CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director

Mayor Timothy M. Keller

October 12, 2018

David Soule, P.E.
Rio Grande Engineering
PO Box 93924
Albuquerque, NM 87199

RE: **Sunset Gardens Apartments**
86th and Sunset Gardens SW
Grading Plan Stamp Date: 10/3/18
Drainage Report Stamp Date: undated, 9/18
Hydrology File: L10D032

Dear Mr. Soule,

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based on the submittal received on 10/3/18, the Grading Plan and Drainage Report cannot be approved until the following are corrected and a complete resubmittal is made:

Prior to Site Plan for Building Permit and Grading Permit:

1. Provide a full size subbasin map; annotations are illegible on the small size provided and additional detail is required:
   a. Define (hatch) the areas of impervious vs. pervious land cover.
   b. Delineate the areas draining to each first flush pond and quantify the required vs. provided volume for each (include supporting calcs in the Report).
   c. Basin F is ROW and drive entrance and can be exempt from the first flush ponding requirement.

2. Correct the following errors and typos in the Drainage Report:
   a. Introduction. *Basin U* (not V) is the correct basin to reference from the Valhalla report, Q_{100}=24.63cfs is still correct. The Valhalla report is under drainage file *L09D019*.
   b. Proposed Conditions. Basin A is the south portion (not the SW portion) and Basin B is the southeastern portion (not the SW portion). Basin B will be discharging to 82nd St (not 84th). Basin C flows are captured by a 24" nyloplast inlet (not a 12").

3. In Appendix B (Hydrology), *Proposed E* should be 12.55cfs, based on the land treatments proposed (see attached spreadsheet). However, the amount of land treatment D is suspect when compared to the grading plan; please correct. Also, *Proposed A* may be overstating the impervious area.

4. Add proposed contour labels and existing minor contour labels.

5. Should there be a valley gutter or something to convey the flow from the western Basin E pond down to the D-inlet? Also, it seems like underground storage in the vicinity of the D-inlet would be a more effective way to capture all the imperious area runoff, especially if the roof runoff can be directed to the internal drive aisles.

6. Add note on the plan that "No work shall be performed in the public ROW without an approved Work Order or Excavation Permit."

7. The following drainage infrastructure needs to be listed on the Infrastructure List:
   a. The single-A inlet on 82nd St. This connecter pipe will need to be 18" RCP, not 12"; if there's a 12" stub, it'll need to be replaced to the manhole with 18".
   b. The new single-A inlet and type-E manhole on Sunset Garden.
   c. The new sidewalk culvert on Sunset Garden.
   d. Additional drainage infrastructure may be identified, pending final approval of this plan.

8. Provide cross sections, one for each road/property line and at the points of maximum retainage. Include retaining walls and footers, property/ROW lines, existing and proposed grades, horizontal and vertical dimensions, and proposed ROW improvements such as: sidewalk, curb and gutter, and paving.

9. For Hydrology, the cross sections must demonstrate that grading and wall construction near the property line will not endanger adjacent property or constrain its use (DPM Ch.22, section 5 part B). Any such encroachment by the retaining wall (including footer) or stable slope will be subject to the following:
   a. Any private encroachment into the public ROW will require a revocable permit.
   b. Any private encroachment into a public easement will require an encroachment agreement.
   c. Any private encroachment into neighboring private property will require written and signed permission from both property owners.

10. For information. The cross sections should be included in the Site Plan as well.

11. This project requires an ESC Plan, submitted to the Stormwater Quality Engineer (Curtis Cherne PE, ccherne@cabq.gov or 924-3420).

12. If only seeking Site Plan for Building Permit approval at this time, label the grading plan "Conceptual, Not For Construction" or similar and address the SPBP comments. If seeking SPBP and Building Permit simultaneously, forgo the conceptual markings and address all SPBP and Building Permit comments.

Prior to Building Permit (For Information):

13. Remove any "Conceptual" markings.

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14. Provide sumps around the nyloplast inlets to generate the head required in Appendix C (Hydraulics). The inlet calcs for the basin A inlet and basin E inlet will need to be reassessed once the land treatments are updated.

15. Pipe capacity and profiles for public and private storm drain, calculated along the EGL, will be required prior to building permit or work order, whichever comes first.

16. If not achieving full capture of the first flush runoff, payment of the Fee in Lieu (Amount = BypassVolume x $8/CF) for the required first flush volume must be made.

17. Additional comments may be provided at Building Permit, based on the outcome of the above remarks and level of detail shown on plans.

Prior to Certificate of Occupancy (For Information):

18. Engineer's Certification, per the DPM Chapter 22.7: *Engineer's Certification Checklist For Non-Subdivision* is required.

PO Box 1293

19. A Bernalillo County Recorded Private Facility Drainage Covenant is required for the stormwater quality pond. The original notarized form, exhibit A (legible on 8.5x11 paper), and recording fee ($25, payable to Bernalillo County) must be turned into DRC (4th, Plaza del Sol) for routing. Please contact Charlotte LaBadie (clabadie@cabq.gov, 924-3996) or Madeline Carruthers (mtafoya@cabq.gov, 924-3997) regarding the routing and recording process for covenants. The routing and recording process for covenants can take a month or longer; Hydrology recommends beginning this process as soon as possible as to not delay approval for certificate of occupancy.

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20. City acceptance and close-out of the public Work Order will be required, unless financial guarantee has been posted.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: SUNSET GARDENS APTS Building Permit #:_____ Hydrology File #: _____

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: TRACT 52, UNIT 2 TOWN OF ATRISCO GRANT

City Address: SOUTH SIDE OF SUNSETGARDENS BETWEEN 82 AND 86

Applicant: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: RIO GRANDE ENGINEERING   Contact: DAVID SOULE

Address: PO BOX 93924   ALB NM 87199

Phone#: 505.321.9099   Fax#: 505.872.0999   E-mail: david@riograndeengineering.com

TYPE OF DEVELOPMENT: ___ PLAT   ___ RESIDENCE   _X_ DRB SITE   ___ ADMIN SITE

Check all that Apply:

DEPARTMENT:
_X_ HYDROLOGY/ DRAINAGE
____ TRAFFIC/ TRANSPORTATION

TYPE OF SUBMITTAL:
____ ENGINEER/ARCHITECT CERTIFICATION
____ PAD CERTIFICATION
____ CONCEPTUAL G & D PLAN
_X_ GRADING PLAN
____ DRAINAGE REPORT
____ DRAINAGE MASTER PLAN
____ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
____ ELEVATION CERTIFICATE
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ STREET LIGHT LAYOUT
____ OTHER (SPECIFY) _____
____ PRE-DESIGN MEETING?

IS THIS A RESUBMITTAL?: ____ Yes _X_ No

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:
_X_ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

____ PRELIMINARY PLAT APPROVAL
____ SITE PLAN FOR SUB'D APPROVAL
_X_ SITE PLAN FOR BLDG. PERMIT APPROVAL
____ FINAL PLAT APPROVAL

____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
_X_ GRADING PERMIT APPROVAL
____ SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR
____ FLOODPLAIN DEVELOPMENT PERMIT
____ OTHER (SPECIFY) _____

DATE SUBMITTED: _____ By: _____

COA STAFF: _____   ELECTRONIC SUBMITTAL RECEIVED:_____

FEE PAID:_____

DRAINAGE REPORT

For

SUNSET GARDENS APARTMENTS
Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

SEPTEMBER 2018

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map
Site Grading and Drainage Plan

PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the development of a 5.8 acre multi family project located on Sunset Gardens Road SW between 86th Street and 82 Street SW. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines, and HYDROCAD. This report will demonstrate that the grading does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 5.8-acre parcel of land located on the south side of Sunset Gardens Road between 86th and 82 streets SW. The legal description of this site is Tract 52, unit 2 Town of Atrisco Grant. As shown on FIRM map35001C0328J, the entire site is located within Flood Zone X. The site has not been developed but is surrounded by fully developed land. The site is in native condition. Due to the upstream construction, the site is not affected by any upland flow other than minor roadway flows adjacent to the site. The site free discharges to the east. The site is located within the Amole Del Norte drainage basin. The site is adjacent to a fully improved storm drain that accounted for the development of this site. The development of the site will require the site to discharge at a rate equal to or less than the fully developed conditions assumed (Basin V-24.63 cfs)for this site in the governing Valhalla drainage report L /9D19,which relevant excerpts can be found in appendix A.

EXISTING CONDITIONS

The site currently does not have structures on it but has been impacted by minor human foot and off road vehicle traffic over the years. The site is not impacted by major upland flows. The surrounding roadway shoulders to drain onto the site. The site currently discharges all of its flow to the East.

VICINITY MAP: L-09-Z

FIRM MAP:

PROPOSED CONDITIONS

The proposed improvements consist of a new multi family apartment complex with associated open space and paved parking areas. The lots shall drain from west to east and will be captured by inlets and conveyed to the existing 54" storm drain in Sunset Gardens.

The site consists of 5 onsite basins and one offsite. Basin A contains the south western portion of the site. This basin encompasses 1.02 acres and drains thru several first flush ponds and ultimately discharges 4.24 cfs to a 24" inlet and 18" storm drain that will connect to the existing drain in sunset gardens. Basin B consists of the south western .22 acres of the site. This portion of this site contains the rear portion of some buildings and landscape areas. This basin is below the proposed storm drain connection and will free discharge to 84th street. The construction of the western half of the street will include a singe A inlet that will capture this flow of 0.7 cfs in addition to the roadway flow. Basin C contains .41 acres consisting of the rear portion of several buildings and the landscape area. The flow is captured by a single 12" inlet connected to the new storm drain that will be connected to the existing Sunset Gardens storm drain. Basin D contains .3 acres consisting of the rear portion of several buildings and the landscaping this basin will discharge 0.31 cfs to Sunset Gardens via a sidewalk culvert. The construction of a single A inlet near the intersection of 84th street will capture this flow as well as the flow from the south half of the road that will be constructed. Basin E contains the main portion of the site that encompasses the majority of the buildings and parking lot. This basin generates 10.32 cfs. The flow is captured by a Double A inlet located on the eastern portion of the parking lot. This inlet shall be connected to the existing storm drain in Sunset gardens by a new 24" storm drain.

Basin F contains the southern portion of sunset gardens and the western portion of 86ths that drains to Sunset Gardens. This basin generates 2.70 cfs. This flow is captured by a new single a inlet that drains to the existing storm drain. The site grading contains multiple 1' deep water

quality ponds that capture 6,840 cubic feet, which exceeds the required volume of 3,058 cubic feet.

The Basin map and hydraulic calculations is located in appendix A. The pipe and inlet capacities are locate with appendix C.   The total flow generated by this development will be 20.18 cfs, which is less than the fully developed assumptions for the storm drain.

SUMMARY AND RECOMMENDATIONS

This project is a development of multi family on the Southwest Mesa. The site is within the Amole Del Norte drainage basin. The site is adjacent to an existing 54" storm drain. The storm drain was designed to accept 24.63 cfs from this site. This site will discharge 20.18 cfs which is less than allowed. The site will manage its first flush requirement by shallow landscape ponds located around the site. The first flush volume is retained onsite. This drainage plan and report conforms to the governing drainage regulations of the City. Since the effected area site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity.

APPENDIX A

Excerpts from relevant plans

CITY OF ALBUQUERQUE

LEGEND

DESCRIPTION	PROPOSED	EXISTING
WATER VALVE		
FIRE HYDRANT		
SINGLE WATER SERVICE		
DOUBLE WATER SERVICE		
STREET LIGHT		
STORM DRAIN MANHOLE		
SAS MANHOLE		
SEWER SERVICE		
WATER LINE	W	W
SEWER LINE	S	S
STORM DRAIN	SD	SD
PERMANENT PAVEMENT		
TEMPORARY PAVEMENT		
CB & GTR.		
SIDEWALK		

R Y A L S
5301 Central, N.E.
(505) 256-4701

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

TITLE: VALHALLA ESTATES
STORM DRAIN PLAN AND PROFILE
CL. STA.15+50-29+00

City Project No. 584181

ENGINEER'S SEAL

SURVEY INFORMATION

FIELD NOTES

BENCH MARKS
CITY OF ALBUQUERQUE SURVEY MONUMENT
ACS CAP "7-X9"
ELEV. = 5137.56

AS BUILT INFORMATION

MICRO-FILM INFORMATION

REVISIONS
DESIGN

SCALES:
HORIZ. 1" = 50'
VERT. 1" = 5'

82ND STREET SW

SUNSET GARDENS SW

86TH STREET SW

MH #6 SD CL. STA. 17+95= CL CHANNEL STA. 15+42.00

MH #7

MH #8

SD CL. STA. 28+76.00 TIE TO EX. SD
EXIST. SD MH

SUNSET GARDENS
SD CENTERLINE STATIONING

Sheet 23 24

VALLE DEL CANTO SITE (PH'S I & II)

BRIDGE BLVD

AMOLE CHANNEL
UPSTREAM END

SITE
VALLE DEL
CANTO

BRIDGEPOINT
APARTMENTS
(DRAINS TO
BRIDGE BL)

SUNSET GARDENS

POINTE WEST
SUBDIVISION

BSN X
BSN Y
BSN W
BSN T
BSN U
BSN V

SELECTED 100 yr 6 HR
PEAK FLOWS SHOWN
THUS Y:Y

DWG: VC0577 DATE: 11/20/97 TIME: 22:36 T. GREEN

ABYMO SUMMARY TABLE (ABYMO194) - AMAFCA Hydrologic Model - January, 1994   RUN DATE (MON/DAY/YR) =11/05/1997
INPUT FILE = CSGIFOOB.DAT   USER NO.= PERSEENG.194

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE : 1 NOTATION

*S FILE CSGIFOOA.DAT: Canto / Sunset Gardens, Interim & Future conditions,
*S (1)00-yr 6-hr storm, version A
*S

100-YR 11-5-97
revised %'s NN&NS

*S FOR INTERIM CONDITIONS, THE SUNSET GARDENS STORM DRAIN STOPS AT 82nd ST
*S AND FLOW IS ROUTED IN AN EARTH CHANNEL THROUGH AN UNDEVELOPED BASIN Y
*S TO THE HEAD OF THE AMOLE CHANNEL. SEE RECALLED HYD 314 AND HYD ____
*S FOR FUTURE, THE SUNSET GARDENS STORM DRAIN CONTINUES TO UNSER THEN
*S NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*S CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*S
*S ALL BASINS --EXCEPT BASIN Y AS NOTED ABOVE-- ARE IN FUTURE FULLY-DEVELOPED
*S CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
*S AND ON ENGINEERING JUDGMENT.
*S

RAINFALL TYPE= 1   RAIN6= 2.220
COMPUTE NM HYD   I   -   1   .00952   18.64   .617   1.21467   1.500   3.059 PER IMP= 38.00
COMPUTE NM HYD   H   -   2   .01501   36.62   1.301   1.62555   1.500   3.812 PER IMP= 70.00
*S E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD   208.00 1& 2 3   .02453   55.25   1.918   1.46607   1.500   3.519
*S DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD   90.S.PAST.SG 3 6   .01052   8.60   .822   1.46607   1.333   1.278
                   SG.E.OF.90 AND   4   .01401   46.65   1.096   1.46607   1.500   5.202
*S ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
ROUTE MCUNGE   209.00   4   5   .01401   46.50   1.093   1.46262   1.567   5.185 CCODE =   .2
COMPUTE NM HYD   J   -   1   .00228   5.97   .218   1.79112   1.500   4.093 PER IMP= 65.00
ADD HYD SG AMOLE CONTIB 210.00 1& 5 3   .01629   51.44   1.311   1.50855   1.567   4.934
*S CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD   SITE.II -   1   .00839   19.39   .685   1.53130   1.500   3.611 PER IMP= 65.00
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH (ID=7, HOLD FOR LATER)
DIVIDE HYD   S2.TO.S3 1   2   .00738   11.60   .602   1.53126   1.433   2.457
                   S2.TO.86TH AND   7   .00101   7.79   .083   1.53126   1.500 12.008
COMPUTE NM HYD   SITE.III -   1   .02360   54.51   1.927   1.53130   1.500   3.609 PER IMP= 65.00
*S TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD   SITE.OUT 1& 2 16 .03098   66.11   2.530   1.53128   1.500   3.335
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD   SG.W.OF.86 3&16 5 .04727   115.19   3.841   1.52344   1.533   3.808
COMPUTE NM HYD   C   -   1   .00127   3.43   .126   1.85607   1.500   4.219 PER IMP= 90.00
ADD HYD   218.00 1& 7 3   .00228   11.22   .208   1.71179   1.500   7.676
*S COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD   86&SG.N&W 3& 5 7 .04955   125.49   4.049   1.53212   1.533   3.957
*S
COMPUTE NM HYD   NN   -   1   .01830   32.97   1.099   1.12653   1.500   2.815 PER IMP= 36.40
*S ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
ADD HYD   INTO.JYDN 1& 6 3 .02882   41.57   1.922   1.25044   1.500   2.254
*S ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
ROUTE MCUNGE   300.00   3   5   .02882   39.88   1.911   1.24326   1.600   2.162 CCODE =   .1
COMPUTE NM HYD   NS   -   1   .01719   34.17   1.167   1.27301   1.500   3.106 PER IMP= 46.60
*S ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
ROUTE MCUNGE   302.00   1   2   .01719   33.65   1.167   1.27335   1.567   3.059 CCODE =   .2

BTK INTO JYD @ 90TH = 41.57 + 34.17 = 75.74   COMP TO 73.50 7/23/97
A = .03549   NN+NS   (%D = 40.0, A = .3277)
%D = 41.34   N AS A WHOLE.

① Dry area 10 yr = 25.41 ± (see CSGIF10B.SUM)
   100 YR SPILL OVER THEN → 51.44 - 25.41 = 26.03

25×☐   32×☐

IN FILE =
CSG IFBOB.DAT

11-5-74   100 11-

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
ADD HYD	304.00	2& 5	3	.04601	72.69	3.078	1.25449	1.600	2.469	
COMPUTE NM HYD	JYD -	17		.02353	54.35	1.922	1.53130	1.500	3.609	PER IMP= 65.00

*$ TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD

| ADD HYD | JYD.E.AT.86 3&17 | 4 | | .06954 | 116.71 | 5.000 | 1.34815 | 1.533 | 2.622 | |

*$ ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE

| ROUTE MCUNGE | 86.S.oF.SG | 4 | 5 | .06954 | 116.55 | 4.998 | 1.34764 | 1.567 | 2.619 | CCODE = .1 |

*$ *AS IF* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7

| ADD HYD | TOT.SG&86 5& 7 | 6 | | .11909 | 235.70 | 9.047 | 1.42440 | 1.533 | 3.092 | |

*$
JULY 23 41 274.23 J. 35.53

*$ FUTURE/FULL DEVELOPMENT   FUTURE/FULL DEVELOPMENT
*$ ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX

ROUTE	308.00	6	5	.11909	234.12	9.047	1.42440	1.567	3.072	
COMPUTE NM HYD	T -	1		.00467	12.22	.446	1.79111	1.500	4.087	PER IMP= 85.00
ADD HYD	310.00	1& 5	3	.12376	244.23	9.493	1.43823	1.567	3.083	
COMPUTE NM HYD	U -	1		.01032	24.63	.879	1.59625	1.500	3.729	PER IMP= 70.00
ADD HYD	312.00	1& 3	19	.13408	264.83	10.372	1.45039	1.567	3.086	
COMPUTE NM HYD	V -	11		.03200	66.62	2.281	1.33643	1.500	3.253	PER IMP= 50.00
ADD HYD	SG.AT.82ND 11&19	3		.16608	323.76	12.653	1.42843	1.533	3.046	
ROUTE	314.00	3	5	.16608	322.21	12.653	1.42844	1.567	3.031	
COMPUTE NM HYD	W -	12		.03422	64.02	2.439	1.33643	1.533	2.923	PER IMP= 50.00
ADD HYD	316.00 12& 5	3		.20030	384.09	15.092	1.41271	1.567	2.996	
COMPUTE NM HYD	X -	13		.00674	17.11	.620	1.72616	1.500	3.967	PER IMP= 80.00
ADD HYD	SG.AT.UNSER 13& 3	4		.20704	398.29	15.712	1.42292	1.567	3.006	
ROUTE	318.00	4	5	.20704	399.01	15.712	1.42292	1.567	3.011	
COMPUTE NM HYD	YD -	14		.02964	78.24	2.855	1.80576	1.500	4.125	PER IMP= 85.00

*$ TOTAL UNSER APX 300' S OF AMOLE CHANNEL AT BRIDGE: FUTURE/FULLY DEVELOPED

| ADD HYD | FUT.TO.AMOLE 14& 5 | 7 | | .23668 | 465.36 | 18.567 | 1.47086 | 1.533 | 3.072 | |

*$
*$

*$ INTERIM   INTERIM   INTERIM
*$ INTERIM: RE-USE HYD 312 W/ ID=19, ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST

| ROUTE MCUNGE | 502.00 | 19 | 5 | .13408 | 260.04 | 10.374 | 1.45076 | 1.600 | 3.030 | CCODE = .2 |
| COMPUTE NM HYD | YE - | 15 | | .02964 | 26.19 | .738 | .46670 | 1.533 | 1.380 | PER IMP= .00 |

*$

| ADD HYD | INT.2.AMOLE 15& 5 | 8 | | .16372 | 281.49 | 11.112 | 1.27260 | 1.600 | 2.686 | |

*$

*$ INTERIM W/ V (POINTE WEST)   INTERIM W/ V (POINTE WEST)
*$ RE-USE HYD 312 W/ ID=19, HYD V W/ ID=11, & HYD YE W/ ID=15
*$ ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST

ADD HYD	602.00 19&11	3		.16608	323.76	12.653	1.42843	1.533	3.046	
ROUTE MCUNGE	604.00	3	5	.16608	320.37	12.643	1.42737	1.600	3.014	CCODE = .2
ADD HYD	INT.V.2AMOLE 15& 3	98		.19572	349.94	13.390	1.28279	1.533	2.794	

*$
*$

*$ ALLEY   ALLEY   ALLEY
*$ BASINS B, G, & SITE-I TO ALLEY. BASIN A NOT CONTRIBUTE INTERIM/FUTURE
*$ FUTURE/INTERIM ALLEY FLOWS FOR INFO ONLY; HOLD TO EXISTING CONDITIONS

COMPUTE NM HYD	B -	1		.01520	38.30	1.376	1.69764	1.500	3.937	PER IMP= 76.00
COMPUTE NM HYD	G -	2		.01501	36.62	1.301	1.62555	1.500	3.812	PER IMP= 70.00
ADD HYD	TO.TOP.ALLEY 1& 2	3		.03021	74.92	2.677	1.66180	1.500	3.875	
COMPUTE NM HYD	SITE.I -	1		.00151	3.50	.123	1.53130	1.500	3.624	PER IMP= 65.00
ADD HYD	BOT.ALLEY 1& 3	4		.03172	78.42	2.801	1.65558	1.500	3.863	

FINISH

PAGE : 2

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AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994      RUN DATE (MON/DAY/YR) =11/05/1997
INPUT FILE = CSGIF10B.DAT                                                      USER NO.: PERSEENG.194

                              FROM  TO              PEAK       RUNOFF              TIME TO   CFS      PAGE :  1
                       HYDROGRAPH  ID    ID   AREA    DISCHARGE   VOLUME    RUNOFF   PEAK     PER
            COMMAND   IDENTIFICATION NO.  NO.  (SQ MI)  (CFS)     (AC-FT)  (INCHES) (HOURS)   ACRE     NOTATION

*S FILE CSGIF10A.DAT: Canto / Sunset Gardens, Interim & Future conditions,
*S 10-yr 6-hr storm, version A
*S
*S FOR INTERIM CONDITIONS, THE SUNSET GARDENS STORM DRAIN STOPS AT 82nd ST
*S AND FLOW IS ROUTED IN AN EARTH CHANNEL THROUGH AN UNDEVELOPED BASIN Y
*S TO THE HEAD OF THE AMOLE CHANNEL. SEE RECALLED HYD 314 AND HYD
*S FOR FUTURE, THE SUNSET GARDENS STORM DRAIN CONTINUES TO UNSER THEM
*S NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*S CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*S
*S ALL BASINS --EXCEPT BASIN Y AS NOTED ABOVE-- ARE IN FUTURE FULLY-DEVELOPED
*S CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
*S AND ON ENGINEERING JUDGMENT.
*S
RAINFALL TYPE: 1                                                                                RAIN6:   1.480
COMPUTE NM HYD          I    -    1   .00952    9.84     .321    .63243   1.500   1.615 PER IMP= 38.00
COMPUTE NM HYD          H    -    2   .01501   21.94     .766    .95742   1.500   2.284 PER IMP= 70.00
*S E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD               208.00  1& 2  3   .02453   31.78    1.088    .83127   1.500   2.024
*S DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD          90.S.PAST.SG  3  6   .01508    8.60     .669    .83127   1.367    .891
                    SG.E.OF.90 AND   4   .00945   23.18     .419    .83127   1.500   3.835
*S ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
ROUTE MCUNGE         203.00   4   5   .00945   22.36     .419    .83156   1.567   3.698 CCODE =    .2
COMPUTE NM HYD          J    -    1   .00228    3.71     .133   1.09340   1.500   2.541 PER IMP= 85.00
ADD HYD              210.00  1& 5  3   .01173   25.41     .552    .88241   1.567   3.386
*S CALC CONTRIBUTING PART OF CANTO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD        SITE.II  -   1   .00839   11.35     .398    .88845   1.500   2.113 PER IMP= 65.00
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH (ID=7, HOLD FOR LATER)
DIVIDE HYD          S2.TO.S3   1   2   .00839   11.35     .398    .88841   1.500   2.113
                    S2.TO.86TH AND   7   .00000     .00     .000    .00000  -.033    .000
COMPUTE NM HYD        SITE.III -   1   .02360   31.91    1.118    .88845   1.500   2.112 PER IMP= 65.00
*S TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD               SITE.OUT 1& 2 16   .03199   43.26    1.516    .88843   1.500   2.113
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD              SG.W.OF.86 3&16  5   .04372   66.30    2.068    .88681   1.533   2.370
COMPUTE NM HYD          C    -    1   .00127    2.15     .078   1.14463   1.500   2.651 PER IMP= 90.00
ADD HYD              218.00  1& 7  3   .00127    2.15     .078   1.14442   1.500   2.651
*S COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD              86&SG.N&W 3& 5  7   .04499   68.35    2.145    .89409   1.533   2.374
*S
COMPUTE NM HYD          NN   -    1   .01830   19.79     .655    .67082   1.500   1.690 PER IMP= 42.00
*S ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
ADD HYD              INTO.JYDN 1& 6  3   .03338   28.39    1.323    .74331   1.500   1.329
*S ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
ROUTE MCUNGE         300.00   3   5   .03338   27.42    1.315    .73832   1.600   1.284 CCODE =    .1
COMPUTE NM HYD          NS   -    1   .01719   20.10     .681    .74294   1.500   1.827 PER IMP= 49.80
*S ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
ROUTE MCUNGE         302.00   1   2   .01719   19.12     .675    .73590   1.600   1.738 CCODE =    .1
```

10 YR 11-5-97
REVISED 9'S LAND
TRTMTS @ NN, NS

① ADD HYD SG ABOVE CANTO

① APX DRY UP 10-YR   # ANY SPILLOVER FROM JYD

IUFILE= CSG IP10B.PAT

11-5-97 10-YR

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
ADD HYD	304.00	2& 5	3	.05057	46.55	1.989	.73748	1.600	1.438	
COMPUTE NM HYD	JYD	-	17	.02353	31.81	1.115	.88845	1.500	2.112	PER IMP= 65.00

*S TOTAL FLOW LEAVING JYD (CANYO III), INCLUDING 86TH ST ROW EAST OF JYD

| ADD HYD | JYD.E.AT.86 | 3&17 | 4 | .07410 | 69.68 | 3.104 | .78541 | 1.567 | 1.469 | |

*S ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1% FRICTION SLOPE

| ROUTE MCUNGE | 86.S.OF.SG | 4 | 5 | .07410 | 69.40 | 3.104 | .78533 | 1.600 | 1.463 | CCODE = .2 |

*S *AS IF* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7

| ADD HYD | TOT.SG&86 | 5& 7 | 6 | .11909 | 135.38 | 5.249 | .82641 | 1.533 | 1.776 | |

*S

*S FUTURE/FULL DEVELOPMENT   FUTURE/FULL DEVELOPMENT

*S ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX

ROUTE	308.00	6	5	.11909	134.17	5.249	.82641	1.567	1.760	
COMPUTE NM HYD	T	-	1	.00467	7.59	.272	1.09340	1.500	2.538	PER IMP= 85.00
ADD HYD	310.00	1& 5	3	.12376	140.42	5.521	.83648	1.567	1.773	
COMPUTE NM HYD	U	-	1	.01032	14.66	.517	.93969	1.500	2.219	PER IMP= 70.00
ADD HYD	312.00	1& 3	19	.13408	152.60	6.038	.84442	1.567	1.778	
COMPUTE NM HYD	V	-	11	.03200	36.76	1.254	.73474	1.500	1.795	PER IMP= 50.00
ADD HYD	SG.AT.82ND	11&19	3	.16608	187.38	7.292	.82329	1.533	1.763	
ROUTE	314.00	3	5	.16608	186.17	7.292	.82329	1.567	1.752	
COMPUTE NM HYD	W	-	12	.03422	35.41	1.341	.73474	1.533	1.617	PER IMP= 50.00
ADD HYD	316.00	12& 5	3	.20030	220.23	8.633	.80816	1.567	1.718	
COMPUTE NM HYD	X	-	13	.00674	10.49	.375	1.04216	1.500	2.431	PER IMP= 80.00
ADD HYD	SG.AT.UNSER	13& 3	4	.20704	228.90	9.008	.81577	1.567	1.727	
ROUTE	318.00	4	5	.20704	230.04	9.008	.81577	1.567	1.736	
COMPUTE NM HYD	YD	-	14	.02964	48.72	1.742	1.10226	1.500	2.569	PER IMP= 85.00

*S TOTAL UNSER APX 300' S OF AMOLE CHANNEL AT BRIDGE: FUTURE/FULLY DEVELOPED

| ADD HYD | FUT.TO.AMOLE | 14& 5 | 7 | .23668 | 270.23 | 10.750 | .85165 | 1.567 | 1.784 | |

*S

*S

*S INTERIM   INTERIM   INTERIM

*S INTERIM: RE-USE HYD 312 W/ ID=19, ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST

| ROUTE MCUNGE | 502.00 | 19 | 5 | .13408 | 150.48 | 6.033 | .84373 | 1.600 | 1.754 | CCODE = .2 |
| COMPUTE NM HYD | YE | - | 15 | .02964 | 5.10 | .142 | .08996 | 1.533 | .269 | PER IMP= .00 |

*S

| ADD HYD | INT.2.AMOLE | 15& 5 | 8 | .16372 | 154.77 | 6.176 | .70726 | 1.600 | 1.477 | |

*S

*S INTERIM W/ V (POINTE WEST)   INTERIM W/ V (POINTE WEST)

*S RE-USE HYD 312 W/ ID=19, HYD V W/ ID=11, & HYD YE W/ ID=15

*S ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST

ADD HYD	602.00	19&11	3	.16608	187.38	7.292	.82329	1.533	1.763	
ROUTE MCUNGE	604.00	3	5	.16608	183.87	7.282	.82214	1.600	1.730	CCODE = .2
ADD HYD	INT.V.2AMOLE	15& 3	98	.19572	192.48	7.435	.71223	1.533	1.537	

*S

*S

*S ALLEY   ALLEY   ALLEY

*S BASINS B, G, & SITE-I TO ALLEY. BASIN A NOT CONTRIBUTE INTERIM/FUTURE

*S FUTURE/INTERIM ALLEY FLOWS FOR INFO ONLY; HOLD TO EXISTING CONDITIONS

COMPUTE NM HYD	B	-	1	.01520	23.33	.823	1.01536	1.500	2.398	PER IMP= 76.00
COMPUTE NM HYD	G	-	2	.01501	21.94	.766	.95742	1.500	2.284	PER IMP= 70.00
ADD HYD	TO.TOP.ALLEY	1& 2	3	.03021	45.27	1.590	.98656	1.500	2.341	
COMPUTE NM HYD	SITE.I	-	1	.00151	2.05	.072	.88845	1.500	2.120	PER IMP= 65.00
ADD HYD	BOT.ALLEY	1& 3	4	.03172	47.32	1.661	.98188	1.500	2.331	

FINISH

25× 32×

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AEYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
      RUN DATE (MON/DAY/YR) = 11/05/1997
      START TIME (HR:MIN:SEC) = 12:36:46     USER NO.= PERSEENG.194
      INPUT FILE = CSGIF00B.DAT

* file (tg386) csgif00a.dat   10-15-96
*                 FINISH CODES AT START = 027 038 107 050 083
*                        00000  00000  00000
*                 CONTROL CODES AT END = 0 0 0 0 0
*                        00000  00000  00000
* CONTROL CODES ABOVE FOR HP DESKJET 540 INKJET PRINTER, START IN COL 21

*C PRINT CODES: 0=ALL; 1=TOTALS ONLY; 2=EVERY 2ND + TOTALS; 3,5,10,20 SIMILAR
*C RATING CURVE ID NEGATIVE => COMPUTE BUT NOT PRINT RATING CURVE
*C RATING CURVE n NEGATIVE => FLOODPLAIN SLOPE, n POSITIVE => CHANNEL SLOPE
*S FILE CSGIF00A.DAT: Canto / Sunset Gardens, Interim & Future conditions,
*S (1)00-yr 6-hr storm, version A
*S
*S FOR INTERIM CONDITIONS, THE SUNSET GARDENS STORM DRAIN STOPS AT 82nd ST
*S AND FLOW IS ROUTED IN AN EARTE CHANNEL THROUGH AN UNDEVELOPED BASIN Y
*S TO THE HEAD OF THE AMOLE CHANNEL. SEE RECALLED HYD 314 AND HYD ____
*C
*C FOR INTERIM, FLOW AT 82nd & SUNSET GARDENS --PRIOR TO THE ADDITION OF FLOW
*C BASIN V (POINTE WEST SUBDV)-- IS SAVED FOR LATER RECALL AND ROUTING.
*C THE HYDS DIRECTLY FOLLOWING THE UNSAVED HYD 314 DON'T APPLY TO INTERIM
*C
*S FOR FUTURE, THE SUNSET GARDENS STORM DRAIN CONTINUES TO UNSER THEH
*S NORTH TO THE HEAD OF THE AMOLE CHANNEL. A FULLY DEVELOPED BASIN Y
*S CONTRIBUTES TO THIS FLOW, AS DO BASINS V (POINTE WEST), W, & X.
*S
*S ALL BASINS --EXCEPT BASIN Y AS NOTED ABOVE-- ARE IN FUTURE FULLY-DEVELOPED
*S CONDITONS BASED ON CURRENT ZONING & DEVELOPMENT, CURRENT DEVELOPMENT PLANS,
*S AND ON ENGINEERING JUDGMENT.
*S
*C BASIN & CHANNEL ROUTING PARAMETERS REFLECT THE JUDGMENT OF THE ENGINEER,
*C AND MAY DIFFER FROM OTHER STUDIES IN THE AREA.
*C
*C REVISION NOTES: BASED ON FILES VCF4100 & SGU100.DAT BY TUCKER GREEN P.E.
*C               REVISED 10-15-97 TO REFLECT NEW BASIN BOUNDARIES BASED ON
*C               DISCUSSION WITH THE CITY, THE ENGINEERS FOR SAD 222, AND
*C               DEVELOPERS OF NEARBY PROPERTIES, ESPECIALLY BASINS V & W.
*C               IN PARTICULAR: (1) BASIN M (S OF SUNSET GARDENS, BETWEEN
*C               94TH & 98TH) IS REMOVED FROM INTERIM & FUTURE CONDTION CASES
*C               BY PROPOSED CONSTRUCTION OF 94TH ST; AND (2) THE HIGH POINT
*C               IN 86 ST IS MOVED NORTH TO THE SOUTH PROPERTY LINE OF THE
*C               CANTO III SITE (BASIN JYD).
*C
************************************************************************
* RAINFALLS PER ALBUQUERQUE NM DPM - COMMENT OUT THOSE THAT DON'T APPLY
* TYPE 1 IS 6-HR STORM PER NOAA ATLAS 2 W PEAK INTENSITY @ 1.4 HRS (EQ C1-C5)
*    FOR 6-HR USE DT = 0.033333 HR = 2 MINUTES
* TYPE 2 IS 24-HR STORM PER NOAA ATLAS 2 W PEAK INTENSITY @ 1.4 HRS (EQ C1-C6)
*    FOR 24-HR USE DT = 0.0500 HR = 5 MINUTES
* RAIN QUARTER = 0.0 EXCEPT FOR TYPE 3 (6-HR PMP: SEE AHYMO MANUAL)
*
************************************************************************
*                RAINFALL AMOUNTS, INCHES
* RAINFALL      HUNDRED  TYPE= 2  RAIN QUARTER= 0.0  RAIN ONE= 2.23
*               RAIN SIX= 2.95  RAIN DAY= 3.76  DT= .033333 HR
RAINFALL        HUNDRED  TYPE= 1   0.0   1.90   2.22   2.67   0.033333

         COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
         DT = .033333 HOURS      END TIME =  5.999940 HOURS
             .0000  .0015  .0030  .0046  .0062  .0079  .0096
             .0113  .0130  .0149  .0167  .0186  .0206  .0226
```

```
.0246   .0268   .0290   .0312   .0336   .0360   .0385
.0411   .0438   .0466   .0496   .0526   .0558   .0592
.0627   .0665   .0704   .0757   .0813   .0873   .1002
.1291   .1735   .2373   .3244   .4388   .5847   .7664
.9881  1.1931  1.2789  1.3514  1.4159  1.4745  1.5285
1.5786  1.6255  1.6694  1.7107  1.7497  1.7865  1.8214
1.8544  1.8857  1.9154  1.9436  1.9704  1.9765  1.9822
1.9876  1.9928  1.9977  2.0025  2.0070  2.0114  2.0156
2.0196  2.0235  2.0273  2.0310  2.0346  2.0381  2.0415
2.0448  2.0480  2.0511  2.0542  2.0571  2.0601  2.0629
2.0657  2.0685  2.0712  2.0738  2.0764  2.0789  2.0814
2.0839  2.0863  2.0887  2.0910  2.0933  2.0955  2.0978
2.0999  2.1021  2.1042  2.1063  2.1084  2.1104  2.1124
2.1144  2.1164  2.1183  2.1202  2.1221  2.1240  2.1258
2.1277  2.1295  2.1312  2.1330  2.1347  2.1365  2.1382
2.1399  2.1415  2.1432  2.1448  2.1464  2.1480  2.1496
2.1512  2.1527  2.1543  2.1558  2.1573  2.1588  2.1603
2.1618  2.1633  2.1647  2.1661  2.1676  2.1690  2.1704
2.1718  2.1732  2.1745  2.1759  2.1772  2.1786  2.1799
2.1812  2.1825  2.1838  2.1851  2.1864  2.1876  2.1889
2.1902  2.1914  2.1926  2.1939  2.1951  2.1963  2.1975
2.1987  2.1999  2.2010  2.2022  2.2034  2.2045  2.2057
2.2068  2.2080  2.2091  2.2102  2.2113  2.2124  2.2135
2.2146  2.2157  2.2168  2.2179  2.2189  2.2200
```

```
* RAINFALL        TENYEAR  TYPE= 1   0.0   1.23   1.48   1.78   0.033333
*
*****************************************************************
*****************************************************************
COMPUTE NM HYD      ID= 1    HYD= I         DA=0.00952 SQ MI
                    PER A= 12    B= 26     C= 24     D= 38
                    TP= -0.13333 HRS   RAIN= -1


   K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =  14.279   CFS   UNIT VOLUME =  .9985      B =  526.28   P60 = 1.9000
   AREA =   .003618 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


   K =  .127510HR   TP =  .133330HR   K/TP RATIO =  .956348    SHAPE CONSTANT, N =  3.695043
   UNIT PEAK =  14.799   CFS   UNIT VOLUME =  .9993      B =  334.30   P60 = 1.9000
   AREA =   .005902 SQ MI   IA =   .47097 INCHES   INF =  1.16871 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


PRINT HYD         ID= 1    CODE= 1


                          HYDROGRAPH FROM AREA I


   RUNOFF VOLUME =    1.21467 INCHES   =     .6167 ACRE-FEET
   PEAK DISCHARGE RATE =    18.64 CFS  AT  1.500 HOURS   BASIN AREA =  .0095 SQ. MI.



*
*****************************************************************
COMPUTE NM HYD      ID= 2    HYD= E         DA=0.01501 SQ MI
                    PER A= 0     B= 20     C= 10     D= 70
                    TP= -0.13333 HRS   RAIN= -1

   K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =  41.473   CFS   UNIT VOLUME =  .9991      B =  526.28   P60 = 1.9000
   AREA =   .010507 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

25× 32×

```
     K =  .122603HR    TP =  .133330HR    K/TP RATIO =   .919546     SHAPE CONSTANT, N = 3.849372
     UNIT PEAK =   11.652    CFS   UNIT VOLUME =    .9992     B =   345.00     P60 = 1.9000
     AREA =    .004503 SQ MI    IA =   .45000 INCHES    INF =   1.11000 INChES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID= 2   CODE= 1

                              HYDROGRAPH FROM AREA H


     RUNOFF VOLUME =    1.62555 INCHES      =      1.3013 ACRE-FEET
     PEAK DISCHARGE RATE =       36.62 CFS  AT   1.500 HOURS   BASIN AREA =   .0150 SQ. MI.



*
********************************************************************************
*S E PLUS H PLUS I AT SUNSET GARDENS & 90TH FOLLOWS
ADD HYD            ID OUT= 3   HYD= 208       IDIN I= 1   IDIN II= 2
PRINT HYD          ID= 3   CODE= 1

                              PARTIAL HYDROGRAPH   208.00


     RUNOFF VOLUME =    1.46607 INCHES      =      1.9180 ACRE-FEET
     PEAK DISCHARGE RATE =       55.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0245 SQ. MI.



*
********************************************************************************
*S DIVIDE SO 1ST 8.6 CFS (ID=6) S ON 90TH (ON HOLD): ID=4 E ON SUNSET GARDENS
DIVIDE HYD         ID=3  Q=8.6 ID=6 HYD= 90.S.PAST.SG  ID=4 HYD= SG.E.OF.90
PRINT HYD          ID= 4   CODE= 1

                              HYDROGRAPH FROM AREA SG.E.OF.90


     RUNOFF VOLUME =    1.46607 INCHES      =      1.0956 ACRE-FEET
     PEAK DISCHARGE RATE =       46.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0140 SQ. MI.



PRINT HYD          ID= 6   CODE= 1

                              HYDROGRAPH FROM AREA 90.S.PAST.SG


     RUNOFF VOLUME =    1.46607 INCHES      =       .8224 ACRE-FEET
     PEAK DISCHARGE RATE =        8.60 CFS  AT   1.333 HOURS   BASIN AREA =   .0105 SQ. MI.



*
********************************************************************************
*S ROUTE MAIN FLOW EAST DOWN SG FROM 90TH, FOLLOW IT TO 86TH ST
*C APPROX AS 40' F-F STREET, ASSUME APX 2.35% SLOPE
*C ASSUME AS IF BOTH SIDES PAVED, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                    ELMIN= 0 ELMAX= 4  FT  CHSLP= .0235  FPSLP= .0235  FT/FT
                    n .017  DIST 40
                    DIST  ELEV     DIST  ELEV     DIST  ELEV     DIST  ELEV
                    0      4        .01   0        20    .40      39.99  0
                    40     4
ROUTE MCUNGE        ID= 5   HYD= 209        INFLOW HYD ID= 4   DT= 0.0 HR
                    LENGTH= 1055    NSUBRCH= 0    SLOPE= .0235
```

25× ☐   32× ☐

```
              MATCODE= 0      REGCODE= 0    CCODE= 0
         Inflow ID end= 63   Max Number=600

         dt = .0333 hr   q0 =    23.33 cfs   ck0 = 5.46 fps
         nlen = 4   dlen = 263.75

         Depth Area   Q      Qbar   ck     b    C    D    c1   c2   vel  fr    tt
          ft   sf    cfs     cfs   fps     ft                         fps        hr
          .00   .0     .0     3.3  2.95  10.5 1.34  .02  .99  .15  2.95 1.60  .099
          .21  2.2    6.5    24.6  5.46  30.5 2.48  .02  .99  .43  4.45 1.84  .066
          .42  8.8   42.7    86.0 10.29  40.0 4.68  .03  .99  .65  6.59 2.03  .044
          .63 17.3  129.3   189.2 14.23  40.0 6.47  .05  .99  .73  8.81 2.12  .033
          .84 25.7  249.1   323.0 17.56  40.0 7.99  .07  .98  .78 10.81 2.20  .027
         1.05 34.1  396.9   483.2 20.51  40.0 9.33  .10  .98  .81 12.62 2.27  .023
         1.26 42.5  569.6   667.1 23.18  40.010.54  .12  .98  .83 14.28 2.33  .021
         1.47 50.9  764.7   872.5 25.62  40.011.66  .14  .98  .84 15.82 2.37  .019
         1.68 59.3  980.4  1097.7 27.88  40.012.69  .16  .98  .86 17.27 2.41  .017
         1.89 67.8 1215.1  1341.3 29.99  40.013.64  .18  .98  .87 18.64 2.45  .016
         2.11 76.2 1467.6  1602.1 31.97  40.014.54  .20  .97  .87 19.93 2.48  .015
         2.32 84.6 1736.7  1879.1 33.83  40.015.39  .22  .97  .88 21.16 2.50  .014
         2.53 93.0 2021.5  2171.3 35.59  40.016.19  .25  .97  .89 22.33 2.52  .013
         2.74 101.4 2321.1 2478.0 37.25  40.016.95  .27  .97  .89 23.45 2.54  .012
         2.95 109.9 2634.8 2798.3 38.84  40.017.67  .29  .97  .89 24.53 2.56  .012
         3.16 118.3 2961.8 3131.6 40.34  40.018.36  .31  .97  .90 25.57 2.57  .011
         3.37 126.7 3301.5 3477.4 41.78  40.019.01  .34  .97  .90 26.56 2.59  .011
         3.58 135.1 3653.3 3835.0 43.16  40.019.63  .36  .97  .90 27.52 2.60  .011
         3.79 143.5 4016.7 4204.0 44.47  40.020.23  .38  .96  .91 28.45 2.61  .010
         4.00 152.0 4391.2    .0   .00    .0  .00  .00  .00  .00  .00  .00  .000
         nlen= 4   Outflow ID end= 0
         Route using Ponce procedure: C1 > 0
PRINT HYD          ID= 5   CODE= 1

                        PARTIAL HYDROGRAPH   209.00


         RUNOFF VOLUME =   1.46262 INCHES    =     1.0931 ACRE-FEET
         PEAK DISCHARGE RATE =    46.50 CFS  AT   1.567 HOURS  BASIN AREA =  .0140 SQ. MI.



     *
     ****************************************************************************
COMPUTE NM HYD      ID= 1   HYD= J        DA=0.00228 SQ MI
                    PER A= 0    B= 15    C= 0    D= 85
                    TP= -0.13333 HRS   RAIN= -1


         K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000   SHAPE CONSTANT, N = 7.106420
         UNIT PEAK =  7.6496   CFS  UNIT VOLUME =   .9978     B =   526.28     P60 = 1.9000
         AREA =    .001938 SQ MI    IA =   .10000 INCHES   INF =  .04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


         K =  .130790HR   TP =  .133330HR   K/TP RATIO =  .980950   SHAPE CONSTANT, N = 3.599935
         UNIT PEAK =  .84019   CFS  UNIT VOLUME =   .9837     B =   327.55     P50 = 1.9000
         AREA =    .000342 SQ MI    IA =   .50000 INCHES   INF = 1.25000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID= 1   CODE= 1

                        HYDROGRAPH FROM AREA J


         RUNOFF VOLUME =  1.79112 INCHES   =      .2178 ACRE-FEET
         PEAK DISCHARGE RATE =     5.97 CFS  AT   1.500 HOURS  BASIN AREA =  .0023 SQ. MI.
```

```
+
**************************************************************2
ADD HYD         ID OUT= 3  HYD= 210          IDIN I= 1  IDIN II= 5
PRINT HYD       ID= 3   CODE= 1


                      PARTIAL HYDROGRAPH   210.00


   RUNOFF VOLUME =    1.50855 INCHES    =      1.3108 ACRE-FEET
   PEAK DISCHARGE RATE =    51.44 CFS AT  1.567 HOURS  BASIN AREA =   .0163 SQ. MI.



   +
**********************************************************************
*S CALC CONTRIBUTING PART OF CANYO SITE; THEN ADD TO HYD 210
COMPUTE NM HYD      ID= 1  HYD=SITE.II      DA=0.00839 SQ MI
                    PER A= 0    B= 35    C= 0    D= 65
                    TP= -0.13333 HRS   RAIN= -1


   K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N = 7.106420
   UNIT PEAK =  21.526   CFS  UNIT VOLUME =   .9988    B =   526.28    P60 = 1.9000
   AREA =    .005454 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333


   K =  .130790HR   TP =  .133330HR   K/TP RATIO =  .980950    SHAPE CONSTANT, N = 3.599935
   UNIT PEAK =  7.2141   CFS  UNIT VOLUME =   .9985    B =   327.55    P60 = 1.9000
   AREA =    .002937 SQ MI    IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333

PRINT HYD       ID= 1  CODE= 5


                      HYDROGRAPH FROM AREA SITE.II


   TIME   FLOW      TIME   FLOW      TIME   FLOW      TIME   FLOW      TIME   FLOW
   HRS    CFS       HRS    CFS       HRS    CFS       HRS    CFS       HRS    CFS
   .000    .0       1.500  19.4      3.000   .2       4.500   .1       6.000   .1
   .167    .0       1.667  10.0      3.167   .2       4.667   .1       6.167   .0
   .333    .0       1.833   5.9      3.333   .1       4.833   .1       6.333   .0
   .500    .0       2.000   4.2      3.500   .1       5.000   .1       6.500   .0
   .667    .0       2.167   2.0      3.667   .1       5.167   .1       6.667   .0
   .833    .0       2.333    .9      3.833   .1       5.333   .1       6.833   .0
  1.000    .0       2.500    .6      4.000   .1       5.500   .1
  1.167    .0       2.667    .4      4.167   .1       5.667   .1
  1.333   4.8       2.833    .3      4.333   .1       5.833   .1


   RUNOFF VOLUME =    1.53130 INCHES    =      .6852 ACRE-FEET
   PEAK DISCHARGE RATE =    19.39 CFS AT  1.500 HOURS  BASIN AREA =   .0084 SQ. MI.



   +
*********************************************************************
*S PARTIAL WATERBLOCK ==> FLOW > 11.6cfs TO 86TH (ID=7, HOLD FOR LATER)
DIVIDE HYD      ID=1  Q=11.6  ID=2 HYD=S2.TO.S3   ID=7 HYD=S2.TO.86TH
PRINT HYD       ID= 2  CODE= 5


                      HYDROGRAPH FROM AREA S2.TO.S3


   TIME   FLOW      TIME   FLOW      TIME   FLOW      TIME   FLOW      TIME   FLOW
   HRS    CFS       HRS    CFS       HRS    CFS       HRS    CFS       HRS    CFS
   .000    .0       1.500  11.6      3.000   .2       4.500   .1       6.000   .1
   .167    .0       1.667  10.0      3.167   .2       4.667   .1       6.167   .0
   .333    .0       1.833   5.9      3.333   .1       4.833   .1       6.333   .0
```

25×⬜   32×⬜

.500	.0	2.000	4.2	3.500	.1	5.000	.1	6.500	.0
.667	.0	2.167	2.0	3.667	.1	5.167	.1	6.667	.0
.833	.0	2.333	.9	3.833	.1	5.333	.1	6.833	.0
1.000	.0	2.500	.6	4.000	.1	5.500	.1		
1.167	.0	2.667	.4	4.167	.1	5.667	.1		
1.333	4.8	2.833	.3	4.333	.1	5.833	.1		

RUNOFF VOLUME = 1.53126 INCHES = .6024 ACRE-FEET
PEAK DISCHARGE RATE = 11.60 CFS AT 1.433 HOURS BASIN AREA = .0074 SQ. MI.

PRINT HYD ID= 7 CODE= 5

HYDROGRAPH FROM AREA S2.TO.86TH

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	.333	.0	.667	.0	1.000	.0	1.333	.0
.167	.0	.500	.0	.833	.0	1.167	.0	1.500	7.8

RUNOFF VOLUME = 1.53126 INCHES = .0828 ACRE-FEET
PEAK DISCHARGE RATE = 7.79 CFS AT 1.500 HOURS BASIN AREA = .0010 SQ. MI.

*
****
COMPUTE NM HYD ID= 1 HYD=SITE.III DA=0.02360 SQ MI
PER A= 0 B= 35 C= 0 D= 65
TP= -0.13333 HRS RAIN= -1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 60.549 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.9000
AREA = .015340 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .130790HR TP = .133330HR K/TP RATIO = .980950 SHAPE CONSTANT, N = 3.599955
UNIT PEAK = 20.292 CFS UNIT VOLUME = .9997 B = 327.55 P60 = 1.9000
AREA = .008260 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID= 1 CODE= 2

HYDROGRAPH FROM AREA SITE.III

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.467	49.5	2.933	.6	4.400	.2	5.867	.3
.067	.0	1.533	52.4	3.000	.6	4.467	.2	5.933	.3
.133	.0	1.600	38.6	3.067	.5	4.533	.2	6.000	.3
.200	.0	1.667	28.1	3.133	.5	4.600	.2	6.067	.3
.267	.0	1.733	22.1	3.200	.4	4.667	.2	6.133	.2
.333	.0	1.800	18.2	3.267	.4	4.733	.2	6.200	.1
.400	.0	1.867	15.5	3.333	.4	4.800	.2	6.267	.0
.467	.0	1.933	13.4	3.400	.3	4.867	.2	6.333	.0
.533	.0	2.000	11.8	3.467	.3	4.933	.2	6.400	.0
.600	.0	2.067	10.1	3.533	.3	5.000	.2	6.467	.0
.667	.0	2.133	6.9	3.600	.3	5.067	.2	6.533	.0
.733	.0	2.200	4.5	3.667	.3	5.133	.2	6.600	.0
.800	.0	2.267	3.3	3.733	.3	5.200	.3	6.667	.0
.867	.0	2.333	2.7	3.800	.3	5.267	.3	6.733	.0
.933	.0	2.400	2.2	3.867	.3	5.333	.3	6.800	.0
1.000	.0	2.467	1.8	3.933	.2	5.400	.3	6.867	.0
1.067	.0	2.533	1.5	4.000	.2	5.467	.3	6.933	.0

25× 32×

```
1.133      .0      2.600     1.3     4.067     .2     5.533     .3     7.000     .0
1.200      .6      2.667     1.1     4.133     .2     5.600     .3     7.067     .0
1.267     5.0      2.733      .9     4.200     .2     5.667     .3
1.333    13.6      2.800      .8     4.267     .2     5.733     .3
1.400    28.8      2.867      .7     4.333     .2     5.800     .3
```

```
RUNOFF VOLUME =    1.53130 INCHES     =      1.9274 ACRE-FEET
PEAK DISCHARGE RATE =     54.51 CFS  AT   1.500 HOURS  BASIN AREA =   .0236 SQ. MI.
```

```
*
*******************************************************************************
*S TOTAL FLOW LEAVING CANTO NORTH OF SUNSET GARDENS
ADD HYD            ID OUT= 16  HYD=SITE.OUT    IDIN I= 1   IDIN II= 2
PRINT HYD          ID= 16   CODE= 1
```

                    HYDROGRAPH FROM AREA SITE.OUT

```
RUNOFF VOLUME =    1.53128 INCHES     =      2.5298 ACRE-FEET
PEAK DISCHARGE RATE =     66.11 CFS  AT   1.500 HOURS  BASIN AREA =   .0310 SQ. MI.
```

```
*
*******************************************************************************
*S TOTAL FLOW SUNSET GARDENS WEST OF 86TH
ADD HYD            ID OUT= 5  HYD= SG.W.OF.86    IDIN I= 3   IDIN II= 16
PRINT HYD          ID= 5   CODE= 1
```

                    HYDROGRAPH FROM AREA SG.W.OF.86

```
RUNOFF VOLUME =    1.52344 INCHES     =      3.8406 ACRE-FEET
PEAK DISCHARGE RATE =    115.19 CFS  AT   1.533 HOURS  BASIN AREA =   .0473 SQ. MI.
```

```
*
*******************************************************************************
COMPUTE NM HYD       ID= 1    HYD= C       DA=0.00127 SQ MI
                     PER A= 0     B= 10     C= 0     D= 90
                     TP= -0.13333 HRS   RAIN= -1
```

```
K =  .072665HR    TP =  .133330HR    K/TP RATIO = .545000    SHAPE CONSTANT, N = 7.106420
UNIT PEAK =   4.5116   CFS   UNIT VOLUME =   .9969      B =   526.28    P60 = 1.9000
AREA =   .001143 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

```
K =  .130790HR    TP =  .133330HR    K/TP RATIO = .980950    SHAPE CONSTANT, N = 3.599935
UNIT PEAK =   .31200   CFS   UNIT VOLUME =   .9579      B =   327.55    P60 = 1.9000
AREA =   .000127 SQ MI    IA =   .50000 INCHES   INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

```
PRINT HYD          ID= 1   CODE= 1
```

                    HYDROGRAPH FROM AREA C

```
RUNOFF VOLUME =    1.85607 INCHES     =       .1257 ACRE-FEET
PEAK DISCHARGE RATE =      3.43 CFS  AT   1.500 HOURS  BASIN AREA =   .0013 SQ. MI.
```

25× □   32× □

```
*
************************************************************
*C ADD SPILL FROM S2 TO ROAD FLOW IN 86TH N OF SUNSET GARDENS
ADD HYD          ID OUT= 3  HYD=  218      IDIN I= 1   IDIN II= 7
PRINT HYD        ID= 3   CODE= 1


                   PARTIAL HYDROGRAPH   218.00


   RUNOFF VOLUME =    1.71179 INCHES    =      .2085 ACRE-FEET
   PEAK DISCHARGE RATE =     11.22 CFS  AT  1.500 HOURS   BASIN AREA =   .0023 SQ. MI.



*
************************************************************
*S COMBINED FLOW TO 86TH & SUNSET GARDENS FROM NORTH & WEST; HOLD FOR LATER
ADD HYD          ID OUT= 7  HYD= 86&SG.N&W     IDIN I= 3   IDIN II= 5
PRINT HYD        ID= 7   CODE= 1


                   HYDROGRAPH FROM AREA 86&SG.N&W


   RUNOFF VOLUME =    1.53212 INCHES    =     4.0491 ACRE-FEET
   PEAK DISCHARGE RATE =    125.49 CFS  AT  1.533 HOURS   BASIN AREA =   .0496 SQ. MI.



************************************************************
************************************************************
*S
*C BASIN NN (N North): CURRENTLY PARTLY DEVELOPED
COMPUTE NN HYD    ID= 1   HYD= NN         DA=0.01830  SQ MI
                  PER A= 28.0  B= 20.2   C= 15.4   D= 36.4
                  TP= -0.13333 HRS  RAIN= -1


  K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000    SHAPE CONSTANT, N =  7.106420
  UNIT PEAK =  26.293   CFS  UNIT VOLUME =   .9989     B =  526.28    P60 = 1.9000
  AREA =    .006661 SQ MI    IA =    .10000 INCHES    INF =   .04000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


  K =   .139008HR    TP =   .133330HR    K/TP RATIO =  1.042583    SHAPE CONSTANT, N =  3.386093
  UNIT PEAK =  27.229   CFS  UNIT VOLUME =   .9996     B =  311.92    P60 = 1.9000
  AREA =    .011639 SQ MI    IA =    .52972 INCHES    INF =  1.33321 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


PRINT HYD        ID= 1   CODE= 0


                   HYDROGRAPH FROM AREA NN
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.400	15.4	2.800	.5	4.200	.1	5.600	.1
.033	.0	1.433	22.7	2.833	.5	4.233	.1	5.633	.1
.067	.0	1.467	29.5	2.867	.4	4.267	.1	5.667	.1
.100	.0	1.500	33.0	2.900	.4	4.300	.1	5.700	.1
.133	.0	1.533	32.2	2.933	.4	4.333	.1	5.733	.1
.167	.0	1.567	28.6	2.967	.3	4.367	.1	5.767	.1
.200	.0	1.600	24.4	3.000	.3	4.400	.1	5.800	.1
.233	.0	1.633	20.7	3.033	.3	4.433	.1	5.833	.1
.267	.0	1.667	17.6	3.067	.3	4.467	.1	5.867	.1
.300	.0	1.700	15.1	3.100	.3	4.500	.1	5.900	.1
.333	.0	1.733	13.1	3.133	.3	4.533	.1	5.933	.1
.367	.0	1.767	11.5	3.167	.2	4.567	.1	5.967	.1
.400	.0	1.800	10.2	3.200	.2	4.600	.1	6.000	.1

.433	.0	1.833	9.0	3.233	.2	4.633	.1	6.033	.1
.467	.0	1.867	8.2	3.267	.2	4.667	.1	6.067	.1
.500	.0	1.900	7.5	3.300	.2	4.700	.1	6.100	.1
.533	.0	1.933	6.9	3.333	.2	4.733	.1	6.133	.1
.567	.0	1.967	6.4	3.367	.2	4.767	.1	6.167	.1
.600	.0	2.000	6.0	3.400	.2	4.800	.1	6.200	.0
.633	.0	2.033	5.6	3.433	.2	4.833	.1	6.233	.0
.667	.0	2.067	5.1	3.467	.2	4.867	.1	6.267	.0
.700	.0	2.100	4.4	3.500	.2	4.900	.1	6.300	.0
.733	.0	2.133	3.6	3.533	.2	4.933	.1	6.333	.0
.767	.0	2.167	3.0	3.567	.1	4.967	.1	6.367	.0
.800	.0	2.200	2.5	3.600	.1	5.000	.1	6.400	.0
.833	.0	2.233	2.1	3.633	.1	5.033	.1	6.433	.0
.867	.0	2.267	1.9	3.667	.1	5.067	.1	6.467	.0
.900	.0	2.300	1.7	3.700	.1	5.100	.1	6.500	.0
.933	.0	2.333	1.5	3.733	.1	5.133	.1	6.533	.0
.967	.0	2.367	1.4	3.767	.1	5.167	.1	6.567	.0
1.000	.0	2.400	1.3	3.800	.1	5.200	.1	6.600	.0
1.033	.0	2.433	1.2	3.833	.1	5.233	.1	6.633	.0
1.067	.0	2.467	1.1	3.867	.1	5.267	.1	6.667	.0
1.100	.0	2.500	1.0	3.900	.1	5.300	.1	6.700	.0
1.133	.0	2.533	.9	3.933	.1	5.333	.1	6.733	.0
1.167	.0	2.567	.8	3.967	.1	5.367	.1	6.767	.0
1.200	.3	2.600	.8	4.000	.1	5.400	.1	6.800	.0
1.233	1.0	2.633	.7	4.033	.1	5.433	.1	6.833	.0
1.267	2.2	2.667	.7	4.067	.1	5.467	.1	6.867	.0
1.300	3.8	2.700	.6	4.100	.1	5.500	.1	6.900	.0
1.333	6.0	2.733	.6	4.133	.1	5.533	.1		
1.367	9.7	2.767	.5	4.167	.1	5.567	.1		

```
RUNOFF VOLUME =    1.12653 INCHES   =     1.0995 ACRE-FEET
PEAK DISCHARGE RATE =     32.97 CFS  AT   1.500 HOURS  BASIN AREA =  .0183 SQ. MI.
```

```
*
**********************************************************************
*S ADD IN HYD 90.S.PAST.SG, ('HELD' SPILL SOUTH OF SUNSET GDNS INTERSECTION)
ADD HYD          ID OUT= 3  HYD= INTO.JYDN   IDIN I= 1   IDIN II= 6
PRINT HYD        ID= 3   CODE= 1
```

                    HYDROGRAPH FROM AREA INTO.JYDN

```
RUNOFF VOLUME =    1.25044 INCHES   =     1.9218 ACRE-FEET
PEAK DISCHARGE RATE =     41.57 CFS  AT   1.500 HOURS  BASIN AREA =  .0288 SQ. MI.
```

```
*
**********************************************************************
*S ROUTE NORTH PART OF OFFSITE THROUGH NORTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 1.8% SLOPE
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE CID= -1   VS NO= 1   NO SEGS FOR MANNING n= 1
                ELMIN= 0 ELMAX= 4  FT  CHSLP= .018  FPSLP= .018  FT/FT
                n .017  DIST 28
                DIST ELEV    DIST ELEV    DIST ELEV    DIST ELEV
                 0    4      .01    0      14    .28   27.99   0
                28    4
ROUTE MCUNGE     ID= 5   HYD= 300         INFLOW HYD ID= 3   DT= 0.0 HR
                 LENGTH= 1338   NSUBRCH= 0     SLOPE= .018
                 MATCODE= 0     REGCODE= 0     CCODE= 0
    Inflow ID end=211  Max Number=600

    dt = .0333 hr   q0 =   20.78 cfs   ck0 =  5.86 fps
```

25× ▮□   32× ▮□

```
nlen =  4   dlen =  334.50

Depth  Area     Q      Qbar    ck    b     C    D    c1   c2   vel   fr   tt
 ft    sf      cfs     cfs    fps    ft                          fps       hr
 .00    .0      .0      2.9   2.58  10.5  .93  .02  .98 -.03  2.58 1.40  .144
 .21   2.2      5.7    22.3   5.86  24.5 2.10  .03  .98  .36  4.42 1.72  .084
 .42   7.9     38.8    68.2   9.97  28.0 3.58  .04  .98  .57  6.31 1.79  .059
 .63  13.8     97.6   136.3  13.15  28.0 4.72  .06  .98  .65  8.16 1.86  .046
 .84  19.6    175.0   221.8  15.86  28.0 5.69  .08  .98  .70  9.82 1.93  .038
1.05  25.5    268.5   322.2  18.24  28.0 6.54  .10  .97  .74 11.31 1.98  .033
1.26  31.4    376.0   436.0  20.38  28.0 7.31  .13  .97  .76 12.68 2.02  .029
1.47  37.3    496.1   561.9  22.33  28.0 8.01  .15  .97  .78 13.95 2.05  .027
1.68  43.2    627.7   698.7  24.12  28.0 8.65  .17  .97  .80 15.14 2.08  .025
1.89  49.1    769.8   845.8  25.78  28.0 9.25  .19  .96  .81 16.25 2.10  .023
2.11  55.0    921.7  1002.2  27.32  28.0 9.80  .22  .96  .82 17.30 2.12  .021
2.32  60.9   1082.7  1167.4  28.76  28.010.32  .24  .96  .83 18.29 2.13  .020
2.53  66.8   1252.2  1340.9  30.10  28.010.80  .26  .96  .83 19.23 2.15  .019
2.74  72.7   1429.6  1522.0  31.37  28.011.25  .29  .95  .84 20.13 2.16  .018
2.95  78.6   1614.4  1710.4  32.56  28.011.68  .31  .95  .85 20.98 2.17  .018
3.16  84.5   1806.3  1905.6  33.69  28.012.09  .34  .95  .85 21.80 2.17  .017
3.37  90.4   2004.9  2107.3  34.75  28.012.47  .36  .95  .86 22.58 2.18  .016
3.58  96.3   2209.7  2315.1  35.76  28.012.83  .38  .95  .86 23.34 2.18  .016
3.79 102.1   2420.5  2528.8  36.73  28.013.17  .41  .94  .86 24.06 2.19  .015
4.00 108.0   2637.0     .0    .00    .0  .00  .00  .00  .00   .00  .00  .000
nlen= 4  Outflow ID end=213
Route using Ponce procedure:  C1 > 0
nlen= 4  Outflow ID end=215
Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD        ID= 5 CODE= 1


                    HYDROGRAPH FROM AREA  300.00


RUNOFF VOLUME =      1.24326 INCHES      =       1.9108 ACRE-FEET
PEAK DISCHARGE RATE =      39.88 CFS  AT   1.600 HOURS  BASIN AREA =   .0288 SQ. MI.



*
***********************************************************************************
*C BASIN NS (N South): CURRENTLY PARTLY DEVELOPED
COMPUTE NM HYD       ID= 1    HYD= NS         DA=0.01719 SQ MI
                     PER A= 16.0    B= 28.6   C= 8.8   D= 46.6
                     TP= -0.13333 HRS   RAIN= -1


K =  .072665HR    TP =  .133330HR    K/TP RATIO =   .545000    SHAPE CONSTANT, N = 7.106420
UNIT PEAK =   31.619   CFS   UNIT VOLUME =   .9990      B =   526.28     P60 = 1.9000
AREA =    .008011 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333


K =  .136383HR    TP =  .133330HR    K/TP RATIO = 1.022896    SHAPE CONSTANT, N = 3.450895
UNIT PEAK =   21.806   CFS   UNIT VOLUME =   .9996      B =   316.73     P60 = 1.9000
AREA =    .009179 SQ MI    IA =   .52022 INCHES   INF = 1.30663 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333

PRINT HYD        ID= 1   CODE= 1


                    HYDROGRAPH FROM AREA NS


RUNOFF VOLUME =      1.27301 INCHES      =       1.1671 ACRE-FEET
PEAK DISCHARGE RATE =      34.17 CFS  AT   1.500 HOURS  BASIN AREA =   .0172 SQ. MI.
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25× 32×

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*
****************************************************************************
*S ROUTE SOUTH PART OF OFFSITE THROUGH SOUTH STREET IN JYD
*C APPROX AS 28' F-F STREET, ASSUME APX 2.0% SLOPE (STEEPER THAN NORTH)
*C ASSUME PAVED ROAD, EST n AS .017
COMPUTE RATING CURVE  CID= -1   VS NO= 1   NO SEGS FOR MANNING n= 1
                      ELMIN= 0 ELMAX= 4  FT   CHSLP= .020   FPSLP= .020  FT/FT
                      n .017  DIST 28
                      DIST ELEV    DIST ELEV    DIST ELEV    DIST ELEV
                      0    4     .01  0     14   .28    27.99   0
                      28   4
ROUTE MCUNGE         ID= 2   HYD= 302          INFLOW HYD ID= 1   DT= 0.0 HR
                     LENGTH= 1221    NSUBRCH= 0     SLOPE= .020
                     MATCODE= 0      REGCODE= 0    CCODE= 0
     Inflow ID end=209   Max Number=600

     dt = .0333 hr   q0 =   17.08 cfs   ck0 =  6.17 fps
     nlen = 4   dlen = 305.25

     Depth Area    Q    Qbar  ck    b    C    D   c1   c2   vel  fr   tt
      ft    sf   cfs   cfs  fps   ft                        fps       hr
      .00    .0    .0    3.0 2.72 10.5 1.07  .02  .98  .04 2.72 1.48 .125
      .21   2.2   6.0   23.5 6.17 24.5 2.43  .03  .99  .42 4.65 1.81 .073
      .42   7.9  40.9   71.9 10.51 28.0 4.13  .04  .98  .61 6.65 1.98 .051
      .63  13.8 102.8  143.7 13.86 28.0 5.45  .06  .98  .69 8.60 1.96 .039
      .84  19.6 184.5  233.8 16.72 28.0 6.57  .08  .98  .74 10.35 2.03 .033
     1.05  25.5 283.0  339.6 19.23 28.0 7.56  .10  .98  .77 11.92 2.08 .028
     1.26  31.4 396.3  459.6 21.49 28.0 8.45  .13  .97  .79 13.37 2.13 .025
     1.47  37.3 522.9  592.2 23.54 28.0 9.25  .15  .97  .81 14.71 2.16 .023
     1.68  43.2 661.6  736.5 25.43 28.010.00  .17  .97  .82 15.96 2.19 .021
     1.89  49.1 811.4  891.5 27.17 28.010.68  .19  .97  .83 17.13 2.21 .020
     2.11  55.0 971.6 1056.4 28.80 28.011.32  .21  .97  .84 18.23 2.23 .019
     2.32  60.9 1141.3 1230.6 30.31 28.011.92  .24  .96  .85 19.28 2.25 .018
     2.53  66.8 1319.9 1413.4 31.73 28.012.47  .26  .96  .85 20.27 2.26 .017
     2.74  72.7 1506.9 1604.3 33.06 28.013.00  .28  .96  .86 21.21 2.27 .016
     2.95  78.6 1701.8 1802.9 34.32 28.013.49  .31  .96  .86 22.12 2.28 .015
     3.16  84.5 1904.0 2008.7 35.51 28.013.96  .33  .96  .87 22.98 2.29 .015
     3.37  90.4 2113.3 2221.1 36.63 28.014.40  .35  .95  .87 23.81 2.30 .014
     3.58  96.3 2329.3 2440.4 37.70 28.014.82  .38  .95  .88 24.60 2.30 .014
     3.79 102.1 2551.5 2665.6 38.71 28.015.22  .40  .95  .88 25.36 2.31 .013
     4.00 108.0 2779.7    .0   .00   .0  .00  .00  .00  .00  .00  .00 .000
     nlen= 4   Outflow ID end=206
     Route using Ponce procedure: C1 > 0
PRINT HYD         ID= 2 CODE= 1

                         HYDROGRAPH FROM AREA   302.00


     RUNOFF VOLUME =    1.27335 INCHES     =     1.1674 ACRE-FEET
     PEAK DISCHARGE RATE =      33.65 CFS  AT   1.567 HOURS   BASIN AREA =  .0172 SQ. MI.


*
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*C ADD NORTH & SOUTH ROUTED OFFSITE, THEN COMPUTE & ADD JYD
ADD HYD          ID OUT= 3  HYD= 304        IDIN I= 2  IDIN II= 5
PRINT HYD        ID= 3   CODE= 1

                         HYDROGRAPH FROM AREA   304.00


     RUNOFF VOLUME =    1.25449 INCHES     =     3.0782 ACRE-FEET
     PEAK DISCHARGE RATE =      72.69 CFS  AT   1.600 HOURS   BASIN AREA =  .0460 SQ. MI.
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25× ◨ 32× ◨

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**********************************************************************
COMPUTE NM HYD      ID= 17   HYD= JYD        DA=0.02353 SQ MI
                    PER A= 0    B= 35    C= 0     D= 65
                    TP= -0.13333 HRS   RAIN= -1


   K =   .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N = 7.106420
   UNIT PEAK =  60.370   CFS  UNIT VOLUME =  .9992      B =  526.28    P60 = 1.9000
   AREA =    .015295 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


   K =   .130790HR   TP =  .133330HR   K/TP RATIO =  .980950    SHAPE CONSTANT, N = 3.599935
   UNIT PEAK =  20.232   CFS  UNIT VOLUME =  .9997      B =  327.55    P60 = 1.9000
   AREA =    .008236 SQ MI   IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID= 17   CODE= 2


                          HYDROGRAPH FROM AREA JYD


  TIME    FLOW      TIME    FLOW      TIME    FLOW      TIME    FLOW      TIME    FLOW
  HRS     CFS       HRS     CFS       HRS     CFS       HRS     CFS       HRS     CFS
  .000    .0        1.467   49.3      2.933   .6        4.400   .2        5.867   .3
  .067    .0        1.533   52.2      3.000   .6        4.467   .2        5.933   .3
  .133    .0        1.600   38.5      3.067   .5        4.533   .2        6.000   .3
  .200    .0        1.667   28.0      3.113   .5        4.600   .2        6.067   .3
  .267    .0        1.733   22.0      3.200   .4        4.667   .2        6.133   .2
  .333    .0        1.800   18.2      3.267   .4        4.733   .2        6.200   .1
  .400    .0        1.867   15.4      3.333   .4        4.800   .2        6.267   .0
  .467    .0        1.933   13.4      3.400   .3        4.867   .2        6.333   .0
  .533    .0        2.000   11.8      3.467   .3        4.933   .2        6.400   .0
  .600    .0        2.067   10.1      3.533   .3        5.000   .2        6.467   .0
  .667    .0        2.133   6.9       3.600   .3        5.067   .2        6.533   .0
  .733    .0        2.200   4.5       3.667   .3        5.133   .2        6.600   .0
  .800    .0        2.267   3.3       3.733   .3        5.200   .3        6.667   .0
  .867    .0        2.333   2.6       3.800   .3        5.267   .3        6.733   .0
  .933    .0        2.400   2.2       3.867   .3        5.333   .3        6.800   .0
  1.000   .0        2.467   1.8       3.933   .2        5.400   .3        6.867   .0
  1.067   .0        2.533   1.5       4.000   .2        5.467   .3        6.933   .0
  1.133   .0        2.600   1.3       4.067   .2        5.533   .3        7.000   .0
  1.200   .6        2.667   1.1       4.133   .2        5.600   .3        7.067   .0
  1.267   5.0       2.733   .9        4.200   .2        5.667   .3
  1.333   13.6      2.800   .8        4.267   .2        5.733   .3
  1.400   28.8      2.867   .7        4.333   .2        5.800   .3


  RUNOFF VOLUME =   1.53130 INCHES    =    1.9217 ACRE-FEET
  PEAK DISCHARGE RATE =     54.35 CFS  AT   1.500 HOURS  BASIN AREA =   .0235 SQ. MI.



*
**********************************************************************
*S TOTAL FLOW LEAVING JYD (CANTO III), INCLUDING 86TH ST ROW EAST OF JYD
ADD HYD            ID OUT= 4  HYD= JYD.E.AT.86   IDIN I= 3   IDIN II= 17
PRINT HYD          ID= 4   CODE= 1


                          HYDROGRAPH FROM AREA JYD.E.AT.86


  RUNOFF VOLUME =   1.34815 INCHES    =    4.9998 ACRE-FEET
  PEAK DISCHARGE RATE =    116.71 CFS  AT   1.533 HOURS  BASIN AREA =   .0695 SQ. MI.
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25×⬜   32×⬜

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*************************************************************************
*S ROUTE TO 86TH & SG INTERSECTION, ASSUME 48" PIPE W/ 1½ FRICTION SLOPE
COMPUTE RATING CURVE CID= -1 VSN= 1  CODE= -1  S= .010  D= 4 FT  n= 0.013
ROUTE MCUNGE        ID= 5   HYD= 86.S.OF.SG   INFLOW HYD ID= 4   DT= 0.0 HR
                    LENGTH= 300      NSUBRCH= 0       SLOPE= .010
                    MATCODE= 0       REGCODE= 0       CCODE= 0
      Inflow ID end=215   Max Number=600

      dt = .0333 hr   q0 =    58.35 cfs   ck0 = 14.67 fps
      nlen = 1   dlen = 300.00

      Depth Area    Q     Qbar   ck    b    C     D    c1   c2  vel   fr   tt
      ft    sf   cfs    cfs   fps   ft                        fps       hr
      .00   .0    .0     .4  3.02   .9 1.21  .05  .96  .11 3.02 1.42 .028
      .21   .2    .8    2.0  5.66  2.1 2.26  .06  .97  .40 4.26 1.59 .020
      .42   .7   3.3    5.4  7.74  2.7 3.09  .09  .96  .52 5.58 1.63 .015
      .63  1.3   7.6   10.6  9.44  3.1 3.78  .12  .95  .59 6.75 1.66 .012
      .83  1.9  13.7   17.5 10.88  3.4 4.35  .16  .94  .64 7.78 1.68 .011
     1.04  2.6  21.4   25.9 12.09  3.6 4.84  .20  .93  .67 8.69 1.69 .010
     1.25  3.4  30.5   35.6 13.12  3.8 5.25  .24  .93  .69 9.50 1.68 .009
     1.46  4.1  40.8   46.5 13.98  3.9 5.59  .28  .92  .71 10.21 1.67 .008
     1.67  5.0  52.2   58.3 14.67  4.0 5.87  .33  .91  .72 10.84 1.64 .008
     1.88  5.8  64.3   70.7 15.19  4.0 6.08  .39  .90  .73 11.39 1.61 .007
     2.08  6.6  77.0   83.4 15.54  4.0 6.22  .45  .88  .74 11.86 1.58 .007
     2.29  7.5  89.9   96.3 15.69  4.0 6.28  .51  .87  .74 12.25 1.54 .007
     2.50  8.3 102.7  108.9 15.62  4.0 6.25  .58  .85  .74 12.57 1.51 .007
     2.71  9.1 115.1  120.9 15.27  4.0 6.11  .66  .83  .74 12.81 1.47 .007
     2.92  9.8 126.7  131.9 14.52  4.0 5.81  .76  .80  .74 12.96 1.43 .006
     3.13 10.5 137.1  141.5 13.18  4.0 5.27  .89  .75  .72 13.02 1.39 .006
     3.34 11.2 145.8  148.9 10.71  4.0 4.29 1.16  .64  .69 12.96 1.35 .006
     3.54 11.8 152.0  153.2  5.41  4.0 2.16 2.36  .14  .64 12.76 1.30 .007
     3.75 12.2 154.5  154.5   .00  4.0  .00***** -1.00 1.00 12.46 1.25 .007
     4.00 12.6 154.5    .0    .00   .0  .00  .00  .00  .00  .00  .00 .000
      nlen= 1   Outflow ID end=215
      Route using Ponce procedure:  C1 > 0
      nlen= 1   Outflow ID end=216
      Route using Maidment procedure:  C0, C1 & C2 > 0
PRINT HYD       ID= 5 CODE= 1


                        HYDROGRAPH FROM AREA 86.S.OF.SG


      RUNOFF VOLUME =    1.34764 INCHES    =     4.9979 ACRE-FEET
      PEAK DISCHARGE RATE =     116.55 CFS  AT   1.567 HOURS  BASIN AREA =  .0695 SQ. MI.


*
*************************************************************************
*S *AS IF* COMBINED FLOWS AT 86TH & SUNSET GARDENS: RETRIEVE 'ON-HOLD' ID=7
ADD HYD         ID OUT= 6  HYD= TOT.SG&86   IDIN I= 5   IDIN II= 7
PRINT HYD       ID= 6   CODE= 2


                        HYDROGRAPH FROM AREA TOT.SG&86

     TIME    FLOW     TIME    FLOW     TIME    FLOW     TIME    FLOW     TIME    FLOW
     HRS     CFS      HRS     CFS      HRS     CFS      HRS     CFS      HRS     CFS
     .000    .0      1.467   180.7    2.933   3.5     4.400   1.0     5.867   1.3
     .067    .0      1.533   235.7    3.000   3.1     4.467   1.0     5.933   1.3
     .133    .0      1.600   211.8    3.067   2.7     4.533   1.0     6.000   1.3
     .200    .0      1.667   165.8    3.133   2.4     4.600   1.0     6.067   1.3
     .267    .0      1.733   125.4    3.200   2.2     4.667   1.0     6.133   1.1
     .333    .0      1.800    98.8    3.267   2.0     4.733   1.0     6.200    .8
     .400    .0      1.867    80.9    3.333   1.8     4.800   1.0     6.267    .6
     .467    .0      1.933    68.5    3.400   1.7     4.867   1.0     6.333    .3
```

25× □   32× □

.533	.0	2.000	60.5	3.467	1.6	4.933	1.1	6.400	.2
.600	.0	2.067	51.9	3.533	1.5	5.000	1.1	6.467	.1
.667	.0	2.133	40.9	3.600	1.4	5.067	1.1	6.533	.1
.733	.0	2 200	30.8	3.667	1.3	5.133	1.1	6.600	.1
.800	.0	2.267	22.5	3.733	1.3	5.200	1.1	6.667	.0
.867	.0	2.333	16.4	3.800	1.2	5.267	1.1	6.733	.0
.933	.0	2.400	13.2	3.867	1.2	5.333	1.1	6.800	.0
1.000	.0	2.467	10.9	3.933	1.1	5.400	1.1	6.867	.0
1.067	.0	2.533	9.0	4.000	1.1	5.467	1.2	6.933	.0
1.133	.0	2.600	7.5	4.067	1.1	5.533	1.2	7.000	.0
1.200	1.0	2.667	6.4	4.133	1.1	5.600	1.2	7.067	.0
1.267	10.8	2.733	5.4	4.200	1.1	5.667	1.2	7.133	.0
1.333	32.2	2.800	4.6	4.267	1.0	5.733	1.2		
1.400	77.4	2.867	4.0	4.333	1.0	5.800	1.3		

```
RUNOFF VOLUME =    1.42440 INCHES    =      9.0470 ACRE-FEET
PEAK DISCHARGE RATE =   235.70 CFS  AT   1.533 HOURS   BASIN AREA =   .1191 SQ. MI.
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*
***************************************************************************
***************************************************************************
*S
*S FUTURE/FULL DEVELOPMENT          FUTURE/FULL DEVELOPMENT
*S ROUTE 86TH TO 82ND IN SUNSET GARDENS: CONC PIPE; Sf=.01 APX
*C IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*C VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S NOT USED BY PROG; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
              SLOPE= .01   DIAM= 5.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01
```

```
                    TRAVEL TIME TABLE
                         REACH= 11.0

              WATER    AVERAGE   FLOW    TRAVEL
              DEPTH    AREA      RATE    TIME
              FEET     SQ.FT.    CFS     HRS
               .261      .390     1.37   .0873
               .521     1.086     5.93   .0559
               .782     1.961    13.79   .0435
              1.042     2.966    24.80   .0365
              1.303     4.069    38.72   .0321
              1.563     5.246    55.24   .0290
              1.824     6.479    74.01   .0267
              2.084     7.749    94.62   .0250
              2.345     9.043   116.65   .0237
              2.606    10.345   139.60   .0226
              2.866    11.641   162.98   .0218
              3.127    12.918   186.22   .0212
              3.387    14.159   208.72   .0207
              3.648    15.348   229.78   .0204
              3.908    16.467   248.64   .0202
              4.169    17.492   264.32   .0202
              4.429    18.395   275.55   .0204
              4.690    19.130   280.16   .0209
              5.000    19.635   280.16   .0214
ROUTE          ID= 5   HYD= 308   IN ID= 6   DT= 0.0
PRINT HYD      ID= 5   CODE= 1

                    HYDROGRAPH FROM AREA  308.00

    RUNOFF VOLUME =   1.42440 INCHES   =       9.0470 ACRE-FEET
    PEAK DISCHARGE RATE =    234.12 CFS  AT   1.567 HOURS   BASIN AREA =   .1191 SQ. MI.
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25×⬛ 32×⬛

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***********************************************************************
* BASIN T
COMPUTE NM HYD      ID= 1    HYD= T         DA= .00467 SQ MI
                    PER A= 0    B= 15    C= 0    D= 85
                    TP= -0.13333 HRS   RAIN= -1

   K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =  15.668   CFS   UNIT VOLUME =  .9987    B =  526.28    P60 = 1.9000
   AREA =   .003970 SQ MI    IA =  .10000 INCHES   INF =  .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333


   K =  .130790HR   TP =  .133330HR   K/TP RATIO =  .980950    SHAPE CONSTANT, N =  3.599935
   UNIT PEAK =  1.7209   CFS   UNIT VOLUME =  .9926    B =  327.55    P60 = 1.9000
   AREA =   .000701 SQ MI    IA =  .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333

PRINT HYD         ID= 1  CODE= 1

                         HYDROGRAPH FROM AREA T


   RUNOFF VOLUME =   1.79111 INCHES    =       .4461 ACRE-FEET
   PEAK DISCHARGE RATE =    12.22 CFS  AT  1.500 HOURS  BASIN AREA =  .0047 SQ. MI.


*
***********************************************************************
ADD HYD           ID OUT= 3  HYD= 310    IDIN I= 1   IDIN II= 5
PRINT HYD         ID= 3  CODE= 1

                         HYDROGRAPH FROM AREA  310.00


   RUNOFF VOLUME =   1.43823 INCHES    =      9.4931 ACRE-FEET
   PEAK DISCHARGE RATE =   244.23 CFS  AT  1.567 HOURS  BASIN AREA =  .1238 SQ. MI.


*
***********************************************************************
* BASIN U
COMPUTE NM HYD      ID= 1    HYD= U         DA= .01032 SQ MI
                    PER A= 0    B= 30    C= 0    D= 70
                    TP= -0.13333 HRS   RAIN= -1

   K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =  28.514   CFS   UNIT VOLUME =  .9990    B =  526.28    P60 = 1.9000
   AREA =   .007224 SQ MI    IA =  .10000 INCHES   INF =  .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333


   K =  .130790HR   TP =  .133330HR   K/TP RATIO =  .980950    SHAPE CONSTANT, N =  3.599935
   UNIT PEAK =  7.6059   CFS   UNIT VOLUME =  .9985    B =  327.55    P60 = 1.9000
   AREA =   .003096 SQ MI    IA =  .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033333

PRINT HYD         ID= 1  CODE= 1

                         HYDROGRAPH FROM AREA U


   RUNOFF VOLUME =   1.59625 INCHES    =       .8786 ACRE-FEET
```

25× □   32× □

PEAK DISCHARGE RATE =   24.63 CFS AT   1.500 HOURS   BASIN AREA =   .0103 SQ. MI.

```
*
****************************************************:***************************
*C NOTE LARGE ID# - WILL RE-USE THIS HYD LATER
ADD HYD            ID OUT= 19   HYD= 312    IDIN I= 1   IDIN II= 3
PRINT HYD          ID= 19  CODE= 1

                          HYDROGRAPH FROM AREA   312.00


   RUNOFF VOLUME =    1.45039 INCHES    =     10.3716 ACRE-FEET
   PEAK DISCHARGE RATE =    264.83 CFS  AT   1.567 HOURS  BASIN AREA =   .1341 SQ. MI.


*
********************************************************************************
* BASIN V: % IMPERV A LA POINTE WEST DESIGN & DENSITY
COMPUTE NM HYD     ID= 11   HYD= V             DA= .03200 SQ MI
                   PER A= 0     B= 50    C= 0     D= 50
                   TP= -0.13333 HRS   RAIN= -1

   K =   .072665HR   TP =  .133330HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N = 7.106420
   UNIT PEAK =   63.155   CFS  UNIT VOLUME =   .9992       B =   526.28     P60 = 1.9000
   AREA =    .016000 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


   K =   .130790HR   TP =  .133330HR   K/TP RATIO =  .980950    SHAPE CONSTANT, N = 3.599935
   UNIT PEAK =   39.307   CFS  UNIT VOLUME =   1.000       B =   327.55     P60 = 1.9000
   AREA =    .016000 SQ MI    IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID= 11  CODE= 1

                          HYDROGRAPH FROM AREA V


   RUNOFF VOLUME =   1.33643 INCHES    =     2.2808 ACRE-FEET
   PEAK DISCHARGE RATE =    66.62 CFS  AT   1.500 HOURS  BASIN AREA =   .0320 SQ. MI.


*
********************************************************************************
ADD HYD            ID OUT= 3  HYD= SG.AT.82ND    IDIN I= 11   IDIN II= 19
PRINT HYD          ID= 3  CODE= 1

                          HYDROGRAPH FROM AREA SG.AT.82ND


   RUNOFF VOLUME =   1.42843 INCHES    =    12.6524 ACRE-FEET
   PEAK DISCHARGE RATE =    323.76 CFS  AT   1.533 HOURS  BASIN AREA =   .1661 SQ. MI.


*
********************************************************************************
*C ROUTE TO UNSER IN CONC PIPE; Sf=.01 APX AVG
*C IF EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*C VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
*C AVAIL SLOPE BTW UNSER/AMOLE & SG/82 APX .01 AVG.
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
```

25× I□   32× I□

```
                     SLOPE= .01   DIAM= 5.5 FT   n= .013
   COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 1100 FT   S= .01

                        TRAVEL TIME TABLE
                              REACH= 11.0

                        WATER      AVERAGE    FLOW      TRAVEL
                        DEPTH      AREA       RATE      TIME
                        FEET       SQ.FT.     CFS       HRS
                         .287       .472       1.76      .0819
                         .573      1.314       7.65      .0525
                         .860      2.373      17.78      .0408
                        1.146      3.589      31.97      .0343
                        1.433      4.923      49.92      .0301
                        1.720      6.348      71.23      .0272
                        2.006      7.839      95.43      .0251
                        2.293      9.377     122.00      .0235
                        2.579     10.942     150.40      .0222
                        2.866     12.518     180.00      .0212
                        3.153     14.086     210.14      .0205
                        3.439     15.630     240.11      .0199
                        3.726     17.132     269.11      .0195
                        4.013     18.571     296.28      .0192
                        4.299     19.925     320.59      .0190
                        4.586     21.166     340.81      .0190
                        4.872     22.258     355.29      .0191
                        5.159     23.147     361.23      .0196
                        5.500     23.758     361.23      .0201
   ROUTE           ID= 5   HYD= 314   IN ID= 3   DT= 0.0
   PRINT HYD       ID= 5   CODE= 1

                        HYDROGRAPH FROM AREA   314.00


      RUNOFF VOLUME =    1.42844 INCHES    =      12.6524 ACRE-FEET
      PEAK DISCHARGE RATE =    322.21 CFS  AT   1.567 HOURS   BASIN AREA =   .1661 SQ. MI.



   ***********************************************************************
   *C BASIN W: % IMPERV A LA POINTE WEST DESIGN & DENSITY: SAME OWNER & ENGR
   *C BASIN W IS ONLY BASIN W Tp (&Tc) > REGULATORY MINIMUM
   COMPUTE NM HYD      ID= 12    HYD= W           DA= .03422 SQ MI
                      PER A= 0    B= 50    C= 0    D= 50
                      TP= -0.16325 HRS   RAIN= -1

     K = .088971HR   TP = .163250HR   K/TP RATIO = .545000   SHAPE CONSTANT, N = 7.106420
     UNIT PEAK =  55.158  CFS  UNIT VOLUME = .9997     B = 526.28   P60 = 1.9000
     AREA =   .017110 SQ MI   IA =  .10000 INCHES   INF =  .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333


     K = .160140HR   TP = .163250HR   K/TP RATIO = .980950   SHAPE CONSTANT, N = 3.599930
     UNIT PEAK =  34.330  CFS  UNIT VOLUME = .9998     B = 327.55   P60 = 1.9000
     AREA =   .017110 SQ MI   IA =  .50000 INCHES   INF =  1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

   PRINT HYD      ID= 12   CODE= 1

                        HYDROGRAPH FROM AREA W


      RUNOFF VOLUME =    1.33643 INCHES    =       2.4391 ACRE-FEET
      PEAK DISCHARGE RATE =     64.02 CFS  AT   1.533 HOURS   BASIN AREA =   .0342 SQ. MI.
```

25× □   32× □

```
*
****************************************************************************
ADD HYD          ID OUT= 3  HYD= 316    IDIN I= 12   IDIN II= 5
PRINT HYD        ID= 3   CODE= 1

                           HYDROGRAPH FROM AREA   316.00


   RUNOFF VOLUME =    1.41271 INCHES    =      15.0915 ACRE-FEET
   PEAK DISCHARGE RATE =    384.09 CFS  AT   1.567 HOURS   BASIN AREA =   .2003 SQ. MI.



*
****************************************************************************
* BASIN X: R.O.W. FOR SUNSET GARDENS AND (LIMITED ACCESS) UNSER
COMPUTE NM HYD       ID= 13    HYD= X        DA= .00674 SQ MI
                     PER A= 0    B= 20    C= 0    D= 80
                     TP= -0.13333 HRS   RAIN= -1


   K =   .072665HR   TP =  .133330HR   K/TP RATIO =  .545000   SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   21.283  CFS   UNIT VOLUME =   .9988     B =   526.28    P60 = 1.9000
   AREA =      .005392 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


   K =   .130790HR   TP =  .133330HR   K/TP RATIO =  .980950   SHAPE CONSTANT, N =  3.599935
   UNIT PEAK =    3.3116  CFS   UNIT VOLUME =   .9961     B =   327.55    P60 = 1.9000
   AREA =      .001348 .Q MI   IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD        ID= 13   CODE= 1

                           HYDROGRAPH FROM AREA X


   RUNOFF VOLUME =    1.72616 INCHES    =       .6205 ACRE-FEET
   PEAK DISCHARGE RATE =     17.11 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.



*
****************************************************************************
ADD HYD          ID OUT= 4  HYD= SG.AT.UNSER   IDIN I= 13   IDIN II= 3
PRINT HYD        ID= 4   CODE= 1

                           HYDROGRAPH FROM AREA SG.AT.UNSER


   RUNOFF VOLUME =    1.42292 INCHES    =      15.7120 ACRE-FEET
   PEAK DISCHARGE RATE =    398.29 CFS  AT   1.567 HOURS   BASIN AREA =   .2070 SQ. MI.



*
****************************************************************************
*C ROUTE TO UNSER 340 FT N OF SG (APX HALF DIST TO AMOLE CHAN); Sf=.01 APX
*C EST DIAM SMALL => TRAVEL FASTER => DNSTR PEAK HIGHER => CONSERVATIVE
*C VALLEY SEGMENT & REACH NUMBERS ARE USER ID'S ONLY; DUMMIES HERE
COMPUTE RATING CURVE CID= -1   VS NO= 11   NO SEGS FOR MANNING n= -1
                     SLOPE= .01   DIAM= 6.0 FT   n= .013
COMPUTE TRAVEL TIME  ID= 5   REACH= 11   NO VS= 1   L= 340 FT   S= .01

                     TRAVEL TIME TABLE
                          REACH= 11.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.22	.0239
.625	1.564	9.64	.0153
.938	2.824	22.42	.0119
1.251	4.271	40.32	.0100
1.563	5.859	62.96	.0088
1.876	7.554	89.83	.0079
2.189	9.329	120.35	.0073
2.501	11.159	153.87	.0068
2.814	13.022	189.68	.0065
3.127	14.897	227.01	.0062
3.439	16.764	265.02	.0060
3.752	18.601	302.81	.0058
4.065	20.388	339.39	.0057
4.377	22.101	373.65	.0056
4.690	23.712	404.31	.0055
5.003	25.189	429.82	.0055
5.315	26.489	448.07	.0056
5.628	27.547	455.57	.0057
6.000	28.274	455.57	.0059

```
ROUTE           ID= 5   HYD= 318   IN ID= 4   DT= 0.0
PRINT HYD       ID= 5   CODE= 1
```

HYDROGRAPH FROM AREA   318.00

```
RUNOFF VOLUME =      1.42292 INCHES    =      15.7120 ACRE-FEET
PEAK DISCHARGE RATE =      399.01 CFS  AT   1.567 HOURS   BASIN AREA =   .2070 SQ. MI.
```

```
*************************************************************************
* BASIN Y DEVELOPED: EST ENTIRE SITE; ZONING = 0-1; USE % IMPERV AS FOR C-2
* WHEN BUILT, N APX 200' POSS DRAIN TO BRIDGE PER GREINER FOR BRIDGE BLVD SD
COMPUTE NM HYD      ID= 14   HYD= YD           DA= .02964 SQ MI
                    PER A= 0      B= 10      C= 5      D= 85
                    TP= -0.13333 HRS   RAIN= -1

K =   .072665HR    TP =   .133330HR   K/TP RATIO =   .545000    SHAPE CONSTANT, N = 7.106420
UNIT PEAK =   99.445   CFS  UNIT VOLUME =    .9993     B =  526.28     P60 = 1.9000
AREA =    .025194 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


K =   .122603HR    TP =   .133330HR   K/TP RATIO =   .919546    SHAPE CONSTANT, N = 3.849372
UNIT PEAK =   11.504   CFS  UNIT VOLUME =    .9992     B =  345.00     P60 = 1.9000
AREA =    .004446 SQ MI    IA =   .45000 INCHES   INF =  1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD       ID= 14   CODE= 1
```

HYDROGRAPH FROM AREA YD

```
RUNOFF VOLUME =      1.80576 INCHES    =       2.8545 ACRE-FEET
PEAK DISCHARGE RATE =       78.24 CFS  AT   1.500 HOURS   BASIN AREA =   .0296 SQ. MI.


*
*************************************************************************
*S TOTAL UNSER APX 300' S OF AMOLE CHANNEL AT BRIDGE: FUTURE/FULLY DEVELOPED
ADD HYD             ID OUT= 7   HYD= FUT.TO.AMOLE   IDIN I= 14   IDIN II= 5
```

25× ▯ 32× ▯

```
PRINT HYD          ID= 7   CODE= 1

                    HYDROGRAPH FROM AREA FUT.TO.AMOLE


   RUNOFF VOLUME =    1.47086 INCHES    =      18.5665 ACRE-FEET
   PEAK DISCHARGE RATE =    465.36 CFS  AT   1.533 HOURS  BASIN AREA =  .2367 SQ. MI.



*
**********************************************************************************
***********************************************************************************
*S
*S
*S INTERIM            INTERIM                  INTERIM
*S INTERIM: RE-USE HYD 312 W/ ID=19, ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST
*C APPROX AS 12' BOTTOM, 3H:1V SIDESLOPES, n=.030, L APX 1250, S=.005
COMPUTE RATING CURVE CID= -1   VS NO= 1   NO SEGS FOR MANNING n= 1
                     ELMIN= 0 ELMAX= 8  FT  CHSLP= .005  FPSLP= .005   FT/FT
                     n .030  DIST 60
                     DIST ELEV    DIST ELEV    DIST ELEV    DIST ELEV
                      0    8       24    0      36    0      60    8
ROUTE MCUNGE         ID= 5  HYD= 502      INFLOW HYD ID= 19  DT= 0.0 HR
                     LENGTH= 1250    NSUBRCH= 0      SLOPE= .005
                     MATCODE= 0      REGCODE= 0      CCODE= 0
   Inflow ID end=222  Max Number=600

   dt = .0333 hr  q0 =   132.42 cfs  ck0 =  6.19 fps
   nlen = 3  dlen = 416.67

   Depth  Area     Q    Qbar    ck    b     C    D    c1   c2   vel   fr    tt
    ft     sf    cfs    cfs    fps   ft                          fps         hr
   .00     .0     .0     5.1  1.84   7.3  .53  .18   .78 -.17  1.84  .52  .189
   .42    5.6   10.3    22.1  3.56  15.8 1.03  .19   .83  .10  2.48  .58  .140
   .84   12.2   34.0    51.°  4.64  18.3 1.34  .29   .78  .24  3.22  .61  .108
  1.26   19.9   69.8    93.8  5.48  20.8 1.58  .39   .73  .33  3.85  .63  .090
  1.68   28.7  117.8   148.3  6.19  23.4 1.78  .49   .70  .39  4.41  .65  .079
  2.11   38.6  178.8   216.0  6.83  25.9 1.97  .59   .67  .44  4.91  .66  .071
  2.53   49.5  253.3   297.7  7.42  28.4 2.14  .68   .64  .48  5.37  .68  .065
  2.95   61.4  342.1   394.0  7.97  30.9 2.29  .77   .62  .51  5.80  .69  .060
  3.37   74.5  445.9   505.7  8.49  33.5 2.44  .85   .60  .53  6.20  .70  .056
  3.79   88.6  565.5   633.6  8.98  36.0 2.59  .94   .58  .56  6.59  .71  .053
  4.21  103.7  701.7   778.4  9.46  38.5 2.72 1.03   .57  .58  6.96  .72  .050
  4.63  119.9  855.1   940.9  9.92  41.1 2.86 1.11   .55  .60  7.32  .73  .047
  5.05  137.2 1026.6  1121.7 10.36  43.6 2.99 1.19   .54  .61  7.66  .74  .045
  5.47  155.6 1216.6  1321.6 10.80  46.1 3.11 1.27   .53  .63  8.00  .74  .043
  5.89  175.0 1426.4  1541.3 11.22  48.6 3.23 1.36   .51  .64  8.32  .75  .042
  6.32  195.5 1656.2  1781.5 11.63  51.2 3.35 1.44   .50  .65  8.64  .76  .C40
  6.74  217.0 1906.8  2042.9 12.04  53.7 3.47 1.52   .49  .67  8.95  .76  .039
  7.16  239.6 2178.9  2326.1 12.44  56.2 3.58 1.60   .48  .68  9.25  .77  .038
  7.58  263.3 2473.5  2631.9 12.82  58.7 3.69 1.68   .47  .69  9.55  .78  .036
  8.00  288.0 2790.4    .0    .00    .0  .00  .00   .00  .00   .00  .00  .000
   nlen= 3  Outflow ID end=228
   Route using Ponce procedure: C1 > 0
PRINT HYD          ID= 5   CODE= 1

                    OUTFLOW HYDROGRAPH RESERVOIR  502.00


   RUNOFF VOLUME =    1.45076 INCHES    =      10.3742 ACRE-FEET
   PEAK DISCHARGE RATE =    260.04 CFS  AT   1.600 HOURS  BASIN AREA =  .1341 SQ. MI.
```

25× ☐   32× ☐

```
****************************************************************************
* BASIN YE
COMPUTE NM HYD      ID= 15   HYD= YE          DA=0.02964 SQ MI
                    PER A= 97   B= 0     C= 3    D= 0
                    TP= -0.13333 HRS   RAIN= -1


   K = .161262HR   TP = .133330HR   K/TP RATIO = 1.209496   SHAPE CONSTANT, N = 2.939924
   UNIT PEAK = 61.553  CFS  UNIT VOLUME = .9995    B = 276.89   P60 = 1.9000
   AREA = .029640 SQ MI   IA = .64100 INCHES   INF = 1.64480 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333


PRINT HYD          ID= 15   CODE= 1

                         HYDROGRAPH FROM AREA YE


   RUNOFF VOLUME =     .46670 INCHES   =       .7378 ACRE-FEET
   PEAK DISCHARGE RATE =    26.19 CFS  AT   1.533 HOURS  BASIN AREA = .0296 SQ. MI.



*
****************************************************************************
*S
ADD HYD            ID OUT= 8  HYD= INT.2.AMOLE   IDIN I= 15   IDIN II= 5
PRINT HYD          ID= 8   CODE= 1

                         HYDROGRAPH FROM AREA INT.2.AMOLE


   RUNOFF VOLUME =   1.27260 INCHES   =     11.1120 ACRE-FEET
   PEAK DISCHARGE RATE =   281.49 CFS  AT   1.600 HOURS  BASIN AREA = .1637 SQ. MI.



*
****************************************************************************
****************************************************************************
*S
*S INTERIM W/ V (POINTE WEST)              INTERIM W/ V (POINTE WEST)
*S RE-USE HYD 312 W/ ID=19, HYD V W/ ID=11, & HYD YE W/ ID=15
*S ROUTE IN DIRT CHAN ACROSS BASIN Y EXIST
ADD HYD            ID OUT= 3  HYD= 602      IDIN I= 19   IDIN II= 11
PRINT HYD          ID= 3   CODE= 1

                         HYDROGRAPH FROM AREA   602.00


   RUNOFF VOLUME =   1.42843 INCHES   =     12.6524 ACRE-FEET
   PEAK DISCHARGE RATE =   323.76 CFS  AT   1.533 HOURS  BASIN AREA = .1661 SQ. MI.



*
****************************************************************************
*C APPROX AS 12' BOTTOM, 3H:1V SIDESLOPES, n=.030, L APX 1250, S=.005
COMPUTE RATING CURVE CID= -1   VS NO= 1    NO SEGS FOR MANNING n= 1
                    ELMIN= 0 ELMAX= 8 FT  CHSLP= .005   FPSLP= .005   FT/FT
                    n .030  DIST 60
                    DIST ELEV    DIST ELEV    DIST ELEV    DIST ELEV
                     0    8       24   0       36    0      60    8
ROUTE MCUNGE       ID= 5   HYD= 604     INFLOW HYD ID= 3  DT= 0.0 HR
                    LENGTH= 1250   NSUBRCH= 0     SLOPE= .005
                    MATCODE= 0     REGCODE= 0    CCODE= 0
      Inflow ID end=222  Max Number=600
```

25 × □   32 × □

```
dt = .0333 hr   q0 =  161.88 cfs   ck0 =  6.19 fps
nlen = 3   dlen =  416.67

Depth  Area     Q     Qbar    ck    b     C     D    c1    c2   vel   fr    tt
 ft     sf    cfs    cfs     fps   ft                           fps         hr
 .00    .0      .0     5.1  1.84   7.3   .53   .18   .78  -.17  1.84  .52  .189
 .42    5.6   10.3    22.1  3.56  15.8  1.03   .19   .83   .10  2.48  .58  .140
 .84   12.2   34.0    51.9  4.64  18.3  1.34   .29   .78   .24  3.22  .61  .108
1.26   19.9   69.8    93.8  5.48  20.8  1.58   .39   .73   .33  3.85  .63  .090
1.68   28.7  117.8   148.3  6.19  23.4  1.78   .49   .70   .39  4.41  .65  .079
2.11   38.6  178.8   216.0  6.83  25.9  1.97   .59   .67   .44  4.91  .66  .071
2.53   49.5  253.3   297.7  7.42  28.4  2.14   .68   .64   .48  5.37  .68  .065
2.95   61.4  342.1   394.0  7.97  30.9  2.29   .77   .62   .51  5.80  .69  .060
3.37   74.5  445.9   505.7  8.49  33.5  2.44   .85   .60   .53  6.20  .70  .056
3.79   88.6  565.5   633.6  8.98  36.0  2.59   .94   .58   .56  6.59  .71  .053
4.21  103.7  701.7   778.4  9.46  38.5  2.72  1.03   .57   .58  6.96  .72  .050
4.63  119.9  855.1   940.9  9.92  41.1  2.86  1.11   .55   .60  7.32  .73  .047
5.05  137.2 1026.6  1121.7 10.36  43.6  2.99  1.19   .54   .61  7.66  .74  .045
5.47  155.6 1216.8  1321.6 10.80  46.1  3.11  1.27   .53   .63  8.00  .74  .043
5.89  175.0 1426.4  1541.3 11.22  48.6  3.23  1.36   .51   .64  8.32  .75  .042
6.32  195.5 1656.2  17B1.5 11.63  51.2  3.35  1.44   .50   .65  8.64  .76  .040
6.74  217.0 1906.8  2042.9 12.04  53.7  3.47  1.52   .49   .67  8.95  .76  .039
7.16  239.6 2178.9  2326.1 12.44  56.2  3.58  1.60   .48   .68  9.25  .77  .038
7.58  263.3 2473.3  2631.9 12.82  58.7  3.69  1.68   .47   .69  9.55  .78  .036
8.00  288.0 2790.4     .0    .00    .0   .00   .00   .00   .00   .00  .00  .000
nlen= 3   Outflow ID end=227
Route using Ponce procedure:  C1 > 0
PRINT HYD        ID= 5   CODE= 1
```

                          HYDROGRAPH FROM AREA   604.00

    RUNOFF VOLUME =   1.42737 INCHES   =   12.6430 ACRE-FEET
    PEAK DISCHARGE RATE =   320.37 CFS AT   1.600 HOURS BASIN AREA =   .1661 SQ. MI.


```
*
********************************************************************
*C RE-USE HYD YE W/ ID=15, ADD TO ROUTED FLOW
ADD HYD           ID OUT= 98  HYD= INT.V.2AMOLE   IDIN I= 15   IDIN II= 3
PRINT HYD        ID= 9   CODE= 1
```

                          OUTFLOW HYDROGRAPH REACH   .00

    RUNOFF VOLUME =   .00000 INCHES   =   .0000 ACRE-FEET
    PEAK DISCHARGE RATE =   .00 CFS AT   .000 HOURS BASIN AREA =   .0000 SQ. MI.


```
*
********************************************************************
********************************************************************
*S
*S
*S ALLEY              ALLEY              ALLEY
*S BASINS B, G, & SITE-1 TO ALLEY. BASIN A NOT CONTRIBUTE INTERIM/FUTURE
*S FUTURE/INTERIM ALLEY FLOWS FOR INFO ONLY; BOLD TO EXISTING CONDITIONS
********************************************************************
* BASIN B
COMPUTE NM HYD    ID= 1    HYD= B        DA=0.01520 SQ MI
                  PER A= 0    B= 16    C= 8     D= 76
                  TP= -0.13333 HRS   RAIN= -1

    K =  .072665HR   TP =  .133330HR   K/TP RATIO =  .545000   SHAPE CONSTANT, N = 7.106420
```

25× 32×

```
UNIT PEAK =   45.598   CFS   UNIT VOLUME =    .9991     B =   526.28    P60 = 1.9000
AREA =    .011552 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


K =   .122603HR    TP =   .133330HR    K/TP RATIO =   .919546    SHAPE CONSTANT, N = 3.849372
UNIT PEAK =   9.4394   CFS   UNIT VOLUME =    .9990     B =   345.00    P60 = 1.9000
AREA =    .003648 SQ MI    IA =   .45000 INCHES   INF =  1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD        ID= 1   CODE= 1

                     HYDROGRAPH FROM AREA B


RUNOFF VOLUME =    1.69764 INCHES    =     1.3762 ACRE-FEET
PEAK DISCHARGE RATE =    38.30 CFS  AT  1.500 HOURS  BASIN AREA =  .0152 SQ. MI.


*
***************************************************************************
* BASIN G
COMPUTE NM HYD      ID= 2   HYD= G        DA=0.01501 SQ MI
                 PER A= 0     B= 20    C= 10    D= 70
                 TP= -0.13333 HRS   RAIN= -1

K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000    SHAPE CONSTANT, N = 7.106420
UNIT PEAK =   41.473   CFS   UNIT VOLUME =    .9991     B =   526.28    P60 = 1.9000
AREA =    .010507 SQ MI    IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


K =   .122603HR    TP =   .133330HR    K/TP RATIO =   .919546    SHAPE CONSTANT, N = 3.849372
UNIT PEAK =   11.652   CFS   UNIT VOLUME =    .9992     B =   345.00    P60 = 1.9000
AREA =    .004503 SQ MI    IA =   .45000 INCHES   INF =  1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD        ID= 2   CODE= 1

                     HYDROGRAPH FROM AREA G


RUNOFF VOLUME =    1.62555 INCHES    =     1.3013 ACRE-FEET
PEAK DISCHARGE RATE =    36.52 CFS  AT  1.500 HOURS  BASIN AREA =  .0150 SQ. MI.


*
***************************************************************************
ADD HYD          ID OUT= 3  HYD= TO.TOP.ALLEY    IDIN I= 1   IDIN II= 2
PRINT HYD        ID= 3   CODE= 1

                     HYDROGRAPH FROM AREA TO.TOP.ALLEY


RUNOFF VOLUME =    1.66180 INCHES    =     2.6775 ACRE-FEET
PEAK DISCHARGE RATE =    74.92 CFS  AT  1.500 HOURS  BASIN AREA =  .0302 SQ. MI.


*
***************************************************************************
* BASIN SITE.I
COMPUTE NM HYD      ID= 1   HYD= SITE.I      DA=0.00151 SQ MI
                 PER A= 0     B= 35    C= 0    D= 65
```

```
                  TP= -0.13333 HRS    RAIN= -1

     K =    .072665HR    TP =   .133330HR    K/TP RATIO =   .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   3.8741    CFS   UNIT VOLUME =    .9965      B =    526.28    P60 = 1.9000
     AREA =    .000982 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333


     K =    .130790HR    TP =   .133330HR    K/TP RATIO =   .980950    SHAPE CONSTANT, N =  3.599935
     UNIT PEAK =   1.2984    CFS   UNIT VOLUME =    .9894      B =    327.55    P60 = 1.9000
     AREA =    .000529 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033333

  PRINT HYD        ID= 1    CODE= 1

                          HYDROGRAPH FROM AREA SITE.I


     RUNOFF VOLUME =    1.53130 INCHES     =        .1233 ACRE-FEET
     PEAK DISCHARGE RATE =      3.50 CFS  AT   1.500 HOURS   BASIN AREA =   .0015 SQ. MI.



  *
  *************************************************************************
  ADD HYD          ID OUT= 4   HYD= BOT.ALLEY      IDIN I= 1   IDIN II= 3
  PRINT HYD        ID= 4    CODE= 1

                          HYDROGRAPH FROM AREA BOT.ALLEY


     RUNOFF VOLUME =    1.65558 INCHES     =       2.8008 ACRE-FEET
     PEAK DISCHARGE RATE =     78.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0317 SQ. MI.



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

     NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 12:37:11
```
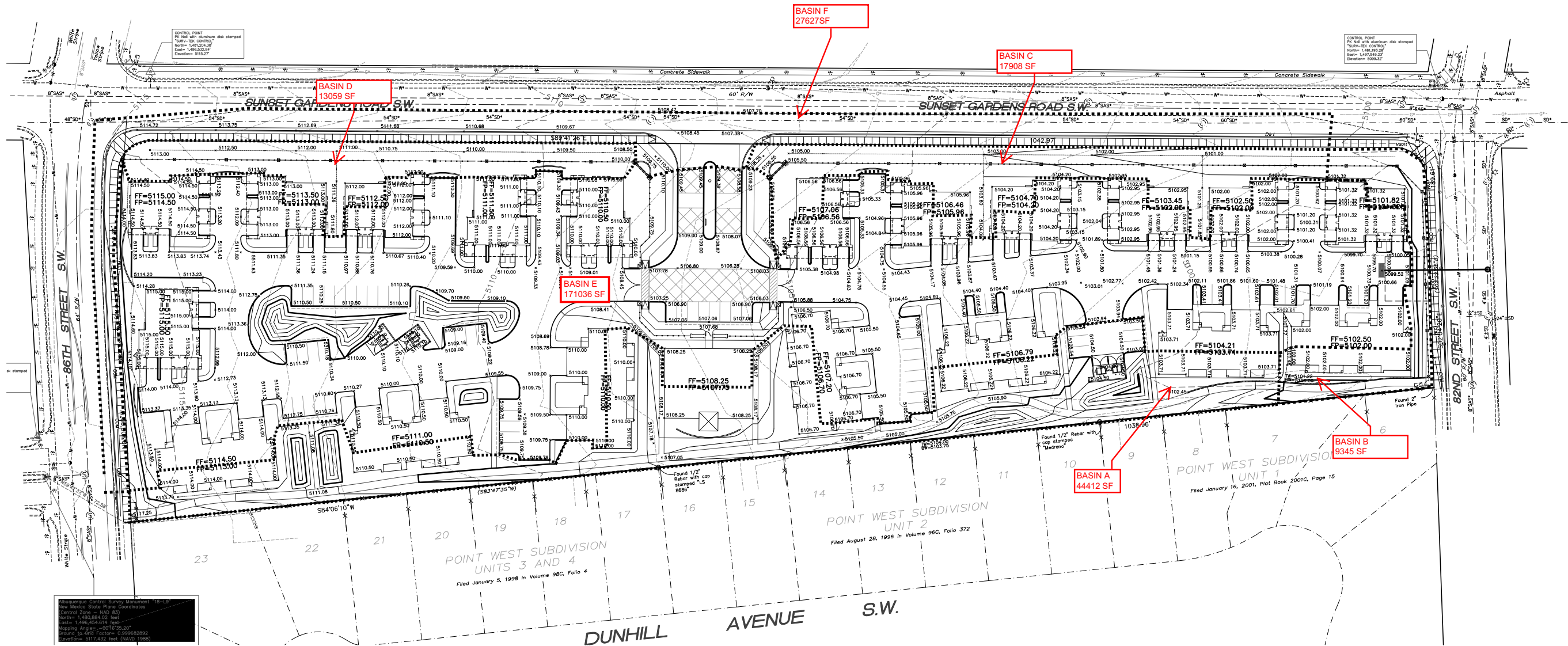
25× 32×

APPENDIX B

SITE HYDROLOGY

BASIN F
27627SF

BASIN C
17908 SF

BASIN D
13059 SF

BASIN E
171036 SF

BASIN A
44412 SF

BASIN B
9345 SF

SUNSET GARDENS ROAD S.W.

DUNHILL AVENUE S.W.

POINT WEST SUBDIVISION
UNIT 1
Filed January 16, 2001, Plat Book 2001C, Page 15

POINT WEST SUBDIVISION
UNIT 2
Filed August 26, 1996 in Volume 96C, Folio 372

POINT WEST SUBDIVISION
UNITS 3 AND 4
Filed January 5, 1998 in Volume 98C, Folio 4

86TH STREET S.W.

82ND STREET S.W.

Concrete Sidewalk

Concrete Sidewalk

60' R/W

Weighted E Method

Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	100-Year, 6-hr. Volume (ac-ft)	Flow cfs
ALLOWED													24.63
PROPOSED A	44412.00	1.020	0%	0	5%	0.051	6%	0.0612	89%	0.907	1.846	0.157	4.24
PROPOSED B	9345.00	0.215	0%	0	20%	0.043	44%	0.0944	36%	0.077	1.279	0.023	0.70
PROPOSED C	17908.00	0.411	0%	0	16%	0.066	60%	0.2467	24%	0.099	1.174	0.040	1.27
PROPOSED D	13059.00	0.300	0%	0	20%	0.060	47%	0.1409	33%	0.099	1.249	0.031	0.96
PROPOSED E	171036.00	3.926	0%	0	20%	0.785	47%	1.8454	33%	1.296	1.124	0.368	10.32
PROPOSED F	27627.00	0.634	0%	0	0%	0.000	8%	0.0507	92%	0.583	0.158	0.008	2.70
TOTAL											2.478		20.18

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm- zone 1

Ea= 0.44	Qa= 1.29
Eb= 0.67	Qb= 2.03
Ec= 0.99	Qc= 2.87
Ed= 1.97	Qd= 4.37

ONSITE Conditons
FIRST FLUSH WATER QUALITY VOLUME

|	REQUIRED (CF)	PROVIDED (CF)
WATER QUALITY	3058	6840

Narrative

This site is within the boundary of the Amole del norte drainage basin. The site is identified as basin U within the Val Halla drainage report.
this site drains to an existing storm drain within sunset gardens. This site is allowed to drain 24.63 cfs. We are draining 20.18 cfs to this storm drain
there is no upland flow. This plan provided for onsite ponding of the water quality volume
This plan is in conformance to the master drainage plan

APPENDIX C

HYDRAULIC CALCULATIONS

Nyloplast 24" Drop In Grate Inlet Capacity Chart
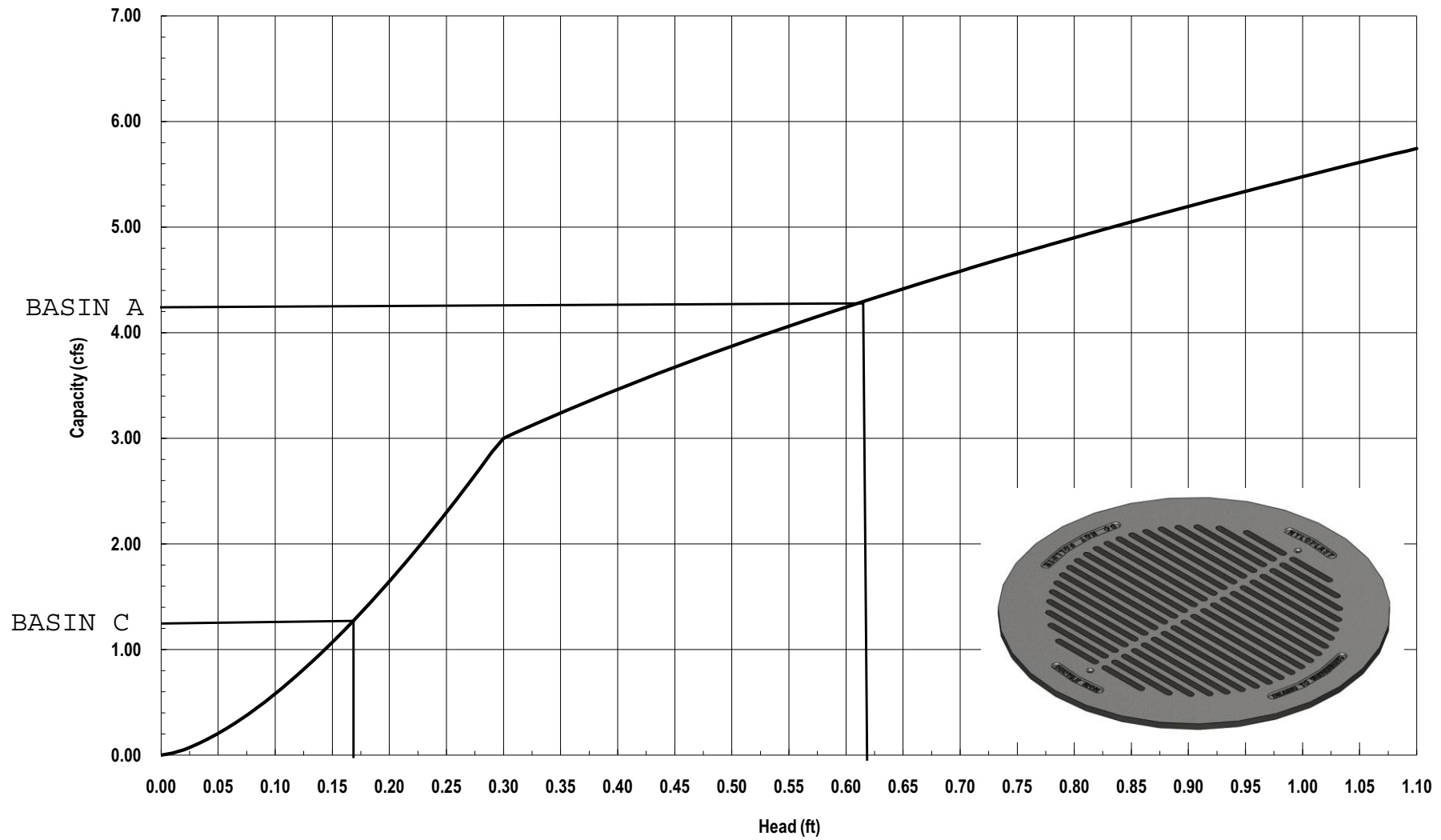
Capacity (cfs) vs Head (ft)

BASIN A

BASIN C

DROP INLET CALCULATIONS

INLET	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
INLET A	DOUBLE	7.68	20.64	0.3115	1

ORIFICE EQUATION

$Q = CA \ \sqrt{2gH}$

C =   0.6

g =   32.2

* FLOW DOUBLED DUE TO SUMP CONDITION

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
EXISISTING	24	3	3.14	0.5	34.05	14.56	4.63

Manning's Equation:
Q = 1.49/n * A * R^(2/3) * S^(1/2)

A = Area
R = D/4
S = Slope
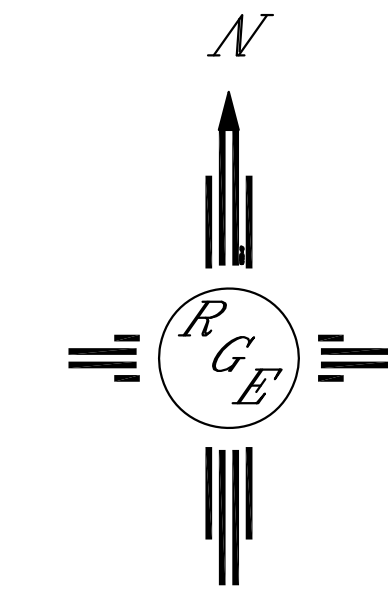n = 0.015

VICINITY MAP:

FIRM MAP:

National Flood Hazard Layer FIRMette

LEGAL DESCRIPTION:
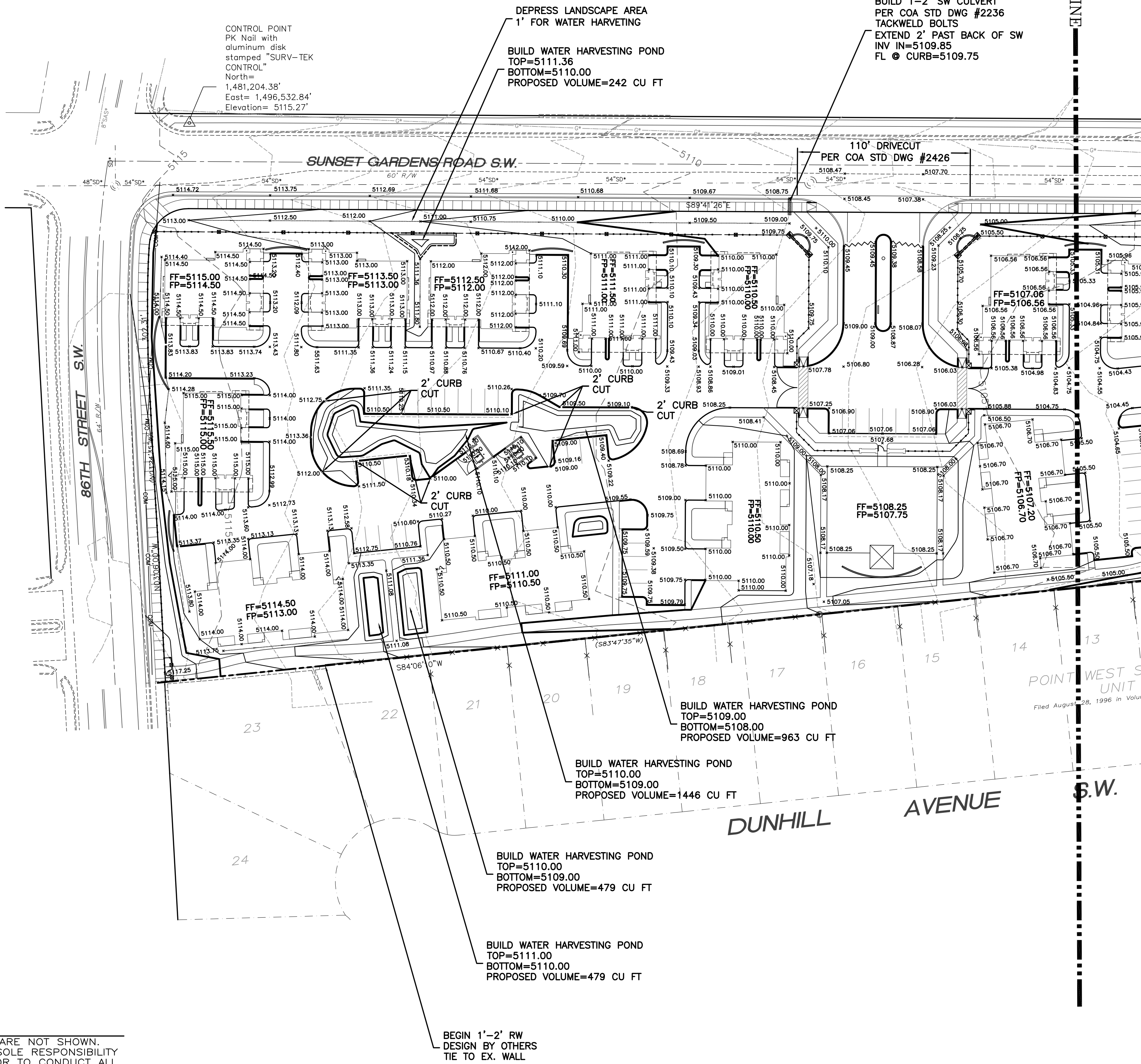
TRACT 52, UNIT 2, TOWN OF ATRISCO GRANT

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.

2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.

3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

4. ALL NEW PAVING SHALL BE 6" PCC OVER 8" SUBGRADE PREPARATION IN CONFORMANCE TO ACI 330R-08. UNLESS OTHERWISE NOTED.

5. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.

6. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9

LEGEND

Symbol	Description
—5414—	EXISTING CONTOUR
—5415—	EXISTING INDEX CONTOUR
—5414—	PROPOSED CONTOUR
—5415—	PROPOSED INDEX CONTOUR
▶	SLOPE TIE
× 4048.25	EXISTING SPOT ELEVATION
× 4048.25	PROPOSED SPOT ELEVATION
—·—·—	BOUNDARY
———	CENTERLINE
———	RIGHT-OF-WAY
———	PROPOSED CURB
———	EXISTING CURB AND GUTTER
▨▨▨	PROPOSED SIDEWALK
-----	EXISTING SIDEWALK
▨▨▨	PROPOSED SCREEN WALL
◄———	FLOWLINE

DEPRESS LANDSCAPE AREA 1' FOR WATER HARVESTING

BUILD WATER HARVESTING POND
TOP=5111.36
BOTTOM=5110.00
PROPOSED VOLUME=242 CU FT

CONTROL POINT
PK Nail with aluminum disk stamped "SURV-TEK CONTROL"
North= 1,481,204.38'
East= 1,496,532.84'
Elevation= 5115.27'

BUILD 1-2' SW CULVERT
PER COA STD DWG #2236
TACKWELD BOLTS
EXTEND 2' PAST BACK OF SW
INV IN=5109.85
FL @ CURB=5109.75

110' DRIVECUT
PER COA STD DWG #2426

SUNSET GARDENS ROAD S.W.

MATCHLINE

2' CURB CUT

2' CURB CUT

2' CURB CUT

FF=5108.25
FP=5107.75

BUILD WATER HARVESTING POND
TOP=5109.00
BOTTOM=5108.00
PROPOSED VOLUME=963 CU FT

BUILD WATER HARVESTING POND
TOP=5110.00
BOTTOM=5109.00
PROPOSED VOLUME=1446 CU FT

BUILD WATER HARVESTING POND
TOP=5110.00
BOTTOM=5109.00
PROPOSED VOLUME=479 CU FT

BUILD WATER HARVESTING POND
TOP=5111.00
BOTTOM=5110.00
PROPOSED VOLUME=479 CU FT

BEGIN 1'-2' RW
DESIGN BY OTHERS
TIE TO EX. WALL

DUNHILL AVENUE S.W.

86TH STREET SW.

N

GRAPHIC SCALE

40 20 0 20 40

SCALE: 1"=40'

ENGINEER'S SEAL	86TH AND SUNSET GARDENS GRADING AND DRAINAGE PLAN	DRAWN BY WCWJ
DAVID SOULE NEW MEXICO 14522		DATE 7-17-18
		21894-LAYOUT-5-01-18
10/3/18	Rio Grande Engineering 1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 872-0999	SHEET # 1
DAVID SOULE P.E. #14522		JOB # 21894

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.

3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.

4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.

VICINITY MAP:

National Flood Hazard Layer FIRMette
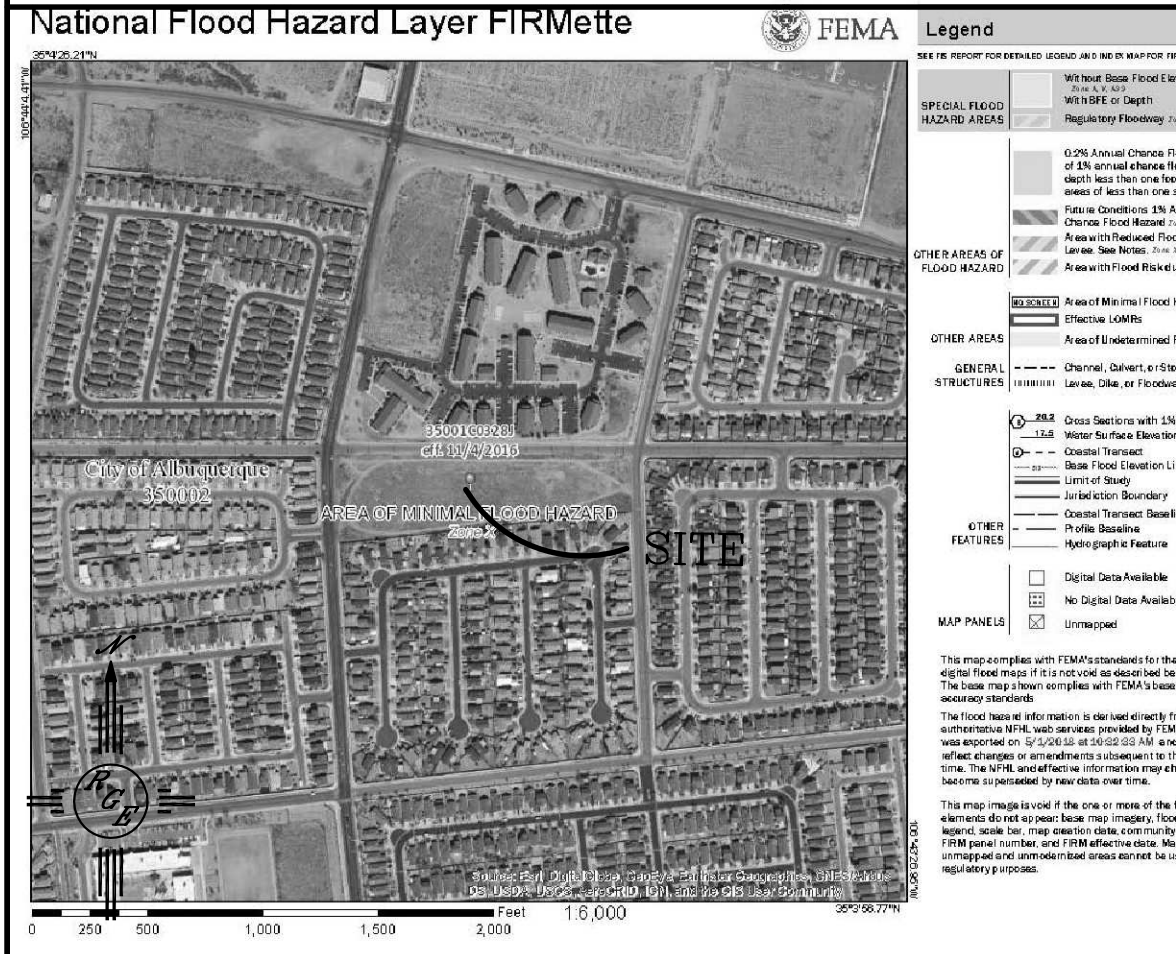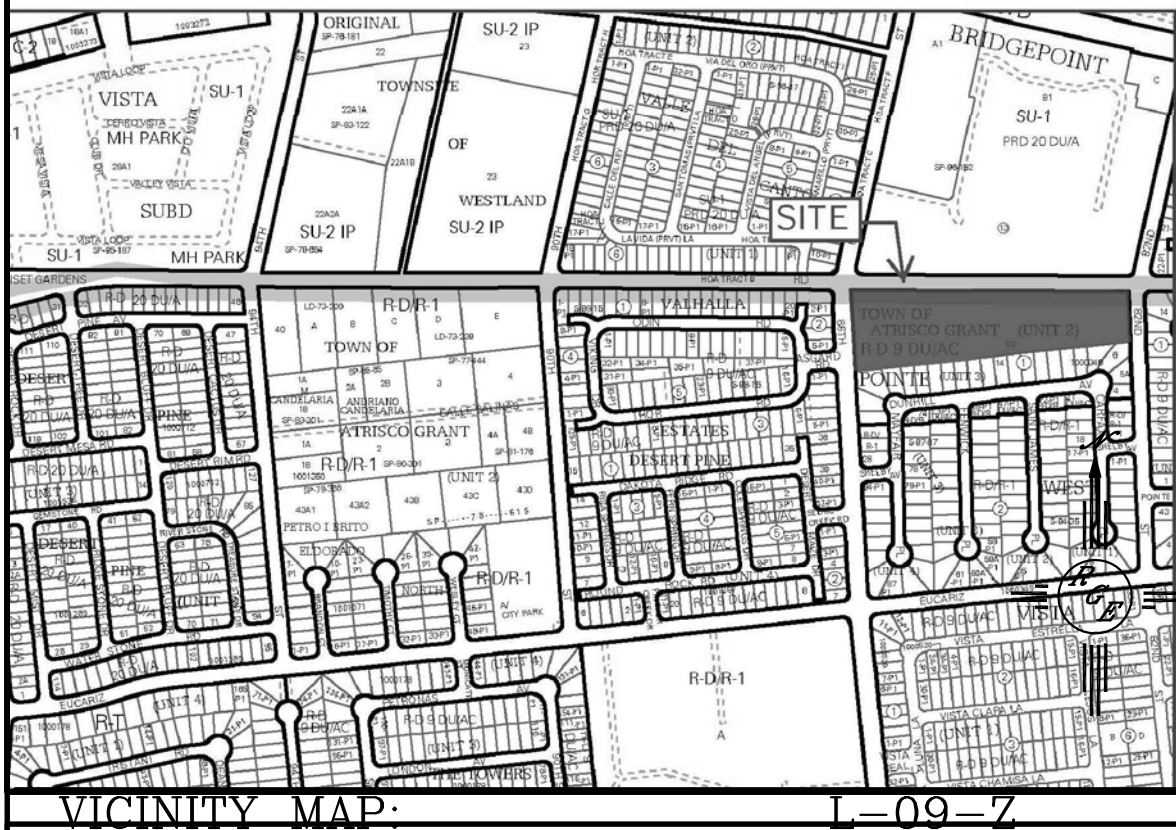
FIRM MAP:

LEGAL DESCRIPTION:
TRACT 52, UNIT 2, TOWN OF ATRISCO GRANT

NOTES:
1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.

2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.

3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

4. ALL NEW PAVING SHALL BE 6" PCC OVER 8" SUBGRADE PREPARATION IN CONFORMANCE TO ACI 330R-08. UNLESS OTHERWISE NOTED.

5. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.

6. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9

LEGEND

—5414—	EXISTING CONTOUR
- - 5415 - -	EXISTING INDEX CONTOUR
—5414—	PROPOSED CONTOUR
5415	PROPOSED INDEX CONTOUR
▶	SLOPE TIE
× 4048.25	EXISTING SPOT ELEVATION
× 4048.25	PROPOSED SPOT ELEVATION
	BOUNDARY
	CENTERLINE
	RIGHT-OF-WAY
	PROPOSED CURB
	EXISTING CURB AND GUTTER
	PROPOSED SIDEWALK
	EXISTING SIDEWALK
	PROPOSED SCREEN WALL
	FLOWLINE

Plan annotations:

MATCHLINE

BUILD WATER HARVESTING POND
TOP=5104.00
BOTTOM=5103.00
PROPOSED VOLUME=457 CU FT

DEPRESS LANDSCAPE AREA
1' FOR WATER HARVETING

BUILD WATER HARVESTING POND
TOP=5101.25
BOTTOM=5100.00
PROPOSED VOLUME=377 CU FT

BUILD 1-8' DIA TYPE E SD MH
PER COA STD DWG #2102
RIM=
EX. 60" RCP INV IN (W)=5087.40
EX. 60" RCP INV OUT (E)=5087.45
24" RCP INV=5089.95

BUILD 1-TYPE A INLET
PER COA STD DWG #22.01 & 2202
GRATE=5100.65
24" CLASS IV RCP INV IN=5091.39
24" CLASS IV RCP INV OUT=5091.29

SUNSET GARDENS ROAD S.W.

INSTALL 24" NYLOPLAST
INLINE DRAIN
GRATE=5100.15

82ND STREET S.W.

BUILD 1-TYPE D INLET (DOUBLE GRATE)
PER COA STD DWG #2206
GRATE=5100.00
12" HDPE INV IN=5095.89
24" HDPE INV OUT=5095.79

TIE NEW 12" RCP
TO EX. 12" RCP
GRATE=5098.50

BUILD 1-TYPE A INLET
PER COA STD DWG #22.01 & 2202

END 1'-2' RW
DESIGN BY OTHERS

INSTALL 24" NYLOPLAST
INLINE DRAIN
GRATE=5099.75
12" HDPE INV OUT=5098.25

BEGIN 1'-2' RW
DESIGN BY OTHERS

2' CURB
CUT

BUILD WATER HARVESTING POND
TOP=510.00
BOTTOM=5100.50
PROPOSED VOLUME=1818 CU FT

BUILD WATER HARVESTING POND
TOP=5104.00
BOTTOM=5103.00
PROPOSED VOLUME=559 CU FT

POINTE WEST SUBDIVISION
UNIT 2
Filed August 28, 1996 in Volume 96C, Folio 372

FF=5107.06
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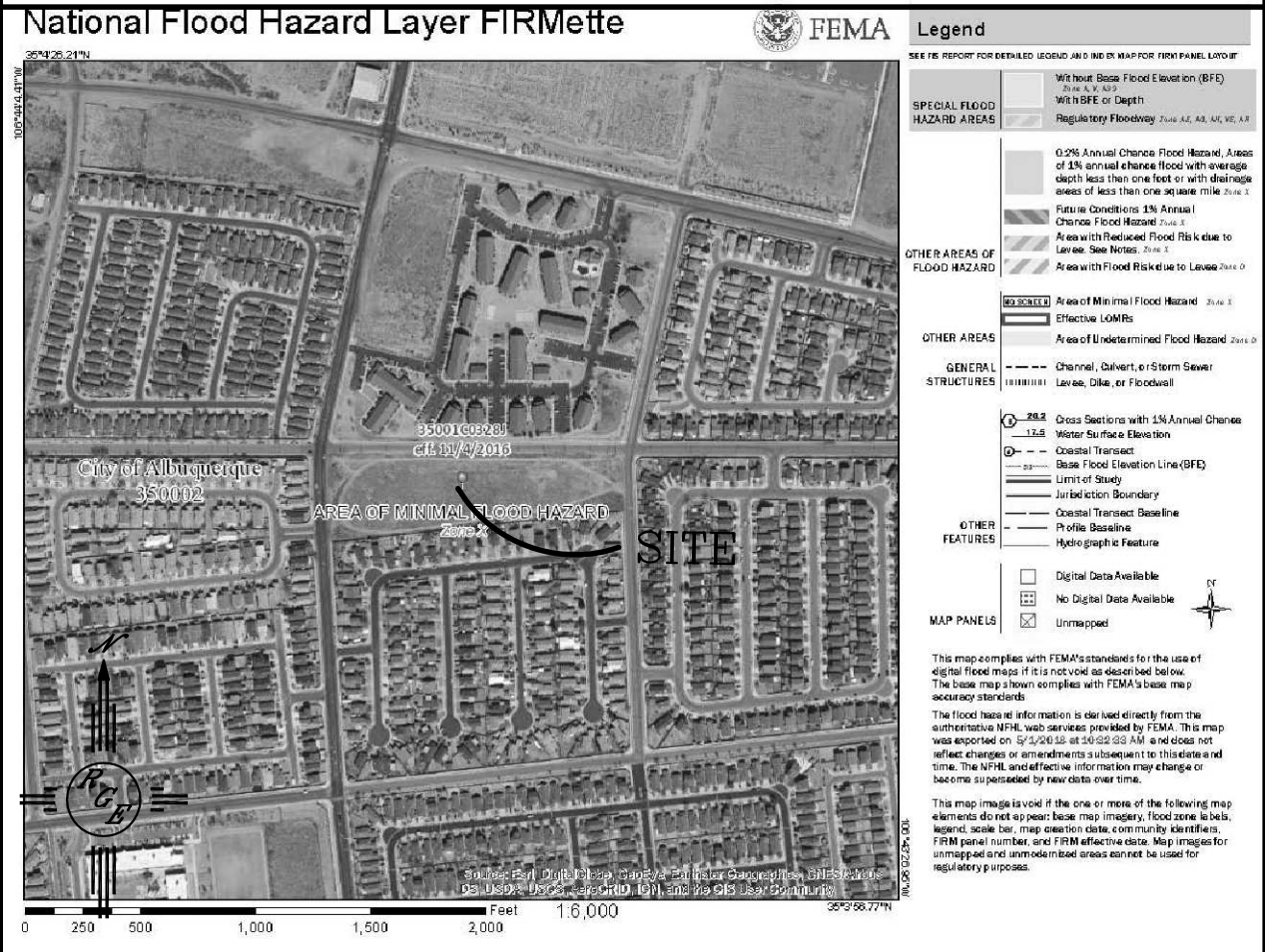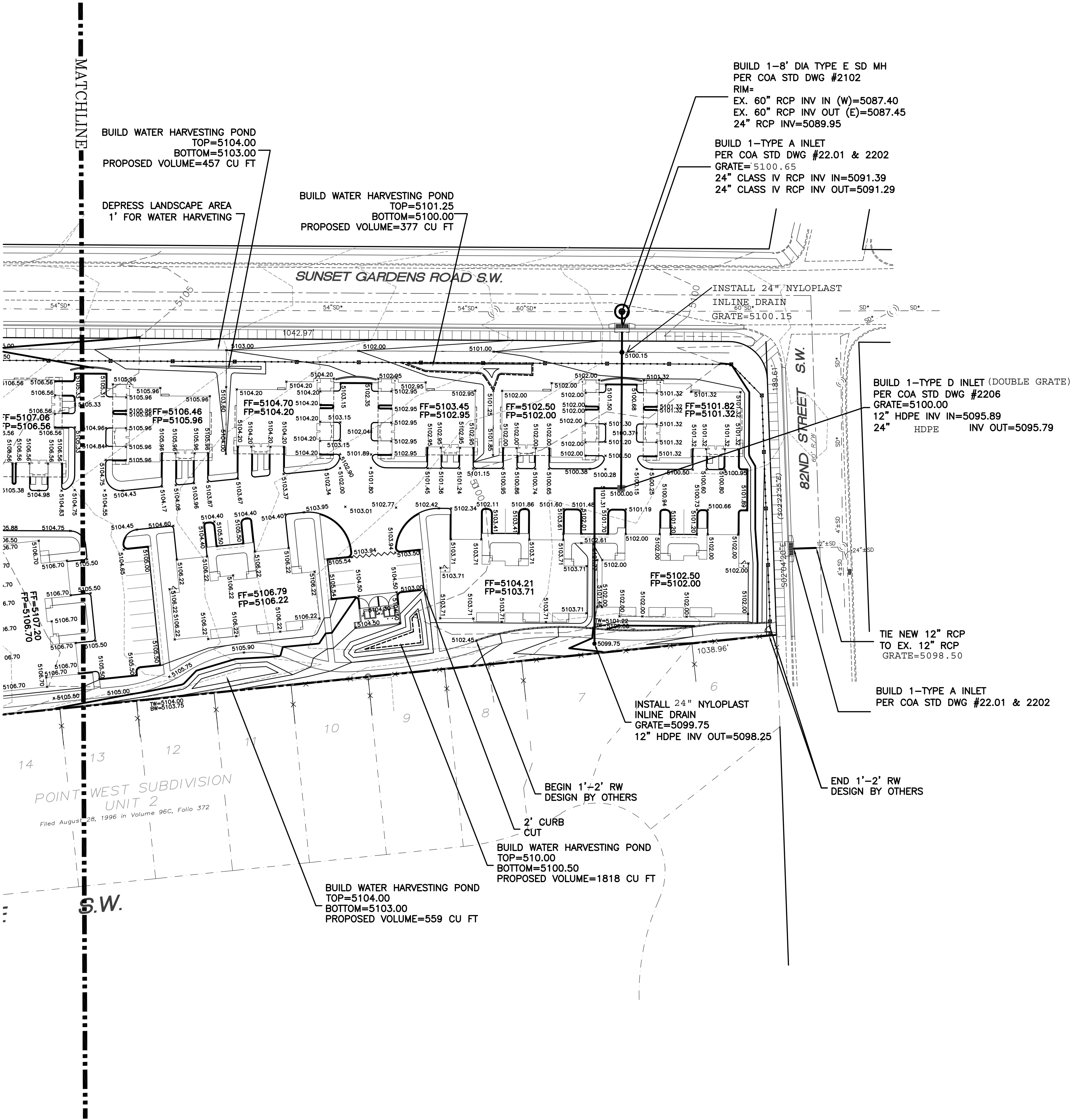FF=5106.79
FP=5106.22
FF=5106.46
FP=5104.20
FF=5102.20
FP=5106.70

CAUTION:
EXISTING UTILITIES ARE NOT SHOWN. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATION TO DETERMINE THE ACTUAL LOCATION OF UTILITIES & OTHER IMPROVEMENTS.

N

GRAPHIC SCALE
40 20 0 20 40
SCALE: 1"=40'

ENGINEER'S SEAL	**86TH AND SUNSET GARDENS GRADING AND DRAINAGE PLAN**	DRAWN BY WCWJ
		DATE 7-17-18
		21894-LAYOUT-5-01-18
DAVID SOULE NEW MEXICO 14522 REGISTERED PROFESSIONAL ENGINEER	Rio Grande Engineering 1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 872-0999	SHEET # 2
10/3/18		JOB # 21894
DAVID SOULE P.E. #14522		