CITY OF ALBUQUERQUE

April 26, 2010

Jarrod D. Likar, P.E.
Huitt-Zollars, Inc.
333 Rio Rancho Blvd.
Rio Rancho, NM 87124

Re: Apache Elementary – Kindergarden Addition, 12800 Copper Ave,
Approval of Permanent Certificate of Occupancy (C.O.),
Engineer's Stamp dated 12-01-08 (K-22/D003)
Certification dated: 4-22-09

Dear Mr. Likar:

Based upon the information provided in your submittal received 4-22-10, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

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

Sincerely,

Timothy E. Sims
Plan Checker
Development and Building Services

C: CO Clerk – Katrina Sigala
File

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003)

PROJECT TITLE: Apache Elementary Kindergarden Addiiton ZONE ATLAS/DRNG. FILE #: K-22 D003

DRB #: _____ EPC#: _____ WORK ORDER #: 200891564

LEGAL DESCRIPTION: Foothill Estates, Block 5, Lots 22 and 23

CITY ADDRESS: 12800 Copper Ave, Albuquerque, NM 87123

ENGINEERING FIRM:	Huitt-Zollars, Inc.	CONTACT:	Jarrod Likar
ADDRESS:	333 Rio Racnho Blvd, Suite 101	PHONE:	892-5141
CITY, STATE:	Rio Rancho, NM	ZIP CODE:	87124
OWNER:	Albuquerque Public Schools	CONTACT:	Tyler Mason
ADDRESS:	12800 Copper Ave	PHONE:	848-8822
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87123
ARCHITECT:	Huitt-Zollars, Inc.	CONTACT:	John Jarrard
ADDRESS:	6501 Americas Parkway NE, Suite 550	PHONE:	883-8114
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87110
SURVEYOR:	_____	CONTACT:	_____
ADDRESS:	_____	PHONE:	_____
CITY, STATE:	_____	ZIP CODE:	_____
CONTRACTOR:	_____	CONTACT:	_____
ADDRESS:	_____	PHONE:	_____
CITY, STATE:	_____	ZIP CODE:	_____

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN MEETING ATTENDED:

- __X___ YES
- _____ NO
- _____ COPY PROVIDED

RECEIVED
APR 22 2010
HYDROLOGY SECTION

DATE SUBMITTED: 4/22/10 BY: Jarrod Likar

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

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

CITY OF ALBUQUERQUE

January 23, 2009

Jarrod D. Likar, P.E.
Huitt-Zollars, Inc.
333 Rio Rancho Blvd, Suite 101
Rio Rancho, NM 87124

Re: Apache Elementary Kindergarten Addition Grading and Drainage Plan Engineer's Stamp dated 1-16-09 (K22/D003)

Dear Mr. Likar,

Based upon the information provided in your submittal received 1-16-09, 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.

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: file

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 12/2005)

K-22/D003

X PROJECT TITLE: Apache Elementary X ZONE MAP: K-22-Z

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

LEGAL DESCRIPTION: Kindergarten Addition

CITY ADDRESS: 12500 Copper Ave. NE Albq, NM 87123

ENGINEERING FIRM: Huitt-Zollars Inc. CONTACT: Jim Honea

ADDRESS: 333 Rio Rancho Dr NE suite 101 PHONE: 892-5141

CITY, STATE: Rio Rancho, NM 87124-1450 ZIP CODE: _____

X OWNER: Albuquerque Public Schools CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

TYPE OF SUBMITTAL:

_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL
__X__ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL G & D PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERT (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT
_____ ENGINEER'S CERT (TCL)
_____ ENGINEER'S CERT (DRB SITE PLAN)
_____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

_____ YES
_____ NO
_____ COPY PROVIDED

DATE SUBMITTED: 1-16-09 BY: _____

RECEIVED
JAN 16 2009
HYDROLOGY SECTION

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

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

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. • 333 Rio Rancho Drive NE • Suite 101 • Rio Rancho, NM 87124-1450 • 505.892.5141 phone • 505.892.3259 fax • huitt-zollars.com

December 16, 2008

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

RE: Response and resubmittal to comments received on Apache Elementary Kindergarten Addition Grading and Drainage Plan (K22/D003)

Dear Mr. Cherne,

Thank you for your review and comments concerning the above mentioned projects. I have included each of your comments below in *italics* and our responses in **bold** text.

1. *Provide the volume required, volume provided and the water surface elevation for Pond 1 on Sheet C-104. Provide the top of the wall grade for Pond 1.*

Please see the attached sheet C-104 with the revisions requested.

2. *Provide the direction of roof flows. The roof should not drain into the parking lot north of the addition.*

A small portion of the roof drains to the north, but has a gutter that will take the runoff from the roof to the parking lot west of the addition.

3. *Provide the Finished Floor elevations for the existing gym building east of the project area.*

Please the attached sheet C-103 for the requested information.

4. *Label 1' contours in the Kindergarten Addition area.*

Please the attached sheet C-103 for the requested information.

5. *Provide BW grade for wall west of the addition.*

The BW grade for the wall west of the addition is the existing grade. The 1' contours are now labeled (Comment 4) so this should provide the clarification requested.

6. *You may want to add some form of energy dissipation at the outlet of the 15" HDPE pipe.*

The outlet is well vegetated with trees and bushes therefore we believe there is no need for more energy dissipation.

Sincerely,

Jarrod Likar, PE
Project Manager
HUITT-ZOLLARS

Cc:

enclosure

CITY OF ALBUQUERQUE

March 26, 2010

Jarrod D. Likar, P.E
Huitt-Zollars, Inc.
333 Rio Rancho Blvd, Suite 101
Rio Rancho, NM 87124

Re: Apache Elementary Kindergarten Addition, 12800 Copper Ave NE, Request for Permanent Certificate of Occupancy - Not Approved Engineer's Stamp dated 12/1/08 (K-22/D003) Certification dated 3-24-10

Dear Mr. Likar,

Based upon the information provided in the Certification received 3-24-10 the above referenced Certification is not approved for Permanent Certificate of Occupancy, (C.O.).

After a recent site visit, Hydrology requests the following items before resubmitting for Permanent CO:

- The grate near the existing gym is required to be lowered to a functional grade. Visual inspection showed it to be higher than the sidewalk.
- Please verify that the first inlet upstream of the "D" inlet accepts runoff. There is a berm in the area.
- Please verify the wall is intact around the pond and the Top of Wall is 5654.00. Visual inspection revealed large gaps/missing blocks in the center section.
- The approved Grading Plan was dated 1-16-9. This is the plan to be certified.
- Please update the Certification showing the pipes under the sidewalk.
- The Certification is required to be stamped.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis Cherne, P.E.
Senior Engineer—Hydrology
Development and Building Services

C: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

December 10, 2008

Jarrod D. Likar, P.E.
Huitt-Zollars, Inc.
333 Rio Rancho Blvd
Rio Rancho, NM 87124

Re: Apache Elementary Kindergarten Addition Grading and Drainage Plan Engineer's Stamp dated 12-1-08 (K22/D003)

Dear Mr. Likar,

Based upon the information provided in your submittal received 12-5-08, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

- Provide the volume required, volume provided and the water surface elevation for Pond 1 on Sheet C-104. Provide the top of the wall grade for Pond 1.
- Provide the direction of roof flows. The roof should not drain into the parking lot north of the addition.
- Provide the Finished Floor elevations for the existing gym and the building east of the project area.
- Label 1' contours in the Kindergarten Addition area.
- Provide the BW grade for the wall west of the addition.
- You may want to add some form of energy dissipation at the outlet of the 15" HDPE pipe.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

Cherne, Curtis

From: Cherne, Curtis
Sent: Monday, January 05, 2009 10:39 AM
To: 'Honea, Jim'
Subject: RE: Apache Elementary

Jim,
Looks good except I would like for you to add the approximate location for the roof discharge to the parking lot West of the addition.

Curtis Cherne, P.E.
Senior Engineer
Development and Building Services
Planning Department, COA
924-3695

From: Honea, Jim [mailto:jhonea@huitt-zollars.com]
Sent: Tuesday, December 30, 2008 11:57 AM
To: Cherne, Curtis
Subject: Apache Elementary

Curtis,

Attached is the response letter to the comments dated 12/10/08. I wanted to check that the response letter and attached revised plan sheets satisfied your comments before sending signed copies. Please let me know if you have any questions or concerns. Have a Happy New Year!

Thank you,

Jim Honea, E.I.T.
HUITT-ZOLLARS
Huitt-Zollars, Inc.
333 Rio Rancho Blvd., Suite 101
Rio Rancho, NM 87124
Tel: (505) 892-5141
Fax: (505) 892-3259

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. • 333 Rio Rancho Drive NE • Suite 101 • Rio Rancho, NM 87124-1450 • 505.892.5141 phone • 505.892.3259 fax • huitt-zollars.com

December 30, 2008

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

RE: Response and resubmittal to comments received on Apache Elementary Kindergarten Addition Grading and Drainage Plan (K22/D003)

Dear Mr. Cherne,

Thank you for your review and comments concerning the above mentioned projects. I have included each of your comments below in *italics* and our responses in **bold** text.

1. *Provide the volume required, volume provided and the water surface elevation for Pond 1 on Sheet C-104. Provide the top of the wall grade for Pond 1.*

Please see the attached sheet C-104 with the revisions requested.

2. *Provide the direction of roof flows. The roof should not drain into the parking lot north of the addition.*

A small portion of the roof drains to the north, but has a gutter that will take the runoff from the roof to the parking lot west of the addition.

3. *Provide the Finished Floor elevations for the existing gym building east of the project area.*

Please the attached sheet C-103 for the requested information.

4. *Label 1' contours in the Kindergarten Addition area.*

Please the attached sheet C-103 for the requested information.

5. *Provide BW grade for wall west of the addition.*

The BW grade for the wall west of the addition is the existing grade. The 1' contours are now labeled (Comment 4) so this should provide the clarification requested.

6. *You may want to add some form of energy dissipation at the outlet of the 15" HDPE pipe.*

The outlet is well vegetated with trees and bushes therefore we believe there is no need for more energy dissipation.

Sincerely,

Jarrod Likar, PE
Project Manager
HUITT-ZOLLARS

Cc:

enclosure

Cherne, Curtis

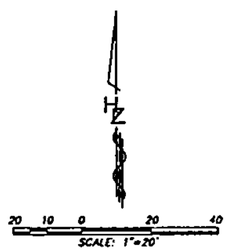
From: Honea, Jim [jhonea@huitt-zollars.com]
Sent: Tuesday, December 30, 2008 11:57 AM
To: Cherne, Curtis
Subject: Apache Elementary
Attachments: CoA Response LETTER.pdf; C-103.pdf; C-104.pdf; C-105.pdf

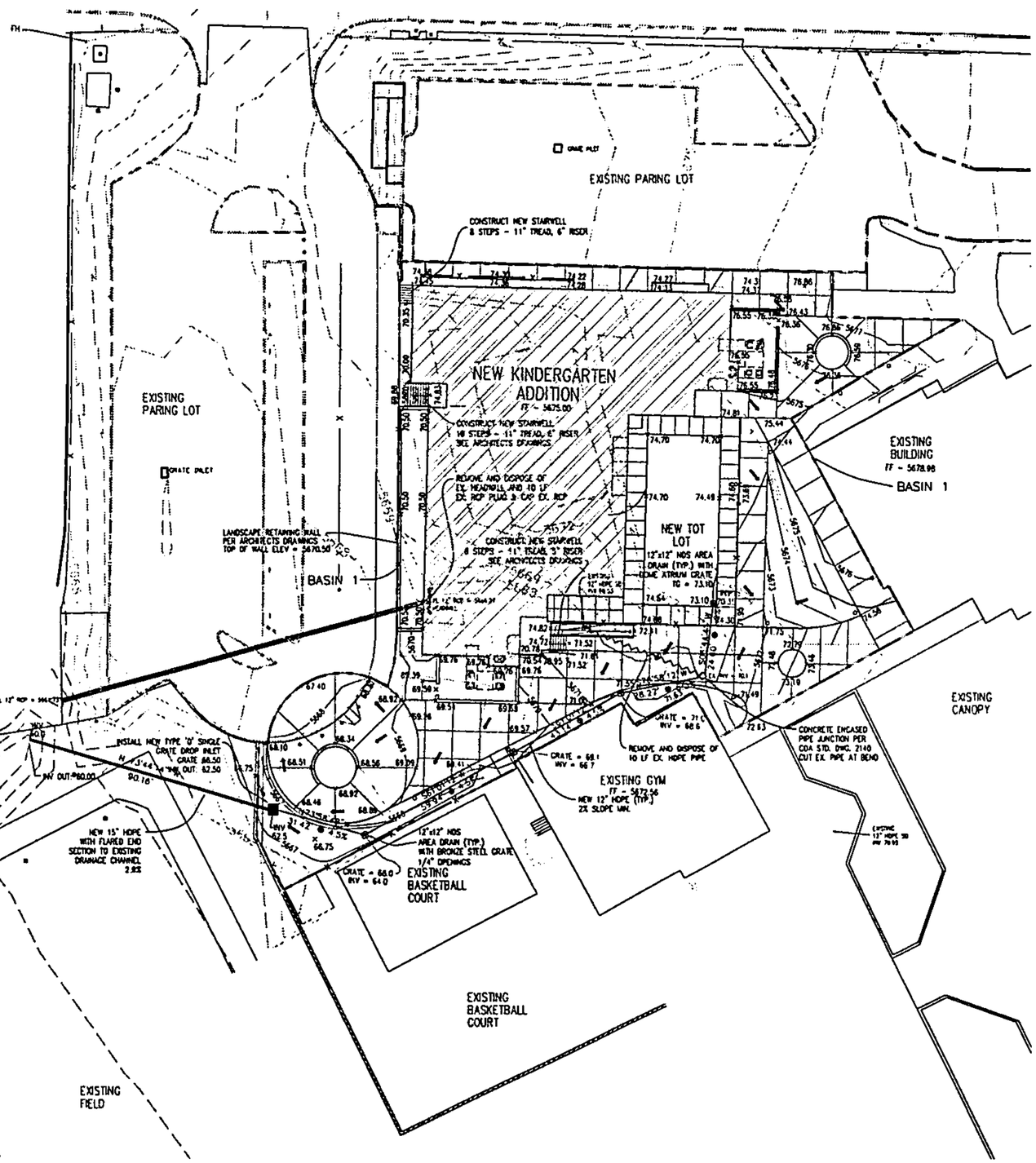
Curtis,

Attached is the response letter to the comments dated 12/10/08. I wanted to check that the response letter and attached revised plan sheets satisfied your comments before sending signed copies. Please let me know if you have any questions or concerns. Have a Happy New Year!

Thank you,

Jim Honea, E.I.T.
HUITT-ZOLLARS
Huitt-Zollars, Inc.
333 Rio Rancho Blvd., Suite 101
Rio Rancho, NM 87124
Tel: (505) 892-5141
Fax: (505) 892-3259





GENERAL SHEET NOTES

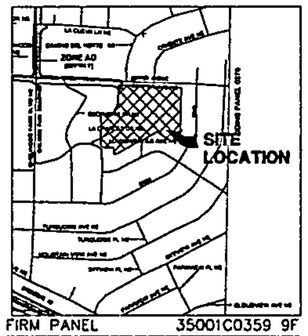
A. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE TO RESOLVE THE CONFLICT WITH A MINIMUM AMOUNT OF DELAY.

B. ALL WORK ON THIS PLAN SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.

C. IF ANY UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE LOCATION ONLY, AND LINES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE UTILITY OWNER OR FROM EXISTING PLANS, AND THIS INFORMATION MAY BE INCOMPLETE, OR OBSOLETE AT THE TIME OF CONSTRUCTION. THE ENGINEER HAS NOT UNDERTAKEN ANY FIELD VERIFICATION OF THESE LOCATIONS, LINE SIZES OR MATERIAL TYPE, MAKES NO REPRESENTATION THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE, PIPELINE OR UNDERGROUND INSTALLATION IN OR NEAR THE AREA IN ADVANCE OF AND DURING ANY EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES AND UNDERGROUND FACILITIES. IN PLANNING AND CONDUCTING EXCAVATIONS, THE CONTRACTOR SHALL COMPLY WITH ALL STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.

D. THE CONTRACTOR SHALL INSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND BY WETTING THE SOIL TO KEEP IT FROM BLOWING.

E. THE CONTRACTOR SHALL OBTAIN ANY AND ALL PERMITS REQUIRED BY THE CITY OF ALBUQUERQUE FOR THE COMPLETION OF THE WORK PRIOR TO BEGINNING CONSTRUCTION.



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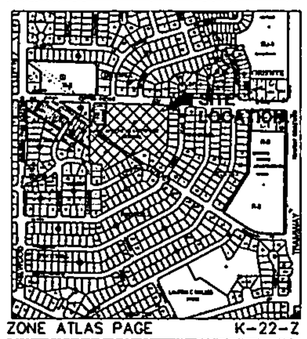


ZONE ATLAS PAGE K-22-Z

LEGAL DESCRIPTION

A parcel of land within Lots 22 & 23 Block 5 of the Foothill Estates Subdivision, Apache Elementary School, in the City of Albuquerque, Bernalillo County, New Mexico.

The parcels contain 8.55 acres, more or less.

NOTES

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE OR TOP OF SIDEWALK ELEVATIONS, UNLESS OTHERWISE NOTED.
2. ADD 5600 TO PROPOSED SPOT ELEVATIONS FOR MEAN SEA LEVEL ELEVATION. ELEVATIONS SHOWN COMPLETE ARE EXISTING (I.E. 5654.42).
3. ALL CONSTRUCTION SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS.

HUITT ZOLLARS

Huitt-Zollars, Inc.
6501 Americas Parkway NE
Suite 850
Albuquerque, N.M. 87110
Phone (505) 883-8114
Fax (505) 883-3022

JARROD D. LUCAS NEW MEXICO 16910 LICENSED PROFESSIONAL ENGINEER

ALBUQUERQUE PUBLIC SCHOOLS

Apache Elementary School

Kindergarten Addition

ADDRESS:
12800 COPPER AVE. NE
ALBUQUERQUE NM
87123

MARK	DATE	DESCRIPTION
03	12/19/08	BIDDING DRAWINGS
02	09/26/08	95% REVIEW SUBMITTAL
01	07/22/08	30% REVIEW SUBMITTAL

ISSUE:

PROJECT NO.: 14026201
CAD DWG FILE: C-103.dwg
DRAWN BY: DLV
CHECKED BY: JDL

SHEET TITLE:

GRADING AND DRAINAGE PLAN

C-103

SHEET OF

1 | 2 | 3 | 4

GENERAL NOTES

I. INTRODUCTION AND EXECUTIVE SUMMARY

THIS PROJECT, LOCATED IN THE NORTHEAST HEIGHTS OF ALBUQUERQUE, REPRESENTS A MODIFICATION TO AN EXISTING SITE WITHIN AN INFILL AREA THE EXISTING SITE IS AN ALBUQUERQUE PUBLIC SCHOOL (APS) ELEMENTARY SCHOOL CAMPUS. THE PROPOSED IMPROVEMENTS CONSIST OF PARKING LOT MODIFICATIONS, A NEW BUILDING (KINDERGARTEN ADDITION), AND SIDEWALK & LANDSCAPING SURROUNDING THE PROPOSED BUILDING. THE DRAINAGE CONCEPT FOR THIS PROJECT IS TO NOT AGGRAVATE OR WORSEN EXISTING DRAINAGE CONDITIONS WITHIN THE WATERSHED BY LIMITING THE PEAK DISCHARGE OF RUNOFF FROM THE SITE. THE PROJECT SITE IS COMPRISED OF ONE DRAINAGE BASIN (BASIN 1) WHICH IS PROPOSED TO DISCHARGED IN TO THE EXISTING POND AT THE SOUTHWEST CORNER OF THE SITE.

II. PROJECT DESCRIPTION

AS SHOWN BY THE VICINITY MAP, THE SITE IS LOCATED ALONG THE SOUTH OF COPPER AVENUE NE. BETWEEN CHELWOOD PARK BLVD NE. AND TRAMWAY BLVD NE. THE CURRENT LEGAL DESCRIPTION IS TRACTS 22 AND 23, FOOTHILLS ESTATES. THE PROPERTY IS OWNED BY THE BOARD OF EDUCATION, ALBUQUERQUE PUBLIC SCHOOLS AND DEVELOPED AS A PUBLIC ELEMENTARY SCHOOL SITE. AS INDICATED BY PANEL 0359 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISH BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO, MARCH 18, 2008, THIS SITE DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE. BASIN 1 CONTRIBUTES RUNOFF TO A DESIGNATED FLOOD HAZARD ZONE SITUATED DOWNSTREAM AT THE INTERSECTION OF COPPER AVENUE NE. AND CHELWOOD PARK BLVD NE. IT IS PROPOSED TO NOT AGGRAVATE OR WORSEN THIS EXISTING CONDITION.

THE PROJECT CONSISTS OF ONE AREA OF DEVELOPMENT IDENTIFIED AS FOLLOWS:
1. KINDERGARTEN ADDITION (BASIN 1)

III. BACKGROUND DOCUMENTS & RESEARCH

THE FOLLOWING DOCUMENTS WERE REVIEWED IN THE PREPARATION OF THIS DRAINAGE SUBMITTAL:

A. APACHE ELEMENTARY SCHOOL MINI GYMNASIUM FACILITY, DATED 07-31-96, PREPARED BY CHAVEZ GRIEVES CONSULTING ENGINEERS, INC. THE 1996 DRAINAGE REPORT WAS CREATED TO UPDATE THE 1993 MASTER DRAINAGE PLAN. THE 1996 PLAN PROPOSED CONVERTING THE SEDIMENT CONTROL POND AT THE SOUTHWEST CORNER OF THE SCHOOL SITE TO A DETENTION POND WITH AN ALLOWABLE DISCHARGE RATE OF 7.4 CFS. PER THIS REPORT THE DETENTION POND NEEDS TO BE 0.42 AC-FT AT A WATER SURFACE DEPTH OF 1.5 FEET.

IV. EXISTING CONDITIONS

AT PRESENT, THE PROJECT SITE IS PLAYGROUND EQUIPMENT. EXISTING CONDITIONS ARE ILLUSTRATED BY ON SHEET C-103 & C-104. THIS PROJECT IS CHARACTERIZED INTO ONE DRAINAGE BASIN (BASIN 1). THE EXISTING DISCHARGE RATE INTO THE DETENTION POND (POND 1) IN THE SOUTHWEST CORNER OF THE SCHOOL SITE IS 23.82 CFS WITH AN ALLOWABLE OUTFLOW DISCHARGE RATE OF 7.4 CFS. ALSO THE ALLOWABLE DEPTH OF THE WATER SURFACE AT THE 100-YR 6-HR STORM IS 1.5 FEET. THE EXISTING BASIN 1 DISCHARGES TO A 12" RCP AT THE EAST SIDE OF THE BASIN. THIS 12" RCP THEN DISCHARGES TO A SWALE AND THE SWALE CONVEYS THE FLOW INTO POND 1.

V. DEVELOPED CONDITIONS

THE PROPOSED IMPROVEMENTS WILL AFFECT ONE AREA WITHIN THE SCHOOL CAMPUS, AS SHOW ON THE DEVELOPED CONDITIONS PLAN, SHEET C-103 & C-104.

THE INCREASED DISCHARGE DUE TO THE IMPROVEMENTS PROPOSED WITH THIS PROJECT IS VERY MINIMAL. THIS PROJECT PROPOSES TO BYPASS THE EXISTING 12" RCP (DISCUSSED IN THE EXISTING CONDITIONS SECTION) AND REDIRECT THAT FLOW SOUTH EAST TO A PROPOSED GRATE INLET WITH A 15" HDPE PIPE DISCHARGING TO THE AFOREMENTIONED SWALE AND INTO POND 1.

POND 1 IS PROPOSED TO BE RE-SIZED TO MEET THE REQUIREMENTS SET IN THE "APACHE ELEMENTARY SCHOOL MINI GYMNASIUM FACILITY". ALSO PROPOSED IS TO PLACE A STANDPIPE AS THE OUTFALL FOR THIS POND TO DECREASE STORMWATER POLLUTION.

VI. GRADING PLAN

THE GRADING PLAN SHOWS: EXISTING GRADES INDICATED BY CONTOURS AT 1'-0" INTERVALS AS TAKEN FROM THE TOPOGRAPHIC SURVEY DATED JULY, 2008; PROPOSED GRADES INDICATED BY SPOT ELEVATIONS AND CONTOURS AT 1'-0" INTERVALS; CONTINUITY BETWEEN EXISTING AND PROPOSED GRADES.

AS SHOWN BY THIS PLAN THE PROPOSED KINDERGARTEN ADDITION WILL CONSIST OF A NEW BUILDING, SIDEWALK, LANDSCAPING, AND REGRADING OF THE EXISTING POND.

VI. CALCULATIONS

THE CALCULATIONS THAT APPEAR HEREON ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEARS, 6-HOUR RAINFALL EVENT FOR EACH RESPECTIVE WORK AREA. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS, AS SET FORTH IN THE REVISION OF SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED OCTOBER 2006, HAS BEEN USED TO QUANTIFY THE PEAK RATE OF DISCHARGE AND VOLUME OF RUNOFF GENERATED. AS SHOWN BY THESE CALCULATIONS, BASIN 1 WILL EXPERIENCE A SLIGHT INCREASE THAT WILL BE ATTENUATED BY ROUTING THROUGH THE EXISTING POND 1.

VII. CONCLUSIONS

THE FOLLOWING CONCLUSIONS ARE PRESENTED AS THE RESULT OF THIS PLAN:

BASIN 1:
1. THE EXISTING DETENTION POND WILL BE EXPANDED WITH THIS PROJECT TO MEET THE VOLUME IN THE 1996 MDP (THIS REPORT PROPOSES 0.44 AC-FT AT WATER SURFACE DEPTH OF 1.5 FEET).
2. THE PROPOSED IMPROVEMENTS WILL CREATE AN NEGLIGIBLE INCREASE IN RUNOFF.
3. THE PEAK DISCHARGE RATE INTO CONEJO DRIVE WILL NOT BE ALTERED AS SHOWN ON THE STANDPIPE TABLE (THIS SHEET).
4. NO ADVERSE IMPACT ON DOWNSTREAM CAPACITY OR DOWNSTREAM PROPERTIES BY CONTINUED ROUTING THROUGH THE EXISTING DETENTION POND.
5. THE EXISTING AND APPROVED DRAINAGE PATTERNS WILL NOT BE ALTERED.
6. THE PROPOSED STANDPIPE WILL REDUCE STORM WATER POLLUTION.

CALCULATIONS

SITE CHARACTERISTICS

1. PRECIPITATION ZONE = 4
2. $P_{6,100} = P_{360} = 2.90$
3. TOTAL PROJECT AREA (A_T) = 30,629 SF / 0.70 AC
4. EXISTING LAND TREATMENT

A. EXISTING PLAYGROUND (BASIN 1) 30,629 SF = 0.70 AC

TREATMENT	AREA(SF/AC)	%
B	2450/0.06	8
C	9495/0.22	31
D	18684/0.43	61

5. DEVELOPED LAND TREATMENT

A. PROPOSED KINDERGARTEN ADDITION (BASIN 1) 30,629 SF = 0.70 AC (TO REPLACE EXISTING PLAYGROUND)

TREATMENT	AREA(SF/AC)	%
B	7236/0.17	24
C	0/0	0
D	23393/0.54	76

EXISTING CONDITIONS

A. KINDERGARTEN ADDITION (BASIN 1)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
$E_W = ((1.08*0.06) + (1.46*0.22) + (2.64*0.43))/0.70 = 2.17$ IN
$V_{100} = (E_W / 12)A_T = (2.17/12)*0.70 = 0.127$ AC-FT = 5532 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100} = (2.92*0.06) + (3.73*0.22) + (5.25*0.43) = 3.25$ CFS

DEVELOPED CONDITIONS

A. KINDERGARTEN ADDITION (IN BASIN 2B TO REPLACE EXISTING PLAYGROUND)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
$E_W = ((1.08*0.17) + (2.64*0.54))/0.70 = 2.30$ IN
$V_{100} = (E_W / 12)A_T = (2.30/12)*0.70 = 0.134$ AC-FT = 5837 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100} = (2.92*0.17) + (5.25*0.54) = 3.33$ CFS

COMPARISON

A. KINDERGARTEN ADDITION (IN BASIN 2B TO REPLACE EXISTING PLAYGROUND)

1. VOLUME

$\Delta V_{100} = 5837 - 5532 = 305$ CF (INCREASE)

2. PEAK DISCHARGE

$\Delta Q_{100} = 3.33 - 3.25 = 0.08$ CFS (INCREASE)

APACHE ELEMENTARY
Proposed Detention Pond Rating Curve
Ultimate Developed Conditions

Side Slope (X:1) 6

Elevation	Depth (ft)	Area (sq ft)	Area (ac)	Volume (ac-ft)	Cum Volume (ac-ft)
[illegible]	0	10704	0.246	0.00	0.00
[illegible]	0.5	12148	0.279	0.13	0.13
[illegible]	1	13956	0.313	0.15	0.28
[illegible]	1.5	15033	0.345	0.16	0.44
[illegible]	2	17482	0.401	0.19	0.63

Standpipe for Pond 1 (TO BE CONSTRUCTED ON TOP OF EXISTING GRATE)

STANDPIPE DIA	HOLES/ ROW	WATER DEPTH	HEAD ROW 1	HEAD WEIR	HEAD ORIFICE	Q (cfs) ROW 1	Q (cfs) WEIR	Q (cfs) ORIFICE	Q total (cfs)
(in) 48	8.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SPACE ABOVE TOP ORIFICE TO WEIR	ROW 1 SIZE	0.5	0.33	0.00	0.00	1.46	0.00	0.00	1.46
	4.00	1.0	0.83	0.00	0.00	2.30	0.00	0.00	2.30
(in)	ROW 2 SIZE	1.5	1.33	0.25	0.25	2.91	4.71	30.25	7.62
11	0.00	2.0	1.83	0.75	0.75	3.47	24.40	52.40	27.90
PIPE HEIGHT (in)	ROW 3 SIZE	2.5	2.33	1.25	1.25	3.85	52.49	67.56	56.34
(ABOVE GROUND)	0.00	3.0	2.83	1.75	1.75	4.24	87.27	80.04	84.29
15	HOLE SPACE	3.5	3.33	2.25	2.25	4.60	127.23	90.75	95.36
PIPE HEIGHT (ft)	0.00	4.0	3.83	2.75	2.75	4.94	171.92	100.34	105.28
(ABOVE GROUND)	# OF ROWS	4.5	4.33	3.25	3.25	5.25	220.64	109.08	114.33
1.25	1.00	5.0	4.83	3.75	3.75	5.54	273.77	117.17	122.71

GENERAL SHEET NOTES

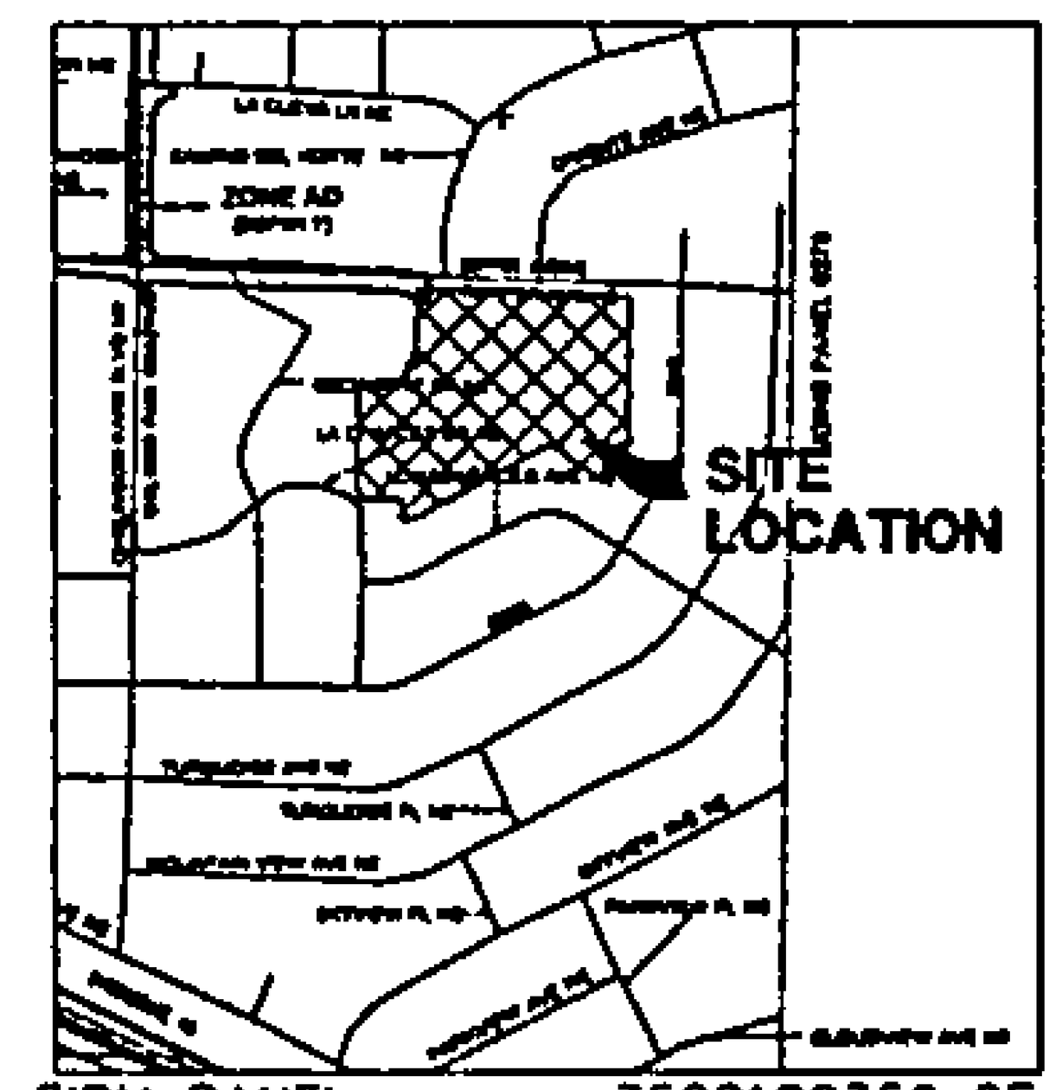
A. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE TO RESOLVE THE CONFLICT WITH A MINIMUM AMOUNT OF DELAY.

B. ALL WORK ON THIS PLAN SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.

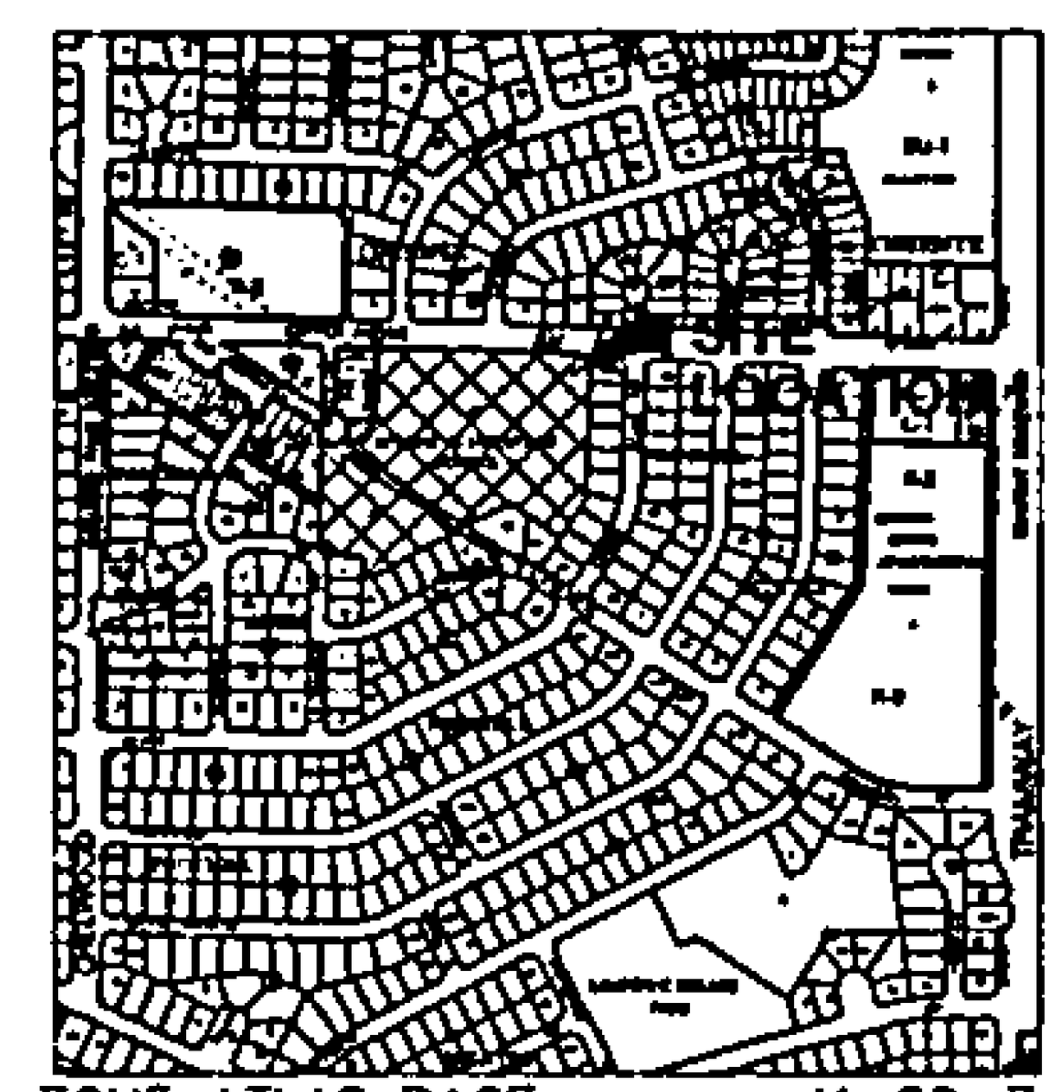
C. IF ANY UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE LOCATION ONLY, AND LINES MAY EXIST WHERE NONE ARE SHOWN. THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE UTILITY OWNER OR FROM EXISTING PLANS, AND THIS INFORMATION MAY BE INCOMPLETE, OR OBSOLETE AT THE TIME OF CONSTRUCTION. THE ENGINEER HAS NOT UNDERTAKEN ANY FIELD VERIFICATION OF THESE LOCATIONS, LINE SIZES OR MATERIAL TYPE, MAKES NO REPRESENTATION THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE, PIPELINE OR UNDERGROUND INSTALLATION IN OR NEAR THE AREA IN ADVANCE OF AND DURING ANY EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES AND UNDERGROUND FACILITIES. IN PLANNING AND CONDUCTING EXCAVATIONS, THE CONTRACTOR SHALL COMPLY WITH ALL STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.

D. THE CONTRACTOR SHALL INSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND BY WETTING THE SOIL TO KEEP IT FROM BLOWING.

E. THE CONTRACTOR SHALL OBTAIN ANY AND ALL PERMITS REQUIRED BY THE CITY OF ALBUQUERQUE FOR THE COMPLETION OF THE WORK PRIOR TO BEGINNING CONSTRUCTION.



FIRM PANEL 35001C0359 9F



ZONE ATLAS PAGE K-22-Z

LEGAL DESCRIPTION

A parcel of land within Lots 22 & 23 Block 5 of the Foothill Estates Subdivision, Apache Elementary School, in the City of Albuquerque, Bernalillo County, New Mexico.

The parcels contain 8.55 acres, more or less.

NOTES
1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE OR TOP OF SIDEWALK ELEVATIONS, UNLESS OTHERWISE NOTED.
2. ADD 5600 TO PROPOSED SPOT ELEVATIONS FOR MEAN SEA LEVEL ELEVATION. ELEVATIONS SHOWN COMPLETE ARE EXISTING (I.E. 5854.42).
3. ALL CONSTRUCTION SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS.

HUITT ~ ZOLLARS
Huitt-Zollars, Inc.
6501 Americas Parkway NE, Suite 550
Albuquerque, N. M. 87110
Phone (505) 883-8114
Fax (505) 883-3022

ALBUQUERQUE PUBLIC SCHOOLS

Apache Elementary School

Kindergarten Addition

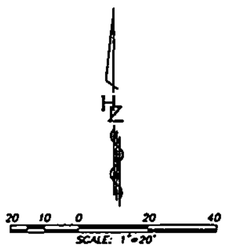
ADDRESS:
12800 COPPER AVE. NE
ALBUQUERQUE NM 87123

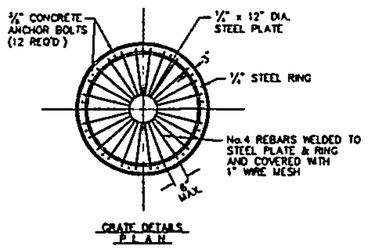
MARK	DATE	DESCRIPTION
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

ISSUE:
PROJECT NO.: 14026201
CAD DWG FILE: C-105.dwg
DRAWN BY: DLV
CHECKED BY: JDL

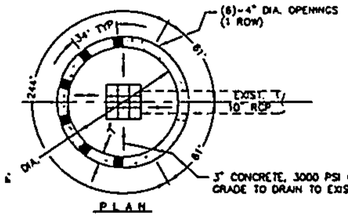
SHEET TITLE: GRADING NOTES

C-105
SHEET OF

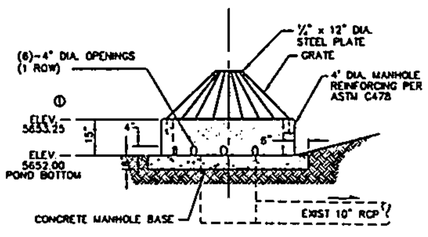




GRATE DETAILS
PLAN



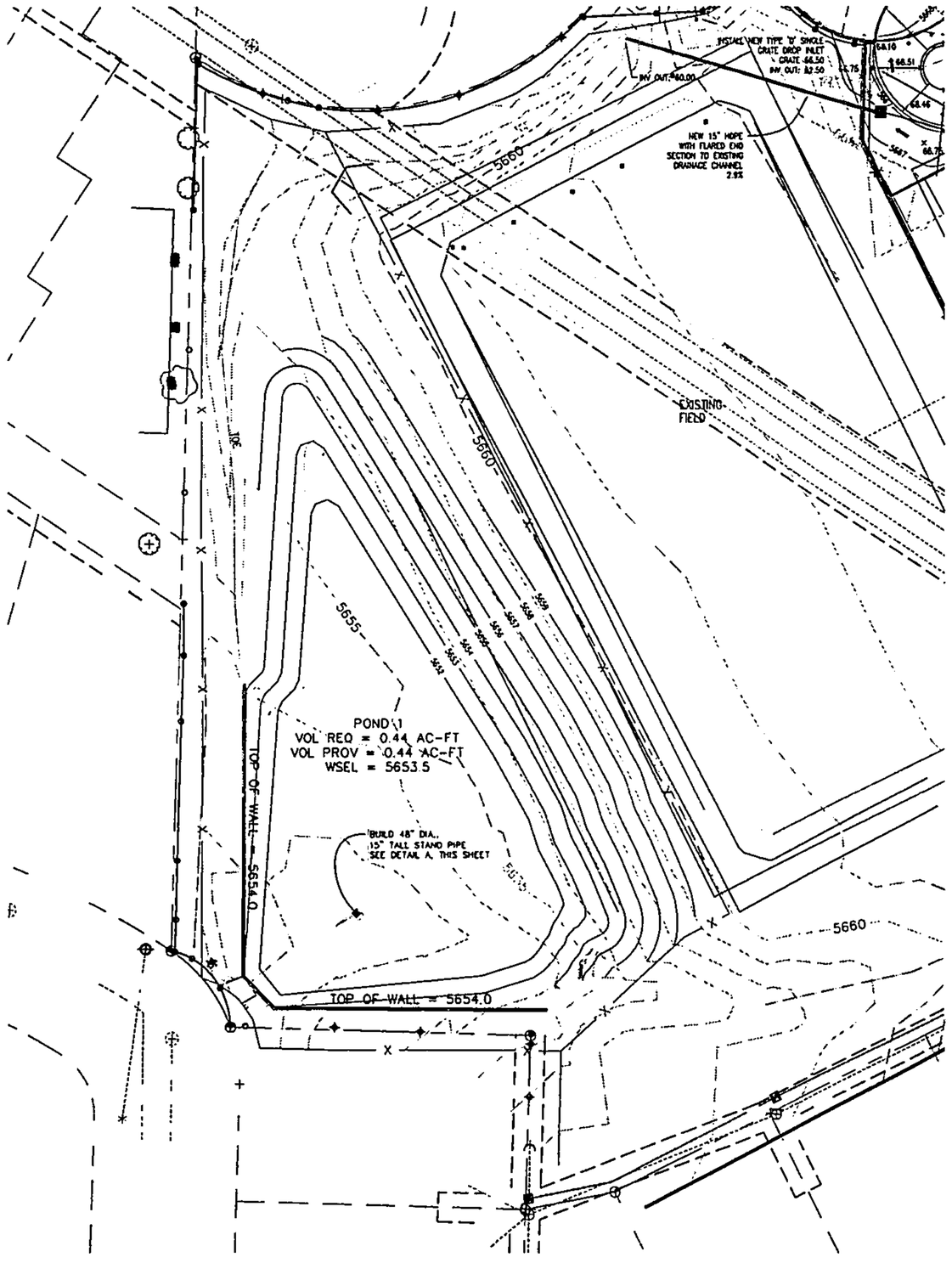
PLAN



ELEVATION

NOTE
1. ALL CONCRETE SHALL BE 3,000 P.S.I. (@ 28 DAYS).

STAND PIPE DETAILS (A)
NOT TO SCALE



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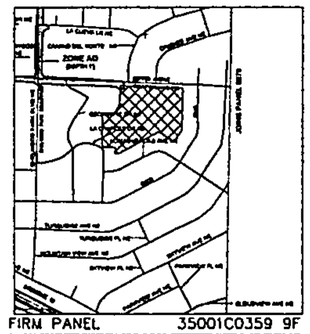
F. THE CONTRACTOR WILL BE RESPONSIBLE FOR RESEEDING ALL DISTURBED AREAS ASSOCIATED WITH THE CONSTRUCTION OF THE POND.



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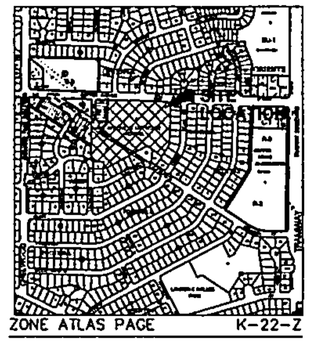

ZONE ATLAS PAGE K-22-Z

LEGAL DESCRIPTION

A parcel of land within Lots 22 & 23 Block 5 of the Foothill Estates Subdivision, Apache Elementary School, in the City of Albuquerque, Bernalillo County, New Mexico.

The parcels contain 8.55 acres, more or less.

NOTES

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3. ALL CONSTRUCTION SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS.

HUITT ZOLLARS
Huitt-Zollars, Inc.
6501 Americas Parkway NE,
Suite 800
Albuquerque, N.M. 87110
Phone (505) 883-8134
Fax (505) 883-3022

JARROD D. LUCAS
NEW MEXICO
14818
LICENSED PROFESSIONAL ENGINEER

ALBUQUERQUE PUBLIC SCHOOLS

Apache Elementary School

Kindergarten Addition

ADDRESS:
12800 COPPER AVE. NE
ALBUQUERQUE NM
87123

MARK	DATE	DESCRIPTION
03	12/8/08	BOOK REVIEW
02	09/26/08	SUB REVIEW SUBMITTAL
01	07/22/08	SUB REVIEW SUBMITTAL

ISSUE:
PROJECT NO.: 14026201
CAD DWG FILE: C-104.dwg
DRAWN BY: DLV
CHECKED BY: JDL

SHEET TITLE:
POND GRADING PLAN

C-104
SHEET OF

Sims, Timothy E.

From: Eddings, Scott [seddings@Huitt-Zollars.com]
Sent: Wednesday, February 24, 2010 1:24 PM
To: Sims, Timothy E.
Cc: Likar, Jarrod; Jarrard, John
Subject: Apache Elementary School

Hi Tim,

We appreciate your assistance in this APS project. Our surveyors were on-site today and confirmed that improvements at Apache Elementary School are in accordance with the approved grading and drainage plans. The City permit number is 200891564. We look forward to submitting the engineer's certificate for compliance with the approved grading and drainage plan.

If you need anything further please let me know.

Scott Eddings

90 day temp
Verbal

RECEIVED
FEB 24 2010
HYDROLOGY
SECTION

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003)

PROJECT TITLE: Apache Elementary Kindergarden Addiiton ZONE ATLAS/DRNG. FILE #: K-22 / D003

DRB #: _____ EPC#: _____ WORK ORDER #: 200891564 PERMIT #

LEGAL DESCRIPTION: Foothill Estates, Block 5, Lots 22 and 23

CITY ADDRESS: 12800 Copper Ave, Albuquerque, NM 87123

ENGINEERING FIRM:	Huitt-Zollars, Inc.	CONTACT:	Jarrod Likar
ADDRESS:	333 Rio Racnho Blvd, Suite 101	PHONE:	892-5141
CITY, STATE:	Rio Rancho, NM	ZIP CODE:	87124
OWNER:	Albuquerque Public Schools	CONTACT:	Tyler Mason
ADDRESS:	12800 Copper Ave	PHONE:	848-8822
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87123
ARCHITECT:	Huitt-Zollars, Inc.	CONTACT:	John Jarrard
ADDRESS:	6501 Americas Parkway NE, Suite 550	PHONE:	883-8114
CITY, STATE:	Albuquerque, NM	ZIP CODE:	87110
SURVEYOR:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
CONTRACTOR:		CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN MEETING ATTENDED:

- __X__ YES
- ____ NO
- ____ COPY PROVIDED

DATE SUBMITTED: 2/26/10 BY: Jarrod Likar

RECEIVED
MAR 1 2010
HYDROLOGY SECTION

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

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

CITY OF
Albuquerque

P.O. Box 1293 Albuquerque, NM 87103

August 19, 1996

Martin J. Chávez, Mayor

Joe P. Kelley, PE
Chavez-Grieves
5639 Jefferson NE
Albuquerque, NM 87109

RE: MASTER DRAINAGE PLAN FOR APACHE ELEMENTARY SCHOOL
(K-22/D3)
RECEIVED AUGUST 1, 1996 FOR MASTER PLAN
ENGINEER'S STAMP DATED 7/29/96

Dear Mr. Kelley:

Based on the information included in the submittal referenced above, City Hydrology accepts the Drainage Master Plan for this site.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer, Hydrology

c: Andrew Garcia
Fred Aguirre
Andre Larroque, APS, 915 Oak SE

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344·4080 · FAX (505) 343·8759

DRAINAGE MASTER PLAN

FOR THE

APACHE ELEMENTARY SCHOOL

ALBUQUERQUE PUBLIC SCHOOLS

ALBUQUERQUE, NEW MEXICO

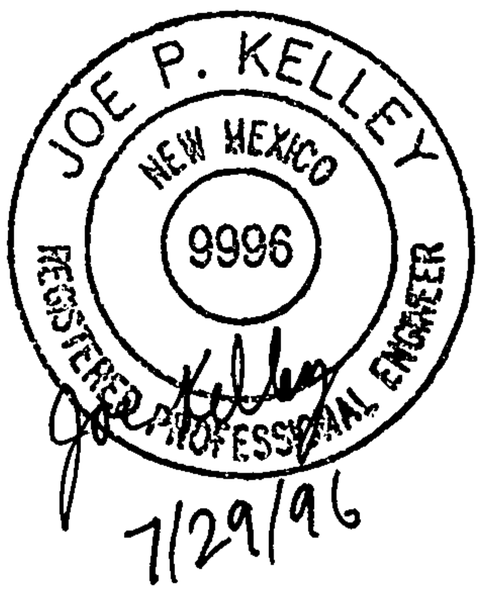
JULY 1996

DRAINAGE MASTER PLAN

FOR THE

APACHE ELEMENTARY SCHOOL

ALBUQUERQUE PUBLIC SCHOOLS



JULY 1996

PROJECT DESCRIPTION

This site is located in northeastern Albuquerque, New Mexico on the south side of Copper Avenue, between Tramway Boulevard and Chelwood Park Boulevard. The plat of survey indicates this site occupies Lots 22 and 23, plus vacated unnamed right-of-way (V.O. 1861), of Block 5, of the Foothill Estates Subdivision residential development. The City of Albuquerque Zone Atlas designation for this site is K-22 (refer to Figure 1).

The site is approximately 8.54 acres in size and is currently occupied by the Apache Elementary School, owned and operated by the Albuquerque Public Schools (APS). The site currently has a mix of permanently constructed classroom, activity and administration buildings, portable classrooms, paved on-site parking areas and open play grounds areas. Existing residential development borders the site to the east, south and a portion of west boundaries, undeveloped land and paved roadway borders the remainder. Refer to Drawing C1 in Appendix B for the existing site conditions.

Future improvements to the Apache Elementary School is currently being master planned by the architectural firm of Wright and Hammer, Albuquerque, New Mexico. The proposed improvements include additions to the existing buildings, upgrade of the portable cluster, a new detached Multi-purpose Center, expanded parking areas, upgraded outside play ground areas, a new ball/soccer field and other site improvements. The level of changes to the existing site conditions warrants the preparation of a new comprehensive drainage plan. The following report will serve as the Drainage Master Plan for the school site for the planning period.

FLOOD HAZARD ZONES

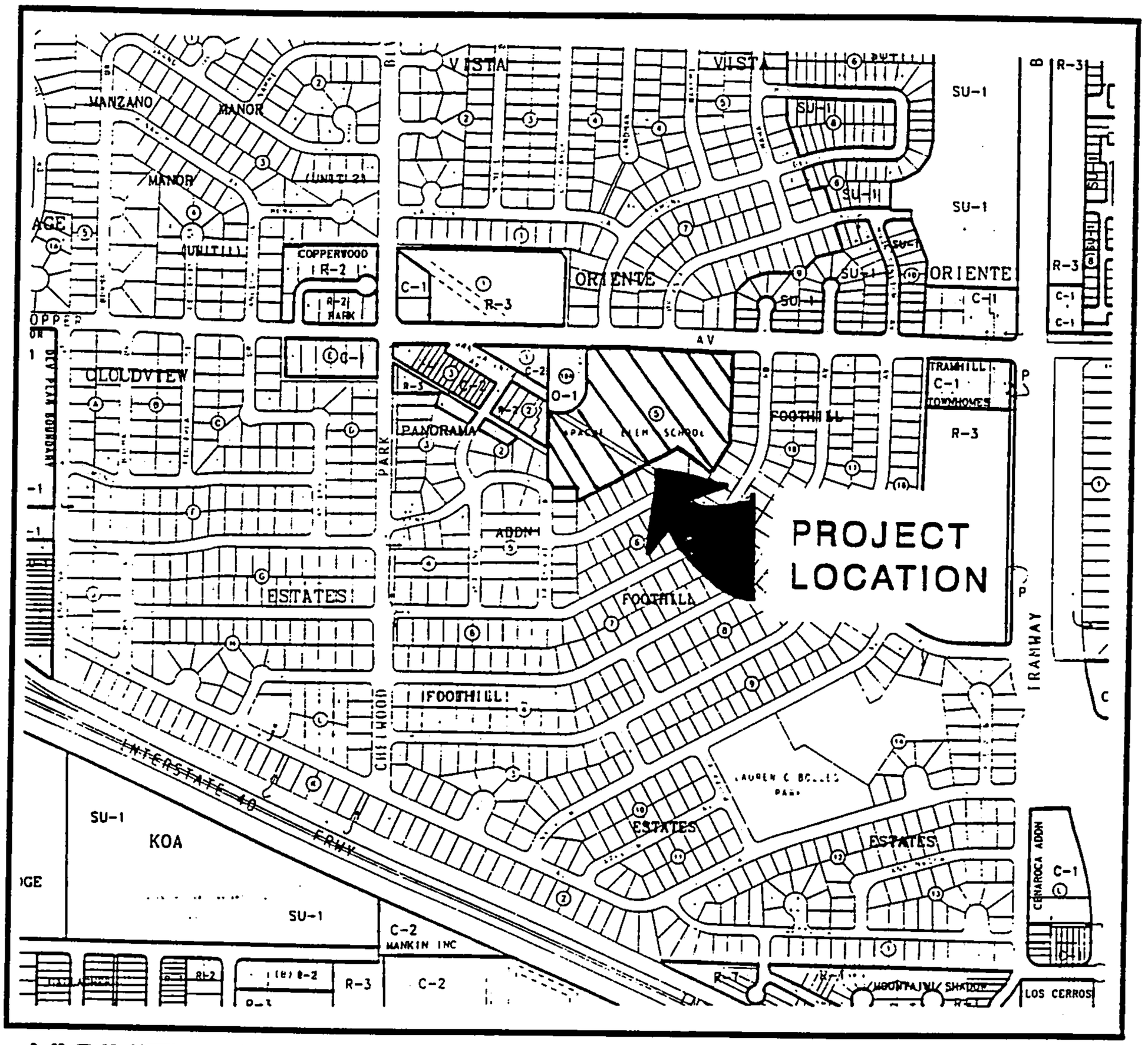
As indicated by National Flood Insurance Rate Map number 350002-0031 for the City of Albuquerque, a flood hazard zone AO exists in Copper Avenue at the northwest corner of the school. The flood water depth is 1 ft. in this zone. The flood hazard zone does not extend into the Apache Elementary school property.

PREVIOUS RELATED PUBLICATIONS

A comprehensive drainage plan was prepared for the subject school site in 1984 (K22/D3). An update was prepared and submitted by Jeff Mortensen Associates, Albuquerque, New Mexico, on May 24, 1993 for parking and other site improvements.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

The site is on gently falling terrain, sloping from the east to the west towards the Rio Grande. In general, the site has a slope of between four to five percent; however, existing localized slopes on the site range from less than one percent to as high as ten percent. The adjacent residential properties to the east discharge a small portion of their respective



VICINITY MAP

K-22-Z

SCALE: 1" = 750'

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

FIGURE 1

storm water run-off onto the school site. There is evidence that a small quantity of storm water run-off enters the school site from the east driveways (along Copper Ave.) when storm run-off generated above the school site reaches the top of curb elevation during a storm event. There does not appear to be any other off-site run-off that enters the subject property.

Presentation of the existing drainage basins is shown on Drawing Sheet C1 included in Appendix B of this report. The storm water generated on the subject site is currently released to the surrounding right-of-ways at several locations. A portion of the existing run-off is released to Copper Ave. either directly or through a small detention/collection basin in an existing parking area. The existing storm water release to Copper Ave. is 0.97 cubic feet per second (cfs). 0.42 cfs is released to a small tract of undeveloped land west of the lower parking area and is primarily from a landscaped buffer. The remainder of the site run-off meanders through on-site channels, swales and by surface sheet flow to the southwestern corner of the site. It is at this location that a detention pond was previously constructed. Over time, this pond has filled with sediment and does not function to capacity. The current storm water release to Conejo Drive is 20.23 cfs. Refer to Drawing C1 in Appendix B for the illustration of the existing drainage basins which was used in the determination of storm water run-off volumes. The drainage computations are presented in Appendix A of this report.

Existing site vegetation consists of limited sodded areas, a few desert shrubs and sparse native grasses. The existing soils appear to be sands and gravels and have been moderately compacted over time due to vehicle traffic and play ground activities. Surface erosion appears to be controlled by graded slopes; however, where concentrated storm water run-off is found, erosion and sediment conveyance is observed.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The proposed improvements to the school site as shown on Drawing C2 in Appendix B are consistent with the master plan as prepared by Wright and Hammer. As mentioned above, the improvements proposed in the site master plan will consist of the construction of building additions, new detached facilities, parking expansions, site upgrades and other improvements. Along with these site change, the grading and drainage for the site must be modified. Drawing C2 also illustrates the proposed changes to the site grading and drainage consistent with the proposed site changes and in accordance with developmental standards set forth by the City of Albuquerque.

This comprehensive drainage master plan will serve as the guide for future grading and drainage plans associated with improvement projects. Close adherence to this master plan will insure that the site as a whole meets the specific drainage design guidelines and City of Albuquerque requirements.

The developed drainage pattern will be similar to the existing drainage pattern as discussed above. The storm water run-off generated from the east side of the school site will be conveyed via a paved access/swale and a compacted dirt swale to the existing on-site detention pond, which is proposed to be improved. The remainder of the on-site storm water run-off will continue to be conveyed through existing facilities to the on-site detention pond. Where the proposed ball/soccer field interrupts the existing surface sheet flow drainage pattern, improved swales will be provided. The detention pond will continue to discharge into Conejo Drive; however through regrading and construction of an inlet and discharge pipe, the developed release to Conejo Drive will be reduced to 7.4 cfs. The 100-year ponding depth will be less than 18". Pursuant to the drainage criteria established by the City of Albuquerque, the pond will therefore not need to be fenced. An overflow via a surface channel will be provided in the event the proposed catch basin and pipe system are surcharged.

The downstream storm drain facilities in which the storm water run-off from this site enters includes a 56 inch diameter storm line in Chelwood Park, NE and series of curbside inlets at the corner of Chelwood Park and Conejo Drive. A street capacity analysis was completed on two segments of Conejo Road and the roadway was found to have sufficient capacity to receive both the existing run-off and the future run-off from the site. The street capacity analysis is summarized below. Refer to Drawing C2 for the proposed developed drainage basins and Appendix A for computations of the developed drainage basin conditions and street capacity.

STREET CAPACITY ANALYSIS

A street capacity analysis for Conejo Road has confirmed that the road has the capacity to accept the developed run-off. Approximation of drainage basin for point east side of Chelwood Park at Conejo Road based on City of Albuquerque Public Works Department Topographic Orthophoto Map No. K-22.

Drainage input through school site	60% of total input
Other areas in basin	40% of total input

	Existing Q (cfs)	Improved Q (cfs)
School	12.21	7.4
Other	8.14	8.14
Total	20.35 16.7?	15.54
Lower street capacity	23.00	23.00
Excess capacity	**2.65**	**7.46**

RUNOFF COMPARISON

A summary table of the existing and developed storm water run-off is included below:

Basin	Q100 Existing (cfs)	Q100 Developed (cfs)	Remarks
1-A	0.36	0.36	Released to Copper Ave.
1-B	~~1.39~~ 1.56	~~2.73~~ 2.51	Released to Copper Ave.
1-C	0.60	0.41	Released to Copper Ave.
1-D	0.42	0.42	Released to adjacent property
2-A	1.73	1.73	Routed through Basin 2-E/2-F
2-B	6.90	6.30	Routed through Basin 2-E/2-F
2-C	8.46	5.09	Routed through Basin 2-E
2-D	2.19	2.19	Routed through inlet/Basin 2-E
2-E	12.21	10.33	Controlled release to Conejo Dr.
2-F		5.96	Routed through Basin 2-E
Total Off-site Release	21.62	9.37	

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 volumes in accordance with Section 22.2. The 100-year, 6-hour storm was used to determine the design discharges.

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
UTILITY DEVELOPMENT DIVISION/HYDROLOGY SECTION

PRE-DESIGN CONFERENCE

DRAINAGE FILE/ZONE ATLAS PAGE NO.: K22 - D3 DATE: 11-6-95

EPC NO.: _____ DRB NO.: _____ ZONE: K22

SUBJECT: APACHE ELEMENTRY MASTER PLAN

STREET ADDRESS: COPPER (EAST OF JUAN TABO)

LEGAL DESCRIPTION: _____

APPROVAL REQUESTED:

____	PRELIMINARY PLAT	____	FINAL PLAT
____	SITE DEVELOPMENT PLAN	____	BUILDING PERMIT
____	GRADING/PAVING PERMIT	✓	OTHER Master Plan.

	WHO	REPRESENTING
ATTENDANCE:	LISA MANOILL	
	BRAD POMDER	

FINDINGS:

FOR MASTER DRAINAGE PLAN - NOT CONSTRUCTION DRAWINGS, ∴ NO EROSION PLAN REQUIRED.

Check DOWN STREAM CAPACITY.

REDUCES FLOWS from 30.6 CFS (BY JMA) to 8.08 CFS. Show all routing calcs.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: _____ SIGNED: Brad Pomder

TITLE: _____ TITLE: Project Manager

DATE: _____ DATE: 11/6/95

NOTE PLEASE PROVIDE A COPY OF THIS PRE-DESIGN FORM WITH THE DRAINAGE SUBMITTAL.

APPENDIX A

COMPUTER PRINTOUT OF AHYMO RUN

AND

HYDRAULIC COMPUTATIONS

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 07/25/1996
     START TIME (HR:MIN:SEC) = 14:44:22     USER NO.= CHVZ_GNM.I01
     INPUT FILE = AHYMO100.IN

*S**************************************************************************
*S*************   CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.  **************
*S*************    APACHE ELEMENTARY SCHOOL SITE, ABQ, NM    **************
*S**************************************************************************
*S*  FILENAME:  G:\W23\W2310051\DOCUMENT\AHYMO100.IN/OUT
*S**************************************************************************
*S******* 100 YEAR STORM, 6 HOUR STORM
START           0.00
RAINFALL          TYPE=1 RAIN QUARTER=0.0 RAIN ONE=2.1
                RAIN SIX=2.6 RAIN DAY=3.3  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  .0033  .0066  .0100  .0135  .0171  .0207
           .0244  .0282  .0321  .0361  .0402  .0444  .0488
           .0532  .0578  .0625  .0673  .0723  .0775  .0829
           .0884  .0942  .1001  .1063  .1128  .1196  .1267
           .1342  .1420  .1503  .1561  .1623  .1690  .1832
           .2150  .2641  .3345  .4307  .5570  .7181  .9187
         1.1636 1.3908 1.4857 1.5658 1.6371 1.7019 1.7616
         1.8171 1.8688 1.9174 1.9631 2.0062 2.0469 2.0854
         2.1219 2.1565 2.1894 2.2206 2.2502 2.2578 2.2649
         2.2717 2.2782 2.2845 2.2905 2.2963 2.3019 2.3074
         2.3127 2.3178 2.3228 2.3276 2.3324 2.3370 2.3415
         2.3459 2.3502 2.3544 2.3585 2.3626 2.3666 2.3705
         2.3743 2.3780 2.3817 2.3854 2.3889 2.3924 2.3959
         2.3993 2.4027 2.4060 2.4092 2.4125 2.4156 2.4188
         2.4218 2.4249 2.4279 2.4309 2.4338 2.4367 2.4396
         2.4424 2.4452 2.4480 2.4508 2.4535 2.4562 2.4588
         2.4615 2.4641 2.4666 2.4692 2.4717 2.4742 2.4767
         2.4792 2.4816 2.4840 2.4864 2.4888 2.4912 2.4935
         2.4958 2.4981 2.5004 2.5027 2.5049 2.5071 2.5093
         2.5115 2.5137 2.5159 2.5180 2.5201 2.5222 2.5243
         2.5264 2.5285 2.5305 2.5326 2.5346 2.5366 2.5386
         2.5406 2.5426 2.5445 2.5465 2.5484 2.5503 2.5523
         2.5542 2.5560 2.5579 2.5598 2.5616 2.5635 2.5653
         2.5671 2.5690 2.5708 2.5725 2.5743 2.5761 2.5779
         2.5796 2.5814 2.5831 2.5848 2.5865 2.5883 2.5900
         2.5916 2.5933 2.5950 2.5967 2.5983 2.6000

*S  COMPUTE THE RUNOFF FROM THE EXISTING BASINS.
*S  BASIN 1-A
COMPUTE NM HYD     ID=16  HYD=EXISTING  DA=.000168 SQ MI
                %A=0  %B=75  %C=0  %D=25
                TP=0.1333  RAINFALL=-1

  K =  .072649HR   TP =  .133300HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
  UNIT PEAK =  .16582   CFS  UNIT VOLUME =   .9286     B =  526.28     P60 = 2.1000
  AREA =     .000042 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


  K =  .133173HR   TP =  .133300HR   K/TP RATIO =  .999050    SHAPE CONSTANT, N =  3.533693
  UNIT PEAK =  .30510   CFS  UNIT VOLUME =   .9562     B =  322.78     P60 = 2.1000
  AREA =     .000126 SQ MI   IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

PRINT HYD ID=16 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.26592 INCHES = .0113 ACRE-FEET
PEAK DISCHARGE RATE = .36 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*S BASIN 1-B
COMPUTE NM HYD ID=17 HYD=EXISTING DA=.000610 SQ MI
%A=0 %B=35 %C=10 %D=55
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.3246 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.1000
AREA = .000336 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .127682HR TP = .133300HR K/TP RATIO = .957853 SHAPE CONSTANT, N = 3.689044
UNIT PEAK = .68754 CFS UNIT VOLUME = .9802 B = 333.88 P60 = 2.1000
AREA = .000275 SQ MI IA = .46667 INCHES INF = 1.15667 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.73170 INCHES = .0563 ACRE-FEET
PEAK DISCHARGE RATE = 1.56 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

*S ROUTE BASIN 1-B THROUGH EXISTING DETENTION IN ASPHALT PARKING
ROUTE RESERVOIR ID=18 HYD=POND_1-B_OUT INFLOW ID=17 CODE=20
OUTFLOW (CFS) STORAGE (AC-FT) ELEV
0 0 0
0.5 0.05 0.5

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	.38	.02	.002	.02
2.00	.32	.34	.034	.34
2.67	.03	.24	.024	.24
3.33	.01	.14	.014	.14
4.00	.01	.09	.009	.09
4.67	.01	.05	.005	.05
5.33	.01	.04	.004	.04
6.00	.01	.02	.002	.02
6.67	.00	.02	.002	.02
7.33	.00	.01	.001	.01
8.00	.00	.01	.001	.01
8.67	.00	.00	.000	.00

PEAK DISCHARGE = .336 CFS - PEAK OCCURS AT HOUR 1.97

MAXIMUM WATER SURFACE ELEVATION = .336
MAXIMUM STORAGE = .0336 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=18 CODE=1

HYDROGRAPH FROM AREA POND_1-B_OUT

RUNOFF VOLUME = 1.73126 INCHES = .0563 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 1.966 HOURS BASIN AREA = .0006 SQ. MI.

*S ROUTE 1-B DETENTION DISCHARGE THROUGH EXISTING INLET AND 4 INCH DIA. PVC STO
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.02
DIA=0.3333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	AREA SQ FT	FLOW RATE CFS	MAX FLOW WIDTH FT
.00	.00	.00	.00
.02	.00	.00	.15
.03	.00	.01	.20
.05	.01	.02	.24
.07	.01	.04	.27
.09	.02	.06	.29
.10	.02	.08	.31
.12	.03	.11	.32
.14	.03	.14	.33
.16	.04	.17	.33
.17	.05	.21	.33
.19	.05	.24	.33
.21	.06	.28	.33
.23	.06	.31	.33
.24	.07	.34	.33
.26	.07	.37	.33
.28	.08	.39	.33
.30	.08	.41	.33
.31	.09	.42	.33
.33	.09	.42	.33

COMPUTE TRAVEL TIME ID=19 REACH=1 VS NO=1 L=35 SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.017	.002	.00	.0083
.035	.005	.01	.0053
.052	.009	.02	.0041
.069	.013	.04	.0035
.087	.018	.06	.0030
.104	.023	.08	.0027
.122	.029	.11	.0025
.139	.034	.14	.0024
.156	.040	.17	.0022
.174	.046	.21	.0021
.191	.052	.24	.0021
.208	.057	.28	.0020
.226	.063	.31	.0020

.243	.068	.34	.0019
.261	.073	.37	.0019
.278	.078	.39	.0019
.295	.082	.41	.0019
.313	.085	.42	.0020
.333	.087	.42	.0020

ROUTE ID=19 HYD=TO_AP_5 INFLOW ID=18 DT=0.03333
PRINT HYD ID=19 CODE=1

HYDROGRAPH FROM AREA TO_AP_5

RUNOFF VOLUME = 1.72894 INCHES = .0562 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 1.966 HOURS BASIN AREA = .0006 SQ. MI.

*S BASIN 1-C
COMPUTE NM HYD ID=20 HYD=EXISTING DA=.000311 SQ MI
%A=0 %B=85 %C=0 %D=15
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .18418 CFS UNIT VOLUME = .9386 B = 526.28 P60 = 2.1000
AREA = .000047 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .64011 CFS UNIT VOLUME = .9795 B = 322.78 P60 = 2.1000
AREA = .000264 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=20 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.12120 INCHES = .0186 ACRE-FEET
PEAK DISCHARGE RATE = .60 CFS AT 1.500 HOURS BASIN AREA = .0003 SQ. MI.

*S BASIN 1-D
COMPUTE NM HYD ID=21 HYD=EXISTING DA=.000186 SQ MI
%A=0 %B=0 %C=100 %D=0
TP=0.1333 RAINFALL=-1

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = .53113 CFS UNIT VOLUME = .9764 B = 380.65 P60 = 2.1000
AREA = .000186 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=21 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.26839 INCHES = .0126 ACRE-FEET
PEAK DISCHARGE RATE = .42 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*S BASIN 2-A
COMPUTE NM HYD ID=1 HYD=EXISTING DA=.000715 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 = 1.4114 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.1000
AREA = .000358 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .86567 CFS UNIT VOLUME = .9841 B = 322.78 P60 = 2.1000
AREA = .000358 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 EXISTING

RUNOFF VOLUME = 1.62772 INCHES = .0621 ACRE-FEET
PEAK DISCHARGE RATE = 1.73 CFS AT 1.500 HOURS BASIN AREA = .0007 SQ. MI.

*S BASIN 2-B
COMPUTE NM HYD ID=2 HYD=EXISTING DA=.002490 SQ MI
%A=0 %B=0 %C=40 %D=60
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.8984 CFS UNIT VOLUME = .9976 B = 526.28 P60 = 2.1000
AREA = .001494 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 2.8441 CFS UNIT VOLUME = .9958 B = 380.65 P60 = 2.1000
AREA = .000996 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.91815 INCHES = .2547 ACRE-FEET
PEAK DISCHARGE RATE = 6.90 CFS AT 1.500 HOURS BASIN AREA = .0025 SQ. MI.

*S ADD BASINS 2-A AND 2-B
ADD HYD ID=3 HYD=AP_1 ID I=1 ID II=2
PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA AP_1

RUNOFF VOLUME = 1.85319 INCHES = .3168 ACRE-FEET
PEAK DISCHARGE RATE = 8.63 CFS AT 1.500 HOURS BASIN AREA = .0032 SQ. MI.

*S BASIN 2-C
COMPUTE NM HYD ID=4 HYD=EXISTING DA=.003349 SQ MI
%A=0 %B=0 %C=65 %D=35
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 4.6277 CFS UNIT VOLUME = .9969 B = 526.28 P60 = 2.1000
AREA = .001172 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 6.2161 CFS UNIT VOLUME = .9984 B = 380.65 P60 = 2.1000
AREA = .002177 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.64742 INCHES = .2942 ACRE-FEET
PEAK DISCHARGE RATE = 8.46 CFS AT 1.500 HOURS BASIN AREA = .0033 SQ. MI.

*S ROUTE BASINS 2-A AND 2-B TO DETENTION AREA IN BASIN 2-C VIA SURFACE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=0 FT MAX ELEV=1.5 FT
CH SLP=0.025 FP SLP=0.025 N=0.03
DIST=10 FT
DIST ELEV
0 1.5
5 0
10 1.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.08	.02	.02	.53
.16	.08	.12	1.05
.24	.19	.34	1.58
.32	.33	.74	2.11
.39	.52	1.34	2.63
.47	.75	2.18	3.16
.55	1.02	3.29	3.68
.63	1.33	4.69	4.21
.71	1.68	6.42	4.74
.79	2.08	8.51	5.26
.87	2.51	10.97	5.79
.95	2.99	13.83	6.32
1.03	3.51	17.13	6.84
1.11	4.07	20.87	7.37
1.18	4.67	25.08	7.89
1.26	5.32	29.79	8.42
1.34	6.00	35.02	8.95
1.42	6.73	40.79	9.47
1.50	7.50	47.12	10.00

COMPUTE TRAVEL TIME ID=5 REACH=1 VS NO=1 L=340 SLP=.0250

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.079	.021	.02	.1070
.158	.083	.12	.0674
.237	.187	.34	.0515
.316	.332	.74	.0425
.395	.519	1.34	.0366
.474	.748	2.18	.0324
.553	1.018	3.29	.0293
.632	1.330	4.69	.0268
.711	1.683	6.42	.0247
.789	2.078	8.51	.0231
.868	2.514	10.97	.0216
.947	2.992	13.83	.0204
1.026	3.511	17.13	.0194
1.105	4.072	20.87	.0184
1.184	4.675	25.08	.0176
1.263	5.319	29.79	.0169
1.342	6.004	35.02	.0162
1.421	6.731	40.79	.0156
1.500	7.500	47.12	.0150

ROUTE ID=5 HYD=TO_AP_2a INFLOW ID=3 DT=0.03333
PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA TO_AP_2a

RUNOFF VOLUME = 1.85334 INCHES = .3168 ACRE-FEET
PEAK DISCHARGE RATE = 8.49 CFS AT 1.533 HOURS BASIN AREA = .0032 SQ. MI.

*S ADD ROUTING OF BASINS 2-A AND 2-B (AP-2a) TO BASIN 2-C
ADD HYD ID=6 HYD=AP_2 ID I=4 ID II=5
PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA AP_2

RUNOFF VOLUME = 1.74800 INCHES = .6110 ACRE-FEET
PEAK DISCHARGE RATE = 16.71 CFS AT 1.500 HOURS BASIN AREA = .0066 SQ. MI.

*S ROUTE AP-2 THROUGH EXISTING DETENTION IN BASIN 2-C
ROUTE RESERVOIR ID=7 HYD=POND_2-C_OUT INFLOW ID=6 CODE=20

OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV
0	0	0
6.0	0.50	0.5

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	3.48	.02	.020	.24

2.00	3.59	.34	.344	4.13
2.67	.36	.22	.223	2.68
3.33	.12	.12	.123	1.47
4.00	.09	.07	.068	.81
4.67	.09	.04	.039	.46
5.33	.09	.02	.023	.28
6.00	.09	.02	.016	.19
6.67	.00	.01	.009	.11
7.33	.00	.00	.005	.06
8.00	.00	.00	.002	.03
8.67	.00	.00	.001	.02
9.33	.00	.00	.001	.01
10.00	.00	.00	.000	.00

PEAK DISCHARGE = 4.145 CFS - PEAK OCCURS AT HOUR 1.93
MAXIMUM WATER SURFACE ELEVATION = .345
MAXIMUM STORAGE = .3454 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=7 CODE=1

HYDROGRAPH FROM AREA POND_2-C_OUT

RUNOFF VOLUME = 1.74800 INCHES = .6110 ACRE-FEET
PEAK DISCHARGE RATE = 4.14 CFS AT 1.933 HOURS BASIN AREA = .0066 SQ. MI.

*S ROUTE AP_2 TOTAL THROUGH EXISTING 10 INCH DIA. PVC STORM PIPE
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.03
DIA=.8333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.04	.01	.03	.37
.09	.03	.12	.51
.13	.05	.29	.61
.17	.08	.52	.68
.22	.11	.81	.73
.26	.15	1.16	.77
.30	.18	1.56	.80
.35	.22	1.99	.82
.39	.25	2.45	.83
.43	.29	2.94	.83
.48	.32	3.43	.83
.52	.36	3.92	.83
.56	.39	4.39	.83
.61	.43	4.84	.83
.65	.46	5.23	.83
.69	.49	5.56	.83
.74	.51	5.80	.83
.78	.53	5.90	.83
.83	.55	5.90	.83

COMPUTE TRAVEL TIME ID=8 REACH=1 VS NO=1 L=120 SLP=.03

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH	AVERAGE AREA	FLOW RATE	TRAVEL TIME

FEET	SQ.FT.	CFS	HRS
.043	.011	.03	.0126
.087	.030	.12	.0081
.130	.054	.29	.0063
.174	.082	.52	.0053
.217	.113	.81	.0046
.261	.146	1.16	.0042
.304	.180	1.56	.0039
.347	.215	1.99	.0036
.391	.251	2.45	.0034
.434	.287	2.94	.0033
.478	.323	3.43	.0031
.521	.359	3.92	.0031
.565	.393	4.39	.0030
.608	.426	4.84	.0029
.651	.457	5.23	.0029
.695	.486	5.56	.0029
.738	.511	5.80	.0029
.782	.531	5.90	.0030
.833	.545	5.90	.0031

ROUTE ID=8 HYD=TO_AP_3a INFLOW ID=7 DT=0.03333
PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA TO_AP_3a

RUNOFF VOLUME = 1.74784 INCHES = .6109 ACRE-FEET
PEAK DISCHARGE RATE = 4.14 CFS AT 1.933 HOURS BASIN AREA = .0066 SQ. MI.

*S BASIN 2D
COMPUTE NM HYD ID=9 HYD=EXISTING DA=.000771
%A=0 %B=12 %C=0 %D=88
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.6787 CFS UNIT VOLUME = .9949 B = 526.28 P60 = 2.1000
AREA = .000678 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .22403 CFS UNIT VOLUME = .9387 B = 322.78 P60 = 2.1000
AREA = .000093 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 2.17766 INCHES = .0895 ACRE-FEET
PEAK DISCHARGE RATE = 2.31 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

*S ROUTE BASIN 2-D THROUGH EXISTING DETENTION IN ASPHALT PARKING
ROUTE RESERVOIR ID=10 HYD=POND_2-D_OUT INFLOW ID=9 CODE=20
OUTFLOW (CFS) STORAGE (AC-FT) ELEV
0 0 0
0.5 0.09 0.5

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	.69	.03	.005	.03
2.00	.55	.33	.060	.33
2.67	.05	.29	.052	.29
3.33	.03	.22	.040	.22
4.00	.02	.17	.031	.17
4.67	.02	.13	.024	.13
5.33	.02	.10	.018	.10
6.00	.02	.08	.014	.08
6.67	.00	.06	.011	.06
7.33	.00	.04	.008	.04
8.00	.00	.03	.006	.03
8.67	.00	.02	.004	.02
9.33	.00	.02	.003	.02
10.00	.00	.01	.002	.01
10.67	.00	.01	.002	.01
11.33	.00	.01	.001	.01
12.00	.00	.01	.001	.01
12.67	.00	.00	.001	.00

PEAK DISCHARGE = .340 CFS - PEAK OCCURS AT HOUR 2.13
MAXIMUM WATER SURFACE ELEVATION = .340
MAXIMUM STORAGE = .0612 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA POND_2-D_OUT

RUNOFF VOLUME = 2.17676 INCHES = .0895 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 2.133 HOURS BASIN AREA = .0008 SQ. MI.

*S ROUTE 2-D DETENTION THROUGH EXISTING INLET AND 4 INCH DIA. PVC STORM PIPE
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.02
DIA=0.3333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.02	.00	.00	.15
.03	.00	.01	.20
.05	.01	.02	.24
.07	.01	.04	.27
.09	.02	.06	.29
.10	.02	.08	.31
.12	.03	.11	.32
.14	.03	.14	.33
.16	.04	.17	.33
.17	.05	.21	.33
.19	.05	.24	.33
.21	.06	.28	.33
.23	.06	.31	.33
.24	.07	.34	.33

.26	.07	.37	.33
.28	.08	.39	.33
.30	.08	.41	.33
.31	.09	.42	.33
.33	.09	.42	.33

COMPUTE TRAVEL TIME ID=11 REACH=1 VS NO=1 L=100 SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.017	.002	.00	.0236
.035	.005	.01	.0151
.052	.009	.02	.0118
.069	.013	.04	.0099
.087	.018	.06	.0087
.104	.023	.08	.0079
.122	.029	.11	.0072
.139	.034	.14	.0068
.156	.040	.17	.0064
.174	.046	.21	.0061
.191	.052	.24	.0059
.208	.057	.28	.0057
.226	.063	.31	.0056
.243	.068	.34	.0055
.261	.073	.37	.0055
.278	.078	.39	.0055
.295	.082	.41	.0055
.313	.085	.42	.0056
.333	.087	.42	.0058

ROUTE ID=11 HYD=TO_AP_3b INFLOW ID=10 DT=0.03333
PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA TO_AP_3b

RUNOFF VOLUME = 2.17361 INCHES = .0894 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 2.133 HOURS BASIN AREA = .0008 SQ. MI.

*S ADD ROUTING OF BASINS 2-A, 2-B, 2-C AND 2-D (AP-3 TOTAL)
ADD HYD ID=12 HYD=AP_3 ID I=8 ID II=11
PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA AP_3

RUNOFF VOLUME = 1.79252 INCHES = .7003 ACRE-FEET
PEAK DISCHARGE RATE = 4.47 CFS AT 1.966 HOURS BASIN AREA = .0073 SQ. MI.

*S BASIN 2E
COMPUTE NM HYD ID=13 HYD=EXISTING DA=.005469
%A=0 %B=0 %C=95 %D=5
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.0796 CFS UNIT VOLUME = .9881 B = 526.28 P60 = 2.1000

AREA = .000273 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 14.836 CFS UNIT VOLUME = .9995 B = 380.65 P60 = 2.1000
AREA = .005196 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA EXISTING

RUNOFF VOLUME = 1.32253 INCHES = .3858 ACRE-FEET
PEAK DISCHARGE RATE = 12.21 CFS AT 1.500 HOURS BASIN AREA = .0055 SQ. MI.

*S ROUTE AP 3 TOTAL TO DRAINAGE OUTLET AT CANEJO DRIVE VIA SURFACE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=0 FT MAX ELEV=1.5 FT
CH SLP=0.0275 FP SLP=0.0275 N=0.03
DIST=20 FT
DIST ELEV
0 1.5
10 0
20 1.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.08	.04	.04	1.05
.16	.17	.25	2.11
.24	.37	.74	3.16
.32	.66	1.58	4.21
.39	1.04	2.87	5.26
.47	1.50	4.67	6.32
.55	2.04	7.04	7.37
.63	2.66	10.05	8.42
.71	3.37	13.77	9.47
.79	4.16	18.23	10.53
.87	5.03	23.51	11.58
.95	5.98	29.64	12.63
1.03	7.02	36.70	13.68
1.11	8.14	44.72	14.74
1.18	9.35	53.75	15.79
1.26	10.64	63.84	16.84
1.34	12.01	75.05	17.89
1.42	13.46	87.40	18.95
1.50	15.00	100.96	20.00

COMPUTE TRAVEL TIME ID=14 REACH=1 VS NO=1 L=400 SLP=.0275

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.079	.042	.04	.1175

.158	.166	.25	.0741
.237	.374	.74	.0565
.316	.665	1.58	.0466
.395	1.039	2.87	.0402
.474	1.496	4.67	.0356
.553	2.036	7.04	.0321
.632	2.659	10.05	.0294
.711	3.366	13.77	.0272
.789	4.155	18.23	.0253
.868	5.028	23.51	.0238
.947	5.983	29.64	.0224
1.026	7.022	36.70	.0213
1.105	8.144	44.72	.0202
1.184	9.349	53.75	.0193
1.263	10.637	63.84	.0185
1.342	12.008	75.05	.0178
1.421	13.463	87.40	.0171
1.500	15.000	100.96	.0165

2A+2B@AP1

ROUTE ID=14 HYD=TO_AP_4a INFLOW ID=3 DT=0.03333
PRINT HYD ID=14 CODE=1

12

HYDROGRAPH FROM AREA TO AP 4a

RUNOFF VOLUME = 1.85334 INCHES = .3168 ACRE-FEET
PEAK DISCHARGE RATE = 8.40 CFS AT 1.533 HOURS BASIN AREA = .0032 SQ. MI.

*S ADD ROUTING OF BASINS AP_4a TO BASIN 2-E
ADD HYD ID=15 HYD=AP_4 ID I=13 ID II=14
PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA AP_4

RUNOFF VOLUME = 1.51859 INCHES = .7025 ACRE-FEET
PEAK DISCHARGE RATE = 20.23 CFS AT 1.533 HOURS BASIN AREA = .0087 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:44:24

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 07/25/1996
     START TIME (HR:MIN:SEC) = 15:04:00     USER NO.= CHVZ_GNM.I01
     INPUT FILE = AHYMO101.IN

*S*************************************************************************
*S*************   CHAVEZ-GRIEVES CONSULTING ENGINEERS, INC.  **************
*S*************    APACHE ELEMENTARY SCHOOL SITE, ABQ, NM    **************
*S*************************************************************************
*S*  FILENAME:  G:\W23\W2310051\DOCUMENT\AHYMO101.IN/OUT
*S*************************************************************************
*S******* 100 YEAR STORM, 6 HOUR STORM
START           0.00
RAINFALL          TYPE=1 RAIN QUARTER=0.0 RAIN ONE=2.1
              RAIN SIX=2.6 RAIN DAY=3.3  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  .0033  .0066  .0100  .0135  .0171  .0207
           .0244  .0282  .0321  .0361  .0402  .0444  .0488
           .0532  .0578  .0625  .0673  .0723  .0775  .0829
           .0884  .0942  .1001  .1063  .1128  .1196  .1267
           .1342  .1420  .1503  .1561  .1623  .1690  .1832
           .2150  .2641  .3345  .4307  .5570  .7181  .9187
         1.1636 1.3908 1.4857 1.5658 1.6371 1.7019 1.7616
         1.8171 1.8688 1.9174 1.9631 2.0062 2.0469 2.0854
         2.1219 2.1565 2.1894 2.2206 2.2502 2.2578 2.2649
         2.2717 2.2782 2.2845 2.2905 2.2963 2.3019 2.3074
         2.3127 2.3178 2.3228 2.3276 2.3324 2.3370 2.3415
         2.3459 2.3502 2.3544 2.3585 2.3626 2.3666 2.3705
         2.3743 2.3780 2.3817 2.3854 2.3889 2.3924 2.3959
         2.3993 2.4027 2.4060 2.4092 2.4125 2.4156 2.4188
         2.4218 2.4249 2.4279 2.4309 2.4338 2.4367 2.4396
         2.4424 2.4452 2.4480 2.4508 2.4535 2.4562 2.4588
         2.4615 2.4641 2.4666 2.4692 2.4717 2.4742 2.4767
         2.4792 2.4816 2.4840 2.4864 2.4888 2.4912 2.4935
         2.4958 2.4981 2.5004 2.5027 2.5049 2.5071 2.5093
         2.5115 2.5137 2.5159 2.5180 2.5201 2.5222 2.5243
         2.5264 2.5285 2.5305 2.5326 2.5346 2.5366 2.5386
         2.5406 2.5426 2.5445 2.5465 2.5484 2.5503 2.5523
         2.5542 2.5560 2.5579 2.5598 2.5616 2.5635 2.5653
         2.5671 2.5690 2.5708 2.5725 2.5743 2.5761 2.5779
         2.5796 2.5814 2.5831 2.5848 2.5865 2.5883 2.5900
         2.5916 2.5933 2.5950 2.5967 2.5983 2.6000

*S  COMPUTE THE RUNOFF FROM THE DEVELOPED BASINS.
*S  BASIN 1-A
COMPUTE NM HYD     ID=19  HYD=FUTURE  DA=.000168 SQ MI
              %A=0  %B=75  %C=0  %D=25
              TP=0.1333  RAINFALL=-1

  K =  .072649HR   TP =  .133300HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
  UNIT PEAK =  .16582   CFS  UNIT VOLUME =  .9286     B =  526.28     P60 = 2.1000
  AREA =     .000042 SQ MI   IA =  .10000 INCHES   INF =  .04000 INCHES PER HOUR
  RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  .033330


  K =  .133173HR   TP =  .133300HR   K/TP RATIO =  .999050    SHAPE CONSTANT, N =  3.533693
  UNIT PEAK =  .30510   CFS  UNIT VOLUME =  .9562     B =  322.78     P60 = 2.1000
  AREA =     .000126 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 FUTURE

RUNOFF VOLUME = 1.26592 INCHES = .0113 ACRE-FEET
PEAK DISCHARGE RATE = .36 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*S BASIN 1-B
COMPUTE NM HYD ID=20 HYD=FUTURE DA=.000980 SQ MI
%A=0 %B=35 %C=8 %D=57
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.2054 CFS UNIT VOLUME = .9941 B = 526.28 P60 = 2.1000
AREA = .000559 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .128576HR TP = .133300HR K/TP RATIO = .964559 SHAPE CONSTANT, N = 3.662621
UNIT PEAK = 1.0496 CFS UNIT VOLUME = .9870 B = 332.01 P60 = 2.1000
AREA = .000421 SQ MI IA = .47209 INCHES INF = 1.17186 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=20 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.75421 INCHES = .0917 ACRE-FEET
PEAK DISCHARGE RATE = 2.51 CFS AT 1.500 HOURS BASIN AREA = .0010 SQ. MI.

*S ROUTE BASIN 1-B THROUGH EXISTING DETENTION IN ASPHALT PARKING
ROUTE RESERVOIR ID=21 HYD=POND_1-B_OUT INFLOW ID=20 CODE=20
OUTFLOW (CFS) STORAGE (AC-FT) ELEV
0 0 0
.5 .098 0.5

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	.62	.02	.004	.02
2.00	.52	.33	.064	.33
2.67	.05	.29	.056	.29
3.33	.02	.22	.044	.22
4.00	.02	.17	.034	.17
4.67	.02	.14	.027	.14
5.33	.02	.11	.021	.11
6.00	.02	.08	.017	.08
6.67	.00	.06	.013	.06
7.33	.00	.05	.010	.05

8.00	.00	.04	.007	.04
8.67	.00	.03	.005	.03
9.33	.00	.02	.004	.02
10.00	.00	.02	.003	.02
10.67	.00	.01	.002	.01
11.33	.00	.01	.002	.01
12.00	.00	.01	.001	.01
12.67	.00	.01	.001	.01
13.33	.00	.00	.001	.00

PEAK DISCHARGE = .331 CFS - PEAK OCCURS AT HOUR 2.13
MAXIMUM WATER SURFACE ELEVATION = .331
MAXIMUM STORAGE = .0648 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=21 CODE=1

HYDROGRAPH FROM AREA POND_1-B_OUT

RUNOFF VOLUME = 1.75303 INCHES = .0916 ACRE-FEET
PEAK DISCHARGE RATE = .33 CFS AT 2.133 HOURS BASIN AREA = .0010 SQ. MI.

*S ROUTE 1-B DETENTION DISCHARGE THROUGH EXISTING INLET AND 4 INCH DIA. PVC STO
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.02
DIA=0.3333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.02	.00	.00	.15
.03	.00	.01	.20
.05	.01	.02	.24
.07	.01	.04	.27
.09	.02	.06	.29
.10	.02	.08	.31
.12	.03	.11	.32
.14	.03	.14	.33
.16	.04	.17	.33
.17	.05	.21	.33
.19	.05	.24	.33
.21	.06	.28	.33
.23	.06	.31	.33
.24	.07	.34	.33
.26	.07	.37	.33
.28	.08	.39	.33
.30	.08	.41	.33
.31	.09	.42	.33
.33	.09	.42	.33

COMPUTE TRAVEL TIME ID=22 REACH=1 VS NO=1 L=35 SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.017	.002	.00	.0083
.035	.005	.01	.0053

.052	.009	.02	.0041
.069	.013	.04	.0035
.087	.018	.06	.0030
.104	.023	.08	.0027
.122	.029	.11	.0025
.139	.034	.14	.0024
.156	.040	.17	.0022
.174	.046	.21	.0021
.191	.052	.24	.0021
.208	.057	.28	.0020
.226	.063	.31	.0020
.243	.068	.34	.0019
.261	.073	.37	.0019
.278	.078	.39	.0019
.295	.082	.41	.0019
.313	.085	.42	.0020
.333	.087	.42	.0020

ROUTE ID=22 HYD=TO_AP_5 INFLOW ID=21 DT=0.03333
PRINT HYD ID=22 CODE=1

HYDROGRAPH FROM AREA TO_AP_5

RUNOFF VOLUME = 1.75063 INCHES = .0915 ACRE-FEET
PEAK DISCHARGE RATE = .33 CFS AT 2.133 HOURS BASIN AREA = .0010 SQ. MI.

*S BASIN 1-C
COMPUTE NM HYD ID=23 HYD=FUTURE DA=.000188 SQ MI
%A=0 %B=70 %C=0 %D=30
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .22267 CFS UNIT VOLUME = .9472 B = 526.28 P60 = 2.1000
AREA = .000056 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .31866 CFS UNIT VOLUME = .9562 B = 322.78 P60 = 2.1000
AREA = .000132 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=23 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.33828 INCHES = .0134 ACRE-FEET
PEAK DISCHARGE RATE = .41 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*S BASIN 1-D
COMPUTE NM HYD ID=24 HYD=FUTURE DA=.000186 SQ MI
%A=0 %B=0 %C=100 %D=0
TP=0.1333 RAINFALL=-1

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = .53113 CFS UNIT VOLUME = .9764 B = 380.65 P60 = 2.1000

AREA = .000186 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=24 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.26839 INCHES = .0126 ACRE-FEET
PEAK DISCHARGE RATE = .42 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*S BASIN 2-A
COMPUTE NM HYD ID=1 HYD=FUTURE DA=.000715 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 = 1.4114 CFS UNIT VOLUME = .9911 B = 526.28 P60 = 2.1000
AREA = .000358 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .86567 CFS UNIT VOLUME = .9841 B = 322.78 P60 = 2.1000
AREA = .000358 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 FUTURE

RUNOFF VOLUME = 1.62772 INCHES = .0621 ACRE-FEET
PEAK DISCHARGE RATE = 1.73 CFS AT 1.500 HOURS BASIN AREA = .0007 SQ. MI.

*S BASIN 2-B
COMPUTE NM HYD ID=2 HYD=FUTURE DA=.002272 SQ MI
%A=0 %B=0 %C=40 %D=60
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 5.3820 CFS UNIT VOLUME = .9973 B = 526.28 P60 = 2.1000
AREA = .001363 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 2.5951 CFS UNIT VOLUME = .9953 B = 380.65 P60 = 2.1000
AREA = .000909 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.91815 INCHES = .2324 ACRE-FEET

PEAK DISCHARGE RATE = 6.30 CFS AT 1.500 HOURS BASIN AREA = .0023 SQ. MI.

*S ADD BASINS 2-A AND 2-B
ADD HYD ID=3 HYD=AP_1 ID I=1 ID II=2
PRINT HYD ID=3 CODE=1

HYDROGRAPH FROM AREA AP_1

RUNOFF VOLUME = 1.84844 INCHES = .2945 ACRE-FEET
PEAK DISCHARGE RATE = 8.03 CFS AT 1.500 HOURS BASIN AREA = .0030 SQ. MI.

*S BASIN 2-F (NEW BASIN IN DEVELOPED SCENARIO)
COMPUTE NM HYD ID=4 HYD=FUTURE DA=.002313 SQ MI
%A=0 %B=0 %C=60 %D=40
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.6527 CFS UNIT VOLUME = .9961 B = 526.28 P60 = 2.1000
AREA = .000925 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 3.9629 CFS UNIT VOLUME = .9970 B = 380.65 P60 = 2.1000
AREA = .001388 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.70156 INCHES = .2099 ACRE-FEET
PEAK DISCHARGE RATE = 5.96 CFS AT 1.500 HOURS BASIN AREA = .0023 SQ. MI.

*S ROUTE BASINS 2-A AND 2-B TO AP_2a IN BASIN 2-F VIA SURFACE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=0 FT MAX ELEV=1.5 FT
CH SLP=0.042 FP SLP=0.042 N=0.03
DIST=10 FT
DIST ELEV
0 1.5
5 0
10 1.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.08	.02	.02	.53
.16	.08	.15	1.05
.24	.19	.44	1.58
.32	.33	.96	2.11

.39	.52	1.74	2.63
.47	.75	2.82	3.16
.55	1.02	4.26	3.68
.63	1.33	6.08	4.21
.71	1.68	8.33	4.74
.79	2.08	11.03	5.26
.87	2.51	14.22	5.79
.95	2.99	17.93	6.32
1.03	3.51	22.20	6.84
1.11	4.07	27.05	7.37
1.18	4.67	32.51	7.89
1.26	5.32	38.62	8.42
1.34	6.00	45.39	8.95
1.42	6.73	52.87	9.47
1.50	7.50	61.07	10.00

COMPUTE TRAVEL TIME ID=5 REACH=1 VS NO=1 L=120 SLP=.0420

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.079	.021	.02	.0291
.158	.083	.15	.0184
.237	.187	.44	.0140
.316	.332	.96	.0116
.395	.519	1.74	.0100
.474	.748	2.82	.0088
.553	1.018	4.26	.0080
.632	1.330	6.08	.0073
.711	1.683	8.33	.0067
.789	2.078	11.03	.0063
.868	2.514	14.22	.0059
.947	2.992	17.93	.0056
1.026	3.511	22.20	.0053
1.105	4.072	27.05	.0050
1.184	4.675	32.51	.0048
1.263	5.319	38.62	.0046
1.342	6.004	45.39	.0044
1.421	6.731	52.87	.0042
1.500	7.500	61.07	.0041

ROUTE ID=5 HYD=TO_AP_2a INFLOW ID=3 DT=0.03333
PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA TO_AP_2a

RUNOFF VOLUME = 1.84862 INCHES = .2945 ACRE-FEET
PEAK DISCHARGE RATE = 8.00 CFS AT 1.500 HOURS BASIN AREA = .0030 SQ. MI.

*S ADD ROUTING OF BASINS 2-A AND 2-B (AP-2a) TO BASIN 2-F
ADD HYD ID=6 HYD=AP_2 ID I=4 ID II=5
PRINT HYD ID=6 CODE=1

HYDROGRAPH FROM AREA AP_2

RUNOFF VOLUME = 1.78431 INCHES = .5044 ACRE-FEET

PEAK DISCHARGE RATE = 13.97 CFS AT 1.500 HOURS BASIN AREA = .0053 SQ. MI.

*S BASIN 2-C
COMPUTE NM HYD ID=7 HYD=FUTURE DA=.001974 SQ MI
%A=0 %B=0 %C=60 %D=40
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.1174 CFS UNIT VOLUME = .9955 B = 526.28 P60 = 2.1000
AREA = .000790 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .108461HR TP = .133300HR K/TP RATIO = .813662 SHAPE CONSTANT, N = 4.394154
UNIT PEAK = 3.3821 CFS UNIT VOLUME = .9966 B = 380.65 P60 = 2.1000
AREA = .001184 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.70156 INCHES = .1791 ACRE-FEET
PEAK DISCHARGE RATE = 5.09 CFS AT 1.500 HOURS BASIN AREA = .0020 SQ. MI.

*S ROUTE BASIN 2-C THROUGH EXISTING DETENTION IN BASIN 2-C
ROUTE RESERVOIR ID=8 HYD=POND_2-C_OUT INFLOW ID=7 CODE=20
OUTFLOW (CFS) STORAGE (AC-FT) ELEV
0 0 0
6.0 .50 .5

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	1.19	.01	.007	.08
2.00	1.01	.10	.102	1.22
2.67	.10	.06	.065	.78
3.33	.03	.04	.035	.43
4.00	.02	.02	.019	.23
4.67	.02	.01	.011	.13
5.33	.02	.01	.007	.08
6.00	.02	.00	.004	.05
6.67	.00	.00	.002	.03
7.33	.00	.00	.001	.02
8.00	.00	.00	.001	.01
8.67	.00	.00	.000	.00

PEAK DISCHARGE = 1.232 CFS - PEAK OCCURS AT HOUR 1.93
MAXIMUM WATER SURFACE ELEVATION = .103
MAXIMUM STORAGE = .1027 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=8 CODE=1

HYDROGRAPH FROM AREA POND_2-C_OUT

RUNOFF VOLUME = 1.70144 INCHES = .1791 ACRE-FEET
PEAK DISCHARGE RATE = 1.23 CFS AT 1.933 HOURS BASIN AREA = .0020 SQ. MI.

*S_ROUTE 2-C DETENTION TOTAL THROUGH EXISTING 10 INCH DIA. PVC STORM PIPE
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.03
DIA=.8333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.04	.01	.03	.37
.09	.03	.12	.51
.13	.05	.29	.61
.17	.08	.52	.68
.22	.11	.81	.73
.26	.15	1.16	.77
.30	.18	1.56	.80
.35	.22	1.99	.82
.39	.25	2.45	.83
.43	.29	2.94	.83
.48	.32	3.43	.83
.52	.36	3.92	.83
.56	.39	4.39	.83
.61	.43	4.84	.83
.65	.46	5.23	.83
.69	.49	5.56	.83
.74	.51	5.80	.83
.78	.53	5.90	.83
.83	.55	5.90	.83

COMPUTE TRAVEL TIME ID=9 REACH=1 VS NO=1 L=120 SLP=.03

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.043	.011	.03	.0126
.087	.030	.12	.0081
.130	.054	.29	.0063
.174	.082	.52	.0053
.217	.113	.81	.0046
.261	.146	1.16	.0042
.304	.180	1.56	.0039
.347	.215	1.99	.0036
.391	.251	2.45	.0034
.434	.287	2.94	.0033
.478	.323	3.43	.0031
.521	.359	3.92	.0031
.565	.393	4.39	.0030
.608	.426	4.84	.0029
.651	.457	5.23	.0029
.695	.486	5.56	.0029
.738	.511	5.80	.0029

.782	.531	5.90	.0030
.833	.545	5.90	.0031

ROUTE ID=9 HYD=TO_AP_3a INFLOW ID=8 DT=0.033338
PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA TO_AP_3a

RUNOFF VOLUME = 1.70087 INCHES = .1791 ACRE-FEET
PEAK DISCHARGE RATE = 1.23 CFS AT 1.934 HOURS BASIN AREA = .0020 SQ. MI.

*S BASIN 2-D
COMPUTE NM HYD ID=10 HYD=FUTURE DA=.000771
%A=0 %B=12 %C=0 %D=88
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 2.6787 CFS UNIT VOLUME = .9949 B = 526.28 P60 = 2.1000
AREA = .000678 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .22403 CFS UNIT VOLUME = .9387 B = 322.78 P60 = 2.1000
AREA = .000093 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 2.17766 INCHES = .0895 ACRE-FEET
PEAK DISCHARGE RATE = 2.31 CFS AT 1.500 HOURS BASIN AREA = .0008 SQ. MI.

*S ROUTE BASIN 2-D THROUGH EXISTING DETENTION IN ASPHALT PARKING
ROUTE RESERVOIR ID=11 HYD=POND_2-D_OUT INFLOW ID=10 CODE=20

OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV
0	0	0
.5	.09	.5

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	.69	.03	.005	.03
2.00	.55	.33	.060	.33
2.67	.05	.29	.052	.29
3.33	.03	.22	.040	.22
4.00	.02	.17	.031	.17
4.67	.02	.13	.024	.13
5.33	.02	.10	.018	.10
6.00	.02	.08	.014	.08
6.67	.00	.06	.011	.06

7.33	.00	.04	.008	.04
8.00	.00	.03	.006	.03
8.67	.00	.02	.004	.02
9.33	.00	.02	.003	.02
10.00	.00	.01	.002	.01
10.67	.00	.01	.002	.01
11.33	.00	.01	.001	.01
12.00	.00	.01	.001	.01
12.67	.00	.00	.001	.00

PEAK DISCHARGE = .340 CFS - PEAK OCCURS AT HOUR 2.13
MAXIMUM WATER SURFACE ELEVATION = .340
MAXIMUM STORAGE = .0612 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA POND_2-D_OUT

RUNOFF VOLUME = 2.17676 INCHES = .0895 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 2.133 HOURS BASIN AREA = .0008 SQ. MI.

*S ROUTE 2-D DETENTION THROUGH EXISTING INLET AND 4 INCH DIA. PVC STORM PIPE
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLP=.02
DIA=0.3333 FT N=.009

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.02	.00	.00	.15
.03	.00	.01	.20
.05	.01	.02	.24
.07	.01	.04	.27
.09	.02	.06	.29
.10	.02	.08	.31
.12	.03	.11	.32
.14	.03	.14	.33
.16	.04	.17	.33
.17	.05	.21	.33
.19	.05	.24	.33
.21	.06	.28	.33
.23	.06	.31	.33
.24	.07	.34	.33
.26	.07	.37	.33
.28	.08	.39	.33
.30	.08	.41	.33
.31	.09	.42	.33
.33	.09	.42	.33

COMPUTE TRAVEL TIME ID=12 REACH=1 VS NO=1 L=100 SLP=.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.017	.002	.00	.0236
.035	.005	.01	.0151

.052	.009	.02	.0118
.069	.013	.04	.0099
.087	.018	.06	.0087
.104	.023	.08	.0079
.122	.029	.11	.0072
.139	.034	.14	.0068
.156	.040	.17	.0064
.174	.046	.21	.0061
.191	.052	.24	.0059
.208	.057	.28	.0057
.226	.063	.31	.0056
.243	.068	.34	.0055
.261	.073	.37	.0055
.278	.078	.39	.0055
.295	.082	.41	.0055
.313	.085	.42	.0056
.333	.087	.42	.0058

ROUTE ID=12 HYD=TO_AP_3b INFLOW ID=11 DT=0.03333
PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA TO_AP_3b

RUNOFF VOLUME = 2.17361 INCHES = .0894 ACRE-FEET
PEAK DISCHARGE RATE = .34 CFS AT 2.133 HOURS BASIN AREA = .0008 SQ. MI.

*S ADD ROUTING OF BASINS 2-C AND 2-D (AP-3 TOTAL)
ADD HYD ID=13 HYD=AP_3 ID I=9 ID II=12
PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA AP_3

RUNOFF VOLUME = 1.83343 INCHES = .2684 ACRE-FEET
PEAK DISCHARGE RATE = 1.56 CFS AT 1.967 HOURS BASIN AREA = .0027 SQ. MI.

*S BASIN 2-E
COMPUTE NM HYD ID=14 HYD=FUTURE DA=.004761
%A=0 %B=20 %C=70 %D=10
TP=0.1333 RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.8797 CFS UNIT VOLUME = .9933 B = 526.28 P60 = 2.1000
AREA = .000476 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .113953HR TP = .133300HR K/TP RATIO = .854859 SHAPE CONSTANT, N = 4.161892
UNIT PEAK = 11.759 CFS UNIT VOLUME = .9991 B = 365.82 P60 = 2.1000
AREA = .004285 SQ MI IA = .38333 INCHES INF = .92333 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=14 CODE=1

HYDROGRAPH FROM AREA FUTURE

RUNOFF VOLUME = 1.29339 INCHES = .3284 ACRE-FEET
PEAK DISCHARGE RATE = 10.33 CFS AT 1.500 HOURS BASIN AREA = .0048 SQ. MI.

*S ROUTE AP_2 TOTAL TO DRAINAGE OUTLET AT CANEJO DRIVE VIA SURFACE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=0 FT MAX ELEV=1.5 FT
CH SLP=0.045 FP SLP=0.045 N=0.03
DIST=20 FT
DIST ELEV
0 1.5
10 0
20 1.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.08	.04	.05	1.05
.16	.17	.32	2.11
.24	.37	.94	3.16
.32	.66	2.03	4.21
.39	1.04	3.67	5.26
.47	1.50	5.97	6.32
.55	2.04	9.01	7.37
.63	2.66	12.86	8.42
.71	3.37	17.61	9.47
.79	4.16	23.32	10.53
.87	5.03	30.07	11.58
.95	5.98	37.92	12.63
1.03	7.02	46.94	13.68
1.11	8.14	57.20	14.74
1.18	9.35	68.76	15.79
1.26	10.64	81.67	16.84
1.34	12.01	96.00	17.89
1.42	13.46	111.81	18.95
1.50	15.00	129.15	20.00

COMPUTE TRAVEL TIME ID=15 REACH=1 VS NO=1 L=440 SLP=.045

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE FLOW AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.079	.042	.05	.1011
.158	.166	.32	.0637
.237	.374	.94	.0486
.316	.665	2.03	.0401
.395	1.039	3.67	.0346
.474	1.496	5.97	.0306
.553	2.036	9.01	.0276
.632	2.659	12.86	.0253
.711	3.366	17.61	.0234
.789	4.155	23.32	.0218
.868	5.028	30.07	.0204
.947	5.983	37.92	.0193
1.026	7.022	46.94	.0183
1.105	8.144	57.20	.0174

1.184	9.349	68.76	.0166
1.263	10.637	81.67	.0159
1.342	12.008	96.00	.0153
1.421	13.463	111.81	.0147
1.500	15.000	129.15	.0142

ROUTE ID=15 HYD=TO_AP_4a INFLOW ID=6 DT=0.03333
PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA TO_AP_4a

RUNOFF VOLUME = 1.78440 INCHES = .5044 ACRE-FEET
PEAK DISCHARGE RATE = 13.79 CFS AT 1.533 HOURS BASIN AREA = .0053 SQ. MI.

*S ROUTE AP_3 TOTAL TO DRAINAGE OUTLET AT CANEJO DRIVE VIA SURFACE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
MIN ELEV=0 FT MAX ELEV=1.5 FT
CH SLP=0.0275 FP SLP=0.0275 N=0.03
DIST=20 FT
DIST ELEV
0 1.5
10 0
20 1.5

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
.00	.00	.00	.00
.08	.04	.04	1.05
.16	.17	.25	2.11
.24	.37	.74	3.16
.32	.66	1.58	4.21
.39	1.04	2.87	5.26
.47	1.50	4.67	6.32
.55	2.04	7.04	7.37
.63	2.66	10.05	8.42
.71	3.37	13.77	9.47
.79	4.16	18.23	10.53
.87	5.03	23.51	11.58
.95	5.98	29.64	12.63
1.03	7.02	36.70	13.68
1.11	8.14	44.72	14.74
1.18	9.35	53.75	15.79
1.26	10.64	63.84	16.84
1.34	12.01	75.05	17.89
1.42	13.46	87.40	18.95
1.50	15.00	100.96	20.00

COMPUTE TRAVEL TIME ID=16 REACH=1 VS NO=1 L=400 SLP=.0275

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.079	.042	.04	.1175
.158	.166	.25	.0741
.237	.374	.74	.0565

.316	.665	1.58	.0466
.395	1.039	2.87	.0402
.474	1.496	4.67	.0356
.553	2.036	7.04	.0321
.632	2.659	10.05	.0294
.711	3.366	13.77	.0272
.789	4.155	18.23	.0253
.868	5.028	23.51	.0238
.947	5.983	29.64	.0224
1.026	7.022	36.70	.0213
1.105	8.144	44.72	.0202
1.184	9.349	53.75	.0193
1.263	10.637	63.84	.0185
1.342	12.008	75.05	.0178
1.421	13.463	87.40	.0171
1.500	15.000	100.96	.0165

ROUTE ID=16 HYD=TO_AP_4b INFLOW ID=13 DT=0.03333
PRINT HYD ID=16 CODE=1

HYDROGRAPH FROM AREA TO_AP_4b

RUNOFF VOLUME = 1.83360 INCHES = .2684 ACRE-FEET
PEAK DISCHARGE RATE = 1.56 CFS AT 2.000 HOURS BASIN AREA = .0027 SQ. MI.

*S ADD ROUTING OF BASINS AP_4a, AP_4b AND BASIN 2-E
ADD HYD ID=17 HYD=AP_4 ID I=14 ID II=15 ID III=16
PRINT HYD ID=17 CODE=1

HYDROGRAPH FROM AREA AP_4

RUNOFF VOLUME = 1.55198 INCHES = .8328 ACRE-FEET
PEAK DISCHARGE RATE = 23.82 CFS AT 1.533 HOURS BASIN AREA = .0101 SQ. MI.

*S ROUTE AP-4 THROUGH PROPOSED DETENTION IN BASIN 2-E TO CANEJO DRIVE
ROUTE RESERVOIR ID=18 HYD=POND_2-F_OUT INFLOW ID=17 CODE=20

OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV
0	0	0
8.0	.46	.75

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

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.67	.00	.00	.000	.00
1.33	3.78	.03	.018	.31
2.00	4.68	.66	.407	7.08
2.67	.49	.34	.206	3.59
3.33	.15	.14	.087	1.52
4.00	.10	.06	.037	.65
4.67	.09	.03	.018	.31
5.33	.09	.02	.010	.17
6.00	.10	.01	.007	.12
6.67	.00	.01	.004	.07

```
   7.33      .00      .00      .001      .03
   8.00      .00      .00      .001      .01
   8.67      .00      .00      .000      .00
 PEAK DISCHARGE =       7.393 CFS - PEAK OCCURS AT HOUR    1.83
 MAXIMUM WATER SURFACE ELEVATION =        .693
 MAXIMUM STORAGE =        .4251 AC-FT     INCREMENTAL TIME=    .033330HRS

PRINT HYD         ID=18 CODE=1

                          HYDROGRAPH FROM AREA POND_2-F_OUT


   RUNOFF VOLUME =    1.55197 INCHES    =       .8328 ACRE-FEET
   PEAK DISCHARGE RATE =     7.39 CFS  AT   1.833 HOURS   BASIN AREA =   .0101 SQ. MI.


FINISH

 NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 15:04:03
```

MAXIMUM Q(CFS) 4" PVC: BASIN 1-B & 2-D
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	4" PVC PIPE
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

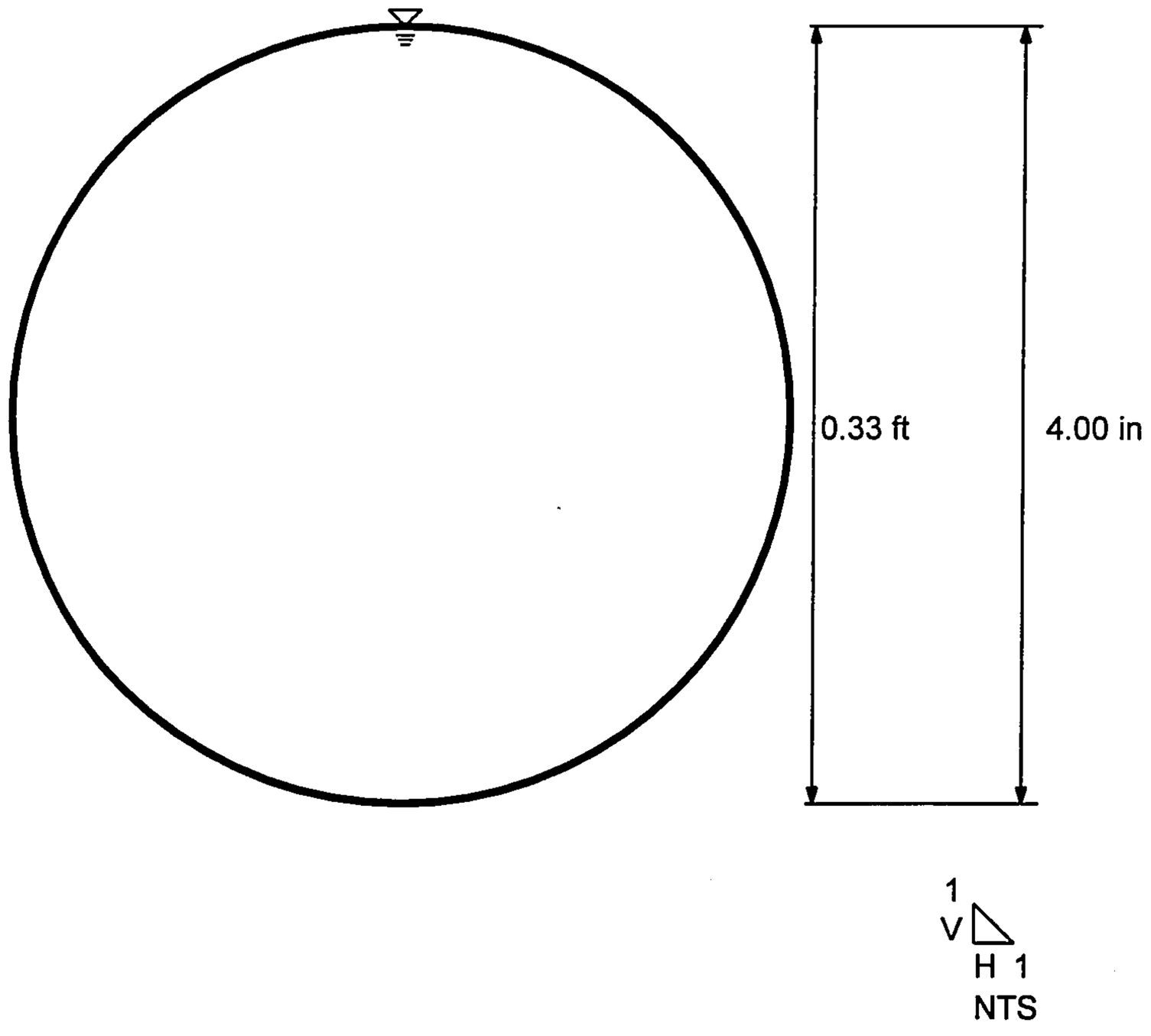
Input Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.33	ft
Diameter	4.00	in

Results		
Discharge	0.35	cfs
Flow Area	0.09	ft²
Wetted Perimeter	1.03	ft
Top Width	0.02	ft
Critical Depth	0.31	ft
Percent Full	99.90	
Critical Slope	0.017757	ft/ft
Velocity	4.06	ft/s
Velocity Head	0.26	ft
Specific Energy	0.59	ft
Froude Number	0.35	
Maximum Discharge	0.38	cfs
Full Flow Capacity	0.35	cfs
Full Flow Slope	0.020546	ft/ft
Flow is subcritical.		

Cross Section: MAXIMUM DISCHARGE 4" PIPE
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	4" PVC PIPE
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

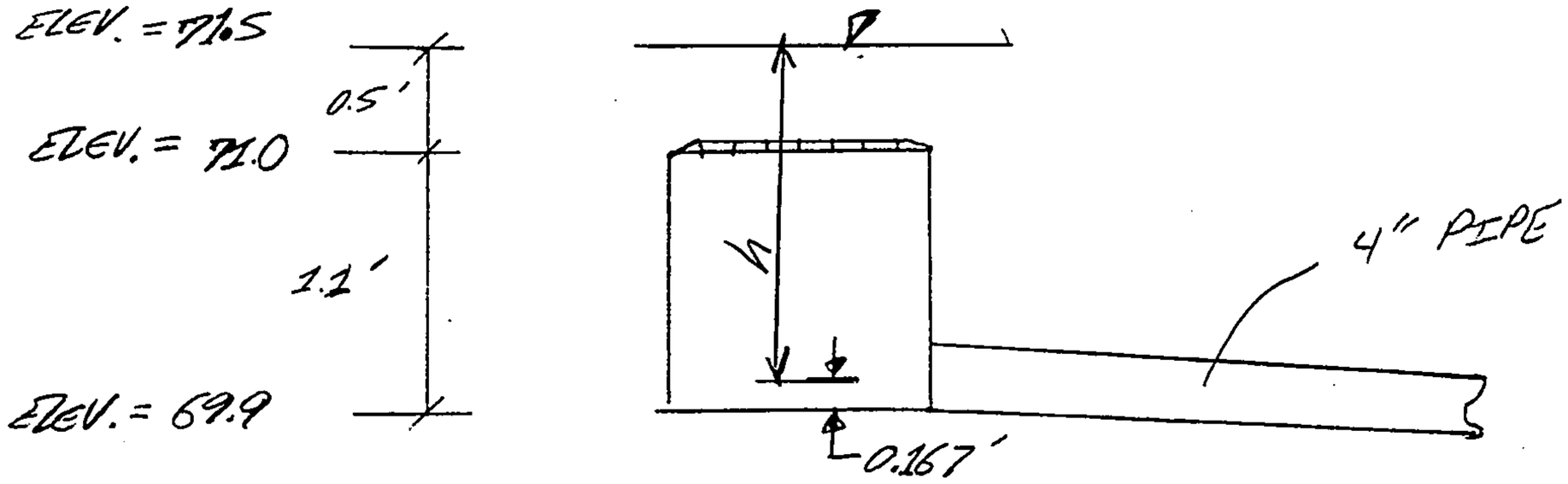
Section Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.33	ft
Diameter	4.00	in
Discharge	0.35	cfs



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

SHEET NO. 1 OF 1
JOB APACHE ELEMENTARY
SUBJECT DROP INLET CAPACITY
~~CLIENT~~ BASIN ~~JOB NO.~~ 1-B POND
BY _____ DATE _____
CHECKED BY _____ DATE _____

ORIFICE EQN. FOR DROP INLET IN BASIN 1-B



$h = (1.1' + 0.5') - 0.167' = \underline{1.43'}$

ORIFICE EQN. @ PIPE ENTRANCE:

$Q = 0.6 \cdot A \sqrt{2gh}$

$Q = 0.6\,(0.087) \sqrt{(2)(32.2)(1.43)}$

$\underline{Q = 0.50 \text{ (cfs)}}$

NOTE: MAXIMUM PIPE FLOW = 0.35 (cfs)
FLOW THROUGH 4" PIPE CONTROLS DISCHARGE TO COPPER AVENUE.

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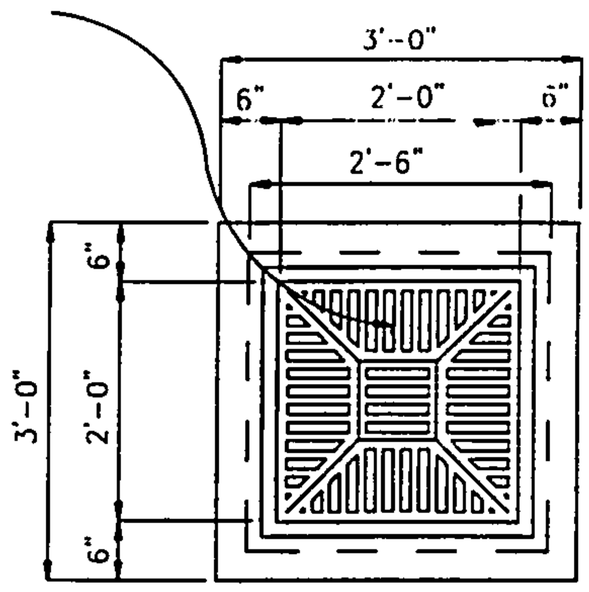
SHEET NO. 1 OF 1
JOB APACHE ELEMENTARY - PHASE I
SUBJECT DROP INLET CAPACITY
CLIENT A.P.S. JOB NO. W23-101-5195
BY J. ALARID DATE June 14, 1996
CHECKED BY _____ DATE _____



MAX. PONDING DEPTH = 1.5'
ASSUME: EFFECTIVE OPENING OF GRATE 50% AREA

ORFICE EQN: $Q = 0.6 A \sqrt{2gh}$

$Q = 0.6(2(5F))\sqrt{2(32.2)(1.5)}$

$Q = 11.80$ (cfs)

$h = 0.5'$ $L = 4(2') = 8'$

$Q = CL(h)^{1.5} = 3.0(8)(.5)^{1.5} = 8.5$ cfs

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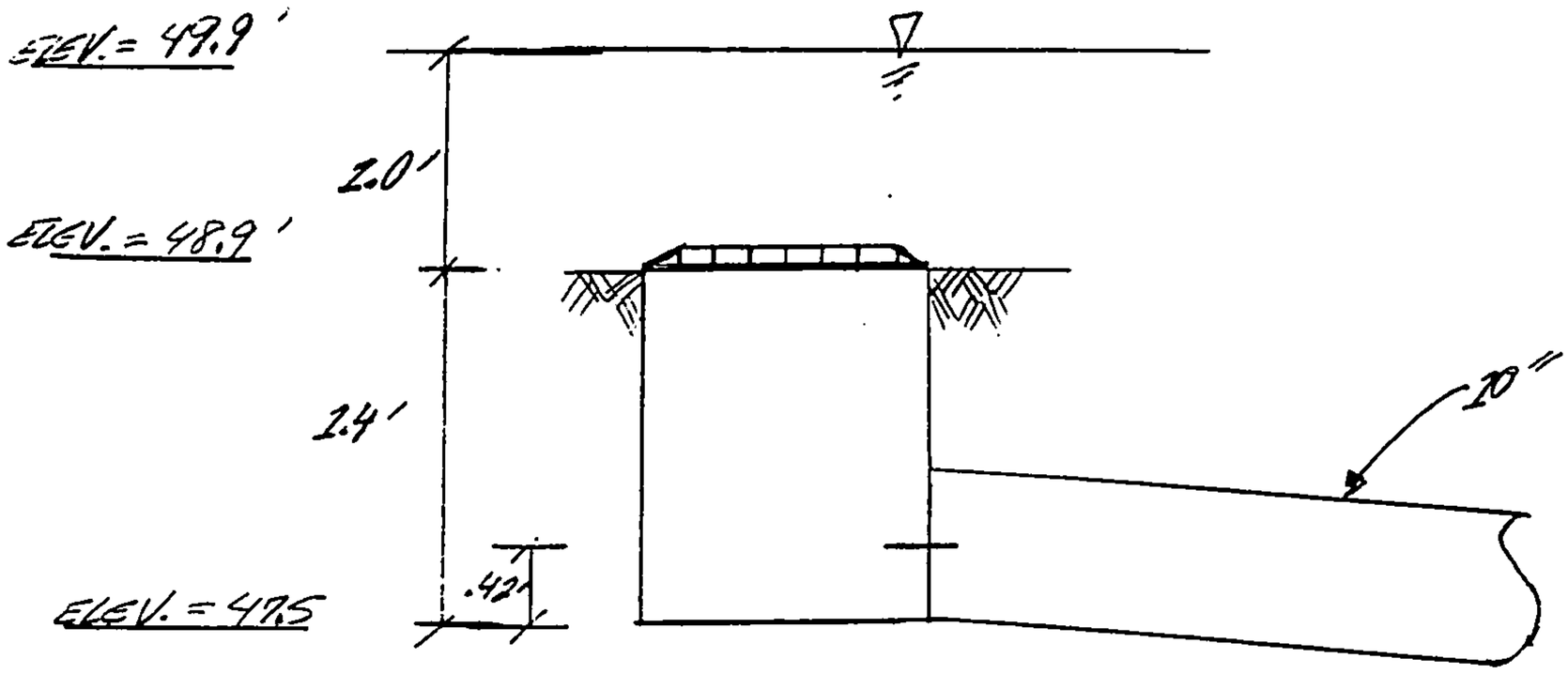
SHEET NO. 1 OF 1
JOB APACHE ELEMENTARY
SUBJECT DROP INLET CAPACITY
~~CLIENT~~ BASIN ~~JOB NO.~~ 2E POND
BY _____ DATE _____
CHECKED BY _____ DATE _____

NO SCALE



$h = (1.4 + 1) - (0.42) = \underline{1.98'}$

ORFICE EQUATION @ PIPE ENTRANCE:

$Q = 0.6 \cdot A \sqrt{2gh}$

$= 0.6(.5454)\sqrt{2(32.2)(1.98)}$

$Q = \underline{3.7 \text{ (CFS)}}$

⟹ USE 2 10" DIAMETER PIPES: $Q = 7.4(cfs)$

NOTE: ORFICE EQUATION FOR DROP INLET DISCHARGE TO 10" PIPE GOVERNS DISCHARGE TO CONEJO ROAD.

Apache Elem. - pond discharge
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

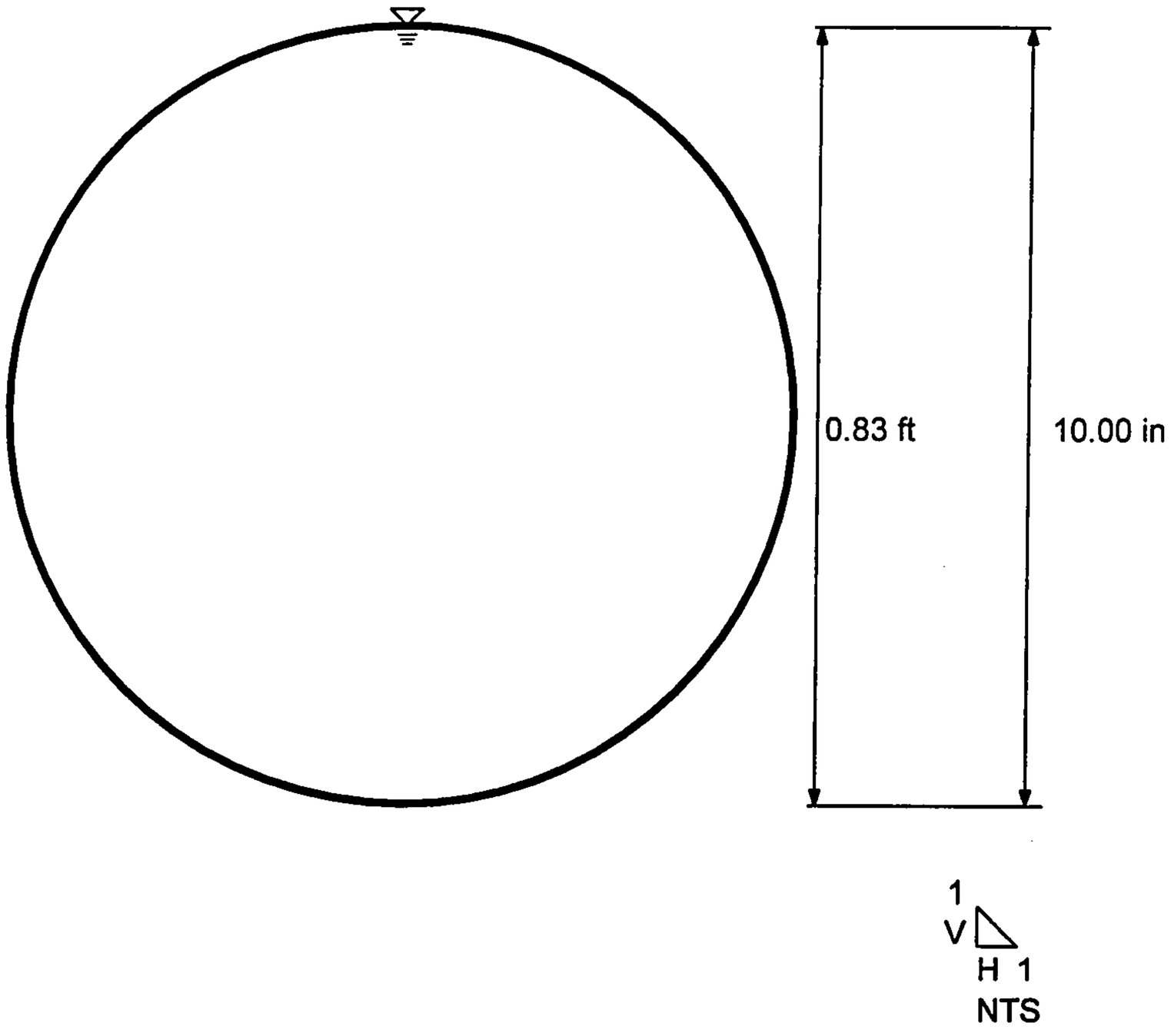
Input Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.83	ft
Diameter	10.00	in

Results		
Discharge	4.04	cfs
Flow Area	0.55	ft²
Wetted Perimeter	2.61	ft
Top Width	0.01	ft
Critical Depth	0.80	ft
Percent Full	100.00	
Critical Slope	0.017586	ft/ft
Velocity	7.40	ft/s
Velocity Head	0.85	ft
Specific Energy	1.69	ft
Froude Number	0.18	
Maximum Discharge	4.33	cfs
Full Flow Capacity	4.03	cfs
Full Flow Slope	0.020108	ft/ft
Flow is subcritical.		

Apache Elem. - pond discharge
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.83	ft
Diameter	10.00	in
Discharge	4.04	cfs



CONTAIN FLOW AT HEADWALL RUNDOWN
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	10" PIPE / HEAD WALL TRANSITION
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

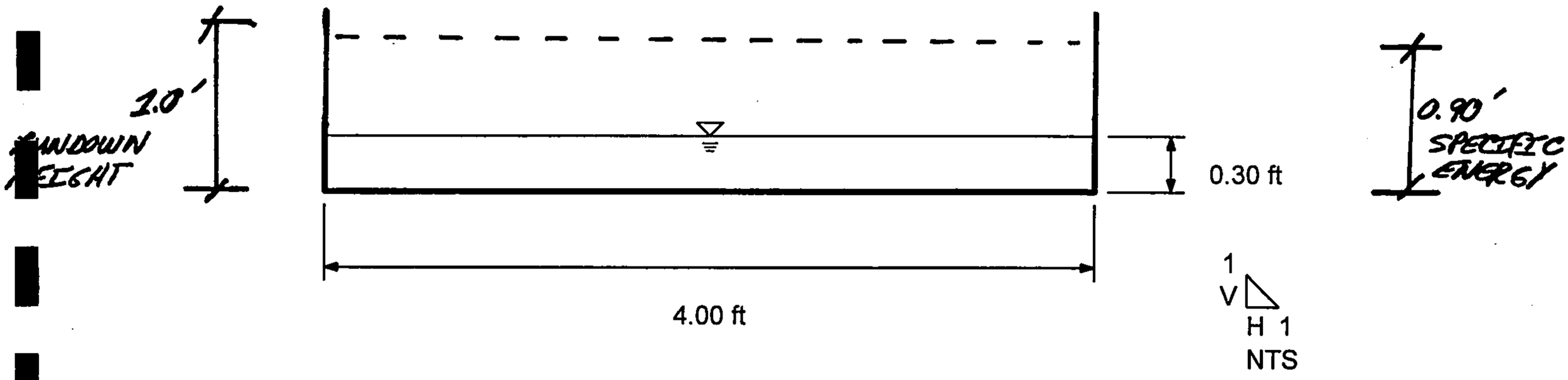
Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.018000	ft/ft
Bottom Width	4.00	ft
Discharge	7.40	cfs

Results		
Depth	0.30	ft
Flow Area	1.19	ft^2
Wetted Perimeter	4.59	ft
Top Width	4.00	ft
Critical Depth	0.47	ft
Critical Slope	0.004194	ft/ft
Velocity	6.23	ft/s
Velocity Head	0.60	ft
Specific Energy	0.90	ft
Froude Number	0.00	

Cross Section
Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	10" PIPE / HEAD WALL TRANSITION
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.018000	ft/ft
Depth	0.30	ft
Bottom Width	4.00	ft
Discharge	7.40	cfs



Apache Elem. - SW culvert
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge (SWC)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

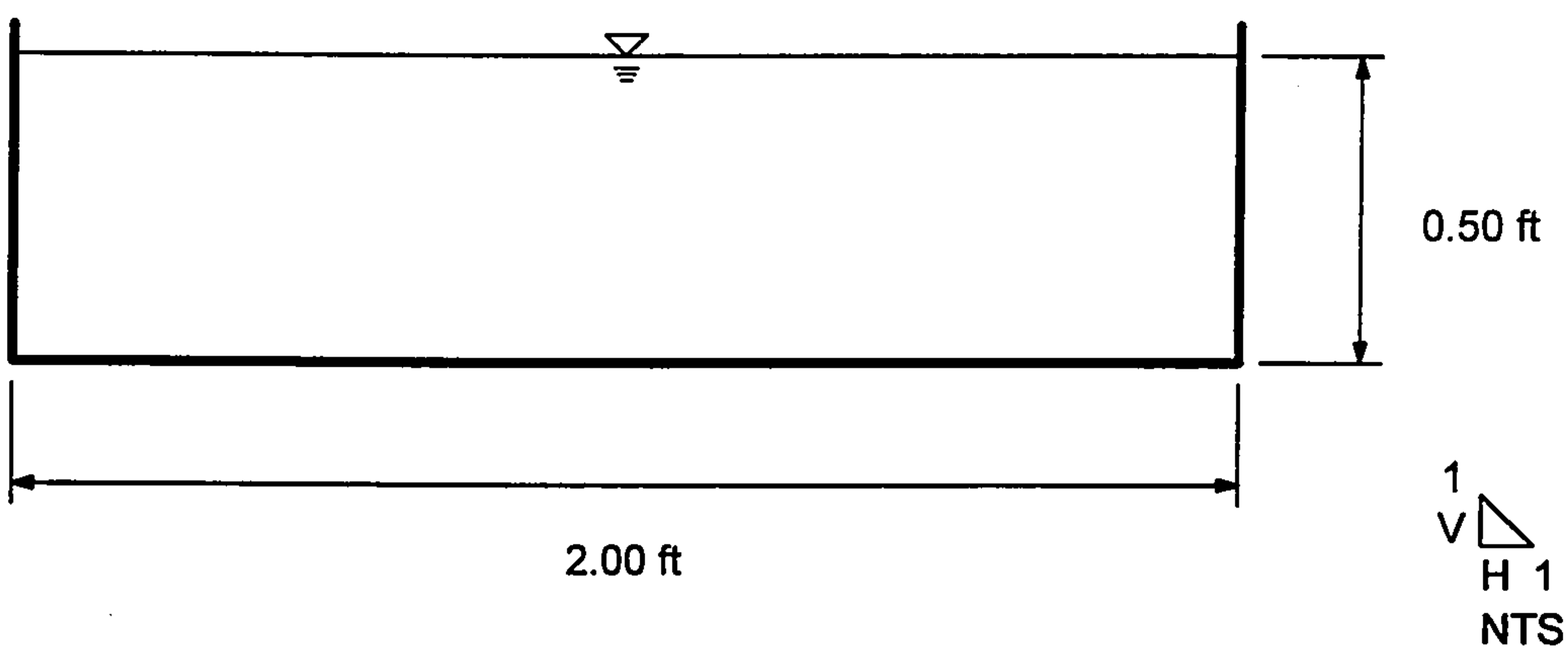
Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Depth	0.50	ft
Bottom Width	2.00	ft

Results		
Discharge	5.50	cfs
Flow Area	1.00	ft^2
Wetted Perimeter	3.00	ft
Top Width	2.00	ft
Critical Depth	0.62	ft
Critical Slope	0.005490	ft/ft
Velocity	5.50	ft/s
Velocity Head	0.47	ft
Specific Energy	0.97	ft
Froude Number	0.00	

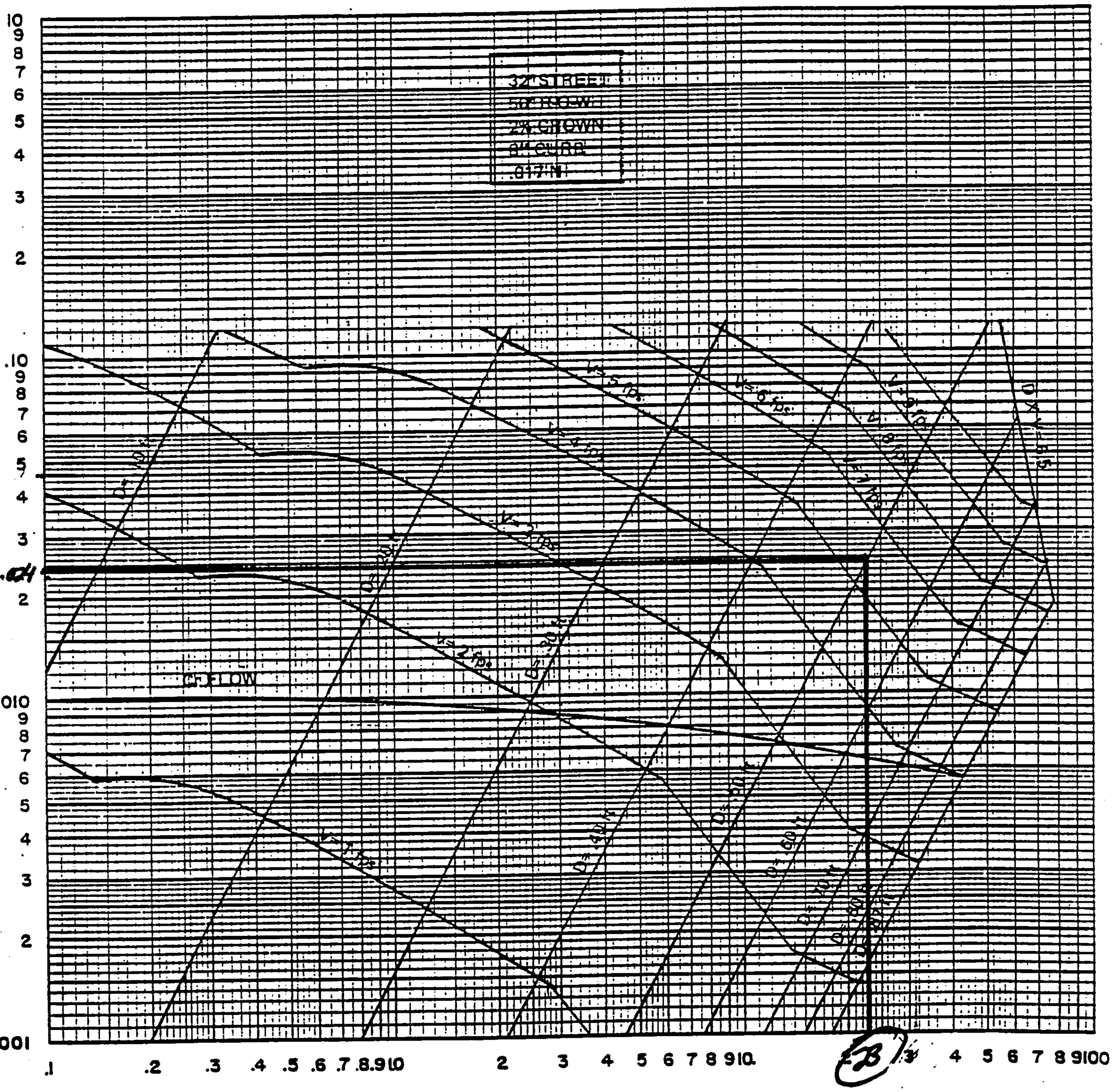
Apache Elem. - SW culvert
Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge (SWC)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Depth	0.50	ft
Bottom Width	2.00	ft
Discharge	5.50	cfs

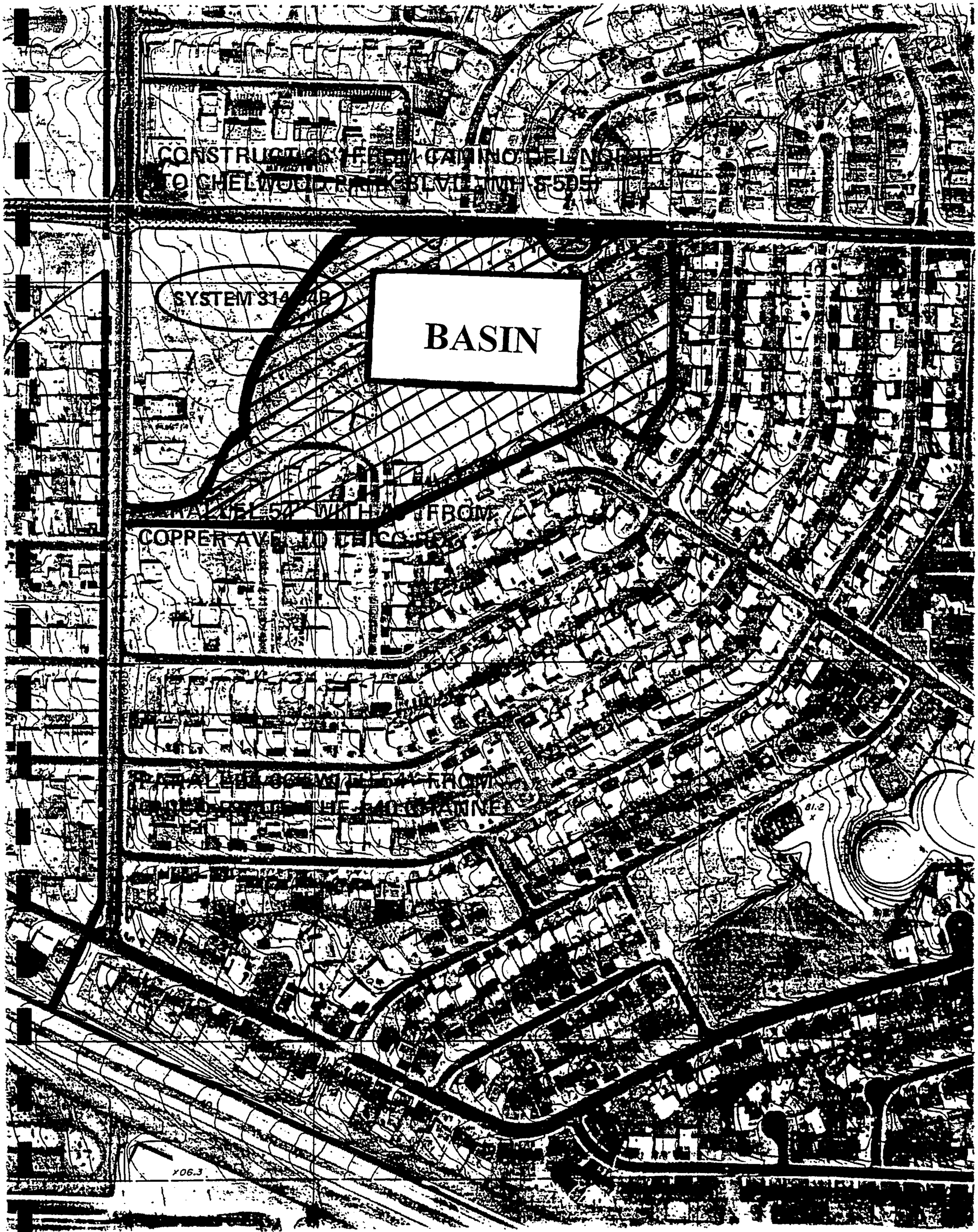


STREET CAPACITY



REV. 3-83

PLATE 22.3 D-1


CONSTRUCT 36" RCP ALONG CAMINO DEL NORTE
TO CHELWOOD DR. & BLVD. (MH 5-595)
SYSTEM 314
BASIN
PARALLEL 54" WITH
FROM
COPPER AVE. TO
PARALLEL 60" WITH 54" FROM
MAINE
81.2
K22
X06.3

APPENDIX B

DESIGN DRAWINGS

CITY OF
Albuquerque

P.O. Box 1293 Albuquerque, NM 87103

August 19, 1996

Martin J. Chávez, Mayor

Joe P. Kelley, PE
Chavez-Grieves
5639 Jefferson NE
Albuquerque, NM 87109

RE: DRAINAGE REPORT FOR APACHE MINI-GYMNASIUM (K-22/D3)
RECEIVED AUGUST 1, 1996 FOR GRADING/PAVING & BUILDING PERMIT
ENGINEER'S STAMP DATED 7/29/96

Dear Mr. Kelley:

Based on the information included in the submittal referenced above, City Hydrology approves the Drainage Report for Grading/Paving & Building Permit.

Include a copy of the Grading & Drainage Plan, dated 7/31/96, in the set of construction documents that will be submitted to Code Administration for the Building Permit.

A separate permit is required for construction of private drainage facilities within the City right of way. A copy of this letter must be on hand when applying for the excavation permit.

Engineer's Certification of grading & drainage per DPM checklist must be accepted by City Hydrology before any Certificate of Occupancy will be released.

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer, Hydrology

c: Andrew Garcia
Fred Aguirre
Andre Larroque, APS, 915 Oak SE, 87106

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CONSULTING ENGINEERS, INC.

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344-4080 · FAX (505) 343-8759

DRAINAGE PLAN

FOR

APACHE ELEMENTARY SCHOOL MINI-GYMNASIUM AND OTHER PHASE I IMPROVEMENTS

ALBUQUERQUE PUBLIC SCHOOLS

ALBUQUERQUE, NEW MEXICO

JULY 1996

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.

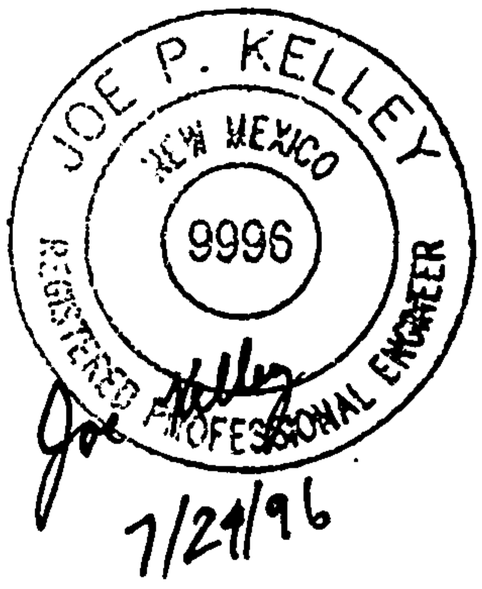
5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344·4080 · FAX (505) 343·8759

DRAINAGE PLAN

FOR

APACHE ELEMENTARY SCHOOL MINI-GYMNASIUM AND OTHER PHASE I IMPROVEMENTS

ALBUQUERQUE PUBLIC SCHOOLS



JULY 1996

PROJECT DESCRIPTION

This site is located in northeastern Albuquerque, New Mexico on the south side of Copper Avenue, between Tramway Boulevard and Chelwood Park Boulevard. The plat of survey indicates this site occupies Lots 22 and 23, plus vacated unnamed right-of-way (V.O. 1861), of Block 5, of the Foothill Estates Subdivision residential development. The City of Albuquerque Zone Atlas designation for this site is K-22 (refer to Figure 1).

The site is approximately 8.54 acres in size and is currently occupied by the Apache Elementary School, owned and operated by the Albuquerque Public Schools (APS). The site currently has a mix of permanently constructed classroom, activity and administration buildings, portable classrooms, paved on-site parking areas and open play grounds areas. Existing residential development borders the site to the east, south and a portion of west boundaries, undeveloped land and paved roadway borders the remainder.

The following report will serve as the Drainage Plan for Phase I of the Apache Elementary School site improvements entitled Mini-Gymnasium. Phase I of the site improvements will include the following:

1) The addition of a new detached mini gymnasium,
2) Improvements to the existing detention pond at the southwest corner of the property,
3) Installation of a new paved access/swale along the southeast corner of the property.

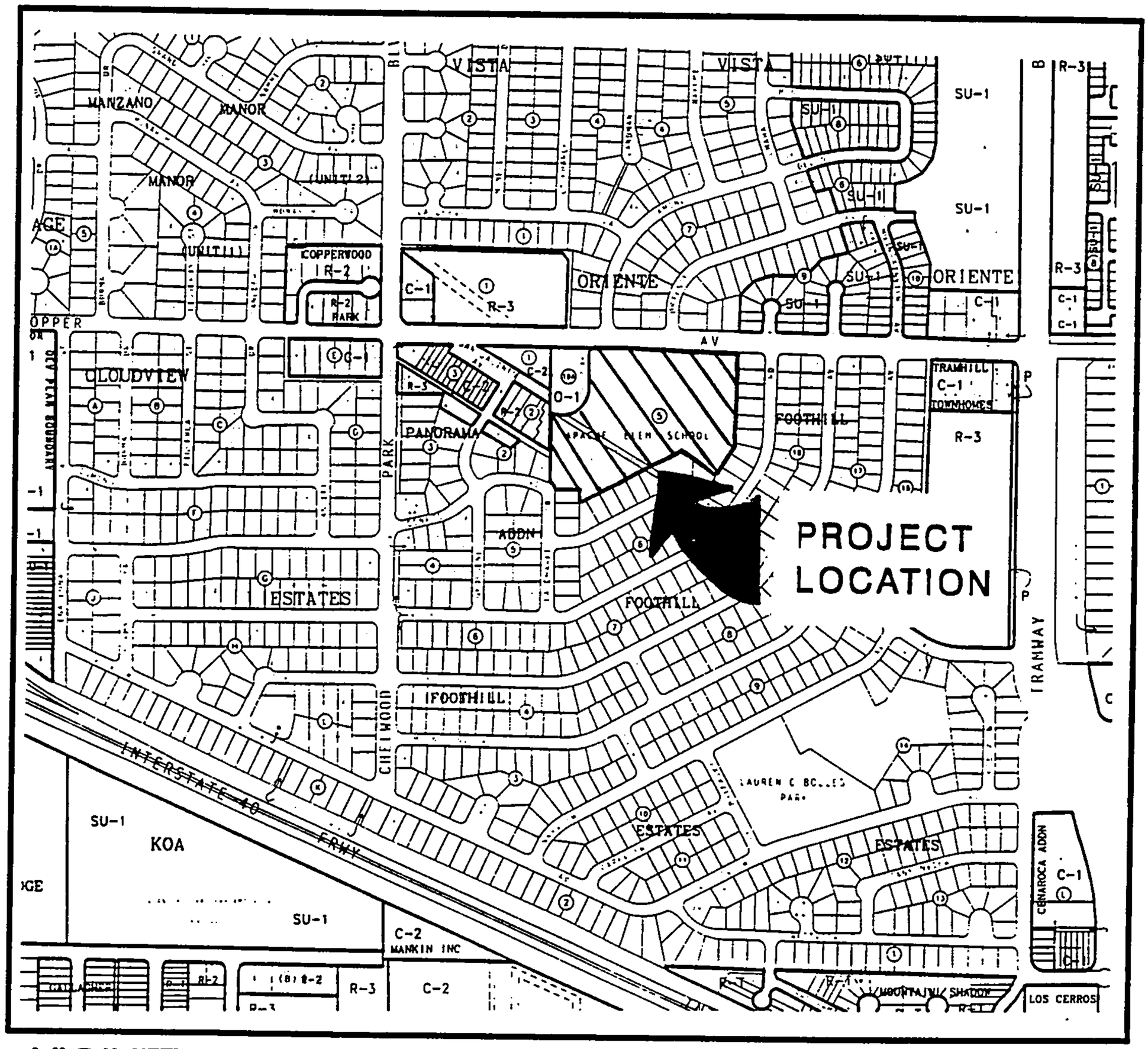
See drawings in Appendix B of this document for details of the proposed site improvements.

FLOOD HAZARD ZONES

As indicated by National Flood Insurance Rate Map number 350002-0031 for the City of Albuquerque, a flood hazard zone AO exists in Copper Avenue at the northwest corner of the school. The flood water depth is 1 ft. in this zone. The flood hazard zone does not extend into the Apache Elementary school property.

PREVIOUS RELATED PUBLICATIONS

A comprehensive drainage plan was prepared for the subject school site in 1984 (K22/D3). An update was prepared and submitted by Jeff Mortenson Associates, Albuquerque, New Mexico, on May 24, 1993 for parking and other site improvements. The most recent drainage master plan was prepared by Chavez-Grieves Consulting Engineers, Inc., on November 13, 1995. This drainage master plan was submitted in conjunction with all phases of the Apache Elementary School site improvements.



VICINITY MAP

K-22-Z

NORTH

SCALE: 1" = 750'

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

FIGURE 1

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

The site is on gently falling terrain, sloping from the east to the west towards the Rio Grande. In general, the site has a slope of between four to five percent; however, existing localized slopes on the site range from less than one percent to as high as ten percent. The adjacent residential properties to the east discharge a small portion of their respective storm water run-off onto the school site. There is evidence that a small quantity of storm water run-off enters the school site from the east driveways (along Copper Ave.) when storm run-off generated above the school site reaches the top of curb elevation during a storm event. There does not appear to be any other off-site run-off that enters the subject property.

The storm water generated on the subject site is currently released to the surrounding right-of-ways at several locations. A portion of the existing run-off is released to Copper Ave. either directly or through a small detention/collection basin in an existing parking area. The existing storm water release to Copper Ave. is 0.97 cubic feet per second (cfs). A small tract of undeveloped land west of the lower parking area receives 0.42 cfs primarily from a landscaped buffer. The remainder of the site run-off meanders through on-site channels, swales and by surface sheet flow to the southwestern corner of the site. It is at this location that a detention pond was previously constructed. Over time, this pond has filled with sediment and does not function to capacity. The current storm water release to Conejo Drive is 20.23 cfs (see master drainage plan for calculations for existing conditions).

Existing site vegetation consists of limited sodded areas, a few desert shrubs and sparse native grasses. The existing soils appear to be sands and gravels and have been moderately compacted over time due to vehicle traffic and play ground activities. Surface erosion appears to be controlled by graded slopes; however, where concentrated storm water run-off is found, erosion and sediment conveyance is observed.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

The proposed improvements to the school site as shown in Appendix B are consistent with the master plan for Apache Elementary site improvements as prepared by Wright and Hammer, Architects. As mentioned above, the Phase I improvements will consist of the construction of a new mini-gymnasium, the construction of a new paved access/swale and the construction of improvements to an existing detention pond and associated drain piping. Along with these site changes, the grading and drainage for the site must be modified. The attached drawings illustrate the proposed changes to the site grading and drainage consistent with the proposed site changes and in accordance with developmental standards set forth by the City of Albuquerque.

The comprehensive drainage master plan completed by Chavez Grieves Consulting Engineers, Inc., serves as the guide for grading and drainage plans associated with Phase I and future phases of Apache Elementary School improvement projects. Close adherence to this master plan will insure that the site as a whole meets the specific drainage design guidelines and City of Albuquerque requirements.

The Phase I developed drainage pattern will be similar to the existing drainage pattern as discussed above. The storm water run-off generated from the east side of the school site will be conveyed via a new paved access/swale and a compacted dirt swale to the existing on-site detention pond, which will be improved as part of Phase I. The remainder of the on-site storm water run-off will continue to be conveyed through existing facilities to the on-site detention pond. The detention pond will continue to discharge into Conejo Drive; however through regrading and construction of an inlet and discharge pipe, the developed release to Conejo Drive will be reduced to 7.4 cfs. See appendix A for calculation for the new drop inlet, storm drain pipes and the sidewalk culvert. The 100-year ponding depth will be less than 18". Pursuant to the drainage criteria established by the City of Albuquerque, the pond will therefore not need to be fenced. An existing overflow will drain the retention pond in the event the proposed catch basin and pipe system are surcharged.

Refer to the attached drawings for the proposed developed drainage basins and Appendix A for computations of the developed drainage basin conditions associated with Phase I of the Apache Elementary School improvements.

STREET CAPACITY ANALYSIS

The downstream storm drain facilities in which the storm water run-off from this site enters includes a 56 inch diameter storm line in Chelwood Park, NE and series of curbside inlets at the corner of Chelwood Park and Conejo Drive.

Approximation of drainage basin for point east side of Chelwood Park at Conejo Road based on City of Albuquerque Public Works Department Topographic Orthophoto Map No. K-22. Street capacity determined per City of Albuquerque Develpment Process Manual, Plate 22.3 D-1.

Drainage input through school site	60% of total input
Other areas in basin	40% of total input

	Existing Q (cfs)	Improved Q (cfs)
School	12.21	7.4
Other	8.14	8.14
Total	20.35	15.54
Lower street capacity	23.0	23.0
Excess capacity	**2.65**	**7.46**

RUNOFF COMPARISON

A summary table of the existing and developed storm water run-off affected by Phase I improvements is included below:

Basin	Q100 Existing (cfs)	Q100 Developed (cfs)
2-B	7.43	6.73
2-C	9.12	5.51
2-E	13.36	11.30
2-F		6.41
Onsite run-off generated	29.91	29.95

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. For Phase I calculations the procedure for 40 acre and smaller basins was used. The computerized hydrologic model, AHYMO, was used to calculate storm volumes for the referenced master drainage plan in accordance with Section 22.2. The 100-year, 6-hour storm was used to determine the design discharges.

APPENDIX A

HYDRAULIC COMPUTATIONS

Printed June 14, 1996 (9:07am)

CHAVEZ - GRIEVES / CONSULTING ENGINEERS, Inc.

5639 Jefferson Street NE, Albuquerque, New Mexico 87109 *Phone (505) 344-4080 - Fax (505) 343-8759*

RUNOFF CALCULATIONS - SIMPLIFIED PROCEDURE

By: James Alarid Date: JUNE 12 , 1996

Project: APACHE ELEMENTARY SCHOOL - PHASE I Zone Atlas: K-22

This procedure is in accordance with the City of Albuquerque Development Process Manual, Volume 2, Section 22.2, "Hydrology", peak discharge rate for small watersheds less than forty acres in size.

Precipitation Zone from Figure A-1: 4

Land treatment descriptions are in Table A-4.

1. RUNOFF RATE COMPUTATION

Use Equation a-10: $Q_P = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$

Values of Q_{pi} are from Table A-9, and are in CFS/acre. Area values are in acres.

BASIN	Q_{PA}	A_A	Q_{PB}	A_B	Q_{PC}	A_C	Q_{PD}	A_D	Q_P
EXISTING BASIN RATE OF RUNOFF (CFS)									
2-B	2.20	0	2.92	0	3.73	0.64	5.25	0.96	7.43
2-C	2.20	0	2.92	0	3.73	1.39	5.25	0.75	9.12
2-E	2.20	0	2.92	0	3.73	3.33	5.25	0.18	13.36
DEVELOPED BASIN RATE OF RUNOFF (CFS)									
2-B	2.20	0.00	2.92	0.00	3.73	0.58	5.25	0.87	6.73
2-C	2.20	0.00	2.92	0.00	3.73	0.76	5.25	0.51	5.51
2-E	2.20	0.00	2.92	0.61	3.73	2.13	5.25	0.30	11.30
2-F	2.20	0.00	2.92	0.00	3.73	0.89	5.25	0.59	6.41

2. RUNOFF VOLUME COMPUTATION

Use Equation a-5 to compute weighted excess precipitation:

Weighted E = "E" = $(E_A A_A + E_B A_B + E_C A_C + E_D A_D)/(A_A + A_B + A_C + A_D)$

$(A_A + A_B + A_C + A_D) = \sum A_i$

Use Equation a-6 to compute the volume:

V_{360} = "E" x $(A_A + A_B + A_C + A_D)$ x 3630 feet^3/acre·inch

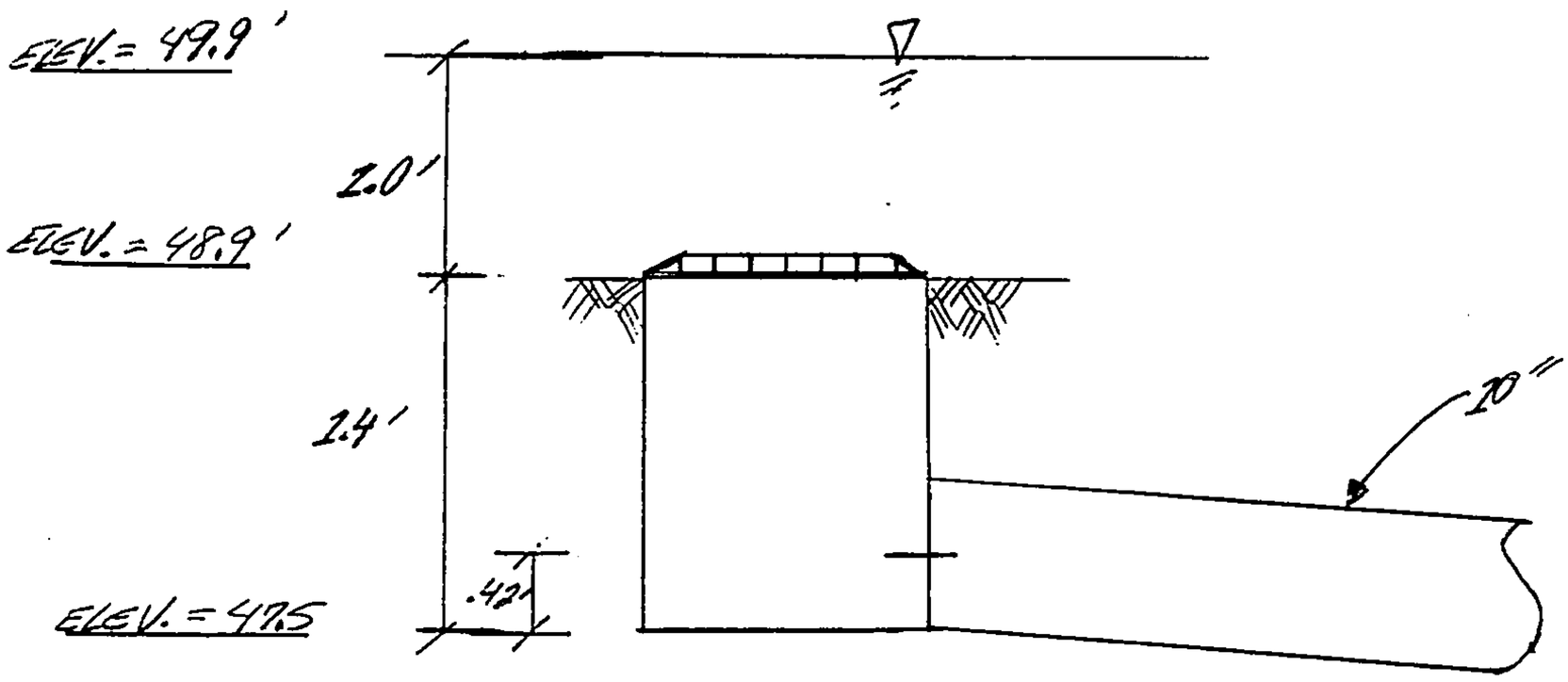
Values of E_i are from Table A-8, and are in inches. Area values are in acres.

BASIN	E_A	A_A	E_B	A_B	E_C	A_C	E_D	A_D	$\sum A_i$	"E"	V_{360}
EXISTING BASIN VOLUME OF RUNOFF (CUBIC FEET)											
2-B	0.80	0	1.08	0	1.46	0.64	2.64	0.96	1.6	2.17	12591.74
2-C	0.80	0	1.08	0	1.46	1.39	2.64	0.75	2.14	1.87	14554.12
2-E	0.80	0	1.08	0	1.46	3.33	2.64	0.18	3.51	1.52	19373.31
DEVELOPED BASIN VOLUME OF RUNOFF (CUBIC FEET)											
2-B	0.80	0	1.08	0	1.46	0.58	2.64	0.87	3.03	1.63	17975.40
2-C	0.80	0	1.08	0	1.46	0.76	2.64	0.51	1.27	1.93	8915.28
2-E	0.80	0	1.08	0.61	1.46	2.13	2.64	0.30	3.04	1.50	16554.98
2-F	0.80	0	1.08	0	1.46	0.89	2.64	0.59	1.48	1.93	10370.91

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

SHEET NO. 1 OF 1
JOB APACHE ELEMENTARY
SUBJECT DROP INLET CAPACITY
CLIENT _____ JOB NO. _____
BY _____ DATE _____
CHECKED BY _____ DATE _____

NO SCALE



$h = (1.4 + 1) - (0.42) = \underline{1.98'}$

ORFICE EQUATION @ PIPE ENTRANCE:

$$Q = 0.6 \cdot A \cdot \sqrt{2gh}$$

$$= 0.6(.5454)\sqrt{2(32.2)(1.98)}$$

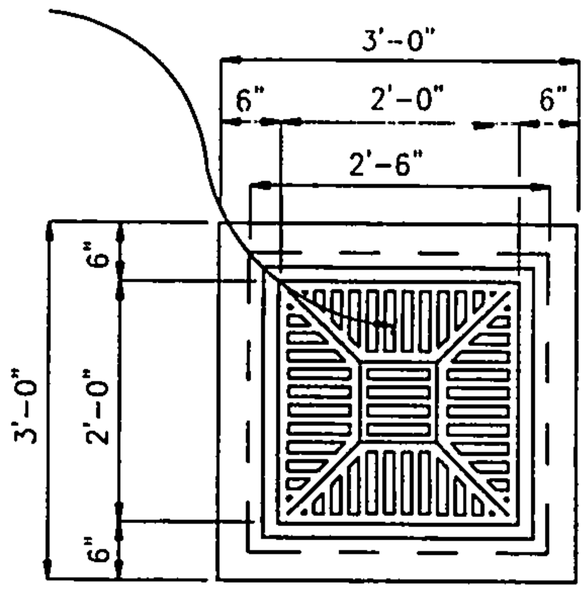
$$Q = \underline{3.7 \text{ (CFS)}}$$

→ USE 2 10" DIAMETER PIPES

NOTE: ORFICE EQUATION FOR DROP INLET DISCHARGE TO 10" PIPE GOVERNS DISCHARGE TO CONEJO ROAD.

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

SHEET NO. 1 OF 1
JOB APACHE ELEMENTARY - PHASE I
SUBJECT DROP INLET CAPACITY
CLIENT A.P.S. JOB NO. W23-101-5195
BY J. ALARID DATE JUNE 14, 1996
CHECKED BY _____ DATE _____



MAX. PONDING DEPTH = 1.5'
ASSUME: EFFECTIVE OPENING OF GRATE 50% AREA

ORIFICE EQN: $Q = 0.6 A \sqrt{2gh}$

$Q = 0.6(2(5ft))\sqrt{2(32.2)(1.5)}$

$Q = 11.80$ (cfs)

Apache Elem. - pond discharge
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

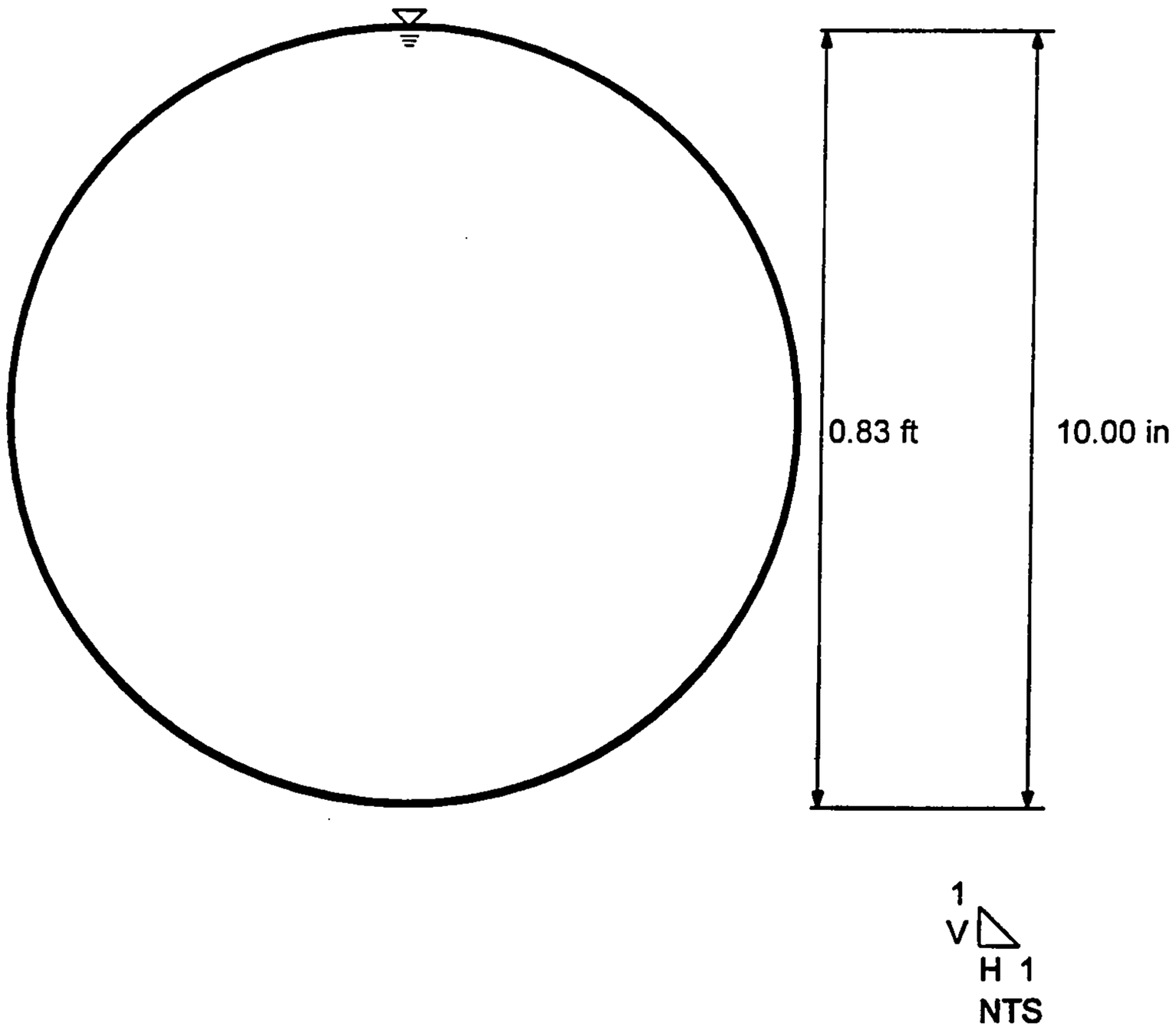
Input Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.83	ft
Diameter	10.00	in

Results		
Discharge	4.04	cfs
Flow Area	0.55	ft^2
Wetted Perimeter	2.61	ft
Top Width	0.01	ft
Critical Depth	0.80	ft
Percent Full	100.00	
Critical Slope	0.017586	ft/ft
Velocity	7.40	ft/s
Velocity Head	0.85	ft
Specific Energy	1.69	ft
Froude Number	0.18	
Maximum Discharge	4.33	cfs
Full Flow Capacity	4.03	cfs
Full Flow Slope	0.020108	ft/ft
Flow is subcritical.		

Apache Elem. - pond discharge
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.010	
Channel Slope	0.020000	ft/ft
Depth	0.83	ft
Diameter	10.00	in
Discharge	4.04	cfs



Worksheet
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\project2.fm2
Worksheet	10" PIPE / HEAD WALL TRANSITION
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.018000	ft/ft
Bottom Width	4.00	ft
Discharge	7.40	cfs

Results		
Depth	0.30	ft
Flow Area	1.19	ft²
Wetted Perimeter	4.59	ft
Top Width	4.00	ft
Critical Depth	0.47	ft
Critical Slope	0.004194	ft/ft
Velocity	6.23	ft/s
Velocity Head	0.60	ft
Specific Energy	0.90	ft
Froude Number	0.00	

Apache Elem. - SW culvert
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge (SWC)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

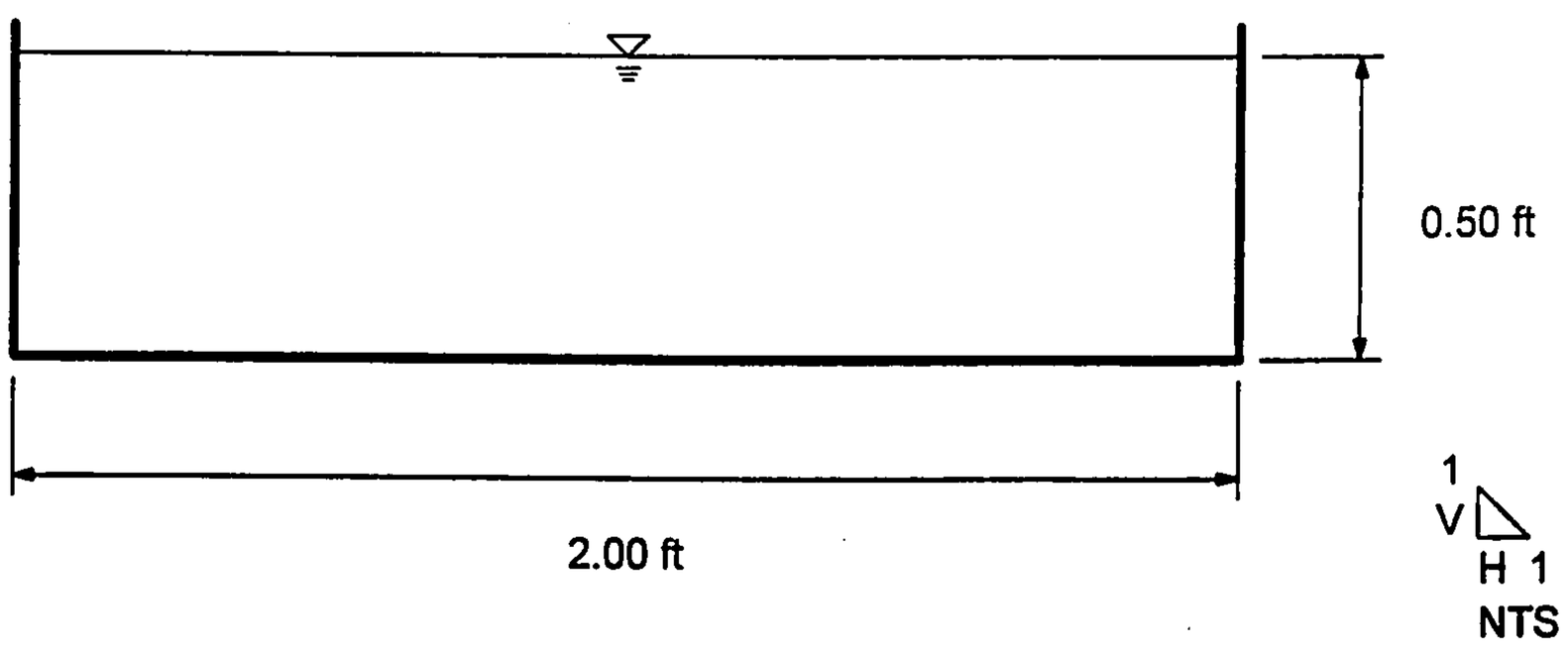
Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Depth	0.50	ft
Bottom Width	2.00	ft

Results		
Discharge	5.50	cfs
Flow Area	1.00	ft^2
Wetted Perimeter	3.00	ft
Top Width	2.00	ft
Critical Depth	0.62	ft
Critical Slope	0.005490	ft/ft
Velocity	5.50	ft/s
Velocity Head	0.47	ft
Specific Energy	0.97	ft
Froude Number	0.00	

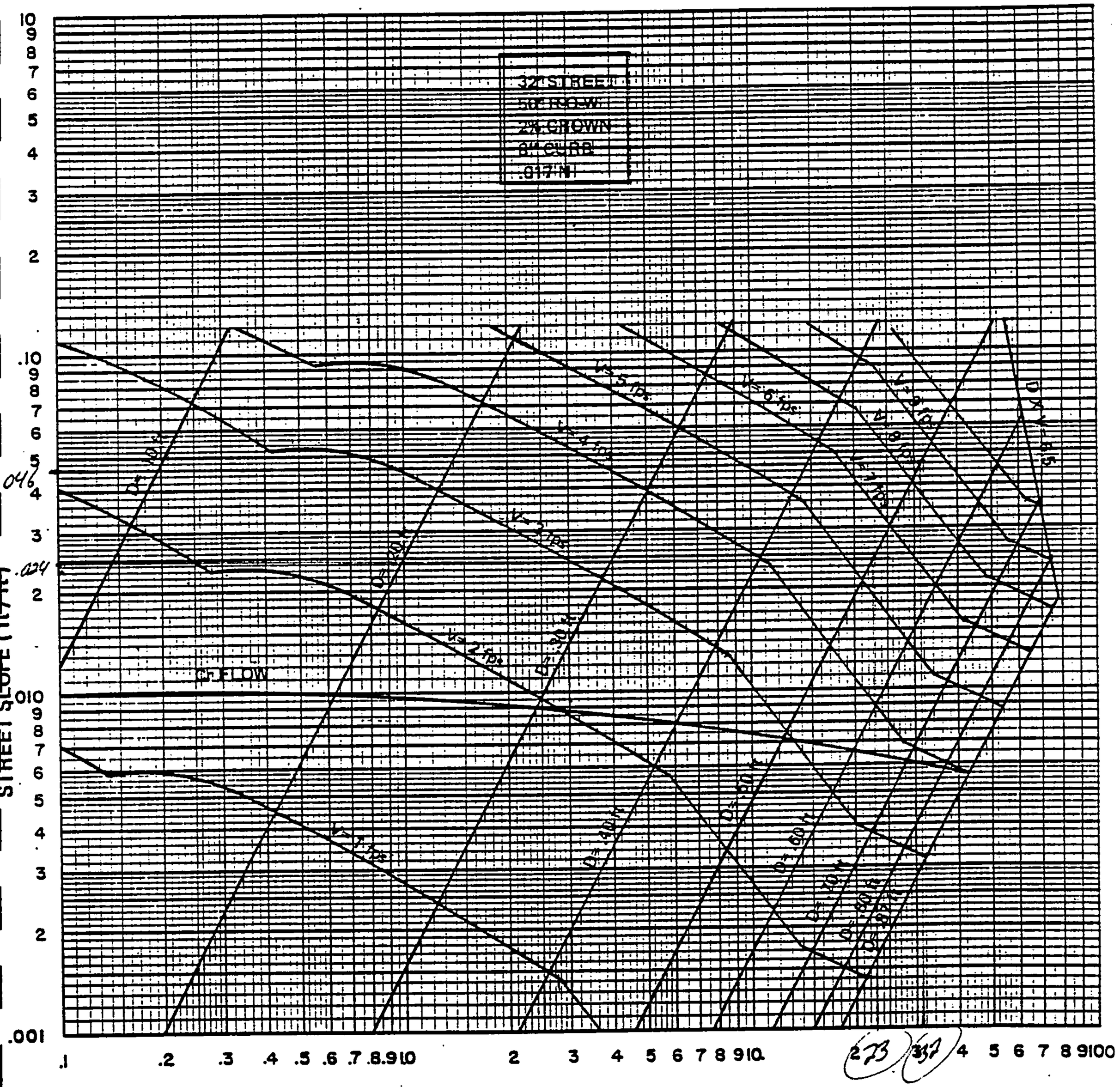
Apache Elem. - SW culvert
Cross Section for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\apache.fm2
Worksheet	Apache Elem. - pond discharge (SWC)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Depth	0.50	ft
Bottom Width	2.00	ft
Discharge	5.50	cfs

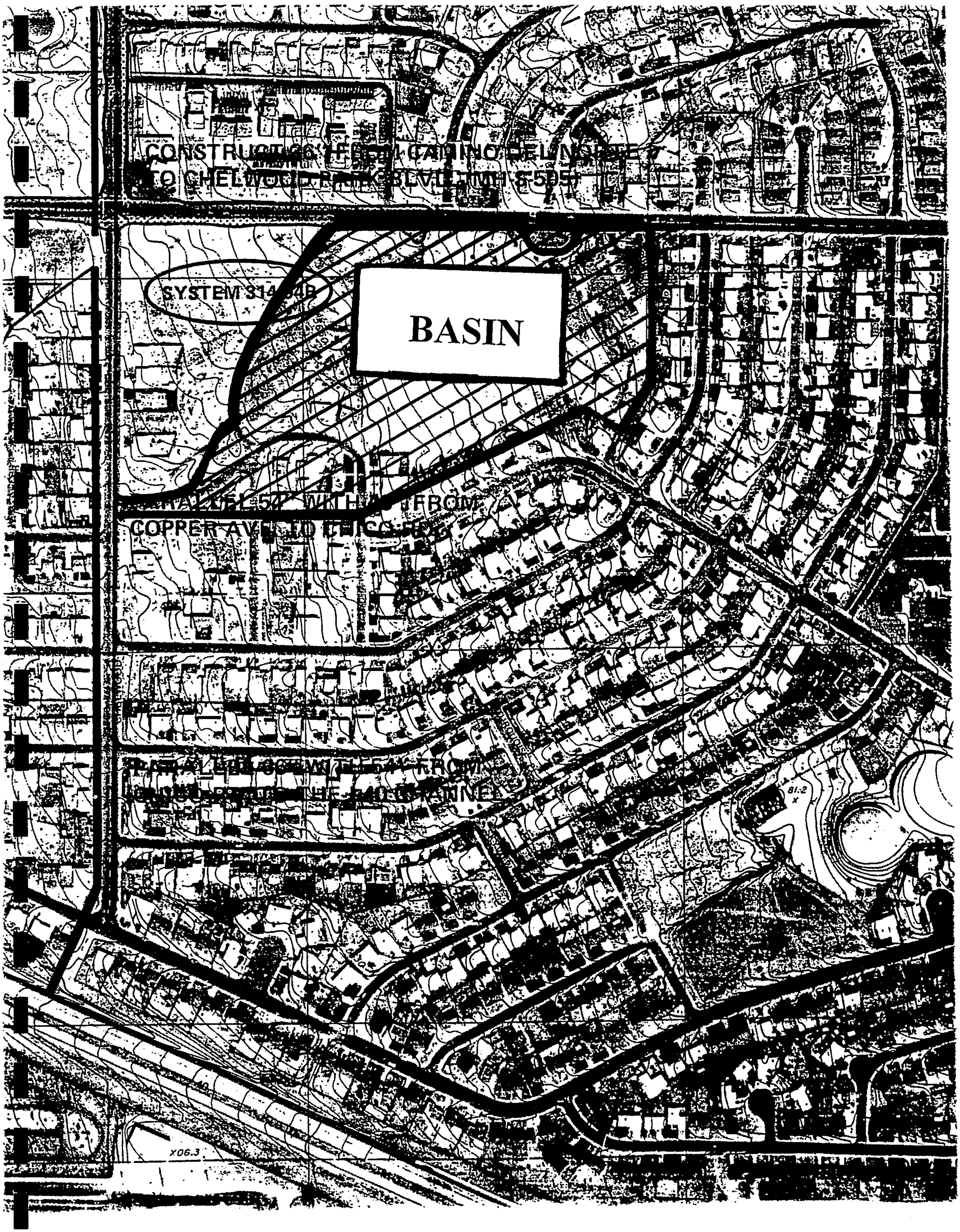


STREET CAPACITY



REV. 3-83

PLATE 22.3 D-1


BASIN

APPENDIX B

DESIGN DRAWINGS

CITY OF
Albuquerque

P.O. Box 1293 Albuquerque, NM 87103

July 18, 1996

Martin J. Chávez, Mayor

Joe P. Kelley, PE
Chavez-Grieves
5639 Jefferson NE
Albuquerque, NM 87109

RE: DRAINAGE REPORT FOR APACHE MINI-GYMNASIUM (K-22/D3)
RECEIVED JUNE 27, 1996 FOR GRADING/PAVING & BUILDING PERMIT
ENGINEER'S STAMP DATED 6/26/96

Dear Mr. Kelley:

Based on the information included in the submittal referenced above, City Hydrology has the following comments that must be addressed:

Orifice equation will control discharge from the detention pond. H = 1.98' instead of 2.98', which will reduce the discharge to 3.7 cfs per pipe. Revise the route reservoir command to check revised outflow. Will there be a separate drop inlet for each pipe? Detail the emergency spillway. Check the rundown at the narrowest section. The transition from the pipes to the rundown will cause turbulence. Depth should exceed the specific energy until the flow becomes steady. Sidewalk Culverts, in the City right of way, must be constructed per C.O.A. Std Dwg # 2236, which will require an S.O.19. What is the street section for Conejos? Why not use Plate 22.3 D-1 to analyze the street capacity?

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer, Hydrology

c: Andrew Garcia
Fred Aguirre
Anore Larroque, APS, 915 Oak SE, 87106

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

November 30, 1995

Joe P. Kelley
Chavez-Grieves
5639 Jefferson NE
Albuquerque, NM 87109

RE: MASTER DRAINAGE PLAN FOR A.P.S. APACHE ELEMENTARY SCHOOL (K22-D3) ENGINEER'S STAMP DATED 11/14/95.

Dear Mr. Kelley:

Based on the information provided on your November 10, 1995 submittal, listed are some concerns that will need to be addressed prior to final Master approval:

1. Release onto Conejos Rd. will need to be accomplished with a battery of 4" pvc pipes. Biggest diameter pipe through curb is 4".

2. What type of erosion and sediment control is proposed within the proposed swales.

3. Please include in your resubmittal the perimeter bearings and distances.

4. You may want to consult the architect and A.P.S. to determine a phasing plan.

5. Note on plan drawing that site specific submittals will be required.

6. Design or phase plan should include the outfall as being part of the first phase.

7. Does Conejos Rd. NE have the capacity to accept the proposed 8.08 cfs?

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,
Bernie J Montoya
Bernie J. Montoya, CE
Engineering Associate

BJM/dl

c: Andrew Garcia
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 2, 1993

Jeff Mortensen
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

RE: MASTER DRAINAGE PLAN & REVISED PARKING LOT PLAN FOR APACHE ELEMENTARY SCHOOL (K22-D3) ENGINEER'S STAMP DATED SHEET 1 OF 3 6/24/93, SHEET 2 OF 3 7/20/93, AND SHEET 3 OF 3 6/24/93.

Dear Mr. Mortensen:

Based on the information provided on your July 21, 1993 resubmittal, the above referenced site is approved for Master and Grading/Paving Plan.

Please be advised that Engineer Certification for the Grading/Paving will be required prior to final approval.

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineer Associate

BJM/dl/WPHYD/7846

xc: Alan Martinez
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 14, 1993

Jeff Mortensen
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

RE: MASTER DRAINAGE PLAN & PARKING LOT PLAN FOR APACHE ELEMENTARY SCHOOL (K22-D3) ENGINEER'S STAMP DATED 6/24/93.

Dear Mr. Mortensen:

Based on the information provided on your June 25, 1993 submittal, listed are some concerns that will need to be addressed prior to final approval for Grading/Paving permit:

1. Please identify the 100-year water surface elevation on the plan drawing.

2. What type of erosion control do you propose at the outlet of the 4" p.v.c.?

If I can be of further assistance, please feel free to contact me at 768-2667.

Sincerely,

Bernie J. Montoya, CE
Engineer Associate

xc: File

CITY OF ALBUQUERQUE

October 2, 2007

Jeffrey Mortensen, P.E.
High Mesa Consulting Group
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

Re: Apache Elementary Parking Lot and Playground Improvements, Certification
Engineer's Stamp dated 5-25-05 (K22-D003)
Certification dated 9-27-07

Dear Mr. Mortensen,

Based upon the information provided in your submittal received 9-28-07, the above referenced certification is approved.

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

Sincerely,

Kristal D. Metro, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: File

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

HMCG 2007.181.1____

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

K-22/D3

PROJECT TITLE: APACHE ELEMENTARY PARKING LOT & PLAYGROUND IMPROVEMENTS ZONE ATLAS/DRNG. FILE #K22 D3

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

LEGAL DESCRIPTION: LOTS 22 & 23, BLOCK 5, FOOTHILL ESTATES PLUS VACATED SAN JACINTO (V.O. 1861)

CITY ADDRESS: 12800 COPPER STREET NE

ENGINEERING FIRM:	HIGH MESA CONSULTING GROUP	CONTACT:	JEFF MORTENSEN
ADDRESS:	6010-B MIDWAY PARK BLVD. NE	PHONE:	(505) 345-4250
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87109
OWNER:	ALBUQUERQUE PUBLIC SCHOOLS, DEPT FDC	CONTACT:	TYLER MASON
ADDRESS:	915 OAK STREET, SE	PHONE:	848-8822
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87106
ARCHITECT:	N/A	CONTACT:	
ADDRESS:		PHONE:	
CITY, STATE:		ZIP CODE:	
SURVEYOR:	HIGH MESA CONSULTING GROUP (NMPS 15075)	CONTACT:	JOE SOLOMON
ADDRESS:	6010-B MIDWAY PARK BLVD. NE	PHONE:	(505) 345-4250
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87109
CONTRACTORS:	UNIVERSAL CONSTRUCTORS/WESTWIND	CONTACT:	PAUL FISHER/KEVIN NEEL
ADDRESS:		PHONE:	884-0400/881-8925 X-104
CITY, STATE:	ALBUQUERQUE, NM	ZIP CODE:	87109

TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

RECEIVED
SEP 28 2007
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

_X_ YES – INFORMAL WITH BRAD BINGHAM
___ NO
___ COPY PROVIDED

DATE SUBMITTED: 09/28/2007 BY: JEFFREY G. MORTENSEN

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

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

CITY OF ALBUQUERQUE

June 15, 2006

Jeffrey G. Mortensen, P.E.
Jeff Mortensen & Assoc., Inc.
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

Re: Apache Elementary School Parking Lot and Playground Improvements Grading and Drainage Plan

Engineer's Stamp dated 5-25-06 (K22/D3)

Dear Mr. Mortensen,

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

Based upon the information provided in your submittal dated 5-25-06, the above referenced plan is approved for Grading Permit and Paving Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Upon completion of the project, please provide an Engineer Certification for our files.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions feel free to call the Municipal Development Department Hydrology Section at 768-3654 (Charles Caruso).

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne

Curtis A. Cherne, E.I.
Engineering Associate, Planning Dept.
Development and Building Services

BB

C: file
Charles Caruso, DMD

CITY OF
Albuquerque

July 8,1998

Brad Ponder
Chavez-Grieves Engineering
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: ENGINEER CERTIFICATION FOR APACHE ELEMENTARY PHASE I
IMPROVEMENTS (K22-D3) CERTIFICATION STATEMENT DATED 5/12/97

Dear Mr. Ponder:

Based on the information provided on your June 2,1998 submittal, Engineer Certification for the above referenced site is acceptable.

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

DRAINAGE INFORMATION

PROJECT TITLE: Apache Elementary Phase I Improvements ZONE ATLAS/DRNG. FILE #: K-22/D3

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

LEGAL DESCRIPTION: Lots 22 & 23, Block 5, Foothill Estates

CITY ADDRESS: Copper Avenue NE

ENGINEERING FIRM: Chavez-Grieves CONTACT: Brad Ponder

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: APS CONTACT: Andre Larroque

ADDRESS: 915 Oak SE PHONE: 242-5865

ARCHITECT: Wright - Hammer CONTACT: Denise Hammer

ADDRESS: 1735 Aliso NE PHONE: 266-6764

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

_x_ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

_X_ YES

____ NO

____ COPY PROVIDED

DATE SUBMITTED: MAY 9, 1997

BY: _____
James Alarid

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

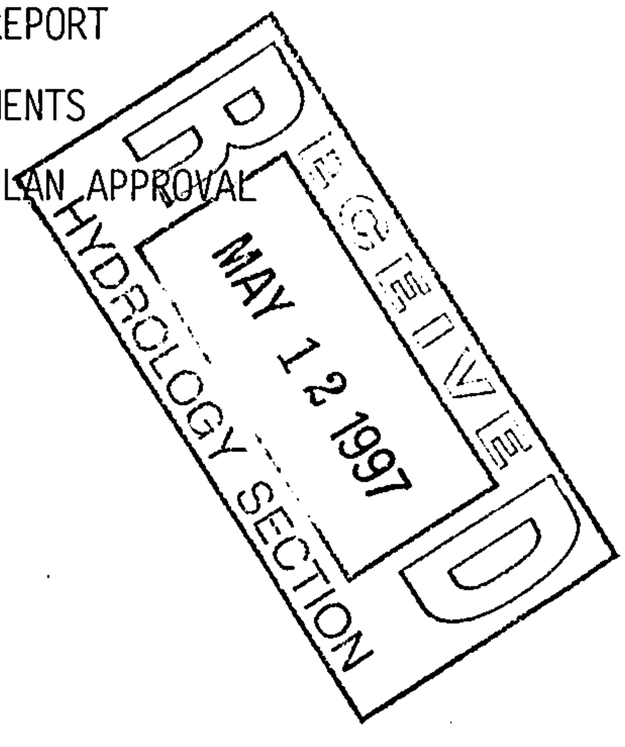
____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

____ DRAINAGE MASTER PLAN APPROVAL



CITY OF
Albuquerque

Martin J. Chávez, Mayor

August 14,1997

James Alarid
Chavez - Grieves Engineering
5639 Jefferson St. NE
Albuquerque, New Mexico 87109

RE: SO19 APPROVAL FOR SIDEWALK CULVERT AND RUNDOWN @ APACHE ELEMENTARY SCHOOL (K22-D3) RECEIVED 7/24/97

Dear Mr. Alarid:

Based on the information provided on your July 24,1997 submittal, the above referenced site is approved for SO19 approval.

Please be advised that a separate permit is required for construction with City R/W. A copy of this approval letter must be on hand when applying for the excavation permit

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

C: Andrew Garcia
Arlene Portillo
File

Sincerely

Bernie J. Montoya

Bernie J. Montoya CE
Associate Engineer

Printed July 24, 1997 (8:35am)

CHAVEZ - GRIEVES / CONSULTING ENGINEERS, Inc.

5639 Jefferson Street NE, Albuquerque, New Mexico 87109 *Phone (505) 344-4080 - Fax (505) 343-8759*

FACSIMILE TRANSMITTAL LETTER

TO: Bernie Montoya, City of Albuquerque Hydrology Department
FAX NO.: 924-3864

FROM: James Alarid

DATE: July 24, 1997

PROJECT NAME: Apache Elementary School, Zone Atlas# K-22 - D3

File with plan

RE: SIDEWALK CULVERT AND RUNDOWN IN R.O.W.

We are in the process of obtaining approval for the S.O. 19 related work at Apache Elementary School for approval of the Engineers Certification for the project. Mr. Jerry Lukins with the Street Maintenance Department will not approve the construction of the sidewalk culvert and a portion of the rundown in the R.O.W. without the following issue being resolved with City Hydrology (per phone conversation between Mr. Lukins and myself on the afternoon of June 26, 1997).

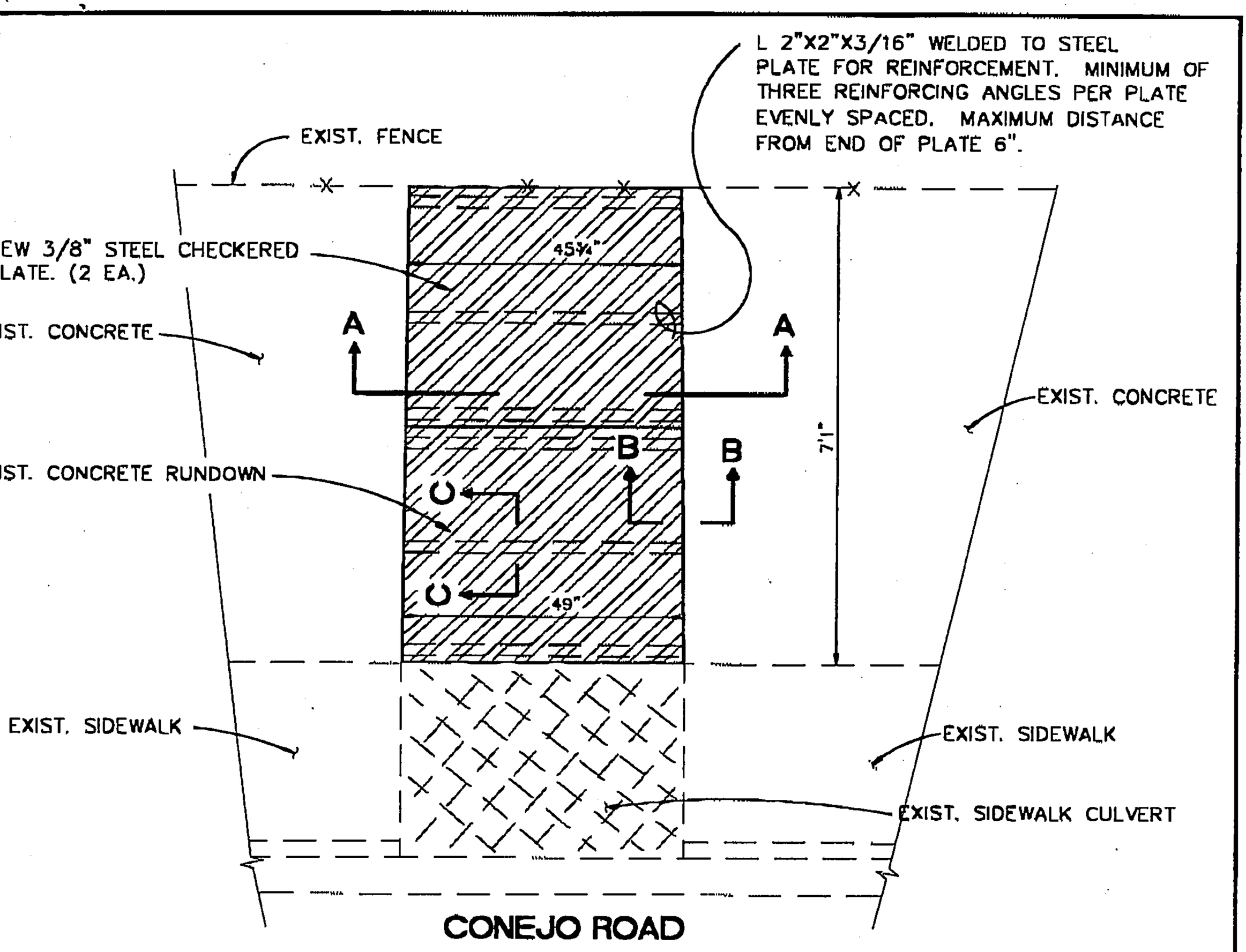
The run-down extends from the back of the sidewalk culvert approximately 7 feet to the fence at the boundary of the school. There is an existing fence opening inside of the run-down which the children use as access to the school. Mr. Lukins' concern is as follows:

1. A safety concern may exist with the 7 feet of open rundown;

On the same afternoon you and I discussed the situation in detail as well as Mr. Lukins' concerns. I proposed a solution to you on June 26, 1997 which you approved (Refer to letter from you dated July 1, 1997).

At this time APS has instructed us to design a cover for the rundown in the R.O.W. instead of building a 6" curb around the rundown. I have attached the detail of the proposed cover for the rundown for your review and approval. If you have any questions or need more information please call. Thank you for your time.

NUMBER OF PAGES TRANSMITTED: 3
(INCLUDING THIS COVER PAGE)



CONSTRUCTION NOTES:

1 USE TWO STEEL PLATES TO COVER RUNDOWN. EACH PLATE SHALL COVER HALF OF THE RUNDOWN.

2 THE NEW STEEL PLATE AND FRAME MEMBERS SHALL BE PAINTED PER COA STD. DWG. #2236.

3 THE NEW STEEL PLATE SHALL BE ANCHORED TO CONCRETE AS SHOWN IN SECTION B-B OF COA STD. DWG. #2236.

4 THIS DRAWING ADDRESSES THE RUNDOWN COVER ONLY. THE CONTRACTOR SHALL COORDINATE WITH THE COA STREET MAINTENANCE DIVISION TO DETERMINE THE EXTENT OF THE WORK ON THIS SIDEWALK CULVERT NECESSARY TO BE APPROVED FOR OCCUPANCY.

NOT TO SCALE

APACHE ELEMENTARY SCHOOL
RUNDOWN COVER/CONEJO RD.
ALBUQUERQUE, NEW MEXICO
GRADING & DRAINAGE

Engineered By: CG – J. ALARID	Date: 07-23-97
Drawn By: CG – J. ALARID	Date: 07-23-97
Revisions	Date: 07-23-97
CG Poject: W23-101-5195	
Reference Sheet #: C5	FIELD CHANGE #1
Sheet Number: FC-1	

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
5639 JEFFERSON STREET N.E. - ALBUQUERQUE, NEW MEXICO 87109
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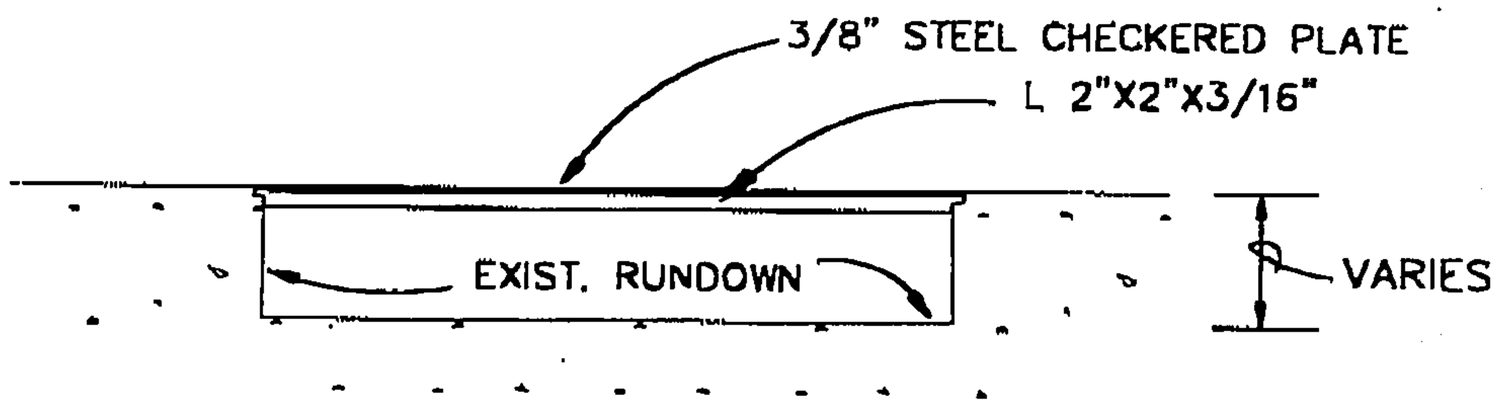
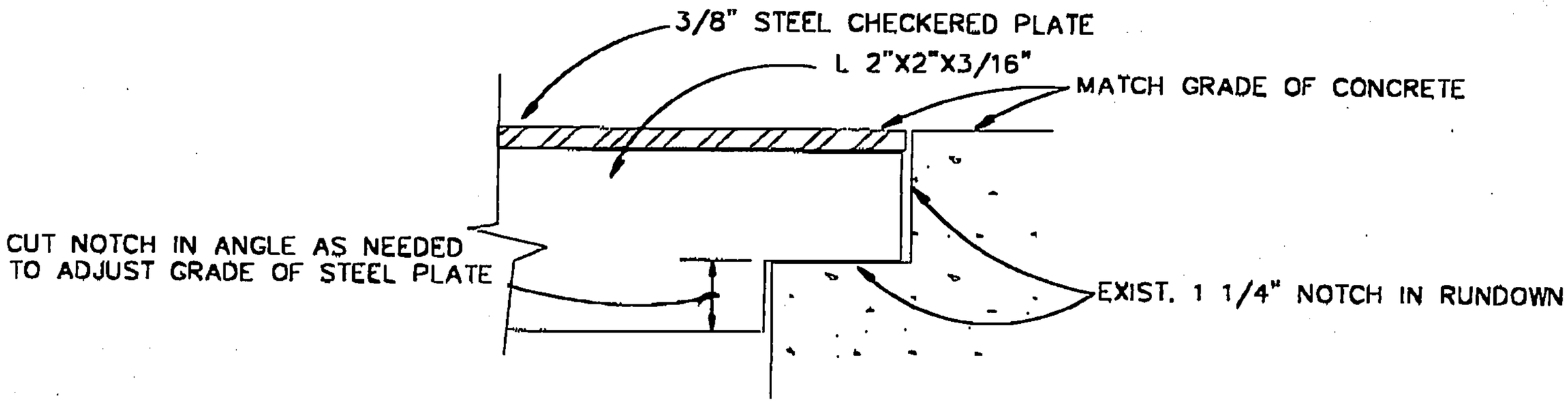
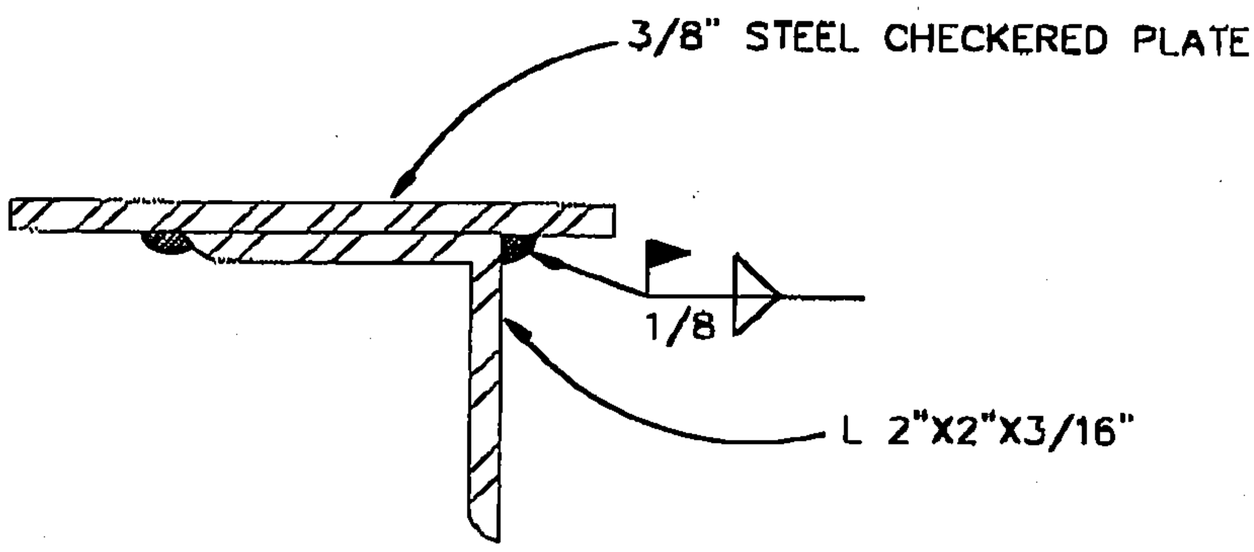
AEDET.DWG



SECTION A-A



SECTION B-B



SECTION C-C

NOT TO SCALE

APACHE ELEMENTARY SCHOOL
RUNDOWN COVER/CONEJO RD.
ALBUQUERQUE, NEW MEXICO
GRADING & DRAINAGE

Engineered By CG – J. ALARID	Date: 07-23-97
Drawn By CG – J. ALARID	Date: 07-23-97
Revisions	Date: 07-23-97
CG Poject: W23-101-5195	
Reference Sheet # C5	FIELD CHANGE #1
Sheet Number: FC-2	

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AEDET.DWG

CITY OF
Albuquerque
Public Works Department

June 4, 1997

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

Brad Ponder
Chavez-Grieves
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: Engineer's Certification for Apache Elementary Phase I Improvements (K22-D3)
Received May 12, 1997

Dear Mr. Ponder:

I have reviewed the referenced plan dated May 12, 1997 and forward the following comment. Please submit the approval documentation from Street Maintenance for the SO #19.

If you have any questions please call me at 924-3984.

Sincerely,

Carlos A. Montoya
Project Manager

c: Andrew Garcia
File