CITY OF
Albuquerque

Martin J. Chávez, Mayor

November 18, 1996

Steve Randall
Red Mountain Engineers
4600-C Montgomery NE, Suite 101
Albuquerque, New Mexico

RE: DRAINAGE REPORT AND GRADING AND DRAINAGE PLAN FOR BLUEWATER VILLAGE, TRACT A-1A-2B AND TRACT A-1A-2C (K10/D20) SUBMITTED FOR GRADING AND FOUNDATION PERMIT APPROVAL, ENGINEER'S STAMP DATE 11/5/96.

Dear Mr. Randall:

Based on the information provided in the submittal of November 6, 1996, the above referenced plan is approved for Rough Grading Permit and for Foundation Permit release.

Prior to release for Building Permit, however, the pond volume calculations must be provided to my office. Also, the details and locations of the proposed spillways must be shown on the plans.

Please be advised that this plan assumed that Tract A-1A-2C was not fully developed at this time. Therefore, before development may occur on this tract, a grading and drainage plan will be required and additional ponding capacity may be required.

After our discussion regarding the Letter of Map Revision from FEMA, I do not think a LOMR would be appropriate for this project. However, a Letter of Map Amendment (LOMA) must be obtained for the apartment buildings within the floodplain. Attached is a copy of the forms to be used for the LOMA submittal. These must be submitted to FEMA through my office. The Conditional LOMA must be issued by FEMA prior to release of the Certificate of Occupancy. Therefore, I recommend that you submit for the CLOMA as soon as possible.

The temporary ponds proposed on this site must be within temporary drainage easements until the permanent off-site improvements are built. The Agreement and Covenant (see copy attached) must also be in place prior to release of the Certificate of Occupancy.

Since all of the ponds work together for this site, the entire on-site drainage system, including all ponds, storm drains and appurtenances, must be certified prior to release of the Certificate of Occupancy for any of the buildings. Each building must also be certified per the D.P.M.

If you should have any questions, please call me at 768-2666.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

Attachments

c: Tom Waggoner, Owner
File

CITY OF
Albuquerque

October 1, 1997

Martin J. Chávez, Mayor

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87505

RE: Grading and Drainage Certification for Buildings 2 & 3, Bluewater Village (K10/D20) Submitted for Temporary Certificate of Occupancy Approval for Phase II, Engineer's Stamp Dated 9/10/97.

Dear Mr. Randall:

Based on the information provided in the submittal of September 10, 1997, the above referenced Certification is acceptable for release of a 60-day Temporary Certificate of Occupancy for Buildings 2 and 3.

If you should have any questions, or need additional assistance, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
Doug Chaplin, Albuquerque Development Services
Tom Waggoner, Hunt Building Corp.
File

CITY OF
Albuquerque

November 4, 1997

Martin J. Chávez, Mayor

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Thomas B. Waggoner
Vice President
HUNT BUILDING CORPORATION
4401 N. Mesa, Suite 201
El Paso, TX 79902

RE: BLUEWATER VILLAGE APARTMENTS; CITY PROJECT NO. 554381; MAP NO. K-10 1020

Dear Mr. Waggoner:

This is to certify that the City of Albuquerque accepts the construction of the infrastructure provided in the Work Order Construction Plans, City Project No. 554381 in compliance with the completion of the required public infrastructure listed in the Subdivision Improvements Agreement (SIA) between Hunt Building Corporation and the City of Albuquerque executed on May 2, 1997.

Having satisfied the requirements referenced above, the SIA and any associated Financial Guaranty, held by the City, can now be released. The Contractors one-year warranty period started at the date of acceptance by the Chief Construction Engineer, dated October 28, 1997.

Please be advised this Certificate of Completion and Acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

Should you have any questions or issues regarding this project, please contact me.

Sincerely,

Ricardo B. Roybal, P.E.
City Engineer
Dev. & Bld. Services Div.
Public Works Department

CITY OF
Albuquerque

Martin J. Chávez, Mayor

December 19, 1996

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87501

RE: DRAINAGE REPORT AND GRADING AND DRAINAGE PLAN FOR BLUEWATER VILLAGE (K10/D20) SUBMITTED FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATED 12/4/96.

Dear Mr. Randall:

Based on the information provided in the submittal of December 12, 1996, the plan for the above referenced project is approved for Building Permit release.

As you are aware, the Engineer's Certification per the D.P.M. checklist will be required prior to release of the Certificate of Occupancy.

If you should have any questions, or need additional assistance, please do not hesitate to call me at 768-2666.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
Tom Waggoner, Hunt Building Corp.
File

CITY OF
Albuquerque

Martin J. Chávez, Mayor

December 17, 1996

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87501

RE: DRAINAGE REPORT AND GRADING AND DRAINAGE PLAN FOR BLUEWATER VILLAGE (K10/D20) SUBMITTED FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATED 12/13/96 ON PLAN AND 12/4/96 ON REPORT.

Dear Mr. Randall:

Based on the information provided in the submittal of December 12, 1996, the plan for the above referenced project is approved for Building Permit release.

As you are aware, the Engineer's Certification per the D.P.M. checklist will be required prior to release of the Certificate of Occupancy.

If you should have any questions, or need additional assistance, please do not hesitate to call me at 768-2666.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
Tom Waggoner, Hunt Building Corp.
File

CITY OF
Albuquerque

Martin J. Chávez, Mayor

December 17, 1996

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87501

RE: DRAINAGE REPORT AND GRADING AND DRAINAGE PLAN FOR BLUEWATER VILLAGE (K10/D20) SUBMITTED FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATED 12/4/96.

Dear Mr. Randall:

Based on the information provided in the submittal of December 12, 1996, the plan for the above referenced project is approved for Building Permit release.

As you are aware, the Engineer's Certification per the D.P.M. checklist will be required prior to release of the Certificate of Occupancy.

If you should have any questions, or need additional assistance, please do not hesitate to call me at 768-2666.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
Tom Waggoner, Hunt Building Corp.
File

Red Mountain Engineers, Inc.
Engineers • Surveyors

December 12, 1996

Susan M. Colonge, P.E.
City of Albuquerque
PW Dept., Hydrology Division
400 Marquette NW, Room 301
Albuquerque, NM 87102

RE: RESPONSE TO NOVEMBER 18, 1996
HYDROLOGY REPORT

Dear Miss Colonge:

In your response to your comments of November 18, 1996, the hydrology report and drawings for Bluewater Village have been revised and are being submitted with this letter.

The pond volume calculations are attached to the report in front of Appendix 1.

The spillways for the ponds are labeled and spot elevations shown to indicate where the berm is lowered for the spillway. There is no detail as the spillway is only a lowered point in the berm to channel water in the event of a storm greater than 100-year intensity. Ponds with berm sections at elevation 84.7 are labeled as "top of berm elevation 84.7", and these lowered sections of berm are both drainage channel and spillway.

The report is annotated to note that no development of tract A-1A-2C will be allowed until an approved grading and drainage plan for this tract has been submitted and approved by city hydrology.

The architect, Robert Zachery, is coordinating the preparation of the LOMA by A.D.S.

The agreement and covenants will be filed with the DRC work order submittal.

Certification of the drainage system will be accomplished when the as-built survey is conducted.

If you have any questions, please contact me.

Sincerely,

Steve Randall

SR/am

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RECEIVED
DEC 12
HYDROLOGY DIVISION

P.O. Box 16115, Santa Fe, NM 87506-6115 Phone: (505) 473-7373 Fax: (505) 473-4865

CITY OF
Albuquerque

Martin J. Chávez, Mayor

December 11, 1996

Steve Randall
Red Mountain Engineers
4600-C Montgomery NE, Suite 101
Albuquerque, New Mexico

RE: GRADING PLAN FOR BLUEWATER VILLAGE, TRACT A-1A-2B AND TRACT A-1A-2C (K10/D20) SUBMITTED FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATE 12/4/96.

Dear Mr. Randall:

The Grading and Drainage plan submitted to City Hydrology on December 5, 1996 is incomplete and therefore not acceptable for review. A complete drainage submittal must be provided.

After only a cursory review, it appears that my previous comments, provided in the letter of November 18, 1996, were not addressed. The pond volume calculations must be incorporated in the report. The report should also state that no development of Tract A-1A-2C will be allowed until an approved grading and drainage plan for this Tract has been submitted and approved by City Hydrology.

If you should have any questions, please call me at 768-2666.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Tom Waggoner, Owner
File

CITY OF
Albuquerque

Martin J. Chávez, Mayor

October 28, 1996

Adam R. Wright, P.E.
Red Mountain Engineers
4600-C Montgomery NE, Suite 101
Albuquerque, New Mexico

RE: Drainage Report and Grading and Drainage Plan for Bluewater Village, Tract A-1A-2B and Tract A-1A-2C (K10/D20) Submitted for Building Permit Approval, Engineer's Stamp Dated 10/3/96 and 10/4/96.

Dear Mr. Wright:

Prior to approval of the above referenced Grading and Drainage Plan for Building Permit release, the following comments must be addressed:

1. Is there a Site Plan and Infrastructure List associated with this development? If so, please include this information along with the DRB number with the resubmittal.

2. The limits of the existing FEMA floodplain must be shown on the grading plan. It appears that buildings are proposed within the floodplain and that new ponds will be provided to accommodate the 100-year runoff. Since you propose to change the existing floodplain, a Letter of Map Revision will be required from FEMA. The LOMR request must be submitted through my office.

3. The drainage concept of ponding the entire site and then releasing the water after a two hour delay seems reasonable. Please provide the reservoir routing in an AHYMO run to confirm the volume requirements, maximum water surface elevations and timing.

4. Please show and label the on-site drainage basins on the plans. (A comprehensive plan of the whole site would be beneficial) The report is very unclear as to where each basin is located and what the ponding requirements are. The runoff from each basin is required to determine each pond and storm drain capacity. Also verify that compensatory volume is provided for the displaced floodplain.

5. Provide the on-site basin runoff calculations. What land treatments were used? Was tract A-1A-2C considered to be fully developed?

6. Is Bluewater paved? The report says that it is graded with a low point at the entrance to the site. The proposed Double "C" inlets in Bluewater should be Double "A" inlets. Type "C" and "D" inlets are typically not used within City right-of-way, however they are acceptable for the private storm drain system within the site.

7. The report states that berms between some of the ponds will provide cover for sewer lines. Please show all existing or proposed utility easements on the plan.

8. Appendix 3 uses the maximum sediment yield. Is this realistic? If all basins are fully developed, then is sediment an issue?

9. It is assumed that all on-site storm drains and ponds are to be privately maintained. Easements must be provided for the ponds. Public easements will be required for those ponds which receive public waters. Agreement and Covenants will be required to assure that the ponds will be privately maintained.

10. Sheet C4 shows a match line on the lower right side. What sheet does this match? Please label the adjacent right-of-way or property to the south of the site. Provide more off-site contours or existing spot elevations to show that off-site flows do not enter the site. (This is typical for all sheets).

11. On sheet C5, please label the off-site development. The plan shows rip-rap rundowns which appear to drain the Bluewater site onto the Arby's site. Please show more detail for this. Are there existing ponds for the Arby's and Giant Station sites? If so, these should be shown and labeled on the plan. This sheet shows a match line to see sheet C5, however this is sheet C5.

12. On sheet C6, the Diamond Shamrock site must be labeled. Show the existing pond for this site. Provide spot elevations to show how the concrete rundown drains. The limits of the existing FEMA floodplain must also be shown. (Also on sheet C5).

13. On sheet C7 please provide off-site contours to show that the property to the west does not drain to the site. Is there existing curb and gutter on the street to the north of Tract A-1A-2C? Please label this and show what is existing. If this street is not paved, provide future street grades.

The drainage report contains a report by Doug Andrews which addresses off-site hydrology. The following comments pertain to Mr. Andrews' report:

14. The runoff calculated for the off-site basins did not address sediment bulking.

15. The report assumes that fully developed conditions are considered for all off-site drainage basins. Are all of the off-site basins fully developed at this time? If not, an interim plan may be needed to deal with existing off-site runoff.

16. The report states that City Hydrology does not have a drainage report on file for Elastimold. The City has approved the plan for this site, located in drainage file number K10/D11.

17. This report identifies ponds which were required for each off-site development. The plan must identify each development and each Q_{100} and V_{100} that the Bluewater Site accepts. The Site should clearly show all existing ponds, show where they are to be relocated and show how the water gets from the off-site basins to the Site.

18. It appears from the basin map that flows from the southwest of basin O-4 can enter basin O-4. Please clarify.

With the resubmittal, please re-date the Engineer's Stamp on the plan and the report with the same date. If you should have any questions regarding these comments, please contact me at City Hydrology.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: File

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

October 19, 1988

Doug Copeland, P.E.
Easterling & Associates, Inc.
5643 Paradise Blvd., NW
Albuquerque, NM 87114

RE: CONCEPTUAL GRADING AND DRAINAGE PLAN OF TRACT D, UNIT 1 ATRISCO BUISNESS PARK, RECEIVED OCTOBER 11, 1988, FOR SITE DEVELOPMENT PLAN APPROVAL. (K-10/D20)

Dear Mr. Copeland:

The above referenced submittal, dated 6/27/88, is approved for Site Development Plan sign off of Arby's by the City Engineer. This approved Plan establishes the drainage scheme to be followed by subsequent Grading and Drainage Plans. Prior to any further subdivision or site plan approvals, a more detailed Grading and Drainage Plan is required to address off site flows, existing flood plain reclamation, and ponding volumes.

Prior to Building Permit approval of Arby's, a detailed Grading and Drainage Plan is required which includes the adjacent ponding area and pond outfall system.

If you have any questions, call me at 768-2650.

Cordially,

Roger A. Green, P.E.
C.E./ Hydrology Section

x.c. George Rainhart, De La Torre/ Rainhart

RAG(WP+885)

CITY OF
Albuquerque

Martin J. Chávez, Mayor

October 29, 1997

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87505

RE: Grading and Drainage Certification for Bluewater Village (K10/D20) Submitted for Permanent Certificate of Occupancy Approval, Engineer's Stamp Dated 10/28/97.

Dear Mr. Randall:

Based on the information provided in the submittal of October 28, 1997, the above referenced Certification is acceptable for release of the Permanent Certificate of Occupancy for this project.

If you should have any questions, or need additional assistance, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Doug Chaplin, Albuquerque Development Services
Lawrence Kline, Herbert M. Denish & Associates
Tom Waggoner, Hunt Building Corp.
File

CITY OF
Albuquerque

Martin J. Chávez, Mayor

October 17, 1997

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87505

RE: Grading and Drainage Certification for Buildings 4 through 10, Bluewater Village (K10/D20) Submitted for Temporary Certificate of Occupancy Approval, Engineer's Stamp Dated 10/2/97.

Dear Mr. Randall:

Based on the information provided in the submittal of October 7, 1997, the above referenced Certification is acceptable for release of a 60-day Temporary Certificate of Occupancy for Buildings 4 through 10.

If you should have any questions, or need additional assistance, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Andrew Garcia, City Hydrology
Doug Chaplin, Albuquerque Development Services
Lawrence Kline, Herbert M. Denish & Associates
Tom Waggoner, Hunt Building Corp.
File

CITY OF
Albuquerque

November 4, 1997

Martin J. Chávez, Mayor

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Thomas B. Waggoner
Vice President
HUNT BUILDING CORPORATION
4401 N. Mesa, Suite 201
El Paso, TX 79902

RE: BLUEWATER VILLAGE APARTMENTS; CITY PROJECT NO. 554381; MAP NO. K-10 1020

Dear Mr. Waggoner:

This is to certify that the City of Albuquerque accepts the construction of the infrastructure provided in the Work Order Construction Plans, City Project No. 554381 in compliance with the completion of the required public infrastructure listed in the Subdivision Improvements Agreement (SIA) between Hunt Building Corporation and the City of Albuquerque executed on May 2, 1997.

Having satisfied the requirements referenced above, the SIA and any associated Financial Guaranty, held by the City, can now be released. The Contractors one-year warranty period started at the date of acceptance by the Chief Construction Engineer, dated October 28, 1997.

Please be advised this Certificate of Completion and Acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

Should you have any questions or issues regarding this project, please contact me.

Sincerely,

Ricardo B. Roybal, P.E.
City Engineer
Dev. & Bld. Services Div.
Public Works Department

c. Steve Randall, Red Mountain Engineers
Teresa Martin, Project Administrator, Project Review
Theresa Lucero, Assistant Project Administrator , PWD
Fred Aguirre, Hydrology, PWD
Richard Dourte, Transportation Development, PWD
Roger Green, Utility Development, PWD
Ed Stang, Planning Section, CIP
f/Project file

Smith Engineering Company

A Full Service Engineering Company

November 4, 1996

Susan M. Calongne, P.E.
City/County Floodplain Administrator
Engineering Group
Hydrology Section
P.O. Box 1293
Albuquerque, NM 87103

Subject: BLUEWATER DEVELOPMENT OFF-SITE HYDROLOGY REPORT

Dear Ms. Calongne,

Smith Engineering Company is responsible for the Off-site Hydrology Report for the subject project. This letter is in response to your comments pertaining to the report. I am also submitting a revised copy of the Bluewater Development Off-site Hydrology Report.

Comment No. 14

The runoff calculated for the off-site basins did not address sediment bulking.

Response to Comment No. 14

All off-site basins are currently fully developed. Thus a bulking factor was not included in the original calculation. As per our phone conversation on November 4, 1996 we do not think a bulking factor is necessary due to the fully developed conditions.

Comment No. 15

The report assumes that fully developed conditions are considered for all off-site drainage basins. Are all of the off-site basins fully developed at this time? If not, an interim plan may be needed to deal with existing off-site runoff.

Response to Comment No. 15

All off-site basins are fully developed at this time.

Comment No. 16

The report states that City Hydrology does not have a drainage report on file for Elastimold. The City has approved the plan for this site, located in drainage file number K10/D11.

Response to Comment No. 16

At the time the report was written, the Elastimold Drainage Report was not on file at the City of Albuquerque. Smith Engineering Company did go back to the City Hydrology Section and performed an extensive search for this report. We did find the report. It was incorrectly filed thus, the reason the report was not found the first time. The Bluewater Development Off-site Hydrology Report has been revised to show the information provided by the Elastimold Drainage Report.

Comment No. 17

This report identifies ponds which were required for each off-site development. The plan must identify each development and each Q(100) and V(100) that the Bluewater Site accepts. The Site should clearly show all existing ponds, show where they are to be relocated and show how the water gets from the off-site basins to the Site.

Response to Comment No. 17

The Bluewater Development Off-site Hydrology Report quantifies the Q(100) and V(100) from each off-site basin. The Plan that is being talked about is the Site Plan for the site. Red Mountain Engineers, Inc. is responsible for all on-site hydrology and drainage information. This comment should be included in items 1 - 13.

Comment No. 18

It appears from the basin map that flows from the southwest of basin O-4 can enter basin O-4. Please clarify.

Response to Comment No. 18

As stated in the report, drainage basin delineation was determined using Orthophoto Topographic Mapping provided by the City of Albuquerque Mapping and Records division along with the use of existing drainage reports relative to the area. The area south west of basin O-4 is now the Coors & Central Shopping Center. A Drainage Report for this area is on file at the City of Albuquerque. The drainage basin boundary for basin O-4 was taken from the report. All flow to the southwest of basin O-4 drains to the southeast.

Do not hesitate to call if you have any questions.

Sincerely,

Smith Engineering Company

Douglas L. Andrews, P.E.

Enclosure

O:\19-66-1\resubmit.doc

6400 Uptown Boulevard, N.E. Suite 500E Albuquerque, New Mexico 87110 Telephone 505/884-0700 Fax 505/884-2376

November 5, 1996

Susan M. Calongne, P.E.
City/County Floodplain Administrator
City of Albuquerque Public Works Dept.
Hydrology Division
P.O. Box 1293
Albuquerque, NM 87103

RE: **PROPOSED RESOLUTION OF 10/28/96 HYDROLOGY COMMENTS**
BLUEWATER VILLAGE

Dear Susan:

Please find enclosed an updated hydrology report and updated drawings for this project, addressing the hydrology comments you have noted. Some of the comments are also addressed with the following explanations.

1. This project has not been submitted to the DRB. As it is sponsored by Albuquerque Development Services, the project is anticipated to be submitted directly to the DRC for a City Work Order.

2. Limits of the existing FEMA floodplain have been incorporated in the updated drawings. Some buildings are proposed to occupy the existing floodplain, and the foundation elevations are one foot higher than the floodplain base elevation (5085), per City of Albuquerque requirements.

   The study by Smith Engineering Company (Appendix 1) is proposed to redefine the volume of off-site runoff to the floodplain occupying the site. The volume of water entering the floodplain on the site is accomodated by the proposed detention ponding. Flow from the Arby's site Basin O-3 is through this same floodplain where it exists on the Arby's site, and this flow is also accounted for by detention ponding on the Bluewater Village site (so volume of the floodplain on the Arby's site, where we do not have topo, should not be an issue).

   The floodplain volume produced by on-site and off-site excess runoff (Appendix 5) is accounted for in the volume of the proposed ponds. Hence the volume of the displaced existing floodplain is incorporated in the proposed detention ponds, as well as the increased runoff produced by site development.

   The scope of services negotiated with Smith Engineering and Red Mountain for this project did not include redefining the boundaries of the FEMA floodplain. It is our understanding after meeting with Fred Aguirre in August, that the City would not require this for a building permit or City Work Order.

3. An AHYMO run is added as Appendix 28. AHYMO does not have instructions to allow decreasing discharge rates from detention ponds, or delayed discharges in combination with non-delayed inputs (other than as an overflow). As a result, the drainage is modeled to graph the delayed discharge from Pond 7, delayed discharge from Pond 6, and delayed discharge to the Coors Street storm drain from Pond 1. Ponds 1 through 5 are equalized at the lower base elevation 5085, and this equalization isn't modeled.

   The AHYMO runs verify that pond capacity is sufficient in each case to prevent overflow. They indicate that drainage from the higher-elevation ponds is delayed long enough not to overflow lower-elevation ponds.

4. On-site drainage basins are illustrated on the enclosed comprehensive site plan. Appendix 5 has been rewritten as Appendix 5A to more clearly report the defined basins and runoff associated with each basin.

   Compensatory volume provided in Appendix 5A is for the displaced floodplain based on off-site and on-site flow calculations, and not on the existing floodplain volume. Development in the tributary area has reduced the amount of runoff draining to the FEMA floodplain on this site. Albuquerque Development Services made the decision that more of their site could be utilized by evaluating this reduced floodplain, and that was the purpose of the Smith Engineering Company study of off-site flows entering the plat.

Tract A-1A 2C - not Consid. - fully dev. - will need grd w/ parking

5. Appendix 5 has been rewritten and enclosed as Appendix 5A to more clearly report the on-site basin runoff calculations and land treatments used.

   Tract A-1A-2C was considered as being cleared and regraded to provide spoil/fill for adjacent tract A-1A-2B, and to provide level building pads for undefined future development. Land treatment 'C' was used for all of Tract A-1A-2C to calculate run-off, so the tract was not considered fully developed for hydrology calculations.

6. Bluewater is paved, the term 'graded' should be replaced with the term 'sloped', and the report has been updated to reflect this.

   Four "A" inlets are shown on the revised drawings in place of the two "Double C" inlets previously shown.

7. The drawings have been revised to show existing and proposed utility easements.

8. Maximum sediment yield was used as a 'worst case' figure to demonstrate that drains with valves will be self-scouring in all circumstances. Sediment does not appear to be an issue with regard to keeping the valves clear.

9. A drawing showing proposed public drainage, access, and utility easements is enclosed with this resubmittal. The grading drawings have also been revised to show the utility and drainage easements. Ponds receiving off-site waters are included as proposed

public drainage easements.

An Agreements and Covenants form to assure private maintenance of the detention ponds has been forwarded to the owner and will be included in the DRC City Work Order application.

10. Sheet C4 has been revised to show Sheet C6 at the lower right match line, and a labeled property on the south boundary line. Contours, spot elevations and flow arrows have been added to illustrate the direction of off-site flows at the plat boundaries.

11. Sheet C5 has been revised to label off-site developments.

The riprap draining toward Arby's is a rundown and swale lining. An inset detail has been added to revised Sheet C5 and is labeled with spot elevations and flow direction arrows to illustrate how water is diverted from the street into the swale on the Bluewater site.

There are no existing ponds that I am aware of for the Arby's and Giant Station Sites. The FEMA floodplain extends into the Arby's site (as defined by presently existing contour 5085) and may be contiguous with ponding excavated for Arby's. At a 1-foot contour level of resolution the FEMA base elevation is a more meaningful representation of the floodplain than the FEMA map, and reference to the FEMA map would not make a contiguous pond discernable.

The erroneous reference to Sheet C5 at the match line has been corrected.

12. Sheet C6 has been revised to label the Diamond Shamrock site. There is a drainage easement for the Diamond Shamrock site onto the Bluewater site, and no pond exists on the Diamond Shamrock site. The flows from Diamond Shamrock are accounted for in Appendix 5.

Spot elevations for the rundown are shown on revised Sheet C6.

The FEMA floodplain limits are shown on the revised grading sheets.

13. Sheet C7 is revised to show contours off-site at the west boundary (taken from Map 3, page 7 of Appendix 1).

Curb and gutter does exist on Bluewater to the north of Tract A-1A-2C. The drawings have been revised to illustrate and label this existing curb and gutter. Bluewater is paved for the entire length of road adjacent to the two Bluewater Tracts.

14-18. See attached text from Smith Engineering Company

17. From the topography supplied at one-foot contours by the City Surveyor (surveyed within the last 18 months), we see no depressions on the plat other than the floodplain itself.

I believe the reference on Smith Engineering Company's report to 'existing ponds' is actually a reference to existing pond capacity. This pond capacity, whether or not it now exists, is incorporated in the calculations for detention pond volume in the proposed grading and drainage drawings accompanying this report.

None of the above-referenced ponds are relocated individually, but all are incorporated in the proposed ponding by evaluating the off-site flows and providing adequated ponding volume to account for them.

Notation is added to the grading and drainage drawings to indicate where the off-site flows enter the site.

Sincerely,

Steve Randall
Red Mountain Engineers

CITY OF
Albuquerque

Martin J. Chávez, Mayor

October 29, 1997

Steve Randall
Red Mountain Engineers
1216 Parkway Dr., Suite A
Santa Fe, New Mexico 87505

RE: Grading and Drainage Certification for Bluewater Village (K10/D20) Submitted for Permanent Certificate of Occupancy Approval, Engineer's Stamp Dated 10/28/97.

Dear Mr. Randall:

Based on the information provided in the submittal of October 28, 1997, the above referenced Certification is acceptable for release of the Permanent Certificate of Occupancy for this project.

If you should have any questions, or need additional assistance, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Doug Chaplin, Albuquerque Development Services
Lawrence Kline, Herbert M. Denish & Associates
Tom Waggoner, Hunt Building Corp.
File

CITY OF ALBUQUERQUE

June 7, 2005

David Gatterman, P.E.
TGC Engineering, Inc.
330 Louisiana Blvd. NE
Albuquerque, NM 87108

Re: Sandia Learning Center, 303 Coors Blvd. NW - Drainage and Grading Plan Engineer's Stamp dated 5-25-05 (K10-D20)

Dear Mr. Gatterman,

Based upon the information provided in your submittal dated 5-25-05, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology and prior to release of the Certificate of Occupancy an Engineer's Certification of the grading plan per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3990.

Sincerely,

Phillip J. Lovato, E.I.
Associate Engineer, Planning Department
Development and Building Services

Cc: file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

K-10/D20

PROJECT TITLE: SANDIA LEARNING CENTER ZONE MAP/DRG. FILE #: K-10-Z
DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: LOT D-3-A, COORS CENTRAL NORTH
CITY ADDRESS: 303 COORS BOULEVARD NE

ENGINEERING FIRM: TGC ENGINEERING INC. CONTACT: TOM JOHNSTON
ADDRESS: 330 LOUISIANA BLVD NE PHONE: 266-7256
CITY, STATE: ALBUQUERQUE NM ZIP CODE: 87108

OWNER: SANDIA LEARNING CENTER CONTACT: _____
ADDRESS: 2333 CHELWOOD BLVD NE PHONE: _____
CITY, STATE: ALBUQUERQUE NM ZIP CODE: 87112

ARCHITECT: ARCH-E-TECH CONTACT: RICHARD RODRIGUEZ
ADDRESS: _____ PHONE: 480-7423
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: WAYJOHN SURVEYING INC. CONTACT: TOM JOHNSTON
ADDRESS 330 LOUISIANA BLVD NE PHONE: 255-2052
CITY, STATE: ALBUQUERQUE NM ZIP CODE: 87108

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

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
MAY 25 2005
HYDROLOGY SECTION

DATE SUBMITTED: 5/25/05 BY: _____

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

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

ADAM R. WRIGHT
NEW MEXICO
12993
REGISTERED PROFESSIONAL ENGINEER
10/4/96

September 18, 1996

Hydrology Report

BLUEWATER VILLAGE

This development is on two adjacent tracts near the southwest corner of Bluewater Road and Coors Boulevard, Zone Map K-10. The proposed development is a turnkey apartment project for Albuquerque Development Services.

Tract A-1A-2C consists of 6.1335 acres of undeveloped property, and will be graded for future building pads and two detention ponds. It will receive several thousand cubic yards of excess excavation from the neighboring tract A-1A-2B.

Site plan?

Tract A-1A-2B consists of 11.4335 acres of undeveloped property, and is slated for construction of a community building, two laundry buildings, and 200 apartments in 10 two-story apartment buildings. Stormwater detention is designated for eight ponding areas on this tract. This tract receives off-site flows and is partially occupied by a FEMA AH floodplain, with base elevation 5085, as defined in Panel 350002 0027 C.

Show fp on plan

The off-site flows contributing to the flood plain have been reduced by recent development. A current evaluation of off-site flows entering the project is attached in Appendix 1. Ponding capacity on the site is calculated (Appendix 5) on the basis of this reduced flow.

Sediment Bulking?

Proposed stormwater discharge to the Coors Boulevard storm sewer from the ponding areas is delayed by two hours as recommended in the West Bluff Drainage Plan, January 1987, Sheet No. 3, and is limited to 0.20 CFS/Ac (Appendix 2).

Type A

Off-site flow from Basin O-1 (Appendix 1, page 6) will be intercepted at the intersection of the proposed access road with Bluewater Road, with 2 'Double C' curb inlets constructed on the southeast corner of the proposed intersection. This off-site flow is then routed through a 24" reinforced concrete pipe (RCP) to detention Pond 8 on tract A-1A-2C. A second pond (Pond 7) on this tract provides the remaining capacity required for Basin O-1 and tract A-1A-2C (Appendix 5). A weir and channel connects these two ponds, so that lower Pond 7 receives stormwater after upper Pond 8 fills. Upper Pond 8 drains to lower Pond 7 after a 4.5 hour delay via a 12" valve and 12" RCP. Lower Pond 7 drains after a 4 hour delay through a 12" valve and 12" RCP to the base elevation ponds. The extra delay is necessary to allow the lower ponds to drain sufficiently to prevent water backing up at the Building 4 parking lot inlets (this parking lot forms part of the 100-year detention basin).

using new hydrology, ① what is the down-stream capacity? ② what release rate is allowed?

Base elevation ponds 1 through 6 are on tract A-1A-2B, at water surface elevation 5085 (the FEMA floodplain base elevation). Pond 6 drains to Pond 5 via 24" RCP, and is equalized in surface elevation through this connection. Pond 5 drains to Pond 4 over a weir and through a 12" RCP. Pond 4 drains to Pond 3 over a weir and through a 12" RCP. Ponds 3 drains to Pond 2 via a double 24" RCP. Pond 1 drains to Pond 2 via a 24" RCP. After a two-hour delay, Pond 2

Ok - pond pool & release 2 hrs after

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OCT - 7 1996
HYDROLOGY DIVISION

drains to a curb inlet on the Coors Boulevard storm sewer through a 12" valve and 18" RCP with a 7-3/8 x 7-3/8" restrictor plate. All the ponds ultimately drain through this connection.

All eight ponds have an overflow path to route stormwater in event of open or closed valve failure.

Pipe inlets have riprap erosion pads to prevent undermining by scour. Inlet screens are provided where the 12" RCP's have valves to prevent clogging by debris. Drain pipe diameters are large compared to the pond depth, which prevents silt deposits clogging the pipe. Scouring velocity is produced in the drainage pipe to remove expected silt buildup (Appendix 3). Also, a level inlet drain pipe section extending to the valve prevents silt settling excessively at the valve.

Total area drained to outlet detention pond is 26.2 acres. Recommended discharge rate, from the West Bluff Drainage Plan, is 0.20 CFS/Ac, giving a maximum allowable discharge of 5.24 CFS to the Coors Boulevard stormdrain.

With an 18" unrestricted drain pipe, maximum inlet-limited discharge will be 22.5 CFS. The 18" drainpipe at Coors is therefore restricted with a 7-3/8" x 7-3/8" square opening restrictor plate on the outlet, giving a maximum discharge of 5.20 CFS (Appendix 4) to meet the West Bluff Drainage Plan recommendation. Ponds 7 and 8 are limited to lesser discharges to the base elevation ponds, and discharge is delayed longer to prevent overflow of the base elevation ponds. Average discharge rate required to drain the 160,000 cubic feet of ponding in 24 hours is 1.85 CFS, and average discharge rate expected is 4.63 CFS (Appendix 4).

DETENTION POND VOLUMES - Vol of 100 yr runoff from on & off-site plus Q100 due to development

Ponds 7 and 8 are sized for 0.6950 acre/feet (30,300 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 22,000 cubic feet of flow generated on the 6.1335 acre tract (Appendix 5).

Pond 7 volume is 30,000 cubic feet and Pond 8 volume is 24,000 cubic feet. Total detention volume required for these two flows equals 52,300 cubic feet, and detention volume provided is 54,000 cubic feet.

AHYMO routing? need pond routing

Ponds 1 through 6 are sized for the remaining 0.9393 acre/feet (40,900 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 66,200 cubic of flow generated on the 11.4335 acre tract (Appendix 5). Pond volumes are noted on the grading and drainage drawing. Total detention volume required for these ponds equals 107,100 cubic feet and total detention volume provided is 107,500 cubic feet.

DRAIN INLET CAPACITIES

on-site basins?

The 2 'Double A Inlets at the Bluewater/access road intersection have a capacity of 9.6 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 19.2 CFS. Expected flow is 15.3 CFS (Appendix 1, page 6). Bluewater Road is already graded with a low point at this location to need to pave adjacent streets

channel water off the road toward the flood plain. A waterstop (higher section of road) prevents overshoot past the grates, and velocity head in the sheet flow to the drain is too low to jump the curb.

private?

The 2 'Double D' inlets on the double 21" RCP's entering Pond 2 from the parking lot west of Building 3 have a capacity of 9.6 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 19.2 CFS. Expected flow is 10.3 CFS on-site surface runoff, plus a potential flow of 4.17 CFS if the valve on Pond 8 is left in open position. Total expected 100-year flow is then 14.3 CFS (Appendix 6), and total capacity is 19.2 CFS.

The Neenah R-2569 inlets on the 12" RCP west of Building 3 have a capacity of 1.5 CFS at 0.3 feet of ponding . Expected 100-year flow is 0.60 CFS to the grate at the west-center of Building 3 and 0.45 CFS to the grate at the northwest side of Building 3 (Appendix 7).

The three Neenah R6672-E inlets draining to Pond 4 through an 18" RCP have a capacity of 5.6 CFS each at 0.3 feet of ponding. Expected 100-year flow is 1.61 CFS for the largest drainage area, which is on the northern-most drain (Appendix 8). Drained areas are smaller for the remaining two inlets. These inlets are provided to ensure drainage of the flat parking lot, and are not required to meet flow capacity. This parking lot is flat to provide 6" of ponding in a 100-year storm event, so no regional slope is possible. Spot elevations ensure that water will flow to these local drains.

private

The double 'C' curb inlets northeast of Building 10 have a capacity of 5.6 CFS each at 6" ponding (DPM page 75). Expected flow is 9.88 CFS (Appendix 9). The road is graded to create a low point at the inlet and a waterstop (higher section of road) beyond, creating this ponding when necessary to match the incoming flow.

A single Neenah R-2569 inlet drains the area north of Building 6. Capacity is 1.5 CFS at 0.3' of ponding (Appendix 7). Expected 100-year flow is 0.40 CFS (Appendix 10). The drain is designed to prevent water passing through the tot lot.

WEIR CAPACITIES

The weir and rundown from Pond 8 to Pond 7 have a capacity of 24.8 CFS (Appendix 11). Expected flow is 15.3 CFS from off-site (intercepted at the Bluewater/access road intersection) plus 8.80 CFS surface drainage from the 6.1335 acre tract. Total 100-year flow is then 24.1 CFS.

Three 4' weirs (curbcuts and rundowns) on the east side of the access road near the south end of the plat drain 11.2 CFS of off-site flow (Appendix 1, page 6) plus 6.99 CFS generated on site (Appendix 10). Each weir has a capacity of 8.33 CFS (Appendix 12). Total capacity is then 25.0 CFS and expected total 100-year flow is 18.3 CFS. The access road is graded for a low spot at these weirs, with a waterstop (higher section of road) to prevent overshoot.

The weir (curbcut and rundown) from the parking lot at Pond 4 drains 3.97 CFS and has a capacity of 8.33 CFS (Appendix 13).

The weir (curbcut) and channel draining the north parking lot to the access road drains 3.04 CFS and has a capacity of 3.78 CFS (Appendix 14).

The weir (curbcut and channel) northwest of Building 10 drains 3.59 CFS and has a capacity of 3.78 CFS (Appendix 15).

sewer easement between ponds?

The berm between Ponds 5 and 4 (which provides groundcover for a proposed 8" sewer line) has a top elevation of 84.8, and acts as a weir channeling flow from Pond 5 to Pond 4. Expected 100-year flow is 31.7 CFS, and capacity is 31.6 CFS (Appendix 16). A 12" RCP under this berm allows Pond 5 to drain.

The berm between Ponds 4 and 3 (providing groundcover for a proposed 6" sewer lateral) has a top elevation of 84.8, and acts as a weir channeling flow from Pond 6 to Pond 5 (Appendix 18). A 12" RCP under this berm allows Pond 4 to drain.

PIPE CAPACITIES

A 24" RCP carries off-site flow from the Bluewater/access road intersection to Pond 8. It is submerged outlet limited to 17.0 CFS capacity, and 100-year flow is 15.3 CFS (Appendix 19).

A 12" RCP carries flow from Pond 8 to Pond 7 in order to drain Pond 8 within 24 hours. Both Ponds 8 and 7 are required to meet detention volume needed, but they are at different elevations. The overflow to equalize volumes is from Pond 8 to Pond 7 via riprap weir. The 12" RCP draining Pond 8 is outlet limited by a restrictor plate to 4.17 CFS (Appendix 4).

A 24" RCP carries flow from Pond 6 to Pond 5, and equalizes the surface elevation of the two ponds. Pond 6 intercepts 9.88 CFS from a north weir (Appendix 11) and drains 2.66 CFS of sheet flow. The 24" RCP is outlet limited to12.9 CFS with least expected head (Appendix 20). Expected 100-year flow is 12.54 CFS.

Two 21" RCP's carriy drainage from the parking lot west of Building 3 to Pond 2. Flow is submerged outlet limited to 16.6 CFS (Appendix 17). Expected 100-year flow is 14.5 CFS.

A 12" RCP carries drainage from two inlets in the landscaped areas west of Building 3. Flow is outlet limited to 1.79 CFS (Appendix 21). Expected 100-year flow is 1.05 CFS (Appendix 7).

A 12" RCP carries drainage from Pond 7 to a drop inlet in the parking lot west of Building 4. The drainage is continued to Pond 4 with an 18" RCP and added influx from the parking lot. Expected 100-year flow from the parking lot area is 2.89 CFS. The length of pipe from the pond to the first drop inlet is submerged outlet limited to 4.48 CFS (Appendix 20). Maximum capacity in the 60' length of pipe connecting each of the 3 drop inlets is outlet limited to 4.80 CFS at the calculated pond surface elevations (Appendix 22). The

Two 24" RCP's carry flow from Pond 3 to Pond 2, and equalize the surface elevation of the 2 ponds. The 24" RCP's are outlet limited to 18.2 CFS at 0.5' difference in head (Appendix 21).

Expected 100-year flow is 13.4 CFS. The capacity appears to be excessive at first glance, but Ponds 3,4, and 5 join the floodplain on the neighboring plat at the property boundary, and cannot surcharge above the design elevation.

An 18" RCP carries drainage from Pond 2 to the back of a curb inlet on the Coors Boulevard storm drain. Flow is outlet limited to 5.20 CFS by a restrictor plate (Appendix 4). There is no flow capacity minimum required, except the 1.84 CFS average needed to drain the detention ponding in 24 hours.

A 24" RCP carries drainage from Pond 1 to Pond 2 and equalizes the surface elevation. Flow to Pond 1 is 11.2 CFS from off-site (Appendix 1 page 6), and 2.88 CFS generated on-site. Capacity is 12.6 CFS (Appendix 24).

A 6" PVC pipe carries drainage under the tot lot north of Building 6. Capacity is 0.94 CFS and expected 100-year flow is 0.60 CFS (Appendix 25).

Several landscaped areas are drained under sidewalks and stairs with 4" PVC pipes, without grates. Inlet limited capacity is 0.84 CFS for these pipes (each installation is two pipes in parallel), and largest expected 100-year flow is 0.33 CFS (Appendix 26).

Ponds 5 and 4 are drained with 12" RCP's. Flow from these ponds is primarily over a lowered section of berm, and the 12" RCP's are present to drain the bottom within 24 hours. Submerged outlet capacity is 1.96 CFS, and flow required to drain in 24 hours is 0.17 CFS (Appendix 27).

<u>CHANNEL CAPACITIES</u>

The 4' riprap channel south of Building 8 has a capacity of 12 CFS (Appendix 28). Expected 100-year flow is 1.16 CFS.

The sidewalk culvert on the south side of Building 7 has a capacity of 1.8 CFS (Appendix 29), and expected 100-year flow is 0.14 CFS.

- Is LOMR proposed to relocate fp w/in new ponds?

APPENDIX 1

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

AUGUST, 1996

Smith Engineering Company

A Full Service Engineering Company

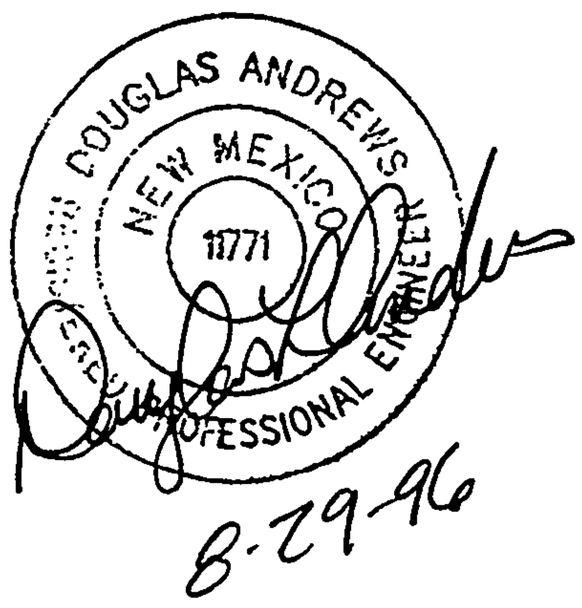
APPENDIX 1

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

AUGUST, 1996



8-29-96

Prepared by

SMITH ENGINEERING COMPANY
6400 UPTOWN BOULEVARD NE SUITE 500E
ALBUQUERQUE, NM 87110

SEC No. 196626

APPENDIX I

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

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MAP NO. 3	OFF-SITE DRAINAGE BASIN MAP	7

APPENDIX "A"

HYDROLOGY COMPUTATIONS

APPENDIX 1

1. INTRODUCTION

The City of Albuquerque Development Service Department contacted Smith Engineering Company (SEC) to determine the impacts of off-site flows to the Bluewater Development. Red Mountain Engineering is performing the on-site drainage work for the site. The Vicinity Map (Map No. 1) shows the location of the site relative to the City of Albuquerque Zone Atlas Map K-10.

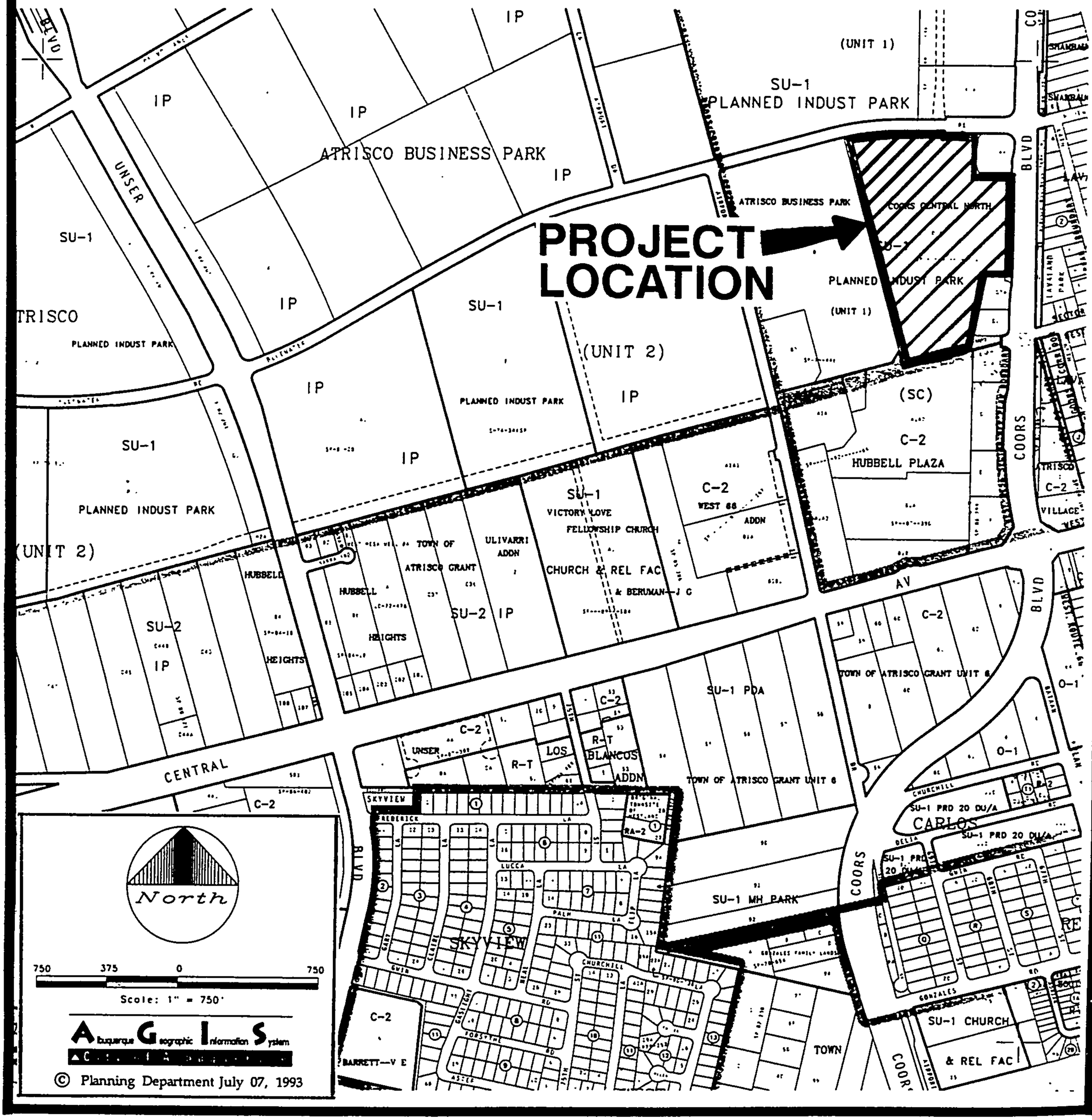
2. HYDROLOGY

Frequency flows and volumes were quantified according to "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque," New Mexico, January 1993. For the purpose of this report only fully developed conditions were considered. Land treatments for all of the off-site basins consist of ten percent (10%) type "B" and ninety percent (90%) type "D". Due to the fact that the off-site basins are relatively small, time of concentrations for the basins are extremely short thus, twelve (12) minute time of concentrations were used for all of the off-site basins. Appendix "A" contains all hydrology computations.

3. FLOOD PLAINS

In reviewing the Flood Boundary and Floodway Maps for the City of Albuquerque, New Mexico, Bernalillo County (Panel 27 of 50 Community-Panel Number 350002 0027) dated October 14, 1983, flood plains do exist. One flood plain exists on the project site with several surrounding the site. A portion of the on site flood plain extends into the undeveloped

APPENDIX 1


PROJECT LOCATION
ATRISCO BUSINESS PARK
SU-1 PLANNED INDUST PARK (UNIT 1)
SU-1 PLANNED INDUST PARK (UNIT 2)
SU-1 PLANNED INDUST PARK
SU-1 PLANNED INDUST PARK (UNIT 2)
SU-1 PLANNED INDUST PARK
SU-1 PLANNED INDUST PARK (UNIT 1

PROJECT LOCATION

AIRPORT DRIVE

BLUEWATER ROAD

OLGAMES ROAD

CENTRAL AVENUE

COORS ROAD

RM 48

COORS ROAD

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

FLOOD PLAIN MAP

MAP NO. 2

SMITH ENGINEERING CO.

LEGEND

EXISTING FLOOD PLAIN

N

0 250 500 1000

SCALE: 1"=500'

APPENDIX I

portion of off-site basin O-3. All other off-site drainage basins do not contain flood plains. Map No. 2 shows the flood boundaries on site and surrounding areas.

4. OFF-SITE CONTRIBUTIONS

The Bluewater Development is bordered on the north by Bluewater Rd. NW and a Diamond Shamrock Service Station, the east by Coors Rd. NW, the south by an Arby's restaurant along with a portion of the Coors & Central Shopping Center and an undeveloped tract and the west by Amity Leather. All of the flow from Amity Leather is retained on their property. The existing storm drain system in Coors Rd. NW handles all flow on Coors Rd. NW thus, flows from Coors Rd. will not enter the Bluewater Development site. All off-site flows entering the project site will enter from the north and south. Map No. 1 (Off-Site Drainage Basin Map) shows contributing basins. Drainage basin delineation was determined using Orthophoto Topographic Mapping provided by the City of Albuquerque Mapping and Records Division along with the use of existing drainage reports relative to the area. The existing drainage report information was provided by the City of Albuquerque Hydrology Division. Field visits were also performed to verify the mapping and existing drainage reports.

Four (4) off-site drainage basins contribute storm water runoff to the Bluewater Development. Basin O-1 consists of a portion of Bluewater Rd. NW along with a portion of the Elastimold Development just north of Bluewater Rd. Basin O-1 is the largest off-site basin and contributes more runoff to the Bluewater Development site than the other off-site drainage basins. The runoff from basin O-1 enters the site at analysis point AP-O1. It should be noted

APPENDIX I

the area contributing by the Elastimold Development was determined using the orthophoto topographic maps provided by the City of Albuquerque. The City of Albuquerque Hydrology Division does not have a drainage report on file for this site. A survey of this area could be performed to verify the topographic features. The survey may show that this area drains to the north and does not contribute to the Bluewater Development.

K10/D11 approved plan dated 3-3-95 Certified 3-28-95

Basin O-2 consists of the Diamond Shamrock Service Station at the southwest corner of Bluewater Rd. and Coors Rd. This flow enters the site from the north at analysis point AP-O2. A temporary retention pond currently exists on the Bluewater site that retains all runoff from basin O-2.

Basin O-3 is located southeast of the Bluewater Development. Basin O-3 consists of a portion of a Giant Service Station, an Arby's Restaurant, and an undeveloped tract of land just north of the Arby's Restaurant. This flow enters the site from the south at analysis point AP-O3. A temporary pond currently exists on the undeveloped tract to handle flows from the Arby's development.

Basin O-4 consists of the remaining portion of the Giant Service Station discussed above and a portion of the Coors & Central Shopping Center. This flow enters the site from the south at analysis point AP-O4. A temporary pond currently exists on the Bluewater site that helps handle the runoff from basin O-4.

Table 1 provides a summary of the hydrology calculations in the form of ten (10) year and one hundred (100) year storm events. In accordance with the DPM, a twenty-four (24) hour storm was used in all volume calculations and a six hour storm was used in all flow calculations.

if all other developments in this area were required to pond, then shouldn't this development pond also? This site accepts all volume from these ponds

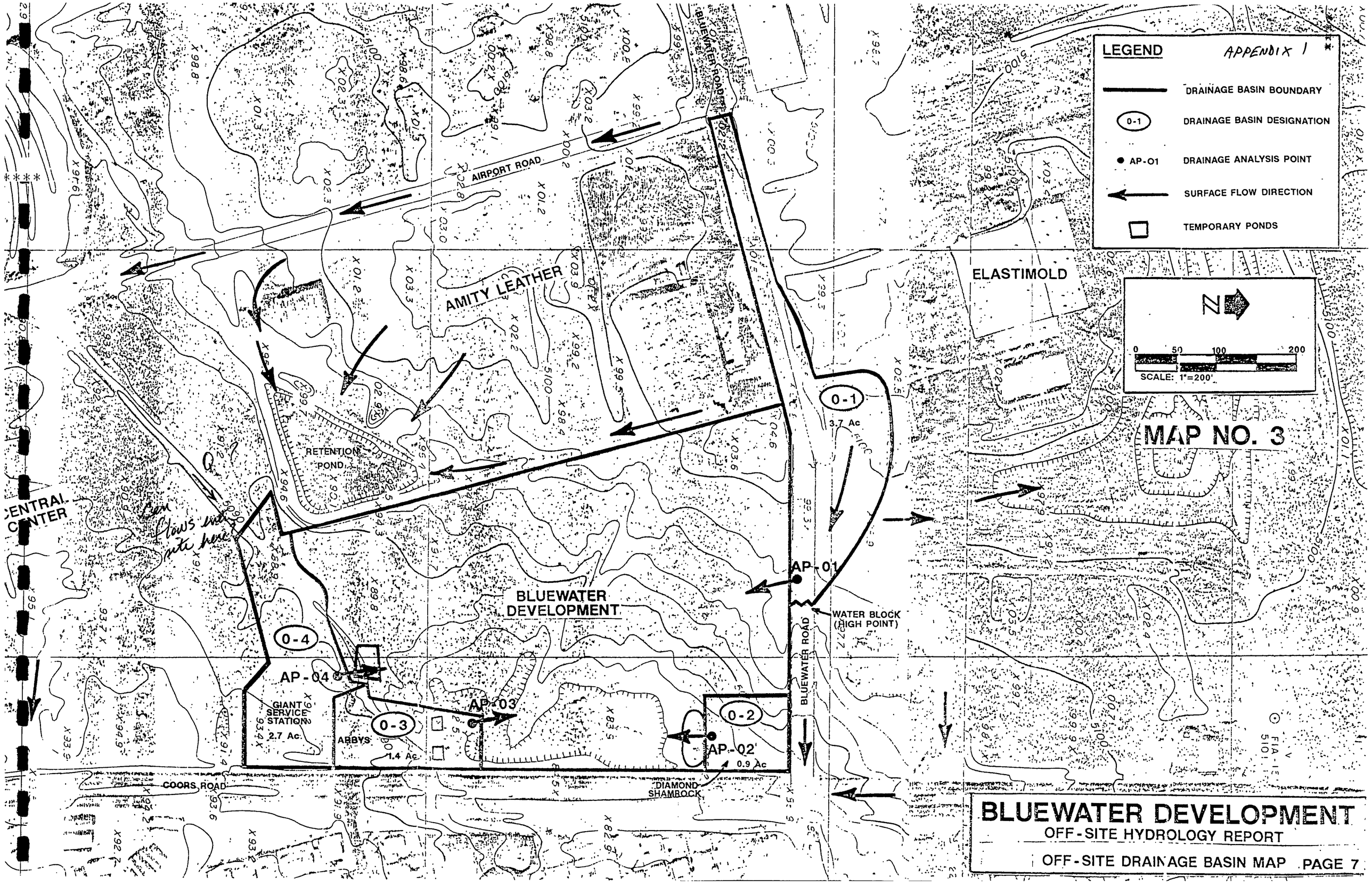
APPENDIX I

TABLE 1

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

SUMMARY OF PEAK DISCHARGES AND PEAK VOLUMES

ANALYSIS POINT	CONTRIBUTING DRAINAGE BASIN	DRAINAGE BASIN AREA (ac.)	Q(10) (6hr.) (cfs)	V(10) (24hr.) (ac.ft.)	Q(100) (6hr.) (cfs)	V(100) (24hr.) (ac.ft.)
AP-O1	O-1	3.7	9.9	0.4785	15.3	0.6950
AP-O2	O-2	0.9	2.4	0.1165	3.7	0.1691
AP-O3	O-3	1.4	3.7	0.1811	5.8	0.2630
AP-O4	O-4	2.7	7.2	0.3492	11.2	0.5072
TOTALS CONTRIBUTING TO THE BLUEWATER DEVELOPMENT	**O-1,O-2,O-3,O-4**	**8.7 ac.**	**23.2 cfs**	**1.1253 ac.ft.**	**36.0 cfs**	**1.6343 ac.ft.**



BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

OFF-SITE DRAINAGE BASIN MAP PAGE 7

APPENDIX I

APPENDIX "A"

HYDROLOGY COMPUTATIONS

APPENDIX 1

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 1 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/7/96 CHECKED BY _____ DATE / /

HYDROLOGY COMPUTATIONS

CRITERIA USED: SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN FOR THE CITY OF ALBUQUERQUE, NM.

ALL BASINS LIE IN PRECIPITATION ZONE ONE (1)

$P_{60} = 1.87$ IN. ; $P_{360} = 2.20$ IN ; $P_{1440} = 2.66$ IN.

VALUES TAKEN FROM TABLE A-2, DPM

BASIN O-1

AREA = 3.7 Ac.; LAND TREATMENTS: "B" = 10%, "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

10 YEAR

$Q_{10} = (0.76\ CFS/Ac)(.10)(3.7\ Ac) + (2.89\ CFS/Ac)(.90)(3.7\ Ac)$

$Q_P = \boxed{9.9\ CFS}$

100 YEAR

$Q_{100} = (2.03\ CFS/Ac)(.10)(3.7\ Ac) + (4.37\ CFS/Ac)(.90)(3.7\ Ac)$

$Q_P = \boxed{15.3\ CFS}$

VOLUMES - 24 HOUR STORM

10-YEAR

$E_{10} = (.22\ IN)(.10) + (1.24\ IN)(.90) = 1.138\ IN.$

$V_{360} = (1.138\ IN)(3.7\ Ac)\left(\frac{1\ FT}{12\ IN.}\right) = 0.3509\ Ac.Ft$

$V_{1440} = .3509\ Ac.Ft + (.90)(3.7\ Ac)[2.66\ IN - 2.20\ IN]\left(\frac{1\ FT}{12\ IN}\right)$

$V_P = \boxed{0.4785\ Ac.Ft}$

CONT.

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 2 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/27/96 CHECKED BY _____ DATE 1/1

BASIN O-1 (CONT.)

VOLUMES - 24 HOUR STORM

100 YEAR

$E_{100} = (.67\,IN.)(.10) + (1.97\,IN)(.90) = 1.84\,IN.$

$V_{360} = (1.84\,IN)(3.7\,Ac)\left(\frac{1\,Ft}{12\,IN}\right) = 0.5673\,Ac.Ft.$

$V_{1440} = 0.5673\,Ac.Ft + (.90)(3.7\,Ac)[2.66\,IN - 2.20\,IN]\left(\frac{1\,Ft}{12\,IN}\right)$

$= \boxed{0.6950\,Ac\,Ft}$

BASIN O-2

AREA = 0.90 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

$Q_{10} = (.76)(.10)(.90) + (2.89)(.90)(.90) = \boxed{2.4\,CFS}$

$Q_{100} = (2.03)(.10)(.90) + (4.37)(.90)(.90) = \boxed{3.7\,CFS}$

VOLUMES - 24-HOUR STORM

$E_{10} = 1.138\,IN$

$V_{360} = (1.138)(.90)(1/12) = 0.0854\,Ac.Ft$

$V_{1440} = 0.0854 + (.90)(.90)(.46)(1/12) = \boxed{0.1165\,Ac.Ft}$

$E_{100} = 1.84\,IN$

$V_{360} = (1.84)(.90)(1/12) = 0.1380\,Ac.Ft$

$V_{1440} = 0.1380 + (.90)(.90)(.46)(1/12) = \boxed{0.1691\,Ac.Ft}$

CONT. →

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 3 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/27/96 CHECKED BY _____ DATE / /

BASIN O-3

AREA = 1.4 Ac.; LAND TREATMENTS "B" - 10%, "D" - 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

$Q_{10} = (.76)(.10)(1.4) + (2.89)(.90)(1.4) =$ **3.1 CFS**

$Q_{100} = (2.03)(.10)(1.4) + (4.37)(.90)(1.4) =$ **5.8 CFS**

VOLUMES - 24-HOUR STORM

$E_{10} = 1.138$ IN.

$V_{360} = (1.138)(1.4)(1/12) = 0.1328$ Ac.Ft.

$V_{1440} = 0.1328 + (.9)(1.4)(.46)(1/12) =$ **0.1811 Ac.Ft**

$E_{100} = 1.84$ IN

$V_{360} = (1.84)(1.4)(1/12) = 0.2147$ Ac.Ft.

$V_{1440} = 0.2147 + (.9)(1.4)(.46)(1/12) =$ **0.2630 Ac.Ft**

BASIN O-4

AREA = 2.7 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN

$Q_{10} = (.76)(.10)(2.7) + (2.89)(.90)(2.7) =$ **7.2 CFS**

$Q_{100} = (2.03)(.10)(2.7) + (4.37)(.90)(2.7) =$ **11.2 CFS**

VOLUMES - 24 HOUR STORM

$E_{10} = 1.138$ IN.; $V_{360} = (1.138\text{IN})(2.7)(1/12) = 0.2561$ Ac.Ft.

$V_{1440} = 0.2561 + (.90)(2.7)(.46)(1/12) =$ **0.3492 Ac.Ft**

$E_{100} = 1.84$ IN.; $V_{360} = (1.84)(2.7)(1/12) = 0.4140$ Ac.Ft.

$V_{1440} = 0.4140 + (.90)(2.7)(.46)(1/12) =$ **0.5072 Ac.Ft**

WEST BLUFF DRAINAGE PLAN
PHASE III

APPENDIX 'D' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED STORM DRAIN FACILITIES", LISTS STORM DRAINS REQUIRED TO MEET THE MINIMUM DESIGN CRITERIA FOR FLOW IN STREETS PER THE CITY OF ALBUQUERQUE DRAINAGE ORDINANCES AND POLICIES.

APPENDIX 'E' - THIS APPENDIX, TITLED "SUMMARY OF EXISTING CROSSING STRUCTURES", CONTAINS INFORMATION RELATIVE TO EXISTING CROSSING STRUCTURES WITHIN THE WEST BLUFF AREA.

APPENDIX 'F' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED CHANNELS AND BOX STRUCTURES", CONTAINS DISCHARGE, FLOW DEPTH AND FLOW VELOCITY INFORMATION FOR THE MAJOR DRAINAGE FACILITIES, I.E., WEST BLUFF OUTFALL, I-40 INTERCEPTOR, WEST MESA DIVERSION AND UNSER DIVERSION FOR THE STRUCTURES AS ASSUMED IN THE COMPUTER MODELING FOR THE 10 YEAR AND 100 YEAR STORM EVENTS. THE FLOW DEPTHS AND FLOW VELOCITIES SHOWN IN THIS APPENDIX ARE CALCULATED FOR NORMAL DEPTH, AND DO NOT REPRESENT THE ULTIMATE BACKWATER ANALYSIS.

THE PROPOSED IMPROVEMENT SIZES, ALIGNMENTS AND LOCATIONS DEPICTED IN THESE APPENDICES ARE NOT MEANT TO BE FINAL BUT EACH MUST BE DETERMINED IN THEIR PRELIMINARY DESIGN.

VII. PROPOSED FLOOD MITIGATION MEASURES

THE DRAINAGE SOLUTION PROPOSED FOR THE MANAGEMENT OF STORM WATER WITHIN THE STUDY AREA INCORPORATES BOTH STRUCTURAL AND NON-STRUCTURAL MEASURES. THE STRUCTURAL MEASURES HAVE BEEN GROUPED INTO CHANNELS AND BOX STRUCTURES AND STORM DRAIN FACILITIES. THE CHANNELS AND BOX STRUCTURES ARE THOSE FACILITIES WHICH WILL PREVENT LARGE UPLAND AREAS FROM INUNDATING DOWNSTREAM AREAS FOR A DEVELOPED WATERSHED. THE STORM DRAIN FACILITIES ARE THOSE FACILITIES WHICH WILL DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE MAJORITY OF THE STUDY AREA RELIES ON STRUCTURAL MEASURES FOR THE MITIGATION OF STORM RUNOFF. A SMALL PORTION OF THE STUDY AREA UTILIZES NON-STRUCTURAL MEASURES (I.E. DETENTION AREAS) FOR THE MITIGATION OF FLOOD WATER. THIS AREA IS THAT PORTION OF THE STUDY AREA THAT LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD.

A. STRUCTURAL FLOOD MITIGATION MEASURES

THE STRUCTURAL DRAINAGE FACILITIES, AS PROPOSED UNDER PHASE III OF THE WEST BLUFF DRAINAGE PLAN, ARE DEFINED BY THE FOLLOWING MAJOR ELEMENTS:

1. WEST BLUFF OUTFALL
2. I-40 INTERCEPTOR
3. WEST MESA DIVERSION
4. UNSER DIVERSION

THE WEST BLUFF OUTFALL IS THAT PORTION OF THE SYSTEM THAT WILL CONVEY STORM FLOWS THROUGH EXISTING CONCRETE BOX CULVERTS UNDER COORS BOULEVARD, NORTH OF INTERSTATE HIGHWAY 40 AND COORS BOULEVARD INTERCHANGE, TO THE RIO GRANDE.

THE I-40 INTERCEPTOR WILL INTERCEPT FLOWS GENERATED NORTH OF INTERSTATE HIGHWAY 40, ALONG THE NORTH RIGHT-OF-WAY OF INTERSTATE HIGHWAY 40, AND CONVEY THE STORM FLOW TO THE WEST BLUFF OUTFALL.

THE WEST MESA DIVERSION WILL INTERCEPT FLOWS GENERATED FROM A PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND CONVEY THE RUNOFF UNDER INTERSTATE HIGHWAY 40, USING EXISTING CONCRETE BOX CULVERTS, TO THE I-40 INTERCEPTOR.

THE UNSER DIVERSION WILL INTERCEPT FLOWS GENERATED FROM THAT PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND WEST OF THE WEST BOUNDARY OF THE ATRISCO BUSINESS PARK AND CONVEY THE RUNOFF TO UNSER BOULEVARD. THE UNSER DIVERSION AND THE EXISTING UNSER BOULEVARD STORM DRAIN, WILL DISCHARGE SOUTH INTO FACILITIES PROPOSED IN UNSER BOULEVARD TO THE AMOLE DEL NORTE DRAINAGE SYSTEM.

THE DRAINAGE FACILITIES, AT THE TIME OF PRELIMINARY DESIGN, SHALL ADDRESS AND INCORPORATE JOINT-USE ASPECTS (I.E. OPEN SPACE BUFFER STRIP, LANDSCAPING, BICYCLE PATHS, JOGGING TRAILS, ETC.) WITH THE PROPOSED FACILITIES, AS REQUIRED BY THE LAND USE PLANS CURRENTLY ADOPTED BY THE CITY OF ALBUQUERQUE FOR THIS AREA OF THE WEST MESA. THE PROPOSED CHANNELS AND BOX STRUCTURES ARE PRESENTED IN APPENDIX 'F'.

THE STORM DRAIN FACILITIES ARE DEFINED AS THOSE FACILITIES WHICH COLLECT RUNOFF AND DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE PROPOSED STORM DRAIN FACILITIES ARE LISTED IN APPENDIX 'D'.

B. NON-STRUCTURAL FLOOD MITIGATION MEASURES

NON-STRUCTURAL MEASURES, FOR THE MANAGEMENT OF STORM RUNOFF, ARE PROPOSED FOR THAT PORTION OF THE STUDY AREA WHICH LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD. THIS PORTION OF THE STUDY AREA WILL UTILIZE THE EXISTING STORM SEWER IN BLUEWATER ROAD EAST OF COORS BOULEVARD AS THE OUTFALL FOR STORM RUNOFF. HOWEVER, DUE TO THE LIMITED CAPACITY OF THE EXISTING STORM DRAIN IN BLUEWATER ROAD, NON-STRUCTURAL MEASURES WILL REQUIRE THE DETENTION OF ALL RUNOFF FOR A PERIOD OF TWO (2) HOURS FROM THE TIME THE STORM BEGINS. AFTER THE TWO HOURS OF DETENTION TIME, FLOWS FROM THIS PORTION OF THE STUDY AREA WILL BE REQUIRED TO DISCHARGE AT A RATE NOT TO EXCEED 0.20 CFS/ACRE.

APPENDIX XXXX

APPENDIX 3

MAXIMUM LENGTH OF LEVEL PIPE WHICH WILL PRODUCE SCOURING VELOCITY

SEDIMENT YIELD (ANNUAL), FROM AMAFCA "SEDIMENT AND EROSION DESIGN GUIDE" NOVEMBER 1994, TABLE 2.1

MAXIMUM = 10.2 TONS/AC./YEAR

SEDIMENT DEPTH (ASSUME ONE YEAR ACCUMULATION)

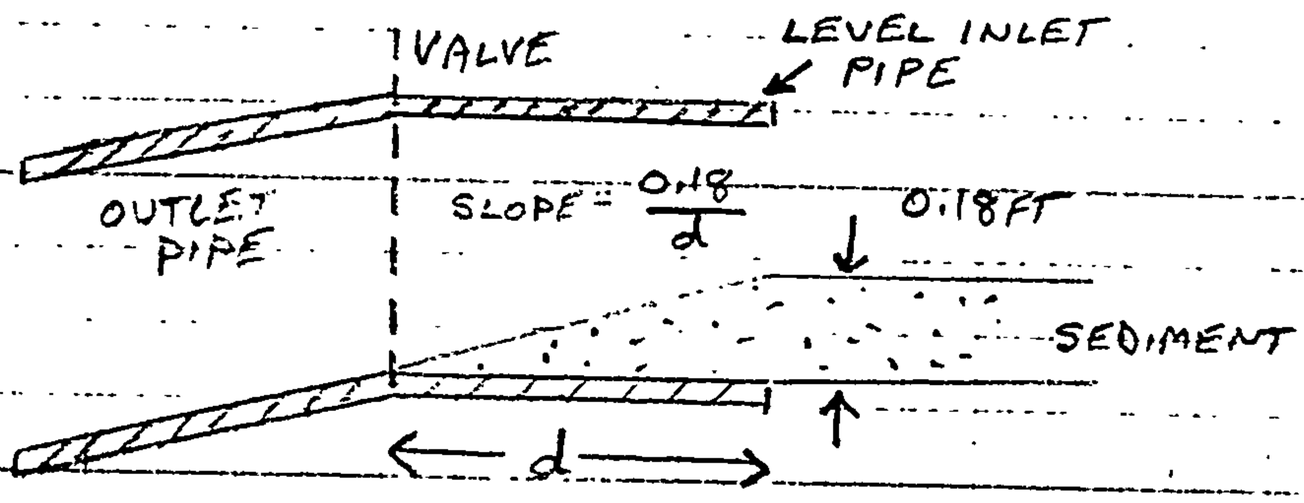
$= [(\text{AREA DRAINED})(10.2 \text{ TONS/AC.})(2000 \text{ LB/TON})] / (100 \text{ LB/CUFT})(\text{AREA OF POND})$

FOR PONDS 7 AND 8 $= [(3.7 \text{ AC OFFSITE} + 6.2 \text{ AC ONSITE})(10.2 \text{ TONS/AC})$

$(2000 \text{ LB/TON})] / [(100 \text{ LB/CU FT})(15{,}000 \text{ FT}^2)] = \underline{0.13 \text{ FT}}$

FOR PONDS 3 AND 4 $= [(5.0 \text{ AC OFFSITE} + 11.5 \text{ AC ONSITE})(10.2 \text{ TONS/ACRE})$

$(2000 \text{ LB/TON})] / [(100 \text{ LB/CU FT})(19{,}200 \text{ FT}^2)] = \underline{0.18 \text{ FT}}$

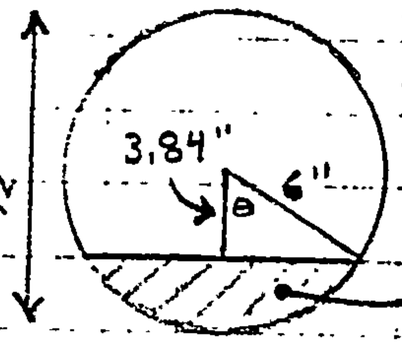


flows were not fulled for sediment. Is this an issue?

$V = \frac{1.486}{n} r^{2/3} S^{1/2}$

$2 \text{ FT/SEC} (= \text{SCOURING VELOCITY}) = \frac{1.486}{0.03} r^{2/3} \left(\frac{0.18}{d}\right)^{1/2}$

WHERE $r = \frac{a}{p}$



$\theta = \cos^{-1} \frac{3.84}{6} = 50.2°$

$(\sin 50.2)(6") = 4.61"$

SEDIMENT = 0.18' = 2.16"

$a = \frac{360 - [2(50.2)]}{360} (\pi(12)^2/4) + [(3.84)(4.61)] = 99.3 \text{ IN}^2$

APPENDIX 3

$$P = \pi(12")\left[\frac{360-(2(50.2))}{360}\right] + [2(4.61)] = 36.4"$$

$$r = \frac{a}{p} = \frac{99.3 in^2}{36.4 in} = 2.73$$

$$2 FT/SEC = \frac{1.486}{0.03}(2.73)^{2/3}\left(\frac{0.18}{d}\right)^{1/2}$$

$d = \underline{421 FT}$ MAXIMUM LENGTH FOR SCOURING VELOCITY

All storm drains and ponds on-site are to be privately maintained? Need pond easements, and agreement & covenants for ponds

APPENDIX 4

DISCHARGE THROUGH RESTRICTOR PLATES

DISCHARGE ON POND 2 TO COORS BOULEVARD STORM DRAIN

H_L HEADLOSS IN PIPE $= F \frac{L}{D} V^2/2g$, ASSUME $L=0$ THEN $H_L=0$

$$H_1 + \frac{V_1^2}{2g} + \frac{P_1}{\omega} = \frac{V_2^2}{2g} + \frac{P_2}{\omega} + H_2$$

ASSUME H_2 = DATUM LEVEL $=0$

$P_1=0$ $P_2=0$

$$\text{THEN } V_2 = \sqrt{2g\left(\frac{V_1^2}{2g} + H\right)}$$

WITH ENERGY LOSS AT THE ORIFICE, THIS BECOMES $V_2 = C_v\sqrt{2gH}$

FOR TANKS WHERE $V_1 \approx 0$, BUT HERE V_1 IS PROPORTIONAL TO V_2

FOR C_v USE 0.603 (URQUHART, 1962, PAGE 4-31)

MAXIMUM HEAD IS AT COORS BOULEVARD CURB INLET INVERT 5078.0, WITH POND SURFACE AT 5085.0, $H = 7$

? where is this determined?

$$\text{THEN } V_2 = C_v\sqrt{2g\left(\frac{V_1^2}{2g} + H\right)}$$

SINCE $Q_1 = V_1A_1 = Q_2 = V_2A_2$ THEN $V_1A_1 = V_2A_2$

$$\text{AND } V_1 = \frac{V_2A_2}{A_1} = \frac{V_2(\pi(18\text{"DIA})^2/4}{7.375\text{ IN}} = 4.68V_2$$

$$\text{THEN } V_2 = C_v\sqrt{2g\left(\frac{4.68V_2}{2g} + H\right)} \quad \text{AND } V_2^2 = C_v^2\left(2g\left(\frac{4.68V_2}{2g} + H\right)\right)$$

$$\text{SIMPLIFYING } V_2^2 = (0.603)^2\left[\left(2(32.2\text{FT/SEC}^2)\right)\left(\frac{4.68V_2}{2(32.2\text{FT/SEC}^2)}\right) + 7\right]$$

$V_2 = 13.7$ FT/SEC

$Q = VA = (13.7\text{ FT/SEC})(0.616\text{FT})^2 = 5.20$ CFS

which on-site basin? What are Q_{100} & V_{100} for this basin (or on & off site?

AVERAGE DISCHARGE AT POND DEPTH 1.5', $H = 5.5'$ $Q = 4.63$ CFS

USE RESTRICTOR PLATE WITH 7.375 IN × 7.375 IN OPENING

FOR DISCHARGE FROM POND 5, $V_1 = \frac{A_2V_2}{A_1} = \frac{V_2(\pi(12\text{"DIA})^2/4}{(6.5\text{ IN})^2} = 2.68V_2$

$V_2 = 14.2$ FT/SEC $Q = VA = (14.2\text{ FT/SEC})(0.542\text{ FT})^2 = 4.17$ CFS

USE RESTRICTOR PLATE WITH 6.5 IN SQUARE OPENING

POND 7 AND 8 VOLUME

TWO PONDS ARE CREATED HERE TO CONFINE DETENTION PONDING TO THE EASTERN EDGE OF THE 6.1335 ACRE TRACT. THE PONDS ARE AT 5 FEET ELEVATION DIFFERENCE TO REDUCE GRADING AND BERM AREA.

THE TRACT IS IN PRECIPITATION ZONE 1, LAND TREATMENT C.

$$E = \frac{E_c A_c}{A_c} = \frac{0.99 A_c}{A_c} = 0.99$$

$V_{360} = E * A_c = (0.99)(6.1335 \text{ ACRES})/(12 \text{ IN/FT}) = 0.506 \text{ ACRE/FEET}$

V_{1440} = SAME AS ABOVE (NO LAND TREATMENT A) = 22,000 FT^3

OFFSITE FLOW IS 0.605 ACRE/FEET = 30,300 CUBIC FEET

TOTAL REQUIRED DETENTION = 52,300 CUBIC FEET

VOLUME PROVIDED = 30,000 (POND 7) + 24,000 (POND 5) = 54,000 CUBIC FEET

POND 1 THROUGH 6 VOLUME

AREA	LAND TREATMENT
1.8935	A
1.7000	B
1.8800	C
5.9700	D
11.4335	

$$E = \frac{(0.44)(1.8935) + 0.67(1.7000) + 0.99(1.8800) + 1.97(5.9700)}{11.4335} = 1.36"$$

$V_{360} = (1.36 \text{ IN})(11.4335 \text{ AC})/(12"/\text{FT}) = 1.296 \text{ ACRE/FT} = 55,300 \text{ FT}^3$

$V_{1440} = (1.296 \text{ ACRE/FT}) + [(5.97 \text{ AC})(2.66 - 2.20)/12 \text{ IN/FT}] = 1.52 \text{ AC/FT} = 66,200 \text{ FT}^3$

OFFSITE FLOW (APPENDIX 1, pg 6) = 0.9393 AC/FT = 40,900 FT^3

TOTAL VOLUME REQUIRED = 107,100 FT^3, VOLUME PROVIDED 107,500 FT^3

APPENDIX 6

FLOW TO TWIN 21" RCP

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.14	D
2.38	

Q_{100} = (2.87 CFS/ACRE)(0.24 ACRE) + (4.37 CFS/ACRE)(2.14 ACRE) = 10.1 CFS

ADDITIONAL FLOW IF POND 8 VALVE FAILS OPEN = 4.17 CFS

TOTAL FLOW = 14.3 CFS

CAPACITY 'DOUBLE D' INLET = 9.6 CFS @ 6" PONDING (DPM Pg 75)

TOTAL CAPACITY = 19.2 CFS

APPENDIX 7

FLOW TO NEENAH R-2569 INLETS

WEST- CENTER GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.137	D

$Q_{100} = (4.37\ CFS/ACRE)(0.137\ AC) = 0.60\ CFS$

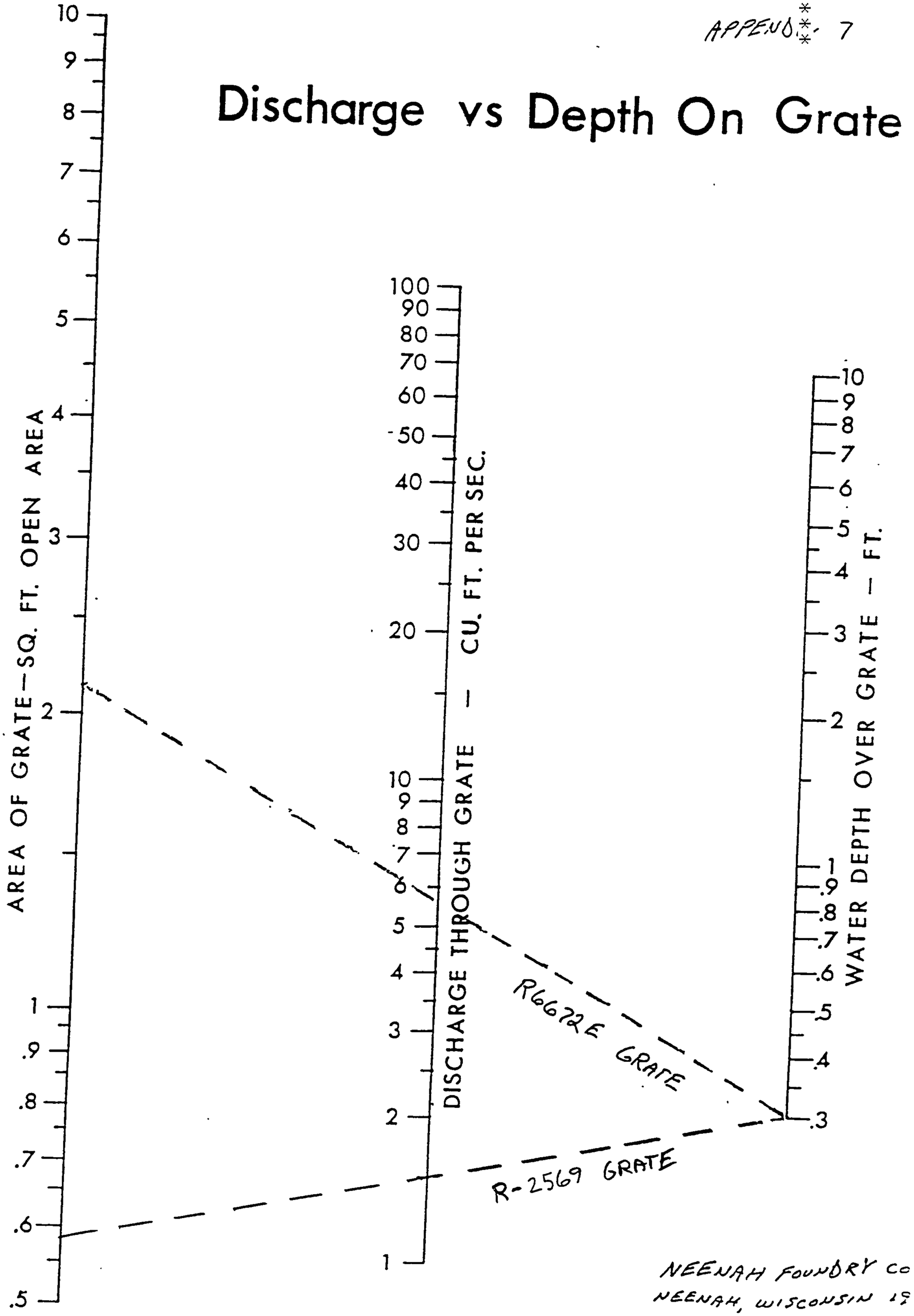
NORTH GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.103	D

$Q_{100} = (4.37\ CFS/ACRE)(0.103\ AC) = 0.45\ AC$

APPENDIX 7

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN U.S.A.

FLOW TO POND 4 18" RCP NORTH INLET GRATE

AREA	TREATMENT
	A
	B
0.038	C
0.343	D
0.381	

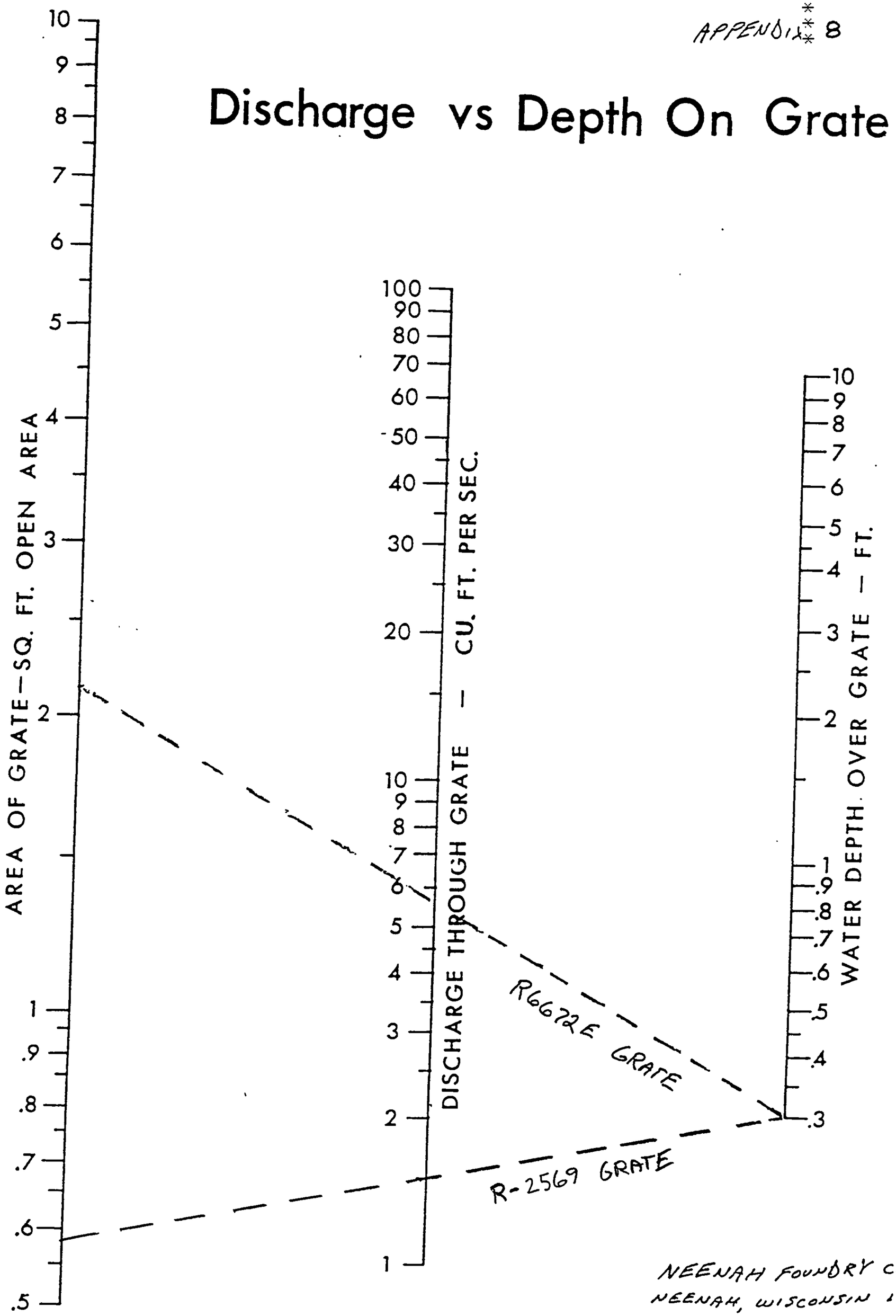
$Q_{100} = (2.87\ CFS/Ac)(0.038\ Ac) + (4.37\ CFS/Ac)(0.343\ Ac) = \underline{1.61\ CFS}$

CAPACITY OF A NEENAH R6672E GRATE IS 5.6 CFS AT 0.3 FT OF PONDIN

REMAINING RATES ON THIS LINE DRAIN SMALLER AREAS

APPENDIX 8

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN 19

APPENDIX 9

FLOW TO DOUBLE C INLETS NE OF BUILDING 10

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.49	C
1.94	D
2.43	

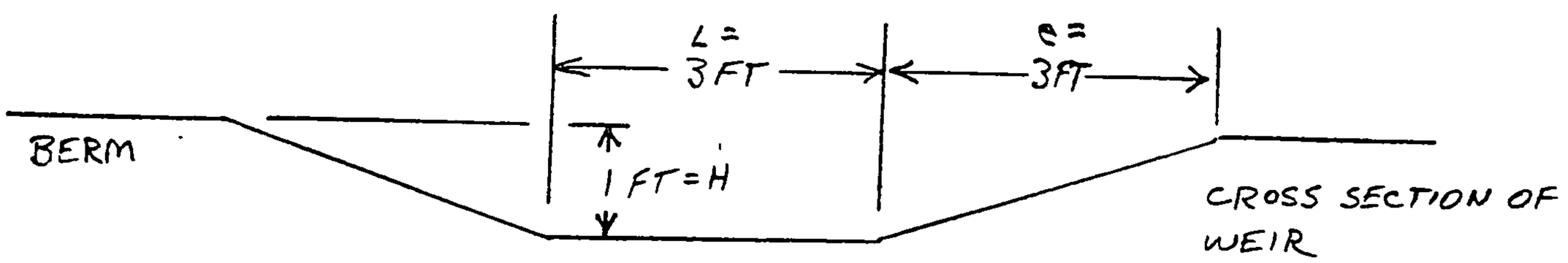
$Q_{100} = (2.87\ cfs/Ac)(0.49\ Ac) + (4.37\ cfs/Ac)(1.94\ Ac) = \underline{\underline{9.88\ CFS}}$

FLOW TO SINGLE NEENAH R-2569 N OF BUILDING 6

AREA	LAND TREATMENT
-	A
-	B
-	C
0.92	D
0.92 Ac	

$$Q_{100} = (4.37\ CFS/Ac)(0.92\ Ac) = 0.40\ CFS$$

POND 8 WEIR CAPACITY



FROM URQUHART, 'CIVIL ENGINEERING HANDBOOK' 1962, pg 4-53

FOR TRAPEZOIDAL WEIRS

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,LH^{3/2} + \tfrac{8}{15}\sqrt{2g}\,ZH^{5/2} \quad \text{WITH } Z = e/H$$

$$= \tfrac{2}{3}\sqrt{2(32.2\,FT/SEC^2)}\,(3')(1')^{3/2} + \tfrac{8}{15}\sqrt{2(32.2\,FT/SEC^2)}\,(3)(1')^{5/2}$$

$$= 28.9\ CFS$$

EXPECTED FLOW

AREA	LAND USE
—	A
—	B
—	C
3.07	D
3.07	

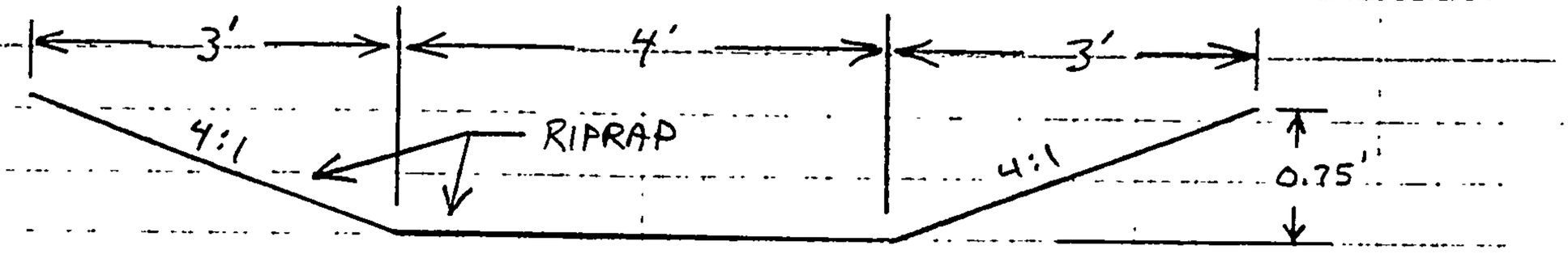
$Q_{100} = (2.87\ CFS/Ac)(3.07\ Ac) = 8.81\ CFS$

OFFSITE FLOW = 15.3 CFS

TOTAL FLOW = 24.1 CFS

APPENDIX II

CHANNEL CAPACITY POND 7 TO POND 8



$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$= (5.25\,FT^2)\left(\frac{1.486}{0.03}\right)\left(\frac{5.25\,FT^2}{10.18\,FT}\right)^{2/3}(0.022)^{1/2} = \underline{24.8\,CFS}$$

WEIR CAPACITY - SOUTH SIDE OF POND 3

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.35	C
1.37	D
1.72	

$Q_{100} = (2.87\ CFS/Ac)(0.35\ Ac) + (4.37\ CFS/Ac)(1.37\ Ac) = \underline{6.99\ CFS}$

CAPACITY (4' CURBCUT)

$Q_T = 2/3\sqrt{2g}\,LH^{3/2} + 8/15\sqrt{2g}\,ZH^{5/2}$

$= 2/3\sqrt{64.4\ FT/SEC^2}\,(4')(0.5')^{3/2} + 8/15\sqrt{64.4\ FT/SEC^2}\,(1)(0.5)^{5/2}$

$= \underline{8.33\ CFS}$

WEIR CAPACITY - POND 4

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.195	C
0.781	D
0.976	

$Q_{100} = (2.87\ CFS/ACRE)(0.195\ Ac) + (4.37\ CFS/Ac)(0.781\ Ac) = \underline{3.97\ CFS}$

WEIR CAPACITY (4' CURBCUT)

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,L H^{3/2} + \tfrac{8}{15}\sqrt{2g}\,Z H^{5/2}$$

$$= \tfrac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(4')(0.5')^{3/2} + \tfrac{8}{15}\sqrt{64.4\ FT/SEC^2}\,(1)(0.5')^{5/2}$$

$$= \underline{8.33\ CFS}$$

WEIR AT NORTH PARKING LOT

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.070	C
0.633	D
0.703Ac	

$Q_{100} = (3.87 CFS/ACRE)(0.070\ Ac) + (4.37 CFS/Ac)(0.633 A_c) = \underline{3.04\ CFS}$

WEIR CAPACITY (2' SIDEWALK CULVERT)

$Q_T = \frac{2}{3}\sqrt{2g}\, L H^{3/2}$

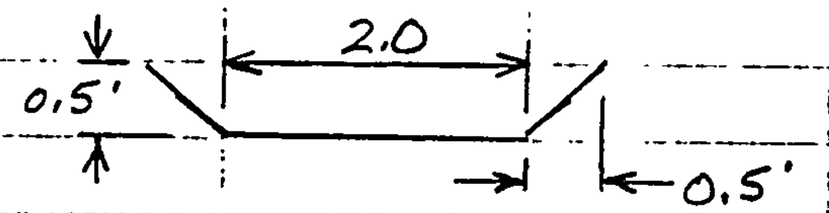
$= \frac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$

$= \underline{3.78\ CFS}$

CHANNEL CAPACITY

$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ FOR n = 0.33 RIPRAP LINING

CROSS-SECTION



$Q = (1.25\ FT^2)\frac{1.486}{0.033}\left(\frac{1.25\ FT^2}{3.41\ FT}\right)^{2/3}(0.02)^{1/2} = \underline{4.08\ CFS}$

WEIR AT WEST PARKING LOT DRIVE

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.168	C
0.672	D
0.840	

$Q_{100} = (3.87\ CFS/Ac)(0.168\ Ac) + (4.37\ CFS/Ac)(0.672\ Ac) = \underline{3.59\ CFS}$

WEIR CAPACITY (2' CURBCUT - VERTICAL SIDES)

$Q_T = {}^2/_3 \sqrt{2g}\, L H^{3/2}$

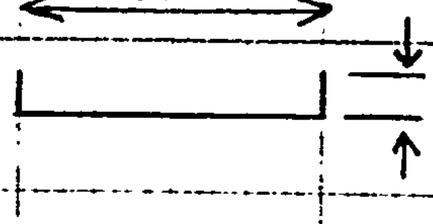
$= {}^2/_3 \sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$

$= \underline{3.78\ CFS}$

CHANNEL CAPACITY

$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ FOR $n = 0.013$ CONCRETE LINING

CROSS-SECTION



$Q = (1\ FT^2)\left(\frac{1.486}{0.013}\right)\left(\frac{1\ FT^2}{2\ FT}\right)^{2/3}(0.00625)^{1/2}$

$= \underline{5.6\ CFS}$

APPENDIX 16

FLOW BETWEEN POND 5 AND POND 4

FLOW FROM ONSITE: FROM POND 6 = 12.6 CFS (APPENDIX 11)
FROM WEIRS ON ACCESS ROAD = 18.3 CFS (APPENDIX 10)

SHEET FLOW TO POND 5

AREA	LAND TREATMENT
-	A
-	B
0.135	C
0.087	D
0.222 ACRES	

$Q_{100} = (2.87 CFS/Ac)(0.135 Ac) + (4.37 CFS/Ac)(0.087 Ac) = 0.768 CFS$

TOTAL FLOW TO POND 5 = 12.6CFS + 18.3CFS + 0.768CFS = 31.7CFS

$WEIR\ CAPACITY = \frac{2}{3}\sqrt{2g}\, L H^{3/2} = \frac{2}{3}\sqrt{2(32.2 FT/SEC^2}\,(37.5FT)(0.292-T)^{3/2}$

$= 31.6\ CFS$

WEIR DEPTH (H) = 3½" SO TOP OF BERM = 85.0 MINUS 3½"

= 84.7

TWIN 21" RCP'S FROM PARKING LOT TO POND 1

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.19	D
2.43	

$Q_{100} = (2.87 CFS/Ac)(0.24 Ac) + (4.37 CFS/Ac)(2.19 Ac) = 10.3 CFS$

TOTAL FLOW = 10.3 CFS + 4.17 CFS (POND 4 OVERFLOW IF VALVE UPSTREAM FAILS)

= 14.5 CFS

ELEVATION AT GRATE WITH 2" PONDING = 86.0

OUTLET INVERT 80.0 TOP OF POND ELEV 85.0

INLET INVERT 82.5

FOR INLET CONTROL (SUBMERGED)

$$Q = C_d A \sqrt{2gh}$$

$$= 0.6(2.41 FT^2)\sqrt{2(32.2 FT/SEC^2)(1')}$$

$$= 11.6 CFS$$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = \frac{0.4 + 1 + 29(0.012)^2(96')}{(0.4375)^{1.33}}\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 3.45 FT/SEC$ $Q = VA = (3.45 FT/SEC)(\pi(1.75')^2/4) = 8.30 CFS$

$Q_{REQUIRED} = 14.5 CFS$ SO USE TWO 21" RCP'S CAPACITY 16.6 CFS

SUMMARY: OUTLET CONTROL GOVERNS, USE TWO 21" RCP'S

APPENDIX 18

FLOW BETWEEN POND 4 AND POND 3

FLOW FROM ON SITE: FROM POND 5 = 31.7 CFS

SHEET FLOW TO POND 4

AREA	LAND TREATMENT
-	A
-	B
0.185	C
0.741	D
0.926	

$Q_{100} = (2.87\ CFS/Ac)(0.185\ AC) + (4.37\ CFS/Ac)(0.741\ AC) = 3.77\ CFS$

FLOW FROM OFF SITE: 5.8 CFS (APPENDIX 1, PAGE 6)

TOTAL FLOW TO POND 4 = 31.7 CFS + 3.77 CFS + 5.8 CFS = 41.3 CFS

WEIR CAPACITY = $\frac{2}{3}\sqrt{2g}\,LH^{3/2} = \frac{2}{3}\sqrt{2(32.2\ FT/SEC^2}\,(50.6\ FT)(0.292')^{3/2}$

= 42.7 CFS

WEIR DEPTH (H) = 3 1/2" SO TOP OF BERM = 85.0 MINUS 3 1/2"

= 84.7 ELEV

24" RCP AT BLUEWATER - CAPACITY

GRATE ELEV = 95.5 — LENGTH = 85 FT

INLET INVERT ELEV = 92.0 — POND SURFACE ELEV = 93.5

OUTLET ELEV = 91.5

$H_W/D = (3.5')/(2.0') = 1.75$

INLET LIMITED CAPACITY (FROM NOMOGRAPH) = 26.0 CFS INLET LIMITED

OUTLET LIMITED CAPACITY (UNSUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (95.5 - 91.5) = \frac{0.4+1+29(0.012)^2(85')}{(0.500')^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 7.63$ FT/SEC

$$Q = VA = (7.63 \text{ FT/SEC})(\pi(2')^2/4) = 24.0 \text{ CFS}$$

OUTLET LIMITED CAPACITY (POND FILLED - OUTLET SUBMERGED)

TAILWATER DEPTH EXCEEDS AVERAGE OF CRITICAL DEPTH AND DIAMETER

USE $H' = H - T_W = 4 - 2 = 2$

$$2 = \frac{0.4+1+29(0.012)^2(85')}{(0.500')^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 5.40$ FT/SEC

$$Q = VA = (5.40 \text{ FT/SEC})(\pi(2')^2/4) = 17.0 \text{ CFS OUTLET LIMITED (SUBMERGED)}$$

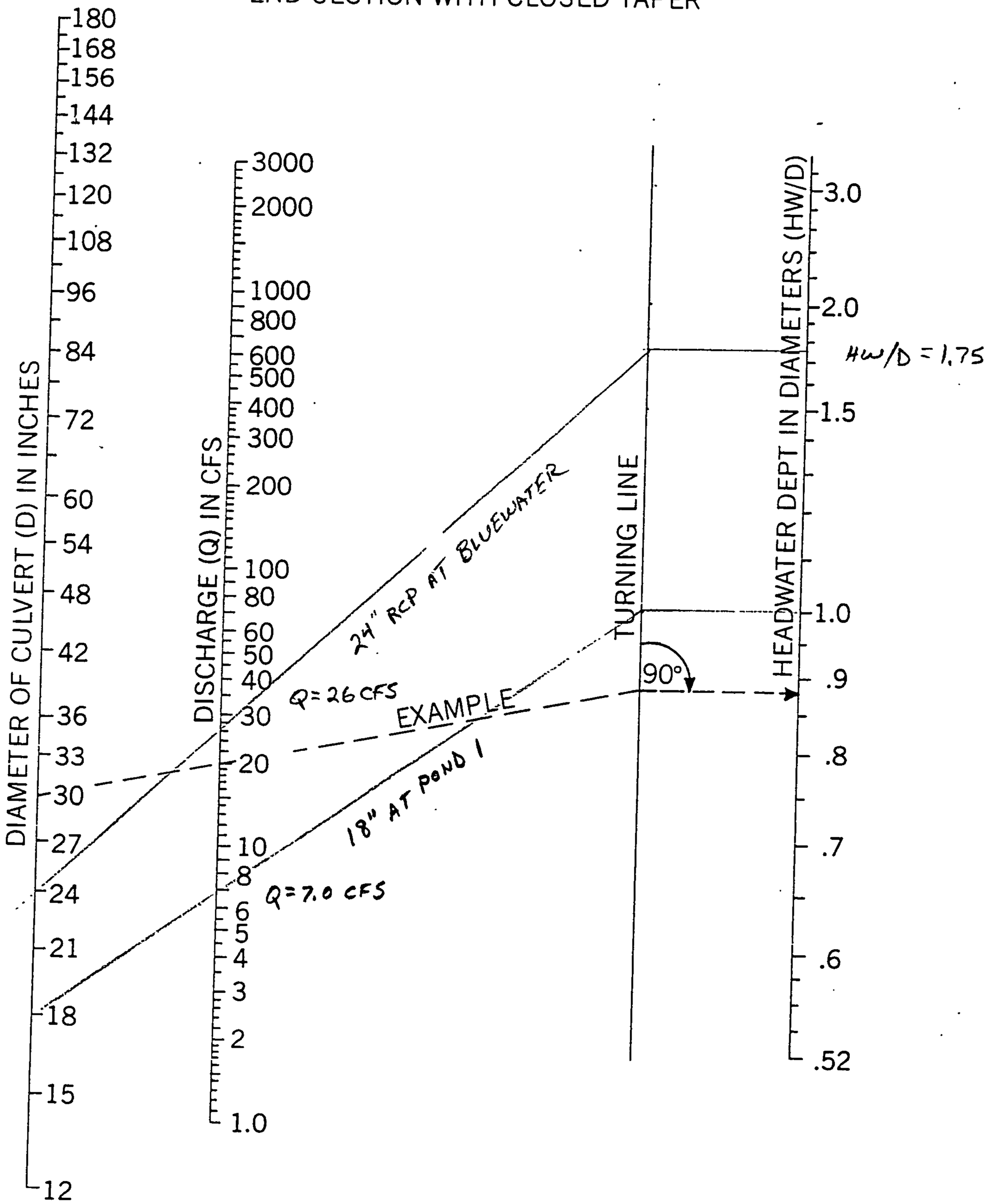
SUMMARY: CAPACITY IS SUBMERGED OUTLET LIMITED TO 17.0 CFS

EXPECTED $Q_{100} = 15.3$ CFS

TABLE A-11

HEADWATER DEPTH FOR CIRCULAR PIPE CULVERTS WITH INLET CONTROL

END SECTION WITH CLOSED TAPER



24" RCP FROM POND 6 TO POND 5

SHEET FLOW TO POND 6

AREA	LAND USE
—	A
—	B
0.131	C
0.523	D
0.654Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.131\ Ac) + (4.37\ CFS/Ac)(0.523\ Ac) = 2.66\ CFS$

TOTAL FLOW TO POND 6 = SHEET FLOW + NORTH WEIR FLOW

$= 2.66\ CFS + 6.99\ CFS = 9.65\ CFS$

POND 6 FILLS FASTER THAN POND 5

Q_{100} TO PONDS 1 THROUGH 6 COMBINED =

$= (1.29\ CFS/Ac)(1.8935\ Ac) + (2.03\ CFS/Ac)(1.700\ Ac) + (2.87\ CFS/Ac)(1.88\ Ac) +$

$+ (4.37\ CFS/Ac)(5.97\ Ac) = 37.4\ CFS + 20.7\ CFS\ (OFFSITE) = \underline{58.1\ CFS}$

POND 1 CAPACITY AS A PERCENTAGE OF TOTAL (FOR PONDS 1 THROUGH 6)

$= (100)\left(\frac{7500\ FT^3}{107,500}\right) = 6.98\%$

PERCENTAGE OF FLOW THROUGH POND 1 $= (100)\left(\frac{10.5\ CFS}{58.1\ CFS}\right) = 18.1\%$

RELATIVE RATE POND 6 FILLS - COMPARED TO PONDS 1 THROUGH 5:

$\frac{18.1\%\ FLOW}{6.98\%\ CAPACITY} = 2.6$ TIMES AS FAST

SO POND 1 WILL BE FULL WHEN PONDS 2 AND 3 HAVE LESS THAN 2' OF WATER PONDED, AND CONNECTION MUST HANDLE FULL FLOW

AT 10.5 CFS UNTIL PONDS 1 THROUGH 6 FILL. WITH MINIMUM FREEBOARD OF 0.5' AND BERM ELEVATION 86.5, THEN H = 86.0 - 85.0 = 1

FOR INLET CONTROL $Q = C_d A \sqrt{2gH}$

$$= (0.6)(\pi)\sqrt{2(32.2\ FT/SEC^2)(1')}$$

$$= 15.1\ CFS$$

FOR OUTLET CONTROL SUBMERGED

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g} = \frac{0.4 + 1 + 29(0.012)^2(63')}{(0.5)^{1.33}} \frac{V^2}{2(32.2\ FT/SEC^2)}$$

$V = 4.11\ FT/SEC$ $Q = VA = (4.11\ FT/SEC)(\pi(2')^2/4) = 12.9\ CFS$

SUMMARY: OUTLET CONTROL GOVERNS, USE ONE 24" RCP

NORTHEAST 12" RCP - CAPACITY

GRATE ELEV 86.2 POND SURFACE ELEV = 85.0

INLET INVERT 83.2

OUTLET INVERT 82.0

FLOW (APPENDIX 7) = 1.84 CFS

FOR INLET CONTROL (SUBMERGED) $Q = C_d A \sqrt{2gh}$

$= 0.6(\pi(1')^2/4)\sqrt{2(32.2 FT/SEC^2)(1')}$

$= \underline{3.78 CFS}$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \left(\frac{k_e + 1 + 29n^2L}{R^{1.33}}\right)\left(\frac{V^2}{2g}\right) = \left(\frac{0.4+1+29(0.012)^2(135')}{(0.25)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 2.28 FT/SEC$ $Q = VA = (2.28 FT/SEC)(\pi(1')^2/4) = \underline{1.79 CFS}$

SUMMARY: OUTLET CONTROL GOVERNS, USE 12" RCP

18" RCP IN SOUTHEAST PARKING LOT AND 12" RCP FROM POND 4 - CAPACITY

FROM POND 4 TO NORTH DROP INLET - 12" RCP

INLET INVERT 87.0 LENGTH 150'
OUTLET INVERT 82.5 POND 4 SURFACE ELEV 89.0
OUTLET GRATE ELEV 84.8

INLET LIMITING (SUBMERGED) $Q = C_d A \sqrt{2gh}$

$= 0.6(\pi(1')^2/4)\sqrt{2(32.2\ FT/SEC^2)(89-87)}$

$= 5.35\ CFS$

OUTLET LIMITING (NOT SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (89.0 - 82.5) = \left(\frac{0.4 + 1 + 29(0.012)^2(150')}{(0.25)^{1.33}}\right)\frac{V^2}{2(32.2)}$$

$V = 5.71\ FT/SEC \quad Q = VA = (5.71\ FT/SEC)(\pi(1')^2/4) = 4.48\ CFS$

FROM NORTH DROP INLET TO POND 2 (18" RCP)

EXPECTED FLOW TO ALL 3 INLETS

AREA	LAND USE
-	A
-	B
0.069	C
0.617	D
0.686 Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.069\ Ac) + (4.37\ CFS/Ac)(0.617\ Ac) = 2.89\ CFS$

TOTAL FLOW = FLOW TO INLETS + FLOW FROM POND 4

$= 2.89\ CFS + 4.48\ CFS = 7.37\ CFS$

18" RCP CAPACITY (CONTINUED)

INLET GRATE ELEV 84.3
INLET PONDING ELEV 85.0
OUTLET INVERT 82.0

OUTLET PONDING ELEV 85.0
LENGTH EACH SECTION 60'

INLET LIMITING (SUBMERGED) $Q = C_D A \sqrt{2gh}$
* (OUTLET POND AT SURFACE ELEV 84.5)

$= 0.6(\pi(1.5')^2/4)\sqrt{2(32.2 FT/SEC^2)(0.5')}$

$= 6.0$ CFS

OUTLET LIMITING (SUBMERGED)

$$H = \frac{K_e + 1 + 29 n^2 L}{R^{1.33}} \frac{V^2}{2g}$$

$$0.5 = \left(\frac{0.4 + 1 + 29(0.012)^2(60)}{(0.375)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right)$$

$V = 2.30$ FT/SEC

$Q = VA = (2.30 FT/SEC)(\pi(1.5)^2/4) = 4.07$ CFS

SINCE 4.07 CFS > 2.89 CFS, PARKING LOT WILL DRAIN TO POND 2 WITH MINIMAL DIFFERENCE IN WATER SURFACE ELEVATION

TO DRAIN POND 4 AFTER DELAYED RELEASE, POND 2 MUST REACH SURFACE ELEVATION 84.3, GIVING H = 0.6 IN EQUATION ABOVE (THEN V = 2.72 FT/SEC, Q = 4.80 CFS, AND 4.80 CFS > 4.48 CFS FROM POND 4. THE PARKING LOT WILL BE DRAINED AT THIS POINT.

PONDS 1,2,3 WILL REACH ELEVATION 84.3 AFTER RELEASE OF APPROXIMATELY 30,000 CUBIC FEET TO THE COORS BOULEVARD STORM SEWER. AT 5 CFS, THIS AMOUNTS TO A 2 HOUR DELAY AFTER THE 2 HOUR DELAY BEFORE DISCHARGE COMMENCES.

24" RCP'S CONNECTING POND 1 AND POND 2

EXPECTED FLOW

PERCENTAGE OF FLOW INTO POND 1

TOTAL FLOW TO PONDS 1, 2, AND 3

= 58.1 CFS (APPENDIX 16)

TOTAL FLOW TO POND 1

FROM TWO 24" RCP'S (APPENDIX 17) = 14.5 CFS

FROM 12" RCP ON NORTH (APPENDIX 18) = 1.84 CFS

FROM DIAMOND SHAMROCK (APPENDIX 1) = 3.7 CFS

FROM SHEET FLOW:

AREA	LANDUSE
—	A
—	B
0.22	C
0.87	D
1.09 Ac	

$Q_{100} = (2.87 CFS/Ac)(0.22 Ac) + (4.37 CFS/Ac)(0.87 Ac) = 4.43 CFS$

TOTAL FLOW TO POND 1 = 24.5 CFS

PERCENTAGE OF FLOW = $\frac{24.5 CFS}{58.1 CFS}(100) = 42.2\%$

PERCENTAGE OF VOLUME IN POND 1

$(100)\frac{70,000 FT^3}{107,100 FT^3} = 65.4\%$

PERCENTAGE OF TOTAL FLOW FROM POND 2 TO POND 1

= (65.4% VOLUME IN POND 1) − (42.2% FLOW TO POND 1)

= 23% OF FLOW TO PASS FROM POND 2 TO POND 1

(0.23)(58.1 CFS) = <u>13.4 CFS</u> CAPACITY REQUIRED

SINCE POND 2 FILLS FASTER THAN POND 1, CAPACITY IS ESTIMATED WITH MINIMAL (0.5') ELEVATION DIFFERENCE IN PONDS

INLET LIMITING (SUBMERGED) $Q = C_D A\sqrt{2gh}$

$= 0.6\left(\pi(2)^2/4\right)\sqrt{2(32.2\,FT/SEC^2)(0.5')}$

$= 10.7$ CFS

OUTLET LIMITING (SUBMERGED)

LENGTH = 30'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\,\frac{V^2}{2g}$$

$$0.5 = \frac{0.4 + 1 + 29(0.012)^2(30')}{(0.5')^{1.33}}\,\frac{V^2}{2(32.2\,FT/SEC^2)}$$

$V = 2.90$ FT/SEC $Q = VA = (2.9\,FT/SEC)(\pi(2)^2/4) = 9.11$ CFS USE TWO = 18.2 CFS

<u>SUMMARY: OUTLET LIMITING CONTROLS, USE TWO 24" RCP's</u>

24" RCP CAPACITY - POND 1 TO POND 2

AREA	LAND TREATMENT
—	A
—	B
0.306	C
0.459	D
0.765 ACRES	

$$Q_{100} = (2.87\,CFS/AC)(0.306\,Ac) + (4.37\,CFS/Ac)(0.459\,Ac) = 2.88\,CFS$$

OFFSITE FLOW = 3.7 CFS (APPENDIX 1, PAGE 6)

TOTAL FLOW = 2.88CFS + 3.7 CFS = 6.58 CFS

INLET-LIMITED CAPACITY (AT H/D = 1) = 13 CFS

OUTLET SUBMERGED CAPACITY (H = 1)

$$H = \left(\frac{K_e + 1 + 29\,n^2 L}{R^{1.33}}\right)\left(\frac{V^2}{2g}\right) = \left(\frac{0.4 + 1 + 29(0.012)^2(47')}{(0.5)^{1.33}}\right)\left(\frac{V^2}{2(32.3\,FT/SEC^2)}\right)$$

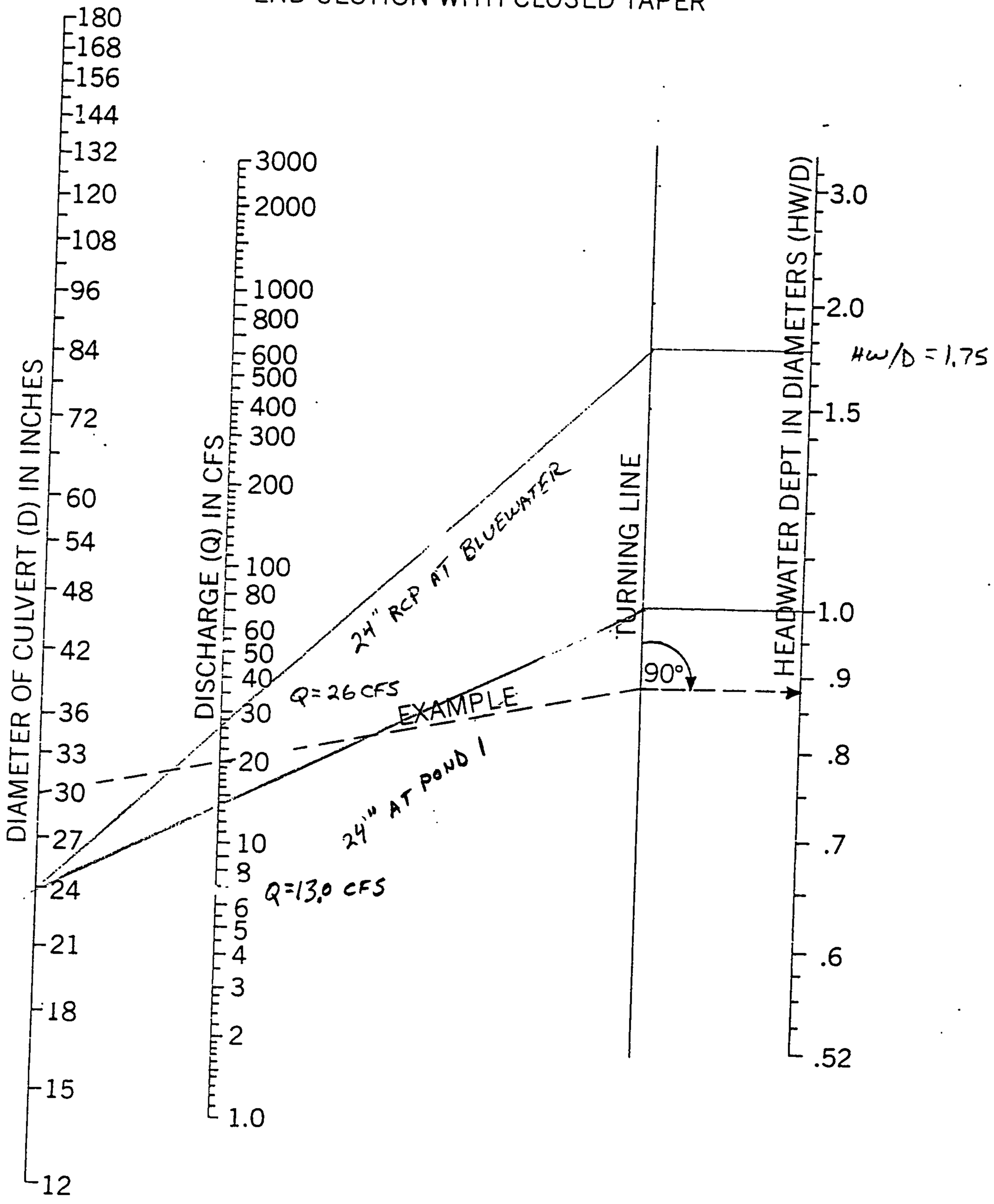
$V = 4.01$ FT/SEC $\quad Q = VA = (4.01\,FT/SEC)(3.14\,FT^2) = 12.6$ CFS

OUTLET-SUBMERGED LIMITING CONTROLS, USE 24" RCP

TABLE A-11

HEADWATER DEPTH FOR CIRCULAR PIPE CULVERTS WITH INLET CONTROL

END SECTION WITH CLOSED TAPER



6" PVC CAPACITY

AREA	LAND TREATMENT
—	A
—	B
0.115	C
0.046	D
0.161 AC	

$Q_{100} = (2.87\,CFS)(0.115\,AC) + (4.37\,CFS/AC)(0.046\,AC) = 0.60\,CFS$

INLET-LIMITED CAPACITY: $Q = A C_D \sqrt{2gH}$ AT $H/D = 1$

$= (0.196\,FT^2)(0.6)\sqrt{2(32.2\,FT/SEC)^2(1)}$

$= 0.94\,CFS$

OUTLET IS NOT SUBMERGED

4" LANDSCAPE PIPE CAPACITY

LARGEST AREA DRAINED

AREA	LAND USE
–	A
–	B
–	C
0.0756	D

0.0756 ACRES

$Q_{100} = (4.37\ CFS/Ac)(0.0756\ Ac) = 0.330\ CFS$

INLET LIMITING: $Q = A C_D \sqrt{2gH}$ AT $H/D = 1$

$= (0.0872 FT^2)(0.6)\sqrt{2(32.2\ FT/SEC^2)(1)}$

$= 0.42$ CFS EACH PIPE

OUTLETS ARE NOT SUBMERGED

12" RCP ON PONDS 4 AND 5

OUTLET SUBMERGED CAPACITY AT $H/D = 1$, LONGEST PIPE = 41'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right)$$

$$= \frac{0.4 + 1 + 29(0.012)^2(41')}{(0.25)^{1.33}} \frac{V^2}{2(32.2\,FT/SEC^2)}$$

$V = 2.5\,FT/SEC$

$Q = VA = (2.5\,FT/SEC)(0.785\,FT/SEC) = 1.96\,CFS$

TIME TO DRAIN AT $H/D = 1$

$$TIME = VOLUME/FLOW = 15{,}000\,FT^3 / 1.96\,CFS = 7639\,SEC$$

$$= 2.1\,HOURS$$

$$FLOW\ TO\ DRAIN\ IN\ 24\,HRS = \frac{15000\,FT^3}{(24\,HR)(3600\,SEC/HR)} = 0.17\,CFS$$

4' RIPRAP CHANNEL AT BUILDING 8

AREA DRAINED

AREA	LAND TREATMENT
—	A
—	B
0.201	C
0.134	D
0.335	

$Q_{100} = (2.87\,CFS/Ac)(0.201\,Ac) + (4.37\,CFS/Ac)(0.134\,Ac) = 1.16\,CFS$

CAPACITY $Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ DEPTH = 0.5 FT,

$= (2\,FT^2) \frac{1.486}{0.03} \left(\frac{2}{3}\right)^{2/3} (0.025)^{1/2} = 12.0\,CFS$

SIDEWALK CULVERT CAPACITY

AREA DRAINED

AREA	LAND TREATMENT
—	A
—	B
—	C
0.032	D
0.032Ac	

$Q_{100} = (4.37\ CFS/Ac)(0.032Ac) = 0.14\ CFS$

CAPACITY $= A C_D \sqrt{2gH}$ CULVERT 2' WIDE, 0.33' HIGH

$= (0.67\ FT^2)(0.6)\sqrt{2(32.2\ FT/SEC^2)(0.33)}$

$= 1.8\ CFS$

November 5, 1996

Revised Hydrology Report

BLUEWATER VILLAGE

This development is on two adjacent tracts near the southwest corner of Bluewater Road and Coors Boulevard, Zone Map K-10. The proposed development is a turnkey apartment project for Albuquerque Development Services.

Tract A-1A-2C consists of 6.1335 acres of undeveloped property, and will be graded for future building pads and two detention ponds. It will provide approximately eight thousand cubic yards of fill for the neighboring tract A-1A-2B.

Tract A-1A-2B consists of 11.4335 acres of undeveloped property, and is slated for construction of a community building, two laundry buildings, and 200 apartments in 10 two-story apartment buildings. Stormwater detention is designated for seven ponding areas on this tract. This tract receives off-site flows and is partially occupied by a FEMA AH floodplain, with base elevation 5085, as defined in Panel 350002 0027 C.

The off-site flows contributing to the flood plain have been reduced by recent development. A current evaluation of off-site flows entering the project is attached in Appendix 1. Ponding capacity on the site is calculated (Appendix 5A) on the basis of this reduced flow.

Proposed stormwater discharge to the Coors Boulevard storm sewer from the ponding areas is delayed by two hours as recommended in the West Bluff Drainage Plan, January 1987, Sheet No. 3, and is limited to 0.20 CFS/Ac (Appendix 2).

Off-site flow from Basin O-1 (Appendix 1, page 6) will be intercepted at the intersection of the proposed access road with Bluewater Road, with four 'A' curb inlets constructed on the southeast corner of the proposed intersection. This off-site flow is then routed through a 24" reinforced concrete pipe (RCP) to detention Pond 7 on tract A-1A-2C. A second pond (Pond 6) on this tract provides the remaining capacity required for Basin O-1 (Appendix 1) and tract A-1A-2C (Appendix 5). A weir and channel connects these two ponds, so that lower Pond 6 receives stormwater after upper Pond 7 fills. Upper Pond 7 drains to lower Pond 6 after a 4.5 hour delay via a 12" valve and 12" HDPE (corrugated high-density polyethylene) drain pipe. Lower Pond 6 drains after a 4 hour delay through a 12" valve and 12" HDPE drain pipe to the base elevation ponds. The extra delay is necessary to allow the lower ponds to drain sufficiently to prevent water backing up at the Building 4 parking lot inlets (this parking lot forms part of the 100-year detention basin).

Base elevation Ponds 1 through 5 are on tract A-1A-2B, at water surface elevation 5085 (the FEMA floodplain base elevation). Pond 5 drains to Pond 4 via 24" RCP, and is equalized in surface elevation through this connection. Pond 4 drains to Pond 3 over a weir (berm) and through a 12" HDPE drain pipe. Pond 3 drains to Pond 2 over a weir (berm) and through a 12"

ADAM R. WRIGHT NEW MEXICO 12993 REGISTERED PROFESSIONAL ENGINEER 11/5/96

6 & ponds on A-1A-2C now - 6 from to 6 increase tract d

how do you know ponds fill to 5085?

HDPE drain pipe. Pond 2 drains to Pond 1 via two 24" HDPE drain pipes . After a two-hour delay, Pond 1 drains to a curb inlet on the Coors Boulevard storm sewer through a 12" valve and 18" PVC with a 7-3/8 x 7-3/8" restrictor plate. All the ponds ultimately drain through this connection.

All seven ponds have an overflow path to route stormwater in event of open or closed valve failure.

Pipe inlets have riprap erosion pads to prevent undermining by scour. Inlet screens are provided where the 12" HDPE's have valves to prevent clogging by debris.

Total area drained to outlet detention pond is 26.2 acres. Recommended discharge rate, from the West Bluff Drainage Plan, is 0.20 CFS/Ac, giving a maximum allowable discharge of 5.24 CFS to the Coors Boulevard stormdrain.

With an 18" unrestricted drain pipe, maximum inlet-limited discharge will be 22.5 CFS. The 18" drainpipe at Coors is therefore restricted with a 7-3/8" x 7-3/8" square opening restrictor plate on the outlet, giving a maximum discharge of 5.20 CFS (Appendix 4) to meet the West Bluff Drainage Plan recommendation. Ponds 6 and 7 are limited to lesser discharges to the base elevation ponds, and discharge is delayed longer to prevent overflow of the base elevation ponds. Average discharge rate required to drain the 160,000 cubic feet of ponding in 24 hours is 1.85 CFS, and average discharge rate expected is 4.63 CFS (Appendix 4).

DETENTION POND VOLUMES

Ponds 6 and 7 are sized for 0.6950 acre/feet (30,300 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 22,000 cubic feet of flow generated on the 6.1335 acre tract (Appendix 5).

Pond 6 volume is 30,000 cubic feet and Pond 7 volume is 24,000 cubic feet. Total detention volume required for these two flows equals 52,300 cubic feet, and detention volume provided is 54,000 cubic feet.

Ponds 1 through 5 are sized for the remaining 0.9393 acre/feet (40,900 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 66,200 cubic of flow generated on the 11.4335 acre tract (Appendix 5). Pond volumes are noted on the grading and drainage drawing. Total detention volume required for these ponds equals 107,100 cubic feet and total detention volume provided is 107,500 cubic feet.

DRAIN INLET CAPACITIES

The four 'A' inlets at the Bluewater/access road intersection have a capacity of 4 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 16 CFS. Expected flow is 15.3 CFS (Appendix 1, page 6). Bluewater Road is already sloped with a low point at this location to channel water off the road toward the flood plain. A waterstop (higher section of road) prevents

overshoot past the grates, and velocity head in the sheet flow to the drain is too low to jump the curb.

The 2 'Double C' inlets on the double 21" HDPE's entering Pond 1 from the parking lot west of Building 3 have a capacity of 9.6 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 19.2 CFS. Expected flow is 10.3 CFS on-site surface runoff, plus a potential flow of 4.17 CFS if the valve on Pond 7 is left in open position. Total expected 100-year flow is then 14.3 CFS (Appendix 6), and total capacity is 19.2 CFS.

The Neenah R-2569 inlets on the 12" HDPE west of Building 3 have a capacity of 1.5 CFS at 0.3 feet of ponding . Expected 100-year flow is 0.60 CFS to the grate at the west-center of Building 3 and 0.45 CFS to the grate at the northwest side of Building 3 (Appendix 7).

The three Neenah R6672-E inlets draining to Pond 3 through an 18" HDPE have a capacity of 5.6 CFS each at 0.3 feet of ponding. Expected 100-year flow is 1.61 CFS for the largest drainage area, which is on the northern-most drain (Appendix 8). Drained areas are smaller for the remaining two inlets. These inlets are provided to ensure drainage of the flat parking lot, and are not required to meet flow capacity. This parking lot is flat to provide 6" of ponding in a 100-year storm event, so no regional slope is possible. Spot elevations ensure that water will flow to these local drains.

The double 'C' curb inlets northeast of Building 10 have a capacity of 5.6 CFS each at 6" ponding (DPM page 75). Expected flow is 9.88 CFS (Appendix 9). The road is graded to create a low point at the inlet and a waterstop (higher section of road) beyond, creating this ponding when necessary to match the incoming flow.

WEIR CAPACITIES

The weir and rundown from Pond 7 to Pond 6 have a capacity of 24.8 CFS (Appendix 11). Expected flow is 15.3 CFS from off-site (intercepted at the Bluewater/access road intersection) plus 8.80 CFS surface drainage from the 6.1335 acre tract. Total 100-year flow is then 24.1 CFS.

The 12' wide weir (curbcut and rundown) on the east side of the access road near the south end of the plat drains 11.2 CFS of off-site flow (Appendix 1, page 6) plus 6.99 CFS generated onsite (Appendix 10). Weir capacity is 25.0 CFS (Appendix 12) and expected total 100-year flow is 18.3 CFS. The access road is sloped for a low spot at this weir, with a waterstop (higher section of road) to prevent overshoot.

The weir (curbcut and rundown) from the parking lot at Pond 3 drains 3.97 CFS and has a capacity of 8.33 CFS (Appendix 13).

The weir (curbcut) and channel draining the north parking lot to the access road drains 3.04 CFS and has a capacity of 3.78 CFS (Appendix 14).

The weir (curbcut and channel) northwest of Building 10 drains 3.59 CFS and has a capacity of 3.78 CFS (Appendix 15).

The berm between Ponds 4 and 3 (which provides groundcover for a proposed 8" sewer line) has a top elevation of 84.7, and acts as a weir channeling flow from Pond 4 to Pond 3. Expected 100-year flow is 31.7 CFS, and capacity is 31.6 CFS (Appendix 16). A 12" HDPE under this berm allows Pond 4 to drain.

The berm between Ponds 3 and 2 (providing groundcover for a proposed 6" sewer lateral) has a top elevation of 84.7, and acts as a weir channeling flow from Pond 3 to Pond 2 (Appendix 18). A 12" HDPE under this berm allows Pond 3 to drain.

PIPE CAPACITIES

A 24" RCP carries off-site flow from the Bluewater/access road intersection to Pond 7. It is submerged outlet limited to 17.0 CFS capacity, and 100-year flow is 15.3 CFS (Appendix 19).

A 12" HDPE carries flow from Pond 7 to Pond 6 in order to drain Pond 7 within 24 hours. Both Ponds 7 and 6 are required to meet detention volume needed, but they are at different elevations. The overflow to equalize volumes is from Pond 7 to Pond 6 via riprap weir. The 12" HDPE draining Pond 7 is outlet limited by a restrictor plate to 4.17 CFS (Appendix 4).

A 24" RCP carries flow from Pond 5 to Pond 4, and equalizes the surface elevation of the two ponds. Pond 5 intercepts 9.88 CFS from a north weir (Appendix 11) and drains 2.66 CFS of sheet flow. The 24" RCP is outlet limited to12.9 CFS with least expected head (Appendix 20). Expected 100-year flow is 12.54 CFS.

Two 21" HDPE's carriy drainage from the parking lot west of Building 3 to Pond 1. Flow is submerged outlet limited to 16.6 CFS (Appendix 17). Expected 100-year flow is 14.5 CFS.

A 12" HDPE carries drainage from two inlets in the landscaped areas west of Building 3. Flow is outlet limited to 1.79 CFS (Appendix 21). Expected 100-year flow is 1.05 CFS (Appendix 7).

A 12" HDPE carries drainage from Pond 6 to a drop inlet in the parking lot west of Building 4. The drainage is continued to Pond 3 with an 18" RCP and added influx from the parking lot. Expected 100-year flow from the parking lot area is 2.89 CFS. The length of pipe from the pond to the first drop inlet is submerged outlet limited to 4.48 CFS (Appendix 20). Maximum capacity in the 60' length of pipe connecting each of the 3 drop inlets is outlet limited to 4.80 CFS at the calculated pond surface elevations (Appendix 22).

Two 24" HDPE's carry flow from Pond 2 to Pond 1, and equalize the surface elevation of the 2 ponds. The 24" HDPE's are outlet limited to 18.2 CFS at 0.5' difference in head (Appendix 21). Expected 100-year flow is 13.4 CFS. The capacity appears to be excessive at first glance, but Ponds 2, 3, and 4 join the floodplain on the neighboring plat at the property boundary, and cannot surcharge above the design elevation.

An 18" PVC carries drainage from Pond 1 to the back of a curb inlet on the Coors Boulevard storm drain. Flow is outlet limited to 5.20 CFS by a restrictor plate (Appendix 4). There is no flow capacity minimum required, except the 1.84 CFS average needed to drain the detention ponding in 24 hours.

Several landscaped areas are drained under sidewalks and stairs with 4" PVC pipes, without grates. Inlet limited capacity is 0.84 CFS for these pipes (each installation is two pipes in parallel), and largest expected 100-year flow is 0.33 CFS (Appendix 26).

Ponds 4 and 3 are drained with 12" HDPE's. Flow from these ponds is primarily over a lowered section of berm, and the 12" HDPE's are present to drain the bottom within 24 hours. Submerged outlet capacity is 1.96 CFS, and flow required to drain in 24 hours is 0.17 CFS (Appendix 27).

APPENDIX 1

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

AUGUST, 1996
Revised, NOVEMBER 1996

Smith Engineering Company

A Full Service Engineering Company

APPENDIX ***

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

AUGUST, 1996
Revised, NOVEMBER, 1996

Prepared by

SMITH ENGINEERING COMPANY
6400 UPTOWN BOULEVARD NE SUITE 500E
ALBUQUERQUE, NM 87110

SEC No. 196626

APPENDIX I

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

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APPENDIX "A"

HYDROLOGY COMPUTATIONS

APPENDIX 1

1. INTRODUCTION

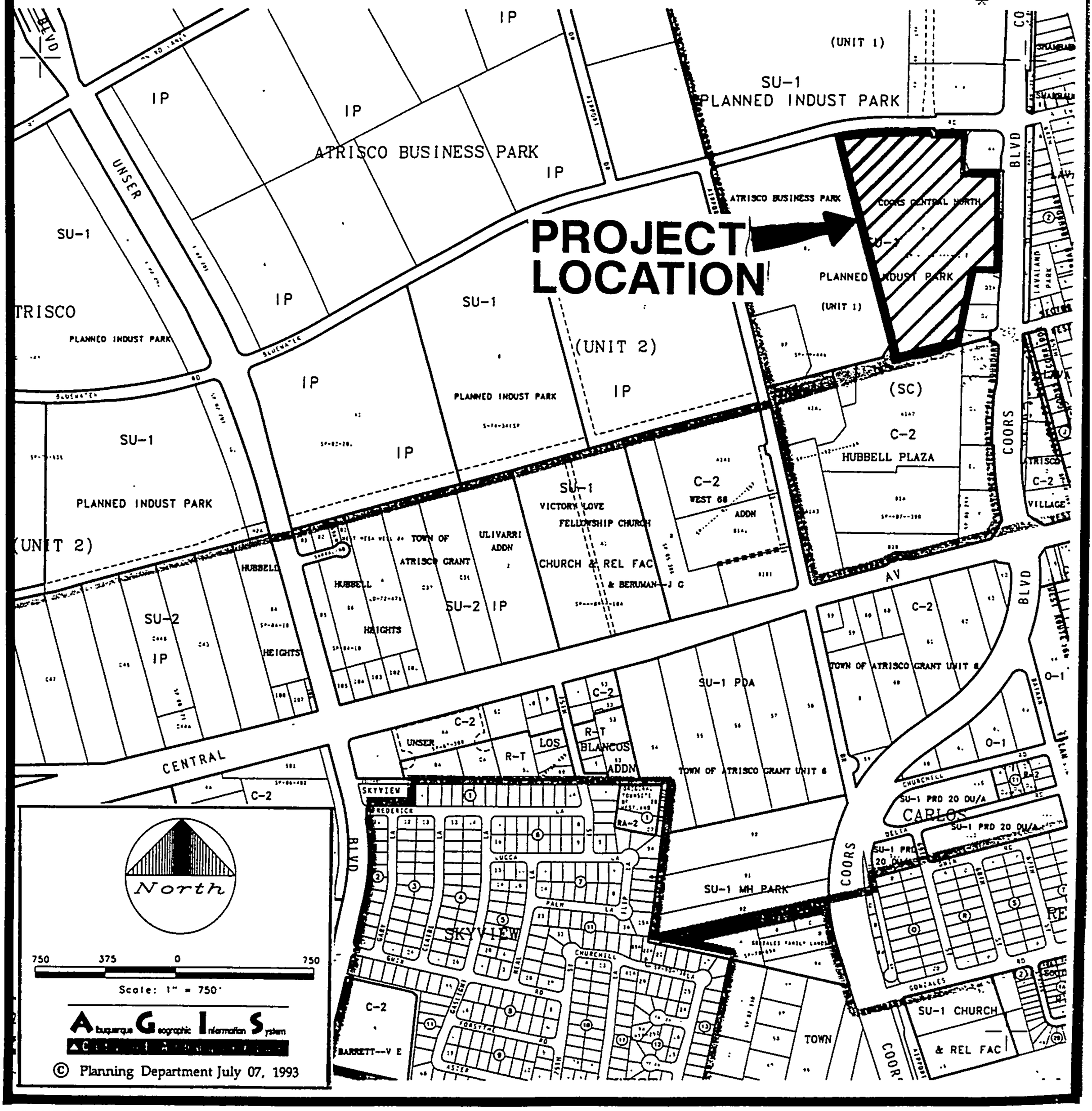
The City of Albuquerque Development Service Department contacted Smith Engineering Company (SEC) to determine the impacts of off-site flows to the Bluewater Development. Red Mountain Engineering is performing the on-site drainage work for the site. The Vicinity Map (Map No. 1) shows the location of the site relative to the City of Albuquerque Zone Atlas Map K-10.

2. HYDROLOGY

Frequency flows and volumes were quantified according to "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque," New Mexico, January 1993. All of the off-site drainage basins are fully developed. Land treatments for all of the off-site basins consist of ten percent (10%) type "B" and ninety percent (90%) type "D". Due to the fact that the off-site basins are relatively small, time of concentrations for the basins are extremely short thus, twelve (12) minute time of concentrations were used for all of the off-site basins. Appendix A contains all hydrology computations.

3. FLOOD PLAINS

In reviewing the Flood Boundary and Floodway Maps for the City of Albuquerque, New Mexico, Bernalillo County (Panel 27 of 50 Community-Panel Number 350002 0027) dated October 14, 1983, flood plains do exist. One flood plain exists on the project site with several surrounding the site. A portion of the on site flood plain extends into the undeveloped portion of off-site basin O-3. All other off-site drainage basins do not contain flood plains.



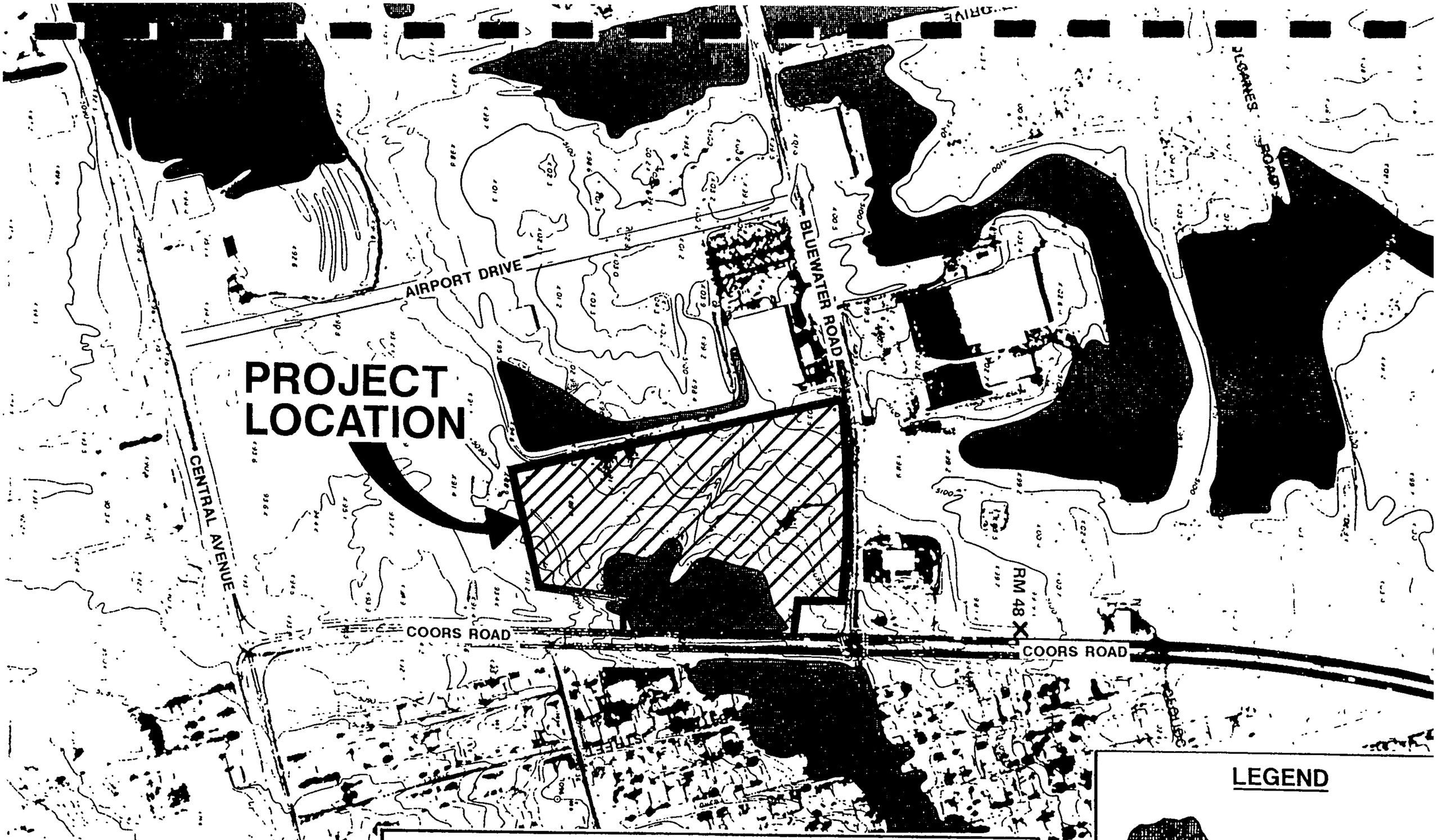
SOURCE: CITY OF ALBUQUERQUE ZONE ATLAS, MAP K-10-Z

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

VICINITY MAP

MAP NO. 1



BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

FLOOD PLAIN MAP

MAP NO. 2

APPENDIX I

Map No. 2 shows the flood boundaries on site and surrounding areas.

4. OFF-SITE CONTRIBUTIONS

The Bluewater Development is bordered on the north by Bluewater Rd. NW and a Diamond Shamrock Service Station, the east by Coors Rd. NW, the south by an Arby's restaurant along with a portion of the Coors & Central Shopping Center and an undeveloped tract and the west by Amity Leather. All of the flow from Amity Leather is retained on their property. The existing storm drain system in Coors Rd. NW handles all flow on Coors Rd. NW thus, flows from Coors Rd. will not enter the Bluewater Development site. All off-site flows entering the project site will enter from the north and south. Map No. 3 (Off-Site Drainage Basin Map) shows contributing basins. Drainage basin delineation was determined using Orthophoto Topographic Mapping provided by the City of Albuquerque Mapping and Records Division along with the use of existing drainage reports relative to the area. The existing drainage report information was provided by the City of Albuquerque Hydrology Division. Field visits were also performed to verify the mapping and existing drainage reports.

Four (4) off-site drainage basins contribute storm water runoff to the Bluewater Development. Basin O-1 consists of Bluewater Rd. NW from Airport Rd. to a high point in Bluewater Rd. just north of the Bluewater Site. The runoff from basin O-1 enters the site at analysis point AP-O1.

Basin O-2 consists of the Diamond Shamrock Service Station at the southwest corner of Bluewater Rd. and Coors Rd. This flow enters the site from the north at analysis point AP-

O2. A temporary retention pond currently exists on the Bluewater site that retains all runoff from basin O-2.

Basin O-3 is located southeast of the Bluewater Development. Basin O-3 consists of a portion of a Giant Service Station, an Arby's Restaurant, and an undeveloped tract of land just north of the Arby's Restaurant. This flow enters the site from the south at analysis point AP-O3. A temporary pond currently exists on the undeveloped tract to handle flows from the Arby's development.

Basin O-4 consists of the remaining portion of the Giant Service Station discussed above and a portion of the Coors & Central Shopping Center. This flow enters the site from the south at analysis point AP-O4. A temporary pond currently exists on the Bluewater site that helps handle the runoff from basin O-4.

Table 1 provides a summary of the hydrology calculations in the form of ten (10) year and one hundred (100) year storm events. In accordance with the DPM, a twenty-four (24) hour storm was used in all volume calculations and a six hour storm was used in all flow calculations.

APPENDIX 1

TABLE 1

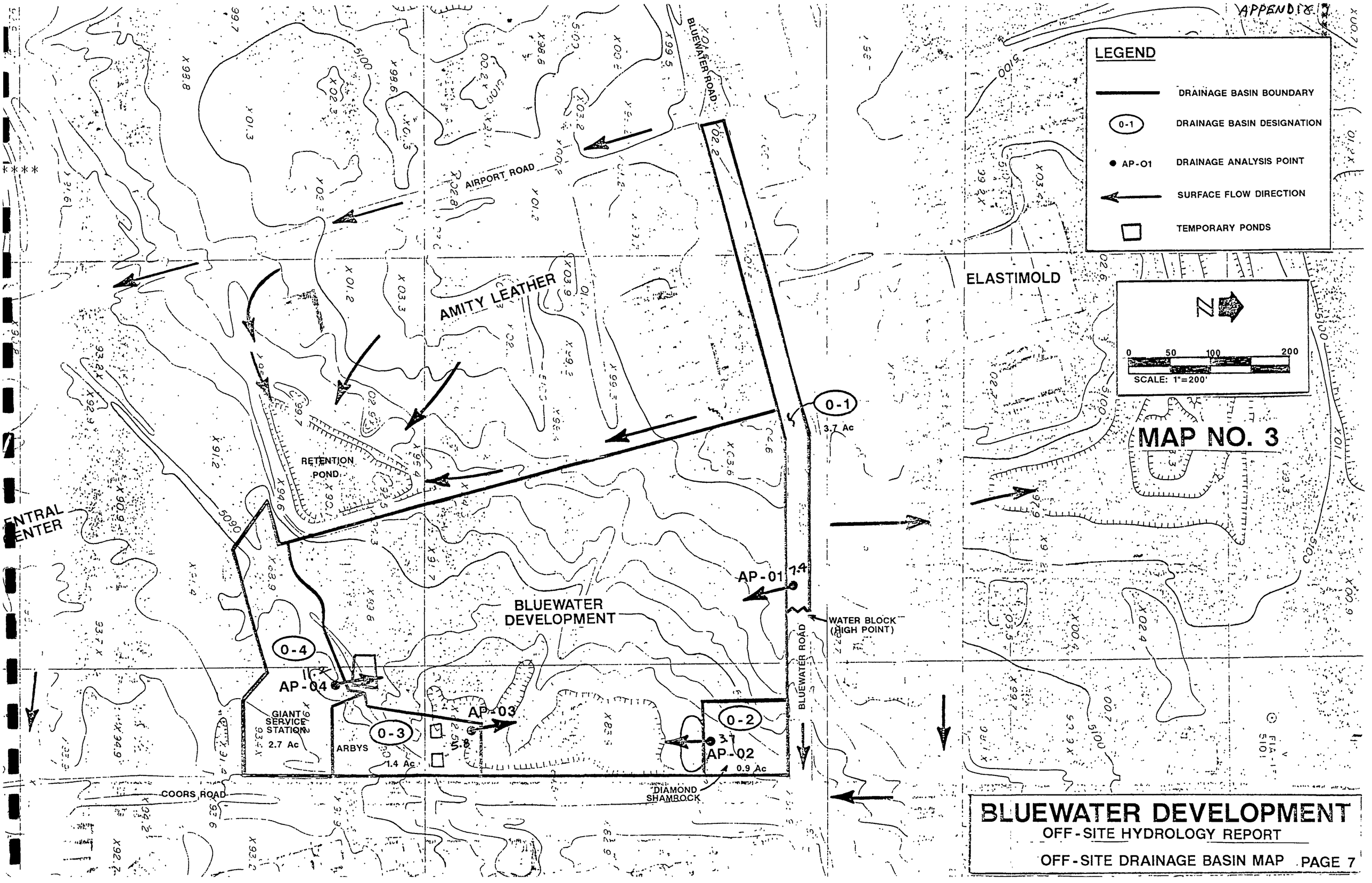
(Revised 11/4/96)

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

SUMMARY OF PEAK DISCHARGES AND PEAK VOLUMES

ANALYSIS POINT	CONTRIBUTING DRAINAGE BASIN	DRAINAGE BASIN AREA (ac.)	Q(10) (6hr.) (cfs)	V(10) (24hr.) (ac.ft.)	Q(100) (6hr.) (cfs)	V(100) (24hr.) (ac.ft.)
AP-O1	O-1	1.8	4.8	0.2328	7.4	0.3381
AP-O2	O-2	0.9	2.4	0.1165	3.7	0.1691
AP-O3	O-3	1.4	3.7	0.1811	5.8	0.2630
AP-O4	O-4	2.7	7.2	0.3492	11.2	0.5072
TOTALS CONTRIBUTING TO THE BLUEWATER DEVELOPMENT	**O-1,O-2,O-3,O-4**	**6.8 ac.**	**18.1 cfs**	**0.8796 ac.ft.**	**28.1 cfs**	**1.2774 ac.ft.**

APPENDIX I



BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

OFF-SITE DRAINAGE BASIN MAP

HYDROLOGY COMPUTATIONS

CRITERIA USED: SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN FOR THE CITY OF ALBUQUERQUE, NM.

ALL BASINS LIE IN PRECIPITATION ZONE ONE (1)

$P_{60} = 1.87$ IN.; $P_{360} = 2.20$ IN; $P_{1440} = 2.66$ IN.

VALUES TAKEN FROM TABLE A-2, DPM

BASIN O-1

AREA = 1.8 Ac.; LAND TREATMENTS: "B" = 10%, "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

10 YEAR

$Q_{10} = (0.76\ CFS/Ac)(.10)(1.8\ Ac) + (2.89\ CFS/Ac)(.90)(1.8\ Ac)$

$Q_P =$ **4.8 CFS**

100 YEAR

$Q_{100} = (2.03\ CFS/Ac)(.10)(1.8\ Ac) + (4.37\ CFS/Ac)(.90)(1.8\ Ac)$

$Q_P =$ **7.4 CFS**

VOLUMES - 24 HOUR STORM

10-YEAR

$E_{10} = (.22\ IN)(.10) + (1.24\ IN)(.90) = 1.138\ IN.$

$V_{360} = (1.138\ IN)(1.8\ Ac)\left(\frac{1\ FT}{12\ IN}\right) = 0.1707\ Ac.Ft$

$V_{1440} = .1707\ Ac.Ft + (.90)(1.8\ Ac)[2.66\ IN - 2.20\ IN]\left(\frac{1\ FT}{12\ IN}\right)$

$Q_P =$ **0.2328 Ac.Ft**

CONT.

BASIN O-1 (CONT.)

VOLUMES - 24 HOUR STORM

100 YEAR

$E_{100} = (.67\,IN.)(.10) + (1.97\,IN)(.90) = 1.84\,IN.$

$V_{360} = (1.84\,IN)(1.8\,Ac)\left(\frac{1\,Ft}{12\,IN}\right) = 0.2760\ Ac.Ft.$

$V_{1440} = 0.2760\,Ac.Ft + (.90)(1.8\,Ac)[2.46\,IN - 2.20\,IN]\left(\frac{1\,Ft}{12\,IN}\right)$

$= \boxed{0.3381\ Ac.Ft}$

BASIN O-2

AREA = 0.90 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN

$Q_{10} = (.76)(.10)(.90) + (2.89)(.90)(.90) = \boxed{2.4\,CFS}$

$Q_{100} = (2.03)(.10)(.90) + (4.37)(.90)(.90) = \boxed{3.7\,CFS}$

VOLUMES - 24-HOUR STORM

$E_{10} = 1.138\,IN$

$V_{360} = (1.138)(.90)(1/12) = 0.0854\,Ac.Ft$

$V_{1440} = 0.0854 + (.90)(.90)(.46)(1/12) = \boxed{0.1165\,Ac.Ft}$

$E_{100} = 1.84\,IN$

$V_{360} = (1.84)(.90)(1/12) = 0.1380\,Ac.Ft$

$V_{1440} = 0.1380 + (.90)(.90)(.46)(1/12) = \boxed{0.1691\,Ac.Ft}$

CONT. →

APPENDIX * * * 3

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 3 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/27/96 CHECKED BY _____ DATE / /

BASIN O-3

AREA = 1.4 Ac.; LAND TREATMENTS "B" - 10%, "D" - 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

$Q_{10} = (.76)(.10)(1.4) + (2.89)(.90)(1.4) =$ **3.1 CFS**

$Q_{100} = (2.03)(.10)(1.4) + (4.37)(.90)(1.4) =$ **5.8 CFS**

VOLUMES - 24-HOUR STORM

$E_{10} = 1.138$ IN

$V_{360} = (1.138)(1.4)(1/12) = 0.1328$ Ac.Ft.

$V_{1440} = 0.1328 + (.9)(1.4)(.46)(1/12) =$ **0.1811 Ac.Ft**

$E_{100} = 1.84$ IN

$V_{360} = (1.84)(1.4)(1/12) = 0.2147$ Ac.Ft.

$V_{1440} = 0.2147 + (.9)(1.4)(.46)(1/12) =$ **0.2630 Ac.Ft**

BASIN O-4

AREA = 2.7 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN

$Q_{10} = (.76)(.10)(2.7) + (2.89)(.90)(2.7) =$ **7.2 CFS**

$Q_{100} = (2.03)(.10)(2.7) + (4.37)(.90)(2.7) =$ **11.2 CFS**

VOLUMES - 24 HOUR STORM

$E_{10} = 1.138$ IN.; $V_{360} = (1.138\text{IN})(2.7)(1/12) = 0.2561$ Ac.Ft.

$V_{1440} = 0.2561 + (.90)(2.7)(.46)(1/12) =$ **0.3492 Ac.Ft**

$E_{100} = 1.84$ IN.; $V_{360} = (1.84)(2.7)(1/12) = 0.4140$ Ac.Ft.

$V_{1440} = 0.4140 + (.90)(2.7)(.46)(1/12) =$ **0.5072 Ac.Ft**

WEST BLUFF DRAINAGE PLAN
PHASE III

APPENDIX 'D' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED STORM DRAIN FACILITIES", LISTS STORM DRAINS REQUIRED TO MEET THE MINIMUM DESIGN CRITERIA FOR FLOW IN STREETS PER THE CITY OF ALBUQUERQUE DRAINAGE ORDINANCES AND POLICIES.

APPENDIX 'E' - THIS APPENDIX, TITLED "SUMMARY OF EXISTING CROSSING STRUCTURES", CONTAINS INFORMATION RELATIVE TO EXISTING CROSSING STRUCTURES WITHIN THE WEST BLUFF AREA

APPENDIX 'F' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED CHANNELS AND BOX STRUCTURES", CONTAINS DISCHARGE, FLOW DEPTH AND FLOW VELOCITY INFORMATION FOR THE MAJOR DRAINAGE FACILITIES, I.E., WEST BLUFF OUTFALL, I-40 INTERCEPTOR, WEST MESA DIVERSION AND UNSER DIVERSION FOR THE STRUCTURES AS ASSUMED IN THE COMPUTER MODELING FOR THE 10 YEAR AND 100 YEAR STORM EVENTS. THE FLOW DEPTHS AND FLOW VELOCITIES SHOWN IN THIS APPENDIX ARE CALCULATED FOR NORMAL DEPTH, AND DO NOT REPRESENT THE ULTIMATE BACKWATER ANALYSIS.

THE PROPOSED IMPROVEMENT SIZES, ALIGNMENTS AND LOCATIONS DEPICTED IN THESE APPENDICES ARE NOT MEANT TO BE FINAL BUT EACH MUST BE DETERMINED IN THEIR PRELIMINARY DESIGN.

VII. PROPOSED FLOOD MITIGATION MEASURES

THE DRAINAGE SOLUTION PROPOSED FOR THE MANAGEMENT OF STORM WATER WITHIN THE STUDY AREA INCORPORATES BOTH STRUCTURAL AND NON-STRUCTURAL MEASURES. THE STRUCTURAL MEASURES HAVE BEEN GROUPED INTO CHANNELS AND BOX STRUCTURES AND STORM DRAIN FACILITIES. THE CHANNELS AND BOX STRUCTURES ARE THOSE FACILITIES WHICH WILL PREVENT LARGE UPLAND AREAS FROM INUNDATING DOWNSTREAM AREAS FOR A DEVELOPED WATERSHED. THE STORM DRAIN FACILITIES ARE THOSE FACILITIES WHICH WILL DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE MAJORITY OF THE STUDY AREA RELIES ON STRUCTURAL MEASURES FOR THE MITIGATION OF STORM RUNOFF. A SMALL PORTION OF THE STUDY AREA UTILIZES NON-STRUCTURAL MEASURES (I.E. DETENTION AREAS) FOR THE MITIGATION OF FLOOD WATER. THIS AREA IS THAT PORTION OF THE STUDY AREA THAT LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD.

A. STRUCTURAL FLOOD MITIGATION MEASURES

THE STRUCTURAL DRAINAGE FACILITIES, AS PROPOSED UNDER PHASE III OF THE WEST BLUFF DRAINAGE PLAN, ARE DEFINED BY THE FOLLOWING MAJOR ELEMENTS:

1. WEST BLUFF OUTFALL
2. I-40 INTERCEPTOR
3. WEST MESA DIVERSION
4. UNSER DIVERSION

THE WEST BLUFF OUTFALL IS THAT PORTION OF THE SYSTEM THAT WILL CONVEY STORM FLOWS THROUGH EXISTING CONCRETE BOX CULVERTS UNDER COORS BOULEVARD, NORTH OF INTERSTATE HIGHWAY 40 AND COORS BOULEVARD INTERCHANGE, TO THE RIO GRANDE.

THE I-40 INTERCEPTOR WILL INTERCEPT FLOWS GENERATED NORTH OF INTERSTATE HIGHWAY 40, ALONG THE NORTH RIGHT-OF-WAY OF INTERSTATE HIGHWAY 40, AND CONVEY THE STORM FLOW TO THE WEST BLUFF OUTFALL.

THE WEST MESA DIVERSION WILL INTERCEPT FLOWS GENERATED FROM A PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND CONVEY THE RUNOFF UNDER INTERSTATE HIGHWAY 40, USING EXISTING CONCRETE BOX CULVERTS, TO THE I-40 INTERCEPTOR.

THE UNSER DIVERSION WILL INTERCEPT FLOWS GENERATED FROM THAT PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND WEST OF THE WEST BOUNDARY OF THE ATRISCO BUSINESS PARK AND CONVEY THE RUNOFF TO UNSER BOULEVARD. THE UNSER DIVERSION AND THE EXISTING UNSER BOULEVARD STORM DRAIN, WILL DISCHARGE SOUTH INTO FACILITIES PROPOSED IN UNSER BOULEVARD TO THE AMOLE DEL NORTE DRAINAGE SYSTEM.

THE DRAINAGE FACILITIES, AT THE TIME OF PRELIMINARY DESIGN, SHALL ADDRESS AND INCORPORATE JOINT-USE ASPECTS (I.E. OPEN SPACE BUFFER STRIP, LANDSCAPING, BICYCLE PATHS, JOGGING TRAILS, ETC.) WITH THE PROPOSED FACILITIES, AS REQUIRED BY THE LAND USE PLANS CURRENTLY ADOPTED BY THE CITY OF ALBUQUERQUE FOR THIS AREA OF THE WEST MESA THE PROPOSED CHANNELS AND BOX STRUCTURES ARE PRESENTED IN APPENDIX 'F'.

THE STORM DRAIN FACILITIES ARE DEFINED AS THOSE FACILITIES WHICH COLLECT RUNOFF AND DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE PROPOSED STORM DRAIN FACILITIES ARE LISTED IN APPENDIX 'D'.

B. NON-STRUCTURAL FLOOD MITIGATION MEASURES

NON-STRUCTURAL MEASURES, FOR THE MANAGEMENT OF STORM RUNOFF, ARE PROPOSED FOR THAT PORTION OF THE STUDY AREA WHICH LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD. THIS PORTION OF THE STUDY AREA WILL UTILIZE THE EXISTING STORM SEWER IN BLUEWATER ROAD EAST OF COORS BOULEVARD AS THE OUTFALL FOR STORM RUNOFF. HOWEVER, DUE TO THE LIMITED CAPACITY OF THE EXISTING STORM DRAIN IN BLUEWATER ROAD, NON-STRUCTURAL MEASURES WILL REQUIRE THE DETENTION OF ALL RUNOFF FOR A PERIOD OF TWO (2) HOURS FROM THE TIME THE STORM BEGINS. AFTER THE TWO HOURS OF DETENTION TIME, FLOWS FROM THIS PORTION OF THE STUDY AREA WILL BE REQUIRED TO DISCHARGE AT A RATE NOT TO EXCEED 0.20 CFS/ACRE.

APPENDIX ****
12

(DELETED)

APPENDIX 4

DISCHARGE THROUGH RESTRICTOR PLATES

DISCHARGE ON POND 1 TO COORS BOULEVARD STORM DRAIN

H_L HEADLOSS IN PIPE $= F \frac{L}{D} V^2/2g$, ASSUME $L=0$ THEN $H_L=0$

$$H_1 + \frac{V_1^2}{2g} + \frac{P_1}{w} = \frac{V_2^2}{2g} + \frac{P_2}{w} + H_2$$

ASSUME H_2 = DATUM LEVEL $=0$

$P_1=0$ $P_2=0$

$$\text{THEN } V_2 = \sqrt{2g\left(\frac{V_1^2}{2g} + H\right)}$$

WITH ENERGY LOSS AT THE ORIFICE, THIS BECOMES $V_2 = C_v\sqrt{2gH}$

FOR TANKS WHERE $V_1 \approx 0$, BUT HERE V_1 IS PROPORTIONAL TO V_2

FOR C_v USE 0.603 (URQUHART, 1962, PAGE 4-31)

MAXIMUM HEAD IS AT COORS BOULEVARD CURB INLET INVERT 5078.0, WITH POND SURFACE AT 5085.0, $H=7$

$$\text{THEN } V_2 = C_v\sqrt{2g\left(\frac{V_1^2}{2g} + H\right)}$$

SINCE $Q_1 = V_1A_1 = Q_2 = V_2A_2$ THEN $V_1A_1 = V_2A_2$

$$\text{AND } V_1 = \frac{V_2A_2}{A_1} = \frac{V_2(\pi(18\text{"DIA})^2/4}{7.375\text{IN}} = 4.68V_2$$

$$\text{THEN } V_2 = C_v\sqrt{2g\left(\frac{4.68V_2}{2g} + H\right)} \quad \text{AND } V_2^2 = C_v^2\left(2g\left(\frac{4.68V_2}{2g} + H\right)\right)$$

$$\text{SIMPLIFYING } V_2^2 = (0.603)^2\left[\left(2(32.2\text{FT/SEC}^2)\right)\left(\frac{4.68V_2}{2(32.2\text{FT/SEC}^2)} + 7\right)\right]$$

$$V_2 = 13.7\text{ FT/SEC}$$

$$Q = VA = (13.7\text{ FT/SEC})(0.616\text{FT})^2 = 5.20\text{ CFS}$$

AVERAGE DISCHARGE AT POND DEPTH 1.5', $H=5.5'$ $Q = 4.63$ CFS

USE RESTRICTOR PLATE WITH 7.375 IN × 7.375 IN OPENING

FOR DISCHARGE FROM POND 7

$$V_1 = \frac{A_2V_2}{A_1} = \frac{V_2(\pi(12\text{"DIA})^2/4}{(6.5\text{IN})^2} = 2.68V_2$$

$V_2 = 14.2$ FT/SEC $\quad Q = VA = (14.2\text{FT/SEC})(0.542\text{FT})^2 = 4.17$ CFS

USE RESTRICTOR PLATE WITH 6.5 IN SQUARE OPENING

APPENDIX 5A

(REPLACES APPENDIX 5)

POND 7 VOLUME

ALL OF POND 7 DRAINAGE BASIN ON-SITE IS LAND TREATMENT C

PRECIPITATION ZONE 1

AREA	LAND TREATMENT
—	A
—	B
2.76 AC	C
—	D
2.76 AC	

$E = E_c A_c / A_c = 0.99$

$V_{360} = E * A_c = (0.99)(2.76 Ac)/(12 IN/FT) = 0.228 Ac/FT = 9920 FT^3$

POND 6 VOLUME

ALL OF POND 6 DRAINAGE BASIN ON-SITE IS LAND TREATMENT C

PRECIPITATION ZONE 1

AREA	LAND TREATMENT
—	A
—	B
3.37	C
—	D
3.37 AC	

pond 7
9920
+14700
24620

$E = E_c A_c / A_c = 0.99$

$V_{360} = E * A_c = (0.99)(3.37 Ac)/(12 IN/FT) = 0.278 \ Ac/FT = 12,100 FT^3$

OFF-SITE FLOW TO POND 7

$V_{100} = 0.3381 \ Ac/FT = 14,700 FT^3$ (APPENDIX 1)

VOLUME REQUIRED

POND 6 IS AN OVERFLOW FOR POND 7, THEY ARE DESIGNED TO ACT TOGETHER — COMBINED CAPACITY = $54,000 FT^3$, REQUIRED VOLUME (SUM OF ABOVE) = $36,700 FT^3$

APPENDIX A

(REPLACES APPENDIX 5)

POND 1 THROUGH POND 5 VOLUME

THESE PONDS ARE INTERCONNECTED, AND EQUALIZED TO THE SAME SURFACE ELEVATION. HERE, THEY ARE TREATED AS HAVING THE SAME DRAINAGE BASIN. INTERCONNECTING PIPES ARE SIZED BY EVALUATING INDIVIDUAL DRAINAGE BASINS (SEE APPENDIX)

AREA	LAND TREATMENT
1.8935	A 17%
1.7000	B 15%
1.8800	C 16%
5.9700	D 52%
11.4335 Ac	

$$E = \frac{(0.44)(1.8935) + (0.67)(1.70000) + (0.99)(1.8800) + (1.97)(5.9700)}{11.4335} = 1.36''$$

$V_{360} = (1.36\ IN)(11.4335 Ac)/(12''/FT) = 1.296\ Ac/FT = 55,300\ FT^3$

$V_{1440} = (1.296 Ac/FT) + [(5.96 Ac)(2.66-2.20)/(12\ IN/FT)] = 1.52\ Ac/FT = 66,200 FT^3$

OFFSITE FLOW (APPENDIX 1, PAGE 6) = (0.1691 Ac. FT.) + (0.2630 Ac. FT.) +

$+ (0.5072 Ac. FT.) = 0.9393 Ac. FT. = 40,900\ FT^3$

TOTAL VOLUME REQUIRED = $107,100\ FT^3$

TOTAL VOLUME PROVIDED = $107,500\ FT^3$

APPENDIX 6

FLOW TO TWIN 21" HDPE, 'DOUBLE C' INLET

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.14	D
2.38	

Q_{100} = (2.87 CFS/ACRE)(0.24 ACRE) + (4.37 CFS/ACRE)(2.14 ACRE) = 10.1 CFS

ADDITIONAL FLOW IF POND 7 VALVE FAILS OPEN = 4.17 CFS

TOTAL FLOW = 14.3 CFS

CAPACITY 'DOUBLE D' INLET = 9.6 CFS @ 6" PONDING (DPM Pg 75)

TOTAL CAPACITY = 19.2 CFS

APPENDIX 7

FLOW TO NEENAH R-2569 INLETS

WEST- CENTER GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.137	D

$Q_{100} = (4.37\ CFS/ACRE)(0.137\ Ac) = 0.60\ CFS$

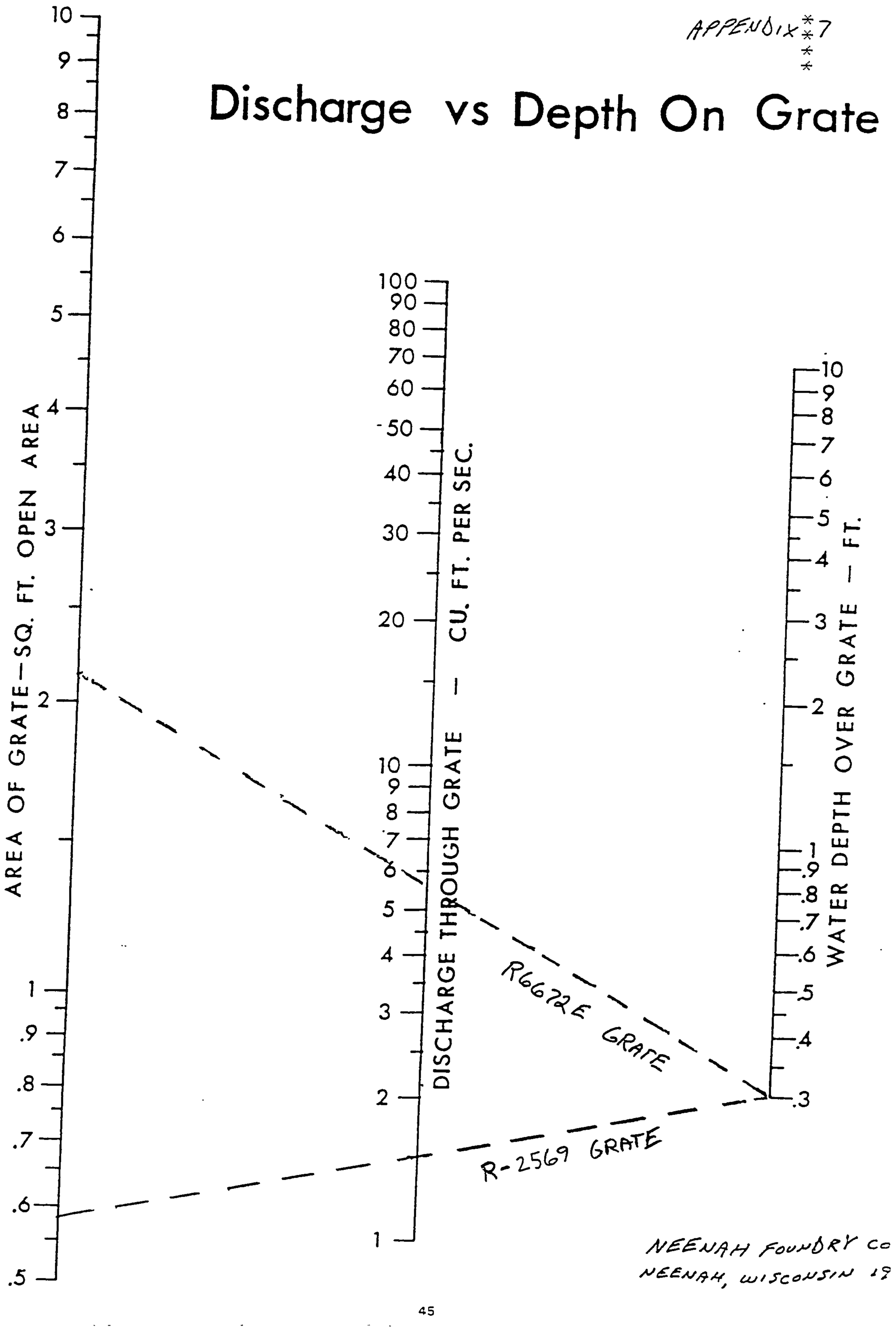
NORTH GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.103	D

$Q_{100} = (4.37\ CFS/ACRE)(0.103\ Ac) = 0.45\ Ac$

APPENDIX ****7

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN 19

FLOW TO POND 3 18" HDPE NORTH INLET GRATE

AREA	TREATMENT
	A
	B
0.038	C
0.343	D
0.381	

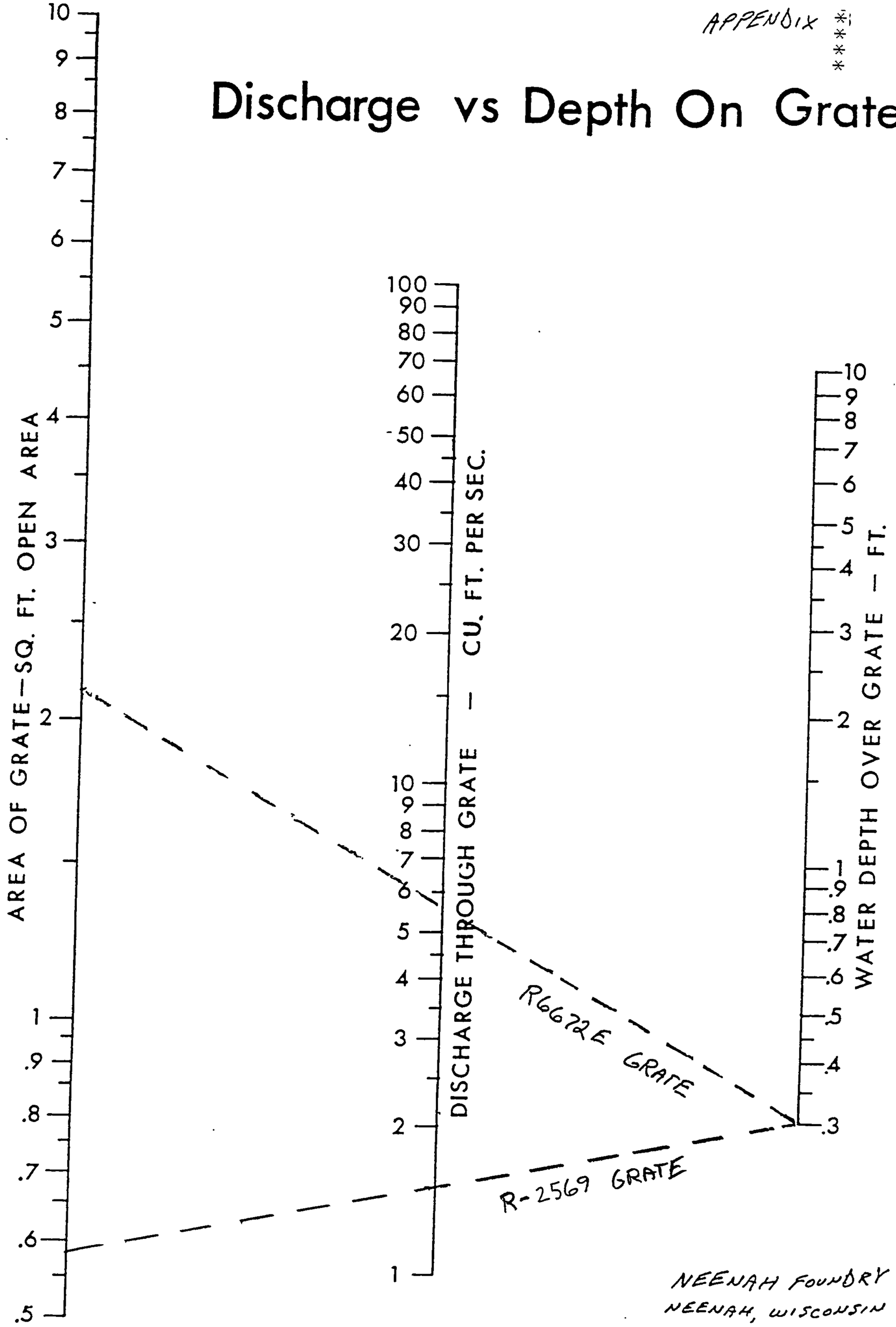
Q_{100} = (2.87 CFS/Ac)(0.038 Ac) + (4.37 CFS/Ac)(0.343 Ac) = 1.61 CFS

CAPACITY OF A NEENAH R6672E GRATE IS 5.6 CFS AT 0.3 FT OF PONDI

REMAINING RATES ON THIS LINE DRAIN SMALLER AREAS

APPENDIX ****

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN 19

FLOW TO 'DOUBLE C' INLETS NE OF BUILDING 10

EXPECTED FLOW

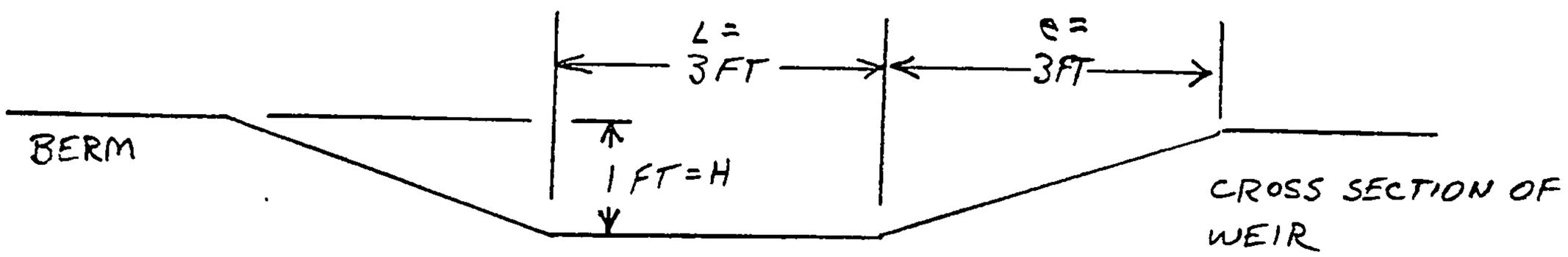
AREA	LAND USE
-	A
-	B
0.49	C
1.94	D
2.43	

$Q_{100} = (2.87\ cfs/Ac)(0.49\ Ac) + (4.37\ cfs/Ac)(1.94\ Ac) = \underline{9.88\ cfs}$

APPENDIX 10***

(DELETED)

POND 7 WEIR CAPACITY



FROM URQUHART, 'CIVIL ENGINEERING HANDBOOK' 1962, pg 4-53

FOR TRAPEZOIDAL WEIRS

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,LH^{3/2} + \tfrac{8}{15}\sqrt{2g}\,ZH^{5/2} \quad \text{WITH } Z = e/H$$

$$= \tfrac{2}{3}\sqrt{2(32.2\,FT/SEC^2}\,(3')(1')^{3/2} + \tfrac{8}{15}\sqrt{2(32.2\,FT/SEC^2)}\,(3)(1')^{5/2}$$

$$= 28.9\,CFS$$

EXPECTED FLOW

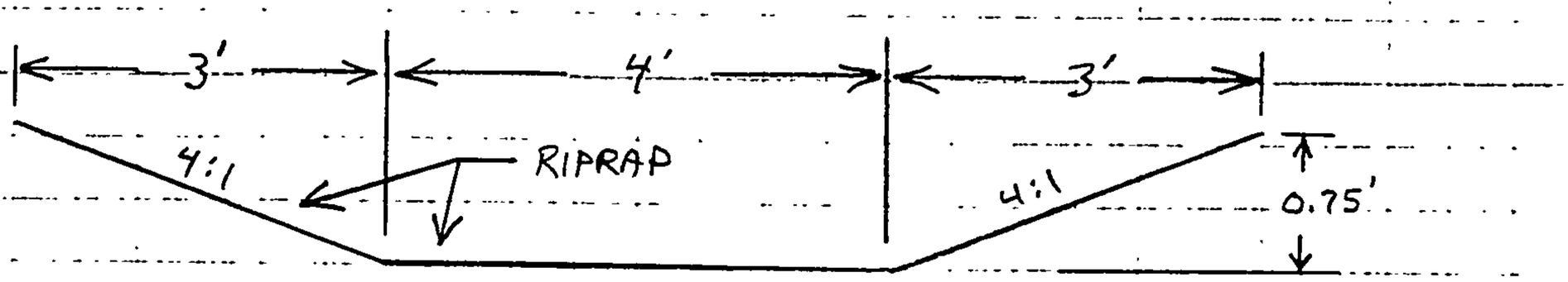
AREA	LAND USE
-	A
-	B
-	C
3.07	D
3.07	

$Q_{100} = (2.87\,CFS/Ac)(3.07\,Ac) = 8.81\,CFS$

OFFSITE FLOW = 15.3 CFS

TOTAL FLOW = 24.1 CFS

CHANNEL CAPACITY POND 7 TO POND 6



$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$= (5.25\,FT^2)\left(\frac{1.486}{0.03}\right)\left(\frac{5.25\,FT^2}{10.18\,FT}\right)^{2/3}(0.022)^{1/2} = \underline{24.8\,CFS}$$

12' WIDE WEIR CAPACITY - SOUTH ACCESS ROAD

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.35	C
1.37	D
1.72	

$Q_{100} = (2.87\ CFS/Ac)(0.35\ Ac) + (4.37\ CFS/Ac)(1.37\ Ac) = \underline{6.99\ CFS}$

OFFSITE FLOW $Q_{100} = 11.2$ CFS (APPENDIX I, PAGE 6.) TOTAL FLOW = 18.2 CFS

CAPACITY (12' CURBCUT) $Q_T = \frac{2}{3}\sqrt{2g}\,LH^{3/2} + \frac{8}{15}\sqrt{2g}\,\frac{z}{2}H^{5/2}$

$= \frac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(12')(0.5')^{3/2} + \frac{8}{15}\sqrt{64.4\ FT/SEC^2}\,(1)(0.5)^{5/2}$

$= \underline{25.0\ CFS}$

WEIR CAPACITY - POND 3

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.195	C
0.781	D
0.976	

$Q_{100} = (2.87\ CFS/ACRE)(0.195\ Ac) + (4.37\ CFS/Ac)(0.781\ Ac) = \underline{3.97\ CFS}$

WEIR CAPACITY (4' CURBCUT)

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,L H^{3/2} + \tfrac{8}{15}\sqrt{2g}\,Z H^{5/2}$$

$$= \tfrac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(4')(0.5')^{3/2} + \tfrac{8}{15}\sqrt{64.4\ FT/SEC^2}\,(1)(0.5')^{5/2}$$

$$= \underline{8.33\ CFS}$$

WEIR AT NORTH PARKING LOT

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.070	C
0.633	D
0.703Ac	

$Q_{100} = (3.87 CFS/ACRE)(0.070\ Ac) + (4.37 CFS/Ac)(0.633 A_c) = \underline{3.04\ CFS}$

WEIR CAPACITY (2' SIDEWALK CULVERT)

$Q_T = \frac{2}{3}\sqrt{2g}\, L H^{3/2}$

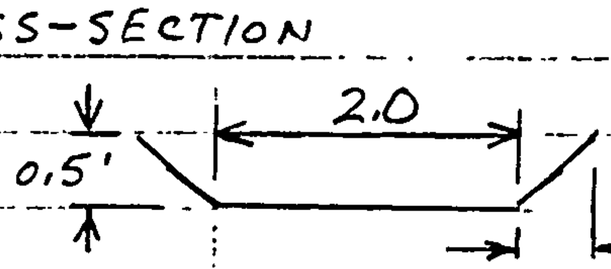
$= \frac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$

$= \underline{3.78\ CFS}$

CHANNEL CAPACITY

$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ FOR $n = 0.33$ RIPRAP LINING

CROSS-SECTION



$Q = (1.25\ FT^2)\ \frac{1.486}{0.033}\left(\frac{1.25\ FT^2}{3.41\ FT}\right)^{2/3}(0.02)^{1/2} = \underline{4.08\ CFS}$

WEIR AT WEST PARKING LOT DRIVE

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.168	C
0.672	D
0.840	

$$Q_{100} = (3.87\ CFS/Ac)(0.168\ Ac) + (4.37\ CFS/Ac)(0.672\ Ac) = 3.59\ CFS$$

WEIR CAPACITY (2' CURBCUT - VERTICAL SIDES)

$$Q_T = {}^2/_3 \sqrt{2g}\, L H^{3/2}$$

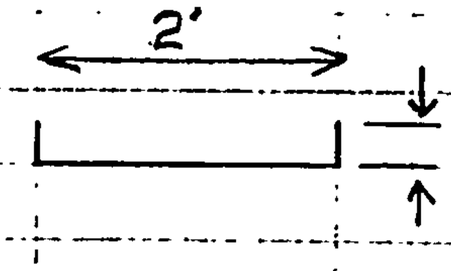
$$= {}^2/_3 \sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$$

$$= 3.78\ CFS$$

CHANNEL CAPACITY

$$Q = A\,\frac{1.486}{n} R^{2/3} S^{1/2}$$ FOR $n = 0.013$ CONCRETE LINING

CROSS-SECTION



$$Q = (1\ FT^2)\left(\frac{1.486}{0.013}\right)\left(\frac{1\ FT^2}{2\ FT}\right)^{2/3}(0.00625)^{1/2}$$

$$= 5.6\ CFS$$

FLOW BETWEEN POND 4 AND POND 3

FLOW FROM ONSITE: FROM POND 5 = 12.6 CFS (APPENDIX 11)
FROM WEIR ON ACCESS ROAD = 18.3 CFS (APPENDIX 10)

SHEET FLOW TO POND 4

AREA	LAND TREATMENT
—	A
—	B
0.135	C
0.087	D
0.222 ACRES	

$Q_{100} = (2.87 CFS/Ac)(0.135 Ac) + (4.37 CFS/Ac)(0.087 Ac) = 0.768 CFS$

TOTAL FLOW TO POND 5 = 12.6CFS + 18.3CFS + 0.768CFS = 31.7CFS

WEIR CAPACITY = $\frac{2}{3}\sqrt{2g}\, L H^{3/2} = \frac{2}{3}\sqrt{2(32.2 FT/SEC^2}\,(37.5FT)(0.292-T)^{3/2}$

= 31.6 CFS

WEIR DEPTH (H) = 3½" SO TOP OF BERM = 85.0 MINUS 3½"

= 84.7

TWIN 21" HDPE FROM PARKING LOT TO POND 1

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.19	D
2.43	

$Q_{100} = (2.87 CFS/Ac)(0.24 Ac) + (4.37 CFS/Ac)(2.19 Ac) = 10.3 CFS$

TOTAL FLOW = 10.3 CFS + 4.17 CFS (POND 4 OVERFLOW IF VALVE UPSTREAM FAILS)

= 14.5 CFS

ELEVATION AT GRATE WITH 2" PONDING = 86.0

OUTLET INVERT 80.0 TOP OF POND ELEV 85.0

INLET INVERT 82.5

FOR INLET CONTROL (SUBMERGED)

$$Q = C_d A \sqrt{2gh}$$

$$= 0.6(2.41 FT^2)\sqrt{2(32.2 FT/SEC^2)(1')}$$

$$= 11.6 CFS$$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \frac{K_e + 1 + 29 n^2 L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = \frac{0.4 + 1 + 29(0.012)^2(96')}{(0.4375)^{1.33}}\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 3.45 FT/SEC$ $Q = VA = (3.45 FT/SEC)(\pi(1.75')^2/4) = 8.30 CFS$

$Q_{REQUIRED} = 14.5 CFS$ SO USE TWO 21" RCP'S CAPACITY 16.6 CFS

SUMMARY: OUTLET CONTROL GOVERNS; USE TWO 21" RCP'S

FLOW BETWEEN POND 3 AND POND 2

FLOW FROM ON SITE: FROM POND 4 = 31.7 CFS

SHEET FLOW TO POND 3

AREA	LAND TREATMENT
-	A
-	B
0.185	C
0.741	D
0.926	

$Q_{100} = (2.87\ CFS/Ac)(0.185\ AC) + (4.37\ CFS/Ac)(0.741\ AC) = 3.77\ CFS$

FLOW FROM OFF SITE: 5.8 CFS (APPENDIX 1, PAGE 6)

TOTAL FLOW TO POND 3 = 31.7 CFS + 3.77 CFS + 5.8 CFS = 41.3 CFS

$WEIR\ CAPACITY = \frac{2}{3}\sqrt{2g}\ LH^{3/2} = \frac{2}{3}\sqrt{2(32.2\ FT/SEC^2}\ (50.6\ FT)(0.292')^{3/2}$

$= 42.7\ CFS$

WEIR DEPTH (H) = 3 1/2" SO TOP OF BERM = 85.0 MINUS 3 1/2"

= 84.7 ELEV

24" RCP AT BLUEWATER - CAPACITY

GRATE ELEV - 95.5 LENGTH = 85 FT

INLET INVERT ELEV - 92.0 POND SURFACE ELEV = 93.5

OUTLET ELEV - 91.5

$Hw/D = (3.5')/(2.0') = 1.75$

INLET LIMITED CAPACITY (FROM NOMOGRAPH) = 26.0 CFS INLET LIMITED

OUTLET LIMITED CAPACITY (UNSUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (95.5 - 91.5) = \frac{0.4+1+29(0.012)^2(85)}{(0.500')^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 7.63$ FT/SEC

$Q = VA = (7.63 \text{ FT/SEC})(\pi(2')^2/4) = 24.0$ CFS

OUTLET LIMITED CAPACITY (POND FILLED - OUTLET SUBMERGED)

TAILWATER DEPTH EXCEEDS AVERAGE OF CRITICAL DEPTH AND DIAMETER.

USE $H' = H - T_w = 4 - 2 = 2$

$$2 = \frac{0.4+1+29(0.012)^2(85)}{(0.500)^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 5.40$ FT/SEC

$Q = VA = (5.40 \text{ FT/SEC})(\pi(2')^2/4) = 17.0$ CFS OUTLET LIMITED (SUBMERGED)

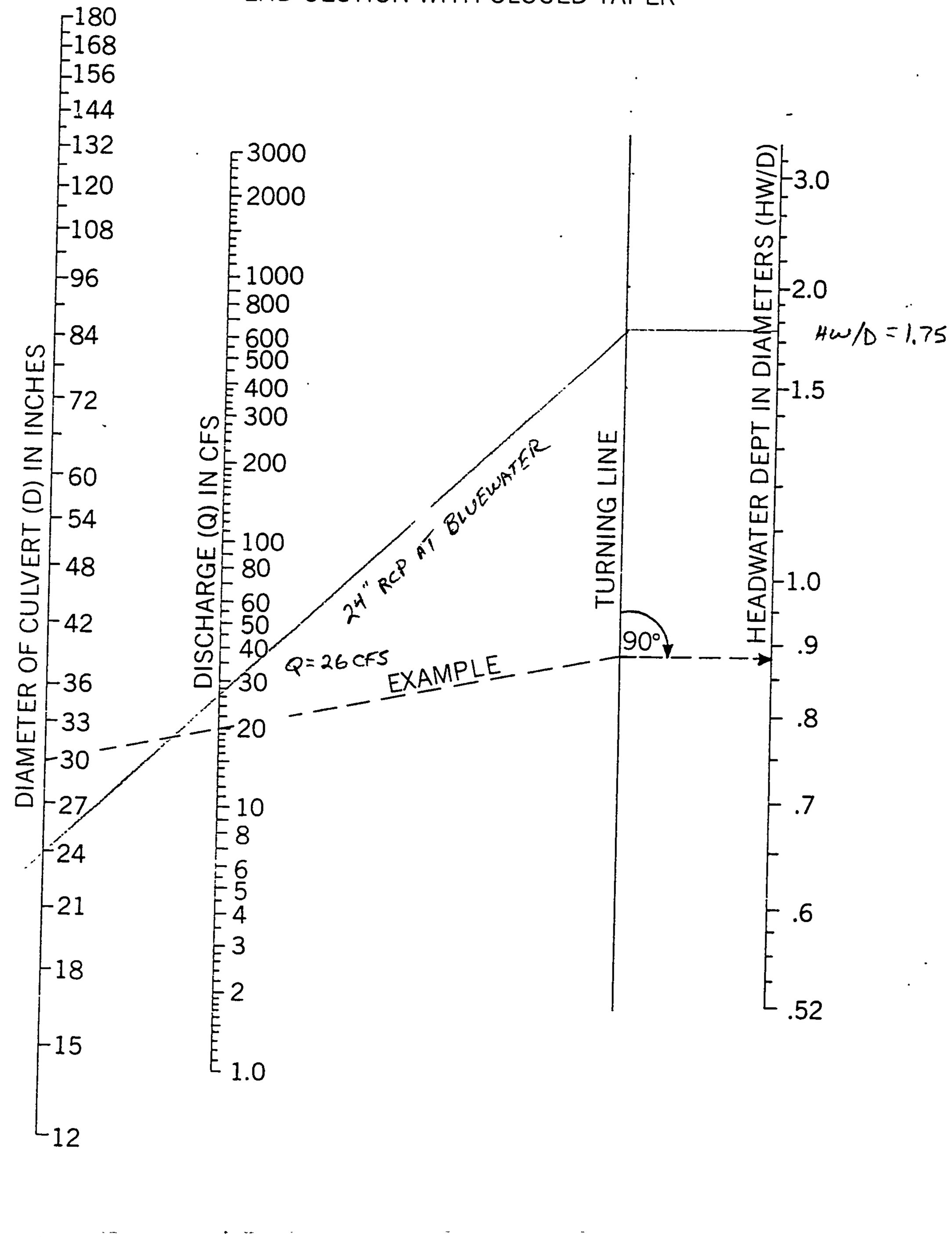
SUMMARY: CAPACITY IS SUBMERGED OUTLET LIMITED TO 17.0 CFS

EXPECTED $Q_{100} = 15.3$ CFS

TABLE A-11

HEADWATER DEPTH FOR CIRCULAR PIPE CULVERTS WITH INLET CONTROL

END SECTION WITH CLOSED TAPER



24" RCP FROM POND 5 TO POND 4

SHEET FLOW TO POND 5

AREA	LAND USE
—	A
—	B
0.131	C
0.523	D
0.654Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.131\ Ac) + (4.37\ CFS/Ac)(0.523 Ac) = 2.66 CFS$

TOTAL FLOW TO POND 5 = SHEET FLOW + NORTH WEIR FLOW

$= 2.66\ CFS + 6.99\ CFS = 9.65 CFS$

POND 5 FILLS FASTER THAN POND 4

Q_{100} TO PONDS 1 THROUGH 5 COMBINED =

$= (1.29\ CFS/Ac)(1.8935 Ac) + (2.03\ CFS/Ac)(1.700 Ac) + (2.87\ CFS/Ac)(1.88 Ac) +$

$+ (4.37\ CFS/Ac)(5.97 Ac) = 37.4\ CFS + 20.7\ CFS\ (OFFSITE) = \underline{58.1\ CFS}$

POND 5 CAPACITY AS A PERCENTAGE OF TOTAL (FOR PONDS 1 THROUGH 5)

$= (100)\left(\frac{7500\ FT^3}{107,500}\right) = 6.98\%$

PERCENTAGE OF FLOW THROUGH POND 5 $= (100)\left(\frac{10.5\ CFS}{58.1\ CFS}\right) = 18.1\%$

RELATIVE RATE POND 5 FILLS - COMPARED TO PONDS 1 THROUGH 4:

$\frac{18.1\%\ FLOW}{6.98\%\ CAPACITY} = 2.6$ TIMES AS FAST

SO POND 5 WILL BE FULL WHEN PONDS 1 THRU 4 HAVE LESS THAN 2' OF WATER PONDED, AND CONNECTION MUST HANDLE FULL FLOW

AT 10.5 CFS UNTIL PONDS 1 THROUGH 4 FILL. WITH MINIMUM FREEBOARD OF 0.5' AND BERM ELEVATION 86.5, THEN H = 86.0 - 85.0 = 1

FOR INLET CONTROL $Q = C_d A \sqrt{2gH}$

$= (0.6)(\pi)\sqrt{2(32.2\ FT/SEC^2)(1')}$

$= 15.1\ CFS$

FOR OUTLET CONTROL SUBMERGED

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g} = \frac{0.4 + 1 + 29(0.012)^2(63')}{(0.5)^{1.33}} \frac{V^2}{2(32.2\ FT/SEC^2)}$$

$V = 4.11\ FT/SEC \quad Q = VA = (4.11\ FT/SEC)(\pi(2')^2/4) = 12.9\ CFS$

SUMMARY: OUTLET CONTROL GOVERNS, USE ONE 24" RCP

NORTHEAST 12" HDPE - CAPACITY

GRATE ELEV 86.2 POND SURFACE ELEV = 85.0

INLET INVERT 83.2

OUTLET INVERT 82.0

FLOW (APPENDIX 7) = 1.84 CFS

FOR INLET CONTROL (SUBMERGED) $Q = C_d A \sqrt{2gh}$

$= 0.6(\pi(1')^2/4)\sqrt{2(32.2 FT/SEC^2)(1')}$

$= \underline{3.78 CFS}$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \left(\frac{K_e + 1 + 29n^2L}{R^{1.33}}\right)\left(\frac{V^2}{2g}\right) = \left(\frac{0.9 + 1 + 29(0.012)^2(135')}{(0.25)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 2.28 FT/SEC$ $Q = VA = (2.28 FT/SEC)(\pi(1')^2/4) = \underline{1.79 CFS}$

SUMMARY: OUTLET CONTROL GOVERNS, USE 12" HDPE

18" HDPE IN SOUTHEAST PARKING LOT AND 12" HDPE FROM POND 6 - CAPACITY

FROM POND 6 TO NORTH DROP INLET - 12" HDPE

INLET INVERT 87.0 LENGTH 150'

OUTLET INVERT 82.5 POND 6 SURFACE ELEV 89.0

OUTLET GRATE ELEV 84.8

INLET LIMITING (SUBMERGED) $Q = C_d A\sqrt{2gh}$

$= 0.6(\pi(1')^2/4)\sqrt{2(32.2\ FT/SEC^2)(89-87)}$

$= 5.35\ CFS$

OUTLET LIMITING (NOT SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (89.0 - 82.5) = \left(\frac{0.4 + 1 + 29(0.012)^2(150')}{(0.25)^{1.33}}\right)\frac{V^2}{2(32.2)}$$

$V = 5.71\ FT/SEC \quad Q = VA = (5.71\ FT/SEC)(\pi(1')^2/4) = 4.48\ CFS$

FROM NORTH DROP INLET TO POND 3 (18" HDPE)

EXPECTED FLOW TO ALL 3 INLETS

AREA	LAND USE
-	A
-	B
0.069	C
0.617	D
0.686 Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.069\ Ac) + (4.37\ CFS/Ac)(0.617 Ac) = 2.89\ CFS$

TOTAL FLOW = FLOW TO INLETS + FLOW FROM POND 6

$= 2.89\ CFS + 4.48\ CFS = 7.37\ CFS$

18" HDPE CAPACITY (CONTINUED)

INLET GRATE ELEV 84.3
INLET PONDING ELEV 85.0
OUTLET INVERT 82.0

OUTLET PONDING ELEV 85.0
LENGTH EACH SECTION 60'

INLET LIMITING (SUBMERGED)
* (OUTLET POND AT SURFACE ELEV 84.5)

$Q = C_D A \sqrt{2gh}$

$= 0.6(\pi(1.5')^2/4\sqrt{2(32.2 FT/SEC^2)(0.5')}$

$= 6.0$ CFS

OUTLET LIMITING (SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g}$$

$$0.5 = \left(\frac{0.4 + 1 + 29(0.012)^2(60)}{(0.375)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right)$$

$V = 2.30$ FT/SEC

$Q = VA = (2.30 FT/SEC)(\pi(1.5)^2/4) = 4.07$ CFS

SINCE 4.07 CFS > 2.89 CFS, PARKING LOT WILL DRAIN TO POND 2 WITH MINIMAL DIFFERENCE IN WATER SURFACE ELEVATION.

TO DRAIN POND 6 AFTER DELAYED RELEASE, POND 3 MUST REACH SURFACE ELEVATION 84.3, GIVING H = 0.6 IN EQUATION ABOVE (THEN V = 2.72 FT/SEC, Q = 4.80 CFS, AND 4.80 CFS > 4.48 CFS FROM POND 4. THE PARKING LOT WILL BE DRAINED AT THIS POINT.

PONDS 1, 2, 3 WILL REACH ELEVATION 84.3 AFTER RELEASE OF APPROXIMATELY 30,000 CUBIC FEET TO THE COORS BOULEVARD STORM SEWER. AT 5 CFS, THIS AMOUNTS TO A 2 HOUR DELAY AFTER THE 2 HOUR DELAY BEFORE DISCHARGE COMMENCES.

24" HDPE'S CONNECTING POND 1 AND POND 2

EXPECTED FLOW

PERCENTAGE OF FLOW INTO POND 1

TOTAL FLOW TO PONDS 1, 2, AND 3

= 58.1 CFS (APPENDIX 16)

TOTAL FLOW TO POND 1

FROM TWO 24" RCP'S (APPENDIX 17) = 14.5 CFS

FROM 12" RCP ON NORTH (APPENDIX 18) = 1.84 CFS

FROM DIAMOND SHAMROCK (APPENDIX 1) = 3.7 CFS

FROM SHEET FLOW:

AREA	LANDUSE
—	A
—	B
0,22	C
0,87	D
1,09 Ac	

$$Q_{100} = (2.87 CFS/Ac)(0.22 Ac) + (4.37 CFS/Ac)(0.87 Ac) = 4.43 CFS$$

TOTAL FLOW TO POND 1 = 24.5 CFS

$$\text{PERCENTAGE OF FLOW} = \frac{24.5 \text{ CFS}}{58.1 \text{ CFS}} (100) = 42.2\%$$

PERCENTAGE OF VOLUME IN POND 1

$$(100) \frac{70,000 \text{ FT}^3}{107,100 \text{ FT}^3} = 65.4\%$$

PERCENTAGE OF TOTAL FLOW FROM POND 2 TO POND 1

= (65.4% VOLUME IN POND 1) − (42.2% FLOW TO POND 1)

= 23% OF FLOW TO PASS FROM POND 2 TO POND 1

(0.23)(58.1 CFS) = 13.4 CFS CAPACITY REQUIRED

SINCE POND 2 FILLS FASTER THAN POND 1, CAPACITY IS ESTIMATED WITH MINIMAL (0.5') ELEVATION DIFFERENCE IN PONDS

INLET LIMITING (SUBMERGED) $Q = C_D A\sqrt{2gh}$

$= 0.6(\pi(2)^2/4)\sqrt{2(32.2\,FT/SEC^2)(0.5')}$

= 10.7 CFS

OUTLET LIMITING (SUBMERGED)

LENGTH = 30'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g}$$

$$0.5 = \frac{0.4 + 1 + 29(0.012)^2(30')}{(0.5')^{1.33}} \frac{V^2}{2(32.2\,FT/SEC^2)}$$

$V = 2.90\,FT/SEC$ $Q = VA = (2.9\,FT/SEC)(\pi(2)^2/4) = 9.11\,CFS$ USE TWO = 18.2 CFS

SUMMARY: OUTLET LIMITING CONTROLS, USE TWO 24" HDPE's

(DELETED)

APPENDIX 24

APPENDIX 2***

(DELETED)

4" LANDSCAPE PIPE CAPACITY

LARGEST AREA DRAINED

AREA	LAND USE
-	A
-	B
-	C
0.0756	D

0.0756 ACRES

$Q_{100} = (4.37\ CFS/Ac)(0.0756 Ac) = 0.330\ CFS$

INLET LIMITING: $Q = A C_D \sqrt{2gH}$ AT $H/D = 1$

$= (0.0872 FT^2)(0.6)\sqrt{2(32.2 FT/SEC^2)(1)}$

$= 0.42$ CFS EACH PIPE

OUTLETS ARE NOT SUBMERGED

12" HDPE ON PONDS 4 AND 3

OUTLET SUBMERGED CAPACITY AT $H/D = 1$, LONGEST PIPE = 41'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right)$$

$$= \frac{0.4 + 1 + 29(0.012)^2(41')}{(0.25)^{1.33}} \frac{V^2}{2(32.2\,FT/SEC^2)}$$

$$V = 2.5\,FT/SEC$$

$$Q = VA = (2.5\,FT/SEC)(0.785\,FT/SEC) = 1.96\,CFS$$

TIME TO DRAIN AT $H/D = 1$

$$TIME = VOLUME/FLOW = 15{,}000\,FT^3 / 1.96\,CFS = 7639\,SEC$$

$$= 2.1\,HOURS$$

$$FLOW\ TO\ DRAIN\ IN\ 24\,HRS = \frac{15000\,FT^3}{(24\,HR)(3600\,SEC/HR)} = 0.17\,CFS$$

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 11/04/1996
     START TIME (HR:MIN:SEC) = 14:00:49     USER NO.= RED_MTNM.194
     INPUT FILE = 4BLUDAT.DAT

*              BLUEWATER INPUT FOR AHYMO
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
*              INPUT - POND 7 INFLUX
START            RAINFALL BEGINS AT 0.0  HRS
RAINFALL           TYPE=2 RAIN QUARTER=0
                ONE=1.90 SIX=2.24
                RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =   23.999940 HOURS
            .0000  .0070  .0147  .0231  .0326  .0433  .0557
            .0705  .0899  .1822  .5934 1.2876 1.5372 1.7194
           1.8631 1.9791 2.0021 2.0212 2.0377 2.0524 2.0656
           2.0776 2.0887 2.0990 2.1087 2.1178 2.1264 2.1346
           2.1424 2.1499 2.1570 2.1638 2.1704 2.1768 2.1830
           2.1889 2.1947 2.2003 2.2057 2.2110 2.2161 2.2211
           2.2260 2.2308 2.2354 2.2400 2.2452 2.2504 2.2555
           2.2606 2.2656 2.2706 2.2755 2.2804 2.2852 2.2900
           2.2948 2.2995 2.3042 2.3089 2.3135 2.3180 2.3226
           2.3271 2.3315 2.3359 2.3403 2.3447 2.3490 2.3533
           2.3575 2.3618 2.3660 2.3701 2.3743 2.3784 2.3824
           2.3865 2.3905 2.3945 2.3984 2.4024 2.4063 2.4101
           2.4140 2.4178 2.4216 2.4254 2.4291 2.4329 2.4366
           2.4402 2.4439 2.4475 2.4511 2.4547 2.4583 2.4618
           2.4654 2.4689 2.4723 2.4758 2.4792 2.4827 2.4860
           2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
           2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
           2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
           2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
           2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
           2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
           2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
           2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
           2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
           2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
           2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD     ID=1  HYD NO=101.0
                DA=0.009508 SQ MI
                PER A=0.0 PER B=5.8
                PER C=51.5 PER D=42.7
                TP=0.133 HR MASSRAIN=-1

  K=  .072485HR   TP=  .133000HR   K/TP RATIO=  .545000    SHAPE CONSTANT, N=  7.106420
  UNIT PEAK=  16.065   CFS  UNIT VOLUME=   1.119     B=  526.28     P60=1.9000
  AREA=     .004060 SQ MI   IA=   .10000 INCHES   INF=   .04000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT=
```

.133333

K = .108446HR TP = .133000HR K/TP RATIO = .815384 SHAPE CONSTANT, N = 4.383857
UNIT PEAK = 15.566 CFS UNIT VOLUME = 1.005 B = 380.00 P60 = 1.9000
AREA = .005448 SQ MI IA = .36518 INCHES INF = .87251 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

```
*              INPUT - POND 7 OUTFLUX
ROUTE RESERVOIR    ID=2  HYD=POND.107  INFLOW ID=1
            OUTFLOW (CFS)    STORAGE (AC FT)
              0              0.551
              8              0.6
              16             0.65
              24.8           0.7
*              INPUT - DIVERT POND 7 TO STORE 4.5 HOURS
DIVIDE HYD         ID=2  Q=-63.6  ID=3  HYD NO=102
                   ID=4  HYD NO=104
*              INPUT - POND 7 DELAYED 4.5 HOURS OUTFLUX
ROUTE RESERVOIR    ID=5  HYD POND.107A  INFLOW ID=4
            OUTFLOW (CFS)    STORAGE (AC FT)
              0              0
              4.17           0.05
              4.17           0.10
              4.17           0.20
              4.17           0.30
              4.17           0.40
              4.17           0.50
              4.17           0.552
*              INPUT - DELAY POND 7 OUTFLUX
MODIFY TIME        ID=5  TIME=4.5 HRS
*              INPUT - POND 6 SHEET FLOW INFLUX
RAINFALL           TYPE=2 RAIN QUARTER=0
                   ONE=1.90 SIX=2.24
                   RAIN DAY=2.70 DT=0.133333 HR
```

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = .133333 HOURS END TIME = 23.999940 HOURS

```
 .0000  .0070  .0147  .0231  .0326  .0433  .0557
 .0705  .0899  .1822  .5934 1.2876 1.5372 1.7194
1.8631 1.9791 2.0021 2.0212 2.0377 2.0524 2.0656
2.0776 2.0887 2.0990 2.1087 2.1178 2.1264 2.1346
2.1424 2.1499 2.1570 2.1638 2.1704 2.1768 2.1830
2.1889 2.1947 2.2003 2.2057 2.2110 2.2161 2.2211
2.2260 2.2308 2.2354 2.2400 2.2452 2.2504 2.2555
2.2606 2.2656 2.2706 2.2755 2.2804 2.2852 2.2900
2.2948 2.2995 2.3042 2.3089 2.3135 2.3180 2.3226
2.3271 2.3315 2.3359 2.3403 2.3447 2.3490 2.3533
2.3575 2.3618 2.3660 2.3701 2.3743 2.3784 2.3824
2.3865 2.3905 2.3945 2.3984 2.4024 2.4063 2.4101
2.4140 2.4178 2.4216 2.4254 2.4291 2.4329 2.4366
2.4402 2.4439 2.4475 2.4511 2.4547 2.4583 2.4618
2.4654 2.4689 2.4723 2.4758 2.4792 2.4827 2.4860
```

2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD ID=6 HYD NO=106.0
DA=0.003727 SQ MI
PER A=0.0 PER B=0.0
PER C=100.0 PER D=0.0
TP=0.133 HR MASSRAIN=-1

K= .105966HR TP= .133000HR K/TP RATIO= .796738 SHAPE CONSTANT, N= 4.498737
UNIT PEAK= 10.849 CFS UNIT VOLUME= 1.009 B= 387.15 P60 = 1.9000
AREA= .003727 SQ MI IA= .35000 INCHES INF= .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

* INPUT - POND 6 OVERFLOW + SHEET
ADD HYD ID=7 HYD=POND.106A ID I=6 ID II=3
* INPUT - IMMEDIATE FLOW TO POND 6
ROUTE RESERVOIR ID=8 HYD=POND.106 INFLOW ID=7
OUTFLOW (CFS) STORAGE (AC FT)
0 0
4.48 0.2
4.48 0.4
4.48 0.6
4.48 0.7
4.48 0.71
4.48 0.72
* DELAY POND 6 DISCHARGE 2.4 HOURS
MODIFY TIME ID=8 TIME=2.4 HRS
* INPUT - ADD DELAYED POND 7 TO POND 6
ADD HYD ID=9 HYD=POND.106B ID I=8 ID II=5
ROUTE RESERVOIR ID=10 HYD=POND.106C INFLOW ID=9
OUTFLOW (CFS) STORAGE (AC FT)
0 0
4.48 0.2
4.48 0.4
4.48 0.6
4.48 0.7
4.48 0.71
4.48 0.72
* POND 6 INFLUX - IMMEDIATE
PRINT HYD ID=7

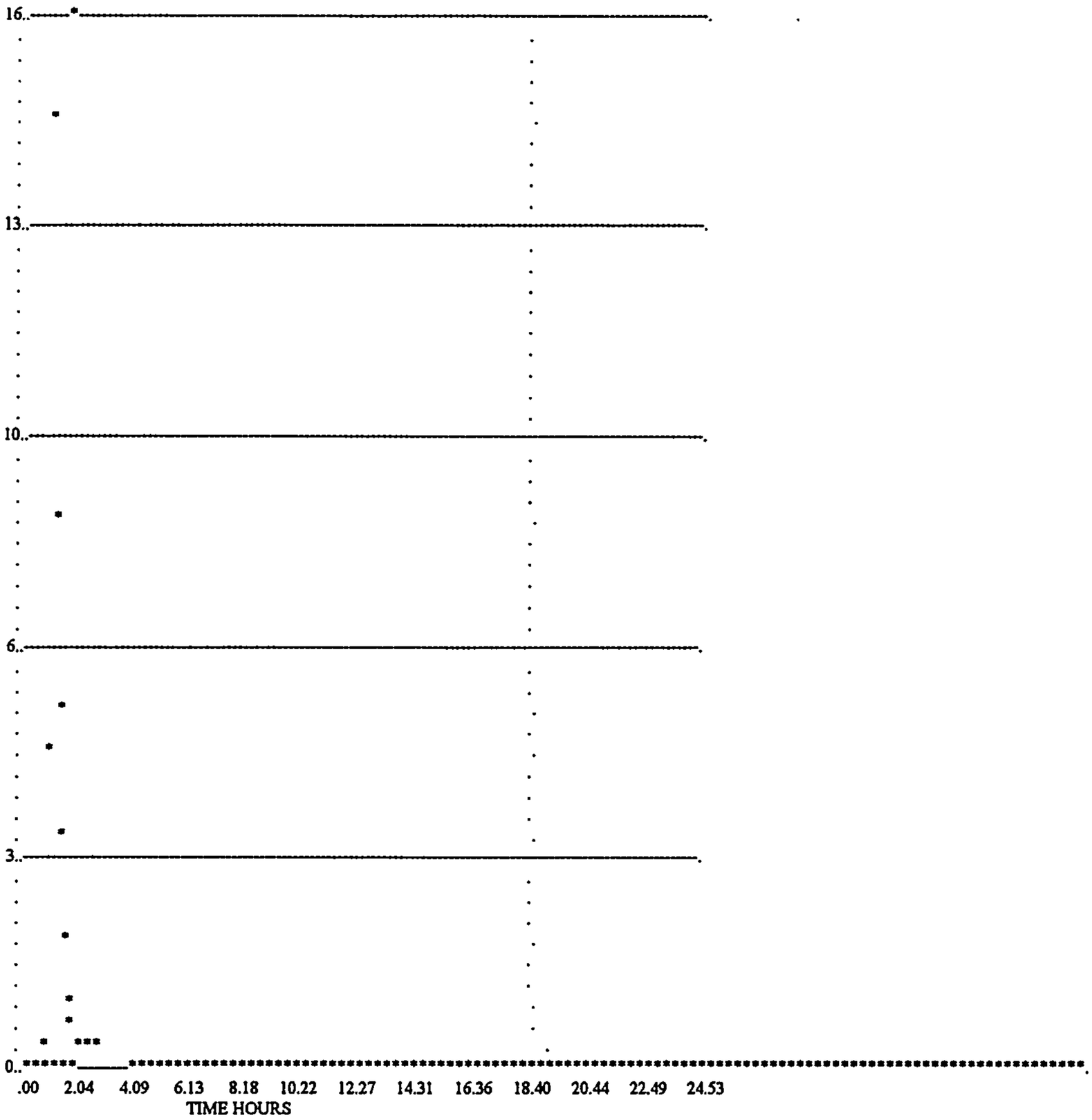
HYDROGRAPH FROM AREA POND.106A

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW

HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	4.933	.0	9.867	.1	14.800	.0	19.733	.0
.133	.0	5.067	.0	10.000	.1	14.933	.0	19.867	.0
.267	.0	5.200	.0	10.133	.1	15.067	.0	20.000	.0
.400	.0	5.333	.0	10.267	.1	15.200	.0	20.133	.0
.533	.0	5.467	.0	10.400	.1	15.333	.0	20.267	.0
.667	.0	5.600	.1	10.533	.1	15.467	.0	20.400	.0
.800	.0	5.733	.1	10.667	.0	15.600	.0	20.533	.0
.933	.0	5.867	.1	10.800	.0	15.733	.0	20.667	.0
1.067	.0	6.000	.1	10.933	.0	15.867	.0	20.800	.0
1.200	.3	6.133	.1	11.067	.0	16.000	.0	20.933	.0
1.333	4.9	6.267	.1	11.200	.0	16.133	.0	21.067	.0
1.467	16.1	6.400	.1	11.333	.0	16.267	.0	21.200	.0
1.600	14.6	6.533	.1	11.467	.0	16.400	.0	21.333	.0
1.733	8.5	6.667	.1	11.600	.0	16.533	.0	21.467	.0
1.867	5.3	6.800	.1	11.733	.0	16.667	.0	21.600	.0
2.000	3.5	6.933	.1	11.867	.0	16.800	.0	21.733	.0
2.133	2.0	7.067	.1	12.000	.0	16.933	.0	21.867	.0
2.267	1.1	7.200	.1	12.133	.0	17.067	.0	22.000	.0
2.400	.7	7.333	.1	12.267	.0	17.200	.0	22.133	.0
2.533	.5	7.467	.1	12.400	.0	17.333	.0	22.267	.0
2.667	.3	7.600	.1	12.533	.0	17.467	.0	22.400	.0
2.800	.2	7.733	.1	12.667	.0	17.600	.0	22.533	.0
2.933	.2	7.867	.1	12.800	.0	17.733	.0	22.667	.0
3.067	.1	8.000	.1	12.933	.0	17.867	.0	22.800	.0
3.200	.1	8.133	.1	13.067	.0	18.000	.0	22.933	.0
3.333	.1	8.267	.1	13.200	.0	18.133	.0	23.067	.0
3.467	.1	8.400	.1	13.333	.0	18.267	.0	23.200	.0
3.600	.1	8.533	.1	13.467	.0	18.400	.0	23.333	.0
3.733	.1	8.667	.1	13.600	.0	18.533	.0	23.467	.0
3.867	.0	8.800	.1	13.733	.0	18.667	.0	23.600	.0
4.000	.0	8.933	.1	13.867	.0	18.800	.0	23.733	.0
4.133	.0	9.067	.1	14.000	.0	18.933	.0	23.867	.0
4.267	.0	9.200	.1	14.133	.0	19.067	.0	24.000	.0
4.400	.0	9.333	.1	14.267	.0	19.200	.0	24.133	.0
4.533	.0	9.467	.1	14.400	.0	19.333	.0	24.267	.0
4.667	.0	9.600	.1	14.533	.0	19.467	.0	24.400	.0
4.800	.0	9.733	.1	14.667	.0	19.600	.0	24.533	.0

RUNOFF VOLUME = 1.38009 INCHES = .7194 ACRE-FEET
PEAK DISCHARGE RATE = 16.10 CFS AT 1.467 HOURS BASIN AREA = .0098 SQ. MI.

PLOT HYD ID=7 POND 6 - SHEET FLOW INFLUX
FLOW RATE (CFS)

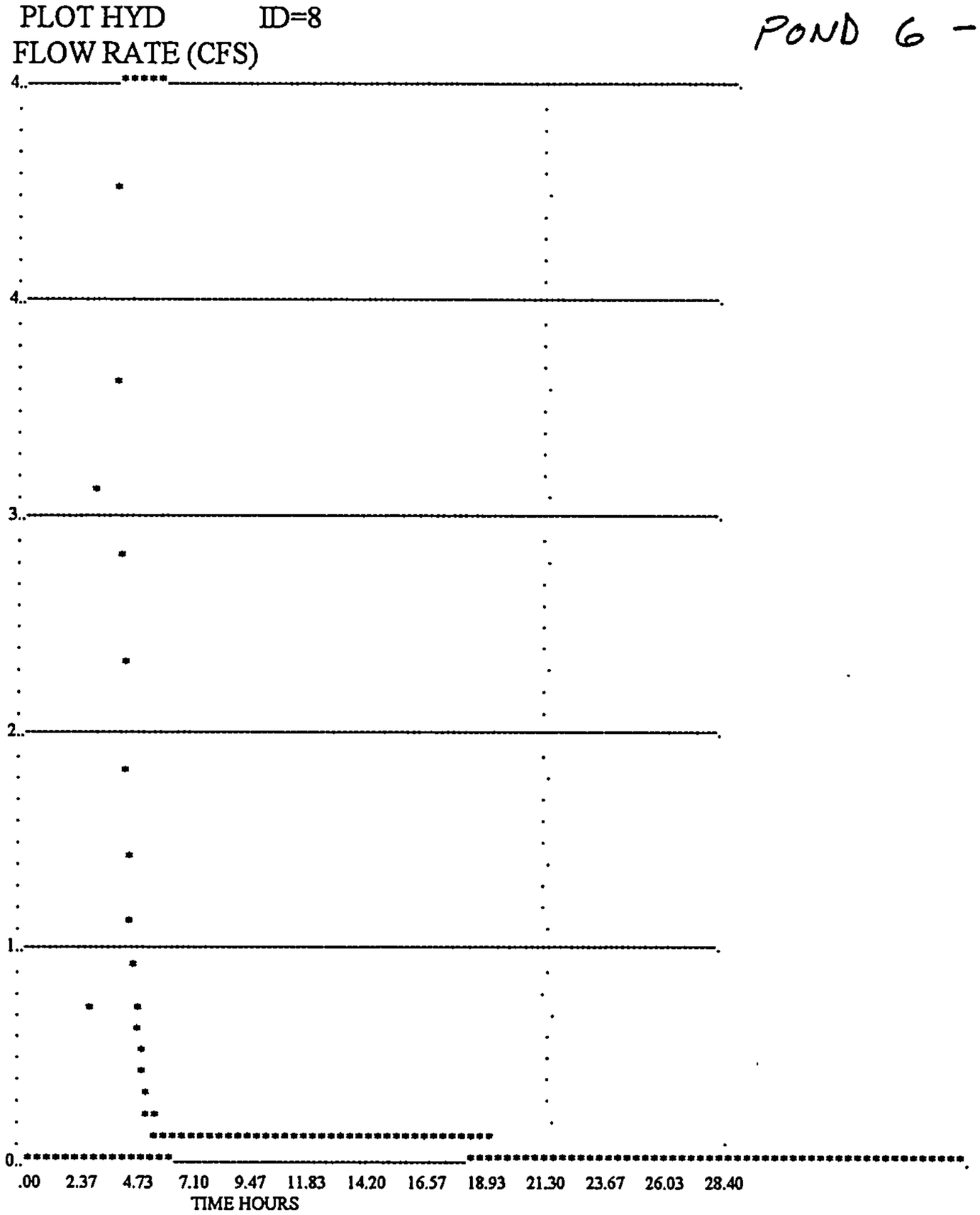


* POND 6 INFLUX - DELAYED
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA POND.106

RUNOFF VOLUME = 1.38001 INCHES = .7194 ACRE-FEET
PEAK DISCHARGE RATE = 4.48 CFS AT 4.000 HOURS BASIN AREA = .0098 SQ. MI.

POND 6 - DELAYED DISCHARGE

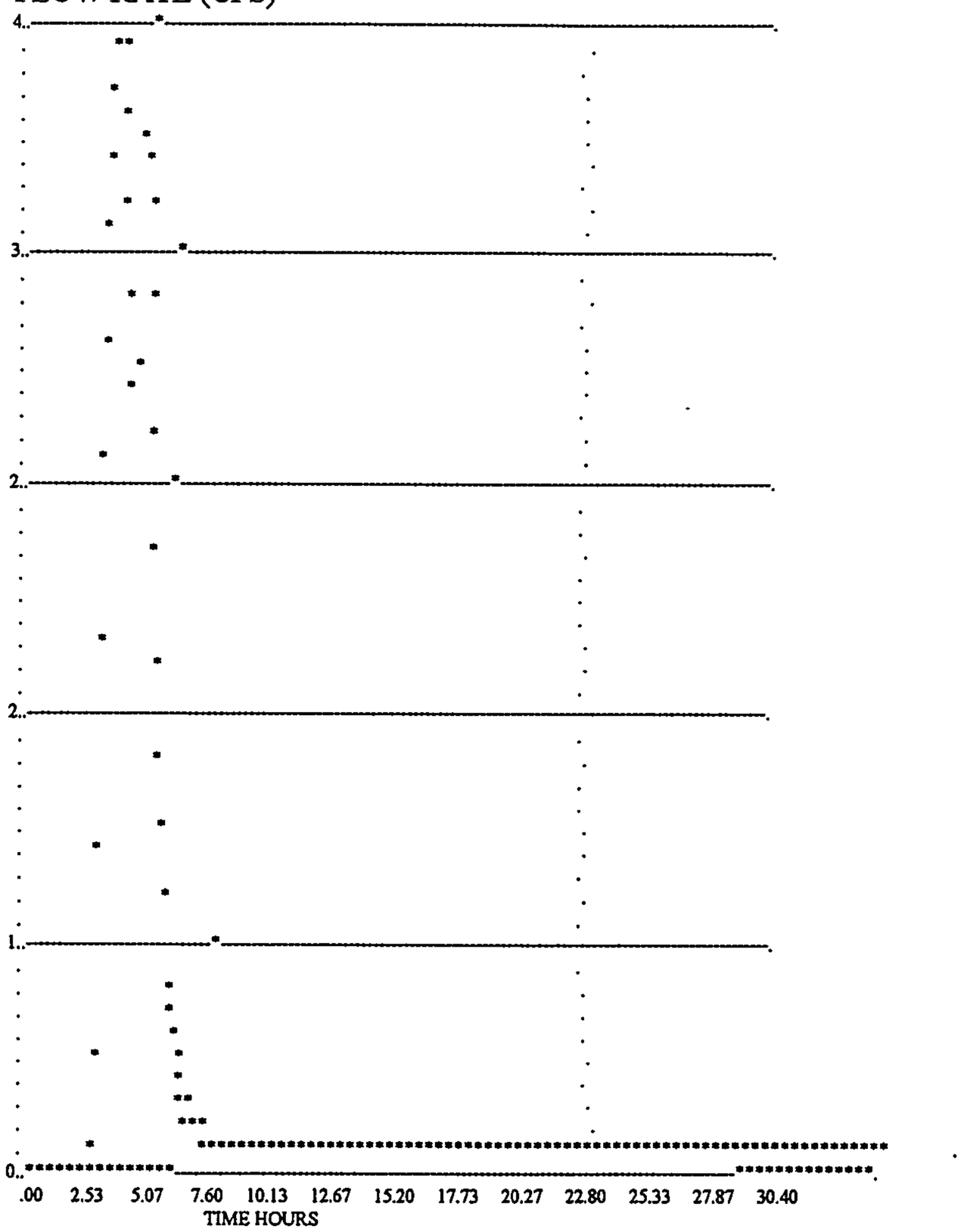


* POND 6 OUTFLUX
PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA POND.107

RUNOFF VOLUME = 1.43961 INCHES = 1.0162 ACRE-FEET
PEAK DISCHARGE RATE = 3.97 CFS AT 5.067 HOURS BASIN AREA = .0132 SQ. MI.

POND 7 - DELAYED DISCHARGE



* INPUT - FLOW TO BASE LEVEL PONDS (EQUALIZED)
RAINFALL TYPE=2 RAIN QUARTER=0
ONE=1.90 SIX=2.24
RAIN DAY=2.70 DT=0.133333 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = .133333 HOURS END TIME = 23.999940 HOURS

.0000	.0070	.0147	.0231	.0326	.0433	.0557
.0705	.0899	.1822	.5934	1.2876	1.5372	1.7194
1.8631	1.9791	2.0021	2.0212	2.0377	2.0524	2.0656
2.0776	2.0887	2.0990	2.1087	2.1178	2.1264	2.1346
2.1424	2.1499	2.1570	2.1638	2.1704	2.1768	2.1830
2.1889	2.1947	2.2003	2.2057	2.2110	2.2161	2.2211
2.2260	2.2308	2.2354	2.2400	2.2452	2.2504	2.2555
2.2606	2.2656	2.2706	2.2755	2.2804	2.2852	2.2900
2.2948	2.2995	2.3042	2.3089	2.3135	2.3180	2.3226
2.3271	2.3315	2.3359	2.3403	2.3447	2.3490	2.3533

2.3575 2.3618 2.3660 2.3701 2.3743 2.3784 2.3824
2.3865 2.3905 2.3945 2.3984 2.4024 2.4063 2.4101
2.4140 2.4178 2.4216 2.4254 2.4291 2.4329 2.4366
2.4402 2.4439 2.4475 2.4511 2.4547 2.4583 2.4618
2.4654 2.4689 2.4723 2.4758 2.4792 2.4827 2.4860
2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD ID=11 HYD NO=108
DA=0.02568 SQ MI
PER A=11.5 PER B=13.4
PER C=11.4 PER D=63.7
TP=0.133 HR MASSRAIN=-1

K = .072485HR TP = .133000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 64.729 CFS UNIT VOLUME = 1.119 B = 526.28 P60 = 1.9000
AREA = .016358 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

K = .132940HR TP = .133000HR K/TP RATIO = .999547 SHAPE CONSTANT, N = 3.531923
UNIT PEAK = 22.614 CFS UNIT VOLUME = .9769 B = 322.65 P60 = 1.9000
AREA = .009322 SQ MI IA = .50041 INCHES INF = 1.25116 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

* INPUT - ADD IMMEDIATE + DELAYED FLOW TO BASE LEVEL PONDS
ADD HYD ID=12 HYD=POND.112 ID I=11 ID II=10
* INPUT - TOTAL FLOW TO BASE LEVEL PONDS
ROUTE RESERVOIR ID=13 HYD POND.112A INFLOW ID=12

OUTFLOW (CFS)	STORAGE (AC FT)
0	0
5.2	0.01
5.2	2.468
5.2	2.6

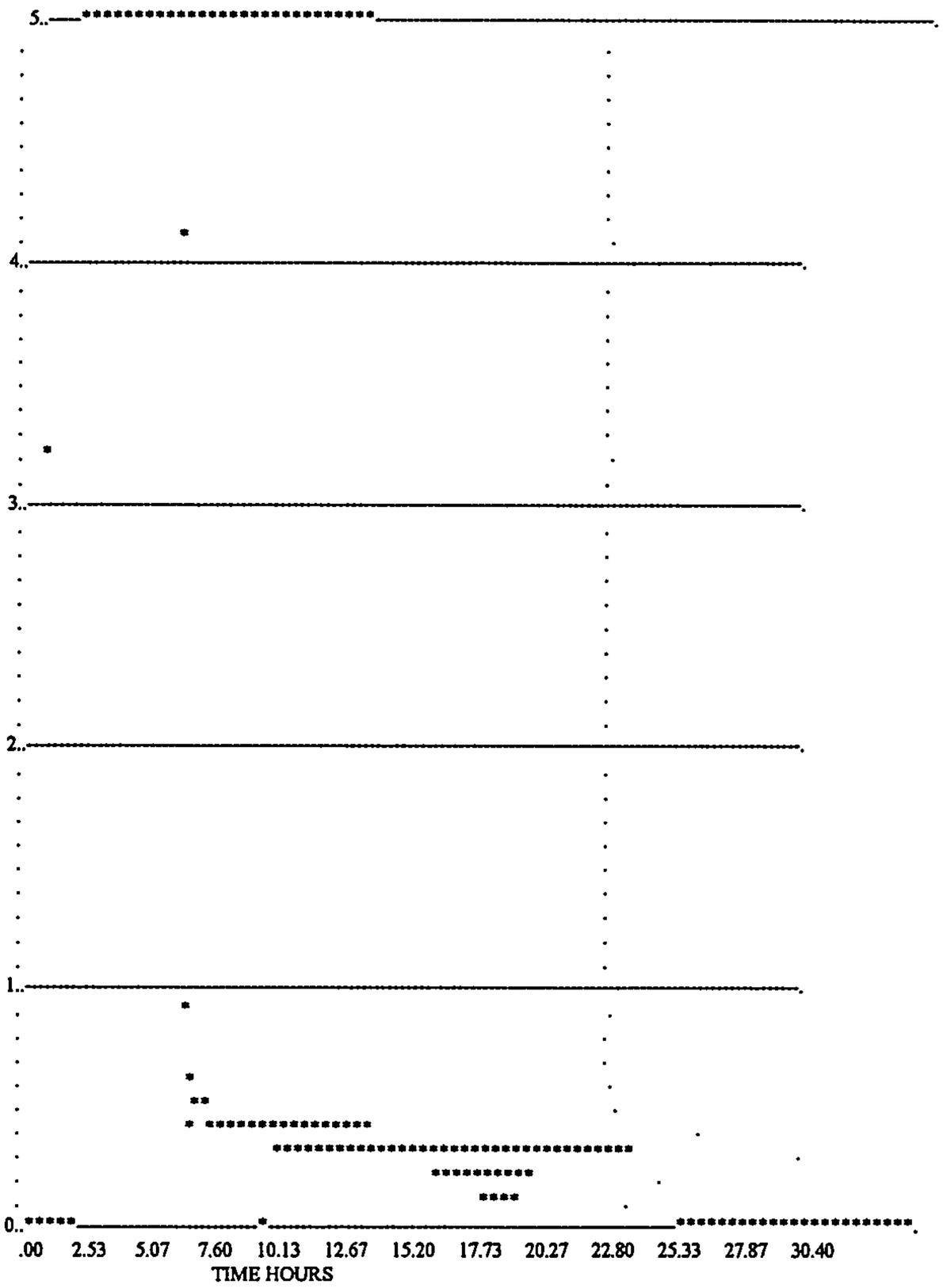
PRINT HYD ID=13 CODE=1

OUTFLOW HYDROGRAPH REACH .11

RUNOFF VOLUME = 1.69336 INCHES = 3.5145 ACRE-FEET
PEAK DISCHARGE RATE = 5.20 CFS AT 1.333 HOURS BASIN AREA = .0389 SQ. MI.

BASE POND - DISCHARGE TO COORS STORM DRAIN

PLOT HYD ID=13
FLOW RATE (CFS)



FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:00:51

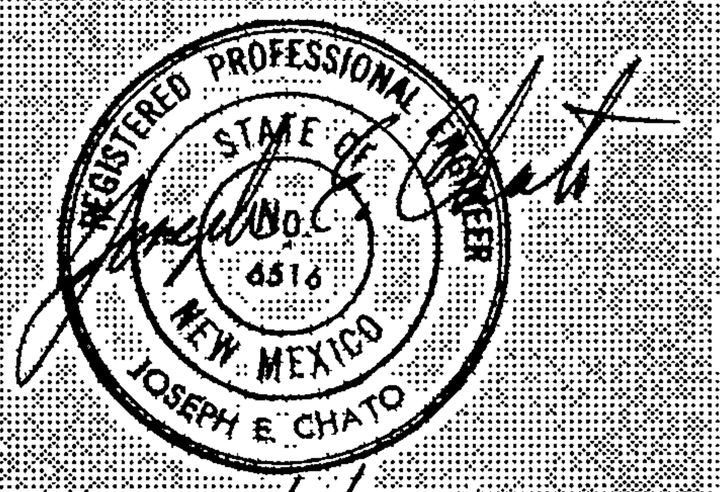
CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

K10-D20

BLUEWATER DEVELOPMENT
HYDROLOGY REPORT

Prepared By:

Red Mountain Engineers, Inc.
Engineers • Surveyors



12/4/96

Revised
December 4, 1996

Revised Hydrology Report

BLUEWATER VILLAGE

This development is on two adjacent tracts near the southwest corner of Bluewater Road and Coors Boulevard, Zone Map K-10. The proposed development is a turnkey apartment project for Albuquerque Development Services.

Tract A-1A-2C consists of 6.1335 acres of undeveloped property, and will be graded for future building pads and two detention ponds. It will provide approximately eight thousand cubic yards of fill for the neighboring tract A-1A-2B.

Tract A-1A-2B consists of 11.4335 acres of undeveloped property, and is slated for construction of a community building, two laundry buildings, and 200 apartments in 10 two-story apartment buildings. Stormwater detention is designated for seven ponding areas on this tract. This tract receives off-site flows and is partially occupied by a FEMA AH floodplain, with base elevation 5085, as defined in Panel 350002 0027 C.

The off-site flows contributing to the flood plain have been reduced by recent development. A current evaluation of off-site flows entering the project is attached in Appendix 1. Ponding capacity on the site is calculated (Appendix 5A) on the basis of this reduced flow.

Proposed stormwater discharge to the Coors Boulevard storm sewer from the ponding areas is delayed by two hours as recommended in the West Bluff Drainage Plan, January 1987, Sheet No. 3, and is limited to 0.20 CFS/Ac (Appendix 2).

Off-site flow from Basin O-1 (Appendix 1, page 6) will be intercepted at the intersection of the proposed access road with Bluewater Road, with four 'A' curb inlets constructed on the southeast corner of the proposed intersection. This off-site flow is then routed through a 24" reinforced concrete pipe (RCP) to detention Pond 7 on tract A-1A-2C. A second pond (Pond 6) on this tract provides the remaining capacity required for Basin O-1 (Appendix 1) and tract A-1A-2C (Appendix 5). A weir and channel connects these two ponds, so that lower Pond 6 receives stormwater after upper Pond 7 fills. Upper Pond 7 drains to lower Pond 6 after a 4.5 hour delay via a 12" valve and 12" HDPE (corrugated high-density polyethylene) drain pipe. Lower Pond 6 drains after a 4 hour delay through a 12" valve and 12" HDPE drain pipe to the base elevation ponds. The extra delay is necessary to allow the lower ponds to drain sufficiently to prevent water backing up at the Building 4 parking lot inlets (this parking lot forms part of the 100-year detention basin).

Base elevation Ponds 1 through 5 are on tract A-1A-2B, at water surface elevation 5085 (the FEMA floodplain base elevation). Pond 5 drains to Pond 4 via 24" RCP, and is equalized in surface elevation through this connection. Pond 4 drains to Pond 3 over a weir (berm) and through a 12" HDPE drain pipe. Pond 3 drains to Pond 2 over a weir (berm) and through a 12"

HDPE drain pipe. Pond 2 drains to Pond 1 via two 24" HDPE drain pipes . After a two-hour delay, Pond 1 drains to a curb inlet on the Coors Boulevard storm sewer through a 12" valve and 18" PVC with a 7-3/8 x 7-3/8" restrictor plate. All the ponds ultimately drain through this connection.

All seven ponds have an overflow path to route stormwater in event of open or closed valve failure.

Pipe inlets have riprap erosion pads to prevent undermining by scour. Inlet screens are provided where the 12" HDPE's have valves to prevent clogging by debris.

Total area drained to outlet detention pond is 26.2 acres. Recommended discharge rate, from the West Bluff Drainage Plan, is 0.20 CFS/Ac, giving a maximum allowable discharge of 5.24 CFS to the Coors Boulevard stormdrain.

With an 18" unrestricted drain pipe, maximum inlet-limited discharge will be 22.5 CFS. The 18" drainpipe at Coors is therefore restricted with a 7-3/8" x 7-3/8" square opening restrictor plate on the outlet, giving a maximum discharge of 5.20 CFS (Appendix 4) to meet the West Bluff Drainage Plan recommendation. Ponds 6 and 7 are limited to lesser discharges to the base elevation ponds, and discharge is delayed longer to prevent overflow of the base elevation ponds. Average discharge rate required to drain the 160,000 cubic feet of ponding in 24 hours is 1.85 CFS, and average discharge rate expected is 4.63 CFS (Appendix 4).

DETENTION POND VOLUMES

Ponds 6 and 7 are sized for 0.6950 acre/feet (30,300 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 22,000 cubic feet of flow generated on the 6.1335 acre tract (Appendix 5).

Pond 6 volume is 30,000 cubic feet and Pond 7 volume is 24,000 cubic feet. Total detention volume required for these two flows equals 52,300 cubic feet, and detention volume provided is 54,000 cubic feet.

Ponds 1 through 5 are sized for the remaining 0.9393 acre/feet (40,900 cubic feet) of 100-year off-site flow (Appendix 1, page 6) plus 66,200 cubic of flow generated on the 11.4335 acre tract (Appendix 5). Pond volumes are noted on the grading and drainage drawing. Total detention volume required for these ponds equals 107,100 cubic feet and total detention volume provided is 107,500 cubic feet.

DRAIN INLET CAPACITIES

The four 'A' inlets at the Bluewater/access road intersection have a capacity of 4 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 16 CFS. Expected flow is 15.3 CFS (Appendix 1, page 6). Bluewater Road is already sloped with a low point at this location to channel water off the road toward the flood plain. A waterstop (higher section of road) prevents

overshoot past the grates, and velocity head in the sheet flow to the drain is too low to jump the curb.

The 2 'Double C' inlets on the double 21" HDPE's entering Pond 1 from the parking lot west of Building 3 have a capacity of 9.6 CFS each at 0.5 feet of ponding (DPM page 75) for a total capacity of 19.2 CFS. Expected flow is 10.3 CFS on-site surface runoff , plus a potential flow of 4.17 CFS if the valve on Pond 7 is left in open position. Total expected 100-year flow is then 14.3 CFS (Appendix 6), and total capacity is 19.2 CFS.

The Neenah R-2569 inlets on the 12" HDPE west of Building 3 have a capacity of 1.5 CFS at 0.3 feet of ponding . Expected 100-year flow is 0.60 CFS to the grate at the west-center of Building 3 and 0.45 CFS to the grate at the northwest side of Building 3 (Appendix 7).

The three Neenah R6672-E inlets draining to Pond 3 through an 18" HDPE have a capacity of 5.6 CFS each at 0.3 feet of ponding. Expected 100-year flow is 1.61 CFS for the largest drainage area, which is on the northern-most drain (Appendix 8). Drained areas are smaller for the remaining two inlets. These inlets are provided to ensure drainage of the flat parking lot, and are not required to meet flow capacity. This parking lot is flat to provide 6" of ponding in a 100-year storm event, so no regional slope is possible. Spot elevations ensure that water will flow to these local drains.

The double 'C' curb inlets northeast of Building 10 have a capacity of 5.6 CFS each at 6" ponding (DPM page 75). Expected flow is 9.88 CFS (Appendix 9). The road is graded to create a low point at the inlet and a waterstop (higher section of road) beyond, creating this ponding when necessary to match the incoming flow.

WEIR CAPACITIES

The weir and rundown from Pond 7 to Pond 6 have a capacity of 24.8 CFS (Appendix 11). Expected flow is 15.3 CFS from off-site (intercepted at the Bluewater/access road intersection) plus 8.80 CFS surface drainage from the 6.1335 acre tract. Total 100-year flow is then 24.1 CFS.

The 12' wide weir (curbcut and rundown) on the east side of the access road near the south end of the plat drains 11.2 CFS of off-site flow (Appendix 1, page 6) plus 6.99 CFS generated onsite (Appendix 10). Weir capacity is 25.0 CFS (Appendix 12) and expected total 100-year flow is 18.3 CFS. The access road is sloped for a low spot at this weir, with a waterstop (higher section of road) to prevent overshoot.

The weir (curbcut and rundown) from the parking lot at Pond 3 drains 3.97 CFS and has a capacity of 8.33 CFS (Appendix 13).

The weir (curbcut) and channel draining the north parking lot to the access road drains 3.04 CFS and has a capacity of 3.78 CFS (Appendix 14).

The weir (curbcut and channel) northwest of Building 10 drains 3.59 CFS and has a capacity of 3.78 CFS (Appendix 15).

The berm between Ponds 4 and 3 (which provides groundcover for a proposed 8" sewer line) has a top elevation of 84.7, and acts as a weir channeling flow from Pond 4 to Pond 3. Expected 100-year flow is 31.7 CFS, and capacity is 31.6 CFS (Appendix 16). A 12" HDPE under this berm allows Pond 4 to drain.

The berm between Ponds 3 and 2 (providing groundcover for a proposed 6" sewer lateral) has a top elevation of 84.7, and acts as a weir channeling flow from Pond 3 to Pond 2 (Appendix 18). A 12" HDPE under this berm allows Pond 3 to drain.

PIPE CAPACITIES

A 24" RCP carries off-site flow from the Bluewater/access road intersection to Pond 7. It is submerged outlet limited to 17.0 CFS capacity, and 100-year flow is 15.3 CFS (Appendix 19).

A 12" HDPE carries flow from Pond 7 to Pond 6 in order to drain Pond 7 within 24 hours. Both Ponds 7 and 6 are required to meet detention volume needed, but they are at different elevations. The overflow to equalize volumes is from Pond 7 to Pond 6 via riprap weir. The 12" HDPE draining Pond 7 is outlet limited by a restrictor plate to 4.17 CFS (Appendix 4).

A 24" RCP carries flow from Pond 5 to Pond 4, and equalizes the surface elevation of the two ponds. Pond 5 intercepts 9.88 CFS from a north weir (Appendix 11) and drains 2.66 CFS of sheet flow. The 24" RCP is outlet limited to12.9 CFS with least expected head (Appendix 20). Expected 100-year flow is 12.54 CFS.

Two 21" HDPE's carriy drainage from the parking lot west of Building 3 to Pond 1. Flow is submerged outlet limited to 16.6 CFS (Appendix 17). Expected 100-year flow is 14.5 CFS.

A 12" HDPE carries drainage from two inlets in the landscaped areas west of Building 3. Flow is outlet limited to 1.79 CFS (Appendix 21). Expected 100-year flow is 1.05 CFS (Appendix 7).

A 12" HDPE carries drainage from Pond 6 to a drop inlet in the parking lot west of Building 4. The drainage is continued to Pond 3 with an 18" RCP and added influx from the parking lot. Expected 100-year flow from the parking lot area is 2.89 CFS. The length of pipe from the pond to the first drop inlet is submerged outlet limited to 4.48 CFS (Appendix 20). Maximum capacity in the 60' length of pipe connecting each of the 3 drop inlets is outlet limited to 4.80 CFS at the calculated pond surface elevations (Appendix 22).

Two 24" HDPE's carry flow from Pond 2 to Pond 1, and equalize the surface elevation of the 2 ponds. The 24" HDPE's are outlet limited to 18.2 CFS at 0.5' difference in head (Appendix 21). Expected 100-year flow is 13.4 CFS. The capacity appears to be excessive at first glance, but Ponds 2, 3, and 4 join the floodplain on the neighboring plat at the property boundary, and cannot surcharge above the design elevation.

An 18" PVC carries drainage from Pond 1 to the back of a curb inlet on the Coors Boulevard storm drain. Flow is outlet limited to 5.20 CFS by a restrictor plate (Appendix 4). There is no flow capacity minimum required, except the 1.84 CFS average needed to drain the detention ponding in 24 hours.

Several landscaped areas are drained under sidewalks and stairs with 4"PVC pipes, without grates. Inlet limited capacity is 0.84 CFS for these pipes (each installation is two pipes in parallel), and largest expected 100-year flow is 0.33 CFS (Appendix 26).

Ponds 4 and 3 are drained with 12" HDPE's. Flow from these ponds is primarily over a lowered section of berm, and the 12" HDPE's are present to drain the bottom within 24 hours. Submerged outlet capacity is 1.96 CFS, and flow required to drain in 24 hours is 0.17 CFS (Appendix 27).

NOTE: No development of Tract A-1A-2C will be allowed until an approved grading and drainage plan for this Tract has been submitted and approved by City Hydrology.

Red Mountain Engineers, Inc.

P.O. BOX 16115
SANTA FE, NM 87506-6115

(505) 473-7373
FAX (505) 473-4865

JOB BLUEWATER POND VOLUME

SHEET NO. 1 OF 3

CALCULATED BY SJR DATE

CHECKED BY N/A DATE N/A

SCALE N/A

$$\text{VOLUME} = \frac{A_1 + A_2 + \sqrt{A_1 A_2}}{3} \times 1'$$

	CONTOUR	SURFACE AREA		
POND 1	79	5590		
			>	6342
	80	7125		
			>	8012
	81	8934		
			>	9880
	82	10858		
			>	12056
	83	13297		
			>	15403
	84	17611		
			>	19361
	85	21166		
			TOTAL	71054
POND 2	79	922		
			>	1161
	80	1417		
			>	1695
	81	1990		
			>	2313
	82	2652		
			>	3011
	83	3385		
			>	3729
	84	4188		
			>	4584
	85	4993		
			TOTAL	16543

Red Mountain Engineers, Inc.
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JOB BLUEWATER POND VOLUMES
SHEET NO. 2 OF 3
CALCULATED BY SVR DATE
CHECKED BY DATE
SCALE

	CONTOUR	SURFACE AREA FT^2		VOLUME FT^3	
POND 3	79	290	>		
				461	
	80	657	>		
				876	
	81	1116	>		
				1373	
	82	1648	>		
				1951	
	83	2272	>		
				2632	
	84	3011	>		
				7708	(15416 × ×0.5)
	85	15416			
			TOTAL	15001	
POND 4	79	280	>		
				441	
	80	625	>		
				849	
	81	1096	>		
				1382	
	82	1689	>		
				2030	
	83	2393	>		
				2676	
	84	2971	>		
				3244	
	85	3526			
			TOTAL	10622	

Red Mountain Engineers, Inc.

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SANTA FE, NM 87506-6115

(505) 473-7373
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JOB BLUEWATER POND VOLUME

SHEET NO. 3 OF 3

CALCULATED BY SJR DATE

CHECKED BY DATE

SCALE

	CONTOUR	SURFACE AREA FT²	VOLUME FT³	
POND 5	82.5	1899		
			1105	(x 0.5)
	83	2539		
			3190	
	84	3869		
			4575	
	85	5297		
		TOTAL	8870	
POND 6	87	12047		
			13054	
	88	14089		
			15081	
	89	16097		
		TOTAL	28,135	
POND 7	91.5	5725		
			2981	(x 0.5)
	92	6203		
			6938	
	93	7700		
			8472	
	94	9269		
			9926	
	95	10599		
		TOTAL	28317	

POND 1-5 (BASE ELEVATION PONDS) TOTAL VOLUME = 114,090 FT³

PONDS 6-7 (UPPER ELEVATION PONDS) TOTAL VOLUME = 56,452 FT³

APPENDIX 1

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

AUGUST, 1996
Revised, NOVEMBER, 1996

Prepared by

SMITH ENGINEERING COMPANY
6400 UPTOWN BOULEVARD NE SUITE 500E
ALBUQUERQUE, NM 87110

SEC No. 196626

APPENDIX 1

1. INTRODUCTION

The City of Albuquerque Development Service Department contacted Smith Engineering Company (SEC) to determine the impacts of off-site flows to the Bluewater Development. Red Mountain Engineering is performing the on-site drainage work for the site. The Vicinity Map (Map No. 1) shows the location of the site relative to the City of Albuquerque Zone Atlas Map K-10.

2. HYDROLOGY

Frequency flows and volumes were quantified according to "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque," New Mexico, January 1993. All of the off-site drainage basins are fully developed. Land treatments for all of the off-site basins consist of ten percent (10%) type "B" and ninety percent (90%) type "D". Due to the fact that the off-site basins are relatively small, time of concentrations for the basins are extremely short thus, twelve (12) minute time of concentrations were used for all of the off-site basins. Appendix A contains all hydrology computations.

3. FLOOD PLAINS

In reviewing the Flood Boundary and Floodway Maps for the City of Albuquerque, New Mexico, Bernalillo County (Panel 27 of 50 Community-Panel Number 350002 0027) dated October 14, 1983, flood plains do exist. One flood plain exists on the project site with several surrounding the site. A portion of the on site flood plain extends into the undeveloped portion of off-site basin O-3. All other off-site drainage basins do not contain flood plains.

APPENDIX I

CITY OF ALBUQUERQUE
DEVELOPMENT SERVICES

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

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3.	FLOOD PLAINS	1
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MAP NO. 2	FLOOD PLAIN MAP	3
MAP NO. 3	OFF-SITE DRAINAGE BASIN MAP	7

APPENDIX "A"

HYDROLOGY COMPUTATIONS

APPENDIX I

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APPENDIX 1

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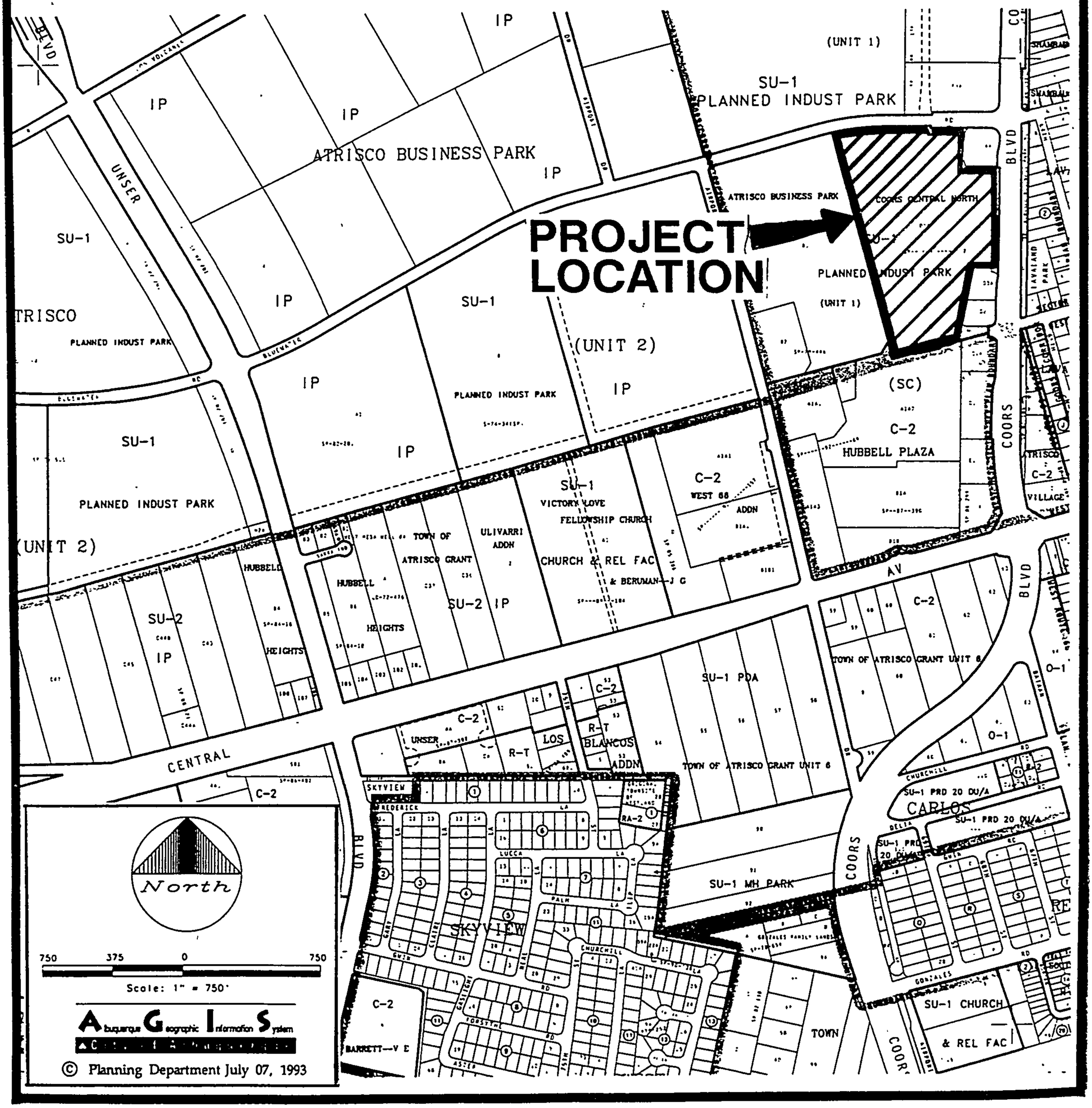
In reviewing the Flood Boundary and Floodway Maps for the City of Albuquerque, New Mexico, Bernalillo County (Panel 27 of 50 Community-Panel Number 350002 0027) dated October 14, 1983, flood plains do exist. One flood plain exists on the project site with several surrounding the site. A portion of the on site flood plain extends into the undeveloped portion of off-site basin O-3. All other off-site drainage basins do not contain flood plains.



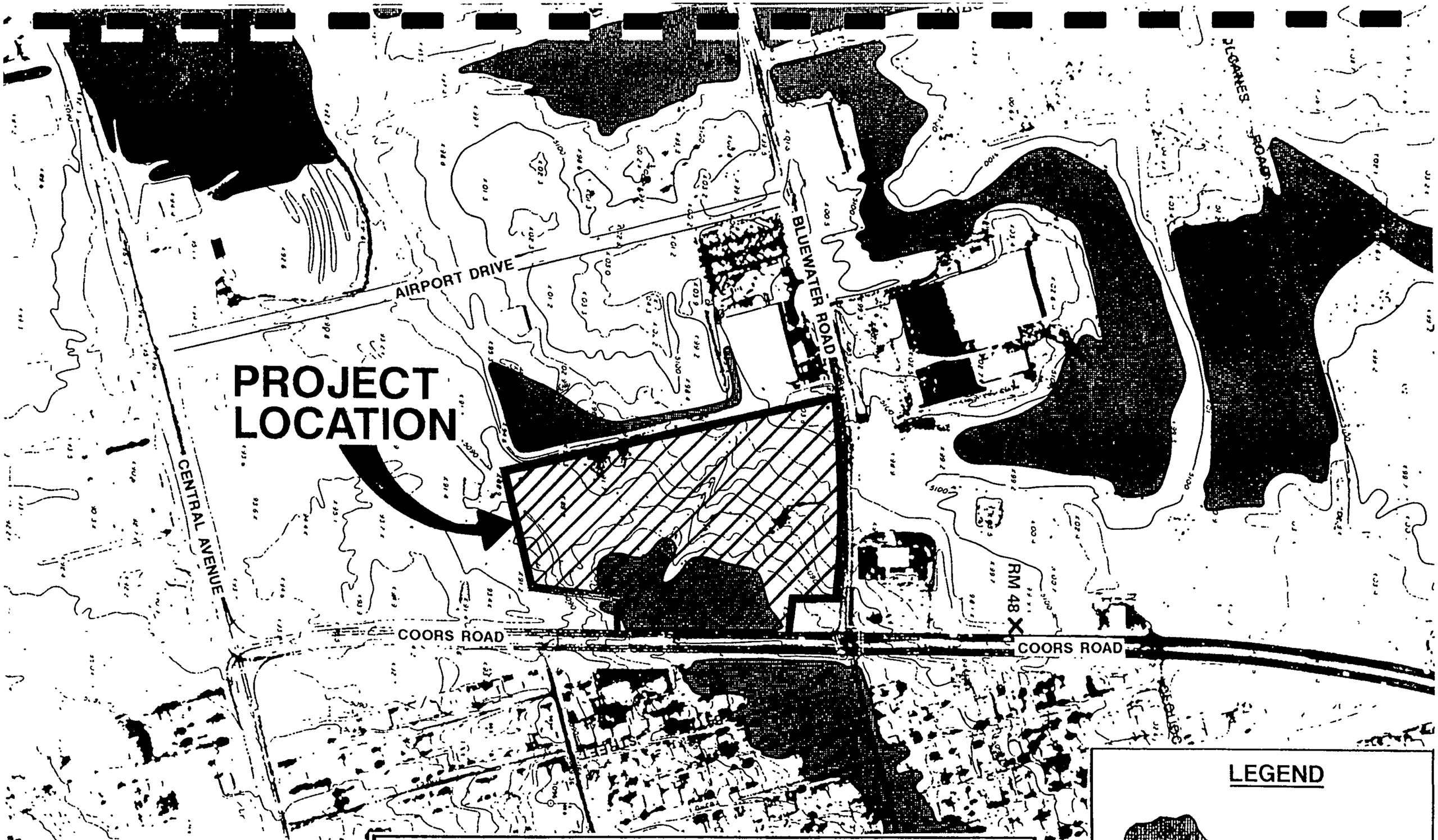
SOURCE: CITY OF ALBUQUERQUE ZONE ATLAS, MAP K-10-Z

BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

VICINITY MAP

MAP NO. 1



BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

FLOOD PLAIN MAP

MAP NO. 2

APPENDIX I

Map No. 2 shows the flood boundaries on site and surrounding areas.

4. OFF-SITE CONTRIBUTIONS

The Bluewater Development is bordered on the north by Bluewater Rd. NW and a Diamond Shamrock Service Station, the east by Coors Rd. NW, the south by an Arby's restaurant along with a portion of the Coors & Central Shopping Center and an undeveloped tract and the west by Amity Leather. All of the flow from Amity Leather is retained on their property. The existing storm drain system in Coors Rd. NW handles all flow on Coors Rd. NW thus, flows from Coors Rd. will not enter the Bluewater Development site. All off-site flows entering the project site will enter from the north and south. Map No. 3 (Off-Site Drainage Basin Map) shows contributing basins. Drainage basin delineation was determined using Orthophoto Topographic Mapping provided by the City of Albuquerque Mapping and Records Division along with the use of existing drainage reports relative to the area. The existing drainage report information was provided by the City of Albuquerque Hydrology Division. Field visits were also performed to verify the mapping and existing drainage reports.

Four (4) off-site drainage basins contribute storm water runoff to the Bluewater Development. Basin O-1 consists of Bluewater Rd. NW from Airport Rd. to a high point in Bluewater Rd. just north of the Bluewater Site. The runoff from basin O-1 enters the site at analysis point AP-O1.

Basin O-2 consists of the Diamond Shamrock Service Station at the southwest corner of Bluewater Rd. and Coors Rd. This flow enters the site from the north at analysis point AP-

O2. A temporary retention pond currently exists on the Bluewater site that retains all runoff from basin O-2.

Basin O-3 is located southeast of the Bluewater Development. Basin O-3 consists of a portion of a Giant Service Station, an Arby's Restaurant, and an undeveloped tract of land just north of the Arby's Restaurant. This flow enters the site from the south at analysis point AP-O3. A temporary pond currently exists on the undeveloped tract to handle flows from the Arby's development.

Basin O-4 consists of the remaining portion of the Giant Service Station discussed above and a portion of the Coors & Central Shopping Center. This flow enters the site from the south at analysis point AP-O4. A temporary pond currently exists on the Bluewater site that helps handle the runoff from basin O-4.

Table 1 provides a summary of the hydrology calculations in the form of ten (10) year and one hundred (100) year storm events. In accordance with the DPM, a twenty-four (24) hour storm was used in all volume calculations and a six hour storm was used in all flow calculations.

APPENDIX 1

TABLE 1

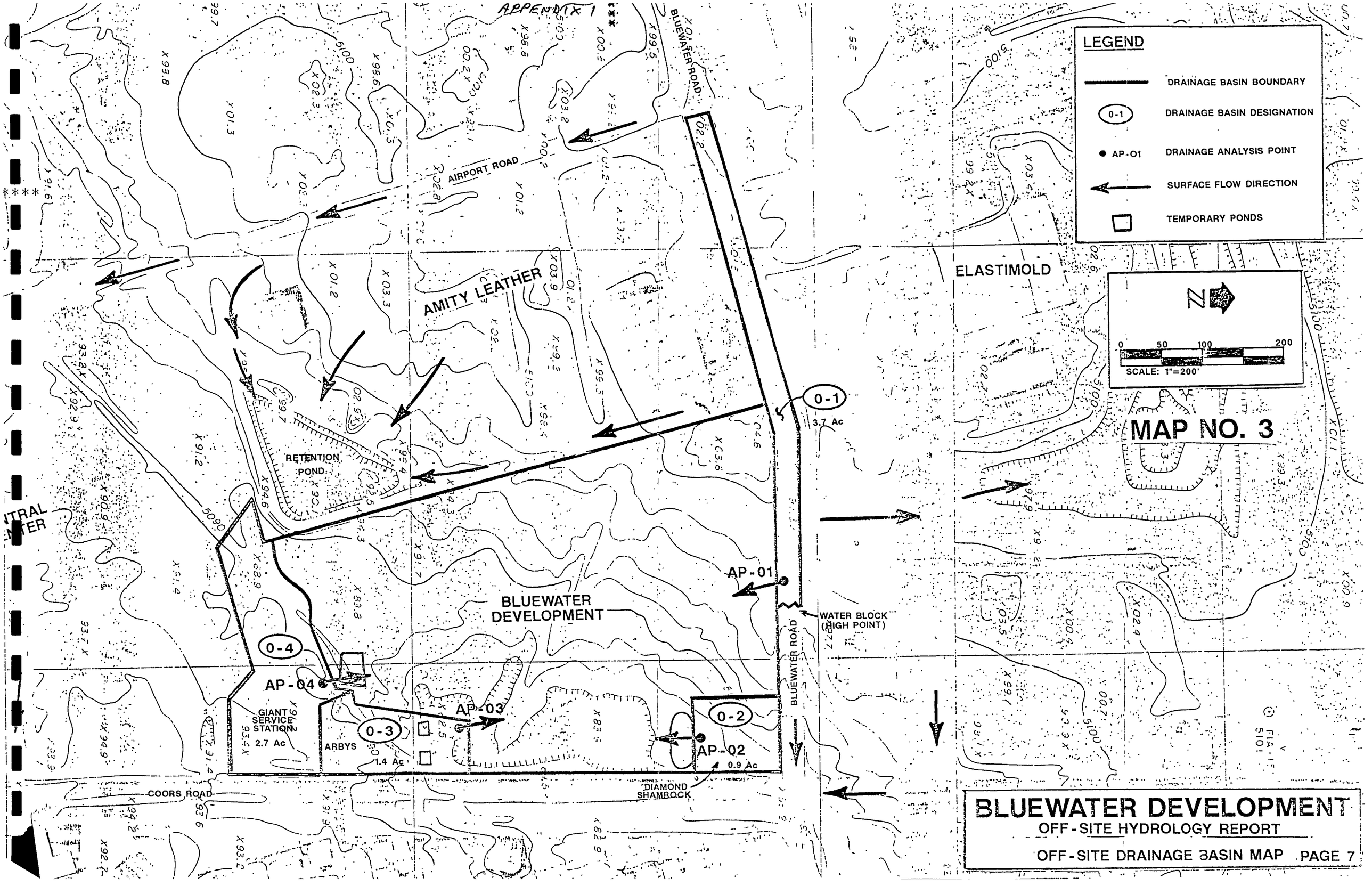
(Revised 11/4/96)

BLUEWATER DEVELOPMENT
OFF-SITE HYDROLOGY REPORT

SUMMARY OF PEAK DISCHARGES AND PEAK VOLUMES

ANALYSIS POINT	CONTRIBUTING DRAINAGE BASIN	DRAINAGE BASIN AREA (ac.)	Q(10) (6hr.) (cfs)	V(10) (24hr.) (ac.ft.)	Q(100) (6hr.) (cfs)	V(100) (24hr.) (ac.ft.)
AP-O1	O-1	1.8	4.8	0.2328	7.4	0.3381
AP-O2	O-2	0.9	2.4	0.1165	3.7	0.1691
AP-O3	O-3	1.4	3.7	0.1811	5.8	0.2630
AP-O4	O-4	2.7	7.2	0.3492	11.2	0.5072
TOTALS CONTRIBUTING TO THE BLUEWATER DEVELOPMENT	**O-1,O-2,O-3,O-4**	**6.8 ac.**	**18.1 cfs**	**0.8796 ac.ft.**	**28.1 cfs**	**1.2774 ac.ft.**

APPENDIX I



BLUEWATER DEVELOPMENT

OFF-SITE HYDROLOGY REPORT

OFF-SITE DRAINAGE BASIN MAP PAGE 7

APPENDIX #1

APPENDIX "A"

HYDROLOGY COMPUTATIONS

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 1 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/7/96 CHECKED BY _____ DATE / /

REVISED 11-4-96 (DLA)

HYDROLOGY COMPUTATIONS

CRITERIA USED: SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN FOR THE CITY OF ALBUQUERQUE, NM.

ALL BASINS LIE IN PRECIPITATION ZONE ONE (1)

$P_{60} = 1.87$ IN.; $P_{360} = 2.20$ IN.; $P_{1440} = 2.66$ IN.

VALUES TAKEN FROM TABLE A-2, DPM

BASIN O-1

AREA = 1.8 AC.; LAND TREATMENTS: "B" = 10%, "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

10 YEAR

$Q_{10} = (0.76\ CFS/Ac)(.10)(1.8\ Ac) + (2.89\ CFS/Ac)(.90)(1.8\ Ac)$

$Q_{10} =$ **4.8 CFS**

100 YEAR

$Q_{100} = (2.03\ CFS/Ac)(.10)(1.8\ Ac) + (4.37\ CFS/Ac)(.90)(1.8\ Ac)$

$Q_{100} =$ **7.4 CFS**

VOLUMES - 24 HOUR STORM

10-YEAR

$E_{10} = (.22\ IN)(.10) + (1.24\ IN)(.90) = 1.138$ IN.

$V_{360} = (1.138\ IN)(1.8\ Ac)\left(\frac{1\ FT}{12\ IN}\right) = 0.1707\ Ac\cdot Ft$

$V_{1440} = .1707\ Ac\cdot Ft + (.90)(1.8\ Ac)[2.66\ IN - 2.20\ IN]\left(\frac{1\ FT}{12\ IN}\right)$

$V_{10} =$ **0.2328 Ac.-Ft**

CONT.

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 2 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/27/96 CHECKED BY DATE / /

REVISED 11-4-96 (DLA)

BASIN O-1 (CONT.)

VOLUMES - 24 HOUR STORM

100 YEAR

$E_{100} = (.67\,IN.)(.10) + (1.97\,IN)(.90) = 1.84\,IN.$

$V_{360} = (1.84\,IN)(1.8\,Ac)\left(\frac{1\,Ft}{12\,IN}\right) = 0.2760\ Ac.Ft.$

$V_{1440} = 0.2760\,Ac.Ft + (.90)(1.8\,Ac)[2.66\,IN - 2.20\,IN]\left(\frac{1\,Ft}{12\,IN}\right)$

$\Rightarrow = \boxed{0.3381\ Ac.Ft}$

BASIN O-2

AREA = 0.90 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN

$Q_{10} = (.76)(.10)(.90) + (2.89)(.90)(.90) = \boxed{2.4\,CFS}$

$Q_{100} = (2.03)(.10)(.90) + (4.37)(.90)(.90) = \boxed{3.7\,CFS}$

VOLUMES - 24 HOUR STORM

$E_{10} = 1.138\,IN$

$V_{360} = (1.138)(.90)(1/12) = 0.0854\,Ac.Ft$

$V_{1440} = 0.0854 + (.90)(.90)(.46)(1/12) = \boxed{0.1165\,Ac.Ft}$

$E_{100} = 1.84\,IN$

$V_{360} = (1.84)(.90)(1/12) = 0.1380\,Ac.Ft$

$V_{1440} = 0.1380 + (.90)(.90)(.46)(1/12) = \boxed{0.1691\,Ac.Ft}$

CONT. →

PROJECT BLUEWATER DEVELOPMENT SHEET NO. 3 OF 3

SUBJECT OFF-SITE DRAINAGE PROJECT NO. 19-66-26

BY DLA DATE 8/27/96 CHECKED BY _____ DATE / /

BASIN O-3

AREA = 1.4 Ac.; LAND TREATMENTS "B" = 10%, "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

$Q_{10} = (.76)(.10)(1.4) + (2.89)(.90)(1.4) =$ **3.1 CFS**

$Q_{100} = (2.03)(.10)(1.4) + (4.37)(.90)(1.4) =$ **5.8 CFS**

VOLUMES - 24-HOUR STORM

$E_{10} = 1.138$ IN

$V_{360} = (1.138)(1.4)(1/12) = 0.1328$ Ac.Ft.

$V_{1440} = 0.1328 + (.9)(1.4)(.46)(1/12) =$ **0.1811 Ac.Ft**

$E_{100} = 1.84$ IN

$V_{360} = (1.84)(1.4)(1/12) = 0.2147$ Ac.Ft.

$V_{1440} = 0.2147 + (.9)(1.4)(.46)(1/12) =$ **0.2630 Ac.Ft**

BASIN O-4

AREA = 2.7 Ac.; LAND TREATMENTS "B" = 10%; "D" = 90%

FLOWS - 6 HOUR STORM; T_c = 12 MIN.

$Q_{10} = (.76)(.10)(2.7) + (2.89)(.90)(2.7) =$ **7.2 CFS**

$Q_{100} = (2.03)(.10)(2.7) + (4.37)(.90)(2.7) =$ **11.2 CFS**

VOLUMES - 24 HOUR STORM

$E_{10} = 1.138$ IN.; $V_{360} = (1.138\text{IN})(2.7)(1/12) = 0.2561$ Ac.Ft.

$V_{1440} = 0.2561 + (.90)(2.7)(.46)(1/12) =$ **0.3492 Ac.Ft**

$E_{100} = 1.84$ IN.; $V_{360} = (1.84)(2.7)(1/12) = 0.4140$ Ac.Ft.

$V_{1440} = 0.4140 + (.90)(2.7)(.46)(1/12) =$ **0.5072 Ac.Ft**

WEST BLUFF DRAINAGE PLAN
PHASE III

APPENDIX 'D' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED STORM DRAIN FACILITIES", LISTS STORM DRAINS REQUIRED TO MEET THE MINIMUM DESIGN CRITERIA FOR FLOW IN STREETS PER THE CITY OF ALBUQUERQUE DRAINAGE ORDINANCES AND POLICIES.

APPENDIX 'E' - THIS APPENDIX, TITLED "SUMMARY OF EXISTING CROSSING STRUCTURES", CONTAINS INFORMATION RELATIVE TO EXISTING CROSSING STRUCTURES WITHIN THE WEST BLUFF AREA.

APPENDIX 'F' - THIS APPENDIX, TITLED "SUMMARY OF PROPOSED CHANNELS AND BOX STRUCTURES", CONTAINS DISCHARGE, FLOW DEPTH AND FLOW VELOCITY INFORMATION FOR THE MAJOR DRAINAGE FACILITIES, I.E., WEST BLUFF OUTFALL, I-40 INTERCEPTOR, WEST MESA DIVERSION AND UNSER DIVERSION FOR THE STRUCTURES AS ASSUMED IN THE COMPUTER MODELING FOR THE 10 YEAR AND 100 YEAR STORM EVENTS. THE FLOW DEPTHS AND FLOW VELOCITIES SHOWN IN THIS APPENDIX ARE CALCULATED FOR NORMAL DEPTH, AND DO NOT REPRESENT THE ULTIMATE BACKWATER ANALYSIS.

THE PROPOSED IMPROVEMENT SIZES, ALIGNMENTS AND LOCATIONS DEPICTED IN THESE APPENDICES ARE NOT MEANT TO BE FINAL BUT EACH MUST BE DETERMINED IN THEIR PRELIMINARY DESIGN.

VII. PROPOSED FLOOD MITIGATION MEASURES

THE DRAINAGE SOLUTION PROPOSED FOR THE MANAGEMENT OF STORM WATER WITHIN THE STUDY AREA INCORPORATES BOTH STRUCTURAL AND NON-STRUCTURAL MEASURES. THE STRUCTURAL MEASURES HAVE BEEN GROUPED INTO CHANNELS AND BOX STRUCTURES AND STORM DRAIN FACILITIES. THE CHANNELS AND BOX STRUCTURES ARE THOSE FACILITIES WHICH WILL PREVENT LARGE UPLAND AREAS FROM INUNDATING DOWNSTREAM AREAS FOR A DEVELOPED WATERSHED. THE STORM DRAIN FACILITIES ARE THOSE FACILITIES WHICH WILL DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE MAJORITY OF THE STUDY AREA RELIES ON STRUCTURAL MEASURES FOR THE MITIGATION OF STORM RUNOFF. A SMALL PORTION OF THE STUDY AREA UTILIZES NON-STRUCTURAL MEASURES (I.E. DETENTION AREAS) FOR THE MITIGATION OF FLOOD WATER. THIS AREA IS THAT PORTION OF THE STUDY AREA THAT LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD.

A. STRUCTURAL FLOOD MITIGATION MEASURES

THE STRUCTURAL DRAINAGE FACILITIES, AS PROPOSED UNDER PHASE III OF THE WEST BLUFF DRAINAGE PLAN, ARE DEFINED BY THE FOLLOWING MAJOR ELEMENTS:

1. WEST BLUFF OUTFALL
2. I-40 INTERCEPTOR
3. WEST MESA DIVERSION
4. UNSER DIVERSION

THE WEST BLUFF OUTFALL IS THAT PORTION OF THE SYSTEM THAT WILL CONVEY STORM FLOWS THROUGH EXISTING CONCRETE BOX CULVERTS UNDER COORS BOULEVARD, NORTH OF INTERSTATE HIGHWAY 40 AND COORS BOULEVARD INTERCHANGE, TO THE RIO GRANDE.

THE I-40 INTERCEPTOR WILL INTERCEPT FLOWS GENERATED NORTH OF INTERSTATE HIGHWAY 40, ALONG THE NORTH RIGHT-OF-WAY OF INTERSTATE HIGHWAY 40, AND CONVEY THE STORM FLOW TO THE WEST BLUFF OUTFALL.

THE WEST MESA DIVERSION WILL INTERCEPT FLOWS GENERATED FROM A PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND CONVEY THE RUNOFF UNDER INTERSTATE HIGHWAY 40, USING EXISTING CONCRETE BOX CULVERTS, TO THE I-40 INTERCEPTOR.

THE UNSER DIVERSION WILL INTERCEPT FLOWS GENERATED FROM THAT PORTION OF THE STUDY AREA LOCATED SOUTH OF INTERSTATE HIGHWAY 40 AND WEST OF THE WEST BOUNDARY OF THE ATRISCO BUSINESS PARK AND CONVEY THE RUNOFF TO UNSER BOULEVARD. THE UNSER DIVERSION AND THE EXISTING UNSER BOULEVARD STORM DRAIN, WILL DISCHARGE SOUTH INTO FACILITIES PROPOSED IN UNSER BOULEVARD TO THE AMOLE DEL NORTE DRAINAGE SYSTEM.

THE DRAINAGE FACILITIES, AT THE TIME OF PRELIMINARY DESIGN, SHALL ADDRESS AND INCORPORATE JOINT-USE ASPECTS (I.E. OPEN SPACE BUFFER STRIP, LANDSCAPING, BICYCLE PATHS, JOGGING TRAILS, ETC.) WITH THE PROPOSED FACILITIES, AS REQUIRED BY THE LAND USE PLANS CURRENTLY ADOPTED BY THE CITY OF ALBUQUERQUE FOR THIS AREA OF THE WEST MESA. THE PROPOSED CHANNELS AND BOX STRUCTURES ARE PRESENTED IN APPENDIX 'F'.

THE STORM DRAIN FACILITIES ARE DEFINED AS THOSE FACILITIES WHICH COLLECT RUNOFF AND DISCHARGE TO A CHANNEL OR BOX STRUCTURE. THE PROPOSED STORM DRAIN FACILITIES ARE LISTED IN APPENDIX 'D'.

B. NON-STRUCTURAL FLOOD MITIGATION MEASURES

NON-STRUCTURAL MEASURES, FOR THE MANAGEMENT OF STORM RUNOFF, ARE PROPOSED FOR THAT PORTION OF THE STUDY AREA WHICH LIES EAST OF UNSER BOULEVARD AND SOUTH OF BLUEWATER ROAD. THIS PORTION OF THE STUDY AREA WILL UTILIZE THE EXISTING STORM SEWER IN BLUEWATER ROAD EAST OF COORS BOULEVARD AS THE OUTFALL FOR STORM RUNOFF. HOWEVER, DUE TO THE LIMITED CAPACITY OF THE EXISTING STORM DRAIN IN BLUEWATER ROAD, NON-STRUCTURAL MEASURES WILL REQUIRE THE DETENTION OF ALL RUNOFF FOR A PERIOD OF TWO (2) HOURS FROM THE TIME THE STORM BEGINS, AFTER THE TWO HOURS OF DETENTION TIME, FLOWS FROM THIS PORTION OF THE STUDY AREA WILL BE REQUIRED TO DISCHARGE AT A RATE NOT TO EXCEED 0.20 CFS/ACRE.

APPENDIX
****
2

APPENDIX J***

(DELETED)

APPENDIX 4

DISCHARGE THROUGH RESTRICTOR PLATES

DISCHARGE ON POND 1 TO COORS BOULEVARD STORM DRAIN

H_L HEADLOSS IN PIPE $= F \frac{L}{D} V^2/2g$, ASSUME $L=0$ THEN $H_L=0$

$$H_1 + \frac{V_1^2}{2g} + \frac{P_1}{w} = \frac{V_2^2}{2g} + \frac{P_2}{w} + H_2$$

ASSUME H_2 = DATUM LEVEL $=0$

$P_1=0$ $P_2=0$

$$\text{THEN } V_2 = \sqrt{2g\left(\frac{V_1^2}{2g}+H\right)}$$

WITH ENERGY LOSS AT THE ORIFICE, THIS BECOMES $V_2 = C_V\sqrt{2gH}$

FOR TANKS WHERE $V_1 \approx 0$, BUT HERE V_1 IS PROPORTIONAL TO V_2

FOR C_V USE 0.603 (URQUHART, 1962, PAGE 4-31)

MAXIMUM HEAD IS AT COORS BOULEVARD CURB INLET INVERT 5078.0, WITH POND SURFACE AT 5085.0, $H = 7$

$$\text{THEN } V_2 = C_V\sqrt{2g\left(\frac{V_1^2}{2g}+H\right)}$$

SINCE $Q_1 = V_1A_1 = Q_2 = V_2A_2$ THEN $V_1A_1 = V_2A_2$

$$\text{AND } V_1 = \frac{V_2A_2}{A_1} = \frac{V_2(\pi(18\text{"DIA})^2/4}{7.375\text{ IN}} = 4.68V_2$$

$$\text{THEN } V_2 = C_V\sqrt{2g\left(\frac{4.68V_2}{2g}+H\right)} \quad \text{AND } V_2^2 = C_V^2\left(2g\left(\frac{4.68V_2}{2g}+H\right)\right)$$

$$\text{SIMPLIFYING } V_2^2 = (0.603)^2\left[\left(2(32.2\text{FT/SEC}^2)\right)\left(\frac{4.68V_2}{2(32.2\text{FT/SEC}^2)}+7\right)\right]$$

$$V_2 = 13.7\text{ FT/SEC}$$

$$Q = VA = (13.7\text{ FT/SEC})(0.616\text{FT})^2 = 5.20\text{ CFS}$$

AVERAGE DISCHARGE AT POND DEPTH 1.5', $H = 5.5'$ $Q = 4.63$ CFS

USE RESTRICTOR PLATE WITH 7.375 IN × 7.375 IN OPENING

FOR DISCHARGE FROM POND 7

$$V_1 = \frac{A_2V_2}{A_1} = \frac{V_2(\pi(12\text{"DIA})^2/4}{(6.5\text{ IN})^2} = 2.68V_2$$

$V_2 = 14.2$ FT/SEC $\quad Q = VA = (14.2\text{ FT/SEC})(0.542\text{ FT})^2 = 4.17$ CFS

USE RESTRICTOR PLATE WITH 6.5 IN SQUARE OPENING

APPENDIX 5 ***
(REPLACES APPENDIX 5)

POND 7 VOLUME

ALL OF POND 7 DRAINAGE BASIN ON-SITE IS LAND TREATMENT C

PRECIPITATION ZONE 1

AREA	LAND TREATMENT
—	A
—	B
2.76 AC	C
—	D
2.76 AC	

$E = E_c A_c / A_c = 0.99$

$V_{360} = E * A_c = (0.99)(2.76 Ac)/(12 IN/FT) = 0.228 Ac/FT = 9920 FT^3$

POND 6 VOLUME

ALL OF POND 6 DRAINAGE BASIN ON-SITE IS LAND TREATMENT C

PRECIPITATION ZONE 1

AREA	LAND TREATMENT
—	A
—	B
3.37	C
—	D
3.37 AC	

$E = E_c A_c / A_c = 0.99$

$V_{360} = E * A_c = (0.99)(3.37 Ac)/(12 IN/FT) = 0.278 \ Ac/FT = 12,100 FT^3$

OFF-SITE FLOW TO POND 7

$V_{100} = 0.3381 \ Ac/FT = 14,700 FT^3$ (APPENDIX 1)

VOLUME REQUIRED

POND 6 IS AN OVERFLOW FOR POND 7, THEY ARE DESIGNED TO ACT TOGETHER - COMBINED CAPACITY = 54,000 FT^3, REQUIRED VOLUME (SUM OF ABOVE) = 36,700 FT^3

APPENDIX 5***
(REPLACES APPENDIX 5)

POND 1 THROUGH POND 5 VOLUME

THESE PONDS ARE INTERCONNECTED, AND EQUALIZED TO THE SAME SURFACE ELEVATION. HERE, THEY ARE TREATED AS HAVING THE SAME DRAINAGE BASIN. INTERCONNECTING PIPES ARE SIZED BY EVALUATING INDIVIDUAL DRAINAGE BASINS (SEE APPENDIX)

AREA	LAND TREATMENT
1.8935	A
1.7000	B
1.8800	C
5.9700	D
11.4335 Ac	

$$E = \frac{(0.44)(1.8935) + (0.67)(1.70000) + (0.99)(1.8800) + (1.97)(5.9700)}{11.4335} = 1.36''$$

$V_{360} = (1.36\ IN)(11.4335 Ac)/(12''/FT) = 1.296\ Ac/FT = 55,300\ FT^3$

$V_{1440} = (1.296\ Ac/FT) + [(5.96\ Ac)(2.66-2.20)/(12\ IN/FT)] = 1.52\ Ac/FT = 66,200 FT^3$

OFFSITE FLOW (APPENDIX 1, PAGE 6) = (0.1691 Ac. FT.) + (0.2630 Ac. FT.) +

+ (0.5072 Ac. FT.) = 0.9393 Ac. FT. = 40,900 FT^3

TOTAL VOLUME REQUIRED = 107,100 FT^3

TOTAL VOLUME PROVIDED = 107,500 FT^3

APPENDIX ***

FLOW TO TWIN 21" HDPE, 'DOUBLE C' INLET

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.14	D
2.38	

Q_{100} = (2.87 CFS/ACRE)(0.24 ACRE) + (4.37 CFS/ACRE)(2.14 ACRE) = 10.1 CFS

ADDITIONAL FLOW IF POND 7 VALVE FAILS OPEN = 4.17 CFS

TOTAL FLOW = 14.3 CFS

CAPACITY 'DOUBLE D' INLET = 9.6 CFS @ 6" PONDING (DPM Pg 75)

TOTAL CAPACITY = 19.2 CFS

FLOW TO NEENAH R-2569 INLETS

WEST - CENTER GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.137	D

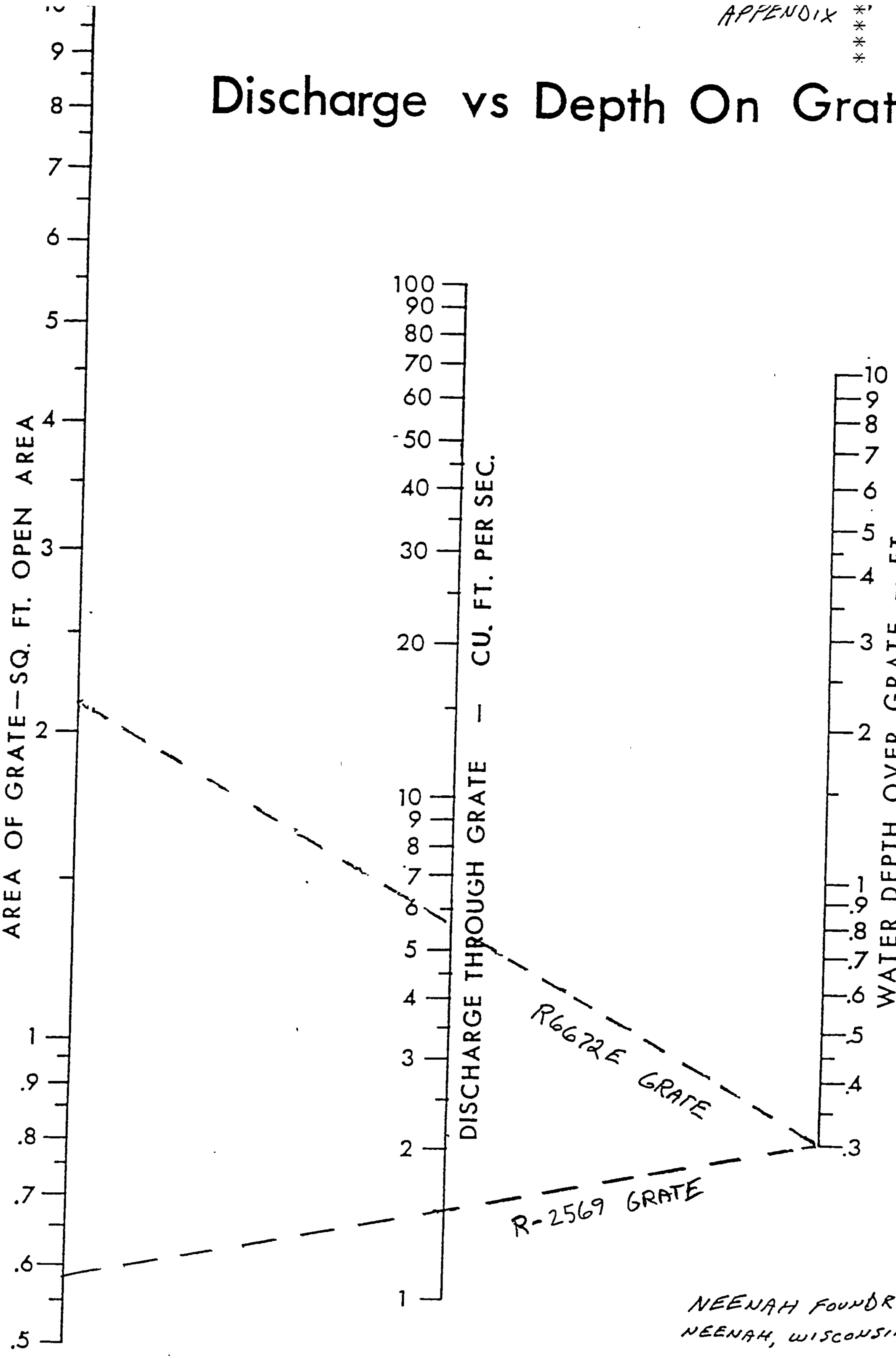
$Q_{100} = (4.37\ CFS/ACRE)(0.137\ Ac) = 0.60\ CFS$

NORTH GRATE

AREA	LAND TREATMENT
-	A
-	B
-	C
0.103	D

$Q_{100} = (4.37\ CFS/ACRE)(0.103\ Ac) = 0.45\ Ac$

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN 19

FLOW TO POND 3 18" HDPE NORTH INLET GRATE

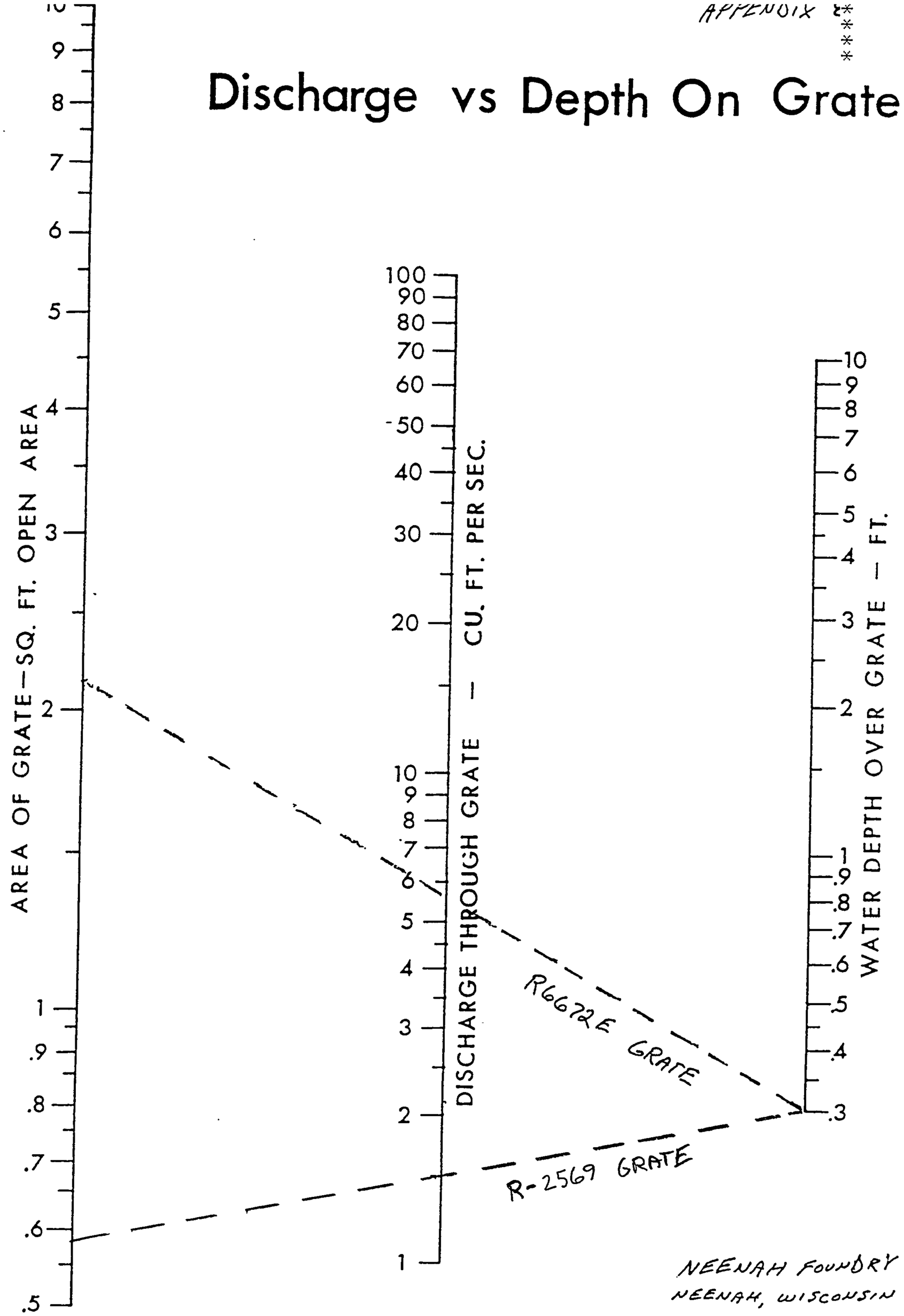
AREA	TREATMENT
	A
	B
0.038	C
0.343	D
0.381	

Q_{100} = (2.87 CFS/Ac)(0.038 Ac) + (4.37 CFS/Ac)(0.343 Ac) = 1.61 CFS

CAPACITY OF A NEENAH R6672E GRATE IS 5.6 CFS AT 0.3 FT OF PONDING

REMAINING RATES ON THIS LINE DRAIN SMALLER AREAS

Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN

FLOW TO 'DOUBLE C' INLETS NE OF BUILDING 10

EXPECTED FLOW

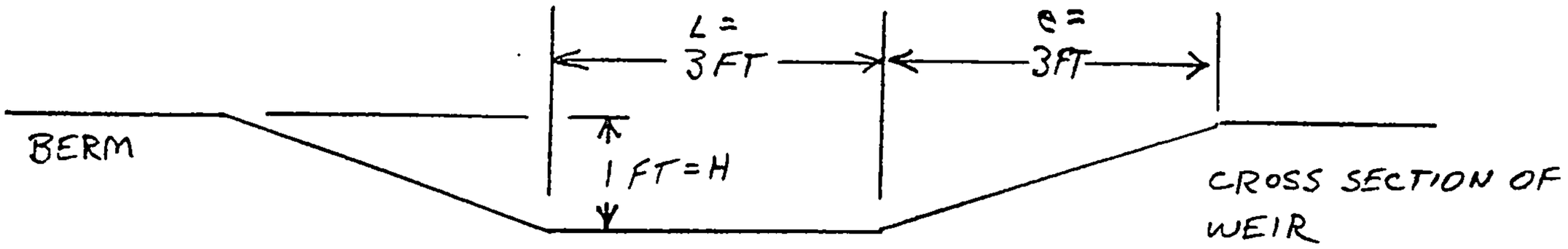
AREA	LAND USE
-	A
-	B
0.49	C
1.94	D
2.43	

$Q_{100} = (2.87\ CFS/AC)(0.49\ AC) + (4.37\ CFS/AC)(1.94\ AC) = \underline{9.88\ CFS}$

APPENDIX 10 ****

(DELETED)

POND 7 WEIR CAPACITY



FROM URQUHART, 'CIVIL ENGINEERING HANDBOOK' 1962, pg 4-53

FOR TRAPEZOIDAL WEIRS

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,LH^{3/2} + \tfrac{8}{15}\sqrt{2g}\,ZH^{5/2} \quad \text{WITH } Z = e/H$$

$$= \tfrac{2}{3}\sqrt{2(32.2\,FT/SEC^2)}\,(3')(1')^{3/2} + \tfrac{8}{15}\sqrt{2(32.2\,FT/SEC^2)}\,(3)(1')^{5/2}$$

$$= 28.9\,CFS$$

EXPECTED FLOW

AREA	LAND USE
–	A
–	B
–	C
3.07	D
3.07	

$Q_{100} = (2.87\,CFS/Ac)(3.07\,Ac) = 8.81\,CFS$

OFFSITE FLOW = 15.3 CFS

TOTAL FLOW = 24.1 CFS

Red Mountain Engineers, Inc.
4600-C MONTGOMERY BLVD., NE, SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
(505) 889-3004
FAX (505) 889-2797

JOB
SHEET NO. OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

APPENDIX II

19" HDPE (REPLACING CURCUT AND RUNDOWN)

TOP OF INLET GRATE = 86.4

ALLOWABLE POND DEPTH AT GRATE = 0.5 FT

SURFACE ELEVATION AT FULL POND 5 (DISCHARGE POINT)
= 85.0

$H = (86.4 + 0.5) - 85.0 = 1.9$

$$H = \frac{K_n + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = 1.9 = \frac{0.4 + 1 + 29(0.011)^2(5.3)}{(0.375)^{1.33}}\frac{V^2}{2(32.}$$

$V = 4.57$ FT/SEC

$Q = VA = (4.57 \text{ FT/SEC})(1.76 \text{ FT}^2) = 8.1$ CFS

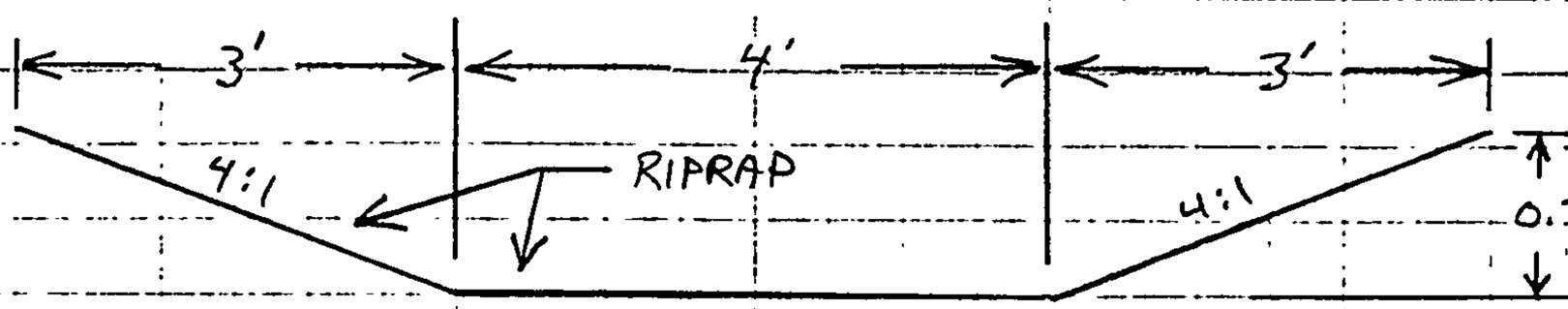
EXPECTED $Q_{100} = 9.88$ CFS

THIS APPEARS TO MEAN PIPE TOO SMALL, BUT

1) THIS IS CAPACITY WITH POND FULL AT END OF RUNOFF - CAPACITY EXCEEDS RUNOFF UNTIL DISCHARGE POND ELEVATION REACHES 84 CONTOUR - CAPACITY IS THERE DURING PEAK RUNOFF CURVE

2) OVERFLOW IS DIRECTLY TO POND OVER SIDEWALK

CHANNEL CAPACITY POND 7 TO POND 6



$$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$= (5.25\,FT^2)\left(\frac{1.486}{0.03}\right)\left(\frac{5.25\,FT^2}{10.18\,FT}\right)^{2/3}(0.022)^{1/2} = \underline{24.8\,CFS}$$

12' WIDE WEIR CAPACITY - SOUTH ACCESS ROAD

EXPECTED FLOW

AREA	LANDUSE
-	A
-	B
0.35	C
1.37	D
1.72	

$Q_{100} = (2.87\ CFS/Ac)(0.35\ Ac) + (4.37\ CFS/Ac)(1.37\ Ac) = \underline{6.99\ CFS}$

OFFSITE FLOW $Q_{100} = 11.2$ CFS (APPENDIX 1, PAGE 6) TOTAL FLOW = 18.2 CFS

CAPACITY (12' CURBCUT)

$$Q_T = \tfrac{2}{3}\sqrt{2g}\,L H^{3/2} + \tfrac{8}{15}\sqrt{2g}\,Z H^{5/2}$$

$$= \tfrac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(12')(0.5')^{3/2} + \tfrac{8}{15}\sqrt{64.4\ FT/SEC^2}\,(1)(0.5')^{5/2}$$

$$= \underline{25.0\ CFS}$$

WEIR CAPACITY – POND 3

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.195	C
0.781	D
0.976	

$Q_{100} = (2.87\ CFS/ACRE)(0.195\ Ac) + (4.37\ CFS/Ac)(0.781\ Ac) = \underline{3.97\ CFS}$

WEIR CAPACITY (4' CURBCUT)

$$Q_T = {}^{2}/_{3}\sqrt{2g}\,L H^{3/2} + {}^{8}/_{15}\sqrt{2g}\,Z H^{5/2}$$

$$= {}^{2}/_{3}\sqrt{64.4\ FT/SEC^2}\,(4')(0.5')^{3/2} + {}^{8}/_{15}\sqrt{64.4\ FT/SEC^2}\,(1)(0.5')^{5/2}$$

$$= \underline{8.33\ CFS}$$

WEIR AT NORTH PARKING LOT

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.070	C
0.633	D
0.703Ac	

$$Q_{100} = (3.87 CFS/ACRE)(0.070\ Ac) + (4.37 CFS/Ac)(0.633 A_c) = \underline{3.04\ CFS}$$

WEIR CAPACITY (2' SIDEWALK CULVERT)

$$Q_T = \tfrac{2}{3}\sqrt{2g}\, L H^{3/2}$$

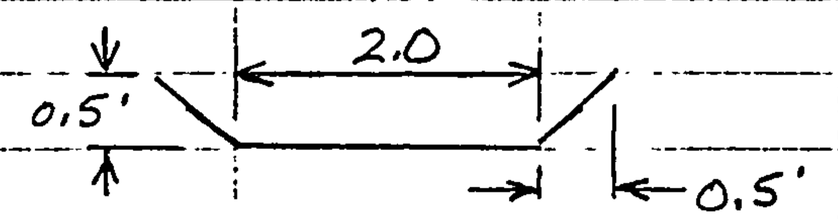
$$= \tfrac{2}{3}\sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$$

$$= \underline{3.78\ CFS}$$

CHANNEL CAPACITY

$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ FOR $n = 0.33$ RIPRAP LINING

CROSS-SECTION



$$Q = (1.25\ FT^2)\frac{1.486}{0.033}\left(\frac{1.25\ FT^2}{3.41\ FT}\right)^{2/3}(0.02)^{1/2} = \underline{4.08\ CFS}$$

WEIR AT WEST PARKING LOT DRIVE

EXPECTED FLOW

AREA	LAND USE
-	A
-	B
0.168	C
0.672	D
0.840	

$Q_{100} = (3.87\ CFS/Ac)(0.168\ Ac) + (4.37\ CFS/Ac)(0.672\ Ac) = \underline{\underline{3.59\ CFS}}$

WEIR CAPACITY (2' CURBCUT - VERTICAL SIDES)

$Q_T = {}^2/_3 \sqrt{2g}\, L H^{3/2}$

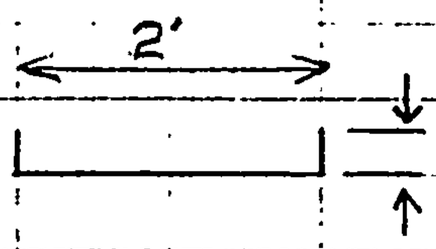
$= {}^2/_3 \sqrt{64.4\ FT/SEC^2}\,(2')(0.5')^{3/2}$

$= \underline{\underline{3.78\ CFS}}$

CHANNEL CAPACITY

$Q = A \frac{1.486}{n} R^{2/3} S^{1/2}$ FOR $n = 0.013$ CONCRETE LINING

CROSS-SECTION



$Q = (1\ FT^2)\left(\frac{1.486}{0.013}\right)\left(\frac{1\ FT^2}{2\ FT}\right)^{2/3}(0.00625)^{1/2}$

$= \underline{\underline{5.6\ CFS}}$

FLOW BETWEEN POND 4 AND POND 3

FLOW FROM ONSITE: FROM POND 5 = 12.6 CFS (APPENDIX 11)
FROM WEIRS ON ACCESS ROAD = 18.3 CFS (APPENDIX 10)

SHEET FLOW TO POND 4

AREA	LAND TREATMENT
—	A
—	B
0.135	C
0.087	D
0.222 ACRES	

$Q_{100} = (2.87 CFS/Ac)(0.135 Ac) + (4.37 CFS/Ac)(0.087 Ac) = 0.768 CFS$

TOTAL FLOW TO POND 5 = 12.6CFS + 18.3CFS + 0.768CFS = 31.7CFS

WEIR CAPACITY = $^2/_3 \sqrt{2g}\, L H^{3/2} = {}^2/_3 \sqrt{2(32.2 FT/SEC^2}\,(37.5FT)(0.292FT)^{3/2}$

= 31.6 CFS

WEIR DEPTH (H) = 3½" SO TOP OF BERM = 85.0 MINUS 3½"

= 84.7

TWIN 21" HDPE FROM PARKING LOT TO POND 1

AREA	LAND TREATMENT
—	A
—	B
0.24	C
2.19	D
2.43	

$Q_{100} = (2.87 CFS/Ac)(0.24 Ac) + (4.37 CFS/Ac)(2.19 Ac) = 10.3 CFS$

TOTAL FLOW = 10.3 CFS + 4.17 CFS (POND 4 OVERFLOW IF VALVE UPSTREAM FAILS)

= 14.5 CFS

ELEVATION AT GRATE WITH 2" PONDING = 86.0

OUTLET INVERT 80.0 TOP OF POND ELEV 85.0

INLET INVERT 82.5

FOR INLET CONTROL (SUBMERGED)

$$Q = C_d A \sqrt{2gh}$$

$$= 0.6(2.41 FT^2)\sqrt{2(32.2 FT/SEC^2)(1')}$$

$$= 11.6 CFS$$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \frac{K_e + 1 + 29 n^2 L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = \frac{0.4 + 1 + 29(0.012)^2(96')}{(0.4375)^{1.33}}\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 3.45 FT/SEC$ $Q = VA = (3.45 FT/SEC)(\pi(1.75')^2/4) = 8.30 CFS$

$Q_{REQUIRED} = 14.5 CFS$ SO USE TWO 21" RCP'S CAPACITY 16.6 CFS

SUMMARY: OUTLET CONTROL GOVERNS, USE TWO 21" RCP'S

FLOW BETWEEN POND 3 AND POND 2

FLOW FROM ON SITE: FROM POND 4 = 31.7 CFS

SHEET FLOW TO POND 3

AREA	LAND TREATMENT
-	A
-	B
0.185	C
0.741	D
0.926	

$Q_{100} = (2.87\ CFS/Ac)(0.185\ Ac) + (4.37\ CFS/Ac)(0.741\ Ac) = 3.77\ CFS$

FLOW FROM OFF SITE: 5.8 CFS (APPENDIX 1, PAGE 6)

TOTAL FLOW TO POND 3 = 31.7 CFS + 3.77 CFS + 5.8 CFS = 41.3 CFS

$WEIR\ CAPACITY = \frac{2}{3}\sqrt{2g}\ L H^{3/2} = \frac{2}{3}\sqrt{2(32.2\ FT/SEC^2}\ (50.6\ FT)(0.292')^{3/2}$

$= 42.7\ CFS$

WEIR DEPTH (H) = 3 1/2" SO TOP OF BERM = 85.0 MINUS 3 1/2"

= 84.7 ELEV

24" RCP AT BLUEWATER - CAPACITY

GRATE ELEV - 95.5 LENGTH = 85 FT

INLET INVERT ELEV - 92.0 POND SURFACE ELEV = 93.5

OUTLET ELEV - 91.5

$Hw/D = (3.5')/(2.0') = 1.75$

INLET LIMITED CAPACITY (FROM NOMOGRAPH) = 26.0 CFS INLET LIMITED

OUTLET LIMITED CAPACITY (UNSUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (95.5 - 91.5) = \frac{0.4+1+29(0.012)^2(85)}{(0.500')^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 7.63$ FT/SEC

$Q = VA = (7.63\ FT/SEC)(\pi(2')^2/4) = 24.0$ CFS

OUTLET LIMITED CAPACITY (POND FILLED - OUTLET SUBMERGED)

TAILWATER DEPTH EXCEEDS AVERAGE OF CRITICAL DEPTH AND DIAMETER

USE $H' = H - T_w = 4 - 2 = 2$

$$2 = \frac{0.4+1+29(0.012)^2(85)}{(0.500)^{1.33}}\left(\frac{V^2}{64.4}\right)$$

$V = 5.40$ FT/SEC

$Q = VA = (5.40\ FT/SEC)(\pi(2')^2/4) =$ 17.0 CFS OUTLET LIMITED (SUBMERGED)

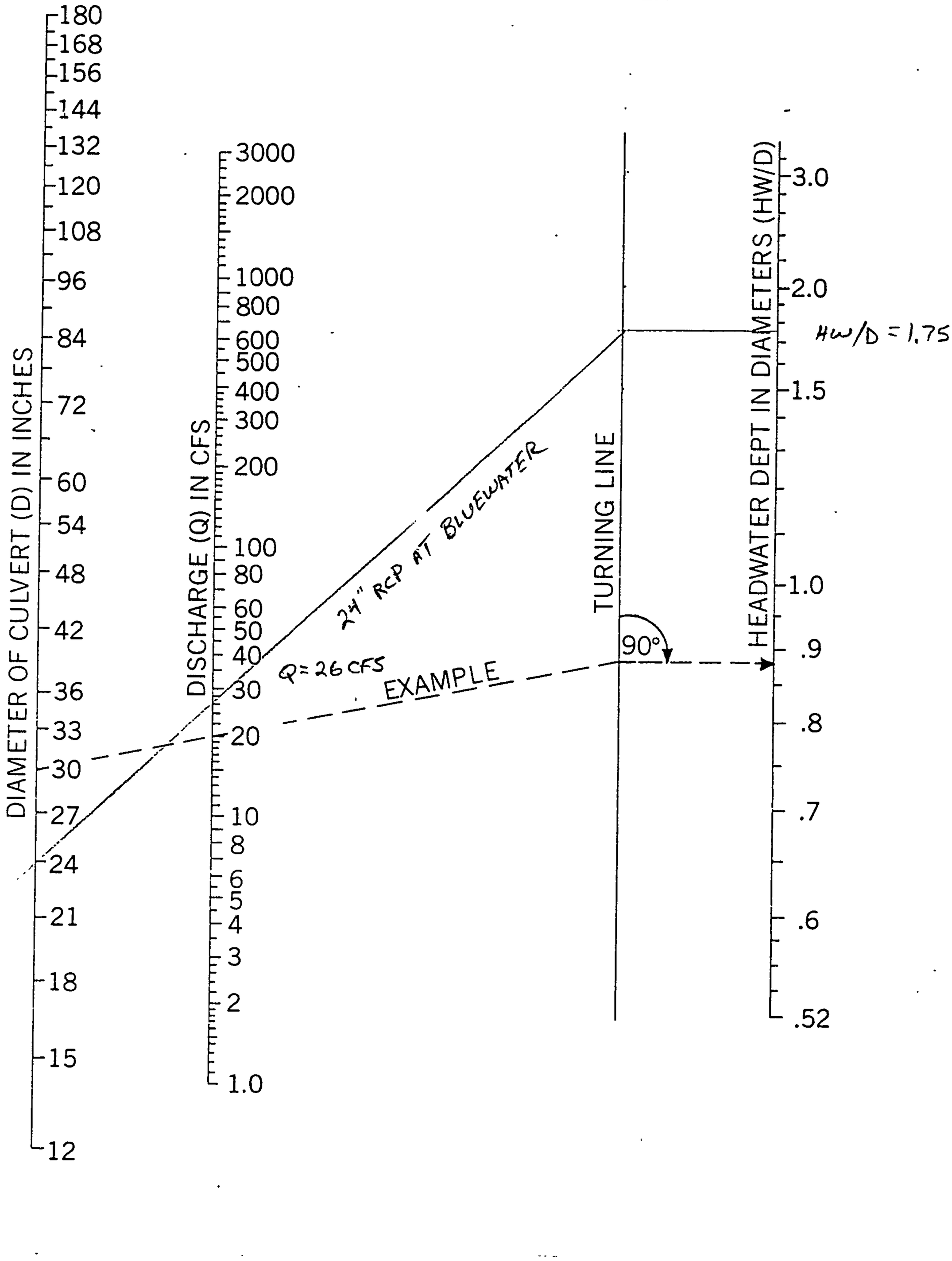
SUMMARY: CAPACITY IS SUBMERGED OUTLET LIMITED TO 17.0 CFS

EXPECTED $Q_{100} = 15.3$ CFS

TABLE A-11

HEADWATER DEPTH FOR CIRCULAR PIPE CULVERTS WITH INLET CONTROL

END SECTION WITH CLOSED TAPER



24" RCP FROM POND 5 TO POND 4

SHEET FLOW TO POND 5

AREA	LAND USE
—	A
—	B
0.131	C
0.523	D
0.654Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.131\ Ac) + (4.37\ CFS/Ac)(0.523\ Ac) = 2.66\ CFS$

TOTAL FLOW TO POND 5 = SHEET FLOW + NORTH WEIR FLOW

$= 2.66\ CFS + 6.99\ CFS = 9.65\ CFS$

POND 5 FILLS FASTER THAN POND 4

Q_{100} TO PONDS 1 THROUGH 5 COMBINED =

$= (1.29\ CFS/Ac)(1.8935\ Ac) + (2.03\ CFS/Ac)(1.700\ Ac) + (2.87\ CFS/Ac)(1.88\ Ac) +$

$+ (4.37\ CFS/Ac)(5.97\ Ac) = 37.4\ CFS + 20.7\ CFS\ (OFFSITE) = \underline{58.1\ CFS}$

POND 5 CAPACITY AS A PERCENTAGE OF TOTAL (FOR PONDS 1 THROUGH 5)

$= (100)\left(\frac{7500\ FT^3}{107,500}\right) = 6.98\%$

PERCENTAGE OF FLOW THROUGH POND 5 $= (100)\left(\frac{10.5\ CFS}{58.1\ CFS}\right) = 18.1\%$

RELATIVE RATE POND 5 FILLS - COMPARED TO PONDS 1 THROUGH 4:

$\frac{18.1\%\ FLOW}{6.98\%\ CAPACITY} = 2.6$ TIMES AS FAST

SO POND 5 WILL BE FULL WHEN PONDS 1 THRU 4 HAVE LESS THAN 2' OF WATER PONDED, AND CONNECTION MUST HANDLE FULL FLOW

APPENDIX "D"

AT 10.5 CFS UNTIL PONDS 1 THROUGH 4 FILL. WITH MINIMUM FREEBOARD OF 0.5' AND BERM ELEVATION 86.5, THEN H = 86.0 - 85.0 = 1

FOR INLET CONTROL $Q = C_d A \sqrt{2gH}$

$= (0.6)(\pi)\sqrt{2(32.2\ FT/SEC^2)(1')}$

$= 15.1\ CFS$

FOR OUTLET CONTROL SUBMERGED

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g} = \frac{0.4 + 1 + 29(0.012)^2(63')}{(0.5)^{1.33}} \frac{V^2}{2(32.2\ FT/SEC^2)}$$

$V = 4.11\ FT/SEC \quad Q = VA = (4.11\ FT/SEC)(\pi(2')^2/4) = 12.9\ CFS$

SUMMARY: OUTLET CONTROL GOVERNS, USE ONE 24" RCP

NORTHEAST 12" HDPE - CAPACITY

GRATE ELEV 86.2 POND SURFACE ELEV = 85.0

INLET INVERT 83.2

OUTLET INVERT 82.0

FLOW (APPENDIX 7) = 1.84 CFS

FOR INLET CONTROL (SUBMERGED) $Q = C_d A \sqrt{2gh}$

$$= 0.6(\pi(1')^2/4)\sqrt{2(32.2 FT/SEC^2)(1')}$$

$$= \underline{3.78 \text{ CFS}}$$

FOR OUTLET CONTROL (SUBMERGED)

$$H = \left(\frac{k_e + 1 + 29n^2L}{R^{1.33}}\right)\left(\frac{V^2}{2g}\right) = \left(\frac{0.4 + 1 + 29(0.012)^2(135')}{(0.25)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right) = 1'$$

$V = 2.28$ FT/SEC $Q = VA = (2.28 FT/SEC)(\pi(1')^2/4) = \underline{1.79 \text{ CFS}}$

SUMMARY: OUTLET CONTROL GOVERNS, USE 12" HDPE

APPENDIX #2

18" HDPE IN SOUTHEAST PARKING LOT AND 12" HDPE FROM POND 6 - CAPACITY

FROM POND 6 TO NORTH DROP INLET - 12" HDPE

INLET INVERT 87.0 LENGTH 150'

OUTLET INVERT 82.5 POND 6 SURFACE ELEV 89.0

OUTLET GRATE ELEV 84.8

INLET LIMITING (SUBMERGED) $Q = C_d A \sqrt{2gh}$

$= 0.6(\pi(1')^2/4)\sqrt{2(32.2\ FT/SEC^2)(89-87)}$

$= 5.35\ CFS$

OUTLET LIMITING (NOT SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right) = (89.0 - 82.5) = \left(\frac{0.4 + 1 + 29(0.012)^2(150')}{(0.25)^{1.33}}\right)\frac{V^2}{2(32.2)}$$

$V = 5.71\ FT/SEC \quad Q = VA = (5.71\ FT/SEC)(\pi(1')^2/4) = 4.48\ CFS$

FROM NORTH DROP INLET TO POND 3 (18" HDPE)

EXPECTED FLOW TO ALL 3 INLETS

AREA	LAND USE
-	A
-	B
0.069	C
0.617	D
0.686 Ac	

$Q_{100} = (2.87\ CFS/Ac)(0.069\ Ac) + (4.37\ CFS/Ac)(0.617 Ac) = 2.89\ CFS$

TOTAL FLOW = FLOW TO INLETS + FLOW FROM POND 6

$= 2.89\ CFS + 4.48 CFS = 7.37\ CFS$

18" HDPE CAPACITY (CONTINUED)

INLET GRATE ELEV 84.3 — OUTLET PONDING ELEV 85.0
INLET PONDING ELEV 85.0 — LENGTH EACH SECTION 60'
OUTLET INVERT 82.0

INLET LIMITING (SUBMERGED) $Q = C_D A \sqrt{2gh}$
* (OUTLET POND AT SURFACE ELEV 84.5)
$= 0.6(\pi(1.5')^2/4)\sqrt{2(32.2 FT/SEC^2)(0.5')}$

$= 6.0$ CFS

OUTLET LIMITING (SUBMERGED)

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g}$$

$$0.5 = \left(\frac{0.4 + 1 + 29(0.012)^2(60)}{(0.375)^{1.33}}\right)\left(\frac{V^2}{2(32.2 FT/SEC^2)}\right)$$

$V = 2.30$ FT/SEC

$Q = VA = (2.30 FT/SEC)(\pi(1.5)^2/4) = 4.07$ CFS

SINCE 4.07 CFS > 2.89 CFS, PARKING LOT WILL DRAIN TO POND 2 WITH MINIMAL DIFFERENCE IN WATER SURFACE ELEVATION

TO DRAIN POND 6 AFTER DELAYED RELEASE, POND 3 MUST REACH SURFACE ELEVATION 84.3, GIVING H = 0.6 IN EQUATION ABOVE (THEN V = 2.72 FT/SEC, Q = 4.80 CFS, AND 4.80 CFS > 4.48 CFS FROM POND 4. THE PARKING LOT WILL BE DRAINED AT THIS POINT.

PONDS 1,2,3 WILL REACH ELEVATION 84.3 AFTER RELEASE OF APPROXIMATELY 30,000 CUBIC FEET TO THE COORS BOULEVARD STORM SEWER. AT 5 CFS, THIS AMOUNTS TO A 2 HOUR DELAY AFTER THE 2 HOUR DELAY BEFORE DISCHARGE COMMENCES.

APPENDIX 23

24" HDPE'S CONNECTING POND 1 AND POND 2

EXPECTED FLOW

PERCENTAGE OF FLOW INTO POND 1

TOTAL FLOW TO PONDS 1, 2, AND 3

= 58.1 CFS (APPENDIX 16)

TOTAL FLOW TO POND 1

FROM TWO 24" RCP'S (APPENDIX 17) = 14.5 CFS

FROM 12" RCP ON NORTH (APPENDIX 18) = 1.84 CFS

FROM DIAMOND SHAMROCK (APPENDIX 1) = 3.7 CFS

FROM SHEET FLOW:

AREA	LANDUSE
—	A
—	B
0.22	C
0.87	D
1.09 Ac	

$$Q_{100} = (2.87 CFS/Ac)(0.22 Ac) + (4.37 CFS/Ac)(0.87 Ac) = 4.43 CFS$$

TOTAL FLOW TO POND 1 = 24.5 CFS

$$\text{PERCENTAGE OF FLOW} = \frac{24.5 CFS}{58.1 CFS}(100) = 42.2\%$$

PERCENTAGE OF VOLUME IN POND 1

$$(100)\frac{70,000 FT^3}{107,100 FT^3} = 65.4\%$$

PERCENTAGE OF TOTAL FLOW FROM POND 2 TO POND 1

= (65.4% VOLUME IN POND 1) − (42.2% FLOW TO POND 1)

= 23% OF FLOW TO PASS FROM POND 2 TO POND 1

(0.23)(58.1 CFS) = 13.4 CFS CAPACITY REQUIRED

SINCE POND 2 FILLS FASTER THAN POND 1, CAPACITY IS ESTIMATED WITH MINIMAL (0.5') ELEVATION DIFFERENCE IN PONDS

INLET LIMITING (SUBMERGED) $Q = C_D A\sqrt{2gh}$

$= 0.6(\pi(2)^2/4)\sqrt{2(32.2\,FT/SEC^2)(0.5')}$

= 10.7 CFS

OUTLET LIMITING (SUBMERGED)

LENGTH = 30'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}} \frac{V^2}{2g}$$

$$0.5 = \frac{0.4 + 1 + 29(0.012)^2(30')}{(0.5')^{1.33}} \frac{V^2}{2(32.2\,FT/SEC^2)}$$

V = 2.90 FT/SEC $Q = VA = (2.9\,FT/SEC)(\pi(2)^2/4) = 9.11$ CFS USE TWO = 18.2 CFS

SUMMARY: OUTLET LIMITING CONTROLS, USE TWO 24" HDPE's

(DELETED)

APPENDIX 2

(DELETED)

4" LANDSCAPE PIPE CAPACITY

LARGEST AREA DRAINED

AREA	LAND USE
–	A
–	B
–	C
0.0756	D

0.0756 ACRES

$Q_{100} = (4.37\ CFS/Ac)(0.0756\ Ac) = 0.330\ CFS$

INLET LIMITING: $Q = A C_D \sqrt{2gH}$ AT $H/D = 1$

$= (0.0872\ FT^2)(0.6)\sqrt{2(32.2\ FT/SEC^2)(1)}$

$= 0.42$ CFS EACH PIPE

OUTLETS ARE NOT SUBMERGED

APPENDIX 2

12" HDPE ON PONDS 4 AND 3

OUTLET SUBMERGED CAPACITY AT $H/D = 1$, LONGEST PIPE = 41'

$$H = \frac{K_e + 1 + 29n^2L}{R^{1.33}}\left(\frac{V^2}{2g}\right)$$

$$= \frac{0.4 + 1 + 29(0.012)^2(41')}{(0.25)^{1.33}} \frac{V^2}{2(32.2\,FT/SEC^2)}$$

$V = 2.5\,FT/SEC$

$Q = VA = (2.5\,FT/SEC)(0.785\,FT/SEC) = 1.96\,CFS$

TIME TO DRAIN AT $H/D = 1$

$$TIME = VOLUME/FLOW = 15{,}000\,FT^3 / 1.96\,CFS = 7639\,SEC$$

$$= 2.1\,HOURS$$

$$FLOW\ TO\ DRAIN\ IN\ 24\ HRS = \frac{15000\,FT^3}{(24\,HR)(3600\,SEC/HR)} = 0.17\,CFS$$

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 11/04/1996
     START TIME (HR:MIN:SEC) = 14:00:49     USER NO.= RED_MTNM.194
     INPUT FILE = 4BLUDAT.DAT

*              BLUEWATER INPUT FOR AHYMO
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
*              INPUT - POND 7 INFLUX
START            RAINFALL BEGINS AT 0.0  HRS
RAINFALL           TYPE=2 RAIN QUARTER=0
                ONE=1.90 SIX=2.24
                RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =   23.999940 HOURS
            .0000  .0070  .0147  .0231  .0326  .0433  .0557
            .0705  .0899  .1822  .5934 1.2876 1.5372 1.7194
           1.8631 1.9791 2.0021 2.0212 2.0377 2.0524 2.0656
           2.0776 2.0887 2.0990 2.1087 2.1178 2.1264 2.1346
           2.1424 2.1499 2.1570 2.1638 2.1704 2.1768 2.1830
           2.1889 2.1947 2.2003 2.2057 2.2110 2.2161 2.2211
           2.2260 2.2308 2.2354 2.2400 2.2452 2.2504 2.2555
           2.2606 2.2656 2.2706 2.2755 2.2804 2.2852 2.2900
           2.2948 2.2995 2.3042 2.3089 2.3135 2.3180 2.3226
           2.3271 2.3315 2.3359 2.3403 2.3447 2.3490 2.3533
           2.3575 2.3618 2.3660 2.3701 2.3743 2.3784 2.3824
           2.3865 2.3905 2.3945 2.3984 2.4024 2.4063 2.4101
           2.4140 2.4178 2.4216 2.4254 2.4291 2.4329 2.4366
           2.4402 2.4439 2.4475 2.4511 2.4547 2.4583 2.4618
           2.4654 2.4689 2.4723 2.4758 2.4792 2.4827 2.4860
           2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
           2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
           2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
           2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
           2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
           2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
           2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
           2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
           2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
           2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
           2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD     ID=1  HYD NO=101.0
                DA=0.009508 SQ MI
                PER A=0.0 PER B=5.8
                PER C=51.5 PER D=42.7
                TP=0.133 HR MASSRAIN=-1

  K=  .072485HR   TP =  .133000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
  UNIT PEAK =  16.065   CFS  UNIT VOLUME =   1.119     B =  526.28     P60 = 1.9000
  AREA =     .004060 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
```

.133333

K = .108446HR TP = .133000HR K/TP RATIO = .815384 SHAPE CONSTANT, N = 4.383857
UNIT PEAK = 15.566 CFS UNIT VOLUME = 1.005 B = 380.00 P60 = 1.9000
AREA = .005448 SQ MI IA = .36518 INCHES INF = .87251 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

```
*              INPUT - POND 7 OUTFLUX
ROUTE RESERVOIR    ID=2  HYD=POND.107  INFLOW ID=1
            OUTFLOW (CFS)    STORAGE (AC FT)
              0              0.551
              8              0.6
              16             0.65
              24.8           0.7
*              INPUT - DIVERT POND 7 TO STORE 4.5 HOURS
DIVIDE HYD         ID=2  Q=-63.6  ID=3  HYD NO=102
                   ID=4  HYD NO=104
*              INPUT - POND 7 DELAYED 4.5 HOURS OUTFLUX
ROUTE RESERVOIR    ID=5  HYD POND.107A  INFLOW ID=4
            OUTFLOW (CFS)    STORAGE (AC FT)
              0              0
              4.17           0.05
              4.17           0.10
              4.17           0.20
              4.17           0.30
              4.17           0.40
              4.17           0.50
              4.17           0.552
*              INPUT - DELAY POND 7 OUTFLUX
MODIFY TIME        ID=5  TIME=4.5 HRS
*              INPUT - POND 6 SHEET FLOW INFLUX
RAINFALL           TYPE=2 RAIN QUARTER=0
            ONE=1.90 SIX=2.24
            RAIN DAY=2.70 DT=0.133333 HR
```

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = .133333 HOURS END TIME = 23.999940 HOURS

.0000	.0070	.0147	.0231	.0326	.0433	.0557
.0705	.0899	.1822	.5934	1.2876	1.5372	1.7194
1.8631	1.9791	2.0021	2.0212	2.0377	2.0524	2.0656
2.0776	2.0887	2.0990	2.1087	2.1178	2.1264	2.1346
2.1424	2.1499	2.1570	2.1638	2.1704	2.1768	2.1830
2.1889	2.1947	2.2003	2.2057	2.2110	2.2161	2.2211
2.2260	2.2308	2.2354	2.2400	2.2452	2.2504	2.2555
2.2606	2.2656	2.2706	2.2755	2.2804	2.2852	2.2900
2.2948	2.2995	2.3042	2.3089	2.3135	2.3180	2.3226
2.3271	2.3315	2.3359	2.3403	2.3447	2.3490	2.3533
2.3575	2.3618	2.3660	2.3701	2.3743	2.3784	2.3824
2.3865	2.3905	2.3945	2.3984	2.4024	2.4063	2.4101
2.4140	2.4178	2.4216	2.4254	2.4291	2.4329	2.4366
2.4402	2.4439	2.4475	2.4511	2.4547	2.4583	2.4618
2.4654	2.4689	2.4723	2.4758	2.4792	2.4827	2.4860

2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD ID=6 HYD NO=106.0
DA=0.003727 SQ MI
PER A=0.0 PER B=0.0
PER C=100.0 PER D=0.0
TP=0.133 HR MASSRAIN=-1

K= .105966HR TP= .133000HR K/TP RATIO= .796738 SHAPE CONSTANT, N= 4.498737
UNIT PEAK= 10.849 CFS UNIT VOLUME= 1.009 B= 387.15 P60 = 1.9000
AREA= .003727 SQ MI IA= .35000 INCHES INF= .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

* INPUT - POND 6 OVERFLOW + SHEET
ADD HYD ID=7 HYD=POND.106A ID I=6 ID II=3
* INPUT - IMMEDIATE FLOW TO POND 6
ROUTE RESERVOIR ID=8 HYD=POND.106 INFLOW ID=7
OUTFLOW (CFS) STORAGE (AC FT)
0 0
4.48 0.2
4.48 0.4
4.48 0.6
4.48 0.7
4.48 0.71
4.48 0.72
* DELAY POND 6 DISCHARGE 2.4 HOURS
MODIFY TIME ID=8 TIME=2.4 HRS
* INPUT - ADD DELAYED POND 7 TO POND 6
ADD HYD ID=9 HYD=POND.106B ID I=8 ID II=5
ROUTE RESERVOIR ID=10 HYD=POND.106C INFLOW ID=9
OUTFLOW (CFS) STORAGE (AC FT)
0 0
4.48 0.2
4.48 0.4
4.48 0.6
4.48 0.7
4.48 0.71
4.48 0.72
* POND 6 INFLUX - IMMEDIATE
PRINT HYD ID=7 `

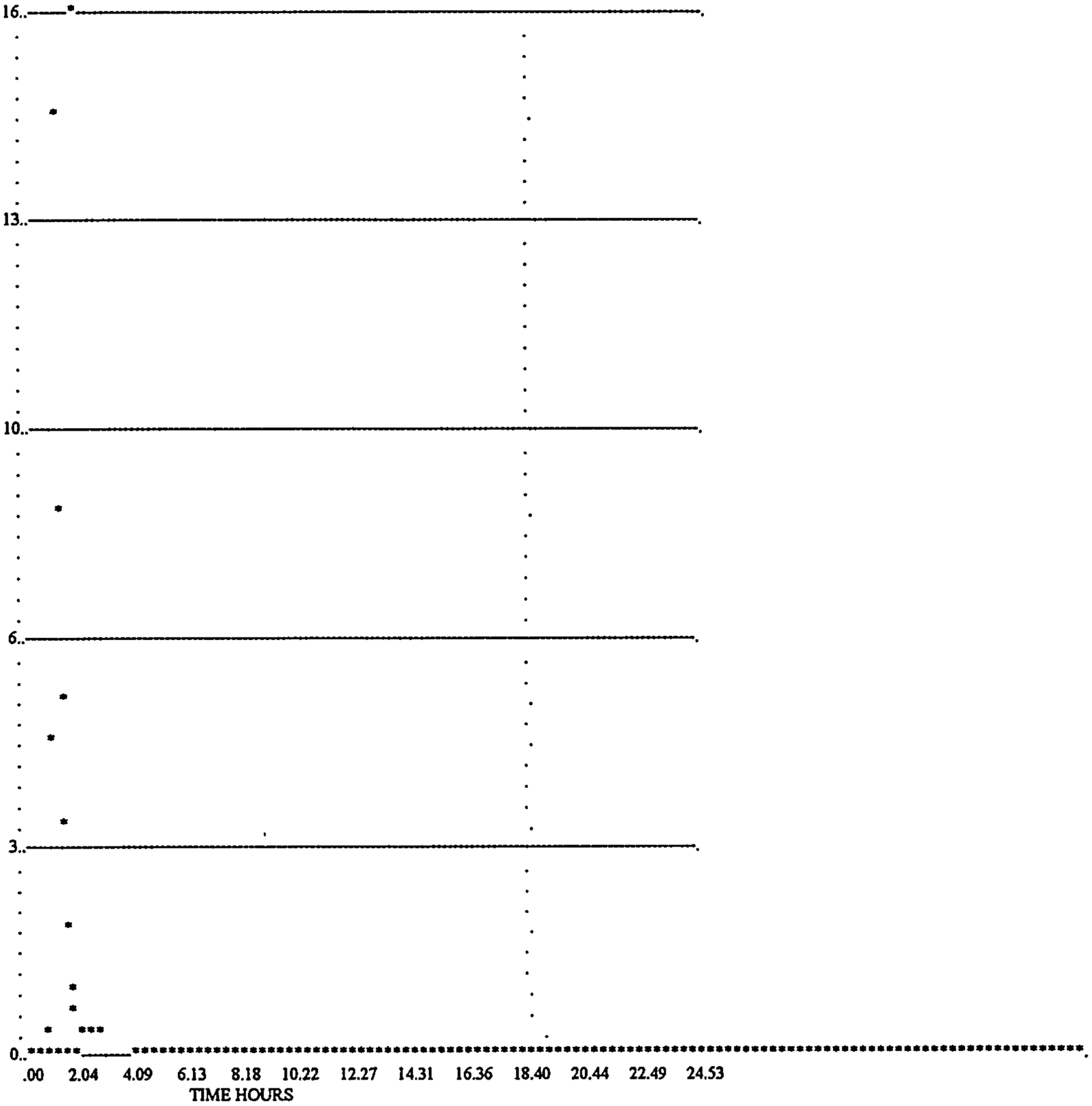
HYDROGRAPH FROM AREA POND.106A

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW

HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	4.933	.0	9.867	.1	14.800	.0	19.733	.0
.133	.0	5.067	.0	10.000	.1	14.933	.0	19.867	.0
.267	.0	5.200	.0	10.133	.1	15.067	.0	20.000	.0
.400	.0	5.333	.0	10.267	.1	15.200	.0	20.133	.0
.533	.0	5.467	.0	10.400	.1	15.333	.0	20.267	.0
.667	.0	5.600	.1	10.533	.1	15.467	.0	20.400	.0
.800	.0	5.733	.1	10.667	.0	15.600	.0	20.533	.0
.933	.0	5.867	.1	10.800	.0	15.733	.0	20.667	.0
1.067	.0	6.000	.1	10.933	.0	15.867	.0	20.800	.0
1.200	.3	6.133	.1	11.067	.0	16.000	.0	20.933	.0
1.333	4.9	6.267	.1	11.200	.0	16.133	.0	21.067	.0
1.467	16.1	6.400	.1	11.333	.0	16.267	.0	21.200	.0
1.600	14.6	6.533	.1	11.467	.0	16.400	.0	21.333	.0
1.733	8.5	6.667	.1	11.600	.0	16.533	.0	21.467	.0
1.867	5.3	6.800	.1	11.733	.0	16.667	.0	21.600	.0
2.000	3.5	6.933	.1	11.867	.0	16.800	.0	21.733	.0
2.133	2.0	7.067	.1	12.000	.0	16.933	.0	21.867	.0
2.267	1.1	7.200	.1	12.133	.0	17.067	.0	22.000	.0
2.400	.7	7.333	.1	12.267	.0	17.200	.0	22.133	.0
2.533	.5	7.467	.1	12.400	.0	17.333	.0	22.267	.0
2.667	.3	7.600	.1	12.533	.0	17.467	.0	22.400	.0
2.800	.2	7.733	.1	12.667	.0	17.600	.0	22.533	.0
2.933	.2	7.867	.1	12.800	.0	17.733	.0	22.667	.0
3.067	.1	8.000	.1	12.933	.0	17.867	.0	22.800	.0
3.200	.1	8.133	.1	13.067	.0	18.000	.0	22.933	.0
3.333	.1	8.267	.1	13.200	.0	18.133	.0	23.067	.0
3.467	.1	8.400	.1	13.333	.0	18.267	.0	23.200	.0
3.600	.1	8.533	.1	13.467	.0	18.400	.0	23.333	.0
3.733	.1	8.667	.1	13.600	.0	18.533	.0	23.467	.0
3.867	.0	8.800	.1	13.733	.0	18.667	.0	23.600	.0
4.000	.0	8.933	.1	13.867	.0	18.800	.0	23.733	.0
4.133	.0	9.067	.1	14.000	.0	18.933	.0	23.867	.0
4.267	.0	9.200	.1	14.133	.0	19.067	.0	24.000	.0
4.400	.0	9.333	.1	14.267	.0	19.200	.0	24.133	.0
4.533	.0	9.467	.1	14.400	.0	19.333	.0	24.267	.0
4.667	.0	9.600	.1	14.533	.0	19.467	.0	24.400	.0
4.800	.0	9.733	.1	14.667	.0	19.600	.0	24.533	.0

RUNOFF VOLUME = 1.38009 INCHES = .7194 ACRE-FEET
PEAK DISCHARGE RATE = 16.10 CFS AT 1.467 HOURS BASIN AREA = .0098 SQ. MI.

PLOT HYD ID=7 POND 6 - SHEET FLOW INFLUX
FLOW RATE (CFS)

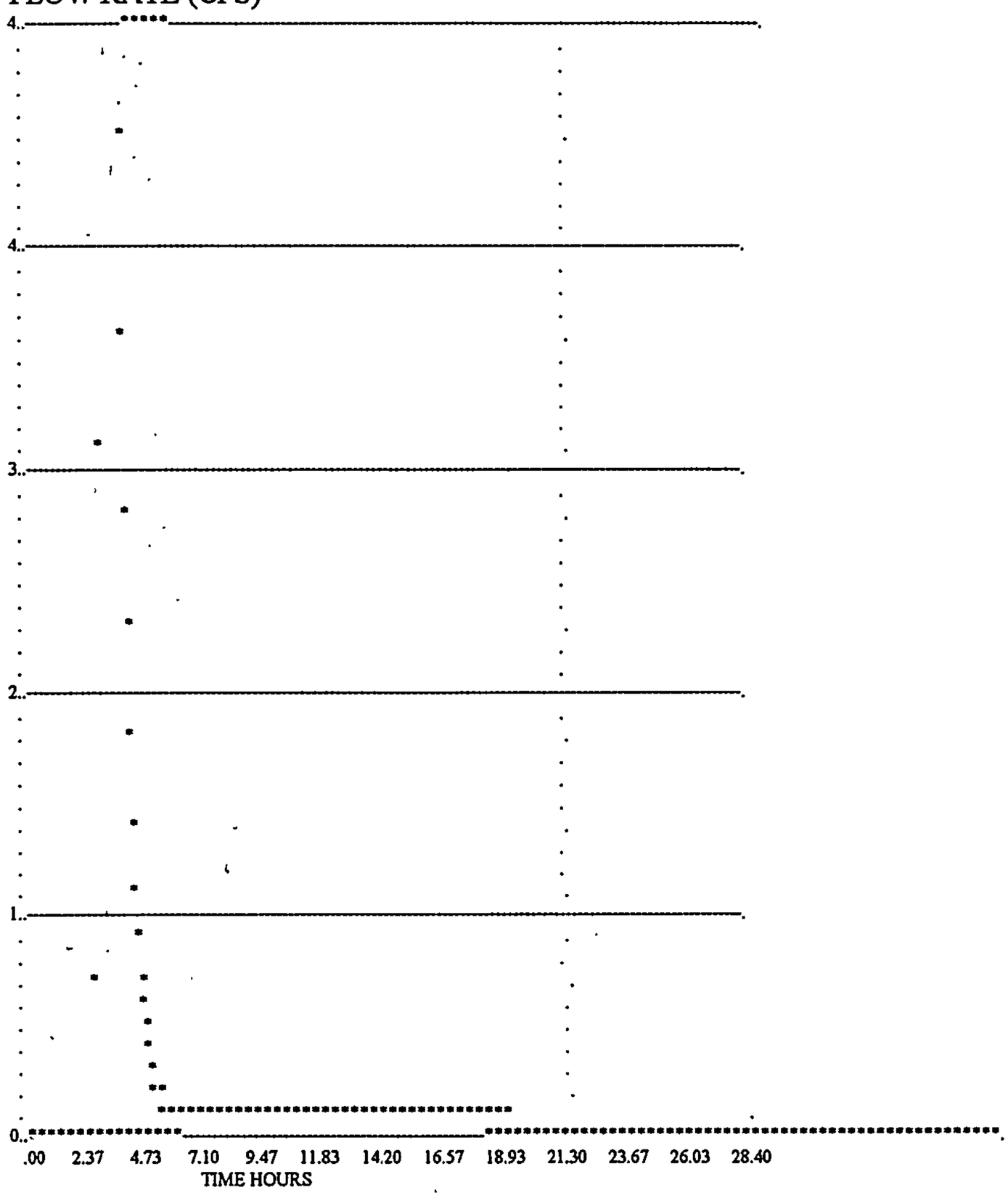


* POND 6 INFLUX - DELAYED
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA POND.106

RUNOFF VOLUME = 1.38001 INCHES = .7194 ACRE-FEET
PEAK DISCHARGE RATE = 4.48 CFS AT 4.000 HOURS BASIN AREA = .0098 SQ. MI.

POND 6 - DELAYED DISCHARGE



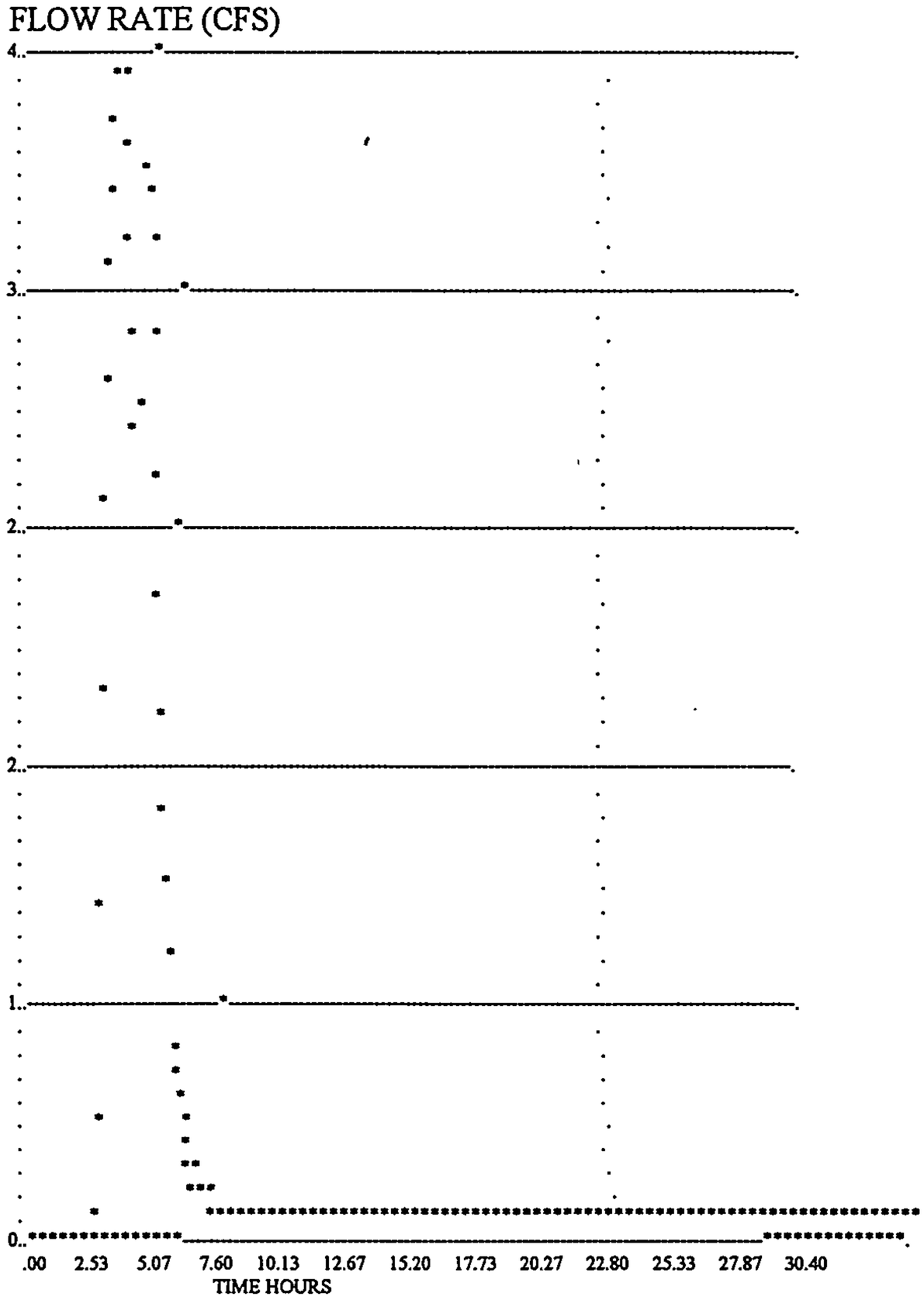
* POND 6 OUTFLUX
PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA POND.107

RUNOFF VOLUME = 1.43961 INCHES = 1.0162 ACRE-FEET
PEAK DISCHARGE RATE = 3.97 CFS AT 5.067 HOURS BASIN AREA = .0132 SQ. MI.

POND 7 - DELAYED DISCHARGE

PLOT HYD ID=10
FLOW RATE (CFS)



* INPUT - FLOW TO BASE LEVEL PONDS (EQUALIZED)
RAINFALL TYPE=2 RAIN QUARTER=0
ONE=1.90 SIX=2.24
RAIN DAY=2.70 DT=0.133333 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = .133333 HOURS END TIME = 23.999940 HOURS

.0000	.0070	.0147	.0231	.0326	.0433	.0557
.0705	.0899	.1822	.5934	1.2876	1.5372	1.7194
1.8631	1.9791	2.0021	2.0212	2.0377	2.0524	2.0656
2.0776	2.0887	2.0990	2.1087	2.1178	2.1264	2.1346
2.1424	2.1499	2.1570	2.1638	2.1704	2.1768	2.1830
2.1889	2.1947	2.2003	2.2057	2.2110	2.2161	2.2211
2.2260	2.2308	2.2354	2.2400	2.2452	2.2504	2.2555
2.2606	2.2656	2.2706	2.2755	2.2804	2.2852	2.2900
2.2948	2.2995	2.3042	2.3089	2.3135	2.3180	2.3226
2.3271	2.3315	2.3359	2.3403	2.3447	2.3490	2.3533

2.3575 2.3618 2.3660 2.3701 2.3743 2.3784 2.3824
2.3865 2.3905 2.3945 2.3984 2.4024 2.4063 2.4101
2.4140 2.4178 2.4216 2.4254 2.4291 2.4329 2.4366
2.4402 2.4439 2.4475 2.4511 2.4547 2.4583 2.4618
2.4654 2.4689 2.4723 2.4758 2.4792 2.4827 2.4860
2.4894 2.4928 2.4961 2.4994 2.5027 2.5060 2.5093
2.5125 2.5158 2.5190 2.5222 2.5254 2.5285 2.5317
2.5348 2.5379 2.5410 2.5441 2.5471 2.5502 2.5532
2.5562 2.5592 2.5622 2.5652 2.5681 2.5711 2.5740
2.5769 2.5798 2.5827 2.5856 2.5884 2.5913 2.5941
2.5969 2.5997 2.6025 2.6053 2.6080 2.6108 2.6135
2.6163 2.6190 2.6217 2.6244 2.6270 2.6297 2.6324
2.6350 2.6376 2.6403 2.6429 2.6455 2.6481 2.6506
2.6532 2.6558 2.6583 2.6608 2.6634 2.6659 2.6684
2.6709 2.6733 2.6758 2.6783 2.6807 2.6832 2.6856
2.6880 2.6904 2.6928 2.6952 2.6976 2.7000

COMPUTE NM HYD ID=11 HYD NO=108
DA=0.02568 SQ MI
PER A=11.5 PER B=13.4
PER C=11.4 PER D=63.7
TP=0.133 HR MASSRAIN=-1

K= .072485HR TP= .133000HR K/TP RATIO= .545000 SHAPE CONSTANT, N= 7.106420
UNIT PEAK= 64.729 CFS UNIT VOLUME= 1.119 B= 526.28 P60 = 1.9000
AREA= .016358 SQ MI IA= .10000 INCHES INF= .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

K= .132940HR TP= .133000HR K/TP RATIO= .999547 SHAPE CONSTANT, N= 3.531923
UNIT PEAK= 22.614 CFS UNIT VOLUME= .9769 B= 322.65 P60 = 1.9000
AREA= .009322 SQ MI IA= .50041 INCHES INF= 1.25116 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .133333

* INPUT - ADD IMMEDIATE + DELAYED FLOW TO BASE LEVEL PONDS
ADD HYD ID=12 HYD=POND.112 ID I=11 ID II=10
* INPUT - TOTAL FLOW TO BASE LEVEL PONDS
ROUTE RESERVOIR ID=13 HYD POND.112A INFLOW ID=12

OUTFLOW (CFS)	STORAGE (AC FT)
0	0
5.2	0.01
5.2	2.468
5.2	2.6

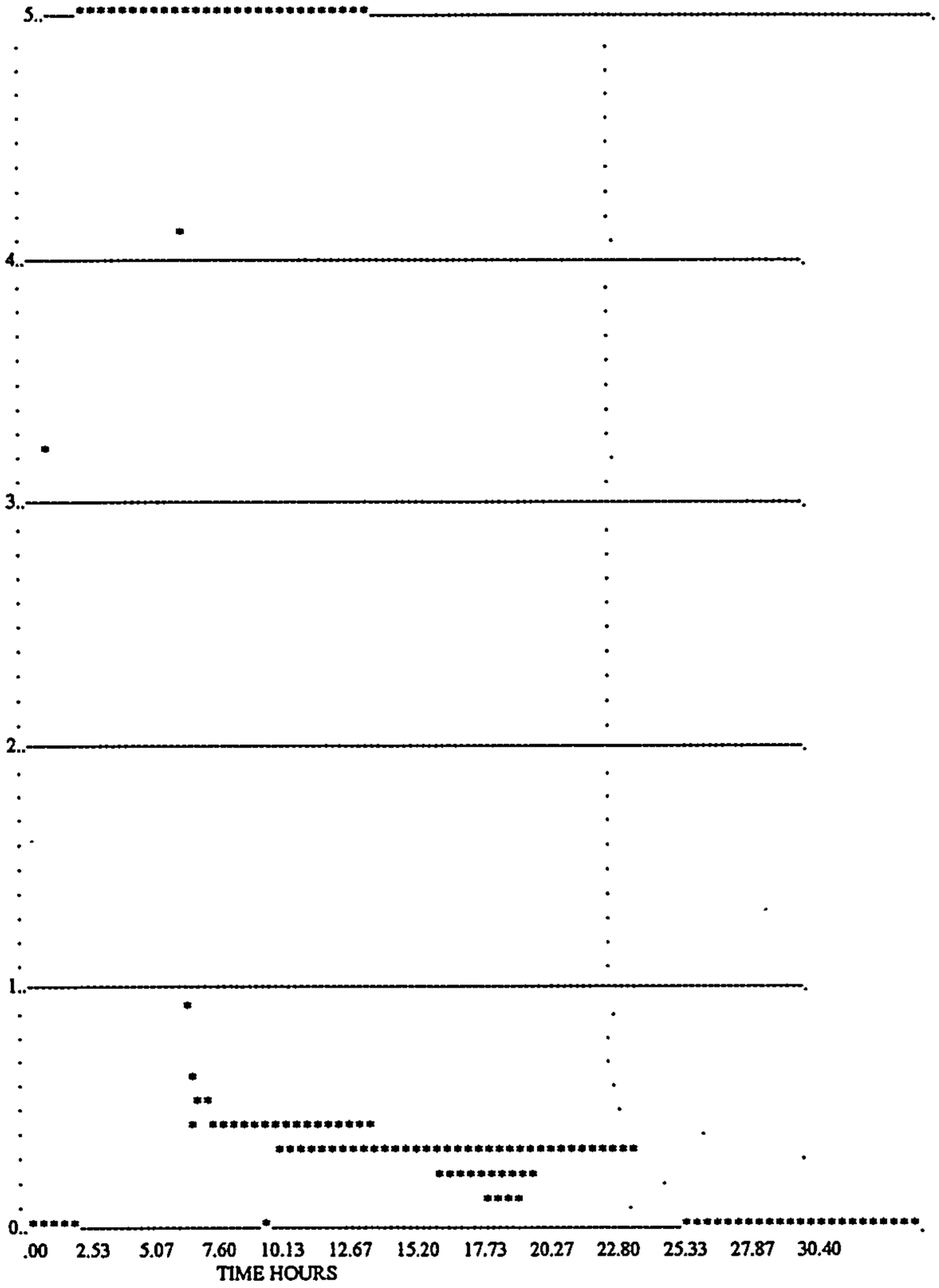
PRINT HYD ID=13 CODE=1

OUTFLOW HYDROGRAPH REACH .11

RUNOFF VOLUME= 1.69336 INCHES = 3.5145 ACRE-FEET
PEAK DISCHARGE RATE= 5.20 CFS AT 1.333 HOURS BASIN AREA= .0389 SQ. MI.

BASE POND - DISCHARGE TO COORS STORM DRAIN

PLOT HYD ID=13
FLOW RATE (CFS)



FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:00:51

```
    AHYMO PROGRAM (AHYM0392) - AMAFCA VERSION OF HYMO - MARCH, 1992
         RUN DATE (MON/DAY/YR) = 09/30/1992
         START TIME (HR:MIN:SEC) = 14:53:26     USER NO.= D_HARRIS.S92
         INPUT FILE = tbsdwi.hmi

**********************************************************************************
**********************************************************************************
** FILE NAME: TBSDWI.HMI(TIERRA BAYITA STORM DRAIN WATERSHED INTERIM)
** CURRENT FILE UPDATED: 9-14-92
** ANALYSIS FOR ATRISCO BUSINESS PARK MASTER DRAINAGE PLAN
** UPPER WATERSHED OF THE FUTURE TIERRA BAYITA STORM DRAIN
** INCLUDES THE PROPOSED UNSER DIVERSION CHANNEL WATERSHED, THE UNSER STORM
** DRAIN WATERSHED AND TRACT A-1 OF ATRISCO BUSINESS PARK
** INTERIM CONDITION
**********************************************************************************
**********************************************************************************
START              0.0 HOURS *****ONE HUNDRED YEAR SIX HOUR STORM******
RAINFALL           TYPE=1  0.0  1.87  2.20  0.00  DT=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   .0016   .0033   .0050   .0067   .0085   .0103
                   .0122   .0141   .0160   .0180   .0201   .0222   .0243
                   .0266   .0289   .0312   .0337   .0362   .0388   .0415
                   .0443   .0472   .0502   .0534   .0567   .0601   .0637
                   .0675   .0715   .0758   .0810   .0865   .0924   .1051
                   .1335   .1773   .2400   .3257   .4384   .5820   .7607
                   .9789  1.1808  1.2652  1.3365  1.4000  1.4577  1.5108
                  1.5602  1.6063  1.6495  1.6902  1.7285  1.7648  1.7991
                  1.8316  1.8624  1.8917  1.9194  1.9458  1.9519  1.9576
                  1.9631  1.9683  1.9732  1.9780  1.9826  1.9870  1.9912
                  1.9953  1.9993  2.0031  2.0068  2.0105  2.0140  2.0174
                  2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                  2.0420  2.0448  2.0476  2.0502  2.0529  2.0554  2.0580
                  2.0605  2.0629  2.0653  2.0677  2.0701  2.0724  2.0746
                  2.0769  2.0791  2.0812  2.0834  2.0855  2.0876  2.0896
                  2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                  2.1052  2.1070  2.1088  2.1106  2.1124  2.1142  2.1159
                  2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                  2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                  2.1401  2.1416  2.1431  2.1446  2.1461  2.1475  2.1489
                  2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                  2.1601  2.1614  2.1627  2.1641  2.1654  2.1667  2.1680
                  2.1693  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                  2.1780  2.1793  2.1805  2.1817  2.1829  2.1841  2.1852
                  2.1864  2.1876  2.1887  2.1899  2.1911  2.1922  2.1933
                  2.1945  2.1956  2.1967  2.1978  2.1989  2.2000

**RAINFALL           TYPE=1  0.0  1.25  1.45  1.65    DT=0.033333
**********************************************************************************
*S BEGIN UNSER DIVERSION CHANNEL WATERSHED
**********************************************************************************
** ANALYSIS ASSUMPTIONS: OFFSITE WATERSHED IN EXISTING CONDITON
```

RECEIVED
OCT - 2
HYDROLOGY

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** LOT 1 IN EXISTING CONDITION
** LOT 2 UNDEVELOPED CONDITION WITH CONSERVATION TREATMENT APPLIED
** ASSUME PROPOSED UNSER DIVERSION CHANNEL IS HARD LINED WITH SOIL CEMENT
*****************************************************************************
** BEGIN OFFSITE WATERSHED NORTH OF THE FUTURE PROPOSED INTERSTATE 40
** INTERCEPTOR CHANNEL
*****************************************************************************
** COMPUTE  HYDROGRAPH BASIN 120.1 ***********************************
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=120.1  DA=0.0259
                    %A=100.0  %B=0.0  %C=0.0  %D=0.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .163724HR    TP =   .133333HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   53.136    CFS   UNIT VOLUME =    .9994       B =   273.54      P60 = 1.8700
    AREA =      .025900 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   120.10


    RUNOFF VOLUME =      .43922 INCHES     =        .6067 ACRE-FEET
    PEAK DISCHARGE RATE =      21.50 CFS  AT   1.533 HOURS  BASIN AREA =   .0259 SQ. MI.



** COMPUTE  HYDROGRAPH BASIN 120.2 ***********************************************
COMPUTE NM HYD      ID=2  HYDROGRAPH NO=120.2 DA=0.0579
                    %A=100.0  %B=0.0  %C=0.0  %D=0.0  TP=0.193
                    MASS RAINFALL=-1

    K =   .236992HR    TP =   .193000HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   82.063    CFS   UNIT VOLUME =    .9997       B =   273.54      P60 = 1.8700
    AREA =      .057900 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   120.20


    RUNOFF VOLUME =      .43922 INCHES     =       1.3563 ACRE-FEET
    PEAK DISCHARGE RATE =      34.48 CFS  AT   1.567 HOURS   BASIN AREA =   .0579 SQ. MI.


** ADD HYDROGRAPHS FOR BASIN 120.1 AND BASIN 120.2
ADD HYD             ID=3  HYDROGRAPH NO=120.21 ID I=1  ID II=2
PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   120.21
```

RUNOFF VOLUME = .43922 INCHES = 1.9630 ACRE-FEET
PEAK DISCHARGE RATE = 54.53 CFS AT 1.567 HOURS BASIN AREA = .0838 SQ. MI.

** ROUTE FLOW DOWN ARROYO TO THE NORTH SIDE OF I-40
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=106.0 FT
CHANNEL SLOPE=0.0229 FLOOD PLAIN SLOPE=0.0256
N=0.035 DIST=20 N=-0.030 DIST=55 N=0.035 DIST=75

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.0	20	105.0	30	100.0	45	100.0
55	105.0	75	106.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	4.9	16.6
100.63	10.3	53.3
100.95	16.0	106.1
101.26	22.1	173.8
101.58	28.7	255.9
101.89	35.6	352.3
102.21	42.9	462.9
102.53	50.7	587.9
102.84	58.8	727.5
103.16	67.3	882.0
103.47	76.2	1051.7
103.79	85.6	1236.9
104.11	95.3	1437.8
104.42	105.4	1654.9
104.74	115.9	1888.5
105.05	126.9	2147.7
105.37	140.6	2474.6
105.68	158.3	2838.2
106.00	180.0	3248.3

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=1750 FT SLOPE=0.0229

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.1445
.632	10.271	53.32	.0937
.947	16.005	106.13	.0733
1.263	22.138	173.83	.0619
1.579	28.670	255.93	.0545
1.895	35.601	352.26	.0491
2.211	42.931	462.87	.0451

2.526	50.659	587.89	.0419
2.842	58.786	727.53	.0393
3.158	67.313	882.05	.0371
3.474	76.238	1051.73	.0352
3.789	85.562	1236.89	.0336
4.105	95.285	1437.85	.0322
4.421	105.407	1654.94	.0310
4.737	115.927	1888.50	.0298
5.053	126.897	2147.74	.0287
5.368	140.608	2474.56	.0276
5.684	158.309	2838.19	.0271
6.000	179.998	3248.30	.0269

ROUTE ID=4 HYDROGRAPH NO=120.22 INFLOW ID=3 DT=0.033333
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 120.22

RUNOFF VOLUME = .43923 INCHES = 1.9631 ACRE-FEET
PEAK DISCHARGE RATE = 45.42 CFS AT 1.633 HOURS BASIN AREA = .0838 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 120.3 **
COMPUTE NM HYD ID=1 HYDROGRAPH NO=120.3 DA=0.0938
%A=100.0 %B=0.0 %C=0.0 %D=0.0 TP=0.2184
MASS RAINFALL=-1

K = .262045HR TP = .218400HR K/TP RATIO = 1.199841 SHAPE CONSTANT, N = 2.961568
UNIT PEAK = 119.69 CFS UNIT VOLUME = .9998 B = 278.67 P60 = 1.8700
AREA = .093800 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 120.30

RUNOFF VOLUME = .43922 INCHES = 2.1973 ACRE-FEET
PEAK DISCHARGE RATE = 50.93 CFS AT 1.600 HOURS BASIN AREA = .0938 SQ. MI.

** ADD HYDROGRAPH FOR BASIN 120.3 TO ROUTED FLOW IN ARROYO N. OF I-40**********
ADD HYD ID=2 HYDROGRAPH NO=120.31 ID I=1 ID II=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 120.31

RUNOFF VOLUME = .43922 INCHES = 4.1603 ACRE-FEET
PEAK DISCHARGE RATE = 95.77 CFS AT 1.633 HOURS BASIN AREA = .1776 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR BASIN 130.1 ****************************************
COMPUTE NM HYD      ID=3  HYDROGRAPH NO=130.1   DA=0.0743
                    %A=100.0  %B=0.0  %C=0.0  %D=0.0  TP=0.237
                    MASS RAINFALL=-1

   K =   .288511HR    TP =   .237000HR    K/TP RATIO =  1.217344     SHAPE CONSTANT, N =  2.922643
   UNIT PEAK =   86.355    CFS   UNIT VOLUME =    .9998       B =   275.45      P60 = 1.8700
   AREA =      .074300 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   130.10


   RUNOFF VOLUME =      .43922 INCHES     =       1.7405 ACRE-FEET
   PEAK DISCHARGE RATE =      36.94 CFS  AT   1.633 HOURS   BASIN AREA =   .0743 SQ. MI.



** COMPUTE HYDROGRAPH FOR BASIN 130.2 ****************************************
COMPUTE NM HYD      ID=4  HYDROGRAPH NO=130.2  DA=0.0489
                    %A=100.0  %B=0.0  %C=0.0  %D=0.0  TP=0.1856
                    MASS RAINFALL=-1

   K =   .227905HR    TP =   .185600HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
   UNIT PEAK =   72.071    CFS   UNIT VOLUME =    .9997       B =   273.54      P60 = 1.8700
   AREA =      .048900 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   130.20


   RUNOFF VOLUME =      .43922 INCHES     =       1.1455 ACRE-FEET
   PEAK DISCHARGE RATE =      30.31 CFS  AT   1.567 HOURS   BASIN AREA =   .0489 SQ. MI.



**COMPUTE HYDOGRAPH FOR BASIN 130.3 (SEGMENT OF MOLASCO STREET)****************
COMPUTE NM HYD      ID=5  HYDROGRAPH NO=130.3  DA=0.0047
                    %A=0.0  %B=0.0  %C=0.0  %D=100.0  TP=0.133333
                    MASS RAINFALL=-1

   K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   18.551    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
   AREA =      .004700 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   130.30
```

RUNOFF VOLUME = 1.96546 INCHES = .4927 ACRE-FEET
PEAK DISCHARGE RATE = 13.15 CFS AT 1.500 HOURS BASIN AREA = .0047 SQ. MI.

** ADD BASINS 130.1 AND 130.2 HYDROGRAPHS***
ADD HYD ID=6 HYDROGRAPH NO=130.21 ID I=4 ID II=3
PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 130.21

RUNOFF VOLUME = .43922 INCHES = 2.8859 ACRE-FEET
PEAK DISCHARGE RATE = 66.48 CFS AT 1.600 HOURS BASIN AREA = .1232 SQ. MI.

** ADD BASIN 130.3 HYDROGRAPH TO BASIN 130.1 AND 130.2 COMBINED HYDRGRAPH *****
ADD HYD ID=1 HYDROGRAPH NO=130.31 ID I=5 ID II=6
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.31

RUNOFF VOLUME = .49530 INCHES = 3.3786 ACRE-FEET
PEAK DISCHARGE RATE = 75.64 CFS AT 1.567 HOURS BASIN AREA = .1279 SQ. MI.

** ROUTE FLOW FROM BASINS 130.1,130.2 AND 130.3 DOWN ARROYO TO THE NORTH SIDE
** OF I-40 ***
COMPUTE RATING CURVE CID=2 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=53.3 FT MAXIMUM ELEV=62.4 FT
CHANNEL SLOPE=0.0310 FLOOD PLAIN SLOPE=0.0333
N=0.035 DIST=20 N=-0.030 DIST=52 N=0.035 DIST=72

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.0	20	105.0	30	100.0	42	100.0
52	105.0	72	106.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
53.30	.0	.0
53.78	.0	.0
54.26	.0	.0
54.74	.0	.0
55.22	.0	.0
55.69	.0	.0
56.17	.0	.0
56.65	.0	.0
57.13	.0	.0

57.61	.0	.0
58.09	.0	.0
58.57	.0	.0
59.05	.0	.0
59.53	.0	.0
60.01	.0	.0
60.48	.0	.0
60.96	.0	.0
61.44	.0	.0
61.92	.0	.0
62.40	.0	.0

COMPUTE TRAVEL TIME ID=3 REACH NO=2 VALLEY SECTIONS=1
LENGTH=1500 FT SLOPE=0.0310

TRAVEL TIME TABLE

REACH= 2.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.1238
.632	10.271	53.32	.0803
.947	16.005	106.13	.0628
1.263	22.138	173.83	.0531
1.579	28.670	255.93	.0467
1.895	35.601	352.26	.0421
2.211	42.931	462.87	.0386
2.526	50.659	587.89	.0359
2.842	58.786	727.53	.0337
3.158	67.313	882.05	.0318
3.474	76.238	1051.73	.0302
3.789	85.562	1236.89	.0288
4.105	95.285	1437.85	.0276
4.421	105.407	1654.94	.0265
4.737	115.927	1888.50	.0256
5.053	126.897	2147.74	.0246
5.368	140.608	2474.56	.0237
5.684	158.309	2838.19	.0232
6.000	179.998	3248.30	.0231

ROUTE ID=3 HYDROGRAPH NO=130.32 INFLOW ID=1 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 130.32

RUNOFF VOLUME = .49531 INCHES = 3.3786 ACRE-FEET
PEAK DISCHARGE RATE = 70.68 CFS AT 1.633 HOURS BASIN AREA = .1279 SQ. MI.

COMPUTE HYDROGRAPH FOR BASIN 130.4 ********
COMPUTE NM HYD ID=1 HYDROGRAPH NO=130.4 DA=0.0612
%A=100.0 %B=0.0 %C=0.0 %D=0.0 TP=0.1454
MASS RAINFALL=-1

K = .178542HR TP = .145400HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 115.14 CFS UNIT VOLUME = .9996 B = 273.54 P60 = 1.8700
AREA = .061200 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.40

RUNOFF VOLUME = .43922 INCHES = 1.4336 ACRE-FEET
PEAK DISCHARGE RATE = 47.31 CFS AT 1.533 HOURS BASIN AREA = .0612 SQ. MI.

** ADD THE HYDOGRAPH FOR BASIN 130.4 TO THE ARROYO N. OF I-40**********
ADD HYD ID=4 HYDROGRAPH NO=130.41 ID I=3 ID II=1
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 130.41

RUNOFF VOLUME = .47715 INCHES = 4.8122 ACRE-FEET
PEAK DISCHARGE RATE = 109.38 CFS AT 1.600 HOURS BASIN AREA = .1891 SQ. MI.

****
** BEGIN OFFSITE WATERSHED SOUTH OF FUTURE PROPOSED INTERSTATE 40
** INTERCEPTOR CHANNEL
****
** ROUTE FLOWS THROUGH BOX CULVERT UNDER I-40**********
COMPUTE RATING CURVE CID=3 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100 FT MAXIMUM ELEV=112 FT
CHANNEL SLOPE=0.020 FLOOD PLAIN SLOPE=0.020
M=-0.013 DIST=20.1

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	108	0.10	100	10.1	100	10.15	108
11	108	11.1	100	20.0	100	20.1	108

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.63	11.9	130.8
101.26	23.9	386.0
101.89	35.9	710.5
102.53	47.9	1081.3
103.16	59.9	1485.3
103.79	71.9	1914.3
104.42	84.0	2362.6
105.05	96.1	2826.4

105.68	108.1	3302.9
106.32	120.2	3789.9
106.95	132.4	4285.8
107.58	144.5	4789.4
108.21	156.8	5309.2
108.84	169.5	6044.6
109.47	182.2	6817.7
110.11	194.9	7627.5
110.74	207.6	8473.3
111.37	220.3	9354.3
112.00	233.0	10269.9

COMPUTE TRAVEL TIME ID=1 REACH NO=3 VALLEY SECTIONS=1
LENGTH=350 FT SLOPE=0.020

TRAVEL TIME TABLE

REACH= 3.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.0289
.632	10.271	53.32	.0187
.947	16.005	106.13	.0147
1.263	22.138	173.83	.0124
1.579	28.670	255.93	.0109
1.895	35.601	352.26	.0098
2.211	42.931	462.87	.0090
2.526	50.659	587.89	.0084
2.842	58.786	727.53	.0079
3.158	67.313	882.05	.0074
3.474	76.238	1051.73	.0070
3.789	85.562	1236.89	.0067
4.105	95.285	1437.85	.0064
4.421	105.407	1654.94	.0062
4.737	115.927	1888.50	.0060
5.053	126.897	2147.74	.0057
5.368	140.608	2474.56	.0055
5.684	158.309	2838.19	.0054
6.000	179.998	3248.30	.0054

ROUTE ID=1 HYDROGRAPH NO=130.42 INFLOW ID=4 DT=0.033333
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 130.42

RUNOFF VOLUME = .47716 INCHES = 4.8123 ACRE-FEET
PEAK DISCHARGE RATE = 109.81 CFS AT 1.600 HOURS BASIN AREA = .1891 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 130.5 (PORTION OF I-40)**********
COMPUTE NM HYD ID=3 HYDROGRAPH NO=130.5 DA=0.0164
%A=51.0 %B=0.0 %C=0.0 %D=49.0 TP=0.133333
MASS RAINFALL=-1

```
    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   20.114    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .005096 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .163724HR    TP =   .133333HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   10.882    CFS   UNIT VOLUME =    .9983       B =   273.54      P60 = 1.8700
    AREA =      .005304 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=3  CODE=1

                              PARTIAL HYDROGRAPH   130.50

    RUNOFF VOLUME =     1.18708 INCHES     =        .6584 ACRE-FEET
    PEAK DISCHARGE RATE =     18.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0104 SQ. MI.


** ADD BASIN 130.5 HYDROGRAPH TO ARROYO FLOW SOUTH OF I-40**********************
ADD HYD             ID=4  HYDROGRAPH NO=130.51 ID I=1  ID II=3
PRINT HYD           ID=4  CODE=1

                              PARTIAL HYDROGRAPH   130.51


    RUNOFF VOLUME =      .51416 INCHES     =       5.4706 ACRE-FEET
    PEAK DISCHARGE RATE =     123.16 CFS  AT   1.600 HOURS   BASIN AREA =   .1995 SQ. MI.


** COMPUTE HYDROGRAPH FOR BASIN 130.6*****************************************
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=130.6  DA=0.0544
                    %A=90.0  %B=10.0  %C=0.0  %D=0.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .160454HR    TP =   .133333HR    K/TP RATIO =  1.203411     SHAPE CONSTANT, N =  2.953513
    UNIT PEAK =   113.43    CFS   UNIT VOLUME =    .9996       B =   278.01      P60 = 1.8700
    AREA =      .054400 SQ MI    IA =    .63500 INCHES    INF =   1.62800 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                              PARTIAL HYDROGRAPH   130.60


    RUNOFF VOLUME =      .45893 INCHES     =       1.3315 ACRE-FEET
    PEAK DISCHARGE RATE =     47.46 CFS  AT   1.533 HOURS   BASIN AREA =   .0544 SQ. MI.
```

** ROUTE FLOWS DOWN ARROYO FROM THE SOUTH SIDE OF I-40 TO SOUTH BOUNDARY OF **
** BASIN 130.6**********

COMPUTE RATING CURVE CID=4 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=14.5 FT MAXIMUM ELEV=30.0FT
CHANNEL SLOPE=0.0278 FLOOD PLAIN SLOPE=0.0286
N=0.035 DIST=20 N=-0.030 DIST=52 N=0.035 DIST=72

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	105.0	20	104.0	28	100.0	45	100.0
52	104.0	72	105.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
14.50	.0	.0
15.32	.0	.0
16.13	.0	.0
16.95	.0	.0
17.76	.0	.0
18.58	.0	.0
19.39	.0	.0
20.21	.0	.0
21.03	.0	.0
21.84	.0	.0
22.66	.0	.0
23.47	.0	.0
24.29	.0	.0
25.11	.0	.0
25.92	.0	.0
26.74	.0	.0
27.55	.0	.0
28.37	.0	.0
29.18	.0	.0
30.00	.0	.0

COMPUTE TRAVEL TIME ID=3 REACH NO=4 VALLEY SECTIONS=1
LENGTH=1800 FT SLOPE=0.0278

TRAVEL TIME TABLE

REACH= 4.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.1486
.632	10.271	53.32	.0963
.947	16.005	106.13	.0754
1.263	22.138	173.83	.0637
1.579	28.670	255.93	.0560
1.895	35.601	352.26	.0505
2.211	42.931	462.87	.0464
2.526	50.659	587.89	.0431
2.842	58.786	727.53	.0404
3.158	67.313	882.05	.0382
3.474	76.238	1051.73	.0362

3.789	85.562	1236.89	.0346
4.105	95.285	1437.85	.0331
4.421	105.407	1654.94	.0318
4.737	115.927	1888.50	.0307
5.053	126.897	2147.74	.0295
5.368	140.608	2474.56	.0284
5.684	158.309	2838.19	.0279
6.000	179.998	3248.30	.0277

```
ROUTE              ID=3  HYDROGRAPH NO=130.52 INFLOW ID=4  DT=0.033333
PRINT HYD          ID=3  CODE=1

                              PARTIAL HYDROGRAPH   130.52

    RUNOFF VOLUME =      .51416 INCHES     =       5.4707 ACRE-FEET
    PEAK DISCHARGE RATE =     113.69 CFS  AT   1.667 HOURS   BASIN AREA =   .1995 SQ. MI.

** ADD THE HYDROGRAPH FOR BASIN 130.6 TO THE ARROYO FLOW************************
ADD HYD            ID=4  HYDROGRAPH NO=130.61 ID I=1  ID II=3
PRINT HYD          ID=4  CODE=1

                              PARTIAL HYDROGRAPH   130.61

    RUNOFF VOLUME =      .50233 INCHES     =       6.8021 ACRE-FEET
    PEAK DISCHARGE RATE =     144.82 CFS  AT   1.633 HOURS   BASIN AREA =   .2539 SQ. MI.

**COMPUTE HYDROGRAPH FOR BASIN 130.7*****************************************
COMPUTE NM HYD     ID=1  HYDROGRAPH NO=130.7  DA=0.0326
                   %A=100.0  %B=0.0  %C=0.0  %D=0.0  TP=0.133333
                   MASS RAINFALL=-1

    K =   .163724HR    TP =   .133333HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   66.882    CFS   UNIT VOLUME =    .9994       B =   273.54      P60 = 1.8700
    AREA =      .032600 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID=1  CODE=1

                              PARTIAL HYDROGRAPH   130.70

    RUNOFF VOLUME =      .43922 INCHES     =        .7637 ACRE-FEET
    PEAK DISCHARGE RATE =     27.06 CFS  AT   1.533 HOURS   BASIN AREA =   .0326 SQ. MI.

** ROUTE FLOWS IN ARROYO TO THE EAST BOUNDARY OF BASIN 130.7*******************
COMPUTE RATING CURVE CID=5  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                   MINIMUM ELEV=71.3 FT  MAXIMUM ELEV=75.0FT
```

CHANNEL SLOPE=0.0230 FLOOD PLAIN SLOPE=0.0286
N=0.035 DIST=40 N=-0.030 DIST=50 N=0.035 DIST=100

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	105.0	20	104.0	28	100.0	43	100.0
53	104.0	73	105.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
71.30	.0	.0
71.49	.0	.0
71.69	.0	.0
71.88	.0	.0
72.08	.0	.0
72.27	.0	.0
72.47	.0	.0
72.66	.0	.0
72.86	.0	.0
73.05	.0	.0
73.25	.0	.0
73.44	.0	.0
73.64	.0	.0
73.83	.0	.0
74.03	.0	.0
74.22	.0	.0
74.42	.0	.0
74.61	.0	.0
74.81	.0	.0
75.00	.0	.0

COMPUTE TRAVEL TIME ID=3 REACH NO=5 VALLEY SECTIONS=1
LENGTH=1000 FT SLOPE=0.0230

TRAVEL TIME TABLE

REACH= 5.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.0826
.632	10.271	53.32	.0535
.947	16.005	106.13	.0419
1.263	22.138	173.83	.0354
1.579	28.670	255.93	.0311
1.895	35.601	352.26	.0281
2.211	42.931	462.87	.0258
2.526	50.659	587.89	.0239
2.842	58.786	727.53	.0224
3.158	67.313	882.05	.0212
3.474	76.238	1051.73	.0201
3.789	85.562	1236.89	.0192
4.105	95.285	1437.85	.0184
4.421	105.407	1654.94	.0177
4.737	115.927	1888.50	.0171

5.053	126.897	2147.74	.0164
5.368	140.608	2474.56	.0158
5.684	158.309	2838.19	.0155
6.000	179.998	3248.30	.0154

ROUTE ID=3 HYDROGRAPH NO=130.62 INFLOW ID=4 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 130.62

RUNOFF VOLUME = .50233 INCHES = 6.8022 ACRE-FEET
PEAK DISCHARGE RATE = 142.51 CFS AT 1.667 HOURS BASIN AREA = .2539 SQ. MI.

** ADD HYDROGRAPH FOR BASIN 130.7 TO FLOW IN THE SOUTH ARROYO AT WEST BOUNDARY
** OF THE ATRISCO BUSINESS PARK
ADD HYD ID=5 HYDROGRAPH NO=130.71 ID I=3 ID II=1
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 130.71

RUNOFF VOLUME = .49515 INCHES = 7.5658 ACRE-FEET
PEAK DISCHARGE RATE = 159.38 CFS AT 1.633 HOURS BASIN AREA = .2865 SQ. MI.

** ROUTE FLOWS IN NORTH ARROYO FROM THE NORTH SIDE OF I-40 THROUGH 4X6X3 BOX
** CULVERTS TO THE SOUTH SIDE OF I-40
COMPUTE RATING CURVE CID=6 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=104FT
CHANNEL SLOPE=0.020 FLOOD PLAIN SLOPE=0.020
M=-0.013 DIST=20.1

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	104	0.1	100	6.0	100	6.1	104
7	104	7.1	100	13.0	100	13.1	104
14	104	14.1	100	20.0	100	20.1	104

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.21	3.7	20.4
100.42	7.5	62.1
100.63	11.2	117.4
100.84	15.0	182.8
101.05	18.7	256.2
101.26	22.5	336.0
101.47	26.2	421.1
101.68	30.0	510.8
101.89	33.8	604.3
102.11	37.6	701.2

102.32	41.4	801.1
102.53	45.2	903.5
102.74	49.0	1008.3
102.95	52.8	1115.2
103.16	56.6	1223.9
103.37	60.5	1334.4
103.58	64.3	1446.5
103.79	68.2	1560.0
104.00	72.0	1674.9

COMPUTE TRAVEL TIME ID=3 REACH NO=6 VALLEY SECTIONS=1
LENGTH=300 FT SLOPE=0.020

TRAVEL TIME TABLE

REACH= 6.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.0248
.632	10.271	53.32	.0161
.947	16.005	106.13	.0126
1.263	22.138	173.83	.0106
1.579	28.670	255.93	.0093
1.895	35.601	352.26	.0084
2.211	42.931	462.87	.0077
2.526	50.659	587.89	.0072
2.842	58.786	727.53	.0067
3.158	67.313	882.05	.0064
3.474	76.238	1051.73	.0060
3.789	85.562	1236.89	.0058
4.105	95.285	1437.85	.0055
4.421	105.407	1654.94	.0053
4.737	115.927	1888.50	.0051
5.053	126.897	2147.74	.0049
5.368	140.608	2474.56	.0047
5.684	158.309	2838.19	.0046
6.000	179.998	3248.30	.0046

ROUTE ID=3 HYDROGRAPH NO=120.31 INFLOW ID=2 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 120.31

RUNOFF VOLUME = .43923 INCHES = 4.1603 ACRE-FEET
PEAK DISCHARGE RATE = 96.33 CFS AT 1.633 HOURS BASIN AREA = .1776 SQ. MI.

** COMPUTE HYDROGRAPH BASIN 120.4 (A SEGMENT OF I-40)**********
COMPUTE NM HYD ID=1 HYDROGRAPH NO=120.4 DA=0.0091
%A=51.0 %B=0.0 %C=0.0 %D=49.0 TP=0.133333
MASS RAINFALL=-1

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420

UNIT PEAK = 17.600 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .004459 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .163724HR TP = .133333HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 9.5214 CFS UNIT VOLUME = .9981 B = 273.54 P60 = 1.8700
AREA = .004641 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 120.40

RUNOFF VOLUME = 1.18708 INCHES = .5761 ACRE-FEET
PEAK DISCHARGE RATE = 16.25 CFS AT 1.500 HOURS BASIN AREA = .0091 SQ. MI.

** ADD HYDROGRAPH FOR BASIN 120.4 TO ARROYO FLOWS**********
ADD HYD ID=2 HYDROGRAPH NO=120.41 ID I=3 ID II=1
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 120.41

RUNOFF VOLUME = .47567 INCHES = 4.7364 ACRE-FEET
PEAK DISCHARGE RATE = 106.21 CFS AT 1.633 HOURS BASIN AREA = .1867 SQ. MI.

** ROUTE FLOWS IN ARROYO TO EAST BOUNDARY OF BASIN 120.5**********
COMPUTE RATING CURVE CID=6 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=3.8 FT MAXIMUM ELEV=8.5FT
CHANNEL SLOPE=0.0244 FLOOD PLAIN SLOPE=0.0272
N=0.035 DIST=20.0 N=-0.030 DIST=57.0 N=0.035 DIST=77.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.0	20	105.0	30	100.0	47	100.0
57	105.0	77	106.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
3.80	.0	.0
4.05	.0	.0
4.29	.0	.0
4.54	.0	.0
4.79	.0	.0
5.04	.0	.0
5.28	.0	.0
5.53	.0	.0
5.78	.0	.0

6.03	.0	.0
6.27	.0	.0
6.52	.0	.0
6.77	.0	.0
7.02	.0	.0
7.26	.0	.0
7.51	.0	.0
7.76	.0	.0
8.01	.0	.0
8.25	.0	.0
8.50	.0	.0

COMPUTE TRAVEL TIME ID=1 REACH NO=7 VALLEY SECTIONS=1
LENGTH=1700 FT SLOPE=0.0244

TRAVEL TIME TABLE

REACH= 7.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	4.936	16.61	.1403
.632	10.271	53.32	.0910
.947	16.005	106.13	.0712
1.263	22.138	173.83	.0601
1.579	28.670	255.93	.0529
1.895	35.601	352.26	.0477
2.211	42.931	462.87	.0438
2.526	50.659	587.89	.0407
2.842	58.786	727.53	.0382
3.158	67.313	882.05	.0360
3.474	76.238	1051.73	.0342
3.789	85.562	1236.89	.0327
4.105	95.285	1437.85	.0313
4.421	105.407	1654.94	.0301
4.737	115.927	1888.50	.0290
5.053	126.897	2147.74	.0279
5.368	140.608	2474.56	.0268
5.684	158.309	2838.19	.0263
6.000	179.998	3248.30	.0262

ROUTE ID=1 HYDROGRAPH NO=120.42 INFLOW ID=2 DT=0.033333
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 120.42

RUNOFF VOLUME = .47568 INCHES = 4.7364 ACRE-FEET
PEAK DISCHARGE RATE = 99.20 CFS AT 1.667 HOURS BASIN AREA = .1867 SQ. MI.

COMPUTE HYDROGRAPH FOR BASIN 120.5 ********
COMPUTE NM HYD ID=2 HYDROGRAPH NO=120.5 DA=0.0162
%A=100.0 %B=0.0 %C=0.0 %D=0.0 TP=0.133333
MASS RAINFALL=-1

```
    K =   .163724HR    TP =   .133333HR   K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   33.236    CFS   UNIT VOLUME =    .9992       B =   273.54      P60 = 1.8700
    AREA =      .016200 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2    CODE=1

                              PARTIAL HYDROGRAPH   120.50


    RUNOFF VOLUME =      .43922 INCHES     =        .3795 ACRE-FEET
    PEAK DISCHARGE RATE =      13.45 CFS  AT   1.533 HOURS   BASIN AREA =   .0162 SQ. MI.


** ADD HYDROGRAPH FOR BASIN 120.5 TO ARROYO FLOW AT WEST BOUNDARY OF ATRISCO
** BUSINESS PARK
ADD HYD             ID=3  HYDROGRAPH NO=120.51  ID I=2  ID II=1
PRINT HYD           ID=3  CODE=1

                              PARTIAL HYDROGRAPH   120.51


    RUNOFF VOLUME =      .47276 INCHES     =       5.1159 ACRE-FEET
    PEAK DISCHARGE RATE =     106.85 CFS  AT   1.667 HOURS   BASIN AREA =   .2029 SQ. MI.


**COMPUTE HYDROGRAPH FOR BASIN 120.6**********************************************
COMPUTE NM HYD      ID=6  HYDROGRAPH NO=120.6  DA=0.0313
                    %A=98.0  %B=0.0  %C=0.0  %D=2.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.4709    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000626 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .163724HR    TP =   .133333HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   62.931    CFS   UNIT VOLUME =    .9994       B =   273.54      P60 = 1.8700
    AREA =      .030674 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=6    CODE=1

                              PARTIAL HYDROGRAPH   120.60


    RUNOFF VOLUME =      .46974 INCHES     =        .7842 ACRE-FEET
    PEAK DISCHARGE RATE =      27.13 CFS  AT   1.533 HOURS   BASIN AREA =   .0313 SQ. MI.
```

```
** ADD HYDROGRAPH FOR BASIN 120.6 TO ARROYO FLOW AT WEST BOUNDARY OF ATRISCO
** BUSINESS PARK
ADD HYD          ID=7  HYDROGRAPH NO=120.61  ID I=3  ID II=6
PRINT HYD        ID=7  CODE=1

                              PARTIAL HYDROGRAPH   120.61


    RUNOFF VOLUME =      .47236 INCHES     =       5.9000 ACRE-FEET
    PEAK DISCHARGE RATE =    122.20 CFS  AT   1.667 HOURS   BASIN AREA =   .2342 SQ. MI.


*******************************************************************************
** BEGIN PROPOSED UNSER DIVERSION CHANNEL APPROXIMENTLY 900 LF NORTH OF LOS
** VOLCANES ROAD
*******************************************************************************
** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL FROM NORTH ARROYO TO SOUTH
** ARROYO. USE AVERAGE SLOPE
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                  MINIMUM ELEV=100.0  MAXIMUM ELEV=106.0
                  CHANNEL SLOPE=0.015  FLOOD PLAIN SLOPE=0.015
                  N=0.017  DIST=50.0
                  DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                    0   106.2    2.0   106.0  20.0   100.0  30.0   100.01
                  48.0  106.0   50.0   106.2

                              RATING CURVE VALLEY SECTION  1.0
                                  WATER     FLOW      FLOW
                                 SURFACE    AREA      RATE
                                  ELEV      SQ FT     CFS
                                 100.00       .0        .0
                                 100.32       3.4      15.7
                                 100.63       7.4      52.4
                                 100.95      12.1     107.5
                                 101.26      17.3     181.2
                                 101.58      23.2     274.1
                                 101.89      29.6     387.1
                                 102.21      36.7     521.1
                                 102.53      44.3     677.3
                                 102.84      52.5     856.5
                                 103.16      61.4    1060.0
                                 103.47      70.8    1288.6
                                 103.79      80.8    1543.4
                                 104.11      91.5    1825.4
                                 104.42     102.7    2135.6
                                 104.74     114.5    2475.0
                                 105.05     127.0    2844.5
                                 105.37     140.0    3245.2
                                 105.68     153.6    3677.8
                                 106.00     167.9    4143.5
COMPUTE TRAVEL TIME ID=10  REACH NO=8.1  VALLEY SECTIONS=1
                  LENGTH=600 FT  SLOPE=0.015
```

TRAVEL TIME TABLE

REACH= 8.1

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0360
.632	7.445	52.40	.0237
.947	12.090	107.54	.0187
1.263	17.334	181.22	.0159
1.579	23.178	274.11	.0141
1.895	29.619	387.09	.0128
2.211	36.660	521.15	.0117
2.526	44.300	677.29	.0109
2.842	52.538	856.55	.0102
3.158	61.376	1059.97	.0097
3.474	70.812	1288.57	.0092
3.789	80.847	1543.37	.0087
4.105	91.481	1825.38	.0084
4.421	102.713	2135.58	.0080
4.737	114.545	2474.97	.0077
5.053	126.975	2844.51	.0074
5.368	140.004	3245.15	.0072
5.684	153.632	3677.84	.0070
6.000	167.859	4143.51	.0068

PRINT HYD ID=10 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.

ROUTE ID=10 HYDROGRAPH NO=120.62 INFLOW ID=7 DT=0.0
** ADD SOUTH ARROYO FLOWS TO PROPOSED CHANNEL AT JUNCTION WITH SOUTH ARROYO****
ADD HYD ID=11 HYDROGRAPH NO=130.72 ID I=10 ID II=5
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.72

RUNOFF VOLUME = .48490 INCHES = 13.4658 ACRE-FEET
PEAK DISCHARGE RATE = 280.49 CFS AT 1.667 HOURS BASIN AREA = .5207 SQ. MI.

** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL TO LOS VOLCANES ROAD******
COMPUTE RATING CURVE CID=2 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0240 FLOOD PLAIN SLOPE=0.0240
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	19.9
100.63	7.4	66.3
100.95	12.1	136.0
101.26	17.3	229.2
101.58	23.2	346.7
101.89	29.6	489.6
102.21	36.7	659.2
102.53	44.3	856.7
102.84	52.5	1083.5
103.16	61.4	1340.8
103.47	70.8	1629.9
103.79	80.8	1952.2
104.11	91.5	2308.9
104.42	102.7	2701.3
104.74	114.5	3130.6
105.05	127.0	3598.1
105.37	140.0	4104.8
105.68	153.6	4652.1
106.00	167.9	5241.2

COMPUTE TRAVEL TIME ID=10 REACH NO=8.2 VALLEY SECTIONS=1
LENGTH=340 FT SLOPE=0.0240

TRAVEL TIME TABLE

REACH= 8.2

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0204
.632	7.445	52.40	.0134
.947	12.090	107.54	.0106
1.263	17.334	181.22	.0090
1.579	23.178	274.11	.0080
1.895	29.619	387.09	.0072
2.211	36.660	521.15	.0066
2.526	44.300	677.29	.0062
2.842	52.538	856.55	.0058
3.158	61.376	1059.97	.0055
3.474	70.812	1288.57	.0052
3.789	80.847	1543.37	.0049
4.105	91.481	1825.38	.0047
4.421	102.713	2135.58	.0045
4.737	114.545	2474.97	.0044
5.053	126.975	2844.51	.0042
5.368	140.004	3245.15	.0041

```
                                5.684     153.632     3677.84       .0039
                                6.000     167.859     4143.51       .0038
ROUTE                ID=10  HYDROGRAPH NO=130.73 INFLOW ID=11  DT=0.0
PRINT HYD            ID=10  CODE=1

                                PARTIAL HYDROGRAPH   130.73


    RUNOFF VOLUME =      .48490 INCHES     =      13.4659 ACRE-FEET
    PEAK DISCHARGE RATE =     281.48 CFS  AT   1.667 HOURS   BASIN AREA =   .5207 SQ. MI.


** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL TO BLUEWATER ROAD********
COMPUTE RATING CURVE CID=3  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=100.0  MAXIMUM ELEV=106.0
                    CHANNEL SLOPE=0.01  FLOOD PLAIN SLOPE=0.01
                    N=0.017  DIST=50.0
                    DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                      0   106.2    2.0   106.0  20.0   100.0  30.0   100.01
                    48.0  106.0   50.0   106.2

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER      FLOW       FLOW
                                  SURFACE     AREA       RATE
                                   ELEV       SQ FT      CFS
                                  100.00        .0         .0
                                  100.32        3.4       12.8
                                  100.63        7.4       42.8
                                  100.95       12.1       87.8
                                  101.26       17.3      148.0
                                  101.58       23.2      223.8
                                  101.89       29.6      316.1
                                  102.21       36.7      425.5
                                  102.53       44.3      553.0
                                  102.84       52.5      699.4
                                  103.16       61.4      865.5
                                  103.47       70.8     1052.1
                                  103.79       80.8     1260.2
                                  104.11       91.5     1490.4
                                  104.42      102.7     1743.7
                                  104.74      114.5     2020.8
                                  105.05      127.0     2322.5
                                  105.37      140.0     2649.7
                                  105.68      153.6     3002.9
                                  106.00      167.9     3383.2
COMPUTE TRAVEL TIME ID=11  REACH NO=8.3  VALLEY SECTIONS=1
                    LENGTH=1100 FT  SLOPE=0.0087

                            TRAVEL TIME TABLE
                                          REACH=  8.3

                            WATER       AVERAGE     FLOW        TRAVEL
                            DEPTH       AREA        RATE        TIME
```

FEET	SQ.FT.	CFS	HRS
.316	3.398	15.72	.0661
.632	7.445	52.40	.0434
.947	12.090	107.54	.0344
1.263	17.334	181.22	.0292
1.579	23.178	274.11	.0258
1.895	29.619	387.09	.0234
2.211	36.660	521.15	.0215
2.526	44.300	677.29	.0200
2.842	52.538	856.55	.0187
3.158	61.376	1059.97	.0177
3.474	70.812	1288.57	.0168
3.789	80.847	1543.37	.0160
4.105	91.481	1825.38	.0153
4.421	102.713	2135.58	.0147
4.737	114.545	2474.97	.0141
5.053	126.975	2844.51	.0136
5.368	140.004	3245.15	.0132
5.684	153.632	3677.84	.0128
6.000	167.859	4143.51	.0124

ROUTE ID=11 HYDROGRAPH NO=130.74 INFLOW ID=10 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 130.74

RUNOFF VOLUME = .48490 INCHES = 13.4658 ACRE-FEET
PEAK DISCHARGE RATE = 281.10 CFS AT 1.667 HOURS BASIN AREA = .5207 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 140.1 **********
COMPUTE NM HYD ID=1 HYDROGRAPH NO=140.1 DA=0.0867
%A=90.0 %B=6.0 %C=4.0 %D=0.0 TP=0.133333
MASS RAINFALL=-1

K = .156768HR TP = .133333HR K/TP RATIO = 1.175763 SHAPE CONSTANT, N = 3.017465
UNIT PEAK = 184.18 CFS UNIT VOLUME = .9997 B = 283.24 P60 = 1.8700
AREA = .086700 SQ MI IA = .62900 INCHES INF = 1.61120 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 140.10

RUNOFF VOLUME = .46688 INCHES = 2.1589 ACRE-FEET
PEAK DISCHARGE RATE = 77.97 CFS AT 1.533 HOURS BASIN AREA = .0867 SQ. MI.

** ADD FLOWS FROM BASIN 140.1 WEST OF TRACT J TO THE PROPOSED UNSER DIVERSION
** CHANNEL
ADD HYD ID=10 HYDROGRAPH NO=140.11 ID I=11 ID II=1

** ROUTE CHANNEL FLOW FROM BLUEWATER ROAD TO THE SOUTH LOT LINE OF LOT 2*******
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0036 FLOOD PLAIN SLOPE=0.0036
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	7.7
100.63	7.4	25.7
100.95	12.1	52.7
101.26	17.3	88.8
101.58	23.2	134.3
101.89	29.6	189.6
102.21	36.7	255.3
102.53	44.3	331.8
102.84	52.5	419.6
103.16	61.4	519.3
103.47	70.8	631.3
103.79	80.8	756.1
104.11	91.5	894.2
104.42	102.7	1046.2
104.74	114.5	1212.5
105.05	127.0	1393.5
105.37	140.0	1589.8
105.68	153.6	1801.8
106.00	167.9	2029.9

COMPUTE TRAVEL TIME ID=11 REACH NO=8.3 VALLEY SECTIONS=1
LENGTH=1100 FT SLOPE=0.0036

TRAVEL TIME TABLE
REACH= 8.3

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	7.70	.1349
.632	7.445	25.67	.0886
.947	12.090	52.68	.0701
1.263	17.334	88.78	.0597
1.579	23.178	134.29	.0527
1.895	29.619	189.64	.0477
2.211	36.660	255.31	.0439
2.526	44.300	331.80	.0408
2.842	52.538	419.62	.0383
3.158	61.376	519.28	.0361
3.474	70.812	631.27	.0343
3.789	80.847	756.09	.0327

4.105	91.481	894.25	.0313
4.421	102.713	1046.22	.0300
4.737	114.545	1212.48	.0289
5.053	126.975	1393.52	.0278
5.368	140.004	1589.79	.0269
5.684	153.632	1801.77	.0261
6.000	167.859	2029.90	.0253

ROUTE ID=11 HYDROGRAPH NO=140.12 INFLOW ID=10 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 140.12

RUNOFF VOLUME = .48233 INCHES = 15.6247 ACRE-FEET
PEAK DISCHARGE RATE = 315.65 CFS AT 1.700 HOURS BASIN AREA = .6074 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 150.1
COMPUTE NM HYD ID=1 HYDROGRAPH NO=150.1 DA=0.1448
%A=100.0 %B=0.0 %C=0.0 %D=0.0 TP=0.2285
MASS RAINFALL=-1

K = .263704HR TP = .228500HR K/TP RATIO = 1.154065 SHAPE CONSTANT, N = 3.070341
UNIT PEAK = 182.19 CFS UNIT VOLUME = .9999 B = 287.51 P60 = 1.8700
AREA = .144800 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 150.10

RUNOFF VOLUME = .43922 INCHES = 3.3919 ACRE-FEET
PEAK DISCHARGE RATE = 77.31 CFS AT 1.633 HOURS BASIN AREA = .1448 SQ. MI.

** ADD FLOWS FROM BASIN 150.1 (WEST OF LOT 2) TO PROPOSED UNSER DIVERSION
** CHANNEL AT THE WEST LINE OF LOT2**********
ADD HYD ID=10 HYDROGRAPH NO=150.11 ID I=11 ID II=1
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 150.11

RUNOFF VOLUME = .47403 INCHES = 19.0166 ACRE-FEET
PEAK DISCHARGE RATE = 387.97 CFS AT 1.667 HOURS BASIN AREA = .7522 SQ. MI.

** COMPUTE HYDROGRAPH FOR LOT 2 (UNDEVELOPED CONDITION)**********
COMPUTE NM HYD ID=1 HYDROGRAPH NO=160.1 DA=0.0517
%A=90.0 %B=0.0 %C=10.0 %D=0.0 TP=0.13333

```
                    MASS RAINFALL=-1

    K =   .157938HR    TP =   .133330HR    K/TP RATIO = 1.184562     SHAPE CONSTANT, M =  2.996709
    UNIT PEAK =   109.17    CFS   UNIT VOLUME =    .9997       B =   281.55      P60 = 1.8700
    AREA =      .051700 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   160.10


    RUNOFF VOLUME =      .47911 INCHES     =       1.3211 ACRE-FEET
    PEAK DISCHARGE RATE =      47.24 CFS  AT   1.533 HOURS   BASIN AREA =   .0517 SQ. MI.
```

```
*S ASSUME ALL FLOWS FROM LOT 2 ARE RETAINED ONSITE
** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL FROM THE WEST LOT LINE OF
** LOT 2 TO THE EAST LOT LINE OF LOT 2
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=100.0  MAXIMUM ELEV=106.0
                    CHANNEL SLOPE=0.018  FLOOD PLAIN SLOPE=0.018
                    N=0.0170  DIST=50.0
                    DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                      0   106.2    2.0   106.0  20.0   100.0  30.0   100.01
                    48.0  106.0   50.0   106.2
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	17.2
100.63	7.4	57.4
100.95	12.1	117.8
101.26	17.3	198.5
101.58	23.2	300.3
101.89	29.6	424.0
102.21	36.7	570.9
102.53	44.3	741.9
102.84	52.5	938.3
103.16	61.4	1161.1
103.47	70.8	1411.6
103.79	80.8	1690.7
104.11	91.5	1999.6
104.42	102.7	2339.4
104.74	114.5	2711.2
105.05	127.0	3116.0
105.37	140.0	3554.9
105.68	153.6	4028.9
106.00	167.9	4539.0

```
COMPUTE TRAVEL TIME ID=12 REACH NO=10  VALLEY SECTIONS=1
                    LENGTH=1300 FT  SLOPE=0.018
```

TRAVEL TIME TABLE

REACH= 10.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	17.22	.0713
.632	7.445	57.40	.0468
.947	12.090	117.80	.0371
1.263	17.334	198.52	.0315
1.579	23.178	300.27	.0279
1.895	29.619	424.04	.0252
2.211	36.660	570.89	.0232
2.526	44.300	741.93	.0216
2.842	52.538	938.30	.0202
3.158	61.376	1161.14	.0191
3.474	70.812	1411.56	.0181
3.789	80.847	1690.68	.0173
4.105	91.481	1999.60	.0165
4.421	102.713	2339.41	.0159
4.737	114.545	2711.20	.0153
5.053	126.975	3116.01	.0147
5.368	140.004	3554.89	.0142
5.684	153.632	4028.87	.0138
6.000	167.859	4538.99	.0134

ROUTE ID=12 HYDROGRAPH NO=160.11 INFLOW ID=10 DT=0.0
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 160.11

RUNOFF VOLUME = .47403 INCHES = 19.0166 ACRE-FEET
PEAK DISCHARGE RATE = 387.20 CFS AT 1.700 HOURS BASIN AREA = .7522 SQ. MI.

** ROUTE CHANNEL FLOW FROM THE EAST LOT LINE OF LOT 2 TO A POINT 700 LF TO THE
** EAST
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.015 FLOOD PLAIN SLOPE=0.015
N=0.0170 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	15.7
100.63	7.4	52.4

100.95	12.1	107.5
101.26	17.3	181.2
101.58	23.2	274.1
101.89	29.6	387.1
102.21	36.7	521.1
102.53	44.3	677.3
102.84	52.5	856.5
103.16	61.4	1060.0
103.47	70.8	1288.6
103.79	80.8	1543.4
104.11	91.5	1825.4
104.42	102.7	2135.6
104.74	114.5	2475.0
105.05	127.0	2844.5
105.37	140.0	3245.2
105.68	153.6	3677.8
106.00	167.9	4143.5

COMPUTE TRAVEL TIME ID=11 REACH NO=11 VALLEY SECTIONS=1
LENGTH=700 FT SLOPE=0.015

TRAVEL TIME TABLE

REACH= 11.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0420
.632	7.445	52.40	.0276
.947	12.090	107.54	.0219
1.263	17.334	181.22	.0186
1.579	23.178	274.11	.0164
1.895	29.619	387.09	.0149
2.211	36.660	521.15	.0137
2.526	44.300	677.29	.0127
2.842	52.538	856.55	.0119
3.158	61.376	1059.97	.0113
3.474	70.812	1288.57	.0107
3.789	80.847	1543.37	.0102
4.105	91.481	1825.38	.0097
4.421	102.713	2135.58	.0094
4.737	114.545	2474.97	.0090
5.053	126.975	2844.51	.0087
5.368	140.004	3245.15	.0084
5.684	153.632	3677.84	.0081
6.000	167.859	4143.51	.0079

ROUTE ID=11 HYDROGRAPH NO=160.13 INFLOW ID=12 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 160.13

RUNOFF VOLUME = .47403 INCHES = 19.0166 ACRE-FEET
PEAK DISCHARGE RATE = 386.97 CFS AT 1.700 HOURS BASIN AREA = .7522 SQ. MI.

** ROUTE CHANNEL FLOW FROM APPROX. 500 LF WEST OF UNSER BOULEVARD TO UNSER BLVD
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0065 FLOOD PLAIN SLOPE=0.0065
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	10.3
100.63	7.4	34.5
100.95	12.1	70.8
101.26	17.3	119.3
101.58	23.2	180.4
101.89	29.6	254.8
102.21	36.7	343.1
102.53	44.3	445.8
102.84	52.5	563.8
103.16	61.4	697.8
103.47	70.8	848.2
103.79	80.8	1016.0
104.11	91.5	1201.6
104.42	102.7	1405.8
104.74	114.5	1629.2
105.05	127.0	1872.5
105.37	140.0	2136.2
105.68	153.6	2421.1
106.00	167.9	2727.6

COMPUTE TRAVEL TIME ID=10 REACH NO=12 VALLEY SECTIONS=1
LENGTH=500 FT SLOPE=0.0065

TRAVEL TIME TABLE
REACH= 12.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	10.34	.0456
.632	7.445	34.49	.0300
.947	12.090	70.79	.0237
1.263	17.334	119.29	.0202
1.579	23.178	180.44	.0178
1.895	29.619	254.82	.0161
2.211	36.660	343.06	.0148
2.526	44.300	445.84	.0138
2.842	52.538	563.85	.0129
3.158	61.376	697.76	.0122

3.474	70.812	848.24	.0116
3.789	80.847	1015.97	.0111
4.105	91.481	1201.61	.0106
4.421	102.713	1405.81	.0101
4.737	114.545	1629.23	.0098
5.053	126.975	1872.49	.0094
5.368	140.004	2136.22	.0091
5.684	153.632	2421.05	.0088
6.000	167.859	2727.59	.0085

```
ROUTE              ID=10  HYDROGRAPH NO=160.14  INFLOW ID=11  DT=0.0
PRINT HYD          ID=10  CODE=1
```

PARTIAL HYDROGRAPH 160.14

RUNOFF VOLUME = .47403 INCHES = 19.0166 ACRE-FEET
PEAK DISCHARGE RATE = 385.49 CFS AT 1.733 HOURS BASIN AREA = .7522 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR LOT 1 FLOWS*****************************************
COMPUTE NM HYD     ID=1  HYDROGRAPH NO=160.2  DA=0.0350
                   %A=40.0  %B=5.0  %C=20.0  %D=35.0  TP=0.13333
                   MASS RAINFALL=-1

   K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   48.353    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
   AREA =      .012250 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


   K =   .143411HR    TP =   .133330HR    K/TP RATIO =  1.075613     SHAPE CONSTANT, N =  3.283992
   UNIT PEAK =   51.907    CFS   UNIT VOLUME =    .9998       B =   304.21      P60 = 1.8700
   AREA =      .022750 SQ MI    IA =    .54615 INCHES    INF =   1.37923 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID=1  CODE=1
```

PARTIAL HYDROGRAPH 160.20

RUNOFF VOLUME = 1.07072 INCHES = 1.9987 ACRE-FEET
PEAK DISCHARGE RATE = 59.72 CFS AT 1.500 HOURS BASIN AREA = .0350 SQ. MI.

```
** ROUTE LOT 1 FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 22 CFS
** APPROX 1.3 CFS PER ACRE
ROUTE RESERVOIR    ID=2  HYDROGRAPH NO=160.21 INFLOW ID=1  CODE=20
                   OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                        0             0              100.0
                       21.99          0.01           101.0
                       22.00         10.00           103.0
```

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
1.33	10.87	100.46	.005	10.17
2.00	10.86	101.09	.458	21.99
2.67	1.23	100.06	.001	1.25
3.33	.37	100.02	.000	.38
4.00	.22	100.01	.000	.22
4.67	.20	100.01	.000	.20
5.33	.22	100.01	.000	.22
6.00	.25	100.01	.000	.25
6.67	.01	100.00	.000	.01

PEAK DISCHARGE = 21.991 CFS - PEAK OCCURS AT HOUR 1.73
MAXIMUM WATER SURFACE ELEVATION = 101.118
MAXIMUM STORAGE = .5988 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 160.21

RUNOFF VOLUME = 1.07151 INCHES = 2.0001 ACRE-FEET
PEAK DISCHARGE RATE = 21.99 CFS AT 1.733 HOURS BASIN AREA = .0350 SQ. MI.

** ADD FLOWS FROM LOT 1 TO CHANNEL**********
ADD HYD ID=10 HYDROGRAPH NO=160.22 ID I=2 ID II=10
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 160.22

RUNOFF VOLUME = .50059 INCHES = 21.0167 ACRE-FEET
PEAK DISCHARGE RATE = 407.48 CFS AT 1.733 HOURS BASIN AREA = .7872 SQ. MI.

** ROUTE THE FLOW IN THE PROPOSED UNSER DIVERSION CHANNEL THROUGH A TRAPAZOIDAL
** BOX CULVERT FROM THE WEST SIDE OF UNSER TO THE TIERRA BAYITA STORM DRAIN
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=104FT
CHANNEL SLOPE=0.005 FLOOD PLAIN SLOPE=0.005
N=-0.014 DIST=24

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	104	8.0	100	18.0	100	24.0	104

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE	FLOW AREA	FLOW RATE

ELEV	SQ FT	CFS
100.00	.0	.0
100.21	2.2	5.6
100.42	4.5	18.0
100.63	7.0	35.7
100.84	9.7	58.3
101.05	12.5	85.6
101.26	15.4	117.4
101.47	18.5	153.8
101.68	21.8	194.7
101.89	25.2	240.3
102.11	28.8	290.5
102.32	32.5	345.4
102.53	36.4	405.1
102.74	40.5	469.7
102.95	44.7	539.3
103.16	49.0	613.9
103.37	53.5	693.7
103.58	58.2	778.7
103.79	63.0	869.1
104.00	68.0	965.0

COMPUTE TRAVEL TIME ID=15 REACH NO=12 VALLEY SECTIONS=1
LENGTH=50 FT SLOPE=0.005

TRAVEL TIME TABLE

REACH= 12.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	2.183	5.62	.0054
.421	4.521	18.00	.0035
.632	7.014	35.72	.0027
.842	9.662	58.31	.0023
1.053	12.465	85.57	.0020
1.263	15.424	117.40	.0018
1.474	18.537	153.78	.0017
1.684	21.806	194.73	.0016
1.895	25.230	240.27	.0015
2.105	28.809	290.46	.0014
2.316	32.543	345.38	.0013
2.526	36.432	405.10	.0012
2.737	40.476	469.71	.0012
2.947	44.676	539.28	.0012
3.158	49.030	613.92	.0011
3.368	53.540	693.71	.0011
3.579	58.205	778.75	.0010
3.789	63.025	869.14	.0010
4.000	68.000	964.97	.0010

ROUTE ID=15 HYDROGRAPH NO=160.23 INFLOW ID=10 DT=0.033333
PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 160.23

```
                                                                                *
                                                                                *
                                                                                *
                                                                                *

   RUNOFF VOLUME =      .50059 INCHES     =      21.0168 ACRE-FEET
   PEAK DISCHARGE RATE =     407.95 CFS  AT   1.733 HOURS   BASIN AREA =   .7872 SQ. MI.


*********************************************************************************
*********************************************************************************
*S BEGIN UNSER BOULEVARD STORM DRAIN SYSTEM BETWEEN I-40 AND THE FUTURE TIERRA
** BAYITA STORM DRAIN
*********************************************************************************
** ASSUMPTIONS: ALL WATER ON EAST SIDE OF UNSER IS INTERCEPTED BY THE STORM
** DRAIN EXCEPT THE FLOW WHICH IS IN EXCESS OF THE S.D. CAPACITY BELOW THE
** INLETS ADJACENT TO THE SAD 214 POND.
** FLOW IN EXCESS OF THE STORM DRAIN CAPACITY IN OTHER AREAS IS ASSUMED TO BE
** CARRIED IN THE WEST SIDE OF UNSER WITH A SMALL PORTION OF THE FLOW CROSSING
** OVER TO THE EAST SIDE AT THE INTERSECTION WITH BLUWATER.
** FLOWS FROM TRACT "T" ARE ASSUMED TO BE RETAINED ONSITE IN DITCH DIKES.
** FLOWS FROM TRACTS "J" AND TRACT "K" ARE ASSUMED TO ENTER THE
** STORM DRAIN AT THE INTERSECTION OF BLUEWATER AND UNSER. FLOW FROM
** THE PROPERTY SOUTH OF BLUEWATER ARE ASSUMED TO FLOW TO THE SOUTH
** TO THE PROPOSED UNSER DIVERSION CHANNEL.
*********************************************************************************
** COMPUTE HYDROGRAPH FOR BASIN 170.1 TRACT "T"(UNDEVELOPED CONDITION WITH
** CONSERVATION TREATMENT APPLIED)***********************************************
COMPUTE NM HYD      ID=2  HYD=170.1  DA==0.0633
                    %A=90.0  %B=00.0  %C=10.0  %D=00.0  TP=0.133333
                    MASS RAINFALL=-1

   K =   .157855HR    TP =   .133333HR    K/TP RATIO =  1.183912     SHAPE CONSTANT, N =  2.998234
   UNIT PEAK =   133.73    CFS   UNIT VOLUME =    .9997       B =   281.68      P60 = 1.8700
   AREA =      .063300 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   170.10

   RUNOFF VOLUME =      .47911 INCHES     =       1.6175 ACRE-FEET
   PEAK DISCHARGE RATE =     57.86 CFS  AT   1.533 HOURS   BASIN AREA =   .0633 SQ. MI.


*S ASSUME ALL FLOWS FROM TRACT "T" ARE RETAINED ONSITE
** COMPUTE HYDROGRAPH FOR BASIN 170.2 THE WEST PORTION OF UNSER BOULEVARD
** AND HIGHWAY RIGHT OF WAY NORTH OF LOS VOLCANES
** ASSUME ALL WATER ABOVE THIS BASIN IS INTERCEPTED BY THE INLETS IN UNSER AND
** ROUTED TO THE HIGHWAY INTERCHANGE POND
COMPUTE NM HYD      ID=3  HYD=170.2  DA==0.0077
                    %A=0.0  %B=60.0  %C=0.0  %D=40.0  TP=0.133333
                    MASS RAINFALL=-1

   K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
```

```
    UNIT PEAK =   12.157    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .003080 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131024HR    TP =   .133333HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593454
    UNIT PEAK =   11.334    CFS   UNIT VOLUME =    .9991       B =   327.09      P60 = 1.8700
    AREA =      .004620 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   170.20


    RUNOFF VOLUME =     1.18661 INCHES     =        .4873 ACRE-FEET
    PEAK DISCHARGE RATE =      14.60 CFS  AT   1.500 HOURS   BASIN AREA =   .0077 SQ. MI.


** COMPUTE HYDROGRAPH FOR BASIN 170.3 LOS VOLCANES WEST OF UNSER
COMPUTE NM HYD      ID=4  HYD=170.3  DA==0.0037
                    %A=0.0  %B=10.0  %C=0.0  %D=90.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.144    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003330 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .90769    CFS   UNIT VOLUME =    .9849       B =   327.09      P60 = 1.8700
    AREA =      .000370 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=4 CODE=1

                                PARTIAL HYDROGRAPH   170.30


    RUNOFF VOLUME =     1.83566 INCHES     =        .3622 ACRE-FEET
    PEAK DISCHARGE RATE =       9.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.


** ADD THE HYDROGRAPHS FROM BASIN 170.2 AND 170.3
** AT THE INTERSECTION OF LOS VOLCANES AND UNSER
ADD HYD             ID=2  HYDROGRAPH NO=170.32  ID I=3  ID II=4
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.32
```

RUNOFF VOLUME = 1.39722 INCHES = .8495 ACRE-FEET
PEAK DISCHARGE RATE = 24.40 CFS AT 1.500 HOURS BASIN AREA = .0114 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR BASIN 170.4 THE EAST PORTION OF UNSER BOULEVARD
** AND HIGHWAY RIGHT OF WAY NORTH OF LOS VOLCANES
** ASSUME ALL WATER ABOVE THIS BASIN IS INTERCEPTED BY THE INLETS IN UNSER AND
** ROUTED TO THE HIGHWAY INTERCHANGE POND
COMPUTE NM HYD      ID=3  HYD=170.4  DA==0.0060
                    %A=0.0  %B=45.0  %C=0.0  %D=55.0  TP=0.133333
                    MASS RAINFALL=-1
```

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 13.025 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .003300 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .131024HR TP = .133333HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593454
UNIT PEAK = 6.6235 CFS UNIT VOLUME = .9983 B = 327.09 P60 = 1.8700
AREA = .002700 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

```
PRINT HYD           ID=3 CODE=1
```

PARTIAL HYDROGRAPH 170.40

RUNOFF VOLUME = 1.38133 INCHES = .4420 ACRE-FEET
PEAK DISCHARGE RATE = 12.73 CFS AT 1.500 HOURS BASIN AREA = .0060 SQ. MI.

```
** ADD THE FLOW FROM THE EAST SIDE OF UNSER TO THE TOTAL FLOW ON THE WEST
** SIDE OF UNSER
ADD HYD             ID=5  HYDROGRAPH NO=170.43 ID I=2  ID II=3
PRINT HYD           ID=5  CODE=1
```

PARTIAL HYDROGRAPH 170.43

RUNOFF VOLUME = 1.39172 INCHES = 1.2915 ACRE-FEET
PEAK DISCHARGE RATE = 37.13 CFS AT 1.500 HOURS BASIN AREA = .0174 SQ. MI.

```
** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 30" RCP MIN SLOPE = 0.01
** HYD 170.44 = FLOW TO UNSER STORM DRAIN
** HYD 170.45= FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=5  Q=41.0  ID I=2    HYD I=170.44
                                  ID II=11  HYD II=170.45
PRINT HYD           ID=2  CODE=1
```

****

PARTIAL HYDROGRAPH 170.44

RUNOFF VOLUME = 1.39172 INCHES = 1.2915 ACRE-FEET
PEAK DISCHARGE RATE = 37.13 CFS AT 1.500 HOURS BASIN AREA = .0174 SQ. MI.

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 170.45

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

** ROUTE THE FLOW IN THE UNSER BLVD STORM DRAIN FROM THE INTERSECTION OF
** LOS VOLCANES AND UNSER TO THE SECOND MANHOLE SOUTH OF THE INTERSECTION
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.010
PIPE DIA=30 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	.9
.39	.5	2.2
.52	.7	3.9
.65	1.0	6.1
.78	1.3	8.7
.91	1.6	11.7
1.04	1.9	14.9
1.17	2.3	18.4
1.30	2.6	22.0
1.43	2.9	25.7
1.56	3.2	29.3
1.69	3.5	32.9
1.82	3.8	36.2
1.95	4.1	39.2
2.08	4.4	41.6
2.21	4.6	43.4
2.35	4.8	44.1
2.50	4.9	44.1

COMPUTE TRAVEL TIME ID=1 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=447 FT SLOPE=0.010

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.22	.0563
.261	.271	.93	.0361
.391	.490	2.17	.0280
.521	.741	3.91	.0236
.651	1.017	6.10	.0207
.782	1.312	8.70	.0187
.912	1.620	11.66	.0173
1.042	1.937	14.90	.0161
1.173	2.261	18.37	.0153
1.303	2.586	21.99	.0146
1.433	2.910	25.67	.0141
1.563	3.229	29.33	.0137
1.694	3.540	32.87	.0134
1.824	3.837	36.19	.0132
1.954	4.117	39.16	.0131
2.084	4.373	41.63	.0130
2.215	4.599	43.40	.0132
2.345	4.783	44.12	.0135
2.500	4.909	44.12	.0138

ROUTE ID=1 HYDROGRAPH NO=170.46 INFLOW ID=2 DT=0.033333
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 170.46

RUNOFF VOLUME = 1.39181 INCHES = 1.2916 ACRE-FEET
PEAK DISCHARGE RATE = 36.54 CFS AT 1.533 HOURS BASIN AREA = .0174 SQ. MI.

** ROUTE THE FLOW DOWN UNSER STORM DRAIN FROM THE SECOND M.H. SOUTH OF
** LOS VOLCANES TO THE THIRD MANHOLE SOUTH OF LOS VOLCANES
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.01744
PIPE DIA=30 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.3
.26	.3	1.2
.39	.5	2.9
.52	.7	5.2
.65	1.0	8.1
.78	1.3	11.5
.91	1.6	15.4
1.04	1.9	19.7
1.17	2.3	24.3
1.30	2.6	29.0
1.43	2.9	33.9

1.56	3.2	38.7
1.69	3.5	43.4
1.82	3.8	47.8
1.95	4.1	51.7
2.08	4.4	55.0
2.21	4.6	57.3
2.35	4.8	58.3
2.50	4.9	58.3

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 FT SLOPE=0.01744

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.28	.0429
.261	.271	1.23	.0275
.391	.490	2.87	.0214
.521	.741	5.16	.0180
.651	1.017	8.05	.0158
.782	1.312	11.49	.0143
.912	1.620	15.39	.0132
1.042	1.937	19.68	.0123
1.173	2.261	24.26	.0116
1.303	2.586	29.03	.0111
1.433	2.910	33.90	.0107
1.563	3.229	38.73	.0104
1.694	3.540	43.41	.0102
1.824	3.837	47.79	.0100
1.954	4.117	51.71	.0100
2.084	4.373	54.97	.0099
2.215	4.599	57.31	.0100
2.345	4.783	58.27	.0103
2.500	4.909	58.27	.0105

ROUTE ID=3 HYDROGRAPH NO=170.47 INFLOW ID=1 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.47

RUNOFF VOLUME = 1.39181 INCHES = 1.2916 ACRE-FEET
PEAK DISCHARGE RATE = 36.91 CFS AT 1.533 HOURS BASIN AREA = .0174 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 170.5 THE WEST HALF OF UNSER BOULEVARD BETWEEN
** LOS VOLCANES AND THE THIRD MANHOLE SOUTH OF THE INTERSECTION
COMPUTE NM HYD ID=2 HYD=170.5 DA==0.0029
%A=0.0 %B=20.0 %C=0.0 %D=80.0 TP=0.13333
MASS RAINFALL=-1

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

```
    UNIT PEAK =   9.1574    CFS . UNIT VOLUME =    .9980       B =   526.28      P60 = 1.8700
    AREA =      .002320 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.4229    CFS   UNIT VOLUME =    .9911       B =   327.09      P60 = 1.8700
    AREA =      .000580 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   170.50


    RUNOFF VOLUME =     1.70585 INCHES     =        .2638 ACRE-FEET
    PEAK DISCHARGE RATE =      7.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


** ADD THE HYDROGRAPH FROM BASINS 170.5 TO THE ROUTED UNSER STORM DRAIN FLOW
ADD HYD             ID=4  HYDROGRAPH NO=170.51  ID I=2  ID II=3
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   170.51


    RUNOFF VOLUME =     1.43663 INCHES     =       1.5554 ACRE-FEET
    PEAK DISCHARGE RATE =     43.84 CFS  AT   1.533 HOURS   BASIN AREA =   .0203 SQ. MI.



** ROUTE THE FLOW IN THE STREET FROM THE LOS VOLCANES & UNSER INTERSECTION TO
** THE THIRD MANHOLE SOUTH OF THE INTERSECTION. USE AVERAGE SLOPE.USE FUTURE
** CROSS SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING SIDEWALK
** ALONG CURB. ASSUME ALL FLOW THAT COULD NOT ENTER THE STORM DRAIN AT
** LOS VOLCANES REMAINS ON THE WEST SIDE OF THE STREET.
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                    MINIMUM ELEV=100.00 FT  MAXIMUM ELEV=100.87 FT
CHANNEL SLOPE=0.013  FLOOD PLAIN SLOPE=0.0129
N=0.035  DIST=5  N=0.017  DIST=10  N=-0.017  DIST=46.15
DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
  0   100.87   5     100.77  10    100.67  10.15 100.00
 12    100.13  46    100.81  46.15 100.31

                RATING CURVE VALLEY SECTION  1.0
                   WATER      FLOW       FLOW
                  SURFACE     AREA       RATE
                   ELEV       SQ FT      CFS
                  100.00        .0         .0
                  100.05        .0         .0
                  100.09        .1         .1
                  100.14        .1         .2
                  100.18        .3         .5
```

100.23	.6	1.0
100.27	.9	2.0
100.32	1.4	3.4
100.37	2.0	5.3
100.41	2.7	7.8
100.46	3.4	11.0
100.50	4.3	15.0
100.55	5.3	19.7
100.60	6.4	25.3
100.64	7.7	31.8
100.69	9.0	39.3
100.73	10.5	48.0
100.78	12.2	58.0
100.82	14.2	70.3
100.87	16.2	86.0

COMPUTE TRAVEL TIME ID=2 REACH NO=1 VALLEY SECTIONS=1
LENGTH=950 FT SLOPE=0.0129

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.015	.01	.3409
.092	.061	.07	.2148
.137	.137	.21	.1765
.183	.293	.46	.1684
.229	.554	1.01	.1442
.275	.920	1.95	.1244
.321	1.392	3.35	.1096
.366	1.969	5.28	.0984
.412	2.653	7.82	.0895
.458	3.442	11.03	.0823
.504	4.337	14.98	.0764
.549	5.338	19.73	.0714
.595	6.445	25.33	.0672
.641	7.658	31.85	.0635
.687	8.984	39.35	.0603
.733	10.500	47.99	.0577
.778	12.226	57.97	.0557
.824	14.157	70.32	.0531
.870	16.218	86.04	.0497

ROUTE ID=2 HYDROGRAPH NO=170.48 INFLOW ID=11 DT=0.033333
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.48

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

```
** ADD THE ROUTED FLOW IN THE STREET TO THE TOTAL FLOW ON THE WEST SIDE OF
** UNSER BOULEVARD @ THE THIRD MANHOLE SOUTH OF LOS VOLCANES
ADD HYD            ID=3  HYDROGRAPH NO=170.52  ID I=4  ID II=2
PRINT HYD          ID=3  CODE=1

                          PARTIAL HYDROGRAPH   170.52


    RUNOFF VOLUME =     1.43663 INCHES     =       1.5554 ACRE-FEET
    PEAK DISCHARGE RATE =      43.84 CFS  AT   1.533 HOURS   BASIN AREA =   .0203 SQ. MI.


** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 36" RCP MIN. SLOPE = 0.0148
** HYD 170.53= FLOW TO UNSER STORM DRAIN
** HYD 170.54= FLOW TO REMAIN IN STREET
DIVIDE HYD         ID=5  Q=81.00  ID I=2    HYD I=170.53
                                  ID II=11  HYD II=170.54
PRINT HYD          ID=2  CODE=1

                          PARTIAL HYDROGRAPH   170.53


    RUNOFF VOLUME =     1.39172 INCHES     =       1.2915 ACRE-FEET
    PEAK DISCHARGE RATE =      37.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0174 SQ. MI.


PRINT HYD          ID=11  CODE=1

                          PARTIAL HYDROGRAPH   170.54


    RUNOFF VOLUME =      .00000 INCHES     =        .0000 ACRE-FEET
    PEAK DISCHARGE RATE =       .00 CFS  AT   -.033 HOURS   BASIN AREA =   .0000 SQ. MI.


** ROUTE THE FLOW IN THE UNSER BLVD STORM DRAIN FROM THE THIRD MANHOLE SOUTH
** OF LOS VOLCANES TO THE FIRST MANHOLE SOUTH OF THE INTERSECTION OF BLUEWATER
** AND UNSER. USE AVERAGE SLOPE.
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.016
                    PIPE DIA=36  N=0.013

                    RATING CURVE PIPE SECTION  1.0
                       WATER      FLOW       FLOW
                      SURFACE     AREA       RATE
                       ELEV       SQ FT      CFS
                        .00         .0         .0
                        .16         .1         .4
                        .31         .4        1.9
                        .47         .7        4.5
                        .63        1.1        8.0
```

.78	1.5	12.5
.94	1.9	17.9
1.09	2.3	24.0
1.25	2.8	30.7
1.41	3.3	37.8
1.56	3.7	45.2
1.72	4.2	52.8
1.88	4.7	60.3
2.03	5.1	67.6
2.19	5.5	74.4
2.35	5.9	80.5
2.50	6.3	85.6
2.66	6.6	89.3
2.81	6.9	90.8
3.00	7.1	90.8

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=795 FT SLOPE=0.016

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.44	.0701
.313	.391	1.92	.0449
.469	.706	4.47	.0349
.625	1.068	8.03	.0294
.782	1.465	12.54	.0258
.938	1.889	17.89	.0233
1.094	2.332	23.97	.0215
1.251	2.790	30.65	.0201
1.407	3.255	37.79	.0190
1.563	3.724	45.22	.0182
1.720	4.191	52.80	.0175
1.876	4.650	60.32	.0170
2.032	5.097	67.61	.0166
2.189	5.525	74.44	.0164
2.345	5.928	80.54	.0163
2.501	6.297	85.62	.0162
2.658	6.622	89.26	.0164
2.814	6.887	90.75	.0168
3.000	7.069	90.75	.0172

ROUTE ID=3 HYDROGRAPH NO=170.55 INFLOW ID=2 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.55

RUNOFF VOLUME = 1.39181 INCHES = 1.2916 ACRE-FEET
PEAK DISCHARGE RATE = 36.72 CFS AT 1.533 HOURS BASIN AREA = .0174 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR BASIN 170.6 THE WEST PORTION OF UNSER BOULEVARD
** BETWEEN THE THIRD MANHOLE SOUTH OF LOS VOLCANES AND THE INTERSECTION OF
** BLUEWATER AND UNSER
COMPUTE NM HYD      ID=2  HYD=170.6  DA==0.0018
                    %A=0.0  %B=20.0  %C=0.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.6839    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001440 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .88316    CFS   UNIT VOLUME =    .9849       B =   327.09      P60 = 1.8700
    AREA =      .000360 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.60


    RUNOFF VOLUME =     1.70585 INCHES     =        .1638 ACRE-FEET
    PEAK DISCHARGE RATE =       4.51 CFS  AT   1.500 HOURS   BASIN AREA =   .0018 SQ. MI.



** ADD THE HYDROGRAPH FROM BASINS 170.6 TO THE UNSER STORM DRAIN FLOW
ADD HYD             ID=4  HYDROGRAPH NO=170.61  ID I=2  ID II=3
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   170.61


    RUNOFF VOLUME =     1.42121 INCHES     =       1.4553 ACRE-FEET
    PEAK DISCHARGE RATE =      41.02 CFS  AT   1.533 HOURS   BASIN AREA =   .0192 SQ. MI.


**COMPUTE A HYDROGRAPH FOR TRACTS "J" AND "K", THE RIO GRANDE ALBUQUERQUE SITE
COMPUTE NM HYD      ID=2  HYD=170.7  DA==0.0859
                    %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .073062HR    TP =   .133330HR    K/TP RATIO =   .547978     SHAPE CONSTANT, N =  7.057009
    UNIT PEAK =   286.93    CFS   UNIT VOLUME =    .9993       B =   523.95      P60 = 1.8700
    AREA =      .073015 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .129910HR    TP =   .133330HR    K/TP RATIO =   .974346     SHAPE CONSTANT, N =  3.624877
    UNIT PEAK =   31.827    CFS   UNIT VOLUME =    .9999       B =   329.33      P60 = 1.8700
    AREA =      .012885 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
```

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.70

RUNOFF VOLUME = 1.77075 INCHES = 8.1124 ACRE-FEET
PEAK DISCHARGE RATE = 220.51 CFS AT 1.500 HOURS BASIN AREA = .0859 SQ. MI.

** ROUTE FLOW FROM tracts "J" AND "K" THRU AN ASSUMED POND
** ALLOWABLE RELEASE RATE=56.6 cfs PER THE SAD 214 DRAINAGE PLAN
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=170.71 INFLOW ID=2 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0.00	0.00	100.00
31.13	1.03	101.00
46.41	2.46	102.00
56.60	4.10	103.00
65.00	6.00	104.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.57	100.00	.001	.02
1.33	63.29	100.27	.281	8.48
1.50	220.51	101.62	1.918	40.62
1.67	112.28	102.67	3.566	53.28
1.83	71.70	102.95	4.026	56.14
2.00	52.29	102.99	4.092	56.55
2.17	23.93	102.86	3.871	55.18
2.33	11.28	102.54	3.353	51.96
2.50	7.01	102.20	2.784	48.43
2.67	4.69	101.83	2.224	43.89
2.83	3.34	101.48	1.712	38.42
3.00	2.51	101.16	1.257	33.56
3.17	1.98	100.84	.866	26.17
3.33	1.69	100.57	.592	17.88
3.50	1.48	100.40	.408	12.32
3.67	1.36	100.28	.285	8.60
3.83	1.27	100.20	.202	6.12
4.00	1.21	100.14	.147	4.45
4.17	1.18	100.11	.110	3.34
4.33	1.15	100.08	.086	2.59

4.50	1.15	100.07	.070	2.10
4.67	1.17	100.06	.059	1.78
4.83	1.19	100.05	.052	1.58
5.00	1.21	100.05	.048	1.45
5.17	1.25	100.04	.045	1.37
5.33	1.28	100.04	.044	1.34
5.50	1.34	100.04	.044	1.33
5.67	1.37	100.04	.044	1.34
5.83	1.44	100.04	.045	1.36
6.00	1.48	100.04	.046	1.40
6.17	.59	100.04	.043	1.31
6.33	.17	100.03	.032	.97
6.50	.08	100.02	.022	.68
6.67	.04	100.01	.015	.46
6.83	.02	100.01	.010	.31
7.00	.01	100.01	.007	.21
7.17	.00	100.00	.005	.14
7.33	.00	100.00	.003	.09
7.50	.00	100.00	.002	.06
7.67	.00	100.00	.001	.04
7.83	.00	100.00	.001	.03
8.00	.00	100.00	.001	.02
8.17	.00	100.00	.000	.01
8.33	.00	100.00	.000	.01
8.50	.00	100.00	.000	.01
8.67	.00	100.00	.000	.00

PEAK DISCHARGE = 56.595 CFS - PEAK OCCURS AT HOUR 1.97
MAXIMUM WATER SURFACE ELEVATION = 102.999
MAXIMUM STORAGE = 4.0992 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.71

RUNOFF VOLUME = 1.77075 INCHES = 8.1123 ACRE-FEET
PEAK DISCHARGE RATE = 56.59 CFS AT 1.967 HOURS BASIN AREA = .0859 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 170.8 BLUEWATER RD.FROM THE WEST BOUNDARY OF
** ATRISCO BUSINESS PARK TO UNSER BOULEVARD
COMPUTE NM HYD ID=2 HYD=170.8 DA==0.0054 SQ MI
%A=0.0 %B=10.0 %C=0.0 %D=90.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 19.183 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .004860 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .131021HR TP = .133330HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.3247 CFS UNIT VOLUME = .9903 B = 327.09 P60 = 1.8700

```
    AREA =      .000540 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   170.80

    RUNOFF VOLUME =     1.83566 INCHES     =        .5287 ACRE-FEET
    PEAK DISCHARGE RATE =      14.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0054 SQ. MI.

** ADD THE FLOW FROM BLUEWATER RD. TO THE CONTROLED FLOW FROM TRACTS "J" & "K"
ADD HYD             ID=5  HYDROGRAPH NO=170.81  ID I=3  ID II=2
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   170.81

    RUNOFF VOLUME =     1.77458 INCHES     =       8.6410 ACRE-FEET
    PEAK DISCHARGE RATE =      60.86 CFS  AT   1.800 HOURS   BASIN AREA =   .0913 SQ. MI.


** ADD THE COMBINED FLOW FROM TRACTS "J" AND "K" & BLUEWATER ROAD TO THE FLOW
** IN STORM DRAIN AT THE UNSER &  BLUEWATER INTERSECTION
ADD HYD             ID=2  HYDROGRAPH NO=170.82  ID I=4  ID II=5
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.82

    RUNOFF VOLUME =     1.71318 INCHES     =      10.0963 ACRE-FEET
    PEAK DISCHARGE RATE =     100.34 CFS  AT   1.533 HOURS   BASIN AREA =   .1105 SQ. MI.


** COMPUTE A HYDROGRAPH FOR THE EAST SIDE OF UNSER BLVD. BETWEEN LOS VOLCANES
** AND BLUWATER
COMPUTE NM HYD      ID=3  HYD=170.9  DA==0.0047 SQ MI
                    %A=0.0  %B=20.0  %C=0.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.841    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =  2.3060    CFS   UNIT VOLUME =    .9943       B =   327.09      P60 = 1.8700
    AREA =      .000940 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

```
PRINT HYD          ID=3 CODE=1

                              PARTIAL HYDROGRAPH   170.90

    RUNOFF VOLUME =     1.70585 INCHES     =        .4276 ACRE-FEET
    PEAK DISCHARGE RATE =      11.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.


** ADD THE FLOW FROM THE EAST SIDE OF UNSER TO THE TOTAL FLOW IN THE STORM
** DRAIN AND IN THE STREET AT THE INTERSECTION OF BLUEWATER AND UNSER
ADD HYD            ID=4  HYDROGRAPH NO=170.91  ID I=3  ID II=2
PRINT HYD          ID=4  CODE=1

                              PARTIAL HYDROGRAPH   170.91

    RUNOFF VOLUME =     1.71288 INCHES     =      10.5238 ACRE-FEET
    PEAK DISCHARGE RATE =     111.56 CFS  AT   1.533 HOURS   BASIN AREA =   .1152 SQ. MI.


** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 42" RCP MIN. SLOPE = 0.00842
** HYD 170.92= FLOW TO UNSER STORM DRAIN
** HYD 170.93= FLOW TO REMAIN IN STREET
DIVIDE HYD         ID=4  Q=92     ID I=2   HYD I=170.92
                                 ID II=10  HYD II=170.93
PRINT HYD          ID=2  CODE=1

                               PARTIAL HYDROGRAPH   170.92

    RUNOFF VOLUME =     1.71288 INCHES     =      10.3513 ACRE-FEET
    PEAK DISCHARGE RATE =      92.00 CFS  AT   1.467 HOURS   BASIN AREA =   .1133 SQ. MI.


PRINT HYD          ID=10  CODE=1

                              PARTIAL HYDROGRAPH   170.93

    RUNOFF VOLUME =     1.71288 INCHES     =        .1725 ACRE-FEET
    PEAK DISCHARGE RATE =      19.56 CFS  AT   1.533 HOURS   BASIN AREA =   .0019 SQ. MI.


** DIVIDE OUT THE STREET FLOW WHICH MAY CROSS FROM THE WEST SIDE TO THE EAST
** SIDE OF UNSER BOULEVARD AT THE INTERSECTION WITH BLUEWATER. PLANS FOR
** UNSER BOULEVARD SHOW 0.3' DIFFERENTIAL BETWEEN THE FLOW LINE ELEVATION AND
** THE CROWN ELEVATION AT THE CENTER OF THE INTERSECTION. ESTIMATE CROSSOVER
```

** FLOW UTILIZING A BROAD CRESTED WIER FORMULA.
** HYD 170.94= FLOW TO CROSS OVER TO EAST SIDE OF STREET
** HYD 170.95= FLOW TO REMAIN ON WEST SIDE OF STREET
DIVIDE HYD ID=10 Q=48.0 ID I=11 HYD I=170.95
ID II=3 HYD II=170.94
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.94

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 170.95

RUNOFF VOLUME = 1.71288 INCHES = .1725 ACRE-FEET
PEAK DISCHARGE RATE = 19.56 CFS AT 1.533 HOURS BASIN AREA = .0019 SQ. MI.

** ROUTE THE STREET FLOW ON THE EAST SIDE OF UNSER BLVD. FROM THE INTERSECTION
** WITH BLUEWATER TO THE INLETS ADJACENT TO THE SAD 214 POND. USE THE FUTURE
** STREET SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING
** SIDEWALK ALONG CURB. USE AN AVERAGE STREET SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=100.00 FT MAXIMUM ELEV=100.87 FT
CHANNEL SLOPE=0.0130 FLOOD PLAIN SLOPE=0.0130
N=0.035 DIST=5 N=0.017 DIST=10 N=-0.017 DIST=46.15
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0 100.87 5 100.77 10 100.67 10.15 100.00
12 100.13 46 100.81 46.15 100.31

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.1	.2
100.18	.3	.5
100.23	.6	1.0
100.27	.9	2.0
100.32	1.4	3.4
100.37	2.0	5.3
100.41	2.7	7.8
100.46	3.4	11.0
100.50	4.3	15.0
100.55	5.3	19.7

100.60	6.4	25.3
100.64	7.7	31.8
100.69	9.0	39.3
100.73	10.5	48.0
100.78	12.2	58.0
100.82	14.2	70.3
100.87	16.2	86.0

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=700 FT SLOPE=0.0130

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.015	.01	.2512
.092	.061	.07	.1583
.137	.137	.21	.1301
.183	.293	.46	.1241
.229	.554	1.01	.1062
.275	.920	1.95	.0917
.321	1.392	3.35	.0808
.366	1.969	5.28	.0725
.412	2.653	7.82	.0660
.458	3.442	11.03	.0607
.504	4.337	14.98	.0563
.549	5.338	19.73	.0526
.595	6.445	25.33	.0495
.641	7.658	31.85	.0468
.687	8.984	39.35	.0444
.733	10.500	48.00	.0425
.778	12.226	57.97	.0410
.824	14.157	70.32	.0391
.870	16.218	86.05	.0366

ROUTE ID=4 HYDROGRAPH NO=170.96 INFLOW ID=3 DT=0.033333
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 170.96

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

** ROUTE FLOW DOWN UNSER STORM DRAIN FROM THE INTERSECTION OF UNSER AND
** BLUEWATER TO THE JUNCTION WITH THE INLETS NEAR THE SAD 214 POND
** USE AVERAGE SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0093
PIPE DIA=42 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER	FLOW	FLOW

SURFACE ELEV	AREA SQ FT	RATE CFS
.00	.0	.0
.18	.2	.5
.36	.5	2.2
.55	1.0	5.1
.73	1.5	9.2
.91	2.0	14.4
1.09	2.6	20.6
1.28	3.2	27.6
1.46	3.8	35.3
1.64	4.4	43.5
1.82	5.1	52.0
2.01	5.7	60.7
2.19	6.3	69.4
2.37	6.9	77.8
2.55	7.5	85.6
2.74	8.1	92.6
2.92	8.6	98.5
3.10	9.0	102.7
3.28	9.4	104.4
3.50	9.6	104.4

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=688 FT SLOPE=0.0093

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	.51	.0718
.365	.532	2.21	.0460
.547	.961	5.14	.0358
.730	1.453	9.24	.0301
.912	1.994	14.42	.0264
1.094	2.571	20.58	.0239
1.277	3.175	27.57	.0220
1.459	3.797	35.25	.0206
1.641	4.431	43.45	.0195
1.824	5.069	52.01	.0186
2.006	5.704	60.72	.0180
2.189	6.330	69.37	.0174
2.371	6.938	77.75	.0171
2.553	7.520	85.60	.0168
2.736	8.069	92.63	.0166
2.918	8.571	98.47	.0166
3.101	9.014	102.65	.0168
3.283	9.374	104.37	.0172
3.500	9.621	104.37	.0176

ROUTE ID=3 HYDROGRAPH NO=170.97 INFLOW ID=2 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.97

```
    RUNOFF VOLUME =     1.71288 INCHES     =      10.3513 ACRE-FEET
    PEAK DISCHARGE RATE =      92.53 CFS  AT   1.500 HOURS   BASIN AREA =   .1133 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE EAST SIDE OF UNSER BOULEVARD BETWEEN BLUEWATER
** ROAD AND THE INLETS ADJACENT TO THE SAD 214 POND
COMPUTE NM HYD      ID=2  HYD=171.1 DA=0.0021
                    %A=0.0  %B=10.0  %C=0.0  %D=90.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.4600    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001890 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .131024HR    TP =   .133333HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593454
    UNIT PEAK =   .51516    CFS   UNIT VOLUME =    .9747       B =   327.09      P60 = 1.8700
    AREA =      .000210 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   171.10


    RUNOFF VOLUME =     1.83566 INCHES     =        .2056 ACRE-FEET
    PEAK DISCHARGE RATE =       5.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


** ADD THE FLOW FROM BASIN 171.1 TO THE ROUTED STREET FLOW ON THE EAST SIDE OF
** UNSER AT THE INLETS ADJACENT TO THE SAD 214 POND
ADD HYD             ID=5  HYDROGRAPH NO=171.11 ID I=4  ID II=2
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   171.11


    RUNOFF VOLUME =     1.83553 INCHES     =        .2056 ACRE-FEET
    PEAK DISCHARGE RATE =       5.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


** ADD THE TOTAL STREET FLOW ON THE EAST SIDE OF UNSER TO THE ROUTED FLOW IN
** UNSER STORM DRAIN
ADD HYD             ID=2  HYDROGRAPH NO=171.12 ID I=3  ID II=5
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   171.12
```

RUNOFF VOLUME = 1.71511 INCHES = 10.5569 ACRE-FEET
PEAK DISCHARGE RATE = 98.10 CFS AT 1.500 HOURS BASIN AREA = .1154 SQ. MI.

```
** DIVIDE OUT FLOW WHICH EXCEEDS THE FULL PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 42" RCP MIN SLOPE = 0.00993
** HYD 171.13 = FLOW TO UNSER STORM DRAIN
** HYD 171.14 = FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=2   Q=100  ID I=3    HYD I=171.13
                                  ID II=4   HYD II=171.14
PRINT HYD           ID=3  CODE=1
```

PARTIAL HYDROGRAPH 171.13

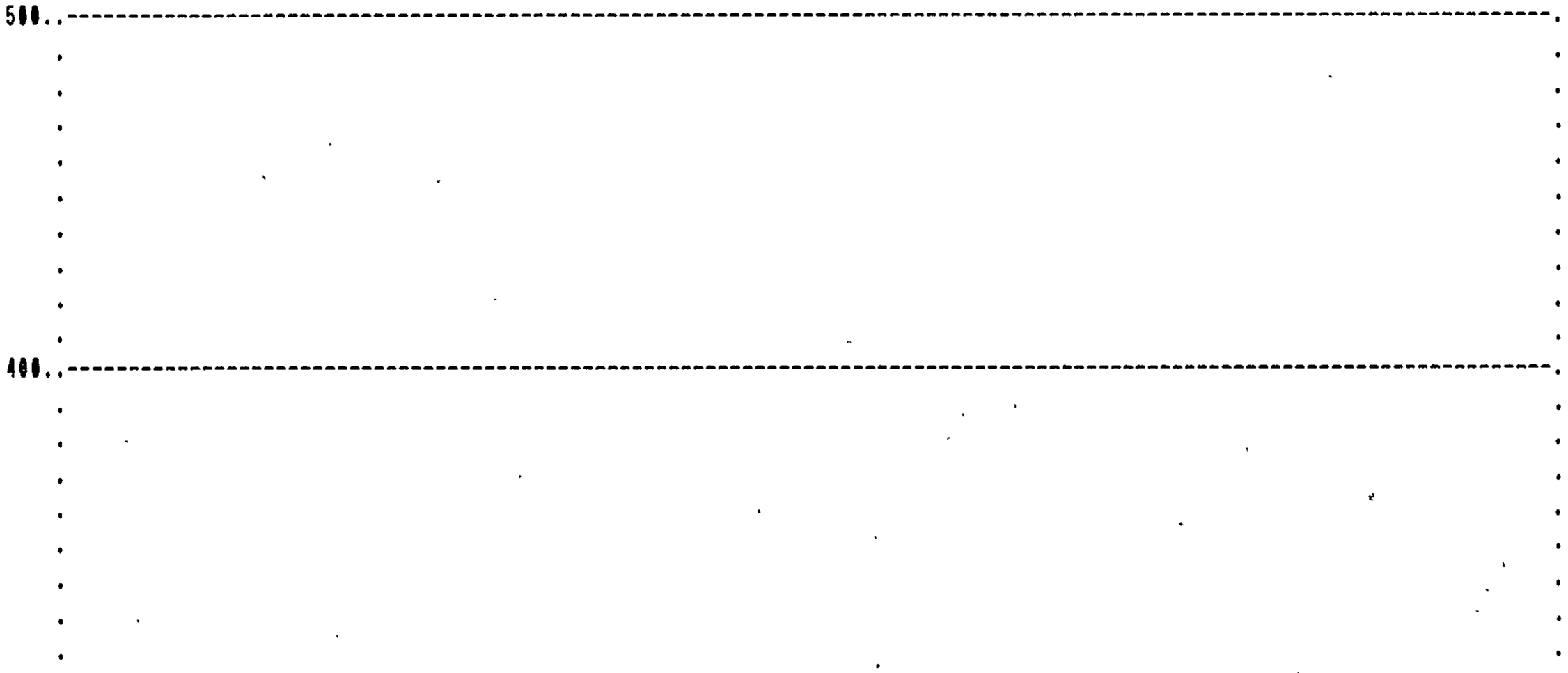
RUNOFF VOLUME = 1.71511 INCHES = 10.5569 ACRE-FEET
PEAK DISCHARGE RATE = 98.10 CFS AT 1.500 HOURS BASIN AREA = .1154 SQ. MI.

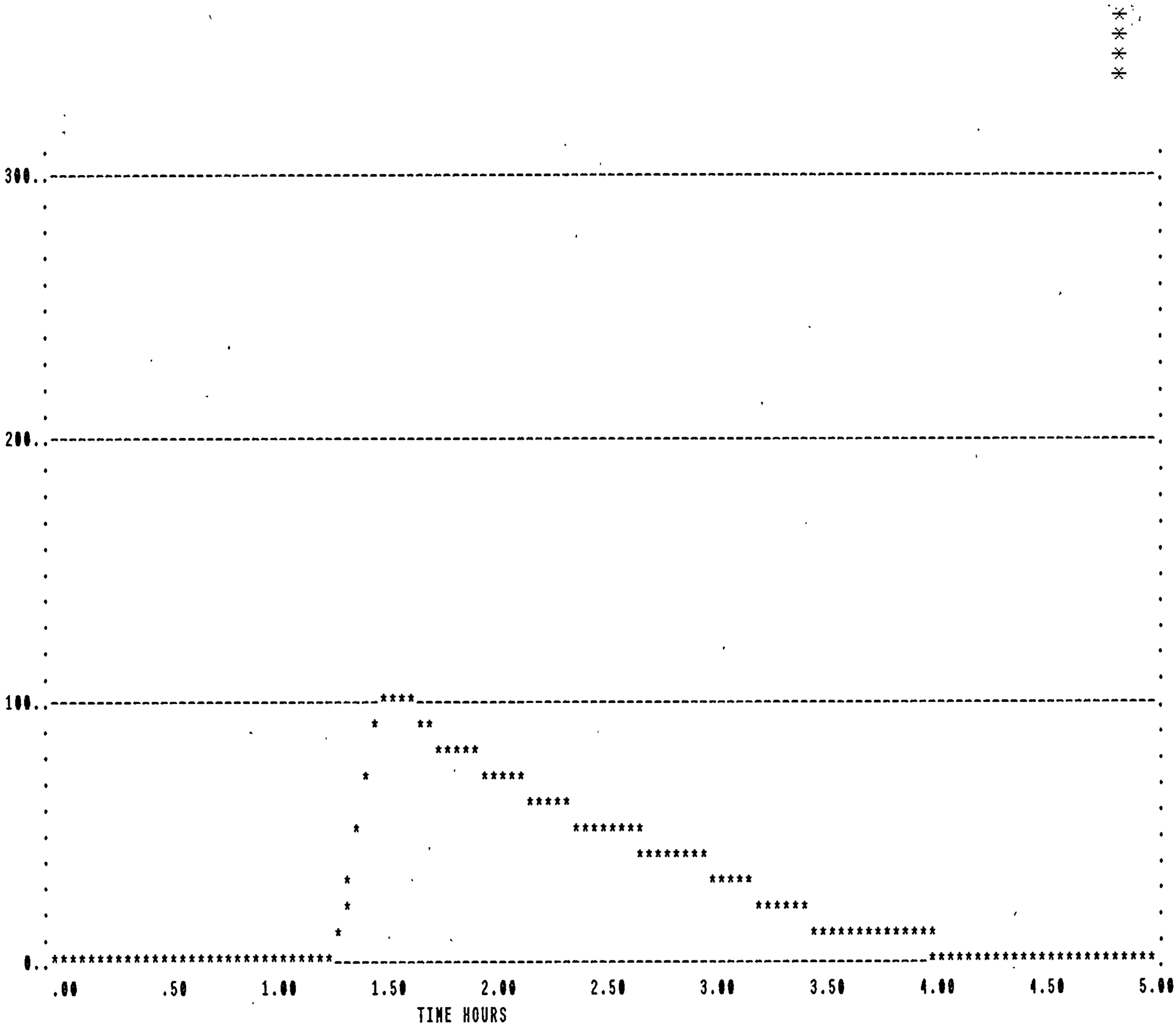
PRINT HYD ID=4 CODE=1 *

PARTIAL HYDROGRAPH 171.14

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

PLOT HYD ID=3 ID=0 Q SCALE=500 T SCALE=5.0





** ROUTE FLOW DOWN UNSER STORM DRAIN FROM THE JUNCTION WITH THE INLETS ADJACENT
** TO THE SAD 214 POND TO THE JUNCTION WITH THE FUTURE TIERRA BAYITA S.D.
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.00993
PIPE DIA=42 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.18	.2	.5
.36	.5	2.3
.55	1.0	5.3
.73	1.5	9.5
.91	2.0	14.9
1.09	2.6	21.3
1.28	3.2	28.5

1.46	3.8	36.4
1.64	4.4	44.9
1.82	5.1	53.7
2.01	5.7	62.7
2.19	6.3	71.7
2.37	6.9	80.3
2.55	7.5	88.5
2.74	8.1	95.7
2.92	8.6	101.8
3.10	9.0	106.1
3.28	9.4	107.8
3.50	9.6	107.8

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=100 FT SLOPE=0.00993

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	.53	.0101
.365	.532	2.28	.0065
.547	.961	5.31	.0050
.730	1.453	9.55	.0042
.912	1.994	14.90	.0037
1.094	2.571	21.26	.0034
1.277	3.175	28.49	.0031
1.459	3.797	36.43	.0029
1.641	4.431	44.90	.0027
1.824	5.069	53.74	.0026
2.006	5.704	62.74	.0025
2.189	6.330	71.69	.0025
2.371	6.938	80.34	.0024
2.553	7.520	88.45	.0024
2.736	8.069	95.71	.0023
2.918	8.571	101.75	.0023
3.101	9.014	106.07	.0024
3.283	9.374	107.85	.0024
3.500	9.621	107.85	.0025

ROUTE ID=10 HYDROGRAPH NO=171.15 INFLOW ID=3 DT=0.033333
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 171.15

RUNOFF VOLUME = 1.71511 INCHES = 10.5569 ACRE-FEET
PEAK DISCHARGE RATE = 98.15 CFS AT 1.500 HOURS BASIN AREA = .1154 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE WEST SIDE OF UNSER BOULEVARD BETWEEN BLUEWATER
** ROAD AND THE INLETS ADJACENT TO THE SAD 214 POND
COMPUTE NM HYD ID=3 HYD=171.0 DA=0.0022

%A=0.0 %B=10.0 %C=0.0 %D=90.0 TP=0.133333
MASS RAINFALL=-1

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.8152 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .001980 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .131024HR TP = .133333HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593454
UNIT PEAK = .53970 CFS UNIT VOLUME = . .9747 B = 327.09 P60 = 1.8700
AREA = .000220 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 171.00

RUNOFF VOLUME = 1.83566 INCHES = .2154 ACRE-FEET
PEAK DISCHARGE RATE = 5.84 CFS AT 1.500 HOURS BASIN AREA = .0022 SQ. MI.

** ROUTE THE STREET FLOW ON THE WEST SIDE OF UNSER BLVD. FROM THE INTERSECTION
** WITH BLUEWATER TO THE INLETS ADJACENT TO THE SAD 214 POND. USE THE FUTURE
** STREET SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING
** SIDEWALK ALONG CURB. USE AN AVERAGE STREET SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=100.00 FT MAXIMUM ELEV=100.87 FT
CHANNEL SLOPE=0.0130 FLOOD PLAIN SLOPE=0.0130
N=0.035 DIST=5 N=0.017 DIST=10 N=-0.017 DIST=46.15
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0 100.87 5 100.77 10 100.67 10.15 100.00
12 100.13 46 100.81 46.15 100.31

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.1	.2
100.18	.3	.5
100.23	.6	1.0
100.27	.9	2.0
100.32	1.4	3.4
100.37	2.0	5.3
100.41	2.7	7.8
100.46	3.4	11.0
100.50	4.3	15.0
100.55	5.3	19.7
100.60	6.4	25.3

```
                                    100.64       7.7      31.8
                                    100.69       9.0      39.3
                                    100.73      10.5      48.0
                                    100.78      12.2      58.0
                                    100.82      14.2      70.3
                                    100.87      16.2      86.0
COMPUTE TRAVEL TIME ID=4  REACH NO=1  VALLEY SECTIONS=1
                    LENGTH=800 FT  SLOPE=0.0130

                          TRAVEL TIME TABLE
                                        REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                             .046        .015         .01       .2871
                             .092        .061         .07       .1809
                             .137        .137         .21       .1486
                             .183        .293         .46       .1418
                             .229        .554        1.01       .1214
                             .275        .920        1.95       .1048
                             .321       1.392        3.35       .0923
                             .366       1.969        5.28       .0829
                             .412       2.653        7.82       .0754
                             .458       3.442       11.03       .0693
                             .504       4.337       14.98       .0643
                             .549       5.338       19.73       .0601
                             .595       6.445       25.33       .0565
                             .641       7.658       31.85       .0534
                             .687       8.984       39.35       .0507
                             .733      10.500       48.00       .0486
                             .778      12.226       57.97       .0469
                             .824      14.157       70.32       .0447
                             .870      16.218       86.05       .0419
ROUTE               ID=4  HYDROGRAPH NO=171.01  INFLOW ID=11 DT=0.033333
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   171.01


    RUNOFF VOLUME =     1.71561 INCHES     =        .1728 ACRE-FEET
    PEAK DISCHARGE RATE =      13.20 CFS  AT   1.567 HOURS   BASIN AREA =   .0019 SQ. MI.


** ADD THE ROUTED STREET FLOW ON THE WEST SIDE OF UNSER TO THE FLOW FROM BASIN
** 170.0
ADD HYD             ID=2  HYDROGRAPH NO=171.02 ID I=3  ID II=4
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   171.02


    RUNOFF VOLUME =     1.78002 INCHES     =        .3882 ACRE-FEET
```

PEAK DISCHARGE RATE = 18.01 CFS AT 1.567 HOURS BASIN AREA = .0041 SQ. MI.

```
** DIVIDE OUT FLOW WHICH EXCEEDS THE CAPACITY OF THE CONNECTOR PIPE BETWEEN THE
** INLETS AND THE CULVERT CROSSING UNSER TO THE SAD 214 POND. PIPE IS AN 18"
** RCP. ESTIMATE CAPACITY ASSUMINING PRESSURE PIPE FLOW WITH HGL AT THE SOFFIT
** AT THE OUTLET END OF THE 18" PIPE
** HYD 171.03 = FLOW TO THE TIERRA BAYITA STORM DRAIN
** HYD 171.04 = FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=2   Q=30   ID I=3    HYD I=171.03
                                  ID II=4   HYD II=171.04
PRINT HYD           ID=3  CODE=1
```

PARTIAL HYDROGRAPH 171.03

RUNOFF VOLUME = 1.78002 INCHES = .3882 ACRE-FEET
PEAK DISCHARGE RATE = 18.01 CFS AT 1.567 HOURS BASIN AREA = .0041 SQ. MI.

```
PRINT HYD           ID=4  CODE=1
```

PARTIAL HYDROGRAPH 171.04

RUNOFF VOLUME = .00000 INCHES = .0000 ACRE-FEET
PEAK DISCHARGE RATE = .00 CFS AT -.033 HOURS BASIN AREA = .0000 SQ. MI.

```
** ADD THE INTERCEPTED FLOW FROM THE WEST SIDE OF UNSER TO THE FLOW FROM THE
** PROPOSED UNSER DIVERSION CHANNEL AT THE JUNCTION WITH THE FUTURE TIERRA
** BAYITA STORM DRAIN
ADD HYD             ID=16  HYDROGRAPH NO=171.05 ID I=15  ID II=3
PRINT HYD           ID=16  CODE=1
```

PARTIAL HYDROGRAPH 171.05

RUNOFF VOLUME = .50720 INCHES = 21.4049 ACRE-FEET
PEAK DISCHARGE RATE = 412.11 CFS AT 1.733 HOURS BASIN AREA = .7913 SQ. MI.

```
** ADD THE FLOW IN THE UNSER STORM DRAIN TO THE TOTAL FLOW AT THE JUNCTION
** WITH THE TIERRA BAYITA STORM DRAIN
ADD HYD             ID=11  HYDROGRAPH NO=171.06 ID I=16  ID II=10
PRINT HYD           ID=11  CODE=1
```

PARTIAL HYDROGRAPH 171.06

RUNOFF VOLUME = .66095 INCHES = 31.9618 ACRE-FEET
PEAK DISCHARGE RATE = 500.44 CFS AT 1.700 HOURS BASIN AREA = .9067 SQ. MI.

****

****
** ASSUME ALL OF THIS FLOW IS ROUTED THROUGH A JUCNTION VAULT BEFORE
** FLOW IS ROUTED TO THE ENLARGED S.A.D. 214 POND. THE TIERRA BAYITA S.D. IS
** ASSUMED TO BE CONNECTED TO THIS VAULT. THE PURPOSE OF THIS CONFIGURATION IS
** TO ACHIEVE HIGHER OUTFLOW FROM THE BASIN IN THE EARLY STAGES OF THE STORM
** WHEN OUTFLOW FROM THE S.A.D. 214 POND WOULD BE LIMITED DUE TO LOW HEAD.
** OUTFLOW CURVE BASED ON ORIFICE FLOW THROUGH 5.5' DIA ORIFICE INTO THE 72"
** DIA. PIPE PLUS A CONSTANT FLOW THROUGH A 24" DIA S.D. CONNECTION BETWEEN
** THE VAULT AND THE S.A.D. 214 POND WHEN FLOW TO THE VAULT EXCEEDS 310 CFS.
** FLOW THROUGH THE 24" DIA LINE BASED ON PRESSURE FLOW WITH FULL VAULT
** CONDITION AT THE INLET AND H.G.L. AT THE OUTLET AT THE SOFFIT OF THE PIPE.
** VAULT PLAN DIMENSIONS ESTIMATED AT 10' X 15'
****

ROUTE RESERVOIR ID=10 HYDROGRAPH NO=172.0 INFLOW ID=11 CODE=5

	OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
	0.0	0.00	5088.0
	12.4	0.002	5088.5
	17.6	0.003	5089.0
	26.3	0.005	5089.5
	40.3	0.007	5090.0
	60.0	0.009	5090.5
	82.0	0.010	5091.0
	103.0	0.012	5091.5
	124.0	0.014	5092.0
	142.0	0.015	5092.5
	164.0	0.017	5093.0
	190.0	0.019	5093.5
	206.0	0.021	5094.0
	221.0	0.022	5094.5
	236.0	0.024	5095.0
	249.0	0.026	5095.5
	262.0	0.028	5096.0
ADD	314.0	0.029	5096.5
	325.0	0.031	5097.0
	337.0	0.033	5097.5
	348.0	0.034	5098.0
	358.0	0.036	5098.5
	1200.0	0.038	5099.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5088.00	.000	.00
.17	.00	5088.00	.000	.00
.33	.00	5088.00	.000	.00

.50	.00	5088.00	.000	.00
.67	.00	5088.00	.000	.00
.83	.00	5088.00	.000	.00
1.00	.00	5088.00	.000	.00
1.17	.10	5088.00	.000	.09
1.33	30.32	5089.60	.005	29.09
1.50	149.18	5092.66	.016	148.93
1.67	485.68	5098.57	.036	483.49
1.83	429.07	5098.54	.036	431.23
2.00	295.36	5096.30	.029	293.67
2.17	207.38	5094.09	.021	208.63
2.33	158.49	5092.87	.016	158.38
2.50	110.88	5091.70	.013	111.59
2.67	88.76	5091.17	.011	88.93
2.83	73.80	5090.81	.010	73.72
3.00	60.63	5090.52	.009	60.77
3.17	48.60	5090.21	.008	48.67
3.33	35.97	5089.85	.006	36.08
3.50	27.01	5089.53	.005	27.09
3.67	20.46	5089.17	.004	20.55
3.83	15.74	5088.83	.003	15.80
4.00	12.24	5088.50	.002	12.28
4.17	9.64	5088.39	.002	9.66
4.33	7.74	5088.31	.001	7.76
4.50	6.34	5088.26	.001	6.35
4.67	5.27	5088.21	.001	5.28
4.83	4.50	5088.18	.001	4.51
5.00	3.95	5088.16	.001	3.96
5.17	3.55	5088.14	.001	3.56
5.33	3.26	5088.13	.001	3.26
5.50	3.06	5088.12	.000	3.07
5.67	2.92	5088.12	.000	2.92
5.83	2.85	5088.11	.000	2.85
6.00	2.81	5088.11	.000	2.81
6.17	2.40	5088.10	.000	2.41
6.33	1.75	5088.07	.000	1.76
6.50	1.31	5088.05	.000	1.31
6.67	.95	5088.04	.000	.95
6.83	.67	5088.03	.000	.67
7.00	.46	5088.02	.000	.46
7.17	.31	5088.01	.000	.31
7.33	.21	5088.01	.000	.21
7.50	.15	5088.01	.000	.15
7.67	.10	5088.00	.000	.10
7.83	.07	5088.00	.000	.07
8.00	.05	5088.00	.000	.05
8.17	.04	5088.00	.000	.04
8.33	.03	5088.00	.000	.03
8.50	.02	5088.00	.000	.02
8.67	.01	5088.00	.000	.01
8.83	.01	5088.00	.000	.01
9.00	.01	5088.00	.000	.01
9.17	.00	5088.00	.000	.00

PEAK DISCHARGE = 502.601 CFS - PEAK OCCURS AT HOUR 1.70

```
 MAXIMUM WATER SURFACE ELEVATION =     5098.586
 MAXIMUM STORAGE =         .0363 AC-FT      INCREMENTAL TIME=     .033333HRS

PRINT HYD           ID=10  CODE=1

                              PARTIAL HYDROGRAPH   172.00


    RUNOFF VOLUME =      .66095 INCHES     =      31.9618 ACRE-FEET
    PEAK DISCHARGE RATE =     502.60 CFS  AT   1.700 HOURS   BASIN AREA =   .9067 SQ. MI.



** DIVIDE OUT THE FLOW WHICH EXCEEDS THE CAPACITY OF THE 24" & 72" OUTFLOW
** PIPES AND SEND THAT FLOW TO THE POND
DIVIDE HYD          ID=10  Q=350  ID I=2    HYD I=172.01
                                  ID II=3   HYD II=172.02
PRINT HYD           ID=2  CODE=1

                              PARTIAL HYDROGRAPH   172.01


    RUNOFF VOLUME =      .66095 INCHES     =      29.2980 ACRE-FEET
    PEAK DISCHARGE RATE =     350.00 CFS  AT   1.600 HOURS   BASIN AREA =   .8311 SQ. MI.



PRINT HYD           ID=3  CODE=1

                              PARTIAL HYDROGRAPH   172.02


    RUNOFF VOLUME =      .66095 INCHES     =       2.6638 ACRE-FEET
    PEAK DISCHARGE RATE =     152.60 CFS  AT   1.700 HOURS   BASIN AREA =   .0756 SQ. MI.



** DIVIDE OUT THE FLOW WHICH EXCEEDS THE CAPACITY OF THE 72" OUTFLOW
** PIPE AND SEND THAT FLOW TO THE POND
DIVIDE HYD          ID=2   Q=310  ID I=4    HYD I=172.03
                                  ID II=5   HYD II=172.04
PRINT HYD           ID=4  CODE=1

                              PARTIAL HYDROGRAPH   172.03


    RUNOFF VOLUME =      .66095 INCHES     =      28.0812 ACRE-FEET
    PEAK DISCHARGE RATE =     310.00 CFS  AT   1.600 HOURS   BASIN AREA =   .7966 SQ. MI.



PRINT HYD           ID=5  CODE=1

                              PARTIAL HYDROGRAPH   172.04
```

RUNOFF VOLUME = .66095 INCHES = 1.2167 ACRE-FEET
PEAK DISCHARGE RATE = 40.00 CFS AT 1.600 HOURS BASIN AREA = .0345 SQ. MI.

** ADD THE TWO FLOWS WHICH HAVE BEEN DIVIDED OUT
ADD HYD ID=2 HYDROGRAPH NO=172.05 ID I=3 ID II=5
PRINT HYD ID=2 CODE=2

PARTIAL HYDROGRAPH 172.05

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	.400	.0	.800	.0	1.200	.0	1.600	80.1
.067	.0	.467	.0	.867	.0	1.267	.0	1.667	173.5
.133	.0	.533	.0	.933	.0	1.333	.0	1.733	186.8
.200	.0	.600	.0	1.000	.0	1.400	.0	1.800	145.9
.267	.0	.667	.0	1.067	.0	1.467	.0	1.867	87.4
.333	.0	.733	.0	1.133	.0	1.533	.0	1.933	31.9

RUNOFF VOLUME = .66095 INCHES = 3.8805 ACRE-FEET
PEAK DISCHARGE RATE = 192.60 CFS AT 1.700 HOURS BASIN AREA = .1101 SQ. MI.

** COMPUTE A HYDROGRAPH FOR TRACT A-1 (UNDEVELOPED CONDITION WITH CONSERVATION
** TREATMENT APPLIED)**********
COMPUTE NM HYD ID=1 HYD=180.1 DA=0.0338
%A=90.0 %B=0.0 %C=10.0 %D=0.0 TP=0.133333
MASS RAINFALL=-1

K = .157941HR TP = .133333HR K/TP RATIO = 1.184562 SHAPE CONSTANT, N = 2.996709
UNIT PEAK = 71.374 CFS UNIT VOLUME = .9996 B = 281.55 P60 = 1.8700
AREA = .033800 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 180.10

RUNOFF VOLUME = .47911 INCHES = .8637 ACRE-FEET
PEAK DISCHARGE RATE = 30.88 CFS AT 1.533 HOURS BASIN AREA = .0338 SQ. MI.

*S ASSUME ALL FLOWS FROM TRACT A-1 ARE RETAINED ONSITE**********
** ROUTE THE FLOW FROM THE VAULT INTO
** THE EXPANDED S.A.D. 214 POND. ASSUME POND FOOT PRINT EXPANDED
** WITHIN EXISTING EASEMENT AND POND DEEPENED TO ELEV. 5090
** OUTFLOW CANNOT BE MODELED HERE AS IT WILL ONLY OCCUR AFTER THE INFLOW
** TO THE INLET VAULT DROPS BELOW 310 CFS. A VERY SMALL OUTLOW IS ENTERED

** IN THE STAGE STORAGE DISCHARGE TABLE TO SATISFY THE PROGRAM REQUIREMENTS
** THIS OUTFLOW IS NEGLIGABLE
ROUTE RESERVOIR ID=11 HYDROGRAPH NO=501 INFLOW ID=2 CODE=24

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0.0	0.00	5090
0.01	4.92	5093.0
0.02	10.97	5096.0
0.03	15.56	5098.0
0.04	18.02	5099.0
0.05	19.02	5099.4
0.06	30.00	5100.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5090.00	.000	.00
.80	.00	5090.00	.000	.00
1.60	80.06	5090.07	.110	.00

PEAK DISCHARGE = .008 CFS - PEAK OCCURS AT HOUR 2.00
MAXIMUM WATER SURFACE ELEVATION = 5092.366
MAXIMUM STORAGE = 3.8804 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=11 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 501.00

RUNOFF VOLUME = .00202 INCHES = .0119 ACRE-FEET
PEAK DISCHARGE RATE = .01 CFS AT 2.000 HOURS BASIN AREA = .1101 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:53:44

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    AHYMO PROGRAM (AHYM0392) - AMAFCA VERSION OF HYMO - MARCH, 1992
         RUN DATE (MON/DAY/YR) = 09/22/1992
         START TIME (HR:MIN:SEC) = 09:31:40     USER NO.= D_HARRIS.S92
         INPUT FILE = tbsdwd.hmi

*******************************************************************************
*******************************************************************************
** FILE NAME: TBSDWD.HMI (TIERRA BAYITA STORM DRAIN WATERSHED DEVELOPED)
** CURRENT FILE UPDATED:9-14-92
** ANALYSIS FOR ATRISCO BUSINESS MASTER DRAINAGE PLAN
** UPPER WATERSHED OF THE FUTURE TIERRA BAYITA STORM DRAIN
** FULLY DEVELOPED CONDITION
** INCLUDES THE PROPOSED UNSER DIVERSION CHANNEL WATERSHED, THE UNSER STORM
** DRAIN WATERSHED AND TRACT A-1 OF ATRISCO BUSINESS PARK
** FLOWS NORTH OF I-40 ASSUMED TO BE CUT OFF BY FUTURE I-40 INTERCEPTER CHANNEL
*******************************************************************************
*******************************************************************************
START              0.0 HOURS *****ONE HUNDRED YEAR SIX HOUR STORM******
RAINFALL           TYPE=1  0.0  1.87  2.20  0.00  DT=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   .0016   .0033   .0050   .0067   .0085   .0103
                  .0122   .0141   .0160   .0180   .0201   .0222   .0243
                  .0266   .0289   .0312   .0337   .0362   .0388   .0415
                  .0443   .0472   .0502   .0534   .0567   .0601   .0637
                  .0675   .0715   .0758   .0810   .0865   .0924   .1051
                  .1335   .1773   .2400   .3257   .4384   .5820   .7607
                  .9789  1.1808  1.2652  1.3365  1.4000  1.4577  1.5108
                 1.5602  1.6063  1.6495  1.6902  1.7285  1.7648  1.7991
                 1.8316  1.8624  1.8917  1.9194  1.9458  1.9519  1.9576
                 1.9631  1.9683  1.9732  1.9780  1.9826  1.9870  1.9912
                 1.9953  1.9993  2.0031  2.0068  2.0105  2.0140  2.0174
                 2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                 2.0420  2.0448  2.0476  2.0502  2.0529  2.0554  2.0580
                 2.0605  2.0629  2.0653  2.0677  2.0701  2.0724  2.0746
                 2.0769  2.0791  2.0812  2.0834  2.0855  2.0876  2.0896
                 2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                 2.1052  2.1070  2.1088  2.1106  2.1124  2.1142  2.1159
                 2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                 2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                 2.1401  2.1416  2.1431  2.1446  2.1461  2.1475  2.1489
                 2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                 2.1601  2.1614  2.1627  2.1641  2.1654  2.1667  2.1680
                 2.1693  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                 2.1780  2.1793  2.1805  2.1817  2.1829  2.1841  2.1852
                 2.1864  2.1876  2.1887  2.1899  2.1911  2.1922  2.1933
                 2.1945  2.1956  2.1967  2.1978  2.1989  2.2000

**RAINFALL           TYPE=1  0.0  1.25  1.45  1.65    DT=0.033333
*******************************************************************************
*S BEGIN UNSER DIVERSION CHANNEL WATERSHED
```

```
**********************************************************************
** ANALYSIS ASSUMPTIONS: OFFSITE WATERSHED IN FULLY DEVELOPED CONDITON*******
** LOT 1 AND LOT 2 OF THE ATRISCO BUSINESS PARK FULLY DEVELOPED**************
** LAND TREATMENT FACTORS SIMILAIR TO THE LAND USES REFLECTED IN THE CURVE
** NUMBERS USED IN THE WEST BLUFF STUDY.**************************************
** ASSUME PROPOSED UNSER DIVERSION CHANNEL IS HARD LINED WITH SOIL CEMENT****
** DUE TO LIMITED CAPACITY IN THE DOWNSTREAM TIERRA BAYITA STORM DRAIN OUTFALL
** FLOW TO THE UNSER DIVERSION CHANNEL IS CONSTRAINED.***********************
** DUE TO LACK OF KNOWLEDGE OF HOW DRAINAGE FACILITIES WILL BE CONFIGURED IN
** THE WATERSHED LOCATED WEST OF THE UNSER DIVERSION CHANNEL A SHORT TIME TO
** PEAK IS ASSUMED. ROUTING THROUGH PONDS IS ACCOMPLISHED WITH THE PEAK ALLOWED
** DISCHARGE BEING DISCHARGED AS SOON AS IT IS AVAILABLE AT THE POND.********
**********************************************************************
** COMPUTE HYDROGRAPH BASIN 120.1 (BASIN ABOVE DAYTONA)**********************
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=120.0 DA=0.1031
                    %A=0.0  %B=15.0  %C=10.0  %D=75.0  TP=0.133333
                    MASS RAINFALL=-1

     K =   .073355HR    TP =   .133333HR    K/TP RATIO =   .550167     SHAPE CONSTANT, N =  7.021134
     UNIT PEAK =   302.88    CFS   UNIT VOLUME =    .9993       B =   522.25      P60 = 1.8700
     AREA =      .077325 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


     K =   .119723HR    TP =   .133333HR    K/TP RATIO =   .897923     SHAPE CONSTANT, N =  3.947530
     UNIT PEAK =   67.980    CFS   UNIT VOLUME =    1.000       B =   351.66      P60 = 1.8700
     AREA =      .025775 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   120.00


     RUNOFF VOLUME =     1.67015 INCHES     =       9.1835 ACRE-FEET
     PEAK DISCHARGE RATE =     254.58 CFS  AT   1.500 HOURS   BASIN AREA =   .1031 SQ. MI.


** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 85.8 CFS
** APPROX 1.3 CFS PER ACRE
ROUTE RESERVOIR     ID=2  HYDROGRAPH NO=120.01  INFLOW ID=1  CODE=20
                    OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                         0             0             100.0
                       85.79         0.01            101.0
                       85.80         3.50            102.0

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

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00    100.00       .000       .00
      .67        .00    100.00       .000       .00
```

1.33	67.69	100.78	.000	66.57
2.00	57.45	101.74	2.587	85.80
2.67	5.23	100.02	.000	1.57
3.33	1.82	100.02	.000	1.70
4.00	1.28	100.01	.000	1.28
4.67	1.24	100.01	.000	1.24
5.33	1.36	100.02	.000	1.36
6.00	1.57	100.02	.000	1.57
6.67	.04	100.00	.000	.04
7.33	.00	100.00	.000	.00

PEAK DISCHARGE = 85.798 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 101.810
MAXIMUM STORAGE = 2.8371 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 120.01

RUNOFF VOLUME = 1.68200 INCHES = 9.2487 ACRE-FEET
PEAK DISCHARGE RATE = 85.80 CFS AT 1.800 HOURS BASIN AREA = .1031 SQ. MI.

****
** BEGIN PROPOSED UNSER DIVERSION CHANNEL AT DAYTONA RD.
****
** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL FROM DAYTONA ROAD
** USE AVERAGE SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.015 FLOOD PLAIN SLOPE=0.015
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	15.7
100.63	7.4	52.4
100.95	12.1	107.5
101.26	17.3	181.2
101.58	23.2	274.1
101.89	29.6	387.1
102.21	36.7	521.1
102.53	44.3	677.3
102.84	52.5	856.5
103.16	61.4	1060.0
103.47	70.8	1288.6
103.79	80.8	1543.4

104.11	91.5	1825.4
104.42	102.7	2135.6
104.74	114.5	2475.0
105.05	127.0	2844.5
105.37	140.0	3245.2
105.68	153.6	3677.8
106.00	167.9	4143.5

COMPUTE TRAVEL TIME ID=10 REACH NO=1 VALLEY SECTIONS=1
LENGTH=600 FT SLOPE=0.015

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0360
.632	7.445	52.40	.0237
.947	12.090	107.54	.0187
1.263	17.334	181.22	.0159
1.579	23.178	274.11	.0141
1.895	29.619	387.09	.0128
2.211	36.660	521.15	.0117
2.526	44.300	677.29	.0109
2.842	52.538	856.55	.0102
3.158	61.376	1059.97	.0097
3.474	70.812	1288.57	.0092
3.789	80.847	1543.37	.0087
4.105	91.481	1825.38	.0084
4.421	102.713	2135.58	.0080
4.737	114.545	2474.97	.0077
5.053	126.975	2844.51	.0074
5.368	140.004	3245.15	.0072
5.684	153.632	3677.84	.0070
6.000	167.859	4143.51	.0068

ROUTE ID=10 HYDROGRAPH NO=120.02 INFLOW ID=2 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 120.02

RUNOFF VOLUME = 1.68201 INCHES = 9.2487 ACRE-FEET
PEAK DISCHARGE RATE = 87.39 CFS AT 1.400 HOURS BASIN AREA = .1031 SQ. MI.

** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL TO LOS VOLCANES ROAD******
COMPUTE RATING CURVE CID=2 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0240 FLOOD PLAIN SLOPE=0.0240
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	19.9
100.63	7.4	66.3
100.95	12.1	136.0
101.26	17.3	229.2
101.58	23.2	346.7
101.89	29.6	489.6
102.21	36.7	659.2
102.53	44.3	856.7
102.84	52.5	1083.5
103.16	61.4	1340.8
103.47	70.8	1629.9
103.79	80.8	1952.2
104.11	91.5	2308.9
104.42	102.7	2701.3
104.74	114.5	3130.6
105.05	127.0	3598.1
105.37	140.0	4104.8
105.68	153.6	4652.1
106.00	167.9	5241.2

COMPUTE TRAVEL TIME ID=11 REACH NO=8.2 VALLEY SECTIONS=1
LENGTH=340 FT SLOPE=0.0240

TRAVEL TIME TABLE

REACH= 8.2

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0204
.632	7.445	52.40	.0134
.947	12.090	107.54	.0106
1.263	17.334	181.22	.0090
1.579	23.178	274.11	.0080
1.895	29.619	387.09	.0072
2.211	36.660	521.15	.0066
2.526	44.300	677.29	.0062
2.842	52.538	856.55	.0058
3.158	61.376	1059.97	.0055
3.474	70.812	1288.57	.0052
3.789	80.847	1543.37	.0049
4.105	91.481	1825.38	.0047
4.421	102.713	2135.58	.0045
4.737	114.545	2474.97	.0044
5.053	126.975	2844.51	.0042
5.368	140.004	3245.15	.0041
5.684	153.632	3677.84	.0039
6.000	167.859	4143.51	.0038

ROUTE ID=11 HYDROGRAPH NO=120.03 INFLOW ID=10 DT=0.0

```
PRINT HYD          ID=11  CODE=1

                              PARTIAL HYDROGRAPH   120.03


    RUNOFF VOLUME =     1.68201 INCHES     =       9.2488 ACRE-FEET
    PEAK DISCHARGE RATE =      87.89 CFS  AT   1.400 HOURS   BASIN AREA =   .1031 SQ. MI.


** COMPUTE HYDROGRAPH FOR BASIN 130.0 (THE BASIN BETWEEN LAS VOLCANES AND ****
** DAYTON RD.
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=130.0  DA=0.0699
                    %A=0.0  %B=15.0  %C=10.0  %D75.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072792HR    TP =   .133333HR    K/TP RATIO =   .545942     SHAPE CONSTANT, N =  7.090720
    UNIT PEAK =   206.63    CFS   UNIT VOLUME =    .9993       B =   525.54      P60 = 1.8700
    AREA =      .052425 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .120744HR    TP =   .133333HR    K/TP RATIO =   .905583     SHAPE CONSTANT, N =  3.912081
    UNIT PEAK =   45.776    CFS   UNIT VOLUME =    1.000       B =   349.26      P60 = 1.8700
    AREA =      .017475 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID=1  CODE=1

                              PARTIAL HYDROGRAPH   130.00


    RUNOFF VOLUME =     1.67015 INCHES     =       6.2263 ACRE-FEET
    PEAK DISCHARGE RATE =     172.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0699 SQ. MI.


** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 58.2 CFS
** APPROX 1.30 CFS PER ACRE
** PEAK DISCHARGE RELEASED AS SOON AS IT IS AVAILABLE IN THE POND
ROUTE RESERVOIR     ID=2  HYDROGRAPH NO=130.01  INFLOW ID=1  CODE=20
                    OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                         0             0             100.0
                        58.19          0.01          101.0
                        58.20          2.50          103.0

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

   TIME      INFLOW    ELEV      VOLUME    OUTFLOW
   (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

     .00        .00    100.00       .000       .00
     .67        .00    100.00       .000       .00
    1.33      45.99    100.77       .008     44.88
```

2.00	38.92	102.40	1.758	58.20
2.67	3.53	100.03	.000	1.75
3.33	1.23	100.02	.000	1.22
4.00	.87	100.01	.000	.87
4.67	.84	100.01	.000	.84
5.33	.92	100.02	.000	.92
6.00	1.07	100.02	.000	1.07
6.67	.03	100.00	.000	.03
7.33	.00	100.00	.000	.00

PEAK DISCHARGE = 58.198 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 102.541
MAXIMUM STORAGE = 1.9283 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 130.01

RUNOFF VOLUME = 1.68182 INCHES = 6.2698 ACRE-FEET
PEAK DISCHARGE RATE = 58.20 CFS AT 1.800 HOURS BASIN AREA = .0699 SQ. MI.

** ADD FLOWS FROM BASIN 130.1 TO THE PROPOSED UNSER DIVERSION CHANNEL AT
** LOS VOLCANES ROAD
ADD HYD ID=3 HYDROGRAPH NO=130.02 ID I=11 ID II=2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 130.02

RUNOFF VOLUME = 1.68193 INCHES = 15.5185 ACRE-FEET
PEAK DISCHARGE RATE = 146.08 CFS AT 1.400 HOURS BASIN AREA = .1730 SQ. MI.

** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL TO BLUEWATER ROAD********
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.01 FLOOD PLAIN SLOPE=0.01
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	12.8
100.63	7.4	42.8
100.95	12.1	87.8
101.26	17.3	148.0

101.58	23.2	223.8
101.89	29.6	316.1
102.21	36.7	425.5
102.53	44.3	553.0
102.84	52.5	699.4
103.16	61.4	865.5
103.47	70.8	1052.1
103.79	80.8	1260.2
104.11	91.5	1490.4
104.42	102.7	1743.7
104.74	114.5	2020.8
105.05	127.0	2322.5
105.37	140.0	2649.7
105.68	153.6	3002.9
106.00	167.9	3383.2

COMPUTE TRAVEL TIME ID=10 REACH NO=8.3 VALLEY SECTIONS=1
LENGTH=1100 FT SLOPE=0.0087

TRAVEL TIME TABLE

REACH= 8.3

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	12.83	.0809
.632	7.445	42.78	.0532
.947	12.090	87.80	.0421
1.263	17.334	147.97	.0358
1.579	23.178	223.81	.0316
1.895	29.619	316.06	.0286
2.211	36.660	425.51	.0263
2.526	44.300	553.00	.0245
2.842	52.538	699.37	.0230
3.158	61.376	865.46	.0217
3.474	70.812	1052.11	.0206
3.789	80.847	1260.15	.0196
4.105	91.481	1490.41	.0188
4.421	102.713	1743.70	.0180
4.737	114.545	2020.81	.0173
5.053	126.975	2322.53	.0167
5.368	140.004	2649.66	.0161
5.684	153.632	3002.95	.0156
6.000	167.859	3383.16	.0152

ROUTE ID=10 HYDROGRAPH NO=130.12 INFLOW ID=3 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 130.12

RUNOFF VOLUME = 1.68193 INCHES = 15.5185 ACRE-FEET
PEAK DISCHARGE RATE = 144.87 CFS AT 1.467 HOURS BASIN AREA = .1730 SQ. MI.

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** COMPUTE HYDROGRAPH FOR BASIN 140.0(BASIN BETWEEN LOS VOLCANES AND BLUEWATER
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=140.0   DA=0.1484
                    %A=0.0  %B=15.0  %C=10.0  %D75.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .074124HR    TP =   .133333HR    K/TP RATIO =   .555932     SHAPE CONSTANT, N =  6.928371
    UNIT PEAK =   432.28    CFS   UNIT VOLUME =    .9995       B =   517.85      P60 = 1.8700
    AREA =      .111300 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .118329HR    TP =   .133333HR    K/TP RATIO =   .887470     SHAPE CONSTANT, N =  3.997157
    UNIT PEAK =   98.773    CFS   UNIT VOLUME =    1.000       B =   354.98      P60 = 1.8700
    AREA =      .037100 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                              PARTIAL HYDROGRAPH   140.00

    RUNOFF VOLUME =     1.67015 INCHES     =      13.2186 ACRE-FEET
    PEAK DISCHARGE RATE =     365.64 CFS  AT   1.500 HOURS   BASIN AREA =   .1484 SQ. MI.


** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 123.5 CFS
** APPROX 1.30 CFS PER ACRE
** PEAK DISCHARGE RELEASED AS SOON AS IT IS AVAILABLE IN THE POND
ROUTE RESERVOIR     ID=2  HYDROGRAPH NO=140.01  INFLOW ID=1  CODE=20
                    OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                         0             0             100.0
                       123.49          0.01          101.0
                       123.50          5.00          102.0

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

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)
      .00       .00    100.00       .000       .00
      .67       .00    100.00       .000       .00
     1.33     97.13    100.78       .008     96.01
     2.00     82.80    101.74      3.713    123.50
     2.67      7.58    100.01       .000      1.04
     3.33      2.63    100.02       .000      2.01
     4.00      1.85    100.01       .000      1.79
     4.67      1.78    100.01       .000      1.77
     5.33      1.96    100.02       .000      1.96
     6.00      2.26    100.02       .000      2.26
     6.67       .06    100.00       .000       .06
     7.33       .00    100.00       .000       .00
PEAK DISCHARGE =      123.498 CFS - PEAK OCCURS AT HOUR    1.80
MAXIMUM WATER SURFACE ELEVATION =      101.814
```

MAXIMUM STORAGE = 4.0713 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 140.01

RUNOFF VOLUME = 1.68267 INCHES = 13.3177 ACRE-FEET
PEAK DISCHARGE RATE = 123.50 CFS AT 1.800 HOURS BASIN AREA = .1484 SQ. MI.

** ADD FLOWS FROM BASIN 140.0 TO THE PROPOSED UNSER DIVERSION CHANNEL AT
** BLUEWATER ROAD
ADD HYD ID=11 HYDROGRAPH NO=140.02 ID I=10 ID II=2
** ROUTE CHANNEL FLOW FROM BLUEWATER ROAD TO THE SOUTH LOT LINE OF LOT 2*******
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0036 FLOOD PLAIN SLOPE=0.0036
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	7.7
100.63	7.4	25.7
100.95	12.1	52.7
101.26	17.3	88.8
101.58	23.2	134.3
101.89	29.6	189.6
102.21	36.7	255.3
102.53	44.3	331.8
102.84	52.5	419.6
103.16	61.4	519.3
103.47	70.8	631.3
103.79	80.8	756.1
104.11	91.5	894.2
104.42	102.7	1046.2
104.74	114.5	1212.5
105.05	127.0	1393.5
105.37	140.0	1589.8
105.68	153.6	1801.8
106.00	167.9	2029.9

COMPUTE TRAVEL TIME ID=10 REACH NO=8.3 VALLEY SECTIONS=1
LENGTH=1100 FT SLOPE=0.0036

TRAVEL TIME TABLE

REACH= 8.3

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	7.70	.1349
.632	7.445	25.67	.0886
.947	12.090	52.68	.0701
1.263	17.334	88.78	.0597
1.579	23.178	134.29	.0527
1.895	29.619	189.64	.0477
2.211	36.660	255.31	.0439
2.526	44.300	331.80	.0408
2.842	52.538	419.62	.0383
3.158	61.376	519.28	.0361
3.474	70.812	631.27	.0343
3.789	80.847	756.09	.0327
4.105	91.481	894.25	.0313
4.421	102.713	1046.22	.0300
4.737	114.545	1212.48	.0289
5.053	126.975	1393.52	.0278
5.368	140.004	1589.79	.0269
5.684	153.632	1801.77	.0261
6.000	167.859	2029.90	.0253

ROUTE ID=10 HYDROGRAPH NO=140.03 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 140.03

RUNOFF VOLUME = 1.68227 INCHES = 28.8362 ACRE-FEET
PEAK DISCHARGE RATE = 267.49 CFS AT 1.900 HOURS BASIN AREA = .3214 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 150.0 (THE AREA SOUTH OF BLUEWATER)
COMPUTE NM HYD ID=1 HYDROGRAPH NO=150.0 DA=0.0395
%A=0.0 %B=15.0 %C=10.0 %D=75.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 116.96 CFS UNIT VOLUME = .9993 B = 526.28 P60 = 1.8700
AREA = .029625 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .120942HR TP = .133300HR K/TP RATIO = .907291 SHAPE CONSTANT, N = 3.904285
UNIT PEAK = 25.835 CFS UNIT VOLUME = .9999 B = 348.74 P60 = 1.8700
AREA = .009875 SQ MI IA = .44000 INCHES INF = 1.08200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 150.00

RUNOFF VOLUME = 1.67015 INCHES = 3.5184 ACRE-FEET
PEAK DISCHARGE RATE = 97.75 CFS AT 1.500 HOURS BASIN AREA = .0395 SQ. MI.

** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 32.80 CFS
** APPROX 1.30 CFS PER ACRE
** PEAK DISCHARGE RELEASED AS SOON AS IT IS AVAILABLE IN THE POND
ROUTE RESERVOIR ID=2 HYDROGRAPH NO=150.01 INFLOW ID=1 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
32.79	0.01	101.0
32.80	2.50	102.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
1.33	26.01	100.76	.008	24.91
2.00	21.99	101.40	1.003	32.79
2.67	1.99	100.05	.000	1.55
3.33	.69	100.02	.000	.69
4.00	.49	100.01	.000	.49
4.67	.47	100.01	.000	.47
5.33	.52	100.02	.000	.52
6.00	.60	100.02	.000	.60
6.67	.01	100.00	.000	.01

PEAK DISCHARGE = 32.794 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 101.437
MAXIMUM STORAGE = 1.0978 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 150.01

RUNOFF VOLUME = 1.67563 INCHES = 3.5300 ACRE-FEET
PEAK DISCHARGE RATE = 32.79 CFS AT 1.800 HOURS BASIN AREA = .0395 SQ. MI.

** ADD FLOWS FROM BASIN 150.0 TO THE PROPOSED UNSER DIVERSION CHANNEL AT THE
** SOUTH LINE OF LOT 2
ADD HYD ID=12 HYDROGRAPH NO=150.02 ID I=10 ID II=2
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 150.02

RUNOFF VOLUME = 1.68155 INCHES = 32.3662 ACRE-FEET
PEAK DISCHARGE RATE = 300.29 CFS AT 1.900 HOURS BASIN AREA = .3609 SQ. MI.

** ROUTE FLOWS DOWN PROPOSED UNSER DIVERSION CHANNEL FROM THE WEST LOT LINE OF
** LOT 2 TO THE EAST LOT LINE OF LOT 2
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.018 FLOOD PLAIN SLOPE=0.018
N=0.0170 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	17.2
100.63	7.4	57.4
100.95	12.1	117.8
101.26	17.3	198.5
101.58	23.2	300.3
101.89	29.6	424.0
102.21	36.7	570.9
102.53	44.3	741.9
102.84	52.5	938.3
103.16	61.4	1161.1
103.47	70.8	1411.6
103.79	80.8	1690.7
104.11	91.5	1999.6
104.42	102.7	2339.4
104.74	114.5	2711.2
105.05	127.0	3116.0
105.37	140.0	3554.9
105.68	153.6	4028.9
106.00	167.9	4539.0

COMPUTE TRAVEL TIME ID=11 REACH NO=10 VALLEY SECTIONS=1
LENGTH=1300 FT SLOPE=0.018

TRAVEL TIME TABLE
REACH= 10.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	17.22	.0713
.632	7.445	57.40	.0468
.947	12.090	117.80	.0371
1.263	17.334	198.52	.0315
1.579	23.178	300.27	.0279
1.895	29.619	424.04	.0252
2.211	36.660	570.89	.0232
2.526	44.300	741.93	.0216

```
                        2.842      52.538      938.30       .0202
                        3.158      61.376     1161.14       .0191
                        3.474      70.812     1411.56       .0181
                        3.789      80.847     1690.68       .0173
                        4.105      91.481     1999.60       .0165
                        4.421     102.713     2339.41       .0159
                        4.737     114.545     2711.20       .0153
                        5.053     126.975     3116.01       .0147
                        5.368     140.004     3554.89       .0142
                        5.684     153.632     4028.87       .0138
                        6.000     167.859     4538.99       .0134
ROUTE            ID=11  HYDROGRAPH NO=150.03  INFLOW ID=12 DT=0.0
PRINT HYD        ID=11  CODE=1

                              PARTIAL HYDROGRAPH   150.03

    RUNOFF VOLUME =     1.68155 INCHES     =      32.3662 ACRE-FEET
    PEAK DISCHARGE RATE =     300.29 CFS  AT   1.867 HOURS   BASIN AREA =   .3609 SQ. MI.


** COMPUTE HYDROGRAPH FOR LOT 2 (DEVELOPED CONDITION)************************
COMPUTE NM HYD      ID=1  HYDROGRAPH NO=160.1  DA=0.0517
                    %A=0.0  %B=15.0  %C=10.0  %D=75.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   153.05    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .038775 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .120969HR    TP =   .133330HR    K/TP RATIO =   .907291     SHAPE CONSTANT, N =  3.904285
    UNIT PEAK =   33.807    CFS   UNIT VOLUME =    1.000       B =   348.74      P60 = 1.8700
    AREA =      .012925 SQ MI    IA =    .44000 INCHES    INF =   1.08200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=1  CODE=1

                              PARTIAL HYDROGRAPH   160.10

    RUNOFF VOLUME =     1.67015 INCHES     =       4.6051 ACRE-FEET
    PEAK DISCHARGE RATE =     127.92 CFS  AT   1.500 HOURS   BASIN AREA =   .0517 SQ. MI.


** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 43.0 CFS
** APPROX 1.30 CFS PER ACRE
** PEAK DISCHARGE RELEASED AS SOON AS IT IS AVAILABLE IN THE POND
ROUTE RESERVOIR     ID=2  HYDROGRAPH NO=160.11  INFLOW ID=1  CODE=20
                    OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                         0             0            100.0
```

	42.99	0.01	101.0
	43.00	2.50	102.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
1.33	34.03	100.77	.008	32.93
2.00	28.78	101.52	1.306	43.00
2.67	2.61	100.04	.000	1.70
3.33	.91	100.02	.000	.91
4.00	.64	100.01	.000	.64
4.67	.62	100.01	.000	.62
5.33	.68	100.02	.000	.68
6.00	.79	100.02	.000	.79
6.67	.02	100.00	.000	.02

PEAK DISCHARGE = 42.996 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 101.570
MAXIMUM STORAGE = 1.4303 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 160.11

RUNOFF VOLUME = 1.67919 INCHES = 4.6301 ACRE-FEET
PEAK DISCHARGE RATE = 43.00 CFS AT 1.800 HOURS BASIN AREA = .0517 SQ. MI.

** ADD FLOWS FROM LOT 2 TO PROPOSED UNSER DIVERSION CHANNEL*****************
ADD HYD ID=10 HYDROGRAPH NO=160.12 ID I=2 ID II=11
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 160.12

RUNOFF VOLUME = 1.68125 INCHES = 36.9963 ACRE-FEET
PEAK DISCHARGE RATE = 343.29 CFS AT 1.867 HOURS BASIN AREA = .4126 SQ. MI.

** ROUTE CHANNEL FLOW FROM THE EAST LOT LINE OF LOT 2 TO A POINT 700 LF TO THE
** EAST
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.015 FLOOD PLAIN SLOPE=0.015
N=0.0170 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	15.7
100.63	7.4	52.4
100.95	12.1	107.5
101.26	17.3	181.2
101.58	23.2	274.1
101.89	29.6	387.1
102.21	36.7	521.1
102.53	44.3	677.3
102.84	52.5	856.5
103.16	61.4	1060.0
103.47	70.8	1288.6
103.79	80.8	1543.4
104.11	91.5	1825.4
104.42	102.7	2135.6
104.74	114.5	2475.0
105.05	127.0	2844.5
105.37	140.0	3245.2
105.68	153.6	3677.8
106.00	167.9	4143.5

COMPUTE TRAVEL TIME ID=11 REACH NO=11 VALLEY SECTIONS=1
LENGTH=700 FT SLOPE=0.015

TRAVEL TIME TABLE

REACH= 11.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	15.72	.0420
.632	7.445	52.40	.0276
.947	12.090	107.54	.0219
1.263	17.334	181.22	.0186
1.579	23.178	274.11	.0164
1.895	29.619	387.09	.0149
2.211	36.660	521.15	.0137
2.526	44.300	677.29	.0127
2.842	52.538	856.55	.0119
3.158	61.376	1059.97	.0113
3.474	70.812	1288.57	.0107
3.789	80.847	1543.37	.0102
4.105	91.481	1825.38	.0097
4.421	102.713	2135.58	.0094
4.737	114.545	2474.97	.0090
5.053	126.975	2844.51	.0087
5.368	140.004	3245.15	.0084
5.684	153.632	3677.84	.0081
6.000	167.859	4143.51	.0079

ROUTE ID=11 HYDROGRAPH NO=160.13 INFLOW ID=10 DT=0.0

PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 160.13

RUNOFF VOLUME = 1.68125 INCHES = 36.9963 ACRE-FEET
PEAK DISCHARGE RATE = 343.29 CFS AT 1.867 HOURS BASIN AREA = .4126 SQ. MI.

** ROUTE CHANNEL FLOW FROM APPROX. 500 LF WEST OF UNSER BOULEVARD TO UNSER BLVD
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0065 FLOOD PLAIN SLOPE=0.0065
N=0.017 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.0
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	10.3
100.63	7.4	34.5
100.95	12.1	70.8
101.26	17.3	119.3
101.58	23.2	180.4
101.89	29.6	254.8
102.21	36.7	343.1
102.53	44.3	445.8
102.84	52.5	563.8
103.16	61.4	697.8
103.47	70.8	848.2
103.79	80.8	1016.0
104.11	91.5	1201.6
104.42	102.7	1405.8
104.74	114.5	1629.2
105.05	127.0	1872.5
105.37	140.0	2136.2
105.68	153.6	2421.1
106.00	167.9	2727.6

COMPUTE TRAVEL TIME ID=10 REACH NO=12 VALLEY SECTIONS=1
LENGTH=500 FT SLOPE=0.0065

TRAVEL TIME TABLE

REACH= 12.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	10.34	.0456
.632	7.445	34.49	.0300

.947	12.090	70.79	.0237
1.263	17.334	119.29	.0202
1.579	23.178	180.44	.0178
1.895	29.619	254.82	.0161
2.211	36.660	343.06	.0148
2.526	44.300	445.84	.0138
2.842	52.538	563.85	.0129
3.158	61.376	697.76	.0122
3.474	70.812	848.24	.0116
3.789	80.847	1015.97	.0111
4.105	91.481	1201.61	.0106
4.421	102.713	1405.81	.0101
4.737	114.545	1629.23	.0098
5.053	126.975	1872.49	.0094
5.368	140.004	2136.22	.0091
5.684	153.632	2421.05	.0088
6.000	167.859	2727.59	.0085

ROUTE ID=10 HYDROGRAPH NO=160.14 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 160.14

RUNOFF VOLUME = 1.68125 INCHES = 36.9963 ACRE-FEET
PEAK DISCHARGE RATE = 343.29 CFS AT 1.900 HOURS BASIN AREA = .4126 SQ. MI.

** COMPUTE HYDROGRAPH FOR LOT 1 FLOWS**********

COMPUTE NM HYD ID=1 HYDROGRAPH NO=160.2 DA=0.0350
%A=0.0 %B=15.0 %C=10.0 %D=75.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 103.61 CFS UNIT VOLUME = .9993 B = 526.28 P60 = 1.8700
AREA = .026250 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .120969HR TP = .133330HR K/TP RATIO = .907291 SHAPE CONSTANT, N = 3.904285
UNIT PEAK = 22.886 CFS UNIT VOLUME = .9999 B = 348.74 P60 = 1.8700
AREA = .008750 SQ MI IA = .44000 INCHES INF = 1.08200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 160.20

RUNOFF VOLUME = 1.67015 INCHES = 3.1176 ACRE-FEET
PEAK DISCHARGE RATE = 86.60 CFS AT 1.500 HOURS BASIN AREA = .0350 SQ. MI.

** ROUTE FLOW THRU A THEORETICAL POND WITH A PEAK DISCHARGE OF 29.1CFS
** APPROX 1.30 CFS PER ACRE
ROUTE RESERVOIR ID=2 HYDROGRAPH NO=160.21 INFLOW ID=1 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
29.09	0.01	101.0
29.10	1.50	102.0

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
1.33	23.04	100.75	.008	21.95
2.00	19.48	101.59	.888	29.10
2.67	1.77	100.05	.001	1.46
3.33	.61	100.02	.000	.62
4.00	.43	100.01	.000	.43
4.67	.42	100.01	.000	.42
5.33	.46	100.02	.000	.46
6.00	.53	100.02	.000	.53
6.67	.01	100.00	.000	.01

PEAK DISCHARGE = 29.096 CFS - PEAK OCCURS AT HOUR 1.80
MAXIMUM WATER SURFACE ELEVATION = 101.646
MAXIMUM STORAGE = .9720 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 160.21

RUNOFF VOLUME = 1.67697 INCHES = 3.1303 ACRE-FEET
PEAK DISCHARGE RATE = 29.10 CFS AT 1.800 HOURS BASIN AREA = .0350 SQ. MI.

** ADD FLOWS FROM LOT 1 TO CHANNEL**********

ADD HYD ID=11 HYDROGRAPH NO=160.22 ID I=2 ID II=10
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 160.22

RUNOFF VOLUME = 1.68092 INCHES = 40.1266 ACRE-FEET
PEAK DISCHARGE RATE = 372.38 CFS AT 1.900 HOURS BASIN AREA = .4476 SQ. MI.

** ROUTE THE FLOW IN THE PROPOSED UNSER DIVERSION CHANNEL THROUGH A TRAPAZOIDAL
** BOX CULVERT FROM THE WEST SIDE OF UNSER TO THE TIERRA BAYITA STORM DRAIN
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=104FT

CHANNEL SLOPE=0.005 FLOOD PLAIN SLOPE=0.005
N=-0.014 DIST=24

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	104	8.0	100	18.0	100	24.0	104

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.21	2.2	5.6
100.42	4.5	18.0
100.63	7.0	35.7
100.84	9.7	58.3
101.05	12.5	85.6
101.26	15.4	117.4
101.47	18.5	153.8
101.68	21.8	194.7
101.89	25.2	240.3
102.11	28.8	290.5
102.32	32.5	345.4
102.53	36.4	405.1
102.74	40.5	469.7
102.95	44.7	539.3
103.16	49.0	613.9
103.37	53.5	693.7
103.58	58.2	778.7
103.79	63.0	869.1
104.00	68.0	965.0

COMPUTE TRAVEL TIME ID=15 REACH NO=12 VALLEY SECTIONS=1
LENGTH=50 FT SLOPE=0.005

TRAVEL TIME TABLE
REACH= 12.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.211	2.183	5.62	.0054
.421	4.521	18.00	.0035
.632	7.014	35.72	.0027
.842	9.662	58.31	.0023
1.053	12.465	85.57	.0020
1.263	15.424	117.40	.0018
1.474	18.537	153.78	.0017
1.684	21.806	194.73	.0016
1.895	25.230	240.27	.0015
2.105	28.809	290.46	.0014
2.316	32.543	345.38	.0013
2.526	36.432	405.10	.0012
2.737	40.476	469.71	.0012
2.947	44.676	539.28	.0012
3.158	49.030	613.92	.0011
3.368	53.540	693.71	.0011

	3.579	58.205	778.75	.0010
	3.789	63.025	869.14	.0010
	4.000	68.000	964.97	.0010

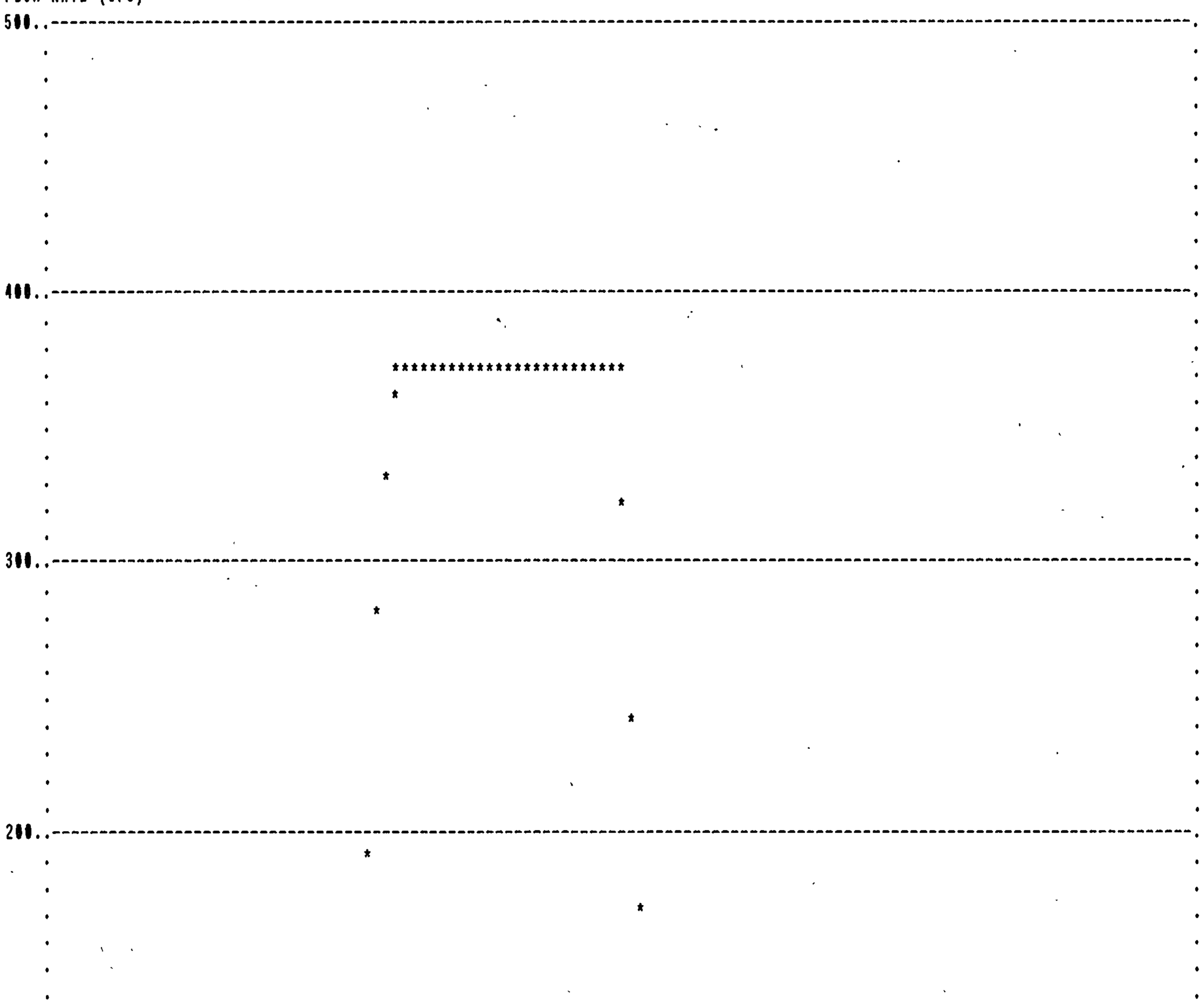
ROUTE ID=15 HYDROGRAPH NO=160.22 INFLOW ID=11 DT=0.033333

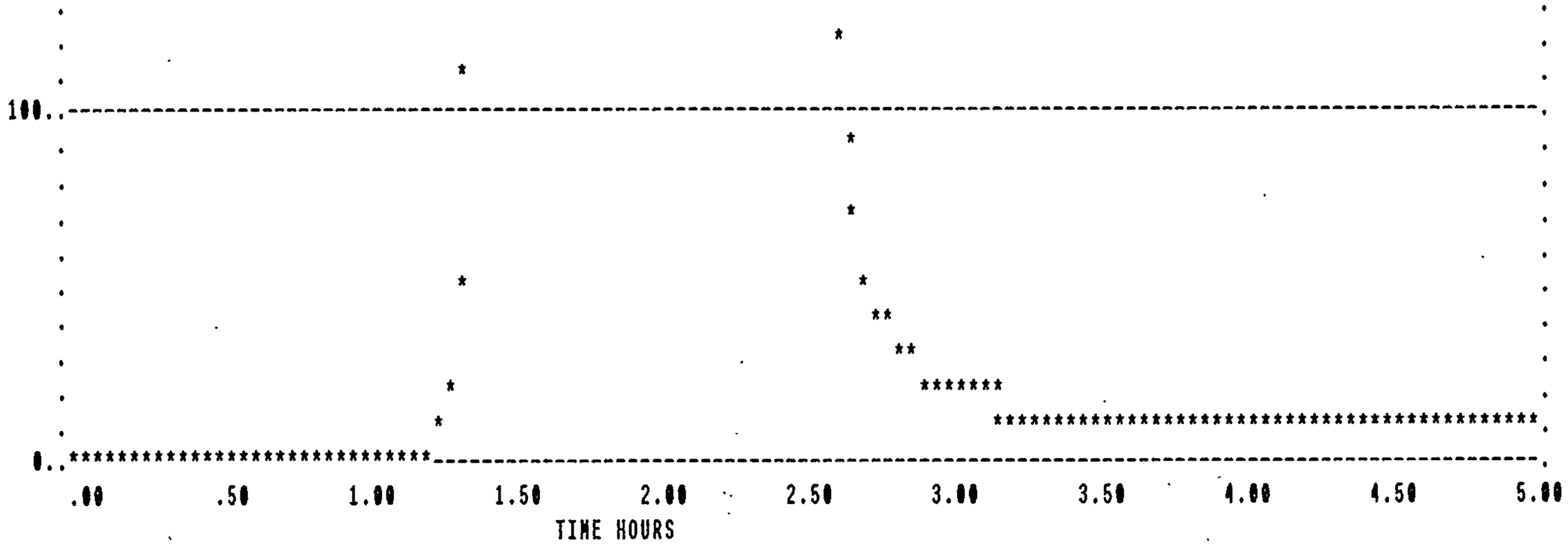
PRINT HYD ID=15 CODE=1 *

PARTIAL HYDROGRAPH 160.22

RUNOFF VOLUME = 1.68092 INCHES = 40.1266 ACRE-FEET
PEAK DISCHARGE RATE = 372.43 CFS AT 1.867 HOURS BASIN AREA = .4476 SQ. MI.

PLOT HYD ID=15 ID=0 Q SCALE=500 T SCALE=5.0



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**********************************************************************************
*S BEGIN UNSER BOULEVARD STORM DRAIN SYSTEM BETWEEN I-40 AND THE FUTURE TIERRA
*s BAYITA STORM DRAIN
**********************************************************************************
** ASSUMPTIONS: ALL WATER ON EAST SIDE OF UNSER IS INTERCEPTED BY THE STORM
** DRAIN EXCEPT THE FLOW WHICH IS IN EXCESS OF THE S.D. CAPACITY BELOW THE
** INLETS ADJACENT TO THE SAD 214 POND.****************************************
** FLOW IN EXCESS OF THE STORM DRAIN CAPACITY IN OTHER AREAS IS ASSUMED TO BE
** CARRIED IN THE WEST SIDE OF UNSER WITH A SMALL PORTION OF THE FLOW CROSSING
** OVER TO THE EAST SIDE AT THE INTERSECTION WITH BLUWATER. FLOWS FROM TRACT
** "T" ARE ASSUMED TO ENTER THE STORM DRAIN AT THE INTERSECTION OF LOS VOLCANES
** AND UNSER. FLOWS FROM TRACTS "J" AND TRACT "K" ARE ASSUMED TO ENTER THE
** STORM DRAIN AT THE INTERSECTION OF BLUEWATER AND UNSER. FLOW FROM
** THE PROPERTY SOUTH OF BLUEWATER ARE ASSUMED TO FLOW TO THE SOUTH
** TO THE PROPOSED UNSER DIVERSION CHANNEL.
** FLOW FROM TRACTS "T", "J",AND "K" ARE RESTRICTED TO THE UNDEVELOPED FLOW
** RATES AS REPORTED IN THE DRAINAGE REPORT FOR SAD 214
**********************************************************************************
**********************************************************************************
** COMPUTE HYDROGRAPH FOR BASIN 170.1 TRACT "T"
COMPUTE NM HYD      ID=2  HYD=170.1  DA==0.0633
                    %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072680HR    TP =   .133333HR    K/TP RATIO =   .545102     SHAPE CONSTANT, N =  7.104727
    UNIT PEAK =   212.34    CFS   UNIT VOLUME =    .9993       B =   526.20      P60 = 1.8700
    AREA =      .053805 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .130986HR    TP =   .133333HR    K/TP RATIO =   .982400     SHAPE CONSTANT, N =  3.594515
    UNIT PEAK =   23.298    CFS   UNIT VOLUME =    .9997       B =   327.16      P60 = 1.8700
    AREA =      .009495 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333
```

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.10

RUNOFF VOLUME = 1.77075 INCHES = 5.9780 ACRE-FEET
PEAK DISCHARGE RATE = 162.71 CFS AT 1.500 HOURS BASIN AREA = .0633 SQ. MI.

** ROUTE FLOW FROM BASIN 170.1 THRU AN ASSUMED POND
** ALLOWABLE RELEASE RATE=47.2cfs
ROUTE RESERVOIR ID=6 HYDROGRAPH NO=170.15 INFLOW ID=2 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0.00	0.00	100.00
25.96	0.70	101.00
38.70	1.68	102.00
47.20	2.78	103.00
54.00	4.00	104.00

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.42	100.00	.001	.02
1.33	46.70	100.29	.202	7.49
1.50	162.71	101.68	1.368	34.64
1.67	82.70	102.75	2.508	45.10
1.83	52.83	102.99	2.766	47.10
2.00	38.50	102.96	2.739	46.88
2.17	17.58	102.75	2.509	45.11
2.33	8.28	102.36	2.072	41.73
2.50	5.14	101.93	1.613	37.82
2.67	3.44	101.50	1.188	32.31
2.83	2.46	101.12	.817	27.49
3.00	1.85	100.74	.518	19.20
3.17	1.46	100.47	.328	12.16
3.33	1.24	100.30	.211	7.83
3.50	1.09	100.20	.139	5.16
3.67	1.00	100.14	.095	3.50
3.83	.93	100.10	.067	2.49
4.00	.89	100.07	.050	1.85
4.17	.87	100.06	.039	1.46
4.33	.85	100.05	.033	1.22
4.50	.85	100.04	.029	1.07
4.67	.86	100.04	.027	.99

4.83	.87	100.04	.025	.94
5.00	.89	100.04	.025	.92
5.17	.92	100.04	.025	.91
5.33	.95	100.04	.025	.92
5.50	.99	100.04	.025	.94
5.67	1.01	100.04	.026	.96
5.83	1.06	100.04	.027	.99
6.00	1.09	100.04	.028	1.03
6.17	.44	100.04	.026	.95
6.33	.12	100.03	.018	.66
6.50	.06	100.02	.012	.43
6.67	.03	100.01	.007	.27
6.83	.01	100.01	.005	.17
7.00	.01	100.00	.003	.11
7.17	.00	100.00	.002	.06
7.33	.00	100.00	.001	.04
7.50	.00	100.00	.001	.02
7.67	.00	100.00	.000	.01
7.83	.00	100.00	.000	.01
8.00	.00	100.00	.000	.01
8.17	.00	100.00	.000	.00

PEAK DISCHARGE = 47.192 CFS - PEAK OCCURS AT HOUR 1.90
MAXIMUM WATER SURFACE ELEVATION = 102.999
MAXIMUM STORAGE = 2.7790 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 170.15

RUNOFF VOLUME = 1.77075 INCHES = 5.9780 ACRE-FEET
PEAK DISCHARGE RATE = 47.19 CFS AT 1.900 HOURS BASIN AREA = .0633 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 170.2 THE WEST PORTION OF UNSER BOULEVARD
** AND HIGHWAY RIGHT OF WAY NORTH OF LOS VOLCANES
** ASSUME ALL WATER ABOVE THIS BASIN IS INTERCEPTED BY THE INLETS IN UNSER AND
** ROUTED TO THE HIGHWAY INTERCHANGE POND

COMPUTE NM HYD ID=3 HYD=170.2 DA==0.0077
%A=0.0 %B=60.0 %C=0.0 %D=40.0 TP=0.133333
MASS RAINFALL=-1

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.157 CFS UNIT VOLUME = .9984 B = 526.28 P60 = 1.8700
AREA = .003080 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .131024HR TP = .133333HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593454
UNIT PEAK = 11.334 CFS UNIT VOLUME = .9991 B = 327.09 P60 = 1.8700
AREA = .004620 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

```
PRINT HYD          ID=3 CODE=1

                              PARTIAL HYDROGRAPH   170.20


    RUNOFF VOLUME =     1.18661 INCHES     =        .4873 ACRE-FEET
    PEAK DISCHARGE RATE =      14.60 CFS  AT   1.500 HOURS   BASIN AREA =   .0077 SQ. MI.



** COMPUTE HYDROGRAPH FOR BASIN 170.3 LOS VOLCANES WEST OF UNSER
COMPUTE NM HYD     ID=4  HYD=170.3  DA==0.0037
                   %A=0.0  %B=10.0  %C=0.0  %D=90.0  TP=0.13333
                   MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.144    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003330 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .90769    CFS   UNIT VOLUME =    .9849       B =   327.09      P60 = 1.8700
    AREA =      .000370 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID=4 CODE=1

                              PARTIAL HYDROGRAPH   170.30


    RUNOFF VOLUME =     1.83566 INCHES     =        .3622 ACRE-FEET
    PEAK DISCHARGE RATE =       9.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.



** ADD THE HYDROGRAPHS FROM BASINS 170.1 AND 170.3
ADD HYD            ID=5  HYDROGRAPH NO=170.31  ID I=6  ID II=4
PRINT HYD          ID=5  CODE=1

                              PARTIAL HYDROGRAPH   170.31


    RUNOFF VOLUME =     1.77432 INCHES     =       6.3402 ACRE-FEET
    PEAK DISCHARGE RATE =      50.38 CFS  AT   1.767 HOURS   BASIN AREA =   .0670 SQ. MI.



** ADD THE COMBINED HYDROGRAPH FROM BASINS 170.2 AND 170.3 TO BASIN 170.1 HYD.
** AT THE INTERSECTION OF LOS VOLCANES AND UNSER
ADD HYD            ID=2  HYDROGRAPH NO=170.32  ID I=3  ID II=5
PRINT HYD          ID=2  CODE=1

                              PARTIAL HYDROGRAPH   170.32
```

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                                                                    ****

    RUNOFF VOLUME =     1.71374 INCHES     =       6.8275 ACRE-FEET
    PEAK DISCHARGE RATE =      62.42 CFS  AT   1.533 HOURS   BASIN AREA =   .0747 SQ. MI.


** COMPUTE HYDROGRAPH FOR BASIN 170.4 THE EAST PORTION OF UNSER BOULEVARD
** AND HIGHWAY RIGHT OF WAY NORTH OF LOS VOLCANES
** ASSUME ALL WATER ABOVE THIS BASIN IS INTERCEPTED BY THE INLETS IN UNSER AND
** ROUTED TO THE HIGHWAY INTERCHANGE POND
COMPUTE NM HYD      ID=3  HYD=170.4  DA==0.0060
                    %A=0.0  %B=45.0  %C=0.0  %D=55.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   13.825    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.8700
    AREA =      .003300 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131024HR    TP =   .133333HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593454
    UNIT PEAK =   6.6235    CFS   UNIT VOLUME =    .9983       B =   327.09      P60 = 1.8700
    AREA =      .002700 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   170.40

    RUNOFF VOLUME =     1.38133 INCHES     =        .4420 ACRE-FEET
    PEAK DISCHARGE RATE =      12.73 CFS  AT   1.500 HOURS   BASIN AREA =   .0060 SQ. MI.


** ADD THE FLOW FROM THE EAST SIDE OF UNSER TO THE TOTAL FLOW ON THE WEST
** SIDE OF UNSER
ADD HYD             ID=5  HYDROGRAPH NO=170.43 ID I=2  ID II=3
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   170.43

    RUNOFF VOLUME =     1.68902 INCHES     =       7.2695 ACRE-FEET
    PEAK DISCHARGE RATE =      74.70 CFS  AT   1.533 HOURS   BASIN AREA =   .0807 SQ. MI.


** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 30" RCP MIN SLOPE = 0.01
** HYD 170.44 = FLOW TO UNSER STORM DRAIN
** HYD 170.45= FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=5  Q=41.0  ID I=2    HYD I=170.44
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                                ID II=11  HYD II=170.45
PRINT HYD          ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.44

    RUNOFF VOLUME =     1.68902 INCHES     =       6.0156 ACRE-FEET
    PEAK DISCHARGE RATE =      41.00 CFS  AT   1.433 HOURS   BASIN AREA =   .0668 SQ. MI.


PRINT HYD          ID=11  CODE=1

                                PARTIAL HYDROGRAPH   170.45

    RUNOFF VOLUME =     1.68902 INCHES     =       1.2539 ACRE-FEET
    PEAK DISCHARGE RATE =      33.70 CFS  AT   1.533 HOURS   BASIN AREA =   .0139 SQ. MI.


** ROUTE THE FLOW IN THE UNSER BLVD STORM DRAIN FROM THE INTERSECTION OF
** LOS VOLCANES AND UNSER TO THE SECOND MANHOLE SOUTH OF THE INTERSECTION
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.010
                     PIPE DIA=30  N=0.013

                                RATING CURVE PIPE SECTION  1.0
                                   WATER      FLOW       FLOW
                                  SURFACE     AREA       RATE
                                   ELEV       SQ FT      CFS
                                     .00         .0         .0
                                     .13         .1         .2
                                     .26         .3         .9
                                     .39         .5        2.2
                                     .52         .7        3.9
                                     .65        1.0        6.1
                                     .78        1.3        8.7
                                     .91        1.6       11.7
                                    1.04        1.9       14.9
                                    1.17        2.3       18.4
                                    1.30        2.6       22.0
                                    1.43        2.9       25.7
                                    1.56        3.2       29.3
                                    1.69        3.5       32.9
                                    1.82        3.8       36.2
                                    1.95        4.1       39.2
                                    2.08        4.4       41.6
                                    2.21        4.6       43.4
                                    2.35        4.8       44.1
                                    2.50        4.9       44.1
COMPUTE TRAVEL TIME ID=1  REACH=1  NUMBER OF VALLEY SECTIONS=1
                     LENGTH=447 FT  SLOPE=0.010

                                TRAVEL TIME TABLE
```

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.22	.0563
.261	.271	.93	.0361
.391	.490	2.17	.0280
.521	.741	3.91	.0236
.651	1.017	6.10	.0207
.782	1.312	8.70	.0187
.912	1.620	11.66	.0173
1.042	1.937	14.90	.0161
1.173	2.261	18.37	.0153
1.303	2.586	21.99	.0146
1.433	2.910	25.67	.0141
1.563	3.229	29.33	.0137
1.694	3.540	32.87	.0134
1.824	3.837	36.19	.0132
1.954	4.117	39.16	.0131
2.084	4.373	41.63	.0130
2.215	4.599	43.40	.0132
2.345	4.783	44.12	.0135
2.500	4.909	44.12	.0138

ROUTE ID=1 HYDROGRAPH NO=170.46 INFLOW ID=2 DT=0.033333
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 170.46

RUNOFF VOLUME = 1.68902 INCHES = 6.0156 ACRE-FEET
PEAK DISCHARGE RATE = 41.00 CFS AT 1.600 HOURS BASIN AREA = .0668 SQ. MI.

** ROUTE THE FLOW DOWN UNSER STORM DRAIN FROM THE SECOND M.H. SOUTH OF
** LOS VOLCANES TO THE THIRD MANHOLE SOUTH OF LOS VOLCANES
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.01744
PIPE DIA=30 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.3
.26	.3	1.2
.39	.5	2.9
.52	.7	5.2
.65	1.0	8.1
.78	1.3	11.5
.91	1.6	15.4
1.04	1.9	19.7
1.17	2.3	24.3

1.30	2.6	29.0
1.43	2.9	33.9
1.56	3.2	38.7
1.69	3.5	43.4
1.82	3.8	47.8
1.95	4.1	51.7
2.08	4.4	55.0
2.21	4.6	57.3
2.35	4.8	58.3
2.50	4.9	58.3

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 FT SLOPE=0.01744

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.28	.0429
.261	.271	1.23	.0275
.391	.490	2.87	.0214
.521	.741	5.16	.0180
.651	1.017	8.05	.0158
.782	1.312	11.49	.0143
.912	1.620	15.39	.0132
1.042	1.937	19.68	.0123
1.173	2.261	24.26	.0116
1.303	2.586	29.03	.0111
1.433	2.910	33.90	.0107
1.563	3.229	38.73	.0104
1.694	3.540	43.41	.0102
1.824	3.837	47.79	.0100
1.954	4.117	51.71	.0100
2.084	4.373	54.97	.0099
2.215	4.599	57.31	.0100
2.345	4.783	58.27	.0103
2.500	4.909	58.27	.0105

ROUTE ID=3 HYDROGRAPH NO=170.47 INFLOW ID=1 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.47

RUNOFF VOLUME = 1.68902 INCHES = 6.0156 ACRE-FEET
PEAK DISCHARGE RATE = 41.53 CFS AT 1.467 HOURS BASIN AREA = .0068 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 170.5 THE WEST HALF OF UNSER BOULEVARD BETWEEN
** LOS VOLCANES AND THE THIRD MANHOLE SOUTH OF THE INTERSECTION
COMPUTE NM HYD ID=2 HYD=170.5 DA==0.0029
%A=0.0 %B=20.0 %C=0.0 %D=80.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.1574 CFS UNIT VOLUME = .9980 B = 526.28 P60 = 1.8700
AREA = .002320 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .131021HR TP = .133330HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.4229 CFS UNIT VOLUME = .9911 B = 327.09 P60 = 1.8700
AREA = .000580 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.50

RUNOFF VOLUME = 1.70585 INCHES = .2638 ACRE-FEET
PEAK DISCHARGE RATE = 7.25 CFS AT 1.500 HOURS BASIN AREA = .0029 SQ. MI.

** ADD THE HYDROGRAPH FROM BASINS 170.5 TO THE ROUTED UNSER STORM DRAIN FLOW
ADD HYD ID=4 HYDROGRAPH NO=170.51 ID I=2 ID II=3
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 170.51

RUNOFF VOLUME = 1.68971 INCHES = 6.2794 ACRE-FEET
PEAK DISCHARGE RATE = 48.15 CFS AT 1.467 HOURS BASIN AREA = .0697 SQ. MI.

** ROUTE THE FLOW IN THE STREET FROM THE LOS VOLCANES & UNSER INTERSECTION TO
** THE THIRD MANHOLE SOUTH OF THE INTERSECTION. USE AVERAGE SLOPE.USE FUTURE
** CROSS SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING SIDEWALK
** ALONG CURB. ASSUME ALL FLOW THAT COULD NOT ENTER THE STORM DRAIN AT
** LOS VOLCANES REMAINS ON THE WEST SIDE OF THE STREET.
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=3
MINIMUM ELEV=100.00 FT MAXIMUM ELEV=100.87 FT
CHANNEL SLOPE=0.013 FLOOD PLAIN SLOPE=0.0129
N=0.035 DIST=5 N=0.017 DIST=10 N=-0.017 DIST=46.15

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	100.87	5	100.77	10	100.67	10.15	100.00
12	100.13	46	100.81	46.15	100.31		

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1

100.14	.1	.2
100.18	.3	.5
100.23	.6	1.0
100.27	.9	2.0
100.32	1.4	3.4
100.37	2.0	5.3
100.41	2.7	7.8
100.46	3.4	11.0
100.50	4.3	15.0
100.55	5.3	19.7
100.60	6.4	25.3
100.64	7.7	31.8
100.69	9.0	39.3
100.73	10.5	48.0
100.78	12.2	58.0
100.82	14.2	70.3
100.87	16.2	86.0

COMPUTE TRAVEL TIME ID=2 REACH NO=1 VALLEY SECTIONS=1
LENGTH=950 FT SLOPE=0.0129

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.015	.01	.3409
.092	.061	.07	.2148
.137	.137	.21	.1765
.183	.293	.46	.1684
.229	.554	1.01	.1442
.275	.920	1.95	.1244
.321	1.392	3.35	.1096
.366	1.969	5.28	.0984
.412	2.653	7.82	.0895
.458	3.442	11.03	.0823
.504	4.337	14.98	.0764
.549	5.338	19.73	.0714
.595	6.445	25.33	.0672
.641	7.658	31.85	.0635
.687	8.984	39.35	.0603
.733	10.500	47.99	.0577
.778	12.226	57.97	.0557
.824	14.157	70.32	.0531
.870	16.218	86.04	.0497

ROUTE ID=2 HYDROGRAPH NO=170.48 INFLOW ID=11 DT=0.033333
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.48

RUNOFF VOLUME = 1.68939 INCHES = 1.2542 ACRE-FEET
PEAK DISCHARGE RATE = 28.82 CFS AT 1.600 HOURS BASIN AREA = .0139 SQ. MI.

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** ADD THE ROUTED FLOW IN THE STREET TO THE TOTAL FLOW ON THE WEST SIDE OF
** UNSER BOULEVARD @ THE THIRD MANHOLE SOUTH OF LOS VOLCANES
ADD HYD             ID=3  HYDROGRAPH NO=170.52  ID I=4  ID II=2
PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   170.52


    RUNOFF VOLUME =     1.68965 INCHES     =       7.5336 ACRE-FEET
    PEAK DISCHARGE RATE =      75.00 CFS  AT   1.567 HOURS   BASIN AREA =   .0836 SQ. MI.



** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 36" RCP MIN. SLOPE = 0.0148
** HYD 170.53= FLOW TO UNSER STORM DRAIN
** HYD 170.54= FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=5  Q=81.00  ID I=2    HYD I=170.53
                                  ID II=11  HYD II=170.54
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.53


    RUNOFF VOLUME =     1.68902 INCHES     =       7.2695 ACRE-FEET
    PEAK DISCHARGE RATE =      74.70 CFS  AT   1.533 HOURS   BASIN AREA =   .0807 SQ. MI.



PRINT HYD           ID=11  CODE=1

                                PARTIAL HYDROGRAPH   170.54


    RUNOFF VOLUME =      .00000 INCHES     =        .0000 ACRE-FEET
    PEAK DISCHARGE RATE =        .00 CFS  AT   -.033 HOURS   BASIN AREA =   .0000 SQ. MI.



** ROUTE THE FLOW IN THE UNSER BLVD STORM DRAIN FROM THE THIRD MANHOLE SOUTH
** OF LOS VOLCANES TO THE FIRST MANHOLE SOUTH OF THE INTERSECTION OF BLUEWATER
** AND UNSER. USE AVERAGE SLOPE.
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.016
                    PIPE DIA=36  N=0.013

                                RATING CURVE PIPE SECTION  1.0
                                   WATER      FLOW       FLOW
                                  SURFACE     AREA       RATE
                                   ELEV       SQ FT      CFS
                                     .00         .0         .0
                                     .16         .1         .4
                                     .31         .4        1.9
```

.47	.7	4.5
.63	1.1	8.0
.78	1.5	12.5
.94	1.9	17.9
1.09	2.3	24.0
1.25	2.8	30.7
1.41	3.3	37.8
1.56	3.7	45.2
1.72	4.2	52.8
1.88	4.7	60.3
2.03	5.1	67.6
2.19	5.5	74.4
2.35	5.9	80.5
2.50	6.3	85.6
2.66	6.6	89.3
2.81	6.9	90.8
3.00	7.1	90.8

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=795 FT SLOPE=0.016

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.44	.0701
.313	.391	1.92	.0449
.469	.706	4.47	.0349
.625	1.068	8.03	.0294
.782	1.465	12.54	.0258
.938	1.889	17.89	.0233
1.094	2.332	23.97	.0215
1.251	2.790	30.65	.0201
1.407	3.255	37.79	.0190
1.563	3.724	45.22	.0182
1.720	4.191	52.80	.0175
1.876	4.650	60.32	.0170
2.032	5.097	67.61	.0166
2.189	5.525	74.44	.0164
2.345	5.928	80.54	.0163
2.501	6.297	85.62	.0162
2.658	6.622	89.26	.0164
2.814	6.887	90.75	.0168
3.000	7.069	90.75	.0172

ROUTE ID=3 HYDROGRAPH NO=170.55 INFLOW ID=2 DT=0.033333
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.55

RUNOFF VOLUME = 1.68902 INCHES = 7.2695 ACRE-FEET
PEAK DISCHARGE RATE = 73.79 CFS AT 1.533 HOURS BASIN AREA = .0807 SQ. MI.

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** COMPUTE HYDROGRAPH FOR BASIN 170.6 THE WEST PORTION OF UNSER BOULEVARD
** BETWEEN THE THIRD MANHOLE SOUTH OF LOS VOLCANES AND THE INTERSECTION OF
** BLUEWATER AND UNSER
COMPUTE NM HYD      ID=2  HYD=170.6  DA==0.0018
                    %A=0.0  %B=20.0  %C=0.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.6839    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001440 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .88316    CFS   UNIT VOLUME =    .9849       B =   327.09      P60 = 1.8700
    AREA =      .000360 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.60


    RUNOFF VOLUME =     1.70585 INCHES     =        .1638 ACRE-FEET
    PEAK DISCHARGE RATE =       4.51 CFS  AT   1.500 HOURS   BASIN AREA =   .0018 SQ. MI.


** ADD THE HYDROGRAPH FROM BASINS 170.6 TO THE UNSER STORM DRAIN FLOW
ADD HYD             ID=4  HYDROGRAPH NO=170.61  ID I=2  ID II=3
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   170.61


    RUNOFF VOLUME =     1.68938 INCHES     =       7.4332 ACRE-FEET
    PEAK DISCHARGE RATE =      78.10 CFS  AT   1.533 HOURS   BASIN AREA =   .0825 SQ. MI.


**COMPUTE A HYDROGRAPH FOR TRACTS "J" AND "K", THE RIO GRANDE ALBUQUERQUE SITE
COMPUTE NM HYD      ID=2  HYD=170.7  DA==0.0859
                    %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .073062HR    TP =   .133330HR    K/TP RATIO =   .547978     SHAPE CONSTANT, N =  7.057009
    UNIT PEAK =   286.93    CFS   UNIT VOLUME =    .9993       B =   523.95      P60 = 1.8700
    AREA =      .073015 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .129910HR    TP =   .133330HR    K/TP RATIO =   .974346     SHAPE CONSTANT, N =  3.624877
```

UNIT PEAK = 31.827 CFS UNIT VOLUME = .9999 B = 329.33 P60 = 1.8700
AREA = .012885 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 170.70

RUNOFF VOLUME = 1.77075 INCHES = 8.1124 ACRE-FEET
PEAK DISCHARGE RATE = 220.51 CFS AT 1.500 HOURS BASIN AREA = .0859 SQ. MI.

** ROUTE FLOW FROM tracts "J" AND "K" THRU AN ASSUMED POND
** ALLOWABLE RELEASE RATE=56.6 cfs PER THE SAD 214 DRAINAGE PLAN
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=170.71 INFLOW ID=2 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0.00	0.00	100.00
31.13	1.03	101.00
46.41	2.46	102.00
56.60	4.10	103.00
65.00	6.00	104.00

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
.17	.00	100.00	.000	.00
.33	.00	100.00	.000	.00
.50	.00	100.00	.000	.00
.67	.00	100.00	.000	.00
.83	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
1.17	.57	100.00	.001	.02
1.33	63.29	100.27	.281	8.48
1.50	220.51	101.62	1.918	40.62
1.67	112.28	102.67	3.566	53.28
1.83	71.70	102.95	4.026	56.14
2.00	52.29	102.99	4.092	56.55
2.17	23.93	102.86	3.871	55.18
2.33	11.28	102.54	3.353	51.96
2.50	7.01	102.20	2.784	48.43
2.67	4.69	101.83	2.224	43.89
2.83	3.34	101.48	1.712	38.42
3.00	2.51	101.16	1.257	33.56
3.17	1.98	100.84	.866	26.17
3.33	1.69	100.57	.592	17.88
3.50	1.48	100.40	.408	12.32
3.67	1.36	100.28	.285	8.60
3.83	1.27	100.20	.202	6.12
4.00	1.21	100.14	.147	4.45

4.17	1.18	100.11	.110	3.34
4.33	1.15	100.08	.086	2.59
4.50	1.15	100.07	.070	2.10
4.67	1.17	100.06	.059	1.78
4.83	1.19	100.05	.052	1.58
5.00	1.21	100.05	.048	1.45
5.17	1.25	100.04	.045	1.37
5.33	1.28	100.04	.044	1.34
5.50	1.34	100.04	.044	1.33
5.67	1.37	100.04	.044	1.34
5.83	1.44	100.04	.045	1.36
6.00	1.48	100.04	.046	1.40
6.17	.59	100.04	.043	1.31
6.33	.17	100.03	.032	.97
6.50	.08	100.02	.022	.68
6.67	.04	100.01	.015	.46
6.83	.02	100.01	.010	.31
7.00	.01	100.01	.007	.21
7.17	.00	100.00	.005	.14
7.33	.00	100.00	.003	.09
7.50	.00	100.00	.002	.06
7.67	.00	100.00	.001	.04
7.83	.00	100.00	.001	.03
8.00	.00	100.00	.001	.02
8.17	.00	100.00	.000	.01
8.33	.00	100.00	.000	.01
8.50	.00	100.00	.000	.01
8.67	.00	100.00	.000	.00

PEAK DISCHARGE = 56.595 CFS - PEAK OCCURS AT HOUR 1.97
MAXIMUM WATER SURFACE ELEVATION = 102.999
MAXIMUM STORAGE = 4.0992 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 170.71

RUNOFF VOLUME = 1.77075 INCHES = 8.1123 ACRE-FEET
PEAK DISCHARGE RATE = 56.59 CFS AT 1.967 HOURS BASIN AREA = .0859 SQ. MI.

** COMPUTE HYDROGRAPH FOR BASIN 170.8 BLUEWATER RD.FROM THE WEST BOUNDARY OF
** ATRISCO BUSINESS PARK TO UNSER BOULEVARD
COMPUTE NM HYD ID=2 HYD=170.8 DA==0.0054 SQ MI
%A=0.0 %B=10.0 %C=0.0 %D=90.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 19.183 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .004860 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

```
    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.3247    CFS   UNIT VOLUME =    .9903       B =   327.09      P60 = 1.8700
    AREA =      .000540 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   170.80


    RUNOFF VOLUME =     1.83566 INCHES     =        .5287 ACRE-FEET
    PEAK DISCHARGE RATE =      14.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0054 SQ. MI.



** ADD THE FLOW FROM BLUEWATER RD. TO THE CONTROLED FLOW FROM TRACTS "J" & "K"
ADD HYD             ID=5  HYDROGRAPH NO=170.81  ID I=3  ID II=2
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   170.81


    RUNOFF VOLUME =     1.77458 INCHES     =       8.6410 ACRE-FEET
    PEAK DISCHARGE RATE =      60.86 CFS  AT   1.800 HOURS   BASIN AREA =   .0913 SQ. MI.



** ADD THE COMBINED FLOW FROM TRACTS "J" AND "K" & BLUEWATER ROAD TO THE FLOW
** IN STORM DRAIN AT THE UNSER &  BLUEWATER INTERSECTION
ADD HYD             ID=2  HYDROGRAPH NO=170.82  ID I=4  ID II=5
PRINT HYD           ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.82


    RUNOFF VOLUME =     1.73414 INCHES     =      16.0742 ACRE-FEET
    PEAK DISCHARGE RATE =     137.76 CFS  AT   1.567 HOURS   BASIN AREA =   .1738 SQ. MI.



** COMPUTE A HYDROGRAPH FOR THE EAST SIDE OF UNSER BLVD. BETWEEN LOS VOLCANES
** AND BLUWATER
COMPUTE NM HYD      ID=3  HYD=170.9  DA==0.0047 SQ MI
                    %A=0.0  %B=20.0  %C=0.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.841    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   2.3060    CFS   UNIT VOLUME =    .9943       B =   327.09      P60 = 1.8700
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    AREA =      .000940 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD          ID=3 CODE=1

                                PARTIAL HYDROGRAPH   170.90


    RUNOFF VOLUME =     1.70585 INCHES     =        .4276 ACRE-FEET
    PEAK DISCHARGE RATE =      11.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0047 SQ. MI.



** ADD THE FLOW FROM THE EAST SIDE OF UNSER TO THE TOTAL FLOW IN THE STORM
** DRAIN AND IN THE STREET AT THE INTERSECTION OF BLUEWATER AND UNSER
ADD HYD            ID=4  HYDROGRAPH NO=170.91  ID I=3  ID II=2
PRINT HYD          ID=4  CODE=1

                                PARTIAL HYDROGRAPH   170.91


    RUNOFF VOLUME =     1.73339 INCHES     =      16.5018 ACRE-FEET
    PEAK DISCHARGE RATE =     148.64 CFS  AT   1.533 HOURS   BASIN AREA =   .1785 SQ. MI.



** DIVIDE OUT FLOW WHICH EXCEEDS THE NON PRESSURE PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 42" RCP MIN. SLOPE = 0.00842
** HYD 170.92= FLOW TO UNSER STORM DRAIN
** HYD 170.93= FLOW TO REMAIN IN STREET
DIVIDE HYD         ID=4  Q=92     ID I=2   HYD I=170.92
                                 ID II=10  HYD II=170.93
PRINT HYD          ID=2  CODE=1

                                PARTIAL HYDROGRAPH   170.92


    RUNOFF VOLUME =     1.73339 INCHES     =      14.2507 ACRE-FEET
    PEAK DISCHARGE RATE =      92.00 CFS  AT   1.433 HOURS   BASIN AREA =   .1541 SQ. MI.

PRINT HYD          ID=10  CODE=1

                                PARTIAL HYDROGRAPH   170.93


    RUNOFF VOLUME =     1.73339 INCHES     =       2.2511 ACRE-FEET
    PEAK DISCHARGE RATE =      56.64 CFS  AT   1.533 HOURS   BASIN AREA =   .0244 SQ. MI.



** DIVIDE OUT THE STREET FLOW WHICH MAY CROSS FROM THE WEST SIDE TO THE EAST
** SIDE OF UNSER BOULEVARD AT THE INTERSECTION WITH BLUEWATER. PLANS FOR
```

```
** UNSER BOULEVARD SHOW 0.3' DIFFERENTIAL BETWEEN THE FLOW LINE ELEVATION AND
** THE CROWN ELEVATION AT THE CENTER OF THE INTERSECTION. ESTIMATE CROSSOVER
** FLOW UTILIZING A BROAD CRESTED WIER FORMULA.
** HYD 170.94= FLOW TO CROSS OVER TO EAST SIDE OF STREET
** HYD 170.95= FLOW TO REMAIN ON WEST SIDE OF STREET
DIVIDE HYD         ID=10  Q=48.0  ID I=11   HYD I=170.95
                                  ID II=3  HYD II=170.94
PRINT HYD          ID=3  CODE=1

                                PARTIAL HYDROGRAPH   170.94

   RUNOFF VOLUME =     1.73339 INCHES     =        .0515 ACRE-FEET
   PEAK DISCHARGE RATE =      8.64 CFS  AT   1.533 HOURS   BASIN AREA =   .0006 SQ. MI.

PRINT HYD          ID=11  CODE=1

                                PARTIAL HYDROGRAPH   170.95

   RUNOFF VOLUME =     1.73339 INCHES     =      2.1997 ACRE-FEET
   PEAK DISCHARGE RATE =     48.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0238 SQ. MI.

** ROUTE THE STREET FLOW ON THE EAST SIDE OF UNSER BLVD. FROM THE INTERSECTION
** WITH BLUEWATER TO THE INLETS ADJACENT TO THE SAD  214 POND. USE THE FUTURE
** STREET SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING
** SIDEWALK ALONG CURB. USE AN AVERAGE STREET SLOPE
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                   MINIMUM ELEV=100.00 FT  MAXIMUM ELEV=100.87 FT
                   CHANNEL SLOPE=0.0130  FLOOD PLAIN SLOPE=0.0130
                   N=0.035  DIST=5  N=0.017  DIST=10  N=-0.017  DIST=46.15
                   DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                     0   100.87   5     100.77  10    100.67  10.15 100.00
                    12    100.13  46    100.81  46.15 100.31

                RATING CURVE VALLEY SECTION  1.0
                   WATER      FLOW      FLOW
                  SURFACE     AREA      RATE
                   ELEV       SQ FT     CFS
                  100.00        .0        .0
                  100.05        .0        .0
                  100.09        .1        .1
                  100.14        .1        .2
                  100.18        .3        .5
                  100.23        .6       1.0
                  100.27        .9       2.0
                  100.32       1.4       3.4
                  100.37       2.0       5.3
                  100.41       2.7       7.8
                  100.46       3.4      11.0
```

100.50	4.3	15.0
100.55	5.3	19.7
100.60	6.4	25.3
100.64	7.7	31.8
100.69	9.0	39.3
100.73	10.5	48.0
100.78	12.2	58.0
100.82	14.2	70.3
100.87	16.2	86.0

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=700 FT SLOPE=0.0130

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.015	.01	.2512
.092	.061	.07	.1583
.137	.137	.21	.1301
.183	.293	.46	.1241
.229	.554	1.01	.1062
.275	.920	1.95	.0917
.321	1.392	3.35	.0808
.366	1.969	5.28	.0725
.412	2.653	7.82	.0660
.458	3.442	11.03	.0607
.504	4.337	14.98	.0563
.549	5.338	19.73	.0526
.595	6.445	25.33	.0495
.641	7.658	31.85	.0468
.687	8.984	39.35	.0444
.733	10.500	48.00	.0425
.778	12.226	57.97	.0410
.824	14.157	70.32	.0391
.870	16.218	86.05	.0366

ROUTE ID=4 HYDROGRAPH NO=170.96 INFLOW ID=3 DT=0.033333
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 170.96

RUNOFF VOLUME = 1.74267 INCHES = .0517 ACRE-FEET
PEAK DISCHARGE RATE = 4.49 CFS AT 1.600 HOURS BASIN AREA = .0006 SQ. MI.

** ROUTE FLOW DOWN UNSER STORM DRAIN FROM THE INTERSECTION OF UNSER AND
** BLUEWATER TO THE JUNCTION WITH THE INLETS NEAR THE SAD 214 POND
** USE AVERAGE SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0093
PIPE DIA=42 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.18	.2	.5
.36	.5	2.2
.55	1.0	5.1
.73	1.5	9.2
.91	2.0	14.4
1.09	2.6	20.6
1.28	3.2	27.6
1.46	3.8	35.3
1.64	4.4	43.5
1.82	5.1	52.0
2.01	5.7	60.7
2.19	6.3	69.4
2.37	6.9	77.8
2.55	7.5	85.6
2.74	8.1	92.6
2.92	8.6	98.5
3.10	9.0	102.7
3.28	9.4	104.4
3.50	9.6	104.4

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=688 FT SLOPE=0.0093

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	.51	.0718
.365	.532	2.21	.0460
.547	.961	5.14	.0358
.730	1.453	9.24	.0301
.912	1.994	14.42	.0264
1.094	2.571	20.58	.0239
1.277	3.175	27.57	.0220
1.459	3.797	35.25	.0206
1.641	4.431	43.45	.0195
1.824	5.069	52.01	.0186
2.006	5.704	60.72	.0180
2.189	6.330	69.37	.0174
2.371	6.938	77.75	.0171
2.553	7.520	85.60	.0168
2.736	8.069	92.63	.0166
2.918	8.571	98.47	.0166
3.101	9.014	102.65	.0168
3.283	9.374	104.37	.0172
3.500	9.621	104.37	.0176

ROUTE ID=3 HYDROGRAPH NO=170.97 INFLOW ID=2 DT=0.033333
PRINT HYD ID=3 CODE=1

```
                                PARTIAL HYDROGRAPH   170.97

    RUNOFF VOLUME =     1.73339 INCHES     =     14.2507 ACRE-FEET
    PEAK DISCHARGE RATE =      92.92 CFS  AT   1.467 HOURS   BASIN AREA =   .1541 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE EAST SIDE OF UNSER BOULEVARD BETWEEN BLUEWATER
** ROAD AND THE INLETS ADJACENT TO THE SAD 214 POND
COMPUTE NM HYD      ID=2  HYD=171.1 DA=0.0021
                    %A=0.0  %B=10.0  %C=0.0  %D=90.0  TP=0.133333
                    MASS RAINFALL=-1

    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.4600    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001890 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333


    K =   .131024HR    TP =   .133333HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593454
    UNIT PEAK =   .51516    CFS   UNIT VOLUME =    .9747       B =   327.09      P60 = 1.8700
    AREA =      .000210 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   171.10

    RUNOFF VOLUME =     1.83566 INCHES     =        .2056 ACRE-FEET
    PEAK DISCHARGE RATE =       5.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0021 SQ. MI.


** ADD THE FLOW FROM BASIN 171.1 TO THE ROUTED STREET FLOW ON THE EAST SIDE OF
** UNSER AT THE INLETS ADJACENT TO THE SAD 214 POND
ADD HYD             ID=5  HYDROGRAPH NO=171.11 ID I=4  ID II=2
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   171.11

    RUNOFF VOLUME =     1.81591 INCHES     =        .2573 ACRE-FEET
    PEAK DISCHARGE RATE =       8.60 CFS  AT   1.567 HOURS   BASIN AREA =   .0027 SQ. MI.


** ADD THE TOTAL STREET FLOW ON THE EAST SIDE OF UNSER TO THE ROUTED FLOW IN
** UNSER STORM DRAIN
ADD HYD             ID=2  HYDROGRAPH NO=171.12 ID I=3  ID II=5
PRINT HYD           ID=2  CODE=1
```

PARTIAL HYDROGRAPH 171.12

RUNOFF VOLUME = 1.73479 INCHES = 14.5079 ACRE-FEET
PEAK DISCHARGE RATE = 100.59 CFS AT 1.567 HOURS BASIN AREA = .1568 SQ. MI.

** DIVIDE OUT FLOW WHICH EXCEEDS THE FULL PIPE CAPACITY OF THE DOWN
** STREAM PORTION OF UNSER BLVD STORM DRAIN. S.D.= 42" RCP MIN SLOPE = 0.00993
** HYD 171.13 = FLOW TO UNSER STORM DRAIN
** HYD 171.14 = FLOW TO REMAIN IN STREET
DIVIDE HYD ID=2 Q=100 ID I=3 HYD I=171.13
                         ID II=4 HYD II=171.14
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 171.13

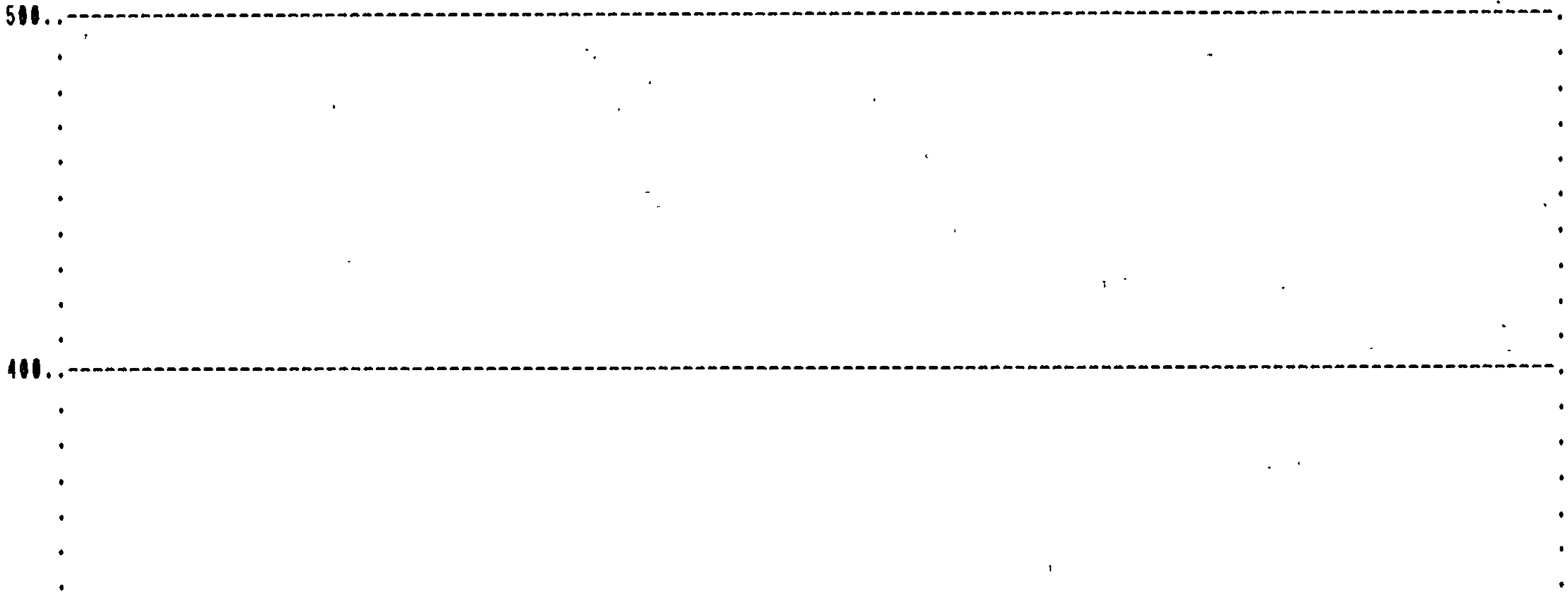
RUNOFF VOLUME = 1.73479 INCHES = 14.5054 ACRE-FEET
PEAK DISCHARGE RATE = 100.00 CFS AT 1.567 HOURS BASIN AREA = .1568 SQ. MI.

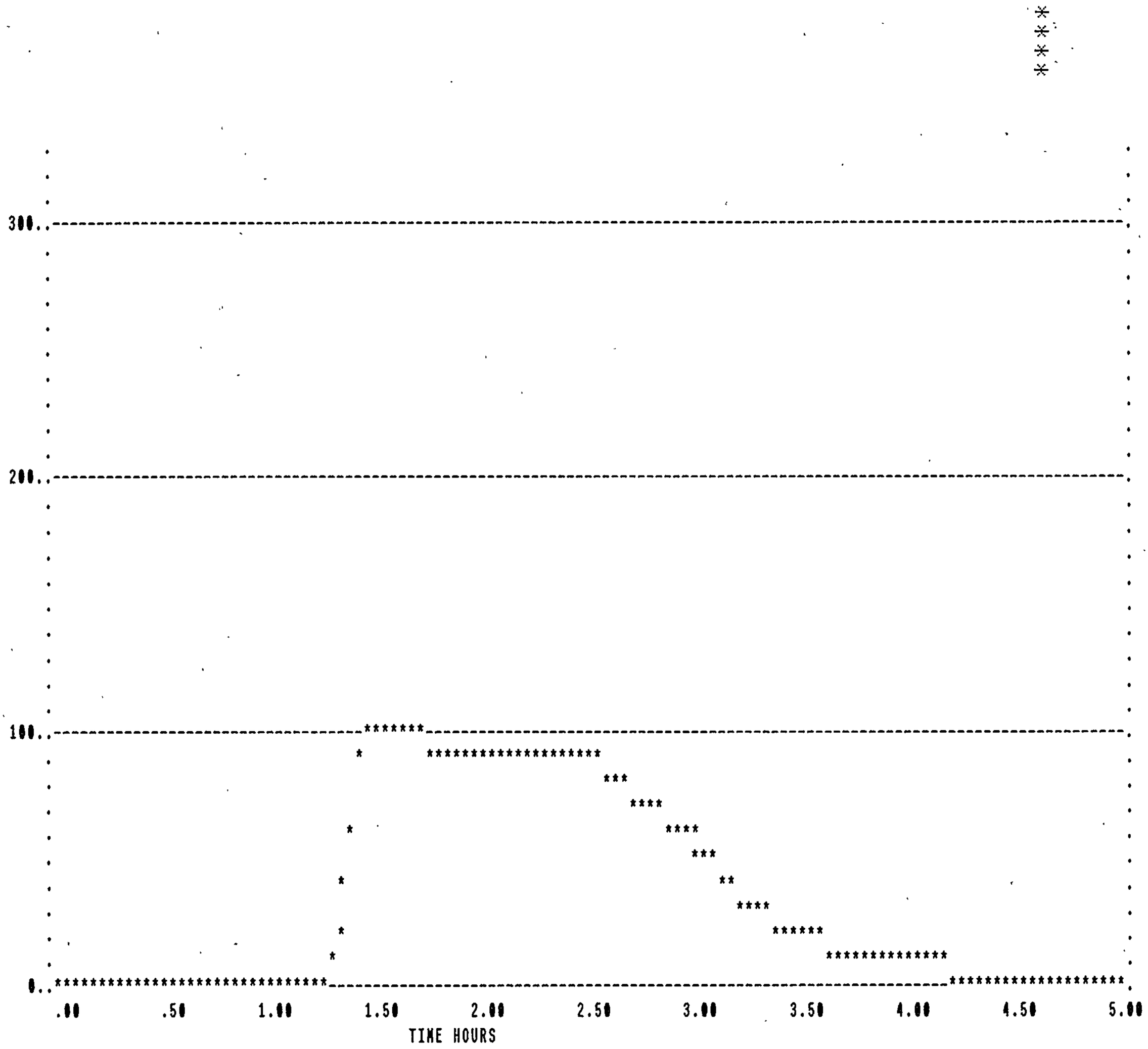
PRINT HYD ID=4 CODE=1 *

PARTIAL HYDROGRAPH 171.14

RUNOFF VOLUME = 1.73479 INCHES = .0025 ACRE-FEET
PEAK DISCHARGE RATE = .59 CFS AT 1.567 HOURS BASIN AREA = .0000 SQ. MI.

PLOT HYD ID=3 ID=0 Q SCALE=500 T SCALE=5.0





** ROUTE FLOW DOWN UNSER STORM DRAIN FROM THE JUNCTION WITH THE INLETS ADJACENT
** TO THE SAD 214 POND TO THE JUNCTION WITH THE FUTURE TIERRA BAYITA S.D.
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.00993
PIPE DIA=42 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.18	.2	.5
.36	.5	2.3
.55	1.0	5.3
.73	1.5	9.5
.91	2.0	14.9

1.09	2.6	21.3
1.28	3.2	28.5
1.46	3.8	36.4
1.64	4.4	44.9
1.82	5.1	53.7
2.01	5.7	62.7
2.19	6.3	71.7
2.37	6.9	80.3
2.55	7.5	88.5
2.74	8.1	95.7
2.92	8.6	101.8
3.10	9.0	106.1
3.28	9.4	107.8
3.50	9.6	107.8

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=100 FT SLOPE=0.00993

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	.53	.0101
.365	.532	2.28	.0065
.547	.961	5.31	.0050
.730	1.453	9.55	.0042
.912	1.994	14.90	.0037
1.094	2.571	21.26	.0034
1.277	3.175	28.49	.0031
1.459	3.797	36.43	.0029
1.641	4.431	44.90	.0027
1.824	5.069	53.74	.0026
2.006	5.704	62.74	.0025
2.189	6.330	71.69	.0025
2.371	6.938	80.34	.0024
2.553	7.520	88.45	.0024
2.736	8.069	95.71	.0023
2.918	8.571	101.75	.0023
3.101	9.014	106.07	.0024
3.283	9.374	107.85	.0024
3.500	9.621	107.85	.0025

ROUTE ID=10 HYDROGRAPH NO=171.15 INFLOW ID=3 DT=0.033333
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 171.15

RUNOFF VOLUME = 1.73479 INCHES = 14.5054 ACRE-FEET
PEAK DISCHARGE RATE = 100.07 CFS AT 1.600 HOURS BASIN AREA = .1568 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE WEST SIDE OF UNSER BOULEVARD BETWEEN BLUEWATER

```
** ROAD AND THE INLETS ADJACENT TO THE SAD 214 POND
COMPUTE NM HYD       ID=3  HYD=171.0 DA=0.0022
                     %A=0.0  %B=10.0  %C=0.0  %D=90.0  TP=0.133333
                     MASS RAINFALL=-1

    K =   .072666HR    TP =   .133333HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.8152    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001980 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

    K =   .131024HR    TP =   .133333HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593454
    UNIT PEAK =   .53970    CFS   UNIT VOLUME =    .9747       B =   327.09      P60 = 1.8700
    AREA =      .000220 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033333

PRINT HYD            ID=3 CODE=1

                                PARTIAL HYDROGRAPH   171.00

    RUNOFF VOLUME =     1.83566 INCHES     =        .2154 ACRE-FEET
    PEAK DISCHARGE RATE =       5.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


** ROUTE THE STREET FLOW ON THE WEST SIDE OF UNSER BLVD. FROM THE INTERSECTION
** WITH BLUEWATER TO THE INLETS ADJACENT TO THE SAD  214 POND. USE THE FUTURE
** STREET SECTION AS SHOWN ON SAD 214 DRAINAGE PLAN SHEET. ADD EXISTING
** SIDEWALK ALONG CURB. USE AN AVERAGE STREET SLOPE
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                     MINIMUM ELEV=100.00 FT  MAXIMUM ELEV=100.87 FT
                     CHANNEL SLOPE=0.0130  FLOOD PLAIN SLOPE=0.0130
                     N=0.035  DIST=5  N=0.017  DIST=10  N=-0.017  DIST=46.15
                     DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                       0   100.87   5     100.77  10    100.67  10.15 100.00
                      12    100.13  46    100.81  46.15 100.31

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER      FLOW      FLOW
                                  SURFACE     AREA      RATE
                                   ELEV       SQ FT     CFS
                                  100.00        .0        .0
                                  100.05        .0        .0
                                  100.09        .1        .1
                                  100.14        .1        .2
                                  100.18        .3        .5
                                  100.23        .6       1.0
                                  100.27        .9       2.0
                                  100.32       1.4       3.4
                                  100.37       2.0       5.3
                                  100.41       2.7       7.8
                                  100.46       3.4      11.0
                                  100.50       4.3      15.0
```

100.55	5.3	19.7
100.60	6.4	25.3
100.64	7.7	31.8
100.69	9.0	39.3
100.73	10.5	48.0
100.78	12.2	58.0
100.82	14.2	70.3
100.87	16.2	86.0

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=800 FT SLOPE=0.0130

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.015	.01	.2871
.092	.061	.07	.1809
.137	.137	.21	.1486
.183	.293	.46	.1418
.229	.554	1.01	.1214
.275	.920	1.95	.1048
.321	1.392	3.35	.0923
.366	1.969	5.28	.0829
.412	2.653	7.82	.0754
.458	3.442	11.03	.0693
.504	4.337	14.98	.0643
.549	5.338	19.73	.0601
.595	6.445	25.33	.0565
.641	7.658	31.85	.0534
.687	8.984	39.35	.0507
.733	10.500	48.00	.0486
.778	12.226	57.97	.0469
.824	14.157	70.32	.0447
.870	16.218	86.05	.0419

ROUTE ID=4 HYDROGRAPH NO=171.01 INFLOW ID=11 DT=0.033333
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 171.01

RUNOFF VOLUME = 1.73361 INCHES = 2.1999 ACRE-FEET
PEAK DISCHARGE RATE = 46.71 CFS AT 1.633 HOURS BASIN AREA = .0238 SQ. MI.

** ADD THE ROUTED STREET FLOW ON THE WEST SIDE OF UNSER TO THE FLOW FROM BASIN
** 170.0
ADD HYD ID=2 HYDROGRAPH NO=171.02 ID I=3 ID II=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 171.02

RUNOFF VOLUME = 1.74222 INCHES = 2.4153 ACRE-FEET
PEAK DISCHARGE RATE = 50.56 CFS AT 1.600 HOURS BASIN AREA = .0260 SQ. MI.

```
** DIVIDE OUT FLOW WHICH EXCEEDS THE CAPACITY OF THE CONNECTOR PIPE BETWEEN THE
** INLETS AND THE CULVERT CROSSING UNSER TO THE SAD 214 POND. PIPE IS AN 18"
** RCP. ESTIMATE CAPACITY ASSUMINING PRESSURE PIPE FLOW WITH HGL AT THE SOFFIT
** AT THE OUTLET END OF THE 18" PIPE
** HYD 171.03 = FLOW TO THE TIERR BAYITA STORM DRAIN
** HYD 171.04 = FLOW TO REMAIN IN STREET
DIVIDE HYD          ID=2   Q=30   ID I=3    HYD I=171.03
                                  ID II=4   HYD II=171.04
PRINT HYD           ID=3  CODE=1
```

PARTIAL HYDROGRAPH 171.03

RUNOFF VOLUME = 1.74222 INCHES = 1.9910 ACRE-FEET
PEAK DISCHARGE RATE = 30.00 CFS AT 1.500 HOURS BASIN AREA = .0214 SQ. MI.

```
PRINT HYD           ID=4  CODE=1
```

PARTIAL HYDROGRAPH 171.04

RUNOFF VOLUME = 1.74222 INCHES = .4242 ACRE-FEET
PEAK DISCHARGE RATE = 20.56 CFS AT 1.600 HOURS BASIN AREA = .0046 SQ. MI.

```
** ADD THE INTERCEPTED FLOW FROM THE WEST SIDE OF UNSER TO THE FLOW FROM THE
** PROPOSED UNSER DIVERSION CHANNEL AT THE JUNCTION WITH THE FUTURE TIERRA
** BAYITA STORM DRAIN
ADD HYD             ID=16  HYDROGRAPH NO=171.05 ID I=15  ID II=3
PRINT HYD           ID=16  CODE=1
```

PARTIAL HYDROGRAPH 171.05

RUNOFF VOLUME = 1.68372 INCHES = 42.1176 ACRE-FEET
PEAK DISCHARGE RATE = 402.43 CFS AT 1.867 HOURS BASIN AREA = .4690 SQ. MI.

```
** ADD THE FLOW IN THE UNSER STORM DRAIN TO THE TOTAL FLOW AT THE JUNCTION
** WITH THE TIERRA BAYITA STORM DRAIN
ADD HYD             ID=11  HYDROGRAPH NO=171.06 ID I=16  ID II=10
PRINT HYD           ID=11  CODE=1
```

PARTIAL HYDROGRAPH 171.06

RUNOFF VOLUME = 1.69651 INCHES = 56.6230 ACRE-FEET
PEAK DISCHARGE RATE = 501.72 CFS AT 1.600 HOURS BASIN AREA = .6258 SQ. MI.

****

****
** ASSUME ALL OF THIS FLOW IS ROUTED THROUGH A JUCNTION VAULT BEFORE
** FLOW IS ROUTED TO THE ENLARGED S.A.D. 214 POND. THE TIERRA BAYITA S.D. IS
** ASSUMED TO BE CONNECTED TO THIS VAULT. THE PURPOSE OF THIS CONFIGURATION IS
** TO ACHIEVE HIGHER OUTFLOW FROM THE BASIN IN THE EARLY STAGES OF THE STORM
** WHEN OUTFLOW FROM THE S.A.D. 214 POND WOULD BE LIMITED DUE TO LOW HEAD.
** OUTFLOW CURVE BASED ON ORIFICE FLOW THROUGH 5.5' DIA ORIFICE INTO THE 72"
** DIA. PIPE PLUS A CONSTANT FLOW THROUGH A 24" DIA S.D. CONNECTION BETWEEN
** THE VAULT AND THE S.A.D. 214 POND WHEN FLOW TO THE VAULT EXCEEDS 310 CFS.
** FLOW THROUGH THE 24" DIA LINE BASED ON PRESSURE FLOW WITH FULL VAULT
** CONDITION AT THE INLET AND H.G.L. AT THE OUTLET AT THE SOFFIT OF THE PIPE.
** VAULT PLAN DIMENSIONS ESTIMATED AT 10' X 15'
****

ROUTE RESERVOIR ID=10 HYDROGRAPH NO=172.0 INFLOW ID=11 CODE=5

	OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
	0.0	0.00	5088.0
	12.4	0.002	5088.5
	17.6	0.003	5089.0
	26.3	0.005	5089.5
	40.3	0.007	5090.0
	60.0	0.009	5090.5
	82.0	0.010	5091.0
	103.0	0.012	5091.5
	124.0	0.014	5092.0
	142.0	0.015	5092.5
	164.0	0.017	5093.0
	190.0	0.019	5093.5
	206.0	0.021	5094.0
	221.0	0.022	5094.5
	236.0	0.024	5095.0
	249.0	0.026	5095.5
	262.0	0.028	5096.0
ADD	314.0	0.029	5096.5
	325.0	0.031	5097.0
	337.0	0.033	5097.5
	348.0	0.034	5098.0
	358.0	0.036	5098.5
	1200.0	0.038	5099.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5088.00	.000	.00

.17	.00	5088.00	.000	.00
.33	.00	5088.00	.000	.00
.50	.00	5088.00	.000	.00
.67	.00	5088.00	.000	.00
.83	.00	5088.00	.000	.00
1.00	.00	5088.00	.000	.00
1.17	.19	5088.01	.000	.17
1.33	75.11	5090.83	.010	74.43
1.50	484.51	5098.57	.036	482.63
1.67	498.33	5098.58	.036	500.17
1.83	496.65	5098.58	.036	494.85
2.00	495.33	5098.58	.036	497.11
2.17	484.92	5098.57	.036	483.18
2.33	473.34	5098.57	.036	475.05
2.50	463.56	5098.56	.036	461.88
2.67	169.72	5093.11	.017	169.72
2.83	100.64	5091.47	.012	101.74
3.00	76.64	5090.87	.010	76.09
3.17	56.36	5090.42	.009	57.01
3.33	39.49	5089.97	.007	39.38
3.50	28.53	5089.59	.005	28.71
3.67	21.29	5089.22	.004	21.37
3.83	16.60	5088.91	.003	16.65
4.00	13.42	5088.60	.002	13.46
4.17	11.33	5088.46	.002	11.35
4.33	9.94	5088.40	.002	9.95
4.50	9.11	5088.37	.001	9.12
4.67	8.61	5088.35	.001	8.61
4.83	8.33	5088.34	.001	8.33
5.00	8.20	5088.33	.001	8.20
5.17	8.21	5088.33	.001	8.21
5.33	8.30	5088.33	.001	8.30
5.50	8.48	5088.34	.001	8.47
5.67	8.70	5088.35	.001	8.70
5.83	8.98	5088.36	.001	8.97
6.00	9.29	5088.37	.001	9.29
6.17	8.79	5088.36	.001	8.81
6.33	6.43	5088.26	.001	6.46
6.50	4.03	5088.16	.001	4.06
6.67	2.28	5088.09	.000	2.30
6.83	1.26	5088.05	.000	1.27
7.00	.71	5088.03	.000	.72
7.17	.41	5088.02	.000	.41
7.33	.24	5088.01	.000	.24
7.50	.14	5088.01	.000	.14
7.67	.09	5088.00	.000	.09
7.83	.05	5088.00	.000	.05
8.00	.03	5088.00	.000	.03
8.17	.02	5088.00	.000	.02
8.33	.01	5088.00	.000	.01
8.50	.01	5088.00	.000	.01
8.67	.00	5088.00	.000	.01
8.83	.00	5088.00	.000	.00

PEAK DISCHARGE = 503.570 CFS - PEAK OCCURS AT HOUR 1.60

MAXIMUM WATER SURFACE ELEVATION = 5098.586
MAXIMUM STORAGE = .0363 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 172.00

RUNOFF VOLUME = 1.69651 INCHES = 56.6231 ACRE-FEET
PEAK DISCHARGE RATE = 503.57 CFS AT 1.600 HOURS BASIN AREA = .6258 SQ. MI.

** DIVIDE OUT THE FLOW WHICH EXCEEDS THE CAPACITY OF THE 24" & 72" OUTFLOW
** PIPES AND SEND THAT FLOW TO THE POND
DIVIDE HYD ID=10 Q=350 ID I=2 HYD I=172.01
ID II=3 HYD II=172.02
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 172.01

RUNOFF VOLUME = 1.69651 INCHES = 44.3989 ACRE-FEET
PEAK DISCHARGE RATE = 350.00 CFS AT 1.433 HOURS BASIN AREA = .4907 SQ. MI.

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 172.02

RUNOFF VOLUME = 1.69651 INCHES = 12.2241 ACRE-FEET
PEAK DISCHARGE RATE = 153.57 CFS AT 1.600 HOURS BASIN AREA = .1351 SQ. MI.

** DIVIDE OUT THE FLOW WHICH EXCEEDS THE CAPACITY OF THE 72" OUTFLOW
** PIPE AND SEND THAT FLOW TO THE POND
DIVIDE HYD ID=2 Q=310 ID I=4 HYD I=172.03
ID II=5 HYD II=172.04
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 172.03

RUNOFF VOLUME = 1.69651 INCHES = 40.5908 ACRE-FEET
PEAK DISCHARGE RATE = 310.00 CFS AT 1.433 HOURS BASIN AREA = .4486 SQ. MI.

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 172.04

RUNOFF VOLUME = 1.69651 INCHES = 3.8081 ACRE-FEET
PEAK DISCHARGE RATE = 40.00 CFS AT 1.433 HOURS BASIN AREA = .0421 SQ. MI.

** ADD THE TWO FLOWS WHICH HAVE BEEN DIVIDED OUT
ADD HYD ID=2 HYDROGRAPH NO=172.05 ID I=3 ID II=5
PRINT HYD ID=2 CODE=2

PARTIAL HYDROGRAPH 172.05

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	.533	.0	1.067	.0	1.600	193.6	2.133	179.5
.067	.0	.600	.0	1.133	.0	1.667	190.2	2.200	173.9
.133	.0	.667	.0	1.200	.0	1.733	189.3	2.267	169.1
.200	.0	.733	.0	1.267	.0	1.800	188.8	2.333	165.0
.267	.0	.800	.0	1.333	.0	1.867	188.3	2.400	161.5
.333	.0	.867	.0	1.400	.0	1.933	188.0	2.467	157.5
.400	.0	.933	.0	1.467	134.4	2.000	187.1	2.533	96.9
.467	.0	1.000	.0	1.533	187.6	2.067	184.2		

RUNOFF VOLUME = 1.69651 INCHES = 16.0322 ACRE-FEET
PEAK DISCHARGE RATE = 193.57 CFS AT 1.600 HOURS BASIN AREA = .1772 SQ. MI.

** COMPUTE A HYDROGRAPH FOR TRACT A-1
COMPUTE NM HYD ID=1 HYD=180.1 DA=0.0338
%A=0.0 %B=28.0 %C=4.0 %D=68.0 TP=0.133333
MASS RAINFALL=-1

K = .072666HR TP = .133333HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 90.720 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
AREA = .022984 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

K = .127883HR TP = .133333HR K/TP RATIO = .959124 SHAPE CONSTANT, N = 3.684002
UNIT PEAK = 27.055 CFS UNIT VOLUME = .9997 B = 333.52 P60 = 1.8700
AREA = .010816 SQ MI IA = .48125 INCHES INF = 1.19750 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033333

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 180.10

RUNOFF VOLUME = 1.56114 INCHES = 2.8142 ACRE-FEET
PEAK DISCHARGE RATE = 78.95 CFS AT 1.500 HOURS BASIN AREA = .0338 SQ. MI.

```
** ADD THE FLOW FROM TRACT  A-1 TO THE SAD 214 POND
ADD HYD            ID=4  HYDROGRAPH NO=180.12 ID I=1  ID II=2
PRINT HYD          ID=4  CODE=2
```

PARTIAL HYDROGRAPH 180.12

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.467	206.1	2.933	.9	4.400	.4	5.867	.5
.067	.0	1.533	263.4	3.000	.8	4.467	.4	5.933	.5
.133	.0	1.600	249.2	3.067	.8	4.533	.4	6.000	.5
.200	.0	1.667	230.7	3.133	.7	4.600	.4	6.067	.4
.267	.0	1.733	221.3	3.200	.6	4.667	.4	6.133	.3
.333	.0	1.800	215.3	3.267	.6	4.733	.4	6.200	.1
.400	.0	1.867	210.9	3.333	.6	4.800	.4	6.267	.1
.467	.0	1.933	207.6	3.400	.5	4.867	.4	6.333	.1
.533	.0	2.000	204.4	3.467	.5	4.933	.4	6.400	.0
.600	.0	2.067	199.0	3.533	.5	5.000	.4	6.467	.0
.667	.0	2.133	189.6	3.600	.4	5.067	.4	6.533	.0
.733	.0	2.200	180.5	3.667	.4	5.133	.4	6.600	.0
.800	.0	2.267	173.9	3.733	.4	5.200	.4	6.667	.0
.867	.0	2.333	168.9	3.800	.4	5.267	.4	6.733	.0
.933	.0	2.400	164.6	3.867	.4	5.333	.4	6.800	.0
1.000	.0	2.467	160.1	3.933	.4	5.400	.4	6.867	.0
1.067	.0	2.533	99.1	4.000	.4	5.467	.4	6.933	.0
1.133	.0	2.600	1.9	4.067	.4	5.533	.4	7.000	.0
1.200	1.2	2.667	1.6	4.133	.4	5.600	.4	7.067	.0
1.267	7.7	2.733	1.4	4.200	.4	5.667	.4	7.133	.0
1.333	20.2	2.800	1.2	4.267	.4	5.733	.4		
1.400	42.3	2.867	1.1	4.333	.4	5.800	.5		

RUNOFF VOLUME = 1.67482 INCHES = 18.8464 ACRE-FEET
PEAK DISCHARGE RATE = 263.36 CFS AT 1.533 HOURS BASIN AREA = .2110 SQ. MI.

```
** ROUTE THE FLOW FROM THE VAULT AND THE FLOW FROM THE  TRACT A-1 THROUGH
** THE EXPANDED S.A.D. 214 POND. ASSUME  POND FOOT PRINT EXPANDED
** WITHIN EXISTING EASEMENT AND POND DEEPENED TO ELEV. 5090
** OUTFLOW CANNOT BE MODELED HERE AS IT WILL ONLY OCCUR AFTER THE INFLOW
** TO THE INLET VAULT DROPS BELOW 310 CFS. A VERY SMALL OUTLOW IS ENTERED
** IN THE STAGE STORAGE DISCHARGE TABLE TO SATISFY THE PROGRAM REQUIREMENTS
** THIS OUTFLOW IS NEGLIGABLE
ROUTE RESERVOIR    ID=11 HYDROGRAPH NO=501  INFLOW ID=4  CODE=1
                   OUTFLOW(cfs)    STORAGE(ac ft)    ELEV(ft)
                          0.0             0.00           5090
                          0.01            4.92           5093.0
                          0.02           10.97           5096.0
                          0.03           15.56           5098.0
                          0.04           18.02           5099.0
                          0.05           19.02           5099.4
                          0.06           30.00           5100.0
```

* * * *

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5090.00	.000	.00
.03	.00	5090.00	.000	.00
.07	.00	5090.00	.000	.00
.10	.00	5090.00	.000	.00
.13	.00	5090.00	.000	.00
.17	.00	5090.00	.000	.00
.20	.00	5090.00	.000	.00
.23	.00	5090.00	.000	.00
.27	.00	5090.00	.000	.00
.30	.00	5090.00	.000	.00
.33	.00	5090.00	.000	.00
.37	.00	5090.00	.000	.00
.40	.00	5090.00	.000	.00
.43	.00	5090.00	.000	.00
.47	.00	5090.00	.000	.00
.50	.00	5090.00	.000	.00
.53	.00	5090.00	.000	.00
.57	.00	5090.00	.000	.00
.60	.00	5090.00	.000	.00
.63	.00	5090.00	.000	.00
.67	.00	5090.00	.000	.00
.70	.00	5090.00	.000	.00
.73	.00	5090.00	.000	.00
.77	.00	5090.00	.000	.00
.80	.00	5090.00	.000	.00
.83	.00	5090.00	.000	.00
.87	.00	5090.00	.000	.00
.90	.00	5090.00	.000	.00
.93	.00	5090.00	.000	.00
.97	.00	5090.00	.000	.00
1.00	.00	5090.00	.000	.00
1.03	.00	5090.00	.000	.00
1.07	.00	5090.00	.000	.00
1.10	.00	5090.00	.000	.00
1.13	.01	5090.00	.000	.00
1.17	.18	5090.00	.000	.00
1.20	1.16	5090.00	.002	.00
1.23	3.67	5090.01	.009	.00
1.27	7.74	5090.02	.024	.00
1.30	13.16	5090.03	.053	.00
1.33	20.20	5090.06	.099	.00
1.37	29.72	5090.10	.168	.00
1.40	42.26	5090.16	.267	.00
1.43	112.73	5090.29	.481	.00
1.47	206.15	5090.56	.920	.00
1.50	251.58	5090.95	1.550	.00
1.53	263.36	5091.38	2.260	.00
1.57	254.75	5091.81	2.973	.01
1.60	249.18	5092.24	3.667	.01

1.63	234.68	5092.64	4.334	.01
1.67	230.75	5093.03	4.975	.01
1.70	221.64	5093.34	5.598	.01
1.73	221.28	5093.64	6.208	.01
1.77	214.35	5093.94	6.808	.01
1.80	215.28	5094.23	7.400	.01
1.83	209.24	5094.52	7.984	.02
1.87	210.90	5094.81	8.563	.02
1.90	205.54	5095.09	9.137	.02
1.93	207.64	5095.37	9.706	.02
1.97	202.66	5095.65	10.271	.02
2.00	204.41	5095.93	10.831	.02
2.03	198.42	5096.18	11.386	.02
2.07	198.98	5096.42	11.934	.02
2.10	191.14	5096.65	12.471	.02
2.13	189.63	5096.88	12.995	.02
2.17	181.22	5097.10	13.506	.03
2.20	180.48	5097.32	14.004	.03
2.23	173.45	5097.53	14.492	.03
2.27	173.90	5097.74	14.970	.03
2.30	167.81	5097.95	15.440	.03
2.33	168.92	5098.14	15.904	.03
2.37	163.30	5098.33	16.362	.03
2.40	164.64	5098.51	16.813	.04
2.43	159.19	5098.69	17.259	.04
2.47	160.10	5098.87	17.699	.04
2.50	154.29	5099.04	18.132	.04
2.53	99.13	5099.18	18.481	.04
2.57	24.40	5099.25	18.651	.05
2.60	1.88	5099.27	18.687	.05
2.63	1.74	5099.27	18.692	.05
2.67	1.61	5099.27	18.696	.05
2.70	1.50	5099.27	18.700	.05
2.73	1.39	5099.27	18.704	.05
2.77	1.30	5099.27	18.708	.05
2.80	1.22	5099.28	18.711	.05
2.83	1.14	5099.28	18.714	.05
2.87	1.07	5099.28	18.717	.05
2.90	1.01	5099.28	18.720	.05
2.93	.95	5099.28	18.723	.05
2.97	.90	5099.28	18.725	.05
3.00	.85	5099.28	18.727	.05
3.03	.80	5099.28	18.729	.05
3.07	.76	5099.28	18.731	.05
3.10	.72	5099.29	18.733	.05
3.13	.69	5099.29	18.735	.05
3.17	.66	5099.29	18.737	.05
3.20	.63	5099.29	18.738	.05
3.23	.61	5099.29	18.740	.05
3.27	.59	5099.29	18.742	.05
3.30	.57	5099.29	18.743	.05
3.33	.55	5099.29	18.744	.05
3.37	.53	5099.29	18.746	.05
3.40	.52	5099.29	18.747	.05

3.43	.50	5099.29	18.748	.05
3.47	.49	5099.29	18.750	.05
3.50	.48	5099.29	18.751	.05
3.53	.47	5099.29	18.752	.05
3.57	.45	5099.29	18.753	.05
3.60	.44	5099.29	18.754	.05
3.63	.44	5099.29	18.755	.05
3.67	.44	5099.29	18.756	.05
3.70	.43	5099.29	18.757	.05
3.73	.42	5099.30	18.759	.05
3.77	.42	5099.30	18.760	.05
3.80	.41	5099.30	18.761	.05
3.83	.40	5099.30	18.762	.05
3.87	.40	5099.30	18.763	.05
3.90	.39	5099.30	18.763	.05
3.93	.39	5099.30	18.764	.05
3.97	.39	5099.30	18.765	.05
4.00	.38	5099.30	18.766	.05
4.03	.37	5099.30	18.767	.05
4.07	.37	5099.30	18.768	.05
4.10	.37	5099.30	18.769	.05
4.13	.37	5099.30	18.770	.05
4.17	.37	5099.30	18.771	.05
4.20	.37	5099.30	18.772	.05
4.23	.36	5099.30	18.773	.05
4.27	.36	5099.30	18.773	.05
4.30	.36	5099.30	18.774	.05
4.33	.36	5099.30	18.775	.05
4.37	.36	5099.30	18.776	.05
4.40	.36	5099.30	18.777	.05
4.43	.36	5099.30	18.778	.05
4.47	.36	5099.30	18.779	.05
4.50	.36	5099.30	18.779	.05
4.53	.36	5099.30	18.780	.05
4.57	.36	5099.30	18.781	.05
4.60	.37	5099.30	18.782	.05
4.63	.37	5099.31	18.783	.05
4.67	.37	5099.31	18.784	.05
4.70	.37	5099.31	18.785	.05
4.73	.37	5099.31	18.786	.05
4.77	.37	5099.31	18.787	.05
4.80	.37	5099.31	18.787	.05
4.83	.37	5099.31	18.788	.05
4.87	.37	5099.31	18.789	.05
4.90	.37	5099.31	18.790	.05
4.93	.38	5099.31	18.791	.05
4.97	.38	5099.31	18.792	.05
5.00	.38	5099.31	18.793	.05
5.03	.38	5099.31	18.794	.05
5.07	.39	5099.31	18.795	.05
5.10	.39	5099.31	18.796	.05
5.13	.39	5099.31	18.797	.05
5.17	.39	5099.31	18.798	.05
5.20	.39	5099.31	18.798	.05

5.23	.39	5099.31	18.799	.05
5.27	.40	5099.31	18.800	.05
5.30	.40	5099.31	18.801	.05
5.33	.40	5099.31	18.802	.05
5.37	.41	5099.31	18.803	.05
5.40	.41	5099.31	18.804	.05
5.43	.41	5099.31	18.805	.05
5.47	.42	5099.31	18.806	.05
5.50	.42	5099.31	18.807	.05
5.53	.42	5099.32	18.808	.05
5.57	.43	5099.32	18.809	.05
5.60	.43	5099.32	18.810	.05
5.63	.43	5099.32	18.811	.05
5.67	.43	5099.32	18.813	.05
5.70	.43	5099.32	18.814	.05
5.73	.44	5099.32	18.815	.05
5.77	.44	5099.32	18.816	.05
5.80	.45	5099.32	18.817	.05
5.83	.45	5099.32	18.818	.05
5.87	.45	5099.32	18.819	.05
5.90	.46	5099.32	18.820	.05
5.93	.46	5099.32	18.821	.05
5.97	.47	5099.32	18.822	.05
6.00	.47	5099.32	18.824	.05
6.03	.47	5099.32	18.825	.05
6.07	.44	5099.32	18.826	.05
6.10	.37	5099.32	18.827	.05
6.13	.27	5099.32	18.828	.05
6.17	.19	5099.32	18.828	.05
6.20	.13	5099.32	18.828	.05
6.23	.10	5099.32	18.829	.05
6.27	.07	5099.32	18.829	.05
6.30	.06	5099.32	18.829	.05
6.33	.05	5099.32	18.829	.05
6.37	.04	5099.32	18.829	.05
6.40	.04	5099.32	18.829	.05
6.43	.03	5099.32	18.829	.05
6.47	.03	5099.32	18.829	.05
6.50	.02	5099.32	18.829	.05
6.53	.02	5099.32	18.829	.05
6.57	.02	5099.32	18.829	.05
6.60	.02	5099.32	18.828	.05
6.63	.01	5099.32	18.828	.05
6.67	.01	5099.32	18.828	.05
6.70	.01	5099.32	18.828	.05
6.73	.01	5099.32	18.828	.05
6.77	.01	5099.32	18.828	.05
6.80	.01	5099.32	18.828	.05
6.83	.01	5099.32	18.828	.05
6.87	.00	5099.32	18.828	.05
6.90	.00	5099.32	18.827	.05
6.93	.00	5099.32	18.827	.05
6.97	.00	5099.32	18.827	.05
7.00	.00	5099.32	18.827	.05

7.03	.00	5099.32	18.827	.05
7.07	.00	5099.32	18.827	.05
7.10	.00	5099.32	18.827	.05
7.13	.00	5099.32	18.827	.05
7.17	.00	5099.32	18.826	.05
7.20	.00	5099.32	18.826	.05
7.23	.00	5099.32	18.826	.05
7.27	.00	5099.32	18.826	.05
7.30	.00	5099.32	18.826	.05
7.33	.00	5099.32	18.826	.05
7.37	.00	5099.32	18.826	.05
7.40	.00	5099.32	18.826	.05
7.43	.00	5099.32	18.825	.05
7.47	.00	5099.32	18.825	.05
7.50	.00	5099.32	18.825	.05
7.53	.00	5099.32	18.825	.05
7.57	.00	5099.32	18.825	.05
7.60	.00	5099.32	18.825	.05
7.63	.00	5099.32	18.825	.05
7.67	.00	5099.32	18.824	.05
7.70	.00	5099.32	18.824	.05
7.73	.00	5099.32	18.824	.05
7.77	.00	5099.32	18.824	.05
7.80	.00	5099.32	18.824	.05
7.83	.00	5099.32	18.824	.05
7.87	.00	5099.32	18.824	.05
7.90	.00	5099.32	18.824	.05
7.93	.00	5099.32	18.823	.05
7.97	.00	5099.32	18.823	.05
8.00	.00	5099.32	18.823	.05
8.03	.00	5099.32	18.823	.05
8.07	.00	5099.32	18.823	.05
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8.13	.00	5099.32	18.823	.05
8.17	.00	5099.32	18.822	.05
8.20	.00	5099.32	18.822	.05
8.23	.00	5099.32	18.822	.05
8.27	.00	5099.32	18.822	.05
8.30	.00	5099.32	18.822	.05
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8.40	.00	5099.32	18.822	.05
8.43	.00	5099.32	18.821	.05
8.47	.00	5099.32	18.821	.05
8.50	.00	5099.32	18.821	.05
8.53	.00	5099.32	18.821	.05
8.57	.00	5099.32	18.821	.05
8.60	.00	5099.32	18.821	.05
8.63	.00	5099.32	18.821	.05
8.67	.00	5099.32	18.821	.05
8.70	.00	5099.32	18.820	.05
8.73	.00	5099.32	18.820	.05
8.77	.00	5099.32	18.820	.05
8.80	.00	5099.32	18.820	.05

8.83	.00	5099.32	18.820	.05
8.87	.00	5099.32	18.820	.05
8.90	.00	5099.32	18.820	.05
8.93	.00	5099.32	18.819	.05
8.97	.00	5099.32	18.819	.05
9.00	.00	5099.32	18.819	.05
9.03	.00	5099.32	18.819	.05
9.07	.00	5099.32	18.819	.05
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9.13	.00	5099.32	18.819	.05
9.17	.00	5099.32	18.819	.05
9.20	.00	5099.32	18.818	.05
9.23	.00	5099.32	18.818	.05
9.27	.00	5099.32	18.818	.05
9.30	.00	5099.32	18.818	.05
9.33	.00	5099.32	18.818	.05
9.37	.00	5099.32	18.818	.05
9.40	.00	5099.32	18.818	.05
9.43	.00	5099.32	18.817	.05
9.47	.00	5099.32	18.817	.05
9.50	.00	5099.32	18.817	.05
9.53	.00	5099.32	18.817	.05
9.57	.00	5099.32	18.817	.05
9.60	.00	5099.32	18.817	.05
9.63	.00	5099.32	18.817	.05
9.67	.00	5099.32	18.817	.05
9.70	.00	5099.32	18.816	.05
9.73	.00	5099.32	18.816	.05
9.77	.00	5099.32	18.816	.05
9.80	.00	5099.32	18.816	.05
9.83	.00	5099.32	18.816	.05
9.87	.00	5099.32	18.816	.05
9.90	.00	5099.32	18.816	.05
9.93	.00	5099.32	18.815	.05
9.97	.00	5099.32	18.815	.05
10.00	.00	5099.32	18.815	.05
10.03	.00	5099.32	18.815	.05
10.07	.00	5099.32	18.815	.05
10.10	.00	5099.32	18.815	.05
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10.30	.00	5099.32	18.814	.05
10.33	.00	5099.32	18.814	.05
10.37	.00	5099.32	18.814	.05
10.40	.00	5099.32	18.814	.05
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10.47	.00	5099.32	18.813	.05
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10.53	.00	5099.32	18.813	.05
10.57	.00	5099.32	18.813	.05
10.60	.00	5099.32	18.813	.05

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10.67	.00	5099.32	18.813	.05
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10.77	.00	5099.32	18.812	.05
10.80	.00	5099.32	18.812	.05
10.83	.00	5099.32	18.812	.05
10.87	.00	5099.32	18.812	.05
10.90	.00	5099.32	18.812	.05
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10.97	.00	5099.32	18.811	.05
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11.60	.00	5099.32	18.809	.05
11.63	.00	5099.32	18.809	.05
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11.77	.00	5099.32	18.808	.05
11.80	.00	5099.31	18.808	.05
11.83	.00	5099.31	18.808	.05
11.87	.00	5099.31	18.808	.05
11.90	.00	5099.31	18.808	.05
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11.97	.00	5099.31	18.807	.05
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12.40	.00	5099.31	18.806	.05

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12.47	.00	5099.31	18.805	.05
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12.80	.00	5099.31	18.804	.05
12.83	.00	5099.31	18.804	.05
12.87	.00	5099.31	18.804	.05
12.90	.00	5099.31	18.804	.05
12.93	.00	5099.31	18.804	.05
12.97	.00	5099.31	18.803	.05
13.00	.00	5099.31	18.803	.05
13.03	.00	5099.31	18.803	.05
13.07	.00	5099.31	18.803	.05
13.10	.00	5099.31	18.803	.05
13.13	.00	5099.31	18.803	.05
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13.33	.00	5099.31	18.802	.05
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13.40	.00	5099.31	18.802	.05
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13.80	.00	5099.31	18.800	.05
13.83	.00	5099.31	18.800	.05
13.87	.00	5099.31	18.800	.05
13.90	.00	5099.31	18.800	.05
13.93	.00	5099.31	18.800	.05
13.97	.00	5099.31	18.800	.05
14.00	.00	5099.31	18.799	.05
14.03	.00	5099.31	18.799	.05
14.07	.00	5099.31	18.799	.05
14.10	.00	5099.31	18.799	.05
14.13	.00	5099.31	18.799	.05
14.17	.00	5099.31	18.799	.05
14.20	.00	5099.31	18.799	.05

14.23	.00	5099.31	18.798	.05
14.27	.00	5099.31	18.798	.05
14.30	.00	5099.31	18.798	.05
14.33	.00	5099.31	18.798	.05
14.37	.00	5099.31	18.798	.05
14.40	.00	5099.31	18.798	.05
14.43	.00	5099.31	18.798	.05
14.47	.00	5099.31	18.798	.05
14.50	.00	5099.31	18.797	.05
14.53	.00	5099.31	18.797	.05
14.57	.00	5099.31	18.797	.05
14.60	.00	5099.31	18.797	.05
14.63	.00	5099.31	18.797	.05
14.67	.00	5099.31	18.797	.05
14.70	.00	5099.31	18.797	.05
14.73	.00	5099.31	18.797	.05
14.77	.00	5099.31	18.796	.05
14.80	.00	5099.31	18.796	.05
14.83	.00	5099.31	18.796	.05
14.87	.00	5099.31	18.796	.05
14.90	.00	5099.31	18.796	.05
14.93	.00	5099.31	18.796	.05
14.97	.00	5099.31	18.796	.05
15.00	.00	5099.31	18.795	.05
15.03	.00	5099.31	18.795	.05
15.07	.00	5099.31	18.795	.05
15.10	.00	5099.31	18.795	.05
15.13	.00	5099.31	18.795	.05
15.17	.00	5099.31	18.795	.05
15.20	.00	5099.31	18.795	.05
15.23	.00	5099.31	18.795	.05
15.27	.00	5099.31	18.794	.05
15.30	.00	5099.31	18.794	.05
15.33	.00	5099.31	18.794	.05
15.37	.00	5099.31	18.794	.05
15.40	.00	5099.31	18.794	.05
15.43	.00	5099.31	18.794	.05
15.47	.00	5099.31	18.794	.05
15.50	.00	5099.31	18.793	.05
15.53	.00	5099.31	18.793	.05
15.57	.00	5099.31	18.793	.05
15.60	.00	5099.31	18.793	.05
15.63	.00	5099.31	18.793	.05
15.67	.00	5099.31	18.793	.05
15.70	.00	5099.31	18.793	.05
15.73	.00	5099.31	18.793	.05
15.77	.00	5099.31	18.792	.05
15.80	.00	5099.31	18.792	.05
15.83	.00	5099.31	18.792	.05
15.87	.00	5099.31	18.792	.05
15.90	.00	5099.31	18.792	.05
15.93	.00	5099.31	18.792	.05
15.97	.00	5099.31	18.792	.05
16.00	.00	5099.31	18.792	.05

16.03	.00	5099.31	18.791	.05
16.07	.00	5099.31	18.791	.05
16.10	.00	5099.31	18.791	.05
16.13	.00	5099.31	18.791	.05
16.17	.00	5099.31	18.791	.05
16.20	.00	5099.31	18.791	.05
16.23	.00	5099.31	18.791	.05
16.27	.00	5099.31	18.790	.05
16.30	.00	5099.31	18.790	.05
16.33	.00	5099.31	18.790	.05
16.37	.00	5099.31	18.790	.05
16.40	.00	5099.31	18.790	.05
16.43	.00	5099.31	18.790	.05
16.47	.00	5099.31	18.790	.05
16.50	.00	5099.31	18.790	.05
16.53	.00	5099.31	18.789	.05
16.57	.00	5099.31	18.789	.05
16.60	.00	5099.31	18.789	.05
16.63	.00	5099.31	18.789	.05
16.67	.00	5099.31	18.789	.05
16.70	.00	5099.31	18.789	.05
16.73	.00	5099.31	18.789	.05
16.77	.00	5099.31	18.788	.05
16.80	.00	5099.31	18.788	.05
16.83	.00	5099.31	18.788	.05
16.87	.00	5099.31	18.788	.05
16.90	.00	5099.31	18.788	.05
16.93	.00	5099.31	18.788	.05
16.97	.00	5099.31	18.788	.05
17.00	.00	5099.31	18.788	.05
17.03	.00	5099.31	18.787	.05
17.07	.00	5099.31	18.787	.05
17.10	.00	5099.31	18.787	.05
17.13	.00	5099.31	18.787	.05
17.17	.00	5099.31	18.787	.05
17.20	.00	5099.31	18.787	.05
17.23	.00	5099.31	18.787	.05
17.27	.00	5099.31	18.786	.05
17.30	.00	5099.31	18.786	.05
17.33	.00	5099.31	18.786	.05
17.37	.00	5099.31	18.786	.05
17.40	.00	5099.31	18.786	.05
17.43	.00	5099.31	18.786	.05
17.47	.00	5099.31	18.786	.05
17.50	.00	5099.31	18.786	.05
17.53	.00	5099.31	18.785	.05
17.57	.00	5099.31	18.785	.05
17.60	.00	5099.31	18.785	.05
17.63	.00	5099.31	18.785	.05
17.67	.00	5099.31	18.785	.05
17.70	.00	5099.31	18.785	.05
17.73	.00	5099.31	18.785	.05
17.77	.00	5099.31	18.785	.05
17.80	.00	5099.31	18.784	.05

17.83	.00	5099.31	18.784	.05
17.87	.00	5099.31	18.784	.05
17.90	.00	5099.31	18.784	.05
17.93	.00	5099.31	18.784	.05
17.97	.00	5099.31	18.784	.05
18.00	.00	5099.31	18.784	.05
18.03	.00	5099.31	18.783	.05
18.07	.00	5099.31	18.783	.05
18.10	.00	5099.31	18.783	.05
18.13	.00	5099.31	18.783	.05
18.17	.00	5099.31	18.783	.05
18.20	.00	5099.31	18.783	.05
18.23	.00	5099.31	18.783	.05
18.27	.00	5099.31	18.783	.05
18.30	.00	5099.30	18.782	.05
18.33	.00	5099.30	18.782	.05
18.37	.00	5099.30	18.782	.05
18.40	.00	5099.30	18.782	.05
18.43	.00	5099.30	18.782	.05
18.47	.00	5099.30	18.782	.05
18.50	.00	5099.30	18.782	.05
18.53	.00	5099.30	18.781	.05
18.57	.00	5099.30	18.781	.05
18.60	.00	5099.30	18.781	.05
18.63	.00	5099.30	18.781	.05
18.67	.00	5099.30	18.781	.05
18.70	.00	5099.30	18.781	.05
18.73	.00	5099.30	18.781	.05
18.77	.00	5099.30	18.781	.05
18.80	.00	5099.30	18.780	.05
18.83	.00	5099.30	18.780	.05
18.87	.00	5099.30	18.780	.05
18.90	.00	5099.30	18.780	.05
18.93	.00	5099.30	18.780	.05
18.97	.00	5099.30	18.780	.05
19.00	.00	5099.30	18.780	.05
19.03	.00	5099.30	18.780	.05
19.07	.00	5099.30	18.779	.05
19.10	.00	5099.30	18.779	.05
19.13	.00	5099.30	18.779	.05
19.17	.00	5099.30	18.779	.05
19.20	.00	5099.30	18.779	.05
19.23	.00	5099.30	18.779	.05
19.27	.00	5099.30	18.779	.05
19.30	.00	5099.30	18.778	.05
19.33	.00	5099.30	18.778	.05
19.37	.00	5099.30	18.778	.05
19.40	.00	5099.30	18.778	.05
19.43	.00	5099.30	18.778	.05
19.47	.00	5099.30	18.778	.05
19.50	.00	5099.30	18.778	.05
19.53	.00	5099.30	18.778	.05
19.57	.00	5099.30	18.777	.05
19.60	.00	5099.30	18.777	.05

19.63	.00	5099.30	18.777	.05
19.67	.00	5099.30	18.777	.05
19.70	.00	5099.30	18.777	.05
19.73	.00	5099.30	18.777	.05
19.77	.00	5099.30	18.777	.05
19.80	.00	5099.30	18.777	.05
19.83	.00	5099.30	18.776	.05
19.87	.00	5099.30	18.776	.05
19.90	.00	5099.30	18.776	.05
19.93	.00	5099.30	18.776	.05
19.97	.00	5099.30	18.776	.05

PEAK DISCHARGE = .048 CFS - PEAK OCCURS AT HOUR 6.37
MAXIMUM WATER SURFACE ELEVATION = 5099.323
MAXIMUM STORAGE = 18.8288 AC-FT INCREMENTAL TIME= .033333HRS

PRINT HYD ID=11 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 501.00

RUNOFF VOLUME = .00628 INCHES = .0707 ACRE-FEET
PEAK DISCHARGE RATE = .05 CFS AT 6.367 HOURS BASIN AREA = .2110 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 09:31:51

AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
RUN DATE (MON/DAY/YR) = 09/30/1992
START TIME (HR:MIN:SEC) = 13:49:20 USER NO.= D_HARRIS.S92
INPUT FILE = ccsdwi.hmi

START 0.0 HOURS ****ONE HUNDRED YEAR TWENTY FOUR HOUR STORM ****
** FILE NAME : CCSDWI.HMI (COORS CONNECTION STORM DRAIN WATERSHED INTERIM)****
** ANALYSIS FOR THE ATRISCO BUSINESS PARK MASTER DRAINAGE PLAN **********
** INCLUDES THE WATERSHED OF THE AIRPORT DRIVE AND COORS BLVD S.D.SYSTEM *****
** INTERIM CONDITION **********
** AREAS OUTSIDE OF THE ATRISCO BUSINESS PARK INCLUDED TO DETERMINE TOTAL
** POTENTIAL FLOWS TO THE AIRPORT DRIVE AND COORS CONNECTION STORM DRAINS*****
****
** ANALYSIS ASSUMPTIONS:
****
** FLOW FROM ALL PRIVATE LAND DIRECTLY CONTRIBUTING FLOW TO THE AIRPORT ROAD
** STORM DRAIN IS RESTRICTED TO 0.1cfs PER ACRE.**********
** PUBLIC STREETS CONTRIBUTING FLOW TO THE AIRPORT DRIVE STORM DRAIN HAVE
** FREE DISCHARGE INTO THE SYSTEM **********
** PUBLIC PLATTED STREETS IN THE ATRISCO BUSINESS PARK ASSUMED TO BE FULLY
** DEVELOPED.**********
** PRIVATE PROPERTY WITHIN THE BUSINESS PARK WHICH HAS THE POTENTIAL TO
** DISCHARGE FLOW TO THE AIRPORT ROAD STORM DRAIN SYSTEM WILL HAVE
** CONSERVATION TREATMENT APPLIED TO IT AND SO WILL CONTRIBUTE NO FLOW TO THE
** STORM DRAIN SYSTEM IN THE INTERIM CONDITION.**********
** IN AREAS OF THE ATRISCO BUSINESS PARK WHERE THE POTENTIAL EXISTS FOR SOME OF
** OF THE PROPERTY ADJACENT TO THE STREETS TO DISCHARGE TO THE STREETS
** UNCONTROLLED DUE TO GRADE CONSTRAINTS, APPOXIMATELY 10 ADDITIONAL FEET OF
** WIDTH WAS USED IN CALCULATING STREET AREAS **********
** THE EXISTING CONDITION LAND TREATMENTS WERE USED IN AREAS OUTSIDE OF THE
** THE ATRISCO BUSINESS PARK AND THE WATERSHED OF THE AIRPORT DRIVE STORM
** DRAIN. ASSUMPTIONS WERE MADE AS TO WHERE FLOW FROM THESE AREAS WILL ENTER
** THE STORM DRAIN SYSTEM IN THE DEVELOPED CONDITION AND THE BASINS WERE
** MODELED ASSUMING THESE CONNECTIONS WERE IN PLACE. THIS WAS DONE TO VERIFY
** CAPACITY FOR THE EXISTING CONDITION FLOWS WAS AVAILABLE IN THE STORM DRAIN
** SYSTEM.
** UPDATED 9-14-92
**RAINFALL TYPE=2 0.0 1.25 1.45 1.65
RAINFALL TYPE=2 0.0 1.87 2.20 2.66 DT=0.05

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .050000 HOURS END TIME = 24.000000 HOURS

.0000	.0025	.0050	.0076	.0103	.0131	.0160
.0190	.0222	.0254	.0289	.0324	.0362	.0401
.0443	.0487	.0534	.0584	.0637	.0695	.0758
.0837	.0924	.1176	.1773	.2798	.4384	.6668
.9790	1.2253	1.3366	1.4295	1.5109	1.5836	1.6495
1.7096	1.7648	1.8156	1.8624	1.9057	1.9458	1.9548
1.9631	1.9708	1.9780	1.9848	1.9912	1.9973	2.0031
2.0087	2.0140	2.0191	2.0240	2.0287	2.0333	2.0377
2.0420	2.0462	2.0502	2.0542	2.0580	2.0617	2.0653
2.0689	2.0724	2.0757	2.0791	2.0823	2.0855	2.0886
2.0916	2.0946	2.0976	2.1005	2.1033	2.1061	2.1088

2.1115	2.1142	2.1168	2.1193	2.1219	2.1244	2.1268
2.1293	2.1316	2.1340	2.1363	2.1386	2.1409	2.1431
2.1453	2.1475	2.1497	2.1518	2.1539	2.1560	2.1580
2.1601	2.1621	2.1641	2.1660	2.1680	2.1699	2.1718
2.1737	2.1756	2.1774	2.1793	2.1811	2.1829	2.1847
2.1864	2.1882	2.1899	2.1916	2.1933	2.1950	2.1967
2.1984	2.2000	2.2020	2.2039	2.2059	2.2078	2.2097
2.2117	2.2136	2.2155	2.2174	2.2193	2.2212	2.2231
2.2249	2.2268	2.2287	2.2305	2.2324	2.2342	2.2361
2.2379	2.2398	2.2416	2.2434	2.2452	2.2470	2.2488
2.2506	2.2524	2.2542	2.2559	2.2577	2.2595	2.2612
2.2630	2.2647	2.2665	2.2682	2.2700	2.2717	2.2734
2.2751	2.2768	2.2785	2.2802	2.2819	2.2836	2.2853
2.2870	2.2887	2.2903	2.2920	2.2937	2.2953	2.2970
2.2986	2.3002	2.3019	2.3035	2.3051	2.3068	2.3084
2.3100	2.3116	2.3132	2.3148	2.3164	2.3180	2.3196
2.3212	2.3227	2.3243	2.3259	2.3274	2.3290	2.3305
2.3321	2.3336	2.3352	2.3367	2.3383	2.3398	2.3413
2.3428	2.3444	2.3459	2.3474	2.3489	2.3504	2.3519
2.3534	2.3549	2.3563	2.3578	2.3593	2.3608	2.3622
2.3637	2.3652	2.3666	2.3681	2.3695	2.3710	2.3724
2.3739	2.3753	2.3767	2.3782	2.3796	2.3810	2.3824
2.3839	2.3853	2.3867	2.3881	2.3895	2.3909	2.3923
2.3937	2.3951	2.3965	2.3978	2.3992	2.4006	2.4020
2.4033	2.4047	2.4061	2.4074	2.4088	2.4101	2.4115
2.4128	2.4142	2.4155	2.4168	2.4182	2.4195	2.4208
2.4222	2.4235	2.4248	2.4261	2.4274	2.4287	2.4300
2.4314	2.4327	2.4340	2.4352	2.4365	2.4378	2.4391
2.4404	2.4417	2.4430	2.4442	2.4455	2.4468	2.4480
2.4493	2.4506	2.4518	2.4531	2.4543	2.4556	2.4568
2.4581	2.4593	2.4606	2.4618	2.4630	2.4643	2.4655
2.4667	2.4680	2.4692	2.4704	2.4716	2.4728	2.4740
2.4753	2.4765	2.4777	2.4789	2.4801	2.4813	2.4825
2.4837	2.4849	2.4860	2.4872	2.4884	2.4896	2.4908
2.4919	2.4931	2.4943	2.4955	2.4966	2.4978	2.4990
2.5001	2.5013	2.5024	2.5036	2.5047	2.5059	2.5070
2.5082	2.5093	2.5105	2.5116	2.5127	2.5139	2.5150
2.5161	2.5172	2.5184	2.5195	2.5206	2.5217	2.5229
2.5240	2.5251	2.5262	2.5273	2.5284	2.5295	2.5306
2.5317	2.5328	2.5339	2.5350	2.5361	2.5372	2.5383
2.5394	2.5404	2.5415	2.5426	2.5437	2.5448	2.5458
2.5469	2.5480	2.5490	2.5501	2.5512	2.5522	2.5533
2.5544	2.5554	2.5565	2.5575	2.5586	2.5596	2.5607
2.5617	2.5628	2.5638	2.5649	2.5659	2.5669	2.5680
2.5690	2.5700	2.5711	2.5721	2.5731	2.5741	2.5752
2.5762	2.5772	2.5782	2.5792	2.5803	2.5813	2.5823
2.5833	2.5843	2.5853	2.5863	2.5873	2.5883	2.5893
2.5903	2.5913	2.5923	2.5933	2.5943	2.5953	2.5963
2.5973	2.5982	2.5992	2.6002	2.6012	2.6022	2.6031
2.6041	2.6051	2.6061	2.6070	2.6080	2.6090	2.6099
2.6109	2.6119	2.6128	2.6138	2.6148	2.6157	2.6167
2.6176	2.6186	2.6195	2.6205	2.6214	2.6224	2.6233
2.6243	2.6252	2.6261	2.6271	2.6280	2.6290	2.6299
2.6308	2.6318	2.6327	2.6336	2.6346	2.6355	2.6364

2.6373 2.6383 2.6392 2.6401 2.6410 2.6419 2.6428
2.6438 2.6447 2.6456 2.6465 2.6474 2.6483 2.6492
2.6501 2.6510 2.6519 2.6528 2.6537 2.6546 2.6555
2.6564 2.6573 2.6582 2.6591 2.6600

****
****
*S BEGIN THE WATERSHED FOR THE AIRPORT ROAD STORM DRAIN **********
****
****
** COMPUTE HYDROGRAPH FOR TRACT "S-1"
** AREA = 133.2 ACRES
COMPUTE NM HYD ID=2 HYD=200.1 DA==0.2081 SM
%A=90.0 %B=0.0 %C=10.0 %D=0.0 TP=0.13333
MASS RAINFALL=-1

K = .142174HR TP = .133330HR K/TP RATIO = 1.066328 SHAPE CONSTANT, N = 3.311895
UNIT PEAK = 478.12 CFS UNIT VOLUME = 1.000 B = 306.34 P60 = 1.8700
AREA = .208100 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = .47815 INCHES = 5.3068 ACRE-FEET
PEAK DISCHARGE RATE = 201.15 CFS AT 1.500 HOURS BASIN AREA = .2081 SQ. MI.

*S ASSUME CONSERVATION TREATMENT IS APPLIED TO THE BASIN AND NO RUNOFF
*S LEAVES THE SITE
** COMPUTE HYDROGRAPH FOR LOS VOLCANES BETWEEN UNSER BLVD AND 1250 LF WEST
** OF AIRPORT ROAD
COMPUTE NM HYD ID=3 HYD=200.4 DA==0.0042
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 13.431 CFS UNIT VOLUME = .9983 B = 526.28 P60 = 1.8700
AREA = .003402 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.9581 CFS UNIT VOLUME = .9944 B = 327.09 P60 = 1.8700
AREA = .000798 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 200.40

RUNOFF VOLUME = 2.09267 INCHES = .4688 ACRE-FEET
PEAK DISCHARGE RATE = 10.40 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

** ROUTE THE FLOW IN THE STREET FROM 1250' WEST OF AIRPORT IN THE STREET TO
** THE INTERSECTION WITH AIRPORT
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0082 FLOOD PLAIN SLOPE=0.0082
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.3
100.18	.6	.8
100.23	1.1	1.7
100.27	1.9	3.2
100.32	2.8	5.4
100.37	4.0	8.5
100.41	5.3	12.6
100.46	6.9	17.7
100.50	8.7	24.1
100.55	10.7	31.6
100.60	12.9	41.8
100.64	15.1	54.3
100.69	17.3	68.1
100.73	19.7	83.2
100.78	22.3	99.7
100.82	25.1	117.8
100.87	28.1	137.4

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1250 FT SLOPE=0.0082

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.02	.5669
.092	.126	.12	.3571
.137	.286	.34	.2921
.183	.605	.76	.2770

.229	1.133	1.66	.2374
.275	1.871	3.17	.2052
.321	2.820	5.41	.1809
.366	3.978	8.52	.1622
.412	5.346	12.59	.1475
.458	6.925	17.73	.1356
.504	8.713	24.05	.1258
.549	10.711	31.65	.1175
.595	12.887	41.81	.1070
.641	15.085	54.29	.0965
.687	17.297	68.05	.0883
.733	19.677	83.18	.0821
.778	22.267	99.74	.0775
.824	25.067	117.78	.0739
.870	28.076	137.38	.0710

ROUTE ID=11 HYDROGRAPH NO=200.45 INFLOW ID=3 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 200.45

RUNOFF VOLUME = 2.09280 INCHES = .4688 ACRE-FEET
PEAK DISCHARGE RATE = 7.01 CFS AT 1.600 HOURS BASIN AREA = .0042 SQ. MI.

** COMPUTE HYDROGRAPH FOR LOS VOLCANES BETWEEN 1250 LF WEST OF AIRPORT ROAD
** AND AIRPORT ROAD
COMPUTE NM HYD ID=4 HYD=200.5 DA==0.0035
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 11.193 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002835 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.6318 CFS UNIT VOLUME = .9935 B = 327.09 P60 = 1.8700
AREA = .000665 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 200.50

RUNOFF VOLUME = 2.09267 INCHES = .3906 ACRE-FEET
PEAK DISCHARGE RATE = 8.67 CFS AT 1.500 HOURS BASIN AREA = .0035 SQ. MI.

** ADD THE FLOW FROM THE EASTERN SEGMENT OF LOS VOLCANES TO THE ROUTED FLOW

** IN THE STREET AT THE INTERSECTION OF LOS VOLCANES AND AIRPORT ROAD
ADD HYD ID=3 HYDROGRAPH NO=200.51 ID I=11 ID II=4
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 200.51

RUNOFF VOLUME = 2.09259 INCHES = .8594 ACRE-FEET
PEAK DISCHARGE RATE = 14.30 CFS AT 1.550 HOURS BASIN AREA = .0077 SQ. MI.

** ROUTE THE FLOW IN THE STREET DOWN AIRPORT ROAD FROM LOS VOLCANES TO THE
** BACK LOT LINE OF LOT 9, TRACT "M"
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0048 FLOOD PLAIN SLOPE=0.0048
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.3
100.18	.6	.6
100.23	1.1	1.3
100.27	1.9	2.4
100.32	2.8	4.1
100.37	4.0	6.5
100.41	5.3	9.6
100.46	6.9	13.6
100.50	8.7	18.4
100.55	10.7	24.2
100.60	12.9	32.0
100.64	15.1	41.5
100.69	17.3	52.1
100.73	19.7	63.6
100.78	22.3	76.3
100.82	25.1	90.1
100.87	28.1	105.1

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=850 FT SLOPE=0.0048

TRAVEL TIME TABLE

REACH= 1.0

WATER	AVERAGE	FLOW	TRAVEL

DEPTH FEET	AREA SQ.FT.	RATE CFS	TIME HRS
.046	.032	.01	.5039
.092	.126	.09	.3174
.137	.286	.26	.2596
.183	.605	.58	.2462
.229	1.133	1.27	.2110
.275	1.871	2.42	.1824
.321	2.820	4.14	.1608
.366	3.978	6.52	.1442
.412	5.346	9.63	.1311
.458	6.925	13.57	.1205
.504	8.713	18.40	.1118
.549	10.711	24.21	.1045
.595	12.887	31.99	.0951
.641	15.085	41.54	.0857
.687	17.297	52.07	.0784
.733	19.677	63.64	.0730
.778	22.267	76.31	.0689
.824	25.067	90.11	.0657
.870	28.076	105.11	.0631

ROUTE ID=11 HYDROGRAPH NO=200.66 INFLOW ID=3 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 200.66

RUNOFF VOLUME = 2.09269 INCHES = .8594 ACRE-FEET
PEAK DISCHARGE RATE = 11.60 CFS AT 1.650 HOURS BASIN AREA = .0077 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE NORTHERN PART OF TRACT "M" ATRISCO BUSINESS PARK
** LOTS 5 TO 9. AREA = 47.9 ACRES
COMPUTE NM HYD ID=2 HYD=210.1 DA==0.0748 SM
%A=90.0 %B=0.0 %C=10.0 %D=0.0 TP=0.13333
MASS RAINFALL=-1

K = .156606HR TP = .133330HR K/TP RATIO = 1.174574 SHAPE CONSTANT, N = 3.020304
UNIT PEAK = 159.03 CFS UNIT VOLUME = .9990 B = 283.47 P60 = 1.8700
AREA = .074800 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.10

RUNOFF VOLUME = .47815 INCHES = 1.9075 ACRE-FEET
PEAK DISCHARGE RATE = 67.68 CFS AT 1.500 HOURS BASIN AREA = .0748 SQ. MI.

*S ASSUME CONSERVATION TREATMENT IS APPLIED TO THE BASIN AND NO RUNOFF

*S LEAVES THE SITE
** COMPUTE HYDROGRAPH FOR AIRPORT RD. FROM THE INTERSECTION OF LOS VOLCANES TO
** THE INTERSECTION WITH THE BACK LOT LINE OF LOT 9 TRACT "M"
COMPUTE NM HYD ID=2 HYD=210.3 DA==0.0025
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.9930 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .002025 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .131021HR TP = .133330HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.1653 CFS UNIT VOLUME = .9900 B = 327.09 P60 = 1.8700
AREA = .000475 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.30

RUNOFF VOLUME = 2.09268 INCHES = .2790 ACRE-FEET
PEAK DISCHARGE RATE = 6.19 CFS AT 1.500 HOURS BASIN AREA = .0025 SQ. MI.

** ADD THE FLOW FROM THE NORTHERN PORTION OF AIRPORT RD. TO THE ROUTED FLOW IN
** THE STREET
ADD HYD ID=12 HYDROGRAPH NO=210.31 ID I=11 ID II=2
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 210.31

RUNOFF VOLUME = 2.09257 INCHES = 1.1383 ACRE-FEET
PEAK DISCHARGE RATE = 15.71 CFS AT 1.600 HOURS BASIN AREA = .0102 SQ. MI.

** ROUTE THE FLOW IN THE STREET DOWN AIRPORT ROAD FROM THE BACK LOT LINE OF LOT
** OF LOT 9 TRACT "M" TO THE INTERSECTION WITH BLUEWATER ROAD
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0048 FLOOD PLAIN SLOPE=0.0048
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER	FLOW	FLOW

SURFACE ELEV	AREA SQ FT	RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.3
100.18	.6	.6
100.23	1.1	1.3
100.27	1.9	2.4
100.32	2.8	4.1
100.37	4.0	6.5
100.41	5.3	9.6
100.46	6.9	13.6
100.50	8.7	18.4
100.55	10.7	24.2
100.60	12.9	32.0
100.64	15.1	41.5
100.69	17.3	52.1
100.73	19.7	63.6
100.78	22.3	76.3
100.82	25.1	90.1
100.87	28.1	105.1

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=850 FT SLOPE=0.0048

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.01	.5039
.092	.126	.09	.3174
.137	.286	.26	.2596
.183	.605	.58	.2462
.229	1.133	1.27	.2110
.275	1.871	2.42	.1824
.321	2.820	4.14	.1608
.366	3.978	6.52	.1442
.412	5.346	9.63	.1311
.458	6.925	13.57	.1205
.504	8.713	18.40	.1118
.549	10.711	24.21	.1045
.595	12.887	31.99	.0951
.641	15.085	41.54	.0857
.687	17.297	52.07	.0784
.733	19.677	63.64	.0730
.778	22.267	76.31	.0689
.824	25.067	90.11	.0657
.870	28.076	105.11	.0631

ROUTE ID=11 HYDROGRAPH NO=210.47 INFLOW ID=12 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 210.47

```
    RUNOFF VOLUME =     2.09263 INCHES     =       1.1384 ACRE-FEET
    PEAK DISCHARGE RATE =      13.77 CFS  AT   1.700 HOURS   BASIN AREA =   .0102 SQ. MI.


** COMPUTE HYDROGRAPH FOR AIRPORT RD. FROM THE INTERSECTION WITH THE BACK
** LOT LINE OF LOT 9 TRACT "M" TO THE INTERSECTION WITH BLUEWATER ROAD
COMPUTE NM HYD      ID=2  HYD=210.5  DA==0.0024
                    %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.6733    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001944 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.1187    CFS   UNIT VOLUME =    .9900       B =   327.09      P60 = 1.8700
    AREA =      .000456 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   210.50


    RUNOFF VOLUME =     2.09267 INCHES     =       .2679 ACRE-FEET
    PEAK DISCHARGE RATE =       5.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0024 SQ. MI.


** ADD THE ROUTED FLOW IN THE STREET TO THE FLOW FROM THE SOUTHERN SEGMENT OF
** AIRPORT ROAD AT THE INTERSECTION AIRPORT ROAD AND BLUEWATER
ADD HYD             ID=11  HYDROGRAPH NO=210.51  ID I=2  ID II=11
PRINT HYD           ID=11  CODE=1

                                PARTIAL HYDROGRAPH   210.51


    RUNOFF VOLUME =     2.09254 INCHES     =       1.4062 ACRE-FEET
    PEAK DISCHARGE RATE =      16.65 CFS  AT   1.650 HOURS   BASIN AREA =   .0126 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE SOUTHERN PART OF TRACT "M" ATRISCO BUSINESS PARK
* LOTS 1 TO 4 AND TRACT "L-1".  AREA = 44.8 ACRES
COMPUTE NM HYD      ID=3  HYD=210.6  DA==0.0700 SM
                    %A=90.0  %B=0.0  %C=10.0  %D=0.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .157126HR    TP =   .133330HR    K/TP RATIO =  1.178472     SHAPE CONSTANT, N =  3.011040
```

```
    UNIT PEAK =   148.43    CFS   UNIT VOLUME =    .9989       B =   282.72      P60 = 1.8700
    AREA =      .070000 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   210.60


    RUNOFF VOLUME =      .47815 INCHES     =       1.7851 ACRE-FEET
    PEAK DISCHARGE RATE =      63.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0700 SQ. MI.


*S ASSUME CONSERVATION TREATMENT IS APPLIED TO THE BASIN AND NO  RUNOFF
*S LEAVES THE SITE
** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM THE INTERSECTION OF UNSER BLVD. TO
** 1050 LF WEST OF THE INTERSECTION WITH AIRPORT ROAD
COMPUTE NM HYD      ID=2  HYD=210.7  DA==0.0033
                    %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.551    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.8700
    AREA =      .002673 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.5382    CFS   UNIT VOLUME =    .9925       B =   327.09      P60 = 1.8700
    AREA =      .000627 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   210.70


    RUNOFF VOLUME =     2.09267 INCHES     =        .3683 ACRE-FEET
    PEAK DISCHARGE RATE =       8.17 CFS  AT   1.500 HOURS   BASIN AREA =   .0033 SQ. MI.


** ROUTE FLOW FROM WESTERN PORTION OF BLUEWATER RD.DOWN THE STREET FROM 1050 LF
** WEST OF AIRPORT ROAD TO THE INTERSECTION WITH AIRPORT ROAD
COMPUTE RATING CURVECID=1  VS NO=1  NUMBER OF SEGS=3
                    MINIMUM ELEV=100.00  MAXIMUM ELEV=100.87
                    CHANNEL SLOPE=0.0030 FLOOD PLAIN SLOPE=0.0030
                    N=0.025  DIST=10.0  N=-0.017  DIST=58.0  N=0.025  DIST=68.0
                    DIST    ELEV   DIST    ELEV    DIST   ELEV    DIST   ELEV
                    0.0     100.87  10.00  100.67  10.05  100.00  12.0  100.13
                    34.0    100.57  56.00  100.13  57.95  100.00  58.00 100.67
                    68.00   100.87
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.2
100.18	.6	.5
100.23	1.1	1.0
100.27	1.9	1.9
100.32	2.8	3.3
100.37	4.0	5.2
100.41	5.3	7.6
100.46	6.9	10.7
100.50	8.7	14.5
100.55	10.7	19.1
100.60	12.9	25.3
100.64	15.1	32.8
100.69	17.3	41.2
100.73	19.7	50.3
100.78	22.3	60.3
100.82	25.1	71.2
100.87	28.1	83.1

COMPUTE TRAVEL TIME ID=12 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1050 FT SLOPE=0.0030

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.01	.7873
.092	.126	.07	.4960
.137	.286	.21	.4057
.183	.605	.46	.3846
.229	1.133	1.00	.3297
.275	1.871	1.91	.2850
.321	2.820	3.27	.2512
.366	3.978	5.15	.2252
.412	5.346	7.61	.2048
.458	6.925	10.73	.1883
.504	8.713	14.55	.1747
.549	10.711	19.14	.1632
.595	12.887	25.29	.1486
.641	15.085	32.84	.1340
.687	17.297	41.16	.1226
.733	19.677	50.31	.1141
.778	22.267	60.33	.1077
.824	25.067	71.24	.1026
.870	28.076	83.09	.0985

ROUTE ID=12 HYDROGRAPH NO=210.71 INFLOW ID=2 DT=0.0
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 210.71

RUNOFF VOLUME = 2.09282 INCHES = .3683 ACRE-FEET
PEAK DISCHARGE RATE = 4.83 CFS AT 1.600 HOURS BASIN AREA = .0033 SQ. MI.

** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM 1050 LF WEST OF AIRPORT TO THE
** INTERSECTION WITH AIRPORT ROAD
COMPUTE NM HYD ID=3 HYD=210.8 DA==0.0028
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.9522 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .002268 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .131021HR TP = .133330HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.3051 CFS UNIT VOLUME = .9913 B = 327.09 P60 = 1.8700
AREA = .000532 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 210.80

RUNOFF VOLUME = 2.09267 INCHES = .3125 ACRE-FEET
PEAK DISCHARGE RATE = 6.94 CFS AT 1.500 HOURS BASIN AREA = .0028 SQ. MI.

** ADD THE ROUTED FLOW FROM THE BLUEWATER RD.TO THE FLOW FROM THE EASTERN
** SEGMENT OF BLUEWATER AT THE INTERSECTION OF AIRPORT AND BLUEWATER
ADD HYD ID=12 HYDROGRAPH NO=210.81 ID I=3 ID II=12
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 210.81

RUNOFF VOLUME = 2.09252 INCHES = .6808 ACRE-FEET
PEAK DISCHARGE RATE = 10.56 CFS AT 1.550 HOURS BASIN AREA = .0061 SQ. MI.

** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM THE INTERSECTION WITH AIRPORT
** ROAD TO THE GRADE BREAK EAST OF THE INTERSECTION WITH AIRPORT DRIVE
COMPUTE NM HYD ID=2 HYD=210.9 DA==0.0017
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.13333
MASS RAINFALL=-1

```
    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.4352    CFS   UNIT VOLUME =    .9971       B =   526.28      P60 = 1.8700
    AREA =       .001377 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .131021HR    TP =   .133330HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .79239    CFS   UNIT VOLUME =    .9848       B =   327.09      P60 = 1.8700
    AREA =       .000323 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD          ID=2 CODE=1

                                PARTIAL HYDROGRAPH   210.90

    RUNOFF VOLUME =     2.09267 INCHES     =        .1897 ACRE-FEET
    PEAK DISCHARGE RATE =       4.22 CFS  AT   1.500 HOURS   BASIN AREA =   .0017 SQ. MI.


** ADD THE FLOW FROM THE FAR EAST SEGMENT OF BLUEWATER RD TO THE BLUEWATER
** FLOW FROM THE WEST AT THE INTERSECTION OF AIRPORT AND  BLUEWATER
ADD HYD            ID=12  HYDROGRAPH NO=210.91  ID I=12  ID II=2
PRINT HYD          ID=12  CODE=1

                                PARTIAL HYDROGRAPH   210.91

    RUNOFF VOLUME =     2.09251 INCHES     =        .8705 ACRE-FEET
    PEAK DISCHARGE RATE =      14.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0078 SQ. MI.


** ADD THE FLOW FROM  BLUEWATER RD TO THE FLOW IN THE STREET AT THE
** INTERSECTION OF AIRPORT AND  BLUEWATER
ADD HYD            ID=11  HYDROGRAPH NO=210.92 ID I=12  ID II=11
PRINT HYD          ID=11  CODE=1

                                PARTIAL HYDROGRAPH   210.92

    RUNOFF VOLUME =     2.09253 INCHES     =       2.2767 ACRE-FEET
    PEAK DISCHARGE RATE =      29.41 CFS  AT   1.550 HOURS   BASIN AREA =   .0204 SQ. MI.


** ROUTE FLOW IN A STORM DRAIN FROM THE INTERSECTION OF BLUEWATER AND AIRPORT
** DOWN AIRPORT RD. TO THE SOUTH LINE OF ATRISCO BUSINESS PARK
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.0027
                    PIPE DIA=4.0  N=0.013

                                RATING CURVE PIPE SECTION  1.0
```

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.4
.42	.7	1.7
.63	1.3	4.0
.83	1.9	7.1
1.04	2.6	11.1
1.25	3.4	15.8
1.46	4.1	21.2
1.67	5.0	27.1
1.88	5.8	33.4
2.08	6.6	40.0
2.29	7.5	46.7
2.50	8.3	53.4
2.71	9.1	59.8
2.92	9.8	65.9
3.13	10.5	71.3
3.34	11.2	75.8
3.54	11.8	79.0
3.75	12.2	80.3
4.00	12.6	80.3

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1850 FT SLOPE=0.0027

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.39	.3279
.417	.695	1.70	.2101
.625	1.255	3.95	.1632
.834	1.898	7.11	.1373
1.042	2.604	11.10	.1206
1.251	3.358	15.83	.1090
1.459	4.146	21.21	.1005
1.668	4.960	27.12	.0940
1.876	5.788	33.43	.0890
2.084	6.621	40.01	.0850
2.293	7.451	46.71	.0820
2.501	8.267	53.37	.0796
2.710	9.062	59.81	.0779
2.918	9.823	65.85	.0767
3.127	10.539	71.26	.0760
3.335	11.195	75.75	.0759
3.544	11.773	78.97	.0766
3.752	12.243	80.29	.0784
4.000	12.566	80.29	.0804

ROUTE ID=10 HYDROGRAPH NO=211.13 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 211.13

RUNOFF VOLUME = 2.09257 INCHES = 2.2767 ACRE-FEET
PEAK DISCHARGE RATE = 26.71 CFS AT 1.650 HOURS BASIN AREA = .0204 SQ. MI.

```
**********************************************************************************
*S BEGIN THE AREA SOUTH OF BLUEWATER ROAD
**********************************************************************************
** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF BLUEWATER TO THE SOUTH LINE OF
** THE ATRISCO BUSINESS PARK
COMPUTE NM HYD      ID=2  HYD=220.1 DA==0.0035
                    %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.1333
                    MASS RAINFALL=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 11.193 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002835 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 1.6318 CFS UNIT VOLUME = .9935 B = 327.09 P60 = 1.8700
AREA = .000665 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
PRINT HYD           ID=2 CODE=1
```

PARTIAL HYDROGRAPH 220.10

RUNOFF VOLUME = 2.09267 INCHES = .3906 ACRE-FEET
PEAK DISCHARGE RATE = 8.67 CFS AT 1.500 HOURS BASIN AREA = .0035 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR TRACT B, UNIT 2, A.B.P. AREA = 20.0 ACRES
COMPUTE NM HYD      ID=3  HYD=220.2  DA==0.0313
                    %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1
```

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 98.837 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
AREA = .025040 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124739HR TP = .133330HR K/TP RATIO = .935564 SHAPE CONSTANT, N = 3.780327
UNIT PEAK = 15.975 CFS UNIT VOLUME = 1.000 B = 340.25 P60 = 1.8700
AREA = .006260 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 220.20

RUNOFF VOLUME = 2.08937 INCHES = 3.4878 ACRE-FEET
PEAK DISCHARGE RATE = 77.77 CFS AT 1.500 HOURS BASIN AREA = .0313 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=2.0cfs
ROUTE RESERVOIR ID=4 HYDROGRAPH NO=220.21 INFLOW ID=3 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
1.12	0.80	101.0
1.68	1.70	102.0
2.04	2.60	103.0
4.00	3.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	17.96	102.67	2.307	1.92
3.00	.87	102.89	2.503	2.00
4.00	.43	102.76	2.386	1.95
5.00	.43	102.62	2.261	1.90
6.00	.53	102.49	2.144	1.86
7.00	.60	102.38	2.042	1.82
8.00	.56	102.27	1.941	1.78
9.00	.53	102.16	1.841	1.74
10.00	.50	102.05	1.742	1.70
11.00	.47	101.94	1.644	1.64
12.00	.45	101.83	1.548	1.59
13.00	.43	101.73	1.456	1.53
14.00	.41	101.63	1.367	1.47
15.00	.39	101.53	1.281	1.42
16.00	.38	101.44	1.197	1.37
17.00	.37	101.35	1.117	1.32
18.00	.35	101.27	1.040	1.27
19.00	.34	101.18	.965	1.22
20.00	.33	101.10	.894	1.18
21.00	.31	101.03	.825	1.14
22.00	.31	100.95	.759	1.06
23.00	.29	100.87	.700	.98
24.00	.29	100.81	.646	.90
25.00	.00	100.72	.580	.81
26.00	.00	100.65	.516	.72
27.00	.00	100.57	.460	.64
28.00	.00	100.51	.410	.57

```
   29.00        .00    100.46        .365        .51
 PEAK DISCHARGE =         2.011 CFS - PEAK OCCURS AT HOUR    2.55
 MAXIMUM WATER SURFACE ELEVATION =      102.920
 MAXIMUM STORAGE =         2.5278 AC-FT      INCREMENTAL TIME=     .050000HRS

PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   220.21

    RUNOFF VOLUME =     1.89413 INCHES     =       3.1619 ACRE-FEET
    PEAK DISCHARGE RATE =       2.01 CFS  AT   2.550 HOURS   BASIN AREA =    .0313 SQ. MI.


** ROUTE FLOW IN A STORM DRAIN FROM THE TRACT "B", UNIT 2 POND TO THE AIRPORT
** ROAD STORM DRAIN
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.007
                    PIPE DIA=1.5  N=0.013

                          RATING CURVE PIPE SECTION  1.0
                            WATER      FLOW       FLOW
                          SURFACE      AREA       RATE
                            ELEV       SQ FT      CFS
                              .00         .0         .0
                              .08         .0         .0
                              .16         .1         .2
                              .23         .2         .5
                              .31         .3         .8
                              .39         .4        1.3
                              .47         .5        1.9
                              .55         .6        2.5
                              .63         .7        3.2
                              .70         .8        3.9
                              .78         .9        4.7
                              .86        1.0        5.5
                              .94        1.2        6.3
                             1.02        1.3        7.0
                             1.09        1.4        7.8
                             1.17        1.5        8.4
                             1.25        1.6        8.9
                             1.33        1.7        9.3
                             1.41        1.7        9.5
                             1.50        1.8        9.5
COMPUTE TRAVEL TIME ID=5  REACH=1  NUMBER OF VALLEY SECTIONS=1
                    LENGTH=1100 FT  SLOPE=0.007

                          TRAVEL TIME TABLE
                                        REACH=  1.0

                          WATER        AVERAGE      FLOW         TRAVEL
                          DEPTH        AREA         RATE         TIME
                          FEET         SQ.FT.       CFS          HRS
                             .078         .035          .05        .2328
```

.156	.098	.20	.1492
.235	.176	.47	.1159
.313	.267	.84	.0975
.391	.366	1.31	.0856
.469	.472	1.86	.0774
.547	.583	2.50	.0713
.625	.697	3.19	.0667
.704	.814	3.94	.0632
.782	.931	4.71	.0604
.860	1.048	5.50	.0582
.938	1.163	6.28	.0565
1.016	1.274	7.04	.0553
1.094	1.381	7.75	.0544
1.173	1.482	8.39	.0540
1.251	1.574	8.92	.0539
1.329	1.656	9.30	.0544
1.407	1.722	9.45	.0556
1.500	1.767	9.45	.0571

ROUTE ID=5 HYDROGRAPH NO=220.22 INFLOW ID=4 DT=0.0
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 220.22

RUNOFF VOLUME = 1.89148 INCHES = 3.1575 ACRE-FEET
PEAK DISCHARGE RATE = 2.01 CFS AT 2.650 HOURS BASIN AREA = .0313 SQ. MI.

** ADD THE ROUTED FLOW FROM PARCEL "B", UNIT 2 TO THE FLOW FROM AIRPORT ROAD
ADD HYD ID=3 HYDROGRAPH NO=220.23 ID I=2 ID= II=5
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 220.23

RUNOFF VOLUME = 1.91170 INCHES = 3.5481 ACRE-FEET
PEAK DISCHARGE RATE = 9.29 CFS AT 1.500 HOURS BASIN AREA = .0348 SQ. MI.

** COMPUTE HYDROGRAPH FOR PARCEL "C", UNIT 2, A.B.P. AREA = 28.6 ACRES
COMPUTE NM HYD ID=2 HYD=220.3 DA==0.0447
%A=90.0 %B=0.0 %C10.0 %D=0.0 TP=0.13333
MASS RAINFALL=-1

K = .157938HR TP = .133330HR K/TP RATIO = 1.184562 SHAPE CONSTANT, N = 2.996709
UNIT PEAK = 94.393 CFS UNIT VOLUME = .9987 B = 281.55 P60 = 1.8700
AREA = .044700 SQ MI IA = .62000 INCHES INF = 1.58600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.30

RUNOFF VOLUME = .47815 INCHES = 1.1399 ACRE-FEET
PEAK DISCHARGE RATE = 40.21 CFS AT 1.500 HOURS BASIN AREA = .0447 SQ. MI.

*S ASSUME CONSERVATION TREATMENT IS APPLIED TO THE BASIN AND NO RUNOFF
*S LEAVES THE SITE
** ADD THE ROUTED FLOW FROM THE NORTH IN THE AIRPORT ROAD STORM DRAIN TO THE
** TOTAL FLOW IN AIRPORT ROAD AT THE SOUTH LINE OF THE ATRISCO BUSINESS PARK
ADD HYD ID=2 HYDROGRAPH NO=220.53 ID I=10 ID= II=3
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.53

RUNOFF VOLUME = 1.97853 INCHES = 5.8248 ACRE-FEET
PEAK DISCHARGE RATE = 32.95 CFS AT 1.600 HOURS BASIN AREA = .0552 SQ. MI.

** ROUTE FLOW IN A STORM DRAIN FROM THE SOUTH LINE OF THE BUSINESS PARK
** TO AIRPORT RD STORM DRAIN STA 28+80 THE JUNCTION WITH FLOW FROM THE
** WEST 66 ADDITION
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0040
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.5
.42	.7	2.1
.63	1.3	4.8
.83	1.9	8.6
1.04	2.6	13.5
1.25	3.4	19.3
1.46	4.1	25.8
1.67	5.0	33.0
1.88	5.8	40.7
2.08	6.6	48.7
2.29	7.5	56.9
2.50	8.3	65.0
2.71	9.1	72.8
2.92	9.8	80.2
3.13	10.5	86.7
3.34	11.2	92.2
3.54	11.8	96.1
3.75	12.2	97.7
4.00	12.6	97.7

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=250 FT SLOPE=0.0037

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.48	.0364
.417	.695	2.07	.0233
.625	1.255	4.81	.0181
.834	1.898	8.65	.0152
1.042	2.604	13.51	.0134
1.251	3.358	19.27	.0121
1.459	4.146	25.82	.0112
1.668	4.960	33.01	.0104
1.876	5.788	40.69	.0099
2.084	6.621	48.70	.0094
2.293	7.451	56.85	.0091
2.501	8.267	64.96	.0088
2.710	9.062	72.80	.0086
2.918	9.823	80.15	.0085
3.127	10.539	86.73	.0084
3.335	11.195	92.20	.0084
3.544	11.773	96.12	.0085
3.752	12.243	97.73	.0087
4.000	12.566	97.73	.0089

ROUTE ID=10 HYDROGRAPH NO=220.54 INFLOW ID=2 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 220.54

RUNOFF VOLUME = 1.97806 INCHES = 5.8234 ACRE-FEET
PEAK DISCHARGE RATE = 32.91 CFS AT 1.600 HOURS BASIN AREA = .0552 SQ. MI.

****
*S BEGIN THE AREA SOUTH OF THE ATRISCO BUSINESS PARK
****
** COMPUTE HYDROGRAPH FOR THE WEST 66 ADDITION AREA = 12.7 ACRES
COMPUTE NM HYD ID=2 HYD=220.6 DA==0.0198
%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 62.537 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.8700
AREA = .015840 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124711HR TP = .133300HR K/TP RATIO = .935564 SHAPE CONSTANT, N = 3.780327
UNIT PEAK = 10.108 CFS UNIT VOLUME = 1.000 B = 340.25 P60 = 1.8700
AREA = .003960 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.60

RUNOFF VOLUME = 2.08937 INCHES = 2.2064 ACRE-FEET
PEAK DISCHARGE RATE = 49.20 CFS AT 1.500 HOURS BASIN AREA = .0198 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=1.27 cfs
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=220.61 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
0.70	0.52	101.0
1.06	1.04	102.0
1.29	1.65	103.0
2.00	2.55	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	11.36	102.69	1.459	1.22
3.00	.55	102.89	1.584	1.27
4.00	.27	102.77	1.509	1.24
5.00	.27	102.64	1.430	1.21
6.00	.33	102.52	1.356	1.18
7.00	.38	102.41	1.291	1.15
8.00	.36	102.31	1.227	1.13
9.00	.33	102.20	1.163	1.11
10.00	.32	102.10	1.099	1.08
11.00	.30	101.99	1.036	1.06
12.00	.29	101.87	.975	1.01
13.00	.27	101.76	.916	.97
14.00	.26	101.65	.859	.93
15.00	.25	101.55	.804	.90
16.00	.24	101.45	.752	.86
17.00	.23	101.35	.702	.83
18.00	.22	101.26	.653	.79
19.00	.22	101.17	.607	.76
20.00	.21	101.08	.563	.73
21.00	.20	101.00	.521	.70
22.00	.19	100.93	.481	.65
23.00	.19	100.86	.446	.60
24.00	.18	100.79	.413	.56
25.00	.00	100.72	.372	.50
26.00	.00	100.64	.333	.45

```
   27.00        .00    100.57       .298       .40
   28.00        .00    100.51       .267       .36
   29.00        .00    100.46       .239       .32
 PEAK DISCHARGE =         1.271 CFS - PEAK OCCURS AT HOUR    2.55
 MAXIMUM WATER SURFACE ELEVATION =      102.917
 MAXIMUM STORAGE =         1.5992 AC-FT      INCREMENTAL TIME=     .050000HRS

PRINT HYD           ID=3  CODE=1

                              PARTIAL HYDROGRAPH   220.61

   RUNOFF VOLUME =     1.88671 INCHES     =      1.9924 ACRE-FEET
   PEAK DISCHARGE RATE =       1.27 CFS  AT   2.550 HOURS   BASIN AREA =   .0198 SQ. MI.

** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF THE SOUTH LINE OF
** THE ATRISCO BUSINESS PARK TO CENTRAL AVE.
COMPUTE NM HYD      ID=4  HYD=220.7 DA==0.0027
                    %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.1333
                    MASS RAINFALL=-1

   K =   .072649HR .  TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   8.6344    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
   AREA =      .002187 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


   K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
   UNIT PEAK =   1.2588    CFS   UNIT VOLUME =    .9913       B =   327.09      P60 = 1.8700
   AREA =      .000513 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=4 CODE=1

                              PARTIAL HYDROGRAPH   220.70

   RUNOFF VOLUME =     2.09267 INCHES     =        .3013 ACRE-FEET
   PEAK DISCHARGE RATE =       6.69 CFS  AT   1.500 HOURS   BASIN AREA =   .0027 SQ. MI.

** ADD CONTROLED DISCHARGE FROM POND TO FLOW FROM AIRPORT ROAD
ADD HYD             ID=5  HYDROGRAPH NO=220.71  ID I=4  ID II=3
PRINT HYD           ID=5  CODE=1

                              PARTIAL HYDROGRAPH   220.71

   RUNOFF VOLUME =     1.91141 INCHES     =       2.2937 ACRE-FEET
   PEAK DISCHARGE RATE =       7.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0225 SQ. MI.
```

** ADD FLOWS TO THE AIRPORT ROAD STORM DRAIN AT STA 28+80
ADD HYD ID=2 HYDROGRAPH NO=220.72 ID I=10 ID II=5
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.72

RUNOFF VOLUME = 1.95876 INCHES = 8.1170 ACRE-FEET
PEAK DISCHARGE RATE = 38.42 CFS AT 1.600 HOURS BASIN AREA = .0777 SQ. MI.

** ROUTE FLOW DOWN AIRPORT ROAD STORM DRAIN FROM STA 28+80 TO STA 9+85
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0037
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.5
.42	.7	2.0
.63	1.3	4.6
.83	1.9	8.3
1.04	2.6	13.0
1.25	3.4	18.5
1.46	4.1	24.8
1.67	5.0	31.7
1.88	5.8	39.1
2.08	6.6	46.8
2.29	7.5	54.7
2.50	8.3	62.5
2.71	9.1	70.0
2.92	9.8	77.1
3.13	10.5	83.4
3.34	11.2	88.7
3.54	11.8	92.4
3.75	12.2	94.0
4.00	12.6	94.0

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1895 FT SLOPE=0.0037

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.46	.2869
.417	.695	1.99	.1838
.625	1.255	4.63	.1428

.834	1.898	8.32	.1201
1.042	2.604	12.99	.1055
1.251	3.358	18.53	.0954
1.459	4.146	24.83	.0879
1.668	4.960	31.74	.0822
1.876	5.788	39.13	.0778
2.084	6.621	46.83	.0744
2.293	7.451	54.68	.0717
2.501	8.267	62.47	.0697
2.710	9.062	70.02	.0681
2.918	9.823	77.09	.0671
3.127	10.539	83.41	.0665
3.335	11.195	88.68	.0665
3.544	11.773	92.44	.0670
3.752	12.243	93.99	.0686
4.000	12.566	93.99	.0704

ROUTE ID=10 HYDROGRAPH NO=220.73 INFLOW ID=2 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 220.73

RUNOFF VOLUME = 1.95467 INCHES = 8.1001 ACRE-FEET
PEAK DISCHARGE RATE = 36.34 CFS AT 1.700 HOURS BASIN AREA = .0777 SQ. MI.

****
*S BEGIN AREA SOUTH OF CENTRAL BOULEVARD
****
** COMPUTE HYDROGRAPH FOR LOT 59, UNIT 6, TOWN OF ATRISCO GRANT
COMPUTE NM HYD ID=2 HYD=230.1 DA==0.0018
%A=0.0 %B=0.0 %C=70.0 %D=30.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.1319 CFS UNIT VOLUME = .9941 B = 526.28 P60 = 1.8700
AREA = .000540 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 3.6689 CFS UNIT VOLUME = .9982 B = 388.14 P60 = 1.8700
AREA = .001260 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.10

RUNOFF VOLUME = 1.42332 INCHES = .1366 ACRE-FEET
PEAK DISCHARGE RATE = 3.80 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

** ROUTE THE FLOW FROM LOT 59, UNIT 6 DOWN AIRPORT ROAD
** USE AVERAGE STREET SLOPE
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0097 FLOOD PLAIN SLOPE=0.0097
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.4
100.18	.6	.8
100.23	1.1	1.8
100.27	1.9	3.4
100.32	2.8	5.9
100.37	4.0	9.3
100.41	5.3	13.7
100.46	6.9	19.3
100.50	8.7	26.2
100.55	10.7	34.4
100.60	12.9	45.5
100.64	15.1	59.0
100.69	17.3	74.0
100.73	19.7	90.5
100.78	22.3	108.5
100.82	25.1	128.1
100.87	28.1	149.4

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=550 FT SLOPE=0.0097

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.02	.2294
.092	.126	.13	.1445
.137	.286	.37	.1182
.183	.605	.82	.1120
.229	1.133	1.80	.0960
.275	1.871	3.44	.0830
.321	2.820	5.89	.0732
.366	3.978	9.26	.0656

.412	5.346	13.69	.0597
.458	6.925	19.29	.0548
.504	8.713	26.16	.0509
.549	10.711	34.42	.0475
.595	12.887	45.48	.0433
.641	15.085	59.05	.0390
.687	17.297	74.02	.0357
.733	19.677	90.47	.0332
.778	22.267	108.48	.0314
.824	25.067	128.10	.0299
.870	28.076	149.41	.0287

```
ROUTE              ID=3  HYDROGRAPH NO=230.11  INFLOW ID=2  DT=0.0
PRINT HYD          ID=3  CODE=1
```

PARTIAL HYDROGRAPH 230.11

RUNOFF VOLUME = 1.42358 INCHES = .1367 ACRE-FEET
PEAK DISCHARGE RATE = 3.14 CFS AT 1.550 HOURS BASIN AREA = .0018 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR TRACT "B", TOWN OF ATRISCO GRANT
COMPUTE NM HYD     ID=2  HYD=230.2  DA==0.0052
                   %A=0.0  %B=0.0  %C=70.0  %D=30.0  TP=0.1333
                   MASS RAINFALL=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 6.1590 CFS UNIT VOLUME = .9975 B = 526.28 P60 = 1.8700
AREA = .001560 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 10.599 CFS UNIT VOLUME = 1.001 B = 388.14 P60 = 1.8700
AREA = .003640 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
PRINT HYD          ID=2 CODE=1
```

PARTIAL HYDROGRAPH 230.20

RUNOFF VOLUME = 1.42332 INCHES = .3947 ACRE-FEET
PEAK DISCHARGE RATE = 10.93 CFS AT 1.500 HOURS BASIN AREA = .0052 SQ. MI.

```
** ADD THE FLOW FROM TRACT "B", TOWN OF ATRISCO GRANT TO THE  ROUTED FLOW
** IN THE STREET
ADD HYD            ID=4  HYDROGRAPH NO=230.21 ID I=2  ID II=3
PRINT HYD          ID=4  CODE=1
```

PARTIAL HYDROGRAPH 230.21

RUNOFF VOLUME = 1.42325 INCHES = .5313 ACRE-FEET
PEAK DISCHARGE RATE = 13.54 CFS AT 1.500 HOURS BASIN AREA = .0070 SQ. MI.

** ROUTE THE COMBINED FLOW IN THE STREET DOWN AIRPORT ROAD TO THE INLET AT THE
** END OF AIRPORT ROAD
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.014 FLOOD PLAIN SLOPE=0.014
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.2
100.14	.3	.4
100.18	.6	1.0
100.23	1.1	2.2
100.27	1.9	4.1
100.32	2.8	7.1
100.37	4.0	11.1
100.41	5.3	16.4
100.46	6.9	23.2
100.50	8.7	31.4
100.55	10.7	41.4
100.60	12.9	54.6
100.64	15.1	70.9
100.69	17.3	88.9
100.73	19.7	108.7
100.78	22.3	130.3
100.82	25.1	153.9
100.87	28.1	179.5

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=100 FT SLOPE=0.0097

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.03	.0347
.092	.126	.16	.0219
.137	.286	.44	.0179

.183	.605	.99	.0170
.229	1.133	2.17	.0145
.275	1.871	4.14	.0126
.321	2.820	7.07	.0111
.366	3.978	11.13	.0099
.412	5.346	16.45	.0090
.458	6.925	23.17	.0083
.504	8.713	31.43	.0077
.549	10.711	41.35	.0072
.595	12.887	54.63	.0066
.641	15.085	70.94	.0059
.687	17.297	88.92	.0054
.733	19.677	108.69	.0050
.778	22.267	130.32	.0047
.824	25.067	153.90	.0045
.870	28.076	179.50	.0043

ROUTE ID=11 HYDROGRAPH NO=230.22 INFLOW ID=4 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 230.22

RUNOFF VOLUME = 1.42336 INCHES = .5314 ACRE-FEET
PEAK DISCHARGE RATE = 13.40 CFS AT 1.500 HOURS BASIN AREA = .0070 SQ. MI.

** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF CENTRAL TO THE SOUTH END OF
** AIRPORT ROAD
COMPUTE NM HYD ID=2 HYD=230.3 DA==0.0024
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.0540 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .002040 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = .88336 CFS UNIT VOLUME = .9867 B = 327.09 P60 = 1.8700
AREA = .000360 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.30

RUNOFF VOLUME = 2.16311 INCHES = .2769 ACRE-FEET
PEAK DISCHARGE RATE = 6.09 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

** ADD THE FLOW FROM AIRPORT DRIVE TO THE ROUTED FLOW IN THE STREET AT
** THE SOUTH END OF AIRPORT
ADD HYD ID=1 HYDROGRAPH NO=230.31 ID I=2 ID II=11
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 230.31

RUNOFF VOLUME = 1.61212 INCHES = .8082 ACRE-FEET
PEAK DISCHARGE RATE = 19.48 CFS AT 1.500 HOURS BASIN AREA = .0094 SQ. MI.

** ADD THE FLOW IN THE STREET TO THE STORM DRAIN AT THE SOUTH END OF AIRPORT
** DRIVE
ADD HYD ID=3 HYDROGRAPH NO=230.32 ID I=1 ID II=10
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 230.32

RUNOFF VOLUME = 1.91770 INCHES = 8.9083 ACRE-FEET
PEAK DISCHARGE RATE = 49.29 CFS AT 1.600 HOURS BASIN AREA = .0871 SQ. MI.

** ROUTE FLOW DOWN AIRPORT ROAD STORM DRAIN FROM STA 10+50 TO M.H ON
** COORS STORM DRAIN AT STA 82+30
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0040
PIPE DIA=3.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.18	.2	.3
.36	.5	1.4
.55	1.0	3.4
.73	1.5	6.1
.91	2.0	9.5
1.09	2.6	13.5
1.28	3.2	18.1
1.46	3.8	23.1
1.64	4.4	28.5
1.82	5.1	34.1
2.01	5.7	39.8
2.19	6.3	45.5
2.37	6.9	51.0
2.55	7.5	56.1
2.74	8.1	60.7
2.92	8.6	64.6
3.10	9.0	67.3
3.28	9.4	68.4

3.50 9.6 68.4

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=150 FT SLOPE=0.0202

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.182	.191	.33	.0239
.365	.532	1.45	.0153
.547	.961	3.37	.0119
.730	1.453	6.06	.0100
.912	1.994	9.46	.0088
1.094	2.571	13.50	.0079
1.277	3.175	18.08	.0073
1.459	3.797	23.12	.0068
1.641	4.431	28.50	.0065
1.824	5.069	34.11	.0062
2.006	5.704	39.82	.0060
2.189	6.330	45.50	.0058
2.371	6.938	50.99	.0057
2.553	7.520	56.14	.0056
2.736	8.069	60.75	.0055
2.918	8.571	64.58	.0055
3.101	9.014	67.32	.0056
3.283	9.374	68.45	.0057
3.500	9.621	68.45	.0059

ROUTE ID=10 HYDROGRAPH NO=230.33 INFLOW ID=3 DT=0.050
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 230.33

RUNOFF VOLUME = 1.91742 INCHES = 8.9070 ACRE-FEET
PEAK DISCHARGE RATE = 49.32 CFS AT 1.600 HOURS BASIN AREA = .0871 SQ. MI.

****
*S END OF AIRPORT ROAD STORM DRAIN
*S BEGIN COORS CONNECTION STORM DRAIN
****
** COMPUTE HYDROGRAPH FOR THE SOUTH HALF OF CENTRAL AVE R.W. BETWEEN AIRPORT
** AND COORS
COMPUTE NM HYD ID=2 HYD=230.6 DA=0.0023
%A=0.0 %B=0.0 %C=10.00 %D=90.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.1725 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .002070 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = .66971 CFS UNIT VOLUME = .9821 B = 388.14 P60 = 1.8700
AREA = .000230 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.60

RUNOFF VOLUME = 2.28382 INCHES = .2801 ACRE-FEET
PEAK DISCHARGE RATE = 6.13 CFS AT 1.500 HOURS BASIN AREA = .0023 SQ. MI.

** ROUTE FLOW DOWN THE WEST SIDE OF COORS BLVD.
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=99.31 FT MAXIMUM ELEV=100.62 FT
CHANNEL SLOPE=0.005 FLOOD PLAIN SLOPE=0.005
N=0.017 DIST=34

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	100.0	1	99.98	1.01	99.31	34.0	100.67
34.01	101.17						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
99.31	.0	.0
99.38	.1	.0
99.45	.2	.2
99.52	.5	.7
99.59	.9	1.5
99.65	1.4	2.7
99.72	2.1	4.4
99.79	2.8	6.6
99.86	3.7	9.4
99.93	4.7	12.9
100.00	5.8	16.5
100.07	7.1	21.7
100.14	8.5	27.8
100.21	10.0	34.8
100.28	11.6	42.8
100.34	13.3	51.8
100.41	15.2	61.8
100.48	17.2	72.9
100.55	19.3	85.1
100.62	21.5	98.6

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=1000 SLOPE=0.005

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.069	.058	.04	.4359
.138	.231	.23	.2746
.207	.519	.69	.2096
.276	.923	1.48	.1730
.345	1.442	2.69	.1491
.414	2.077	4.37	.1320
.483	2.827	6.59	.1191
.552	3.692	9.41	.1090
.621	4.673	12.88	.1008
.689	5.779	16.51	.0972
.758	7.059	21.73	.0902
.827	8.455	27.83	.0844
.896	9.966	34.84	.0795
.965	11.592	42.80	.0752
1.034	13.334	51.77	.0715
1.103	15.191	61.79	.0683
1.172	17.163	72.90	.0654
1.241	19.251	85.15	.0628
1.310	21.453	98.57	.0605

ROUTE ID=3 HYDROGRAPH NO=230.61 INFLOW ID=2 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 230.61

RUNOFF VOLUME = 2.28404 INCHES = .2802 ACRE-FEET
PEAK DISCHARGE RATE = 4.53 CFS AT 1.600 HOURS BASIN AREA = .0023 SQ. MI.

** COMPUTE HYDOGRAPH FOR COORS BLVD R.W. FROM CENTRAL TO STA 89+20 COORS
COMPUTE NM HYD ID=2 HYD=230.7 DA=0.0058
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 19.460 CFS UNIT VOLUME = .9986 B = 526.28 P60 = 1.8700
AREA = .004930 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .131021HR TP = .133330HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 2.1343 CFS UNIT VOLUME = .9952 B = 327.09 P60 = 1.8700
AREA = .000870 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.70

```
    RUNOFF VOLUME =     2.16311 INCHES     =        .6691 ACRE-FEET
    PEAK DISCHARGE RATE =      14.69 CFS  AT   1.500 HOURS   BASIN AREA =    .0058 SQ. MI.


** ADD  FLOW FROM COORS TO THE ROUTED FLOW AT COORS STA. 89+20
ADD HYD             ID=4  HYDROGRAPH NO=230.71  ID I=3  ID II=2
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   230.71

    RUNOFF VOLUME =     2.19732 INCHES     =        .9492 ACRE-FEET
    PEAK DISCHARGE RATE =      18.45 CFS  AT   1.500 HOURS   BASIN AREA =    .0081 SQ. MI.


** COMPUTE HYDOGRAPH FOR THE AREA S.& W. OF THE INTERSECTION OF COORS BLVD
** AND CENTRAL BOULEVARD. ASSUME ALL FLOW IS ROUTED TO THE SOUTH TO COORS
COMPUTE NM HYD      ID=2  HYD=230.5  DA=0.0066
                    %A=80.0  %B=0.0  %C=20.0  %0.0          TP=0.13333
                    MASS RAINFALL=-1

    K =   .152155HR    TP =   .133330HR    K/TP RATIO =  1.141188     SHAPE CONSTANT, N =  3.102909
    UNIT PEAK =   14.361    CFS   UNIT VOLUME =    .9986       B =   290.11      P60 = 1.8700
    AREA =      .006600 SQ MI    IA =    .59000 INCHES    INF =   1.50200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   230.50


    RUNOFF VOLUME =      .52015 INCHES     =        .1831 ACRE-FEET
    PEAK DISCHARGE RATE =       6.49 CFS  AT   1.500 HOURS   BASIN AREA =    .0066 SQ. MI.


** ADD BASIN 230.5  FLOW TO ROUTED FLOW IN COORS BOULEVARD
ADD HYD             ID=5  HYDROGRAPH NO=230.51  ID I=2  ID II=4
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   230.51


    RUNOFF VOLUME =     1.44430 INCHES     =       1.1323 ACRE-FEET
    PEAK DISCHARGE RATE =      24.94 CFS  AT   1.500 HOURS   BASIN AREA =    .0147 SQ. MI.


** ROUTE FLOW IN COORS STORM DRAIN FROM STA 89+00 TO STA 85+70
** USE FRICTION SLOPE
```

COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0111
PIPE DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	1.0
.39	.5	2.3
.52	.7	4.1
.65	1.0	6.4
.78	1.3	9.2
.91	1.6	12.3
1.04	1.9	15.7
1.17	2.3	19.4
1.30	2.6	23.2
1.43	2.9	27.0
1.56	3.2	30.9
1.69	3.5	34.6
1.82	3.8	38.1
1.95	4.1	41.3
2.08	4.4	43.9
2.21	4.6	45.7
2.35	4.8	46.5
2.50	4.9	46.5

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=330 FT SLOPE=0.0111

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.23	.0395
.261	.271	.98	.0253
.391	.490	2.29	.0196
.521	.741	4.11	.0165
.651	1.017	6.42	.0145
.782	1.312	9.17	.0131
.912	1.620	12.28	.0121
1.042	1.937	15.70	.0113
1.173	2.261	19.35	.0107
1.303	2.586	23.16	.0102
1.433	2.910	27.04	.0099
1.563	3.229	30.90	.0096
1.694	3.540	34.63	.0094
1.824	3.837	38.13	.0092
1.954	4.117	41.26	.0091
2.084	4.373	43.86	.0091
2.215	4.599	45.72	.0092
2.345	4.783	46.49	.0094

```
                                    2.500        4.909        46.49        .0097
ROUTE                  ID=4  HYDROGRAPH NO=230.52  INFLOW ID=5  DT=0.0
PRINT HYD              ID=4  CODE=1

                                    PARTIAL HYDROGRAPH   230.52


    RUNOFF VOLUME =      1.44435 INCHES      =        1.1324 ACRE-FEET
    PEAK DISCHARGE RATE =      24.72 CFS  AT   1.500 HOURS   BASIN AREA =    .0147 SQ. MI.



** COMPUTE HYDOGRAPH FOR AREA 230.8. ASSUME ALL FLOW FROM THIS AREA WILL BE
** ROUTED TO THE SOUTH TO COORS
COMPUTE NM HYD         ID=2  HYD=230.8  DA=0.0112
                       %A=50.0  %B=0.0  %C=35.0  %15.0          TP=0.13333
                       MASS RAINFALL=-1

    K =    .072665HR     TP =    .133330HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.6312     CFS   UNIT VOLUME =     .9975        B =   526.28.      P60 = 1.8700
    AREA =       .001680 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .139908HR     TP =    .133330HR     K/TP RATIO =  1.049338      SHAPE CONSTANT, N =  3.364553
    UNIT PEAK =   22.157     CFS   UNIT VOLUME =     .9994        B =   310.31       P60 = 1.8700
    AREA =       .009520 SQ MI     IA =     .52647 INCHES     INF =   1.32412 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD              ID=2 CODE=1

                                    PARTIAL HYDROGRAPH   230.80


    RUNOFF VOLUME =       .89042 INCHES      =         .5319 ACRE-FEET
    PEAK DISCHARGE RATE =      15.84 CFS  AT   1.500 HOURS   BASIN AREA =    .0112 SQ. MI.



** ADD BASIN 230.8  FLOW TO THE ROUTED FLOW IN COORS BOULEVARD STORM DRAIN
** AT THE MANHOLE AT STA. 85+70
ADD HYD                ID=5  HYDROGRAPH NO=230.82  ID I=2  ID II=4
PRINT HYD              ID=5  CODE=1

                                    PARTIAL HYDROGRAPH   230.82


    RUNOFF VOLUME =      1.20477 INCHES      =        1.6642 ACRE-FEET
    PEAK DISCHARGE RATE =      40.56 CFS  AT   1.500 HOURS   BASIN AREA =    .0259 SQ. MI.



** ROUTE FLOW IN COORS STORM DRAIN FROM STA 85+70 TO STA 82+33
** PRESUURE FLOW USE FRICTION SLOPE
```

COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0111
PIPE DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	1.0
.39	.5	2.3
.52	.7	4.1
.65	1.0	6.4
.78	1.3	9.2
.91	1.6	12.3
1.04	1.9	15.7
1.17	2.3	19.4
1.30	2.6	23.2
1.43	2.9	27.0
1.56	3.2	30.9
1.69	3.5	34.6
1.82	3.8	38.1
1.95	4.1	41.3
2.08	4.4	43.9
2.21	4.6	45.7
2.35	4.8	46.5
2.50	4.9	46.5

COMPUTE TRAVEL TIME ID=2 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=337 FT SLOPE=0.0111

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.23	.0403
.261	.271	.98	.0258
.391	.490	2.29	.0201
.521	.741	4.11	.0169
.651	1.017	6.42	.0148
.782	1.312	9.17	.0134
.912	1.620	12.28	.0123
1.042	1.937	15.70	.0116
1.173	2.261	19.35	.0109
1.303	2.586	23.16	.0105
1.433	2.910	27.04	.0101
1.563	3.229	30.90	.0098
1.694	3.540	34.63	.0096
1.824	3.837	38.13	.0094
1.954	4.117	41.26	.0093
2.084	4.373	43.86	.0093
2.215	4.599	45.72	.0094
2.345	4.783	46.49	.0096

```
                                2.500        4.909        46.49        .0099
ROUTE                ID=2  HYDROGRAPH NO=230.83  INFLOW ID=5  DT=0.0
PRINT HYD            ID=2  CODE=1

                                PARTIAL HYDROGRAPH   230.83


    RUNOFF VOLUME =     1.20480 INCHES     =       1.6642 ACRE-FEET
    PEAK DISCHARGE RATE =      39.99 CFS  AT   1.500 HOURS   BASIN AREA =    .0259 SQ. MI.


** ADD FLOW FROM AIRPORT STORM DRAIN TO COORS STORM DRAIN AT STA 82+33
ADD HYD              ID=11  HYDROGRAPH NO=230.84  ID I=2  ID II=10
PRINT HYD            ID=11  CODE=1

                                PARTIAL HYDROGRAPH   230.84


    RUNOFF VOLUME =     1.75408 INCHES     =       10.5712 ACRE-FEET
    PEAK DISCHARGE RATE =      86.64 CFS  AT   1.550 HOURS   BASIN AREA =    .1130 SQ. MI.


** ROUTE FLOW IN COORS STORM DRAIN FROM STA 82+33 TO STA 79+32
** NOTE THE EXISTING PIPE IS A 24" RCP PIPE. UPGRADE TO 48"
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.0550
                    PIPE DIA=4.0  N=0.013

                        RATING CURVE PIPE SECTION  1.0
                          WATER      FLOW       FLOW
                        SURFACE      AREA       RATE
                         ELEV        SQ FT      CFS
                           .00          .0         .0
                           .21          .2        1.8
                           .42          .7        7.7
                           .63         1.3       17.8
                           .83         1.9       32.1
                          1.04         2.6       50.1
                          1.25         3.4       71.5
                          1.46         4.1       95.7
                          1.67         5.0      122.4
                          1.88         5.8      150.9
                          2.08         6.6      180.6
                          2.29         7.5      210.8
                          2.50         8.3      240.9
                          2.71         9.1      270.0
                          2.92         9.8      297.2
                          3.13        10.5      321.6
                          3.34        11.2      341.9
                          3.54        11.8      356.4
                          3.75        12.2      362.4
                          4.00        12.6      362.4
COMPUTE TRAVEL TIME ID=10  REACH=1  NUMBER OF VALLEY SECTIONS=1
```

LENGTH=301 FT SLOPE=0.0550

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.77	.0118
.417	.695	7.67	.0076
.625	1.255	17.83	.0059
.834	1.898	32.07	.0049
1.042	2.604	50.08	.0043
1.251	3.358	71.45	.0039
1.459	4.146	95.73	.0036
1.668	4.960	122.39	.0034
1.876	5.788	150.88	.0032
2.084	6.621	180.57	.0031
2.293	7.451	210.81	.0030
2.501	8.267	240.87	.0029
2.710	9.062	269.97	.0028
2.918	9.823	297.22	.0028
3.127	10.539	321.60	.0027
3.335	11.195	341.89	.0027
3.544	11.773	356.41	.0028
3.752	12.243	362.38	.0028
4.000	12.566	362.38	.0029

ROUTE ID=10 HYDROGRAPH NO=230.85 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 230.85

RUNOFF VOLUME = 1.75395 INCHES = 10.5704 ACRE-FEET
PEAK DISCHARGE RATE = 86.71 CFS AT 1.550 HOURS BASIN AREA = .1130 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 79+32 TO STA 75+80
** NOTE THE EXISTING PIPE IS A 30" DIA RCP PIPE . UPGRADE TO 48"
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.03
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	1.3
.42	.7	5.7
.63	1.3	13.2
.83	1.9	23.7
1.04	2.6	37.0
1.25	3.4	52.8

1.46	4.1	70.7
1.67	5.0	90.4
1.88	5.8	111.4
2.08	6.6	133.4
2.29	7.5	155.7
2.50	8.3	177.9
2.71	9.1	199.4
2.92	9.8	219.5
3.13	10.5	237.5
3.34	11.2	252.5
3.54	11.8	263.2
3.75	12.2	267.6
4.00	12.6	267.6

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=352 FT SLOPE=0.066

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.31	.0187
.417	.695	5.67	.0120
.625	1.255	13.17	.0093
.834	1.898	23.69	.0078
1.042	2.604	36.99	.0069
1.251	3.358	52.77	.0062
1.459	4.146	70.70	.0057
1.668	4.960	90.39	.0054
1.876	5.788	111.43	.0051
2.084	6.621	133.36	.0049
2.293	7.451	155.69	.0047
2.501	8.267	177.89	.0045
2.710	9.062	199.38	.0044
2.918	9.823	219.51	.0044
3.127	10.539	237.52	.0043
3.335	11.195	252.50	.0043
3.544	11.773	263.23	.0044
3.752	12.243	267.63	.0045
4.000	12.566	267.63	.0046

ROUTE ID=11 HYDROGRAPH NO=230.86 INFLOW ID=10 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 230.86

RUNOFF VOLUME = 1.75375 INCHES = 10.5692 ACRE-FEET
PEAK DISCHARGE RATE = 86.96 CFS AT 1.550 HOURS BASIN AREA = .1130 SQ. MI.

****

*S BEGIN THE AREA NORTH OF CENTRAL AVENUE BETWEEN UNSER AND THE WEST 66

*S ADDITION
****
** COMPUTE HYDROGRAPH FOR AREA 240.1
COMPUTE NM HYD ID=2 HYD=240.1 DA=0.0333
%A=0.0 %B=0.0 %C=65.0 %D=35.0 TP=0.19
MASS RAINFALL=-1

K = .103550HR TP = .190000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 32.283 CFS UNIT VOLUME = 1.000 B = 526.28 P60 = 1.8700
AREA = .011655 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .150898HR TP = .190000HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514863
UNIT PEAK = 44.218 CFS UNIT VOLUME = .9999 B = 388.14 P60 = 1.8700
AREA = .021645 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 240.10

RUNOFF VOLUME = 1.49503 INCHES = 2.6552 ACRE-FEET
PEAK DISCHARGE RATE = 58.74 CFS AT 1.550 HOURS BASIN AREA = .0333 SQ. MI.

** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025 DIST=22

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102.0	1	101.9	11.0	100.0	15.0	100.1
25	101.9	26	102.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	.3	.1
100.21	.8	.6
100.32	1.5	1.5
100.42	2.2	2.8
100.53	3.1	4.5
100.63	4.2	6.7
100.74	5.3	9.4
100.84	6.6	12.6
100.95	7.9	16.3
101.05	9.4	20.6
101.16	11.1	25.5
101.26	12.8	31.1

101.37	14.7	37.4
101.47	16.7	44.3
101.58	18.8	52.0
101.68	21.0	60.4
101.79	23.3	69.7
101.89	25.8	79.7
102.00	28.3	90.8

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=320 SLOPE=0.0025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.250	.11	.2081
.211	.793	.63	.1121
.316	1.455	1.53	.0845
.421	2.237	2.83	.0703
.526	3.139	4.55	.0614
.632	4.161	6.72	.0550
.737	5.303	9.38	.0502
.842	6.564	12.56	.0464
.947	7.946	16.30	.0433
1.053	9.447	20.61	.0407
1.158	11.068	25.54	.0385
1.263	12.810	31.12	.0366
1.368	14.671	37.37	.0349
1.474	16.651	44.32	.0334
1.579	18.752	52.00	.0321
1.684	20.973	60.44	.0308
1.789	23.313	69.66	.0297
1.895	25.774	79.70	.0287
2.000	28.350	90.79	.0278

ROUTE ID=3 HYDROGRAPH NO=240.11 INFLOW ID=2 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 240.11

RUNOFF VOLUME = 1.49504 INCHES = 2.6552 ACRE-FEET
PEAK DISCHARGE RATE = 56.78 CFS AT 1.600 HOURS BASIN AREA = .0333 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 240.2
COMPUTE NM HYD ID=4 HYD=240.2 DA=0.0125
%A=0.0 %B=9.0 %C=20.0 %D=71.0 TP=0.19
MASS RAINFALL=-1

K = .103550HR TP = .190000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 24.583 CFS UNIT VOLUME = .9999 B = 526.28 P60 = 1.8700
AREA = .008875 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .162012HR TP = .190000HR K/TP RATIO = .852695 SHAPE CONSTANT, N = 4.173391
UNIT PEAK = 6.9938 CFS UNIT VOLUME = .9987 B = 366.57 P60 = 1.8700
AREA = .003625 SQ MI IA = .39655 INCHES INF = .96034 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 240.20

RUNOFF VOLUME = 1.97801 INCHES = 1.3187 ACRE-FEET
PEAK DISCHARGE RATE = 25.65 CFS AT 1.550 HOURS BASIN AREA = .0125 SQ. MI.

** ADD FLOW FROM AREA 240.2 TO ROUTED FLOW IN SWALE NORTH OF CENTRAL
ADD HYD ID=5 HYDROGRAPH NO=240.21 ID I=4 ID II=3
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 240.21

RUNOFF VOLUME = 1.62683 INCHES = 3.9738 ACRE-FEET
PEAK DISCHARGE RATE = 80.95 CFS AT 1.550 HOURS BASIN AREA = .0458 SQ. MI.

** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE TO CULVERTS CROSSING CENTRAL
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025 DIST=22

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102.0	1	101.9	11.0	100.0	15.0	100.1
25	101.9	26	102.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	.3	.1
100.21	.8	.6
100.32	1.5	1.5
100.42	2.2	2.8
100.53	3.1	4.5
100.63	4.2	6.7
100.74	5.3	9.4
100.84	6.6	12.6
100.95	7.9	16.3
101.05	9.4	20.6

101.16	11.1	25.5
101.26	12.8	31.1
101.37	14.7	37.4
101.47	16.7	44.3
101.58	18.8	52.0
101.68	21.0	60.4
101.79	23.3	69.7
101.89	25.8	79.7
102.00	28.3	90.8

COMPUTE TRAVEL TIME ID=15 REACH NO=1 VALLEY SECTIONS=1
LENGTH=300 SLOPE=0.0025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.250	.11	.1951
.211	.793	.63	.1051
.316	1.455	1.53	.0792
.421	2.237	2.83	.0659
.526	3.139	4.55	.0575
.632	4.161	6.72	.0516
.737	5.303	9.38	.0471
.842	6.564	12.56	.0435
.947	7.946	16.30	.0406
1.053	9.447	20.61	.0382
1.158	11.068	25.54	.0361
1.263	12.810	31.12	.0343
1.368	14.671	37.37	.0327
1.474	16.651	44.32	.0313
1.579	18.752	52.00	.0301
1.684	20.973	60.44	.0289
1.789	23.313	69.66	.0279
1.895	25.774	79.70	.0269
2.000	28.350	90.79	.0260

ROUTE ID=15 HYDROGRAPH NO=240.22 INFLOW ID=5 DT=0.0
PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 240.22

RUNOFF VOLUME = 1.62685 INCHES = 3.9738 ACRE-FEET
PEAK DISCHARGE RATE = 80.73 CFS AT 1.600 HOURS BASIN AREA = .0458 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 240.3
COMPUTE NM HYD ID=3 HYD=240.3 DA=0.0080
%A=0.0 %B=0.0 %C=75.00 %D=25.0 TP=0.20
MASS RAINFALL=-1

K = .109000HR TP = .200000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420

UNIT PEAK = 5.2628 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 1.8700
AREA = .002000 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .158840HR TP = .200000HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 11.644 CFS UNIT VOLUME = .9994 B = 388.14 P60 = 1.8700
AREA = .006000 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 240.30

RUNOFF VOLUME = 1.35161 INCHES = .5767 ACRE-FEET
PEAK DISCHARGE RATE = 12.85 CFS AT 1.550 HOURS BASIN AREA = .0080 SQ. MI.

** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025 DIST=22

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102.0	1	101.9	11.0	100.0	21.0	101.9
22.0	102.0						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	.1	.0
100.21	.2	.2
100.32	.5	.5
100.42	.9	1.0
100.53	1.5	1.8
100.63	2.1	2.9
100.74	2.9	4.3
100.84	3.7	6.2
100.95	4.7	8.4
101.05	5.8	11.2
101.16	7.1	14.4
101.26	8.4	18.2
101.37	9.9	22.5
101.47	11.4	27.4
101.58	13.1	32.9
101.68	14.9	39.1
101.79	16.9	46.0
101.89	18.9	53.5
102.00	21.1	60.3

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1

[redacted]

LENGTH=350 SLOPE=0.0025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.058	.02	.2357
.211	.233	.15	.1485
.316	.525	.45	.1133
.421	.933	.97	.0935
.526	1.458	1.76	.0806
.632	2.099	2.86	.0714
.737	2.858	4.31	.0644
.842	3.732	6.16	.0589
.947	4.724	8.43	.0545
1.053	5.832	11.17	.0508
1.158	7.056	14.40	.0477
1.263	8.398	18.16	.0450
1.368	9.856	22.48	.0426
1.474	11.430	27.39	.0406
1.579	13.121	32.92	.0388
1.684	14.929	39.10	.0371
1.789	16.854	45.96	.0356
1.895	18.895	53.53	.0343
2.000	21.100	60.32	.0340

ROUTE ID=4 HYDROGRAPH NO=240.31 INFLOW ID=3 DT=0.050
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 240.31

RUNOFF VOLUME = 1.35166 INCHES = .5767 ACRE-FEET
PEAK DISCHARGE RATE = 12.27 CFS AT 1.600 HOURS BASIN AREA = .0080 SQ. MI.

** ADD ROUTED FLOW IN THE SWALE FROM THE EAST TO ROUTED FLOW FROM THE WEST AT
** ENTRANCE TO THE 3 - 36" DIA CULVERTS
ADD HYD ID=16 HYDROGRAPH NO=240.32 ID I=4 ID II=15
PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 240.32

RUNOFF VOLUME = 1.58590 INCHES = 4.5505 ACRE-FEET
PEAK DISCHARGE RATE = 93.00 CFS AT 1.600 HOURS BASIN AREA = .0538 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 240.4
COMPUTE NM HYD ID=2 HYD=240.4 DA=0.0231
%A=0.0 %B=5.0 %C=35.00 %D=60.0 TP=0.21

MASS RAINFALL=-1

K = .114450HR TP = .210000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 34.734 CFS UNIT VOLUME = .9998 B = 526.28 P60 = 1.8700
AREA = .013860 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .171730HR TP = .210000HR K/TP RATIO = .817760 SHAPE CONSTANT, N = 4.369721
UNIT PEAK = 16.681 CFS UNIT VOLUME = .9995 B = 379.11 P60 = 1.8700
AREA = .009240 SQ MI IA = .36875 INCHES INF = .88250 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 240.40

RUNOFF VOLUME = 1.83425 INCHES = 2.2598 ACRE-FEET
PEAK DISCHARGE RATE = 42.45 CFS AT 1.600 HOURS BASIN AREA = .0231 SQ. MI.

** ROUTE FLOW THROUGH THE EXISTING RETENTION POND ON THE CHURCH PROPERTY.
** POND VOLUME TAKEN FROM DRAINAGE PLAN FOR CHURCH SITE. ASSUME FREE DISCHARGE
** OF FLOW FROM POND AFTER POND STAGE REACHES ELEV. 5088
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=240.41 INFLOW ID=2 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	5083.0
0.01	1.19	5088.0
100.00	1.191	5088.01
100.01	1.192	5089.0

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5083.00	.000	.00
.25	.00	5083.00	.000	.00
.50	.00	5083.00	.000	.00
.75	.00	5083.00	.000	.00
1.00	.00	5083.00	.000	.00
1.25	1.00	5083.01	.003	.00
1.50	35.54	5084.19	.284	.00
1.75	27.45	5087.44	1.056	.01
2.00	14.00	5088.00	1.190	5.15
2.25	6.16	5088.00	1.190	12.94
2.50	2.83	5088.00	1.189	.01
2.75	1.67	5088.00	1.190	3.23
3.00	1.03	5088.00	1.190	.01
3.25	.67	5088.00	1.190	1.34
3.50	.47	5088.00	1.190	.01
3.75	.36	5088.00	1.190	.70

4.00	.29	5088.00	1.190	.01
4.25	.26	5088.00	1.190	.51
4.50	.24	5088.00	1.190	.01
4.75	.23	5088.00	1.190	.45
5.00	.24	5088.00	1.190	.02
5.25	.24	5088.00	1.190	.44
5.50	.26	5088.00	1.190	.06
5.75	.27	5088.00	1.190	.45
6.00	.28	5088.00	1.190	.11
6.25	.32	5088.00	1.190	.49
6.50	.34	5088.00	1.190	.18
6.75	.33	5088.00	1.190	.48
7.00	.33	5088.00	1.190	.19
7.25	.33	5088.00	1.190	.46
7.50	.32	5088.00	1.190	.19
7.75	.32	5088.00	1.190	.44
8.00	.31	5088.00	1.190	.20
8.25	.31	5088.00	1.190	.42
8.50	.31	5088.00	1.190	.20
8.75	.30	5088.00	1.190	.40
9.00	.29	5088.00	1.190	.20
9.25	.29	5088.00	1.190	.38
9.50	.29	5088.00	1.190	.20
9.75	.28	5088.00	1.190	.37
10.00	.28	5088.00	1.190	.20
10.25	.27	5088.00	1.190	.35
10.50	.27	5088.00	1.190	.20
10.75	.27	5088.00	1.190	.33
11.00	.26	5088.00	1.190	.20
11.25	.26	5088.00	1.190	.32
11.50	.26	5088.00	1.190	.20
11.75	.26	5088.00	1.190	.31
12.00	.25	5088.00	1.190	.20
12.25	.25	5088.00	1.190	.30
12.50	.25	5088.00	1.190	.20
12.75	.24	5088.00	1.190	.29
13.00	.24	5088.00	1.190	.19
13.25	.24	5088.00	1.190	.28
13.50	.24	5088.00	1.190	.20
13.75	.23	5088.00	1.190	.27
14.00	.23	5088.00	1.190	.19
14.25	.23	5088.00	1.190	.26
14.50	.22	5088.00	1.190	.19
14.75	.22	5088.00	1.190	.25
15.00	.22	5088.00	1.190	.19
15.25	.22	5088.00	1.190	.25
15.50	.22	5088.00	1.190	.19
15.75	.21	5088.00	1.190	.24
16.00	.21	5088.00	1.190	.19
16.25	.21	5088.00	1.190	.23
16.50	.21	5088.00	1.190	.18
16.75	.20	5088.00	1.190	.23
17.00	.20	5088.00	1.190	.18
17.25	.20	5088.00	1.190	.22

17.50	.20	5088.00	1.190	.18
17.75	.20	5088.00	1.190	.21
18.00	.19	5088.00	1.190	.18
18.25	.19	5088.00	1.190	.21
18.50	.19	5088.00	1.190	.18
18.75	.19	5088.00	1.190	.20
19.00	.19	5088.00	1.190	.17
19.25	.19	5088.00	1.190	.20
19.50	.19	5088.00	1.190	.17
19.75	.18	5088.00	1.190	.20
20.00	.18	5088.00	1.190	.17
20.25	.18	5088.00	1.190	.19
20.50	.18	5088.00	1.190	.17
20.75	.18	5088.00	1.190	.19
21.00	.18	5088.00	1.190	.17
21.25	.17	5088.00	1.190	.18
21.50	.17	5088.00	1.190	.16
21.75	.17	5088.00	1.190	.18
22.00	.17	5088.00	1.190	.16
22.25	.17	5088.00	1.190	.18
22.50	.17	5088.00	1.190	.16
22.75	.17	5088.00	1.190	.17
23.00	.17	5088.00	1.190	.16
23.25	.17	5088.00	1.190	.17
23.50	.16	5088.00	1.190	.16
23.75	.16	5088.00	1.190	.17
24.00	.16	5088.00	1.190	.16
24.25	.07	5088.00	1.190	.07
24.50	.02	5088.00	1.190	.01
24.75	.01	5088.00	1.190	.01
25.00	.00	5088.00	1.190	.01
25.25	.00	5088.00	1.190	.01
25.50	.00	5088.00	1.190	.01
25.75	.00	5088.00	1.189	.01
26.00	.00	5088.00	1.189	.01
26.25	.00	5088.00	1.189	.01
26.50	.00	5088.00	1.189	.01
26.75	.00	5087.99	1.189	.01
27.00	.00	5087.99	1.188	.01
27.25	.00	5087.99	1.188	.01
27.50	.00	5087.99	1.188	.01
27.75	.00	5087.99	1.188	.01
28.00	.00	5087.99	1.188	.01
28.25	.00	5087.99	1.187	.01
28.50	.00	5087.99	1.187	.01
28.75	.00	5087.99	1.187	.01
29.00	.00	5087.99	1.187	.01
29.25	.00	5087.99	1.187	.01
29.50	.00	5087.98	1.186	.01
29.75	.00	5087.98	1.186	.01

PEAK DISCHARGE = 29.289 CFS - PEAK OCCURS AT HOUR 1.85

MAXIMUM WATER SURFACE ELEVATION = 5088.003

MAXIMUM STORAGE = 1.1903 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 240.41

RUNOFF VOLUME = .87164 INCHES = 1.0739 ACRE-FEET
PEAK DISCHARGE RATE = 29.29 CFS AT 1.850 HOURS BASIN AREA = .0231 SQ. MI.

** ADD ROUTED FLOW IN THE SWALE TO FLOW FROM AREA 240.4
ADD HYD ID=15 HYDROGRAPH NO=240.42 ID I=3 ID II=16
PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 240.42

RUNOFF VOLUME = 1.37135 INCHES = 5.6243 ACRE-FEET
PEAK DISCHARGE RATE = 93.00 CFS AT 1.600 HOURS BASIN AREA = .0769 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE NORTH SIDE OF CENTRAL AVE BETWEEN UNSER & AIRPORT
COMPUTE NM HYD ID=4 HYD=240.5 DA=0.0093
%A=0.0 %B=0.0 %C=10.0 %D=90.0 TP=0.14
MASS RAINFALL=-1

K = .076300HR TP = .140000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 31.464 CFS UNIT VOLUME = .9980 B = 526.28 P60 = 1.8700
AREA = .008370 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .111188HR TP = .140000HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 2.5784 CFS UNIT VOLUME = .9963 B = 388.14 P60 = 1.8700
AREA = .000930 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 code=1

PARTIAL HYDROGRAPH 240.50

RUNOFF VOLUME = 2.28382 INCHES = 1.1328 ACRE-FEET
PEAK DISCHARGE RATE = 24.26 CFS AT 1.500 HOURS BASIN AREA = .0093 SQ. MI.

** ADD FLOW FROM THE NORTH SIDE OF CENTRAL AVE. TO FLOW IN SWALE AT THE NORTH
** SIDE OF CENTRAL AVE. THIS IS THE TOTAL FLOW AT THE ENTRANCE TO THE 3 - 36"
** CULVERTS WHICH CROSS CENTRAL
ADD HYD ID=16 HYDROGRAPH NO=240.51 ID I=4 ID II=15
PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 240.51

RUNOFF VOLUME = 1.46979 INCHES = 6.7571 ACRE-FEET
PEAK DISCHARGE RATE = 110.29 CFS AT 1.600 HOURS BASIN AREA = .0862 SQ. MI.

** ROUTE FLOW THROUGH THE SWALE AND THE VOLUME OF THE RETENTION POND AND
** PARKING AREA WHICH IS LOCATED ABOVE ELEVATION 5088 . ASSUME FLOW FROM THIS
** AREA IS CONTROLED BY THE ENTRANCE OF THE 3 - 36" CULVERTS
ROUTE RESERVOIR ID=15 HYDROGRAPH NO=240.52 INFLOW ID=16 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	5085.9
21	0.046	5087.0
60	0.127	5088.0
105	0.647	5089.0
150	1.437	5090.0

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5085.90	.000	.00
.25	.00	5085.90	.000	.00
.50	.00	5085.90	.000	.00
.75	.00	5085.90	.000	.00
1.00	.00	5085.90	.000	.00
1.25	2.38	5085.98	.003	1.44
1.50	89.56	5088.10	.178	64.40
1.75	74.41	5088.64	.459	88.77
2.00	41.92	5088.15	.205	66.73
2.25	28.78	5087.08	.053	24.14
2.50	7.13	5086.47	.024	10.85
2.75	7.30	5086.21	.013	5.94
3.00	2.47	5086.09	.008	3.67
3.25	2.93	5086.02	.005	2.35
3.50	1.10	5085.99	.004	1.65
3.75	1.51	5085.96	.003	1.19
4.00	.68	5085.95	.002	.98
4.25	1.10	5085.94	.002	.86
4.50	.56	5085.94	.002	.80
4.75	.99	5085.94	.002	.76
5.00	.55	5085.94	.002	.76
5.25	.98	5085.94	.002	.78
5.50	.62	5085.94	.002	.81
5.75	1.04	5085.94	.002	.85
6.00	.73	5085.95	.002	.90
6.25	1.18	5085.95	.002	1.00
6.50	.92	5085.96	.002	1.08
6.75	1.23	5085.96	.002	1.08
7.00	.93	5085.96	.002	1.08
7.25	1.20	5085.96	.002	1.06

7.50	.92	5085.96	.002	1.05
7.75	1.15	5085.95	.002	1.03
8.00	.90	5085.95	.002	1.02
8.25	1.11	5085.95	.002	1.00
8.50	.88	5085.95	.002	.99
8.75	1.07	5085.95	.002	.97
9.00	.85	5085.95	.002	.95
9.25	1.03	5085.95	.002	.94
9.50	.84	5085.95	.002	.93
9.75	.99	5085.95	.002	.91
10.00	.82	5085.95	.002	.90
10.25	.97	5085.95	.002	.89
10.50	.80	5085.95	.002	.88
10.75	.93	5085.95	.002	.86
11.00	.79	5085.94	.002	.86
11.25	.91	5085.94	.002	.84
11.50	.77	5085.94	.002	.83
11.75	.88	5085.94	.002	.83
12.00	.76	5085.94	.002	.82
12.25	.85	5085.94	.002	.80
12.50	.74	5085.94	.002	.80
12.75	.83	5085.94	.002	.79
13.00	.73	5085.94	.002	.78
13.25	.81	5085.94	.002	.76
13.50	.72	5085.94	.002	.76
13.75	.79	5085.94	.002	.75
14.00	.70	5085.94	.002	.74
14.25	.77	5085.94	.002	.73
14.50	.69	5085.94	.002	.73
14.75	.75	5085.94	.002	.72
15.00	.68	5085.94	.002	.71
15.25	.73	5085.94	.002	.71
15.50	.67	5085.94	.002	.70
15.75	.72	5085.94	.002	.69
16.00	.66	5085.94	.001	.68
16.25	.70	5085.94	.001	.68
16.50	.65	5085.94	.001	.67
16.75	.68	5085.93	.001	.66
17.00	.63	5085.93	.001	.65
17.25	.67	5085.93	.001	.65
17.50	.62	5085.93	.001	.64
17.75	.66	5085.93	.001	.64
18.00	.61	5085.93	.001	.63
18.25	.64	5085.93	.001	.63
18.50	.60	5085.93	.001	.62
18.75	.63	5085.93	.001	.62
19.00	.60	5085.93	.001	.61
19.25	.62	5085.93	.001	.60
19.50	.59	5085.93	.001	.60
19.75	.60	5085.93	.001	.59
20.00	.58	5085.93	.001	.59
20.25	.59	5085.93	.001	.58
20.50	.57	5085.93	.001	.58
20.75	.58	5085.93	.001	.58

21.00	.56	5085.93	.001	.57
21.25	.57	5085.93	.001	.57
21.50	.55	5085.93	.001	.56
21.75	.56	5085.93	.001	.56
22.00	.54	5085.93	.001	.55
22.25	.55	5085.93	.001	.55
22.50	.54	5085.93	.001	.54
22.75	.55	5085.93	.001	.54
23.00	.53	5085.93	.001	.54
23.25	.54	5085.93	.001	.53
23.50	.52	5085.93	.001	.53
23.75	.53	5085.93	.001	.52
24.00	.52	5085.93	.001	.52
24.25	.31	5085.92	.001	.33
24.50	.14	5085.91	.000	.15
24.75	.07	5085.90	.000	.08
25.00	.04	5085.90	.000	.04
25.25	.02	5085.90	.000	.03
25.50	.02	5085.90	.000	.02
25.75	.01	5085.90	.000	.01
26.00	.01	5085.90	.000	.01
26.25	.01	5085.90	.000	.01
26.50	.01	5085.90	.000	.01
26.75	.01	5085.90	.000	.01
27.00	.01	5085.90	.000	.01
27.25	.01	5085.90	.000	.01
27.50	.01	5085.90	.000	.01
27.75	.01	5085.90	.000	.01
28.00	.01	5085.90	.000	.01
28.25	.01	5085.90	.000	.01
28.50	.01	5085.90	.000	.01
28.75	.01	5085.90	.000	.01
29.00	.01	5085.90	.000	.01
29.25	.01	5085.90	.000	.01
29.50	.01	5085.90	.000	.01
29.75	.01	5085.90	.000	.01

PEAK DISCHARGE = 92.225 CFS - PEAK OCCURS AT HOUR 1.70
MAXIMUM WATER SURFACE ELEVATION = 5088.716
MAXIMUM STORAGE = .4994 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 240.52

RUNOFF VOLUME = 1.46979 INCHES = 6.7571 ACRE-FEET
PEAK DISCHARGE RATE = 92.22 CFS AT 1.700 HOURS BASIN AREA = .0862 SQ. MI.

** ROUTE FLOW FROM THE NORTH SIDE OF CENTRAL THROUGH 3 EXISTING 36" CULVERTS TO
** THE SOUTH SIDE OF CENTRAL. SLOPE UNKNOWN ASSUME 0.005. USE 1 54" PIPE AS
** EQUIVILANT CONVEYANCE.
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.005

PIPE DIA=4.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.23	.3	.7
.47	.9	3.2
.70	1.6	7.4
.94	2.4	13.2
1.17	3.3	20.7
1.41	4.2	29.5
1.64	5.2	39.5
1.88	6.3	50.5
2.11	7.3	62.3
2.35	8.4	74.5
2.58	9.4	87.0
2.81	10.5	99.4
3.05	11.5	111.4
3.28	12.4	122.7
3.52	13.3	132.7
3.75	14.2	141.1
3.99	14.9	147.1
4.22	15.5	149.6
4.50	15.9	149.6

COMPUTE TRAVEL TIME ID=5 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=140 FT SLOPE=0.005

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.235	.316	.73	.0169
.469	.880	3.17	.0108
.704	1.588	7.36	.0084
.938	2.402	13.24	.0071
1.173	3.296	20.67	.0062
1.407	4.249	29.49	.0056
1.641	5.248	39.51	.0052
1.876	6.277	50.52	.0048
2.111	7.325	62.28	.0046
2.345	8.380	74.53	.0044
2.579	9.430	87.02	.0042
2.814	10.463	99.42	.0041
3.049	11.468	111.43	.0040
3.283	12.432	122.68	.0039
3.518	13.338	132.75	.0039
3.752	14.169	141.12	.0039
3.987	14.900	147.12	.0039
4.221	15.495	149.58	.0040
4.500	15.904	149.58	.0041

```
ROUTE                ID=5  HYDROGRAPH NO=240.53  INFLOW ID=15  DT=0.0
PRINT HYD            ID=5  CODE=1

                                PARTIAL HYDROGRAPH   240.53


    RUNOFF VOLUME =      1.46978 INCHES      =        6.7570 ACRE-FEET
    PEAK DISCHARGE RATE =       92.27 CFS  AT    1.700 HOURS   BASIN AREA =    .0862 SQ. MI.



** COMPUTE HYDROGRAPH FOR THE SOUTH SIDE OF CENTRAL AVE BETWEEN UNSER & AIRPORT
COMPUTE NM HYD       ID=2  HYD=240.6  DA=0.0065
                     %A=0.0  %B=0.0  %C=10.0  %D=90.0  TP=0.14
                     MASS RAINFALL=-1

    K =    .076300HR     TP =    .140000HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    21.991     CFS   UNIT VOLUME =     .9979        B =    526.28       P60 = 1.8700
    AREA =       .005850 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .111188HR     TP =    .140000HR     K/TP RATIO =    .794199      SHAPE CONSTANT, N =  4.514851
    UNIT PEAK =    1.8021     CFS   UNIT VOLUME =     .9945        B =    388.14       P60 = 1.8700
    AREA =       .000650 SQ MI     IA =     .35000 INCHES     INF =     .83000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD            ID=2  code=1

                                PARTIAL HYDROGRAPH   240.60


    RUNOFF VOLUME =      2.28382 INCHES      =         .7917 ACRE-FEET
    PEAK DISCHARGE RATE =       16.96 CFS  AT    1.500 HOURS   BASIN AREA =    .0065 SQ. MI.



**********************************************************************************************
*S BEGIN AREA SOUTH OF CENTRAL AVENUE BETWEEN UNSER AND AIRPORT
** ASSUME A CHANNEL WILL BE CONSTRUCTED BETWEEN THE CULVERTS AT CENTRAL AVE
** AND THE COORS CONNECTION STORM DRAIN
**********************************************************************************************
** ADD FLOW FROM THE SOUTH SIDE OF CENTRAL TO THE ROUTED FLOW FROM THE NORTH
** SIDE OF CENTRAL
ADD HYD              ID=3  HYDROGRAPH NO=240.61  ID I=2  ID II=5
PRINT HYD            ID=3  CODE=1

                                PARTIAL HYDROGRAPH   240.61


    RUNOFF VOLUME =      1.52686 INCHES      =        7.5487 ACRE-FEET
    PEAK DISCHARGE RATE =      100.86 CFS  AT    1.650 HOURS   BASIN AREA =    .0927 SQ. MI.
```

** NOTE: NO WELL DEFINED FLOW PATH IS APPARENT IN THE FOLLOWING REACH
** ROUTE FLOW DOWN AN ASSUMED WIDE DEPRESSION SECTION FROM THE SOUTH SIDE OF
** CENTRAL TO THE SOUTH EAST CORNER OF AREA 250.1

COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=105.1FT
CHANNEL SLOPE=0.003 FLOOD PLAIN SLOPE=0.003
N=0.055 DIST=122

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102	30	100	100	100	130	102

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.27	19.9	11.8
100.54	41.9	38.4
100.81	66.1	77.2
101.07	92.4	127.9
101.34	121.0	190.3
101.61	151.6	264.6
101.88	184.5	351.1
102.15	219.2	459.1
102.42	254.0	587.2
102.68	288.9	727.7
102.95	323.8	880.0
103.22	358.7	1043.7
103.49	393.6	1218.3
103.76	428.5	1403.6
104.03	463.4	1599.2
104.29	498.3	1804.9
104.56	533.2	2020.4
104.83	568.1	2245.6
105.10	603.0	2480.2

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=700 SLOPE=0.003

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.268	19.870	11.81	.3272
.537	41.901	38.35	.2124
.805	66.094	77.22	.1664
1.074	92.448	127.89	.1406
1.342	120.964	190.31	.1236
1.611	151.641	264.62	.1114
1.879	184.480	351.09	.1022
2.147	219.154	459.07	.0928
2.416	254.048	587.25	.0841
2.684	288.943	727.74	.0772

2.953	323.837	880.04	.0716
3.221	358.731	1043.70	.0668
3.489	393.625	1218.33	.0628
3.758	428.520	1403.60	.0594
4.026	463.414	1599.22	.0563
4.295	498.308	1804.91	.0537
4.563	533.202	2020.44	.0513
4.832	568.097	2245.59	.0492
5.100	602.991	2480.15	.0473

ROUTE ID=4 HYDROGRAPH NO=240.62 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 240.62

RUNOFF VOLUME = 1.52680 INCHES = 7.5485 ACRE-FEET
PEAK DISCHARGE RATE = 87.46 CFS AT 1.800 HOURS BASIN AREA = .0927 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 250.1
COMPUTE NM HYD ID=2 HYD=250.1 DA=0.0247
%A=20.0 %B=10.0 %C=40.0 %D=30.0 TP=0.22
MASS RAINFALL=-1

K = .119900HR TP = .220000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 17.726 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
AREA = .007410 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .207911HR TP = .220000HR K/TP RATIO = .945051 SHAPE CONSTANT, N = 3.740813
UNIT PEAK = 26.525 CFS UNIT VOLUME = .9998 B = 337.50 P60 = 1.8700
AREA = .017290 SQ MI IA = .45714 INCHES INF = 1.13000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 250.10

RUNOFF VOLUME = 1.25219 INCHES = 1.6495 ACRE-FEET
PEAK DISCHARGE RATE = 33.20 CFS AT 1.600 HOURS BASIN AREA = .0247 SQ. MI.

** ADD FLOW FROM AREA 250.1 TO FLOW IN THE ASSUMED CHANNEL AT SOUTH EAST CORNER
** OF AREA 250.1
ADD HYD ID=3 HYDROGRAPH NO=250.11 ID I=4 ID II=2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 250.11

```
    RUNOFF VOLUME =     1.46902 INCHES     =       9.1980 ACRE-FEET
    PEAK DISCHARGE RATE =     110.19 CFS  AT   1.750 HOURS   BASIN AREA =   .1174 SQ. MI.


** COMPUTE HYDROGRAPH FOR AREA 250.2
COMPUTE NM HYD      ID=2  HYD=250.2  DA=0.0079
                    %A=0.0  %B=20.0  %C=45.0  %D=35.0  TP=0.15
                    MASS RAINFALL=-1

    K =   .081750HR    TP =   .150000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   9.7010    CFS   UNIT VOLUME =    .9994       B =   526.28      P60 = 1.8700
    AREA =      .002765 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .127829HR    TP =   .150000HR    K/TP RATIO =   .852195     SHAPE CONSTANT, N =  4.176058
    UNIT PEAK =   12.555    CFS   UNIT VOLUME =    .9998       B =   366.74      P60 = 1.8700
    AREA =      .005135 SQ MI    IA =    .39615 INCHES    INF =    .95923 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2  code=1

                                PARTIAL HYDROGRAPH   250.20


    RUNOFF VOLUME =     1.42095 INCHES     =        .5987 ACRE-FEET
    PEAK DISCHARGE RATE =      14.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0079 SQ. MI.


** NOTE: NO WELL DEFINED FLOW PATH IS APPARENT IN THE FOLLOWING REACH
** ADD FLOW FROM AREA 250.2 TO FLOW IN ASSUMED CHANNEL AT SOUTH WEST CORNER OF
** AREA 260.1
ADD HYD             ID=4  HYDROGRAPH NO=250.21 ID I=3  ID II=2
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   250.21


    RUNOFF VOLUME =     1.46599 INCHES     =       9.7966 ACRE-FEET
    PEAK DISCHARGE RATE =     117.95 CFS  AT   1.700 HOURS   BASIN AREA =   .1253 SQ. MI.


** ROUTE FLOW DOWN ASSUMED CHANNEL SECTION FROM THE SOUTH EAST CORNER OF
** OF AREA 250.1 TO THE SOUTH LINE OF AREA 260.1
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=100.0 FT  MAXIMUM ELEV=102 FT
                    CHANNEL SLOPE=0.011  FLOOD PLAIN SLOPE=0.011
                    N=0.045  DIST=102
                    DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                      0   102      30    100     80    100     110   102
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	5.4	4.1
100.21	11.2	13.2
100.32	17.3	26.3
100.42	23.7	43.0
100.53	30.5	63.2
100.63	37.6	86.7
100.74	45.0	113.7
100.84	52.7	144.0
100.95	60.8	177.8
101.05	69.3	214.9
101.16	78.0	255.5
101.26	87.1	299.6
101.37	96.5	347.2
101.47	106.3	398.5
101.58	116.3	453.4
101.68	126.8	512.0
101.79	137.5	574.4
101.89	148.6	640.7
102.00	160.0	710.8

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.011

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	5.429	4.11	.1652
.211	11.191	13.20	.1060
.316	17.285	26.26	.0823
.421	23.712	42.97	.0690
.526	30.471	63.15	.0603
.632	37.562	86.74	.0541
.737	44.986	113.71	.0495
.842	52.742	144.04	.0458
.947	60.831	177.77	.0428
1.053	69.252	214.91	.0403
1.158	78.005	255.50	.0382
1.263	87.091	299.60	.0363
1.368	96.509	347.24	.0347
1.474	106.260	398.49	.0333
1.579	116.343	453.40	.0321
1.684	126.758	512.02	.0309
1.789	137.506	574.42	.0299
1.895	148.586	640.67	.0290
2.000	159.999	710.81	.0281

ROUTE ID=3 HYDROGRAPH NO=250.22 INFLOW ID=4 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 250.22

RUNOFF VOLUME = 1.46597 INCHES = 9.7965 ACRE-FEET
PEAK DISCHARGE RATE = 117.24 CFS AT 1.750 HOURS BASIN AREA = .1253 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 260.1
COMPUTE NM HYD ID=2 HYD=260.1 DA=0.0398
%A=88.0 %B=0.0 %C=10.0 %D=2.0 TP=0.1555
MASS RAINFALL=-1

K = .084748HR TP = .155500HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.6940 CFS UNIT VOLUME = .9964 B = 526.28 P60 = 1.8700
AREA = .000796 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .184062HR TP = .155500HR K/TP RATIO = 1.183677 SHAPE CONSTANT, N = 2.998783
UNIT PEAK = 70.664 CFS UNIT VOLUME = .9994 B = 281.72 P60 = 1.8700
AREA = .039004 SQ MI IA = .61939 INCHES INF = 1.58429 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 260.10

RUNOFF VOLUME = .51796 INCHES = 1.0995 ACRE-FEET
PEAK DISCHARGE RATE = 33.14 CFS AT 1.550 HOURS BASIN AREA = .0398 SQ. MI.

** ADD FLOW FROM AREA 260.1 TO FLOW IN ASSUMED CHANNEL AT SOUTH LINE OF
** AREA 260.1
ADD HYD ID=4 HYDROGRAPH NO=260.11 ID I=3 ID II=2
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 260.11

RUNOFF VOLUME = 1.23743 INCHES = 10.8960 ACRE-FEET
PEAK DISCHARGE RATE = 134.74 CFS AT 1.700 HOURS BASIN AREA = .1651 SQ. MI.

** ROUTE FLOW DOWN ASSUMED CHANNEL SECTION FROM THE SOUTH LINE
** OF AREA 260.1 TO THE START OF INCISED CHANNEL
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=105.1FT
CHANNEL SLOPE=0.027 FLOOD PLAIN SLOPE=0.027
N=0.040 DIST=102

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102	30	100	80	100	110	102

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.27	14.5	35.1
100.54	31.2	115.2
100.81	50.0	234.5
101.07	71.0	392.6
101.34	94.1	590.4
101.61	119.4	829.4
101.88	146.9	1111.2
102.15	176.2	1471.4
102.42	205.7	1904.9
102.68	235.3	2382.0
102.95	264.8	2900.8
103.22	294.3	3459.7
103.49	323.8	4057.3
103.76	353.4	4692.4
104.03	382.9	5363.9
104.29	412.4	6070.9
104.56	441.9	6812.5
104.83	471.5	7587.8
105.10	501.0	8396.2

COMPUTE TRAVEL TIME ID=2 REACH NO=1 VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.027

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.268	14.502	35.10	.0516
.537	31.165	115.19	.0338
.805	49.989	234.49	.0266
1.074	70.975	392.60	.0226
1.342	94.122	590.43	.0199
1.611	119.431	829.42	.0180
1.879	146.901	1111.23	.0165
2.147	176.207	1471.42	.0150
2.416	205.733	1904.89	.0135
2.684	235.259	2381.99	.0123
2.953	264.785	2900.81	.0114
3.221	294.311	3459.72	.0106
3.489	323.837	4057.33	.0100
3.758	353.363	4692.43	.0094
4.026	382.889	5363.95	.0089
4.295	412.415	6070.91	.0085
4.563	441.940	6812.45	.0081
4.832	471.466	7587.79	.0078

```
                                    5.100      500.992      8396.19         .0075
ROUTE                 ID=2  HYDROGRAPH NO=260.12  INFLOW ID=4  DT=0.0
PRINT HYD             ID=2  CODE=1

                                        PARTIAL HYDROGRAPH   260.12

    RUNOFF VOLUME =      1.23743 INCHES      =       10.8959 ACRE-FEET
    PEAK DISCHARGE RATE =      134.85 CFS  AT    1.700 HOURS   BASIN AREA =    .1651 SQ. MI.

** ROUTE FLOW DOWN ASSUMED CHANNEL SECTION FROM THE START OF THE INCISED
** CHANNEL TO THE S.E. CORNER OF AREA 270.1
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                      MINIMUM ELEV=100.0 FT  MAXIMUM ELEV=105.1FT
                      CHANNEL SLOPE=0.05 FLOOD PLAIN SLOPE=0.05
                      N=0.035  DIST=31
                      DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                        0   105.12    1     105.0  10    100.1.  20    100.0
                       30   105.0     31    105.1

                                        RATING CURVE VALLEY SECTION  1.0
                                           WATER      FLOW       FLOW
                                          SURFACE     AREA       RATE
                                           ELEV       SQ FT      CFS
                                          100.00        .0         .0
                                          100.27       2.3        7.6
                                          100.54       5.3       29.3
                                          100.81       8.7       61.8
                                          101.07      12.3      104.4
                                          101.34      16.1      156.7
                                          101.61      20.3      218.9
                                          101.88      24.7      290.9
                                          102.15      29.4      373.0
                                          102.42      34.4      465.4
                                          102.68      39.7      568.4
                                          102.95      45.2      682.2
                                          103.22      51.0      807.2
                                          103.49      57.1      943.5
                                          103.76      63.5     1091.5
                                          104.03      70.1     1251.5
                                          104.29      77.1     1423.7
                                          104.56      84.2     1608.6
                                          104.83      91.7     1806.3
                                          105.10      99.5     1962.1
COMPUTE TRAVEL TIME ID=2  REACH NO=1  VALLEY SECTIONS=1
                      LENGTH=400  SLOPE=0.050

                                        TRAVEL TIME TABLE
                                                        REACH=  1.0

                                        WATER        AVERAGE      FLOW         TRAVEL
                                        DEPTH        AREA         RATE         TIME
```

FEET	SQ.FT.	CFS	HRS
.268	2.282	7.62	.0333
.537	5.332	29.29	.0202
.805	8.658	61.81	.0156
1.074	12.260	104.38	.0131
1.342	16.139	156.73	.0114
1.611	20.294	218.87	.0103
1.879	24.726	290.91	.0094
2.147	29.434	373.03	.0088
2.416	34.418	465.45	.0082
2.684	39.679	568.43	.0078
2.953	45.217	682.24	.0074
3.221	51.031	807.15	.0070
3.489	57.121	943.47	.0067
3.758	63.487	1091.47	.0065
4.026	70.131	1251.45	.0062
4.295	77.050	1423.72	.0060
4.563	84.246	1608.55	.0058
4.832	91.718	1806.26	.0056
5.100	99.540	1962.08	.0056

ROUTE ID=4 HYDROGRAPH NO=260.13 INFLOW ID=2 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 260.13

RUNOFF VOLUME = 1.23743 INCHES = 10.8959 ACRE-FEET
PEAK DISCHARGE RATE = 135.33 CFS AT 1.700 HOURS BASIN AREA = .1651 SQ. MI.

** COMPUTE HYDOGRAPH FOR AREA 270.1. ASSUME ALL FLOW FROM THIS AREA WILL BE
** ROUTED TO THE SOUTH TO COORS STORM DRAIN
COMPUTE NM HYD ID=3 HYD=270.1 DA=0.0222
%A=87.0 %B=0.0 %C=10.0 %D=3.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.6294 CFS UNIT VOLUME = .9951 B = 526.28 P60 = 1.8700
AREA = .000666 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .157723HR TP = .133300HR K/TP RATIO = 1.183221 SHAPE CONSTANT, N = 2.999850
UNIT PEAK = 45.525 CFS UNIT VOLUME = .9986 B = 281.81 P60 = 1.8700
AREA = .021534 SQ MI IA = .61907 INCHES INF = 1.58340 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 270.10

RUNOFF VOLUME = .53787 INCHES = .6368 ACRE-FEET

PEAK DISCHARGE RATE = 21.27 CFS AT 1.500 HOURS BASIN AREA = .0222 SQ. MI.

** ADD BASIN 270.1 FLOW TO THE ROUTED FLOW IN THE ASSUMED CHANNEL
** AT THE SOUTHEAST CORNER OF BASIN 270.1
ADD HYD ID=4 HYDROGRAPH NO=270.11 ID I=3 ID II=4
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 270.11

RUNOFF VOLUME = 1.15451 INCHES = 11.5327 ACRE-FEET
PEAK DISCHARGE RATE = 145.68 CFS AT 1.650 HOURS BASIN AREA = .1873 SQ. MI.

** ADD FLOW FROM THE ASSSUMED CHANNEL TO THE COORS STORM DRAIN AT STA 75+79
ADD HYD ID=10 HYDROGRAPH NO=260.13 ID I=4 ID II=11
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 260.13

RUNOFF VOLUME = 1.38000 INCHES = 22.1019 ACRE-FEET
PEAK DISCHARGE RATE = 222.15 CFS AT 1.650 HOURS BASIN AREA = .3003 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 270.2 COORS BLVD R.W. STA 89+20 TO STA 76+15
COMPUTE NM HYD ID=3 HYD=270.2 DA=0.0071
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 23.826 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
AREA = .006035 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 2.6133 CFS UNIT VOLUME = .9959 B = 327.09 P60 = 1.8700
AREA = .001065 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 code=1

PARTIAL HYDROGRAPH 270.20

RUNOFF VOLUME = 2.16311 INCHES = .8191 ACRE-FEET
PEAK DISCHARGE RATE = 17.98 CFS AT 1.500 HOURS BASIN AREA = .0071 SQ. MI.

** ADD FLOW FROM AREA 270.2 TO FLOW IN COORS S.D MANHOLE AT STA. 75+80
ADD HYD ID=4 HYDROGRAPH NO=270.23 ID I=10 ID II=3
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 270.23

RUNOFF VOLUME = 1.39809 INCHES = 22.9210 ACRE-FEET
PEAK DISCHARGE RATE = 231.82 CFS AT 1.650 HOURS BASIN AREA = .3074 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 75+80
** TO COORS S.D. MANHOLE AT STA 71+29 PRESURE FLOW USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0303
PIPE DIA=4.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.23	.3	1.8
.47	.9	7.8
.70	1.6	18.1
.94	2.4	32.6
1.17	3.3	50.9
1.41	4.2	72.6
1.64	5.2	97.3
1.88	6.3	124.4
2.11	7.3	153.3
2.35	8.4	183.5
2.58	9.4	214.2
2.81	10.5	244.8
3.05	11.5	274.3
3.28	12.4	302.0
3.52	13.3	326.8
3.75	14.2	347.4
3.99	14.9	362.2
4.22	15.5	368.2
4.50	15.9	368.2

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 FT SLOPE=0.0303

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.235	.316	1.80	.0220
.469	.880	7.79	.0141
.704	1.588	18.12	.0110

.938	2.402	32.59	.0092
1.173	3.296	50.89	.0081
1.407	4.249	72.60	.0073
1.641	5.248	97.27	.0067
1.876	6.277	124.37	.0063
2.111	7.325	153.31	.0060
2.345	8.380	183.48	.0057
2.579	9.430	214.21	.0055
2.814	10.463	244.75	.0053
3.049	11.468	274.32	.0052
3.283	12.432	302.01	.0051
3.518	13.338	326.79	.0051
3.752	14.169	347.41	.0051
3.987	14.900	362.16	.0051
4.221	15.495	368.22	.0053
4.500	15.904	368.22	.0054

ROUTE ID=10 HYDROGRAPH NO=270.24 INFLOW ID=4 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 270.24

RUNOFF VOLUME = 1.39800 INCHES = 22.9196 ACRE-FEET
PEAK DISCHARGE RATE = 232.17 CFS AT 1.650 HOURS BASIN AREA = .3074 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 280.1
COMPUTE NM HYD ID=2 HYD=280.1 DA=0.0066
%A=85.0 %B=0.0 %C=10.0 %D=5.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.3029 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 1.8700
AREA = .000330 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .157598HR TP = .133300HR K/TP RATIO = 1.182279 SHAPE CONSTANT, N = 3.002060
UNIT PEAK = 13.264 CFS UNIT VOLUME = .9978 B = 281.99 P60 = 1.8700
AREA = .006270 SQ MI IA = .61842 INCHES INF = 1.58158 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 280.10

RUNOFF VOLUME = .57768 INCHES = .2033 ACRE-FEET
PEAK DISCHARGE RATE = 6.59 CFS AT 1.500 HOURS BASIN AREA = .0066 SQ. MI.

** ADD FLOW FROM AREA 280.1 TO FLOW IN COORS S.D MANHOLE AT STA. 71+29

```
ADD HYD             ID=3  HYDROGRAPH NO=280.11 ID I=10  ID II=2
PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   280.11


    RUNOFF VOLUME =     1.38075 INCHES     =      23.1229 ACRE-FEET
    PEAK DISCHARGE RATE =     236.11 CFS  AT   1.650 HOURS   BASIN AREA =   .3140 SQ. MI.



** COMPUTE HYD. FOR  AREA 280.2 COORS BLVD R.W. FROM STA 76+15 TO STA 71+70
COMPUTE NM HYD      ID=4  HYD=280.2  DA=0.0025
                    %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.1333
                    MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.3896    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .002125 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .92016    CFS   UNIT VOLUME =    .9867       B =   327.09      P60 = 1.8700
    AREA =      .000375 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=4  code=1

                                PARTIAL HYDROGRAPH   280.20


    RUNOFF VOLUME =    2.16311 INCHES     =        .2884 ACRE-FEET
    PEAK DISCHARGE RATE =      6.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0025 SQ. MI.



** ADD FLOW FROM AREA 280.2 TO FLOW IN COORS S.D AT MANHOLE  AT STA. 71+29
ADD HYD             ID=5  HYDROGRAPH NO=280.21 ID I=3  ID II=4
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   280.21


    RUNOFF VOLUME =     1.38693 INCHES     =      23.4113 ACRE-FEET
    PEAK DISCHARGE RATE =     239.52 CFS  AT   1.650 HOURS   BASIN AREA =   .3165 SQ. MI.



** COMPUTE HYDROGRAPH FOR AREA 280.3 A PORTION OF AIRPORT DRIVE
COMPUTE NM HYD      ID=6  HYD=280.3  DA=0.0045
                    %A=20.0  %B=30.0  %C=0.0  %D=50.0  TP=0.1333
                    MASS RAINFALL=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.8831 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.8700
AREA = .002250 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .144069HR TP = .133300HR K/TP RATIO = 1.080785 SHAPE CONSTANT, N = 3.268709
UNIT PEAK = 5.1151 CFS UNIT VOLUME = .9973 B = 303.04 P60 = 1.8700
AREA = .002250 SQ MI IA = .56000 INCHES INF = 1.41800 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=6 code=1

PARTIAL HYDROGRAPH 280.30

RUNOFF VOLUME = 1.49614 INCHES = .3591 ACRE-FEET
PEAK DISCHARGE RATE = 8.64 CFS AT 1.500 HOURS BASIN AREA = .0045 SQ. MI.

** ADD FLOW FROM AREA 280.3 TO FLOW IN COORS S.D AT MANHOLE AT STA. 71+29
ADD HYD ID=7 HYDROGRAPH NO=280.31 ID I=5 ID II=6
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 280.31

RUNOFF VOLUME = 1.38846 INCHES = 23.7704 ACRE-FEET
PEAK DISCHARGE RATE = 244.30 CFS AT 1.650 HOURS BASIN AREA = .3210 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 71+29
** TO COORS S.D. MANHOLE AT STA 66+79
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.010
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	2.2
.63	1.6	9.6
.94	2.8	22.4
1.25	4.3	40.3
1.56	5.9	63.0
1.88	7.6	89.8
2.19	9.3	120.3
2.50	11.2	153.9
2.81	13.0	189.7
3.13	14.9	227.0
3.44	16.8	265.0

3.75	18.6	302.8
4.06	20.4	339.4
4.38	22.1	373.7
4.69	23.7	404.3
5.00	25.2	429.8
5.32	26.5	448.1
5.63	27.5	455.6
6.00	28.3	455.6

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.010

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	2.22	.0316
.625	1.564	9.64	.0203
.938	2.824	22.42	.0157
1.251	4.271	40.32	.0132
1.563	5.859	62.96	.0116
1.876	7.554	89.83	.0105
2.189	9.329	120.35	.0097
2.501	11.159	153.87	.0091
2.814	13.022	189.68	.0086
3.127	14.897	227.01	.0082
3.439	16.764	265.02	.0079
3.752	18.601	302.81	.0077
4.065	20.388	339.39	.0075
4.377	22.101	373.65	.0074
4.690	23.712	404.31	.0073
5.003	25.189	429.82	.0073
5.315	26.489	448.07	.0074
5.628	27.547	455.57	.0076
6.000	28.274	455.57	.0078

ROUTE ID=10 HYDROGRAPH NO=280.32 INFLOW ID=7 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 280.32

RUNOFF VOLUME = 1.38834 INCHES = 23.7683 ACRE-FEET
PEAK DISCHARGE RATE = 244.86 CFS AT 1.650 HOURS BASIN AREA = .3210 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 290.1
COMPUTE NM HYD ID=2 HYD=290.1 DA=0.03144
%A=90.0 %B=2.0 %C=6.0 %D=2.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.4825 CFS UNIT VOLUME = .9951 B = 526.28 P60 = 1.8700

AREA = .000629 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .159477HR TP = .133300HR K/TP RATIO = 1.196375 SHAPE CONSTANT, N = 2.969438
UNIT PEAK = 64.563 CFS UNIT VOLUME = .9984 B = 279.32 P60 = 1.8700
AREA = .030811 SQ MI IA = .62857 INCHES INF = 1.61000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 290.10

RUNOFF VOLUME = .50557 INCHES = .8477 ACRE-FEET
PEAK DISCHARGE RATE = 28.78 CFS AT 1.500 HOURS BASIN AREA = .0314 SQ. MI.

** ADD FLOW FROM AREA 290.1 TO FLOW IN COORS S.D MANHOLE AT STA. 66+79
ADD HYD ID=3 HYDROGRAPH NO=290.12 ID I=10 ID II=2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 290.12

RUNOFF VOLUME = 1.30959 INCHES = 24.6160 ACRE-FEET
PEAK DISCHARGE RATE = 262.22 CFS AT 1.650 HOURS BASIN AREA = .3524 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 66+79
** TO COORS S.D. MANHOLE AT STA 62+29
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	6.1
.63	1.6	26.4
.94	2.8	61.4
1.25	4.3	110.4
1.56	5.9	172.4
1.88	7.6	246.0
2.19	9.3	329.6
2.50	11.2	421.4
2.81	13.0	519.5
3.13	14.9	621.7
3.44	16.8	725.8
3.75	18.6	829.3
4.06	20.4	929.5

4.38	22.1	1023.3
4.69	23.7	1107.3
5.00	25.2	1177.1
5.32	26.5	1227.1
5.63	27.5	1247.6
6.00	28.3	1247.6

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	6.08	.0115
.625	1.564	26.41	.0074
.938	2.824	61.40	.0057
1.251	4.271	110.42	.0048
1.563	5.859	172.42	.0042
1.876	7.554	246.00	.0038
2.189	9.329	329.58	.0035
2.501	11.159	421.38	.0033
2.814	13.022	519.46	.0031
3.127	14.897	621.69	.0030
3.439	16.764	725.79	.0029
3.752	18.601	829.29	.0028
4.065	20.388	929.47	.0027
4.377	22.101	1023.29	.0027
4.690	23.712	1107.25	.0027
5.003	25.189	1177.11	.0027
5.315	26.489	1227.09	.0027
5.628	27.547	1247.63	.0028
6.000	28.274	1247.63	.0028

ROUTE ID=4 HYDROGRAPH NO=290.13 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 290.13

RUNOFF VOLUME = 1.30955 INCHES = 24.6153 ACRE-FEET
PEAK DISCHARGE RATE = 262.97 CFS AT 1.650 HOURS BASIN AREA = .3524 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 62.29
** TO COORS S.D. MANHOLE AT STA 58+89
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS

.00	.0	.0
.31	.6	1.9
.63	1.6	8.4
.94	2.8	19.4
1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=340 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0276
.625	1.564	8.35	.0177
.938	2.824	19.42	.0137
1.251	4.271	34.92	.0116
1.563	5.859	54.52	.0101
1.876	7.554	77.79	.0092
2.189	9.329	104.22	.0085
2.501	11.159	133.25	.0079
2.814	13.022	164.27	.0075
3.127	14.897	196.59	.0072
3.439	16.764	229.52	.0069
3.752	18.601	262.25	.0067
4.065	20.388	293.92	.0066
4.377	22.101	323.59	.0065
4.690	23.712	350.14	.0064
5.003	25.189	372.23	.0064
5.315	26.489	388.04	.0064
5.628	27.547	394.54	.0066
6.000	28.274	394.54	.0068

ROUTE ID=10 HYDROGRAPH NO=290.14 INFLOW ID=4 DT=0.
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 290.14

RUNOFF VOLUME = 1.30946 INCHES = 24.6134 ACRE-FEET
PEAK DISCHARGE RATE = 263.41 CFS AT 1.650 HOURS BASIN AREA = .3524 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 290.2 COORS BLVD.RW FROM STA. 71+70 TO STA 59+40
COMPUTE NM HYD ID=2 HYD=290.2 DA=0.0069
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 23.155 CFS UNIT VOLUME = .9986 B = 526.28 P60 = 1.8700
AREA = .005865 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .130992HR TP = .133300HR K/TP RATIO = .982685 SHAPE CONSTANT, N = 3.593448
UNIT PEAK = 2.5396 CFS UNIT VOLUME = .9959 B = 327.09 P60 = 1.8700
AREA = .001035 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 290.20

RUNOFF VOLUME = 2.16311 INCHES = .7960 ACRE-FEET
PEAK DISCHARGE RATE = 17.48 CFS AT 1.500 HOURS BASIN AREA = .0069 SQ. MI.

** ADD FLOW FROM AREA 290.2 TO FLOW IN COORS S.D MANHOLE AT STA. 58+89
ADD HYD ID=3 HYDROGRAPH NO=290.21 ID I=10 ID II=2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 290.21

RUNOFF VOLUME = 1.32585 INCHES = 25.4094 ACRE-FEET
PEAK DISCHARGE RATE = 272.98 CFS AT 1.600 HOURS BASIN AREA = .3593 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 58+89
** TO COORS S.D. MANHOLE AT STA 58+00
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	1.9

.63	1.6	8.4
.94	2.8	19.4
1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=89 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0072
.625	1.564	8.35	.0046
.938	2.824	19.42	.0036
1.251	4.271	34.92	.0030
1.563	5.859	54.52	.0027
1.876	7.554	77.79	.0024
2.189	9.329	104.22	.0022
2.501	11.159	133.25	.0021
2.814	13.022	164.27	.0020
3.127	14.897	196.59	.0019
3.439	16.764	229.52	.0018
3.752	18.601	262.25	.0018
4.065	20.388	293.92	.0017
4.377	22.101	323.59	.0017
4.690	23.712	350.14	.0017
5.003	25.189	372.23	.0017
5.315	26.489	388.04	.0017
5.628	27.547	394.54	.0017
6.000	28.274	394.54	.0018

ROUTE ID=4 HYDROGRAPH NO=290.22 INFLOW ID=3 DT=0.050
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 290.22

RUNOFF VOLUME = 1.32582 INCHES = 25.4090 ACRE-FEET
PEAK DISCHARGE RATE = 273.04 CFS AT 1.650 HOURS BASIN AREA = .3593 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 58+00
** TO OUTLET AT POND AT STA 56+10 (170' LEFT)
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	1.9
.63	1.6	8.4
.94	2.8	19.4
1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=5 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=248 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0201
.625	1.564	8.35	.0129
.938	2.824	19.42	.0100
1.251	4.271	34.92	.0084
1.563	5.859	54.52	.0074
1.876	7.554	77.79	.0067
2.189	9.329	104.22	.0062
2.501	11.159	133.25	.0058
2.814	13.022	164.27	.0055
3.127	14.897	196.59	.0052
3.439	16.764	229.52	.0050
3.752	18.601	262.25	.0049
4.065	20.388	293.92	.0048

4.377	22.101	323.59	.0047
4.690	23.712	350.14	.0047
5.003	25.189	372.23	.0047
5.315	26.489	388.04	.0047
5.628	27.547	394.54	.0048
6.000	28.274	394.54	.0049

ROUTE ID=5 HYDROGRAPH NO=290.23 INFLOW ID=4 DT=0.050
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 290.23

RUNOFF VOLUME = 1.32576 INCHES = 25.4077 ACRE-FEET
PEAK DISCHARGE RATE = 273.70 CFS AT 1.650 HOURS BASIN AREA = .3593 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 13:49:39

AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
RUN DATE (MON/DAY/YR) = 09/30/1992
START TIME (HR:MIN:SEC) = 13:12:57 USER NO.= D_HARRIS.S92
INPUT FILE = ccsdwd.hmi

START 0.0 HOURS ****ONE HUNDRED YEAR TWENTY FOUR HOUR STORM ****
** FILE NAME : CCSDWD.HMI (COORS CONNECTION STORM DRAIN WATERSHED DEVELOPED)**
** ANALYSIS FOR THE ATRISCO BUSINESS PARK MASTER DRAINAGE PLAN **********
** INCLUDES THE WATERSHED OF THE AIRPORT DRIVE AND COORS BLVD S.D.SYSTEM *****
** FULLY DEVELOPED CONNDITION **********
** AREAS OUTSIDE OF THE ATRISCO BUSINESS PARK INCLUDED TO DETERMINE TOTAL
** POTENTIAL FLOWS TO THE AIRPORT DRIVE AND COORS CONNECTION STORM DRAINS*****
****
** ANALYSIS ASSUMPTIONS:
****
** FLOW FROM ALL PRIVATE LAND NORTH OF CENTRAL AVE. CONTRIBUTING FLOW TO THE
** AIRPORT ROAD STORM DRAIN IS RESTRICTED TO 0.1cfs PER ACRE.**********
** LOTS SOUTH OF CENTRAL AVE. LOCATED ALONG THE EAST SIDE OF AIRPORT DRIVE
** ARE ASSUMED TO DISCHARGE AT THE EXISTING CONDITION FLOW RATE INTO AIRPORT
** DRIVE AND THEN flow IS ROUTED IN THE STREET TO THE CUL-DE-SAC BEFORE
** ENTERING THE STORM DRAIN **********
** PUBLIC STREETS CONTRIBUTING FLOW TO THE AIRPORT DRIVE STORM DRAIN HAVE
** FREE DISCHARGE INTO THE SYSTEM **********
** IN AREAS OF THE ATRISCO BUSINESS PARK WHERE THE POTENTIAL EXISTS FOR SOME OF
** OF THE PROPERTY ADJACENT TO THE STREETS TO DISCHARGE TO THE STREETS
** UNCONTROLLED DUE TO GRADE CONSTRAINTS, APPOXIMATELY 10 ADDITIONAL FEET OF
** WIDTH WAS USED IN CALCULATING STREET AREAS **********
** FLOW FROM THE AREAS OUTSIDE OF THE ATRISCO BUSINESS PARK AND THE WATERSHED
** OF THE AIRPORT DRIVE STORM DRAIN LIMITED TO THE EXISTING CONDITION FLOW
** RATE AT THE POINT WHERE THE FLOW ENTERS THE COORS STORM DRAIN **********
** UPDATED 9-14-92
RAINFALL TYPE=2 0.0 1.25 1.45 1.65

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .050000 HOURS END TIME = 24.000000 HOURS

.0000	.0014	.0028	.0042	.0057	.0072	.0088
.0105	.0122	.0141	.0159	.0179	.0200	.0222
.0245	.0269	.0295	.0323	.0353	.0385	.0420
.0473	.0531	.0700	.1098	.1784	.2844	.4370
.6458	.8104	.8848	.9469	1.0013	1.0499	1.0940
1.1341	1.1710	1.2050	1.2363	1.2652	1.2920	1.2978
1.3031	1.3080	1.3126	1.3169	1.3209	1.3248	1.3285
1.3319	1.3353	1.3385	1.3416	1.3446	1.3474	1.3502
1.3529	1.3555	1.3580	1.3604	1.3628	1.3651	1.3674
1.3696	1.3718	1.3739	1.3759	1.3779	1.3799	1.3818
1.3837	1.3856	1.3874	1.3892	1.3909	1.3926	1.3943
1.3960	1.3976	1.3992	1.4008	1.4023	1.4039	1.4054
1.4069	1.4083	1.4098	1.4112	1.4126	1.4140	1.4154
1.4167	1.4180	1.4194	1.4207	1.4219	1.4232	1.4245
1.4257	1.4269	1.4282	1.4294	1.4305	1.4317	1.4329
1.4340	1.4352	1.4363	1.4374	1.4385	1.4396	1.4407
1.4418	1.4428	1.4439	1.4449	1.4460	1.4470	1.4480

1.4490 1.4500 1.4509 1.4517 1.4526 1.4535 1.4543
1.4552 1.4560 1.4569 1.4577 1.4586 1.4594 1.4602
1.4611 1.4619 1.4627 1.4635 1.4644 1.4652 1.4660
1.4668 1.4676 1.4684 1.4692 1.4700 1.4708 1.4716
1.4724 1.4732 1.4740 1.4748 1.4755 1.4763 1.4771
1.4779 1.4786 1.4794 1.4802 1.4809 1.4817 1.4825
1.4832 1.4840 1.4847 1.4855 1.4862 1.4870 1.4877
1.4884 1.4892 1.4899 1.4907 1.4914 1.4921 1.4928
1.4936 1.4943 1.4950 1.4957 1.4964 1.4971 1.4979
1.4986 1.4993 1.5000 1.5007 1.5014 1.5021 1.5028
1.5035 1.5042 1.5048 1.5055 1.5062 1.5069 1.5076
1.5083 1.5089 1.5096 1.5103 1.5110 1.5116 1.5123
1.5130 1.5136 1.5143 1.5150 1.5156 1.5163 1.5169
1.5176 1.5182 1.5189 1.5195 1.5202 1.5208 1.5215
1.5221 1.5227 1.5234 1.5240 1.5247 1.5253 1.5259
1.5265 1.5272 1.5278 1.5284 1.5290 1.5297 1.5303
1.5309 1.5315 1.5321 1.5328 1.5334 1.5340 1.5346
1.5352 1.5358 1.5364 1.5370 1.5376 1.5382 1.5388
1.5394 1.5400 1.5406 1.5412 1.5418 1.5424 1.5429
1.5435 1.5441 1.5447 1.5453 1.5459 1.5464 1.5470
1.5476 1.5482 1.5487 1.5493 1.5499 1.5505 1.5510
1.5516 1.5522 1.5527 1.5533 1.5538 1.5544 1.5550
1.5555 1.5561 1.5566 1.5572 1.5577 1.5583 1.5588
1.5594 1.5599 1.5605 1.5610 1.5616 1.5621 1.5627
1.5632 1.5637 1.5643 1.5648 1.5653 1.5659 1.5664
1.5669 1.5675 1.5680 1.5685 1.5691 1.5696 1.5701
1.5706 1.5712 1.5717 1.5722 1.5727 1.5732 1.5738
1.5743 1.5748 1.5753 1.5758 1.5763 1.5768 1.5773
1.5779 1.5784 1.5789 1.5794 1.5799 1.5804 1.5809
1.5814 1.5819 1.5824 1.5829 1.5834 1.5839 1.5844
1.5849 1.5854 1.5859 1.5863 1.5868 1.5873 1.5878
1.5883 1.5888 1.5893 1.5898 1.5902 1.5907 1.5912
1.5917 1.5922 1.5926 1.5931 1.5936 1.5941 1.5945
1.5950 1.5955 1.5960 1.5964 1.5969 1.5974 1.5978
1.5983 1.5988 1.5992 1.5997 1.6002 1.6006 1.6011
1.6016 1.6020 1.6025 1.6029 1.6034 1.6039 1.6043
1.6048 1.6052 1.6057 1.6061 1.6066 1.6070 1.6075
1.6079 1.6084 1.6088 1.6093 1.6097 1.6102 1.6106
1.6111 1.6115 1.6119 1.6124 1.6128 1.6133 1.6137
1.6141 1.6146 1.6150 1.6155 1.6159 1.6163 1.6168
1.6172 1.6176 1.6181 1.6185 1.6189 1.6194 1.6198
1.6202 1.6206 1.6211 1.6215 1.6219 1.6223 1.6228
1.6232 1.6236 1.6240 1.6244 1.6249 1.6253 1.6257
1.6261 1.6265 1.6270 1.6274 1.6278 1.6282 1.6286
1.6290 1.6294 1.6299 1.6303 1.6307 1.6311 1.6315
1.6319 1.6323 1.6327 1.6331 1.6335 1.6339 1.6343
1.6347 1.6351 1.6355 1.6360 1.6364 1.6368 1.6372
1.6376 1.6379 1.6383 1.6387 1.6391 1.6395 1.6399
1.6403 1.6407 1.6411 1.6415 1.6419 1.6423 1.6427
1.6431 1.6435 1.6439 1.6442 1.6446 1.6450 1.6454
1.6458 1.6462 1.6466 1.6469 1.6473 1.6477 1.6481
1.6485 1.6489 1.6492 1.6496 1.6500

**RAINFALL TYPE=2 0.0 1.87 2.20 2.66 DT=0.05

****
****
*S BEGIN THE WATERSHED FOR THE AIRPORT ROAD STORM DRAIN **********
****
****
** COMPUTE HYDROGRAPH FOR TRACT "S-1"*********
** AREA = 133.2 ACRES
COMPUTE NM HYD ID=2 HYD=200.1 DA==0.2081 SM
%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.13333
MASS RAINFALL=-1

K = .081314HR TP = .133330HR K/TP RATIO = .609870 SHAPE CONSTANT, N = 6.167348
UNIT PEAK = 599.80 CFS UNIT VOLUME = .9990 B = 480.37 P60 = 1.2500
AREA = .166480 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .137807HR TP = .133330HR K/TP RATIO = 1.033579 SHAPE CONSTANT, N = 3.415344
UNIT PEAK = 98.048 CFS UNIT VOLUME = 1.000 B = 314.10 P60 = 1.2500
AREA = .041620 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 1.18860 INCHES = 13.1917 ACRE-FEET
PEAK DISCHARGE RATE = 313.99 CFS AT 1.500 HOURS BASIN AREA = .2081 SQ. MI.

** ROUTE FLOW FROM TRACT "S-1"THRU A POND WITH A MAX. DISCHARGE RATE OF .1 CFS
** PER ACRE. ALLOWABLE RELEASE RATE=13.32 cfs
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=200.11 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
7.46	5.0	101.0
11.18	11.0	102.0
13.58	17.5	103.0
22.91	24.0	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	77.89	101.70	9.208	10.07
3.00	2.23	101.81	9.854	10.47
4.00	.59	101.68	9.089	10.00
5.00	1.10	101.56	8.349	9.54
6.00	2.03	101.45	7.706	9.14

7.00	1.77	101.35	7.120	8.77
8.00	1.65	101.26	6.550	8.42
9.00	1.52	101.17	6.000	8.08
10.00	1.46	101.08	5.470	7.75
11.00	1.37	100.99	4.959	7.40
12.00	1.30	100.90	4.488	6.70
13.00	1.25	100.81	4.067	6.07
14.00	1.18	100.74	3.689	5.50
15.00	1.15	100.67	3.352	5.00
16.00	1.09	100.61	3.049	4.55
17.00	1.06	100.56	2.778	4.15
18.00	1.00	100.51	2.535	3.78
19.00	.97	100.46	2.318	3.46
20.00	.94	100.42	2.123	3.17
21.00	.90	100.39	1.948	2.91
22.00	.86	100.36	1.790	2.67
23.00	.86	100.33	1.649	2.46
24.00	.79	100.30	1.523	2.27
25.00	.01	100.27	1.358	2.03
26.00	.00	100.24	1.200	1.79
27.00	.00	100.21	1.061	1.58
28.00	.00	100.19	.938	1.40
29.00	.00	100.17	.829	1.24

PEAK DISCHARGE = 10.610 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.847
MAXIMUM STORAGE = 10.0810 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 200.11

RUNOFF VOLUME = 1.12234 INCHES = 12.4564 ACRE-FEET
PEAK DISCHARGE RATE = 10.61 CFS AT 2.450 HOURS BASIN AREA = .2081 SQ. MI.

** COMPUTE A HYDROGRAPH FOR FUTURE PUBLIC STREETS IN THE EASTERN PORTION OF
** TRACT "S-1"

COMPUTE NM HYD ID=2 HYD=200.2 DA==0.0042
%A=0.0 %B=23.0 %C=0.0 %D=77.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 12.768 CFS UNIT VOLUME = .9983 B = 526.28 P60 = 1.2500
AREA = .003234 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 2.2230 CFS UNIT VOLUME = .9943 B = 306.75 P60 = 1.2500
AREA = .000966 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 200.20

RUNOFF VOLUME = 1.14323 INCHES = .2561 ACRE-FEET
PEAK DISCHARGE RATE = 6.33 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

** ADD THE FLOW FROM THE FUTURE STREETS TO THE CONTROLLED FLOW FROM TRACT"S-1"
** AT THE INTERSECTION OF LOS VOLCANES AND AIRPORT ASSUME FLOW TO BE ROUTED TO
** THE AIRPORT ROAD STORM DRAIN
ADD HYD ID=4 HYDROGRAPH NO=200.21 ID I=3 ID II=2
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 200.21

RUNOFF VOLUME = 1.12275 INCHES = 12.7125 ACRE-FEET
PEAK DISCHARGE RATE = 12.14 CFS AT 1.550 HOURS BASIN AREA = .2123 SQ. MI.

** COMPUTE A HYDROGRAPH FOR FUTURE PUBLIC STREETS IN THE WESTERN PORTION OF
** OF TRACT "S-1"
COMPUTE NM HYD ID=2 HYD=200.3 DA==0.0076
%A=0.0 %B=23.0 %C=0.0 %D=77.0 TP=0.1400
MASS RAINFALL=-1

K = .076300HR TP = .140000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.998 CFS UNIT VOLUME = .9979 B = 526.28 P60 = 1.2500
AREA = .005852 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .149034HR TP = .140000HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 3.8300 CFS UNIT VOLUME = .9966 B = 306.75 P60 = 1.2500
AREA = .001748 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 200.30

RUNOFF VOLUME = 1.14323 INCHES = .4634 ACRE-FEET
PEAK DISCHARGE RATE = 11.21 CFS AT 1.500 HOURS BASIN AREA = .0076 SQ. MI.

** COMPUTE HYDROGRAPH FOR LOS VOLCANES BETWEEN UNSER BLVD AND 1250 LF WEST
** OF AIRPORT ROAD
COMPUTE NM HYD ID=3 HYD=200.4 DA==0.0042

%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 13.431 CFS UNIT VOLUME = .9983 B = 526.28 P60 = 1.2500
AREA = .003402 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 1.8364 CFS UNIT VOLUME = .9928 B = 306.75 P60 = 1.2500
AREA = .000798 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 200.40

RUNOFF VOLUME = 1.19139 INCHES = .2669 ACRE-FEET
PEAK DISCHARGE RATE = 6.56 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

** ADD THE FLOW FROM THE FUTURE STREETS IN THE WEST PORTION OF TRACT "S-1" TO
** THE FLOW FROM THE WESTERN SEGMENT OF LOS VOLCANES 1250 WEST OF AIRPORT RD.
ADD HYD ID=5 HYDROGRAPH NO=200.41 ID I=2 ID II=3
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 200.41

RUNOFF VOLUME = 1.16032 INCHES = .7302 ACRE-FEET
PEAK DISCHARGE RATE = 17.77 CFS AT 1.500 HOURS BASIN AREA = .0118 SQ. MI.

** ROUTE THE FLOW IN THE STREET FROM 1250' WEST OF AIRPORT IN THE STREET TO
** THE INTERSECTION WITH AIRPORT
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0082 FLOOD PLAIN SLOPE=0.0082
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0

100.09	.1	.1
100.14	.3	.3
100.18	.6	.8
100.23	1.1	1.7
100.27	1.9	3.2
100.32	2.8	5.4
100.37	4.0	8.5
100.41	5.3	12.6
100.46	6.9	17.7
100.50	8.7	24.1
100.55	10.7	31.6
100.60	12.9	41.8
100.64	15.1	54.3
100.69	17.3	68.1
100.73	19.7	83.2
100.78	22.3	99.7
100.82	25.1	117.8
100.87	28.1	137.4

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1250 FT SLOPE=0.0082

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH	AVERAGE AREA	FLOW RATE	TRAVEL TIME	
FEET	SQ.FT.	CFS	HRS	
.046	.032	.02	.5669	
.092	.126	.12	.3571	
.137	.286	.34	.2921	
.183	.605	.76	.2770	
.229	1.133	1.66	.2374	
.275	1.871	3.17	.2052	
.321	2.820	5.41	.1809	
.366	3.978	8.52	.1622	
.412	5.346	12.59	.1475	
.458	6.925	17.73	.1356	
.504	8.713	24.05	.1258	
.549	10.711	31.65	.1175	
.595	12.887	41.81	.1070	
.641	15.085	54.29	.0965	
.687	17.297	68.05	.0883	
.733	19.677	83.18	.0821	
.778	22.267	99.74	.0775	
.824	25.067	117.78	.0739	
.870	28.076	137.38	.0710	

ROUTE ID=11 HYDROGRAPH NO=200.45 INFLOW ID=5 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 200.45

RUNOFF VOLUME = 1.16038 INCHES = .7303 ACRE-FEET
PEAK DISCHARGE RATE = 12.57 CFS AT 1.600 HOURS BASIN AREA = .0118 SQ. MI.

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** COMPUTE HYDROGRAPH FOR LOS VOLCANES BETWEEN  1250 LF WEST OF AIRPORT ROAD
** AND AIRPORT ROAD
COMPUTE NM HYD       ID=3  HYD=200.5  DA==0.0035
                     %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.1333
                     MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.193    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.2500
    AREA =      .002835 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    K =   .141901HR    TP =   .133300HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =  1.5303    CFS   UNIT VOLUME =    .9908       B =   306.75      P60 = 1.2500
    AREA =      .000665 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=3 CODE=1

                                   PARTIAL HYDROGRAPH   200.50


    RUNOFF VOLUME =     1.19139 INCHES     =        .2224 ACRE-FEET
    PEAK DISCHARGE RATE =       5.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0035 SQ. MI.


** ADD THE FLOW FROM THE EASTERN SEGMENT OF LOS VOLCANES TO THE ROUTED FLOW
** IN THE STREET AT THE INTERSECTION OF LOS VOLCANES AND AIRPORT ROAD
ADD HYD              ID=3  HYDROGRAPH NO=200.51  ID I=11  ID II=3
PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   200.51


    RUNOFF VOLUME =     1.16739 INCHES     =        .9526 ACRE-FEET
    PEAK DISCHARGE RATE =      16.74 CFS  AT   1.550 HOURS   BASIN AREA =   .0153 SQ. MI.


** COMPUTE A HYDROGRAPH FOR THE WESTERN PORTION OF LOT 2, TRACT "N", A.B.P.
** AREA = 4.5 ACRES
COMPUTE NM HYD       ID=1  HYD=200.6  DA==0.0070
                     %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   22.104    CFS   UNIT VOLUME =    .9986       B =   526.28      P60 = 1.2500
    AREA =      .005600 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000
```

K = .133460HR TP = .133330HR K/TP RATIO = 1.000974 SHAPE CONSTANT, N = 3.526827
UNIT PEAK = 3.3840 CFS UNIT VOLUME = .9971 B = 322.28 P60 = 1.2500
AREA = .001400 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 200.60

RUNOFF VOLUME = 1.18860 INCHES = .4437 ACRE-FEET
PEAK DISCHARGE RATE = 10.98 CFS AT 1.500 HOURS BASIN AREA = .0070 SQ. MI.

** ROUTE FLOW FROM THE WESTERN PORTION OF LOT 2, TRACT "N", A.B.P. THRU A
** POND TO CONTROL DISCHARGE TO A MAX. OF 0.1 CFS PER ACRE. ALLOWABLE RELEASE
** RATE = .45 CFS
ROUTE RESERVOIR ID=2 HYDROGRAPH NO=200.61 INFLOW ID=1 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
0.252	0.17	101.0
0.378	0.38	102.0
0.459	0.59	103.0
0.774	0.90	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	2.57	101.68	.314	.34
3.00	.06	101.77	.332	.35
4.00	.02	101.65	.306	.33
5.00	.04	101.53	.281	.32
6.00	.07	101.43	.260	.31
7.00	.06	101.33	.240	.29
8.00	.06	101.24	.221	.28
9.00	.05	101.16	.203	.27
10.00	.05	101.07	.185	.26
11.00	.05	100.99	.168	.25
12.00	.04	100.89	.152	.23
13.00	.04	100.81	.138	.20
14.00	.04	100.74	.125	.19
15.00	.04	100.67	.114	.17
16.00	.04	100.61	.103	.15
17.00	.04	100.55	.094	.14
18.00	.03	100.51	.086	.13
19.00	.03	100.46	.079	.12
20.00	.03	100.42	.072	.11
21.00	.03	100.39	.066	.10

22.00	.03	100.36	.061	.09
23.00	.03	100.33	.056	.08
24.00	.03	100.30	.052	.08
25.00	.00	100.27	.046	.07
26.00	.00	100.24	.041	.06
27.00	.00	100.21	.036	.05
28.00	.00	100.19	.032	.05
29.00	.00	100.17	.028	.04

PEAK DISCHARGE = .354 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.813
MAXIMUM STORAGE = .3408 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 200.61

RUNOFF VOLUME = 1.12128 INCHES = .4186 ACRE-FEET
PEAK DISCHARGE RATE = .35 CFS AT 2.450 HOURS BASIN AREA = .0070 SQ. MI.

** ADD THE CONTROLED FLOW FROM LOT 2, TRACT "N", A.B.P. TO THE FLOW AT
** FROM TRACT "S-1" AT THE INTERSECTION OF LOS VOLCANES AND AIRPORT ALL OF
** THIS FLOW TO BE ROUTED IN THE AIRPORT RD. S.D.
ADD HYD ID=1 HYDROGRAPH NO=200.62 ID I=4 ID II=2
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 200.62

RUNOFF VOLUME = 1.12271 INCHES = 13.1311 ACRE-FEET
PEAK DISCHARGE RATE = 12.37 CFS AT 1.550 HOURS BASIN AREA = .2193 SQ. MI.

** ROUTE FLOW IN A STORM DRAIN FROM THE INTERSECTION OF LOS VOLCANES AND
** AIRPORT DOWN AIRPORT RD. TO A POINT APPROXIMATELY 850 LF. SOUTH OF
** LOS VOLCANES
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0050
PIPE DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	.7
.39	.5	1.5
.52	.7	2.8
.65	1.0	4.3
.78	1.3	6.2
.91	1.6	8.2

```
                                    1.04        1.9       10.5
                                    1.17        2.3       13.0
                                    1.30        2.6       15.5
                                    1.43        2.9       18.1
                                    1.56        3.2       20.7
                                    1.69        3.5       23.2
                                    1.82        3.8       25.6
                                    1.95        4.1       27.7
                                    2.08        4.4       29.4
                                    2.21        4.6       30.7
                                    2.35        4.8       31.2
                                    2.50        4.9       31.2
COMPUTE TRAVEL TIME ID=10  REACH=1  NUMBER OF VALLEY SECTIONS=1
                    LENGTH=850 FT  SLOPE=0.0050

                              TRAVEL TIME TABLE
                                        REACH=  1.0

     WATER          AVERAGE        FLOW          TRAVEL
     DEPTH          AREA           RATE          TIME
     FEET           SQ.FT.         CFS           HRS
       .130            .098           .15         .1514
       .261            .271           .66         .0970
       .391            .490          1.54         .0754
       .521            .741          2.76         .0634
       .651           1.017          4.31         .0557
       .782           1.312          6.15         .0503
       .912           1.620          8.24         .0464
      1.042           1.937         10.54         .0434
      1.173           2.261         12.99         .0411
      1.303           2.586         15.55         .0393
      1.433           2.910         18.15         .0379
      1.563           3.229         20.74         .0368
      1.694           3.540         23.24         .0360
      1.824           3.837         25.59         .0354
      1.954           4.117         27.69         .0351
      2.084           4.373         29.44         .0351
      2.215           4.599         30.69         .0354
      2.345           4.783         31.20         .0362
      2.500           4.909         31.20         .0371
ROUTE              ID=10  HYDROGRAPH NO=200.65  INFLOW ID=1  DT=0.0
PRINT HYD          ID=10  CODE=1

                                  PARTIAL HYDROGRAPH   200.65


    RUNOFF VOLUME =     1.12202 INCHES      =      13.1231 ACRE-FEET
    PEAK DISCHARGE RATE =      12.26 CFS  AT   1.600 HOURS   BASIN AREA =    .2193 SQ. MI.


** ROUTE THE FLOW IN THER STREET DOWN AIRPORT ROAD FROM LOS VOLCANES TO THE
** BACK LOT LINE OF LOT 9, TRACT "M"
COMPUTE RATING CURVECID=1  VS NO=1  NUMBER OF SEGS=3
```

MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0048 FLOOD PLAIN SLOPE=0.0048
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.3
100.18	.6	.6
100.23	1.1	1.3
100.27	1.9	2.4
100.32	2.8	4.1
100.37	4.0	6.5
100.41	5.3	9.6
100.46	6.9	13.6
100.50	8.7	18.4
100.55	10.7	24.2
100.60	12.9	32.0
100.64	15.1	41.5
100.69	17.3	52.1
100.73	19.7	63.6
100.78	22.3	76.3
100.82	25.1	90.1
100.87	28.1	105.1

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=850 FT SLOPE=0.0048

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.01	.5039
.092	.126	.09	.3174
.137	.286	.26	.2596
.183	.605	.58	.2462
.229	1.133	1.27	.2110
.275	1.871	2.42	.1824
.321	2.820	4.14	.1608
.366	3.978	6.52	.1442
.412	5.346	9.63	.1311
.458	6.925	13.57	.1205
.504	8.713	18.40	.1118
.549	10.711	24.21	.1045
.595	12.887	31.99	.0951

.641	15.085	41.54	.0857
.687	17.297	52.07	.0784
.733	19.677	63.64	.0730
.778	22.267	76.31	.0689
.824	25.067	90.11	.0657
.870	28.076	105.11	.0631

ROUTE ID=11 HYDROGRAPH NO=200.66 INFLOW ID=3 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 200.66

RUNOFF VOLUME = 1.16744 INCHES = .9526 ACRE-FEET
PEAK DISCHARGE RATE = 13.89 CFS AT 1.650 HOURS BASIN AREA = .0153 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE NORTHERN PART OF TRACT "M" ATRISCO BUSINESS PARK
** LOTS 5 TO 9. AREA = 47.9 ACRES
COMPUTE NM HYD ID=2 HYD=210.1 DA==0.0748 SM
%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.13333
MASS RAINFALL=-1

K = .073396HR TP = .133330HR K/TP RATIO = .550480 SHAPE CONSTANT, N = 7.016026
UNIT PEAK = 234.29 CFS UNIT VOLUME = .9990 B = 522.01 P60 = 1.2500
AREA = .059840 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133827HR TP = .133330HR K/TP RATIO = 1.003728 SHAPE CONSTANT, N = 3.517061
UNIT PEAK = 36.081 CFS UNIT VOLUME = 1.001 B = 321.57 P60 = 1.2500
AREA = .014960 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.10

RUNOFF VOLUME = 1.18860 INCHES = 4.7417 ACRE-FEET
PEAK DISCHARGE RATE = 116.91 CFS AT 1.500 HOURS BASIN AREA = .0748 SQ. MI.

** ROUTE FLOW FROM TRACT "M" LOTS 5 - 9 THRU A THEORETICAL POND WITH A
** MAX. DISCHARGE OF 0.1 CFS PER ACRE. ALLOWABLE RELEASE RATE=4.79 cfs
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=210.11 INFLOW ID=2 CODE=5

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
2.68	2.00	101.0
4.02	4.10	102.0
4.88	6.30	103.0
6.00	7.00	104.0

* * * \

12.25	.46	100.83	1.663	2.23
12.50	.46	100.81	1.628	2.18
12.75	.46	100.80	1.592	2.13
13.00	.45	100.78	1.558	2.09
13.25	.45	100.76	1.524	2.04
13.50	.43	100.75	1.492	2.00
13.75	.43	100.73	1.460	1.96
14.00	.42	100.71	1.429	1.91
14.25	.43	100.70	1.398	1.87
14.50	.42	100.68	1.369	1.83
14.75	.41	100.67	1.340	1.80
15.00	.41	100.66	1.312	1.76
15.25	.40	100.64	1.284	1.72
15.50	.40	100.63	1.257	1.68
15.75	.39	100.62	1.231	1.65
16.00	.39	100.60	1.205	1.62
16.25	.39	100.59	1.180	1.58
16.50	.39	100.58	1.156	1.55
16.75	.37	100.57	1.132	1.52
17.00	.38	100.55	1.109	1.49
17.25	.38	100.54	1.086	1.46
17.50	.36	100.53	1.064	1.43
17.75	.36	100.52	1.042	1.40
18.00	.36	100.51	1.021	1.37
18.25	.37	100.50	1.001	1.34
18.50	.36	100.49	.981	1.31
18.75	.35	100.48	.961	1.29
19.00	.35	100.47	.942	1.26
19.25	.35	100.46	.923	1.24
19.50	.34	100.45	.905	1.21
19.75	.34	100.44	.887	1.19
20.00	.34	100.43	.870	1.17
20.25	.34	100.43	.853	1.14
20.50	.33	100.42	.836	1.12
20.75	.32	100.41	.820	1.10
21.00	.32	100.40	.804	1.08
21.25	.32	100.39	.789	1.06
21.50	.33	100.39	.774	1.04
21.75	.31	100.38	.759	1.02
22.00	.31	100.37	.745	1.00
22.25	.33	100.37	.731	.98
22.50	.29	100.36	.717	.96
22.75	.31	100.35	.704	.94
23.00	.31	100.35	.691	.93
23.25	.31	100.34	.678	.91
23.50	.30	100.33	.666	.89
23.75	.29	100.33	.654	.88
24.00	.28	100.32	.642	.86
24.25	.05	100.31	.628	.84
24.50	.02	100.31	.611	.82
24.75	.00	100.30	.595	.80
25.00	.00	100.29	.579	.78
25.25	.00	100.28	.563	.75
25.50	.00	100.27	.548	.73

25.75	.00	100.27	.533	.71
26.00	.00	100.26	.518	.69
26.25	.00	100.25	.504	.68
26.50	.00	100.25	.490	.66
26.75	.00	100.24	.477	.64
27.00	.00	100.23	.464	.62
27.25	.00	100.23	.451	.60
27.50	.00	100.22	.439	.59
27.75	.00	100.21	.427	.57
28.00	.00	100.21	.415	.56
28.25	.00	100.20	.404	.54
28.50	.00	100.20	.393	.53
28.75	.00	100.19	.382	.51
29.00	.00	100.19	.372	.50
29.25	.00	100.18	.361	.48
29.50	.00	100.18	.352	.47
29.75	.00	100.17	.342	.46

PEAK DISCHARGE = 3.730 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.784
MAXIMUM STORAGE = 3.6460 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 210.11

RUNOFF VOLUME = 1.10498 INCHES = 4.4081 ACRE-FEET
PEAK DISCHARGE RATE = 3.73 CFS AT 2.450 HOURS BASIN AREA = .0748 SQ. MI.

** ADD CONTROLLED DISCHARGE FROM TRACT "M" LOTS 5 - 9 TO THE ROUTED FLOW IN THE
** AIRPORT ROAD STORM DRAIN
ADD HYD ID=10 HYDROGRAPH NO=210.12 ID I=10 ID II=3
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 210.12

RUNOFF VOLUME = 1.11769 INCHES = 17.5312 ACRE-FEET
PEAK DISCHARGE RATE = 15.50 CFS AT 2.050 HOURS BASIN AREA = .2941 SQ. MI.

** COMPUTE A HYDROGRAPH FOR FUTURE PUBLIC STREETS IN TRACT "M"
COMPUTE NM HYD ID=2 HYD=210.2 DA=0.0078 SM
%A=0.0 %B=23.0 %C=0.0 %D=77.0 TP=0.1450
MASS RAINFALL=-1

K = .079025HR TP = .145000HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.799 CFS UNIT VOLUME = .9995 B = 526.28 P60 = 1.2500
AREA = .006006 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

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K =  .154356HR    TP =  .145000HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
UNIT PEAK =  3.7953    CFS   UNIT VOLUME =    .9964       B =   306.75      P60 = 1.2500
AREA =      .001794 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   210.20


RUNOFF VOLUME =     1.14323 INCHES     =        .4756 ACRE-FEET
PEAK DISCHARGE RATE =      11.28 CFS  AT   1.500 HOURS   BASIN AREA =   .0078 SQ. MI.


** ASSUME TWO TYPE DOUBLE "C" INLETS INTERCEPT FLOW FROM THE FUTURE PUBLIC
** STREETS IN TRACT "M" DIVIDE OUT THE APPROXIMATE FLOW INTERCEPTED BY THE
** INLETS  Q10=8cfs  Q100=11cfs
** HYD 210.21 = FLOW TO THE AIRPORT ROAD STORM DRAIN
** HYD 210.22 = FLOW TO REMAIN IN THE STREET
DIVIDE HYD          ID=2  Q=11.00  ID I=3  HYD I=210.21
                                   ID II=6 HYD II=210.22
PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   210.21


RUNOFF VOLUME =     1.14318 INCHES     =        .4744 ACRE-FEET
PEAK DISCHARGE RATE =      11.00 CFS  AT   1.500 HOURS   BASIN AREA =   .0078 SQ. MI.


PRINT HYD           ID=6  CODE=1

                                PARTIAL HYDROGRAPH   210.22


RUNOFF VOLUME =     1.14318 INCHES     =        .0011 ACRE-FEET
PEAK DISCHARGE RATE =        .28 CFS  AT   1.500 HOURS   BASIN AREA =   .0000 SQ. MI.


** ADD THE INTERCEPTED FLOW FROM THE FUTURE STREETS TO THE AIRPORT RD. S.D.
ADD HYD             ID=10  HYDROGRAPH NO=210.23  ID I=10  ID II=3
PRINT HYD           ID=10  CODE=1

                                PARTIAL HYDROGRAPH   210.23


RUNOFF VOLUME =     1.11834 INCHES     =      18.0056 ACRE-FEET
PEAK DISCHARGE RATE =      24.28 CFS  AT   1.550 HOURS   BASIN AREA =   .3019 SQ. MI.
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** COMPUTE HYDROGRAPH FOR AIRPORT RD. FROM THE INTERSECTION OF LOS VOLCANES TO
** THE INTERSECTION WITH THE BACK LOT LINE OF LOT 9 TRACT "M"
COMPUTE NM HYD       ID=2  HYD=210.3  DA==0.0025
                     %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.9930    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.2500
    AREA =       .002025 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .141933HR    TP =   .133330HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   1.0928    CFS   UNIT VOLUME =    .9884       B =   306.75      P60 = 1.2500
    AREA =       .000475 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=2 CODE=1

                                PARTIAL HYDROGRAPH   210.30


    RUNOFF VOLUME =     1.19139 INCHES     =        .1589 ACRE-FEET
    PEAK DISCHARGE RATE =       3.91 CFS  AT   1.500 HOURS   BASIN AREA =   .0025 SQ. MI.


** ADD THE FLOW FROM THE NORTHERN PORTION OF AIRPORT RD. TO THE ROUTED FLOW IN
** THE STREET
ADD HYD              ID=11  HYDROGRAPH NO=210.31  ID I=11  ID II=2
PRINT HYD            ID=11  CODE=1

                                PARTIAL HYDROGRAPH   210.31


    RUNOFF VOLUME =     1.17074 INCHES     =       1.1114 ACRE-FEET
    PEAK DISCHARGE RATE =      15.97 CFS  AT   1.650 HOURS   BASIN AREA =   .0178 SQ. MI.


** COMPUTE A HYDROGRAPH FOR LOT 1, TRACT "A", A.B.P.
** AREA = 7.5 ACRES
COMPUTE NM HYD       ID=2  HYD=210.4  DA==0.0117
                     %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   36.945    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.2500
    AREA =       .009360 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .133460HR    TP =   .133330HR    K/TP RATIO =  1.000974     SHAPE CONSTANT, N =  3.526827
```

UNIT PEAK = 5.6562 CFS UNIT VOLUME = .9986 B = 322.28 P60 = 1.2500
AREA = .002340 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.40

RUNOFF VOLUME = 1.18859 INCHES = .7417 ACRE-FEET
PEAK DISCHARGE RATE = 18.35 CFS AT 1.500 HOURS BASIN AREA = .0117 SQ. MI.

** ROUTE FLOW FROM LOT 1, TRACT "A", A.B.P. THRU A POND TO CONTROL THE
** DISCHARGE TO A MAX. OF 0.1 CFS PER ACRE. ALLOWABLE RELEASE RATE
** = .75 CFS
ROUTE RESERVOIR ID=4 HYDROGRAPH NO=210.41 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
0.42	0.30	101.0
0.63	0.66	102.0
0.76	1.02	103.0
1.00	1.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	4.30	101.62	.525	.55
3.00	.11	101.71	.557	.57
4.00	.03	101.60	.515	.55
5.00	.06	101.48	.474	.52
6.00	.11	101.39	.439	.50
7.00	.10	101.30	.407	.48
8.00	.09	101.21	.376	.46
9.00	.09	101.13	.346	.45
10.00	.08	101.05	.317	.43
11.00	.08	100.96	.288	.40
12.00	.07	100.88	.263	.37
13.00	.07	100.80	.240	.34
14.00	.07	100.73	.219	.31
15.00	.06	100.67	.200	.28
16.00	.06	100.61	.183	.26
17.00	.06	100.56	.168	.23
18.00	.06	100.51	.154	.22
19.00	.05	100.47	.141	.20
20.00	.05	100.43	.130	.18
21.00	.05	100.40	.120	.17
22.00	.05	100.37	.111	.15
23.00	.05	100.34	.102	.14

```
   24.00        .04    100.32       .095       .13
   25.00        .00    100.28       .085       .12
   26.00        .00    100.25       .076       .11
   27.00        .00    100.22       .067       .09
   28.00        .00    100.20       .060       .08
   29.00        .00    100.18       .054       .07
PEAK DISCHARGE =          .578 CFS - PEAK OCCURS AT HOUR    2.45
MAXIMUM WATER SURFACE ELEVATION =      101.752
MAXIMUM STORAGE =          .5706 AC-FT      INCREMENTAL TIME=     .050000HRS

PRINT HYD           ID=4  CODE=1

                        PARTIAL HYDROGRAPH   210.41

   RUNOFF VOLUME =     1.11191 INCHES     =         .6938 ACRE-FEET
   PEAK DISCHARGE RATE =         .58 CFS  AT   2.450 HOURS   BASIN AREA =    .0117 SQ. MI.


** ADD THE CONTROLLED FLOW FROM LOT 1, TRACT "A", A.B.P. TO THE STORM DRAIN AT
** THE INTERSECTION OF THE BACK LOT LINE OF LOT 9, TRACT "M" AND AIRPORT RD.
ADD HYD             ID=13  HYDROGRAPH NO=210.42  ID I=10  ID II=4
PRINT HYD           ID=13  CODE=1

                        PARTIAL HYDROGRAPH   210.42

   RUNOFF VOLUME =     1.11810 INCHES     =       18.6994 ACRE-FEET
   PEAK DISCHARGE RATE =       24.64 CFS  AT   1.550 HOURS   BASIN AREA =    .3136 SQ. MI.


** ADD THE FLOW FROM THE FUTURE STREETS IN TRACT "M" THAT BYPASSES THE INLETS
** TO THE ROUTED FLOW IN THE STREET AT THE INTERSECTION OF THE BACK LOT
** LOT LINE OF LOT 9, TRACT "M" AND AIRPORT ROAD
ADD HYD             ID=12  HYDROGRAPH NO=210.43  ID I=6  ID II=11
PRINT HYD           ID=12  CODE=1

                        PARTIAL HYDROGRAPH   210.43

   RUNOFF VOLUME =     1.17071 INCHES     =        1.1126 ACRE-FEET
   PEAK DISCHARGE RATE =       15.97 CFS  AT   1.650 HOURS   BASIN AREA =    .0178 SQ. MI.


** ROUTE FLOW IN A STORM DRAIN FROM THE INTERSECTION OF THE BACK LOT LINE
** OF LOT 9, TRACT "M" AND AIRPORT ROAD
** DOWN AIRPORT RD. TO A THE INTERSECTION WITH BLUEWATER ROAD
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.0048
                    PIPE DIA=3.0  N=0.013

                        RATING CURVE PIPE SECTION  1.0
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WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.16	.1	.2
.31	.4	1.1
.47	.7	2.4
.63	1.1	4.4
.78	1.5	6.9
.94	1.9	9.8
1.09	2.3	13.1
1.25	2.8	16.8
1.41	3.3	20.7
1.56	3.7	24.8
1.72	4.2	28.9
1.88	4.7	33.0
2.03	5.1	37.0
2.19	5.5	40.8
2.35	5.9	44.1
2.50	6.3	46.9
2.66	6.6	48.9
2.81	6.9	49.7
3.00	7.1	49.7

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=850 FT SLOPE=0.0048

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.156	.140	.24	.1369
.313	.391	1.05	.0877
.469	.706	2.45	.0681
.625	1.068	4.40	.0573
.782	1.465	6.87	.0503
.938	1.889	9.80	.0455
1.094	2.332	13.13	.0419
1.251	2.790	16.79	.0392
1.407	3.255	20.70	.0371
1.563	3.724	24.77	.0355
1.720	4.191	28.92	.0342
1.876	4.650	33.04	.0332
2.032	5.097	37.03	.0325
2.189	5.525	40.77	.0320
2.345	5.928	44.12	.0317
2.501	6.297	46.90	.0317
2.658	6.622	48.89	.0320
2.814	6.887	49.71	.0327
3.000	7.069	49.71	.0336

ROUTE ID=10 HYDROGRAPH NO=210.46 INFLOW ID=13 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 210.46

RUNOFF VOLUME = 1.11745 INCHES = 18.6885 ACRE-FEET
PEAK DISCHARGE RATE = 24.22 CFS AT 1.600 HOURS BASIN AREA = .3136 SQ. MI.

** ROUTE THE FLOW IN THE STREET DOWN AIRPORT ROAD FROM THE BACK LOT LINE OF LOT
** OF LOT 9 TRACT "M" TO THE INTERSECTION WITH BLUEWATER ROAD
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0048 FLOOD PLAIN SLOPE=0.0048
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.3
100.18	.6	.6
100.23	1.1	1.3
100.27	1.9	2.4
100.32	2.8	4.1
100.37	4.0	6.5
100.41	5.3	9.6
100.46	6.9	13.6
100.50	8.7	18.4
100.55	10.7	24.2
100.60	12.9	32.0
100.64	15.1	41.5
100.69	17.3	52.1
100.73	19.7	63.6
100.78	22.3	76.3
100.82	25.1	90.1
100.87	28.1	105.1

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=850 FT SLOPE=0.0048

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.01	.5039
.092	.126	.09	.3174

.137	.286	.26	.2596
.183	.605	.58	.2462
.229	1.133	1.27	.2110
.275	1.871	2.42	.1824
.321	2.820	4.14	.1608
.366	3.978	6.52	.1442
.412	5.346	9.63	.1311
.458	6.925	13.57	.1205
.504	8.713	18.40	.1118
.549	10.711	24.21	.1045
.595	12.887	31.99	.0951
.641	15.085	41.54	.0857
.687	17.297	52.07	.0784
.733	19.677	63.64	.0730
.778	22.267	76.31	.0689
.824	25.067	90.11	.0657
.870	28.076	105.11	.0631

ROUTE ID=11 HYDROGRAPH NO=210.47 INFLOW ID=12 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 210.47

RUNOFF VOLUME = 1.17074 INCHES = 1.1126 ACRE-FEET
PEAK DISCHARGE RATE = 14.24 CFS AT 1.750 HOURS BASIN AREA = .0178 SQ. MI.

** COMPUTE HYDROGRAPH FOR AIRPORT RD. FROM THE INTERSECTION WITH THE BACK
** LOT LINE OF LOT 9 TRACT "M" TO THE INTERSECTION WITH BLUEWATER ROAD
COMPUTE NM HYD ID=2 HYD=210.5 DA==0.0024
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 7.6733 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.2500
AREA = .001944 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141933HR TP = .133330HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 1.0491 CFS UNIT VOLUME = .9869 B = 306.75 P60 = 1.2500
AREA = .000456 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.50

RUNOFF VOLUME = 1.19139 INCHES = .1525 ACRE-FEET
PEAK DISCHARGE RATE = 3.75 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

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** ADD THE ROUTED FLOW IN THE STREET TO THE FLOW FROM THE SOUTHERN SEGMENT OF
** AIRPORT ROAD AT THE INTERSECTION AIRPORT ROAD AND BLUEWATER
ADD HYD             ID=11  HYDROGRAPH NO=210.51  ID I=2  ID II=11
PRINT HYD           ID=11  CODE=1

                                PARTIAL HYDROGRAPH   210.51


    RUNOFF VOLUME =     1.17314 INCHES     =       1.2650 ACRE-FEET
    PEAK DISCHARGE RATE =      15.70 CFS  AT   1.750 HOURS   BASIN AREA =   .0202 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE SOUTHERN PART OF TRACT "M" ATRISCO BUSINESS PARK
* LOTS 1 TO 4 AND TRACT "L-1".  AREA = 44.8 ACRES
COMPUTE NM HYD      ID=3  HYD=210.6  DA==0.0700 SM
                    %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .073110HR    TP =   .133330HR    K/TP RATIO =   .548342     SHAPE CONSTANT, N =  7.051042
    UNIT PEAK =   219.95    CFS   UNIT VOLUME =    .9991       B =   523.67      P60 = 1.2500
    AREA =      .056000 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .133684HR    TP =   .133330HR    K/TP RATIO =  1.002653     SHAPE CONSTANT, N =  3.520870
    UNIT PEAK =   33.795    CFS   UNIT VOLUME =    1.001       B =   321.85      P60 = 1.2500
    AREA =      .014000 SQ MI    IA =    .46250 INCHES    INF =   1.14500 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=3 CODE=1

                                PARTIAL HYDROGRAPH   210.60


    RUNOFF VOLUME =     1.18859 INCHES     =       4.4374 ACRE-FEET
    PEAK DISCHARGE RATE =     109.55 CFS  AT   1.500 HOURS   BASIN AREA =   .0700 SQ. MI.


** ROUTE FLOW FROM TRACT "M" LOTS 1 - 4  AND TRACT "L-1" THRU A POND WITH A
** MAX. DISCHARGE OF 0.1 CFS PER ACRE. ALLOWABLE RELEASE RATE=4.48 cfs
ROUTE RESERVOIR     ID=4  HYDROGRAPH NO=210.61  INFLOW ID=3  CODE=20
                    OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                         0             0            100.0
                         2.5           1.60         101.0
                         3.75          3.70         102.0
                         4.50          5.80         103.0
                         6.00          8.00         104.0

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

     TIME       INFLOW    ELEV      VOLUME    OUTFLOW
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(HRS)	(CFS)	(FEET)	(AC-FT)	(CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	25.75	101.73	3.130	3.41
3.00	.64	101.82	3.314	3.52
4.00	.19	101.69	3.054	3.37
5.00	.37	101.57	2.804	3.22
6.00	.68	101.47	2.588	3.09
7.00	.59	101.38	2.389	2.97
8.00	.55	101.28	2.196	2.85
9.00	.51	101.19	2.009	2.74
10.00	.49	101.11	1.828	2.64
11.00	.46	101.03	1.654	2.53
12.00	.44	100.93	1.489	2.33
13.00	.42	100.84	1.342	2.10
14.00	.40	100.76	1.211	1.89
15.00	.39	100.68	1.094	1.71
16.00	.36	100.62	.991	1.55
17.00	.36	100.56	.899	1.40
18.00	.33	100.51	.816	1.28
19.00	.33	100.46	.743	1.16
20.00	.32	100.42	.678	1.06
21.00	.30	100.39	.620	.97
22.00	.29	100.35	.568	.89
23.00	.29	100.33	.521	.81
24.00	.27	100.30	.480	.75
25.00	.00	100.27	.425	.66
26.00	.00	100.23	.374	.58
27.00	.00	100.21	.329	.51
28.00	.00	100.18	.289	.45
29.00	.00	100.16	.254	.40

PEAK DISCHARGE = 3.572 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.858
MAXIMUM STORAGE = 3.4014 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 210.61

RUNOFF VOLUME = 1.12866 INCHES = 4.2136 ACRE-FEET
PEAK DISCHARGE RATE = 3.57 CFS AT 2.450 HOURS BASIN AREA = .0700 SQ. MI.

** ADD THE ROUTED FLOW IN THE AIRPORT ROAD STORM DRAIN TO THE CONTROLLED FLOW
** FROM THE SOUTHERN PART OF TRACT "M" AT THE WEST INTERSECTION OF BLUEWATER
** AND AIRPORT ROAD
ADD HYD ID=10 HYDROGRAPH NO=210.62 ID I=4 ID II=10
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 210.62

RUNOFF VOLUME = 1.11950 INCHES = 22.9022 ACRE-FEET
PEAK DISCHARGE RATE = 26.88 CFS AT 1.600 HOURS BASIN AREA = .3836 SQ. MI.

** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM THE INTERSECTION OF UNSER BLVD. TO
** 1050 LF WEST OF THE INTERSECTION WITH AIRPORT ROAD
COMPUTE NM HYD ID=2 HYD=210.7 DA==0.0033
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 10.551 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.2500
AREA = .002673 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141933HR TP = .133330HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 1.4425 CFS UNIT VOLUME = .9908 B = 306.75 P60 = 1.2500
AREA = .000627 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.70

RUNOFF VOLUME = 1.19139 INCHES = .2097 ACRE-FEET
PEAK DISCHARGE RATE = 5.15 CFS AT 1.500 HOURS BASIN AREA = .0033 SQ. MI.

** ROUTE FLOW FROM WESTERN PORTION OF BLUEWATER RD.DOWN THE STREET FROM 1050 LF
** WEST OF AIRPORT ROAD TO THE INTERSECTION WITH AIRPORT ROAD
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0030 FLOOD PLAIN SLOPE=0.0030
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.2
100.18	.6	.5
100.23	1.1	1.0

100.27	1.9	1.9
100.32	2.8	3.3
100.37	4.0	5.2
100.41	5.3	7.6
100.46	6.9	10.7
100.50	8.7	14.5
100.55	10.7	19.1
100.60	12.9	25.3
100.64	15.1	32.8
100.69	17.3	41.2
100.73	19.7	50.3
100.78	22.3	60.3
100.82	25.1	71.2
100.87	28.1	83.1

COMPUTE TRAVEL TIME ID=12 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1050 FT SLOPE=0.0030

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.01	.7873
.092	.126	.07	.4960
.137	.286	.21	.4057
.183	.605	.46	.3846
.229	1.133	1.00	.3297
.275	1.871	1.91	.2850
.321	2.820	3.27	.2512
.366	3.978	5.15	.2252
.412	5.346	7.61	.2048
.458	6.925	10.73	.1883
.504	8.713	14.55	.1747
.549	10.711	19.14	.1632
.595	12.887	25.29	.1486
.641	15.085	32.84	.1340
.687	17.297	41.16	.1226
.733	19.677	50.31	.1141
.778	22.267	60.33	.1077
.824	25.067	71.24	.1026
.870	28.076	83.09	.0985

ROUTE ID=12 HYDROGRAPH NO=210.71 INFLOW ID=2 DT=0.0
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 210.71

RUNOFF VOLUME = 1.19151 INCHES = .2097 ACRE-FEET
PEAK DISCHARGE RATE = 2.76 CFS AT 1.600 HOURS BASIN AREA = .0033 SQ. MI.

** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM 1050 LF WEST OF AIRPORT TO THE

```
** WEST INTERSECTION WITH AIRPORT ROAD
COMPUTE NM HYD       ID=3  HYD=210.8  DA==0.0028
                     %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.9522   CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.2500
    AREA =      .002268 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .141933HR    TP =   .133330HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   1.2240    CFS   UNIT VOLUME =    .9897       B =   306.75      P60 = 1.2500
    AREA =      .000532 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=3 CODE=1

                              PARTIAL HYDROGRAPH   210.80

    RUNOFF VOLUME =     1.19139 INCHES     =        .1779 ACRE-FEET
    PEAK DISCHARGE RATE =       4.38 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


** ADD THE ROUTED FLOW FROM THE BLUEWATER RD.TO THE FLOW FROM THE EASTERN
** SEGMENT OF BLUEWATER AT THE INTERSECTION OF AIRPORT AND  BLUEWATER
ADD HYD              ID=12  HYDROGRAPH NO=210.81  ID I=3  ID II=12
PRINT HYD            ID=12  CODE=1

                              PARTIAL HYDROGRAPH   210.81

    RUNOFF VOLUME =     1.19121 INCHES     =        .3875 ACRE-FEET
    PEAK DISCHARGE RATE =       6.34 CFS  AT   1.550 HOURS   BASIN AREA =   .0061 SQ. MI.


** COMPUTE HYDROGRAPH FOR BLUEWATER RD. FROM THE INTERSECTION WITH AIRPORT
** ROAD TO THE GRADE BREAK EAST OF THE INTERSECTION WITH AIRPORT DRIVE
COMPUTE NM HYD       ID=2  HYD=210.9  DA==0.0017
                     %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.4352    CFS   UNIT VOLUME =    .9971       B =   526.28      P60 = 1.2500
    AREA =      .001377 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .141933HR    TP =   .133330HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   .74312    CFS   UNIT VOLUME =    .9814       B =   306.75      P60 = 1.2500
    AREA =      .000323 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
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RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 210.90

RUNOFF VOLUME = 1.19139 INCHES = .1080 ACRE-FEET
PEAK DISCHARGE RATE = 2.66 CFS AT 1.500 HOURS BASIN AREA = .0017 SQ. MI.

** ADD THE FLOW FROM THE FAR EAST SEGMENT OF BLUEWATER RD TO THE BLUEWATER
** FLOW FROM THE WEST AT THE INTERSECTION OF AIRPORT AND BLUEWATER
ADD HYD ID=12 HYDROGRAPH NO=210.91 ID I=12 ID II=2
PRINT HYD ID=12 CODE=1

PARTIAL HYDROGRAPH 210.91

RUNOFF VOLUME = 1.19121 INCHES = .4955 ACRE-FEET
PEAK DISCHARGE RATE = 8.93 CFS AT 1.500 HOURS BASIN AREA = .0078 SQ. MI.

** ADD THE FLOW FROM BLUEWATER RD TO THE FLOW IN THE STREET AT THE
** INTERSECTION OF AIRPORT ROAD AND BLUEWATER ROAD
ADD HYD ID=11 HYDROGRAPH NO=210.92 ID I=12 ID II=11
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 210.92

RUNOFF VOLUME = 1.17817 INCHES = 1.7606 ACRE-FEET
PEAK DISCHARGE RATE = 21.22 CFS AT 1.700 HOURS BASIN AREA = .0280 SQ. MI.

** ADD THE TOTAL FLOW IN THE STREET TO THE STORM DRAIN FLOW AT THE INTERSECTION
** OF BLUEWATER ROAD AND AIRPORT ROAD
ADD HYD ID=10 HYDROGRAPH NO=210.93 ID I=11 ID II=10
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 210.93

RUNOFF VOLUME = 1.12349 INCHES = 24.6627 ACRE-FEET
PEAK DISCHARGE RATE = 47.22 CFS AT 1.600 HOURS BASIN AREA = .4116 SQ. MI.

** COMPUTE A HYDROGRAPH FOR LOT 2, TRACT "A", A.B.P.
** AREA = 7.5 ACRES
COMPUTE NM HYD ID=2 HYD=211.10 DA==0.0117

%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 36.945 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.2500
AREA = .009360 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133460HR TP = .133330HR K/TP RATIO = 1.000974 SHAPE CONSTANT, N = 3.526827
UNIT PEAK = 5.6562 CFS UNIT VOLUME = .9986 B = 322.28 P60 = 1.2500
AREA = .002340 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 211.10

RUNOFF VOLUME = 1.18859 INCHES = .7417 ACRE-FEET
PEAK DISCHARGE RATE = 18.35 CFS AT 1.500 HOURS BASIN AREA = .0117 SQ. MI.

** ROUTE FLOW FROM LOT 2, TRACT "A", A.B.P. THRU A POND TO CONTROL THE
** DISCHARGE TO A MAX. OF 0.1 CFS PER ACRE. ALLOWABLE RELEASE RATE
** = .75 CFS
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=211.11 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
0.42	0.28	101.0
0.60	0.64	102.0
0.75	0.98	103.0
1.00	1.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	4.30	101.68	.524	.54
3.00	.11	101.77	.558	.56
4.00	.03	101.66	.516	.54
5.00	.06	101.54	.476	.52
6.00	.11	101.45	.441	.50
7.00	.10	101.36	.409	.48
8.00	.09	101.27	.378	.47
9.00	.09	101.19	.347	.45
10.00	.08	101.10	.317	.44
11.00	.08	101.02	.288	.42
12.00	.07	100.93	.260	.39
13.00	.07	100.84	.236	.35

14.00	.07	100.76	.213	.32
15.00	.06	100.69	.194	.29
16.00	.06	100.63	.176	.26
17.00	.06	100.57	.160	.24
18.00	.06	100.52	.146	.22
19.00	.05	100.48	.133	.20
20.00	.05	100.43	.122	.18
21.00	.05	100.40	.112	.17
22.00	.05	100.37	.102	.15
23.00	.05	100.34	.094	.14
24.00	.04	100.31	.087	.13
25.00	.00	100.28	.077	.12
26.00	.00	100.24	.068	.10
27.00	.00	100.22	.060	.09
28.00	.00	100.19	.053	.08
29.00	.00	100.17	.047	.07

PEAK DISCHARGE = .565 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.808
MAXIMUM STORAGE = .5708 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 211.11

RUNOFF VOLUME = 1.12165 INCHES = .6999 ACRE-FEET
PEAK DISCHARGE RATE = .57 CFS AT 2.450 HOURS BASIN AREA = .0117 SQ. MI.

** ADD THE CONTROLLED FLOW FROM LOT 2, TRACT "A", A.B.P. TO THE TOTAL FLOW IN
** THE STORM DRAIN AT THE INTERSECTION OF BLUEWATER RD.AND AIRPORT RD.
ADD HYD ID=11 HYDROGRAPH NO=211.12 ID I=3 ID II=10
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 211.12

RUNOFF VOLUME = 1.12344 INCHES = 25.3626 ACRE-FEET
PEAK DISCHARGE RATE = 47.66 CFS AT 1.600 HOURS BASIN AREA = .4233 SQ. MI.

** ROUTE FLOW IN A STORM DRAIN FROM THE INTERSECTION OF BLUEWATER AND AIRPORT
** DOWN AIRPORT RD. TO THE SOUTH LINE OF ATRISCO BUSINESS PARK
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0027
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.4

.42	.7	1.7
.63	1.3	4.0
.83	1.9	7.1
1.04	2.6	11.1
1.25	3.4	15.8
1.46	4.1	21.2
1.67	5.0	27.1
1.88	5.8	33.4
2.08	6.6	40.0
2.29	7.5	46.7
2.50	8.3	53.4
2.71	9.1	59.8
2.92	9.8	65.9
3.13	10.5	71.3
3.34	11.2	75.8
3.54	11.8	79.0
3.75	12.2	80.3
4.00	12.6	80.3

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1850 FT SLOPE=0.0027

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.39	.3279
.417	.695	1.70	.2101
.625	1.255	3.95	.1632
.834	1.898	7.11	.1373
1.042	2.604	11.10	.1206
1.251	3.358	15.83	.1090
1.459	4.146	21.21	.1005
1.668	4.960	27.12	.0940
1.876	5.788	33.43	.0890
2.084	6.621	40.01	.0850
2.293	7.451	46.71	.0820
2.501	8.267	53.37	.0796
2.710	9.062	59.81	.0779
2.918	9.823	65.85	.0767
3.127	10.539	71.26	.0760
3.335	11.195	75.75	.0759
3.544	11.773	78.97	.0766
3.752	12.243	80.29	.0784
4.000	12.566	80.29	.0804

ROUTE ID=10 HYDROGRAPH NO=211.13 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 211.13

RUNOFF VOLUME = 1.12187 INCHES = 25.3273 ACRE-FEET
PEAK DISCHARGE RATE = 44.98 CFS AT 1.700 HOURS BASIN AREA = .4233 SQ. MI.

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**********************************************************************************************
*S BEGIN THE AREA SOUTH OF BLUEWATER ROAD
**********************************************************************************************
** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF BLUEWATER TO THE SOUTH LINE OF
** THE ATRISCO BUSINESS PARK
COMPUTE NM HYD       ID=2  HYD=220.1 DA==0.0035
                     %A=0.0  %B=19.0  %C=0.0  %D=81.0  TP=0.1333
                     MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   11.193    CFS   UNIT VOLUME =    .9981       B =   526.28      P60 = 1.2500
    AREA =       .002835 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

    K =   .141901HR    TP =   .133300HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   1.5303    CFS   UNIT VOLUME =    .9908       B =   306.75      P60 = 1.2500
    AREA =       .000665 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=2 CODE=1

                                  PARTIAL HYDROGRAPH   220.10


    RUNOFF VOLUME =     1.19139 INCHES      =         .2224 ACRE-FEET
    PEAK DISCHARGE RATE =       5.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0035 SQ. MI.



** COMPUTE HYDROGRAPH FOR TRACT B, UNIT 2, A.B.P. AREA = 20.0 ACRES
COMPUTE NM HYD       ID=3  HYD=220.2  DA==0.0313
                     %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   98.837    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.2500
    AREA =       .025040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .133460HR    TP =   .133330HR    K/TP RATIO =  1.000974     SHAPE CONSTANT, N =  3.526827
    UNIT PEAK =   15.132    CFS   UNIT VOLUME =   1.000       B =   322.28      P60 = 1.2500
    AREA =       .006260 SQ MI    IA =    .46250 INCHES    INF =   1.14500 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=3 CODE=1

                                  PARTIAL HYDROGRAPH   220.20
```

RUNOFF VOLUME = 1.18860 INCHES = 1.9841 ACRE-FEET
PEAK DISCHARGE RATE = 49.09 CFS AT 1.500 HOURS BASIN AREA = .0313 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=2.0cfs
ROUTE RESERVOIR ID=4 HYDROGRAPH NO=220.21 INFLOW ID=3 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
1.12	0.80	101.0
1.68	1.70	102.0
2.04	2.60	103.0
4.00	3.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	11.50	101.67	1.403	1.50
3.00	.29	101.76	1.487	1.55
4.00	.09	101.64	1.373	1.48
5.00	.17	101.51	1.263	1.41
6.00	.31	101.41	1.169	1.35
7.00	.27	101.31	1.083	1.30
8.00	.25	101.22	.999	1.24
9.00	.23	101.13	.918	1.19
10.00	.22	101.04	.840	1.14
11.00	.21	100.96	.765	1.07
12.00	.19	100.87	.698	.98
13.00	.19	100.80	.636	.89
14.00	.18	100.73	.581	.81
15.00	.17	100.66	.531	.74
16.00	.16	100.61	.486	.68
17.00	.16	100.56	.446	.62
18.00	.15	100.51	.409	.57
19.00	.15	100.47	.376	.53
20.00	.14	100.43	.346	.48
21.00	.14	100.40	.319	.45
22.00	.13	100.37	.294	.41
23.00	.13	100.34	.272	.38
24.00	.12	100.32	.252	.35
25.00	.00	100.28	.226	.32
26.00	.00	100.25	.202	.28
27.00	.00	100.22	.180	.25
28.00	.00	100.20	.160	.22
29.00	.00	100.18	.142	.20

PEAK DISCHARGE = 1.571 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.805
MAXIMUM STORAGE = 1.5248 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 220.21

RUNOFF VOLUME = 1.11233 INCHES = 1.8568 ACRE-FEET
PEAK DISCHARGE RATE = 1.57 CFS AT 2.450 HOURS BASIN AREA = .0313 SQ. MI.

** ROUTE FLOW IN A STORM DRAIN FROM THE TRACT "B", UNIT 2 POND TO THE AIRPORT
** ROAD STORM DRAIN
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.007
PIPE DIA=1.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.08	.0	.0
.16	.1	.2
.23	.2	.5
.31	.3	.8
.39	.4	1.3
.47	.5	1.9
.55	.6	2.5
.63	.7	3.2
.70	.8	3.9
.78	.9	4.7
.86	1.0	5.5
.94	1.2	6.3
1.02	1.3	7.0
1.09	1.4	7.8
1.17	1.5	8.4
1.25	1.6	8.9
1.33	1.7	9.3
1.41	1.7	9.5
1.50	1.8	9.5

COMPUTE TRAVEL TIME ID=5 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1100 FT SLOPE=0.007

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.078	.035	.05	.2328
.156	.098	.20	.1492
.235	.176	.47	.1159
.313	.267	.84	.0975
.391	.366	1.31	.0856
.469	.472	1.86	.0774

.547	.583	2.50	.0713
.625	.697	3.19	.0667
.704	.814	3.94	.0632
.782	.931	4.71	.0604
.860	1.048	5.50	.0582
.938	1.163	6.28	.0565
1.016	1.274	7.04	.0553
1.094	1.381	7.75	.0544
1.173	1.482	8.39	.0540
1.251	1.574	8.92	.0539
1.329	1.656	9.30	.0544
1.407	1.722	9.45	.0556
1.500	1.767	9.45	.0571

```
ROUTE          ID=5  HYDROGRAPH NO=220.22  INFLOW ID=4  DT=0.0
PRINT HYD      ID=5  CODE=1
```

PARTIAL HYDROGRAPH 220.22

RUNOFF VOLUME = 1.11092 INCHES = 1.8545 ACRE-FEET
PEAK DISCHARGE RATE = 1.57 CFS AT 2.500 HOURS BASIN AREA = .0313 SQ. MI.

```
** ADD THE ROUTED FLOW FROM PARCEL "B", UNIT 2 TO THE FLOW FROM AIRPORT ROAD
ADD HYD        ID=3  HYDROGRAPH NO=220.23  ID I=2 ID= II=5
PRINT HYD      ID=3  CODE=1
```

PARTIAL HYDROGRAPH 220.23

RUNOFF VOLUME = 1.11900 INCHES = 2.0769 ACRE-FEET
PEAK DISCHARGE RATE = 5.76 CFS AT 1.500 HOURS BASIN AREA = .0348 SQ. MI.

```
** COMPUTE HYDROGRAPH FOR PARCEL "C", UNIT 2, A.B.P. AREA = 28.6 ACRES
COMPUTE NM HYD     ID=2  HYD=220.3   DA==0.0447
                   %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                   MASS RAINFALL=-1
```

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 141.15 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.2500
AREA = .035760 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133460HR TP = .133330HR K/TP RATIO = 1.000974 SHAPE CONSTANT, N = 3.526827
UNIT PEAK = 21.610 CFS UNIT VOLUME = 1.000 B = 322.28 P60 = 1.2500
AREA = .008940 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
PRINT HYD      ID=2 CODE=1
```

PARTIAL HYDROGRAPH 220.30

RUNOFF VOLUME = 1.18859 INCHES = 2.8336 ACRE-FEET
PEAK DISCHARGE RATE = 70.10 CFS AT 1.500 HOURS BASIN AREA = .0447 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=2.86 cfs
ROUTE RESERVOIR ID=4 HYDROGRAPH NO=220.31 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
1.60	1.20	101.0
2.40	2.40	102.0
2.90	3.70	103.0
3.50	5.00	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	16.42	101.67	2.005	2.14
3.00	.41	101.77	2.124	2.22
4.00	.12	101.63	1.961	2.11
5.00	.24	101.50	1.805	2.00
6.00	.44	101.39	1.671	1.91
7.00	.38	101.29	1.549	1.83
8.00	.35	101.19	1.431	1.75
9.00	.33	101.10	1.318	1.68
10.00	.31	101.01	1.209	1.61
11.00	.30	100.92	1.106	1.48
12.00	.28	100.84	1.013	1.35
13.00	.27	100.77	.929	1.24
14.00	.25	100.71	.852	1.14
15.00	.25	100.65	.783	1.04
16.00	.23	100.60	.720	.96
17.00	.23	100.55	.663	.88
18.00	.21	100.51	.611	.81
19.00	.21	100.47	.564	.75
20.00	.20	100.43	.521	.69
21.00	.19	100.40	.482	.64
22.00	.18	100.37	.446	.60
23.00	.18	100.35	.414	.55
24.00	.17	100.32	.385	.51
25.00	.00	100.29	.347	.46
26.00	.00	100.26	.311	.41
27.00	.00	100.23	.279	.37
28.00	.00	100.21	.249	.33
29.00	.00	100.19	.223	.30

PEAK DISCHARGE = 2.252 CFS - PEAK OCCURS AT HOUR 2.45

MAXIMUM WATER SURFACE ELEVATION = 101.815
MAXIMUM STORAGE = 2.1785 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 220.31

RUNOFF VOLUME = 1.10441 INCHES = 2.6329 ACRE-FEET
PEAK DISCHARGE RATE = 2.25 CFS AT 2.450 HOURS BASIN AREA = .0447 SQ. MI.

** ADD THE CONTROLLED FLOW FROM TRACT "C", UNIT 2 TO THE TOTAL FLOW IN AIRPORT
** ROAD AT THE SOUTH LINE OF THE ATRISCO BUSINESS PARK
ADD HYD ID=2 HYDROGRAPH NO=220.32 ID I=3 ID= II=4
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.32

RUNOFF VOLUME = 1.11080 INCHES = 4.7098 ACRE-FEET
PEAK DISCHARGE RATE = 6.71 CFS AT 1.500 HOURS BASIN AREA = .0795 SQ. MI.

** COMPUTE HYDROGRAPH FOR FUTURE STREETS IN PARCEL "C"
COMPUTE NM HYD ID=4 HYD=220.40 DA==0.0018
%A=0.0 %B=23.0 %C=0.0 %D=77.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.4708 CFS UNIT VOLUME = .9971 B = 526.28 P60 = 1.2500
AREA = .001386 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141933HR TP = .133330HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = .95249 CFS UNIT VOLUME = .9853 B = 306.75 P60 = 1.2500
AREA = .000414 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 220.40

RUNOFF VOLUME = 1.14323 INCHES = .1097 ACRE-FEET
PEAK DISCHARGE RATE = 2.72 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

** ADD THE FLOW FROM FUTURE STREETS IN PARCEL "C" TO THE TOTAL FLOW IN AIRPORT
** ROAD AT THE SOUTH LINE OF THE ATRISCO BUSINESS PARK

```
ADD HYD              ID=1  HYDROGRAPH NO=220.41  ID I=2 ID= II=4
PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   220.41


    RUNOFF VOLUME =     1.11151 INCHES     =       4.8195 ACRE-FEET
    PEAK DISCHARGE RATE =       9.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0813 SQ. MI.


** COMPUTE HYDROGRAPH FOR TRACT "B", UNIT 1, A.B.P. AREA = 20.0 ACRES
COMPUTE NM HYD       ID=3  HYD=220.50   DA==0.0313
                     %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.13333
                     MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   98.837    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.2500
    AREA =      .025040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .133460HR    TP =   .133330HR    K/TP RATIO = 1.000974     SHAPE CONSTANT, N =  3.526827
    UNIT PEAK =   15.132    CFS   UNIT VOLUME =    1.000       B =   322.28      P60 = 1.2500
    AREA =      .006260 SQ MI    IA =    .46250 INCHES    INF =   1.14500 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=3 CODE=1

                                PARTIAL HYDROGRAPH   220.50


    RUNOFF VOLUME =     1.18860 INCHES     =       1.9841 ACRE-FEET
    PEAK DISCHARGE RATE =      49.09 CFS  AT   1.500 HOURS   BASIN AREA =   .0313 SQ. MI.


** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=2.00 cfs
ROUTE RESERVOIR      ID=4  HYDROGRAPH NO=220.51  INFLOW ID=3  CODE=20
                     OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                          0             0              100.0
                          1.12          0.80           101.0
                          1.68          1.70           102.0
                          2.04          2.60           103.0
                          4.00          3.50           104.0

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

    TIME       INFLOW     ELEV       VOLUME     OUTFLOW
    (HRS)      (CFS)      (FEET)     (AC-FT)    (CFS)

      .00         .00    100.00        .000         .00
     1.00         .00    100.00        .000         .00
```

2.00	11.50	101.67	1.403	1.50
3.00	.29	101.76	1.487	1.55
4.00	.09	101.64	1.373	1.48
5.00	.17	101.51	1.263	1.41
6.00	.31	101.41	1.169	1.35
7.00	.27	101.31	1.083	1.30
8.00	.25	101.22	.999	1.24
9.00	.23	101.13	.918	1.19
10.00	.22	101.04	.840	1.14
11.00	.21	100.96	.765	1.07
12.00	.19	100.87	.698	.98
13.00	.19	100.80	.636	.89
14.00	.18	100.73	.581	.81
15.00	.17	100.66	.531	.74
16.00	.16	100.61	.486	.68
17.00	.16	100.56	.446	.62
18.00	.15	100.51	.409	.57
19.00	.15	100.47	.376	.53
20.00	.14	100.43	.346	.48
21.00	.14	100.40	.319	.45
22.00	.13	100.37	.294	.41
23.00	.13	100.34	.272	.38
24.00	.12	100.32	.252	.35
25.00	.00	100.28	.226	.32
26.00	.00	100.25	.202	.28
27.00	.00	100.22	.180	.25
28.00	.00	100.20	.160	.22
29.00	.00	100.18	.142	.20

PEAK DISCHARGE = 1.571 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.805
MAXIMUM STORAGE = 1.5248 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 220.51

RUNOFF VOLUME = 1.11233 INCHES = 1.8568 ACRE-FEET
PEAK DISCHARGE RATE = 1.57 CFS AT 2.450 HOURS BASIN AREA = .0313 SQ. MI.

** ADD THE CONTROLLED FLOW FROM TRACT "B", UNIT 1 TO THE TOTAL FLOW IN AIRPORT
** ROAD AT THE SOUTH LINE OF THE ATRISCO BUSINESS PARK
ADD HYD ID=3 HYDROGRAPH NO=220.52 ID I=4 ID= II=1
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 220.52

RUNOFF VOLUME = 1.11174 INCHES = 6.6763 ACRE-FEET
PEAK DISCHARGE RATE = 10.12 CFS AT 1.500 HOURS BASIN AREA = .1126 SQ. MI.

** ADD THE ROUTED FLOW FROM THE NORTH IN THE AIRPORT ROAD STORM DRAIN TO THE
** TOTAL FLOW IN AIRPORT ROAD AT THE SOUTH LINE OF THE ATRISCO BUSINESS PARK
ADD HYD ID=2 HYDROGRAPH NO=220.53 ID I=10 ID= II=3
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.53

RUNOFF VOLUME = 1.11975 INCHES = 32.0036 ACRE-FEET
PEAK DISCHARGE RATE = 52.83 CFS AT 1.700 HOURS BASIN AREA = .5359 SQ. MI.

** ROUTE FLOW IN A STORM DRAIN FROM THE SOUTH LINE OF THE BUSINESS PARK
** TO AIRPORT RD STORM DRAIN STA 28+80 THE JUNCTION WITH FLOW FROM THE
** WEST 66 ADDITION
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0040
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.5
.42	.7	2.1
.63	1.3	4.8
.83	1.9	8.6
1.04	2.6	13.5
1.25	3.4	19.3
1.46	4.1	25.8
1.67	5.0	33.0
1.88	5.8	40.7
2.08	6.6	48.7
2.29	7.5	56.9
2.50	8.3	65.0
2.71	9.1	72.8
2.92	9.8	80.2
3.13	10.5	86.7
3.34	11.2	92.2
3.54	11.8	96.1
3.75	12.2	97.7
4.00	12.6	97.7

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=250 FT SLOPE=0.0037

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.48	.0364

.417	.695	2.07	.0233
.625	1.255	4.81	.0181
.834	1.898	8.65	.0152
1.042	2.604	13.51	.0134
1.251	3.358	19.27	.0121
1.459	4.146	25.82	.0112
1.668	4.960	33.01	.0104
1.876	5.788	40.69	.0099
2.084	6.621	48.70	.0094
2.293	7.451	56.85	.0091
2.501	8.267	64.96	.0088
2.710	9.062	72.80	.0086
2.918	9.823	80.15	.0085
3.127	10.539	86.73	.0084
3.335	11.195	92.20	.0084
3.544	11.773	96.12	.0085
3.752	12.243	97.73	.0087
4.000	12.566	97.73	.0089

ROUTE ID=10 HYDROGRAPH NO=220.54 INFLOW ID=2 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 220.54

RUNOFF VOLUME = 1.11957 INCHES = 31.9986 ACRE-FEET
PEAK DISCHARGE RATE = 52.79 CFS AT 1.700 HOURS BASIN AREA = .5359 SQ. MI.

****
*S BEGIN THE AREA SOUTH OF THE ATRISCO BUSINESS PARK
****
** COMPUTE HYDROGRAPH FOR THE WEST 66 ADDITION AREA = 12.7 ACRES
COMPUTE NM HYD ID=2 HYD=220.6 DA==0.0198
%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 62.537 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 1.2500
AREA = .015840 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133430HR TP = .133300HR K/TP RATIO = 1.000974 SHAPE CONSTANT, N = 3.526827
UNIT PEAK = 9.5742 CFS UNIT VOLUME = .9995 B = 322.28 P60 = 1.2500
AREA = .003960 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.60

RUNOFF VOLUME = 1.18860 INCHES = 1.2551 ACRE-FEET

PEAK DISCHARGE RATE = 31.06 CFS AT 1.500 HOURS BASIN AREA = .0198 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A DISCHARGE OF .1 CFS PER ACRE
** ALLOWABLE RELEASE RATE=1.27 cfs
ROUTE RESERVOIR ID=3 HYDROGRAPH NO=220.61 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
0.70	0.52	101.0
1.06	1.04	102.0
1.29	1.65	103.0
2.00	2.55	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	7.28	101.71	.888	.95
3.00	.18	101.81	.940	.99
4.00	.05	101.67	.867	.94
5.00	.10	101.53	.797	.89
6.00	.19	101.42	.738	.85
7.00	.17	101.31	.684	.81
8.00	.16	101.21	.631	.78
9.00	.14	101.12	.581	.74
10.00	.14	101.02	.533	.71
11.00	.13	100.94	.487	.66
12.00	.12	100.86	.446	.60
13.00	.12	100.79	.409	.55
14.00	.11	100.72	.375	.50
15.00	.11	100.66	.344	.46
16.00	.10	100.61	.316	.43
17.00	.10	100.56	.290	.39
18.00	.09	100.51	.267	.36
19.00	.09	100.47	.247	.33
20.00	.09	100.44	.228	.31
21.00	.09	100.40	.211	.28
22.00	.08	100.37	.195	.26
23.00	.08	100.35	.181	.24
24.00	.08	100.32	.168	.23
25.00	.00	100.29	.151	.20
26.00	.00	100.26	.135	.18
27.00	.00	100.23	.121	.16
28.00	.00	100.21	.108	.15
29.00	.00	100.19	.097	.13

PEAK DISCHARGE = 1.008 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 101.855
MAXIMUM STORAGE = .9645 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 220.61

RUNOFF VOLUME = 1.10617 INCHES = 1.1681 ACRE-FEET
PEAK DISCHARGE RATE = 1.01 CFS AT 2.450 HOURS BASIN AREA = .0198 SQ. MI.

** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF THE SOUTH LINE OF
** THE ATRISCO BUSINESS PARK TO CENTRAL AVE.
COMPUTE NM HYD ID=4 HYD=220.7 DA==0.0027
%A=0.0 %B=19.0 %C=0.0 %D=81.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.6344 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.2500
AREA = .002187 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 1.1805 CFS UNIT VOLUME = .9884 B = 306.75 P60 = 1.2500
AREA = .000513 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 220.70

RUNOFF VOLUME = 1.19139 INCHES = .1716 ACRE-FEET
PEAK DISCHARGE RATE = 4.22 CFS AT 1.500 HOURS BASIN AREA = .0027 SQ. MI.

** ADD CONTROLED DISCHARGE FROM POND TO FLOW FROM AIRPORT ROAD
ADD HYD ID=5 HYDROGRAPH NO=220.71 ID I=4 ID II=3
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 220.71

RUNOFF VOLUME = 1.11638 INCHES = 1.3397 ACRE-FEET
PEAK DISCHARGE RATE = 4.64 CFS AT 1.500 HOURS BASIN AREA = .0225 SQ. MI.

** ADD FLOWS TO THE AIRPORT ROAD STORM DRAIN AT STA 28+80
ADD HYD ID=2 HYDROGRAPH NO=220.72 ID I=10 ID II=5
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 220.72

RUNOFF VOLUME = 1.11944 INCHES = 33.3383 ACRE-FEET
PEAK DISCHARGE RATE = 55.47 CFS AT 1.700 HOURS BASIN AREA = .5584 SQ. MI.

** ROUTE FLOW DOWN AIRPORT ROAD STORM DRAIN FROM STA 28+80 TO STA 9+85
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0037
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.5
.42	.7	2.0
.63	1.3	4.6
.83	1.9	8.3
1.04	2.6	13.0
1.25	3.4	18.5
1.46	4.1	24.8
1.67	5.0	31.7
1.88	5.8	39.1
2.08	6.6	46.8
2.29	7.5	54.7
2.50	8.3	62.5
2.71	9.1	70.0
2.92	9.8	77.1
3.13	10.5	83.4
3.34	11.2	88.7
3.54	11.8	92.4
3.75	12.2	94.0
4.00	12.6	94.0

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=1895 FT SLOPE=0.0037

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.46	.2869
.417	.695	1.99	.1838
.625	1.255	4.63	.1428
.834	1.898	8.32	.1201
1.042	2.604	12.99	.1055
1.251	3.358	18.53	.0954
1.459	4.146	24.83	.0879
1.668	4.960	31.74	.0822
1.876	5.788	39.13	.0778
2.084	6.621	46.83	.0744
2.293	7.451	54.68	.0717

2.501	8.267	62.47	.0697
2.710	9.062	70.02	.0681
2.918	9.823	77.09	.0671
3.127	10.539	83.41	.0665
3.335	11.195	88.68	.0665
3.544	11.773	92.44	.0670
3.752	12.243	93.99	.0686
4.000	12.566	93.99	.0704

ROUTE ID=10 HYDROGRAPH NO=220.73 INFLOW ID=2 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 220.73

RUNOFF VOLUME = 1.11807 INCHES = 33.2974 ACRE-FEET
PEAK DISCHARGE RATE = 54.30 CFS AT 1.800 HOURS BASIN AREA = .5584 SQ. MI.

****
*S BEGIN AREA SOUTH OF CENTRAL BOULEVARD
****
** COMPUTE HYDROGRAPH FOR LOT 59, UNIT 6, TOWN OF ATRISCO GRANT
COMPUTE NM HYD ID=2 HYD=230.1 DA==0.0018
%A=0.0 %B=15.0 %C=5.0 %D=80.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.6852 CFS UNIT VOLUME = .9971 B = 526.28 P60 = 1.2500
AREA = .001440 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133430HR TP = .133300HR K/TP RATIO = 1.000974 SHAPE CONSTANT, N = 3.526827
UNIT PEAK = .87038 CFS UNIT VOLUME = .9856 B = 322.28 P60 = 1.2500
AREA = .000360 SQ MI IA = .46250 INCHES INF = 1.14500 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.10

RUNOFF VOLUME = 1.18859 INCHES = .1141 ACRE-FEET
PEAK DISCHARGE RATE = 2.83 CFS AT 1.500 HOURS BASIN AREA = .0018 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A MAX. DISCHARGE OF 3.80 CFS
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=230.11 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
2.20	0.005	101.0
3.11	0.012	102.0

3.80	0.02	103.0
5.00	1.00	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	.66	100.32	.002	.70
3.00	.01	100.01	.000	.01
4.00	.00	100.00	.000	.00
5.00	.01	100.00	.000	.01
6.00	.02	100.01	.000	.02
7.00	.02	100.01	.000	.02
8.00	.01	100.01	.000	.01
9.00	.01	100.01	.000	.01
10.00	.01	100.01	.000	.01
11.00	.01	100.01	.000	.01
12.00	.01	100.01	.000	.01
13.00	.01	100.00	.000	.01
14.00	.01	100.00	.000	.01
15.00	.01	100.00	.000	.01
16.00	.01	100.00	.000	.01
17.00	.01	100.00	.000	.01
18.00	.01	100.00	.000	.01
19.00	.01	100.00	.000	.01
20.00	.01	100.00	.000	.01
21.00	.01	100.00	.000	.01
22.00	.01	100.00	.000	.01
23.00	.01	100.00	.000	.01
24.00	.01	100.00	.000	.01

PEAK DISCHARGE = 2.500 CFS - PEAK OCCURS AT HOUR 1.55
MAXIMUM WATER SURFACE ELEVATION = 101.330
MAXIMUM STORAGE = .0073 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 230.11

RUNOFF VOLUME = 1.18842 INCHES = .1141 ACRE-FEET
PEAK DISCHARGE RATE = 2.50 CFS AT 1.550 HOURS BASIN AREA = .0018 SQ. MI.

** ROUTE THE FLOW FROM LOT 59, UNIT 6 DOWN AIRPORT ROAD
** USE AVERAGE STREET SLOPE
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3
MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.0097 FLOOD PLAIN SLOPE=0.0097
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0
DIST ELEV DIST ELEV DIST ELEV DIST ELEV

0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.1
100.14	.3	.4
100.18	.6	.8
100.23	1.1	1.8
100.27	1.9	3.4
100.32	2.8	5.9
100.37	4.0	9.3
100.41	5.3	13.7
100.46	6.9	19.3
100.50	8.7	26.2
100.55	10.7	34.4
100.60	12.9	45.5
100.64	15.1	59.0
100.69	17.3	74.0
100.73	19.7	90.5
100.78	22.3	108.5
100.82	25.1	128.1
100.87	28.1	149.4

COMPUTE TRAVEL TIME ID=3 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=550 FT SLOPE=0.0097

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.02	.2294
.092	.126	.13	.1445
.137	.286	.37	.1182
.183	.605	.82	.1120
.229	1.133	1.80	.0960
.275	1.871	3.44	.0830
.321	2.820	5.89	.0732
.366	3.978	9.26	.0656
.412	5.346	13.69	.0597
.458	6.925	19.29	.0548
.504	8.713	26.16	.0509
.549	10.711	34.42	.0475
.595	12.887	45.48	.0433
.641	15.085	59.05	.0390
.687	17.297	74.02	.0357
.733	19.677	90.47	.0332
.778	22.267	108.48	.0314

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                                .824      25.067      128.10       .0299
                                .870      28.076      149.41       .0287
ROUTE                ID=3  HYDROGRAPH NO=230.12  INFLOW ID=20  DT=0.0
PRINT HYD            ID=3  CODE=1

                                PARTIAL HYDROGRAPH   230.12


    RUNOFF VOLUME =     1.18899 INCHES     =         .1141 ACRE-FEET
    PEAK DISCHARGE RATE =       2.20 CFS  AT   1.600 HOURS   BASIN AREA =    .0018 SQ. MI.



** COMPUTE HYDROGRAPH FOR TRACT "B", TOWN OF ATRISCO GRANT
COMPUTE NM HYD       ID=2  HYD=230.2  DA==0.0052
                     %A=0.0  %B=15.0  %C=5.0  %D=80.0  TP=0.1333
                     MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   16.424    CFS   UNIT VOLUME =    .9985       B =   526.28      P60 = 1.2500
    AREA =      .004160 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .133430HR    TP =   .133300HR    K/TP RATIO =  1.000974     SHAPE CONSTANT, N =  3.526827
    UNIT PEAK =   2.5144    CFS   UNIT VOLUME =    .9960       B =   322.28      P60 = 1.2500
    AREA =      .001040 SQ MI    IA =    .46250 INCHES    INF =   1.14500 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=2 CODE=1

                                PARTIAL HYDROGRAPH   230.20


    RUNOFF VOLUME =     1.18859 INCHES     =         .3296 ACRE-FEET
    PEAK DISCHARGE RATE =       8.16 CFS  AT   1.500 HOURS   BASIN AREA =    .0052 SQ. MI.



** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 10.93 CFS
ROUTE RESERVOIR      ID=20  HYDROGRAPH NO=230.21 INFLOW ID=2  CODE=20
                     OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                          0             0             100.0
                          6.34          0.01          101.0
                          8.96          0.024          102.0
                         10.93          0.04          103.0
                         15.00          1.50          104.0

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

    TIME       INFLOW     ELEV       VOLUME     OUTFLOW
    (HRS)      (CFS)      (FEET)     (AC-FT)    (CFS)

      .00         .00     100.00        .000        .00
```

1.00	.00	100.00	.000	.00
2.00	1.91	100.31	.003	1.98
3.00	.04	100.01	.000	.05
4.00	.01	100.00	.000	.01
5.00	.03	100.00	.000	.03
6.00	.05	100.01	.000	.05
7.00	.04	100.01	.000	.04
8.00	.04	100.01	.000	.04
9.00	.04	100.01	.000	.04
10.00	.04	100.01	.000	.04
11.00	.03	100.01	.000	.03
12.00	.03	100.01	.000	.03
13.00	.03	100.00	.000	.03
14.00	.03	100.00	.000	.03
15.00	.03	100.00	.000	.03
16.00	.03	100.00	.000	.03
17.00	.03	100.00	.000	.03
18.00	.02	100.00	.000	.03
19.00	.02	100.00	.000	.02
20.00	.02	100.00	.000	.02
21.00	.02	100.00	.000	.02
22.00	.02	100.00	.000	.02
23.00	.02	100.00	.000	.02
24.00	.02	100.00	.000	.02

PEAK DISCHARGE = 7.399 CFS - PEAK OCCURS AT HOUR 1.55
MAXIMUM WATER SURFACE ELEVATION = 101.404
MAXIMUM STORAGE = .0157 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 230.21

RUNOFF VOLUME = 1.18854 INCHES = .3296 ACRE-FEET
PEAK DISCHARGE RATE = 7.40 CFS AT 1.550 HOURS BASIN AREA = .0052 SQ. MI.

** ADD THE FLOW FROM TRACT "B", TOWN OF ATRISCO GRANT TO THE ROUTED FLOW
** IN THE STREET
ADD HYD ID=4 HYDROGRAPH NO=230.22 ID I=20 ID II=3
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 230.22

RUNOFF VOLUME = 1.18856 INCHES = .4437 ACRE-FEET
PEAK DISCHARGE RATE = 9.37 CFS AT 1.550 HOURS BASIN AREA = .0070 SQ. MI.

** ROUTE THE COMBINED FLOW IN THE STREET DOWN AIRPORT ROAD TO THE INLET AT THE
** END OF AIRPORT ROAD
COMPUTE RATING CURVECID=1 VS NO=1 NUMBER OF SEGS=3

MINIMUM ELEV=100.00 MAXIMUM ELEV=100.87
CHANNEL SLOPE=0.014 FLOOD PLAIN SLOPE=0.014
N=0.025 DIST=10.0 N=-0.017 DIST=58.0 N=0.025 DIST=68.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0.0	100.87	10.00	100.67	10.05	100.00	12.0	100.13
34.0	100.57	56.00	100.13	57.95	100.00	58.00	100.67
68.00	100.87						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.05	.0	.0
100.09	.1	.2
100.14	.3	.4
100.18	.6	1.0
100.23	1.1	2.2
100.27	1.9	4.1
100.32	2.8	7.1
100.37	4.0	11.1
100.41	5.3	16.4
100.46	6.9	23.2
100.50	8.7	31.4
100.55	10.7	41.4
100.60	12.9	54.6
100.64	15.1	70.9
100.69	17.3	88.9
100.73	19.7	108.7
100.78	22.3	130.3
100.82	25.1	153.9
100.87	28.1	179.5

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=100 FT SLOPE=0.0097

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.046	.032	.03	.0347
.092	.126	.16	.0219
.137	.286	.44	.0179
.183	.605	.99	.0170
.229	1.133	2.17	.0145
.275	1.871	4.14	.0126
.321	2.820	7.07	.0111
.366	3.978	11.13	.0099
.412	5.346	16.45	.0090
.458	6.925	23.17	.0083
.504	8.713	31.43	.0077
.549	10.711	41.35	.0072
.595	12.887	54.63	.0066

.641	15.085	70.94	.0059
.687	17.297	88.92	.0054
.733	19.677	108.69	.0050
.778	22.267	130.32	.0047
.824	25.067	153.90	.0045
.870	28.076	179.50	.0043

ROUTE ID=11 HYDROGRAPH NO=230.23 INFLOW ID=4 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 230.23

RUNOFF VOLUME = 1.18866 INCHES = .4438 ACRE-FEET
PEAK DISCHARGE RATE = 9.25 CFS AT 1.550 HOURS BASIN AREA = .0070 SQ. MI.

** COMPUTE HYDROGRAPH FOR AIRPORT ROAD SOUTH OF CENTRAL TO THE SOUTH END OF
** AIRPORT ROAD
COMPUTE NM HYD ID=2 HYD=230.30 DA==0.0024
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.0540 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.2500
AREA = .002040 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = .82844 CFS UNIT VOLUME = .9834 B = 306.75 P60 = 1.2500
AREA = .000360 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.30

RUNOFF VOLUME = 1.23955 INCHES = .1587 ACRE-FEET
PEAK DISCHARGE RATE = 3.88 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

** ADD AIRPORT DRIVE FLOWS TO THE ROUTED FLOWS IN AIRPORT DRIVE
ADD HYD ID=3 HYDROGRAPH NO=230.31 ID I=2 ID II=11
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 230.31

RUNOFF VOLUME = 1.20154 INCHES = .6024 ACRE-FEET
PEAK DISCHARGE RATE = 12.65 CFS AT 1.550 HOURS BASIN AREA = .0094 SQ. MI.

** ADD THE FLOW IN THE STREET TO THE ROUTED FLOW IN THE STORM DRAIN AT
** THE SOUTH END OF AIRPORT ROAD
ADD HYD ID=1 HYDROGRAPH NO=230.32 ID I=10 ID II=3
PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 230.32

RUNOFF VOLUME = 1.11945 INCHES = 33.8998 ACRE-FEET
PEAK DISCHARGE RATE = 60.53 CFS AT 1.750 HOURS BASIN AREA = .5678 SQ. MI.

** ROUTE FLOW DOWN AIRPORT ROAD STORM DRAIN FROM STA 9+85 TO M.H ON
** COORS STORM DRAIN AT STA 82+30
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.01
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	.8
.42	.7	3.3
.63	1.3	7.6
.83	1.9	13.7
1.04	2.6	21.4
1.25	3.4	30.5
1.46	4.1	40.8
1.67	5.0	52.2
1.88	5.8	64.3
2.08	6.6	77.0
2.29	7.5	89.9
2.50	8.3	102.7
2.71	9.1	115.1
2.92	9.8	126.7
3.13	10.5	137.1
3.34	11.2	145.8
3.54	11.8	152.0
3.75	12.2	154.5
4.00	12.6	154.5

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=130 FT SLOPE=0.01

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.75	.0120

.417	.695	3.27	.0077
.625	1.255	7.60	.0060
.834	1.898	13.68	.0050
1.042	2.604	21.35	.0044
1.251	3.358	30.47	.0040
1.459	4.146	40.82	.0037
1.668	4.960	52.19	.0034
1.876	5.788	64.33	.0032
2.084	6.621	77.00	.0031
2.293	7.451	89.89	.0030
2.501	8.267	102.71	.0029
2.710	9.062	115.11	.0028
2.918	9.823	126.73	.0028
3.127	10.539	137.13	.0028
3.335	11.195	145.78	.0028
3.544	11.773	151.97	.0028
3.752	12.243	154.52	.0029
4.000	12.566	154.52	.0029

ROUTE ID=10 HYDROGRAPH NO=230.33 INFLOW ID=1 DT=0.050
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 230.33

RUNOFF VOLUME = 1.11939 INCHES = 33.8978 ACRE-FEET
PEAK DISCHARGE RATE = 60.53 CFS AT 1.750 HOURS BASIN AREA = .5678 SQ. MI.

****
*S END OF AIRPORT ROAD STORM DRAIN
*S BEGIN COORS CONNECTION STORM DRAIN
****
** COMPUTE HYDOGRAPH FOR THE AREA S.& W. OF THE INTERSECTION OF COORS BLVD.
** AND CENTRAL BOULEVARD. ASSUME ALL FLOW IS ROUTED TO THE SOUTH TO COORS
COMPUTE NM HYD ID=2 HYD=230.5 DA=0.0066
%A=0.0 %B=10.0 %C=10.0 %80.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 20.841 CFS UNIT VOLUME = .9986 B = 526.28 P60 = 1.2500
AREA = .005280 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124987HR TP = .133330HR K/TP RATIO = .937423 SHAPE CONSTANT, N = 3.772497
UNIT PEAK = 3.3632 CFS UNIT VOLUME = .9976 B = 339.71 P60 = 1.2500
AREA = .001320 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.50

RUNOFF VOLUME = 1.19856 INCHES = .4219 ACRE-FEET
PEAK DISCHARGE RATE = 10.51 CFS AT 1.500 HOURS BASIN AREA = .0066 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 6.49 CFS
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=530.51 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
3.75	0.06	101.0
5.32	0.13	102.0
6.49	0.22	103.0
15.00	1.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	2.44	101.33	.083	4.27
3.00	.06	100.04	.003	.16
4.00	.02	100.01	.000	.02
5.00	.03	100.01	.000	.03
6.00	.06	100.02	.001	.06
7.00	.06	100.02	.001	.06
8.00	.05	100.01	.001	.05
9.00	.05	100.01	.001	.05
10.00	.05	100.01	.001	.05
11.00	.04	100.01	.001	.04
12.00	.04	100.01	.001	.04
13.00	.04	100.01	.001	.04
14.00	.04	100.01	.001	.04
15.00	.04	100.01	.001	.04
16.00	.03	100.01	.001	.04
17.00	.03	100.01	.001	.03
18.00	.03	100.01	.001	.03
19.00	.03	100.01	.000	.03
20.00	.03	100.01	.000	.03
21.00	.03	100.01	.000	.03
22.00	.03	100.01	.000	.03
23.00	.03	100.01	.000	.03
24.00	.03	100.01	.000	.03

PEAK DISCHARGE = 5.044 CFS - PEAK OCCURS AT HOUR 1.70
MAXIMUM WATER SURFACE ELEVATION = 101.824
MAXIMUM STORAGE = .1177 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

OUTFLOW HYDROGRAPH RESERVOIR 530.51

RUNOFF VOLUME = 1.19851 INCHES = .4219 ACRE-FEET
PEAK DISCHARGE RATE = 5.04 CFS AT 1.700 HOURS BASIN AREA = .0066 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 91+38 TO STA 89+00
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0059
PIPE DIA=2.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.10	.1	.1
.21	.2	.4
.31	.3	.9
.42	.5	1.7
.52	.7	2.6
.63	.8	3.7
.73	1.0	4.9
.83	1.2	6.3
.94	1.4	7.8
1.04	1.7	9.3
1.15	1.9	10.9
1.25	2.1	12.4
1.35	2.3	13.9
1.46	2.5	15.3
1.56	2.6	16.6
1.67	2.8	17.6
1.77	2.9	18.4
1.88	3.1	18.7
2.00	3.1	18.7

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=330 FT SLOPE=0.0059

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.09	.0628
.208	.174	.40	.0402
.313	.314	.92	.0313
.417	.475	1.65	.0263
.521	.651	2.58	.0231
.625	.839	3.69	.0209
.730	1.037	4.94	.0192
.834	1.240	6.31	.0180
.938	1.447	7.78	.0170
1.042	1.655	9.31	.0163
1.146	1.863	10.87	.0157
1.251	2.067	12.42	.0152

1.355	2.265	13.93	.0149
1.459	2.456	15.33	.0147
1.563	2.635	16.59	.0146
1.668	2.799	17.64	.0145
1.772	2.943	18.38	.0147
1.876	3.061	18.69	.0150
2.000	3.142	18.69	.0154

```
ROUTE          ID=4  HYDROGRAPH NO=230.52  INFLOW ID=20  DT=0.0
PRINT HYD      ID=4  CODE=1

                          PARTIAL HYDROGRAPH   230.52

    RUNOFF VOLUME =     1.19859 INCHES     =        .4219 ACRE-FEET
    PEAK DISCHARGE RATE =       5.05 CFS  AT   1.700 HOURS   BASIN AREA =   .0066 SQ. MI.

** COMPUTE HYDROGRAPH FOR THE SOUTH HALF OF CENTRAL AVE R.W. BETWEEN AIRPORT
** AND COORS
COMPUTE NM HYD      ID=2  HYD=230.6   DA=0.0023
                    %A=0.0  %B=0.0  %C=10.00  %D=90.0  TP=0.1333
                    MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   8.1725    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.2500
    AREA =      .002070 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .108016HR    TP =   .133300HR    K/TP RATIO =   .810320     SHAPE CONSTANT, N =  4.414309
    UNIT PEAK =   .65896    CFS   UNIT VOLUME =    .9840       B =   381.91      P60 = 1.2500
    AREA =      .000230 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                          PARTIAL HYDROGRAPH   230.60

    RUNOFF VOLUME =     1.32112 INCHES     =        .1621 ACRE-FEET
    PEAK DISCHARGE RATE =       3.99 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.

** ROUTE FLOW DOWN THE WEST SIDE OF COORS BLVD.
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=99.31 FT  MAXIMUM ELEV=100.62 FT
                    CHANNEL SLOPE=0.005 FLOOD PLAIN SLOPE=0.005
                    N=0.017  DIST=34
                    DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
                      0   100.0    1     99.98  1.01   99.31  34.0   100.67
                    34.01  101.17
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
99.31	.0	.0
99.38	.1	.0
99.45	.2	.2
99.52	.5	.7
99.59	.9	1.5
99.65	1.4	2.7
99.72	2.1	4.4
99.79	2.8	6.6
99.86	3.7	9.4
99.93	4.7	12.9
100.00	5.8	16.5
100.07	7.1	21.7
100.14	8.5	27.8
100.21	10.0	34.8
100.28	11.6	42.8
100.34	13.3	51.8
100.41	15.2	61.8
100.48	17.2	72.9
100.55	19.3	85.1
100.62	21.5	98.6

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=1000 SLOPE=0.005

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.069	.058	.04	.4359
.138	.231	.23	.2746
.207	.519	.69	.2096
.276	.923	1.48	.1730
.345	1.442	2.69	.1491
.414	2.077	4.37	.1320
.483	2.827	6.59	.1191
.552	3.692	9.41	.1090
.621	4.673	12.88	.1008
.689	5.779	16.51	.0972
.758	7.059	21.73	.0902
.827	8.455	27.83	.0844
.896	9.966	34.84	.0795
.965	11.592	42.80	.0752
1.034	13.334	51.77	.0715
1.103	15.191	61.79	.0683
1.172	17.163	72.90	.0654
1.241	19.251	85.15	.0628
1.310	21.453	98.57	.0605

ROUTE ID=3 HYDROGRAPH NO=230.61 INFLOW ID=2 DT=0.0
PRINT HYD ID=3 CODE=1

```
                                PARTIAL HYDROGRAPH   230.61

    RUNOFF VOLUME =     1.32130 INCHES     =         .1621 ACRE-FEET
    PEAK DISCHARGE RATE =       2.80 CFS  AT   1.600 HOURS   BASIN AREA =    .0023 SQ. MI.


** COMPUTE HYDOGRAPH FOR COORS BLVD R.W. FROM CENTRAL TO STA 89+20 COORS
COMPUTE NM HYD      ID=2  HYD=230.7 DA=0.0058
                    %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.13333
                    MASS RAINFALL=-1

    K =   .072665HR    TP =   .133330HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.460    CFS   UNIT VOLUME =    .9986       B =   526.28      P60 = 1.2500
    AREA =      .004930 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .141933HR    TP =   .133330HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   2.0016    CFS   UNIT VOLUME =    .9936       B =   306.75      P60 = 1.2500
    AREA =      .000870 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=2 CODE=1

                                PARTIAL HYDROGRAPH   230.70

    RUNOFF VOLUME =     1.23955 INCHES     =         .3834 ACRE-FEET
    PEAK DISCHARGE RATE =       9.37 CFS  AT   1.500 HOURS   BASIN AREA =    .0058 SQ. MI.


** ADD  FLOW FROM COORS TO THE ROUTED FLOW AT COORS STA. 89+20
ADD HYD             ID=1  HYDROGRAPH NO=230.71  ID I=3  ID II=2
PRINT HYD           ID=1  CODE=1

                                PARTIAL HYDROGRAPH   230.71

    RUNOFF VOLUME =     1.26262 INCHES     =         .5455 ACRE-FEET
    PEAK DISCHARGE RATE =      11.54 CFS  AT   1.500 HOURS   BASIN AREA =    .0081 SQ. MI.


** ADD THE FLOW IN COORS BOULEVARD TO THE ROUTED FLOW IN THE STORM DRAIN
** AT STA 89+00
ADD HYD             ID=5  HYDROGRAPH NO=230.72  ID I=4  ID II=1
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   230.72
```

RUNOFF VOLUME = 1.23382 INCHES = .9673 ACRE-FEET
PEAK DISCHARGE RATE = 15.41 CFS AT 1.550 HOURS BASIN AREA = .0147 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 89+00 TO STA 85+70
** USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0111
PIPE DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	1.0
.39	.5	2.3
.52	.7	4.1
.65	1.0	6.4
.78	1.3	9.2
.91	1.6	12.3
1.04	1.9	15.7
1.17	2.3	19.4
1.30	2.6	23.2
1.43	2.9	27.0
1.56	3.2	30.9
1.69	3.5	34.6
1.82	3.8	38.1
1.95	4.1	41.3
2.08	4.4	43.9
2.21	4.6	45.7
2.35	4.8	46.5
2.50	4.9	46.5

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=330 FT SLOPE=0.0111

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.23	.0395
.261	.271	.98	.0253
.391	.490	2.29	.0196
.521	.741	4.11	.0165
.651	1.017	6.42	.0145
.782	1.312	9.17	.0131
.912	1.620	12.28	.0121
1.042	1.937	15.70	.0113
1.173	2.261	19.35	.0107
1.303	2.586	23.16	.0102

1.433	2.910	27.04	.0099
1.563	3.229	30.90	.0096
1.694	3.540	34.63	.0094
1.824	3.837	38.13	.0092
1.954	4.117	41.26	.0091
2.084	4.373	43.86	.0091
2.215	4.599	45.72	.0092
2.345	4.783	46.49	.0094
2.500	4.909	46.49	.0097

```
ROUTE              ID=4  HYDROGRAPH NO=230.73  INFLOW ID=5  DT=0.0
PRINT HYD          ID=4  CODE=1
```

PARTIAL HYDROGRAPH 230.73

RUNOFF VOLUME = 1.23387 INCHES = .9673 ACRE-FEET
PEAK DISCHARGE RATE = 15.70 CFS AT 1.550 HOURS BASIN AREA = .0147 SQ. MI.

```
** COMPUTE HYDOGRAPH FOR AREA 230.8. ASSUME ALL FLOW FROM THIS AREA WILL BE
** ROUTED TO THE SOUTH TO COORS
COMPUTE NM HYD     ID=2  HYD=230.8  DA=0.0112
                   %A=0.0  %B=10.0  %C=10.0  %D80.0          TP=0.13333
                   MASS RAINFALL=-1
```

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 35.367 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.2500
AREA = .008960 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124987HR TP = .133330HR K/TP RATIO = .937423 SHAPE CONSTANT, N = 3.772497
UNIT PEAK = 5.7072 CFS UNIT VOLUME = .9992 B = 339.71 P60 = 1.2500
AREA = .002240 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

```
PRINT HYD          ID=2 CODE=1
```

PARTIAL HYDROGRAPH 230.80

RUNOFF VOLUME = 1.19856 INCHES = .7159 ACRE-FEET
PEAK DISCHARGE RATE = 17.83 CFS AT 1.500 HOURS BASIN AREA = .0112 SQ. MI.

```
** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 15.84 CFS
ROUTE RESERVOIR    ID=20  HYDROGRAPH NO=230.81 INFLOW ID=2  CODE=20
                   OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                        0             0              100.0
                        9.18          0.06           101.0
                       12.99          0.15           102.0
                       15.84          0.25           103.0
```

25.00 2.00 104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	4.13	100.57	.034	5.25
3.00	.10	100.01	.001	.13
4.00	.03	100.00	.000	.03
5.00	.06	100.01	.000	.06
6.00	.11	100.01	.001	.11
7.00	.10	100.01	.001	.10
8.00	.09	100.01	.001	.09
9.00	.08	100.01	.001	.08
10.00	.08	100.01	.001	.08
11.00	.07	100.01	.000	.07
12.00	.07	100.01	.000	.07
13.00	.07	100.01	.000	.07
14.00	.06	100.01	.000	.06
15.00	.06	100.01	.000	.06
16.00	.06	100.01	.000	.06
17.00	.06	100.01	.000	.06
18.00	.05	100.01	.000	.05
19.00	.05	100.01	.000	.05
20.00	.05	100.01	.000	.05
21.00	.05	100.01	.000	.05
22.00	.05	100.01	.000	.05
23.00	.05	100.01	.000	.05
24.00	.04	100.00	.000	.04

PEAK DISCHARGE = 11.773 CFS - PEAK OCCURS AT HOUR 1.60
MAXIMUM WATER SURFACE ELEVATION = 101.681
MAXIMUM STORAGE = .1212 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 230.81

RUNOFF VOLUME = 1.19853 INCHES = .7159 ACRE-FEET
PEAK DISCHARGE RATE = 11.77 CFS AT 1.600 HOURS BASIN AREA = .0112 SQ. MI.

** ADD BASIN 230.8 FLOW TO THE ROUTED FLOW IN COORS BOULEVARD STORM DRAIN
** AT THE MANHOLE AT STA. 85+70
ADD HYD ID=5 HYDROGRAPH NO=230.82 ID I=20 ID II=4
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 230.82

RUNOFF VOLUME = 1.21856 INCHES = 1.6832 ACRE-FEET
PEAK DISCHARGE RATE = 27.07 CFS AT 1.550 HOURS BASIN AREA = .0259 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 85+70 TO STA 82+33
** PRESUURE FLOW USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0111
PIPE DIA=2.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.13	.1	.2
.26	.3	1.0
.39	.5	2.3
.52	.7	4.1
.65	1.0	6.4
.78	1.3	9.2
.91	1.6	12.3
1.04	1.9	15.7
1.17	2.3	19.4
1.30	2.6	23.2
1.43	2.9	27.0
1.56	3.2	30.9
1.69	3.5	34.6
1.82	3.8	38.1
1.95	4.1	41.3
2.08	4.4	43.9
2.21	4.6	45.7
2.35	4.8	46.5
2.50	4.9	46.5

COMPUTE TRAVEL TIME ID=2 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=337 FT SLOPE=0.0111

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.23	.0403
.261	.271	.98	.0258
.391	.490	2.29	.0201
.521	.741	4.11	.0169
.651	1.017	6.42	.0148
.782	1.312	9.17	.0134
.912	1.620	12.28	.0123
1.042	1.937	15.70	.0116
1.173	2.261	19.35	.0109
1.303	2.586	23.16	.0105
1.433	2.910	27.04	.0101

1.563	3.229	30.90	.0098
1.694	3.540	34.63	.0096
1.824	3.837	38.13	.0094
1.954	4.117	41.26	.0093
2.084	4.373	43.86	.0093
2.215	4.599	45.72	.0094
2.345	4.783	46.49	.0096
2.500	4.909	46.49	.0099

ROUTE ID=2 HYDROGRAPH NO=230.83 INFLOW ID=5 DT=0.0
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 230.83

RUNOFF VOLUME = 1.21859 INCHES = 1.6833 ACRE-FEET
PEAK DISCHARGE RATE = 27.02 CFS AT 1.550 HOURS BASIN AREA = .0259 SQ. MI.

** ADD FLOW FROM AIRPORT STORM DRAIN TO COORS STORM DRAIN AT STA 82+33
ADD HYD ID=11 HYDROGRAPH NO=230.84 ID I=2 ID II=10
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 230.84

RUNOFF VOLUME = 1.12371 INCHES = 35.5810 ACRE-FEET
PEAK DISCHARGE RATE = 83.32 CFS AT 1.700 HOURS BASIN AREA = .5937 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 82+33 TO STA 79+32
** NOTE THE EXISTING PIPE IS A 24" RCP PIPE. UPGRADE TO 48"
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0550
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.21	.2	1.8
.42	.7	7.7
.63	1.3	17.8
.83	1.9	32.1
1.04	2.6	50.1
1.25	3.4	71.5
1.46	4.1	95.7
1.67	5.0	122.4
1.88	5.8	150.9
2.08	6.6	180.6
2.29	7.5	210.8
2.50	8.3	240.9
2.71	9.1	270.0

2.92	9.8	297.2
3.13	10.5	321.6
3.34	11.2	341.9
3.54	11.8	356.4
3.75	12.2	362.4
4.00	12.6	362.4

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=301 FT SLOPE=0.0550

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.77	.0118
.417	.695	7.67	.0076
.625	1.255	17.83	.0059
.834	1.898	32.07	.0049
1.042	2.604	50.08	.0043
1.251	3.358	71.45	.0039
1.459	4.146	95.73	.0036
1.668	4.960	122.39	.0034
1.876	5.788	150.88	.0032
2.084	6.621	180.57	.0031
2.293	7.451	210.81	.0030
2.501	8.267	240.87	.0029
2.710	9.062	269.97	.0028
2.918	9.823	297.22	.0028
3.127	10.539	321.60	.0027
3.335	11.195	341.89	.0027
3.544	11.773	356.41	.0028
3.752	12.243	362.38	.0028
4.000	12.566	362.38	.0029

ROUTE ID=10 HYDROGRAPH NO=230.85 INFLOW ID=11 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 230.85

RUNOFF VOLUME = 1.12363 INCHES = 35.5784 ACRE-FEET
PEAK DISCHARGE RATE = 83.29 CFS AT 1.650 HOURS BASIN AREA = .5937 SQ. MI.

** ROUTE FLOW IN COORS STORM DRAIN FROM STA 79+32 TO STA 75+80
** NOTE THE EXISTING PIPE IS A 30" DIA RCP PIPE . UPGRADE TO 48"
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.03
PIPE DIA=4.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS

.00	.0	.0
.21	.2	1.3
.42	.7	5.7
.63	1.3	13.2
.83	1.9	23.7
1.04	2.6	37.0
1.25	3.4	52.8
1.46	4.1	70.7
1.67	5.0	90.4
1.88	5.8	111.4
2.08	6.6	133.4
2.29	7.5	155.7
2.50	8.3	177.9
2.71	9.1	199.4
2.92	9.8	219.5
3.13	10.5	237.5
3.34	11.2	252.5
3.54	11.8	263.2
3.75	12.2	267.6
4.00	12.6	267.6

COMPUTE TRAVEL TIME ID=11 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=352 FT SLOPE=0.066

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	1.31	.0187
.417	.695	5.67	.0120
.625	1.255	13.17	.0093
.834	1.898	23.69	.0078
1.042	2.604	36.99	.0069
1.251	3.358	52.77	.0062
1.459	4.146	70.70	.0057
1.668	4.960	90.39	.0054
1.876	5.788	111.43	.0051
2.084	6.621	133.36	.0049
2.293	7.451	155.69	.0047
2.501	8.267	177.89	.0045
2.710	9.062	199.38	.0044
2.918	9.823	219.51	.0044
3.127	10.539	237.52	.0043
3.335	11.195	252.50	.0043
3.544	11.773	263.23	.0044
3.752	12.243	267.63	.0045
4.000	12.566	267.63	.0046

ROUTE ID=11 HYDROGRAPH NO=230.86 INFLOW ID=10 DT=0.0
PRINT HYD ID=11 CODE=1

PARTIAL HYDROGRAPH 230.86

RUNOFF VOLUME = 1.12351 INCHES = 35.5746 ACRE-FEET
PEAK DISCHARGE RATE = 83.41 CFS AT 1.700 HOURS BASIN AREA = .5937 SQ. MI.

****
*S BEGIN THE AREA NORTH OF CENTRAL AVENUE BETWEEN UNSER AND THE WEST 66
*S ADDITION
****
** COMPUTE HYDROGRAPH FOR AREA 240.1
COMPUTE NM HYD ID=2 HYD=240.1 DA=0.0333
%A=0.0 %B=15.0 %C=10.0 %D=75.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 98.603 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.2500
AREA = .024975 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .128347HR TP = .133300HR K/TP RATIO = .962843 SHAPE CONSTANT, N = 3.669343
UNIT PEAK = 20.765 CFS UNIT VOLUME = 1.001 B = 332.49 P60 = 1.2500
AREA = .008325 SQ MI IA = .44000 INCHES INF = 1.08200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 240.10

RUNOFF VOLUME = 1.13800 INCHES = 2.0211 ACRE-FEET
PEAK DISCHARGE RATE = 50.75 CFS AT 1.500 HOURS BASIN AREA = .0333 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 58.74CFS
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=240.11 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
34.00	0.10	101.0
48.20	0.24	102.0
58.74	0.40	103.0
75.00	4.00	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	11.59	100.36	.036	12.40
3.00	.29	100.01	.001	.33
4.00	.09	100.00	.000	.09

5.00	.17	100.00	.000	.16
6.00	.31	100.01	.001	.30
7.00	.26	100.01	.001	.27
8.00	.25	100.01	.001	.25
9.00	.23	100.01	.001	.23
10.00	.22	100.01	.001	.22
11.00	.21	100.01	.001	.20
12.00	.19	100.01	.001	.20
13.00	.19	100.01	.001	.19
14.00	.18	100.01	.001	.18
15.00	.17	100.01	.001	.17
16.00	.16	100.00	.000	.16
17.00	.16	100.00	.000	.16
18.00	.15	100.00	.000	.15
19.00	.15	100.00	.000	.14
20.00	.14	100.00	.000	.14
21.00	.14	100.00	.000	.14
22.00	.13	100.00	.000	.13
23.00	.13	100.00	.000	.13
24.00	.12	100.00	.000	.12

PEAK DISCHARGE = 41.748 CFS - PEAK OCCURS AT HOUR 1.55
MAXIMUM WATER SURFACE ELEVATION = 101.546
MAXIMUM STORAGE = .1764 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 240.11

RUNOFF VOLUME = 1.13799 INCHES = 2.0211 ACRE-FEET
PEAK DISCHARGE RATE = 41.75 CFS AT 1.550 HOURS BASIN AREA = .0333 SQ. MI.

** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025 DIST=22

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102.0	1	101.9	11.0	100.0	15.0	100.1
25	101.9	26	102.0				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	.3	.1
100.21	.8	.6
100.32	1.5	1.5
100.42	2.2	2.8
100.53	3.1	4.5
100.63	4.2	6.7

100.74	5.3	9.4
100.84	6.6	12.6
100.95	7.9	16.3
101.05	9.4	20.6
101.16	11.1	25.5
101.26	12.8	31.1
101.37	14.7	37.4
101.47	16.7	44.3
101.58	18.8	52.0
101.68	21.0	60.4
101.79	23.3	69.7
101.89	25.8	79.7
102.00	28.3	90.8

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=320 SLOPE=0.0025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.250	.11	.2081
.211	.793	.63	.1121
.316	1.455	1.53	.0845
.421	2.237	2.83	.0703
.526	3.139	4.55	.0614
.632	4.161	6.72	.0550
.737	5.303	9.38	.0502
.842	6.564	12.56	.0464
.947	7.946	16.30	.0433
1.053	9.447	20.61	.0407
1.158	11.068	25.54	.0385
1.263	12.810	31.12	.0366
1.368	14.671	37.37	.0349
1.474	16.651	44.32	.0334
1.579	18.752	52.00	.0321
1.684	20.973	60.44	.0308
1.789	23.313	69.66	.0297
1.895	25.774	79.70	.0287
2.000	28.350	90.79	.0278

ROUTE ID=3 HYDROGRAPH NO=240.12 INFLOW ID=20 DT=0.0
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 240.12

RUNOFF VOLUME = 1.13802 INCHES = 2.0211 ACRE-FEET
PEAK DISCHARGE RATE = 41.09 CFS AT 1.600 HOURS BASIN AREA = .0333 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 240.2
COMPUTE NM HYD ID=4 HYD=240.2 DA=0.0125

```
                    %A=0.0  %B=9.0  %C=20.0  %D=71.0  TP=0.19
                    MASS RAINFALL=-1

    K =   .103550HR    TP =   .190000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.583    CFS   UNIT VOLUME =    .9999       B =   526.28      P60 = 1.2500
    AREA =      .008875 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .168950HR    TP =   .190000HR    K/TP RATIO =   .889211     SHAPE CONSTANT, N =  3.988791
    UNIT PEAK =   6.7620    CFS   UNIT VOLUME =    .9984       B =   354.42      P60 = 1.2500
    AREA =      .003625 SQ MI    IA =    .39655 INCHES    INF =    .96034 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD           ID=4   CODE=1

                                PARTIAL HYDROGRAPH   240.20

    RUNOFF VOLUME =     1.11053 INCHES     =        .7404 ACRE-FEET
    PEAK DISCHARGE RATE =      15.90 CFS  AT   1.550 HOURS   BASIN AREA =   .0125 SQ. MI.


** ADD  FLOW FROM AREA 240.2 TO ROUTED FLOW IN SWALE NORTH OF CENTRAL
ADD HYD             ID=5  HYDROGRAPH NO=240.21  ID I=4  ID II=3
PRINT HYD           ID=5  CODE=1

                                PARTIAL HYDROGRAPH   240.21

    RUNOFF VOLUME =     1.13050 INCHES     =       2.7614 ACRE-FEET
    PEAK DISCHARGE RATE =      56.11 CFS  AT   1.600 HOURS   BASIN AREA =   .0458 SQ. MI.


** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE TO CULVERTS CROSSING CENTRAL
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=100.0 FT  MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025  DIST=22
DIST  ELEV    DIST   ELEV   DIST   ELEV   DIST   ELEV
  0   102.0    1     101.9  11.0   100.0  15.0   100.1
 25   101.9   26     102.0

                RATING CURVE VALLEY SECTION  1.0
                   WATER      FLOW       FLOW
                  SURFACE     AREA       RATE
                   ELEV       SQ FT      CFS
                  100.00        .0         .0
                  100.11        .3         .1
                  100.21        .8         .6
                  100.32       1.5        1.5
                  100.42       2.2        2.8
```

100.53	3.1	4.5
100.63	4.2	6.7
100.74	5.3	9.4
100.84	6.6	12.6
100.95	7.9	16.3
101.05	9.4	20.6
101.16	11.1	25.5
101.26	12.8	31.1
101.37	14.7	37.4
101.47	16.7	44.3
101.58	18.8	52.0
101.68	21.0	60.4
101.79	23.3	69.7
101.89	25.8	79.7
102.00	28.3	90.8

COMPUTE TRAVEL TIME ID=15 REACH NO=1 VALLEY SECTIONS=1
LENGTH=300 SLOPE=0.0025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.105	.250	.11	.1951
.211	.793	.63	.1051
.316	1.455	1.53	.0792
.421	2.237	2.83	.0659
.526	3.139	4.55	.0575
.632	4.161	6.72	.0516
.737	5.303	9.38	.0471
.842	6.564	12.56	.0435
.947	7.946	16.30	.0406
1.053	9.447	20.61	.0382
1.158	11.068	25.54	.0361
1.263	12.810	31.12	.0343
1.368	14.671	37.37	.0327
1.474	16.651	44.32	.0313
1.579	18.752	52.00	.0301
1.684	20.973	60.44	.0289
1.789	23.313	69.66	.0279
1.895	25.774	79.70	.0269
2.000	28.350	90.79	.0260

ROUTE ID=15 HYDROGRAPH NO=240.22 INFLOW ID=5 DT=0.0
PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 240.22

RUNOFF VOLUME = 1.13051 INCHES = 2.7615 ACRE-FEET
PEAK DISCHARGE RATE = 55.57 CFS AT 1.600 HOURS BASIN AREA = .0458 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 240.3
COMPUTE NM HYD ID=3 HYD=240.3 DA=0.0080
%A=0.0 %B=10.0 %C=10.00 %D=80.0 TP=0.13333
MASS RAINFALL=-1

K = .072665HR TP = .133330HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 25.262 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.2500
AREA = .006400 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124987HR TP = .133330HR K/TP RATIO = .937423 SHAPE CONSTANT, N = 3.772497
UNIT PEAK = 4.0766 CFS UNIT VOLUME = .9981 B = 339.71 P60 = 1.2500
AREA = .001600 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 240.30

RUNOFF VOLUME = 1.19856 INCHES = .5114 ACRE-FEET
PEAK DISCHARGE RATE = 12.74 CFS AT 1.500 HOURS BASIN AREA = .0080 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 12.85 CFS
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=240.31 INFLOW ID=3 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
7.45	0.04	101.0
10.54	0.10	102.0
12.85	0.16	103.0
20.00	1.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	2.95	100.46	.018	3.42
3.00	.07	100.01	.000	.09
4.00	.02	100.00	.000	.02
5.00	.04	100.01	.000	.04
6.00	.08	100.01	.000	.08
7.00	.07	100.01	.000	.07
8.00	.06	100.01	.000	.06
9.00	.06	100.01	.000	.06
10.00	.06	100.01	.000	.06
11.00	.05	100.01	.000	.05
12.00	.05	100.01	.000	.05
13.00	.05	100.01	.000	.05

14.00	.05	100.01	.000	.05
15.00	.04	100.01	.000	.04
16.00	.04	100.01	.000	.04
17.00	.04	100.01	.000	.04
18.00	.04	100.01	.000	.04
19.00	.04	100.00	.000	.04
20.00	.04	100.00	.000	.04
21.00	.03	100.00	.000	.04
22.00	.03	100.00	.000	.03
23.00	.03	100.00	.000	.03
24.00	.03	100.00	.000	.03

PEAK DISCHARGE = 9.135 CFS - PEAK OCCURS AT HOUR 1.60
MAXIMUM WATER SURFACE ELEVATION = 101.545
MAXIMUM STORAGE = .0727 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 240.31

RUNOFF VOLUME = 1.19851 INCHES = .5114 ACRE-FEET
PEAK DISCHARGE RATE = 9.14 CFS AT 1.600 HOURS BASIN AREA = .0080 SQ. MI.

** ROUTE FLOW DOWN SWALE NORTH OF CENTRAL AVE
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 FT MAXIMUM ELEV=102 FT
CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025
N=0.025 DIST=22

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	102.0	1	101.9	11.0	100.0	21.0	101.9
22.0	102.0						

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.11	.1	.0
100.21	.2	.2
100.32	.5	.5
100.42	.9	1.0
100.53	1.5	1.8
100.63	2.1	2.9
100.74	2.9	4.3
100.84	3.7	6.2
100.95	4.7	8.4
101.05	5.8	11.2
101.16	7.1	14.4
101.26	8.4	18.2
101.37	9.9	22.5
101.47	11.4	27.4
101.58	13.1	32.9

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                                    101.68      14.9      39.1
                                    101.79      16.9      46.0
                                    101.89      18.9      53.5
                                    102.00      21.1      60.3
COMPUTE TRAVEL TIME ID=4  REACH NO=1  VALLEY SECTIONS=1
                    LENGTH=350  SLOPE=0.0025

                              TRAVEL TIME TABLE
                                          REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .105        .058        .02       .2357
                                 .211        .233        .15       .1485
                                 .316        .525        .45       .1133
                                 .421        .933        .97       .0935
                                 .526       1.458       1.76       .0806
                                 .632       2.099       2.86       .0714
                                 .737       2.858       4.31       .0644
                                 .842       3.732       6.16       .0589
                                 .947       4.724       8.43       .0545
                                1.053       5.832      11.17       .0508
                                1.158       7.056      14.40       .0477
                                1.263       8.398      18.16       .0450
                                1.368       9.856      22.48       .0426
                                1.474      11.430      27.39       .0406
                                1.579      13.121      32.92       .0388
                                1.684      14.929      39.10       .0371
                                1.789      16.854      45.96       .0356
                                1.895      18.895      53.53       .0343
                                2.000      21.100      60.32       .0340
ROUTE              ID=4  HYDROGRAPH NO=240.32  INFLOW ID=20  DT=0.0
PRINT HYD          ID=4  CODE=1

                                  PARTIAL HYDROGRAPH   240.32


    RUNOFF VOLUME =      1.19860 INCHES      =          .5114 ACRE-FEET
    PEAK DISCHARGE RATE =       8.87 CFS  AT   1.650 HOURS   BASIN AREA =   .0080 SQ. MI.


** ADD  ROUTED FLOW IN THE SWALE FROM THE EAST TO ROUTED FLOW FROM THE WEST AT
** ENTRANCE TO THE 3 - 36" DIA CULVERTS
ADD HYD            ID=16  HYDROGRAPH NO=240.33 ID I=4  ID II=15
PRINT HYD          ID=16  CODE=1

                                  PARTIAL HYDROGRAPH   240.33


    RUNOFF VOLUME =      1.14062 INCHES      =         3.2728 ACRE-FEET
    PEAK DISCHARGE RATE =      64.29 CFS  AT   1.600 HOURS   BASIN AREA =   .0538 SQ. MI.
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** COMPUTE HYDROGRAPH FOR AREA 240.4
COMPUTE NM HYD       ID=2  HYD=240.4   DA=0.0231
                     %A=0.0  %B=5.0  %C=35.00  %D=60.0  TP=0.21
                     MASS RAINFALL=-1

    K =   .114450HR    TP =   .210000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   34.734    CFS   UNIT VOLUME =    .9998       B =   526.28      P60 = 1.2500
    AREA =       .013860 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .176840HR    TP =   .210000HR    K/TP RATIO =   .842096     SHAPE CONSTANT, N =  4.230788
    UNIT PEAK =   16.292    CFS   UNIT VOLUME =    .9995       B =   370.27      P60 = 1.2500
    AREA =       .009240 SQ MI    IA =    .36875 INCHES    INF =    .88250 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=2  CODE=1

                                PARTIAL HYDROGRAPH   240.40

    RUNOFF VOLUME =     1.01075 INCHES     =       1.2452 ACRE-FEET
    PEAK DISCHARGE RATE =      25.81 CFS  AT   1.600 HOURS   BASIN AREA =   .0231 SQ. MI.


** ROUTE FLOW THROUGH THE EXISTING RETENTION POND ON THE CHURCH PROPERTY.
** POND VOLUME TAKEN FROM DRAINAGE PLAN FOR CHURCH SITE. ASSUME FREE DISCHARGE
** OF FLOW FROM POND AFTER POND STAGE REACHES ELEV. 5088
ROUTE RESERVOIR      ID=3  HYDROGRAPH NO=240.41  INFLOW ID=2  CODE=5
                     OUTFLOW(cfs)  STORAGE(ac ft)     ELEV(ft)
                          0             0             5083.0
                          0.01          1.19          5088.0
                        100.00          1.191         5088.01
                        100.01          1.192         5089.0

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

TIME       INFLOW     ELEV       VOLUME     OUTFLOW
(HRS)      (CFS)      (FEET)     (AC-FT)    (CFS)

  .00         .00    5083.00       .000        .00
  .25         .00    5083.00       .000        .00
  .50         .00    5083.00       .000        .00
  .75         .00    5083.00       .000        .00
 1.00         .00    5083.00       .000        .00
 1.25         .12    5083.00       .000        .00
 1.50       20.99    5083.63       .149        .00
 1.75       16.32    5085.58       .615        .01
 2.00        8.22    5086.57       .850        .01
 2.25        3.62    5087.10       .975        .01
 2.50        1.56    5087.30      1.024        .01
```

2.75	.86	5087.40	1.048	.01
3.00	.47	5087.46	1.061	.01
3.25	.26	5087.49	1.068	.01
3.50	.16	5087.50	1.072	.01
3.75	.10	5087.51	1.074	.01
4.00	.07	5087.52	1.076	.01
4.25	.07	5087.53	1.077	.01
4.50	.07	5087.53	1.078	.01
4.75	.07	5087.54	1.080	.01
5.00	.09	5087.54	1.081	.01
5.25	.10	5087.55	1.083	.01
5.50	.12	5087.56	1.085	.01
5.75	.14	5087.57	1.088	.01
6.00	.16	5087.58	1.090	.01
6.25	.16	5087.60	1.094	.01
6.50	.15	5087.61	1.097	.01
6.75	.15	5087.62	1.100	.01
7.00	.15	5087.63	1.103	.01
7.25	.14	5087.64	1.105	.01
7.50	.14	5087.66	1.108	.01
7.75	.14	5087.67	1.111	.01
8.00	.14	5087.68	1.114	.01
8.25	.14	5087.69	1.116	.01
8.50	.13	5087.70	1.119	.01
8.75	.13	5087.71	1.121	.01
9.00	.13	5087.72	1.124	.01
9.25	.13	5087.73	1.126	.01
9.50	.13	5087.74	1.129	.01
9.75	.12	5087.75	1.131	.01
10.00	.12	5087.76	1.133	.01
10.25	.12	5087.77	1.136	.01
10.50	.12	5087.78	1.138	.01
10.75	.12	5087.79	1.140	.01
11.00	.11	5087.80	1.142	.01
11.25	.11	5087.81	1.145	.01
11.50	.11	5087.82	1.147	.01
11.75	.11	5087.83	1.149	.01
12.00	.11	5087.84	1.151	.01
12.25	.11	5087.84	1.153	.01
12.50	.11	5087.85	1.155	.01
12.75	.10	5087.86	1.157	.01
13.00	.10	5087.87	1.159	.01
13.25	.10	5087.88	1.161	.01
13.50	.10	5087.89	1.163	.01
13.75	.10	5087.89	1.165	.01
14.00	.10	5087.90	1.167	.01
14.25	.10	5087.91	1.168	.01
14.50	.10	5087.92	1.170	.01
14.75	.10	5087.92	1.172	.01
15.00	.10	5087.93	1.174	.01
15.25	.09	5087.94	1.175	.01
15.50	.09	5087.95	1.177	.01
15.75	.09	5087.95	1.179	.01
16.00	.09	5087.96	1.181	.01

16.25	.09	5087.97	1.182	.01
16.50	.09	5087.97	1.184	.01
16.75	.09	5087.98	1.186	.01
17.00	.09	5087.99	1.187	.01
17.25	.09	5087.99	1.189	.01
17.50	.09	5088.00	1.190	.14
17.75	.08	5088.00	1.190	.03
18.00	.08	5088.00	1.190	.14
18.25	.08	5088.00	1.190	.03
18.50	.08	5088.00	1.190	.13
18.75	.08	5088.00	1.190	.04
19.00	.08	5088.00	1.190	.12
19.25	.08	5088.00	1.190	.04
19.50	.08	5088.00	1.190	.12
19.75	.08	5088.00	1.190	.04
20.00	.08	5088.00	1.190	.11
20.25	.08	5088.00	1.190	.04
20.50	.08	5088.00	1.190	.11
20.75	.08	5088.00	1.190	.05
21.00	.08	5088.00	1.190	.10
21.25	.08	5088.00	1.190	.05
21.50	.07	5088.00	1.190	.10
21.75	.07	5088.00	1.190	.05
22.00	.07	5088.00	1.190	.10
22.25	.07	5088.00	1.190	.05
22.50	.07	5088.00	1.190	.09
22.75	.07	5088.00	1.190	.05
23.00	.07	5088.00	1.190	.09
23.25	.07	5088.00	1.190	.05
23.50	.07	5088.00	1.190	.09
23.75	.07	5088.00	1.190	.05
24.00	.07	5088.00	1.190	.08
24.25	.03	5088.00	1.190	.01
24.50	.01	5088.00	1.190	.01
24.75	.00	5088.00	1.190	.01
25.00	.00	5088.00	1.190	.01
25.25	.00	5088.00	1.190	.01
25.50	.00	5088.00	1.189	.01
25.75	.00	5088.00	1.189	.01
26.00	.00	5088.00	1.189	.01
26.25	.00	5087.99	1.189	.01
26.50	.00	5087.99	1.189	.01
26.75	.00	5087.99	1.188	.01
27.00	.00	5087.99	1.188	.01
27.25	.00	5087.99	1.188	.01
27.50	.00	5087.99	1.188	.01
27.75	.00	5087.99	1.188	.01
28.00	.00	5087.99	1.187	.01
28.25	.00	5087.99	1.187	.01
28.50	.00	5087.99	1.187	.01
28.75	.00	5087.99	1.187	.01
29.00	.00	5087.99	1.186	.01
29.25	.00	5087.98	1.186	.01
29.50	.00	5087.98	1.186	.01

```
   29.75        .00   5087.98      1.186       .01
 PEAK DISCHARGE =          .142 CFS - PEAK OCCURS AT HOUR   17.50
 MAXIMUM WATER SURFACE ELEVATION =     5088.000
 MAXIMUM STORAGE =         1.1900 AC-FT      INCREMENTAL TIME=     .050000HRS

PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   240.41


    RUNOFF VOLUME =      .04833 INCHES     =         .0595 ACRE-FEET
    PEAK DISCHARGE RATE =         .14 CFS  AT  17.500 HOURS   BASIN AREA =    .0231 SQ. MI.


** ADD  ROUTED FLOW IN THE SWALE TO FLOW FROM AREA 240.4
ADD HYD             ID=15  HYDROGRAPH NO=240.42  ID I=3  ID II=16
PRINT HYD           ID=15  CODE=1

                                PARTIAL HYDROGRAPH   240.42


    RUNOFF VOLUME =      .81250 INCHES     =        3.3323 ACRE-FEET
    PEAK DISCHARGE RATE =       64.30 CFS  AT   1.600 HOURS   BASIN AREA =    .0769 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE NORTH SIDE OF CENTRAL AVE BETWEEN UNSER & AIRPORT
COMPUTE NM HYD      ID=4  HYD=240.5  DA=0.0093
                    %A=0.0  %B=0.0  %C=10.0  %D=90.0  TP=0.14
                    MASS RAINFALL=-1

    K =    .076300HR     TP =    .140000HR     K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   31.464     CFS   UNIT VOLUME =     .9980       B =   526.28      P60 = 1.2500
    AREA =       .008370 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .113445HR     TP =    .140000HR     K/TP RATIO =    .810320     SHAPE CONSTANT, N =  4.414309
    UNIT PEAK =   2.5370     CFS   UNIT VOLUME =     .9964       B =   381.91      P60 = 1.2500
    AREA =       .000930 SQ MI     IA =     .35000 INCHES     INF =     .83000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD           ID=4  code=1

                                PARTIAL HYDROGRAPH   240.50


    RUNOFF VOLUME =     1.32112 INCHES     =         .6553 ACRE-FEET
    PEAK DISCHARGE RATE =       15.78 CFS  AT   1.500 HOURS   BASIN AREA =    .0093 SQ. MI.


** ADD FLOW FROM THE NORTH SIDE OF CENTRAL AVE. TO FLOW IN SWALE AT THE NORTH
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** SIDE OF CENTRAL AVE. THIS IS THE TOTAL FLOW AT THE ENTRANCE TO THE 3 - 36"
** CULVERTS WHICH CROSS CENTRAL
ADD HYD             ID=16  HYDROGRAPH NO=240.51 ID I=4  ID II=15
PRINT HYD           ID=16  CODE=1
```

PARTIAL HYDROGRAPH 240.51

RUNOFF VOLUME = .86737 INCHES = 3.9876 ACRE-FEET
PEAK DISCHARGE RATE = 75.52 CFS AT 1.600 HOURS BASIN AREA = .0862 SQ. MI.

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** ROUTE FLOW THROUGH THE SWALE AND THE VOLUME OF THE RETENTION POND AND
** PARKING AREA WHICH IS LOCATED ABOVE ELEVATION 5088 . ASSUME FLOW FROM THIS
** AREA IS CONTROLED BY THE ENTRANCE OF THE 3 - 36" CULVERTS
ROUTE RESERVOIR     ID=15  HYDROGRAPH NO=240.52  INFLOW ID=16 CODE=5
```

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	5085.9
21	0.046	5087.0
60	0.127	5088.0
105	0.647	5089.0
150	1.437	5090.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5085.90	.000	.00
.25	.00	5085.90	.000	.00
.50	.00	5085.90	.000	.00
.75	.00	5085.90	.000	.00
1.00	.00	5085.90	.000	.00
1.25	.45	5085.91	.001	.24
1.50	65.91	5087.89	.118	55.63
1.75	54.32	5088.12	.191	65.52
2.00	26.96	5087.19	.061	28.44
2.25	11.28	5086.58	.028	12.96
2.50	4.13	5086.14	.010	4.53
2.75	1.99	5086.01	.005	2.14
3.00	1.01	5085.96	.002	1.09
3.25	.54	5085.93	.001	.57
3.50	.36	5085.92	.001	.38
3.75	.26	5085.91	.001	.27
4.00	.21	5085.91	.000	.22
4.25	.20	5085.91	.000	.20
4.50	.21	5085.91	.000	.21
4.75	.24	5085.91	.001	.23
5.00	.28	5085.91	.001	.28
5.25	.34	5085.92	.001	.33
5.50	.40	5085.92	.001	.39
5.75	.47	5085.92	.001	.47
6.00	.55	5085.93	.001	.54

6.25	.57	5085.93	.001	.57
6.50	.56	5085.93	.001	.56
6.75	.54	5085.93	.001	.54
7.00	.53	5085.93	.001	.53
7.25	.52	5085.93	.001	.52
7.50	.51	5085.93	.001	.51
7.75	.51	5085.93	.001	.51
8.00	.50	5085.93	.001	.50
8.25	.49	5085.93	.001	.49
8.50	.48	5085.93	.001	.48
8.75	.47	5085.92	.001	.47
9.00	.47	5085.92	.001	.47
9.25	.46	5085.92	.001	.46
9.50	.45	5085.92	.001	.45
9.75	.44	5085.92	.001	.44
10.00	.44	5085.92	.001	.44
10.25	.43	5085.92	.001	.43
10.50	.43	5085.92	.001	.43
10.75	.42	5085.92	.001	.42
11.00	.42	5085.92	.001	.42
11.25	.41	5085.92	.001	.41
11.50	.41	5085.92	.001	.41
11.75	.40	5085.92	.001	.40
12.00	.40	5085.92	.001	.40
12.25	.39	5085.92	.001	.39
12.50	.39	5085.92	.001	.39
12.75	.38	5085.92	.001	.38
13.00	.38	5085.92	.001	.38
13.25	.37	5085.92	.001	.37
13.50	.37	5085.92	.001	.37
13.75	.36	5085.92	.001	.36
14.00	.36	5085.92	.001	.36
14.25	.36	5085.92	.001	.36
14.50	.35	5085.92	.001	.35
14.75	.35	5085.92	.001	.35
15.00	.35	5085.92	.001	.35
15.25	.34	5085.92	.001	.34
15.50	.34	5085.92	.001	.34
15.75	.33	5085.92	.001	.33
16.00	.33	5085.92	.001	.33
16.25	.33	5085.92	.001	.33
16.50	.33	5085.92	.001	.33
16.75	.32	5085.92	.001	.32
17.00	.32	5085.92	.001	.32
17.25	.32	5085.92	.001	.32
17.50	.44	5085.92	.001	.38
17.75	.33	5085.92	.001	.38
18.00	.43	5085.92	.001	.38
18.25	.33	5085.92	.001	.38
18.50	.42	5085.92	.001	.37
18.75	.32	5085.92	.001	.37
19.00	.41	5085.92	.001	.37
19.25	.32	5085.92	.001	.36
19.50	.40	5085.92	.001	.36

19.75	.32	5085.92	.001	.36
20.00	.39	5085.92	.001	.35
20.25	.32	5085.92	.001	.35
20.50	.38	5085.92	.001	.35
20.75	.31	5085.92	.001	.34
21.00	.37	5085.92	.001	.34
21.25	.31	5085.92	.001	.34
21.50	.36	5085.92	.001	.33
21.75	.31	5085.92	.001	.33
22.00	.35	5085.92	.001	.33
22.25	.31	5085.92	.001	.33
22.50	.35	5085.92	.001	.33
22.75	.30	5085.92	.001	.32
23.00	.34	5085.92	.001	.32
23.25	.30	5085.92	.001	.32
23.50	.33	5085.92	.001	.31
23.75	.29	5085.92	.001	.31
24.00	.32	5085.92	.001	.31
24.25	.19	5085.91	.000	.22
24.50	.11	5085.91	.000	.11
24.75	.06	5085.90	.000	.06
25.00	.03	5085.90	.000	.03
25.25	.02	5085.90	.000	.02
25.50	.01	5085.90	.000	.01
25.75	.01	5085.90	.000	.01
26.00	.01	5085.90	.000	.01
26.25	.01	5085.90	.000	.01
26.50	.01	5085.90	.000	.01
26.75	.01	5085.90	.000	.01
27.00	.01	5085.90	.000	.01
27.25	.01	5085.90	.000	.01
27.50	.01	5085.90	.000	.01
27.75	.01	5085.90	.000	.01
28.00	.01	5085.90	.000	.01
28.25	.01	5085.90	.000	.01
28.50	.01	5085.90	.000	.01
28.75	.01	5085.90	.000	.01
29.00	.01	5085.90	.000	.01
29.25	.01	5085.90	.000	.01
29.50	.01	5085.90	.000	.01
29.75	.01	5085.90	.000	.01

PEAK DISCHARGE = 68.823 CFS - PEAK OCCURS AT HOUR 1.65
MAXIMUM WATER SURFACE ELEVATION = 5088.196
MAXIMUM STORAGE = .2290 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 240.52

RUNOFF VOLUME = .86737 INCHES = 3.9876 ACRE-FEET
PEAK DISCHARGE RATE = 68.82 CFS AT 1.650 HOURS BASIN AREA = .0862 SQ. MI.

** ROUTE FLOW FROM THE NORTH SIDE OF CENTRAL THROUGH 3 EXISTING 36" CULVERTS TO
** THE SOUTH SIDE OF CENTRAL. SLOPE UNKNOWN ASSUME 0.005. USE 1 54" PIPE AS
** EQUIVILANT CONVEYANCE.
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.005
PIPE DIA=4.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.23	.3	.7
.47	.9	3.2
.70	1.6	7.4
.94	2.4	13.2
1.17	3.3	20.7
1.41	4.2	29.5
1.64	5.2	39.5
1.88	6.3	50.5
2.11	7.3	62.3
2.35	8.4	74.5
2.58	9.4	87.0
2.81	10.5	99.4
3.05	11.5	111.4
3.28	12.4	122.7
3.52	13.3	132.7
3.75	14.2	141.1
3.99	14.9	147.1
4.22	15.5	149.6
4.50	15.9	149.6

COMPUTE TRAVEL TIME ID=5 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=140 FT SLOPE=0.005

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.235	.316	.73	.0169
.469	.880	3.17	.0108
.704	1.588	7.36	.0084
.938	2.402	13.24	.0071
1.173	3.296	20.67	.0062
1.407	4.249	29.49	.0056
1.641	5.248	39.51	.0052
1.876	6.277	50.52	.0048
2.111	7.325	62.28	.0046
2.345	8.380	74.53	.0044
2.579	9.430	87.02	.0042
2.814	10.463	99.42	.0041
3.049	11.468	111.43	.0040
3.283	12.432	122.68	.0039

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                                3.518       13.338       132.75        .0039
                                3.752       14.169       141.12        .0039
                                3.987       14.900       147.12        .0039
                                4.221       15.495       149.58        .0040
                                4.500       15.904       149.58        .0041
ROUTE                 ID=5  HYDROGRAPH NO=240.53  INFLOW ID=15  DT=0.0
PRINT HYD             ID=5  CODE=1

                                PARTIAL HYDROGRAPH   240.53


    RUNOFF VOLUME =       .86736 INCHES      =        3.9875 ACRE-FEET
    PEAK DISCHARGE RATE =      69.06 CFS  AT    1.650 HOURS   BASIN AREA =    .0862 SQ. MI.


** COMPUTE HYDROGRAPH FOR THE SOUTH SIDE OF CENTRAL AVE BETWEEN UNSER & AIRPORT
COMPUTE NM HYD        ID=2  HYD=240.6  DA=0.0065
                      %A=0.0  %B=0.0  %C=10.0  %D=90.0  TP=0.14
                      MASS RAINFALL=-1

    K =    .076300HR     TP =    .140000HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   21.991     CFS   UNIT VOLUME =     .9979        B =   526.28       P60 = 1.2500
    AREA =       .005850 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .113445HR     TP =    .140000HR     K/TP RATIO =    .810320      SHAPE CONSTANT, N =  4.414309
    UNIT PEAK =   1.7731     CFS   UNIT VOLUME =     .9937        B =   381.91       P60 = 1.2500
    AREA =       .000650 SQ MI     IA =     .35000 INCHES     INF =     .83000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD             ID=2  code=1

                                PARTIAL HYDROGRAPH   240.60


    RUNOFF VOLUME =      1.32112 INCHES      =         .4580 ACRE-FEET
    PEAK DISCHARGE RATE =      11.03 CFS  AT    1.500 HOURS   BASIN AREA =    .0065 SQ. MI.


*****************************************************************************************
*S BEGIN AREA SOUTH OF CENTRAL AVENUE BETWEEN UNSER AND AIRPORT
** ASSUME A CHANNEL WILL BE CONSTRUCTED BETWEEN THE CULVERTS AT CENTRAL AVE
** AND THE COORS CONNECTION STORM DRAIN
*****************************************************************************************
** ADD FLOW FROM THE SOUTH SIDE OF CENTRAL TO THE ROUTED FLOW FROM THE NORTH
** SIDE OF CENTRAL
ADD HYD               ID=3  HYDROGRAPH NO=240.61  ID I=2  ID II=5
PRINT HYD             ID=3  CODE=1

                                PARTIAL HYDROGRAPH   240.61
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RUNOFF VOLUME = .89918 INCHES = 4.4455 ACRE-FEET
PEAK DISCHARGE RATE = 75.23 CFS AT 1.650 HOURS BASIN AREA = .0927 SQ. MI.

** ROUTE FLOW DOWN AN ASSUMED CHANNEL FROM THE SOUTH SIDE OF CENTRAL
** TO THE SOUTH EAST CORNER OF AREA 250.1
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0
CHANNEL SLOPE=0.0070 FLOOD PLAIN SLOPE=0.0070
N=0.013 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	14.0
100.63	7.4	46.8
100.95	12.1	96.1
101.26	17.3	161.9
101.58	23.2	244.9
101.89	29.6	345.8
102.21	36.7	465.6
102.53	44.3	605.0
102.84	52.5	765.2
103.16	61.4	946.9
103.47	70.8	1151.1
103.79	80.8	1378.7
104.11	91.5	1630.7
104.42	102.7	1907.8
104.74	114.5	2211.0
105.05	127.0	2541.1
105.37	140.0	2899.0
105.68	153.6	3285.5
106.00	167.9	3701.5

COMPUTE TRAVEL TIME ID=4 REACH NO=1 VALLEY SECTIONS=1
LENGTH=700 SLOPE=0.0070

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	14.04	.0471
.632	7.445	46.81	.0309
.947	12.090	96.07	.0245
1.263	17.334	161.89	.0208
1.579	23.178	244.87	.0184

1.895	29.619	345.80	.0167
2.211	36.660	465.55	.0153
2.526	44.300	605.04	.0142
2.842	52.538	765.18	.0134
3.158	61.376	946.89	.0126
3.474	70.812	1151.11	.0120
3.789	80.847	1378.73	.0114
4.105	91.481	1630.65	.0109
4.421	102.713	1907.77	.0105
4.737	114.545	2210.95	.0101
5.053	126.975	2541.07	.0097
5.368	140.004	2898.97	.0094
5.684	153.632	3285.50	.0091
6.000	167.859	3701.50	.0088

ROUTE ID=4 HYDROGRAPH NO=240.62 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 240.62

RUNOFF VOLUME = .89917 INCHES = 4.4455 ACRE-FEET
PEAK DISCHARGE RATE = 74.99 CFS AT 1.600 HOURS BASIN AREA = .0927 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 250.1
COMPUTE NM HYD ID=2 HYD=250.1 DA=0.0247
%A=0.0 %B=10.0 %C=10.0 %D=80.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 78.014 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.2500
AREA = .019760 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124958HR TP = .133300HR K/TP RATIO = .937423 SHAPE CONSTANT, N = 3.772497
UNIT PEAK = 12.589 CFS UNIT VOLUME = 1.000 B = 339.71 P60 = 1.2500
AREA = .004940 SQ MI IA = .42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 250.10

RUNOFF VOLUME = 1.19856 INCHES = 1.5789 ACRE-FEET
PEAK DISCHARGE RATE = 39.32 CFS AT 1.500 HOURS BASIN AREA = .0247 SQ. MI.

** ADD FLOW FROM AREA 250.1 TO FLOW IN THE ASSUMED CHANNEL AT THE SOUTH EAST
** CORNER OF AREA 250.1
ADD HYD ID=3 HYDROGRAPH NO=250.11 ID I=4 ID II=2

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                                                                                *
                                                                                *
                                                                                *
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PRINT HYD           ID=3  CODE=1

                                PARTIAL HYDROGRAPH   250.11


    RUNOFF VOLUME =       .96216 INCHES     =       6.0244 ACRE-FEET
    PEAK DISCHARGE RATE =     107.60 CFS  AT   1.550 HOURS   BASIN AREA =    .1174 SQ. MI.



** COMPUTE HYDROGRAPH FOR AREA 250.2
COMPUTE NM HYD      ID=2  HYD=250.2  DA=0.0079
                    %A=0.0  %B=20.0  %C=45.0  %D=35.0  TP=0.15
                    MASS RAINFALL=-1

    K =    .081750HR     TP =    .150000HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   9.7010     CFS   UNIT VOLUME =     .9994        B =   526.28       P60 = 1.2500
    AREA =       .002765 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .133281HR     TP =    .150000HR     K/TP RATIO =    .888537      SHAPE CONSTANT, N =  3.992019
    UNIT PEAK =   12.140     CFS   UNIT VOLUME =     .9994        B =   354.64       P60 = 1.2500
    AREA =       .005135 SQ MI     IA =     .39615 INCHES     INF =     .95923 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD           ID=2  code=1

                                PARTIAL HYDROGRAPH   250.20


    RUNOFF VOLUME =       .72659 INCHES     =         .3061 ACRE-FEET
    PEAK DISCHARGE RATE =       8.24 CFS  AT   1.500 HOURS   BASIN AREA =    .0079 SQ. MI.



** ADD FLOW FROM AREA 250.2 TO FLOW IN THE ASSUMED CHANNEL AT SOUTH EAST
** CORNER OF AREA 250.1
ADD HYD             ID=4  HYDROGRAPH NO=250.21 ID I=3  ID II=2
PRINT HYD           ID=4  CODE=1

                                PARTIAL HYDROGRAPH   250.21


    RUNOFF VOLUME =       .94730 INCHES     =       6.3305 ACRE-FEET
    PEAK DISCHARGE RATE =     115.76 CFS  AT   1.550 HOURS   BASIN AREA =    .1253 SQ. MI.



** ROUTE FLOW DOWN ASSUMED CHANNEL FROM THE SOUTH EAST CORNER OF
** OF AREA 250.1 TO THE SOUTH LINE OF AREA 260.1
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=1
                    MINIMUM ELEV=100.0  MAXIMUM ELEV=106.0
                    CHANNEL SLOPE=0.0070  FLOOD PLAIN SLOPE=0.0070
```

N=0.013 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	14.0
100.63	7.4	46.8
100.95	12.1	96.1
101.26	17.3	161.9
101.58	23.2	244.9
101.89	29.6	345.8
102.21	36.7	465.6
102.53	44.3	605.0
102.84	52.5	765.2
103.16	61.4	946.9
103.47	70.8	1151.1
103.79	80.8	1378.7
104.11	91.5	1630.7
104.42	102.7	1907.8
104.74	114.5	2211.0
105.05	127.0	2541.1
105.37	140.0	2899.0
105.68	153.6	3285.5
106.00	167.9	3701.5

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=350 SLOPE=0.007

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	14.04	.0235
.632	7.445	46.81	.0155
.947	12.090	96.07	.0122
1.263	17.334	161.89	.0104
1.579	23.178	244.87	.0092
1.895	29.619	345.80	.0083
2.211	36.660	465.55	.0077
2.526	44.300	605.04	.0071
2.842	52.538	765.18	.0067
3.158	61.376	946.89	.0063
3.474	70.812	1151.11	.0060
3.789	80.847	1378.73	.0057
4.105	91.481	1630.65	.0055
4.421	102.713	1907.77	.0052
4.737	114.545	2210.95	.0050
5.053	126.975	2541.07	.0049

```
                                5.368     140.004     2898.97       .0047
                                5.684     153.632     3285.50       .0045
                                6.000     167.859     3701.50       .0044
ROUTE                 ID=3  HYDROGRAPH NO=250.22  INFLOW ID=4  DT=0.0
PRINT HYD             ID=3  CODE=1

                                      PARTIAL HYDROGRAPH   250.22


    RUNOFF VOLUME =       .94730 INCHES     =       6.3304 ACRE-FEET
    PEAK DISCHARGE RATE =     115.99 CFS  AT   1.550 HOURS   BASIN AREA =    .1253 SQ. MI.



** COMPUTE HYDROGRAPH FOR AREA 260.1
COMPUTE NM HYD        ID=2  HYD=260.1  DA=0.0398
                      %A=0.0  %B=15.0  %C=10.0  %D=75.0  TP=0.1333
                    MASS RAINFALL=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   117.85    CFS   UNIT VOLUME =     .9990       B =   526.28      P60 = 1.2500
    AREA =        .029850 SQ MI    IA =     .10000 INCHES    INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .050000


    K =    .128347HR    TP =    .133300HR    K/TP RATIO =    .962843     SHAPE CONSTANT, N =  3.669343
    UNIT PEAK =   24.818    CFS   UNIT VOLUME =    1.001        B =   332.49      P60 = 1.2500
    AREA =        .009950 SQ MI    IA =     .44000 INCHES    INF =    1.08200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD             ID=2  code=1

                                      PARTIAL HYDROGRAPH   260.10


    RUNOFF VOLUME =      1.13800 INCHES     =       2.4156 ACRE-FEET
    PEAK DISCHARGE RATE =      60.66 CFS  AT   1.500 HOURS   BASIN AREA =    .0398 SQ. MI.


** ADD FLOW FROM AREA 260.1 TO FLOW IN ASSUMED CHANNEL AT THE SOUTH LINE OF
** AREA 260.1
ADD HYD               ID=4  HYDROGRAPH NO=260.11 ID I=2  ID II=3
PRINT HYD             ID=4  CODE=1

                                      PARTIAL HYDROGRAPH   260.11


    RUNOFF VOLUME =       .99327 INCHES     =       8.7460 ACRE-FEET
    PEAK DISCHARGE RATE =     169.39 CFS  AT   1.550 HOURS   BASIN AREA =    .1651 SQ. MI.



** ROUTE FLOW DOWN ASSUMED CHANNEL FROM THE SOUTH LINE
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** OF AREA 260.1 TO THE SOUTH EAST CORNER OF AREA 270.1

COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1

MINIMUM ELEV=100.0 MAXIMUM ELEV=106.0

CHANNEL SLOPE=0.0025 FLOOD PLAIN SLOPE=0.0025

N=0.013 DIST=50.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	106.2	2.0	106.0	20.0	100.0	30.0	100.01
48.0	106.0	50.0	106.2				

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
100.00	.0	.0
100.32	3.4	8.4
100.63	7.4	28.0
100.95	12.1	57.4
101.26	17.3	96.7
101.58	23.2	146.3
101.89	29.6	206.7
102.21	36.7	278.2
102.53	44.3	361.6
102.84	52.5	457.3
103.16	61.4	565.9
103.47	70.8	687.9
103.79	80.8	823.9
104.11	91.5	974.5
104.42	102.7	1140.1
104.74	114.5	1321.3
105.05	127.0	1518.6
105.37	140.0	1732.5
105.68	153.6	1963.5
106.00	167.9	2212.1

COMPUTE TRAVEL TIME ID=2 REACH NO=1 VALLEY SECTIONS=1

LENGTH=800 SLOPE=0.025

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.316	3.398	8.39	.0900
.632	7.445	27.97	.0591
.947	12.090	57.41	.0468
1.263	17.334	96.75	.0398
1.579	23.178	146.34	.0352
1.895	29.619	206.65	.0319
2.211	36.660	278.22	.0293
2.526	44.300	361.58	.0272
2.842	52.538	457.28	.0255
3.158	61.376	565.88	.0241
3.474	70.812	687.92	.0229
3.789	80.847	823.95	.0218

4.105	91.481	974.50	.0209
4.421	102.713	1140.11	.0200
4.737	114.545	1321.30	.0193
5.053	126.975	1518.58	.0186
5.368	140.004	1732.47	.0180
5.684	153.632	1963.46	.0174
6.000	167.859	2212.07	.0169

ROUTE ID=2 HYDROGRAPH NO=260.12 INFLOW ID=4 DT=0.0
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 260.12

RUNOFF VOLUME = .99326 INCHES = 8.7459 ACRE-FEET
PEAK DISCHARGE RATE = 165.53 CFS AT 1.550 HOURS BASIN AREA = .1651 SQ. MI.

** COMPUTE HYDOGRAPH FOR AREA 270.1. ASSUME ALL FLOW FROM THIS AREA WILL BE
** ROUTED TO THE SOUTH TO COORS STORM DRAIN
COMPUTE NM HYD ID=3 HYD=270.1 DA=0.0222
%A=0.0 %B=15.0 %C=10.0 %D=75.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 65.735 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.2500
AREA = .016650 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .128347HR TP = .133300HR K/TP RATIO = .962843 SHAPE CONSTANT, N = 3.669343
UNIT PEAK = 13.843 CFS UNIT VOLUME = 1.000 B = 332.49 P60 = 1.2500
AREA = .005550 SQ MI IA = .44000 INCHES INF = 1.08200 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 270.10

RUNOFF VOLUME = 1.13800 INCHES = 1.3474 ACRE-FEET
PEAK DISCHARGE RATE = 33.84 CFS AT 1.500 HOURS BASIN AREA = .0222 SQ. MI.

** ADD BASIN 270.1 FLOW TO THE ROUTED FLOW IN THE ASSUMED CHANNEL FROM THE WEST
** AT THE SOUTHEAST CORNER OF BASIN 270.1
ADD HYD ID=4 HYDROGRAPH NO=270.11 ID I=3 ID II=2
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 270.11

RUNOFF VOLUME = 1.01041 INCHES = 10.0933 ACRE-FEET

PEAK DISCHARGE RATE = 195.32 CFS AT 1.550 HOURS BASIN AREA = .1873 SQ. MI.

** ROUTE THE TOTAL FLOW IN THE ASSUMED CHANNEL FROM THE WEST THRU AN
** ASSUMED DETENTION BASIN
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=270.12 INFLOW ID=4 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
87.0	1.40	101.0
116.0	3.00	102.0
145.0	5.00	103.0
200.0	6.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	69.74	101.57	2.309	103.48
3.00	3.02	100.09	.119	7.40
4.00	.51	100.01	.011	.68
5.00	.72	100.01	.010	.64
6.00	1.37	100.01	.020	1.23
7.00	1.34	100.02	.022	1.36
8.00	1.25	100.01	.020	1.26
9.00	1.17	100.01	.019	1.18
10.00	1.10	100.01	.018	1.11
11.00	1.04	100.01	.017	1.05
12.00	.99	100.01	.016	1.00
13.00	.94	100.01	.015	.95
14.00	.90	100.01	.015	.91
15.00	.86	100.01	.014	.87
16.00	.83	100.01	.013	.83
17.00	.80	100.01	.013	.80
18.00	.83	100.01	.013	.83
19.00	.80	100.01	.013	.81
20.00	.78	100.01	.013	.78
21.00	.75	100.01	.012	.75
22.00	.72	100.01	.012	.73
23.00	.70	100.01	.011	.70
24.00	.68	100.01	.011	.68
25.00	.05	100.00	.002	.11
26.00	.01	100.00	.000	.01
27.00	.01	100.00	.000	.01
28.00	.01	100.00	.000	.01
29.00	.01	100.00	.000	.01

PEAK DISCHARGE = 107.700 CFS - PEAK OCCURS AT HOUR 1.85
MAXIMUM WATER SURFACE ELEVATION = 101.714
MAXIMUM STORAGE = 2.5421 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 270.12

RUNOFF VOLUME = 1.01040 INCHES = 10.0931 ACRE-FEET
PEAK DISCHARGE RATE = 107.70 CFS AT 1.850 HOURS BASIN AREA = .1873 SQ. MI.

** ADD THE DETAINED FLOW FROM THE CHANNEL FROM THE WEST TO THE COORS STORM
** DRAIN AT STATION 75+79
ADD HYD ID=10 HYDROGRAPH NO=270.13 ID I=20 ID II=11
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 270.13

RUNOFF VOLUME = 1.09638 INCHES = 45.6676 ACRE-FEET
PEAK DISCHARGE RATE = 188.02 CFS AT 1.750 HOURS BASIN AREA = .7810 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 270.2 COORS BLVD R.W. STA 89+20 TO STA 76+15
COMPUTE NM HYD ID=3 HYD=270.2 DA=0.0071
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 23.826 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.2500
AREA = .006035 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = 2.4508 CFS UNIT VOLUME = .9943 B = 306.75 P60 = 1.2500
AREA = .001065 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=3 code=1

PARTIAL HYDROGRAPH 270.20

RUNOFF VOLUME = 1.23955 INCHES = .4694 ACRE-FEET
PEAK DISCHARGE RATE = 11.47 CFS AT 1.500 HOURS BASIN AREA = .0071 SQ. MI.

** ASSMUME HGL AT STREET LEVEL IN THE 100 YEAR STORM. MOST FLOW FROM AREA
** 270.2 BYPASSSES INLETS AND FLOWS IN STREET
** HYD 270.21 = FLOW TO THE COORS STORM DRAIN
** HYD 270.22 = FLOW TO REMAIN IN COORS
DIVIDE HYD ID=3 Q=2.00 ID I=2 HYD I=270.21
ID II=4 HYD II=270.22

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 270.21

RUNOFF VOLUME = 1.23950 INCHES = .2423 ACRE-FEET
PEAK DISCHARGE RATE = 2.00 CFS AT 1.350 HOURS BASIN AREA = .0037 SQ. MI.

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 270.22

RUNOFF VOLUME = 1.23950 INCHES = .2271 ACRE-FEET
PEAK DISCHARGE RATE = 9.47 CFS AT 1.500 HOURS BASIN AREA = .0034 SQ. MI.

** ADD A PORTION OF THE AREA 270.3 FLOW TO THE STORM DRAIN AT THE MANHOLE AT
** STA. 75+80
ADD HYD ID=3 HYDROGRAPH NO=270.23 ID I=10 ID II=2
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 270.23

RUNOFF VOLUME = 1.09705 INCHES = 45.9099 ACRE-FEET
PEAK DISCHARGE RATE = 190.02 CFS AT 1.750 HOURS BASIN AREA = .7847 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 75+80
** TO COORS S.D. MANHOLE AT STA 71+29 PRESURE FLOW USE FRICTION SLOPE
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0303
PIPE DIA=4.5 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.23	.3	1.8
.47	.9	7.8
.70	1.6	18.1
.94	2.4	32.6
1.17	3.3	50.9
1.41	4.2	72.6
1.64	5.2	97.3
1.88	6.3	124.4
2.11	7.3	153.3
2.35	8.4	183.5
2.58	9.4	214.2

2.81	10.5	244.8
3.05	11.5	274.3
3.28	12.4	302.0
3.52	13.3	326.8
3.75	14.2	347.4
3.99	14.9	362.2
4.22	15.5	368.2
4.50	15.9	368.2

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 FT SLOPE=0.0303

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.235	.316	1.80	.0220
.469	.880	7.79	.0141
.704	1.588	18.12	.0110
.938	2.402	32.59	.0092
1.173	3.296	50.89	.0081
1.407	4.249	72.60	.0073
1.641	5.248	97.27	.0067
1.876	6.277	124.37	.0063
2.111	7.325	153.31	.0060
2.345	8.380	183.48	.0057
2.579	9.430	214.21	.0055
2.814	10.463	244.75	.0053
3.049	11.468	274.32	.0052
3.283	12.432	302.01	.0051
3.518	13.338	326.79	.0051
3.752	14.169	347.41	.0051
3.987	14.900	362.16	.0051
4.221	15.495	368.22	.0053
4.500	15.904	368.22	.0054

ROUTE ID=10 HYDROGRAPH NO=270.24 INFLOW ID=3 DT=0.0
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 270.24

RUNOFF VOLUME = 1.09693 INCHES = 45.9050 ACRE-FEET
PEAK DISCHARGE RATE = 190.13 CFS AT 1.800 HOURS BASIN AREA = .7847 SQ. MI.

** ROUTE THE REMAINING FLOW FROM AREA 270.2 DOWN COORS BLVD FROM STA 75+80 TO
** STA 71+29
COMPUTE RATING CURVE CID=1 VALLEY SECTION=1 NUMBER OF SEGMENTS=1
MINIMUM ELEV=99.31 FT MAXIMUM ELEV=101.17 FT
CHANNEL SLOPE=0.0215 FLOOD PLAIN SLOPE=0.0215
N=0.017 DIST=117.00
DIST ELEV DIST ELEV DIST ELEV DIST ELEV

```
  0   100.0    1     99.98  1.01   99.31  34.0   100.67
34.01  101.17  81.98 101.17 82.00 100.67  116.00 99.31
116.02  99.98  117.0  100.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
99.31	.0	.0
99.41	.2	.4
99.51	.9	2.5
99.60	2.1	7.4
99.70	3.8	15.9
99.80	5.9	28.8
99.90	8.5	46.9
100.00	11.6	68.9
100.09	15.3	100.4
100.19	19.5	139.9
100.29	24.2	187.4
100.39	29.4	243.6
100.48	35.0	308.8
100.58	41.1	383.7
100.68	47.7	470.9
100.78	54.4	586.3
100.88	61.2	711.3
100.97	67.9	845.4
101.07	74.7	988.3
101.17	81.4	1139.8

COMPUTE TRAVEL TIME ID=3 REACH NO=1 VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.0215

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.098	.236	.39	.0748
.196	.945	2.51	.0471
.294	2.126	7.39	.0360
.392	3.780	15.91	.0297
.489	5.906	28.84	.0256
.587	8.504	46.90	.0227
.685	11.587	68.94	.0210
.783	15.323	100.39	.0191
.881	19.532	139.90	.0175
.979	24.213	187.45	.0161
1.077	29.366	243.58	.0151
1.175	34.991	308.84	.0142
1.273	41.088	383.74	.0134
1.370	47.655	470.94	.0126
1.468	54.410	586.29	.0116
1.566	61.165	711.26	.0107
1.664	67.921	845.40	.0100

```
                                    1.762       74.678       988.35        .0094
                                    1.860       81.435      1139.76        .0089
ROUTE                 ID=3  HYDROGRAPH NO=270.25  INFLOW ID=4  DT=0.0
PRINT HYD             ID=3  CODE=1

                                        PARTIAL HYDROGRAPH   270.25


    RUNOFF VOLUME =     1.24176 INCHES     =         .2275 ACRE-FEET
    PEAK DISCHARGE RATE =       8.90 CFS  AT   1.550 HOURS   BASIN AREA =    .0034 SQ. MI.



** ADD THE ROUTED FLOW IN THE STREET TO THE FLOW IN THE STORM DRAIN AT STA
** STA. 71+29
ADD HYD               ID=4  HYDROGRAPH NO=270.26 ID I=10 ID II=3
PRINT HYD             ID=4  CODE=1

                                        PARTIAL HYDROGRAPH   270.26


    RUNOFF VOLUME =     1.09756 INCHES     =       46.1324 ACRE-FEET
    PEAK DISCHARGE RATE =     192.82 CFS  AT   1.700 HOURS   BASIN AREA =    .7881 SQ. MI.



** COMPUTE HYDROGRAPH FOR AREA 280.1
COMPUTE NM HYD        ID=2  HYD=280.1  DA=0.0066
                      %A=0.0  %B=15.0  %C=10.0  %D=75.0  TP=0.1333
                      MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.543     CFS   UNIT VOLUME =     .9986        B =   526.28       P60 = 1.2500
    AREA =        .004950 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000


    K =    .128347HR     TP =    .133300HR     K/TP RATIO =    .962843      SHAPE CONSTANT, N =  3.669343
    UNIT PEAK =   4.1156     CFS   UNIT VOLUME =     .9981        B =   332.49       P60 = 1.2500
    AREA =        .001650 SQ MI     IA =     .44000 INCHES     INF =   1.08200 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000

PRINT HYD             ID=2  code=1

                                        PARTIAL HYDROGRAPH   280.10


    RUNOFF VOLUME =     1.13800 INCHES     =         .4006 ACRE-FEET
    PEAK DISCHARGE RATE =       10.07 CFS  AT   1.500 HOURS   BASIN AREA =    .0066 SQ. MI.



** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 6.59 CFS
ROUTE RESERVOIR       ID=20  HYDROGRAPH NO=280.11  INFLOW ID=2  CODE=20
```

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
3.8	0.06	101.0
5.4	0.13	102.0
6.6	0.22	103.0
10.00	1.50	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	2.30	101.20	.074	4.12
3.00	.05	100.04	.002	.15
4.00	.02	100.00	.000	.02
5.00	.03	100.01	.000	.03
6.00	.06	100.01	.001	.06
7.00	.05	100.01	.001	.05
8.00	.05	100.01	.001	.05
9.00	.05	100.01	.001	.05
10.00	.04	100.01	.001	.04
11.00	.04	100.01	.001	.04
12.00	.04	100.01	.001	.04
13.00	.04	100.01	.001	.04
14.00	.04	100.01	.001	.04
15.00	.03	100.01	.001	.03
16.00	.03	100.01	.001	.03
17.00	.03	100.01	.000	.03
18.00	.03	100.01	.000	.03
19.00	.03	100.01	.000	.03
20.00	.03	100.01	.000	.03
21.00	.03	100.01	.000	.03
22.00	.03	100.01	.000	.03
23.00	.03	100.01	.000	.03
24.00	.02	100.01	.000	.02

PEAK DISCHARGE = 4.941 CFS - PEAK OCCURS AT HOUR 1.65
MAXIMUM WATER SURFACE ELEVATION = 101.713
MAXIMUM STORAGE = .1099 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 280.11

RUNOFF VOLUME = 1.13795 INCHES = .4006 ACRE-FEET
PEAK DISCHARGE RATE = 4.94 CFS AT 1.650 HOURS BASIN AREA = .0066 SQ. MI.

** ADD FLOW FROM AREA 280.1 TO FLOW IN COORS S.D MANHOLE AT STA. 71+29
ADD HYD ID=3 HYDROGRAPH NO=280.12 ID I=4 ID II=20
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 280.12

RUNOFF VOLUME = 1.09790 INCHES = 46.5329 ACRE-FEET
PEAK DISCHARGE RATE = 197.76 CFS AT 1.700 HOURS BASIN AREA = .7947 SQ. MI.

** COMPUTE HYD. FOR AREA 280.2 COORS BLVD R.W. FROM STA 76+15 TO STA 71+70
COMPUTE NM HYD ID=4 HYD=280.2 DA=0.0025
%A=0.0 %B=15.0 %C=0.0 %D=85.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.3896 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.2500
AREA = .002125 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .141901HR TP = .133300HR K/TP RATIO = 1.064525 SHAPE CONSTANT, N = 3.317383
UNIT PEAK = .86295 CFS UNIT VOLUME = .9853 B = 306.75 P60 = 1.2500
AREA = .000375 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=4 code=1

PARTIAL HYDROGRAPH 280.20

RUNOFF VOLUME = 1.23955 INCHES = .1653 ACRE-FEET
PEAK DISCHARGE RATE = 4.04 CFS AT 1.500 HOURS BASIN AREA = .0025 SQ. MI.

** ADD FLOW FROM AREA 280.2 TO FLOW IN COORS S.D AT MANHOLE AT STA. 71+29
ADD HYD ID=5 HYDROGRAPH NO=280.21 ID I=3 ID II=4
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 280.21

RUNOFF VOLUME = 1.09834 INCHES = 46.6982 ACRE-FEET
PEAK DISCHARGE RATE = 199.55 CFS AT 1.700 HOURS BASIN AREA = .7972 SQ. MI.

** COMPUTE HYDROGRAPH FOR AREA 280.3 A PORTION OF AIRPORT DRIVE
COMPUTE NM HYD ID=6 HYD=280.3 DA=0.0045
%A=20.0 %B=30.0 %C=0.0 %D=50.0 TP=0.1333
MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.8831 CFS UNIT VOLUME = .9978 B = 526.28 P60 = 1.2500

AREA = .002250 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .156866HR TP = .133300HR K/TP RATIO = 1.176791 SHAPE CONSTANT, N = 3.015021
UNIT PEAK = 4.7776 CFS UNIT VOLUME = .9960 B = 283.04 P60 = 1.2500
AREA = .002250 SQ MI IA = .56000 INCHES INF = 1.41800 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=6 code=1

PARTIAL HYDROGRAPH 280.30

RUNOFF VOLUME = .78701 INCHES = .1889 ACRE-FEET
PEAK DISCHARGE RATE = 4.79 CFS AT 1.500 HOURS BASIN AREA = .0045 SQ. MI.

** ADD FLOW FROM AREA 280.3 TO FLOW IN COORS S.D AT MANHOLE AT STA. 71+29
ADD HYD ID=7 HYDROGRAPH NO=280.31 ID I=5 ID II=6
PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 280.31

RUNOFF VOLUME = 1.09659 INCHES = 46.8871 ACRE-FEET
PEAK DISCHARGE RATE = 201.68 CFS AT 1.700 HOURS BASIN AREA = .8017 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 71+29
** TO COORS S.D. MANHOLE AT STA 66+79
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.010
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	2.2
.63	1.6	9.6
.94	2.8	22.4
1.25	4.3	40.3
1.56	5.9	63.0
1.88	7.6	89.8
2.19	9.3	120.3
2.50	11.2	153.9
2.81	13.0	189.7
3.13	14.9	227.0
3.44	16.8	265.0
3.75	18.6	302.8
4.06	20.4	339.4

```
                                    4.38        22.1       373.7
                                    4.69        23.7       404.3
                                    5.00        25.2       429.8
                                    5.32        26.5       448.1
                                    5.63        27.5       455.6
                                    6.00        28.3       455.6
COMPUTE TRAVEL TIME ID=10  REACH=1  NUMBER OF VALLEY SECTIONS=1
                    LENGTH=450   SLOPE=0.010

                              TRAVEL TIME TABLE
                                        REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                 .313         .562        2.22        .0316
                                 .625        1.564        9.64        .0203
                                 .938        2.824       22.42        .0157
                                1.251        4.271       40.32        .0132
                                1.563        5.859       62.96        .0116
                                1.876        7.554       89.83        .0105
                                2.189        9.329      120.35        .0097
                                2.501       11.159      153.87        .0091
                                2.814       13.022      189.68        .0086
                                3.127       14.897      227.01        .0082
                                3.439       16.764      265.02        .0079
                                3.752       18.601      302.81        .0077
                                4.065       20.388      339.39        .0075
                                4.377       22.101      373.65        .0074
                                4.690       23.712      404.31        .0073
                                5.003       25.189      429.82        .0073
                                5.315       26.489      448.07        .0074
                                5.628       27.547      455.57        .0076
                                6.000       28.274      455.57        .0078
ROUTE                ID=10  HYDROGRAPH NO=280.32  INFLOW ID=7  DT=0.0
PRINT HYD            ID=10  CODE=1

                                  PARTIAL HYDROGRAPH   280.32

    RUNOFF VOLUME =      1.09642 INCHES      =       46.8797 ACRE-FEET
    PEAK DISCHARGE RATE =     201.34 CFS  AT   1.750 HOURS   BASIN AREA =    .8017 SQ. MI.


** COMPUTE HYDROGRAPH FOR AREA 290.1
COMPUTE NM HYD       ID=2  HYD=290.1  DA=0.03144
                     %A=0.0  %B=35.00  %C=10.0  %D=55.0  TP=0.1333
                     MASS RAINFALL=-1

    K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000      SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   68.270     CFS   UNIT VOLUME =     .9989        B =   526.28       P60 = 1.2500
    AREA =       .017292 SQ MI     IA =     .10000 INCHES     INF =     .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .050000
```

K = .134371HR TP = .133300HR K/TP RATIO = 1.008035 SHAPE CONSTANT, N = 3.501919
UNIT PEAK = 34.014 CFS UNIT VOLUME = 1.000 B = 320.47 P60 = 1.2500
AREA = .014148 SQ MI IA = .46667 INCHES INF = 1.15667 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=2 code=1

PARTIAL HYDROGRAPH 290.10

RUNOFF VOLUME = .89678 INCHES = 1.5037 ACRE-FEET
PEAK DISCHARGE RATE = 39.30 CFS AT 1.500 HOURS BASIN AREA = .0314 SQ. MI.

** ROUTE FLOW THRU AN ASSUMED POND WITH A PEAK DISCHARGE OF 28.8 CFS
ROUTE RESERVOIR ID=20 HYDROGRAPH NO=290.11 INFLOW ID=2 CODE=20

OUTFLOW(cfs)	STORAGE(ac ft)	ELEV(ft)
0	0	100.0
16.7	0.22	101.0
23.6	0.50	102.0
28.8	0.88	103.0
35.0	4.00	104.0

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	100.00	.000	.00
1.00	.00	100.00	.000	.00
2.00	8.35	100.94	.207	15.74
3.00	.23	100.03	.006	.46
4.00	.06	100.00	.001	.07
5.00	.11	100.01	.001	.10
6.00	.21	100.01	.003	.20
7.00	.18	100.01	.002	.19
8.00	.17	100.01	.002	.17
9.00	.16	100.01	.002	.16
10.00	.15	100.01	.002	.15
11.00	.14	100.01	.002	.14
12.00	.13	100.01	.002	.14
13.00	.13	100.01	.002	.13
14.00	.12	100.01	.002	.12
15.00	.12	100.01	.002	.12
16.00	.11	100.01	.002	.11
17.00	.11	100.01	.001	.11
18.00	.10	100.01	.001	.10
19.00	.10	100.01	.001	.10
20.00	.10	100.01	.001	.10
21.00	.09	100.01	.001	.09
22.00	.09	100.01	.001	.09

23.00	.09	100.01	.001	.09
24.00	.08	100.01	.001	.09
25.00	.00	100.00	.000	.00

PEAK DISCHARGE = 20.803 CFS - PEAK OCCURS AT HOUR 1.65
MAXIMUM WATER SURFACE ELEVATION = 101.595
MAXIMUM STORAGE = .3865 AC-FT INCREMENTAL TIME= .050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 290.11

RUNOFF VOLUME = .89677 INCHES = 1.5037 ACRE-FEET
PEAK DISCHARGE RATE = 20.80 CFS AT 1.650 HOURS BASIN AREA = .0314 SQ. MI.

** ADD FLOW FROM AREA 290.1 TO FLOW IN COORS S.D MANHOLE AT STA. 66+79
ADD HYD ID=3 HYDROGRAPH NO=290.12 ID I=10 ID II=20
PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 290.12

RUNOFF VOLUME = 1.08888 INCHES = 48.3834 ACRE-FEET
PEAK DISCHARGE RATE = 221.81 CFS AT 1.700 HOURS BASIN AREA = .8331 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 66+79
** TO COORS S.D. MANHOLE AT STA 62+29
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	6.1
.63	1.6	26.4
.94	2.8	61.4
1.25	4.3	110.4
1.56	5.9	172.4
1.88	7.6	246.0
2.19	9.3	329.6
2.50	11.2	421.4
2.81	13.0	519.5
3.13	14.9	621.7
3.44	16.8	725.8
3.75	18.6	829.3
4.06	20.4	929.5
4.38	22.1	1023.3
4.69	23.7	1107.3

5.00	25.2	1177.1
5.32	26.5	1227.1
5.63	27.5	1247.6
6.00	28.3	1247.6

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=450 SLOPE=0.075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	6.08	.0115
.625	1.564	26.41	.0074
.938	2.824	61.40	.0057
1.251	4.271	110.42	.0048
1.563	5.859	172.42	.0042
1.876	7.554	246.00	.0038
2.189	9.329	329.58	.0035
2.501	11.159	421.38	.0033
2.814	13.022	519.46	.0031
3.127	14.897	621.69	.0030
3.439	16.764	725.79	.0029
3.752	18.601	829.29	.0028
4.065	20.388	929.47	.0027
4.377	22.101	1023.29	.0027
4.690	23.712	1107.25	.0027
5.003	25.189	1177.11	.0027
5.315	26.489	1227.09	.0027
5.628	27.547	1247.63	.0028
6.000	28.274	1247.63	.0028

ROUTE ID=4 HYDROGRAPH NO=290.13 INFLOW ID=3 DT=0.0
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 290.13

RUNOFF VOLUME = 1.08882 INCHES = 48.3805 ACRE-FEET
PEAK DISCHARGE RATE = 221.96 CFS AT 1.750 HOURS BASIN AREA = .8331 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 62.29
** TO COORS S.D. MANHOLE AT STA 58+89
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	1.9

.63	1.6	8.4
.94	2.8	19.4
1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=10 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=340 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0276
.625	1.564	8.35	.0177
.938	2.824	19.42	.0137
1.251	4.271	34.92	.0116
1.563	5.859	54.52	.0101
1.876	7.554	77.79	.0092
2.189	9.329	104.22	.0085
2.501	11.159	133.25	.0079
2.814	13.022	164.27	.0075
3.127	14.897	196.59	.0072
3.439	16.764	229.52	.0069
3.752	18.601	262.25	.0067
4.065	20.388	293.92	.0066
4.377	22.101	323.59	.0065
4.690	23.712	350.14	.0064
5.003	25.189	372.23	.0064
5.315	26.489	388.04	.0064
5.628	27.547	394.54	.0066
6.000	28.274	394.54	.0068

ROUTE ID=10 HYDROGRAPH NO=290.14 INFLOW ID=4 DT=0.
PRINT HYD ID=10 CODE=1

PARTIAL HYDROGRAPH 290.14

RUNOFF VOLUME = 1.08868 INCHES = 48.3742 ACRE-FEET
PEAK DISCHARGE RATE = 222.12 CFS AT 1.750 HOURS BASIN AREA = .8331 SQ. MI.

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** COMPUTE HYDROGRAPH FOR AREA 290.2 COORS BLVD.RW FROM STA. 71+70 TO STA 59+40
COMPUTE NM HYD       ID=2  HYD=290.2  DA=0.0069
                     %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.1333
                     MASS RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   23.155    CFS   UNIT VOLUME =    .9986       B =   526.28      P60 = 1.2500
    AREA =      .005865 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000


    K =   .141901HR    TP =   .133300HR    K/TP RATIO =  1.064525     SHAPE CONSTANT, N =  3.317383
    UNIT PEAK =   2.3818    CFS   UNIT VOLUME =    .9943       B =   306.75      P60 = 1.2500
    AREA =      .001035 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .050000

PRINT HYD            ID=2  code=1

                                   PARTIAL HYDROGRAPH   290.20


    RUNOFF VOLUME =     1.23955 INCHES      =        .4562 ACRE-FEET
    PEAK DISCHARGE RATE =      11.15 CFS  AT   1.500 HOURS   BASIN AREA =    .0069 SQ. MI.



** ADD FLOW FROM AREA 290.2 TO FLOW IN COORS S.D MANHOLE  AT STA. 58+89
ADD HYD              ID=3  HYDROGRAPH NO=290.21 ID I=10  ID II=2
PRINT HYD            ID=3  CODE=1

                                   PARTIAL HYDROGRAPH   290.21


    RUNOFF VOLUME =     1.08992 INCHES      =      48.8303 ACRE-FEET
    PEAK DISCHARGE RATE =     226.46 CFS  AT   1.750 HOURS   BASIN AREA =    .8400 SQ. MI.



** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 58+89
** TO COORS S.D. MANHOLE AT STA 58+00
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.0075
                     PIPE DIA=6.0  N=0.013

                          RATING CURVE PIPE SECTION  1.0
                    WATER      FLOW       FLOW
                  SURFACE      AREA       RATE
                    ELEV       SQ FT      CFS
                     .00         .0         .0
                     .31         .6        1.9
                     .63        1.6        8.4
                     .94        2.8       19.4
```

1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=4 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=89 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0072
.625	1.564	8.35	.0046
.938	2.824	19.42	.0036
1.251	4.271	34.92	.0030
1.563	5.859	54.52	.0027
1.876	7.554	77.79	.0024
2.189	9.329	104.22	.0022
2.501	11.159	133.25	.0021
2.814	13.022	164.27	.0020
3.127	14.897	196.59	.0019
3.439	16.764	229.52	.0018
3.752	18.601	262.25	.0018
4.065	20.388	293.92	.0017
4.377	22.101	323.59	.0017
4.690	23.712	350.14	.0017
5.003	25.189	372.23	.0017
5.315	26.489	388.04	.0017
5.628	27.547	394.54	.0017
6.000	28.274	394.54	.0018

ROUTE ID=4 HYDROGRAPH NO=290.22 INFLOW ID=3 DT=0.050
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 290.22

RUNOFF VOLUME = 1.08988 INCHES = 48.8287 ACRE-FEET
PEAK DISCHARGE RATE = 226.45 CFS AT 1.750 HOURS BASIN AREA = .8400 SQ. MI.

** ROUTE FLOW IN STORM DRAIN FROM COORS STORM DRAIN M.H. AT STA 58+00
** TO OUTLET AT POND AT STA 56+10 (170' LEFT)
COMPUTE RATING CURVE CID=1 VALLEY SECTION NO=1 CODE=-1 SLOPE=0.0075
PIPE DIA=6.0 N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS
.00	.0	.0
.31	.6	1.9
.63	1.6	8.4
.94	2.8	19.4
1.25	4.3	34.9
1.56	5.9	54.5
1.88	7.6	77.8
2.19	9.3	104.2
2.50	11.2	133.3
2.81	13.0	164.3
3.13	14.9	196.6
3.44	16.8	229.5
3.75	18.6	262.2
4.06	20.4	293.9
4.38	22.1	323.6
4.69	23.7	350.1
5.00	25.2	372.2
5.32	26.5	388.0
5.63	27.5	394.5
6.00	28.3	394.5

COMPUTE TRAVEL TIME ID=5 REACH=1 NUMBER OF VALLEY SECTIONS=1
LENGTH=248 SLOPE=0.0075

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.313	.562	1.92	.0201
.625	1.564	8.35	.0129
.938	2.824	19.42	.0100
1.251	4.271	34.92	.0084
1.563	5.859	54.52	.0074
1.876	7.554	77.79	.0067
2.189	9.329	104.22	.0062
2.501	11.159	133.25	.0058
2.814	13.022	164.27	.0055
3.127	14.897	196.59	.0052
3.439	16.764	229.52	.0050
3.752	18.601	262.25	.0049
4.065	20.388	293.92	.0048
4.377	22.101	323.59	.0047
4.690	23.712	350.14	.0047

****

5.003	25.189	372.23	.0047
5.315	26.489	388.04	.0047
5.628	27.547	394.54	.0048
6.000	28.274	394.54	.0049

ROUTE ID=5 HYDROGRAPH NO=290.23 INFLOW ID=4 DT=0.050
PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 290.23

RUNOFF VOLUME = 1.08978 INCHES = 48.8240 ACRE-FEET
PEAK DISCHARGE RATE = 226.70 CFS AT 1.750 HOURS BASIN AREA = .8400 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 13:13:27