CITY OF ALBUQUERQUE

May 12, 2016

Glen Broughton, PE
Bohannan Huston, Inc.
7500 Jefferson NE, Courtyard I
Albuquerque, NM 87109

Re: Pat Hurley Community Center
Grading and Drainage Plan
Engineer's Stamp Date 5/9/2016 (J11/D012)

Dear Mr. Broughton,

Based upon the information provided in your submittal received 5-9-2016, 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.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more.

If you have any questions, you can contact me at 924-3999.

Sincerely,

Shahab Biazar, P.E.
City Engineer, Planning Dept.
Development Review Services

C: e-mail

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 10/2015)

Project Title: Pat Hurley Community Center Building Permit #:_____ Hydrology File #: J11D012

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

Legal Description: Pat Hurley Park & Lots 216 Through 222 & Westerly Portion of Lot 223 Glendale Garden Addition

City Address: 3828 Rincon Rd. NW Albuquerque, NM 87105

Applicant: Bohannan Huston Contact: Glenn Broughton

Address: 7500 Jefferson NE Albuquerque, NM 87109

Phone#: 505-823-1000 Fax#: _____ E-mail: gbrought@bhinc.com

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
____ TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN
X GRADING PLAN
____ DRAINAGE MASTER PLAN
____ DRAINAGE REPORT
____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: X Yes ____ No

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

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

____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
____ GRADING PERMIT APPROVAL
____ SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR

____ **PRE-DESIGN MEETING?**

____ OTHER (SPECIFY) _____

RECEIVED
MAY 09 2016
LAND DEVELOPMENT SECTION

DATE SUBMITTED: 5/10/16 By: Glenn Broughton

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Glenn Broughton

From: Glenn Broughton
Sent: Monday, May 09, 2016 3:00 PM
To: COA Hydro/TCL Submittal (PLNDRS@cabq.gov)
Subject: Pat Hurley Community Center - Hydrology Resubmittal
Attachments: DRAINAGE INFO SHEET_ELECTRONICrev10-15.pdf; DMP.pdf; C101.pdf

Please see our resubmittal for Hydrology review.

Thank you,

Glenn Broughton, P.E., LEED AP
Senior Project Manager
Community Development & Planning
Direct line: 505-798-7872

Bohannan Huston
Courtyard I
7500 Jefferson St. NE
Albuquerque, NM 87109-4335
www.bhinc.com
voice: 505.823.1000 **facsimile:** 505.798-7988 **toll free:** 800.877.5332

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RECEIVED
MAY 09 2016
LAND DEVELOPMENT SECTION

From: Abiel X. Carrillo
To: "gbrought@bhinc.com"
Subject: J11D012 - Pat Hurley - Stamp Date 4-1-16
Date: Wednesday, April 27, 2016 2:36:00 PM

Glenn,

This email is being sent in lieu of an attached comment letter in order to expedite the response for initial reviews. Responses to comments should continue to be included in the re-submittal. A reply to this email with responses to comments will not be considered a re-submittal.

Based on the information provided in your submittal for the above-referenced project, which was received 3-25-201, the Grading and Drainage plan cannot be approved for Building Permit until the following comments are addressed:

1. The drainage narrative mentions that the first flush volume will be managed passively by the landscaped areas. However, the volume needs to be accounted for on site to the best extent practicable. An option is to raise the grate elevation of the proposed dome grates and shape those landscaped areas into small ponds (if feasible).

    a. Roof flows should be passed through the first flush facility prior to entering the storm drain system.

Any question just let me know.

Abiel Carrillo, PE, CFM

Principal Engineer - Hydrology
Planning Department
Development Review Services Division
City of Albuquerque
505-924-3986
acarrillo@cabq.gov
600 2nd Street NW
Albuquerque, NM 87102

CITY OF ALBUQUERQUE

May 10, 2016

Lawrence Ortiz
Greer Stafford Architecture
1717 Louisiana Blvd., NE
Albuquerque, NM 87110

Re: Pat Hurley Community Center
3828 Rincon Rd., NW
Traffic Circulation Layout
Engineer's/Architect's Stamp dated 4-1-16 (J11-D012)

Dear Mr. Ortiz,

The TCL submittal received 5-5-16 is approved for Building Permit. A copy of the stamped and signed plan will be needed for each of the building permit plans. Please keep the original to be used for certification of the site for final C.O. for Transportation.

When the site construction is completed and a Certificate of Occupancy (C.O.) is requested, use the original City stamped approved TCL for certification. Redline any minor changes and adjustments that were made in the field. A NM registered architect or engineer must stamp, sign, and date the certification TCL along with indicating that the development was built in "substantial compliance" with the TCL. Submit this certification TCL with a completed Drainage and Transportation Information Sheet to front counter personnel for log in and evaluation by Transportation.

Once verification of certification is completed and approved, notification will be made to Building Safety to issue Final C.O. To confirm that a final C.O. has been issued, call Building Safety at 924-3690.

Sincerely,

Racquel M. Michel, P.E.
Traffic Engineer, Planning Dept.
Development Review Services

\gs via: email
C: CO Clerk, File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 1/2016)

Project Title: PAT HURLEY COMMUNITY CENTER Building Permit #: T201690936 Hydrology File #: J11D012

DRB#: N/A EPC#: N/A Work Order#: _____

Legal Description: PAT HURLEY PARK, GLENDALE GARDENS NO. 2 UPC: 101105832408340143

City Address: 3828 RINCON ROAD, NW ALBUQUERQUE, NM 87102

Applicant: GREER STAFFORD ARCHITECTURE Contact: LAWRENCE R. ORTIZ, AIA

Address: 1717 LOUISIANA BLVD., NE SUITE 205 ALBQ., NM 87110

Phone#: (505) 821-0235 Fax#: (505) 821-0348 E-mail: lortiz@greer-stafford.com

Other Contact: CHRISTOPHER K. RASMUSSEN, AIA PRINCIPAL-IN-CHARGE Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: crasmussen@greer-stafford.com

Check all that Apply:

DEPARTMENT:

____ HYDROLOGY/ DRAINAGE
_X_ TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ AS-BUILT CERTIFICATION

____ CONCEPTUAL G & D PLAN
____ GRADING PLAN
____ DRAINAGE MASTER PLAN
____ DRAINAGE REPORT
____ CLOMR/LOMR

_X_ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ NEIGHBORHOOD IMPACT ASSESMENT (NIA)

____ EROSION & SEDIMENT CONTROL PLAN (ESC)
____ OTHER (SPECIFY) _____

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_X_ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY
____ GRADING/ESC PERMIT APPROVAL

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

____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
____ SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR

____ **PRE-DESIGN MEETING?**

____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: ____ Yes _X_ No

DATE SUBMITTED: MAY 03, 2016 By: LAWRENCE R. ORTIZ, AIA

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ____ FEE RECEIVED: ____

Abiel X. Carrillo

From: Abiel X. Carrillo
Sent: Wednesday, April 27, 2016 2:36 PM
To: 'gbrought@bhinc.com'
Subject: J11D012 - Pat Hurley - Stamp Date 4-1-16

Glenn,

This email is being sent in lieu of an attached comment letter in order to expedite the response for initial reviews. Responses to comments should continue to be included in the re-submittal. A reply to this email with responses to comments will not be considered a re-submittal.

Based on the information provided in your submittal for the above-referenced project, which was received 3-25-201, the Grading and Drainage plan cannot be approved for Building Permit until the following comments are addressed:

1. The drainage narrative mentions that the first flush volume will be managed passively by the landscaped areas. However, the volume needs to be accounted for on site to the best extent practicable. An option is to raise the grate elevation of the proposed dome grates and shape those landscaped areas into small ponds (if feasible).

    a. Roof flows should be passed through the first flush facility prior to entering the storm drain system.

Any question just let me know.

Abiel Carrillo, PE, CFM
Principal Engineer - Hydrology
Planning Department
Development Review Services Division
City of Albuquerque
505-924-3986
acarrillo@cabq.gov
600 2nd Street NW
Albuquerque, NM 87102

Drawing Sheet
#'s are wrong too

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 10/2015)

Project Title: Pat Hurley Community Center Building Permit #:_____ Hydrology File #: J11D012

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

Legal Description: Pat Hurley Park & Lots 216 Through 222 & Westerly Portion of Lot 223 Glendale Garden Addition

City Address: 3828 Rincon Rd. NW Albuquerque, NM 87105

Applicant: Bohannan Huston Contact: Glenn Broughton

Address: 7500 Jefferson NE Albuquerque, NM 87109

Phone#: 505-823-1000 Fax#: _____ E-mail: gbrought@bhinc.com

Other Contact: _____ Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
____ TRAFFIC/ TRANSPORTATION
____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

____ ENGINEER/ARCHITECT CERTIFICATION

____ CONCEPTUAL G & D PLAN
X GRADING PLAN
____ DRAINAGE MASTER PLAN
____ DRAINAGE REPORT
____ CLOMR/LOMR

____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ EROSION & SEDIMENT CONTROL PLAN (ESC)

____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: ____ Yes X No

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

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

____ SIA/ RELEASE OF FINANCIAL GUARANTEE
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____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR

____ **PRE-DESIGN MEETING?**

____ OTHER (SPECIFY) _____

RECEIVED
MAR 25 2016
LAND DEVELOPMENT SECTION

Paid $50.00

DATE SUBMITTED: 3/25/16 By: Glenn Broughton

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED. ____

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS 1706 • 2006
ALBUQUERQUE
Making History

J-11/D12

April 22, 2005

Anna Caffrey
Bohannan Huston, Inc.
7500 Jefferson NE – Courtyard 1
Albuquerque, NM 87109

Re: Pat Hurley Park, 3828 Mountain Rd NW, Grading and Drainage Plan (J11-D12)

Dear Ms. Caffrey,

Based upon the information provided in your submittal received 4-21-05, the above referenced plan is approved for Park Construction. Please supply a stamped, signed copy of the above referenced plan for our files.

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

Sincerely,

for

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

CITY OF ALBUQUERQUE

SMA File

See emails to David B 4/25/05

ALBUQUERQUE
Making History

April 22, 2005

Anna Caffrey
Bohannan Huston, Inc.
7500 Jefferson NE – Courtyard 1
Albuquerque, NM 87109

Re: Pat Hurley Park, 3828 Mountain Rd NW, Grading and Drainage Plan (J11-D12)

See 4/29/05 email to Brad B.

Dear Ms. Caffrey,

Based upon the information provided in your submittal received 4-21-05, the above referenced plan is approved for Park Construction. Please supply a stamped, signed copy of the above referenced plan for our files.

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

Sincerely,

for

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

RECEIVED
HYDROLOGY SECTION

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 22, 2001

Thomas B. Ponder, P.E.
Chavez-Grieves Consulting Engineers, Inc.
5639 Jefferson St. NE
Albuquerque, NM 87109

RE: **Grading and Drainage Certification**
Pat Hurley Park Renovation II (Yucca & La Bajada)
(J-11/D012)
Engineer's Stamp dated 3/2/1999
Engineering Certification dated 1/12/2001

Dear Mr. Ponder:

Based upon the information provided in your Engineers Certification submittal dated 1/12/2001, the above referenced site is approved for Certificate of Occupancy.

Since the original engineer (Billy McCarty, P.E. who stamped the grading & drainage plan approved for building permit on 9/29/1998), is no longer with your company, we accept your engineers stamp dated 1/12/2001.

If I can be of further assistance, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Senior Civil Engineer, PWD

C: Vickie Chavez, COA
Teresa Martin,COA
file

DRAINAGE INFORMATION

PROJECT Pat Hurley Park ZONE ATLAS/DRNG. FILE #: J-11/D12

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOT 88-B, Regina Addition

CITY ADDRESS: 150' South East of Bluewater/Regina Circle

ENGINEERING FIRM: CHAVEZ-GRIEVES CONTACT: Brad Ponder

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: City of Albuquerque CONTACT: LEE LUNSFORD

ADDRESS: P.O. Box 1293, Albuq New Mexico 87103 PHONE: 768-3965

ARCHITECT: PDS Southwest, Ltd. CONTACT: WARREN MCCLUNG

ADDRESS: 4830 Juan Tabo NE Albuq. NM PHONE: 323-5001

SURVEYOR: Albuquerque Surveying CONTACT: Vladimir Jirik

ADDRESS: 2119 Menual NE Albuq. NM PHONE: 884-2036

CONTRACTOR: Inca Construction CONTACT: Jim Burnett

ADDRESS: 8359 Corona Loop NE Albuq. NM PHONE: 822-9747

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
_X_ ENGINEER'S CERTIFICATION
____ OTHER

PRE-DESIGN MEETING:

____ YES
_X_ NO
____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
_X_ CERTIFICATE OF OCCUPANCY APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ S.A.D. DRAINAGE REPORT
____ DRAINAGE REQUIREMENTS
____ OTHER _____ (SPECIFY)

RECEIVED
JAN 16 2001
HYDROLOGY SECTION

DATE SUBMITTED: January 16, 2001

BY: Ernie Salazar

G:\m23\103\document\drainfo2

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • SUITE 1 • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

LETTER OF TRANSMITTAL

TO: C.O.A. Hydrology
Plaza Del Sol Bldg
600 2nd Street

DATE: 1-16-01

JOB # N123-103-5197

RE: COA # 4981.93
Drainage CERT

ATTN:

WE ARE SENDING YOU ___ATTACHED ___UNDER SEPARATE COVER, THE FOLLOWING ITEMS:

____SHOP DRAWINGS	✓ PLANS	____SPECIFICATIONS	____DISKETTE
____CHANGE ORDER	____PRINTS	____CALCULATIONS	____PROPOSAL INFO
____COPY OF LETTER	____SAMPLES	____REPORT	____ _____

COPIES	DATE	NO.	DESCRIPTION
1	Sheets 13 & 16	Bluelme G&D	CERT.

THESE ARE TRANSMITTED AS CHECKED BELOW:

✓ FOR YOUR USE
____AS REQUESTED
____PLEASE CORRECT AND RESUBMIT
____RESUBMITTAL IS NOT REQUIRED
CORRECTIONS, IF ANY, ARE NOTED

____FOR REVIEW & COMMENT
____RETURNED AFTER LOAN TO US
____SUBMIT____COPIES FOR DISTRIBUTION
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____BIDS/PROPOSALS DUE _____ 199_

REMARKS:

RECEIVED
JAN 16 2001
HYDROLOGY SECTION

COPIES TO:

SIGNED: Ernie Salazar

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

REV.9/95

CITY OF
Albuquerque

November 18,1998

Billy O. McCarty PE
Chavez-Grieves Consulting Engineers, Inc.
5639 Jefferson St. NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR PAT HURLEY PARK (J11-D12) REVISION DATED 9/11/98

Dear Mr. McCarty:

Based on the information provided on your September 29,1998 resubmittal, the above referenced site is approved for Grading & Building Permit.

Please be advised that Engineer Certification per the DPM checklist will be required after construction is completed.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya CE
Associate Engineer

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

DRAINAGE REPORT

FOR

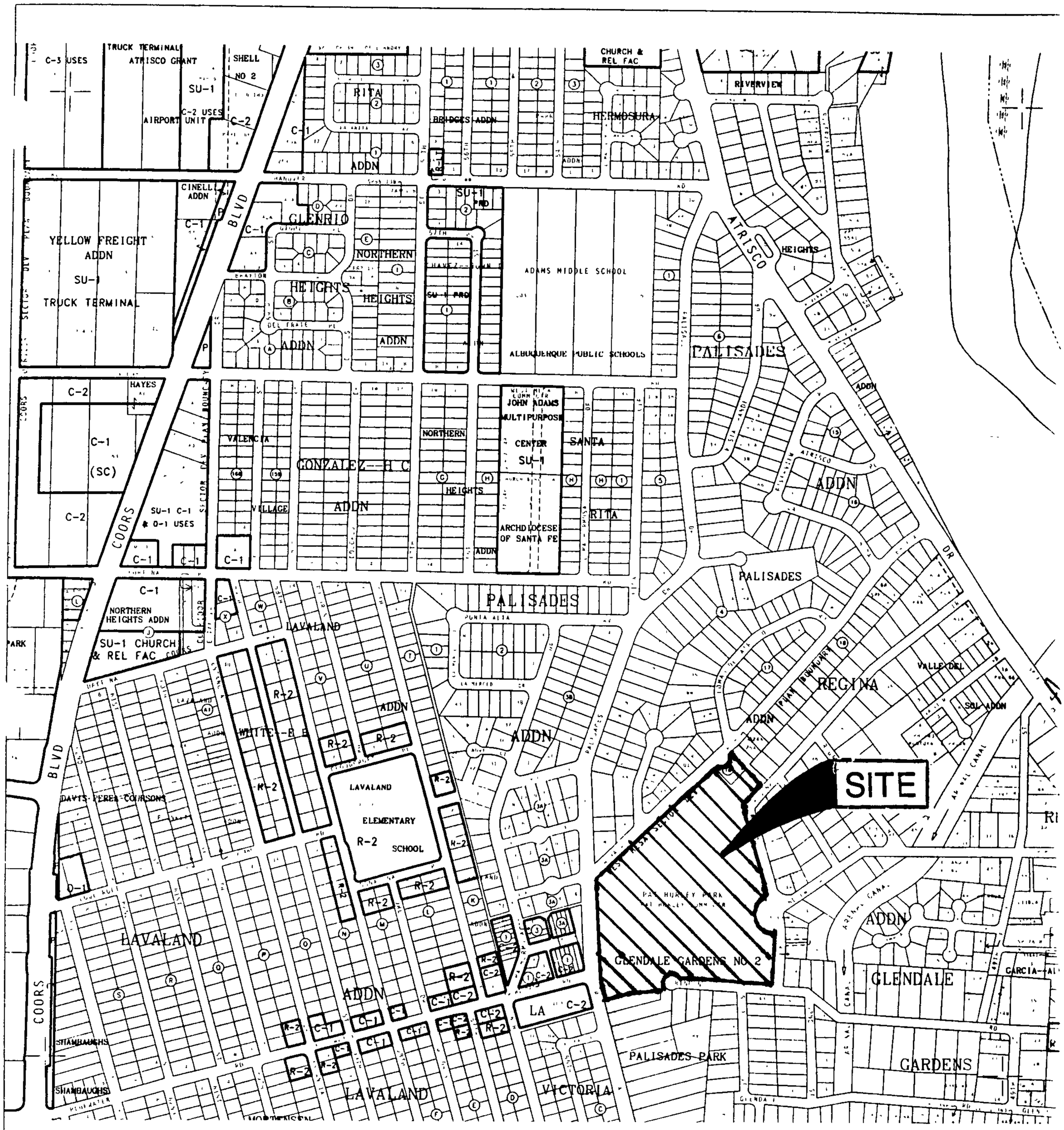
PAT HURLEY PARK

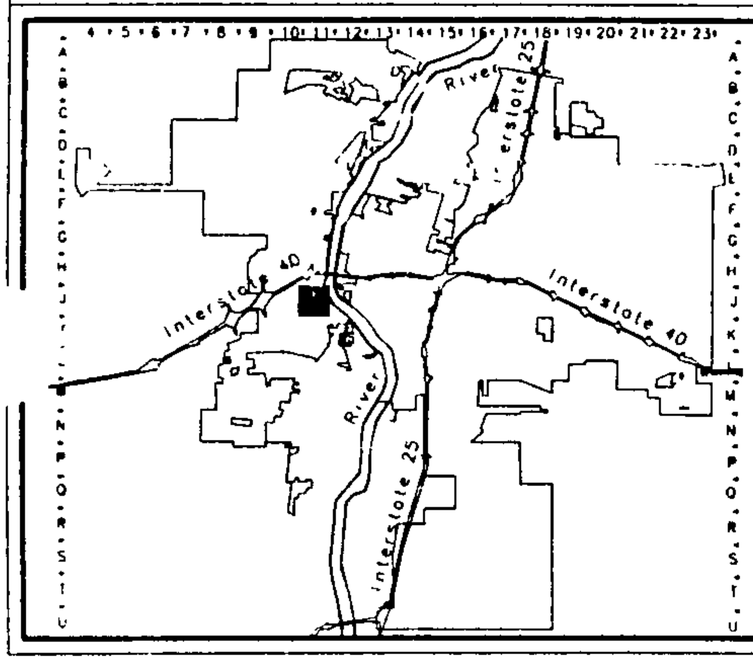
ALBUQUERQUE, NEW MEXICO

BILLY O. McCARTY
STATE OF NEW MEXICO
13872
REGISTERED PROFESSIONAL ENGINEER
9-11-98

RECEIVED
SEP 29 1998
HYDROLOGY SECTION

SEPTEMBER, 1998





750 375 0 750

Scale 1" = 750'

Albuquerque Geographic Information System

City of Albuquerque

© Planning Department July 06, 1993

LEGAL DESCRIPTION

T10N

R2E

SEC 14

UNIFORM PROPERTY CODE

1-011-058

J-11-Z

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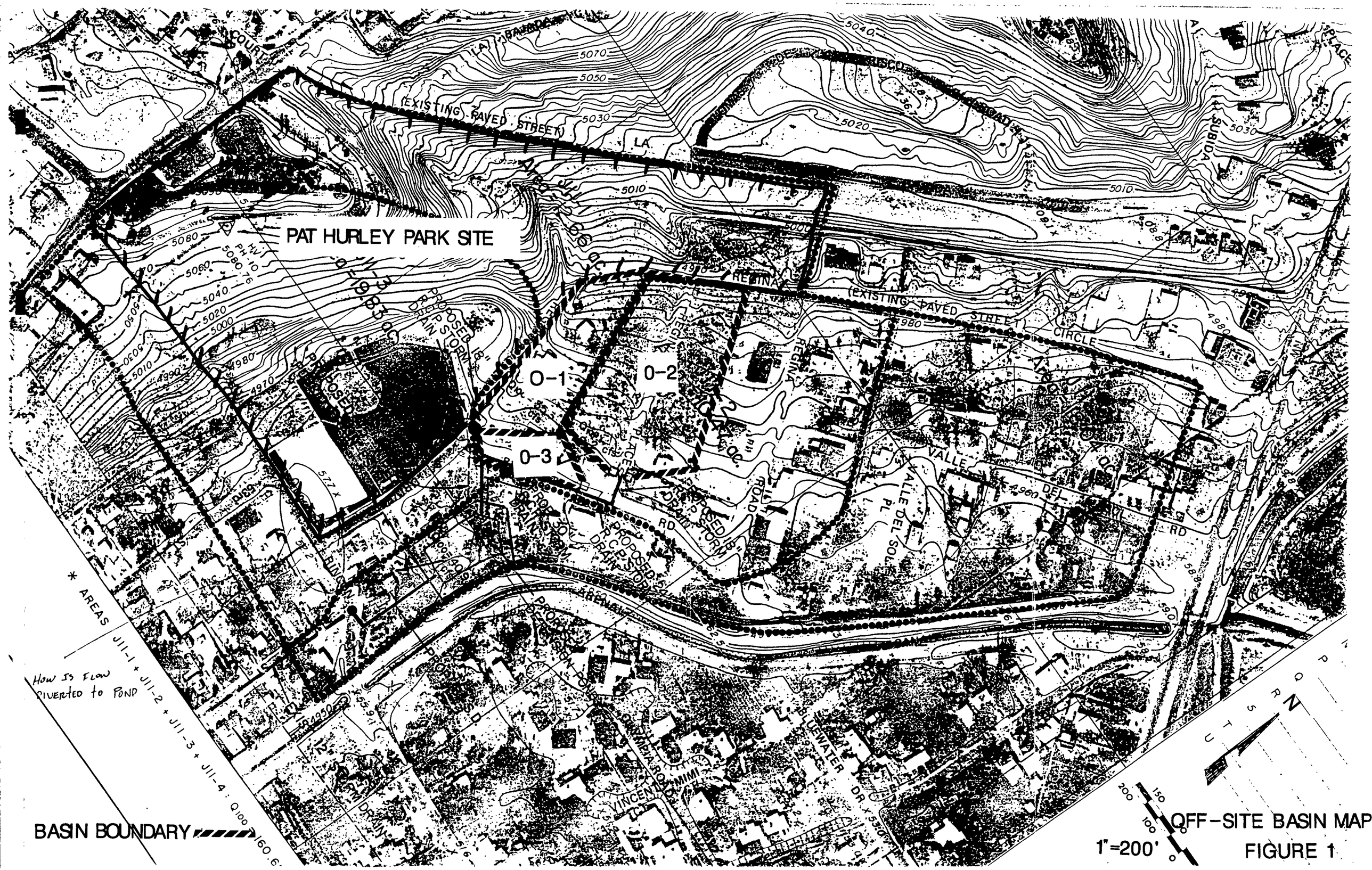
Storm Runoff Summary ..... Figure 2
Narrative ..... Page 1
100-Year Design Storm AHYMO Analysis ..... Appendix A
Supplemental Calculations ..... Appendix B
SAD 219 Data and Correspondence ..... Appendix C



OFF-SITE BASIN MAP

FIGURE 1

STORM RUNOFF SUMMARY

ANALYSIS POINT	EXISTING		DEVELOPED	
	Q_{100} (CFS)	V_{100} (AC-FT)	Q_{100} (CFS)	V_{100} (AC-FT)
A.P.1	94.64	3.01	61.41	1.776
A.P.1 (INTO PIPE)	12.75	1.179	12.75	0.643
A.P.2	6.3	0.191	4.38	0.221
A.P.3	88.19	2.022	70.51	2.164
ARENAL POND (IN)	18.49	1.375	18.49	0.84
ARENAL POND (OUT)	2.94	1.363*	2.19	0.833**

*Available volume = 2.49 ac-ft, Volume used = 1.017 ac-ft
**Available volume = 2.49 ac-ft, Volume used = 0.682 ac-ft

Figure 2

LOCATION

This site is located between Coors Road and the Arenal Canal in west Albuquerque. It is bordered on the southwest by Yucca Drive, on the northeast by La Bajada Rd., on the east by Regina Circle, and on the south by Rincon Rd. It is in the middle of a fully-developed residential area.

FLOOD HAZARD ZONES

As shown by Panel 3500020027 of the National Flood Insurance Rate Map for the City of Albuquerque, dated October 14, 1983, the site is not located within a flood plain.

RELATED REPORTS

SAD 219 was prepared in 1990 by Mark Goodwin and Associates, and the storm drainage improvements designed by that SAD were installed in 1991 (Appendix C). The subject site is contained within Basins J11-1 and J11-3 (see Figure 1 and page C-2). The J11 watershed is the watershed designated by the report as the "Regina area." A portion of this watershed discharges to a detention pond that was constructed between Arenal and Bluewater as part of the SAD.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

Per Figure 1, the western 1/6th of the site is developed by lawn areas, and is the site of upper Pat Hurley Park. It is some 50 vertical feet above the lower park. The lower park along the east and south edges consists of a parking lot, buildings, tennis courts, a playground, and a sodded baseball field. Slopes in the developed areas are from ½ to 5%. The intermediary area between the two developed portions is covered by very steep undeveloped land that has slopes which vary between 20% and 45%.

The site does not accept any off-site runoff. Runoff generated from Yucca Drive and La Bajada Road is intercepted by curb and gutter and is discharged around the site and to the north and west into another watershed.

All on-site runoff discharges to Regina Circle. A portion of this runoff enters the existing inlet on Regina at Bluewater, and is discharged to a nearby detention pond between Arenal and Bluewater via an underground storm drain system constructed as part of SAD 219 (page C-2). The remainder of the runoff discharges to the south and west via the paved surfaces of Regina Circle and Rincon Rd.

The underground storm drain system data was taken from the SAD 219 report, and is shown on pages C-3 and C-4. This data was input into the AHYMO run. Much of the runoff discharges downstream in the streets into other watersheds because the inlet capacity is not large enough to capture more runoff. As shown in the AHYMO run, the system has sufficient capacity to discharge the intercepted runoff to the pond, but not much more than that.

This storm drain system discharges into a detention pond that was designed as part of the SAD. Per Figure 2, the pond has greater capacity than what discharges to it. However, the existing storm drain system does not have sufficient capacity to deliver more. The data for the pond volume is on page C-5. The controlled discharge from the pond is created by an 8" discharge pipe that connects to a standpipe located in a concrete inlet box (page C-8 and following). The discharge pipe connects to a downstream storm drain in 51st St. that conveys the runoff downstream. Under existing conditions, the pond is well within its capacity.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The developed drainage pattern is similar to the existing. All runoff will discharge to Regina Circle. On the east side of the site, a new parking lot, basketball court, and buildings will be constructed, while a footpath will be constructed on the north part of the site connecting the upper and lower parks. Several small on-site detention ponds will be incorporated into the path system. The detention ponds assist in sediment control, as well as in slowing the rate of the surface runoff so that erosion is somewhat mitigated by this drainage scheme. However, these small ponds fill up quickly and discharge the full 100-year peak flow with only a 1.5' depth. Therefore, reservoir routings were not used in the AHYMO analysis since timing and storage volume are insignificant for the 100-year event.

A new detention pond (POND F) will be incorporated into the grading of the lower park area. This pond will release in two directions: 1) To the street downstream, and then into the adjacent downstream watershed via paved surfaces, and 2) into the back of the existing inlet. The surface discharge from the pond will be 7.52 cfs. while the storm drain discharge will be limited to the existing capacity of 12.75 cfs. As shown in Figure 2, the downstream runoff in the street at A.P.3 will be less under developed conditions than under existing for two reasons: the detention in the lower park area will attenuate the peak flow; and some of the runoff will be discharged directly to the storm drain system.

As shown on Figure 2, the existing Arenal detention pond will have slightly more capacity after development. The decreased volume of water contained in the pond is 0.335 ac-ft. As shown in Figure 2, after development the detention pond will still have 1.81 ac-ft of excess capacity. So even under fully-developed conditions, the pond will function satisfactorily.

HYDROLOGY

The runoff calculations and design have been done in accordance with Section 22.2 of the Development Process Manual of the City of Albuquerque, January 1993. The computerized hydrologic model, AHYMO, was used to calculate storm runoff in accordance with Section 22.2. The 100-year, 6-hour storm was used to model the runoff due to the short detention time for the ponds in this development. Pond sizing, and surface conveyance capacities were all computed in the AHYMO run.

Appendix A

AHYMO Hydrologic Calculations

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
AHYMO PROGRAM (AHYMO_97) -                          - Version:  1997.02c
     RUN DATE (MON/DAY/YR) = 09/10/1998
     START TIME (HR:MIN:SEC) = 08:14:19     USER NO.= AHYMO-I3Chavez-Grieves-C
     INPUT FILE = G:\M23\103\DOCUMENT\AHYMO6.IN

*S*************************************************************************
*S**********    CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.   **************
*S**************                PAT HURLEY PARK               **************
*S*************************************************************************
*S*  FILENAME:  G:\M23\103\DOCUMENT\AHYMO6.IN/OUT
*S*************************************************************************
*S******* 100 YEAR, 24 HOUR STORM (Section 22.2 Hydrology)
START               0.00
RAINFALL            TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
                    RAIN SIX=2.20  RAIN DAY=2.66 DT=0.03333

              COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
              DT =    .033330 HOURS       END TIME =     5.999400 HOURS
                .0000   .0016   .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   .0809   .0865   .0924   .1050
                .1334   .1771   .2398   .3254   .4379   .5814   .7600
                .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
               1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
               1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
               1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
               1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
               2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
               2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
               2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
               2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
               2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
               2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  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  2.1460  2.1475  2.1489
               2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
               2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
               2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
               2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
               2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
               2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S*************************************************************************
*S*****************  EXISTING BASINS  ****************************************
*S*************************************************************************
*S  COMPUTE BASIN B   REGINA CR STREET FLOW ABOVE DOUBLE C INLET(ANALYSIS POINT
COMPUTE NM HYD      ID=1 HYD=EXIST_B DA=0.02591 SQ MI
                    %A=0 %B=50 %C=0 %D=50
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   51.147    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
     AREA =      .012955 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   31.789    CFS   UNIT VOLUME =    .9999       B =   327.09      P60 = 1.8700
     AREA =      .012955 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
                                        HYDROGRAPH FROM AREA EXIST_B


    RUNOFF VOLUME =     1.31643 INCHES     =       1.8191 ACRE-FEET
    PEAK DISCHARGE RATE =      52.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0259 SQ. MI.


*S  COMPUTE BASIN   O-1  OFF-SITE BASIN WHICH DISCHARGES TO REGINA CR
COMPUTE NM HYD      ID=2 HYD=EXIST_01 DA=0.0280 SQ MI
                    %A=2 %B=68 %C=25 %D=5
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
     AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .125068HR    TP =   .133300HR    K/TP RATIO =   .938247     SHAPE CONSTANT, N =  3.769050
     UNIT PEAK =   67.740    CFS   UNIT VOLUME =    1.000       B =   339.47      P60 = 1.8700
     AREA =      .026600 SQ MI    IA =    .46368 INCHES    INF =   1.14832 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=2 CODE=1

                                        HYDROGRAPH FROM AREA EXIST_01


    RUNOFF VOLUME =      .79725 INCHES     =       1.1906 ACRE-FEET
    PEAK DISCHARGE RATE =      41.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S TOTAL FLOW TO REGINA CR EXISTING DOUBLE C INLET ( ANALYSIS POINT 1)
ADD HYD             ID=3  HYD=A_P_1  ID I=1  ID II=2
PRINT HYD           ID=3  CODE=1

                                        HYDROGRAPH FROM AREA A_P_1


    RUNOFF VOLUME =     1.04677 INCHES     =       3.0096 ACRE-FEET
    PEAK DISCHARGE RATE =      94.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0539 SQ. MI.


*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THEINLET
*S  ON REGINA CIRCLE.  THE INLET OVERFLOW DISCHARGES SOUTH ON REGINA
*S  INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=3  Q=12.75 CFS  ID I=4   HYD=STORM_DRAIN
                                      ID II=5  HYD=DOWNSTREAM
PRINT HYD           ID=5  CODE=1

                                        HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =     1.04677 INCHES     =       1.8310 ACRE-FEET
    PEAK DISCHARGE RATE =      81.89 CFS  AT   1.500 HOURS   BASIN AREA =   .0328 SQ. MI.


*S  COMPUTE BASIN A   DISCHARGE TO REGINA CR BELOW ANALYSIS POINT1(ANALYSIS POIN
COMPUTE NM HYD      ID=6 HYD=A_P_2 DA=0.00410 SQ MI
                    %A=0 %B=84 %C=0 %D=16
                    TP=0.1333 RAINFALL=-1
```

```
K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   2.5899    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
AREA =      .000656 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
UNIT PEAK =   8.4508    CFS   UNIT VOLUME =    .9988       B =   327.09      P60 = 1.8700
AREA =      .003444 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=6 CODE=1

                                    HYDROGRAPH FROM AREA A_P_2


   RUNOFF VOLUME =      .87508 INCHES     =        .1913 ACRE-FEET
   PEAK DISCHARGE RATE =      6.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0041 SQ. MI.


*S*************************************************************************
*S TOTAL STREET FLOW IN REGINA CR EXITING THIS SITE (ANALYSIS POINT 3)
ADD HYD             ID=7  HYD=A_P_3  ID I=5 ID II=6
PRINT HYD           ID=7  CODE=1

                                    HYDROGRAPH FROM AREA A_P_3


   RUNOFF VOLUME =     1.02768 INCHES     =       2.0223 ACRE-FEET
   PEAK DISCHARGE RATE =      88.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0369 SQ. MI.


*S  COMPUTE BASIN O-2   OFF-SITE BASIN STORM DRAIN TO EXISTING DETENTION POND
COMPUTE NM HYD      ID=8 HYD=EXIST_O2 DA=0.00280 SQ MI
                    %A=0 %B=50 %C=0 %D=50
                    TP=0.1333  RAINFALL=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
UNIT PEAK =   3.4353    CFS   UNIT VOLUME =    .9964       B =   327.09      P60 = 1.8700
AREA =      .001400 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=8 CODE=1

                                    HYDROGRAPH FROM AREA EXIST_O2


   RUNOFF VOLUME =     1.31643 INCHES     =        .1966 ACRE-FEET
   PEAK DISCHARGE RATE =      5.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S TOTAL STORM DRAIN FLOW TO EXISTING DETENTION POND
ADD HYD             ID=9  HYD=TOTL_TO_POND  ID I=4  ID II=8
PRINT HYD           ID=9  CODE=1

                                    HYDROGRAPH FROM AREA TOTL_TO_POND
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
RUNOFF VOLUME =     1.07833 INCHES     =       1.3752 ACRE-FEET
PEAK DISCHARGE RATE =      18.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0239 SQ. MI.


*S*************************************************************************
*S DISCHARGE FROM EXISTING DETENTION POND
ROUTE RESERVOIR     ID=10  HYD=EXST_POND_OUT  INFLOW ID=9  CODE=10
                    OUTFLOW (CFS)     STORAGE (AC_FT)      ELEVATION
                         0.0              0.00               4950
                         2.8              0.87               4952
                         3.3              1.41               4953
                         3.7              1.95               4954
                         4.0              2.49               4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	14.00	4950.15	.067	.22
1.67	15.75	4951.16	.503	1.62
2.00	13.89	4951.94	.844	2.72
2.33	4.32	4952.26	1.009	2.93
2.67	1.79	4952.25	1.007	2.93
3.00	.86	4952.17	.961	2.88
3.33	.49	4952.06	.900	2.83
3.67	.35	4951.92	.835	2.69
4.00	.28	4951.78	.772	2.49
4.33	.25	4951.64	.714	2.30
4.67	.25	4951.52	.660	2.12
5.00	.26	4951.40	.611	1.97
5.33	.28	4951.30	.566	1.82
5.67	.30	4951.21	.525	1.69
6.00	.32	4951.12	.489	1.57
6.33	.04	4951.04	.452	1.45
6.67	.01	4950.95	.414	1.33
7.00	.00	4950.87	.379	1.22
7.33	.00	4950.80	.347	1.12
7.67	.00	4950.73	.317	1.02
8.00	.00	4950.67	.290	.93
8.33	.00	4950.61	.266	.86
8.67	.00	4950.56	.243	.78
9.00	.00	4950.51	.223	.72
9.33	.00	4950.47	.204	.66
9.67	.00	4950.43	.186	.60
10.00	.00	4950.39	.171	.55
10.33	.00	4950.36	.156	.50
10.67	.00	4950.33	.143	.46
11.00	.00	4950.30	.131	.42
11.33	.00	4950.27	.120	.39
11.67	.00	4950.25	.110	.35
12.00	.00	4950.23	.100	.32
12.33	.00	4950.21	.092	.30
12.67	.00	4950.19	.084	.27
13.00	.00	4950.18	.077	.25
13.33	.00	4950.16	.070	.23
13.67	.00	4950.15	.064	.21
14.00	.00	4950.14	.059	.19
14.33	.00	4950.12	.054	.17

```
14.67        .00   4950.11       .049       .16
15.00        .00   4950.10       .045       .15
15.33        .00   4950.09       .041       .13
15.67        .00   4950.09       .038       .12
16.00        .00   4950.08       .035       .11
16.33        .00   4950.07       .032       .10
16.67        .00   4950.07       .029       .09
17.00        .00   4950.06       .027       .09
17.33        .00   4950.06       .024       .08
17.66        .00   4950.05       .022       .07
18.00        .00   4950.05       .020       .07
18.33        .00   4950.04       .019       .06

TIME      INFLOW    ELEV      VOLUME    OUTFLOW
(HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

18.66        .00   4950.04       .017       .05
19.00        .00   4950.04       .016       .05
19.33        .00   4950.03       .014       .05
19.66        .00   4950.03       .013       .04
 PEAK DISCHARGE =        2.936 CFS - PEAK OCCURS AT HOUR    2.47
 MAXIMUM WATER SURFACE ELEVATION =     4952.272
 MAXIMUM STORAGE =        1.0168 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=10  CODE=1

                                        HYDROGRAPH FROM AREA EXST_POND_OUT


    RUNOFF VOLUME =     1.06893 INCHES     =       1.3633 ACRE-FEET
    PEAK DISCHARGE RATE =       2.94 CFS  AT   2.466 HOURS   BASIN AREA =   .0239 SQ. MI.


*S*************************************************************************
*S******************  PROPOSED BASINS  ************************************
*S*************************************************************************
*S  COMPUTE BASIN B-6
COMPUTE NM HYD      ID=11 HYD=DEV_B6 DA=0.00424 SQ MI
                    %A=0 %B=10 %C=88 %D=2
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .33479    CFS   UNIT VOLUME =    .9664       B =   526.28      P60 = 1.8700
     AREA =      .000085 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .108431HR    TP =   .133300HR    K/TP RATIO =   .813433     SHAPE CONSTANT, N =  4.395534
     UNIT PEAK =   11.868    CFS   UNIT VOLUME =    .9993       B =   380.73      P60 = 1.8700
     AREA =      .004155 SQ MI    IA =    .36531 INCHES    INF =    .87286 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=11 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B6


    RUNOFF VOLUME =      .97488 INCHES     =        .2205 ACRE-FEET
    PEAK DISCHARGE RATE =       7.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.


*S  COMPUTE BASIN B-4
COMPUTE NM HYD      ID=12 HYD=DEV_B4 DA=0.00289 SQ MI
```

```
                %A=2 %B=0 %C=98 %D=0
                TP=0.1333  RAINFALL=-1

     K =   .107023HR    TP =   .133300HR    K/TP RATIO =   .802874     SHAPE CONSTANT, N =  4.460289
     UNIT PEAK =   8.3419    CFS   UNIT VOLUME =    .9989       B =   384.77      P60 = 1.8700
     AREA =      .002890 SQ MI    IA =    .35600 INCHES    INF =    .84680 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=12 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B4


    RUNOFF VOLUME =      .97870 INCHES     =        .1508 ACRE-FEET
    PEAK DISCHARGE RATE =      5.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


ADD HYD             ID=13 HYD=B46 ID I=11  ID II=12
PRINT HYD           ID=13  CODE=1

                                    HYDROGRAPH FROM AREA B46


    RUNOFF VOLUME =      .97638 INCHES     =        .3713 ACRE-FEET
    PEAK DISCHARGE RATE =     12.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0071 SQ. MI.


*S  COMPUTE BASIN B-5
COMPUTE NM HYD      ID=14 HYD=DEV_B5 DA=0.00145 SQ MI
                    %A=0 %B=67 %C=30 %D=3
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .17174    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
     AREA =      .000044 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .123221HR    TP =   .133300HR    K/TP RATIO =   .924391     SHAPE CONSTANT, N =  3.828171
     UNIT PEAK =   3.6249    CFS   UNIT VOLUME =    .9965       B =   343.55      P60 = 1.8700
     AREA =      .001407 SQ MI    IA =    .45361 INCHES    INF =   1.12010 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=14 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B5


    RUNOFF VOLUME =      .79249 INCHES     =        .0613 ACRE-FEET
    PEAK DISCHARGE RATE =      2.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0015 SQ. MI.


ADD HYD             ID=15  HYD=B456  ID I=13  ID II=14
PRINT HYD           ID=15  CODE=1

                                    HYDROGRAPH FROM AREA B456


    RUNOFF VOLUME =      .94493 INCHES     =        .4324 ACRE-FEET
    PEAK DISCHARGE RATE =     15.09 CFS  AT   1.500 HOURS   BASIN AREA =   .0086 SQ. MI.
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
*S  COMPUTE BASIN E-2
COMPUTE NM HYD      ID=16 HYD=DEV_E2 DA=0.00108 SQ MI
                    %A=5 %B=13 %C=80 %D=2
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .85278E-01CFS   UNIT VOLUME =    .8874       B =   526.28      P60 = 1.8700
     AREA =      .000022 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .112150HR    TP =   .133300HR    K/TP RATIO =   .841332     SHAPE CONSTANT, N =  4.234994
     UNIT PEAK =   2.9421    CFS   UNIT VOLUME =    .9958       B =   370.55      P60 = 1.8700
     AREA =      .001058 SQ MI    IA =    .38520 INCHES    INF =    .92857 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=16 CODE=1

                                    HYDROGRAPH FROM AREA DEV_E2


    RUNOFF VOLUME =      .92676 INCHES     =        .0534 ACRE-FEET
    PEAK DISCHARGE RATE =       1.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0011 SQ. MI.


ADD HYD             ID=17  HYD=B456E2  ID I=15  ID II=16
PRINT HYD           ID=17  CODE=1

                                    HYDROGRAPH FROM AREA B456E2


    RUNOFF VOLUME =      .94271 INCHES     =        .4857 ACRE-FEET
    PEAK DISCHARGE RATE =      16.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  COMPUTE BASIN E-1
COMPUTE NM HYD      ID=18 HYD=DEV_E1 DA=0.00103 SQ MI
                    %A=0 %B=30 %C=0 %D=70
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   2.8465    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
     AREA =      .000721 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .75821    CFS   UNIT VOLUME =    .9821       B =   327.09      P60 = 1.8700
     AREA =      .000309 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=18 CODE=1

                                    HYDROGRAPH FROM AREA DEV_E1


    RUNOFF VOLUME =     1.57605 INCHES     =        .0866 ACRE-FEET
    PEAK DISCHARGE RATE =       2.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0010 SQ. MI.


*S  COMPUTE BASIN D
COMPUTE NM HYD      ID=19 HYD=DEV_D DA=0.00014 SQ MI
```

```
                %A=0 %B=20 %C=0 %D=80
                TP=0.1333  RAINFALL=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   .44218    CFS   UNIT VOLUME =    .9751       B =   526.28      P60 = 1.8700
AREA =      .000112 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
UNIT PEAK =   .68705E-01CFS   UNIT VOLUME =    .8722       B =   327.09      P60 = 1.8700
AREA =      .000028 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19 CODE=1

                                    HYDROGRAPH FROM AREA DEV_D

    RUNOFF VOLUME =     1.70586 INCHES     =        .0127 ACRE-FEET
    PEAK DISCHARGE RATE =        .36 CFS  AT   1.500 HOURS   BASIN AREA =   .0001 SQ. MI.


ADD HYD             ID=20  HYD=E1D  ID I=18  ID II=19
PRINT HYD           ID=20  CODE=1

                                    HYDROGRAPH FROM AREA E1D

    RUNOFF VOLUME =     1.59117 INCHES     =        .0993 ACRE-FEET
    PEAK DISCHARGE RATE =       2.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0012 SQ. MI.


ADD HYD             ID=21  HYD=B456E12D  ID I=17  ID II=20
PRINT HYD           ID=21  CODE=1

                                    HYDROGRAPH FROM AREA B456E12D

    RUNOFF VOLUME =     1.01277 INCHES     =        .5850 ACRE-FEET
    PEAK DISCHARGE RATE =      19.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0108 SQ. MI.


*S TOTAL FLOW TO REGINA CR EXISTING DOUBLE C INLET ( ANALYSIS POINT 1)
*S INCLUDING OFFSITE BASIN O-1
ADD HYD             ID=22  HYD=A_P_1  ID I=2  ID II=21
PRINT HYD           ID=22  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1

    RUNOFF VOLUME =      .85735 INCHES     =       1.7755 ACRE-FEET
    PEAK DISCHARGE RATE =      61.41 CFS  AT   1.500 HOURS   BASIN AREA =   .0388 SQ. MI.


*S  COMPUTE BASIN B-2
COMPUTE NM HYD      ID=26 HYD=DEV_B2 DA=0.00666 SQ MI
                    %A=5 %B=5 %C=88 %D=2
                    TP=0.1333  RAINFALL=-1

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

```
UNIT PEAK =   .52588    CFS   UNIT VOLUME =    .9786       B =   526.28      P60 = 1.8700
AREA =      .000133 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .110099HR    TP =   .133300HR    K/TP RATIO =   .825945     SHAPE CONSTANT, N =  4.321835
UNIT PEAK =   18.414    CFS   UNIT VOLUME =    .9996       B =   376.09      P60 = 1.8700
AREA =      .006527 SQ MI    IA =    .37296 INCHES    INF =    .89429 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=26 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B2


RUNOFF VOLUME =      .95621 INCHES     =        .3396 ACRE-FEET
PEAK DISCHARGE RATE =      11.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S DIVIDE OUT THE PORTION WHICH DISCHARGES TO REGINA CR. AND THE
*S PORTION WHICH DISCHARGES TO POND B-1
DIVIDE HYD          ID=26  Q=1.74 CFS   ID I=27   HYD=DOWNSTREAM
                                       ID II=28   HYD=STORM_DRAIN
PRINT HYD           ID=28  CODE=1

                                    HYDROGRAPH FROM AREA STORM_DRAIN


RUNOFF VOLUME =      .95619 INCHES     =        .2123 ACRE-FEET
PEAK DISCHARGE RATE =      10.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.



*S  COMPUTE BASIN A-2  (EXISTING PARKING LOT)
COMPUTE NM HYD      ID=29 HYD=DEV_A2 DA=0.00073 SQ MI
                    %A=0 %B=0 %C=0 %D=100
                    TP=0.1333 RAINFALL=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   2.8821    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
AREA =      .000730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=29 CODE=1

                                    HYDROGRAPH FROM AREA DEV_A2


RUNOFF VOLUME =     1.96548 INCHES     =        .0765 ACRE-FEET
PEAK DISCHARGE RATE =       2.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


ADD HYD             ID=30  HYD=A2B1  ID I=27  ID II=29
PRINT HYD           ID=30  CODE=1

                                    HYDROGRAPH FROM AREA A2B1


RUNOFF VOLUME =     1.18441 INCHES     =        .2039 ACRE-FEET
PEAK DISCHARGE RATE =       3.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0032 SQ. MI.
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
*S  COMPUTE BASIN A-1.
COMPUTE NM HYD       ID=31 HYD=DEV_A1 DA=0.00040 SQ MI
                     %A=0 %B=90 %C=0 %D=10
                     TP=0.1333 RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .15792    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
     AREA =      .000040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .88336    CFS   UNIT VOLUME =    .9850       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 =   .033330

PRINT HYD            ID=31 CODE=1

                                        HYDROGRAPH FROM AREA DEV_A1


    RUNOFF VOLUME =      .79719 INCHES     =        .0170 ACRE-FEET
    PEAK DISCHARGE RATE =        .59 CFS  AT   1.500 HOURS   BASIN AREA =   .0004 SQ. MI.


*S TOTAL FLOW THROUGH CURB OPENING AT ANALYSIS POINT 2
ADD HYD              ID=32  HYD=A_P_2  ID I=30  ID II=31
PRINT HYD            ID=32  CODE=1

                                        HYDROGRAPH FROM AREA A_P_2


    RUNOFF VOLUME =     1.14076 INCHES     =        .2207 ACRE-FEET
    PEAK DISCHARGE RATE =       4.38 CFS  AT   1.500 HOURS   BASIN AREA =   .0036 SQ. MI.


ADD HYD              ID=33  HYD=A_P_2  ID I=22  ID II=32
PRINT HYD            ID=33  CODE=1

                                        HYDROGRAPH FROM AREA A_P_2


    RUNOFF VOLUME =      .88157 INCHES     =       1.9962 ACRE-FEET
    PEAK DISCHARGE RATE =      65.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0425 SQ. MI.


*S*************************************************************************
*S  COMPUTE BASIN E-3
COMPUTE NM HYD       ID=34 HYD=DEV_E3 DA=0.00049 SQ MI
                     %A=0 %B=0 %C=100 %D=0
                     TP=0.1333  RAINFALL=-1

     K =   .105867HR    TP =   .133300HR    K/TP RATIO =   .794199     SHAPE CONSTANT, N =  4.514851
     UNIT PEAK =   1.4268    CFS   UNIT VOLUME =    .9917       B =   388.14      P60 = 1.8700
     AREA =      .000490 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=34 CODE=1

                                        HYDROGRAPH FROM AREA DEV_E3
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```
    RUNOFF VOLUME =      .99441 INCHES     =        .0260 ACRE-FEET
    PEAK DISCHARGE RATE =        .91 CFS  AT   1.500 HOURS   BASIN AREA =   .0005 SQ. MI.


*S  COMPUTE BASIN B-3
COMPUTE NM HYD      ID=35 HYD=DEV_B3 DA=0.00219 SQ MI
                    %A=0 %B=6 %C=94 %D=0
                    TP=0.1333  RAINFALL=-1

     K =   .107374HR    TP =   .133300HR    K/TP RATIO =   .805509     SHAPE CONSTANT, N =  4.444013
     UNIT PEAK =   6.3047    CFS   UNIT VOLUME =    .9983       B =   383.75      P60 = 1.8700
     AREA =      .002190 SQ MI    IA =    .35900 INCHES    INF =    .85520 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=35 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B3

    RUNOFF VOLUME =      .97094 INCHES     =        .1134 ACRE-FEET
    PEAK DISCHARGE RATE =       3.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


ADD HYD             ID=36  HYD=B3E3  ID I=34  ID II=35
PRINT HYD           ID=36  CODE=1

                                        HYDROGRAPH FROM AREA B3E3

    RUNOFF VOLUME =      .97512 INCHES     =        .1394 ACRE-FEET
    PEAK DISCHARGE RATE =       4.87 CFS  AT   1.500 HOURS   BASIN AREA =   .0027 SQ. MI.


*S  COMPUTE BASIN C
COMPUTE NM HYD      ID=37 HYD=DEV_C DA=0.00128 SQ MI
                    %A=0 %B=20 %C=0 %D=80
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   4.0428    CFS   UNIT VOLUME =    .9965       B =   526.28      P60 = 1.8700
     AREA =      .001024 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .62816    CFS   UNIT VOLUME =    .9787       B =   327.09      P60 = 1.8700
     AREA =      .000256 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=37 CODE=1

                                        HYDROGRAPH FROM AREA DEV_C

    RUNOFF VOLUME =     1.70586 INCHES     =        .1165 ACRE-FEET
    PEAK DISCHARGE RATE =       3.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


ADD HYD             ID=38  HYD=B3E3C  ID I=36  ID II=37
PRINT HYD           ID=38  CODE=1
```

```
                                        HYDROGRAPH FROM AREA B3E3C


    RUNOFF VOLUME =      1.21126 INCHES     =        .2558 ACRE-FEET
    PEAK DISCHARGE RATE =       8.08 CFS  AT   1.500 HOURS   BASIN AREA =   .0040 SQ. MI.


*S  COMPUTE BASIN B-1
COMPUTE NM HYD       ID=39 HYD=DEV_B1 DA=0.00743 SQ MI
                     %A=0 %B=50 %C=45 %D=5
                     TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   1.4667    CFS   UNIT VOLUME =    .9911       B =   526.28      P60 = 1.8700
     AREA =      .000372 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .119091HR    TP =   .133300HR    K/TP RATIO =   .893402     SHAPE CONSTANT, N =  3.968817
     UNIT PEAK =   18.697    CFS   UNIT VOLUME =    .9997       B =   353.08      P60 = 1.8700
     AREA =      .007059 SQ MI    IA =    .42895 INCHES    INF =   1.05105 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=39 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B1


    RUNOFF VOLUME =      .86530 INCHES     =        .3429 ACRE-FEET
    PEAK DISCHARGE RATE =      11.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


ADD HYD              ID=40  HYD=B1_POND_IN  ID I=38  ID II=39
PRINT HYD            ID=40  CODE=1

                                        HYDROGRAPH FROM AREA B1_POND_IN


    RUNOFF VOLUME =      .98555 INCHES     =        .5987 ACRE-FEET
    PEAK DISCHARGE RATE =      20.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0114 SQ. MI.


*S TOTAL FLOW TO POND B-1
ADD HYD              ID=41  HYD=B1_POND_IN_TOTL  ID I=28  ID II=40
PRINT HYD            ID=41  CODE=1

                                        HYDROGRAPH FROM AREA B1_POND_IN_TOTL


    RUNOFF VOLUME =      .97769 INCHES     =        .8110 ACRE-FEET
    PEAK DISCHARGE RATE =      30.10 CFS  AT   1.500 HOURS   BASIN AREA =   .0156 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-1 POND
ROUTE RESERVOIR      ID=42  HYD=B1_POND_OUT  INFLOW ID=41  CODE=10
                     OUTFLOW (CFS)     STORAGE (AC_FT)      ELEVATION
                          0.00            0.00000            4951.39
                          7.36            0.00045            4952.89
                         10.41            0.00067            4953.64
                         12.75            0.00090            4954.39
                         24.60            0.22200            4955.00
```

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

  TIME      INFLOW    ELEV      VOLUME    OUTFLOW
  (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

    .00        .00   4951.39      .000       .00
    .33        .00   4951.39      .000       .00
    .67        .00   4951.39      .000       .00
   1.00        .00   4951.39      .000       .00
   1.33       1.93   4951.78      .000      1.89
   1.67      15.32   4954.75      .133     19.81
   2.00       2.63   4952.26      .000      4.25
   2.33        .74   4951.68      .000      1.40
   2.67        .28   4951.50      .000       .55
   3.00        .12   4951.44      .000       .23
   3.33        .05   4951.41      .000       .10
   3.67        .03   4951.40      .000       .05
   4.00        .02   4951.40      .000       .03
   4.33        .02   4951.40      .000       .03
   4.67        .02   4951.40      .000       .02
   5.00        .02   4951.40      .000       .02
   5.33        .02   4951.40      .000       .02
   5.67        .03   4951.40      .000       .03
   6.00        .03   4951.40      .000       .03
   6.33        .00   4951.39      .000       .00
 PEAK DISCHARGE =       20.274 CFS - PEAK OCCURS AT HOUR    1.63
 MAXIMUM WATER SURFACE ELEVATION =     4954.777
 MAXIMUM STORAGE =         .1413 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=42  CODE=1

                                        HYDROGRAPH FROM AREA B1_POND_OUT


   RUNOFF VOLUME =      .97769 INCHES     =        .8110 ACRE-FEET
   PEAK DISCHARGE RATE =      20.27 CFS  AT   1.633 HOURS   BASIN AREA =   .0156 SQ. MI.


*S  DIVIDE THE POND OUTFLOW INTO STORM DRAIN AND STREET COMPONENTS
DIVIDE HYD          ID=42  Q=12.75 CFS  ID I=43   HYD=STORMDRAIN
                                      ID II=44  HYD=DOWNSTREAM
PRINT HYD           ID=44  CODE=1

                                        HYDROGRAPH FROM AREA DOWNSTREAM


   RUNOFF VOLUME =      .97769 INCHES     =        .1678 ACRE-FEET
   PEAK DISCHARGE RATE =       7.52 CFS  AT   1.633 HOURS   BASIN AREA =   .0032 SQ. MI.


*S*************************************************************************
*S TOTAL STREET FLOW IN REGINA CR EXITING THIS SITE (ANALYSIS POINT 3)
*S*************************************************************************
ADD HYD             ID=45  HYD=A_P_3  ID I=33  ID II=44
PRINT HYD           ID=45  CODE=1

                                        HYDROGRAPH FROM AREA A_P_3


   RUNOFF VOLUME =      .88834 INCHES     =       2.1640 ACRE-FEET
   PEAK DISCHARGE RATE =      70.51 CFS  AT   1.533 HOURS   BASIN AREA =   .0457 SQ. MI.
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
*S  ADD EXISTING O-2 FOR TOTAL FLOW INTO EXISTING DETENTION POND
ADD HYD            ID=46  HYD=INLET_TOTAL  ID I=8  ID II=43
PRINT HYD          ID=46  CODE=1
```

HYDROGRAPH FROM AREA INLET_TOTAL

RUNOFF VOLUME = 1.04035 INCHES = .8397 ACRE-FEET
PEAK DISCHARGE RATE = 18.49 CFS AT 1.500 HOURS BASIN AREA = .0151 SQ. MI.

```
*S*************************************************************************
*S DISCHARGE FROM EXISTING DETENTION POND
*S*************************************************************************
ROUTE RESERVOIR    ID=47  HYD=DEV_POND_OUT  INFLOW ID=46  CODE=10
```

OUTFLOW (CFS)	STORAGE (AC_FT)	ELEVATION
0.0	0.00	4950
2.8	0.87	4952
3.3	1.41	4953
3.7	1.95	4954
4.0	2.49	4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	3.14	4950.03	.013	.04
1.67	15.75	4950.96	.416	1.34
2.00	5.38	4951.55	.672	2.16
2.33	1.68	4951.54	.670	2.16
2.67	.66	4951.45	.630	2.03
3.00	.28	4951.34	.584	1.88
3.33	.13	4951.24	.537	1.73
3.67	.08	4951.13	.494	1.59
4.00	.05	4951.04	.453	1.46
4.33	.05	4950.96	.416	1.34
4.67	.05	4950.88	.382	1.23
5.00	.05	4950.81	.350	1.13
5.33	.05	4950.74	.322	1.04
5.67	.05	4950.68	.296	.95
6.00	.06	4950.63	.272	.88
6.33	.01	4950.57	.250	.80
6.67	.00	4950.53	.229	.74
7.00	.00	4950.48	.209	.67
7.33	.00	4950.44	.192	.62
7.67	.00	4950.40	.175	.56
8.00	.00	4950.37	.161	.52
8.33	.00	4950.34	.147	.47
8.67	.00	4950.31	.134	.43
9.00	.00	4950.28	.123	.40
9.33	.00	4950.26	.113	.36
9.67	.00	4950.24	.103	.33
10.00	.00	4950.22	.094	.30
10.33	.00	4950.20	.086	.28
10.67	.00	4950.18	.079	.25
11.00	.00	4950.17	.072	.23
11.33	.00	4950.15	.066	.21
11.67	.00	4950.14	.061	.19
12.00	.00	4950.13	.055	.18

```
12.33        .00   4950.12       .051       .16
12.67        .00   4950.11       .046       .15
13.00        .00   4950.10       .042       .14
13.33        .00   4950.09       .039       .13
13.67        .00   4950.08       .036       .11
14.00        .00   4950.07       .033       .10
14.33        .00   4950.07       .030       .10
14.67        .00   4950.06       .027       .09
15.00        .00   4950.06       .025       .08
15.33        .00   4950.05       .023       .07
15.67        .00   4950.05       .021       .07
16.00        .00   4950.04       .019       .06
16.33        .00   4950.04       .017       .06
16.67        .00   4950.04       .016       .05
17.00        .00   4950.03       .015       .05
17.33        .00   4950.03       .013       .04
17.66        .00   4950.03       .012       .04
18.00        .00   4950.03       .011       .04
18.33        .00   4950.02       .010       .03

   TIME      INFLOW    ELEV      VOLUME    OUTFLOW
   (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

18.66        .00   4950.02       .009       .03
19.00        .00   4950.02       .009       .03
19.33        .00   4950.02       .008       .03
19.66        .00   4950.02       .007       .02
 PEAK DISCHARGE =        2.194 CFS - PEAK OCCURS AT HOUR    2.13
 MAXIMUM WATER SURFACE ELEVATION =     4951.567
 MAXIMUM STORAGE =         .6817 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=47  CODE=1

                                        HYDROGRAPH FROM AREA DEV_POND_OUT


   RUNOFF VOLUME =     1.03213 INCHES     =        .8331 ACRE-FEET
   PEAK DISCHARGE RATE =       2.19 CFS  AT   2.133 HOURS   BASIN AREA =   .0151 SQ. MI.



FINISH

   NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:14:20
```

Appendix B

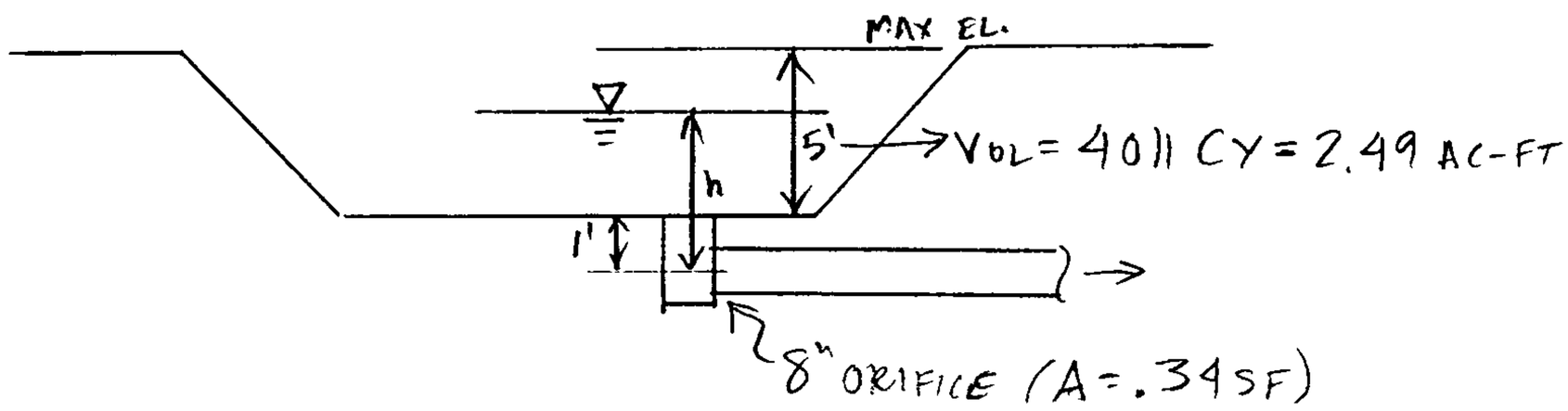
Supplemental Calculations

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
5639 JEFFERSON STREET N.E. • ALBUQUERQUE, NEW MEXICO 87109
PHONE (505) 344-4080 • FAX (505) 343-8759

SHEET NO. _____ OF _____
JOB PAT HURLEY PARK
SUBJECT _____
CLIENT _____ JOB NO. _____
BY JK DATE 9/26/97
CHECKED BY _____ DATE _____

SUPPLEMENTAL CALCULATIONS

1. EXISTING POND BETWEEN BLUEWATER AND ARENAL.



USE ORIFICE EQUATION TO ANALYZE:

$$Q_{CAP} = .6\,A\sqrt{2gh}$$

$$= .6\,(.34)\sqrt{2(32.2)h}$$

h (ft.)	Q_{CAP} (cfs)	Vol (ac-ft.)
3	2.8	0.87
4	3.3	1.41
5	3.7	1.95
6	4.0	2.49

2. DETERMINATION OF LAND TREATMENT TYPES:

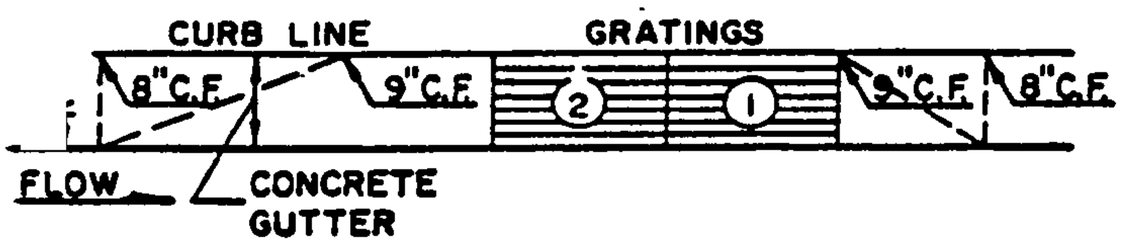
DEVELOPED "C" FACTOR OF 0.60 WAS USED IN SAP 219 (1990), FOR USE WITH RATIONAL METHODOLOGY.

CURRENT AHYMO METHODOLOGY REQUIRES THE USE OF LAND TREATMENT FACTORS. CORRESPONDING LAND TREATMENT FACTORS ARE:

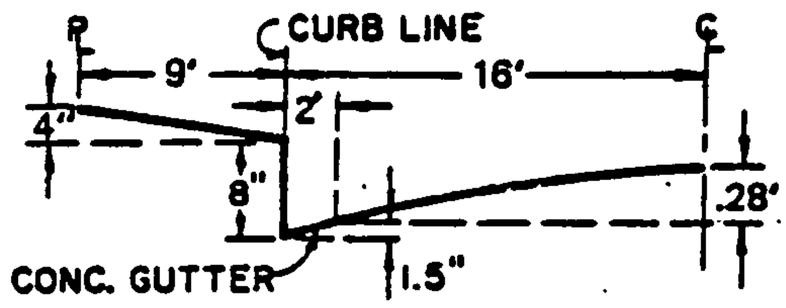
				OLD "C" FACTOR		
"B"	LANDSCAPED	50%	×	0.25	=	.125
"D"	IMPERVIOUS	50%	×	0.95	=	.475
						0.600 ✓

USE 50% "B" & 50% "D".

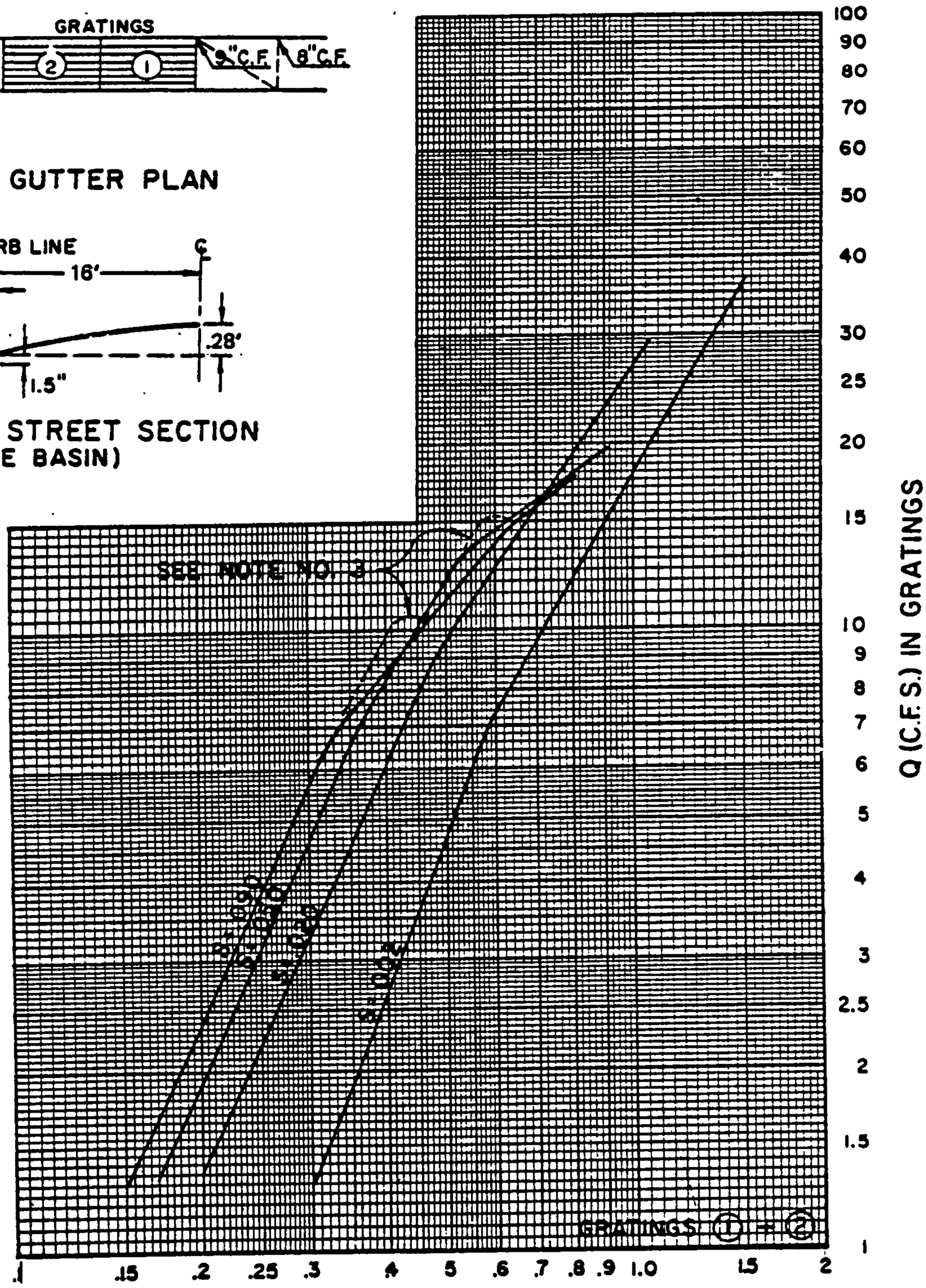
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



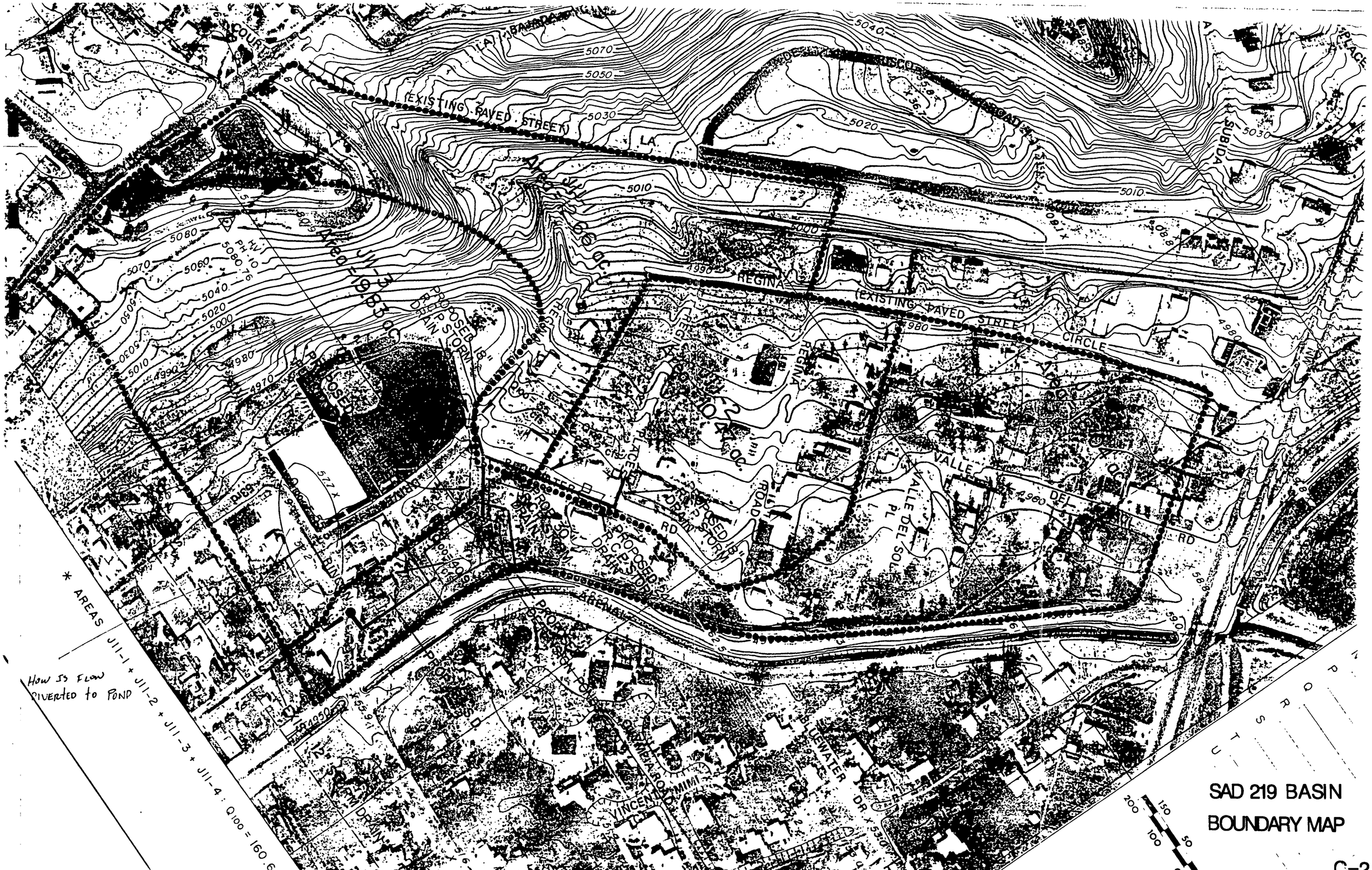
Appendix C

SAD 219 Data

SAD 219 DRAINAGE SUMMARY SHEET

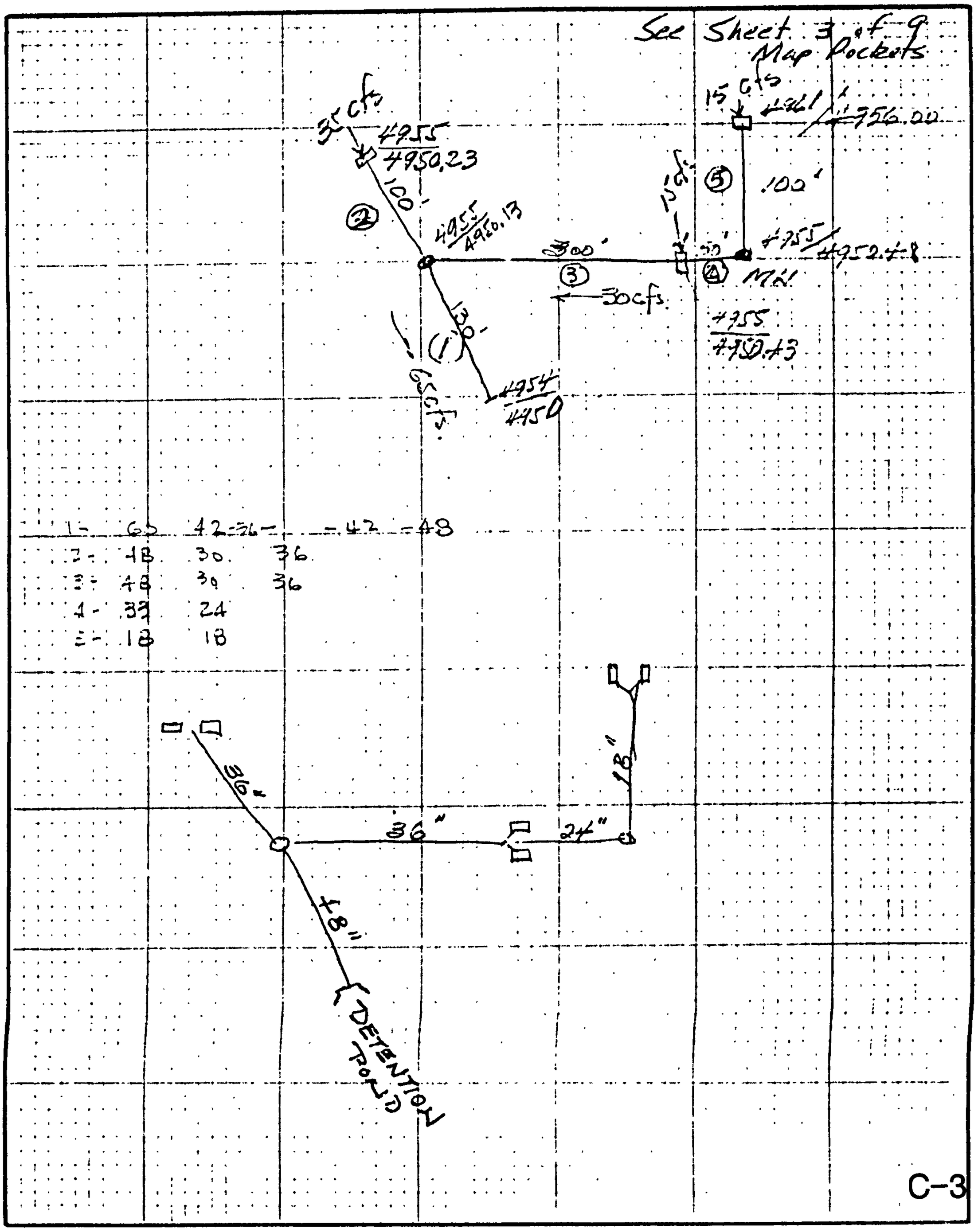
REGINA AREA

Area Designation	Area (Acres)	Rainfall Intensity (i)	C Factor	100 year Runoff Rate
51st and Rincon Outfall				
J11-1	12.66	4.65	0.60	35.32
J11-2	10.47	4.65	0.60	29.21
J11-3	19.83	4.65	0.60	55.33
J11-4	18.04	3.78	0.60	40.91


(EXISTING) PAVED STREET
LA
REGINA
(EXISTING) PAVED STREET
CIRCLE
VALLE
DEL
SOL
RD
PROPOSED 18" STORM DRAIN
PROPOSED 54" R.C.P. STORM DRAIN
PROPOSED 18" STORM DRAIN
PROPOSED DETENTION POND
COLUMBIA ROAD
VINCENT
MIMI
BLUEWATER
DR
* AREAS J11-1 + J11-2 + J11-3 + J11-4 : Q100 = 160.6
How is Flow Diverted to Pond
SAD 219 BASIN
BOUNDARY MAP
C-2

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Regina
SUBJECT Storm Drains
JOB NO.
SHEET 1 OF 1
BY ZMG
DATE 11-13-89
CHECKED
DATE



1-	60	42	36	42	48
2-	48	30	36		
3-	48	30	36		
4-	33	24			
5-	18	18			

JOB TESCA: REGINA 1
RUN DATE :11-13-1989

STORM SEWER - HYDRAULIC ANALYSIS - FILE: REGINA 1.STM

RAINFALL LOCATION: SOMEWHERE UNITED STATES
RETURN PERIOD = 100 YRS

LINE 1 / DFQ = 65.0 / HT = 48 / WID = 48 / N = .015 / L = 130 / JLC = 1

OUTFALL

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4952.61	31.27	4950.10	7.37	4953.45	45.42	30.04	8.32
UPSTRM	4953.37	38.89	4950.13	5.96	4952.92	37.65	30.04	10.91

DA = 0 C = 0 Tc = 1.5 INL TM = 0 INT = 11.15 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 2 / DFQ = 35.0 / HT = 36 / WID = 36 / N = .015 / L = 100 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	3[illegible].00	4950.13	4.95	4954.30	0.00	23.39	7.07
UPSTRM	4954.67	3[illegible].00	4950.23	4.95	4955.05	0.00	23.39	7.07

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 3 / DFQ = 30.0 / HT = 36 / WID = 36 / N = .015 / L = 300 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	3[illegible].00	4950.13	4.24	495[illegible].20	0.00	21.65	7.07
UPSTRM	4954.73	36.00	4950.[illegible]	4.24	4955.01	0.00	21.65	7.07

DA = 0 C = 0 Tc = .5 INL TM = 0 INT = 11.66 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 4 / DFQ = 15.0 / HT = 24 / WID = 24 / N = .015 / L = 50 / JLC = 1

DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.01	24.00	4950.43	4.77	4955.36	0.00	16.99	3.14
UPSTRM	4955.70	24.00	4950.43	4.77	4955.66	0.00	16.99	3.14

DA = 0 C = 0 Tc = .3 INL TM = 0 INT = 11.75 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 5 / DFQ = 15.0 / HT = 18 / WID = 18 / N = .015 / L = 100 / JLC = 1

DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.[illegible]	18.00	4950.48	6.49	4956.78	0.00	16.93	1.77
UPSTRM	4959.49	16.00	4950.00	6.49	4960.51	0.00	16.93	1.77

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB SAD 219
SUBJECT Regina Drainage
JOB NO. 88-10 SHEET 1 OF 1
BY tab DATE 5/30/90
CHECKED DATE

It is proposed to pave Regina Circle, Regina Place, and Regina Drive as part of SAD 219. All three streets lie within drainage areas J11-1 and J11-2. Paving these streets and constructing homes in the area will increase the C Factor from 0.50 to 0.60.

The resulting increase in stormwater runoff volume is calculated as follows:

Area J11-1

Area = 12.66 Acres = 550,000 FT^2

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(550,000) = 59,600\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(550,000) = 71,500\ FT^3$

Net increase in runoff (J11-1) = 12,000 FT^3

Area J11-2

Area = 10.47 Acres = 456,000 FT^3

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(456,000) = 49,400\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(456,000) = 59,300\ FT^3$

Net increase in runoff (J11-2) = 9,900 FT^3

Net calculated runoff due to development = 21,900 FT^3

Proposed new detention pond will intercept 100% of the runoff from Area J11-2 and 25% runoff from J11-1

Total Pond Volume = 1.00 x 59,300 + 0.25(71,500)
= 77,000 FT^3

Ponded Volume = 77,000 FT^3
Runoff Increase = 21,900 FT^3
Net Pond Benefit 55,100 FT^3

Outlet

$Q = CA\sqrt{2gh} = 0.70\ (.35)\sqrt{2(32.2)(6)} = .5$ cfs

A (8" orifice) $= \left(\frac{4}{12}\right)^2\pi = 0.35\ ft^2$

Terry O. Brown, P.E.

P. O. Box 92051
Albuquerque, New Mexico 87199
Ph. 768-9447

Consulting Engineer

July 10, 1991

Gilbert Aldaz, P.E.
Public Works Department
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Redesign of Regina Pond in SAD 219

Dear Gilbert:

Enclosed are the completed Drainage Information Sheet and some drawings showing the proposed design of the reference Regina Pond redesign in conformance with my discussions with Glenn Jergensen of Arroyo Maintenance. As you can see, even though we are proposing to raise the bottom of the pond by an average of 2.5 feet, the capacity of the pond is still well above the 3,000 cubic yards (81,000 cubic feet) required.

If you have questions, please call me.

Sincerely,

Terry O. Brown

Terry O. Brown, P.E.

cc: Glenn Jergensen, City of Alb. Arroyo Maintenance w/attach.
File - D:\WP51\219\REGIPOND.LET/1

DRAINAGE INFORMATION SHEET

PROJECT TITLE: **SAD 219** ZONE ATLAS/DRNG FILE # **J-11-Z**

LEGAL DESCRIPTION: **LOT 88-B, REGINA ADDITION**

CITY ADDRESS: **150' S.E. OF BLUEWATER/REGINA CIRCLE**

ENGINEERING FIRM: **TERRY O. BROWN, P.E.** CONTACT: **TERRY O. BROWN**

ADDRESS: **P.O. BOX 92051, ALBUQUERQUE, NM 87199** TELEPHONE: **768-9447**

OWNER: **CITY OF ALBUQUERQUE** CONTACT: **LEE LUNSFORD**

ADDRESS: **P.O. BOX 1293, ALBUQUERQUE, NM 87103** TELEPHONE: **768-3965**

ARCHITECT: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

SURVEYOR: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

CONTRACTOR: **CCM, INC.** CONTACT: **JAY CARAZZA**

ADDRESS: **8019 EDITH, ALBUQUERQUE, NM 87113** TELEPHONE: **898-7777**

PRE-DESIGN MEETING: **YES**

TYPE OF SUBMITTAL: **DRAINAGE POND REDESIGN**

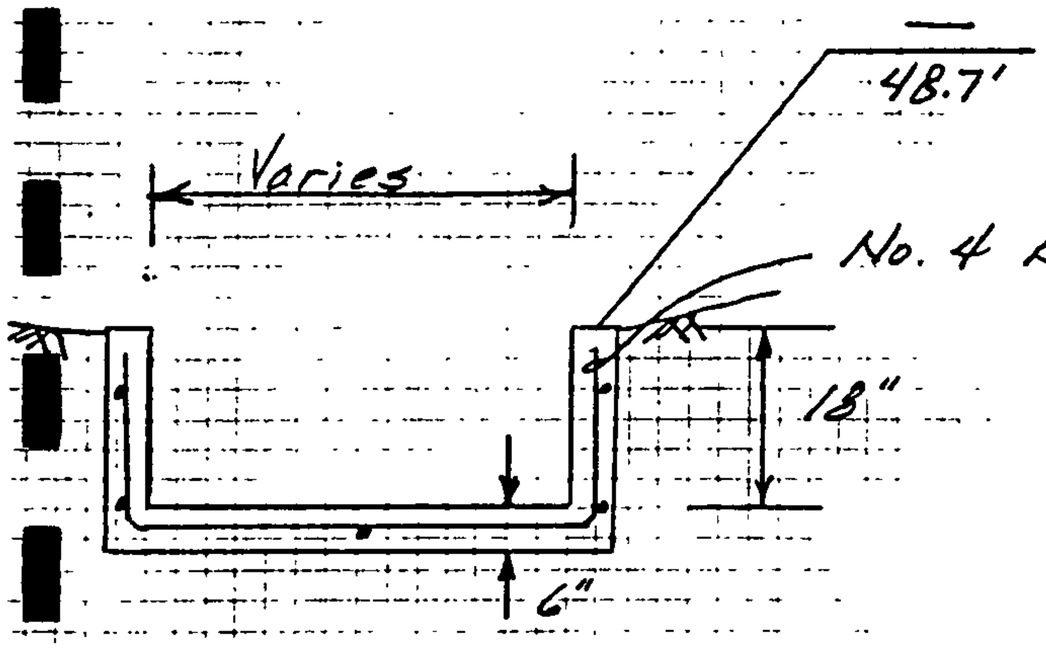
TYPE OF APPROVAL SOUGHT: **REDESIGN (SAD)**

DRB NO., EPC NO., PROJ. NO.: **PROJECT NO. 3558**

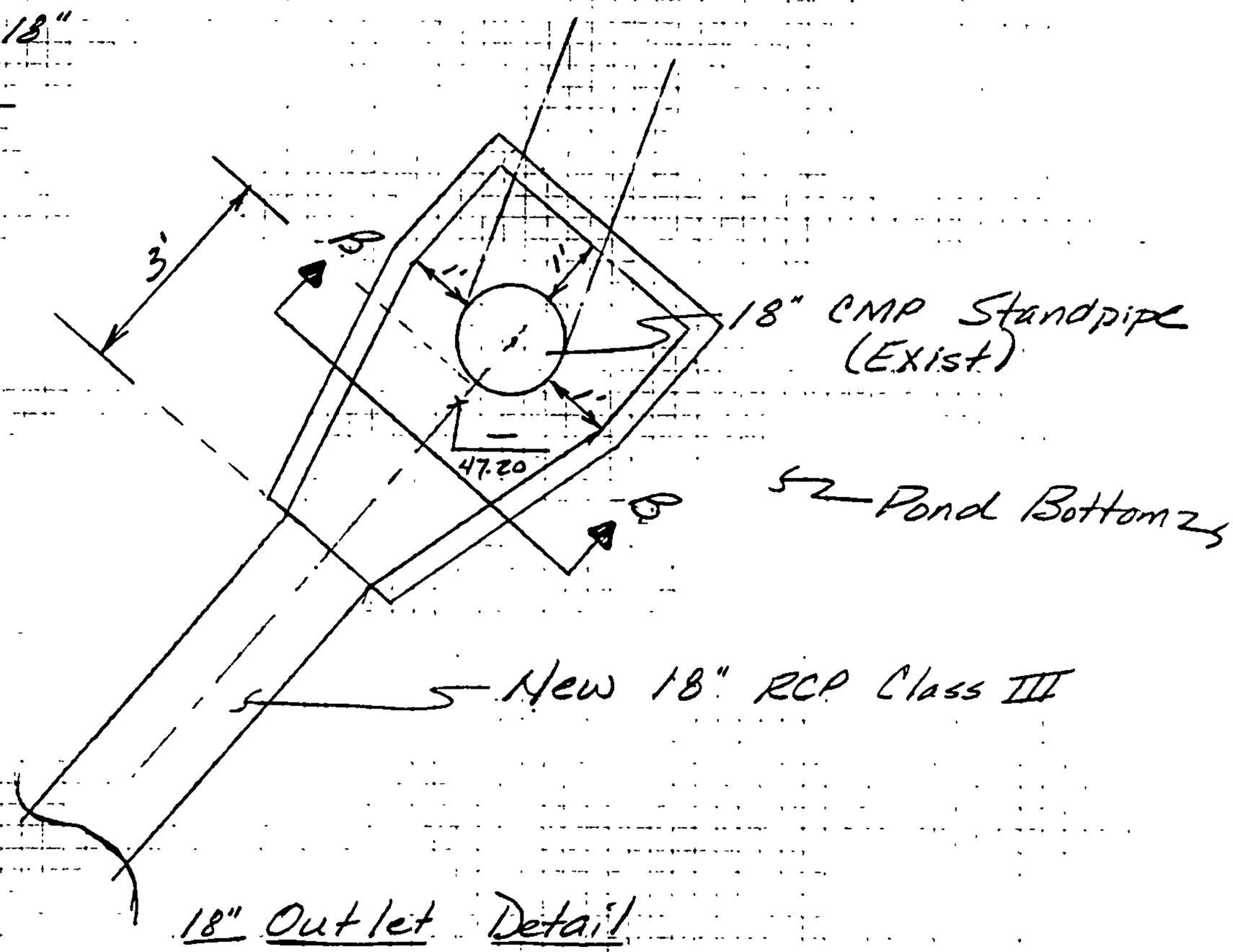
DATE SUBMITTED: **07/10/91**

BY: Terry O. Brown

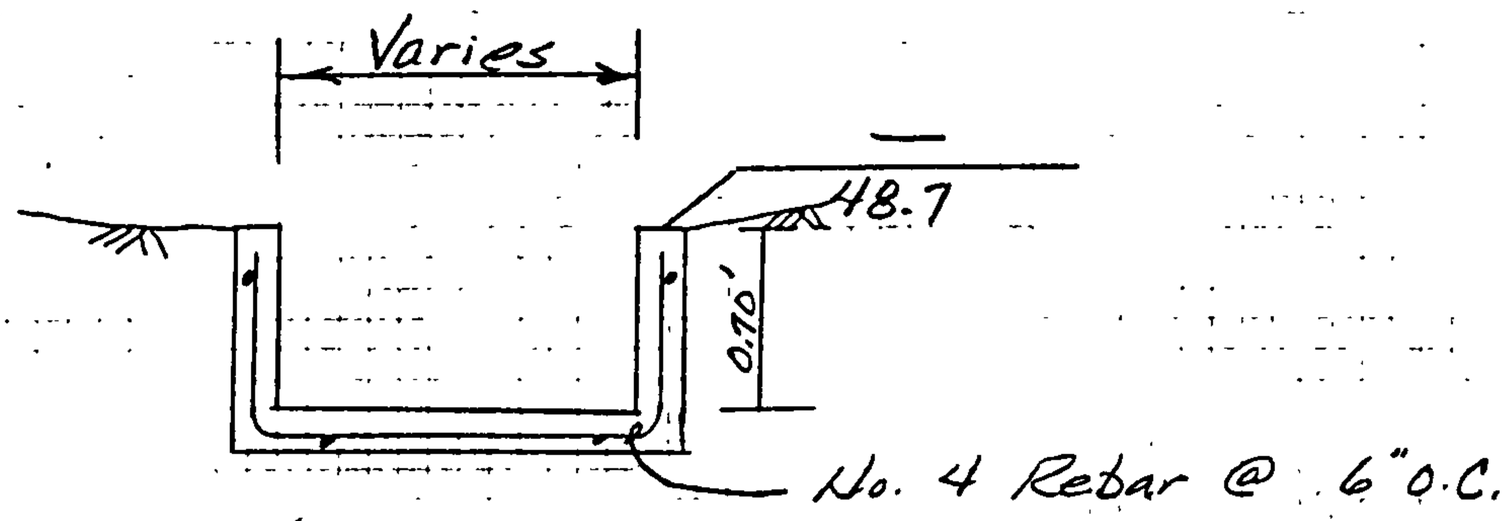
Terry O. Brown, P. E.



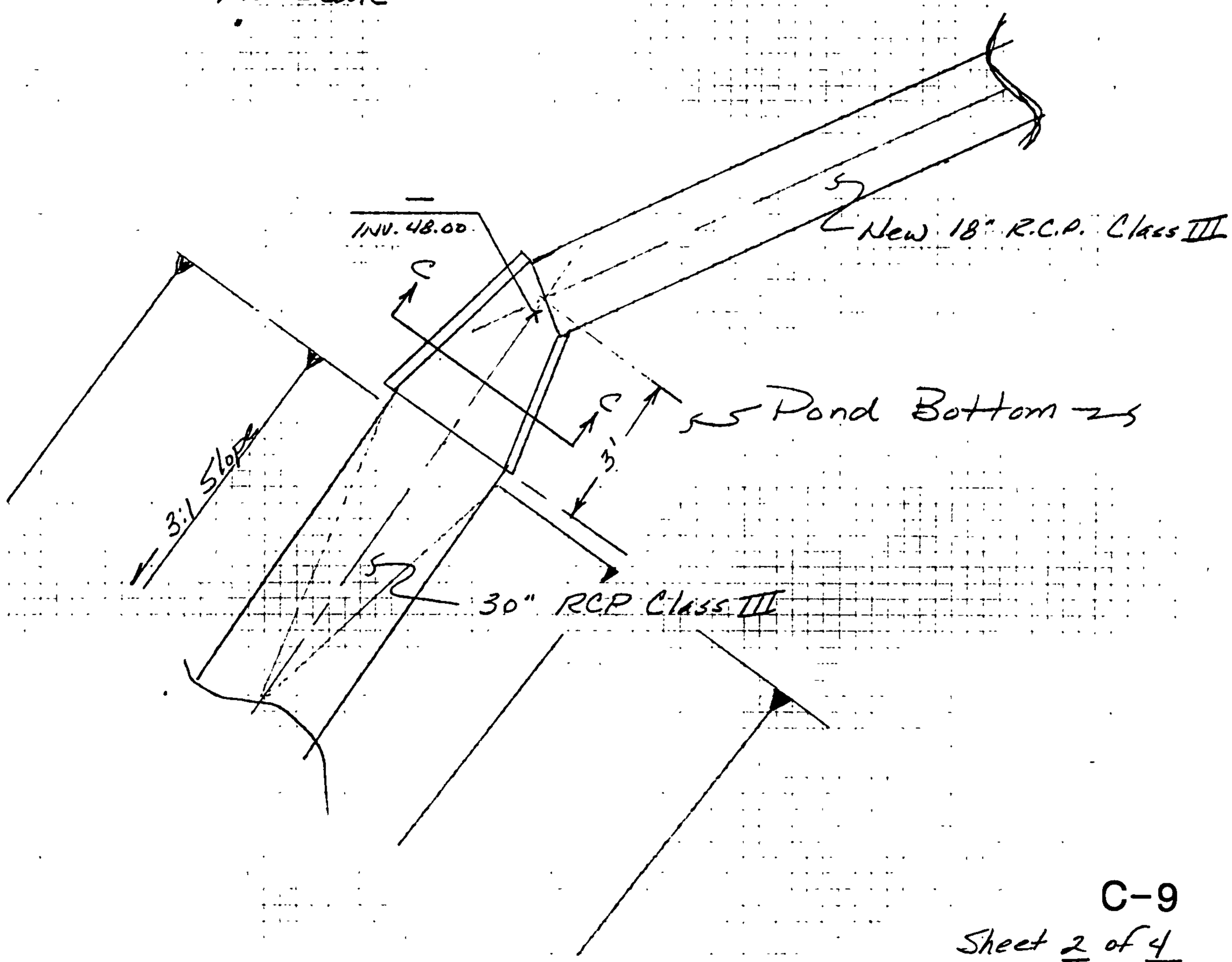
Section B-B
(No Scale)



18" Outlet Detail



Section C-C
No Scale



18" Inlet Detail

C-9

Sheet 2 of 4

7/9/91

Pond Volume Calculation

Pond Top = 55.15

New Pond Bottom = 50.00

Area of Pond Bottom = 12,600 S.F.

Depth = 5.15'

Volume Pond Bottom = 64,890 C.F. or 2,400 C.Y.

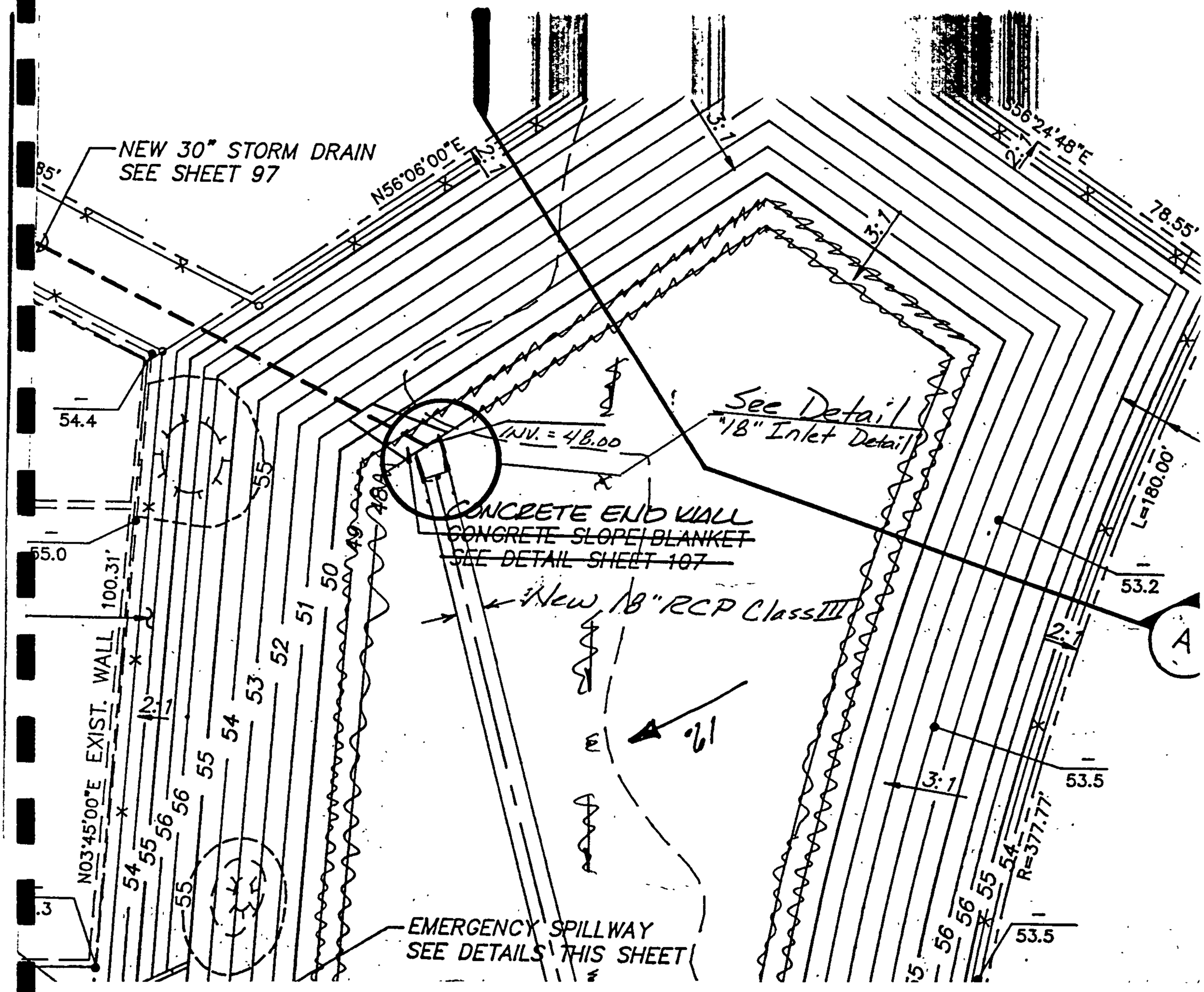
Slope Volume = 15' x 5' x (90 + 170 + 80 + 50 + 190)

= 43,500 C.F or 1,611 C.Y.

Total Pond Volume (Revised) = 4,011 C.Y.

Pond Volume Required = 3,000 C.Y.

Note: Elevation of outfall invert at 51st/Rincon = 48.5


NEW 30" STORM DRAIN
SEE SHEET 97
85'
N56°06'00"E
2:1
3:1
S56°24'48"E
78.55'
54.4
55.0
100.31'
EXIST. WALL
N03°45'00"E
See Detail
"18" Inlet Detail
INV. = 48.00
CONCRETE END WALL
~~CONCRETE SLOPE/BLANKET~~
~~SEE DETAIL SHEET 107~~
New 18" RCP Class III
L=180.00'
53.2
53.5
R=377.77'
A
EMERGENCY SPILLWAY
SEE DETAILS THIS SHEET

DRAINAGE INFORMATION

PROJECT Pat Hurley Park ZONE ATLAS/DRNG. FILE #: J-11/D12

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOT 88-B, Regina Addition

CITY ADDRESS: 150' South East of Bluewater/Regina Circle

ENGINEERING FIRM: CHAVEZ-GRIEVES CONTACT: Amy L. Driscoll

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: City of Albuquerque CONTACT: LEE LUNSFORD

ADDRESS: P.O. Box 1293, Albuq New Mexico 87103 PHONE: 768-3965

ARCHITECT: PDS Southwest, Ltd. CONTACT: WARREN MCCLUNG

ADDRESS: N/A PHONE: 323-5001

SURVEYOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

X NO

____ COPY PROVIDED

RECEIVED
SEP 29 1998
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

X DRAINAGE REQUIREMENTS

____ OTHER _____ (SPECIFY)

DATE SUBMITTED: September 25, 1998

BY: Amy L. Driscoll

G:\m23\103\document\drainfo

FIGURE 6

CITY OF ALBUQUERQUE

NOTICE OF D.R.C. MEETING

12-3-98
(DATE)

DRB NO: N/A
PROJECT NO: 498/93
ZONE ATLAS: J-11 / D-12

PROJECT NAME: Pat Hurley Park Renov.
LOCATION: Yucca & La Bajada

TYPE OF PROJECT: AHBA ____ CIP X PWC ____ SAD ____ ALL PRIVATE ____

Contact Person: Rob McNary **Phone:** 857-8634
Firm: CTP

X Scheduled with the D.R.C. on 12-7-98 at 1:30 Plaza Del Sol/2nd Fl.
____ No DRC Meeting Scheduled. Please return any comments by _____

The Project Is Scheduled For:

/ / Design Report Review
/ / Pre-Design Meeting
/ / Preliminary Plan Review
X Final Plan Review
/ / Signoff of Plans
/ / _____

The Project Relates To:

/ / Water / / San. Sewer / / Paving / / Storm Drainage X Band.

The Attached Package Includes:

/D/ Drawings /S/ Spec's /E/ Estimate /R/ Report /M/ Memo Only

Indicated below are the Departments/Divisions that have received project documents and/or are invited to attend. It will be the Project Managers responsiblity to notify consulting engineering firms of date and time of scheduled meetings.

D	DRC Chairman	Project Review Section	All Drawings
D	Traffic Repres	Transportation Development	All Drawings
/ /	Utility Dev.(Bob Kane)	Utility Design	All AHBA Drawings
D/	Utility Dev.(Keith Reed)	Utility Design	All CIP Drawings
D/	Hydro Repres. MURRAY	Hydrology	All Drawings
/ /	Const. Repres.	Construction	All Drawings
/ /	Ray Chavez	Traffic Operations	All Drawings
/ /	Sergio Miranda	Water (Shutoff Plan)	All Water Shutoff
/ /	CIP/Parks Repres.	Parks & Recreation	ALL Landscaping
/ /	Andre Houle	Street Maintenance	All Paving
D/	Kevin Broderick	Utility Coordinator	ALL PWC & CIP
/ /	Jim Hamel	Transit Department	CIP/Memo
D	Joe Luehring	Construction Coordinator	CIP/Memo
/ /	Jim Fink	Line Maintenance	CIP & SAS/Memo
/ /	George Gee	City Architect	Arch. Drawings
/ /	Lee Lunsford	SAD Engineer	SAD/Memo
/ /	Tom Ellis	Park Mangement	Parks/Community Ctrs/APS
/ /	Gene Bustamante	General Services Dept.	Arch. Drawings
/ /	Greg Smith	PWD/Legal	Specs & Dwgs.
/ /	Richard Sertich	Planning Department	CIP/Memos
/ /	CIP Project Manager	CIP	CIP/Memos
/ /	Donald Bartlett	Risk Management	Arch. Drawings
/ /	_____	_____	_____

DRCNOTIC. 10/19/95

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

September 10, 1998

Mr. Bernie Montoya
City of Albuquerque
Hydrology Dept.
600 2nd St., NW
Albuquerque, NM

RE: Revised Drainage Plan for Pat Hurley Park (J11-D12)

Dear Mr. Montoya:

The concerns which you expressed in your letter dated July 27, 1998 to James Millington, are addressed in the Drainage Report for Pat Hurley Park dated September 1998. These concerns are also addressed as follows:

1. Proposed Site Conditions, Paragraph 2, on page 2 of the report, identifies the surface discharge from the pond will be 7.52 cfs. and the storm drain discharge will be 12.75 cfs. This maintains the same runoff in the storm drain after development that is currently discharging to it. The 7.52 cfs. surface discharge enables the net 100-year peak flow in Regina Circle below Pat Hurley Park to be decreased by 20 percent (20%).

2. The AHYMO analysis has been changed from the 24-hour storm event to the 6-hour event. This does not change the hydrologic results for this small of a basin. However, it is consistent with the detention pond requirement.

3. The ponds will not be fenced separate from the rest of the park. All of the ponds are designed for a maximum detention depth of 1.5' for the 100-year storm. The side slopes are flat enough for anyone to get out of the pond areas and they will detain water for short periods of time. Therefore, fenceing is not needed.

If you have any additional questions or comments, please call me at 344-4080 and I will assist you in your review.

Sincerely,

CHAVEZ-GRIEVES CONSULTING ENGINEERS, Inc

Billy O McCarty

Billy O. McCarty, P.E.
Design Engineer

c.c. Warren McClung, PDS Southwest, LTD.

G \M23\103\PM\COALET WPD

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

LETTER OF TRANSMITTAL

TO: COA Hydrology

DATE: 9-25-98

JOB # M23-100-5197

RE: Pat Hurley Park Drainage Report

ATTN: Bernie Montoya

WE ARE SENDING YOU ✓ **ATTACHED** ___ **UNDER SEPARATE COVER, THE FOLLOWING ITEMS:**

___ SHOP DRAWINGS	___ PLANS	___ SPECIFICATIONS	___ DISKETTE
___ CHANGE ORDER	___ PRINTS	___ CALCULATIONS	___ PROPOSAL INFO
✓ COPY OF LETTER	___ SAMPLES	✓ REPORT	___ ___

COPIES	DATE	NO.	DESCRIPTION
1	9-10-98	1	letter
2	9-11-98		Report
1	9-25-98	1	Drainage Info Sheet

THESE ARE TRANSMITTED AS CHECKED BELOW:

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___ AS REQUESTED
___ PLEASE CORRECT AND RESUBMIT
___ RESUBMITTAL IS NOT REQUIRED
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SEP 29 1998
HYDROLOGY SECTION

REMARKS: The attached report and letter address your comments from the previous review of this project.

COPIES TO: Files, PDS Southwest

SIGNED: Billy O'Malley

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

REV.9/95

DRAINAGE INFORMATION

PROJECT Pat Hurley Park ZONE ATLAS/DRNG. FILE #: J-11/D12

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOT 88-B, Regina Addition

CITY ADDRESS: 150' South East of Bluewater/Regina Circle

ENGINEERING FIRM: CHAVEZ-GRIEVES CONTACT: Amy L. Driscoll

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: City of Albuquerque CONTACT: LEE LUNSFORD

ADDRESS: P.O. Box 1293, Albuq New Mexico 87103 PHONE: 768-3965

ARCHITECT: PDS Southwest, Ltd. CONTACT: WARREN MCCLUNG

ADDRESS: N/A PHONE: 323-5001

SURVEYOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

X NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

X DRAINAGE REQUIREMENTS

X OTHER Rough Grading Approval (SPECIFY)

RECEIVED
JUL 7 - 1998
HYDROLOGY SECTION

DATE SUBMITTED: July 2, 1998

BY: Amy L. Driscoll

G:\m23\103\document\drainfo

CITY OF
Albuquerque

July 27,1998

James E. Millington
Chavez-Grieves Engineering
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR PAT HURLEY PARK (J11-D12) REVISION DATED 7/4/98

Dear Mr. Millington:

Based on the information provided on your July 7,1998 resubmittal, listed are some concerns that will need to be addressed prior to Work Order and Building Permit.

1. Within the report you indicate that the surface run-off from the pond was not determined, you will need to include that number with your resubmittal.

2. Detention ponds are designed for the 100-year 6 hr. storm and the retention ponds are designed for twice the 100-year 24 hr. or the 10 day storm. Please clarify on your report.

3. Will the total parameter of the site be fenced? If not, the areas where the ponds are located will need to be protected from human intrusion.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya

Bernie J. Montoya CE
Associate Engineer

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

July 2, 1998

Mr. Bernie Montoya
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: MASTER DRAINAGE PLAN FOR PAT HURLEY PARK (J11-D12)
C-G PROJECT NO. M23-103-5197

Dear Mr. Montoya:

We received a Master Plan and Rough Grading approval from you on October 22, 1997. The City would like to proceed with rough grading on the site, however the plans that were approved did not have a PE stamp on them. As a result, we are submitting the latest version of our grading and drainage plan for a Master Plan and Rough Grading Approval. The changes since our previous submittal are the following:

1. The grading and drainage plan has been enlarged and spread over three sheets.

2. A legend has been included.

3. The existing and proposed run off has been estimated for each basin.

4. Grading at the pond has changed.

We look forward to receiving your approval of this master plan and would be pleased to respond to any comments you may have in the meantime.

Sincerely,

CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.

RECEIVED
JUL 7 - 1998
HYDROLOGY SECTION

Amy L. Driscoll, EI
Project Manager

Cy: Warren McClung

G.\m23\103\document\montoya2

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THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE • ALBUQUERQUE, NEW MEXICO 87109 • PHONE (505) 344-4080 • FAX (505) 343-8759

DRAINAGE REPORT

FOR

PAT HURLEY PARK

ALBUQUERQUE, NEW MEXICO

JAMES E. MILLINGTON
NEW MEXICO
7070
REGISTERED PROFESSIONAL ENGINEER
07/07/98

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JULY, 1998

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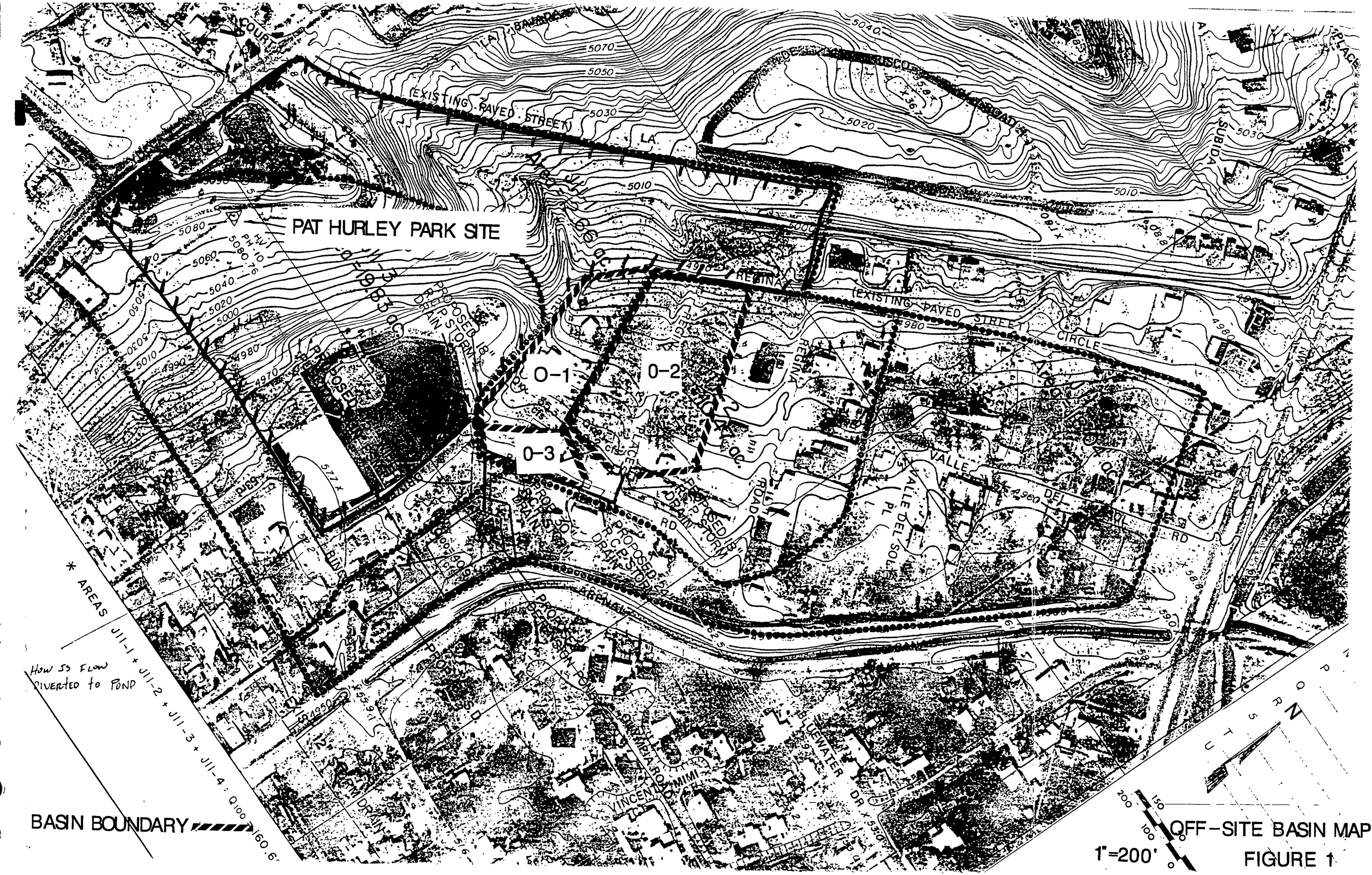
Storm Runoff Summary ..... Figure 2
Narrative ..... Page 1
100-Year Design Storm AHYMO Analysis ..... Appendix A
Supplemental Calculations ..... Appendix B
SAD 219 Data and Correspondence ..... Appendix C



OFF-SITE BASIN MAP
FIGURE 1

STORM RUNOFF SUMMARY

ANALYSIS POINT	EXISTING		DEVELOPED	
	Q_{100} (CFS)	V_{100} (AC-FT)	Q_{100} (CFS)	V_{100} (AC-FT)
A.P.1	94.64	3.3003	57.28	1.8537
A.P.1 (INTO PIPE)	14.8	--	19.23	1.4616
A.P.2	6.3	0.2046	2.59	0.108
A.P.3	86.14	1.917	56.64	1.4435
ARENAL POND (IN)	20.49	1.8124	24.93	1.6862
ARENAL POND (OUT)	3.03	1.7273*	3.16	1.6481**

*Available volume = 2.49 ac-ft, Volume used = 1.1215 ac-ft
**Available volume = 2.49 ac-ft, Volume used = 1.2593 ac-ft

Figure 2

LOCATION

This site is located between Coors Road and the Arenal Canal in west Albuquerque. It is bordered on the southwest by Yucca Drive, on the northeast by La Bajada Rd., on the east by Regina Circle, and on the south by Rincon Rd. It is in the middle of a fully-developed residential area.

FLOOD HAZARD ZONES

As shown by Panel 3500020027 of the National Flood Insurance Rate Map for the City of Albuquerque, dated October 14, 1983, the site is not located within a flood plain.

RELATED REPORTS

SAD 219 was prepared in 1990 by Mark Goodwin and Associates, and the storm drainage improvements designed by that SAD were installed in 1991 (Appendix C). The subject site is contained within Basins J11-1 and J11-3 (see Figure 1 and page C-2). The J11 watershed is the watershed designated by the report as the "Regina area". A portion of this watershed discharges to a detention pond that was constructed between Arenal and Bluewater as part of the SAD.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

Per Figure 1, the western 1/6th of the site is developed by lawn areas, and is the site of upper Pat Hurley Park. It is some 50 vertical feet above the lower park. The lower park along the east and south edges consists of a parking lot, buildings, tennis courts, a playground, and a sodded baseball field. Slopes in the developed areas are from ½ to 5%. The intermediary area between the two developed portions is covered by very steep undeveloped land that has slopes which vary between 20% and 45%.

The site does not accept any off-site runoff. Runoff generated from Yucca Drive and La Bajada Road is intercepted by curb and gutter and is discharged around the site and to the north and west into another watershed.

All on-site runoff discharges to Regina Circle. A portion of this runoff enters the existing inlet on Regina at Bluewater, and is discharged to a nearby detention pond between Arenal and Bluewater via an underground storm drain system constructed as part of SAD 219 (page C-2). The remainder of the runoff discharges to the south and west via the paved surfaces of Regina Circle and Rincon Rd..

The underground storm drain system data was taken from the SAD 219 report, and is shown on pages C-3 and C-4. This data was input into the AHYMO run. Much of the runoff discharges downstream in the streets into other watersheds because the inlet capacity is not large enough to capture more runoff. As shown in the AHYMO run, the system has sufficient capacity to discharge the intercepted runoff to the pond, but not much more than that.

This storm drain system discharges into a detention pond that was designed as part of the SAD. Per Figure 2, the pond has greater capacity than what discharges to it. However, the existing storm drain system does not have sufficient capacity to deliver more. The data for the pond volume is on page C-5. The controlled discharge from the pond is created by an 8" discharge pipe that connects to a standpipe located in a concrete inlet box (page C-8 and following). The discharge pipe connects to a downstream storm drain in 51st St. that conveys the runoff downstream. This data was input into the AHYMO run (pages A-3 and A-40). Under existing conditions, the pond is well within its capacity.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The developed drainage pattern is similar to the existing. All runoff will discharge to Regina Circle. On the east side of the site, a new parking lot, basketball court, and buildings will be constructed, while a footpath will be constructed on the north part of the site connecting the upper and lower parks. Several small on-site detention ponds will be incorporated into the path system. The detention ponds assist in sediment control, as well as in slowing the rate of the surface runoff so that erosion is somewhat mitigated by this drainage scheme.

A new detention pond will be incorporated into the grading of the lower park area. This pond will release in two directions: 1) To the street downstream, and then into the adjacent downstream watershed via paved surfaces; and 2) into the back of the existing inlet. The surface discharge from the pond has not been designed at this time, but will be sized such that it releases the appropriate amount of runoff to the street. As shown in Figure 2, the downstream runoff in the street at A.P.3 will be less under developed conditions than under existing for two reasons: the detention in the lower park area will attenuate the peak flow; and some of the runoff will be discharged directly to the storm drain system.

As shown on Figure 2, the existing Arenal detention pond will have slightly less capacity after development. The increased volume of water ponded is 0.14 ac-ft. As shown in Figure 2, after development the detention pond will still have 1.26 ac-ft of excess capacity. In the developed condition, the peak flow entering the pond is greater, but the total volume is less. As computed on page A-49, 1.2593 ac-ft of the pond's available 2.49 ac-ft volume will actually be used. So even under fully-developed conditions, the pond will function satisfactorily.

HYDROLOGY

The runoff calculations and design have been done in accordance with Section 22.2 of the Development Process Manual of the City of Albuquerque, January 1993. The computerized hydrologic model, AHYMO, was used to calculate storm runoff in accordance with Section 22.2. The 100-year, 24-hour storm was used to model the runoff due to the detention ponding that is part of this development. Pond sizing, pipe capacities, and surface conveyance capacities were all computed in the AHYMO run.

Appendix A

AHYMO Hydrologic Calculations

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
AHYMO PROGRAM (AHYMO_97) -                          - Version:  1997.02c
     RUN DATE (MON/DAY/YR) = 07/01/1998
     START TIME (HR:MIN:SEC) = 09:51:03     USER NO.= AHYMO-I3Chavez-Grieves-C
     INPUT FILE = C:\KIM\AHYMOX.IN

*S*************************************************************************
*S**************    CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.   **************
*S**************                 PAT HURLEY PARK                **************
*S*************************************************************************
*S*  FILENAME:  G:\M23\103\AHYMOX.IN/OUT
*S*************************************************************************
*S******* 100 YEAR, 24 HOUR STORM (Section 22.2 Hydrology)
START                0.00
RAINFALL             TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.87
                     RAIN SIX=2.20  RAIN DAY=2.66 DT=0.03333

              COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT =     .033330 HOURS        END TIME =     19.964670 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   .0809   .0865   .0924   .1050
   .1334   .1771   .2398   .3254   .4379   .5814   .7600
   .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
  1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
  1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
  1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
  1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
  2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
  2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
  2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
  2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
  2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
  2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  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  2.1460  2.1475  2.1489
  2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
  2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
  2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
  2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
  2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
  2.1944  2.1956  2.1967  2.1978  2.1989  2.2000  2.2013
  2.2026  2.2039  2.2052  2.2065  2.2078  2.2091  2.2103
  2.2116  2.2129  2.2142  2.2155  2.2167  2.2180  2.2193
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  2.2547  2.2559  2.2571  2.2583  2.2595  2.2606  2.2618
  2.2630  2.2641  2.2653  2.2665  2.2676  2.2688  2.2699
  2.2711  2.2722  2.2734  2.2745  2.2757  2.2768  2.2779
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  2.2870  2.2881  2.2892  2.2903  2.2914  2.2925  2.2936
  2.2947  2.2958  2.2969  2.2980  2.2991  2.3002  2.3013
  2.3024  2.3035  2.3046  2.3057  2.3067  2.3078  2.3089
  2.3100  2.3110  2.3121  2.3132  2.3142  2.3153  2.3164
  2.3174  2.3185  2.3195  2.3206  2.3216  2.3227  2.3237
  2.3248  2.3258  2.3269  2.3279  2.3290  2.3300  2.3310
  2.3321  2.3331  2.3341  2.3352  2.3362  2.3372  2.3382
  2.3392  2.3403  2.3413  2.3423  2.3433  2.3443  2.3453
  2.3463  2.3473  2.3483  2.3493  2.3503  2.3513  2.3523
```

```
2.3533  2.3543  2.3553  2.3563  2.3573  2.3583  2.3593
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2.3671  2.3681  2.3690  2.3700  2.3710  2.3719  2.3729
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2.3871  2.3881  2.3890  2.3899  2.3909  2.3918  2.3927
2.3936  2.3946  2.3955  2.3964  2.3973  2.3983  2.3992
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2.4065  2.4074  2.4083  2.4092  2.4101  2.4110  2.4119
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2.4190  2.4199  2.4208  2.4217  2.4226  2.4234  2.4243
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2.4374  2.4382  2.4391  2.4399  2.4408  2.4416  2.4425
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2.4946  2.4954  2.4962  2.4970  2.4978  2.4985  2.4993
2.5001  2.5008  2.5016  2.5024  2.5032  2.5039  2.5047
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2.5161  2.5168  2.5176  2.5183  2.5191  2.5198  2.5206
2.5213  2.5221  2.5228  2.5236  2.5243  2.5250  2.5258
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2.5317  2.5324  2.5331  2.5339  2.5346  2.5353  2.5361
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2.5418  2.5426  2.5433  2.5440  2.5447  2.5454  2.5462
2.5469  2.5476  2.5483  2.5490  2.5497  2.5504  2.5511
2.5518  2.5526  2.5533  2.5540  2.5547  2.5554  2.5561
2.5568  2.5575  2.5582  2.5589  2.5596  2.5603  2.5610
2.5617  2.5624  2.5631  2.5638  2.5645  2.5652  2.5659
2.5665  2.5672  2.5679  2.5686  2.5693  2.5700  2.5707
2.5714  2.5721  2.5727  2.5734  2.5741  2.5748  2.5755
2.5761  2.5768  2.5775  2.5782  2.5789  2.5795  2.5802
2.5809  2.5816  2.5822  2.5829  2.5836

*S******************  EXISTING BASINS  ****************************************
*S  COMPUTE RUNOFF FROM BASIN A AT ANALYSIS POINT 2 (DISCHARGE TO REGINA
*S  CIRCLE, DOWNSTREAM OF THE EXISTING DBL C INLET IN REGINA CIRCLE).  THIS
*S  RUNOFF DISCHARGES ELSEWHERE, DOWNSTREAM OF THE DETENTION POND BETWEEN
*S  BLUEWATER AND ARENAL.
COMPUTE NM HYD       ID=111 HYD=A_P_2 DA=0.00410 SQ MI
                     %A=0 %B=84 %C=0 %D=16
                     TP=0.1333 RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   2.5899    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
     AREA =      .000656 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   8.4508    CFS   UNIT VOLUME =    .9988       B =   327.09      P60 = 1.8700
     AREA =      .003444 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=111 CODE=1
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
                                   HYDROGRAPH FROM AREA A_P_2

    RUNOFF VOLUME =      .93584 INCHES     =        .2046 ACRE-FEET
    PEAK DISCHARGE RATE =      6.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0041 SQ. MI.


*S*****************************************************************************
*S  THE REMAINDER OF THE RUNOFF TO BE COMPUTED DISCHARGES TO THE DETENTION
*S  POND.
*S*****************************************************************************
*S  COMPUTE RUNOFF FROM BASIN O-2, AN OFF-SITE BASIN ON REGINA PLACE THAT
*S  IS PARTIALLY INTERCEPTED BY STORM INLETS AT THE BASE OF REGINA PLACE.
*S  THE STORM INLETS ARE PART OF THE SYSTEM THAT INTERCEPTS RUNOFF AND
*S  DISCHARGES IT TO THE DETENTION POND.  THIS BASIN COMPRISES PART OF
*S  BASIN J11-2 FROM THE SAD 219 REPORT DATED 06/15/90, BY MARK GOODWIN.
COMPUTE NM HYD      ID=1 HYD=EXIST_O2 DA=0.00280 SQ MI
                    %A=0 %B=50 %C=0 %D=50
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
     AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   3.4353    CFS   UNIT VOLUME =    .9964       B =   327.09      P60 = 1.8700
     AREA =      .001400 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                   HYDROGRAPH FROM AREA EXIST_O2

    RUNOFF VOLUME =     1.50628 INCHES     =        .2249 ACRE-FEET
    PEAK DISCHARGE RATE =      5.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S  COMPUTE THE RATING CURVE FOR THE REGINA PLACE STREET CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.04  FP SLP=.04  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
                    16     .41
                    30     .13
                    32      0
                    32     .67

                         RATING CURVE VALLEY SECTION  1.0
                             WATER        FLOW        FLOW        TOP
                            SURFACE       AREA        RATE       WIDTH
                             ELEV         SQ FT       CFS        FT
                               .00          .00         .00        .00
                               .04          .02         .02       1.09
                               .07          .08         .14       2.17
                               .11          .17         .41       3.26
```

.14	.31	.82	5.11
.18	.55	1.52	8.63
.21	.92	2.84	12.16
.25	1.41	4.89	15.68
.28	2.03	7.82	19.21
.32	2.76	11.75	22.74
.35	3.63	16.80	26.26
.39	4.62	23.08	29.79
.42	5.72	31.46	32.00
.46	6.85	42.43	32.00
.49	7.98	54.67	32.00
.53	9.11	68.11	32.00
.56	10.23	82.69	32.00
.60	11.36	98.36	32.00
.63	12.49	115.09	32.00
.67	13.62	132.84	32.00

```
*S  SPLIT STORM DRAIN FLOW TO 2 INLETS ON REGINA PL.
DIVIDE HYD          ID=1  PER=-0.5  ID I=21   HYD=STORM_DRAIN_LT
                                    ID II=22  HYD=STORM_DRAIN_RT
PRINT HYD           ID=22  CODE=1

                                HYDROGRAPH FROM AREA STORM_DRAIN_RT

    RUNOFF VOLUME =     1.50628 INCHES     =        .1125 ACRE-FEET
    PEAK DISCHARGE RATE =       2.87 CFS  AT   1.500 HOURS   BASIN AREA =   .0014 SQ. MI.


*S  ROUTE THE RUNOFF TO THE NEXT MH, WHICH IS ON REGINA PL.  (STORM SYSTEM
*S  DATA IS DERIVED FROM THE ASBUILTS)
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.063
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.14	.67
.16	.10	.60	.92
.23	.18	1.40	1.09
.31	.27	2.51	1.22
.39	.37	3.92	1.32
.47	.47	5.59	1.39
.55	.58	7.49	1.44
.63	.70	9.58	1.48
.70	.81	11.81	1.50
.78	.93	14.13	1.50
.86	1.05	16.50	1.50
.94	1.16	18.85	1.50
1.02	1.27	21.13	1.50
1.09	1.38	23.26	1.50
1.17	1.48	25.17	1.50
1.25	1.57	26.76	1.50
1.33	1.66	27.89	1.50
1.41	1.72	28.36	1.50
1.50	1.77	28.36	1.50

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=38  SLP=.063
```

TRAVEL TIME TABLE

REACH= 1.0

WATER	AVERAGE	FLOW	TRAVEL

DEPTH FEET	AREA SQ.FT.	RATE CFS	TIME HRS
.078	.035	.14	.0027
.156	.098	.60	.0017
.235	.176	1.40	.0013
.313	.267	2.51	.0011
.391	.366	3.92	.0010
.469	.472	5.59	.0009
.547	.583	7.49	.0008
.625	.697	9.58	.0008
.704	.814	11.81	.0007
.782	.931	14.13	.0007
.860	1.048	16.50	.0007
.938	1.163	18.85	.0007
1.016	1.274	21.13	.0006
1.094	1.381	23.26	.0006
1.173	1.482	25.17	.0006
1.251	1.574	26.76	.0006
1.329	1.656	27.89	.0006
1.407	1.722	28.36	.0006
1.500	1.767	28.36	.0007

```
ROUTE              ID=3  HYD=PIPE  INFLOW ID=21  DT=.03333
PRINT HYD          ID=3  CODE=1
```

HYDROGRAPH FROM AREA PIPE

RUNOFF VOLUME = 1.50625 INCHES = .1125 ACRE-FEET
PEAK DISCHARGE RATE = 2.87 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

```
*S  ROUTE THE RUNOFF TO THE NEXT MH, WHICH IS ON REGINA PL.  (STORM SYSTEM
*S  DATA IS DERIVED FROM THE ASBUILTS)
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.075
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.15	.67
.16	.10	.66	.92
.23	.18	1.52	1.09
.31	.27	2.74	1.22
.39	.37	4.28	1.32
.47	.47	6.10	1.39
.55	.58	8.17	1.44
.63	.70	10.45	1.48
.70	.81	12.88	1.50
.78	.93	15.42	1.50
.86	1.05	18.00	1.50
.94	1.16	20.57	1.50
1.02	1.27	23.05	1.50
1.09	1.38	25.38	1.50
1.17	1.48	27.46	1.50
1.25	1.57	29.20	1.50
1.33	1.66	30.44	1.50
1.41	1.72	30.95	1.50
1.50	1.77	30.95	1.50

```
COMPUTE TRAVEL TIME ID=31  REACH=1  VS NO=1  L=52  SLP=.075
```

TRAVEL TIME TABLE

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.078	.035	.15	.0034
.156	.098	.66	.0022
.235	.176	1.52	.0017
.313	.267	2.74	.0014
.391	.366	4.28	.0012
.469	.472	6.10	.0011
.547	.583	8.17	.0010
.625	.697	10.45	.0010
.704	.814	12.88	.0009
.782	.931	15.42	.0009
.860	1.048	18.00	.0008
.938	1.163	20.57	.0008
1.016	1.274	23.05	.0008
1.094	1.381	25.38	.0008
1.173	1.482	27.46	.0008
1.251	1.574	29.20	.0008
1.329	1.656	30.44	.0008
1.407	1.722	30.95	.0008
1.500	1.767	30.95	.0008

```
ROUTE                ID=31  HYD=PIPE  INFLOW ID=22  DT=.03333
PRINT HYD            ID=31  CODE=1
```

HYDROGRAPH FROM AREA PIPE

RUNOFF VOLUME = 1.50625 INCHES = .1125 ACRE-FEET
PEAK DISCHARGE RATE = 2.87 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

```
*S ADD FLOWS IN MH ON REGINA PL.
ADD HYD              ID=32  HYD=MH_REGINA_PL  ID I=3  ID II=31
PRINT HYD            ID=32  CODE=1
```

HYDROGRAPH FROM AREA MH_REGINA_PL

RUNOFF VOLUME = 1.50625 INCHES = .2249 ACRE-FEET
PEAK DISCHARGE RATE = 5.74 CFS AT 1.500 HOURS BASIN AREA = .0028 SQ. MI.

```
*S  ROUTE THE RUNOFF TO THE NEXT MH, WHICH IS ON BLUEWATER.  (STORM SYSTEM
*S  DATA IS DERIVED FROM THE ASBUILTS)
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.0046
                     DIA=27 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.12	.08	.11	1.00
.23	.22	.48	1.37
.35	.40	1.11	1.63
.47	.60	2.00	1.83
.59	.82	3.12	1.98
.70	1.06	4.46	2.09
.82	1.31	5.97	2.17

.94	1.57	7.63	2.22
1.06	1.83	9.41	2.25
1.17	2.09	11.26	2.25
1.29	2.36	13.14	2.25
1.41	2.62	15.02	2.25
1.52	2.87	16.83	2.25
1.64	3.11	18.53	2.25
1.76	3.33	20.05	2.25
1.88	3.54	21.32	2.25
1.99	3.72	22.22	2.25
2.11	3.87	22.60	2.25
2.25	3.98	22.60	2.25

```
COMPUTE TRAVEL TIME ID=4  REACH=1  VS NO=1  L=65  SLP=.0046
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.117	.079	.11	.0130
.235	.220	.48	.0083
.352	.397	1.11	.0064
.469	.601	2.00	.0054
.586	.824	3.12	.0048
.704	1.062	4.46	.0043
.821	1.312	5.97	.0040
.938	1.569	7.63	.0037
1.055	1.831	9.41	.0035
1.173	2.095	11.26	.0034
1.290	2.357	13.14	.0032
1.407	2.616	15.02	.0031
1.524	2.867	16.83	.0031
1.641	3.108	18.53	.0030
1.759	3.334	20.05	.0030
1.876	3.542	21.32	.0030
1.993	3.725	22.22	.0030
2.111	3.874	22.60	.0031
2.250	3.976	22.60	.0032

```
ROUTE              ID=4  HYD=PIPE  INFLOW ID=32  DT=.03333
PRINT HYD          ID=4  CODE=1
```

HYDROGRAPH FROM AREA PIPE

```
    RUNOFF VOLUME =     1.50612 INCHES     =        .2249 ACRE-FEET
    PEAK DISCHARGE RATE =       5.73 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.
```

```
*S  ROUTE THE RUNOFF TO THE NEXT MH, WHICH IS ON REGINA CIRCLE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.005
                    DIA=24 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.08	.89
.21	.17	.36	1.22
.31	.31	.85	1.45
.42	.47	1.52	1.62
.52	.65	2.38	1.76

```
                                   .63        .84       3.39       1.85
                                   .73       1.04       4.55       1.93
                                   .83       1.24       5.81       1.97
                                   .94       1.45       7.16       2.00
                                  1.04       1.66       8.57       2.00
                                  1.15       1.86      10.01       2.00
                                  1.25       2.07      11.44       2.00
                                  1.35       2.27      12.82       2.00
                                  1.46       2.46      14.11       2.00
                                  1.56       2.63      15.27       2.00
                                  1.67       2.80      16.23       2.00
                                  1.77       2.94      16.92       2.00
                                  1.88       3.06      17.21       2.00
                                  2.00       3.14      17.21       2.00
COMPUTE TRAVEL TIME ID=5  REACH=1  VS NO=1  L=375  SLP=.005

                        TRAVEL TIME TABLE
                                     REACH=  1.0

                        WATER      AVERAGE     FLOW        TRAVEL
                        DEPTH      AREA        RATE        TIME
                        FEET       SQ.FT.      CFS         HRS
                          .104       .062         .08       .0775
                          .208       .174         .36       .0497
                          .313       .314         .85       .0386
                          .417       .475        1.52       .0325
                          .521       .651        2.38       .0285
                          .625       .839        3.39       .0258
                          .730      1.037        4.55       .0238
                          .834      1.240        5.81       .0222
                          .938      1.447        7.16       .0210
                         1.042      1.655        8.57       .0201
                         1.146      1.863       10.01       .0194
                         1.251      2.067       11.44       .0188
                         1.355      2.265       12.82       .0184
                         1.459      2.456       14.11       .0181
                         1.563      2.635       15.27       .0180
                         1.668      2.799       16.23       .0180
                         1.772      2.943       16.92       .0181
                         1.876      3.061       17.21       .0185
                         2.000      3.142       17.21       .0190
ROUTE              ID=5  HYD=PIPE  INFLOW ID=4  DT=.03333
PRINT HYD          ID=5  CODE=1

                                HYDROGRAPH FROM AREA PIPE

    RUNOFF VOLUME =     1.50533 INCHES     =        .2248 ACRE-FEET
    PEAK DISCHARGE RATE =       5.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0028 SQ. MI.


*S  COMPUTE RUNOFF FROM ON-SITE BASIN B (DISCHARGE TO REGINA CIRCLE/
*S  BLUEWATER, UPSTREAM OF THE EXISTING INLET).
COMPUTE NM HYD      ID=6 HYD=EXIST_B DA=0.02591 SQ MI
                    %A=0 %B=50 %C=0 %D=50
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   51.147    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
     AREA =      .012955 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   31.789    CFS   UNIT VOLUME =    .9999       B =   327.09      P60 = 1.8700
     AREA =      .012955 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=6 CODE=1

                                        HYDROGRAPH FROM AREA EXIST_B


    RUNOFF VOLUME =     1.50626 INCHES     =       2.0814 ACRE-FEET
    PEAK DISCHARGE RATE =      52.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0259 SQ. MI.


*S  COMPUTE RUNOFF FROM OFF-SITE BASIN O-1, WHICH DISCHARGES TO REGINA
*S  CIRCLE.
COMPUTE NM HYD      ID=7 HYD=EXIST_01 DA=0.0280 SQ MI
                    %A=2 %B=68 %C=25 %D=5
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
     AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .125068HR    TP =   .133300HR    K/TP RATIO =   .938247     SHAPE CONSTANT, N =  3.769050
     UNIT PEAK =   67.740    CFS   UNIT VOLUME =    1.000       B =   339.47      P60 = 1.8700
     AREA =      .026600 SQ MI    IA =    .46368 INCHES    INF =   1.14832 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7 CODE=1

                                        HYDROGRAPH FROM AREA EXIST_01


    RUNOFF VOLUME =      .81624 INCHES     =       1.2189 ACRE-FEET
    PEAK DISCHARGE RATE =      41.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S  ADD THE RUNOFF FROM BASIN B FOR TOTAL IN REGINA CIRCLE UPSTREAM OF THE
*S  EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD             ID=8  HYD=A_P_1  ID I=6  ID II=7
PRINT HYD           ID=8  CODE=1

                                        HYDROGRAPH FROM AREA A_P_1


    RUNOFF VOLUME =     1.14787 INCHES     =       3.3003 ACRE-FEET
    PEAK DISCHARGE RATE =      94.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0539 SQ. MI.


*S  COMPUTE THE RATING CURVE FOR THE REGINA CIRCLE CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.03  FP SLP=.03  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
```

```
16      .41
30      .13
32       0
32      .67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.04	.02	.02	1.09
.07	.08	.12	2.17
.11	.17	.36	3.26
.14	.31	.71	5.11
.18	.55	1.32	8.63
.21	.92	2.46	12.16
.25	1.41	4.24	15.68
.28	2.03	6.77	19.21
.32	2.76	10.18	22.74
.35	3.63	14.55	26.26
.39	4.62	19.99	29.79
.42	5.72	27.24	32.00
.46	6.85	36.75	32.00
.49	7.98	47.35	32.00
.53	9.11	58.98	32.00
.56	10.23	71.61	32.00
.60	11.36	85.18	32.00
.63	12.49	99.67	32.00
.67	13.62	115.04	32.00

```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLET
*S  ON REGINA CIRCLE.  THE INLET OVERFLOW DISCHARGES SOUTH ON REGINA
*S  INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=8  Q=14.8 CFS  ID I=9   HYD=STORM_DRAIN
                                      ID II=10  HYD=DOWNSTREAM
PRINT HYD           ID=10  CODE=1

                                    HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =     1.14787 INCHES     =       1.7123 ACRE-FEET
    PEAK DISCHARGE RATE =      79.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S  ADD THE OVERFLOW TO THE DOWNSTREAM FLOW FROM BASIN A FOR THE TOTAL
*S  FLOW IN REGINA CIRCLE DOWNSTREAM OF THE PARK AT ANALYSIS POINT 3.
ADD HYD             ID=11  HYD=A_P_3  ID I=10  ID II=111
PRINT HYD           ID=11  CODE=1

                                    HYDROGRAPH FROM AREA A_P_3


    RUNOFF VOLUME =     1.12076 INCHES     =       1.9170 ACRE-FEET
    PEAK DISCHARGE RATE =      86.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0321 SQ. MI.


*S  ADD THE STORM DRAIN FLOWS TO OBTAIN THE TOTAL IN THE STORM DRAIN.
ADD HYD             ID=12  HYD=TOTL_TO_POND  ID I=9  ID II=5
PRINT HYD           ID=12  CODE=1

                                    HYDROGRAPH FROM AREA TOTL_TO_POND
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
RUNOFF VOLUME =      1.18270 INCHES      =        1.8128 ACRE-FEET
PEAK DISCHARGE RATE =      20.48 CFS  AT   1.533 HOURS   BASIN AREA =   .0287 SQ. MI.


*S  ROUTE THE RUNOFF TO THE POND.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.0084
                    DIA=30 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.13	.10	.20	1.11
.26	.27	.86	1.53
.39	.49	1.99	1.82
.52	.74	3.58	2.03
.65	1.02	5.59	2.19
.78	1.31	7.97	2.32
.91	1.62	10.68	2.41
1.04	1.94	13.66	2.47
1.17	2.26	16.84	2.50
1.30	2.59	20.15	2.50
1.43	2.91	23.52	2.50
1.56	3.23	26.88	2.50
1.69	3.54	30.13	2.50
1.82	3.84	33.17	2.50
1.95	4.12	35.89	2.50
2.08	4.37	38.15	2.50
2.21	4.60	39.77	2.50
2.35	4.78	40.44	2.50
2.50	4.91	40.44	2.50

```
COMPUTE TRAVEL TIME ID=13  REACH=1  VS NO=1  L=184.5  SLP=.0084
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.20	.0254
.261	.271	.86	.0163
.391	.490	1.99	.0126
.521	.741	3.58	.0106
.651	1.017	5.59	.0093
.782	1.312	7.97	.0084
.912	1.620	10.68	.0078
1.042	1.937	13.66	.0073
1.173	2.261	16.84	.0069
1.303	2.586	20.15	.0066
1.433	2.910	23.52	.0063
1.563	3.229	26.88	.0062
1.694	3.540	30.13	.0060
1.824	3.837	33.17	.0059
1.954	4.117	35.89	.0059
2.084	4.373	38.15	.0059
2.215	4.599	39.77	.0059
2.345	4.783	40.44	.0061
2.500	4.909	40.44	.0062

```
ROUTE              ID=13  HYD=PIPE  INFLOW ID=12  DT=.03333
PRINT HYD          ID=13  CODE=1
```

HYDROGRAPH FROM AREA PIPE

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
RUNOFF VOLUME =     1.18242 INCHES     =       1.8124 ACRE-FEET
PEAK DISCHARGE RATE =      20.49 CFS  AT   1.533 HOURS   BASIN AREA =   .0287 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE POND.
ROUTE RESERVOIR     ID=14  HYD=EXST_POND_OUT  INFLOW ID=13  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0               4950
                     2.8             0.87              4952
                     3.3             1.41              4953
                     3.7             1.95              4954
                     4.0             2.49              4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	13.33	4950.13	.057	.18
1.67	18.22	4951.24	.540	1.74
2.00	16.02	4952.12	.937	2.86
2.33	4.45	4952.45	1.114	3.03
2.67	1.85	4952.45	1.111	3.02
3.00	.89	4952.36	1.064	2.98
3.33	.50	4952.24	1.001	2.92
3.67	.35	4952.12	.933	2.86
4.00	.29	4951.99	.864	2.78
4.33	.25	4951.83	.798	2.57
4.67	.25	4951.69	.737	2.37
5.00	.26	4951.56	.681	2.19
5.33	.28	4951.45	.630	2.03
5.67	.29	4951.34	.584	1.88
6.00	.32	4951.25	.543	1.75
6.33	.38	4951.16	.506	1.63
6.67	.38	4951.09	.473	1.52
7.00	.38	4951.02	.443	1.43
7.33	.37	4950.96	.415	1.34
7.67	.36	4950.90	.390	1.25
8.00	.35	4950.84	.366	1.18
8.33	.35	4950.79	.344	1.11
8.67	.34	4950.75	.324	1.04
9.00	.34	4950.70	.306	.98
9.33	.33	4950.66	.288	.93
9.67	.32	4950.63	.272	.88
10.00	.32	4950.59	.258	.83
10.33	.31	4950.56	.244	.79
10.67	.31	4950.53	.231	.74
11.00	.30	4950.50	.220	.71
11.33	.29	4950.48	.209	.67
11.67	.29	4950.46	.199	.64
12.00	.28	4950.44	.190	.61
12.33	.28	4950.42	.181	.58
12.67	.28	4950.40	.173	.56
13.00	.27	4950.38	.165	.53
13.33	.27	4950.36	.158	.51
13.67	.26	4950.35	.152	.49
14.00	.26	4950.34	.146	.47
14.33	.25	4950.32	.140	.45

```
14.67        .25   4950.31       .135       .43
15.00        .25   4950.30       .130       .42
15.33        .24   4950.29       .126       .40
15.67        .24   4950.28       .121       .39
16.00        .24   4950.27       .117       .38
16.33        .24   4950.26       .114       .37
16.67        .23   4950.25       .110       .35
17.00        .23   4950.25       .107       .34
17.33        .23   4950.24       .104       .33
17.66        .22   4950.23       .101       .33
18.00        .22   4950.23       .098       .32
18.33        .22   4950.22       .096       .31

TIME      INFLOW    ELEV      VOLUME    OUTFLOW
(HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

18.66        .22   4950.21       .093       .30
19.00        .21   4950.21       .091       .29
19.33        .21   4950.20       .089       .29
19.66        .21   4950.20       .087       .28
 PEAK DISCHARGE = 3.033 CFS - PEAK OCCURS AT HOUR    2.47
 MAXIMUM WATER SURFACE ELEVATION =     4952.466
 MAXIMUM STORAGE =        1.1215 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=14  CODE=1

                                    HYDROGRAPH FROM AREA EXST_POND_OUT


   RUNOFF VOLUME =     1.12689 INCHES     =       1.7273 ACRE-FEET
   PEAK DISCHARGE RATE =       3.03 CFS  AT   2.466 HOURS   BASIN AREA =   .0287 SQ. MI.


*S******************  PROPOSED BASINS  ****************************************
*S  COMPUTE RUNOFF FROM BASIN A-2, THE EXISTING PARKING LOT.
COMPUTE NM HYD      ID=15 HYD=DEV_A2 DA=0.00073 SQ MI
                    %A=0 %B=0 %C=0 %D=100
                    TP=0.1333 RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.8821    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
    AREA =      .000730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=15 CODE=1

                                    HYDROGRAPH FROM AREA DEV_A2


   RUNOFF VOLUME =     2.34521 INCHES     =        .0913 ACRE-FEET
   PEAK DISCHARGE RATE =       2.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S  ROUTE BASIN A-2 TO BASIN A-1 OUTFALL.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV=0  MAX ELEV=0.50
                    CH SLP=.014  FP SLP=.014  N=.030  DIST=3
                    DIST   ELEV
                    0      .50
                    1       0
                    2      0
                    3     .50
```

```
RATING CURVE VALLEY SECTION  1.0
    WATER        FLOW        FLOW        TOP
   SURFACE       AREA        RATE        WIDTH
    ELEV         SQ FT       CFS         FT
      .00          .00         .00        1.00
      .03          .03         .01        1.11
      .05          .06         .04        1.21
      .08          .09         .09        1.32
      .11          .13         .15        1.42
      .13          .17         .22        1.53
      .16          .21         .30        1.63
      .18          .25         .39        1.74
      .21          .30         .50        1.84
      .24          .35         .63        1.95
      .26          .40         .76        2.05
      .29          .46         .91        2.16
      .32          .52        1.08        2.26
      .34          .58        1.26        2.37
      .37          .64        1.46        2.47
      .39          .71        1.67        2.58
      .42          .78        1.89        2.68
      .45          .85        2.14        2.79
      .47          .92        2.40        2.89
      .50         1.00        2.68        3.00
COMPUTE TRAVEL TIME ID=16  REACH=1  VS NO=1  L=210  SLP=.014

                    TRAVEL TIME TABLE
                              REACH=  1.0

                    WATER       AVERAGE     FLOW        TRAVEL
                    DEPTH       AREA        RATE        TIME
                    FEET        SQ.FT.      CFS         HRS
                      .026        .028         .01       .1171
                      .053        .058         .04       .0763
                      .079        .091         .09       .0600
                      .105        .127         .15       .0508
                      .132        .166         .22       .0448
                      .158        .208         .30       .0405
                      .184        .252         .39       .0372
                      .211        .299         .50       .0346
                      .237        .349         .63       .0325
                      .263        .402         .76       .0307
                      .289        .457         .91       .0292
                      .316        .515        1.08       .0279
                      .342        .576        1.26       .0267
                      .368        .640        1.46       .0257
                      .395        .706        1.67       .0247
                      .421        .776        1.89       .0239
                      .447        .848        2.14       .0231
                      .474        .922        2.40       .0224
                      .500       1.000        2.68       .0218
ROUTE              ID=16  HYD=A2_TO_A1  INFLOW ID=15  DT=0.03333
PRINT HYD          ID=16  CODE=1

                                HYDROGRAPH FROM AREA A2_TO_A1


    RUNOFF VOLUME =     2.34283 INCHES     =        .0912 ACRE-FEET
    PEAK DISCHARGE RATE =       2.01 CFS  AT   1.533 HOURS   BASIN AREA =   .0007 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN A-1.
COMPUTE NM HYD      ID=17 HYD=DEV_A1 DA=0.00040 SQ MI
```

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```
                %A=0 %B=90 %C=0 %D=10
                TP=0.1333 RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .15792    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
     AREA =      .000040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .88336    CFS   UNIT VOLUME =    .9850       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 =   .033330

PRINT HYD           ID=17 CODE=1

                                    HYDROGRAPH FROM AREA DEV_A1

    RUNOFF VOLUME =      .83523 INCHES     =        .0178 ACRE-FEET
    PEAK DISCHARGE RATE =        .59 CFS  AT   1.500 HOURS   BASIN AREA =   .0004 SQ. MI.


*S  ADD THE RUNOFF TO DETERMINE THE TOTAL FROM BASIN A, WHICH DISCHARGES
*S  THROUGH THE EXISTING CURB OPENING INTO REGINA CIRCLE AT ANALYSIS POINT 2.
ADD HYD             ID=18  HYD=A_P_2  ID I=16  ID II=17
PRINT HYD           ID=18  CODE=1

                                    HYDROGRAPH FROM AREA A_P_2


    RUNOFF VOLUME =     1.79267 INCHES     =        .1080 ACRE-FEET
    PEAK DISCHARGE RATE =       2.59 CFS  AT   1.533 HOURS   BASIN AREA =   .0011 SQ. MI.


*S*************************************************************************
*S  THE REMAINDER OF THE RUNOFF TO BE COMPUTED DISCHARGES TO THE DETENTION
*S  POND.  OFF-SITE BASIN DATA WILL BE AS BEFORE.
*S*************************************************************************
*S  BEGIN COMPUTATION OF NEW ON-SITE BASINS
*S  COMPUTE RUNOFF FROM BASIN B-6
COMPUTE NM HYD      ID=19 HYD=DEV_B6 DA=0.00424 SQ MI
                    %A=0 %B=10 %C=88 %D=2
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .33479    CFS   UNIT VOLUME =    .9664       B =   526.28      P60 = 1.8700
     AREA =      .000085 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .108431HR    TP =   .133300HR    K/TP RATIO =   .813433     SHAPE CONSTANT, N =  4.395534
     UNIT PEAK =   11.868    CFS   UNIT VOLUME =    .9993       B =   380.73      P60 = 1.8700
     AREA =      .004155 SQ MI    IA =    .36531 INCHES    INF =    .87286 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B6

    RUNOFF VOLUME =      .98249 INCHES     =        .2222 ACRE-FEET
```

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PEAK DISCHARGE RATE = 7.65 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

```
*S  ROUTE BASIN B-6 THROUGH POND AT BOTTOM OF BASIN B-6
ROUTE RESERVOIR     ID=20  HYD=B6_POND_OUT  INFLOW ID=19  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0               5041.5
                     7.6             0.02              5043
```

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5041.50	.000	.00
.33	.00	5041.50	.000	.00
.67	.00	5041.50	.000	.00
1.00	.00	5041.50	.000	.00
1.33	.56	5041.55	.001	.25
1.67	4.07	5042.46	.013	4.84
2.00	.92	5041.71	.003	1.08
2.33	.25	5041.56	.001	.28
2.67	.09	5041.52	.000	.10
3.00	.03	5041.51	.000	.04
3.33	.01	5041.50	.000	.01
3.67	.00	5041.50	.000	.00

PEAK DISCHARGE = 7.262 CFS - PEAK OCCURS AT HOUR 1.53
MAXIMUM WATER SURFACE ELEVATION = 5042.933
MAXIMUM STORAGE = .0191 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=20 CODE=1

HYDROGRAPH FROM AREA B6_POND_OUT

RUNOFF VOLUME = .98247 INCHES = .2222 ACRE-FEET
PEAK DISCHARGE RATE = 7.26 CFS AT 1.533 HOURS BASIN AREA = .0042 SQ. MI.

```
*S  ROUTE BASIN B-6 TO BASIN B-4 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.13  FP SLP=.13  N=.030  DIST=20
                    DIST   ELEV
                    0      .50
                    0      0
                    20     0
                    20     .50
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	20.00
.03	.53	.83	20.00
.05	1.05	2.64	20.00
.08	1.58	5.18	20.00
.11	2.11	8.35	20.00
.13	2.63	12.11	20.00
.16	3.16	16.39	20.00
.18	3.68	21.17	20.00
.21	4.21	26.43	20.00

```
                                        .24        4.74       32.13       20.00
                                        .26        5.26       38.27       20.00
                                        .29        5.79       44.81       20.00
                                        .32        6.32       51.76       20.00
                                        .34        6.84       59.10       20.00
                                        .37        7.37       66.81       20.00
                                        .39        7.89       74.89       20.00
                                        .42        8.42       83.32       20.00
                                        .45        8.95       92.10       20.00
                                        .47        9.47      101.22       20.00
                                        .50       10.00      110.67       20.00
COMPUTE TRAVEL TIME ID=21  REACH=1  VS NO=1  L=330  SLP=.13

                              TRAVEL TIME TABLE
                                          REACH=  1.0

                              WATER       AVERAGE     FLOW        TRAVEL
                              DEPTH       AREA        RATE        TIME
                              FEET        SQ.FT.      CFS         HRS
                                .026        .526        .83       .0581
                                .053       1.053       2.64       .0366
                                .079       1.579       5.18       .0280
                                .105       2.105       8.35       .0231
                                .132       2.632      12.11       .0199
                                .158       3.158      16.39       .0177
                                .184       3.684      21.17       .0160
                                .211       4.211      26.43       .0146
                                .237       4.737      32.13       .0135
                                .263       5.263      38.27       .0126
                                .289       5.789      44.81       .0118
                                .316       6.316      51.76       .0112
                                .342       6.842      59.10       .0106
                                .368       7.368      66.81       .0101
                                .395       7.895      74.89       .0097
                                .421       8.421      83.32       .0093
                                .447       8.947      92.10       .0089
                                .474       9.474     101.22       .0086
                                .500      10.000     110.67       .0083
ROUTE                ID=21  HYD=B6_TO_B4  INFLOW ID=20  DT=0.03333
PRINT HYD            ID=21  CODE=1

                                        HYDROGRAPH FROM AREA B6_TO_B4


    RUNOFF VOLUME =       .98245 INCHES     =        .2222 ACRE-FEET
    PEAK DISCHARGE RATE =       7.31 CFS  AT   1.567 HOURS   BASIN AREA =   .0042 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-5
COMPUTE NM HYD       ID=22 HYD=DEV_B5 DA=0.00145 SQ MI
                     %A=0 %B=67 %C=30 %D=3
                     TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .17174    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
     AREA =      .000044 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .123221HR    TP =   .133300HR    K/TP RATIO =   .924391     SHAPE CONSTANT, N =  3.828171
     UNIT PEAK =   3.6249    CFS   UNIT VOLUME =    .9965       B =   343.55      P60 = 1.8700
     AREA =      .001407 SQ MI    IA =    .45361 INCHES    INF =   1.12010 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
PRINT HYD          ID=22 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B5


   RUNOFF VOLUME =      .80391 INCHES     =        .0622 ACRE-FEET
   PEAK DISCHARGE RATE =      2.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  ROUTE BASIN B-5 TO BASIN B-5 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                   MIN ELEV =0  MAX ELEV=1
                   CH SLP=.05  FP SLP=.05  N=.030  DIST=3
                   DIST   ELEV
                   0       .5
                   1       0
                   2       0
                   3       .5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.05	.06	.08	1.21
.11	.13	.28	1.42
.16	.21	.57	1.63
.21	.30	.95	1.84
.26	.40	1.44	2.05
.32	.52	2.04	2.26
.37	.64	2.75	2.47
.42	.78	3.58	2.68
.47	.92	4.54	2.89
.53	1.08	5.75	3.00
.58	1.24	7.21	3.00
.63	1.39	8.81	3.00
.68	1.55	10.54	3.00
.74	1.71	12.39	3.00
.79	1.87	14.35	3.00
.84	2.03	16.43	3.00
.89	2.18	18.61	3.00
.95	2.34	20.91	3.00
1.00	2.50	23.31	3.00

```
COMPUTE TRAVEL TIME ID=23  REACH=1  VS NO=1  L=260  SLP=.05
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.058	.08	.0500
.105	.127	.28	.0333
.158	.208	.57	.0265
.211	.299	.95	.0227
.263	.402	1.44	.0201
.316	.515	2.04	.0182
.368	.640	2.75	.0168
.421	.776	3.58	.0156
.474	.922	4.54	.0147
.526	1.079	5.75	.0136
.579	1.237	7.21	.0124
.632	1.395	8.81	.0114

```
                                .684        1.553        10.54        .0106
                                .737        1.711        12.39        .0100
                                .789        1.868        14.35        .0094
                                .842        2.026        16.43        .0089
                                .895        2.184        18.61        .0085
                                .947        2.342        20.91        .0081
                               1.000        2.500        23.31        .0077
ROUTE                ID=23  HYD=B5_TO_POND  INFLOW ID=22  DT=0.03333
PRINT HYD            ID=23  CODE=1

                                     HYDROGRAPH FROM AREA B5_TO_POND


    RUNOFF VOLUME =      .79434 INCHES     =        .0614 ACRE-FEET
    PEAK DISCHARGE RATE =       2.21 CFS  AT   1.533 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-5 POND
ROUTE RESERVOIR      ID=24  HYD=B5_POND_OUT  INFLOW ID=23  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               5014
                        5             0.0065            5015

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

    TIME       INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)      (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00   5014.00       .000       .00
      .33        .00   5014.00       .000       .00
      .67        .00   5014.00       .000       .00
     1.00        .00   5014.00       .000       .00
     1.33        .04   5014.01       .000       .03
     1.67       1.30   5014.28       .002      1.42
     2.00        .23   5014.05       .000       .25
     2.33        .09   5014.02       .000       .09
     2.67        .04   5014.01       .000       .04
     3.00        .02   5014.00       .000       .02
     3.33        .00   5014.00       .000       .00
 PEAK DISCHARGE =        2.167 CFS - PEAK OCCURS AT HOUR    1.53
 MAXIMUM WATER SURFACE ELEVATION =     5014.434
 MAXIMUM STORAGE =         .0028 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD            ID=24  CODE=1

                                     HYDROGRAPH FROM AREA B5_POND_OUT


    RUNOFF VOLUME =      .79397 INCHES     =        .0614 ACRE-FEET
    PEAK DISCHARGE RATE =       2.17 CFS  AT   1.533 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-4
COMPUTE NM HYD       ID=25 HYD=DEV_B4 DA=0.00289 SQ MI
                     %A=2 %B=0 %C=98 %D=0
                     TP=0.1333  RAINFALL=-1

     K =   .107023HR    TP =   .133300HR    K/TP RATIO =   .802874     SHAPE CONSTANT, N =  4.460289
     UNIT PEAK =   8.3419    CFS   UNIT VOLUME =    .9989       B =   384.77      P60 = 1.8700
     AREA =      .002890 SQ MI    IA =    .35600 INCHES    INF =    .84680 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
PRINT HYD            ID=25 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B4


    RUNOFF VOLUME =       .97870 INCHES     =        .1508 ACRE-FEET
    PEAK DISCHARGE RATE =       5.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


*S  ADD B-4 AND B-6 FOR THE TOTAL TO THE B-4 POND
ADD HYD              ID=26  HYD=B4_POND_IN  ID I=25  ID II=21
PRINT HYD            ID=26  CODE=1

                                        HYDROGRAPH FROM AREA B4_POND_IN


    RUNOFF VOLUME =       .98091 INCHES     =        .3730 ACRE-FEET
    PEAK DISCHARGE RATE =      12.23 CFS  AT   1.533 HOURS   BASIN AREA =   .0071 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-4 POND
ROUTE RESERVOIR      ID=27  HYD=B4_POND_OUT  INFLOW ID=26  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               5001
                     14.4            0.0221             5002

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

    TIME       INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)      (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00   5001.00       .000       .00
      .33        .00   5001.00       .000       .00
      .67        .00   5001.00       .000       .00
     1.00        .00   5001.00       .000       .00
     1.33        .45   5001.02       .000       .25
     1.67       8.07   5001.61       .014      8.83
     2.00       1.89   5001.14       .003      2.05
     2.33        .52   5001.04       .001       .56
     2.67        .18   5001.01       .000       .19
     3.00        .07   5001.00       .000       .07
     3.33        .02   5001.00       .000       .02
     3.67        .00   5001.00       .000       .00
 PEAK DISCHARGE =       12.053 CFS - PEAK OCCURS AT HOUR    1.57
 MAXIMUM WATER SURFACE ELEVATION =     5001.837
 MAXIMUM STORAGE =         .0185 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD            ID=27  CODE=1

                                        HYDROGRAPH FROM AREA B4_POND_OUT


    RUNOFF VOLUME =       .98090 INCHES     =        .3730 ACRE-FEET
    PEAK DISCHARGE RATE =      12.05 CFS  AT   1.567 HOURS   BASIN AREA =   .0071 SQ. MI.


*S  ROUTE BASIN B-4 TO BASIN E-2 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV =0  MAX ELEV=1
                     CH SLP=.055  FP SLP=.055  N=.030  DIST=20
                     DIST   ELEV
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
0       1
10      0
20      1
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.05	.03	.03	1.05
.11	.11	.18	2.11
.16	.25	.53	3.16
.21	.44	1.14	4.21
.26	.69	2.07	5.26
.32	1.00	3.37	6.32
.37	1.36	5.09	7.37
.42	1.77	7.26	8.42
.47	2.24	9.94	9.47
.53	2.77	13.17	10.53
.58	3.35	16.98	11.58
.63	3.99	21.42	12.63
.68	4.68	26.51	13.68
.74	5.43	32.31	14.74
.79	6.23	38.83	15.79
.84	7.09	46.12	16.84
.89	8.01	54.22	17.89
.95	8.98	63.14	18.95
1.00	10.00	72.94	20.00

COMPUTE TRAVEL TIME ID=271 REACH=1 VS NO=1 L=200 SLP=.055

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.028	.03	.0542
.105	.111	.18	.0342
.158	.249	.53	.0261
.211	.443	1.14	.0215
.263	.693	2.07	.0185
.316	.997	3.37	.0164
.368	1.357	5.09	.0148
.421	1.773	7.26	.0136
.474	2.244	9.94	.0125
.526	2.770	13.17	.0117
.579	3.352	16.98	.0110
.632	3.989	21.42	.0103
.684	4.681	26.51	.0098
.737	5.429	32.31	.0093
.789	6.233	38.83	.0089
.842	7.091	46.12	.0085
.895	8.006	54.22	.0082
.947	8.975	63.14	.0079
1.000	10.000	72.94	.0076

```
ROUTE          ID=271  HYD=B4_TO_E2  INFLOW ID=27  DT=0.03333
PRINT HYD      ID=271  CODE=1
```

HYDROGRAPH FROM AREA B4_TO_E2

RUNOFF VOLUME = .98089 INCHES = .3730 ACRE-FEET
PEAK DISCHARGE RATE = 12.08 CFS AT 1.567 HOURS BASIN AREA = .0071 SQ. MI.

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
*S  ROUTE BASIN B-5 TO BASIN E-2 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=.5
                    CH SLP=.108  FP SLP=.108  N=.030  DIST=20
                    DIST   ELEV
                    0       .5
                    1       0
                    19      0
                    20      .5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	18.00
.03	.48	.68	18.11
.05	.95	2.17	18.21
.08	1.43	4.26	18.32
.11	1.92	6.89	18.42
.13	2.40	10.00	18.53
.16	2.89	13.56	18.63
.18	3.38	17.54	18.74
.21	3.88	21.93	18.84
.24	4.38	26.70	18.95
.26	4.88	31.85	19.05
.29	5.38	37.36	19.16
.32	5.88	43.22	19.26
.34	6.39	49.42	19.37
.37	6.90	55.95	19.47
.39	7.42	62.81	19.58
.42	7.93	69.99	19.68
.45	8.45	77.49	19.79
.47	8.98	85.30	19.89
.50	9.50	93.41	20.00

```
COMPUTE TRAVEL TIME ID=28  REACH=1  VS NO=1  L=250  SLP=.108
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.475	.68	.0483
.053	.953	2.17	.0305
.079	1.434	4.26	.0233
.105	1.917	6.89	.0193
.132	2.403	10.00	.0167
.158	2.892	13.56	.0148
.184	3.384	17.54	.0134
.211	3.878	21.93	.0123
.237	4.375	26.70	.0114
.263	4.875	31.85	.0106
.289	5.378	37.36	.0100
.316	5.884	43.22	.0095
.342	6.392	49.42	.0090
.368	6.903	55.95	.0086
.395	7.417	62.81	.0082
.421	7.934	69.99	.0079
.447	8.453	77.49	.0076
.474	8.975	85.30	.0073
.500	9.500	93.41	.0071

```
ROUTE              ID=28  HYD=B5_TO_E2  INFLOW ID=23  DT=0.03333
PRINT HYD          ID=28  CODE=1
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
                                    HYDROGRAPH FROM AREA B5_TO_E2

    RUNOFF VOLUME =      .79429 INCHES     =        .0614 ACRE-FEET
    PEAK DISCHARGE RATE =      2.21 CFS  AT   1.567 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  ADD B-4 AND B-5 FOR SUBTOTAL TO THE E-2 POND
ADD HYD             ID=281  HYD=E2_POND_IN  ID I=28  ID II=271
PRINT HYD           ID=281  CODE=1

                                    HYDROGRAPH FROM AREA E2_POND_IN

    RUNOFF VOLUME =      .94929 INCHES     =        .4344 ACRE-FEET
    PEAK DISCHARGE RATE =     14.29 CFS  AT   1.567 HOURS   BASIN AREA =   .0086 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN E-2
COMPUTE NM HYD      ID=29 HYD=DEV_E2 DA=0.00108 SQ MI
                    %A=5 %B=13 %C=80 %D=2
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .85278E-01CFS   UNIT VOLUME =    .8874       B =   526.28      P60 = 1.8700
     AREA =      .000022 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .112150HR    TP =   .133300HR    K/TP RATIO =   .841332     SHAPE CONSTANT, N =  4.234994
     UNIT PEAK =   2.9421    CFS   UNIT VOLUME =    .9958       B =   370.55      P60 = 1.8700
     AREA =      .001058 SQ MI    IA =    .38520 INCHES    INF =    .92857 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=29 CODE=1

                                    HYDROGRAPH FROM AREA DEV_E2

    RUNOFF VOLUME =      .93437 INCHES     =        .0538 ACRE-FEET
    PEAK DISCHARGE RATE =      1.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0011 SQ. MI.


*S  ADD E-2 FOR THE TOTAL TO THE POND
ADD HYD             ID=30  HYD=E2_POND_TOTL  ID I=281  ID II=29
PRINT HYD           ID=30  CODE=1

                                    HYDROGRAPH FROM AREA E2_POND_TOTL

    RUNOFF VOLUME =      .94659 INCHES     =        .4877 ACRE-FEET
    PEAK DISCHARGE RATE =     15.95 CFS  AT   1.567 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN E-2 POND
ROUTE RESERVOIR     ID=31  HYD=E2_POND_OUT  INFLOW ID=30  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0              4986.5
                      13.9          0.00005          4986.51
                      13.9          0.01995          4987.99
```

```
                    18            0.02              4988

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

  TIME       INFLOW    ELEV      VOLUME    OUTFLOW
  (HRS)      (CFS)     (FEET)    (AC-FT)   (CFS)

    .00        .00   4986.50       .000       .00
    .33        .00   4986.50       .000       .00
    .67        .00   4986.50       .000       .00
   1.00        .00   4986.50       .000       .00
   1.33        .22   4986.50       .000       .22
   1.67      11.67   4987.99       .020     13.90
   2.00       2.67   4986.50       .000       .00
   2.33        .76   4986.50       .000       .00
   2.67        .28   4986.50       .000       .00
   3.00        .10   4986.50       .000       .00
   3.33        .03   4986.50       .000       .00
   3.67        .01   4986.50       .000       .00
 PEAK DISCHARGE =       13.900 CFS - PEAK OCCURS AT HOUR    1.53
 MAXIMUM WATER SURFACE ELEVATION =     4987.990
 MAXIMUM STORAGE =         .0200 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=31  CODE=1

                                    HYDROGRAPH FROM AREA E2_POND_OUT


   RUNOFF VOLUME =      .95572 INCHES     =        .4924 ACRE-FEET
   PEAK DISCHARGE RATE =      13.90 CFS  AT   1.533 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN E-1N POND
ROUTE RESERVOIR     ID=311  HYD=E1N_POND_OUT  INFLOW ID=31  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0              4985.5
                      20             0.0024           4986

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

   TIME       INFLOW    ELEV      VOLUME    OUTFLOW
   (HRS)      (CFS)     (FEET)    (AC-FT)   (CFS)

     .00        .00   4985.50       .000       .00
     .33        .00   4985.50       .000       .00
     .67        .00   4985.50       .000       .00
    1.00        .00   4985.50       .000       .00
    1.33        .22   4985.51       .000       .21
    1.67      13.90   4985.85       .002     13.91
    2.00        .00   4985.57       .000      2.78
    2.33        .00   4985.54       .000      1.57
    2.67        .00   4985.51       .000       .59
    3.00        .00   4985.51       .000       .21
    3.33        .00   4985.50       .000       .07
    3.67        .00   4985.50       .000       .01
    4.00        .00   4985.50       .000       .00
 PEAK DISCHARGE =       13.920 CFS - PEAK OCCURS AT HOUR    1.53
 MAXIMUM WATER SURFACE ELEVATION =     4985.848
 MAXIMUM STORAGE =         .0017 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=311  CODE=1

                                    HYDROGRAPH FROM AREA E1N_POND_OUT
```

```
RUNOFF VOLUME =      .95631 INCHES     =        .4927 ACRE-FEET
PEAK DISCHARGE RATE =      13.92 CFS  AT   1.533 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  ROUTE THE POND DISCHARGE INTO REGINA CIRCLE VIA A 48" CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=.50
                    CH SLP=.02  FP SLP=.02  N=.013  DIST=4
                    DIST   ELEV
                    0       .5
                    0       0
                    4       0
                    4       .5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	4.00
.03	.11	.15	4.00
.05	.21	.47	4.00
.08	.32	.93	4.00
.11	.42	1.49	4.00
.13	.53	2.15	4.00
.16	.63	2.91	4.00
.18	.74	3.74	4.00
.21	.84	4.66	4.00
.24	.95	5.64	4.00
.26	1.05	6.70	4.00
.29	1.16	7.82	4.00
.32	1.26	9.00	4.00
.34	1.37	10.24	4.00
.37	1.47	11.54	4.00
.39	1.58	12.90	4.00
.42	1.68	14.31	4.00
.45	1.79	15.77	4.00
.47	1.89	17.27	4.00
.50	2.00	18.83	4.00

```
COMPUTE TRAVEL TIME ID=32  REACH=1  VS NO=1  L=30  SLP=.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.105	.15	.0059
.053	.211	.47	.0037
.079	.316	.93	.0028
.105	.421	1.49	.0024
.132	.526	2.15	.0020
.158	.632	2.91	.0018
.184	.737	3.74	.0016
.211	.842	4.66	.0015
.237	.947	5.64	.0014
.263	1.053	6.70	.0013
.289	1.158	7.82	.0012
.316	1.263	9.00	.0012
.342	1.368	10.24	.0011
.368	1.474	11.54	.0011
.395	1.579	12.90	.0010
.421	1.684	14.31	.0010

```
                                .447        1.789        15.77        .0009
                                .474        1.895        17.27        .0009
                                .500        2.000        18.83        .0009
ROUTE                ID=32  HYD=E1_POND_TO_STREET  INFLOW ID=311  DT=0.03333
PRINT HYD            ID=32  CODE=1

                                        HYDROGRAPH FROM AREA E1_POND_TO_STREET


    RUNOFF VOLUME =      .95631 INCHES     =        .4927 ACRE-FEET
    PEAK DISCHARGE RATE =      13.96 CFS  AT   1.533 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN E-3
COMPUTE NM HYD       ID=80 HYD=DEV_E3 DA=0.00049 SQ MI
                     %A=0 %B=0 %C=100 %D=0
                     TP=0.1333  RAINFALL=-1

     K =   .105867HR    TP =   .133300HR    K/TP RATIO =   .794199     SHAPE CONSTANT, N =  4.514851
     UNIT PEAK =   1.4268    CFS   UNIT VOLUME =    .9917       B =   388.14      P60 = 1.8700
     AREA =      .000490 SQ MI    IA =    .35000 INCHES    INF =    .83000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=80 CODE=1

                                        HYDROGRAPH FROM AREA DEV_E3


    RUNOFF VOLUME =      .99441 INCHES     =        .0260 ACRE-FEET
    PEAK DISCHARGE RATE =        .91 CFS  AT   1.500 HOURS   BASIN AREA =   .0005 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN E-1S POND
ROUTE RESERVOIR      ID=81  HYD=E1S_POND_OUT  INFLOW ID=80  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0              4981.5
                       10             0.0063           4982

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

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00   4981.50       .000       .00
      .33        .00   4981.50       .000       .00
      .67        .00   4981.50       .000       .00
     1.00        .00   4981.50       .000       .00
     1.33        .07   4981.50       .000       .05
     1.67        .48   4981.52       .000       .50
     2.00        .11   4981.51       .000       .12
     2.33        .03   4981.50       .000       .03
     2.67        .01   4981.50       .000       .01
 PEAK DISCHARGE =         .901 CFS - PEAK OCCURS AT HOUR    1.53
 MAXIMUM WATER SURFACE ELEVATION =     4981.545
 MAXIMUM STORAGE =         .0006 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD            ID=81  CODE=1

                                        HYDROGRAPH FROM AREA E1S_POND_OUT


    RUNOFF VOLUME =      .99417 INCHES     =        .0260 ACRE-FEET
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

PEAK DISCHARGE RATE = .90 CFS AT 1.533 HOURS BASIN AREA = .0005 SQ. MI.

```
*S  ROUTE BASIN E-1S POND TO REGINA.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.02  FP SLP=.02  N=.013  DIST=1
                    DIST   ELEV
                    0      .50
                    0       0
                    1       0
                    1      .50
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.03	.03	.04	1.00
.05	.05	.12	1.00
.08	.08	.22	1.00
.11	.11	.35	1.00
.13	.13	.51	1.00
.16	.16	.68	1.00
.18	.18	.86	1.00
.21	.21	1.06	1.00
.24	.24	1.27	1.00
.26	.26	1.50	1.00
.29	.29	1.73	1.00
.32	.32	1.97	1.00
.34	.34	2.22	1.00
.37	.37	2.48	1.00
.39	.39	2.75	1.00
.42	.42	3.03	1.00
.45	.45	3.31	1.00
.47	.47	3.59	1.00
.50	.50	3.89	1.00

```
COMPUTE TRAVEL TIME ID=82  REACH=1  VS NO=1  L=18  SLP=.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.026	.04	.0036
.053	.053	.12	.0023
.079	.079	.22	.0018
.105	.105	.35	.0015
.132	.132	.51	.0013
.158	.158	.68	.0012
.184	.184	.86	.0011
.211	.211	1.06	.0010
.237	.237	1.27	.0009
.263	.263	1.50	.0009
.289	.289	1.73	.0008
.316	.316	1.97	.0008
.342	.342	2.22	.0008
.368	.368	2.48	.0007
.395	.395	2.75	.0007
.421	.421	3.03	.0007
.447	.447	3.31	.0007
.474	.474	3.59	.0007

```
                                .500        .500        3.89        .0006
ROUTE                ID=82  HYD=E1S_POND_TO_REGINA  INFLOW ID=81  DT=0.03333
PRINT HYD            ID=82  CODE=1

                                    HYDROGRAPH FROM AREA E1S_POND_TO_REGINA


    RUNOFF VOLUME =      .99517 INCHES     =        .0260 ACRE-FEET
    PEAK DISCHARGE RATE =        .90 CFS  AT   1.533 HOURS   BASIN AREA =   .0005 SQ. MI.


*S  ADD E-1S OVERFLOW TO TOTAL IN REGINA
ADD HYD              ID=83  HYD=TOTAL_IN_STREET  ID I=32  ID II=82
PRINT HYD            ID=83  CODE=1

                                    HYDROGRAPH FROM AREA TOTAL_IN_STREET


    RUNOFF VOLUME =      .95813 INCHES     =        .5187 ACRE-FEET
    PEAK DISCHARGE RATE =      14.86 CFS  AT   1.533 HOURS   BASIN AREA =   .0102 SQ. MI.


*S  ROUTE THE RUNOFF SOUTH ON REGINA CIRCLE TO THE EXISTING INLET AT THE
*S  BOTTOM OF BASIN E-1 VIA A HALF-STREET SECTION.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                     MIN ELEV =0  MAX ELEV=0.41
                     CH SLP=.059  FP SLP=.059  N=.017  DIST=16
                     DIST   ELEV
                     0      .41
                     0       0
                     2      .13
                     16     .41

                                RATING CURVE VALLEY SECTION  1.0
                                    WATER       FLOW        FLOW        TOP
                                   SURFACE      AREA        RATE        WIDTH
                                    ELEV        SQ FT       CFS         FT
                                     .00         .00         .00         .00
                                     .02         .00         .00         .33
                                     .04         .01         .02         .66
                                     .06         .03         .07        1.00
                                     .09         .06         .14        1.33
                                     .11         .09         .26        1.66
                                     .13         .13         .42        1.99
                                     .15         .18         .58        3.05
                                     .17         .26         .85        4.13
                                     .19         .36        1.26        5.21
                                     .22         .49        1.83        6.29
                                     .24         .63        2.56        7.37
                                     .26         .80        3.48        8.45
                                     .28        1.00        4.61        9.53
                                     .30        1.21        5.97       10.61
                                     .32        1.46        7.56       11.68
                                     .35        1.72        9.42       12.76
                                     .37        2.01       11.54       13.84
                                     .39        2.32       13.96       14.92
                                     .41        2.65       16.68       16.00
COMPUTE TRAVEL TIME ID=33  REACH=1  VS NO=1  L=660  SLP=.059

                            TRAVEL TIME TABLE
                                          REACH=  1.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.022	.004	.00	.1847
.043	.014	.02	.1163
.065	.032	.07	.0888
.086	.057	.14	.0733
.108	.090	.26	.0632
.129	.129	.42	.0559
.151	.183	.58	.0582
.173	.261	.85	.0560
.194	.361	1.26	.0524
.216	.486	1.83	.0487
.237	.633	2.56	.0453
.259	.804	3.48	.0423
.281	.998	4.61	.0396
.302	1.215	5.97	.0373
.324	1.455	7.56	.0353
.345	1.719	9.42	.0335
.367	2.006	11.54	.0319
.388	2.316	13.96	.0304
.410	2.650	16.68	.0291

```
ROUTE              ID=33  HYD=E2_TO_E1  INFLOW ID=83  DT=0.03333
PRINT HYD          ID=33  CODE=1

                                   HYDROGRAPH FROM AREA E2_TO_E1


    RUNOFF VOLUME =      .95810 INCHES     =        .5186 ACRE-FEET
    PEAK DISCHARGE RATE =      14.70 CFS  AT   1.600 HOURS   BASIN AREA =   .0102 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-3
COMPUTE NM HYD      ID=34 HYD=DEV_B3 DA=0.00219 SQ MI
                    %A=0 %B=6 %C=94 %D=0
                    TP=0.1333  RAINFALL=-1

     K =   .107374HR    TP =   .133300HR    K/TP RATIO =   .805509     SHAPE CONSTANT, N =  4.444013
     UNIT PEAK =   6.3047    CFS   UNIT VOLUME =    .9983       B =   383.75      P60 = 1.8700
     AREA =      .002190 SQ MI    IA =    .35900 INCHES    INF =    .85520 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=34 CODE=1

                                   HYDROGRAPH FROM AREA DEV_B3

    RUNOFF VOLUME =      .97094 INCHES     =        .1134 ACRE-FEET
    PEAK DISCHARGE RATE =      3.96 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


*S  ROUTE BASIN B-3 TO INLET
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.05  FP SLP=.05  N=.013  DIST=3
                    DIST   ELEV
                    0       .5
                    1       0
                    2       0
                    3       .5

                              RATING CURVE VALLEY SECTION  1.0
```

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	1.00
.03	.03	.06	1.11
.05	.06	.19	1.21
.08	.09	.39	1.32
.11	.13	.64	1.42
.13	.17	.94	1.53
.16	.21	1.30	1.63
.18	.25	1.72	1.74
.21	.30	2.20	1.84
.24	.35	2.73	1.95
.26	.40	3.33	2.05
.29	.46	3.98	2.16
.32	.52	4.71	2.26
.34	.58	5.49	2.37
.37	.64	6.35	2.47
.39	.71	7.27	2.58
.42	.78	8.26	2.68
.45	.85	9.33	2.79
.47	.92	10.47	2.89
.50	1.00	11.68	3.00

```
COMPUTE TRAVEL TIME ID=37  REACH=1  VS NO=1  L=150  SLP=.05
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.028	.06	.0192
.053	.058	.19	.0125
.079	.091	.39	.0098
.105	.127	.64	.0083
.132	.166	.94	.0073
.158	.208	1.30	.0066
.184	.252	1.72	.0061
.211	.299	2.20	.0057
.237	.349	2.73	.0053
.263	.402	3.33	.0050
.289	.457	3.98	.0048
.316	.515	4.71	.0046
.342	.576	5.49	.0044
.368	.640	6.35	.0042
.395	.706	7.27	.0040
.421	.776	8.26	.0039
.447	.848	9.33	.0038
.474	.922	10.47	.0037
.500	1.000	11.68	.0036

```
ROUTE                ID=37  HYD=B3_TO_INLET  INFLOW ID=34  DT=0.03333
PRINT HYD            ID=37  CODE=1
```

HYDROGRAPH FROM AREA B3_TO_INLET

```
    RUNOFF VOLUME =      .97114 INCHES     =        .1134 ACRE-FEET
    PEAK DISCHARGE RATE =       3.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


*S  ROUTE THE RUNOFF TO INLET NEAR BLDGS.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.03
                     DIA=12 IN  N=.013
```

```
RATING CURVE PIPE SECTION  1.0
    WATER        FLOW        FLOW        MAX
   SURFACE       AREA        RATE        WIDTH
    ELEV         SQ FT       CFS         FT
      .00          .00         .00         .00
      .05          .02         .03         .44
      .10          .04         .14         .61
      .16          .08         .33         .73
      .21          .12         .59         .81
      .26          .16         .92         .88
      .31          .21        1.31         .93
      .36          .26        1.75         .96
      .42          .31        2.24         .99
      .47          .36        2.76        1.00
      .52          .41        3.31        1.00
      .57          .47        3.86        1.00
      .63          .52        4.41        1.00
      .68          .57        4.95        1.00
      .73          .61        5.44        1.00
      .78          .66        5.89        1.00
      .83          .70        6.26        1.00
      .89          .74        6.53        1.00
      .94          .77        6.64        1.00
     1.00          .79        6.64        1.00
COMPUTE TRAVEL TIME ID=38  REACH=1  VS NO=1  L=135  SLP=.03

                    TRAVEL TIME TABLE
                                REACH=  1.0

                    WATER       AVERAGE     FLOW        TRAVEL
                    DEPTH       AREA        RATE        TIME
                    FEET        SQ.FT.      CFS         HRS
                      .052        .016         .03       .0181
                      .104        .043         .14       .0116
                      .156        .078         .33       .0090
                      .208        .119         .59       .0076
                      .261        .163         .92       .0067
                      .313        .210        1.31       .0060
                      .365        .259        1.75       .0055
                      .417        .310        2.24       .0052
                      .469        .362        2.76       .0049
                      .521        .414        3.31       .0047
                      .573        .466        3.86       .0045
                      .625        .517        4.41       .0044
                      .677        .566        4.95       .0043
                      .730        .614        5.44       .0042
                      .782        .659        5.89       .0042
                      .834        .700        6.26       .0042
                      .886        .736        6.53       .0042
                      .938        .765        6.64       .0043
                     1.000        .785        6.64       .0044
ROUTE              ID=38  HYD=PIPE_FROM_B3  INFLOW ID=37  DT=.03333
PRINT HYD          ID=38  CODE=1

                                HYDROGRAPH FROM AREA PIPE_FROM_B3


    RUNOFF VOLUME =      .97114 INCHES     =        .1134 ACRE-FEET
    PEAK DISCHARGE RATE =      3.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0022 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN C
COMPUTE NM HYD      ID=39 HYD=DEV_C DA=0.00128 SQ MI
```

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```
                %A=0 %B=20 %C=0 %D=80
                TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.0428    CFS   UNIT VOLUME =    .9965       B =   526.28      P60 = 1.8700
    AREA =      .001024 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .62816    CFS   UNIT VOLUME =    .9787       B =   327.09      P60 = 1.8700
    AREA =      .000256 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=39 CODE=1

                                    HYDROGRAPH FROM AREA DEV_C

    RUNOFF VOLUME =     2.00963 INCHES     =        .1372 ACRE-FEET
    PEAK DISCHARGE RATE =       3.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*S  SPLIT BASIN C TO 2 INLETS.
DIVIDE HYD          ID=39  PER=-0.33  ID I=40   HYD=INLET_BLDG
                                      ID II=41  HYD=INLET_PARKING
PRINT HYD           ID=40  CODE=1

                                    HYDROGRAPH FROM AREA INLET_BLDG

    RUNOFF VOLUME =     2.00963 INCHES     =        .0453 ACRE-FEET
    PEAK DISCHARGE RATE =       1.06 CFS  AT   1.500 HOURS   BASIN AREA =   .0004 SQ. MI.


PRINT HYD           ID=41  CODE=1

                                    HYDROGRAPH FROM AREA INLET_PARKING

    RUNOFF VOLUME =     2.00963 INCHES     =        .0919 ACRE-FEET
    PEAK DISCHARGE RATE =       2.15 CFS  AT   1.500 HOURS   BASIN AREA =   .0009 SQ. MI.


*S  ADD B-3 TO INLET NEAR BLDGS.
ADD HYD             ID=42  HYD=TO_PARKING_INLET  ID I=38  ID II=40
PRINT HYD           ID=42  CODE=1

                                    HYDROGRAPH FROM AREA TO_PARKING_INLET

    RUNOFF VOLUME =     1.13886 INCHES     =        .1587 ACRE-FEET
    PEAK DISCHARGE RATE =       5.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0026 SQ. MI.


*S  ROUTE THE RUNOFF TO INLET IN PARKING AREA.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.03
                    DIA=12 IN  N=.013

                                    RATING CURVE PIPE SECTION  1.0
```

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.05	.02	.03	.44
.10	.04	.14	.61
.16	.08	.33	.73
.21	.12	.59	.81
.26	.16	.92	.88
.31	.21	1.31	.93
.36	.26	1.75	.96
.42	.31	2.24	.99
.47	.36	2.76	1.00
.52	.41	3.31	1.00
.57	.47	3.86	1.00
.63	.52	4.41	1.00
.68	.57	4.95	1.00
.73	.61	5.44	1.00
.78	.66	5.89	1.00
.83	.70	6.26	1.00
.89	.74	6.53	1.00
.94	.77	6.64	1.00
1.00	.79	6.64	1.00

```
COMPUTE TRAVEL TIME ID=43  REACH=1  VS NO=1  L=125  SLP=.03
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.052	.016	.03	.0167
.104	.043	.14	.0107
.156	.078	.33	.0083
.208	.119	.59	.0070
.261	.163	.92	.0062
.313	.210	1.31	.0056
.365	.259	1.75	.0051
.417	.310	2.24	.0048
.469	.362	2.76	.0045
.521	.414	3.31	.0043
.573	.466	3.86	.0042
.625	.517	4.41	.0041
.677	.566	4.95	.0040
.730	.614	5.44	.0039
.782	.659	5.89	.0039
.834	.700	6.26	.0039
.886	.736	6.53	.0039
.938	.765	6.64	.0040
1.000	.785	6.64	.0041

```
ROUTE              ID=43  HYD=PIPE_to_PARKING  INFLOW ID=42  DT=.03333
PRINT HYD          ID=43  CODE=1
```

HYDROGRAPH FROM AREA PIPE_to_PARKING

```
    RUNOFF VOLUME =     1.13882 INCHES     =        .1587 ACRE-FEET
    PEAK DISCHARGE RATE =       4.99 CFS  AT   1.533 HOURS   BASIN AREA =   .0026 SQ. MI.


*S  ADD THE REST OF C TO INLET IN PARKING AREA.
ADD HYD            ID=44  HYD=TO_PARKING_INLET  ID I=41  ID II=43
PRINT HYD          ID=44  CODE=1
```

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HYDROGRAPH FROM AREA TO_PARKING_INLET

```
RUNOFF VOLUME =      1.35404 INCHES     =        .2506 ACRE-FEET
PEAK DISCHARGE RATE =       7.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0035 SQ. MI.
```

```
*S  ROUTE THE RUNOFF TO JUNCTION BOX IN DRIVEWAY.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.03
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.10	.67
.16	.10	.41	.92
.23	.18	.96	1.09
.31	.27	1.73	1.22
.39	.37	2.70	1.32
.47	.47	3.86	1.39
.55	.58	5.17	1.44
.63	.70	6.61	1.48
.70	.81	8.15	1.50
.78	.93	9.75	1.50
.86	1.05	11.39	1.50
.94	1.16	13.01	1.50
1.02	1.27	14.58	1.50
1.09	1.38	16.05	1.50
1.17	1.48	17.37	1.50
1.25	1.57	18.47	1.50
1.33	1.66	19.25	1.50
1.41	1.72	19.57	1.50
1.50	1.77	19.57	1.50

```
COMPUTE TRAVEL TIME ID=45  REACH=1  VS NO=1  L=50  SLP=.03
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.078	.035	.10	.0051
.156	.098	.41	.0033
.235	.176	.96	.0025
.313	.267	1.73	.0021
.391	.366	2.70	.0019
.469	.472	3.86	.0017
.547	.583	5.17	.0016
.625	.697	6.61	.0015
.704	.814	8.15	.0014
.782	.931	9.75	.0013
.860	1.048	11.39	.0013
.938	1.163	13.01	.0012
1.016	1.274	14.58	.0012
1.094	1.381	16.05	.0012
1.173	1.482	17.37	.0012
1.251	1.574	18.47	.0012
1.329	1.656	19.25	.0012
1.407	1.722	19.57	.0012
1.500	1.767	19.57	.0013

```
ROUTE              ID=45  HYD=PIPE_to_JUNCTION  INFLOW ID=44  DT=.03333
```

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```
PRINT HYD          ID=45  CODE=1

                                   HYDROGRAPH FROM AREA PIPE_to_JUNCTION

    RUNOFF VOLUME =     1.35401 INCHES     =        .2506 ACRE-FEET
    PEAK DISCHARGE RATE =       7.13 CFS  AT   1.500 HOURS   BASIN AREA =   .0035 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-2
COMPUTE NM HYD      ID=46 HYD=DEV_B2 DA=0.00666 SQ MI
                    %A=5 %B=5 %C=88 %D=2
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .52588    CFS   UNIT VOLUME =    .9786       B =   526.28      P60 = 1.8700
     AREA =      .000133 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .110099HR    TP =   .133300HR    K/TP RATIO =   .825945     SHAPE CONSTANT, N =  4.321835
     UNIT PEAK =   18.414    CFS   UNIT VOLUME =    .9996       B =   376.09      P60 = 1.8700
     AREA =      .006527 SQ MI    IA =    .37296 INCHES    INF =    .89429 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=46 CODE=1

                                   HYDROGRAPH FROM AREA DEV_B2


    RUNOFF VOLUME =      .96381 INCHES     =        .3423 ACRE-FEET
    PEAK DISCHARGE RATE =      11.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S  ROUTE BASIN B-2 TO BASIN B-1 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.055  FP SLP=.055  N=.024  DIST=20
                    DIST   ELEV
                    0      .50
                    1       0
                    19      0
                    20     .50
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	18.00
.03	.48	.61	18.11
.05	.95	1.93	18.21
.08	1.43	3.80	18.32
.11	1.92	6.15	18.42
.13	2.40	8.92	18.53
.16	2.89	12.10	18.63
.18	3.38	15.65	18.74
.21	3.88	19.56	18.84
.24	4.38	23.82	18.95
.26	4.88	28.41	19.05
.29	5.38	33.32	19.16
.32	5.88	38.55	19.26
.34	6.39	44.08	19.37

```
                                    .37        6.90       49.91       19.47
                                    .39        7.42       56.03       19.58
                                    .42        7.93       62.44       19.68
                                    .45        8.45       69.12       19.79
                                    .47        8.98       76.09       19.89
                                    .50        9.50       83.33       20.00
COMPUTE TRAVEL TIME ID=47  REACH=1  VS NO=1  L=180  SLP=.055

                         TRAVEL TIME TABLE
                                     REACH=  1.0

                         WATER      AVERAGE     FLOW        TRAVEL
                         DEPTH      AREA        RATE        TIME
                         FEET       SQ.FT.      CFS         HRS
                            .026       .475         .61       .0390
                            .053       .953        1.93       .0246
                            .079      1.434        3.80       .0188
                            .105      1.917        6.15       .0156
                            .132      2.403        8.92       .0135
                            .158      2.892       12.10       .0120
                            .184      3.384       15.65       .0108
                            .211      3.878       19.56       .0099
                            .237      4.375       23.82       .0092
                            .263      4.875       28.41       .0086
                            .289      5.378       33.32       .0081
                            .316      5.884       38.55       .0076
                            .342      6.392       44.08       .0073
                            .368      6.903       49.91       .0069
                            .395      7.417       56.03       .0066
                            .421      7.934       62.44       .0064
                            .447      8.453       69.12       .0061
                            .474      8.975       76.09       .0059
                            .500      9.500       83.33       .0057
ROUTE              ID=47  HYD=B2_TO_B1  INFLOW ID=46  DT=0.03333
PRINT HYD          ID=47  CODE=1

                                    HYDROGRAPH FROM AREA B2_TO_B1


    RUNOFF VOLUME =      .96380 INCHES     =        .3423 ACRE-FEET
    PEAK DISCHARGE RATE =      11.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0067 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-1
COMPUTE NM HYD     ID=48 HYD=DEV_B1 DA=0.00743 SQ MI
                   %A=0 %B=50 %C=45 %D=5
                   TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.4667    CFS   UNIT VOLUME =    .9911       B =   526.28      P60 = 1.8700
    AREA =      .000372 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .119091HR    TP =   .133300HR    K/TP RATIO =   .893402     SHAPE CONSTANT, N =  3.968817
    UNIT PEAK =   18.697    CFS   UNIT VOLUME =    .9997       B =   353.08      P60 = 1.8700
    AREA =      .007059 SQ MI    IA =    .42895 INCHES    INF =   1.05105 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=48 CODE=1

                                    HYDROGRAPH FROM AREA DEV_B1
```

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
RUNOFF VOLUME =      .88429 INCHES     =        .3504 ACRE-FEET
PEAK DISCHARGE RATE =      11.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S  ADD BASIN B-1 FOR TOTAL RUNOFF INTO THE B-1 POND
ADD HYD             ID=49  HYD=B1_POND_IN_TOTL  ID I=47  ID II=48
PRINT HYD           ID=49  CODE=1

                                    HYDROGRAPH FROM AREA B1_POND_IN_TOTL


RUNOFF VOLUME =      .92187 INCHES     =        .6927 ACRE-FEET
PEAK DISCHARGE RATE =      23.71 CFS  AT   1.500 HOURS   BASIN AREA =   .0141 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-1 POND
ROUTE RESERVOIR     ID=50  HYD=B1_POND_OUT  INFLOW ID=49  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0              4953.50
                      5.45           0.0004          4953.51
                      5.45           0.21999         4954.99
                      50             0.222           4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4953.50	.000	.00
.33	.00	4953.50	.000	.00
.67	.00	4953.50	.000	.00
1.00	.00	4953.50	.000	.00
1.33	1.03	4953.50	.000	1.00
1.67	13.14	4954.99	.220	12.33
2.00	2.76	4954.99	.220	5.45
2.33	.87	4954.99	.220	5.45
2.67	.33	4953.50	.000	.01
3.00	.13	4953.50	.000	.02
3.33	.05	4953.50	.000	.02
3.67	.02	4953.50	.000	.01
4.00	.01	4953.50	.000	.00
4.33	.01	4953.50	.000	.01
4.67	.01	4953.50	.000	.01
5.00	.01	4953.50	.000	.01
5.33	.01	4953.50	.000	.01
5.67	.01	4953.50	.000	.01
6.00	.01	4953.50	.000	.01
6.33	.01	4953.50	.000	.01
6.67	.01	4953.50	.000	.01
7.00	.01	4953.50	.000	.01
7.33	.01	4953.50	.000	.01
7.67	.01	4953.50	.000	.01
8.00	.01	4953.50	.000	.01
8.33	.01	4953.50	.000	.01
8.67	.01	4953.50	.000	.01
9.00	.01	4953.50	.000	.01
9.33	.01	4953.50	.000	.01
9.67	.01	4953.50	.000	.01
10.00	.01	4953.50	.000	.01
10.33	.01	4953.50	.000	.01
10.67	.01	4953.50	.000	.01
11.00	.01	4953.50	.000	.01

```
11.33        .01   4953.50       .000       .01
11.67        .01   4953.50       .000       .01
12.00        .01   4953.50       .000       .01
12.33        .01   4953.50       .000       .01
12.67        .01   4953.50       .000       .01
13.00        .01   4953.50       .000       .01
13.33        .01   4953.50       .000       .01
13.67        .01   4953.50       .000       .01
14.00        .01   4953.50       .000       .01
14.33        .01   4953.50       .000       .01
14.67        .01   4953.50       .000       .01
15.00        .01   4953.50       .000       .01
15.33        .01   4953.50       .000       .01
15.67        .01   4953.50       .000       .01
16.00        .01   4953.50       .000       .01
16.33        .01   4953.50       .000       .01
16.67        .01   4953.50       .000       .01
17.00        .01   4953.50       .000       .01
17.33        .01   4953.50       .000       .01
17.66        .01   4953.50       .000       .01
18.00        .01   4953.50       .000       .01
18.33        .01   4953.50       .000       .01

TIME       INFLOW    ELEV      VOLUME    OUTFLOW
(HRS)      (CFS)     (FEET)    (AC-FT)   (CFS)

18.66        .01   4953.50       .000       .01
19.00        .01   4953.50       .000       .01
19.33        .01   4953.50       .000       .01
19.66        .01   4953.50       .000       .01
 PEAK DISCHARGE =       17.606 CFS - PEAK OCCURS AT HOUR    1.60
 MAXIMUM WATER SURFACE ELEVATION =     4954.993
 MAXIMUM STORAGE =         .2205 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=50  CODE=1

                                        HYDROGRAPH FROM AREA B1_POND_OUT


    RUNOFF VOLUME =      .92961 INCHES     =        .6986 ACRE-FEET
    PEAK DISCHARGE RATE =      17.61 CFS  AT   1.600 HOURS   BASIN AREA =   .0141 SQ. MI.


*S  DIVIDE THE POND OUTFLOW INTO TWO COMPONENTS:  ONE WILL DISCHARGE TO THE
*S  EXISTING INLET VIA PIPES, WHILE THE OTHER WILL DISCHARGE TO
*S  REGINA CIRCLE DOWNSTREAM OF THE INLET VIA SURFACE DISCHARGE.
DIVIDE HYD          ID=50  Q=5.45 CFS  ID I=52   HYD=PIPE_TO_INLET
                                      ID II=53  HYD=SURFC_TO_REGINA
PRINT HYD           ID=53  CODE=1

                                        HYDROGRAPH FROM AREA SURFC_TO_REGINA


    RUNOFF VOLUME =      .92961 INCHES     =        .1216 ACRE-FEET
    PEAK DISCHARGE RATE =      12.16 CFS  AT   1.600 HOURS   BASIN AREA =   .0025 SQ. MI.


*S  ADD THE SURFACE DISCHARGE TO THE OTHER SURFACE DISCHARGE AT ANALYSIS
*S  POINT 3.
ADD HYD             ID=54  HYD=A_P_3_SUBTL  ID I=18  ID II=53
PRINT HYD           ID=54  CODE=1
```

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HYDROGRAPH FROM AREA A_P_3_SUBTL

```
RUNOFF VOLUME =     1.20184 INCHES     =        .2296 ACRE-FEET
PEAK DISCHARGE RATE =      14.17 CFS  AT   1.600 HOURS   BASIN AREA =   .0036 SQ. MI.
```

```
*S  DIVIDE PIPE DISCHARGE TO GO THROUGH 3 PIPES.
DIVIDE HYD          ID=52  PER=-.33  ID I=521   HYD=1_PIPE_TO_INLET
                                     ID II=522  HYD=REMAINDER
PRINT HYD           ID=521  CODE=1
```

HYDROGRAPH FROM AREA 1_PIPE_TO_INLET

```
RUNOFF VOLUME =      .92961 INCHES     =        .1904 ACRE-FEET
PEAK DISCHARGE RATE =       1.80 CFS  AT   1.400 HOURS   BASIN AREA =   .0038 SQ. MI.
```

```
*S  ROUTE 1/3 THE RUNOFF INTO THE BACK OF THE EXISTING INLET ON REGINA
*S  CIRCLE VIA AN 8" PIPE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.028
                    DIA=8 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.42	1.00	8.01	3.56
.83	2.78	34.75	4.89
1.25	5.02	80.79	5.81
1.67	7.59	145.31	6.50
2.08	10.42	226.88	7.02
2.50	13.43	323.71	7.42
2.92	16.59	433.69	7.70
3.34	19.84	554.49	7.89
3.75	23.15	683.54	7.98
4.17	26.48	818.07	8.00
4.59	29.80	955.06	8.00
5.00	33.07	1091.25	8.00
5.42	36.25	1223.07	8.00
5.84	39.29	1346.53	8.00
6.25	42.15	1457.02	8.00
6.67	44.78	1548.94	8.00
7.09	47.09	1614.71	8.00
7.50	48.97	1641.74	8.00
8.00	50.27	1641.74	8.00

```
COMPUTE TRAVEL TIME ID=551  REACH=1  VS NO=1  L=62  SLP=.028
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.417	.999	8.01	.0021
.834	2.780	34.75	.0014
1.251	5.020	80.79	.0011
1.668	7.592	145.31	.0009
2.084	10.416	226.88	.0008
2.501	13.430	323.71	.0007

```
                    2.918      16.585      433.69       .0007
                    3.335      19.838      554.49       .0006
                    3.752      23.150      683.54       .0006
                    4.169      26.483      818.07       .0006
                    4.586      29.802      955.06       .0005
                    5.003      33.069     1091.25       .0005
                    5.420      36.246     1223.07       .0005
                    5.836      39.290     1346.53       .0005
                    6.253      42.154     1457.02       .0005
                    6.670      44.780     1548.94       .0005
                    7.087      47.091     1614.71       .0005
                    7.504      48.973     1641.74       .0005
                    8.000      50.265     1641.74       .0005
ROUTE          ID=551  HYD=1_PIPE  INFLOW ID=521  DT=.03333
PRINT HYD      ID=551  CODE=1

                          HYDROGRAPH FROM AREA 1_PIPE

    RUNOFF VOLUME =      .92961 INCHES     =        .1904 ACRE-FEET
    PEAK DISCHARGE RATE =       1.82 CFS  AT   1.433 HOURS   BASIN AREA =   .0038 SQ. MI.


*S  ADD 2 PIPES BACK TOGETHER.
ADD HYD        ID=550  HYD=FROM_POND_B-1_SUB  ID I=551  ID II=551
PRINT HYD      ID=550  CODE=1

                          HYDROGRAPH FROM AREA FROM_POND_B-1_SUB


    RUNOFF VOLUME =      .92961 INCHES     =        .3808 ACRE-FEET
    PEAK DISCHARGE RATE =       3.64 CFS  AT   1.433 HOURS   BASIN AREA =   .0077 SQ. MI.


*S  ADD 3RD PIPE.
ADD HYD        ID=55  HYD=FROM_POND_B-1_TOTL  ID I=550  ID II=551
PRINT HYD      ID=55  CODE=1

                          HYDROGRAPH FROM AREA FROM_POND_B-1_TOTL


    RUNOFF VOLUME =      .92961 INCHES     =        .5712 ACRE-FEET
    PEAK DISCHARGE RATE =       5.47 CFS  AT   1.433 HOURS   BASIN AREA =   .0115 SQ. MI.


*S  ADD THE RUNOFF INTO THE BACK OF THE INLET FOR THE SUBTOTAL INSIDE THE
*S  JUNCTION BOX.
ADD HYD        ID=99  HYD=IN_JUNCTION  ID I=55  ID II=45
PRINT HYD      ID=99  CODE=1

                          HYDROGRAPH FROM AREA IN_JUNCTION


    RUNOFF VOLUME =     1.02784 INCHES     =        .8218 ACRE-FEET
    PEAK DISCHARGE RATE =      12.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0150 SQ. MI.


*S  ROUTE THE RUNOFF INTO THE BACK OF THE EXISTING INLET ON REGINA
*S  CIRCLE VIA AN 24" PIPE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.01
```

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```
DIA=24 IN  N=.013

                    RATING CURVE PIPE SECTION  1.0
                       WATER        FLOW        FLOW        MAX
                      SURFACE       AREA        RATE        WIDTH
                       ELEV        SQ FT       CFS         FT
                        .00          .00         .00         .00
                        .10          .06         .12         .89
                        .21          .17         .52        1.22
                        .31          .31        1.20        1.45
                        .42          .47        2.15        1.62
                        .52          .65        3.36        1.76
                        .63          .84        4.80        1.85
                        .73         1.04        6.43        1.93
                        .83         1.24        8.22        1.97
                        .94         1.45       10.13        2.00
                       1.04         1.66       12.13        2.00
                       1.15         1.86       14.16        2.00
                       1.25         2.07       16.18        2.00
                       1.35         2.27       18.13        2.00
                       1.46         2.46       19.96        2.00
                       1.56         2.63       21.60        2.00
                       1.67         2.80       22.96        2.00
                       1.77         2.94       23.93        2.00
                       1.88         3.06       24.34        2.00
                       2.00         3.14       24.34        2.00
COMPUTE TRAVEL TIME ID=56  REACH=1  VS NO=1  L=25  SLP=.01

                         TRAVEL TIME TABLE
                                      REACH=  1.0

                         WATER       AVERAGE     FLOW        TRAVEL
                         DEPTH       AREA        RATE        TIME
                         FEET        SQ.FT.      CFS         HRS
                           .104        .062         .12       .0037
                           .208        .174         .52       .0023
                           .313        .314        1.20       .0018
                           .417        .475        2.15       .0015
                           .521        .651        3.36       .0013
                           .625        .839        4.80       .0012
                           .730       1.037        6.43       .0011
                           .834       1.240        8.22       .0010
                           .938       1.447       10.13       .0010
                          1.042       1.655       12.13       .0009
                          1.146       1.863       14.16       .0009
                          1.251       2.067       16.18       .0009
                          1.355       2.265       18.13       .0009
                          1.459       2.456       19.96       .0009
                          1.563       2.635       21.60       .0008
                          1.668       2.799       22.96       .0008
                          1.772       2.943       23.93       .0009
                          1.876       3.061       24.34       .0009
                          2.000       3.142       24.34       .0009
ROUTE                ID=56  HYD=PIPE_JNCT  INFLOW ID=99  DT=.03333
PRINT HYD            ID=56  CODE=1

                                   HYDROGRAPH FROM AREA PIPE_JNCT


    RUNOFF VOLUME =     1.02784 INCHES     =        .8218 ACRE-FEET
    PEAK DISCHARGE RATE =      12.56 CFS  AT   1.500 HOURS   BASIN AREA =   .0150 SQ. MI.
```

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```
*S  COMPUTE RUNOFF FROM BASIN D
COMPUTE NM HYD      ID=57 HYD=DEV_D DA=0.00014 SQ MI
                    %A=0 %B=20 %C=0 %D=80
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   .44218    CFS   UNIT VOLUME =    .9751       B =   526.28      P60 = 1.8700
     AREA =      .000112 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .68705E-01CFS   UNIT VOLUME =    .8722       B =   327.09      P60 = 1.8700
     AREA =      .000028 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=57 CODE=1

                                    HYDROGRAPH FROM AREA DEV_D


    RUNOFF VOLUME =     2.00986 INCHES     =        .0150 ACRE-FEET
    PEAK DISCHARGE RATE =        .36 CFS  AT   1.500 HOURS   BASIN AREA =   .0001 SQ. MI.


*S  ADD BASIN D TO THE REMAINDER IN REGINA CIRCLE.
ADD HYD             ID=58  HYD=REGINA  ID I=33  ID II=57
PRINT HYD           ID=58  CODE=1

                                    HYDROGRAPH FROM AREA REGINA


    RUNOFF VOLUME =      .97241 INCHES     =        .5337 ACRE-FEET
    PEAK DISCHARGE RATE =      14.95 CFS  AT   1.600 HOURS   BASIN AREA =   .0103 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN E-1
COMPUTE NM HYD      ID=59 HYD=DEV_E1 DA=0.00103 SQ MI
                    %A=0 %B=30 %C=0 %D=70
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   2.8465    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
     AREA =      .000721 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

     K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
     UNIT PEAK =   .75821    CFS   UNIT VOLUME =    .9821       B =   327.09      P60 = 1.8700
     AREA =      .000309 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=59 CODE=1

                                    HYDROGRAPH FROM AREA DEV_E1


    RUNOFF VOLUME =     1.84186 INCHES     =        .1012 ACRE-FEET
    PEAK DISCHARGE RATE =       2.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0010 SQ. MI.
```

```
*S  ADD BASIN E-1 TO THE REMAINDER IN REGINA CIRCLE FOR THE SUBTOTAL FROM
*S  THE PARK THAT DISCHARGES ACROSS THE EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD             ID=60  HYD=A_P_1_SUBTOTL  ID I=58  ID II=59
PRINT HYD           ID=60  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1_SUBTOTL


    RUNOFF VOLUME =     1.05152 INCHES     =        .6348 ACRE-FEET
    PEAK DISCHARGE RATE =      16.94 CFS  AT   1.567 HOURS   BASIN AREA =   .0113 SQ. MI.


*S  COMPUTE RUNOFF FROM OFF-SITE BASIN O-1, WHICH DISCHARGES TO REGINA
*S  CIRCLE.
COMPUTE NM HYD      ID=61 HYD=EXIST_O-1 DA=0.0280 SQ MI
                    %A=2 %B=68 %C=25 %D=5
                    TP=0.1333  RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
     AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .125068HR    TP =   .133300HR    K/TP RATIO =   .938247     SHAPE CONSTANT, N =  3.769050
     UNIT PEAK =   67.740    CFS   UNIT VOLUME =    1.000       B =   339.47      P60 = 1.8700
     AREA =      .026600 SQ MI    IA =    .46368 INCHES    INF =   1.14832 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=61 CODE=1

                                    HYDROGRAPH FROM AREA EXIST_O-1


    RUNOFF VOLUME =      .81624 INCHES     =       1.2189 ACRE-FEET
    PEAK DISCHARGE RATE =      41.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S  ADD THE RUNOFF FROM BASIN B FOR TOTAL IN REGINA CIRCLE UPSTREAM OF THE
*S  EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD             ID=62  HYD=A_P_1_TOTL  ID I=61  ID II=60
PRINT HYD           ID=62  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1_TOTL

    RUNOFF VOLUME =      .88397 INCHES     =       1.8537 ACRE-FEET
    PEAK DISCHARGE RATE =      57.28 CFS  AT   1.533 HOURS   BASIN AREA =   .0393 SQ. MI.


*S  COMPUTE THE RATING CURVE FOR THE REGINA CIRCLE CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.06  FP SLP=.06  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
                    16     .41
                    30     .13
```

```
32      0
32     .67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.04	.02	.03	1.09
.07	.08	.17	2.17
.11	.17	.51	3.26
.14	.31	1.01	5.11
.18	.55	1.87	8.63
.21	.92	3.48	12.16
.25	1.41	5.99	15.68
.28	2.03	9.58	19.21
.32	2.76	14.39	22.74
.35	3.63	20.58	26.26
.39	4.62	28.27	29.79
.42	5.72	38.52	32.00
.46	6.85	51.97	32.00
.49	7.98	66.96	32.00
.53	9.11	83.41	32.00
.56	10.23	101.27	32.00
.60	11.36	120.47	32.00
.63	12.49	140.96	32.00
.67	13.62	162.70	32.00

COMPUTE TRAVEL TIME ID=621 REACH=1 VS NO=1 L=660 SLP=.059

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.035	.019	.03	.1293
.071	.077	.17	.0815
.106	.172	.51	.0622
.141	.310	1.01	.0565
.176	.553	1.87	.0543
.212	.919	3.48	.0485
.247	1.410	5.99	.0431
.282	2.025	9.58	.0388
.317	2.765	14.39	.0352
.353	3.629	20.58	.0323
.388	4.617	28.27	.0299
.423	5.721	38.52	.0272
.458	6.849	51.97	.0242
.494	7.978	66.96	.0218
.529	9.106	83.41	.0200
.564	10.235	101.27	.0185
.599	11.363	120.47	.0173
.635	12.492	140.96	.0162
.670	13.620	162.70	.0153

```
ROUTE          ID=621  HYD=REGINA  INFLOW ID=62  DT=0.03333
PRINT HYD      ID=621  CODE=1
```

HYDROGRAPH FROM AREA REGINA

RUNOFF VOLUME = .88382 INCHES = 1.8534 ACRE-FEET
PEAK DISCHARGE RATE = 56.74 CFS AT 1.533 HOURS BASIN AREA = .0393 SQ. MI.

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```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLET
*S  ON REGINA CIRCLE AT ANALYSIS POINT 1.  THE INLET OVERFLOW DISCHARGES
*S  SOUTH ON REGINA INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=62  Q=6.67 CFS  ID I=63   HYD=STORM_DRAIN
                                       ID II=64  HYD=DOWNSTREAM
PRINT HYD           ID=64  CODE=1

                                    HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =      .88397 INCHES     =       1.2139 ACRE-FEET
    PEAK DISCHARGE RATE =      50.61 CFS  AT   1.533 HOURS   BASIN AREA =   .0257 SQ. MI.


*S  ADD THE OVERFLOW TO THE DOWNSTREAM FLOW FROM BASIN A FOR THE TOTAL
*S  FLOW IN REGINA CIRCLE DOWNSTREAM OF THE PARK AT ANALYSIS POINT 3.
ADD HYD             ID=65  HYD=A_P_3  ID I=64  ID II=54
PRINT HYD           ID=65  CODE=1

                                    HYDROGRAPH FROM AREA A_P_3


    RUNOFF VOLUME =      .92280 INCHES     =       1.4435 ACRE-FEET
    PEAK DISCHARGE RATE =      56.64 CFS  AT   1.600 HOURS   BASIN AREA =   .0293 SQ. MI.


*S  ADD THE RUNOFF INTO THE INLET GRATE TO THE NEW RUNOFF THAT ENTERED THE
*S  INLET FROM THE NEW ON-SITE PIPES.
ADD HYD             ID=66  HYD=INLET_TOTAL  ID I=63  ID II=56
PRINT HYD           ID=66  CODE=1

                                    HYDROGRAPH FROM AREA INLET_TOTAL


    RUNOFF VOLUME =      .95948 INCHES     =       1.4616 ACRE-FEET
    PEAK DISCHARGE RATE =      19.23 CFS  AT   1.500 HOURS   BASIN AREA =   .0286 SQ. MI.


*S  ROUTE PIPE FROM INLET TO MH.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.029
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.09	.67
.16	.10	.41	.92
.23	.18	.95	1.09
.31	.27	1.70	1.22
.39	.37	2.66	1.32
.47	.47	3.79	1.39
.55	.58	5.08	1.44
.63	.70	6.50	1.48
.70	.81	8.01	1.50
.78	.93	9.59	1.50
.86	1.05	11.19	1.50
.94	1.16	12.79	1.50
1.02	1.27	14.34	1.50
1.09	1.38	15.78	1.50

```
                                    1.17        1.48        17.08        1.50
                                    1.25        1.57        18.15        1.50
                                    1.33        1.66        18.93        1.50
                                    1.41        1.72        19.24        1.50
                                    1.50        1.77        19.24        1.50
COMPUTE TRAVEL TIME ID=67  REACH=1  VS NO=1  L=58  SLP=.029

                        TRAVEL TIME TABLE
                                        REACH=  1.0

                        WATER       AVERAGE     FLOW        TRAVEL
                        DEPTH       AREA        RATE        TIME
                        FEET        SQ.FT.      CFS         HRS
                           .078        .035         .09       .0060
                           .156        .098         .41       .0039
                           .235        .176         .95       .0030
                           .313        .267        1.70       .0025
                           .391        .366        2.66       .0022
                           .469        .472        3.79       .0020
                           .547        .583        5.08       .0018
                           .625        .697        6.50       .0017
                           .704        .814        8.01       .0016
                           .782        .931        9.59       .0016
                           .860       1.048       11.19       .0015
                           .938       1.163       12.79       .0015
                          1.016       1.274       14.34       .0014
                          1.094       1.381       15.78       .0014
                          1.173       1.482       17.08       .0014
                          1.251       1.574       18.15       .0014
                          1.329       1.656       18.93       .0014
                          1.407       1.722       19.24       .0014
                          1.500       1.767       19.24       .0015
ROUTE                ID=67  HYD=PIPE  INFLOW ID=66  DT=.03333
PRINT HYD            ID=67  CODE=1

                                    HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =      .95946 INCHES     =       1.4616 ACRE-FEET
    PEAK DISCHARGE RATE =      19.23 CFS  AT   1.533 HOURS   BASIN AREA =   .0286 SQ. MI.


*S  ADD THE STORM DRAIN FLOWS IN MH TO OBTAIN THE TOTAL.
ADD HYD              ID=68  HYD=TOTL_TO_POND  ID I=67  ID II=5
PRINT HYD            ID=68  CODE=1

                                    HYDROGRAPH FROM AREA TOTL_TO_POND


    RUNOFF VOLUME =     1.00820 INCHES     =       1.6864 ACRE-FEET
    PEAK DISCHARGE RATE =      24.92 CFS  AT   1.533 HOURS   BASIN AREA =   .0314 SQ. MI.


*S  ROUTE THE RUNOFF TO THE POND.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.0084
                     DIA=30 IN  N=.013

                                RATING CURVE PIPE SECTION  1.0
                                    WATER       FLOW        FLOW        MAX
                                   SURFACE      AREA        RATE        WIDTH
                                    ELEV        SQ FT       CFS         FT
                                      .00         .00         .00         .00
```

.13	.10	.20	1.11
.26	.27	.86	1.53
.39	.49	1.99	1.82
.52	.74	3.58	2.03
.65	1.02	5.59	2.19
.78	1.31	7.97	2.32
.91	1.62	10.68	2.41
1.04	1.94	13.66	2.47
1.17	2.26	16.84	2.50
1.30	2.59	20.15	2.50
1.43	2.91	23.52	2.50
1.56	3.23	26.88	2.50
1.69	3.54	30.13	2.50
1.82	3.84	33.17	2.50
1.95	4.12	35.89	2.50
2.08	4.37	38.15	2.50
2.21	4.60	39.77	2.50
2.35	4.78	40.44	2.50
2.50	4.91	40.44	2.50

COMPUTE TRAVEL TIME ID=69 REACH=1 VS NO=1 L=184.5 SLP=.0084

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.20	.0254
.261	.271	.86	.0163
.391	.490	1.99	.0126
.521	.741	3.58	.0106
.651	1.017	5.59	.0093
.782	1.312	7.97	.0084
.912	1.620	10.68	.0078
1.042	1.937	13.66	.0073
1.173	2.261	16.84	.0069
1.303	2.586	20.15	.0066
1.433	2.910	23.52	.0063
1.563	3.229	26.88	.0062
1.694	3.540	30.13	.0060
1.824	3.837	33.17	.0059
1.954	4.117	35.89	.0059
2.084	4.373	38.15	.0059
2.215	4.599	39.77	.0059
2.345	4.783	40.44	.0061
2.500	4.909	40.44	.0062

ROUTE ID=69 HYD=PIPE INFLOW ID=68 DT=.03333
PRINT HYD ID=69 CODE=1

HYDROGRAPH FROM AREA PIPE

RUNOFF VOLUME = 1.00811 INCHES = 1.6862 ACRE-FEET
PEAK DISCHARGE RATE = 24.93 CFS AT 1.533 HOURS BASIN AREA = .0314 SQ. MI.

*S ROUTE THE RUNOFF THROUGH THE POND.
ROUTE RESERVOIR ID=70 HYD=DEV_POND_OUT INFLOW ID=69 CODE=10

OUTFLOW (CFS)	STORAGE (AC_FT)	ELEVATION
0	0	4950
2.8	0.87	4952
3.3	1.41	4953
3.7	1.95	4954

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

4.0 2.49 4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	4.47	4950.04	.015	.05
1.67	19.51	4951.23	.537	1.73
2.00	14.57	4952.10	.921	2.85
2.33	8.76	4952.54	1.161	3.07
2.67	1.54	4952.71	1.253	3.15
3.00	.69	4952.61	1.197	3.10
3.33	.32	4952.47	1.126	3.04
3.67	.16	4952.33	1.050	2.97
4.00	.11	4952.19	.973	2.89
4.33	.09	4952.05	.896	2.82
4.67	.08	4951.89	.823	2.65
5.00	.09	4951.74	.755	2.43
5.33	.09	4951.59	.694	2.23
5.67	.10	4951.46	.637	2.05
6.00	.11	4951.35	.586	1.89
6.33	.13	4951.24	.539	1.74
6.67	.13	4951.14	.497	1.60
7.00	.13	4951.05	.458	1.47
7.33	.12	4950.97	.423	1.36
7.67	.12	4950.90	.390	1.26
8.00	.12	4950.83	.360	1.16
8.33	.12	4950.76	.333	1.07
8.67	.11	4950.71	.307	.99
9.00	.11	4950.65	.284	.91
9.33	.11	4950.60	.263	.85
9.67	.11	4950.56	.244	.78
10.00	.11	4950.52	.226	.73
10.33	.10	4950.48	.209	.67
10.67	.10	4950.45	.194	.63
11.00	.10	4950.41	.180	.58
11.33	.10	4950.39	.168	.54
11.67	.10	4950.36	.156	.50
12.00	.09	4950.33	.145	.47
12.33	.09	4950.31	.135	.44
12.67	.09	4950.29	.126	.41
13.00	.09	4950.27	.118	.38
13.33	.09	4950.25	.110	.36
13.67	.09	4950.24	.103	.33
14.00	.09	4950.22	.097	.31
14.33	.08	4950.21	.091	.29
14.67	.08	4950.20	.085	.27
15.00	.08	4950.18	.080	.26
15.33	.08	4950.17	.076	.24
15.67	.08	4950.16	.071	.23
16.00	.08	4950.16	.067	.22
16.33	.08	4950.15	.064	.21
16.67	.08	4950.14	.060	.19
17.00	.08	4950.13	.057	.18
17.33	.08	4950.13	.055	.18
17.66	.07	4950.12	.052	.17
18.00	.07	4950.11	.049	.16
18.33	.07	4950.11	.047	.15

Pat Hurley Park Renovation II -- 100-Year Design Storm AHYMO Analysis

```
   TIME       INFLOW    ELEV       VOLUME    OUTFLOW
   (HRS)      (CFS)     (FEET)     (AC-FT)   (CFS)

   18.66        .07   4950.10        .045       .15
   19.00        .07   4950.10        .043       .14
   19.33        .07   4950.10        .041       .13
   19.66        .07   4950.09        .040       .13
 PEAK DISCHARGE =        3.160 CFS - PEAK OCCURS AT HOUR    2.60
 MAXIMUM WATER SURFACE ELEVATION =     4952.721
 MAXIMUM STORAGE =        1.2593 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=70  CODE=1

                                    HYDROGRAPH FROM AREA DEV_POND_OUT


   RUNOFF VOLUME =      .98529 INCHES     =       1.6481 ACRE-FEET
   PEAK DISCHARGE RATE =       3.16 CFS  AT   2.600 HOURS   BASIN AREA =   .0314 SQ. MI.


FINISH

   NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 09:51:07
```

Appendix B

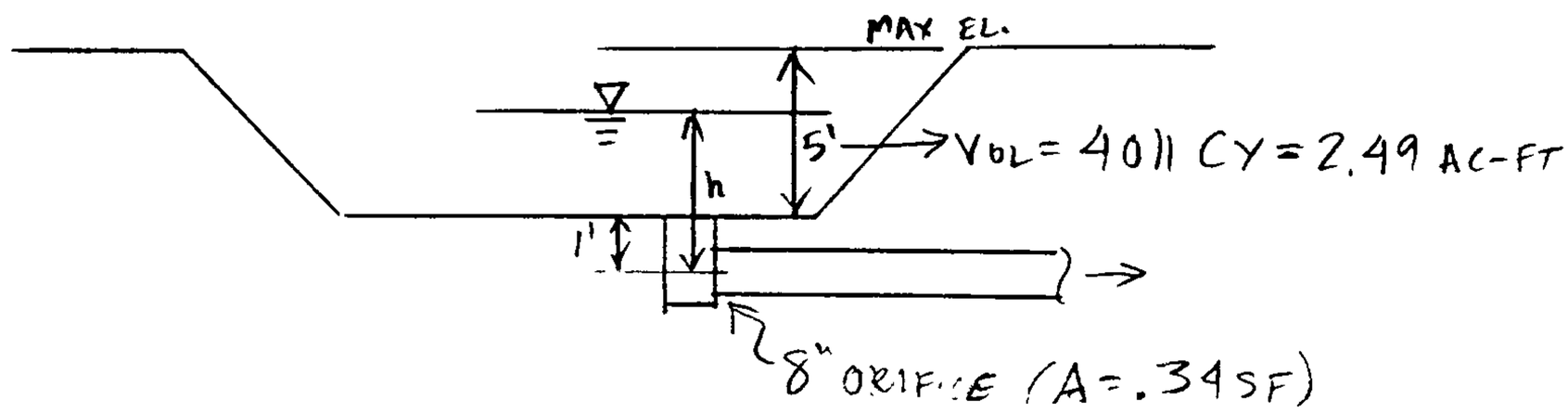
Supplemental Calculations

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
5639 JEFFERSON STREET N.E. • ALBUQUERQUE, NEW MEXICO 87109
PHONE (505) 344-4080 • FAX (505) 343-8759

SHEET NO. _____ OF _____
JOB PAT HURLEY PARK
SUBJECT _____
CLIENT _____ JOB NO. _____
BY JK DATE 9/26/97
CHECKED BY _____ DATE _____

SUPPLEMENTAL CALCULATIONS

1. EXISTING POND BETWEEN BLUEWATER AND ARENAL.



USE ORIFICE EQUATION TO ANALYZE:

$$Q_{CAP} = .6\,A\sqrt{2gh}$$

$$= .6\,(.34)\sqrt{2(32.2)h}$$

h (ft.)	Q_{CAP} (cfs)	Vol (ac-ft.)
3	2.8	0.87
4	3.3	1.41
5	3.7	1.95
6	4.0	2.49

2. DETERMINATION OF LAND TREATMENT TYPES:

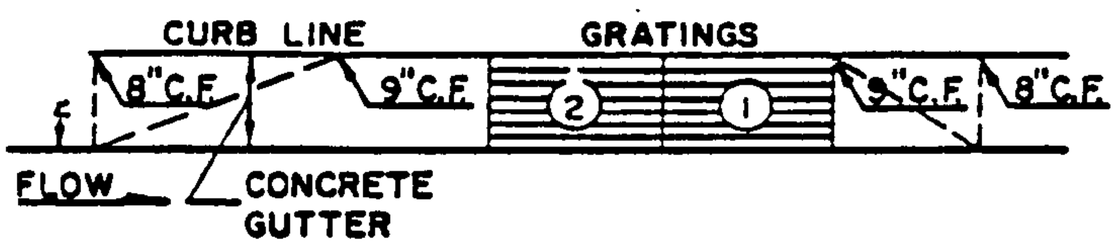
DEVELOPED "C" FACTOR OF 0.60 WAS USED IN SAP 219 (1990), FOR USE WITH RATIONAL METHODOLOGY.

CURRENT AHYMO METHODOLOGY REQUIRES THE USE OF LAND TREATMENT FACTORS. CORRESPONDING LAND TREATMENT FACTORS ARE:

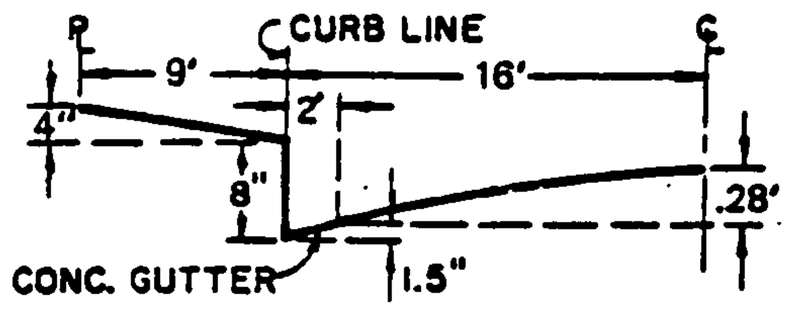
				OLD "C" FACTOR		
"B"	LANDSCAPED	50%	×	0.25	=	.125
"D"	IMPERVIOUS	50%	×	0.95	=	.475
						0.600 ✓

USE 50% "B" & 50% "D".

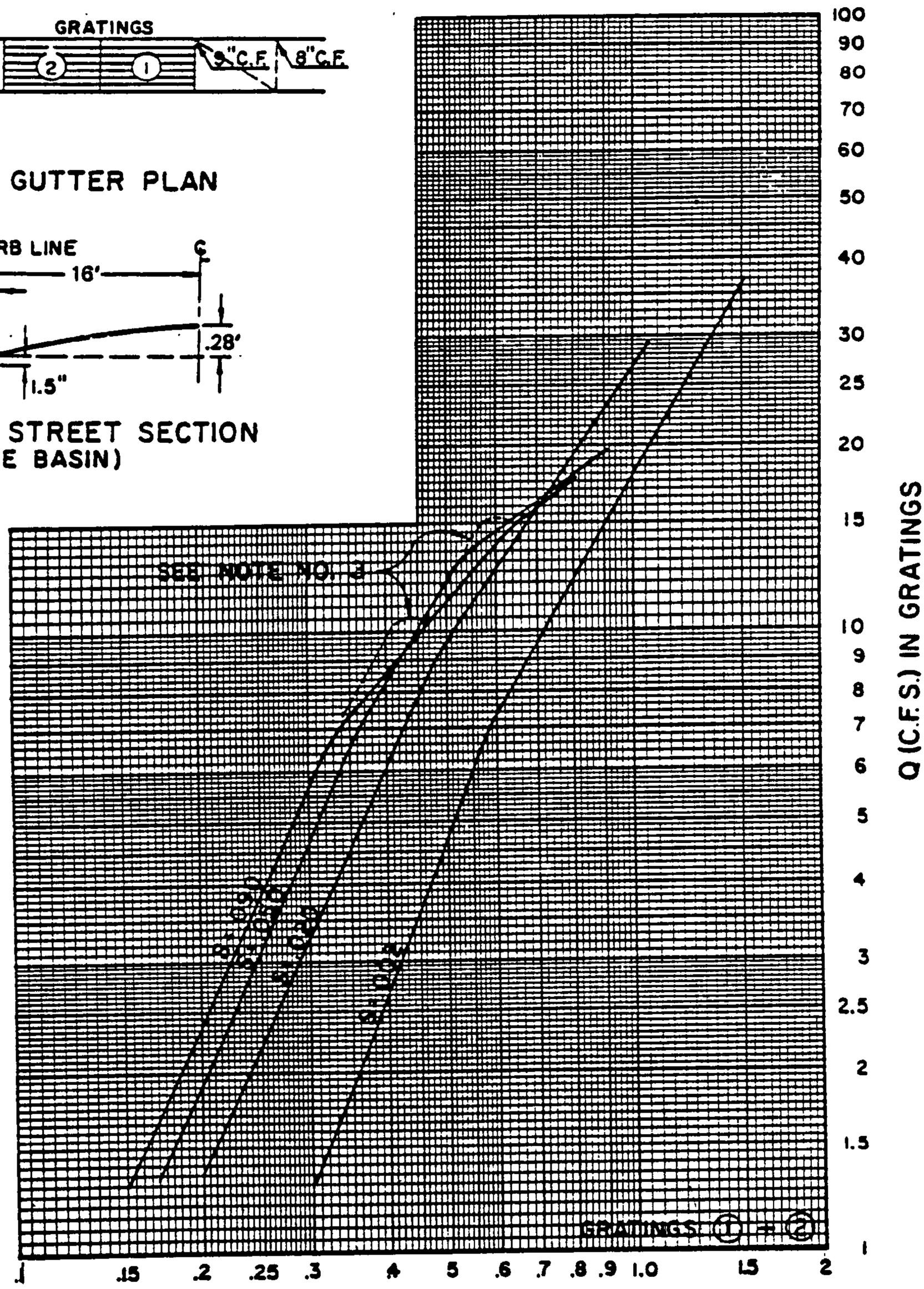
GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



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

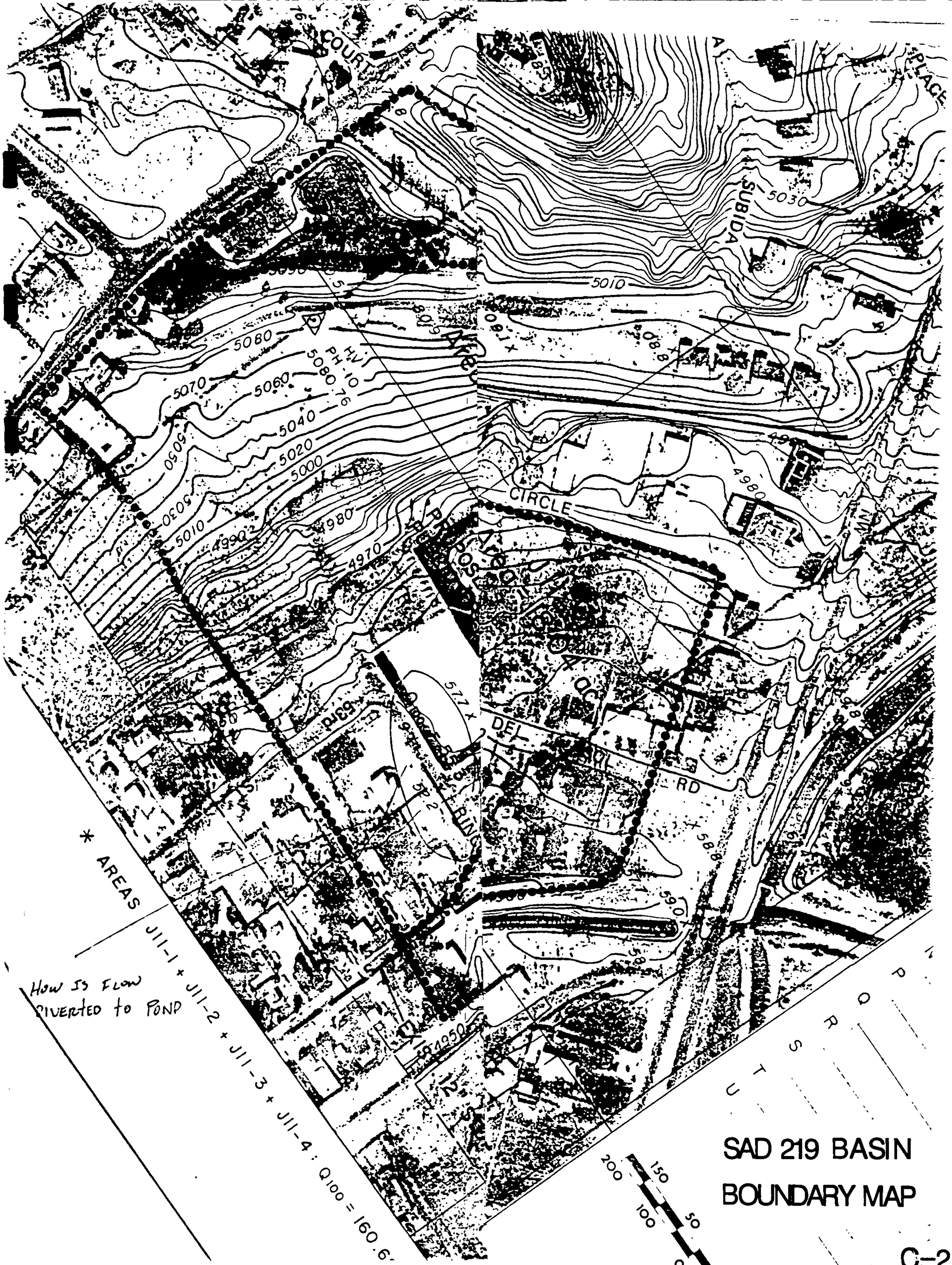
Appendix C

SAD 219 Data

SAD 219 DRAINAGE SUMMARY SHEET

REGINA AREA

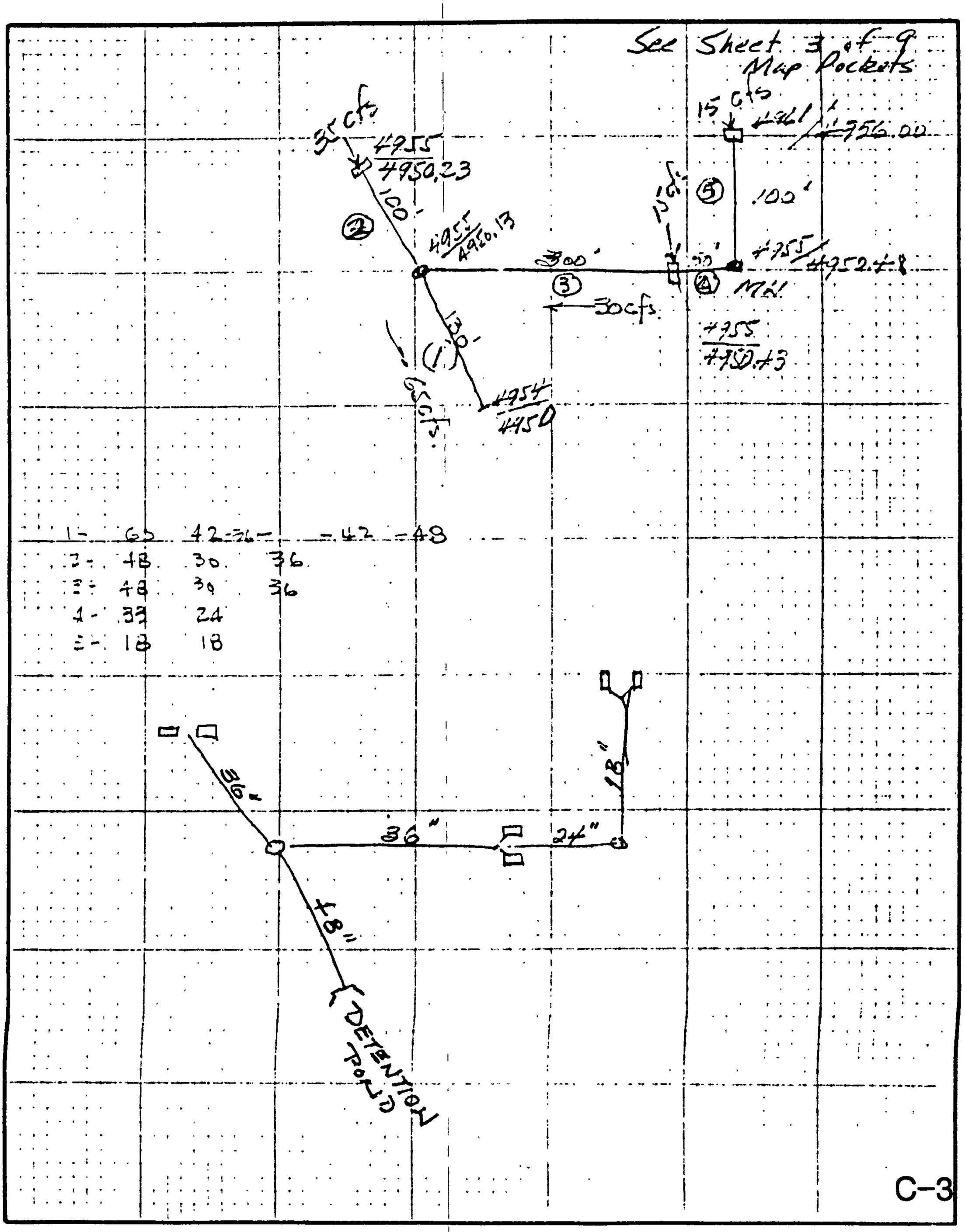
Area Designation	Area (Acres)	Rainfall Intensity (i)	C Factor	100 year Runoff Rate
51st and Rincon Outfall				
J11-1	12.66	4.65	0.60	35.32
J11-2	10.47	4.65	0.60	29.21
J11-3	19.83	4.65	0.60	55.33
J11-4	18.04	3.78	0.60	40.91



SAD 219 BASIN
BOUNDARY MAP

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Regina
SUBJECT Storm Drains
JOB NO.
SHEET 1 OF 1
BY ZMG
DATE 11-13-89
CHECKED
DATE



C-3

JOB DESCR. REGINA 1
RUN DATE :11-13-1989

STORM SEWER - HYDRAULIC ANALYSIS - FILE: REGINA 1.STM

RAINFALL LOCATION: SOMEWHERE UNITED STATES
RETURN PERIOD = 100 YRS

LINE 1 / DFQ = 65.0 / HT = 48 / WID = 48 / N = .015 / L = 130 / JLC = 1

OUTFALL

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4952.61	31.27	4950.10	7.37	4953.45	45.42	30.04	8.42
UPSTRM	4953.37	38.89	4950.13	5.96	4953.92	37.65	30.04	10.91

DA = 0 C = 0 Tc = 1.5 INL TM = 0 INT = 11.15 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 2 / DFQ = 35.0 / HT = 36 / WID = 36 / N = .015 / L = 100 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	36.00	4950.13	4.75	4954.30	0.00	23.39	7.07
UPSTRM	4954.67	36.00	4950.23	4.95	4955.05	0.00	23.39	7.07

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 3 / DFQ = 30.0 / HT = 36 / WID = 36 / N = .015 / L = 300 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	36.00	4950.13	4.24	4954.20	0.00	21.65	7.07
UPSTRM	4954.72	36.00	4950.63	4.24	4955.01	0.00	21.65	7.07

DA = 0 C = 0 Tc = .5 INL TM = 0 INT = 11.66 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 4 / DFQ = 15.0 / HT = 24 / WID = 24 / N = .015 / L = 50 / JLC = 1

DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.01	24.00	4950.43	4.76	4955.36	0.00	16.99	3.14
UPSTRM	4955.70	24.00	4950.43	4.77	4955.66	0.00	16.99	3.14

DA = 0 C = 0 Tc = .3 INL TM = 0 INT = 11.75 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 5 / DFQ = 15.0 / HT = 18 / WID = 18 / N = .015 / L = 100 / JLC = 1

DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.38	18.00	4950.48	6.49	4956.78	0.00	16.93	1.77
UPSTRM	4955.49	18.00	4950.00	6.49	4956.81	0.00	16.93	1.77

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB SAD 219
SUBJECT Regina Drainage
JOB NO. 88-10 SHEET 1 OF 1
BY tab DATE 5/30/90
CHECKED DATE

It is proposed to pave Regina Circle, Regina Place, and Regina Drive as part of SAD 219. All three streets lie within drainage areas J11-1 and J11-2. Paving these streets and constructing homes in the area will increase the C Factor from 0.50 to 0.60.

The resulting increase in stormwater runoff volume is calculated as follows:

Area J11-1

Area = 12.66 Acres = 550,000 FT^2

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(550,000) = 59,600\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(550,000) = 71,500\ FT^3$

Net increase in runoff (J11-1) = 12,000 FT^3

Area J11-2

Area = 10.47 Acres = 456,000 FT^3

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(456,000) = 49,400\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(456,000) = 59,300\ FT^3$

Net increase in runoff (J11-2) = 9,900 FT^3

Net calculated runoff due to development = 21,900 FT^3

Proposed new detention pond will intercept 100% of the runoff from Area J11-2 and 25% runoff from J11-1

Total Pond Volume = 1.00 x 59,300 + 0.25(71,500)
= 77,000 FT^3

Ponded Volume = 77,000 FT^3
Runoff Increase = 21,900 FT^3
Net Pond Benefit 55,100 FT^3

Outlet

$Q = CA\sqrt{2gh} = 0.70\ (.35)\sqrt{2(32.2)(6)} = .5$ cfs

A (8" orifice) = $\left(\frac{4}{12}\right)^2\pi = 0.35\ ft^2$

Terry O. Brown, P.E.

P. O. Box 92051
Albuquerque, New Mexico 87199
Ph. 768-9447

Consulting Engineer

July 10, 1991

Gilbert Aldaz, P.E.
Public Works Department
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Redesign of Regina Pond in SAD 219

Dear Gilbert:

Enclosed are the completed Drainage Information Sheet and some drawings showing the proposed design of the reference Regina Pond redesign in conformance with my discussions with Glenn Jergensen of Arroyo Maintenance. As you can see, even though we are proposing to raise the bottom of the pond by an average of 2.5 feet, the capacity of the pond is still well above the 3,000 cubic yards (81,000 cubic feet) required.

If you have questions, please call me.

Sincerely,

Terry O. Brown

Terry O. Brown, P.E.

cc: Glenn Jergensen, City of Alb. Arroyo Maintenance w/attach.
File - D:\WP51\219\REGIPOND.LET/1

DRAINAGE INFORMATION SHEET

PROJECT TITLE: **SAD 219** ZONE ATLAS/DRNG FILE # **J-11-Z**

LEGAL DESCRIPTION: **LOT 88-B, REGINA ADDITION**

CITY ADDRESS: **150' S.E. OF BLUEWATER/REGINA CIRCLE**

ENGINEERING FIRM: **TERRY O. BROWN, P.E.** CONTACT: **TERRY O. BROWN**

ADDRESS: **P.O. BOX 92051, ALBUQUERQUE, NM 87199** TELEPHONE: **768-9447**

OWNER: **CITY OF ALBUQUERQUE** CONTACT: **LEE LUNSFORD**

ADDRESS: **P.O. BOX 1293, ALBUQUERQUE, NM 87103** TELEPHONE: **768-3965**

ARCHITECT: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

SURVEYOR: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

CONTRACTOR: **CCM, INC.** CONTACT: **JAY CARAZZA**

ADDRESS: **8019 EDITH, ALBUQUERQUE, NM 87113** TELEPHONE: **898-7777**

PRE-DESIGN MEETING: **YES**

TYPE OF SUBMITTAL: **DRAINAGE POND REDESIGN**

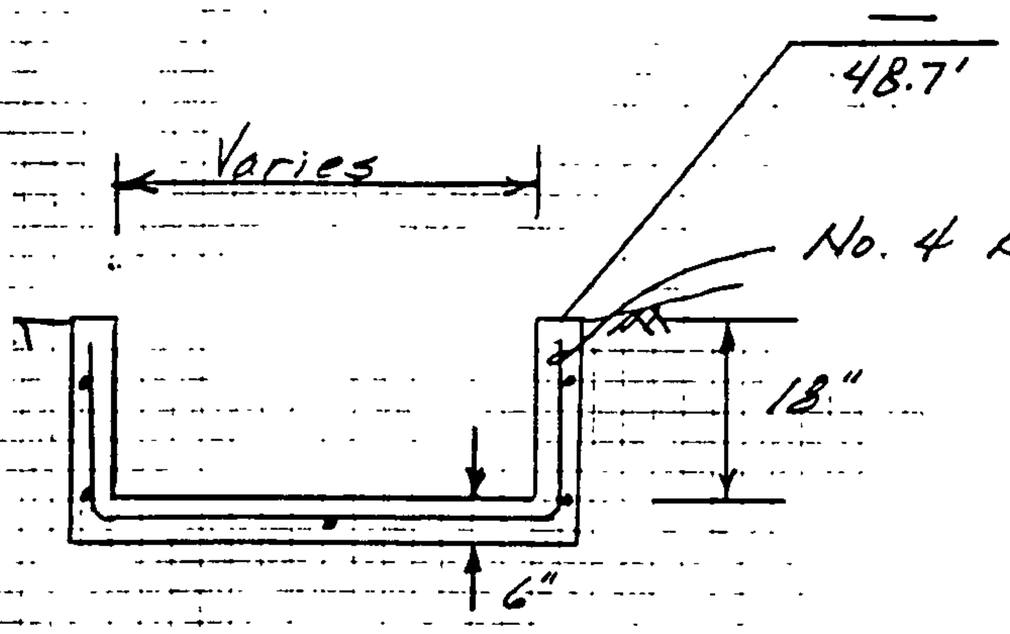
TYPE OF APPROVAL SOUGHT: **REDESIGN (SAD)**

DRB NO., EPC NO., PROJ. NO.: **PROJECT NO. 3558**

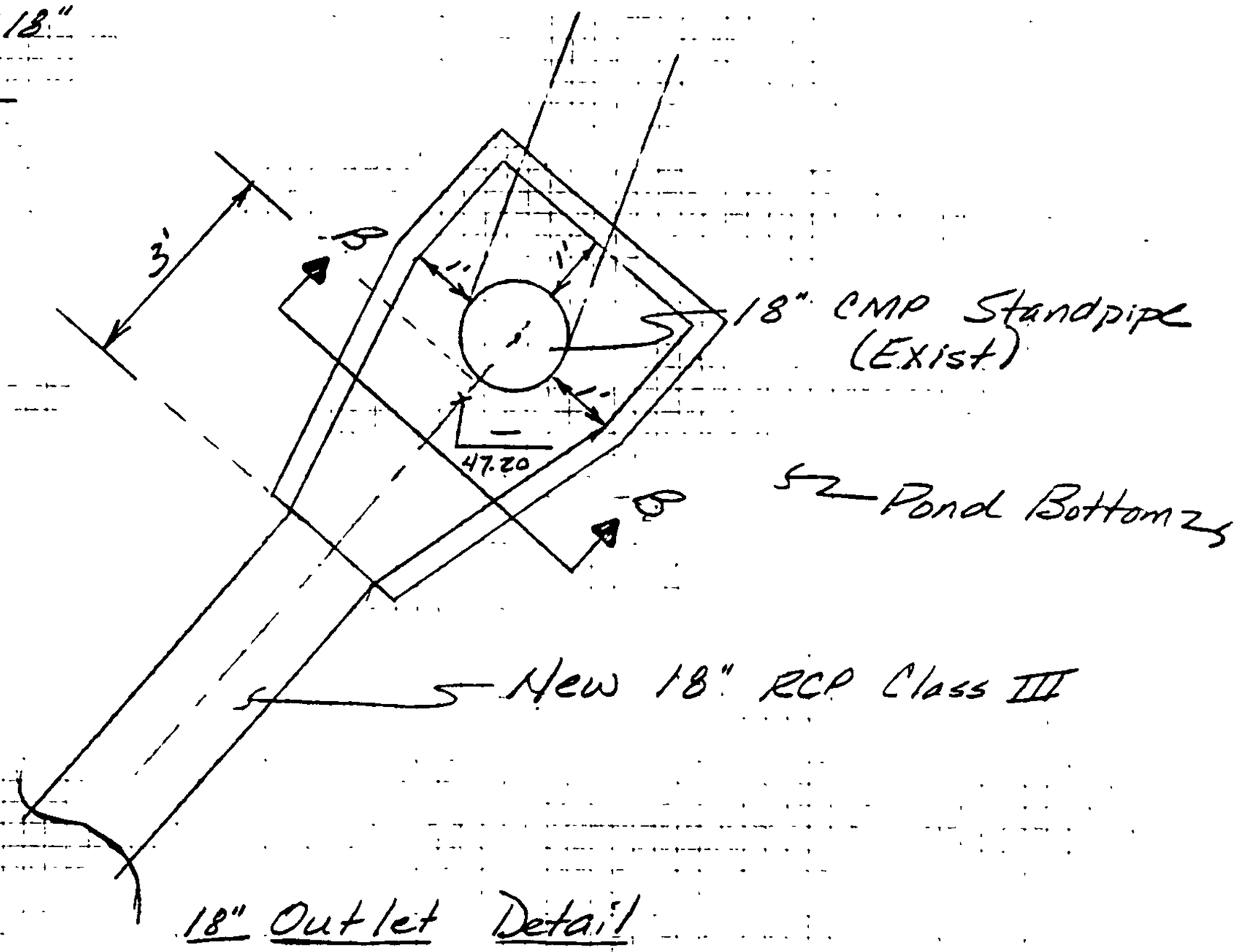
DATE SUBMITTED: **07/10/91**

BY: Terry O. Brown

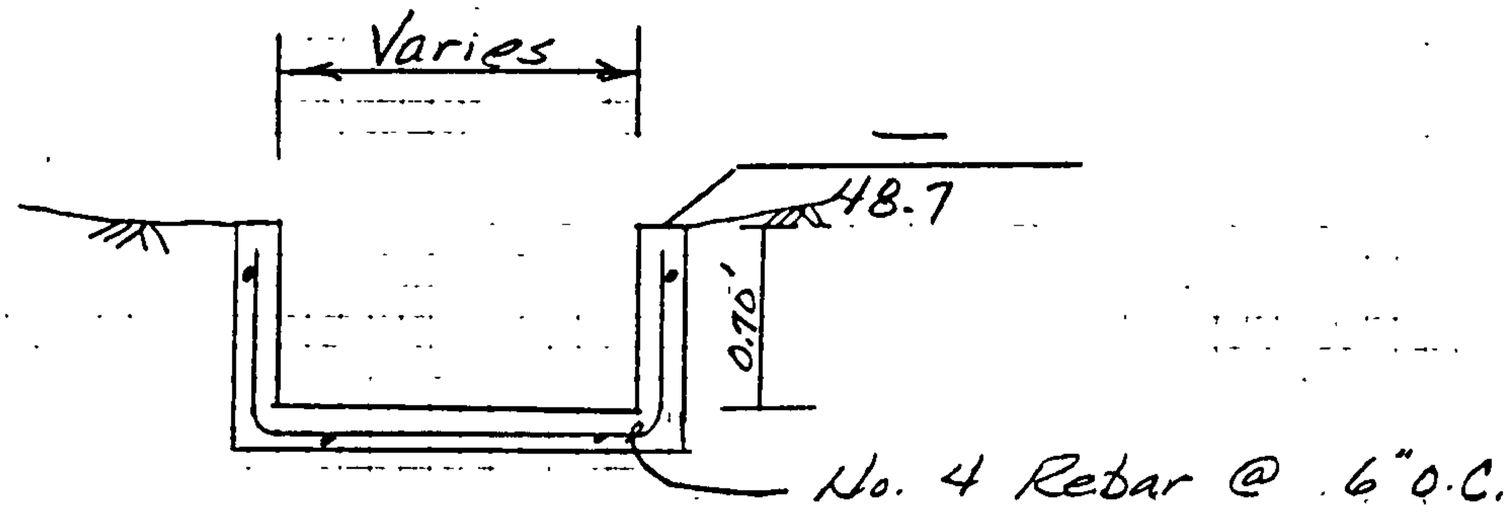
Terry O. Brown, P. E.



Section B-B
(No Scale)



18" Outlet Detail



Section C-C
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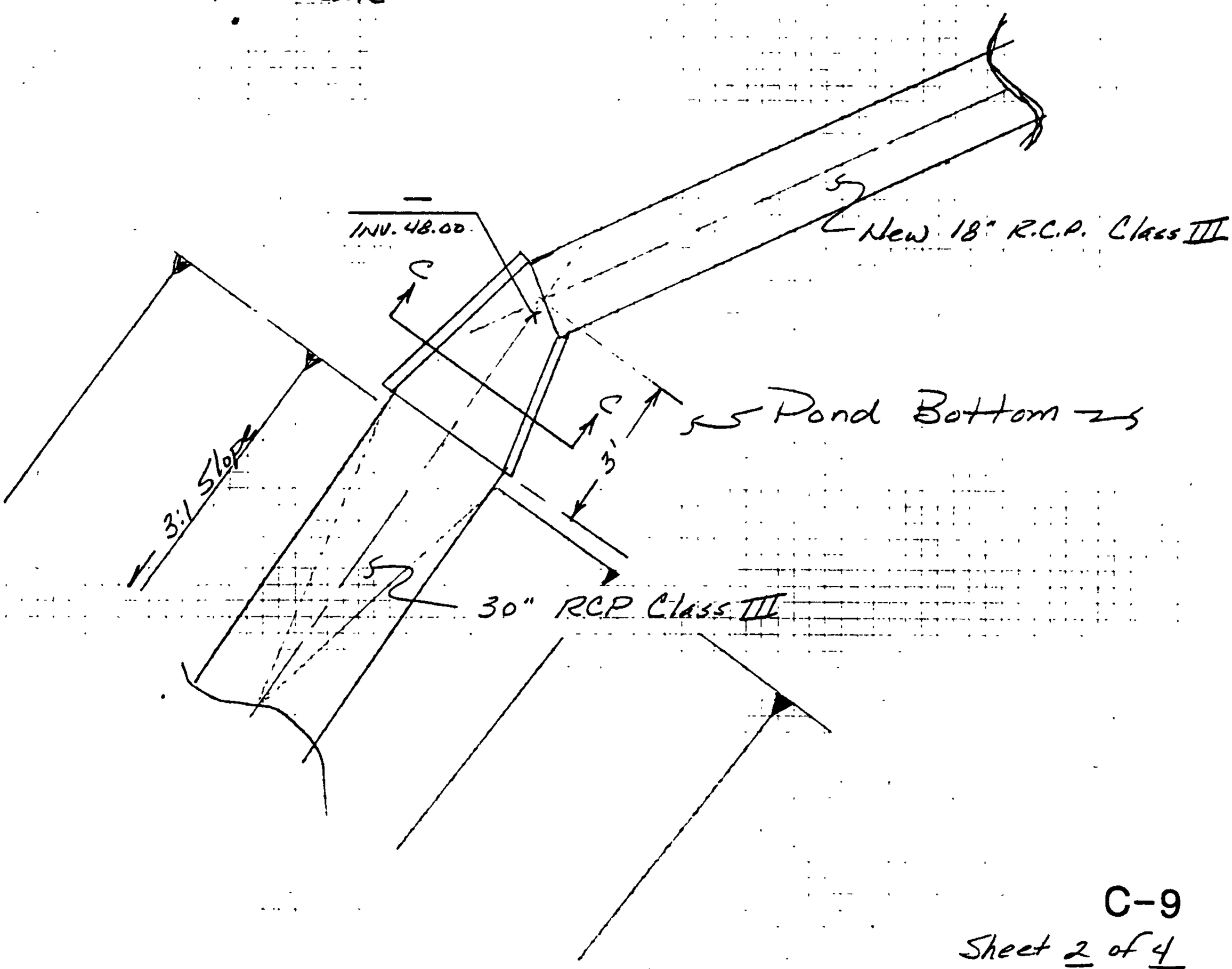


18" Inlet Detail

C-9

Sheet 2 of 4

7/9/91

Pond Volume Calculation

Pond Top = 55.15

New Pond Bottom = 50.00

Area of Pond Bottom = 12,600 S.F.

Depth = 5.15'

Volume Pond Bottom = 64,890 C.F. or 2,400 C.Y.

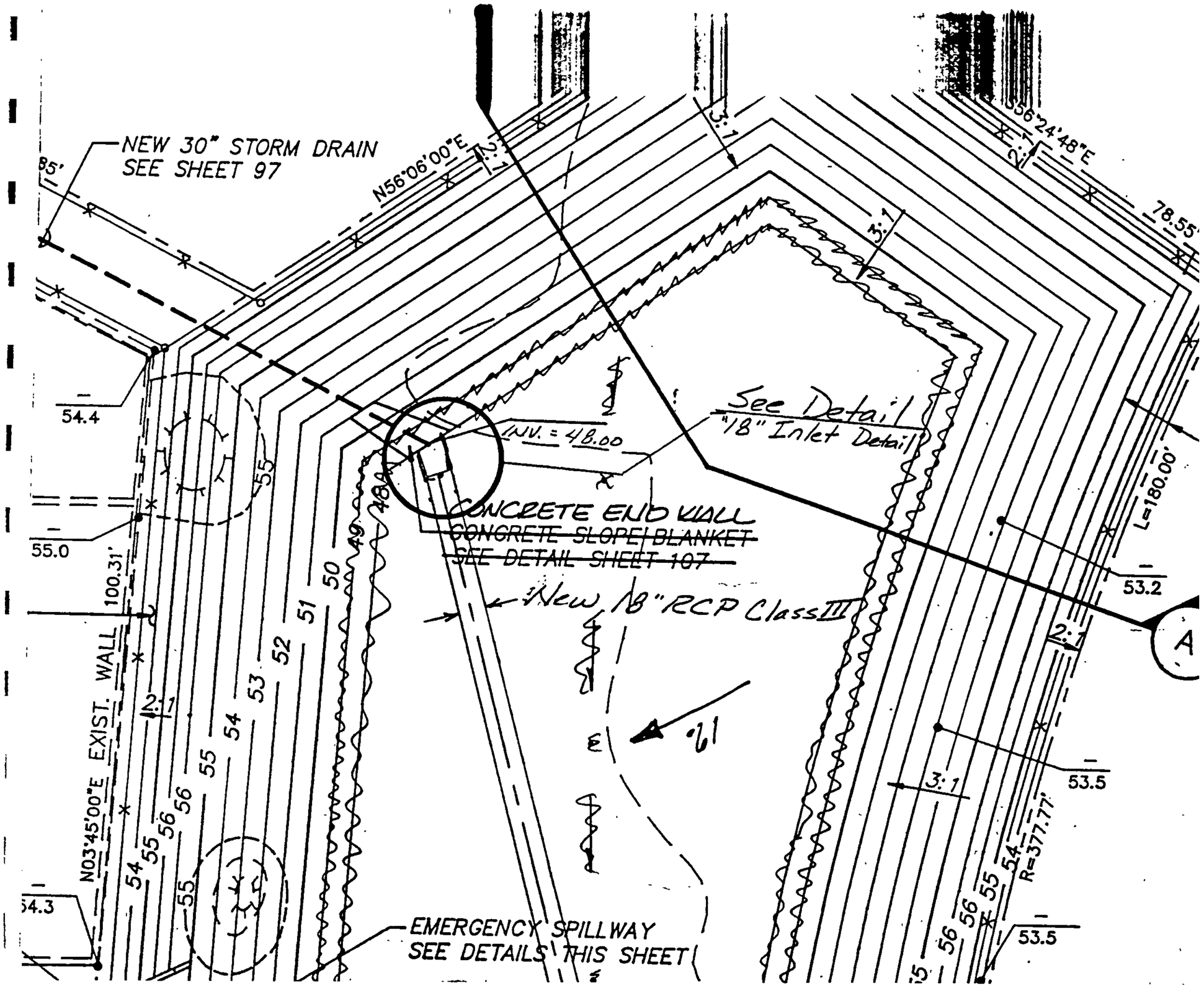
Slope Volume = 15' x 5' x (90 + 170 + 80 + 50 + 190)

= 43,500 C.F or 1,611 C.Y.

Total Pond Volume (Revised) = 4,011 C.Y.

Pond Volume Required = 3,000 C.Y.

Note: Elevation of outfall invert at 51st/Rincon = 48.5


NEW 30" STORM DRAIN
SEE SHEET 97
N56°06'00"E
N56°24'48"E
78.55'
3:1
2:1
See Detail
"18" Inlet Detail
INV. = 48.00
CONCRETE END WALL
~~CONCRETE SLOPE/BLANKET~~
~~SEE DETAIL SHEET 107~~
New 18" RCP Class III
L=180.00'
R=377.77'
100.31'
EXIST. WALL
N03°45'00"E
54.4
55.0
54.3
53.2
53.5
53.5
EMERGENCY SPILLWAY
SEE DETAILS THIS SHEET
A

CITY OF
Albuquerque
Public Works Department

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

October 22,1997

Joe Kelley
Chavez-Grieves Engineering
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: REVISED CONCEPTUAL DRAINAGE PLAN FOR PAT HURLEY PARK (J11-D12)
REVISION DATED 10/2/97

Dear Mr. Kelley:

Based on the information provided on your October 3,1997 resubmittal, the above referenced site is approved for Master Plan & Rough Grading.

Please be advised that the following information must be included on your site specific plan for Building Permit approval:

1. A blow up of the site specific area which will be developed.

2. Please include a legend on your resubmittal.

3. Will the development be in phases? If so, I will need a phasing plan.

4. Top of curb and flow line elevations for all the streets.

5. Please tabulate the existing and proposed runoff for each basin.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya

Bernie J. Montoya CE
Associate Engineer

DRAINAGE INFORMATION

PROJECT Pat Hurley Park ZONE ATLAS/DRNG. FILE #: J-11/D12

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOT 88-B, Regina Addition

CITY ADDRESS: 150' South East of Bluewater/Regina Circle

ENGINEERING FIRM: CHAVEZ-GRIEVES CONTACT: JOE P. KELLEY

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: City of Albuquerque CONTACT: LEE LUNSFORD

ADDRESS: P.O. Box 1293, Albuq New Mexico 87103 PHONE: 768-3965

ARCHITECT: PDS Southwest, Ltd. CONTACT: WARREN MCCLUNG

ADDRESS: N/A PHONE: 323-5001

SURVEYOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: N/A PHONE: _____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

X NO

____ COPY PROVIDED

DATE SUBMITTED: October 3,1997

BY: JERRIE L. MARTINEZ

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

X BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

X GRADING PERMIT APPROVAL

X PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

X DRAINAGE REQUIREMENTS MASTER Approval

____ OTHER ROUGH GRADING (SPECIFY)

RECEIVED
OCT 03 1997
HYDROLOGY SECTION

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 PHONE (505) 344·4080 · FAX (505) 343 8759

October 2, 1997

Mr. Bernie Montoya
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: MASTER DRAINAGE PLAN FOR PAT HURLEY PARK (J11-D12)
C-G PROJECT NO. M23-103-5197

Dear Mr. Montoya:

Your comments dated 7/7/97 have been addressed as follows:

1. Downstream capacity has been analyzed. It was found that release rates are governed by an existing off-site detention pond, which has ample capacity to accept the developed runoff from the site.

2. Existing and developed flowrates at key analysis points have been tabulated, and I hope it will facilitate your review.

3. Existing and developed basins have been identified on two separate plans. A discharge comparison was made at key points.

4. The contours have been reduced in number. I hope it is easier to read.

5. Vicinity map has been revised.

We look forward to receiving your approval of this master plan, and would be pleased to respond to any comments you may have in the meantime.

Sincerely,

CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.

Joe Kelley

Joe P. Kelley, P.E.
Senior Engineer

RECEIVED
OCT 0 3 1997
HYDROLOGY SECTION

Cy: Warren McClung

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344 4080 · FAX (505) 343 8759

DRAINAGE REPORT

FOR

PAT HURLEY PARK

ALBUQUERQUE, NEW MEXICO

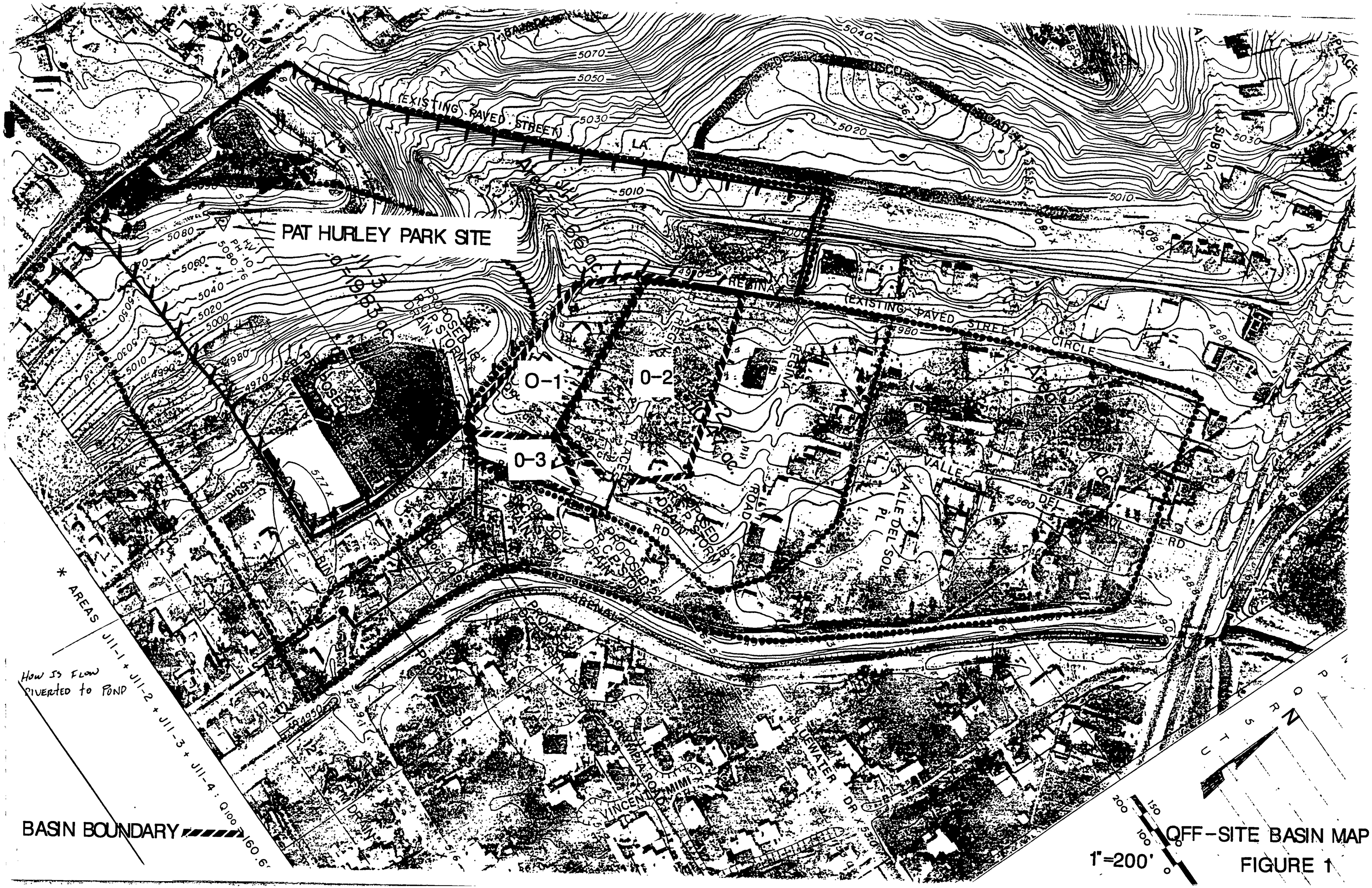
JOE P. KELLEY
NEW MEXICO
9996
REGISTERED PROFESSIONAL ENGINEER
10/2/97

RECEIVED
OCT 0 3 1997
HYDROLOGY SECTION

October, 1997

TABLE OF CONTENTS

Off-Site Basin Map ..... Figure 1
Storm Runoff Summary ..... Figure 2
Narrative ..... Page 1
100-Year Design Storm AHYMO Analysis ..... Appendix A
Supplemental Calculations ..... Appendix B
SAD 219 Data and Correspondence ..... Appendix C



OFF-SITE BASIN MAP

FIGURE 1

STORM RUNOFF SUMMARY

ANALYSIS POINT	EXISTING		DEVELOPED	
	Q_{100} (CFS)	V_{100} (AC-FT)	Q_{100} (CFS)	V_{100} (AC-FT)
A.P.1	94.64	3.3003	56.1	1.8228
A.P.1 (INTO PIPE)	13	--	20.32	1.4885
A.P.2	6.3	0.2046	2.54	0.108
A.P.3	87.94	2.0205	40.68	1.2137
ARENAL POND (IN)	16.65	1.7206	20.38	1.4883
ARENAL POND (OUT)	2.95	1.6346*	2.98	1.4506**

*Available volume = 2.49 ac-ft, Volume used = 1.0304 ac-ft
**Available volume = 2.49 ac-ft, Volume used = 1.0606 ac-ft

Figure 2

LOCATION

This site is located between Coors Road and the Arenal in west Albuquerque. It is bordered on the southwest by Yucca Drive, on the northeast by La Bajada Rd., on the east by Regina Circle, and on the south by Rincon Rd. It is in the middle of a fully-developed residential area.

FLOOD HAZARD ZONES

As shown by Panel 3500020027 of the National Flood Insurance Rate Map for the City of Albuquerque, dated October 14, 1983, the site is not located within a flood plain.

RELATED REPORTS

SAD 219 was prepared in 1990 by Mark Goodwin and Associates, and the storm drainage improvements designed by that SAD were installed in 1991 (Appendix C). The subject site is contained within Basins J11-1 and J11-3 (see Figure 1 and page C-2). The J11 watershed is the watershed designated by the report as the "Regina area". A portion of this watershed discharges to a detention pond that was constructed between Arenal and Bluewater as part of the SAD.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

Per Figure 1, the western 1/6th of the site is developed by lawn areas, and is the site of upper Pat Hurley Park. It is some 50 vertical feet above the lower park. The lower park along the east and south edges consists of a parking lot, buildings, tennis courts, a playground, and a sodded baseball field. Slopes in the developed areas are from ½ to 5%. The intermediary area between the two developed portions is covered by very steep undeveloped land that has slopes which vary between 20% and 45%.

The site does not accept any off-site runoff. Runoff generated from Yucca Drive and La Bajada Road is intercepted by curb and gutter and is discharged around the site and to the north and west into another watershed.

All on-site runoff discharges to Regina Circle. A portion of this runoff enters the existing inlet on Regina at Bluewater, and is discharged to a nearby detention pond between Arenal and Bluewater via an underground storm drain system constructed as part of SAD 219 (page C-2). The remainder of the runoff discharges to the south and west via the paved surfaces of Regina Circle and Rincon Rd..

The underground storm drain system data was taken from the SAD 219 report, and is shown on pages C-3 and C-4. This data was input into the AHYMO run. Much of the runoff discharges downstream in the streets into other watersheds because the inlet capacity is not large enough to capture more runoff. As shown in the AHYMO run, the system has sufficient capacity to discharge the intercepted runoff to the pond, but not much more than that.

This storm drain system discharges into a detention pond that was designed as part of the SAD. Per Figure 2, the pond has greater capacity than what discharges to it. However, the existing storm drain system does not have sufficient capacity to deliver more. The data for the pond volume is on page C-5. The controlled discharge from the pond is created by an 8" discharge pipe that connects to a standpipe located in a concrete inlet box (page C-8 and following). The discharge pipe connects to a downstream storm drain in 51st St. that conveys the runoff downstream. This data was input into the AHYMO run (pages A-11 and A-41). Under existing conditions, the pond is well within its capacity.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The developed drainage pattern is similar to the existing. All runoff will discharge to Regina Circle. On the east side of the site, a new parking lot, basketball court, and buildings will be constructed, while a footpath will be constructed on the north part of the site connecting the upper and lower parks. Several small on-site detention ponds will be incorporated into the path system. The detention ponds assist in sediment control, as well as in slowing the rate of the surface runoff so that erosion is somewhat mitigated by this drainage scheme.

A new detention pond will be incorporated into the grading of the lower park area. This pond will release in two directions: 1) To the street downstream, and then into the adjacent downstream watershed via paved surfaces; and 2) into the back of the existing inlet. The surface discharge from the pond has not been designed at this time, but will be sized such that it releases the appropriate amount of runoff to the street. As shown in Figure 2, the downstream runoff in the street at A.P.3 will be less under developed conditions than under existing for two reasons: the detention in the lower park area will attenuate the peak flow; and some of the runoff will be discharged directly to the storm drain system.

As shown on Figure 2, the existing Arenal detention pond will actually have more capacity after development because less runoff will reach it. This is due to on-site runoff that will now soak into the on-site retention ponds, but would otherwise have escaped the park. The peak flow entering the pond is greater, but the total volume is less. As computed on page A-42, 1.0606 ac-ft of the pond's available 2.49 ac-ft volume will actually be used. So even under fully-developed conditions, the pond will function satisfactorily.

HYDROLOGY

The runoff calculations and design have been done in accordance with Section 22.2 of the Development Process Manual of the City of Albuquerque, January 1993. The computerized hydrologic model, AHYMO, was used to calculate storm runoff in accordance with Section 22.2. The 100-year, 24-hour storm was used to model the runoff due to the detention ponding that is part of this development. Pond sizing, pipe capacities, and surface conveyance capacities were all computed in the AHYMO run.

Appendix A

AHYMO Hydrologic Calculations

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
    AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
         RUN DATE (MON/DAY/YR) = 09/30/1997
         START TIME (HR:MIN:SEC) = 16:10:21     USER NO.= CHVZ_GNM.I01
         INPUT FILE = ahymo.in

*S*************************************************************************
*S**************    CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.   **************
*S**************                  PAT HURLEY PARK               **************
*S*************************************************************************
*S*  FILENAME:  G:\M23\103\AHYMO.IN/OUT
*S*************************************************************************
*S******* 100 YEAR, 24 HOUR STORM (Section 22.2 Hydrology)
START                0.00
RAINFALL             TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.87
                     RAIN SIX=2.20  RAIN DAY=2.66 DT=0.03333

               COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
               DT =    .033330 HOURS        END TIME =    19.964670 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   .0809   .0865   .0924   .1050
                  .1334   .1771   .2398   .3254   .4379   .5814   .7600
                  .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
                 1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
                 1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
                 1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
                 1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
                 2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                 2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
                 2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
                 2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
                 2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                 2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  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  2.1460  2.1475  2.1489
                 2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                 2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
                 2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                 2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
                 2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
                 2.1944  2.1956  2.1967  2.1978  2.1989  2.2000  2.2013
                 2.2026  2.2039  2.2052  2.2065  2.2078  2.2091  2.2103
                 2.2116  2.2129  2.2142  2.2155  2.2167  2.2180  2.2193
                 2.2205  2.2218  2.2230  2.2243  2.2255  2.2268  2.2280
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                 2.2711  2.2722  2.2734  2.2745  2.2757  2.2768  2.2779
                 2.2791  2.2802  2.2813  2.2825  2.2836  2.2847  2.2858
                 2.2870  2.2881  2.2892  2.2903  2.2914  2.2925  2.2936
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                 2.3024  2.3035  2.3046  2.3057  2.3067  2.3078  2.3089
                 2.3100  2.3110  2.3121  2.3132  2.3142  2.3153  2.3164
                 2.3174  2.3185  2.3195  2.3206  2.3216  2.3227  2.3237
                 2.3248  2.3258  2.3269  2.3279  2.3290  2.3300  2.3310
                 2.3321  2.3331  2.3341  2.3352  2.3362  2.3372  2.3382
                 2.3392  2.3403  2.3413  2.3423  2.3433  2.3443  2.3453
                 2.3463  2.3473  2.3483  2.3493  2.3503  2.3513  2.3523
```

2.3533	2.3543	2.3553	2.3563	2.3573	2.3583	2.3593
2.3603	2.3612	2.3622	2.3632	2.3642	2.3651	2.3661
2.3671	2.3681	2.3690	2.3700	2.3710	2.3719	2.3729
2.3738	2.3748	2.3758	2.3767	2.3777	2.3786	2.3796
2.3805	2.3815	2.3824	2.3834	2.3843	2.3852	2.3862
2.3871	2.3881	2.3890	2.3899	2.3909	2.3918	2.3927
2.3936	2.3946	2.3955	2.3964	2.3973	2.3983	2.3992
2.4001	2.4010	2.4019	2.4028	2.4038	2.4047	2.4056
2.4065	2.4074	2.4083	2.4092	2.4101	2.4110	2.4119
2.4128	2.4137	2.4146	2.4155	2.4164	2.4173	2.4181
2.4190	2.4199	2.4208	2.4217	2.4226	2.4234	2.4243
2.4252	2.4261	2.4270	2.4278	2.4287	2.4296	2.4304
2.4313	2.4322	2.4331	2.4339	2.4348	2.4356	2.4365
2.4374	2.4382	2.4391	2.4399	2.4408	2.4416	2.4425
2.4434	2.4442	2.4450	2.4459	2.4467	2.4476	2.4484
2.4493	2.4501	2.4510	2.4518	2.4526	2.4535	2.4543
2.4551	2.4560	2.4568	2.4576	2.4585	2.4593	2.4601
2.4609	2.4618	2.4626	2.4634	2.4642	2.4651	2.4659
2.4667	2.4675	2.4683	2.4691	2.4700	2.4708	2.4716
2.4724	2.4732	2.4740	2.4748	2.4756	2.4764	2.4772
2.4780	2.4788	2.4796	2.4804	2.4812	2.4820	2.4828
2.4836	2.4844	2.4852	2.4860	2.4868	2.4876	2.4884
2.4892	2.4899	2.4907	2.4915	2.4923	2.4931	2.4939
2.4946	2.4954	2.4962	2.4970	2.4978	2.4985	2.4993
2.5001	2.5008	2.5016	2.5024	2.5032	2.5039	2.5047
2.5055	2.5062	2.5070	2.5078	2.5085	2.5093	2.5100
2.5108	2.5116	2.5123	2.5131	2.5138	2.5146	2.5153
2.5161	2.5168	2.5176	2.5183	2.5191	2.5198	2.5206
2.5213	2.5221	2.5228	2.5236	2.5243	2.5250	2.5258
2.5265	2.5273	2.5280	2.5287	2.5295	2.5302	2.5309
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2.5368	2.5375	2.5382	2.5390	2.5397	2.5404	2.5411
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2.5469	2.5476	2.5483	2.5490	2.5497	2.5504	2.5511
2.5518	2.5526	2.5533	2.5540	2.5547	2.5554	2.5561
2.5568	2.5575	2.5582	2.5589	2.5596	2.5603	2.5610
2.5617	2.5624	2.5631	2.5638	2.5645	2.5652	2.5659
2.5665	2.5672	2.5679	2.5686	2.5693	2.5700	2.5707
2.5714	2.5721	2.5727	2.5734	2.5741	2.5748	2.5755
2.5761	2.5768	2.5775	2.5782	2.5789	2.5795	2.5802
2.5809	2.5816	2.5822	2.5829	2.5836		

```
*S******************  EXISTING BASINS  ****************************************
*S  COMPUTE RUNOFF FROM BASIN A AT ANALYSIS POINT 2 (DISCHARGE TO REGINA
*S  CIRCLE, DOWNSTREAM OF THE EXISTING DBL C INLET IN REGINA CIRCLE).  THIS
*S  RUNOFF DISCHARGES ELSEWHERE, DOWNSTREAM OF THE DETENTION POND BETWEEN
*S  BLUEWATER AND ARENAL.
COMPUTE NM HYD      ID=7 HYD=A_P_2 DA=0.00410 SQ MI
                    %A=0 %B=84 %C=0 %D=16
                    TP=0.1333 RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.5899    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000656 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   8.4508    CFS   UNIT VOLUME =    .9988       B =   327.09      P60 = 1.8700
    AREA =      .003444 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7 CODE=1
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
                                   HYDROGRAPH FROM AREA A_P_2

    RUNOFF VOLUME =      .93584 INCHES     =        .2046 ACRE-FEET
    PEAK DISCHARGE RATE =       6.30 CFS  AT   1.500 HOURS   BASIN AREA =   .0041 SQ. MI.


*S*************************************************************************
*S  THE REMAINDER OF THE RUNOFF TO BE COMPUTED DISCHARGES TO THE DETENTION
*S  POND.
*S*************************************************************************
*S  COMPUTE RUNOFF FROM BASIN O-2, AN OFF-SITE BASIN ON REGINA PLACE THAT
*S  IS PARTIALLY INTERCEPTED BY STORM INLETS AT THE BASE OF REGINA PLACE.
*S  THE STORM INLETS ARE PART OF THE SYSTEM THAT INTERCEPTS RUNOFF AND
*S  DISCHARGES IT TO THE DETENTION POND.  THIS BASIN COMPRISES PART OF
*S  BASIN J11-2 FROM THE SAD 219 REPORT DATED 06/15/90, BY MARK GOODWIN.
COMPUTE NM HYD      ID=1 HYD=EXIST_O2 DA=0.00280 SQ MI
                    %A=0 %B=50 %C=0 %D=50
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   3.4353    CFS   UNIT VOLUME =    .9964       B =   327.09      P60 = 1.8700
    AREA =      .001400 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                   HYDROGRAPH FROM AREA EXIST_O2


    RUNOFF VOLUME =     1.50628 INCHES     =        .2249 ACRE-FEET
    PEAK DISCHARGE RATE =       5.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S  COMPUTE THE RATING CURVE FOR THE REGINA PLACE STREET CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.04  FP SLP=.04  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
                    16     .41
                    30     .13
                    32      0
                    32     .67

                         RATING CURVE VALLEY SECTION  1.0
                             WATER        FLOW        FLOW        TOP
                            SURFACE       AREA        RATE       WIDTH
                             ELEV         SQ FT       CFS        FT
                               .00          .00         .00        .00
                               .04          .02         .02       1.09
                               .07          .08         .14       2.17
                               .11          .17         .41       3.26
```

.14	.31	.82	5.11
.18	.55	1.52	8.63
.21	.92	2.84	12.16
.25	1.41	4.89	15.68
.28	2.03	7.82	19.21
.32	2.76	11.75	22.74
.35	3.63	16.80	26.26
.39	4.62	23.08	29.79
.42	5.72	31.46	32.00
.46	6.85	42.43	32.00
.49	7.98	54.67	32.00
.53	9.11	68.11	32.00
.56	10.23	82.69	32.00
.60	11.36	98.36	32.00
.63	12.49	115.09	32.00
.67	13.62	132.84	32.00

```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLETS
*S  ON REGINA CIRCLE.  THE INLET OVERFLOW DISCHARGES SOUTH ON REGINA
*S  PLACE AND EAST ON BLUEWATER INTO A DOWNSTREAM WATERSHED.  IT DOES NOT
*S  ENTER THE POND.
DIVIDE HYD          ID=1  Q=2.1 CFS  ID I=2   HYD=STORM_DRAIN
                                     ID II=3  HYD=DOWNSTREAM
PRINT HYD           ID=3  CODE=1

                                     HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =     1.50628 INCHES     =        .0570 ACRE-FEET
    PEAK DISCHARGE RATE =       3.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S  ROUTE THE RUNOFF TO THE NEXT INLET, WHICH IS ON BLUEWATER.  (STORM SYSTEM
*S  DATA IS DERIVED FROM THE SAD 219 REPORT.)
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.035
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.10	.67
.16	.10	.45	.92
.23	.18	1.04	1.09
.31	.27	1.87	1.22
.39	.37	2.92	1.32
.47	.47	4.17	1.39
.55	.58	5.58	1.44
.63	.70	7.14	1.48
.70	.81	8.80	1.50
.78	.93	10.53	1.50
.86	1.05	12.30	1.50
.94	1.16	14.05	1.50
1.02	1.27	15.75	1.50
1.09	1.38	17.34	1.50
1.17	1.48	18.76	1.50
1.25	1.57	19.94	1.50
1.33	1.66	20.79	1.50
1.41	1.72	21.14	1.50
1.50	1.77	21.14	1.50

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=100  SLP=.035
```

TRAVEL TIME TABLE

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
                                   REACH=  1.0

                    WATER       AVERAGE     FLOW        TRAVEL
                    DEPTH       AREA        RATE        TIME
                    FEET        SQ.FT.      CFS         HRS
                       .078        .035         .10       .0095
                       .156        .098         .45       .0061
                       .235        .176        1.04       .0047
                       .313        .267        1.87       .0040
                       .391        .366        2.92       .0035
                       .469        .472        4.17       .0031
                       .547        .583        5.58       .0029
                       .625        .697        7.14       .0027
                       .704        .814        8.80       .0026
                       .782        .931       10.53       .0025
                       .860       1.048       12.30       .0024
                       .938       1.163       14.05       .0023
                      1.016       1.274       15.75       .0022
                      1.094       1.381       17.34       .0022
                      1.173       1.482       18.76       .0022
                      1.251       1.574       19.94       .0022
                      1.329       1.656       20.79       .0022
                      1.407       1.722       21.14       .0023
                      1.500       1.767       21.14       .0023
ROUTE                 ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD             ID=3  CODE=1

                                   HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =     1.50615 INCHES     =        .1679 ACRE-FEET
    PEAK DISCHARGE RATE =       2.14 CFS  AT   1.400 HOURS   BASIN AREA =   .0021 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN O-3, AN OFF-SITE BASIN ON BLUEWATER RD. THAT
*S  IS PARTIALLY INTERCEPTED BY STORM INLETS ON BLUEWATER.
COMPUTE NM HYD        ID=1 HYD=EXIST_O3 DA=0.00086 SQ MI
                      %A=0 %B=50 %C=0 %D=50
                      TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.6977    CFS   UNIT VOLUME =    .9922       B =   526.28      P60 = 1.8700
    AREA =      .000430 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   1.0551    CFS   UNIT VOLUME =    .9874       B =   327.09      P60 = 1.8700
    AREA =      .000430 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=1 CODE=1

                                   HYDROGRAPH FROM AREA EXIST_O3


    RUNOFF VOLUME =     1.50632 INCHES     =        .0691 ACRE-FEET
    PEAK DISCHARGE RATE =       1.77 CFS  AT   1.500 HOURS   BASIN AREA =   .0009 SQ. MI.


*S  COMPUTE THE RATING CURVE FOR THE BLUEWATER ROAD CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.01  FP SLP=.01  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
                    16     .41
                    30     .13
                    32      0
                    32     .67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE *CFS	TOP WIDTH FT
.00	.00	.00	.00
.04	.02	.01	1.09
.07	.08	.07	2.17
.11	.17	.21	3.26
.14	.31	.41	5.11
.18	.55	.76	8.63
.21	.92	1.42	12.16
.25	1.41	2.45	15.68
.28	2.03	3.91	19.21
.32	2.76	5.88	22.74
.35	3.63	8.40	26.26
.39	4.62	11.54	29.79
.42	5.72	15.73	32.00
.46	6.85	21.22	32.00
.49	7.98	27.34	32.00
.53	9.11	34.05	32.00
.56	10.23	41.34	32.00
.60	11.36	49.18	32.00
.63	12.49	57.55	32.00
.67	13.62	66.42	32.00

```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLETS
*S  ON BLUEWATER RD.  THE INLET OVERFLOW DISCHARGES EAST ON BLUEWATER
*S  INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=1  Q=1.7 CFS  ID I=2   HYD=STORM_DRAIN
                                     ID II=9  HYD=DOWNSTREAM
PRINT HYD           ID=9  CODE=1
```

HYDROGRAPH FROM AREA DOWNSTREAM

```
    RUNOFF VOLUME =     1.50633 INCHES     =        .0002 ACRE-FEET
    PEAK DISCHARGE RATE =        .07 CFS  AT   1.500 HOURS   BASIN AREA =   .0000 SQ. MI.


*S  ADD THE STORM DRAIN FLOWS TO OBTAIN THE TOTAL IN THE PIPE.
ADD HYD             ID=2  HYD=STRM_DRN_TOTL  ID I=2  ID II=3
PRINT HYD           ID=2  CODE=1
```

HYDROGRAPH FROM AREA STRM_DRN_TOTL

```
    RUNOFF VOLUME =     1.50620 INCHES     =        .2368 ACRE-FEET
    PEAK DISCHARGE RATE =       3.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0029 SQ. MI.


*S  ROUTE THE RUNOFF TO THE NEXT INLET, WHICH IS ON REGINA CIRCLE.
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.001
                    DIA=24 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.04	.89
.21	.17	.16	1.22
.31	.31	.38	1.45
.42	.47	.68	1.62
.52	.65	1.06	1.76
.63	.84	1.52	1.85
.73	1.04	2.03	1.93
.83	1.24	2.60	1.97
.94	1.45	3.20	2.00
1.04	1.66	3.83	2.00
1.15	1.86	4.48	2.00
1.25	2.07	5.12	2.00
1.35	2.27	5.73	2.00
1.46	2.46	6.31	2.00
1.56	2.63	6.83	2.00
1.67	2.80	7.26	2.00
1.77	2.94	7.57	2.00
1.88	3.06	7.70	2.00
2.00	3.14	7.70	2.00

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=300  SLP=.001
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.04	.1387
.208	.174	.16	.0889
.313	.314	.38	.0690
.417	.475	.68	.0581
.521	.651	1.06	.0510
.625	.839	1.52	.0461
.730	1.037	2.03	.0425
.834	1.240	2.60	.0398
.938	1.447	3.20	.0376
1.042	1.655	3.83	.0360
1.146	1.863	4.48	.0347
1.251	2.067	5.12	.0337
1.355	2.265	5.73	.0329
1.459	2.456	6.31	.0324
1.563	2.635	6.83	.0321
1.668	2.799	7.26	.0321
1.772	2.943	7.57	.0324
1.876	3.061	7.70	.0331
2.000	3.142	7.70	.0340

```
ROUTE                ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD            ID=3  CODE=1
```

HYDROGRAPH FROM AREA PIPE

```
RUNOFF VOLUME =      1.50444 INCHES     =        .2365 ACRE-FEET
PEAK DISCHARGE RATE =       3.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0029 SQ. MI.
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
*S  COMPUTE RUNOFF FROM ON-SITE BASIN B (DISCHARGE TO REGINA CIRCLE/
*S  BLUEWATER, UPSTREAM OF THE EXISTING INLET).
COMPUTE NM HYD       ID=2 HYD=EXIST_B DA=0.02591 SQ MI
                     %A=0 %B=50 %C=0 %D=50
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   51.147    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .012955 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   31.789    CFS   UNIT VOLUME =    .9999       B =   327.09      P60 = 1.8700
    AREA =      .012955 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2 CODE=1

                                    HYDROGRAPH FROM AREA EXIST_B


    RUNOFF VOLUME =     1.50626 INCHES     =       2.0814 ACRE-FEET
    PEAK DISCHARGE RATE =      52.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0259 SQ. MI.


*S  COMPUTE RUNOFF FROM OFF-SITE BASIN O-1, WHICH DISCHARGES TO REGINA
*S  CIRCLE.
COMPUTE NM HYD       ID=1 HYD=EXIST_01 DA=0.0280 SQ MI
                     %A=2 %B=68 %C=25 %D=5
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .125068HR    TP =   .133300HR    K/TP RATIO =   .938247     SHAPE CONSTANT, N =  3.769050
    UNIT PEAK =   67.740    CFS   UNIT VOLUME =    1.000       B =   339.47      P60 = 1.8700
    AREA =      .026600 SQ MI    IA =    .46368 INCHES    INF =   1.14832 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                    HYDROGRAPH FROM AREA EXIST_01


    RUNOFF VOLUME =      .81624 INCHES     =       1.2189 ACRE-FEET
    PEAK DISCHARGE RATE =      41.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S  ADD THE RUNOFF FROM BASIN B FOR TOTAL IN REGINA CIRCLE UPSTREAM OF THE
*S  EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD              ID=1  HYD=A_P_1  ID I=1  ID II=2
PRINT HYD            ID=1  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1


    RUNOFF VOLUME =     1.14787 INCHES     =       3.3003 ACRE-FEET
    PEAK DISCHARGE RATE =      94.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0539 SQ. MI.
```

```
*S  COMPUTE THE RATING CURVE FOR THE REGINA CIRCLE CAPACITY SO THE
*S  RUNOFF DEPTH CAN BE COMPUTED, AND THE INTERCEPTED RUNOFF DETERMINED.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.67
                    CH SLP=.03  FP SLP=.03  N=.017  DIST=32
                    DIST   ELEV
                    0      .67
                    0       0
                    2      .13
                    16     .41
                    30     .13
                    32      0
                    32     .67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.04	.02	.02	1.09
.07	.08	.12	2.17
.11	.17	.36	3.26
.14	.31	.71	5.11
.18	.55	1.32	8.63
.21	.92	2.46	12.16
.25	1.41	4.24	15.68
.28	2.03	6.77	19.21
.32	2.76	10.18	22.74
.35	3.63	14.55	26.26
.39	4.62	19.99	29.79
.42	5.72	27.24	32.00
.46	6.85	36.75	32.00
.49	7.98	47.35	32.00
.53	9.11	58.98	32.00
.56	10.23	71.61	32.00
.60	11.36	85.18	32.00
.63	12.49	99.67	32.00
.67	13.62	115.04	32.00

```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLET
*S  ON REGINA CIRCLE.  THE INLET OVERFLOW DISCHARGES SOUTH ON REGINA
*S  INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=1  Q=13 CFS  ID I=2   HYD=STORM_DRAIN
                                    ID II=4  HYD=DOWNSTREAM
PRINT HYD           ID=4  CODE=1
```

HYDROGRAPH FROM AREA DOWNSTREAM

```
    RUNOFF VOLUME =     1.14787 INCHES     =       1.8158 ACRE-FEET
    PEAK DISCHARGE RATE =      81.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0297 SQ. MI.


*S  ADD THE OVERFLOW TO THE DOWNSTREAM FLOW FROM BASIN A FOR THE TOTAL
*S  FLOW IN REGINA CIRCLE DOWNSTREAM OF THE PARK AT ANALYSIS POINT 3.
ADD HYD             ID=7  HYD=A_P_3  ID I=4  ID II=7
PRINT HYD           ID=7  CODE=1
```

HYDROGRAPH FROM AREA A_P_3

```
    RUNOFF VOLUME =     1.12212 INCHES     =       2.0205 ACRE-FEET
```

```
    PEAK DISCHARGE RATE =      87.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0338 SQ. MI.


*S  ADD THE STORM DRAIN FLOWS TO OBTAIN THE TOTAL IN THE STORM DRAIN.
ADD HYD             ID=2  HYD=TOTL_TO_POND  ID I=2  ID II=3
PRINT HYD           ID=2  CODE=1

                                        HYDROGRAPH FROM AREA TOTL_TO_POND


    RUNOFF VOLUME =     1.18652 INCHES     =       1.7210 ACRE-FEET
    PEAK DISCHARGE RATE =      16.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0272 SQ. MI.


*S  ROUTE THE RUNOFF TO THE POND.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.004
                    DIA=30 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.13	.10	.14	1.11
.26	.27	.59	1.53
.39	.49	1.37	1.82
.52	.74	2.47	2.03
.65	1.02	3.86	2.19
.78	1.31	5.50	2.32
.91	1.62	7.37	2.41
1.04	1.94	9.42	2.47
1.17	2.26	11.62	2.50
1.30	2.59	13.91	2.50
1.43	2.91	16.23	2.50
1.56	3.23	18.55	2.50
1.69	3.54	20.79	2.50
1.82	3.84	22.89	2.50
1.95	4.12	24.77	2.50
2.08	4.37	26.33	2.50
2.21	4.60	27.45	2.50
2.35	4.78	27.91	2.50
2.50	4.91	27.91	2.50

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=130  SLP=.004
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.14	.0259
.261	.271	.59	.0166
.391	.490	1.37	.0129
.521	.741	2.47	.0108
.651	1.017	3.86	.0095
.782	1.312	5.50	.0086
.912	1.620	7.37	.0079
1.042	1.937	9.42	.0074
1.173	2.261	11.62	.0070
1.303	2.586	13.91	.0067
1.433	2.910	16.23	.0065
1.563	3.229	18.55	.0063

1.694	3.540	20.79	.0061
1.824	3.837	22.89	.0061
1.954	4.117	24.77	.0060
2.084	4.373	26.33	.0060
2.215	4.599	27.45	.0061
2.345	4.783	27.91	.0062
2.500	4.909	27.91	.0064

```
ROUTE              ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD          ID=3  CODE=1
```

HYDROGRAPH FROM AREA PIPE

```
RUNOFF VOLUME =     1.18622 INCHES     =       1.7206 ACRE-FEET
PEAK DISCHARGE RATE =      16.65 CFS  AT   1.567 HOURS   BASIN AREA =   .0272 SQ. MI.
```

```
*S  ROUTE THE RUNOFF THROUGH THE POND.
ROUTE RESERVOIR     ID=2  HYD=EXST_POND_OUT  INFLOW ID=3  CODE=10
```

OUTFLOW (CFS)	STORAGE (AC_FT)	ELEVATION
0	0	4950
2.8	0.87	4952
3.3	1.41	4953
3.7	1.95	4954
4.0	2.49	4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	13.16	4950.13	.058	.19
1.67	16.16	4951.09	.475	1.53
2.00	14.63	4951.93	.840	2.70
2.33	4.57	4952.28	1.021	2.94
2.67	1.89	4952.28	1.022	2.94
3.00	.90	4952.20	.978	2.90
3.33	.51	4952.09	.918	2.84
3.67	.36	4951.96	.852	2.74
4.00	.29	4951.81	.788	2.54
4.33	.26	4951.67	.728	2.34
4.67	.26	4951.55	.673	2.17
5.00	.27	4951.43	.623	2.01
5.33	.28	4951.33	.578	1.86
5.67	.30	4951.23	.536	1.73
6.00	.33	4951.15	.499	1.61
6.33	.39	4951.07	.466	1.50
6.67	.39	4951.01	.437	1.41
7.00	.39	4950.94	.410	1.32
7.33	.38	4950.89	.386	1.24
7.67	.37	4950.83	.363	1.17
8.00	.36	4950.79	.342	1.10
8.33	.36	4950.74	.322	1.04
8.67	.35	4950.70	.304	.98
9.00	.34	4950.66	.288	.93
9.33	.34	4950.63	.272	.88
9.67	.33	4950.59	.258	.83
10.00	.32	4950.56	.245	.79
10.33	.32	4950.53	.232	.75

```
10.67        .31   4950.51       .221       .71
11.00        .31   4950.48       .210       .68
11.33        .30   4950.46       .200       .65
11.67        .30   4950.44       .191       .62
12.00        .29   4950.42       .183       .59
12.33        .29   4950.40       .175       .56
12.67        .28   4950.39       .168       .54
13.00        .28   4950.37       .161       .52
13.33        .27   4950.35       .154       .50
13.67        .27   4950.34       .149       .48
14.00        .27   4950.33       .143       .46
14.33        .26   4950.32       .138       .44
14.67        .26   4950.31       .133       .43
15.00        .26   4950.30       .128       .41
15.33        .25   4950.29       .124       .40
15.67        .25   4950.28       .120       .39
16.00        .24   4950.27       .117       .38
16.33        .24   4950.26       .113       .36
16.67        .24   4950.25       .110       .35
17.00        .24   4950.25       .107       .34
17.33        .23   4950.24       .104       .33
17.66        .23   4950.23       .101       .33
18.00        .23   4950.23       .099       .32
18.33        .23   4950.22       .096       .31

TIME      INFLOW    ELEV      VOLUME    OUTFLOW
(HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

18.66        .22   4950.22       .094       .30
19.00        .22   4950.21       .092       .30
19.33        .22   4950.21       .090       .29
19.66        .21   4950.20       .088       .28
 PEAK DISCHARGE =        2.948 CFS - PEAK OCCURS AT HOUR    2.50
 MAXIMUM WATER SURFACE ELEVATION =     4952.297
 MAXIMUM STORAGE =        1.0304 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=2  CODE=1

                                    HYDROGRAPH FROM AREA EXST_POND_OUT


   RUNOFF VOLUME =     1.12692 INCHES     =       1.6346 ACRE-FEET
   PEAK DISCHARGE RATE =       2.95 CFS  AT   2.500 HOURS   BASIN AREA =   .0272 SQ. MI.


*S******************  PROPOSED BASINS  ****************************************
*S  COMPUTE RUNOFF FROM BASIN A-2, THE EXISTING PARKING LOT.
COMPUTE NM HYD      ID=1 HYD=DEV_A2 DA=0.00073 SQ MI
                    %A=0 %B=0 %C=0 %D=100
                    TP=0.1333 RAINFALL=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   2.8821    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
   AREA =      .000730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                    HYDROGRAPH FROM AREA DEV_A2


   RUNOFF VOLUME =     2.34521 INCHES     =        .0913 ACRE-FEET
   PEAK DISCHARGE RATE =       2.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.
```

```
*S  ROUTE BASIN A-2 TO BASIN A-1 OUTFALL.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV=0  MAX ELEV=0.50
                    CH SLP=.01  FP SLP=.01  N=.030  DIST=10
                    DIST   ELEV
                    0      .50
                    0       0
                    10      0
                    10     .50
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.03	.26	.12	10.00
.05	.53	.36	10.00
.08	.79	.72	10.00
.11	1.05	1.15	10.00
.13	1.32	1.67	10.00
.16	1.58	2.26	10.00
.18	1.84	2.92	10.00
.21	2.11	3.64	10.00
.24	2.37	4.42	10.00
.26	2.63	5.26	10.00
.29	2.89	6.16	10.00
.32	3.16	7.10	10.00
.34	3.42	8.11	10.00
.37	3.68	9.16	10.00
.39	3.95	10.25	10.00
.42	4.21	11.40	10.00
.45	4.47	12.59	10.00
.47	4.74	13.82	10.00
.50	5.00	15.10	10.00

```
COMPUTE TRAVEL TIME ID=2  REACH=1  VS NO=1  L=240  SLP=.01
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.263	.12	.1524
.053	.526	.36	.0962
.079	.789	.72	.0735
.105	1.053	1.15	.0608
.132	1.316	1.67	.0525
.158	1.579	2.26	.0466
.184	1.842	2.92	.0421
.211	2.105	3.64	.0386
.237	2.368	4.42	.0357
.263	2.632	5.26	.0333
.289	2.895	6.16	.0313
.316	3.158	7.10	.0296
.342	3.421	8.11	.0281
.368	3.684	9.16	.0268
.395	3.947	10.25	.0257
.421	4.211	11.40	.0246
.447	4.474	12.59	.0237
.474	4.737	13.82	.0228
.500	5.000	15.10	.0221

```
ROUTE                ID=2  HYD=A2_TO_A1  INFLOW ID=1  DT=0.03333
```

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```
PRINT HYD            ID=2  CODE=1

                                    HYDROGRAPH FROM AREA A2_TO_A1


    RUNOFF VOLUME =     2.34211 INCHES     =        .0912 ACRE-FEET
    PEAK DISCHARGE RATE =       1.95 CFS  AT   1.533 HOURS   BASIN AREA =   .0007 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN A-1.
COMPUTE NM HYD       ID=1 HYD=DEV_A1 DA=0.00040 SQ MI
                     %A=0 %B=90 %C=0 %D=10
                     TP=0.1333 RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .15792    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
    AREA =      .000040 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .88336    CFS   UNIT VOLUME =    .9850       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 =   .033330

PRINT HYD            ID=1 CODE=1

                                    HYDROGRAPH FROM AREA DEV_A1


    RUNOFF VOLUME =      .83523 INCHES     =        .0178 ACRE-FEET
    PEAK DISCHARGE RATE =        .59 CFS  AT   1.500 HOURS   BASIN AREA =   .0004 SQ. MI.


*S  ADD THE RUNOFF TO DETERMINE THE TOTAL FROM BASIN A, WHICH DISCHARGES
*S  THROUGH THE EXISTING CURB OPENING INTO REGINA CIRCLE AT ANALYSIS POINT 2.
ADD HYD              ID=7  HYD=A_P_2  ID I=1  ID II=2
PRINT HYD            ID=7  CODE=1

                                    HYDROGRAPH FROM AREA A_P_2


    RUNOFF VOLUME =     1.79221 INCHES     =        .1080 ACRE-FEET
    PEAK DISCHARGE RATE =       2.54 CFS  AT   1.533 HOURS   BASIN AREA =   .0011 SQ. MI.


*S*************************************************************************
*S  THE REMAINDER OF THE RUNOFF TO BE COMPUTED DISCHARGES TO THE DETENTION
*S  POND.  OFF-SITE BASIN DATA WILL BE AS BEFORE.
*S*************************************************************************
*S  COMPUTE RUNOFF FROM BASIN O-2, AN OFF-SITE BASIN ON REGINA PLACE THAT
*S  IS PARTIALLY INTERCEPTED BY STORM INLETS AT THE BASE OF REGINA PLACE.
*S  THE STORM INLETS ARE PART OF THE SYSTEM THAT INTERCEPTS RUNOFF AND
*S  DISCHARGES IT TO THE DETENTION POND.  THIS BASIN COMPRISES PART OF
*S  BASIN J11-2 FROM THE SAD 219 REPORT.
COMPUTE NM HYD       ID=1 HYD=EXIST_O2 DA=0.00280 SQ MI
                     %A=0 %B=50 %C=0 %D=50
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
```

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```
    AREA =       .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   3.4353    CFS   UNIT VOLUME =    .9964       B =   327.09      P60 = 1.8700
    AREA =       .001400 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                        HYDROGRAPH FROM AREA EXIST_02


    RUNOFF VOLUME =     1.50628 INCHES     =        .2249 ACRE-FEET
    PEAK DISCHARGE RATE =       5.74 CFS  AT   1.500 HOURS   BASIN AREA =   .0028 SQ. MI.


*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLETS
*S  ON REGINA CIRCLE.  THE INLET OVERFLOW DISCHARGES SOUTH ON REGINA
*S  PLACE AND EAST ON BLUEWATER INTO A DOWNSTREAM WATERSHED.  IT DOES NOT
*S  ENTER THE POND.
DIVIDE HYD          ID=1  Q=2.1 CFS  ID I=2   HYD=STORM_DRAIN
                                     ID II=3  HYD=DOWNSTREAM
PRINT HYD           ID=3  CODE=1

                                        HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =     1.50628 INCHES     =        .0570 ACRE-FEET
    PEAK DISCHARGE RATE =       3.64 CFS  AT   1.500 HOURS   BASIN AREA =   .0007 SQ. MI.


*S  ROUTE THE RUNOFF TO THE NEXT INLET, WHICH IS ON BLUEWATER.  (STORM SYSTEM
*S  DATA IS DERIVED FROM THE SAD 219 REPORT.)
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.035
                    DIA=18 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.08	.04	.10	.67
.16	.10	.45	.92
.23	.18	1.04	1.09
.31	.27	1.87	1.22
.39	.37	2.92	1.32
.47	.47	4.17	1.39
.55	.58	5.58	1.44
.63	.70	7.14	1.48
.70	.81	8.80	1.50
.78	.93	10.53	1.50
.86	1.05	12.30	1.50
.94	1.16	14.05	1.50
1.02	1.27	15.75	1.50
1.09	1.38	17.34	1.50
1.17	1.48	18.76	1.50
1.25	1.57	19.94	1.50
1.33	1.66	20.79	1.50
1.41	1.72	21.14	1.50
1.50	1.77	21.14	1.50

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=100  SLP=.035

                    TRAVEL TIME TABLE
                                REACH=  1.0

                    WATER      AVERAGE     FLOW       TRAVEL
                    DEPTH      AREA        RATE       TIME
                    FEET       SQ.FT.      CFS        HRS
                      .078       .035        .10       .0095
                      .156       .098        .45       .0061
                      .235       .176       1.04       .0047
                      .313       .267       1.87       .0040
                      .391       .366       2.92       .0035
                      .469       .472       4.17       .0031
                      .547       .583       5.58       .0029
                      .625       .697       7.14       .0027
                      .704       .814       8.80       .0026
                      .782       .931      10.53       .0025
                      .860      1.048      12.30       .0024
                      .938      1.163      14.05       .0023
                     1.016      1.274      15.75       .0022
                     1.094      1.381      17.34       .0022
                     1.173      1.482      18.76       .0022
                     1.251      1.574      19.94       .0022
                     1.329      1.656      20.79       .0022
                     1.407      1.722      21.14       .0023
                     1.500      1.767      21.14       .0023
ROUTE              ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD          ID=3  CODE=1

                          HYDROGRAPH FROM AREA PIPE


   RUNOFF VOLUME =     1.50615 INCHES     =        .1679 ACRE-FEET
   PEAK DISCHARGE RATE =       2.14 CFS  AT   1.400 HOURS   BASIN AREA =   .0021 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN O-3, AN OFF-SITE BASIN ON BLUEWATER RD. THAT
*S  IS PARTIALLY INTERCEPTED BY STORM INLETS ON BLUEWATER.
COMPUTE NM HYD     ID=1 HYD=EXIST_O3 DA=0.00086 SQ MI
                   %A=0 %B=50 %C=0 %D=50
                   TP=0.1333  RAINFALL=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   1.6977    CFS   UNIT VOLUME =    .9922       B =   526.28      P60 = 1.8700
   AREA =      .000430 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


   K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
   UNIT PEAK =   1.0551    CFS   UNIT VOLUME =    .9874       B =   327.09      P60 = 1.8700
   AREA =      .000430 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=1 CODE=1

                          HYDROGRAPH FROM AREA EXIST_O3


   RUNOFF VOLUME =     1.50632 INCHES     =        .0691 ACRE-FEET
   PEAK DISCHARGE RATE =       1.77 CFS  AT   1.500 HOURS   BASIN AREA =   .0009 SQ. MI.
```

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```
*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLETS
*S  ON BLUEWATER RD.  THE INLET OVERFLOW DISCHARGES EAST ON BLUEWATER
*S  INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=1  Q=1.7 CFS  ID I=2   HYD=STORM_DRAIN
                                     ID II=4  HYD=DOWNSTREAM
PRINT HYD           ID=4  CODE=1

                                     HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =     1.50633 INCHES     =        .0002 ACRE-FEET
    PEAK DISCHARGE RATE =        .07 CFS  AT   1.500 HOURS   BASIN AREA =   .0000 SQ. MI.


*S  ADD THE STORM DRAIN FLOWS TO OBTAIN THE TOTAL.
ADD HYD             ID=2  HYD=STRM_DRN_TOTL  ID I=2  ID II=3
PRINT HYD           ID=2  CODE=1

                                     HYDROGRAPH FROM AREA STRM_DRN_TOTL


    RUNOFF VOLUME =     1.50620 INCHES     =        .2368 ACRE-FEET
    PEAK DISCHARGE RATE =       3.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0029 SQ. MI.


*S  ROUTE THE RUNOFF TO THE NEXT INLET, WHICH IS ON REGINA CIRCLE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.001
                    DIA=24 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.10	.06	.04	.89
.21	.17	.16	1.22
.31	.31	.38	1.45
.42	.47	.68	1.62
.52	.65	1.06	1.76
.63	.84	1.52	1.85
.73	1.04	2.03	1.93
.83	1.24	2.60	1.97
.94	1.45	3.20	2.00
1.04	1.66	3.83	2.00
1.15	1.86	4.48	2.00
1.25	2.07	5.12	2.00
1.35	2.27	5.73	2.00
1.46	2.46	6.31	2.00
1.56	2.63	6.83	2.00
1.67	2.80	7.26	2.00
1.77	2.94	7.57	2.00
1.88	3.06	7.70	2.00
2.00	3.14	7.70	2.00

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=300  SLP=.001
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.104	.062	.04	.1387

.208	.174	.16	.0889
.313	.314	.38	.0690
.417	.475	.68	.0581
.521	.651	1.06	.0510
.625	.839	1.52	.0461
.730	1.037	2.03	.0425
.834	1.240	2.60	.0398
.938	1.447	3.20	.0376
1.042	1.655	3.83	.0360
1.146	1.863	4.48	.0347
1.251	2.067	5.12	.0337
1.355	2.265	5.73	.0329
1.459	2.456	6.31	.0324
1.563	2.635	6.83	.0321
1.668	2.799	7.26	.0321
1.772	2.943	7.57	.0324
1.876	3.061	7.70	.0331
2.000	3.142	7.70	.0340

```
ROUTE              ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD          ID=3  CODE=1

                                   HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =     1.50444 INCHES     =        .2365 ACRE-FEET
    PEAK DISCHARGE RATE =      3.68 CFS  AT   1.533 HOURS   BASIN AREA =   .0029 SQ. MI.


*S  BEGIN COMPUTATION OF NEW ON-SITE BASINS
*S  COMPUTE RUNOFF FROM BASIN B-6
COMPUTE NM HYD     ID=1 HYD=DEV_B6 DA=0.00424 SQ MI
                   %A=0 %B=10 %C=88 %D=2
                   TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .33479    CFS   UNIT VOLUME =    .9664       B =   526.28      P60 = 1.8700
    AREA =      .000085 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .108431HR    TP =   .133300HR    K/TP RATIO =   .813433     SHAPE CONSTANT, N =  4.395534
    UNIT PEAK =   11.868    CFS   UNIT VOLUME =    .9993       B =   380.73      P60 = 1.8700
    AREA =      .004155 SQ MI    IA =    .36531 INCHES    INF =    .87286 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=1 CODE=1

                                   HYDROGRAPH FROM AREA DEV_B6


    RUNOFF VOLUME =      .98249 INCHES     =        .2222 ACRE-FEET
    PEAK DISCHARGE RATE =      7.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.


*S  ROUTE BASIN B-6 THROUGH POND AT BOTTOM OF BASIN B-6
ROUTE RESERVOIR    ID=2  HYD=B6_POND_OUT  INFLOW ID=1  CODE=10
                   OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                      0               0               5040.5
                     7.6            0.013             5042

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

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	5040.50	.000	.00
.33	.00	5040.50	.000	.00
.67	.00	5040.50	.000	.00
1.00	.00	5040.50	.000	.00
1.33	.56	5040.56	.001	.31
1.67	4.07	5041.40	.008	4.56
2.00	.92	5040.70	.002	1.02
2.33	.25	5040.55	.000	.27
2.67	.09	5040.52	.000	.10
3.00	.03	5040.51	.000	.04
3.33	.01	5040.50	.000	.01
3.67	.00	5040.50	.000	.00

PEAK DISCHARGE = 7.516 CFS - PEAK OCCURS AT HOUR 1.53
MAXIMUM WATER SURFACE ELEVATION = 5041.983
MAXIMUM STORAGE = .0129 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA B6_POND_OUT

RUNOFF VOLUME = .98248 INCHES = .2222 ACRE-FEET
PEAK DISCHARGE RATE = 7.52 CFS AT 1.533 HOURS BASIN AREA = .0042 SQ. MI.

*S ROUTE BASIN B-6 TO BASIN B-4 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV =0 MAX ELEV=0.50
CH SLP=.13 FP SLP=.13 N=.030 DIST=20

DIST	ELEV
0	.50
0	0
20	0
20	.50

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.03	.53	.83	20.00
.05	1.05	2.64	20.00
.08	1.58	5.18	20.00
.11	2.11	8.35	20.00
.13	2.63	12.11	20.00
.16	3.16	16.39	20.00
.18	3.68	21.17	20.00
.21	4.21	26.43	20.00
.24	4.74	32.13	20.00
.26	5.26	38.27	20.00
.29	5.79	44.81	20.00
.32	6.32	51.76	20.00
.34	6.84	59.10	20.00
.37	7.37	66.81	20.00
.39	7.89	74.89	20.00
.42	8.42	83.32	20.00
.45	8.95	92.10	20.00
.47	9.47	101.22	20.00
.50	10.00	110.67	20.00

COMPUTE TRAVEL TIME ID=4 REACH=1 VS NO=1 L=330 SLP=.13

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
TRAVEL TIME TABLE
                    REACH=  1.0

WATER       AVERAGE     FLOW        TRAVEL
DEPTH       AREA        RATE        TIME
FEET        SQ.FT.      CFS         HRS
   .026        .526         .83       .0581
   .053       1.053        2.64       .0366
   .079       1.579        5.18       .0280
   .105       2.105        8.35       .0231
   .132       2.632       12.11       .0199
   .158       3.158       16.39       .0177
   .184       3.684       21.17       .0160
   .211       4.211       26.43       .0146
   .237       4.737       32.13       .0135
   .263       5.263       38.27       .0126
   .289       5.789       44.81       .0118
   .316       6.316       51.76       .0112
   .342       6.842       59.10       .0106
   .368       7.368       66.81       .0101
   .395       7.895       74.89       .0097
   .421       8.421       83.32       .0093
   .447       8.947       92.10       .0089
   .474       9.474      101.22       .0086
   .500      10.000      110.67       .0083
ROUTE              ID=4  HYD=B6_TO_B4  INFLOW ID=2  DT=0.03333
PRINT HYD          ID=4  CODE=1

                                HYDROGRAPH FROM AREA B6_TO_B4


    RUNOFF VOLUME =      .98245 INCHES     =        .2222 ACRE-FEET
    PEAK DISCHARGE RATE =       7.47 CFS  AT   1.533 HOURS   BASIN AREA =   .0042 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-5
COMPUTE NM HYD      ID=1 HYD=DEV_B5 DA=0.00145 SQ MI
                    %A=0 %B=67 %C=30 %D=3
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .17174    CFS   UNIT VOLUME =    .9286       B =   526.28      P60 = 1.8700
    AREA =      .000044 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .123221HR    TP =   .133300HR    K/TP RATIO =   .924391     SHAPE CONSTANT, N =  3.828171
    UNIT PEAK =   3.6249    CFS   UNIT VOLUME =    .9965       B =   343.55      P60 = 1.8700
    AREA =      .001407 SQ MI    IA =    .45361 INCHES    INF =   1.12010 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                HYDROGRAPH FROM AREA DEV_B5


    RUNOFF VOLUME =      .80391 INCHES     =        .0622 ACRE-FEET
    PEAK DISCHARGE RATE =       2.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  ROUTE BASIN B-5 TO BASIN B-4 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
MIN ELEV =0  MAX ELEV=1
CH SLP=.05  FP SLP=.05  N=.030  DIST=5
DIST   ELEV
0       1
1       0
4       0
5       1
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.05	.16	.24	3.11
.11	.33	.78	3.21
.16	.50	1.52	3.32
.21	.68	2.46	3.42
.26	.86	3.56	3.53
.32	1.05	4.83	3.63
.37	1.24	6.26	3.74
.42	1.44	7.83	3.84
.47	1.65	9.55	3.95
.53	1.86	11.41	4.05
.58	2.07	13.41	4.16
.63	2.29	15.56	4.26
.68	2.52	17.84	4.37
.74	2.75	20.26	4.47
.79	2.99	22.82	4.58
.84	3.24	25.53	4.68
.89	3.48	28.37	4.79
.95	3.74	31.35	4.89
1.00	4.00	34.47	5.00

```
COMPUTE TRAVEL TIME ID=2  REACH=1  VS NO=1  L=260  SLP=.05
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.161	.24	.0474
.105	.327	.78	.0304
.158	.499	1.52	.0237
.211	.676	2.46	.0199
.263	.859	3.56	.0174
.316	1.047	4.83	.0156
.368	1.241	6.26	.0143
.421	1.440	7.83	.0133
.474	1.645	9.55	.0124
.526	1.856	11.41	.0117
.579	2.072	13.41	.0112
.632	2.294	15.56	.0106
.684	2.521	17.84	.0102
.737	2.753	20.26	.0098
.789	2.992	22.82	.0095
.842	3.235	25.53	.0092
.895	3.485	28.37	.0089
.947	3.740	31.35	.0086
1.000	4.000	34.47	.0084

```
ROUTE          ID=2  HYD=B5_TO_B4  INFLOW ID=1  DT=0.03333
PRINT HYD      ID=2  CODE=1
```

HYDROGRAPH FROM AREA B5_TO_B4

```
    RUNOFF VOLUME =      .79434 INCHES     =        .0614 ACRE-FEET
    PEAK DISCHARGE RATE =      2.22 CFS  AT   1.533 HOURS   BASIN AREA =   .0015 SQ. MI.


*S  ADD B-5 AND B-6 IN THE POND
ADD HYD              ID=2  HYD=B4_POND  ID I=2  ID II=4
PRINT HYD            ID=2  CODE=1

                                        HYDROGRAPH FROM AREA B4_POND


    RUNOFF VOLUME =      .93442 INCHES     =        .2836 ACRE-FEET
    PEAK DISCHARGE RATE =      9.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0057 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-4
COMPUTE NM HYD       ID=1 HYD=DEV_B4 DA=0.00289 SQ MI
                     %A=2 %B=0 %C=98 %D=0
                     TP=0.1333  RAINFALL=-1

    K =   .107023HR    TP =   .133300HR    K/TP RATIO =   .802874     SHAPE CONSTANT, N =  4.460289
    UNIT PEAK =   8.3419    CFS   UNIT VOLUME =    .9989       B =   384.77      P60 = 1.8700
    AREA =      .002890 SQ MI    IA =    .35600 INCHES    INF =    .84680 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B4


    RUNOFF VOLUME =      .97870 INCHES     =        .1508 ACRE-FEET
    PEAK DISCHARGE RATE =      5.25 CFS  AT   1.500 HOURS   BASIN AREA =   .0029 SQ. MI.


*S  ADD B-4 FOR THE TOTAL TO THE POND
ADD HYD              ID=1  HYD=B4_POND_IN  ID I=2  ID II=1
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA B4_POND_IN


    RUNOFF VOLUME =      .94932 INCHES     =        .4344 ACRE-FEET
    PEAK DISCHARGE RATE =     14.83 CFS  AT   1.533 HOURS   BASIN AREA =   .0086 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-4 POND
ROUTE RESERVOIR      ID=2  HYD=B4_POND_OUT  INFLOW ID=1  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               4999.5
                     14.4             0.028             5001

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

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

     .00        .00   4999.50      .000       .00
     .33        .00   4999.50      .000       .00
     .67        .00   4999.50      .000       .00
    1.00        .00   4999.50      .000       .00
```

```
    1.33        .51   4999.53       .001       .26
    1.67       9.09   5000.57       .020     10.28
    2.00       2.09   4999.74       .004      2.31
    2.33        .59   4999.57       .001       .64
    2.67        .21   4999.52       .000       .23
    3.00        .08   4999.51       .000       .09
    3.33        .02   4999.50       .000       .02
    3.67        .00   4999.50       .000       .00
 PEAK DISCHARGE =       14.378 CFS - PEAK OCCURS AT HOUR    1.57
 MAXIMUM WATER SURFACE ELEVATION =     5000.998
 MAXIMUM STORAGE =         .0280 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=2  CODE=1

                                        HYDROGRAPH FROM AREA B4_POND_OUT


    RUNOFF VOLUME =      .94931 INCHES     =        .4344 ACRE-FEET
    PEAK DISCHARGE RATE =      14.38 CFS  AT   1.567 HOURS   BASIN AREA =   .0086 SQ. MI.


*S  ROUTE BASIN B-4 TO BASIN E-2 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=1
                    CH SLP=.05  FP SLP=.05  N=.030  DIST=5
                    DIST   ELEV
                    0       1
                    1       0
                    4       0
                    5       1

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                     .00         .00         .00         .00
                                     .05         .16         .24        3.11
                                     .11         .33         .78        3.21
                                     .16         .50        1.52        3.32
                                     .21         .68        2.46        3.42
                                     .26         .86        3.56        3.53
                                     .32        1.05        4.83        3.63
                                     .37        1.24        6.26        3.74
                                     .42        1.44        7.83        3.84
                                     .47        1.65        9.55        3.95
                                     .53        1.86       11.41        4.05
                                     .58        2.07       13.41        4.16
                                     .63        2.29       15.56        4.26
                                     .68        2.52       17.84        4.37
                                     .74        2.75       20.26        4.47
                                     .79        2.99       22.82        4.58
                                     .84        3.24       25.53        4.68
                                     .89        3.48       28.37        4.79
                                     .95        3.74       31.35        4.89
                                    1.00        4.00       34.47        5.00
COMPUTE TRAVEL TIME ID=4  REACH=1  VS NO=1  L=250  SLP=.05

                          TRAVEL TIME TABLE
                                          REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
```

```
                    .053        .161        .24        .0456
                    .105        .327        .78        .0293
                    .158        .499       1.52        .0228
                    .211        .676       2.46        .0191
                    .263        .859       3.56        .0167
                    .316       1.047       4.83        .0150
                    .368       1.241       6.26        .0138
                    .421       1.440       7.83        .0128
                    .474       1.645       9.55        .0120
                    .526       1.856      11.41        .0113
                    .579       2.072      13.41        .0107
                    .632       2.294      15.56        .0102
                    .684       2.521      17.84        .0098
                    .737       2.753      20.26        .0094
                    .789       2.992      22.82        .0091
                    .842       3.235      25.53        .0088
                    .895       3.485      28.37        .0085
                    .947       3.740      31.35        .0083
                               1.000       4.000       34.47        .0081
ROUTE                ID=4  HYD=B4_TO_E2  INFLOW ID=2  DT=0.03333
PRINT HYD            ID=4  CODE=1

                                        HYDROGRAPH FROM AREA B4_TO_E2


    RUNOFF VOLUME =       .94930 INCHES     =        .4344 ACRE-FEET
    PEAK DISCHARGE RATE =      14.47 CFS  AT   1.567 HOURS   BASIN AREA =   .0086 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN E-2
COMPUTE NM HYD       ID=1 HYD=DEV_E2 DA=0.00108 SQ MI
                     %A=5 %B=13 %C=80 %D=2
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .85278E-01CFS   UNIT VOLUME =    .8874       B =   526.28      P60 = 1.8700
    AREA =      .000022 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .112150HR    TP =   .133300HR    K/TP RATIO =   .841332     SHAPE CONSTANT, N =  4.234994
    UNIT PEAK =   2.9421    CFS   UNIT VOLUME =    .9958       B =   370.55      P60 = 1.8700
    AREA =      .001058 SQ MI    IA =    .38520 INCHES    INF =    .92857 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA DEV_E2


    RUNOFF VOLUME =       .93437 INCHES     =        .0538 ACRE-FEET
    PEAK DISCHARGE RATE =       1.88 CFS  AT   1.500 HOURS   BASIN AREA =   .0011 SQ. MI.


*S  ADD E-2 FOR THE TOTAL TO THE POND
ADD HYD              ID=1  HYD=E2_POND_IN  ID I=4  ID II=1
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA E2_POND_IN


    RUNOFF VOLUME =       .94660 INCHES     =        .4877 ACRE-FEET
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

PEAK DISCHARGE RATE = 16.13 CFS AT 1.567 HOURS BASIN AREA = .0097 SQ. MI.

```
*S  ROUTE THE RUNOFF THROUGH THE BASIN E-2 POND
ROUTE RESERVOIR     ID=2  HYD=E2_POND_OUT  INFLOW ID=1  CODE=10
                    OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                       0               0               4987.5
                    16.2             0.014             4989

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4987.50	.000	.00
.33	.00	4987.50	.000	.00
.67	.00	4987.50	.000	.00
1.00	.00	4987.50	.000	.00
1.33	.21	4987.51	.000	.15
1.67	11.68	4988.64	.011	12.28
2.00	2.63	4987.75	.002	2.74
2.33	.74	4987.57	.001	.77
2.67	.28	4987.53	.000	.29
3.00	.10	4987.51	.000	.11
3.33	.03	4987.50	.000	.03
3.67	.00	4987.50	.000	.00

```
 PEAK DISCHARGE =       16.041 CFS - PEAK OCCURS AT HOUR    1.57
 MAXIMUM WATER SURFACE ELEVATION =     4988.985
 MAXIMUM STORAGE =         .0139 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=2  CODE=1

                                        HYDROGRAPH FROM AREA E2_POND_OUT
```

RUNOFF VOLUME = .94660 INCHES = .4877 ACRE-FEET
PEAK DISCHARGE RATE = 16.04 CFS AT 1.567 HOURS BASIN AREA = .0097 SQ. MI.

```
*S  ROUTE THE POND DISCHARGE INTO REGINA CIRCLE VIA A 48" CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=.50
                    CH SLP=.02  FP SLP=.02  N=.013  DIST=4
                    DIST   ELEV
                    0       .5
                    0       0
                    4       0
                    4       .5
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.03	.11	.15	4.00
.05	.21	.47	4.00
.08	.32	.93	4.00
.11	.42	1.49	4.00
.13	.53	2.15	4.00
.16	.63	2.91	4.00
.18	.74	3.74	4.00
.21	.84	4.66	4.00

```
                                        .24        .95       5.64       4.00
                                        .26       1.05       6.70       4.00
                                        .29       1.16       7.82       4.00
                                        .32       1.26       9.00       4.00
                                        .34       1.37      10.24       4.00
                                        .37       1.47      11.54       4.00
                                        .39       1.58      12.90       4.00
                                        .42       1.68      14.31       4.00
                                        .45       1.79      15.77       4.00
                                        .47       1.89      17.27       4.00
                                        .50       2.00      18.83       4.00
COMPUTE TRAVEL TIME ID=1  REACH=1  VS NO=1  L=30  SLP=.02

                          TRAVEL TIME TABLE
                                       REACH=  1.0

                          WATER       AVERAGE     FLOW        TRAVEL
                          DEPTH       AREA        RATE        TIME
                          FEET        SQ.FT.      CFS         HRS
                            .026        .105        .15       .0059
                            .053        .211        .47       .0037
                            .079        .316        .93       .0028
                            .105        .421       1.49       .0024
                            .132        .526       2.15       .0020
                            .158        .632       2.91       .0018
                            .184        .737       3.74       .0016
                            .211        .842       4.66       .0015
                            .237        .947       5.64       .0014
                            .263       1.053       6.70       .0013
                            .289       1.158       7.82       .0012
                            .316       1.263       9.00       .0012
                            .342       1.368      10.24       .0011
                            .368       1.474      11.54       .0011
                            .395       1.579      12.90       .0010
                            .421       1.684      14.31       .0010
                            .447       1.789      15.77       .0009
                            .474       1.895      17.27       .0009
                            .500       2.000      18.83       .0009
ROUTE                ID=1  HYD=E2_TO_E1  INFLOW ID=2  DT=0.03333
PRINT HYD            ID=1  CODE=1

                                     HYDROGRAPH FROM AREA E2_TO_E1


    RUNOFF VOLUME =      .94659 INCHES     =        .4877 ACRE-FEET
    PEAK DISCHARGE RATE =      16.05 CFS  AT   1.567 HOURS   BASIN AREA =   .0097 SQ. MI.


*S  ROUTE THE RUNOFF SOUTH ON REGINA CIRCLE TO THE EXISTING INLET AT THE
*S  BOTTOM OF BASIN E-1 VIA A HALF-STREET SECTION.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.41
                    CH SLP=.059  FP SLP=.059  N=.017  DIST=16
                    DIST   ELEV
                    0      .41
                    0       0
                    2      .13
                    16     .41

                              RATING CURVE VALLEY SECTION  1.0
                                 WATER       FLOW        FLOW        TOP
                                SURFACE      AREA        RATE        WIDTH
                                 ELEV        SQ FT       CFS         FT
```

.00	.00	.00	.00
.02	.00	.00	.33
.04	.01	.02	.66
.06	.03	.07	1.00
.09	.06	.14	1.33
.11	.09	.26	1.66
.13	.13	.42	1.99
.15	.18	.58	3.05
.17	.26	.85	4.13
.19	.36	1.26	5.21
.22	.49	1.83	6.29
.24	.63	2.56	7.37
.26	.80	3.48	8.45
.28	1.00	4.61	9.53
.30	1.21	5.97	10.61
.32	1.46	7.56	11.68
.35	1.72	9.42	12.76
.37	2.01	11.54	13.84
.39	2.32	13.96	14.92
.41	2.65	16.68	16.00

```
COMPUTE TRAVEL TIME ID=4  REACH=1  VS NO=1  L=660  SLP=.059
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.022	.004	.00	.1847
.043	.014	.02	.1163
.065	.032	.07	.0888
.086	.057	.14	.0733
.108	.090	.26	.0632
.129	.129	.42	.0559
.151	.183	.58	.0582
.173	.261	.85	.0560
.194	.361	1.26	.0524
.216	.486	1.83	.0487
.237	.633	2.56	.0453
.259	.804	3.48	.0423
.281	.998	4.61	.0396
.302	1.215	5.97	.0373
.324	1.455	7.56	.0353
.345	1.719	9.42	.0335
.367	2.006	11.54	.0319
.388	2.316	13.96	.0304
.410	2.650	16.68	.0291

```
ROUTE                ID=4  HYD=E2_TO_E1  INFLOW ID=1  DT=0.03333
PRINT HYD            ID=4  CODE=1
```

HYDROGRAPH FROM AREA E2_TO_E1

RUNOFF VOLUME = .94656 INCHES = .4877 ACRE-FEET
PEAK DISCHARGE RATE = 15.76 CFS AT 1.600 HOURS BASIN AREA = .0097 SQ. MI.

```
*S  COMPUTE RUNOFF FROM BASIN B-3
COMPUTE NM HYD       ID=1 HYD=DEV_B3 DA=0.00268 SQ MI
                     %A=0 %B=5 %C=95 %D=0
                     TP=0.1333  RAINFALL=-1
```

K = .107123HR TP = .133300HR K/TP RATIO = .803624 SHAPE CONSTANT, N = 4.455646

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```
UNIT PEAK =   7.7299    CFS   UNIT VOLUME =    .9987       B =   384.48      P60 = 1.8700
AREA =      .002680 SQ MI    IA =    .35750 INCHES    INF =    .85100 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B3


RUNOFF VOLUME =      .97482 INCHES     =        .1393 ACRE-FEET
PEAK DISCHARGE RATE =       4.86 CFS  AT   1.500 HOURS   BASIN AREA =   .0027 SQ. MI.


*S  ROUTE BASIN B-3 TO BASIN B-1 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.03  FP SLP=.03  N=.024  DIST=20
                    DIST   ELEV
                    0      .50
                    1       0
                    19      0
                    20     .50

                          RATING CURVE VALLEY SECTION  1.0
                              WATER       FLOW        FLOW        TOP
                             SURFACE      AREA        RATE       WIDTH
                              ELEV        SQ FT       CFS        FT
                                .00         .00         .00        .00
                                .03         .48         .45      18.11
                                .05         .95        1.43      18.21
                                .08        1.43        2.81      18.32
                                .11        1.92        4.54      18.42
                                .13        2.40        6.59      18.53
                                .16        2.89        8.93      18.63
                                .18        3.38       11.56      18.74
                                .21        3.88       14.45      18.84
                                .24        4.38       17.59      18.95
                                .26        4.88       20.98      19.05
                                .29        5.38       24.61      19.16
                                .32        5.88       28.47      19.26
                                .34        6.39       32.56      19.37
                                .37        6.90       36.86      19.47
                                .39        7.42       41.38      19.58
                                .42        7.93       46.11      19.68
                                .45        8.45       51.05      19.79
                                .47        8.98       56.20      19.89
                                .50        9.50       61.54      20.00
COMPUTE TRAVEL TIME ID=2  REACH=1  VS NO=1  L=380  SLP=.03

                         TRAVEL TIME TABLE
                                     REACH=  1.0

                         WATER       AVERAGE     FLOW        TRAVEL
                         DEPTH       AREA        RATE        TIME
                         FEET        SQ.FT.      CFS         HRS
                            .026        .475         .45       .1115
                            .053        .953        1.43       .0704
                            .079       1.434        2.81       .0539
                            .105       1.917        4.54       .0446
                            .132       2.403        6.59       .0385
                            .158       2.892        8.93       .0342
                            .184       3.384       11.56       .0309
                            .211       3.878       14.45       .0283
```

```
                    .237      4.375      17.59      .0263
                    .263      4.875      20.98      .0245
                    .289      5.378      24.61      .0231
                    .316      5.884      28.47      .0218
                    .342      6.392      32.56      .0207
                    .368      6.903      36.86      .0198
                    .395      7.417      41.38      .0189
                    .421      7.934      46.11      .0182
                    .447      8.453      51.05      .0175
                    .474      8.975      56.20      .0169
                    .500      9.500      61.54      .0163
ROUTE          ID=2  HYD=B3_TO_B1  INFLOW ID=1  DT=0.03333
PRINT HYD      ID=2  CODE=1

                         HYDROGRAPH FROM AREA B3_TO_B1

    RUNOFF VOLUME =      .97498 INCHES     =        .1394 ACRE-FEET
    PEAK DISCHARGE RATE =      4.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0027 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-2
COMPUTE NM HYD      ID=1 HYD=DEV_B2 DA=0.00666 SQ MI
                    %A=5 %B=5 %C=88 %D=2
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .52588    CFS   UNIT VOLUME =    .9786       B =   526.28      P60 = 1.8700
    AREA =      .000133 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .110099HR    TP =   .133300HR    K/TP RATIO =   .825945     SHAPE CONSTANT, N =  4.321835
    UNIT PEAK =   18.414    CFS   UNIT VOLUME =    .9996       B =   376.09      P60 = 1.8700
    AREA =      .006527 SQ MI    IA =    .37296 INCHES    INF =    .89429 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                         HYDROGRAPH FROM AREA DEV_B2

    RUNOFF VOLUME =      .96381 INCHES     =        .3423 ACRE-FEET
    PEAK DISCHARGE RATE =      11.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.


*S  ROUTE BASIN B-2 TO BASIN B-1 POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                    MIN ELEV =0  MAX ELEV=0.50
                    CH SLP=.03  FP SLP=.03  N=.024  DIST=20
                    DIST   ELEV
                    0      .50
                    1       0
                    19      0
                    20     .50

                         RATING CURVE VALLEY SECTION  1.0
                             WATER       FLOW        FLOW        TOP
                            SURFACE      AREA        RATE        WIDTH
                             ELEV        SQ FT       CFS         FT
                               .00         .00         .00         .00
                               .03         .48         .45       18.11
```

.05	.95	1.43	18.21
.08	1.43	2.81	18.32
.11	1.92	4.54	18.42
.13	2.40	6.59	18.53
.16	2.89	8.93	18.63
.18	3.38	11.56	18.74
.21	3.88	14.45	18.84
.24	4.38	17.59	18.95
.26	4.88	20.98	19.05
.29	5.38	24.61	19.16
.32	5.88	28.47	19.26
.34	6.39	32.56	19.37
.37	6.90	36.86	19.47
.39	7.42	41.38	19.58
.42	7.93	46.11	19.68
.45	8.45	51.05	19.79
.47	8.98	56.20	19.89
.50	9.50	61.54	20.00

```
COMPUTE TRAVEL TIME ID=5  REACH=1  VS NO=1  L=380  SLP=.03
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.026	.475	.45	.1115
.053	.953	1.43	.0704
.079	1.434	2.81	.0539
.105	1.917	4.54	.0446
.132	2.403	6.59	.0385
.158	2.892	8.93	.0342
.184	3.384	11.56	.0309
.211	3.878	14.45	.0283
.237	4.375	17.59	.0263
.263	4.875	20.98	.0245
.289	5.378	24.61	.0231
.316	5.884	28.47	.0218
.342	6.392	32.56	.0207
.368	6.903	36.86	.0198
.395	7.417	41.38	.0189
.421	7.934	46.11	.0182
.447	8.453	51.05	.0175
.474	8.975	56.20	.0169
.500	9.500	61.54	.0163

```
ROUTE              ID=5  HYD=B2_TO_B1  INFLOW ID=1  DT=0.03333
PRINT HYD          ID=5  CODE=1
```

HYDROGRAPH FROM AREA B2_TO_B1

RUNOFF VOLUME = .96377 INCHES = .3423 ACRE-FEET
PEAK DISCHARGE RATE = 11.81 CFS AT 1.533 HOURS BASIN AREA = .0067 SQ. MI.

```
*S  ADD BASIN B-2 AND B-3 RUNOFF IN THE B-1 POND
ADD HYD            ID=2  HYD=B1_POND_IN  ID I=2  ID II=5
PRINT HYD          ID=2  CODE=1
```

HYDROGRAPH FROM AREA B1_POND_IN

RUNOFF VOLUME = .96694 INCHES = .4817 ACRE-FEET

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```
PEAK DISCHARGE RATE =      16.51 CFS  AT   1.533 HOURS   BASIN AREA =   .0093 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN B-1
COMPUTE NM HYD       ID=1 HYD=DEV_B1 DA=0.00743 SQ MI
                     %A=0 %B=50 %C=45 %D=5
                     TP=0.1333  RAINFALL=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   1.4667    CFS   UNIT VOLUME =    .9911       B =   526.28      P60 = 1.8700
AREA =      .000372 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .119091HR    TP =   .133300HR    K/TP RATIO =   .893402     SHAPE CONSTANT, N =  3.968817
UNIT PEAK =   18.697    CFS   UNIT VOLUME =    .9997       B =   353.08      P60 = 1.8700
AREA =      .007059 SQ MI    IA =    .42895 INCHES    INF =   1.05105 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA DEV_B1


RUNOFF VOLUME =      .88429 INCHES     =        .3504 ACRE-FEET
PEAK DISCHARGE RATE =      11.97 CFS  AT   1.500 HOURS   BASIN AREA =   .0074 SQ. MI.


*S  ADD BASIN B-1 FOR TOTAL RUNOFF INTO THE B-1 POND
ADD HYD              ID=1  HYD=B1_POND_IN_TOTL  ID I=2  ID II=1
PRINT HYD            ID=1  CODE=1

                                        HYDROGRAPH FROM AREA B1_POND_IN_TOTL


RUNOFF VOLUME =      .93032 INCHES     =        .8321 ACRE-FEET
PEAK DISCHARGE RATE =      28.33 CFS  AT   1.533 HOURS   BASIN AREA =   .0168 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN B-1 POND
ROUTE RESERVOIR      ID=2  HYD=B1_POND_OUT  INFLOW ID=1  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               4953.5
                       50             0.22              4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4953.50	.000	.00
.33	.00	4953.50	.000	.00
.67	.00	4953.50	.000	.00
1.00	.00	4953.50	.000	.00
1.33	.92	4953.51	.002	.35
1.67	16.67	4954.12	.092	20.82
2.00	3.74	4953.64	.021	4.74
2.33	1.19	4953.54	.006	1.41
2.67	.46	4953.52	.002	.55
3.00	.18	4953.51	.001	.21
3.33	.07	4953.50	.000	.08

3.67	.02	4953.50	.000	.03
4.00	.01	4953.50	.000	.01
4.33	.01	4953.50	.000	.01
4.67	.01	4953.50	.000	.01
5.00	.01	4953.50	.000	.01
5.33	.01	4953.50	.000	.01
5.67	.01	4953.50	.000	.01
6.00	.01	4953.50	.000	.01
6.33	.01	4953.50	.000	.01
6.67	.01	4953.50	.000	.01
7.00	.01	4953.50	.000	.01
7.33	.01	4953.50	.000	.01
7.67	.01	4953.50	.000	.01
8.00	.01	4953.50	.000	.01
8.33	.01	4953.50	.000	.01
8.67	.01	4953.50	.000	.01
9.00	.01	4953.50	.000	.01
9.33	.01	4953.50	.000	.01
9.67	.01	4953.50	.000	.01
10.00	.01	4953.50	.000	.01
10.33	.01	4953.50	.000	.01
10.67	.01	4953.50	.000	.01
11.00	.01	4953.50	.000	.01
11.33	.01	4953.50	.000	.01
11.67	.01	4953.50	.000	.01
12.00	.01	4953.50	.000	.01
12.33	.01	4953.50	.000	.01
12.67	.01	4953.50	.000	.01
13.00	.01	4953.50	.000	.01
13.33	.01	4953.50	.000	.01
13.67	.01	4953.50	.000	.01
14.00	.01	4953.50	.000	.01
14.33	.01	4953.50	.000	.01
14.67	.01	4953.50	.000	.01
15.00	.01	4953.50	.000	.01
15.33	.01	4953.50	.000	.01
15.67	.01	4953.50	.000	.01
16.00	.01	4953.50	.000	.01
16.33	.01	4953.50	.000	.01
16.67	.01	4953.50	.000	.01
17.00	.01	4953.50	.000	.01
17.33	.01	4953.50	.000	.01
17.66	.01	4953.50	.000	.01
18.00	.01	4953.50	.000	.01
18.33	.01	4953.50	.000	.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
18.66	.01	4953.50	.000	.01
19.00	.01	4953.50	.000	.01
19.33	.01	4953.50	.000	.01
19.66	.01	4953.50	.000	.01

PEAK DISCHARGE = 24.921 CFS - PEAK OCCURS AT HOUR 1.57
MAXIMUM WATER SURFACE ELEVATION = 4954.248
MAXIMUM STORAGE = .1097 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA B1_POND_OUT

RUNOFF VOLUME = .93029 INCHES = .8320 ACRE-FEET
PEAK DISCHARGE RATE = 24.92 CFS AT 1.567 HOURS BASIN AREA = .0168 SQ. MI.

```
*S  DIVIDE THE POND OUTFLOW INTO TWO COMPONENTS:  ONE WILL DISCHARGE TO THE
*S  EXISTING INLET VIA A PIPE, WHILE THE OTHER WILL DISCHARGE TO
*S  REGINA CIRCLE DOWNSTREAM OF THE INLET VIA SURFACE DISCHARGE.
DIVIDE HYD          ID=2  Q=4 CFS  ID I=2    HYD=PIPE_TO_INLET
                                   ID II=10  HYD=SURFC_TO_REGINA
PRINT HYD           ID=10  CODE=1

                                     HYDROGRAPH FROM AREA SURFC_TO_REGINA


    RUNOFF VOLUME =      .93029 INCHES     =        .5018 ACRE-FEET
    PEAK DISCHARGE RATE =      20.92 CFS  AT   1.567 HOURS   BASIN AREA =   .0101 SQ. MI.


*S  ADD THE SURFACE DISCHARGE TO THE OTHER SURFACE DISCHARGE AT ANALYSIS
*S  POINT 3.
ADD HYD             ID=7  HYD=A_P_3_SUBTL  ID I=7  ID II=10
PRINT HYD           ID=7  CODE=1

                                     HYDROGRAPH FROM AREA A_P_3_SUBTL


    RUNOFF VOLUME =     1.01690 INCHES     =        .6098 ACRE-FEET
    PEAK DISCHARGE RATE =      23.31 CFS  AT   1.567 HOURS   BASIN AREA =   .0112 SQ. MI.


*S  ROUTE THE RUNOFF INTO THE BACK OF THE EXISTING INLET ON REGINA CIRCLE
*S  VIA A 12" PIPE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.02
                    DIA=12 IN  N=.013

                                RATING CURVE PIPE SECTION  1.0
                                    WATER       FLOW        FLOW        MAX
                                   SURFACE      AREA        RATE        WIDTH
                                    ELEV        SQ FT       CFS         FT
                                     .00         .00         .00         .00
                                     .05         .02         .03         .44
                                     .10         .04         .11         .61
                                     .16         .08         .27         .73
                                     .21         .12         .48         .81
                                     .26         .16         .75         .88
                                     .31         .21        1.07         .93
                                     .36         .26        1.43         .96
                                     .42         .31        1.83         .99
                                     .47         .36        2.26        1.00
                                     .52         .41        2.70        1.00
                                     .57         .47        3.15        1.00
                                     .63         .52        3.60        1.00
                                     .68         .57        4.04        1.00
                                     .73         .61        4.45        1.00
                                     .78         .66        4.81        1.00
                                     .83         .70        5.11        1.00
                                     .89         .74        5.33        1.00
                                     .94         .77        5.42        1.00
                                    1.00         .79        5.42        1.00
COMPUTE TRAVEL TIME ID=5  REACH=1  VS NO=1  L=70  SLP=.02

                           TRAVEL TIME TABLE
                                          REACH=  1.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.052	.016	.03	.0115
.104	.043	.11	.0074
.156	.078	.27	.0057
.208	.119	.48	.0048
.261	.163	.75	.0042
.313	.210	1.07	.0038
.365	.259	1.43	.0035
.417	.310	1.83	.0033
.469	.362	2.26	.0031
.521	.414	2.70	.0030
.573	.466	3.15	.0029
.625	.517	3.60	.0028
.677	.566	4.04	.0027
.730	.614	4.45	.0027
.782	.659	4.81	.0027
.834	.700	5.11	.0027
.886	.736	5.33	.0027
.938	.765	5.42	.0027
1.000	.785	5.42	.0028

```
ROUTE                ID=5  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD            ID=5  CODE=1

                                   HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =      .93027 INCHES     =        .3302 ACRE-FEET
    PEAK DISCHARGE RATE =       4.06 CFS  AT   1.433 HOURS   BASIN AREA =   .0067 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN C
COMPUTE NM HYD       ID=1 HYD=DEV_C DA=0.00128 SQ MI
                     %A=0 %B=20 %C=0 %D=80
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   4.0428    CFS   UNIT VOLUME =    .9965       B =   526.28      P60 = 1.8700
    AREA =      .001024 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .62816    CFS   UNIT VOLUME =    .9787       B =   327.09      P60 = 1.8700
    AREA =      .000256 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                   HYDROGRAPH FROM AREA DEV_C


    RUNOFF VOLUME =     2.00963 INCHES     =        .1372 ACRE-FEET
    PEAK DISCHARGE RATE =       3.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE BASIN C POND
ROUTE RESERVOIR      ID=2  HYD=C_POND_OUT  INFLOW ID=1  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               4957
                      3.2             0.001             4957.5
```

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4957.00	.000	.00
.33	.00	4957.00	.000	.00
.67	.00	4957.00	.000	.00
1.00	.00	4957.00	.000	.00
1.33	.89	4957.13	.000	.86
1.67	1.64	4957.26	.001	1.66
2.00	.74	4957.12	.000	.75
2.33	.16	4957.03	.000	.16
2.67	.06	4957.01	.000	.06
3.00	.03	4957.00	.000	.03
3.33	.02	4957.00	.000	.02
3.67	.02	4957.00	.000	.02
4.00	.02	4957.00	.000	.02
4.33	.02	4957.00	.000	.02
4.67	.02	4957.00	.000	.02
5.00	.02	4957.00	.000	.02
5.33	.02	4957.00	.000	.02
5.67	.02	4957.00	.000	.02
6.00	.02	4957.00	.000	.02
6.33	.02	4957.00	.000	.02
6.67	.02	4957.00	.000	.02
7.00	.02	4957.00	.000	.02
7.33	.02	4957.00	.000	.02
7.67	.02	4957.00	.000	.02
8.00	.02	4957.00	.000	.02
8.33	.02	4957.00	.000	.02
8.67	.02	4957.00	.000	.02
9.00	.02	4957.00	.000	.02
9.33	.02	4957.00	.000	.02
9.67	.02	4957.00	.000	.02
10.00	.02	4957.00	.000	.02
10.33	.02	4957.00	.000	.02
10.67	.02	4957.00	.000	.02
11.00	.02	4957.00	.000	.02
11.33	.02	4957.00	.000	.02
11.67	.02	4957.00	.000	.02
12.00	.02	4957.00	.000	.02
12.33	.02	4957.00	.000	.02
12.67	.02	4957.00	.000	.02
13.00	.02	4957.00	.000	.02
13.33	.02	4957.00	.000	.02
13.67	.02	4957.00	.000	.02
14.00	.02	4957.00	.000	.02
14.33	.02	4957.00	.000	.02
14.67	.02	4957.00	.000	.02
15.00	.02	4957.00	.000	.02
15.33	.02	4957.00	.000	.02
15.67	.02	4957.00	.000	.02
16.00	.02	4957.00	.000	.02
16.33	.02	4957.00	.000	.02
16.67	.02	4957.00	.000	.02
17.00	.01	4957.00	.000	.01
17.33	.01	4957.00	.000	.01
17.66	.01	4957.00	.000	.01
18.00	.01	4957.00	.000	.01
18.33	.01	4957.00	.000	.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)

```
   18.66        .01   4957.00       .000       .01
   19.00        .01   4957.00       .000       .01
   19.33        .01   4957.00       .000       .01
   19.66        .01   4957.00       .000       .01
 PEAK DISCHARGE =        3.195 CFS - PEAK OCCURS AT HOUR    1.50
 MAXIMUM WATER SURFACE ELEVATION =     4957.500
 MAXIMUM STORAGE =         .0010 AC-FT      INCREMENTAL TIME=     .033330HRS

PRINT HYD           ID=2  CODE=1

                                        HYDROGRAPH FROM AREA C_POND_OUT


   RUNOFF VOLUME =     2.00957 INCHES     =        .1372 ACRE-FEET
   PEAK DISCHARGE RATE =       3.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*S  ROUTE THE RUNOFF INTO THE BACK OF THE EXISTING INLET ON REGINA CIRCLE
*S  VIA AN 8" PIPE.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.10
                    DIA=.67 FT  N=.013

                                RATING CURVE PIPE SECTION  1.0
                                    WATER       FLOW        FLOW        MAX
                                   SURFACE      AREA        RATE        WIDTH
                                    ELEV        SQ FT       CFS         FT
                                      .00         .00         .00         .00
                                      .03         .01         .02         .30
                                      .07         .02         .09         .41
                                      .10         .04         .20         .49
                                      .14         .05         .37         .54
                                      .17         .07         .58         .59
                                      .21         .09         .82         .62
                                      .24         .12        1.10         .65
                                      .28         .14        1.41         .66
                                      .31         .16        1.73         .67
                                      .35         .19        2.08         .67
                                      .38         .21        2.42         .67
                                      .42         .23        2.77         .67
                                      .45         .25        3.10         .67
                                      .49         .28        3.42         .67
                                      .52         .30        3.70         .67
                                      .56         .31        3.93         .67
                                      .59         .33        4.10         .67
                                      .63         .34        4.17         .67
                                      .67         .35        4.17         .67
COMPUTE TRAVEL TIME ID=1  REACH=1  VS NO=1  L=45  SLP=.10

                            TRAVEL TIME TABLE
                                        REACH=  1.0

                            WATER       AVERAGE     FLOW        TRAVEL
                            DEPTH       AREA        RATE        TIME
                            FEET        SQ.FT.      CFS         HRS
                               .035        .007         .02       .0043
                               .070        .019         .09       .0028
                               .105        .035         .20       .0021
                               .140        .053         .37       .0018
                               .175        .073         .58       .0016
                               .209        .094         .82       .0014
                               .244        .116        1.10       .0013
                               .279        .139        1.41       .0012
                               .314        .162        1.73       .0012
```

```
                    .349        .186        2.08        .0011
                    .384        .209        2.42        .0011
                    .419        .232        2.77        .0010
                    .454        .254        3.10        .0010
                    .489        .276        3.42        .0010
                    .524        .296        3.70        .0010
                    .559        .314        3.93        .0010
                    .594        .330        4.10        .0010
                    .628        .343        4.17        .0010
                    .670        .353        4.17        .0011
ROUTE          ID=1  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD      ID=1  CODE=1

                          HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =     2.00950 INCHES     =        .1372 ACRE-FEET
    PEAK DISCHARGE RATE =      3.19 CFS  AT   1.500 HOURS   BASIN AREA =   .0013 SQ. MI.


*S  ADD THE RUNOFF INTO THE BACK OF THE INLET FOR THE SUBTOTAL INSIDE THE
*S  INLET.
ADD HYD        ID=5  HYD=E1_INLET  ID I=5  ID II=1
PRINT HYD      ID=5  CODE=1

                          HYDROGRAPH FROM AREA E1_INLET


    RUNOFF VOLUME =     1.10435 INCHES     =        .4674 ACRE-FEET
    PEAK DISCHARGE RATE =      7.21 CFS  AT   1.500 HOURS   BASIN AREA =   .0079 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN D
COMPUTE NM HYD      ID=1 HYD=DEV_D DA=0.00014 SQ MI
                    %A=0 %B=20 %C=0 %D=80
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .44218    CFS   UNIT VOLUME =    .9751       B =   526.28      P60 = 1.8700
    AREA =      .000112 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .68705E-01CFS   UNIT VOLUME =    .8722       B =   327.09      P60 = 1.8700
    AREA =      .000028 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1 CODE=1

                          HYDROGRAPH FROM AREA DEV_D


    RUNOFF VOLUME =     2.00986 INCHES     =        .0150 ACRE-FEET
    PEAK DISCHARGE RATE =       .36 CFS  AT   1.500 HOURS   BASIN AREA =   .0001 SQ. MI.


*S  ADD BASIN D TO THE REMAINDER IN REGINA CIRCLE.
ADD HYD        ID=4  HYD=REGINA  ID I=4  ID II=1
PRINT HYD      ID=4  CODE=1
```

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```
                                    HYDROGRAPH FROM AREA REGINA


    RUNOFF VOLUME =       .96175 INCHES     =        .5027 ACRE-FEET
    PEAK DISCHARGE RATE =      16.02 CFS  AT   1.600 HOURS   BASIN AREA =   .0098 SQ. MI.


*S  COMPUTE RUNOFF FROM BASIN E-1
COMPUTE NM HYD       ID=1 HYD=DEV_E1 DA=0.00103 SQ MI
                     %A=0 %B=30 %C=0 %D=70
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.8465    CFS   UNIT VOLUME =    .9955       B =   526.28      P60 = 1.8700
    AREA =      .000721 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .75821    CFS   UNIT VOLUME =    .9821       B =   327.09      P60 = 1.8700
    AREA =      .000309 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                    HYDROGRAPH FROM AREA DEV_E1


    RUNOFF VOLUME =     1.84186 INCHES     =        .1012 ACRE-FEET
    PEAK DISCHARGE RATE =       2.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0010 SQ. MI.


*S  ADD BASIN E-1 TO THE REMAINDER IN REGINA CIRCLE FOR THE SUBTOTAL FROM
*S  THE PARK THAT DISCHARGES ACROSS THE EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD              ID=4  HYD=A_P_1_SUBTOTL  ID I=4  ID II=1
PRINT HYD            ID=4  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1_SUBTOTL


    RUNOFF VOLUME =     1.04546 INCHES     =        .6039 ACRE-FEET
    PEAK DISCHARGE RATE =      17.73 CFS  AT   1.600 HOURS   BASIN AREA =   .0108 SQ. MI.


*S  COMPUTE RUNOFF FROM OFF-SITE BASIN O-1, WHICH DISCHARGES TO REGINA
*S  CIRCLE.
COMPUTE NM HYD       ID=1 HYD=EXIST_O-1 DA=0.0280 SQ MI
                     %A=2 %B=68 %C=25 %D=5
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.5273    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001400 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .125068HR    TP =   .133300HR    K/TP RATIO =   .938247     SHAPE CONSTANT, N =  3.769050
    UNIT PEAK =   67.740    CFS   UNIT VOLUME =    1.000       B =   339.47      P60 = 1.8700
    AREA =      .026600 SQ MI    IA =    .46368 INCHES    INF =   1.14832 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

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```
PRINT HYD           ID=1 CODE=1

                                    HYDROGRAPH FROM AREA EXIST_0-1


    RUNOFF VOLUME =      .81624 INCHES     =       1.2189 ACRE-FEET
    PEAK DISCHARGE RATE =      41.66 CFS  AT   1.500 HOURS   BASIN AREA =   .0280 SQ. MI.


*S  ADD THE RUNOFF FROM BASIN B FOR TOTAL IN REGINA CIRCLE UPSTREAM OF THE
*S  EXISTING INLET AT ANALYSIS POINT 1.
ADD HYD             ID=1  HYD=A_P_1_TOTL  ID I=1  ID II=4
PRINT HYD           ID=1  CODE=1

                                    HYDROGRAPH FROM AREA A_P_1_TOTL

    RUNOFF VOLUME =      .88017 INCHES     =       1.8228 ACRE-FEET
    PEAK DISCHARGE RATE =      56.10 CFS  AT   1.533 HOURS   BASIN AREA =   .0388 SQ. MI.


*S  DIVIDE OUT THE PORTION OF THE RUNOFF THAT DISCHARGES INTO THE INLET
*S  ON REGINA CIRCLE AT ANALYSIS POINT 1.  THE INLET OVERFLOW DISCHARGES
*S  SOUTH ON REGINA INTO A DOWNSTREAM WATERSHED.  IT DOES NOT ENTER THE POND.
DIVIDE HYD          ID=1  Q=9.5 CFS  ID I=2   HYD=STORM_DRAIN
                                     ID II=6  HYD=DOWNSTREAM
PRINT HYD           ID=6  CODE=1

                                    HYDROGRAPH FROM AREA DOWNSTREAM


    RUNOFF VOLUME =      .88017 INCHES     =       1.0382 ACRE-FEET
    PEAK DISCHARGE RATE =      46.60 CFS  AT   1.533 HOURS   BASIN AREA =   .0221 SQ. MI.


*S  ADD THE OVERFLOW TO THE DOWNSTREAM FLOW FROM BASIN A FOR THE TOTAL
*S  FLOW IN REGINA CIRCLE DOWNSTREAM OF THE PARK AT ANALYSIS POINT 3.
ADD HYD             ID=7  HYD=A_P_3  ID I=4  ID II=7
PRINT HYD           ID=7  CODE=1

                                    HYDROGRAPH FROM AREA A_P_3


    RUNOFF VOLUME =     1.03091 INCHES     =       1.2137 ACRE-FEET
    PEAK DISCHARGE RATE =      40.68 CFS  AT   1.600 HOURS   BASIN AREA =   .0221 SQ. MI.


*S  ADD THE RUNOFF INTO THE INLET GRATE TO THE NEW RUNOFF THAT ENTERED THE
*S  INLET FROM THE NEW ON-SITE PIPES.
ADD HYD             ID=2  HYD=INLET_TOTAL  ID I=2  ID II=5
PRINT HYD           ID=2  CODE=1

                                    HYDROGRAPH FROM AREA INLET_TOTAL


    RUNOFF VOLUME =      .95234 INCHES     =       1.2519 ACRE-FEET
    PEAK DISCHARGE RATE =      16.71 CFS  AT   1.500 HOURS   BASIN AREA =   .0246 SQ. MI.
```

Pat Hurley Park -- 100-Year Design Storm AHYMO Analysis

```
*S  ADD THE STORM DRAIN FLOWS TO OBTAIN THE TOTAL.
ADD HYD            ID=2  HYD=TOTL_TO_POND  ID I=2  ID II=3
PRINT HYD          ID=2  CODE=1

                                   HYDROGRAPH FROM AREA TOTL_TO_POND


    RUNOFF VOLUME =     1.01131 INCHES     =       1.4885 ACRE-FEET
    PEAK DISCHARGE RATE =      20.32 CFS  AT   1.500 HOURS   BASIN AREA =   .0276 SQ. MI.


*S  ROUTE THE RUNOFF TO THE POND.
COMPUTE RATING CURVE CID=1  VS NO=1  CODE=-1  SLP=.004
                   DIA=30 IN  N=.013
```

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.13	.10	.14	1.11
.26	.27	.59	1.53
.39	.49	1.37	1.82
.52	.74	2.47	2.03
.65	1.02	3.86	2.19
.78	1.31	5.50	2.32
.91	1.62	7.37	2.41
1.04	1.94	9.42	2.47
1.17	2.26	11.62	2.50
1.30	2.59	13.91	2.50
1.43	2.91	16.23	2.50
1.56	3.23	18.55	2.50
1.69	3.54	20.79	2.50
1.82	3.84	22.89	2.50
1.95	4.12	24.77	2.50
2.08	4.37	26.33	2.50
2.21	4.60	27.45	2.50
2.35	4.78	27.91	2.50
2.50	4.91	27.91	2.50

```
COMPUTE TRAVEL TIME ID=3  REACH=1  VS NO=1  L=130  SLP=.004
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.130	.098	.14	.0259
.261	.271	.59	.0166
.391	.490	1.37	.0129
.521	.741	2.47	.0108
.651	1.017	3.86	.0095
.782	1.312	5.50	.0086
.912	1.620	7.37	.0079
1.042	1.937	9.42	.0074
1.173	2.261	11.62	.0070
1.303	2.586	13.91	.0067
1.433	2.910	16.23	.0065
1.563	3.229	18.55	.0063
1.694	3.540	20.79	.0061
1.824	3.837	22.89	.0061
1.954	4.117	24.77	.0060
2.084	4.373	26.33	.0060

```
                          2.215       4.599       27.45       .0061
                          2.345       4.783       27.91       .0062
                          2.500       4.909       27.91       .0064
ROUTE                ID=3  HYD=PIPE  INFLOW ID=2  DT=.03333
PRINT HYD            ID=3  CODE=1

                                   HYDROGRAPH FROM AREA PIPE


    RUNOFF VOLUME =     1.01121 INCHES     =       1.4883 ACRE-FEET
    PEAK DISCHARGE RATE =      20.38 CFS  AT   1.533 HOURS   BASIN AREA =   .0276 SQ. MI.


*S  ROUTE THE RUNOFF THROUGH THE POND.
ROUTE RESERVOIR      ID=2  HYD=DEV_POND_OUT  INFLOW ID=3  CODE=10
                     OUTFLOW (CFS)  STORAGE (AC_FT)  ELEVATION
                        0               0               4950
                      2.8             0.87              4952
                      3.3             1.41              4953
                      3.7             1.95              4954
                      4.0             2.49              4955

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	4950.00	.000	.00
.33	.00	4950.00	.000	.00
.67	.00	4950.00	.000	.00
1.00	.00	4950.00	.000	.00
1.33	4.46	4950.04	.016	.05
1.67	18.37	4951.10	.477	1.54
2.00	14.74	4952.02	.882	2.81
2.33	4.72	4952.33	1.050	2.97
2.67	1.84	4952.34	1.052	2.97
3.00	.77	4952.25	1.004	2.92
3.33	.35	4952.13	.939	2.86
3.67	.18	4952.00	.868	2.79
4.00	.12	4951.83	.798	2.57
4.33	.09	4951.69	.733	2.36
4.67	.09	4951.55	.673	2.17
5.00	.09	4951.42	.619	1.99
5.33	.10	4951.31	.569	1.83
5.67	.11	4951.20	.523	1.68
6.00	.11	4951.11	.482	1.55
6.33	.14	4951.02	.444	1.43
6.67	.14	4950.94	.410	1.32
7.00	.14	4950.87	.379	1.22
7.33	.13	4950.81	.350	1.13
7.67	.13	4950.75	.324	1.04
8.00	.13	4950.69	.300	.97
8.33	.13	4950.64	.278	.89
8.67	.12	4950.59	.258	.83
9.00	.12	4950.55	.239	.77
9.33	.12	4950.51	.222	.71
9.67	.12	4950.47	.206	.66
10.00	.11	4950.44	.192	.62
10.33	.11	4950.41	.178	.57
10.67	.11	4950.38	.166	.53
11.00	.11	4950.36	.155	.50
11.33	.11	4950.33	.145	.47
11.67	.10	4950.31	.135	.43

12.00	.10	4950.29	.126	.41
12.33	.10	4950.27	.118	.38
12.67	.10	4950.25	.111	.36
13.00	.10	4950.24	.104	.34
13.33	.10	4950.23	.098	.31
13.67	.09	4950.21	.092	.30
14.00	.09	4950.20	.087	.28
14.33	.09	4950.19	.082	.26
14.67	.09	4950.18	.077	.25
15.00	.09	4950.17	.073	.24
15.33	.09	4950.16	.069	.22
15.67	.09	4950.15	.066	.21
16.00	.09	4950.14	.062	.20
16.33	.09	4950.14	.059	.19
16.67	.08	4950.13	.057	.18
17.00	.08	4950.12	.054	.17
17.33	.08	4950.12	.052	.17
17.66	.08	4950.11	.049	.16
18.00	.08	4950.11	.047	.15
18.33	.08	4950.10	.045	.15

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
18.66	.08	4950.10	.044	.14
19.00	.08	4950.10	.042	.13
19.33	.08	4950.09	.040	.13
19.66	.08	4950.09	.039	.13

PEAK DISCHARGE = 2.976 CFS - PEAK OCCURS AT HOUR 2.50
MAXIMUM WATER SURFACE ELEVATION = 4952.353
MAXIMUM STORAGE = 1.0606 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA DEV_POND_OUT

RUNOFF VOLUME = .98561 INCHES = 1.4506 ACRE-FEET
PEAK DISCHARGE RATE = 2.98 CFS AT 2.500 HOURS BASIN AREA = .0276 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 16:10:35

Appendix B

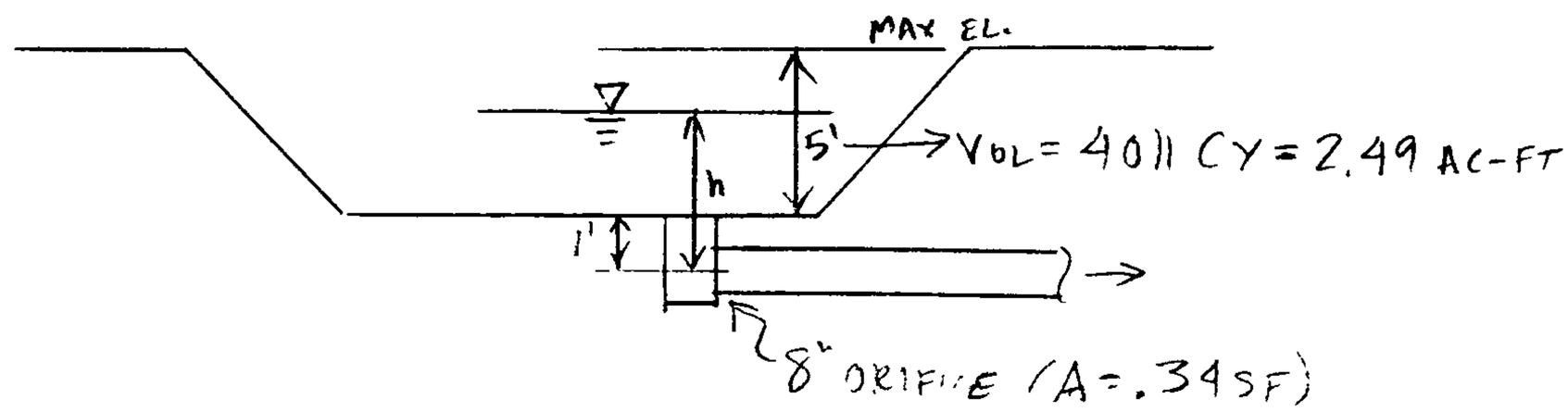
Supplemental Calculations

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
5639 JEFFERSON STREET N.E. • ALBUQUERQUE, NEW MEXICO 87109
PHONE (505) 344-4080 • FAX (505) 343-8759

SHEET NO. _____ OF _____
JOB PAT HURLEY PARK
SUBJECT _____
CLIENT _____ JOB NO. _____
BY JK DATE 9/26/97
CHECKED BY _____ DATE _____

SUPPLEMENTAL CALCULATIONS

1. EXISTING POND BETWEEN BLUEWATER AND ARENAL.



USE ORIFICE EQUATION TO ANALYZE:

$$Q_{CAP} = .6\,A\sqrt{2gh}$$

$$= .6\,(.34)\sqrt{2(32.2)h}$$

h (ft.)	Q_{CAP} (CFS)	Vol (ac-ft.)
3	2.8	0.87
4	3.3	1.41
5	3.7	1.95
6	4.0	2.49

2. DETERMINATION OF LAND TREATMENT TYPES:

DEVELOPED "C" FACTOR OF 0.60 WAS USED IN SAP 219 (1990), FOR USE WITH RATIONAL METHODOLOGY

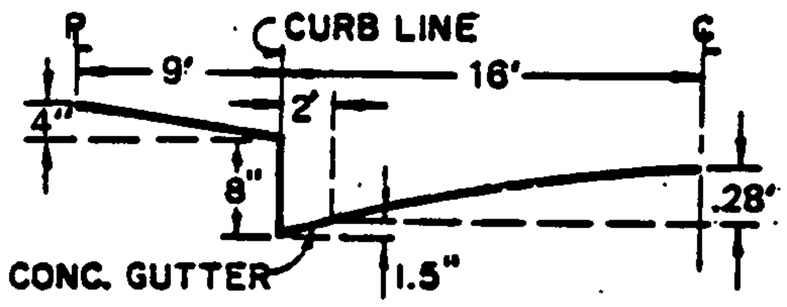
CURRENT AHYMO METHODOLOGY REQUIRES THE USE OF LAND TREATMENT FACTORS. CORRESPONDING LAND TREATMENT FACTORS ARE:

				OLD "C" FACTOR		
"B"	LANDSCAPED	50%	×	0.25	=	.125
"D"	IMPERVIOUS	50%	×	0.95	=	.475
						0.600 ✓

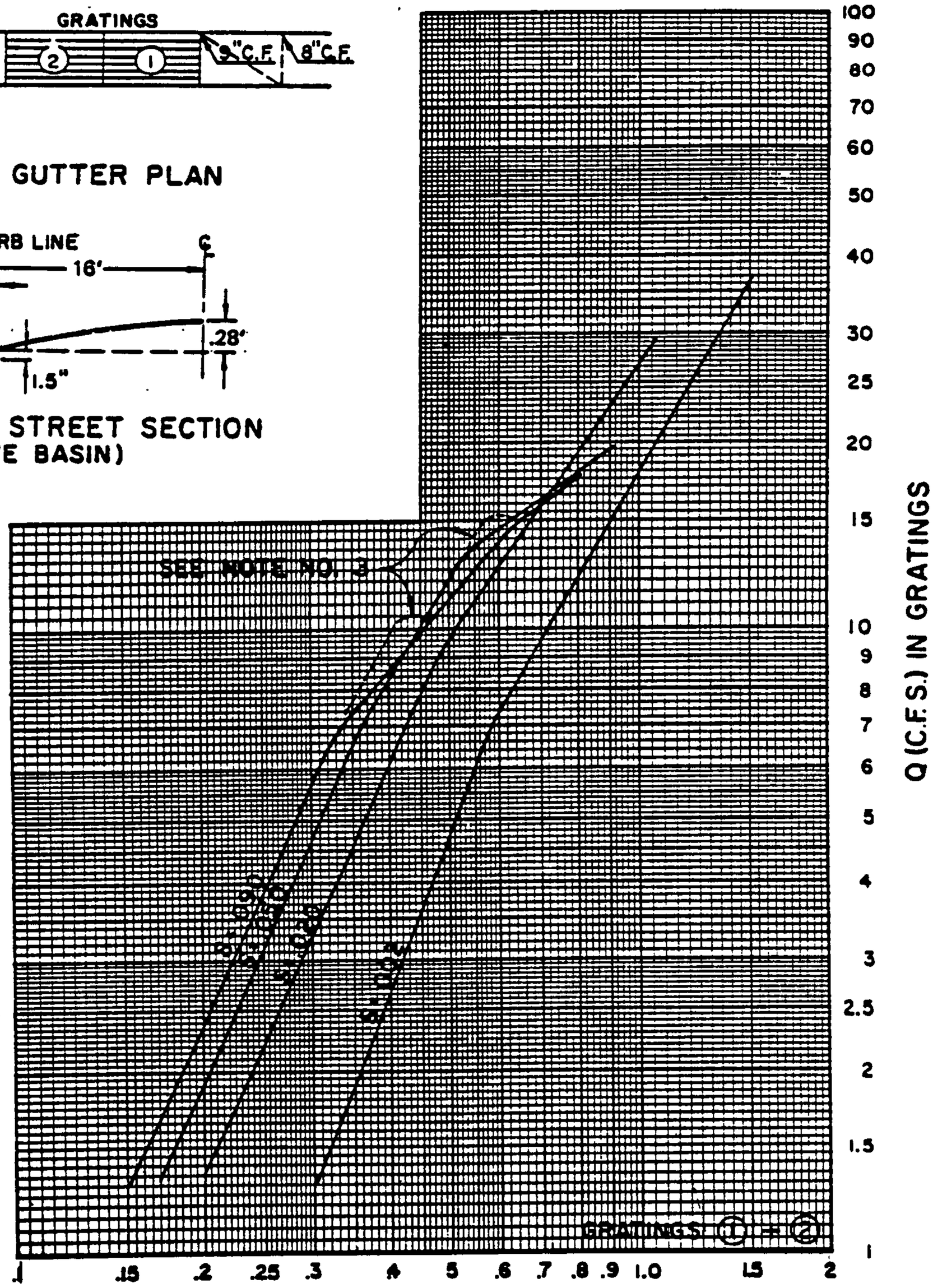
USE 50% "B" & 50% "D".

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

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



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

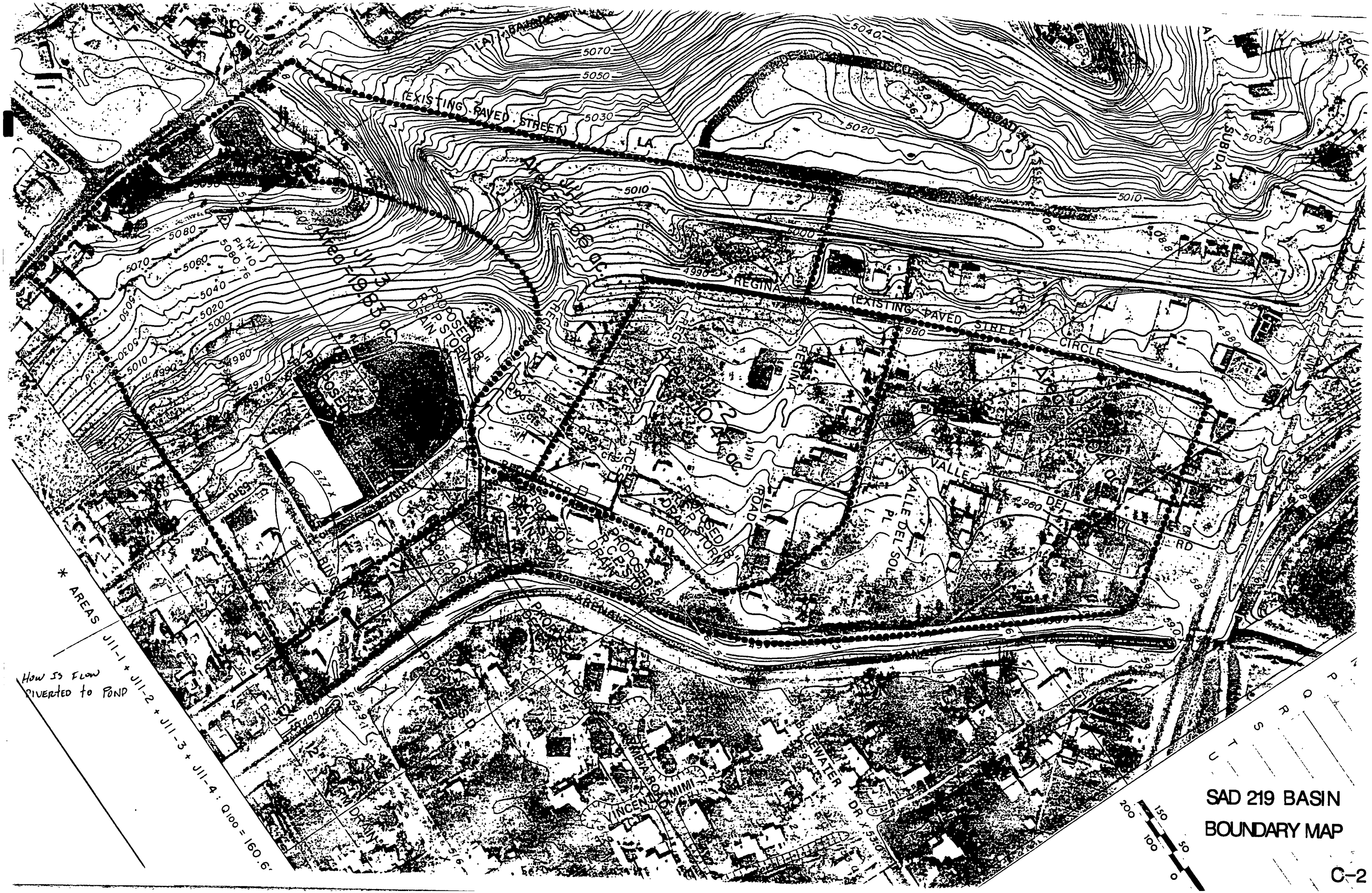
Appendix C

SAD 219 Data

SAD 219 DRAINAGE SUMMARY SHEET

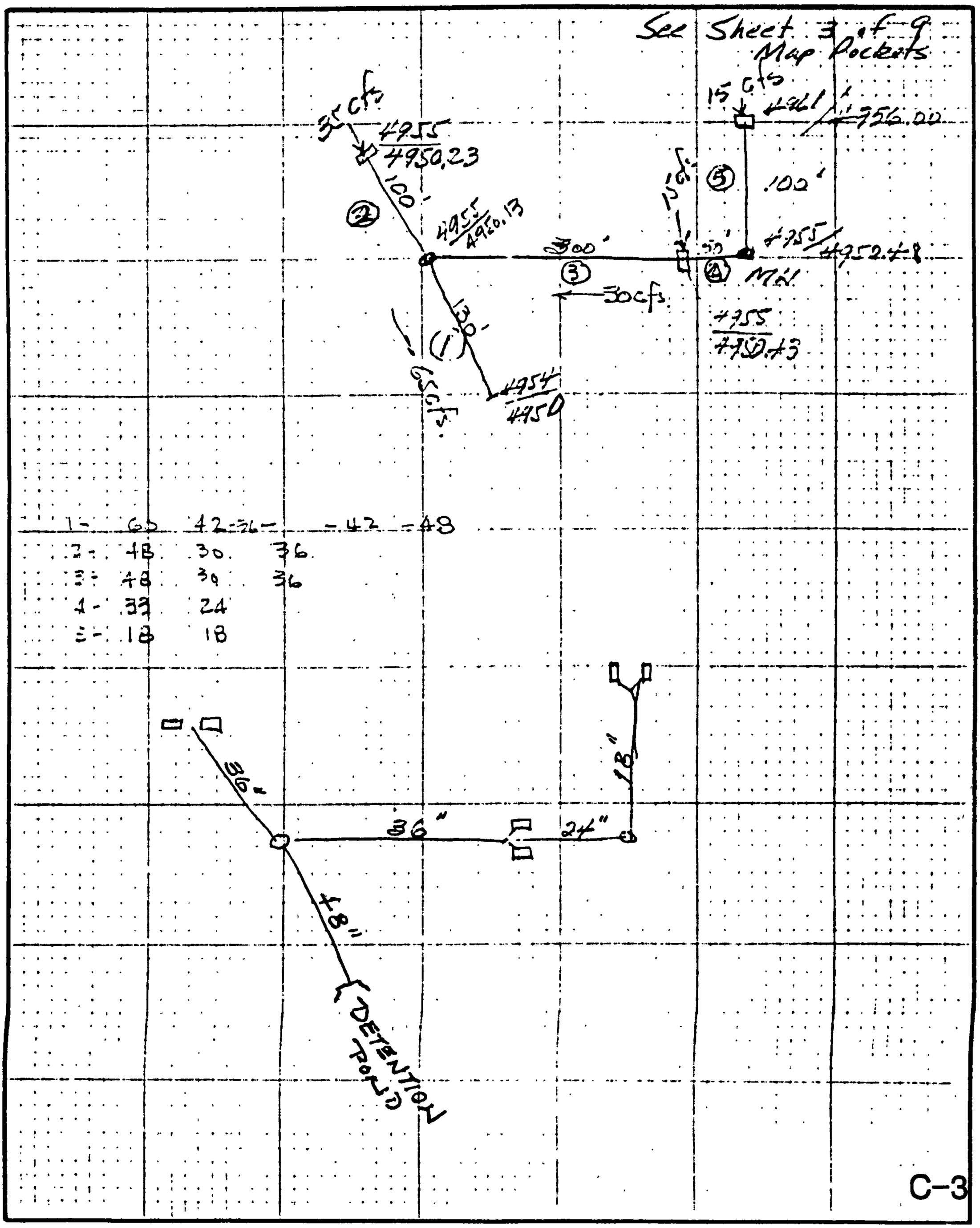
REGINA AREA

Area Designation	Area (Acres)	Rainfall Intensity (i)	C Factor	100 year Runoff Rate
51st and Rincon Outfall				
J11-1	12.66	4.65	0.60	35.32
J11-2	10.47	4.65	0.60	29.21
J11-3	19.83	4.65	0.60	55.33
J11-4	18.04	3.78	0.60	40.91


SAD 219 BASIN
BOUNDARY MAP
(EXISTING PAVED STREET)
REGINA
CIRCLE
VALLE DEL SOLES PL
VALLE DEL
RD
PROPOSED 18" RCP STORM DRAIN
PROPOSED 30" RCP STORM DRAIN
PROPOSED DETENTION POND
COLUMBIA ROAD
VINCENTI
BLUEWATER DR
AREAS J11-1 + J11-2 + J11-3 + J11-4 : Q100 = 160.6
How is Flow Diverted to Pond
Area = 1,983,000 sq.
Area = 1,041,000 sq.
Area = 1,000,000 sq.
5070
5050
5040
5030
5020
5010
5000
4990
4980
4970
4960
4950
150
200
100
50
0

D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB Regina
SUBJECT Storm Drains
JOB NO.
SHEET 1 OF 1
BY ZMG
DATE 11-13-89
CHECKED
DATE



JOB DESCR: REGINA 1
RUN DATE :11-13-1989

STORM SEWER - HYDRAULIC ANALYSIS - FILE: REGINA 1.STM

RAINFALL LOCATION: SOMEWHERE UNITED STATES
RETURN PERIOD = 100 YRS

LINE 1 / DFQ = 65.0 / HT = 48 / WID = 48 / N = .015 / L = 130 / JLC = 1

OUTFALL

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.61	31.27	4950.00	7.37	4953.45	45.42	30.04	8.42
UPSTRM	4953.37	38.69	4950.13	5.96	4953.92	37.65	30.04	10.91

DA = 0 C = 0 Tc = 1.5 INL TM = 0 INT = 11.15 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 2 / DFQ = 35.0 / HT = 36 / WID = 36 / N = .015 / L = 100 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	36.00	4950.13	4.95	4954.30	0.00	23.39	7.07
UPSTRM	4954.67	36.00	4950.23	4.95	4955.05	0.00	23.39	7.07

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 3 / DFQ = 30.0 / HT = 36 / WID = 36 / N = .015 / L = 300 / JLC = 1

DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4953.92	36.00	4950.13	4.24	4954.20	0.00	21.65	7.07
UPSTRM	4954.73	36.00	4950.42	4.24	4955.01	0.00	21.65	7.07

DA = 0 C = 0 Tc = .5 INL TM = 0 INT = 11.66 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 4 / DFQ = 15.0 / HT = 24 / WID = 24 / N = .015 / L = 50 / JLC = 1

DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.01	24.00	4950.43	4.76	4955.36	0.00	16.99	3.14
UPSTRM	4955.79	24.00	4950.43	4.77	4955.66	0.00	16.99	3.14

DA = 0 C = 0 Tc = .3 INL TM = 0 INT = 11.75 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

SLOPE OF INVERT = 0.100 % , ALLOWABLE DEPTH AT INLET OPENING = 0.0 IN

LINE 5 / DFQ = 15.0 / HT = 18 / WID = 18 / N = .015 / L = 100 / JLC = 1

DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	CR DP	AREA
DNSTRM	4955.58	18.00	4950.48	6.49	4956.78	0.00	16.93	1.77
UPSTRM	4959.45	18.00	4952.00	6.49	4960.81	0.00	16.93	1.77

DA = 0 C = 0 Tc = 0 INL TM = 0 INT = 11.93 TOT CA = 0

REQ'D GRATE AREA = 0.0 SQFT , REQ'D LENGTH OF CURB INLET = 0.0 FT

dmg D. MARK GOODWIN & ASSOC.
CONSULTING ENGINEERS

JOB SAD 219
SUBJECT Regina Drainage
JOB NO. 88-10 SHEET 1 OF 1
BY tab DATE 5/30/90
CHECKED DATE

It is proposed to pave Regina Circle, Regina Place, and Regina Drive as part of SAD 219. All three streets lie within drainage areas J11-1 and J11-2. Paving these streets and constructing homes in the area will increase the C Factor from 0.50 to 0.60.

The resulting increase in stormwater runoff volume is calculated as follows:

Area J11-1

Area = 12.66 Acres = 550,000 FT^2

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(550,000) = 59,600\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(550,000) = 71,500\ FT^3$

Net increase in runoff (J11-1) = 12,000 FT^3

Area J11-2

Area = 10.47 Acres = 456,000 FT^3

Before Development

$V = CdA = 0.5\left(\frac{2.6}{12}\right)(456,000) = 49,400\ FT^3$

After Development

$V = CdA = 0.6\left(\frac{2.6}{12}\right)(456,000) = 59,300\ FT^3$

Net increase in runoff (J11-2) = 9,900 FT^3

Net calculated runoff due to development = 21,900 FT^3

Proposed new detention pond will intercept 100% of the runoff from Area J11-2 and 25% runoff from J11-1

Total Pond Volume = 1.00 x 59300 + 0.25(71,500)
= 77,000 FT^3

Ponded Volume = 77,000 FT^3
Runoff Increase = 21,900 FT^3
Net Pond Benefit 55,100 FT^3

Outlet

$Q = CA\sqrt{2gh} = 0.70\,(.35)\sqrt{2(32.2)(6)} = .5$ cfs

A (8" orifice) = $\left(\frac{4}{12}\right)^2\pi = 0.35\ ft^2$

Terry O. Brown, P.E.

P. O. Box 92051
Albuquerque, New Mexico 87199
Ph. 768-9447

Consulting Engineer

July 10, 1991

Gilbert Aldaz, P.E.
Public Works Department
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Redesign of Regina Pond in SAD 219

Dear Gilbert:

Enclosed are the completed Drainage Information Sheet and some drawings showing the proposed design of the reference Regina Pond redesign in conformance with my discussions with Glenn Jergensen of Arroyo Maintenance. As you can see, even though we are proposing to raise the bottom of the pond by an average of 2.5 feet, the capacity of the pond is still well above the 3,000 cubic yards (81,000 cubic feet) required.

If you have questions, please call me.

Sincerely,

Terry O. Brown

Terry O. Brown, P.E.

cc: Glenn Jergensen, City of Alb. Arroyo Maintenance w/attach.
File - D:\WP51\219\REGIPOND.LET/1

DRAINAGE INFORMATION SHEET

PROJECT TITLE: **SAD 219** ZONE ATLAS/DRNG FILE # **J-11-Z**

LEGAL DESCRIPTION: **LOT 88-B, REGINA ADDITION**

CITY ADDRESS: **150' S.E. OF BLUEWATER/REGINA CIRCLE**

ENGINEERING FIRM: **TERRY O. BROWN, P.E.** CONTACT: **TERRY O. BROWN**

ADDRESS: **P.O. BOX 92051, ALBUQUERQUE, NM 87199** TELEPHONE: **768-9447**

OWNER: **CITY OF ALBUQUERQUE** CONTACT: **LEE LUNSFORD**

ADDRESS: **P.O. BOX 1293, ALBUQUERQUE, NM 87103** TELEPHONE: **768-3965**

ARCHITECT: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

SURVEYOR: **N/A** CONTACT: **N/A**

ADDRESS: **N/A** TELEPHONE: **N/A**

CONTRACTOR: **CCM, INC.** CONTACT: **JAY CARAZZA**

ADDRESS: **8019 EDITH, ALBUQUERQUE, NM 87113** TELEPHONE: **898-7777**

PRE-DESIGN MEETING: **YES**

TYPE OF SUBMITTAL: **DRAINAGE POND REDESIGN**

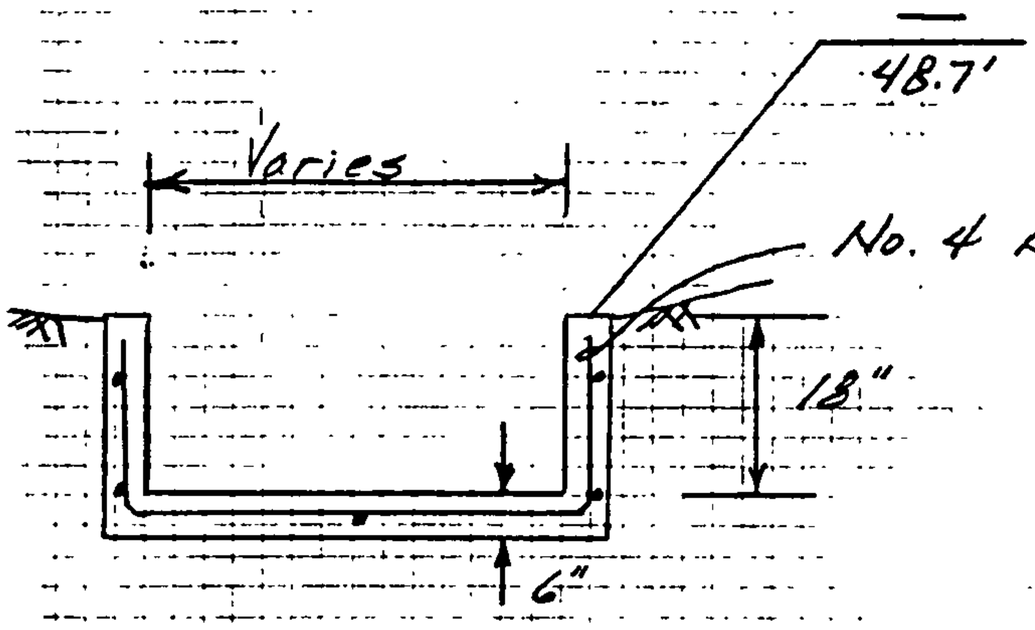
TYPE OF APPROVAL SOUGHT: **REDESIGN (SAD)**

DRB NO., EPC NO., PROJ. NO.: **PROJECT NO. 3558**

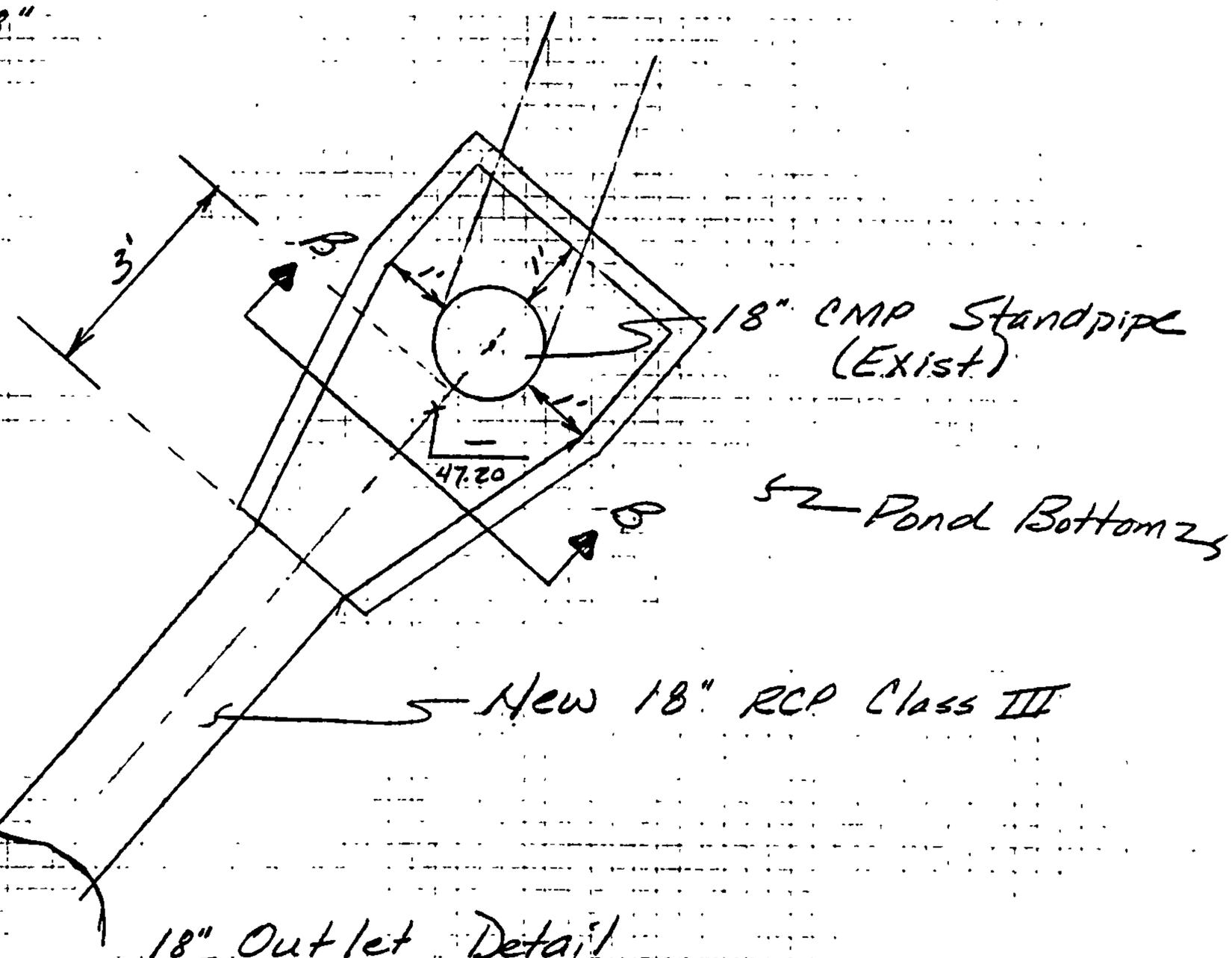
DATE SUBMITTED: **07/10/91**

BY: Terry O. Brown

Terry O. Brown, P. E.



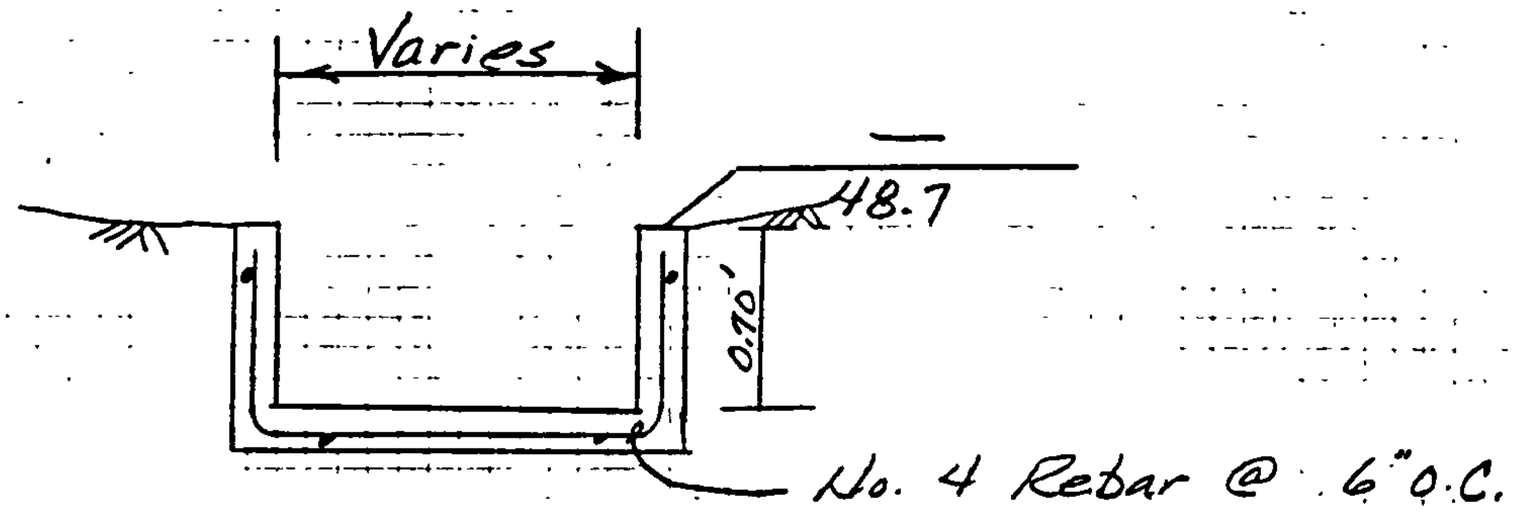
Section B-B
(No Scale)



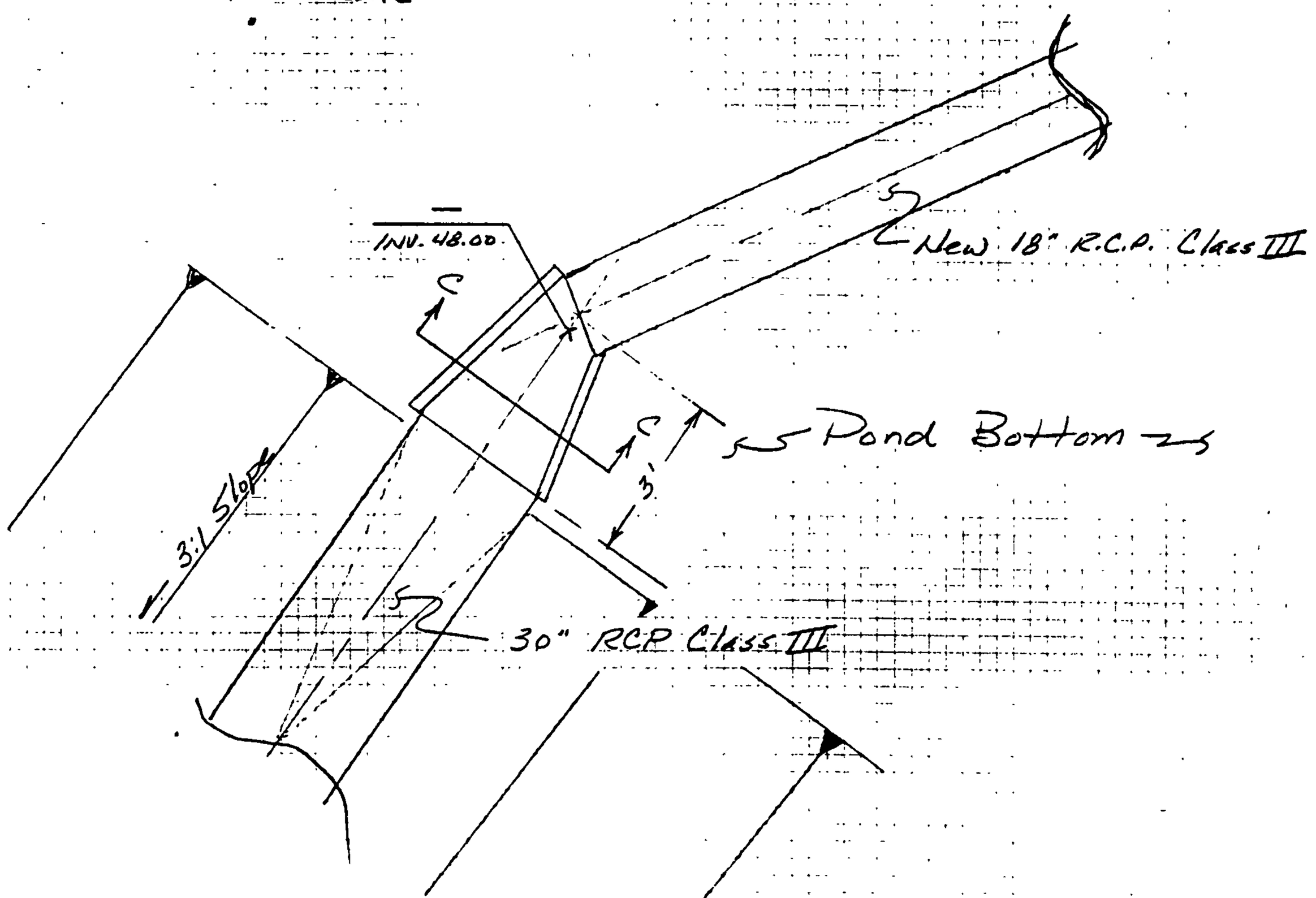
18" Outlet Detail

Sheet 1 of 4

7/9/91



Section C-C
No Scale



18" Inlet Detail

C-9

Sheet 2 of 4

7/9/91

Pond Volume Calculation

Pond Top = 55.15

New Pond Bottom = 50.00

Area of Pond Bottom = 12,600 S.F.

Depth = 5.15'

Volume Pond Bottom = 64,890 C.F. or 2,400 C.Y.

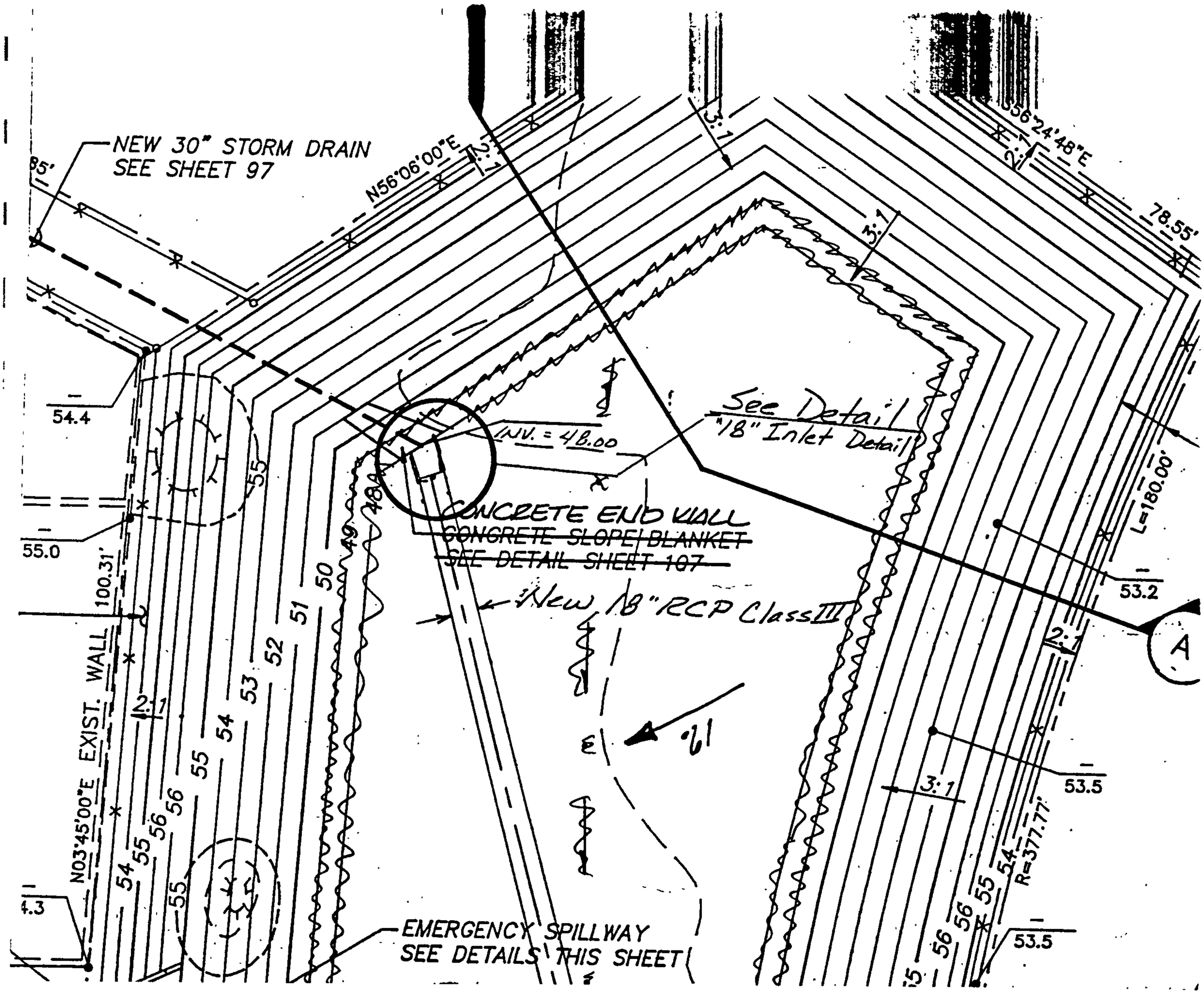
Slope Volume = 15' x 5' x (90 + 170 + 80 + 50 + 190)

= 43,500 C.F or 1,611 C.Y.

Total Pond Volume (Revised) = 4,011 C.Y.

Pond Volume Required = 3,000 C.Y.

Note: Elevation of outfall invert at 51st/Rincon = 48.5


NEW 30" STORM DRAIN
SEE SHEET 97
N56°06'00"E
3:1
S56°24'48"E
78.55'
54.4
55.0
See Detail
"18" Inlet Detail
INV. = 48.00
CONCRETE END WALL
~~CONCRETE SLOPE/BLANKET~~
~~SEE DETAIL SHEET 107~~
New 18" RCP Class III
L=180.00'
53.2
A
100.31'
EXIST. WALL
N03°45'00"E
2:1
53.5
R=377.77'
EMERGENCY SPILLWAY
SEE DETAILS THIS SHEET

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344-4080 · FAX (505) 343 8759

LETTER OF TRANSMITTAL

RECEIVED OCT - 7 1997 DRAINAGE SECTION

TO: City of Albuquerque
Hydrology Department
Plaza del Sol
ATTN: Bernie Montoya

DATE: 10/17/97
JOB # M23-103-5197
RE: Pat Hurley Park
Basin Boundary Maps

WE ARE SENDING YOU ✓ ATTACHED ___ UNDER SEPARATE COVER, THE FOLLOWING ITEMS:

___ SHOP DRAWINGS	___ PLANS	___ SPECIFICATIONS	___ DISKETTE
___ CHANGE ORDER	✓ PRINTS	___ CALCULATIONS	___ PROPOSAL INFO
___ COPY OF LETTER	___ SAMPLES	___ REPORT	___ ___

COPIES	DATE	NO.	DESCRIPTION
1	10/17/97	1	Existing Basin Boundary Map
1	10/17/97	2	Proposed Basin Boundary Map

THESE ARE TRANSMITTED AS CHECKED BELOW:

✓ FOR YOUR USE
___ AS REQUESTED
___ PLEASE CORRECT AND RESUBMIT
___ RESUBMITTAL IS NOT REQUIRED
CORRECTIONS, IF ANY, ARE NOTED

✓ FOR REVIEW & COMMENT
___ RETURNED AFTER LOAN TO US
___ SUBMIT ___ COPIES FOR DISTRIBUTION
___ RETURN ___ CORRECTED PRINTS
___ BIDS/PROPOSALS DUE _____ 199_

REMARKS: Could you please replace the attached Basin Boundary Maps to the Drainage Report for Pat Hurley Park submitted on October 3 1997. These maps were cleaned up for better clarification of existing & proposed features.

COPIES TO: File

SIGNED: Jerrie Martinez

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

REV.9/95

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344 4080 · FAX (505) 343 8759

DRAINAGE REPORT

FOR

PAT HURLEY PARK

ALBUQUERQUE, NEW MEXICO

JUN 2 5 1997
HYDROLOGY SECTION

JUNE, 1997

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
THE ENGINEERING FIRM OF CHOICE
5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344 4080 · FAX (505) 343-8759

DRAINAGE REPORT

FOR

PAT HURLEY PARK

ALBUQUERQUE, NEW MEXICO

JOE P. KELLEY
NEW MEXICO
9996
REGISTERED PROFESSIONAL ENGINEER
6/25/97

JUNE, 1997

LOCATION

This site is located between Yucca Drive and Regina Circle in southwest Albuquerque. It is bordered by La Bajada Road on the northwest side and Rincon Road on the south side.

FLOOD HAZARD ZONES

As shown by Panel 3500020027 of the National Flood Insurance Rate Map for the City of Albuquerque, dated October 14, 1983, the site is not located within a flood plain.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

The site slopes from Yucca Drive on the west side toward Regina Circle on the east side. Half of the site is covered by very steep undeveloped land that has slopes which vary between 20% and 45%, and the other half is developed. On the far southwest corner of the site, development includes an existing parking lot, a basketball court, four tennis courts, a playground area, and a baseball field. In the developed area, the site is landscaped on gentle slopes of 1 to 2%.

The site does not accept any off-site runoff. Runoff generated from Yucca Drive and La Bajada Road is intercepted by curb and gutter and is discharged to the north.

All on-site runoff discharges to Regina Circle. The existing runoff amount for the entire park is 60.32 cfs (page A-6). From Regina Circle, it joins other public runoff and discharges to the east through a channel to an existing retention pond.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The developed drainage pattern is essentially the same as existing. All runoff will discharge to Regina Circle. On the far east side of the site, a new parking lot, basketball court, and amphitheater will be constructed. All runoff will discharge to Regina Circle. In order to decrease the developed discharge to less than the existing runoff amount, a detention pond will be constructed on the east side of the site. The attenuated runoff will be released from the pond through nine 6" pipes. The pipe capacity for each of the 6" pipes is 1.12 cfs (Page C-5). These pipes will release runoff onto Regina Circle. The total proposed discharged runoff amount is 41.78 cfs, (page B-7) and the released runoff amount from the pond is 8.84 cfs (page B-6). A table on the following page lists existing runoff, proposed runoff, and outlet capacities for each of the basins.

A proposed retaining wall will separate existing steep slopes in the west part of the park from more usable areas. These slopes will not be graded but be reseeded for erosion control. Runoff from these slopes will be collected by a series of inlets along the toe of the

slope and discharge into the proposed detention pond through a new storm drain system. Sizing for the pipes in this storm drain system is based on Manning's Equation (Pages C-1 through C-3). A 100-year runoff amount of 24.02 cfs from Basin D (page B-7) will discharge through four proposed sidewalk culverts onto Regina Circle. Each of the sidewalk culverts has the capacity to convey 6.85 cfs (page C-4).

DRAINAGE BASIN SUMMARY

BASIN	EXISTING Q (CFS)	DEVELOPED Q (CFS)	OUTLET MECHANISM	OUTLET CAPACITY (CFS)
A1	5.08	5.08	FREE DISCHARGE	---
A2	8.18	8.18	FREE DISCHARGE	---
B1	5.94	5.94	9-6" PIPES (1% SLOPE)	10.08
B2	12.47	12.47	18" PIPE (1.7% SLOPE)	13.70
C1	2.12	5.95	24" PIPE (1.5% SLOPE)	27.71
C2	3.17	3.20	18" PIPE (1.5% SLOPE)	4.36
D	23.4	24.03	4 SW CULVERTS (1%SLOPE)	27.40
TOTAL	60.36	64.85		

PROPOSED RELEASED DISCHARGE FROM SITE=41.78 CFS

APPENDIX A

EXISTING

HYDROLOGIC COMPUTATIONS

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 05/13/1997
     START TIME (HR:MIN:SEC) = 16:34:43     USER NO.= CHVZ_GNM.I01
     INPUT FILE = G:\M23\102\AHYMOEX.IN

*S*************************************************************************
*S*************    CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.   *S*************
*S*************                PAT HURLEY PARK                 **************
*S*************************************************************************
*S*  FILENAME:  G:\M23\103\AHYMPROP.IN/OUT
*S*************************************************************************
*S******* 100 YEAR, 24 HOUR STORM (Section 22.2 Hydrology)
START              0.00
RAINFALL           TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.87
                   RAIN SIX=2.20  RAIN DAY=2.66 DT=0.03333

              COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT =    .033330 HOURS        END TIME =    19.964670 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   .0809   .0865   .0924   .1050
   .1334   .1771   .2398   .3254   .4379   .5814   .7600
   .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
  1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
  1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
  1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
  1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
  2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
  2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
  2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
  2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
  2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
  2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  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  2.1460  2.1475  2.1489
  2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
  2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
  2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
  2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
  2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
  2.1944  2.1956  2.1967  2.1978  2.1989  2.2000  2.2013
  2.2026  2.2039  2.2052  2.2065  2.2078  2.2091  2.2103
  2.2116  2.2129  2.2142  2.2155  2.2167  2.2180  2.2193
  2.2205  2.2218  2.2230  2.2243  2.2255  2.2268  2.2280
  2.2293  2.2305  2.2318  2.2330  2.2342  2.2354  2.2367
  2.2379  2.2391  2.2403  2.2415  2.2428  2.2440  2.2452
  2.2464  2.2476  2.2488  2.2500  2.2512  2.2524  2.2536
  2.2547  2.2559  2.2571  2.2583  2.2595  2.2606  2.2618
  2.2630  2.2641  2.2653  2.2665  2.2676  2.2688  2.2699
  2.2711  2.2722  2.2734  2.2745  2.2757  2.2768  2.2779
  2.2791  2.2802  2.2813  2.2825  2.2836  2.2847  2.2858
  2.2870  2.2881  2.2892  2.2903  2.2914  2.2925  2.2936
  2.2947  2.2958  2.2969  2.2980  2.2991  2.3002  2.3013
  2.3024  2.3035  2.3046  2.3057  2.3067  2.3078  2.3089
  2.3100  2.3110  2.3121  2.3132  2.3142  2.3153  2.3164
  2.3174  2.3185  2.3195  2.3206  2.3216  2.3227  2.3237
  2.3248  2.3258  2.3269  2.3279  2.3290  2.3300  2.3310
  2.3321  2.3331  2.3341  2.3352  2.3362  2.3372  2.3382
  2.3392  2.3403  2.3413  2.3423  2.3433  2.3443  2.3453
  2.3463  2.3473  2.3483  2.3493  2.3503  2.3513  2.3523
  2.3533  2.3543  2.3553  2.3563  2.3573  2.3583  2.3593
```

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

2.3603	2.3612	2.3622	2.3632	2.3642	2.3651	2.3661
2.3671	2.3681	2.3690	2.3700	2.3710	2.3719	2.3729
2.3738	2.3748	2.3758	2.3767	2.3777	2.3786	2.3796
2.3805	2.3815	2.3824	2.3834	2.3843	2.3852	2.3862
2.3871	2.3881	2.3890	2.3899	2.3909	2.3918	2.3927
2.3936	2.3946	2.3955	2.3964	2.3973	2.3983	2.3992
2.4001	2.4010	2.4019	2.4028	2.4038	2.4047	2.4056
2.4065	2.4074	2.4083	2.4092	2.4101	2.4110	2.4119
2.4128	2.4137	2.4146	2.4155	2.4164	2.4173	2.4181
2.4190	2.4199	2.4208	2.4217	2.4226	2.4234	2.4243
2.4252	2.4261	2.4270	2.4278	2.4287	2.4296	2.4304
2.4313	2.4322	2.4331	2.4339	2.4348	2.4356	2.4365
2.4374	2.4382	2.4391	2.4399	2.4408	2.4416	2.4425
2.4434	2.4442	2.4450	2.4459	2.4467	2.4476	2.4484
2.4493	2.4501	2.4510	2.4518	2.4526	2.4535	2.4543
2.4551	2.4560	2.4568	2.4576	2.4585	2.4593	2.4601
2.4609	2.4618	2.4626	2.4634	2.4642	2.4651	2.4659
2.4667	2.4675	2.4683	2.4691	2.4700	2.4708	2.4716
2.4724	2.4732	2.4740	2.4748	2.4756	2.4764	2.4772
2.4780	2.4788	2.4796	2.4804	2.4812	2.4820	2.4828
2.4836	2.4844	2.4852	2.4860	2.4868	2.4876	2.4884
2.4892	2.4899	2.4907	2.4915	2.4923	2.4931	2.4939
2.4946	2.4954	2.4962	2.4970	2.4978	2.4985	2.4993
2.5001	2.5008	2.5016	2.5024	2.5032	2.5039	2.5047
2.5055	2.5062	2.5070	2.5078	2.5085	2.5093	2.5100
2.5108	2.5116	2.5123	2.5131	2.5138	2.5146	2.5153
2.5161	2.5168	2.5176	2.5183	2.5191	2.5198	2.5206
2.5213	2.5221	2.5228	2.5236	2.5243	2.5250	2.5258
2.5265	2.5273	2.5280	2.5287	2.5295	2.5302	2.5309
2.5317	2.5324	2.5331	2.5339	2.5346	2.5353	2.5361
2.5368	2.5375	2.5382	2.5390	2.5397	2.5404	2.5411
2.5418	2.5426	2.5433	2.5440	2.5447	2.5454	2.5462
2.5469	2.5476	2.5483	2.5490	2.5497	2.5504	2.5511
2.5518	2.5526	2.5533	2.5540	2.5547	2.5554	2.5561
2.5568	2.5575	2.5582	2.5589	2.5596	2.5603	2.5610
2.5617	2.5624	2.5631	2.5638	2.5645	2.5652	2.5659
2.5665	2.5672	2.5679	2.5686	2.5693	2.5700	2.5707
2.5714	2.5721	2.5727	2.5734	2.5741	2.5748	2.5755
2.5761	2.5768	2.5775	2.5782	2.5789	2.5795	2.5802
2.5809	2.5816	2.5822	2.5829	2.5836		

```
*S COMPUTE RUNOFF FROM EXISTING BASIN A2
COMPUTE NM HYD       ID=1 HYD=BASIN_A2 DA=0.00424 SQ MI
                     %A=0 %B=10 %C=75 %D=15
                     TP=0.1333 RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.5110    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000636 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .108823HR    TP =   .133300HR    K/TP RATIO =   .816374     SHAPE CONSTANT, N =  4.377955
    UNIT PEAK =   10.264    CFS   UNIT VOLUME =    .9992       B =   379.63      P60 = 1.8700
    AREA =      .003604 SQ MI    IA =    .36765 INCHES    INF =    .87941 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                    HYDROGRAPH FROM AREA BASIN_A2


    RUNOFF VOLUME =     1.15823 INCHES     =        .2619 ACRE-FEET
    PEAK DISCHARGE RATE =       8.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.
```

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

```
*S COMPUTE RUNOFF FROM ON-SITE BASIN A1
COMPUTE NM HYD      ID=2 HYD=BASIN_A1 DA=0.00203 SQ MI
                    %A=0 %B=20 %C=0 %D=80
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4116    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001624 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .99623    CFS   UNIT VOLUME =    .9862       B =   327.09      P60 = 1.8700
    AREA =      .000406 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=2 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_A1


    RUNOFF VOLUME =     2.00961 INCHES     =        .2176 ACRE-FEET
    PEAK DISCHARGE RATE =       5.08 CFS  AT   1.500 HOURS   BASIN AREA =   .0020 SQ. MI.


*S  ADD BASINS A1 AND A2
ADD HYD             ID=10  HYD NO=BASINS_A1,A2 ID I=1 ID II=2
PRINT HYD           ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_A1,A2


    RUNOFF VOLUME =     1.43387 INCHES     =        .4795 ACRE-FEET
    PEAK DISCHARGE RATE =      13.26 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


 *S COMPUTE RUNOFF FROM ON-SITE BASIN B2
COMPUTE NM HYD      ID=3 HYD=BASIN_B2  DA=0.00674 SQ MI
                    %A=0 %B=15 %C=75 %D=10
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.6610    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000674 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .110054HR    TP =   .133300HR    K/TP RATIO =   .825614     SHAPE CONSTANT, N =  4.323756
    UNIT PEAK =   17.120    CFS   UNIT VOLUME =    .9996       B =   376.21      P60 = 1.8700
    AREA =      .006066 SQ MI    IA =    .37500 INCHES    INF =    .90000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=3 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_B2


    RUNOFF VOLUME =     1.07205 INCHES     =        .3854 ACRE-FEET
    PEAK DISCHARGE RATE =      12.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.
```

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

```
*S COMPUTE RUNOFF FROM ON-SITE BASIN B1
COMPUTE NM HYD       ID=4 HYD=BASIN_B1 DA=0.00411 SQ MI
                     %A=0 %B=90 %C=0 %D=10
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.6226    CFS   UNIT VOLUME =    .9922       B =   526.28      P60 = 1.8700
    AREA =      .000411 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   9.0765    CFS   UNIT VOLUME =    .9988       B =   327.09      P60 = 1.8700
    AREA =      .003699 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_B1


    RUNOFF VOLUME =      .83517 INCHES     =        .1831 ACRE-FEET
    PEAK DISCHARGE RATE =       5.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0041 SQ. MI.


*S  ADD BASIN B2 AND BASIN B1
ADD HYD              ID=2  HYD NO=BASINS_B2,B1 ID I=3 ID II=4
PRINT HYD            ID=2 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_B2,B1


    RUNOFF VOLUME =      .98232 INCHES     =        .5684 ACRE-FEET
    PEAK DISCHARGE RATE =      18.41 CFS  AT   1.500 HOURS   BASIN AREA =   .0109 SQ. MI.


*S  ADD BASINS A AND B
ADD HYD              ID=10  HYD NO=BASINS_A,B ID I=2 ID II=10
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_A,B


    RUNOFF VOLUME =     1.14769 INCHES     =       1.0479 ACRE-FEET
    PEAK DISCHARGE RATE =      31.67 CFS  AT   1.500 HOURS   BASIN AREA =   .0171 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN C2
COMPUTE NM HYD       ID=1 HYD=BASIN_C2 DA=0.00172 SQ MI
                     %A=0 %B=4 %C=94 %D=2
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .13581    CFS   UNIT VOLUME =    .9169       B =   526.28      P60 = 1.8700
    AREA =      .000034 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .106892HR    TP =   .133300HR    K/TP RATIO =   .801893     SHAPE CONSTANT, N =  4.466388
    UNIT PEAK =   4.8702    CFS   UNIT VOLUME =    .9979       B =   385.14      P60 = 1.8700
    AREA =      .001686 SQ MI    IA =    .35612 INCHES    INF =    .84714 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

```
PRINT HYD          ID=1 CODE=1

                                    HYDROGRAPH FROM AREA BASIN_C2


    RUNOFF VOLUME =     1.00573 INCHES     =        .0923 ACRE-FEET
    PEAK DISCHARGE RATE =      3.17 CFS  AT   1.500 HOURS   BASIN AREA =   .0017 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN D
COMPUTE NM HYD      ID=2 HYD=BASIN_D DA=0.01377 SQ MI
                    %A=0 %B=28 %C=70 %D=2
                    TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.0873    CFS   UNIT VOLUME =    .9881       B =   526.28      P60 = 1.8700
    AREA =      .000275 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .113045HR    TP =   .133300HR    K/TP RATIO =   .848052     SHAPE CONSTANT, N =  4.198298
    UNIT PEAK =   37.273    CFS   UNIT VOLUME =    .9998       B =   368.18      P60 = 1.8700
    AREA =      .013495 SQ MI    IA =    .39286 INCHES    INF =    .95000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=2 CODE=1

                                    HYDROGRAPH FROM AREA BASIN_D


    RUNOFF VOLUME =      .91674 INCHES     =        .6733 ACRE-FEET
    PEAK DISCHARGE RATE =     23.40 CFS  AT   1.500 HOURS   BASIN AREA =   .0138 SQ. MI.


*S  ADD BASIN C2 AND BASIN D
ADD HYD             ID=1  HYD NO=BASINS_C2,D ID I=1 ID II=2
PRINT HYD           ID=1 CODE=1

                                    HYDROGRAPH FROM AREA BASINS_C2,D


    RUNOFF VOLUME =      .92561 INCHES     =        .7647 ACRE-FEET
    PEAK DISCHARGE RATE =     26.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0155 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN C1
COMPUTE NM HYD      ID=2 HYD=BASIN_C1 DA=0.00231 SQ MI
                    %A=80 %B=20 %C=0 %D=0
                    TP=0.1333  RAINFALL=-1

    K =   .157145HR    TP =   .133300HR    K/TP RATIO =  1.178885     SHAPE CONSTANT, N =  3.010060
    UNIT PEAK =   4.8980    CFS   UNIT VOLUME =    .9968       B =   282.64      P60 = 1.8700
    AREA =      .002310 SQ MI    IA =    .62000 INCHES    INF =   1.58600 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD          ID=2 CODE=1

                                    HYDROGRAPH FROM AREA BASIN_C1


    RUNOFF VOLUME =      .47913 INCHES     =        .0590 ACRE-FEET
    PEAK DISCHARGE RATE =      2.12 CFS  AT   1.533 HOURS   BASIN AREA =   .0023 SQ. MI.
```

PAT HURLEY PARK - EXISTING HYDROLOGICAL OUTPUT

```
*S  ADD BASIN C1 TO C2 AND D
ADD HYD              ID=1  HYD NO=BASIN_TOTAL ID I=1 ID II=2
PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_TOTAL


    RUNOFF VOLUME =       .86767 INCHES     =        .8237 ACRE-FEET
    PEAK DISCHARGE RATE =      28.65 CFS  AT   1.500 HOURS   BASIN AREA =   .0178 SQ. MI.


*S  ADD BASINS FOR TOTAL
ADD HYD              ID=10  HYD NO=BASINS_TOTAL ID I=1 ID II=10
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_TOTAL


    RUNOFF VOLUME =     1.00495 INCHES     =       1.8716 ACRE-FEET
    PEAK DISCHARGE RATE =      60.32 CFS  AT   1.500 HOURS   BASIN AREA =   .0349 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 16:34:46
```

APPENDIX B

PROPOSED

HYDROLOGIC COMPUTATIONS

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 06/18/1997
     START TIME (HR:MIN:SEC) = 16:15:56     USER NO.= CHVZ_GNM.I01
     INPUT FILE = G:\M23\102\AHYMO.IN

*S*************************************************************************
*S**************    CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.   **************
*S**************                 PAT HURLEY PARK                **************
*S*************************************************************************
*S*  FILENAME:  G:\M23\103\AHYMPROP.IN/OUT
*S*************************************************************************
*S******* 100 YEAR, 24 HOUR STORM (Section 22.2 Hydrology)
START                0.00
RAINFALL             TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.87
                     RAIN SIX=2.20  RAIN DAY=2.66 DT=0.03333

                COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT =    .033330 HOURS        END TIME =    19.964670 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   .0809   .0865   .0924   .1050
   .1334   .1771   .2398   .3254   .4379   .5814   .7600
   .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
  1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
  1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
  1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
  1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
  2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
  2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
  2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
  2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
  2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
  2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  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  2.1460  2.1475  2.1489
  2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
  2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
  2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
  2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
  2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
  2.1944  2.1956  2.1967  2.1978  2.1989  2.2000  2.2013
  2.2026  2.2039  2.2052  2.2065  2.2078  2.2091  2.2103
  2.2116  2.2129  2.2142  2.2155  2.2167  2.2180  2.2193
  2.2205  2.2218  2.2230  2.2243  2.2255  2.2268  2.2280
  2.2293  2.2305  2.2318  2.2330  2.2342  2.2354  2.2367
  2.2379  2.2391  2.2403  2.2415  2.2428  2.2440  2.2452
  2.2464  2.2476  2.2488  2.2500  2.2512  2.2524  2.2536
  2.2547  2.2559  2.2571  2.2583  2.2595  2.2606  2.2618
  2.2630  2.2641  2.2653  2.2665  2.2676  2.2688  2.2699
  2.2711  2.2722  2.2734  2.2745  2.2757  2.2768  2.2779
  2.2791  2.2802  2.2813  2.2825  2.2836  2.2847  2.2858
  2.2870  2.2881  2.2892  2.2903  2.2914  2.2925  2.2936
  2.2947  2.2958  2.2969  2.2980  2.2991  2.3002  2.3013
  2.3024  2.3035  2.3046  2.3057  2.3067  2.3078  2.3089
  2.3100  2.3110  2.3121  2.3132  2.3142  2.3153  2.3164
  2.3174  2.3185  2.3195  2.3206  2.3216  2.3227  2.3237
  2.3248  2.3258  2.3269  2.3279  2.3290  2.3300  2.3310
  2.3321  2.3331  2.3341  2.3352  2.3362  2.3372  2.3382
  2.3392  2.3403  2.3413  2.3423  2.3433  2.3443  2.3453
  2.3463  2.3473  2.3483  2.3493  2.3503  2.3513  2.3523
  2.3533  2.3543  2.3553  2.3563  2.3573  2.3583  2.3593
```

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

2.3603	2.3612	2.3622	2.3632	2.3642	2.3651	2.3661
2.3671	2.3681	2.3690	2.3700	2.3710	2.3719	2.3729
2.3738	2.3748	2.3758	2.3767	2.3777	2.3786	2.3796
2.3805	2.3815	2.3824	2.3834	2.3843	2.3852	2.3862
2.3871	2.3881	2.3890	2.3899	2.3909	2.3918	2.3927
2.3936	2.3946	2.3955	2.3964	2.3973	2.3983	2.3992
2.4001	2.4010	2.4019	2.4028	2.4038	2.4047	2.4056
2.4065	2.4074	2.4083	2.4092	2.4101	2.4110	2.4119
2.4128	2.4137	2.4146	2.4155	2.4164	2.4173	2.4181
2.4190	2.4199	2.4208	2.4217	2.4226	2.4234	2.4243
2.4252	2.4261	2.4270	2.4278	2.4287	2.4296	2.4304
2.4313	2.4322	2.4331	2.4339	2.4348	2.4356	2.4365
2.4374	2.4382	2.4391	2.4399	2.4408	2.4416	2.4425
2.4434	2.4442	2.4450	2.4459	2.4467	2.4476	2.4484
2.4493	2.4501	2.4510	2.4518	2.4526	2.4535	2.4543
2.4551	2.4560	2.4568	2.4576	2.4585	2.4593	2.4601
2.4609	2.4618	2.4626	2.4634	2.4642	2.4651	2.4659
2.4667	2.4675	2.4683	2.4691	2.4700	2.4708	2.4716
2.4724	2.4732	2.4740	2.4748	2.4756	2.4764	2.4772
2.4780	2.4788	2.4796	2.4804	2.4812	2.4820	2.4828
2.4836	2.4844	2.4852	2.4860	2.4868	2.4876	2.4884
2.4892	2.4899	2.4907	2.4915	2.4923	2.4931	2.4939
2.4946	2.4954	2.4962	2.4970	2.4978	2.4985	2.4993
2.5001	2.5008	2.5016	2.5024	2.5032	2.5039	2.5047
2.5055	2.5062	2.5070	2.5078	2.5085	2.5093	2.5100
2.5108	2.5116	2.5123	2.5131	2.5138	2.5146	2.5153
2.5161	2.5168	2.5176	2.5183	2.5191	2.5198	2.5206
2.5213	2.5221	2.5228	2.5236	2.5243	2.5250	2.5258
2.5265	2.5273	2.5280	2.5287	2.5295	2.5302	2.5309
2.5317	2.5324	2.5331	2.5339	2.5346	2.5353	2.5361
2.5368	2.5375	2.5382	2.5390	2.5397	2.5404	2.5411
2.5418	2.5426	2.5433	2.5440	2.5447	2.5454	2.5462
2.5469	2.5476	2.5483	2.5490	2.5497	2.5504	2.5511
2.5518	2.5526	2.5533	2.5540	2.5547	2.5554	2.5561
2.5568	2.5575	2.5582	2.5589	2.5596	2.5603	2.5610
2.5617	2.5624	2.5631	2.5638	2.5645	2.5652	2.5659
2.5665	2.5672	2.5679	2.5686	2.5693	2.5700	2.5707
2.5714	2.5721	2.5727	2.5734	2.5741	2.5748	2.5755
2.5761	2.5768	2.5775	2.5782	2.5789	2.5795	2.5802
2.5809	2.5816	2.5822	2.5829	2.5836		

```
*S COMPUTE RUNOFF FROM PROPOSED BASIN A2
COMPUTE NM HYD       ID=1 HYD=BASIN_A2 DA=0.00424 SQ MI
                     %A=0 %B=10 %C=75 %D=15
                     TP=0.1333 RAINFALL=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.5110    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =       .000636 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .108823HR    TP =    .133300HR    K/TP RATIO =    .816374     SHAPE CONSTANT, N =  4.377955
    UNIT PEAK =   10.264    CFS   UNIT VOLUME =    .9992       B =   379.63      P60 = 1.8700
    AREA =       .003604 SQ MI    IA =    .36765 INCHES    INF =    .87941 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_A2


    RUNOFF VOLUME =     1.15823 INCHES     =        .2619 ACRE-FEET
    PEAK DISCHARGE RATE =       8.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0042 SQ. MI.
```

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

```
*S COMPUTE RUNOFF FROM ON-SITE BASIN A1
COMPUTE NM HYD       ID=2 HYD=BASIN_A1 DA=0.00203 SQ MI
                     %A=0 %B=20 %C=0 %D=80
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   6.4116    CFS   UNIT VOLUME =    .9976       B =   526.28      P60 = 1.8700
    AREA =      .001624 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .99623    CFS   UNIT VOLUME =    .9862       B =   327.09      P60 = 1.8700
    AREA =      .000406 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_A1


    RUNOFF VOLUME =     2.00961 INCHES     =        .2176 ACRE-FEET
    PEAK DISCHARGE RATE =       5.08 CFS  AT   1.500 HOURS   BASIN AREA =   .0020 SQ. MI.


*S  ADD BASINS A1 AND A2
ADD HYD              ID=10  HYD NO=BASINS_A1,A2 ID I=1 ID II=2
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_A1,A2


    RUNOFF VOLUME =     1.43387 INCHES     =        .4795 ACRE-FEET
    PEAK DISCHARGE RATE =      13.26 CFS  AT   1.500 HOURS   BASIN AREA =   .0063 SQ. MI.


 *S COMPUTE RUNOFF FROM ON-SITE BASIN B2
COMPUTE NM HYD       ID=3 HYD=BASIN_B2  DA=0.00674 SQ MI
                     %A=0 %B=15 %C=75 %D=10
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.6610    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000674 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .110054HR    TP =   .133300HR    K/TP RATIO =   .825614     SHAPE CONSTANT, N =  4.323756
    UNIT PEAK =   17.120    CFS   UNIT VOLUME =    .9996       B =   376.21      P60 = 1.8700
    AREA =      .006066 SQ MI    IA =    .37500 INCHES    INF =    .90000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_B2


    RUNOFF VOLUME =     1.07205 INCHES     =        .3854 ACRE-FEET
    PEAK DISCHARGE RATE =      12.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0067 SQ. MI.
```

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

```
*S COMPUTE RUNOFF FROM ON-SITE BASIN B1
COMPUTE NM HYD       ID=4 HYD=BASIN_B1 DA=0.00411 SQ MI
                     %A=0 %B=90 %C=0 %D=10
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   1.6226    CFS   UNIT VOLUME =    .9922       B =   526.28      P60 = 1.8700
    AREA =      .000411 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   9.0765    CFS   UNIT VOLUME =    .9988       B =   327.09      P60 = 1.8700
    AREA =      .003699 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_B1


    RUNOFF VOLUME =      .83517 INCHES     =        .1831 ACRE-FEET
    PEAK DISCHARGE RATE =       5.94 CFS  AT   1.500 HOURS   BASIN AREA =   .0041 SQ. MI.


*S  ADD BASINS B1 AND B2
ADD HYD              ID=1 HYD NO=BASINS_B1,B2 ID I=3 ID II=4
PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_B1,B2


    RUNOFF VOLUME =      .98232 INCHES     =        .5684 ACRE-FEET
    PEAK DISCHARGE RATE =      18.41 CFS  AT   1.500 HOURS   BASIN AREA =   .0109 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN C2
COMPUTE NM HYD       ID=5 HYD=BASIN_C2 DA=0.00172 SQ MI
                     %A=0 %B=3 %C=94 %D=3
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   .20372    CFS   UNIT VOLUME =    .9472       B =   526.28      P60 = 1.8700
    AREA =      .000052 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .106644HR    TP =   .133300HR    K/TP RATIO =   .800029     SHAPE CONSTANT, N =  4.478028
    UNIT PEAK =   4.8295    CFS   UNIT VOLUME =    .9979       B =   385.87      P60 = 1.8700
    AREA =      .001668 SQ MI    IA =    .35464 INCHES    INF =    .84299 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=5 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_C2


    RUNOFF VOLUME =     1.02313 INCHES     =        .0939 ACRE-FEET
    PEAK DISCHARGE RATE =       3.20 CFS  AT   1.500 HOURS   BASIN AREA =   .0017 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN C1
```

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

```
COMPUTE NM HYD        ID=6 HYD=BASIN_C1 DA=0.00231 SQ MI
                      %A=0 %B=15 %C=0 %D=85
                      TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   7.7520    CFS   UNIT VOLUME =    .9978       B =   526.28      P60 = 1.8700
    AREA =      .001964 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .130992HR    TP =   .133300HR    K/TP RATIO =   .982685     SHAPE CONSTANT, N =  3.593448
    UNIT PEAK =   .85023    CFS   UNIT VOLUME =    .9836       B =   327.09      P60 = 1.8700
    AREA =      .000347 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=6 CODE=1

                                          HYDROGRAPH FROM AREA BASIN_C1

    RUNOFF VOLUME =     2.09350 INCHES     =        .2579 ACRE-FEET
    PEAK DISCHARGE RATE =       5.95 CFS  AT   1.500 HOURS   BASIN AREA =   .0023 SQ. MI.


*S  ADD BASIN C1 AND BASIN C3
ADD HYD               ID=2  HYD NO=BASINS_C1,C2 ID I=5 ID II=6
PRINT HYD             ID=2 CODE=1

                                          HYDROGRAPH FROM AREA BASINS_C1,C2


    RUNOFF VOLUME =     1.63365 INCHES     =        .3511 ACRE-FEET
    PEAK DISCHARGE RATE =       9.15 CFS  AT   1.500 HOURS   BASIN AREA =   .0040 SQ. MI.


*S  ADD BASIN B AND C
ADD HYD               ID=1  HYD NO=BASINS_B,C ID I=1 ID II=2
PRINT HYD             ID=1 CODE=1

                                          HYDROGRAPH FROM AREA BASINS_B,C


    RUNOFF VOLUME =     1.15872 INCHES     =        .9196 ACRE-FEET
    PEAK DISCHARGE RATE =      27.57 CFS  AT   1.500 HOURS   BASIN AREA =   .0149 SQ. MI.


*S ROUTE BASINS B AND C THROUGH THE DETENTION POND
ROUTE RESERVOIR       ID=2  HYD NO=BASIN_ROUTE INFLOW ID=1 CODE=10
                      OUTFLOW(CFS)   STORAGE(AC-FT)  ELEVATION(FT)
                      0               0               0
                      10              0.500           1.50

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

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

      .00        .00       .00       .000       .00
      .33        .00       .00       .000       .00
      .67        .00       .00       .000       .00
     1.00        .00       .00       .000       .00
     1.33       3.66       .04       .014       .28
```

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

1.67	14.61	1.25	.417	8.34
2.00	4.18	1.20	.399	7.97
2.33	1.08	.83	.275	5.50
2.67	.42	.52	.173	3.45
3.00	.18	.32	.105	2.10
3.33	.10	.19	.063	1.27
3.67	.06	.11	.038	.76
4.00	.05	.07	.023	.46
4.33	.05	.04	.014	.29
4.67	.05	.03	.009	.19
5.00	.05	.02	.006	.13
5.33	.05	.01	.005	.10
5.67	.06	.01	.004	.08
6.00	.06	.01	.004	.07
6.33	.08	.01	.004	.07
6.67	.08	.01	.004	.07
7.00	.07	.01	.004	.07
7.33	.07	.01	.004	.07
7.67	.07	.01	.004	.07
8.00	.07	.01	.004	.07
8.33	.07	.01	.004	.07
8.67	.07	.01	.003	.07
9.00	.07	.01	.003	.07
9.33	.06	.01	.003	.07
9.67	.06	.01	.003	.07
10.00	.06	.01	.003	.06
10.33	.06	.01	.003	.06
10.67	.06	.01	.003	.06
11.00	.06	.01	.003	.06
11.33	.06	.01	.003	.06
11.67	.06	.01	.003	.06
12.00	.05	.01	.003	.06
12.33	.05	.01	.003	.06
12.67	.05	.01	.003	.05
13.00	.05	.01	.003	.05
13.33	.05	.01	.003	.05
13.67	.05	.01	.003	.05
14.00	.05	.01	.003	.05
14.33	.05	.01	.003	.05
14.67	.05	.01	.002	.05
15.00	.05	.01	.002	.05
15.33	.05	.01	.002	.05
15.67	.05	.01	.002	.05
16.00	.05	.01	.002	.05
16.33	.05	.01	.002	.05
16.67	.05	.01	.002	.05
17.00	.04	.01	.002	.05
17.33	.04	.01	.002	.04
17.66	.04	.01	.002	.04
18.00	.04	.01	.002	.04
18.33	.04	.01	.002	.04

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
18.66	.04	.01	.002	.04
19.00	.04	.01	.002	.04
19.33	.04	.01	.002	.04
19.66	.04	.01	.002	.04

PEAK DISCHARGE = 8.839 CFS - PEAK OCCURS AT HOUR 1.77
MAXIMUM WATER SURFACE ELEVATION = 1.326
MAXIMUM STORAGE = .4419 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=2 CODE=1

PAT HURLEY PARK - PROPOSED HYDROLOGICAL OUTPUT

```
                                        HYDROGRAPH FROM AREA BASIN_ROUTE

    RUNOFF VOLUME =      1.15616 INCHES      =         .9175 ACRE-FEET
    PEAK DISCHARGE RATE =        8.84 CFS  AT    1.766 HOURS   BASIN AREA =   .0149 SQ. MI.


*S  ADD BASINS A,B,C
ADD HYD              ID=10  HYD NO=BASIN_A,B,C ID I=2 ID II=10
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_A,B,C

    RUNOFF VOLUME =      1.23849 INCHES      =        1.3970 ACRE-FEET
    PEAK DISCHARGE RATE =       18.19 CFS  AT    1.533 HOURS   BASIN AREA =   .0212 SQ. MI.


*S COMPUTE RUNOFF FROM ON-SITE BASIN D
COMPUTE NM HYD       ID=1 HYD=BASIN_D DA=0.01377 SQ MI
                     %A=0 %B=25 %C=70 %D=5
                     TP=0.1333  RAINFALL=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   2.7182    CFS   UNIT VOLUME =    .9949       B =   526.28      P60 = 1.8700
    AREA =      .000689 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .112479HR    TP =   .133300HR    K/TP RATIO =   .843801     SHAPE CONSTANT, N =  4.221430
    UNIT PEAK =   36.278    CFS   UNIT VOLUME =    .9998       B =   369.67      P60 = 1.8700
    AREA =      .013082 SQ MI    IA =    .38947 INCHES    INF =    .94053 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1 CODE=1

                                        HYDROGRAPH FROM AREA BASIN_D


    RUNOFF VOLUME =       .96801 INCHES      =         .7109 ACRE-FEET
    PEAK DISCHARGE RATE =       24.03 CFS  AT    1.500 HOURS   BASIN AREA =   .0138 SQ. MI.


*S  ADD BASINS FOR TOTAL
ADD HYD              ID=10  HYD NO=BASINS_TOTAL ID I=1 ID II=10
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA BASINS_TOTAL


    RUNOFF VOLUME =      1.13183 INCHES      =        2.1079 ACRE-FEET
    PEAK DISCHARGE RATE =       41.78 CFS  AT    1.533 HOURS   BASIN AREA =   .0349 SQ. MI.


FINISH

    NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 16:15:59
```

APPENDIX C

PROPOSED

HYDRAULIC COMPUTATIONS

18" PIPE FROM BASIN B2
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\18.fm2
Worksheet	18" PIPE
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.017000	ft/ft
Diameter	18.00	in

Results		
Depth	1.50	ft
Discharge	13.70	cfs
Flow Area	1.77	ft²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.37	ft
Percent Full	100.00	
Critical Slope	0.014795	ft/ft
Velocity	7.75	ft/s
Velocity Head	0.93	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	14.73	cfs
Full Flow Capacity	13.70	cfs
Full Flow Slope	0.017000	ft/ft

[illegible] CFS From BASIN B2 (Page B-3)

12" PIPE FROM BASIN C2
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project9.fm2
Worksheet	18" PIPE CAPACITY
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.015000	ft/ft
Diameter	12.00	in

Results		
Depth	1.00	ft
Discharge	4.36	cfs
Flow Area	0.79	ft²
Wetted Perimeter	3.14	ft
Top Width	0.00	ft
Critical Depth	0.88	ft
Percent Full	100.00	
Critical Slope	0.013553	ft/ft
Velocity	5.56	ft/s
Velocity Head	0.48	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	4.69	cfs
Full Flow Capacity	4.36	cfs
Full Flow Slope	0.015000	ft/ft

> 3.20 CFS From BASIN C2 (Page B-4)

24" PIPE FROM BASINS B2, C1, AND C2
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\18.fm2
Worksheet	18" PIPE
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.015000	ft/ft
Diameter	24.00	in

Results		
Depth	2.00	ft
Discharge	27.71	cfs
Flow Area	3.14	ft²
Wetted Perimeter	6.28	ft
Top Width	0.00	ft
Critical Depth	1.82	ft
Percent Full	100.00	
Critical Slope	0.013087	ft/ft
Velocity	8.82	ft/s
Velocity Head	1.21	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	29.80	cfs
Full Flow Capacity	27.71	cfs
Full Flow Slope	0.015000	ft/ft

> 21.62 CFS

BASINS C1 and C2 9.15 CFS (Page B-5)
BASIN B2 12.47 CFS (Page B-3)
21.62 CFS

24" CULVERT CAPACITY FOR BASIN D
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\project9.fm2
Worksheet	24" SIDEWALK CULVERT
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Depth	0.58	ft
Bottom Width	2.00	ft

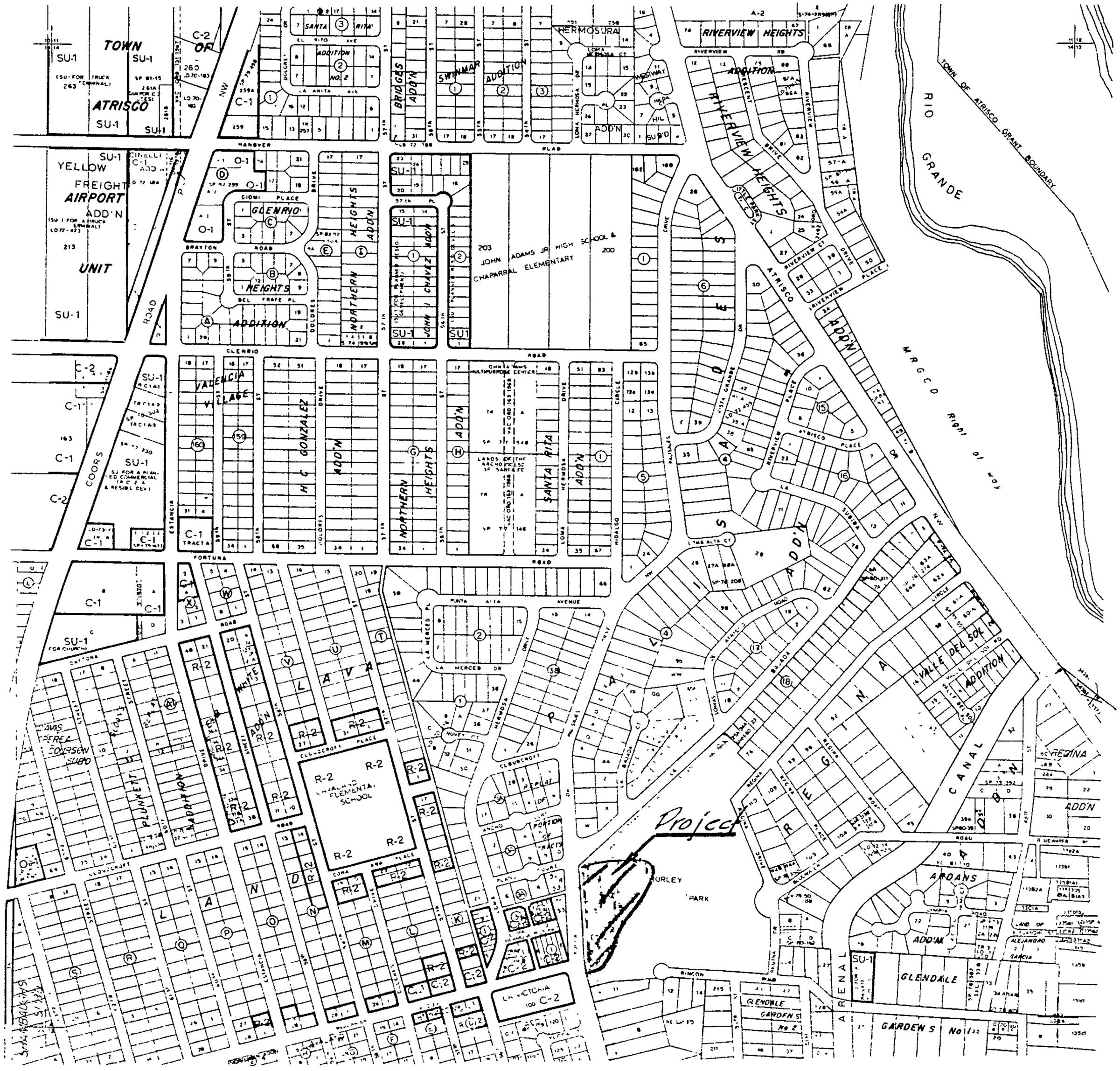
Results		
Discharge	6.85	cfs
Flow Area	1.17	ft²
Wetted Perimeter	3.17	ft
Top Width	2.00	ft
Critical Depth	0.71	ft
Critical Slope	0.005652	ft/ft
Velocity	5.87	ft/s
Velocity Head	0.54	ft
Specific Energy	1.12	ft
Froude Number	0.00	

PIPE CAPACITY FROM DETENTION POND

$Q = CdA\ \sqrt{(2gh)}$

Cd = 0.67
A(for 6" pipe) = 0.196 sf
h= 1.35 ft
Q= 1.12 cfs

Q= 1.12 cfs through 6" pipe when pond is full
Q= 10 cfs through 9-6" pipes at a full pond depth of 1.6'


TOWN OF ATRISCO
ATRISCO
YELLOW FREIGHT AIRPORT ADD'N
UNIT
RIO GRANDE
TOWN OF ATRISCO GRANT BOUNDARY
MRGCD Right of way
RIVERVIEW HEIGHTS
HERMOSURA
SWINMAR ADDITION
BRIDGES ADD'N
GLENRIO HEIGHTS
NORTHERN HEIGHTS ADDITION
JOHN ADAMS JR. HIGH SCHOOL & CHAPARRAL ELEMENTARY
JOHN J CHAVEZ ADDN
VALENCIA VILLAGE
H C GONZALEZ ADD'N
SANTA RITA ADD'N
COORS
LA VALLE
VALLE DEL SOL ADDITION
REGINA
CANAL
ARCHANS
GLENDALE
GARDEN S No 1
GLENDALE GARDEN S No 2
LA VICTORIA
Project
EGAL DESCRIPTION
T 10 N
R 2 E
SEC 4
TOWN OF ATRISCO GRANT
UNIFORM PROPERTY CODE
1-011 058
MAP AMENDED THROUGH
J-11-Z
ALBUQUERQUE PLANNING DIVISION
MUNICIPAL DEVELOPMENT DEPARTMENT
SCALE

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

August 8, 1986

Bob Sykes
Wilson & Company
Post Office Box 3548
Albuquerque, New Mexico 87190

RE: DRAINAGE SUBMITTAL FOR PAT HURLEY PARK RENOVATION
(J-11/D12) RECEIVED JULY 23, 1986

Dear Mr. Sykes:

The above referenced information is in compliance with this sections requirement and is approved.

Please advise the Parks & Recreation representative that they may proceed with obtaining sign-off at DRC for a construction permit.

If I can be of further assistance, please advise.

Cordially,

Billy J. Goolsby

Billy J. Goolsby, P.E.
C.E./Hydrology Section

BJG/bsj

WILSON & COMPANY
ENGINEERS & ARCHITECTS

RECEIVED
JUL 23 1986
HYDROLOGY SECTION

505 345-5345

ENGINEERS
ARCHITECTS
PLANNERS

Office Location... 6611 GULTON CT., N.E. ■ ALBUQUERQUE, NEW MEXICO 87109

An Equal Opportunity Employer

Mailing Address... P.O. BOX 3548 ■ ALBUQUERQUE, NEW MEXICO 87190

23 July 1986

Mr. Billy J. Goolsby
Design Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Pat Hurley Park Renovations
WCEA File: 85-516

Dear Mr. Goolsby:

I have reviewed the grading plan prepared by Elizabeth Fish of Morrow & Company. Originally there was a perimeter road to which most of the park drainage discharged and the perimeter road then discharged to Yucca Drive.

The perimeter road has been eliminated and Areas 1, 2 and 3 discharge over the bluff to the valley below. The stormwater flows are not concentrated and will be retarded by a concrete mowing strip. The flows are as follows:

A_1 = 0.19 Ac; Q_{100} = 0.28 cfs
A_2 = 1.42 Ac; Q_{100} = 2.06 cfs
A_3 = 1.24 Ac; Q_{100} = 1.80 cfs

Areas 4, 5 and 6 discharge to Yucca Drive. The flows are as follows:

A_4 = 0.59 Ac; Q_{100} = 0.86 cfs
A_5 = 0.27 Ac; Q_{100} = 0.39 cfs
A_6 = 0.34 Ac; Q_{100} = 0.49 cfs

This project will reduce the flow in Yucca Drive. The flows across the crest of the bluff are not concentrated and I do not believe a significant amount of erosion will occur.

Attached are prints of the proposed project.

I will be glad to answer any questions you may have about the drainage.

WILSON & COMPANY

Robert F. Sykes, P.E.
Partner

enc.

cc: Sandra C. Zuschlag
Elizabeth C. Fish

kl

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Pat Hurley Park Renovations ZONE ATLAS/DRNG. FILE #: J-11 / D12

LEGAL DESCRIPTION: Pat Hurley Park

CITY ADDRESS:

ENGINEERING FIRM: Wilson & Co CONTACT: Bob Sykes

ADDRESS: PO Box 3548 87190 PHONE: 345-5345

OWNER: Parks & Recreation CONTACT: Sandy Euschlag

ADDRESS: PHONE: 766-5080

* ARCHITECT: Morrow & Co CONTACT: Elizabeth Fish

ADDRESS: 119 Industrial NE, Alb 87107 PHONE: 345-6631

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED
JUL 23 1986
HYDROLOGY SECTION

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. ___

EPC NO. ___

PROJ. NO. ___

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

X GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

X GRADING/PAVING PERMIT APPROVAL

___ OTHER ___ (SPECIFY)

* Prepared the plans

DATE SUBMITTED: Wilson & Co.

BY: Robert F. Syke

DRAINAGE INFORMATION

PROJECT TITLE: Pat Hurley Park

ZONE ATLAS/DRNG. FILE #: J-11-Z / D12

DRB#: _____ EPC #: _____

WORK ORDER #: _____

LEGAL DESCRIPTION: Glendale Gardens Number 2

CITY ADDRESS: _____

ENGINEERING FIRM: Chavez-Grieves

CONTACT: Jeanne Wolfenbarger

ADDRESS: 5639 Jefferson NE

PHONE: 344-4080

OWNER: _____

CONTACT: _____

ADDRESS: _____

PHONE: _____

ARCHITECT: PDS Southwest

CONTACT: Warren McClung

ADDRESS: _____

PHONE: 323-5001

SURVEYOR: _____

CONTACT: _____

ADDRESS: _____

PHONE: _____

CONTRACTOR: _____

CONTACT: _____

ADDRESS: _____

PHONE: _____

TYPE OF SUBMITTAL:

~~X DRAINAGE REPORT~~ NA NA

____ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

____ YES

X NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

NA X ~~BUILDING PERMIT APPROVAL~~

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE ~~REQUIREMENTS~~ CONCEPT

____ OTHER

DATE SUBMITTED: June 24,1997

BY: Jeanne Wolfenbarger, E.I.T.

RECEIVED
JUN 25 1997
HYDROLOGY SECTION