CITY OF
Albuquerque

City of Albuquerque

P. O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103
PUBLIC WORKS DEPARTMENT

January 17, 1996

CERTIFICATE OF WORK ORDER COMPLETION

Biebros Development Co.
5920 Midway Park Blvd. NE
Albuquerque, NM 87109

RE: CLIFFORD INDUSTRIAL PARK PROJECT NO. 5179.90, MAP NO. C-17

Dear Sir:

This is to certify that the City of Albuquerque accepts Project No. 5179.90 as being completed according to approved plans and construction specifications. Please be advised this certificate of completion and acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

The project is described as follows:

_ The project consisted of installation of water and sanitary sewer to provide services to Tracts B-1-A-1 thru B-1-A-7 and Tracts B-2-A-1 and B-2-A-2. Included also was paving and drainage improvements.

The contractor's correction period began the date of this letter and is effective for a period of one (1) year.

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer,
Engineering Group
Public Works Department

JAN 3 1 1996

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 27, 1995

Charles M. Easterling, P.E.
Easterling & Associates, Inc.
10131 Coors Rd. NW, Suite H-7
Albuquerque, New Mexico 87114

RE: CONCEPTUAL GRADING AND DRAINAGE PLAN FOR TRACT B-1-A-3, CLIFFORD INDUSTRIAL PARK (C17/D1U), SUBMITTED FOR SITE DEVELOPMENT PLAN FOR BUILDING PERMIT APPROVAL, ENGINEER'S STAMP DATED 7/7/95.

Dear Mr. Easterling:

The above referenced plan is not in compliance with the previously approved Amended Drainage Master Plan (DMP), dated 3/7/95, and is therefore not approved. The DMP identified a maximum allowable release rate of 2.3 cfs/acre based on downstream capacity. According to the DMP, 7.3 cfs from Basin A was to discharge to Alameda and 7.3 cfs from Basin B was to flow to the drainage channel to the south. The above referenced plan proposes to discharge 13.7 cfs into Alameda. How will the release of 13.7 cfs effect the downstream capacity of the Alameda system? It appears that ponding is necessary to reduce this flow rate.

Prior to approval for Building Permit release, you may wish to revise the DMP, revise to conceptual grading and drainage plan to comply with the DMP, or justify the proposed free discharge.

If you should have any questions, please feel free to call me.

Sincerely,

Susan Calongne

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

c: Andrew Garcia, City Hydrology
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 29, 1995

Charles M. Easterling, P.E.
Easterling & Associates, Inc.
10131 Coors Rd. NW, Suite H-7
Albuquerque, New Mexico 87114

RE: REVISED DRAINAGE PLAN FOR CLIFFORD INDUSTRIAL PARK (C17/D1U), SUBMITTED FOR PRELIMINARY PLAT APPROVAL, ENGINEER'S STAMP DATED 3/7/95.

Dear Mr. Easterling:

Based on the information provided in the resubmittal of March 8, 1995, the above referenced plan is approved for Preliminary Plat.

Prior to approval for Final Plat, all financial guarantees must be in place.

If you should have any questions, or if I can be of further assistance, please do not hesitate to call me at 768-2650.

Sincerely,

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

c: Andrew Garcia, City Hydrology
Mike Mechenbier, Owner
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 28, 1995

Chuck Easterling
Easterling & Associates
10131 Coors Rd. NW, Ste. H-7
Albuquerque, NM 87114

RE: CLIFFORD INDUSTRIAL PARK (C-17/D1U), ENGINEER'S STAMP DATED 2-6-95

Dear Mr. Easterling:

Based upon the information included in your 2/13/95 submittal, the referenced project is approved for Preliminary Plat. Final Plat approval cannot be authorized until all financial guarantees are in place.

If I can be of further assistance, feel free to call me at 768-3622.

Cordially,

Scott Davis
PWD, Hydrology Division

c: Andrew Garcia
File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 8, 1993

Frank D. Lovelady, P.E.
Lovelady & Associates
7408 Morrow Avenue NE
Albuquerque, N.M. 87110

RE: CON GRADING & DRAINAGE PLAN FOR WASHINGTON BUS. PARK (C-17/D1U)
ENGINEER'S STAMP DATED 11/4/93; RECEIVED NOVEMBER 23, 1993
FOR S. DEV PLAN FOR BLDG PERMIT APPROVAL

Dear Mr. Lovelady:

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

1. What is the DRB number? Are you required to replat? A private drainage easement will be required for Lot J to drain across the Project.

2. Are there any off-site flows from the south? The Easterling Report; received Aug 29,1988; identified 22.3 acres draining to AP-6 instead of 17.22 acres. Also the Easterling Report stated that development was limited to Q100 due to lack of capacity in downstream structures. It seems that the values you used are from the Jun 24, 1988 version of the Easterling Report. The Report received Aug 29, 1993 states that Q100 = 53.3 cfs instead of 59.0 cfs & Capacity Provided = 125.9 cfs instead of 150 cfs at AP-6.

3. Verify that downstream improvements required by the Aug 29, 1993 Report were constructed and are still functioning adequately.

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

xc: Fred Aguirre

WPHYD/8141/jpc

CITY OF
Albuquerque

October 30,1998

Jackie McDowell
McDowell Engineering Inc.
7820 Beverly Hills Ave. NE
Albuquerque, New Mexico 87122

RE: ENGINEER CERTIFICATION FOR SUNDANCE PRES. PL. (C17-D1U)
CERTIFICATION STATEMENT DATED 10/7/98

Dear Ms. McDowell:

Based on the information provided on your October 8,1998 submittal, Engineer Certification for the above referenced site is acceptable.

Please be advised that the final C.O. will not be issued until a copy of the green tag for the SO19 work is submitted for our files.

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

McDowell Engineering, Inc.
Jackie Sedillo McDowell, P.E.
Civil Engineering Consultant

February 6, 1998

Ms. Lisa Ann Manwill, P.E.
City of Albuquerque Hydrology
P.O. Box 1293
Albuquerque, NM 87103

RE: SUNDANCE (C17-D1U) GRADING & DRAINAGE PLAN AND S.O. 19

Dear Ms. Manwill:

We received your comments dated January 30, 1998 and offer the following response in the same numerical order listed.

1. Rip rap protection has been added to the pond design and should eliminate sediment from entering the existing concrete channel.

2. We are using 2~12" culverts to tie into the existing inlet in Alameda because of capacity requirements and minimum size requirements shown on the standard detail. The existing inlet is a double "C". We have modified the alignment of the pipes tying into the inlet which comply with the standard detail.

3. A legal size portion of the plat is attached.

Your timely approval of this plan is appreciated.

Sincerely,

MCDOWELL ENGINEERING, INC.

Jackie S. McDowell, P.E.

7820 Beverly Hills Ave. NE • Albuquerque, New Mexico 87122 • (505) 828-2430 • Fax (505) 821-4857

CITY OF ALBUQUERQUE

PUBLIC WORKS DEPARTMENT

February 9, 1998

INTEROFFICE CORRESPONDENCE HYDROLOGY DIVISION

TO: Desiderio Salas, Street Maintenance Division

FROM: Lisa Ann Manwill, P.E. Engineering Associate, PWD LAM

SUBJECT: **PRIVATE DRAINAGE FACILITIES WITHIN PUBLIC RIGHT-OF-WAY DRAINAGE FILE NUMBER C17-D1U.**

Transmitted herewith, is a copy of the approved drainage plan for the referenced project incorporating the SO #19 design.

This plan is being submitted to you for permitting and inspection. Please provide this section with a signed-off copy per the signature block upon construction and acceptance by your office.

As you are aware, the signed off SO #19 is required by this office for Certificate of Occupancy release; therefore your expeditious processing of this plan would be greatly appreciated and would avoid any unnecessary delay in the release of the Certificate of Occupancy.

Thank you for your cooperation and if you should have any questions and/or comments, please feel free to call me at 924-3984.

Attachment

Fld Copy

ATTACHMENT NO. 1

SUPPLEMENTAL CALCULATIONS TO

SUNDANCE
CLIFFORD INDUSTRIAL PARK
TRACT B-1-A-2

GRADING & DRAINAGE PLAN

I, Jackie S. McDowell, Registered Professional Engineer, No. 10903, hereby certify that I have prepared the attached calculations.

12-31-97

Jackie S. McDowell, P.E. No. 10903

TABLE OF CONTENTS

	Page No.
Vicinity Map - Zone Atlas C-17	1
FEMA FIRM Map (1996)	2
Reduced Grading & Drainage Plan	3
Partial Map of Master Plan	4
North On-site Basin Calculations	5-7
North Hydrograph Pond Calcs	8
South On-Site Basin Calculations	9-11
South Hydrograph Pond Calcs	12
Pond Calculations	13

A-1 SU-PERMIT
NAZARETH HOSPITAL

SU-2 IP-EP

U-2
-EP

RICHFIELD

WILDFLOWER PARK

SU-1
APT - 30 DU/A

IP

SU-1 C-1 USES

PARK

SPERRY SITE & WILDFLOWER PARK
SU-2 PARK & DRAINAGE EASEMENT

WILDFLOWER

R-D

PHASE I

ALAMEDA

BLVD

WOODSTO

EAGLE R

OAKLAND

SU-2

ARCHDIOCESE OF SANTA FE
SU-1
ALAMEDA
CEMETERY

SITE

BALLOON FIESTA PARK

CLIFFORD

INDUSTRIAL
SU-2 M-1

PARK

WASHINGTON BUSINESS PARK

LOOP

MOTOROLA LOT

SU-2 M-1

INDUSTRIAL

(UNIT 1)

DISTRICT

SAN MATEO

LEVI

WILSHIRE

E

MATERIALS

CORP

SU-2 PARK

SU-2 M-1

INDUSTRIAL

DISTRICT

(UNIT 5)

ESTATES

RESERVOIR SITE

CORONADO VILLAGE

MOBILE HOME PARK

SU-2 MUD

NORTH DIVERSION
CHANNEL AND INLET CHANNELS
PHASE 4

AMAFCA NORTH DIVERSION CHANNEL EASEMENT

SPRINGER BUILDING

MATERIALS CORP

LOOP INDUSTRIAL PARK

RAFAR INVESTMENTS

OVERMYER--D H

BIO THREE
INDUSTRIES

LOS ANGELES

HARLEY TRACT

INVESTORS

HOGUE

JEFFERSON

WASHINGTON

PASEO

DEL NORTE

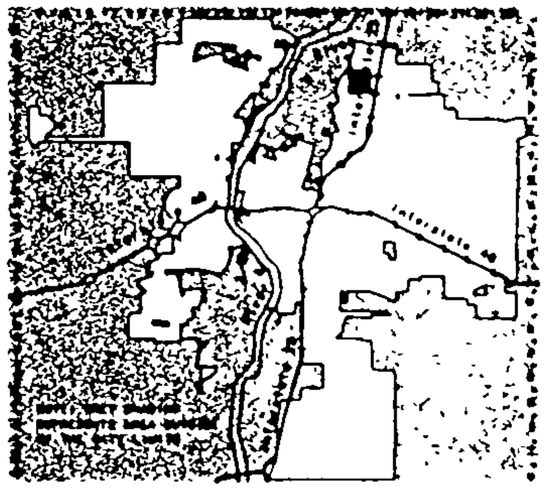
GRAPHIC SCALE IN FEET

250 0 500 1000

CITY OF
Albuquerque

PLANNING DEPARTMENT

Map Amended through June 19, 1997



LEGAL DESCRIPTION

T11N
R3E
SEC 14

UNIFORM PROPERTY CODE
1-017-084

C-17-Z

35°11'15

BERNALILLO COUNTY
UNINCORPORATED AREAS
350001

ZONE X

ZONE X

WASHINGTON STREET

ZONE AO
(DEPTH 1)

COLUMBINE AVENUE

ZONE AO
(DEPTH 2)

ZONE X

EDITH BOULEVARD

BOULEVARD

CORPORATE LIMITS

ZONE AO
(DEPTH 1)

SITE

Diversion Channel

STREET

WASHINGTON

ZONE A

ZONE X

PLACE

WASHINGTON

CORONA LOOP

North Amafca

ANAHEIM AVENUE

ZONE A

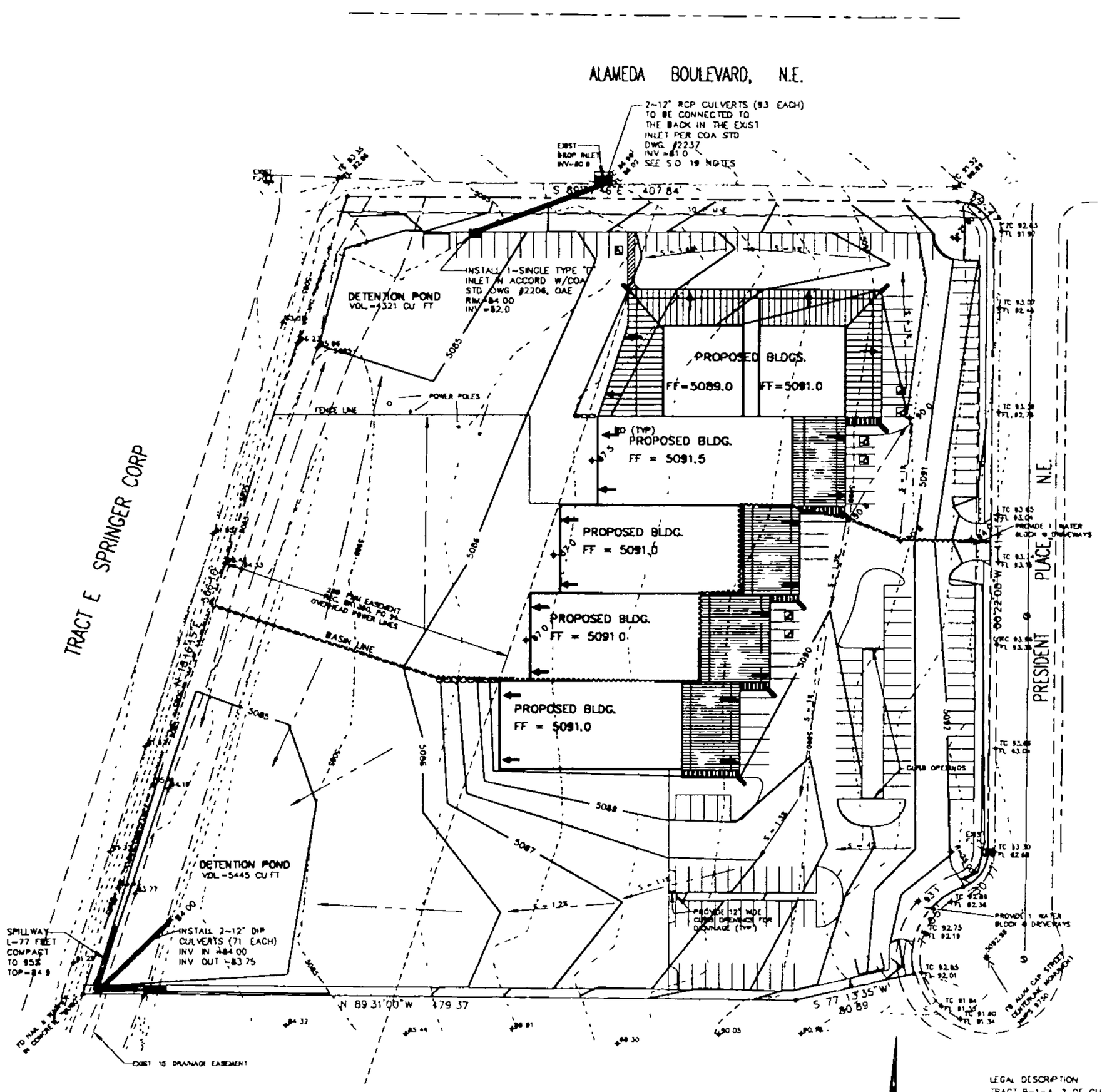
100-YEAR FLOOD
CONFINED TO
CONSTRUCTED CHANNEL

PASEO DEL NORTE

ATCHISON TOPEKA AND SANTA FE

RM15

2



TRACT B-1-A

STANDARD GRADING NOTE

1 THE MAXIMUM GRADED SIDE SLOPE SHALL NOT EXCEED 3 FEET (HORIZONTALLY) TO 1 FOOT (VERTICALLY)

2 AREAS DISTURBED DUE TO GRADING SHALL BE RESEEDED IN ACCORDANCE WITH CITY OF ALBUQUERQUE STD SPECIFICATION 1012 - NATIVE GRASS SEEDING/O.A.E.

TRACT B-1-A-2

WITHIN

CLIFFORD INDUSTRIAL PARK

ALBUQUERQUE BERNALILLO COUNTY NEW MEXICO

GRAPHIC SCALE

(IN FEET)

1 inch = 40 ft

GRADING
12-31-97
1=40
SUN01977

LEGEND

	EXISTING	PROPOSED
CONTOUR	5080	5850
PROPERTY LINE		
ROAD		
SETBACK		
WALL		
SPOT	TC 83.66 FL 83.04	± 91.5

DRAINAGE PLAN

SCOPE

Pursuant to the latest City of Albuquerque Ordinance the Drainage Plan shown hereon outlines the drainage management criteria for controlling developed runoff on and exiting the project site Six connecting buildings are proposed for the subject property with associated access parking and landscaping

EXISTING CONDITIONS

Presently the 6.34 acre site is undeveloped The site is bounded on the north by Alameda Boulevard, on the east by President Place on the south and west by private property The site slopes from the east to the west with an average slope of 1.5 percent Vegetation on the site consists of weeds, grasses, and occasional cacti There is an existing 200 PNM easement located along the west property line As shown by FEMA Map Panel No. 136, dated 1996, the site is not located in a 100-year floodplain An approved master drainage plan is on file with the City of Albuquerque (File No C17/16) for the subject property The master plan allows for a developed discharge rate from the site of 14.6 cfs, which shall be divided for half of the flow to go to the north and the other half of the flow to go to the south Therefore the north half of the site shall have an allowable discharge rate of 7.3 cfs, as does the south half No offsite runoff enters the property

PROPOSED CONDITIONS

As shown by the plan the building site is located along the easterly portion of the property not encroaching into the PNM easement On site flows will drain around the structures and flow to the west to existing drainage paths. All roof drainage will discharge from the roof to the lot and be directed around the structures to existing drainage routes. The drainage basins are shown on the plan Runoff from the north drainage basin will be collected in a retention pond which will outfall to a storm inlet which will connect to an existing inlet in Alameda Boulevard Runoff from the south drainage basin will be collected in a retention pond which will outfall to an existing drainage easement. Access will be taken from President Pl

Supplemental calculation have been provided to the City of Albuquerque Hydrology Department

CALCULATIONS

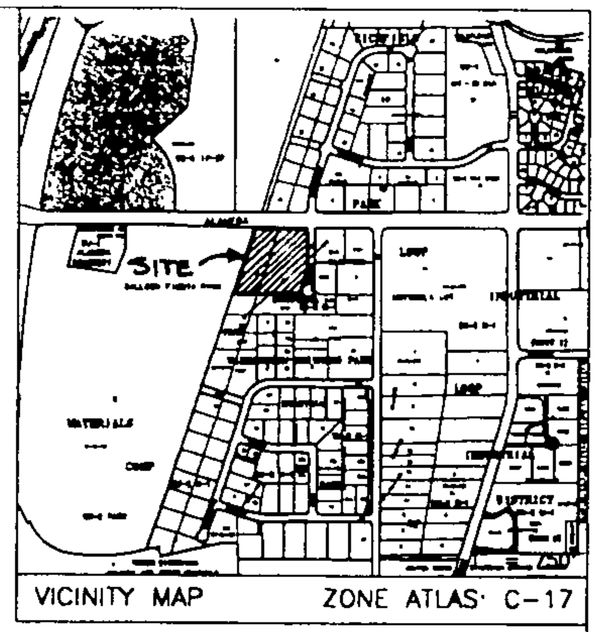
The calculations shown hereon define the 100 year-6 hour design storm falling within the project area under existing and developed conditions. The Hydrology is per "Section 22.2, Hydrology of the Development Process Manual Volume 2, Design Criteria, for the City of Albuquerque New Mexico in cooperation with Bernalillo County New Mexico and the Albuquerque Metropolitan Arroyo Flood Control Authority

PROPERTY ADDRESS

President Pl NE

TOPOGRAPHY

Topographic information provided by E Maxwell Deok, dated September, 1997



S.O. 19 NOTES

NOTICE TO CONTRACTOR

1 An excavation/construction permit will be required before beginning any work within City right-of-way An approved copy of these plans must be submitted at the time of application for this permit

2 All work detailed on these plans to be performed except as otherwise stated or provided herein shall be constructed in accordance with City of Albuquerque Interim Standard Specifications for Public Works Construction 1986 as amended through the latest edition

3 Two working days prior to any excavation contractor must contact New Mexico One Call System, 260-1990 for location of existing utilities.

4 Prior to construction, the contractor shall excavate and verify the horizontal and vertical locations of all constructions. Should a conflict exist the contractor shall notify the engineer so that the conflict can be resolved with a minimum amount of delay

5 Backfill compaction shall be according to _____ street use.

6 Maintenance of these facilities shall be the responsibility of the Owner of the property served

PRIVATE DRAINAGE FACILITIES WITHIN CITY RIGHT OF WAY

DESIGN APPROVAL _____
Hydrology Section Date

INSPECTION APPROVAL _____
Trans./Street Maint. Date

ACCEPTANCE _____
Construction Mgt Div Date

ROUTE AS-BUILT DWG TO MAPS AND RECORDS
ROUTE 1-COPY OF AS-BUILT TO HYDROLOGY SECTION

JACKIE B. McDOWELL
NEW MEXICO
12-31-97

LEGAL DESCRIPTION

TRACT B-1-A-2 OF CLIFFORD INDUSTRIAL PARK PROJECTED SECTION 14 TOWNSHIP 11 NORTH RANGE 3 EAST NEW MEXICO PRINCIPAL MERIDIAN CITY OF ALBUQUERQUE, COUNTY OF BERNALILLO, NEW MEXICO SURVEY SEPTEMBER 23 1997

BASIS OF ELEVATION NGC 7 PUBLISHED ELEVATION=5052.60

BERNALILLO COUNTY NEW MEXICO

TRACT B-1-A-2, SEC 14, T11N, R3E
CLIFFORD INDUSTRIAL PARK

SUNDANCE GRADING & DRAINAGE PLAN

McDowell Engineering Inc.

Designed JSM	Drawn STAFF	Checked JSM	Sheet 1 of 1
File SUN01977	Date DECEMBER 1997		

EXISTING 60" RCP STORM DRAIN

ALAMEDA BOULEVARD

EXISTING CATCH BASIN

S 89°37'54" E

10' Communication & P.N.M. Easement

Q_{100} = 7.3 CFS ✓

566.30'

3.17 Ac.

TRACT B-1-A

CLIFFORD INDUSTRIAL P.

FILED JUNE 30, 1978, C20-101

exico Easement
D390, page 99
ook C21 Folio
Book C36, Folio 181

(N 18°16'41" E)
566.30'

TRACT B-1-A-2
6.3386 Ac.

15' PVT. DRAINAGE EASEMENT TO TRACT B-1-A-4

TRACT
1.50

PRESIDENT PLACE

SPRINGER CORP.

TRACT B-1-A-
1.0025 Ac.

15' PVT. DRAINAGE EASEMENT TO LOT J & TRACT B-1-A-7

3.17 Ac.

Q_{100} = 7.3 CFS ✓

AP1

15' PUBLIC DRAINAGE EASEMENT

B B

TRACT B-1-A-1
2.2576 Ac.

TRACT B-1-A-
0.9142 Ac.

B 15' 10' x 25' Water line esmt.

B 12' x 30' Water line esmt.

B

N 89°

2"W

A

Project: SUNDANCE ON-SITE NORTH BASIN

29-Dec-97

Calculations: Total Basin

Calculations are based on "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 - basins < 40 acres".

Precipitation Zone = 2

Depth at 100-year, 6-hour storm: (Table A-2) P = 2.35 inches

Land Treatments

From Table 5 - Percent Treatment D

Single Family Residential =

7*SQR((N*N) +(5*N))

where N = units/acre

N = ---------- = ------, ok < 6 N = 0.00

Therefore Percent Treatment D = 0.00%

(includes local streets)

Areas: (acres)	Existing	Proposed
Treatment A	2.97	0.00
Treatment B	0.00	0.35
Treatment C	0.00	1.45
Treatment D	0.20	1.37
Total (acres) =	3.17	3.17

Excess Precipitation (E): (Table A-8)	100 yr	10 yr	2 yr
Treatment A	0.53	0.13	0.00
Treatment B	0.78	0.28	0.02
Treatment C	1.13	0.52	0.15
Treatment D	2.12	1.34	0.79

Weighted E:	100 year Existing E*A	100 year Proposed E*A	10 year Existing E*A	10 year Proposed E*A	2 year Existing E*A	2 year Proposed E*A
Treatment A	1.57	0.00	0.39	0.00	0.00	0.00
Treatment B	0.00	0.27	0.00	0.10	0.00	0.01
Treatment C	0.00	1.64	0.00	0.75	0.00	0.22
Treatment D	0.42	2.90	0.27	1.84	0.16	1.08
Total	2.00	4.82	0.65	2.69	0.16	1.31

Project: SUNDANCE ON-SITE NORTH BASIN

Weighted E = Total E*A/Total Area

Total Area = 3.17

	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Weighted E (inches) =	0.63	1.52	0.21	0.85	0.05	0.41
Weighted E (feet) =	0.05	0.13	0.02	0.07	0.00	0.03

Volume = Weighted E * Watershed Area:

	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Volume (acre-feet) =	0.17	0.40	0.05	0.22	0.01	0.11
Volume (cubic feet) =	7,253	17,482	2,374	9,757	574	4,744

Peak Discharge (cfs/acre) = Q(p) (Table A-9)	Q(p) 100 year	Q(p) 10 year	Q(p) 2 year
Treatment A	1.56	0.38	0.00
Treatment B	2.28	0.95	0.08
Treatment C	3.14	1.71	0.60
Treatment D	4.70	3.14	1.86

Total Q(p), cfs.	100 year Existing Q(p)*A	100 year Proposed Q(p)*A	10 year Existing Q(p)*A	10 year Proposed Q(p)*A	2 year Existing Q(p)*A	2 year Proposed Q(p)*A
Treatment A	4.63	0.00	1.13	0.00	0.00	0.00
Treatment B	0.00	0.80	0.00	0.33	0.00	0.03
Treatment C	0.00	4.55	0.00	2.48	0.00	0.87
Treatment D	0.94	6.44	0.63	4.30	0.37	2.55
Total Q (cfs) =	5.57	11.79	1.76	7.11	0.37	3.45

Project: SUNDANCE ON-SITE NORTH BASIN

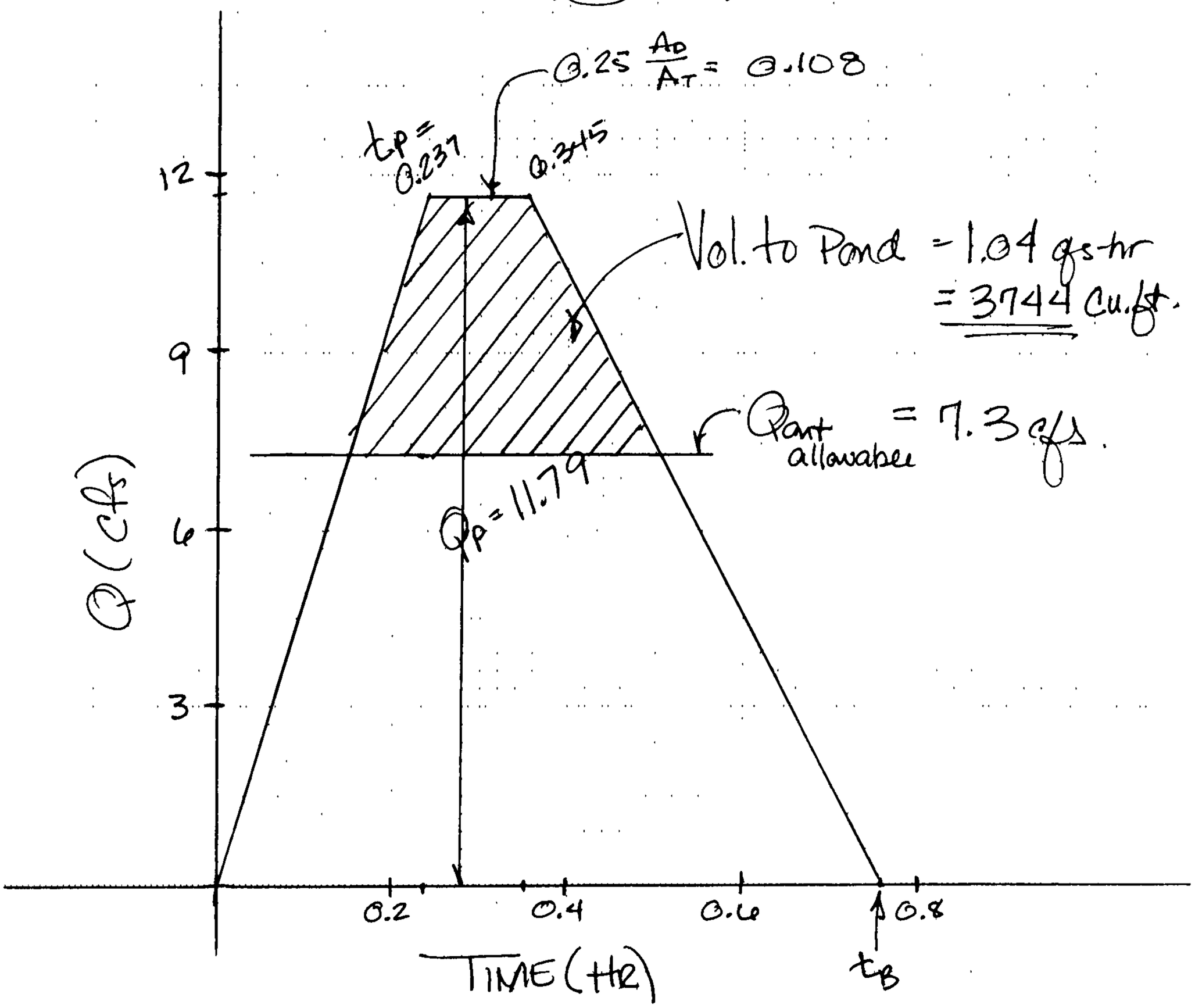
RATIONAL METHOD:

Coefficient C: (Table A-11)	100 year	10 year	2 year
Treatment A	0.31	0.11	0.00
Treatment B	0.45	0.28	0.04
Treatment C	0.62	0.50	0.29
Treatment D	0.93	0.92	0.91
Peak Intensity (in/hour): (Table A-10)	5.05	3.41	2.04

Q = CIA (cfs):	100 year Existing CIA	100 year Proposed CIA	10 year Existing CIA	10 year Proposed CIA	2 year Existing CIA	2 year Proposed CIA
Treatment A	4.65	0.00	1.11	0.00	0.00	0.00
Treatment B	0.00	0.80	0.00	0.33	0.00	0.03
Treatment C	0.00	4.54	0.00	2.47	0.00	0.86
Treatment D	0.94	6.43	0.63	4.30	0.37	2.54
Total Q (cfs) =	5.59	11.77	1.74	7.10	0.37	3.43

McDowell Engineering, Inc.
7820 Beverly Hills Ave. NE
Albuquerque, New Mexico 87122
Tele: (505)828-2430
Fax: (505)821-4857

Project: SUNDANCE - PRESIDENTS DEV.
Project No.: SUN #1977 Date: 12/29/97
Subject: NORTH POND CALCS
By: DSM Sheet 1 of 1



$t_p = 0.7(t_c) + [(1.6 - A_D/A_T)/12] = 0.237$

where $t_c = 0.2$, $A_D = 1.37$, $A_T = 3.17$

$t_B = 2.107(E)\frac{A_T}{Q_P} - 0.25\left(\frac{A_D}{A_T}\right) = 0.753$

where $Q_P = 11.79$, $A_T = 3.17$, $E = 1.52$

Project: SUNDANCE ON-SITE SOUTH BASIN

29-Dec-97

Calculations: Total Basin

Calculations are based on "Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 - basins < 40 acres".

Precipitation Zone = 2

Depth at 100-year, 6-hour storm: (Table A-2) P = 2.35 inches

Land Treatments:

From Table 5 - Percent Treatment D
Single Family Residential =
7*SQR((N*N) +(5*N))
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Treatment A	1.57	0.00	0.39	0.00	0.00	0.00
Treatment B	0.00	0.27	0.00	0.10	0.00	0.01
Treatment C	0.00	1.56	0.00	0.72	0.00	0.21
Treatment D	0.42	3.07	0.27	1.94	0.16	1.15
Total	2.00	4.90	0.65	2.76	0.16	1.36

Project: SUNDANCE ON-SITE SOUTH BASIN

Weighted E = Total E*A/Total Area

Total Area = 3.17

	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Weighted E (inches) =	0.63	1.55	0.21	0.87	0.05	0.43
Weighted E (feet) =	0.05	0.13	0.02	0.07	0.00	0.04

Volume = Weighted E * Watershed Area:

	100 year Existing	100 year Proposed	10 year Existing	10 year Proposed	2 year Existing	2 year Proposed
Volume (acre-feet) =	0.17	0.41	0.05	0.23	0.01	0.11
Volume (cubic feet) =	7,253	17,782	2,374	10,004	574	4,934

Peak Discharge (cfs/acre) = Q(p): (Table A-9)	Q(p) 100 year	Q(p) 10 year	Q(p) 2 year
Treatment A	1.56	0.38	0.00
Treatment B	2.28	0.95	0.08
Treatment C	3.14	1.71	0.60
Treatment D	4.70	3.14	1.86

Total Q(p), cfs:	100 year Existing Q(p)*A	100 year Proposed Q(p)*A	10 year Existing Q(p)*A	10 year Proposed Q(p)*A	2 year Existing Q(p)*A	2 year Proposed Q(p)*A
Treatment A	4.63	0.00	1.13	0.00	0.00	0.00
Treatment B	0.00	0.78	0.00	0.32	0.00	0.03
Treatment C	0.00	4.33	0.00	2.36	0.00	0.83
Treatment D	0.94	6.82	0.63	4.55	0.37	2.70
Total Q (cfs) =	5.57	11.92	1.76	7.24	0.37	3.55

Project: SUNDANCE ON-SITE SOUTH BASIN

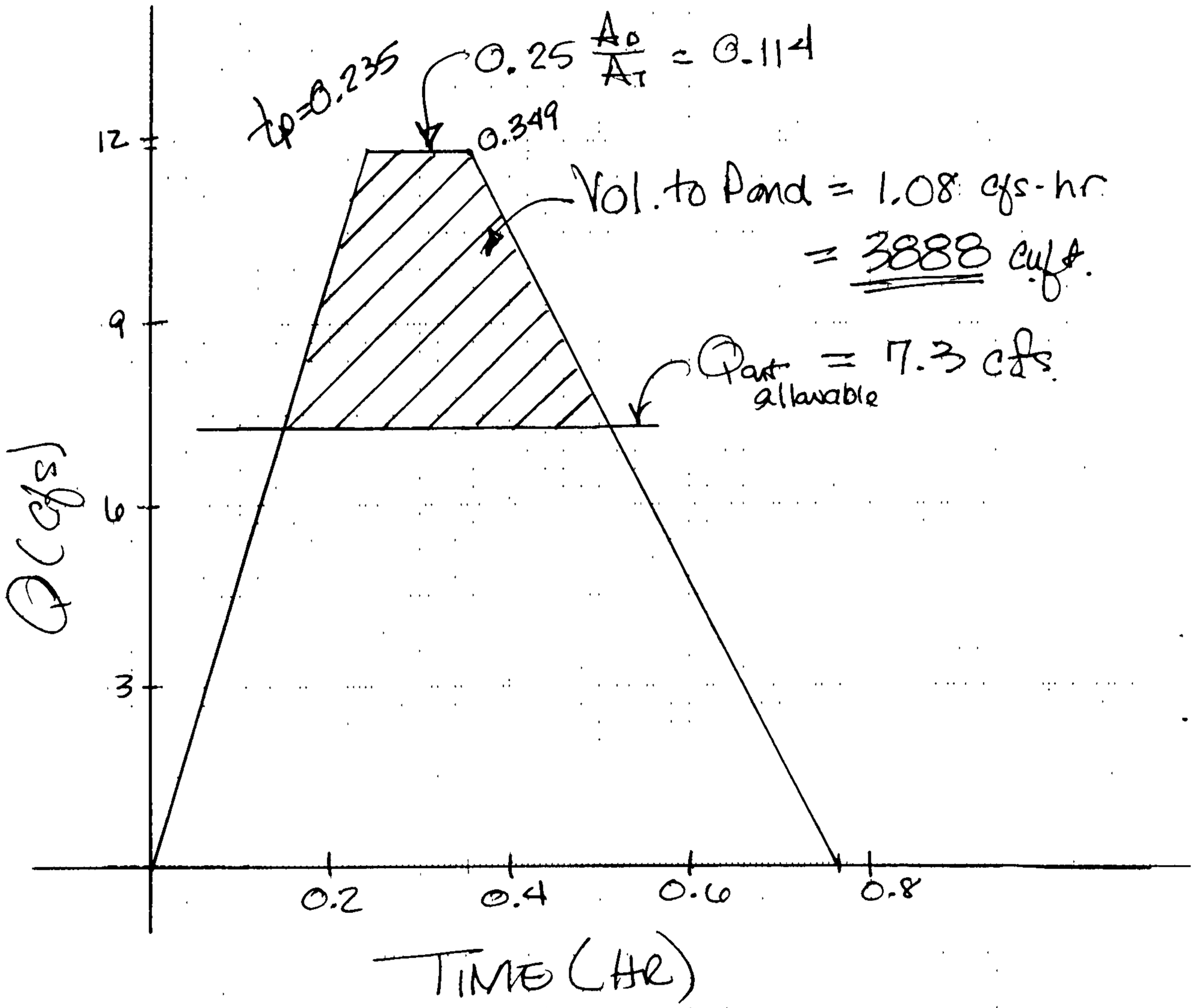
RATIONAL METHOD:

Coefficient C: (Table A-11)	100 year	10 year	2 year
Treatment A	0.31	0.11	0.00
Treatment B	0.45	0.28	0.04
Treatment C	0.62	0.50	0.29
Treatment D	0.93	0.92	0.91
Peak Intensity (in/hour): (Table A-10)	5.05	3.41	2.04

Q = CIA (cfs):	100 year Existing CIA	100 year Proposed CIA	10 year Existing CIA	10 year Proposed CIA	2 year Existing CIA	2 year Proposed CIA
Treatment A	4.65	0.00	1.11	0.00	0.00	0.00
Treatment B	0.00	0.77	0.00	0.32	0.00	0.03
Treatment C	0.00	4.32	0.00	2.35	0.00	0.82
Treatment D	0.94	6.81	0.63	4.55	0.37	2.69
Total Q (cfs) =	5.59	11.90	1.74	7.23	0.37	3.54

McDowell Engineering, Inc.
7820 Beverly Hills Ave. NE
Albuquerque, New Mexico 87122
Tele: (505)828-2430
Fax: (505)821-4857

Project: SUNDANCE-PRESIDENTS DRIVE
Project No.: SUN@197T Date: 12-29-97
Subject: SOUTH POND CALCS
By: JSM Sheet 1 of 1



$$t_p = 0.7(t_c) + \left[\left(1.6 - \frac{A_D}{A_T}\right)/12\right] = 0.235$$

where $t_c = 0.2$, $A_D = 1.45$, $A_T = 3.17$

$$t_B = 2.107\,(E)\frac{A_T}{Q_p} - 0.25\left(\frac{A_D}{A_T}\right) = 0.754$$

where $Q_p = 11.92$ cfs.

$A_T = 3.17$, $E = 1.55$

McDowell Engineering, Inc.
7820 Beverly Hills Ave. NE
Albuquerque, New Mexico 87122
Tele: (505)828-2430
Fax: (505)821-4857

Project: SUNDANCE - PRESIDENT PL. DEV.
Project No.: SUN #97T Date: 12-30-97
Subject: POND CALCS
By: DSM Sheet 1 of 1

OUTLET FOR PONDS:

Try 2-12" culverts/per pond.

$Q = CA\sqrt{2gh}$

where $C = 0.6$, $A = \frac{\pi d^2}{4} = 0.785$

$g = 32.2$, $h = 1.0$

$\therefore Q = 3.78$ cfs/pipe $\times 2 = 7.56$ cfs (max) ✓OK

NORTH POND VOLUME:

Elevation		Area	Volume
84.0	> 1.0	0	4321 cu.ft.
85.0		8642	

TYPE "D" (SINGLE) INLET CAPACITY: (NORTH POND)

$Q = CLH^{3/2}$ where $C = 3.0$, $L = 10$, $h = 1.0$

$\therefore Q = 30$ cfs ✓OK

SOUTH POND VOLUME:

Elevation		Area	Volume
84.0	> 0.9	0	5445 cu.ft.
84.9		12100	

SPILLWAY: (SOUTH POND)

$Q = CLH^{3/2}$, where $C = 3.0$, $Q = 7.3$ cfs. $H = 0.1$

$\therefore L = 77$ ft. ✓OK

FILE COPY

KEN SCHULTZ
MAYOR

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 1, 1988

Douglas W. Copeland, P.E.
Easterling & Associates, Inc.
5643 Paradise Boulevard, NW
Albuquerque, New Mexico 87114

RE: REVISED GRADING & DRAINAGE PLAN, TRACT 1
CLIFFORD INDUSTRIAL PARK, RECEIVED AUGUST 29, 1988
FOR FINAL PLAT APPROVAL (C-17/D1U)

Dear Mr. Copeland:

The above referenced submittal, revised August 8, 1988, is approved as the Master Drainage Plan to be followed for subsequent development and subdivision. Any proposed subdivisions will require an executed Subdivision Improvements Agreement prior to the City Engineer's sign-off on any Final Plats if infrastructures are required.

All site development of lots will require a separate detailed Drainage and Grading Plan submittal, with the drainage scheme being consistent with this approved plan.

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

Cordially,

Roger A. Green, PE

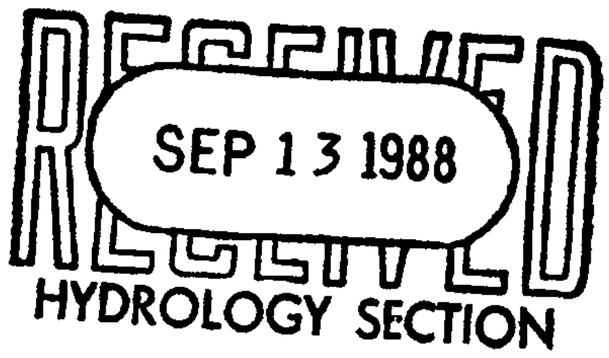
Roger A. Green, P.E.
C.E./Hydrology Section

xc: Robert Kastning

RAG/bsj
(WP+748)

C 17/D14

Jack Clifford & Company



September 9, 1988

Project # 3628

Mr. Roger A. Green, P.E.
C.E./Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Dear Mr. Green:

Re: Clifford Industrial Park/Washington Business Park
Drainage Plan Submittal

The above-referenced submittal requires a design variance for public drainage structures on Lot 15 of the subject subdivision.

Proposed is a public drainage swale versus the typical concrete channel. The swale is designed to match the existing swale constructed within the 35-foot public drainage easement at the west side of the subdivision. The proposed design also conforms to the approved drainage report prepared by Bohannan-Huston, Inc. dated August, 1982 for Clifford Industrial Park, Lots 1-63 and Tract B.

If you have any questions, call me at 881-0900.

Sincerely,

Robert L. Kastning
Land Development Planner
and Coordinator

RLK:lm

FILE COPY

wpt748

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 27, 1988

Douglas W. Copeland, P.E.
Easterling & Associates, Inc.
5643 Paradise Boulevard, NW
Albuquerque, New Mexico 87114

RE: REVISED GRADING & DRAINAGE PLAN, TRACT 1
CLIFFORD INDUSTRIAL PARK, RECEIVED JUNE 24, 1988
FOR FINAL PLAT APPROVAL (C-17/D1U)

Dear Mr. Copeland:

The above referenced submittal, revised June 24, 1988, is approved as the Master Drainage Plan to be followed for subsequent development and subdivision. Any proposed subdivisions will require an executed Subdivision Improvements Agreement prior to the City Engineer's sign-off on any Final Plats if infrastructures are required.

All site development of lots will require a separate detailed Drainage and Grading Plan submittal, with the drainage scheme being consistent with this approved plan.

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

Cordially,

Roger A. Green, PE

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

xc: Robert Kastning

RAG/bsj

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
UTILI EVELOPMENT DIVISION/HYDROLOGY TION

PRE-DESIGN CONFERENCE

DRAINAGE FILE/ZONE ATLAS PAGE NO.: C-17/D14 DATE: 6-22-88

EPC NO.: _____ DRB NO.: 88-355 ZONE: SU-1 for M-1

SUBJECT: Clifford Industrial Park

STREET ADDRESS: Washington & Alameda

LEGAL DESCRIPTION: Tracts B-1, B-2, B-3, B-4

APPROVAL REQUESTED:

X	PRELIMINARY PLAT	X	FINAL PLAT
____	SITE DEVELOPMENT PLAN	____	BUILDING PERMIT
____	GRADING/PAVING PERMIT	____	OTHER

RECEIVED
AUG 22 1988
HYDROLOGY SECTION

	WHO	REPRESENTING
ATTENDANCE:	Robert Kastning	Clifford & Co.
	Roger Green	City Hydrology

FINDINGS:

① To replat Tract B-1, one of the following items are required:
a. Make Tract B-1-A have a blanket drainage easement granted to Lot J to provide for a drainage swale outfall or retention pond site. This way, no Master Drainage Plan revision would be necessary.
(b). Revise the Master Drainage Plan showing the revised Lot J. Plan would show one of the following drainage schemes:
i. - Retention pending on Lot J until Tract B-1-A is subdivided and drainage outfall is constructed.
? → ii - Retention pending on Tract B-1-A until further subdivision.
iii - discharge to Washington street with reanalysis of downstream capacity
iv - Construction of downstream drainage system across Tract B-1-A.
② If replat is approved with blanket Drainage Easement, then revised Grading & Drainage Plan will be required at time of Lot J development.

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:	Roger A Green	SIGNED:	Robert Kastning
TITLE:	Civil Engineer	TITLE:	
DATE:	6/22/88	DATE:	6-22-88

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

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 31, 1988

Douglas Copeland, P.E.
Easterling & Associates, Inc.
5643 Paradise Boulevard, NW
Albuquerque, New Mexico 87114

RE: GRADING & DRAINAGE REPORT SUBMITTAL OF CLIFFORD INDUSTRIAL PARK, TRACTS B-2, B-3, & B-4, RECEIVED MAY 13, 1988 FOR FINAL PLAT APPROVAL (C-17/D1U)

Dear Mr. Copeland:

The above referenced submittal dated May 4, 1988, is approved for platting purposes. Any proposed subdivision will require an executed Subdivision Improvements Agreement prior to the City Engineer's sign-off of the Final Plat if infrastructures are required.

All site development of lots will require a separate detailed drainage and grading plan submittal, with the drainage scheme consistent with this approved plan.

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

Cordially,

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

xc: Robert Kastning, Jack Clifford & Co.

RAG/bsj

C-17/D1U

WEISS-HINES ENGINEERING, INC.

October 16, 1987

Mr. Fred Aguirre
City of Albuquerque
Hydrology Section
POB 1293
Albuquerque, NM 87103

Dear Fred:

This is a request for a variance from the Master Drainage Plan (Bohannan-Huston, August 1982) for Clifford Industrial Park (Zone Atlas C-17).

A Grading/Drainage Plan was approved February 10, 1986 for Washington Business Park, a 23-lot development located at the northeast corner of Washington Street and Washington Place, N.E. The scope of this project was reduced to 8 lots and a second Drainage/Grading Plan was approved June 19, 1986. Both the 23-lot and the 8-lot plans used a runoff coefficient of 0.88 in the calculations which was higher than the 0.70 used in the Master Plan calculations. The 8-lot approval was made contingent upon any further development addressing this runoff coefficient discrepancy.

A summary of the development of the site thus far is as follows (see accompanying site sketch):

- Lots 5-8, C = 0.88
- Tract B-2, Phase I, C = 0.70

We are proposing developing the remainder of the site so that the total developed peak discharge will be in compliance with the Master Plan. This will be accomplished as follows (see accompanying calculations):

- Lots 1-4, C = 0.88
- Tract B-3, C = 0.88
- Tract B-2, Phase II, C = 0.70
- Construction of a detention pond on Tract B-2, Phase II, which along with a similar pond existing on Tract B-2, Phase I, will limit discharge from the total site (16 acres) to an acceptable peak rate.

RECEIVED
OCT 16 1987
HYDROLOGY SECTION

CIVIL ENGINEERING / HYDROLOGY / ENVIRONMENTAL DESIGN
1100 ALVARADO N.E. ALBUQUERQUE, NEW MEXICO 87110 (505) 266-3444

This plan will establish the site's peak discharge rate at the same level planned for in the Master Plan to comply with the downstream capacities of drainage structures in Clifford Industrial Park. If we can provide any further information or data regarding this request, please don't hesitate to call.

Sincerely,

WEISS-HINES ENGINEERING, INC.

Steve Clark

Steve Clark

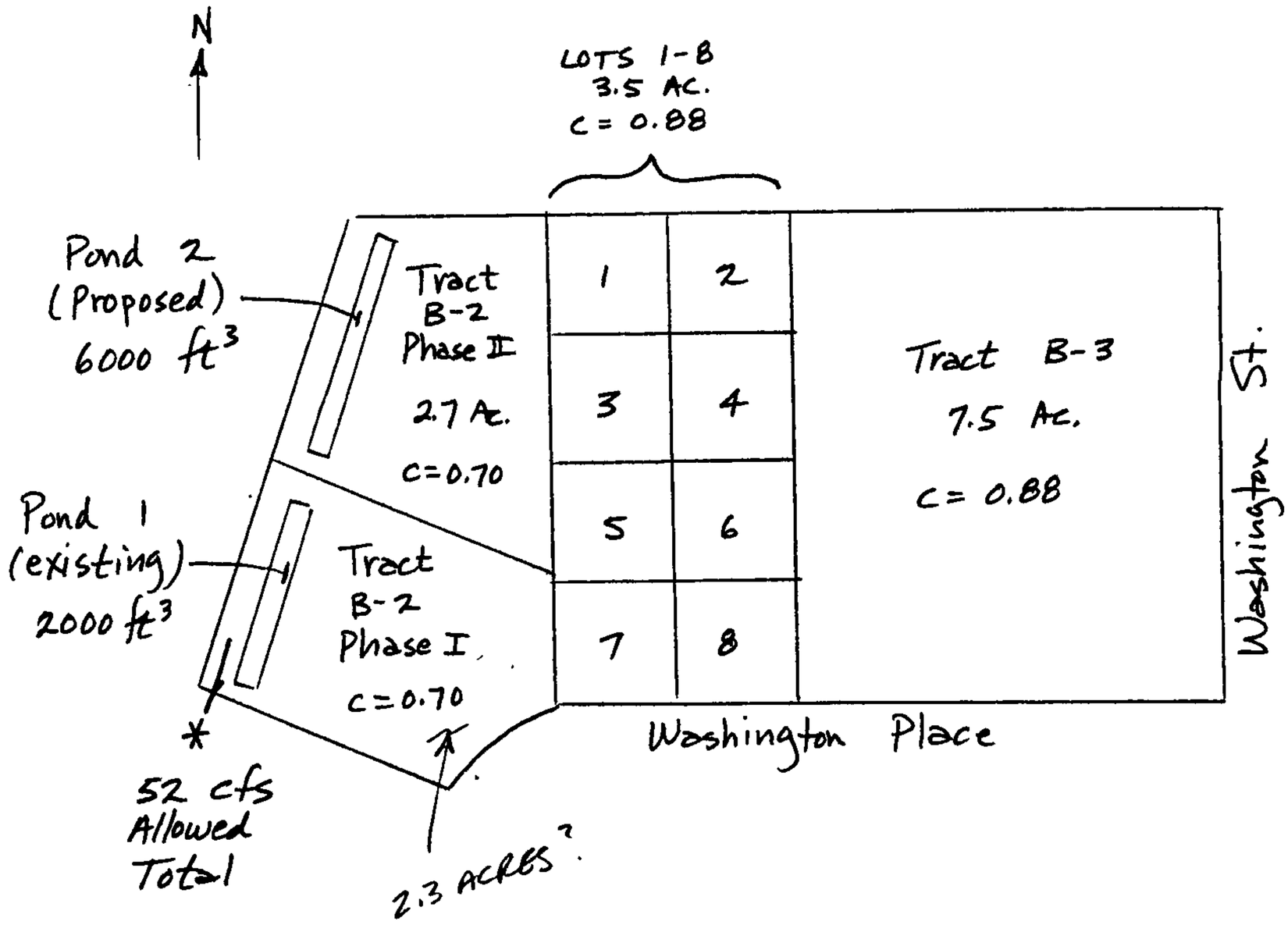
SC/tdq

Attachments

cc: Frank Gauer
Jack Clifford & Co.

Jim Lewis
Schlegel Lewis Nelson Brawley
Architects

CALCULATIONS



- Per Bohannan-Huston Master Drainage Plan, total allowed peak flow at C = 0.70 at Point *:

  Q = CIA = (0.70)(4.65)(7.5 + 3.5 + 2.2 + 2.7) = 52 CFS

- Free Discharge Lots 1-8 and Tract B-3 at C = 0.88:

  Q = CIA = (0.88)(4.65)(3.5 + 7.5) = 45 cfs

- Discharge allowed Tract B-2 to total 52 cfs at Point *:

  52 - 45 = 7 cfs

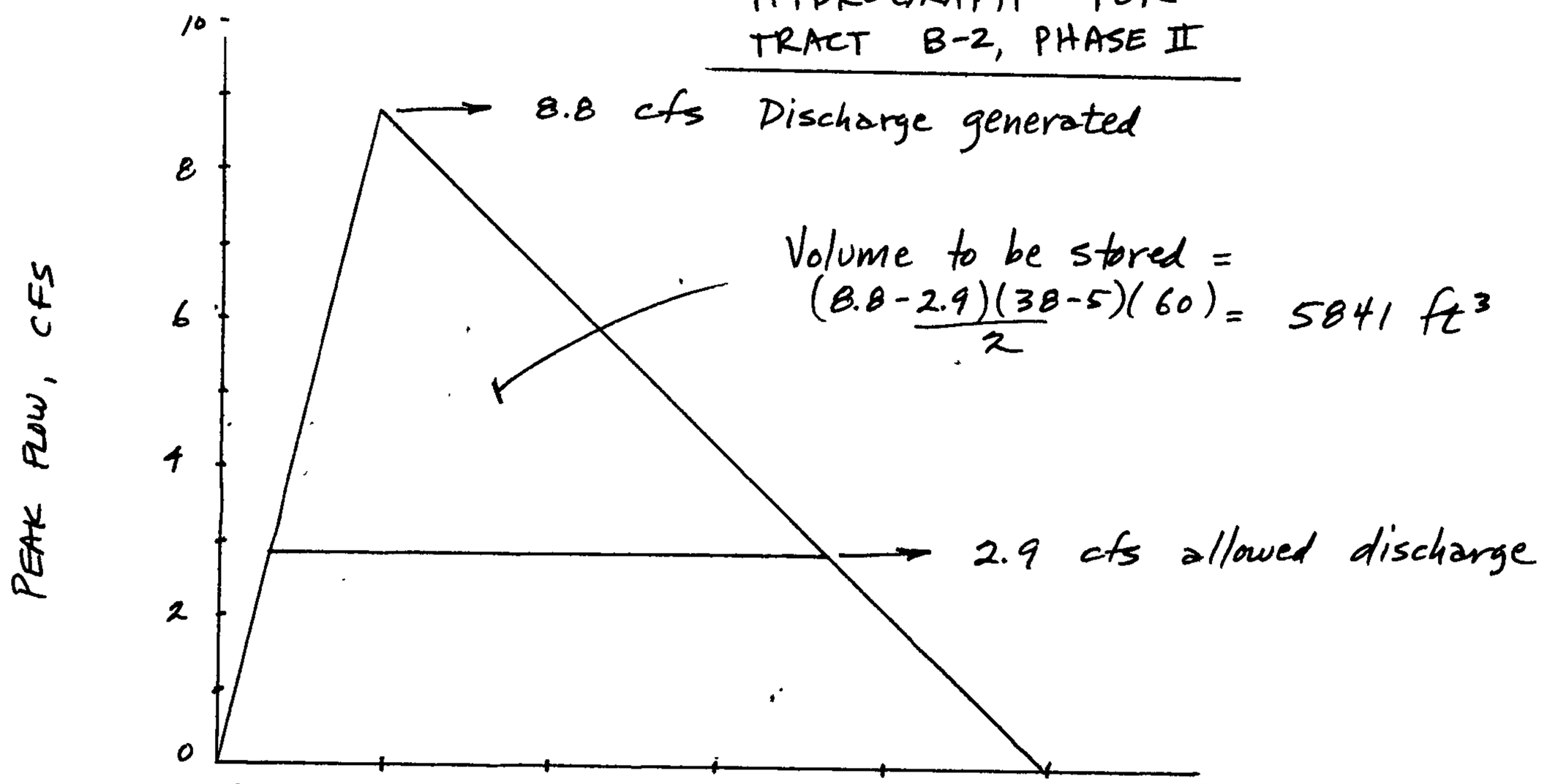
- Discharge Tract B-2, Phase I = 4.1 cfs with Pond 1

- Discharge allowed Tract B-2, Phase II to total 7 cfs:

  7 - 4.1 = 2.9 cfs (Phase II allowed)

- Discharge Tract B-2, Phase II at C = 0.70:

  Q = CIA = (0.70)(4.65)(2.7) = 8.8 cfs (Phase II allowed)



Pond Size Proposed Phase II, Tract B-2:

(300')(20')(1') = 6000 CF

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

File Copy

June 19, 1986

Steve Clark
Weiss-Hines Engineering, Inc.
1100 Alvarado, NE
Albuquerque, New Mexico 87110

RE: REVISED DRAINAGE REPORT OF WASHINGTON BUSINESS PARK, RECEIVED MAY 30, 1986 FOR PRELIMINARY PLAT APPROVAL (C17/D10)

Dear Steve:

The above referenced submittal, revised June 16, 1986, is approved for Preliminary Plat. The existing infrastructure listing approved by DRB will need to be revised appropriately.

The approved Master Plan for Clifford Industrial Park assumed 72% impervious for the watershed under developed conditions. Your Drainage Report assumes 93% impervious. If the remaining watershed is also proposed to be developed with more than 72% impervious area, then the downstream stormdrain systems must be analyzed for capacity with runoff greater than originally designed for.

Final Plat sign-off by the City Engineer will require an executed Subdivision Improvements Agreement.

If you have any questions, call me at 766-7644.

Cordially,

Roger A. Green, PE

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

cc: Jim Folkman, Jack Clifford & Company
Jim Lewis, Schlegal, Lewis Architects

RAG/bsj

DRAINAGE INFORMATION SHEET

PROJECT TITLE: WASHINGTON BUSINESS PARK ZONE ATLAS/DRNG. FILE #: C-17-Z

LEGAL DESCRIPTION: LOTS 55-62 + TRACT 'B', CLIFFORD INDUSTRIAL PARK

CITY ADDRESS: NW CORNER WASHINGTON ST + WASHINGTON PLACE NE.

ENGINEERING FIRM: WEISS-HINES ENGINEERING CONTACT: STEVE CLARK

ADDRESS: 1100 ALVARADO NE PHONE: 505-266-3444

OWNER: PARKWAY PARTNERS LTD CONTACT:

ADDRESS: PHONE:

ARCHITECT: SCHLEGAL-LEWIS CONTACT:

ADDRESS: PHONE:

SURVEYOR: CLAUSEN + ASSOCIATES CONTACT:

ADDRESS: PHONE:

CONTRACTOR: FRANK HINES CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

___ YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED
MAY 30 1986
HYDROLOGY SECTION

DRB NO. 86-340

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

X DRAINAGE/GRADING PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

___ RESUBMITTAL

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

X PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

NOTE: SUBSTITUTE THESE DRAWINGS FOR THOSE SUBMITTED 5/27/86 WITH DRAINAGE REPORT.

DATE SUBMITTED: MAY 30, 1986 DATE RECEIVED: 5/30

BY: Weiss-Hines Engineering, Inc. RECEIVED BY:

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

February 10, 1986

Steve Clark
Weiss-Hines Engineering, Inc.
1100 Alvarado, NE
Albuquerque, New Mexico 87110

RE: DRAINAGE & GRADING PLAN OF WASHINGTON BUSINESS PARK
RECEIVED JANUARY 17, 1986 FOR PRELIMINARY PLAT APPROVAL
(C-17/D1U)

Dear Steve:

The above referenced submittal, dated January 14, 1986, is approved for Preliminary Plat. Plat should identify all access easements for Lots 1 thru 23 as drainage easements also.

Before Final Plat sign-off by City Engineer, an executed Subdivision Improvements Agreement is needed.

If you have any questions, call me at 766-7644.

Cordially,

Roger A. Green, PE

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

cc: Jack Clifford & Company
P.O. Box 35640 Station D 87176

RAG/bsj

WEISS-HINES ENGINEERING, INC.

January 17, 1986

Mr. Carlos Montoya, P.E.
Design Hydrology Section
123 Central N.W.
Albuquerque, NM 87102

Re: Review of Washington Business Park (DRB #85-726)

Dear Mr. Montoya:

In response to your letter dated January 10, 1986, the three missing items are addressed as follows:

1. Plans are stamped, dated, and signed.

2. Grading Plan has been submitted.

3. The Master Plan for Clifford Industrial Park does include runoff from Tract 'B', and the 35' drainage easement on the west property line was sized accordingly.

If you have any questions regarding these items, please call me at 266-3444.

Thank you,

Steve Clark

Steve Clark
Weiss-Hines Engineering, Inc.

SC:tdq

CIVIL ENGINEERING / HYDROLOGY / ENVIRONMENTAL DESIGN
1100 ALVARADO N.E. SUITE B ALBUQUERQUE, NEW MEXICO 87110 (505) 266-3444

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

January 10, 1986

Steve Clark
Weiss-Hines Engineering, Inc.
1100 Alvarado, NE
Albuquerque, New Mexico 87110

RE: PRELIMINARY REVIEW OF WASHINGTON BUSINESS PARK
RECEIVED JANUARY 8, 1986 (C-17/D1U)

Dear Mr. Clark:

A preliminary review of the referenced drainage plan has shown the following items missing.

1. Require engineer stamp, signature, and date.

2. Require proposed grading for the site.

3. Please address if the master plan includes developed runoff from Tract B. If the master plan does not include this information, then downstream capacity will need to be addressed.

If you have any questions regarding this project, call me at 766-7644.

Cordially,

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

DRAINAGE REPORT

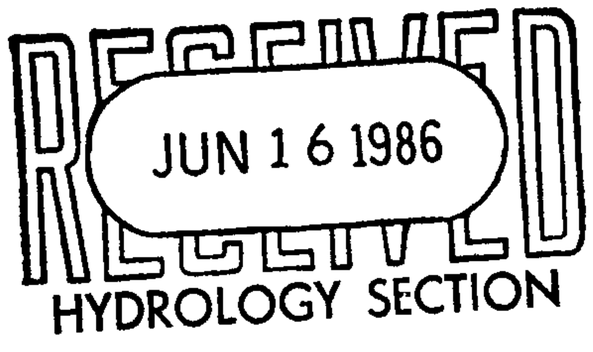
FOR

WASHINGTON BUSINESS PARK

Weiss-Hines Engineering, Inc.
1100-B Alvarado N.E.
Albuquerque, NM 87110

505-266-3444

May, 1986



DRAINAGE REPORT
FOR
WASHINGTON BUSINESS PARK

TABLE OF CONTENTS

	Page
Introduction	1
Site Location	1
Site Description	1
Proposed Development	1
Soils Report	1
Topographic Map	2
Existing Drainage Conditions	2
Developed Drainage Conditions	2
Methods of Analysis	2
On-Site Runoff	3
Conclusions	3

TABLES

Table 1 - Drainage Data 4

FIGURES

Figure 1 - Analysis Point 3 5
Figure 2 - Analysis Point 4 6

PLATES

Plate 1 - Conceptual Drainage Plan . . . Back Pocket

DRAINAGE REPORT FOR
WASHINGTON BUSINESS PARK

Introduction

At the request of Mr. Jim Folkman, Vice President of Jack Clifford & Company, Weiss-Hines Engineering, Inc., has prepared this drainage report to describe the treatment of storm waters generated within a 16-acre portion of Clifford Industrial Park, which is to be known as the Washington Business Park. The site will be developed into a group of office/warehouse units. The recommendations set forth in this report are in compliance with and an expansion of the Master Drainage Report for Clifford Industrial Park, prepared in August, 1982, by Bohannan-Huston, Inc., and approved by the City of Albuquerque.

Site Location

The site is located in the area shown on the Vicinity Map on the Conceptual Drainage Plan (Plate 1). It is composed of Lots 55 through 62, and the southern portion of Tract B of the Clifford Industrial Park. It is bounded on the east by Washington Street, on the south by Washington Place, on the west by the City's sanitary landfill site, and on the north by the northern portion of Tract 'B', which extends to Alameda Boulevard.

Site Description

The site slopes uniformly at 2% from east to west. An earth diversion berm lies on the west property line. Adjacent to the east of this berm is a paved public drainage easement (Swale 'A'). Swale 'A' flows to the south, eventually emptying into AMAFCA's North Diversion Channel. A 200'-wide PNM easement overlaps this drainage easement along the west property line.

Proposed Development

The first phase of the development to be built on Lots 1-8 of the site will include 8 one-story frame and stucco, slab-on-grade office/warehouse buildings (typical size approximately 70x90 feet). At some future date, 16 similar office/warehouse buildings will be built on Tract B-3, and 3 larger warehouses (approximately 100x150 feet) will be built on Tract B-2. In addition, paved access drives and parking areas will be constructed, and necessary public utilities will be provided to the individual buildings.

Soils Report

The three types of soils found on the site are the Embudo gravelly fine sandy loams (EmB), the Embudo-Tijeras soil complex (EtC), and the Wink-Embudo soil complex (WeB). All three soil types are classified as Hydrologic Group "B".

A soils report, Geotechnical Engineering Evaluation, Project No. 3225J069, was prepared by Western Technologies Inc. in October, 1985. The report recommends positive drainage be provided throughout the site, and particularly in the vicinity of the buildings during and after construction. Site drainage plans are in accordance with the soils report recommendations.

Topographic Map

The topographic map used as a basis for the drainage and grading plans is the result of a field survey conducted by Clausen & Associates, Inc., in October, 1985. This map represents the site topography as it now exists.

EXISTING DRAINAGE CONDITIONS

The site presently drains to the west boundary as sheet flow where it is intercepted by Swale 'A'. Swale 'A', which is a paved drainage channel, drains to the south and west, eventually emptying into the AMAFCA North Diversion Channel.

The site is isolated from the effects of offsite runof due to the following: Offsite runoff from the east is intercepted in Washington Street, which drains north to Alameda Boulevard, then west to the North Diversion Channel. The site is not affected by offsite flows from the west, due to an earth berm, or from the south, due to the Washington Place Street improvements. Offsite flows on the north parallel the flow patterns of the site and drain to the west into the drainage easement (Swale 'A').

DEVELOPED DRAINAGE CONDITIONS

The drainage plan is based on the Bohannan-Huston Master Plan developed for Clifford Industrial Park in 1982 and approved by the City of Albuquerque. Only on-site flows are being considered, because offsite flows do not reach the property.

Methods of Analysis

The peak flow rates were determined by application of the Modified Rational Method as outlined in the Development Process Manual (DPM).

Rainfall intensities were determined from Plates 22.2 D-1 and 22.2 D-2 of the DPM. The 100-year, 6-hour rainfall for the site is 2.2 inches.

Runoff coefficients were obtained by combining the pervious percentages of different land uses to arrive at a composite "C" factor. what % impervious

Flow depths and velocities were computed using Manning's equation for open channel flow.

Master Plan uses 72% impervious

On-Site Runoff

The hydrologic data for the developed basins, calculated by using the Rational Method, is summarized in Table 1. Hydrographs were prepared using the SCS "convex" routing method to establish peak flows at four Analysis Points (Figures 1 & 2). Plate 1 (Conceptual Drainage Plan) shows flow routes and data for the first phase of development.

Basin 'A' - The runoff from Basin 'A' will travel west as sheet flow to a 1' high earth berm located near the Tract B-3 west line. This berm will direct flows to Analysis Point 1. From Analysis Point 1, the flows travel west across a paved access drive to Analysis Point 2, then through the remainder of the site as described below. The peak flow discharging from Basin 'A' is 12 cfs.

Basin 'B' - The runoff from Basin 'B' flows across paved access drives and parking areas in a north-and westerly pattern until it reaches the NW corner of Lot 1 (Analysis Point 2). It then combines with discharge from Basin 'A' and travels west in a proposed paved drainage swale to Analysis Point 3 (the head of Swale 'A'). Basin 'B' discharges a peak flow of ~~11 cfs~~ 14 cfs. sc 6/16/86

Basin 'C' - The runoff from Basin 'C' travels as sheet flow to the paved west drainage swale on Tract B-3 (Swale 'A'). This flow combines with runoffs from Basins 'A', 'B', and 'D'. This discharge passes through Analysis Point 4 and eventually empties into the North Diversion Channel. Basin 'C' contributes a peak flow of 8 cfs.

Basin 'D' - The runoff from Basin 'D' travels as sheet flow to the existing west drainage swale and then south to the site's SW corner (Analysis Point 3). The paved drainage swale (Swale 'A') will extend to this point to pick up these flows. Basin 'D' contributes a peak flow of 22 cfs.

Analysis Point 1 - Runoff from Basin 'A' discharges at AP-1. The hydrograph (Figure 1) indicates a maximum flow rate of 12 cfs. The flows passing through AP-1 travel west to AP-2.

Analysis Point 2 - Runoff from Basins 'A' and 'B' combine at AP-2. The combined hydrographs at AP-2 (Figure 1) indicate a peak discharge rate of ~~23~~ 26 cfs. These flows continue west to AP-3. sc 6/16/86

Analysis Point 3 - The combined runoff from Basins 'A', 'B', and 'D' discharge through AP-3 at a maximum rate of ~~43~~ 46 cfs (see Figure 1). These flows then travel south to AP-4. sc 6/16/86

Analysis Point 4 - Discharges from Basins 'A', 'B', and 'D' (AP-3) combine with those in Basin 'C' and are routed in Swale 'A' southerly to AP-4. These flows discharge at a peak rate of ~~39~~ 40 cfs (see Figure 2). From AP-4, flows discharge into the North Diversion Channel. sc 6/16/86

CONCLUSIONS

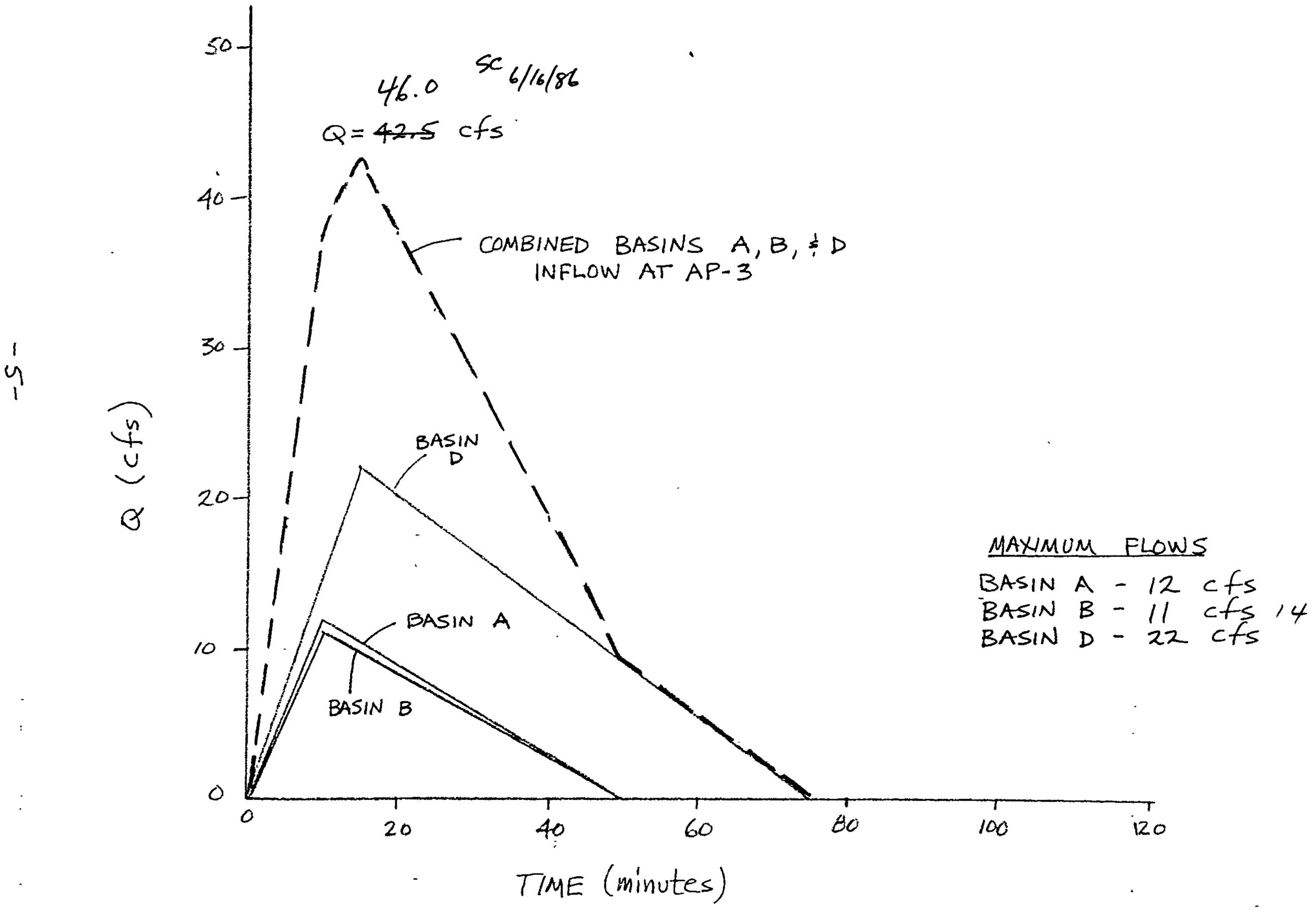
Based on the recommendations set forth in this report, the developed site will safely handle all on-site runoff generated during a 100-year storm and discharge these flows to the North Diversion Channel at an uncontrolled rate. Off-site flows do not affect the developed site. Thus, site development will comply with current AMAFCA and City of Albuquerque requirements.

Table 1. Washington Business Park Drainage Data

Basin	Area (Ac)	H (Ft)	L (Ft)	Slope (Ft/Ft)	V (Ft/Sec)	Tc (min)	I_{100}(In.)	Q_{100}(cfs)
Total Undeveloped	33.08	22	2300	0.0096	1.9	20	3.27	36.8
Developed								
A (Tract B-3)	7.50	14	1075	0.013	1.8	10	4.65	11.9
B (Lots 1-8)	3.51	6	775	0.008	1.3	10	4.65	~~11.4~~ 14.4 SC 6/14/82
C (Tract B-2)	4.92	8	800	0.010	1.3	10	4.65	7.8
D (Tract B-1)	17.16	22	1600	0.014	1.8	15	3.78	22.1

COMBINED HYDROGRAPHS

BASINS A, B, & D AT
AP-3



MAXIMUM FLOWS

BASIN A - 12 cfs
BASIN B - 11 cfs 14
BASIN D - 22 cfs

FIGURE 1

COMBINED HYDROGRAPHS

BASINS A, B, C, & D AT AP-4

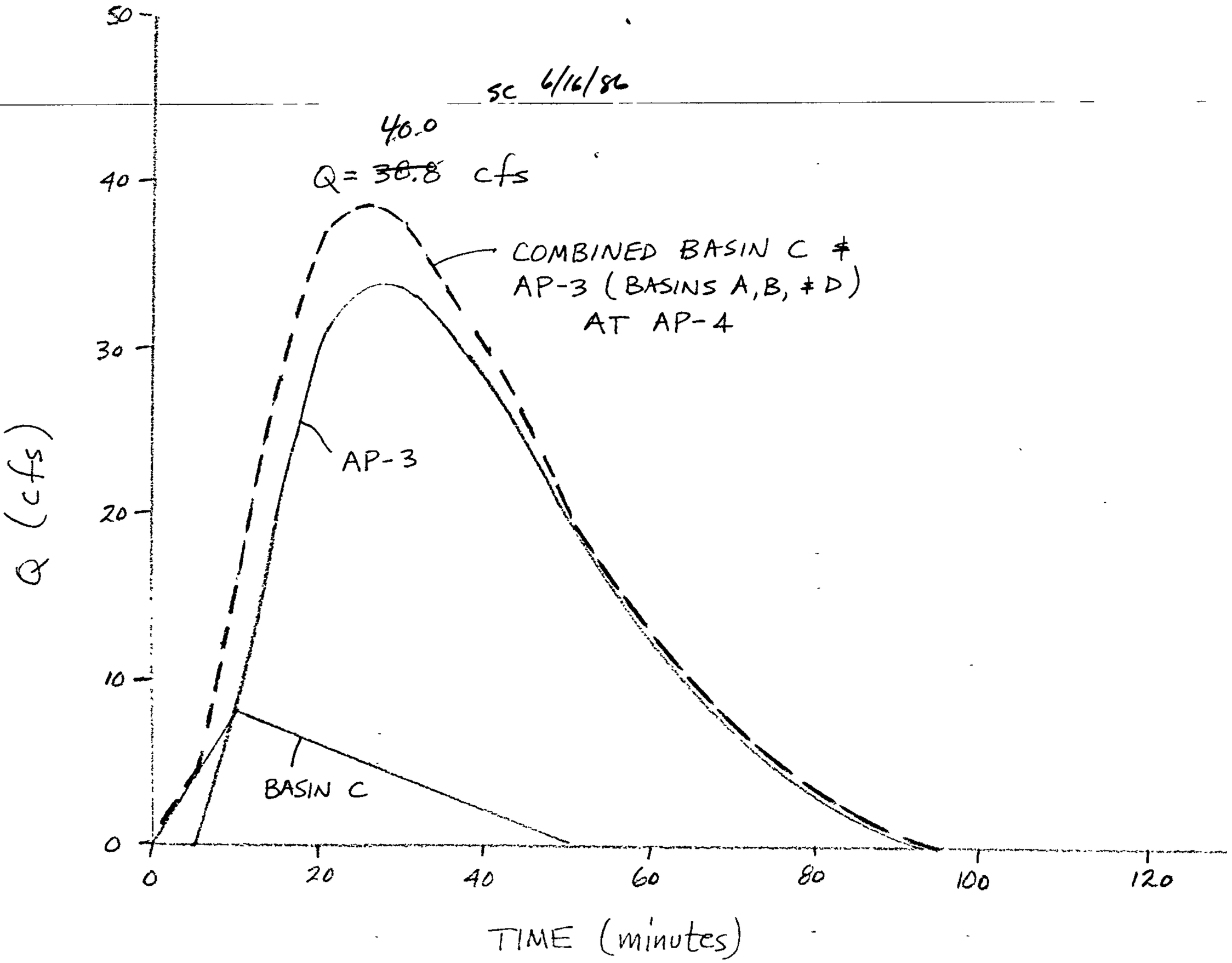


FIGURE 2