERVOIR	150.10	70	5	.02853	23.61	2.893	1.90140	1.800	1.293	AC-FT= .693
ADD HYD	170.20	12& 5	12	.09573	80.56	10.088	1.97591	1.400	1.315	
ROUTE	150.30	12	11	.09573	83.24	10.088	1.97592	1.400	1.359	
COMPUTE NM HYD	160.00	-	2	.02170	50.17	2.198	1.89898	1.500	3.612	PER IMP= 70.00
ROUTE RESERVOIR	160.10	2	5	.02170	15.89	2.198	1.89896	1.850	1.144	AC-FT= .888
ADD HYD	160.20	11& 5	12	.11743	94.99	12.286	1.96168	1.850	1.264	
ROUTE	170.40	12	11	.11743	94.99	12.286	1.96169	1.850	1.264	
COMPUTE NM HYD	180.00	-	2	.02810	64.96	2.846	1.89898	1.500	3.612	PER IMP= 70.00

ROUTE RESERVOIR	180.10	2	5	.02810	23.20	2.854	1.90432	1.800	1.290 AC-FT=	.684
ADD HYD	180.20	11& 5	10	.14553	118.19	15.140	1.95061	1.850	1.269	
ROUTE	180.30	10	11	.14553	118.20	15.140	1.95061	1.850	1.269	
COMPUTE NM HYD	190.00	-	2	.03130	79.22	3.611	2.16311	1.500	3.955 PER IMP=	85.00
ROUTE RESERVOIR	190.10	2	5	.03130	25.80	3.611	2.16310	1.850	1.288 AC-FT=	.950
ADD HYD	190.00	90& 5	1	.31620	267.54	36.602	2.17043	1.450	1.322	
ROUTE	190.20	1	10	.31620	271.17	36.602	2.17043	1.450	1.340	
ADD HYD	190.30	11&10	12	.46173	380.80	51.742	2.10114	1.450	1.289	
COMPUTE NM HYD	200.00	-	2	.02520	49.60	2.074	1.54349	1.500	3.075 PER IMP=	52.00
*S THE VOLUME FROM 200.1 IS THE SNOW VISTA POND VOLUME UNDER DEV. COND.										
*S HYD=200.1 IS *****AP 21.1*****										
ADD HYD	200.10	2&12	10	.48693	423.42	53.816	2.07228	1.450	1.359	
ROUTE RESERVOIR	200.20	10	3	.48693	387.71	53.814	2.07218	2.000	1.244 AC-FT=	6.455
*S HYD=200.2 IS *****AP 21*****										
MODIFY TIME	200.20	3	3	.48693	388.53	53.814	2.07218	1.950	1.247	
*s BEGIN ONSITE WATERSHED										
COMPUTE NM HYD	210.00	-	2	.00920	20.66	.871	1.77514	1.500	3.509 PER IMP=	61.00
ADD HYD	210.10	3& 2	10	.49613	393.57	54.685	2.06667	1.900	1.239	
ROUTE	210.20	10	11	.49613	393.76	54.684	2.06663	1.950	1.240	
COMPUTE NM HYD	220.00	-	2	.00800	17.97	.757	1.77514	1.500	3.510 PER IMP=	61.00
ADD HYD	220.10	11& 2	10	.50413	397.90	55.441	2.06200	1.950	1.233	
ROUTE	220.20	10	11	.50413	397.80	55.440	2.06198	1.900	1.233	
COMPUTE NM HYD	230.00	-	2	.00940	21.11	.890	1.77514	1.500	3.509 PER IMP=	61.00
ADD HYD	230.10	11& 2	10	.51353	403.48	56.330	2.05673	1.850	1.228	
ROUTE	230.20	10	11	.51353	404.02	56.330	2.05670	1.900	1.229	
COMPUTE NM HYD	240.00	-	2	.01450	32.56	1.373	1.77514	1.500	3.509 PER IMP=	61.00
*s END ONSITE WATERSHED										
ADD HYD	240.10	11& 2	10	.52803	412.58	57.702	2.04897	1.800	1.221	
COMPUTE NM HYD	250.00	-	2	.00220	5.04	.201	1.71016	1.500	3.582 PER IMP=	50.00
ADD HYD	250.10	10& 2	11	.53023	414.22	57.903	2.04756	1.800	1.221	
COMPUTE NM HYD	260.00	-	2	.01570	34.01	1.443	1.72289	1.500	3.385 PER IMP=	60.00
ROUTE	260.10	2	15	.01570	32.36	1.443	1.72292	1.550	3.221	
COMPUTE NM HYD	270.00	-	2	.01020	20.61	.841	1.54680	1.500	3.157 PER IMP=	50.00
ADD HYD	270.10	15& 2	16	.02590	52.62	2.284	1.65352	1.500	3.175	
DIVIDE HYD	270.20	16	15	.02035	25.79	1.795	1.65352	1.500	1.980	
	270.30	AND	3	.00555	26.84	.489	1.65352	1.500	7.556	
ROUTE	270.40	3	16	.00555	24.11	.489	1.65360	1.550	6.788	
COMPUTE NM HYD	280.00	-	2	.00220	5.42	.243	2.07506	1.500	3.850 PER IMP=	80.00
ADD HYD	280.10	16& 2	17	.00775	28.88	.733	1.77310	1.550	5.821	
ADD HYD	280.20	17&11	10	.53798	419.19	58.636	2.04361	1.750	1.217	
ROUTE	280.30	10	11	.53798	419.02	58.632	2.04348	1.750	1.217	
COMPUTE NM HYD	290.00	-	2	.00670	12.00	.421	1.17900	1.500	2.799 PER IMP=	25.00
ADD HYD	290.10	11& 2	10	.54468	424.08	59.053	2.03284	1.700	1.217	
COMPUTE NM HYD	300.00	-	2	.07090	179.34	8.179	2.16311	1.500	3.952 PER IMP=	85.00
ROUTE RESERVOIR	300.10	2	5	.07090	58.60	8.192	2.16634	1.850	1.291 AC-FT=	2.142
ROUTE	300.20	5	11	.07090	58.59	8.192	2.16636	2.350	1.291	
COMPUTE NM HYD	310.00	-	2	.08640	214.61	9.724	2.11028	1.500	3.881 PER IMP=	82.00
ROUTE RESERVOIR	310.10	2	5	.08640	71.30	9.826	2.13237	1.800	1.289 AC-FT=	2.505
ADD HYD	310.20	11& 5	12	.15730	129.89	18.018	2.14769	2.300	1.290	
ROUTE	310.30	12	11	.15730	129.89	18.018	2.14769	2.300	1.290	
ROUTE	310.40	11	13	.15730	129.89	18.018	2.14769	2.350	1.290	

COMPUTE NM HYD	320.00	-	2	.05470	122.45	5.283	1.81093	1.500	3.498 PER IMP=	65.00
ROUTE RESERVOIR	320.10	2	5	.05470	16.32	5.206	1.78457	2.100	.466 AC-FT=	3.035
ROUTE	320.20	5	11	.05470	16.32	5.205	1.78432	2.150	.466	
COMPUTE NM HYD	330.00	-	2	.02380	53.29	2.299	1.81093	1.500	3.498 PER IMP=	65.00
ADD HYD	330.10	11& 2	12	.07850	63.27	7.504	1.79239	1.500	1.259	
ADD HYD	330.20	12&13	14	.23580	190.99	25.522	2.02940	1.500	1.266	
ROUTE	330.30	14	12	.23580	189.79	25.521	2.02938	1.550	1.258	
ROUTE	330.40	12	11	.23580	190.04	25.521	2.02933	1.550	1.259	
ROUTE	330.50	15	17	.02035	25.49	1.795	1.65356	1.550	1.957	
ROUTE	330.60	17	16	.02035	25.11	1.795	1.65356	1.550	1.928	
COMPUTE NM HYD	340.00	-	2	.01550	31.31	1.279	1.54680	1.500	3.156 PER IMP=	50.00
ADD HYD	340.10	16& 2	15	.03585	55.01	3.073	1.60737	1.500	2.398	
ROUTE	340.20	15	16	.03585	54.76	3.073	1.60739	1.500	2.387	
ROUTE	340.30	16	15	.03585	54.42	3.073	1.60739	1.500	2.372	
COMPUTE NM HYD	350.00	-	2	.04830	97.54	3.985	1.54680	1.500	3.155 PER IMP=	50.00
ADD HYD	350.10	15& 2	16	.08415	151.96	7.058	1.57260	1.500	2.822	
ROUTE	350.20	16	15	.08415	151.86	7.058	1.57261	1.500	2.820	
ROUTE	350.30	15	16	.08415	150.38	7.058	1.57261	1.500	2.792	
COMPUTE NM HYD	360.00	-	2	.02080	42.01	1.716	1.54680	1.500	3.156 PER IMP=	50.00
ADD HYD	360.10	16& 2	15	.10495	192.40	8.774	1.56748	1.500	2.864	
ADD HYD	360.20	15&11	17	.34075	379.27	34.295	1.88709	1.500	1.739	
ROUTE	360.30	17	16	.34075	377.82	34.295	1.88708	1.500	1.732	
ADD HYD	360.40	16&10	15	.88543	741.01	93.348	1.97675	1.600	1.308	
COMPUTE NM HYD	370.00	-	2	.01830	36.97	1.510	1.54680	1.500	3.156 PER IMP=	50.00
ROUTE RESERVOIR	370.10	2	5	.01830	6.64	1.510	1.54678	2.050	.567 AC-FT=	.768
*S HYD=AP22 IS *****AP 22*****										
ADD HYD	AP22	5&15	22	.90373	747.11	94.857	1.96804	1.600	1.292	
ROUTE	100.00	22	88	.90373	752.81	94.856	1.96801	1.600	1.302	
*S COMPUTE HYD FOR BASIN 301.61										
COMPUTE NM HYD	301.61	-	61	.03590	84.71	3.399	1.77514	1.500	3.687 PER IMP=	61.00
*S ROUTE ID=61 THROUGH POND.61										
ROUTE RESERVOIR	.61	61	1	.03590	26.35	3.411	1.78163	1.750	1.147 AC-FT=	1.154
*S ROUTE THIS FLOW DOWN THE 24" STORM DRAIN PIPE TO POND.62										
ROUTE	.61	1	11	.03590	26.36	3.411	1.78166	1.800	1.147	
*S HYDROGRAPH ID = 11 IS THE ROUTED FLOW OUT OF POND.61										
*S COMPUTE HYD FOR BASIN 301.62										
COMPUTE NM HYD	301.62	-	62	.03440	81.18	3.257	1.77514	1.500	3.687 PER IMP=	61.00

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*S TO POND.64
ADD HYD          POND.63 1&12 1          .10470          76.42          9.944          1.78086          1.800          1.140
ROUTE           .63 1 13          .10470          76.44          9.944          1.78087          1.800          1.141
*S HYDROGRAPH ID = 13 IS THE ROUTED FLOW DOWN THE 36" STORM DRAIN PIPE
*S TO THE INLET OF POND.64 TO THIS STORM DRAIN PIPE
*S COMPUTE HYD FOR BASIN 301.64
COMPUTE NM HYD   301.64 - 64          .03440          81.18          3.257          1.77514          1.500          3.687 PER IMP= 61.00
*S ROUTE ID=64 THROUGH POND.64
ROUTE RESERVOIR  .64 64 1          .03440          25.02          3.267          1.78046          1.800          1.136 AC-FT= 1.098
*S ROUTED FLOW OUT OF POND.64
*S ADD HYD ID=13 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 36" STORM DRAIN
*S TO POND.65
ADD HYD          POND.64 1&13 1          .13910          101.46          13.211          1.78076          1.800          1.140
ROUTE           .64 1 14          .13910          101.46          13.211          1.78077          1.800          1.140
*S HYDROGRAPH ID = 14 IS THE ROUTED FLOW DOWN THE 36" STORM DRAIN PIPE
*S TO THE INLET OF POND.64 TO THIS STORM DRAIN PIPE
*S COMPUTE HYD FOR BASIN 301.65
COMPUTE NM HYD   301.65 - 65          .03440          81.18          3.257          1.77514          1.500          3.687 PER IMP= 61.00
*S ROUTE ID=65 THROUGH POND.65
ROUTE RESERVOIR  .65 65 1          .03440          25.02          3.267          1.78046          1.800          1.136 AC-FT= 1.098
*S ROUTED FLOW OUT OF POND.65
*S ADD HYD ID=14 TO ID=1 AND ROUTE THIS FLOW THROUGH THE 36" STORM DRAIN
*S TO SNOW VISTA CHANNEL
ADD HYD          POND.65 1&14 1          .17350          126.48          16.477          1.78070          1.800          1.139
*S COMPUTE HYD FOR BASIN 301.05
COMPUTE NM HYD   301.05 - 5          .03280          77.40          3.105          1.77514          1.500          3.687 PER IMP= 61.00
*S TOTAL FLOW AT AP-22.1 IN SNOW VISTA CHANNEL
ADD HYD          301.00 88& 1 3          1.07723          870.85          111.334          1.93785          1.600          1.263
*S HYD=AP22.1 IS *****AP 22.1*****
ADD HYD          AP22.1 3& 5 2          1.11003          916.28          114.439          1.93304          1.600          1.290
ROUTE           301.60 2 1          1.11003          925.36          114.436          1.93299          1.600          1.303
*S COMPUTE HYD FOR BASIN 301.04
COMPUTE NM HYD   301.04 - 4          .07660          180.72          7.252          1.77515          1.500          3.686 PER IMP= 61.00
*S HYD=AP22.2 IS *****AP 22.2*****
ADD HYD          AP22.2 1& 4 1          1.18663          1031.47          121.688          1.92280          1.600          1.358
ROUTE           300.00 1 9          1.18663          1037.20          121.687          1.92278          1.600          1.366
*S COMPUTE HYD FOR BASIN 301.71
COMPUTE NM HYD   301.71 - 71          .06940          163.75          6.570          1.77514          1.500          3.687 PER IMP= 61.00
*S ROUTE THIS FLOW DOWN THE 60" STORM DRAIN PIPE LINE TO 301.72
ROUTE           .71 71 11          .06940          167.38          6.570          1.77515          1.500          3.769
*S COMPUTE HYD FOR BASIN 301.72
COMPUTE NM HYD   301.72 - 72          .04220          99.58          3.995          1.77514          1.500          3.687 PER IMP= 61.00
*S ADD BASIN 301.71 AND ROUTE THIS FLOW DOWN THE 60" STORM DRAIN PIPE LINE TO 3
ADD HYD          301.72 72&11 2          .11160          266.96          10.566          1.77514          1.500          3.738
ROUTE           .71 2 11          .11160          269.93          10.566          1.77515          1.500          3.779
*S COMPUTE HYD FOR BASIN 301.74
COMPUTE NM HYD   301.74 - 74          .00910          21.88          .830          1.71015          1.500          3.757 PER IMP= 50.00
*S ADD BASIN 301.72 AND BASIN 301.74
ADD HYD          301.74 74&11 11          .12070          291.81          11.396          1.77024          1.500          3.778
COMPUTE NM HYD   301.73 - 73          .01940          45.78          1.837          1.77514          1.500          3.688 PER IMP= 61.00
*S ADD HYDGRAPHS FROM

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ADD HYD	301.73	73&11	4	.14010	337.60	13.232	1.77092	1.500	3.765	
*S COMPUTE HYD FOR BASIN 301.03										
COMPUTE NM HYD	301.03	-	3	.34380	810.21	32.549	1.77514	1.500	3.682	PER IMP= 61.00
*S HYDROGRAPH ID 73 IS THE INFLOW TO THE SNOW VISTA CHANNEL AT AP-23										
ADD HYD	301.03	3& 4	73	.48390	1147.81	45.781	1.77392	1.500	3.706	
*S HYD=AP23 IS *****AP 23*****										
ADD HYD	AP23	9&73	1	1.67053	2058.10	167.468	1.87966	1.500	1.925	
ROUTE	400.00	1	2	1.67053	2065.12	167.468	1.87965	1.500	1.932	
ROUTE	500.00	2	3	1.67053	2022.43	167.464	1.87961	1.500	1.892	
ROUTE	600.00	3	4	1.67053	2008.97	167.462	1.87960	1.550	1.879	
*S COMPUTE HYD FOR BASIN 301.02										
COMPUTE NM HYD	301.02	-	2	.03910	92.26	3.702	1.77514	1.500	3.687	PER IMP= 61.00
ROUTE RESERVOIR	.02	2	1	.03910	44.19	3.702	1.77514	1.650	1.766	AC-FT= 1.152
ADD HYD	AP23.1	4& 1	3	1.70963	2048.99	171.164	1.87720	1.550	1.873	
ROUTE	700.00	3	2	1.70963	2040.10	171.156	1.87711	1.550	1.865	
*S COMPUTE HYD FOR BASIN 301.01										
COMPUTE NM HYD	301.01	-	1	.07810	184.26	7.394	1.77514	1.500	3.686	PER IMP= 61.00
ROUTE RESERVOIR	.01	1	5	.07810	102.50	7.394	1.77514	1.600	2.051	AC-FT= 1.789
ADD HYD	AP23.2	5& 2	6	1.78773	2142.56	178.549	1.87266	1.550	1.873	
ROUTE	800.00	6	4	1.78773	2038.68	178.537	1.87252	1.600	1.782	
*S COMPUTE HYD FOR BASIN 301.00										
COMPUTE NM HYD	300.00	-	1	.05156	121.66	4.881	1.77514	1.500	3.687	PER IMP= 61.00
ROUTE RESERVOIR	.01	1	5	.05156	42.85	4.881	1.77514	1.750	1.298	AC-FT= 1.790
*S HYD=AP24 IS *****AP 24*****										
ADD HYD	AP24	5& 4	2	1.83929	2081.41	183.418	1.86979	1.600	1.768	
ROUTE	SV_DMP2.HYD	2	66	1.83929	2062.57	183.409	1.86969	1.600	1.752	
FINISH										

APPENDIX B
TOWER SAGE BASIN
AHYMO PRINTOUTS

Input File Revisions

```
START                0.0 HOURS   PC=0   PL=-1
*S
*S      TOWER/SAGE WATERSHED SAD 222
*S
*S 100-YR, 24-HR STORM WITH SEDIMENT
*S FILE NAME: TS_DMPR.DAT
*S BY: RICHARD STOCKTON   PEER REVIEWED BY: DEBORAH DIXON
*S LAST REVISION: 06-8-99 (kmj HYD=AP#22R)
*S DMG* REVISION 11-20-00: ADDED SUBASIN 190B TO SUBASIN A1-D
*S DMG* REVISED SUBASIN A2-D AREA
*****
*****
**S100 YEAR 24HR STORM DEVELOPED CONDITION
RAINFALL              TYPE=2  0.0  1.87  2.20  2.66      DT=0.05
** 10 YEAR 24HR STORM DEVELOPED CONDITION
**RAINFALL            TYPE=2  0.0  1.25  1.47  1.77      DT=0.05
** 2 YEAR 24HR STORM DEVELOPED CONDITION
**RAINFALL            TYPE=2  0.0  0.74  0.95  1.15      DT=0.05
*****
*LH*   THIS IS THE INPUT FILE FOR THE MASTER DRAINAGE STUDY FOR SAD-222 AREA.
*LH*   DEVELOPED CONDITIONS
*LH**  INPUT FILE NAME: MASTER24.IN
*LH**  100 YEAR 24 HOUR STORM.
*LH**
*LH***** Set time to start *****
*LH**
*LH*START              TIME = 0.0
*LH**
*LH***** COMPUTE RAINFALL DISTRIBUTION
*LH**
*LH*RAINFALL           TYPE=2
*LH*                   RAIN QUARTER=0.0      RAIN ONE = 1.90 IN
*LH*                   RAIN SIX=2.21 IN      RAIN DAY = 2.67 IN
*LH*                   DT=0.075
*LH**
*LH**
*LH** THE FOLLOWING HYDROLOGY IS TO DETERMINE THE TOTAL FLOW AND VOLUME INTO
*LH** TOWER POND.
*LH**
*LH**
*LH***** SEDIMENT BULKING FACTOR = 5%
*LH**
*LH**SEDIMENT BULK      CODE=1   BULK FACTOR=1.05
*
*DMG* (REVISION 11-20-00: ADD SUBASIN 190B AT SUNSET GARDENS TO TOWER-SAGE BASIN)
*
COMPUTE NM HYD        ID=3  HYD=190B  DA==0.01252 SM
                     %A=0  %B=15.0  %C=0.0  %D=85.0 TP=0.13333
                     MASS RAINFALL=-1
PRINT HYD             ID=3 CODE=1
*DMG* USE A ROUTE RESERVOIR ROUTINE TO SIMULATE CONTROLLED DISCHARGE
*DMG* ASSUMED ALLOWABLE DISCHARGE Q=10.32 cfs
*
ROUTE RESERVOIR       ID=1 HYDROGRAPH NO=190.1  INFLOW ID=3  CODE=24
                     OUTFLOW(cfs)  STORAGE(ac ft)  ELEV(ft)
                           0          0.0          100
                           10.31       0.001        100.1
                           10.32       1.30         105
PRINT HYD             ID=1 CODE=1
*
***** BASIN A1-D
*
COMPUTE NM HYD        ID=2  HYD NO=A1-D&AP#1 DRAINAGE AREA=.0458  SQ MI
                     PERCENT A=0 PERCENT B=24 PERCENT C=0 PERCENT D=76
                     TP=.15 HRS
                     MASSRAINFALL=-1
PRINT HYD             ID=2 CODE=1
*
*DMG* ADD SUBASIN 190 TO SUBASIN A1-D
*
ADD HYD               ID=3  HYD NO=AP#2  ID I=1  ID II=2
```

```

*
*   TOTAL FLOW AT AP#2
*
PRINT HYD          ID=3  CODE=1
*
*   TOTAL FLOW AT AP#1
*
PRINT HYD          ID=3  CODE=1
*
*
***** ROUTE FLOW AT AP#1 TO AP#2 THROUGH PIPE IN 98TH ST.
*
COMPUTE RATING CURVE ID=1  VS NO=1  CODE=-1 SLP=0.0085 DIA=4.0 FT N=0.015
*
COMPUTE TRAVEL TIME ID=2  REACH=1  NO VS=1
                      L=1000  SLP=0.0085
*
ROUTE              ID=2    HYD NO=AP-1R
                      INFLOW=3 DT=0.00
*
PRINT HYD          ID=2  CODE=1
**
*DMG* REVISED SUBASIN A2-D AREA AND LAND TREATMENT VALUES (INCLUDES EUCARIZ AND 98TH ST)
*
***** BASIN A2-D
**
COMPUTE NM HYD      ID=3  HYD NO=A2-D DRAINAGE AREA=.04067 SQ MI
                      PERCENT A=0 PERCENT B=20 PERCENT C=20 PERCENT D=60
                      TP=.14 HRS
                      MASSRAINFALL=-1
*
PRINT HYD          ID=3  CODE=1
*
*
***** ADD HYDROGRAPHS A1-D, A2-D
*
ADD HYD             ID=10  HYD NO=AP#2  ID I=2  ID II=3
*
*   TOTAL FLOW AT AP#2
*
PRINT HYD          ID=10  CODE=1
*
*
***** ROUTE FLOW AT AP#2 TO AP#3 THROUGH PIPE IN 98TH ST.
*
COMPUTE RATING CURVE ID=1  VS NO=1  CODE=-1 SLP=0.0072 DIA=5.0 FT N=0.015
*
COMPUTE TRAVEL TIME ID=2  REACH=1  NO VS=1
                      L=1150  SLP=0.0072
*
ROUTE              ID=2    HYD NO=AP#2R
                      INFLOW=10 DT=0.00
*
PRINT HYD          ID=2  CODE=1
*
*
***** BASIN A3-D
*
COMPUTE NM HYD      ID=3  HYD NO=A3-D DRAINAGE AREA=.0419 SQ MI
                      PERCENT A=0 PERCENT B=35 PERCENT C=0 PERCENT D=65
                      TP=.13 HRS
                      MASSRAINFALL=-1
*
PRINT HYD          ID=3  CODE=1
*
*
***** ADD HYDROGRAPHS A1-D, A2-D, A3-D
*
ADD HYD             ID=10  HYD NO=AP#3  ID I=2  ID II=3
*
*   TOTAL FLOW AT AP#3

```

Summary File w/ Revisions

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = TS_DMPR.DAT

RUN DATE (MON/DAY/YR) =11/21/2000
USER NO. = M_GOODWN.101

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
START											TIME= .00
*S											
*S	TOWER/SAGE WATERSHED SAD 222										
*S											
*S	100-YR, 24-HR STORM WITH SEDIMENT										
*S	FILE NAME: TS_DMPR.DAT										
*S	BY: RICHARD STOCKTON										
	PEER REVIEWED BY: DEBORAH DIXON										
*S	LAST REVISION: 06-8-99 (kmj HYD=AP#22R)										
S	DMG REVISION 11-20-00: ADDED SUBBASIN 190B TO SUBBASIN A1-D										
S	DMG REVISED SUBBASIN A2-D AREA										
RAINFALL	TYPE= 2										RAIN24= 2.660
COMPUTE NM HYD	190B	-	3	.01252	31.70	1.444	2.16311	1.500	3.956	PER IMP=	85.00
ROUTE RESERVOIR	190.10	3	1	.01252	10.31	1.445	2.16337	1.850	1.287	AC-FT=	.381
COMPUTE NM HYD	A1-D&AP#1	-	2	.04580	103.28	4.897	2.00463	1.500	3.523	PER IMP=	76.00
ADD HYD	AP#2	1& 2	3	.05832	113.59	6.341	2.03870	1.500	3.043		
ROUTE	AP-1R	3	2	.05832	111.50	6.341	2.03871	1.550	2.987		
COMPUTE NM HYD	A2-D	-	3	.04067	90.24	3.866	1.78251	1.500	3.467	PER IMP=	60.00
ADD HYD	AP#2	2& 3	10	.09899	196.39	10.208	1.93344	1.500	3.100		
ROUTE	AP#2R	10	2	.09899	194.85	10.208	1.93345	1.550	3.076		
COMPUTE NM HYD	A3-D	-	3	.04190	94.80	4.047	1.81093	1.500	3.535	PER IMP=	65.00
ADD HYD	AP#3	2& 3	10	.14089	277.38	14.254	1.89700	1.550	3.076		
ROUTE	AP#3R	10	2	.14089	281.60	14.254	1.89701	1.550	3.123		
COMPUTE NM HYD	A4-D	-	3	.04390	101.56	4.858	2.07506	1.500	3.615	PER IMP=	80.00
ADD HYD	AP#4	2& 3	10	.18479	378.53	19.113	1.93930	1.550	3.201		
ROUTE	AP#4R	10	2	.18479	381.46	19.113	1.93931	1.550	3.225		
COMPUTE NM HYD	A5-D	-	3	.04520	95.53	4.153	1.72289	1.500	3.302	PER IMP=	60.00
ADD HYD	AP#5	2& 3	10	.22999	469.25	23.266	1.89677	1.550	3.188		
ROUTE	AP#5R	10	2	.22999	470.67	23.266	1.89677	1.550	3.198		
COMPUTE NM HYD	A6-D	-	3	.04520	88.89	3.729	1.54680	1.500	3.073	PER IMP=	50.00
ADD HYD	PART AP#9	2& 3	10	.27519	552.89	26.995	1.83929	1.550	3.139		
COMPUTE NM HYD	A7-D	-	3	.02060	40.52	1.699	1.54680	1.500	3.074	PER IMP=	50.00
ADD HYD	PART AP#9	10& 3	10	.29579	590.37	28.694	1.81892	1.550	3.119		
COMPUTE NM HYD	A8-D&AP#6	-	3	.05700	110.97	5.773	1.89898	1.550	3.042	PER IMP=	70.00
ROUTE	AP#6R	3	2	.05700	108.92	5.773	1.89898	1.600	2.986		
COMPUTE NM HYD	A9-D	-	3	.01020	20.86	.841	1.54680	1.500	3.196	PER IMP=	50.00
ADD HYD	AP#7	2& 3	20	.06720	123.22	6.614	1.84551	1.600	2.865		
ROUTE	AP#7R	20	2	.06720	123.98	6.614	1.84552	1.600	2.883		
COMPUTE NM HYD	A10-D	-	3	.01020	20.86	.841	1.54680	1.500	3.196	PER IMP=	50.00
ADD HYD	AP#8	2& 3	20	.07740	138.28	7.456	1.80614	1.600	2.791		
ROUTE	AP#8R	20	2	.07740	136.11	7.456	1.80615	1.600	2.748		
ADD HYD	AP#9	10& 2	10	.37319	711.96	36.150	1.81627	1.550	2.981		
ROUTE	AP#9R	10	2	.37319	710.84	36.150	1.81627	1.550	2.976		
COMPUTE NM HYD	A11-D	-	3	.00860	20.85	.919	2.00463	1.500	3.787	PER IMP=	76.00

ADD HYD	AP#10	2& 3	20	.38179	728.87	37.069	1.82051	1.550	2.983	
COMPUTE NM HYD	B1-D&AP#11	-	3	.02300	53.05	2.286	1.86376	1.500	3.604	PER IMP= 68.00
ROUTE	AP#11R	3	2	.02300	49.30	2.286	1.86378	1.550	3.349	
COMPUTE NM HYD	B2-D	-	3	.03500	76.65	3.216	1.72289	1.500	3.422	PER IMP= 60.00
ADD HYD	AP#12	2& 3	10	.05800	122.10	5.502	1.77874	1.500	3.289	
ROUTE	AP#12R	10	2	.05800	117.16	5.502	1.77876	1.550	3.156	
COMPUTE NM HYD	B3-D	-	3	.04360	81.77	3.597	1.54680	1.500	2.931	PER IMP= 50.00
ADD HYD	AP#13	2& 3	10	.10160	196.47	9.099	1.67920	1.550	3.021	
ROUTE	AP#13R	10	2	.10160	195.91	9.099	1.67921	1.550	3.013	
COMPUTE NM HYD	B4-D	-	3	.02300	47.03	1.897	1.54680	1.500	3.195	PER IMP= 50.00
ADD HYD	AP#14	2& 3	10	.12460	237.27	10.996	1.65476	1.550	2.975	
ROUTE	AP#14R	10	12	.12460	236.83	10.996	1.65477	1.550	2.970	
COMPUTE NM HYD	S1-D&AP#15	-	3	.03140	71.05	3.033	1.81093	1.500	3.536	PER IMP= 65.00
ROUTE	AP-15R	3	2	.03140	69.21	3.033	1.81095	1.500	3.444	
COMPUTE NM HYD	S2-D	-	3	.01630	33.33	1.345	1.54680	1.500	3.195	PER IMP= 50.00
ADD HYD	AP#16	2& 3	10	.04770	102.54	4.377	1.72066	1.500	3.359	
ROUTE	AP#16R	10	2	.04770	100.02	4.377	1.72068	1.550	3.276	
COMPUTE NM HYD	S3-D	-	3	.05670	111.51	4.678	1.54680	1.500	3.073	PER IMP= 50.00
ADD HYD	AP#17	2& 3	10	.10440	208.85	9.055	1.62623	1.500	3.126	
ROUTE	AP#17R	10	2	.10440	208.86	9.055	1.62624	1.550	3.126	
COMPUTE NM HYD	S4-D	-	3	.04360	84.44	4.006	1.72289	1.550	3.026	PER IMP= 60.00
ADD HYD	AP#18	2& 3	10	.14800	293.30	13.061	1.65471	1.550	3.096	
ROUTE	AP#18R	10	2	.14800	282.01	13.061	1.65471	1.550	2.977	
COMPUTE NM HYD	S5-D	-	3	.02380	51.78	2.165	1.70528	1.500	3.399	PER IMP= 59.00
ADD HYD	AP#19	2& 3	10	.17180	327.26	15.226	1.66171	1.550	2.976	
ADD HYD	AP#20	12&10	10	.29640	564.09	26.222	1.65879	1.550	2.974	
ADD HYD	PART AP#21	20&10	10	.67819	1292.96	63.292	1.74983	1.550	2.979	
COMPUTE NM HYD	B5-D_TWRPND	-	3	.03910	50.89	1.489	.71403	1.500	2.033	PER IMP= 5.00
ADD HYD	AP#21	10& 3	20	.71729	1340.22	64.781	1.69337	1.550	2.919	
ROUTE RESERVOIR	AP#22	20	12	.71729	24.89	64.690	1.69099	3.000	.054	AC-FT= 48.879
MODIFY TIME	AP#22	12	12	.71729	30.53	64.690	1.69099	2.950	.066	
ROUTE	AP#22R	12	2	.71729	30.53	64.606	1.68880	2.950	.066	
COMPUTE NM HYD	B6-D	-	3	.04590	63.53	4.433	1.81093	1.700	2.163	PER IMP= 65.00
ADD HYD	AP#23	2& 3	10	.76319	90.01	69.039	1.69614	1.700	.184	
ROUTE	AP#23R	10	2	.76319	87.84	68.927	1.69339	1.750	.180	
COMPUTE NM HYD	B7-D	-	3	.05910	90.35	5.819	1.84615	1.650	2.389	PER IMP= 67.00
ADD HYD	AP#24	2& 3	10	.82229	172.54	74.746	1.70437	1.700	.328	
ROUTE	AP#24R	10	2	.82229	170.63	74.649	1.70216	1.700	.324	
COMPUTE NM HYD	B8-D	-	3	.08910	80.38	7.350	1.54680	1.900	1.410	PER IMP= 50.00
ADD HYD	TS2_DMP.HYD	2& 3	30	.91139	239.84	81.999	1.68697	1.750	.411	
COMPUTE NM HYD	A12-D&AP#26	-	3	.03590	84.31	3.838	2.00463	1.500	3.669	PER IMP= 76.00
ROUTE	AP#26R	3	2	.03590	80.90	3.838	2.00464	1.550	3.521	
COMPUTE NM HYD	A13-D	-	3	.04520	79.18	4.366	1.81093	1.600	2.737	PER IMP= 65.00
ADD HYD	AP#27	2& 3	10	.08110	159.76	8.204	1.89667	1.550	3.078	
ROUTE	AP#27R	10	2	.08110	152.20	8.204	1.89667	1.600	2.932	
COMPUTE NM HYD	A14-D	-	3	.04520	59.45	4.578	1.89897	1.750	2.055	PER IMP= 70.00
ADD HYD	AP#28	2& 3	10	.12630	195.52	12.781	1.89749	1.600	2.419	
ROUTE	AP#28R	10	2	.12630	194.13	12.782	1.89749	1.600	2.402	
COMPUTE NM HYD	A15-D	-	3	.02530	44.20	2.325	1.72289	1.550	2.730	PER IMP= 60.00
ADD HYD	PART AP#33	2& 3	20	.15160	237.29	15.106	1.86835	1.600	2.446	
COMPUTE NM HYD	A17-D&AP#29	-	3	.01080	22.09	.891	1.54680	1.500	3.196	PER IMP= 50.00

[illegible]

* REVISED DEVELOPED CONDITIONS 11-20-00

*
*
*
*
*
*
*

THE FOLOWING IS TO DETERMINE THE FLOW INTO THE AMOLE DEL NORTE CHANNEL
FROM THE SAN YAGNACIO STORM DRAIN LINE.

***** ROUTE HYDROGRAPH THROUGH THE TOWER DETENTION POND

ROUTE RESERVOIR	ID=12	HYD NO=AP#22	INFLOW ID=20	CODE=20.2
	OUTFLOW (CFS)	STORAGE (AC-FT)	ELEVATION (FT)	
	0.0	0.0	72.0	
	11.9	5.8	76.0	
	17.4	13.0	80.0	
	18.5	15.2	81.0	
	19.6	17.7	82.0	
	20.6	20.5	83.0	
	21.5	23.8	84.0	
	22.5	28.2	85.0	
	23.3	34.4	86.0	
	25.0	49.9	88.0	
	25.8	58.0	89.0	
	3000.0	84.4	92.0	

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	72.00	.000	.00
1.00	.00	72.00	.000	.00
2.00	372.33	86.87	41.178	24.04
3.00	22.70	87.87	48.879	24.89
4.00	8.28	87.74	47.900	24.78
5.00	7.02	87.56	46.458	24.62
6.00	8.32	87.37	45.055	24.47
7.00	10.06	87.22	43.831	24.33
8.00	9.52	87.06	42.636	24.20
9.00	8.93	86.90	41.403	24.07
10.00	8.44	86.74	40.138	23.93
11.00	7.99	86.57	38.846	23.79
12.00	7.62	86.40	37.531	23.64
13.00	7.25	86.23	36.197	23.50
14.00	6.93	86.06	34.847	23.35
15.00	6.64	85.85	33.485	23.18
16.00	6.38	85.63	32.115	23.01
17.00	6.13	85.41	30.738	22.83
18.00	5.90	85.19	29.357	22.65
19.00	5.70	84.95	27.972	22.45
20.00	5.52	84.63	26.593	22.13
21.00	5.33	84.32	25.224	21.82
22.00	5.16	84.02	23.867	21.52
23.00	5.01	83.61	22.524	21.15
24.00	4.86	83.21	21.198	20.79
25.00	.34	82.71	19.677	20.31
26.00	.02	82.12	18.031	19.72
27.00	.00	81.49	16.429	19.04
28.00	.00	80.86	14.884	18.34
29.00	.00	80.18	13.399	17.60
30.00	.00	79.43	11.982	16.62
31.00	.00	78.70	10.651	15.61
32.00	.00	78.00	9.401	14.65
33.00	.00	77.35	8.228	13.75
34.00	.00	76.74	7.126	12.91
35.00	.00	76.16	6.092	12.12
36.00	.00	75.55	5.146	10.56
37.00	.00	75.00	4.343	8.91

ADD HYD	AP#12	2& 3	10	.05800	122.10	5.502	1.77874	1.500	3.289	
ROUTE	AP#12R	10	2	.05800	117.16	5.502	1.77876	1.550	3.156	
COMPUTE NM HYD	B3-D	-	3	.04360	81.77	3.597	1.54680	1.500	2.931	PER IMP= 50.00
ADD HYD	AP#13	2& 3	10	.10160	196.47	9.099	1.67920	1.550	3.021	
ROUTE	AP#13R	10	2	.10160	195.91	9.099	1.67921	1.550	3.013	
COMPUTE NM HYD	B4-D	-	3	.02300	47.03	1.897	1.54680	1.500	3.195	PER IMP= 50.00
ADD HYD	AP#14	2& 3	10	.12460	237.27	10.996	1.65476	1.550	2.975	
ROUTE	AP#14R	10	12	.12460	236.83	10.996	1.65477	1.550	2.970	
COMPUTE NM HYD	S1-D&AP#15	-	3	.03140	71.05	3.033	1.81093	1.500	3.536	PER IMP= 65.00
ROUTE	AP-15R	3	2	.03140	69.21	3.033	1.81095	1.500	3.444	
COMPUTE NM HYD	S2-D	-	3	.01630	33.33	1.345	1.54680	1.500	3.195	PER IMP= 50.00
ADD HYD	AP#16	2& 3	10	.04770	102.54	4.377	1.72066	1.500	3.359	
ROUTE	AP#16R	10	2	.04770	100.02	4.377	1.72068	1.550	3.276	
COMPUTE NM HYD	S3-D	-	3	.05670	111.51	4.678	1.54680	1.500	3.073	PER IMP= 50.00
ADD HYD	AP#17	2& 3	10	.10440	208.85	9.055	1.62623	1.500	3.126	
ROUTE	AP#17R	10	2	.10440	208.86	9.055	1.62624	1.550	3.126	
COMPUTE NM HYD	S4-D	-	3	.04360	84.44	4.006	1.72289	1.550	3.026	PER IMP= 60.00
ADD HYD	AP#18	2& 3	10	.14800	293.30	13.061	1.65471	1.550	3.096	
ROUTE	AP#18R	10	2	.14800	282.01	13.061	1.65471	1.550	2.977	
COMPUTE NM HYD	S5-D	-	3	.02380	51.78	2.165	1.70528	1.500	3.399	PER IMP= 59.00
ADD HYD	AP#19	2& 3	10	.17180	327.26	15.226	1.66171	1.550	2.976	
ADD HYD	AP#20	12&10	10	.29640	564.09	26.222	1.65879	1.550	2.974	
ADD HYD	PART AP#21	20&10	10	.66450	1282.35	61.981	1.74891	1.550	3.015	
COMPUTE NM HYD	B5-D TWRPND	-	3	.03910	50.89	1.489	.71403	1.500	2.033	PER IMP= 5.00
ADD HYD	AP#21	10& 3	20	.70360	1329.61	63.470	1.69140	1.550	2.953	
ROUTE RESERVOIR	AP#22	20	12	.70360	24.77	63.388	1.68920	2.900	.055	AC-FT= 47.808
MODIFY TIME	AP#22	12	12	.70360	30.06	63.388	1.68920	2.950	.067	
ROUTE	AP#22R	12	2	.70360	30.05	63.307	1.68704	2.850	.067	
COMPUTE NM HYD	B6-D	-	3	.04590	63.53	4.433	1.81093	1.700	2.163	PER IMP= 65.00
ADD HYD	AP#23	2& 3	10	.74950	89.65	67.740	1.69463	1.700	.187	
ROUTE	AP#23R	10	2	.74950	87.49	67.632	1.69193	1.750	.182	
COMPUTE NM HYD	B7-D	-	3	.05910	90.35	5.819	1.84615	1.650	2.389	PER IMP= 67.00
ADD HYD	AP#24	2& 3	10	.80860	172.21	73.451	1.70320	1.700	.333	
ROUTE	AP#24R	10	2	.80860	170.31	73.358	1.70103	1.700	.329	
COMPUTE NM HYD	B8-D	-	3	.08910	80.38	7.350	1.54680	1.900	1.410	PER IMP= 50.00
ADD HYD	TS2_DMP.HYD	2& 3	30	.89770	239.50	80.708	1.68572	1.750	.417	
COMPUTE NM HYD	A12-D&AP#26	-	3	.03590	84.31	3.838	2.00463	1.500	3.669	PER IMP= 76.00
ROUTE	AP#26R	3	2	.03590	80.90	3.838	2.00464	1.550	3.521	
COMPUTE NM HYD	A13-D	-	3	.04520	79.18	4.366	1.81093	1.600	2.737	PER IMP= 65.00
ADD HYD	AP#27	2& 3	10	.08110	159.76	8.204	1.89667	1.550	3.078	
ROUTE	AP#27R	10	2	.08110	152.20	8.204	1.89667	1.600	2.932	
COMPUTE NM HYD	A14-D	-	3	.04520	59.45	4.578	1.89897	1.750	2.055	PER IMP= 70.00
ADD HYD	AP#28	2& 3	10	.12630	195.52	12.781	1.89749	1.600	2.419	
ROUTE	AP#28R	10	2	.12630	194.13	12.782	1.89749	1.600	2.402	
COMPUTE NM HYD	A15-D	-	3	.02530	44.20	2.325	1.72289	1.550	2.730	PER IMP= 60.00
ADD HYD	PART AP#33	2& 3	20	.15160	237.29	15.106	1.86835	1.600	2.446	
COMPUTE NM HYD	A17-D&AP#29	-	3	.01080	22.09	.891	1.54680	1.500	3.196	PER IMP= 50.00
ROUTE	AP&29R	3	2	.01080	16.02	.891	1.54684	1.600	2.317	
COMPUTE NM HYD	A18-D	-	3	.01030	22.57	.946	1.72289	1.500	3.423	PER IMP= 60.00
ADD HYD	AP#30	2& 3	10	.02110	35.43	1.837	1.63273	1.550	2.624	
ROUTE	AP&30R	10	2	.02110	25.29	1.837	1.63269	1.650	1.873	

[illegible]

Tower Pond - Before Revisions

*
 *
 ***** ROUTE FLOW AT AP#9 TO AP#10 THROUGH PIPE IN TOWER RD.
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 *
 *
 * THE FOLOWING IS TO DETERMINE THE FLOW INTO THE AMOLE DEL NORTE CHANNEL
 * FROM THE SAN YAGNACIO STORM DRAIN LINE.
 *
 *
 ***** ROUTE HYDROGRAPH THROUGH THE TOWER DETENTION POND
 *

ROUTE RESERVOIR	ID=12	HYD NO=AP#22	INFLOW ID=20	CODE=20.2
	OUTFLOW (CFS)	STORAGE (AC-FT)	ELEVATION (FT)	
	0.0	0.0	72.0	
	11.9	5.8	76.0	
	17.4	13.0	80.0	
	18.5	15.2	81.0	
	19.6	17.7	82.0	
	20.6	20.5	83.0	
	21.5	23.8	84.0	
	22.5	28.2	85.0	
	23.3	34.4	86.0	
	25.0	49.9	88.0	
	25.8	58.0	89.0	
	3000.0	84.4	92.0	

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	72.00	.000	.00
1.00	.00	72.00	.000	.00
2.00	363.29	86.81	40.659	23.99
3.00	22.40	87.73	47.805	24.77
4.00	8.15	87.60	46.820	24.66
5.00	6.90	87.42	45.378	24.50
6.00	8.18	87.24	43.973	24.35
7.00	9.88	87.08	42.746	24.22
8.00	9.35	86.92	41.546	24.08
9.00	8.78	86.76	40.310	23.95
10.00	8.29	86.60	39.041	23.81
11.00	7.85	86.43	37.747	23.67
12.00	7.49	86.26	36.431	23.52
13.00	7.13	86.09	35.096	23.38
14.00	6.81	85.89	33.746	23.22
15.00	6.52	85.68	32.386	23.04
16.00	6.27	85.45	31.018	22.86
17.00	6.03	85.23	29.643	22.69
18.00	5.80	85.01	28.265	22.51
19.00	5.60	84.70	26.888	22.20
20.00	5.42	84.39	25.521	21.89
21.00	5.23	84.08	24.165	21.58
22.00	5.07	83.70	22.821	21.23
23.00	4.92	83.30	21.494	20.87
24.00	4.78	82.89	20.184	20.49
25.00	.33	82.35	18.686	19.95
26.00	.02	81.75	17.070	19.32
27.00	.00	81.12	15.502	18.63

28.00	.00	80.45	13.992	17.90
29.00	.00	79.75	12.545	17.05
30.00	.00	78.99	11.179	16.01
31.00	.00	78.28	9.897	15.03
32.00	.00	77.61	8.693	14.11
33.00	.00	76.98	7.563	13.25
34.00	.00	76.39	6.502	12.44
35.00	.00	75.80	5.511	11.31
36.00	.00	75.21	4.651	9.54
37.00	.00	74.71	3.926	8.05
38.00	.00	74.29	3.314	6.80
39.00	.00	73.93	2.797	5.74
40.00	.00	73.63	2.361	4.84
41.00	.00	73.37	1.992	4.09
42.00	.00	73.16	1.682	3.45
43.00	.00	72.98	1.419	2.91
44.00	.00	72.83	1.198	2.46
45.00	.00	72.70	1.011	2.07
46.00	.00	72.59	.853	1.75
47.00	.00	72.50	.720	1.48
48.00	.00	72.42	.608	1.25
49.00	.00	72.35	.513	1.05
50.00	.00	72.30	.433	.89
51.00	.00	72.25	.366	.75
52.00	.00	72.21	.309	.63
53.00	.00	72.18	.260	.53
54.00	.00	72.15	.220	.45
55.00	.00	72.13	.186	.38

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
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56.00	.00	72.11	.157	.32
57.00	.00	72.09	.132	.27
58.00	.00	72.08	.112	.23
59.00	.00	72.06	.094	.19

PEAK DISCHARGE = 24.771 CFS - PEAK OCCURS AT HOUR 2.90

MAXIMUM WATER SURFACE ELEVATION = 87.730

MAXIMUM STORAGE = 47.8083 AC-FT INCREMENTAL TIME= .100000HRS

*

* AP#22 = OUTFLOW FROM TOWER DETENTION POND

*

PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA AP#22

RUNOFF VOLUME = 1.68920 INCHES = 63.3874 ACRE-FEET

PEAK DISCHARGE RATE = 24.77 CFS AT 2.900 HOURS BASIN AREA = .7036 SQ. MI.

38.00	.00	74.53	3.666	7.52
39.00	.00	74.13	3.094	6.35
40.00	.00	73.80	2.611	5.36
41.00	.00	73.52	2.204	4.52
42.00	.00	73.28	1.860	3.82
43.00	.00	73.08	1.570	3.22
44.00	.00	72.91	1.325	2.72
45.00	.00	72.77	1.119	2.30
46.00	.00	72.65	.944	1.94
47.00	.00	72.55	.797	1.64
48.00	.00	72.46	.673	1.38
49.00	.00	72.39	.568	1.16
50.00	.00	72.33	.479	.98
51.00	.00	72.28	.404	.83
52.00	.00	72.24	.341	.70
53.00	.00	72.20	.288	.59
54.00	.00	72.17	.243	.50
55.00	.00	72.14	.205	.42

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
56.00	.00	72.12	.173	.36
57.00	.00	72.10	.146	.30
58.00	.00	72.09	.123	.25
59.00	.00	72.07	.104	.21
PEAK DISCHARGE =		24.888 CFS - PEAK OCCURS AT HOUR 3.00		
MAXIMUM WATER SURFACE ELEVATION =		87.868		
MAXIMUM STORAGE =		48.8790 AC-FT	INCREMENTAL TIME= .100000HRS	

Summary File - Before Revisions

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = TS_DMP.DAT

RUN DATE (MON/DAY/YR) = 11/20/2000
USER NO. = M_GOODWN.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
START											TIME= .00
*S											
*S	TOWER/SAGE WATERSHED SAD 222										
*S											
*S											
*S	100-YR, 24-HR STORM WITH SEDIMENT										
*S	FILE NAME: TS_DMP.DAT										
*S	BY: RICHARD STOCKTON										
*S	PEER REVIEWED BY: DEBORAH DIXON										
*S	LAST REVISION: 06-8-99 (kmj HYD=AP#22R)										
RAINFALL TYPE= 2											RAIN24= 2.660
COMPUTE NM HYD	A1-D&AP#1	-	3	.04580	103.28	4.897	2.00463	1.500	3.523	PER IMP=	76.00
ROUTE	AP-1R	3	2	.04580	101.55	4.897	2.00464	1.550	3.464		
COMPUTE NM HYD	A2-D	-	3	.03950	89.28	4.001	1.89898	1.500	3.532	PER IMP=	70.00
ADD HYD	AP#2	2& 3	10	.08530	185.32	8.897	1.95570	1.500	3.395		
ROUTE	AP#2R	10	2	.08530	184.43	8.897	1.95571	1.550	3.378		
COMPUTE NM HYD	A3-D	-	3	.04190	94.80	4.047	1.81093	1.500	3.535	PER IMP=	65.00
ADD HYD	AP#3	2& 3	10	.12720	266.97	12.944	1.90801	1.550	3.279		
ROUTE	AP#3R	10	2	.12720	271.22	12.944	1.90801	1.550	3.332		
COMPUTE NM HYD	A4-D	-	3	.04390	101.56	4.858	2.07506	1.500	3.615	PER IMP=	80.00
ADD HYD	AP#4	2& 3	10	.17110	368.16	17.802	1.95087	1.550	3.362		
ROUTE	AP#4R	10	2	.17110	371.05	17.802	1.95087	1.550	3.388		
COMPUTE NM HYD	A5-D	-	3	.04520	95.53	4.153	1.72289	1.500	3.302	PER IMP=	60.00
ADD HYD	AP#5	2& 3	10	.21630	458.83	21.956	1.90323	1.550	3.314		
ROUTE	AP#5R	10	2	.21630	460.09	21.956	1.90323	1.550	3.324		
COMPUTE NM HYD	A6-D	-	3	.04520	88.89	3.729	1.54680	1.500	3.073	PER IMP=	50.00
ADD HYD	PART AP#9	2& 3	10	.26150	542.31	25.684	1.84162	1.550	3.240		
COMPUTE NM HYD	A7-D	-	3	.02060	40.52	1.699	1.54680	1.500	3.074	PER IMP=	50.00
ADD HYD	PART AP#9	10& 3	10	.28210	579.79	27.384	1.82009	1.550	3.211		
COMPUTE NM HYD	A8-D&AP#6	-	3	.05700	110.97	5.773	1.89898	1.550	3.042	PER IMP=	70.00
ROUTE	AP#6R	3	2	.05700	108.92	5.773	1.89898	1.600	2.986		
COMPUTE NM HYD	A9-D	-	3	.01020	20.86	.841	1.54680	1.500	3.196	PER IMP=	50.00
ADD HYD	AP#7	2& 3	20	.06720	123.22	6.614	1.84551	1.600	2.865		
ROUTE	AP#7R	20	2	.06720	123.98	6.614	1.84552	1.600	2.883		
COMPUTE NM HYD	A10-D	-	3	.01020	20.86	.841	1.54680	1.500	3.196	PER IMP=	50.00
ADD HYD	AP#8	2& 3	20	.07740	138.28	7.456	1.80614	1.600	2.791		
ROUTE	AP#8R	20	2	.07740	136.11	7.456	1.80615	1.600	2.748		
ADD HYD	AP#9	10& 2	10	.35950	701.38	34.840	1.81709	1.550	3.048		
ROUTE	AP#9R	10	2	.35950	700.23	34.840	1.81709	1.550	3.043		
COMPUTE NM HYD	A11-D	-	3	.00860	20.85	.919	2.00463	1.500	3.787	PER IMP=	76.00
ADD HYD	AP#10	2& 3	20	.36810	718.26	35.759	1.82147	1.550	3.049		
COMPUTE NM HYD	B1-D&AP#11	-	3	.02300	53.05	2.286	1.86376	1.500	3.604	PER IMP=	68.00
ROUTE	AP#11R	3	2	.02300	49.30	2.286	1.86378	1.550	3.349		
COMPUTE NM HYD	B2-D	-	3	.03500	76.65	3.216	1.72289	1.500	3.422	PER IMP=	60.00