



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 23, 2003

Dennis Lorenz, PE
Brasher & Lorenz, Inc.
2201 San Pedro NE, Bldg. 1
Albuquerque, NM 87110

Re: GE Capitol Modular Space Drainage Report
Engineer's Stamp dated 6-30-03 (G10/D29F)

Dear Mr. Lorenz,

Based upon the information provided in your submittal dated 7-10-03, the above referenced report is approved for Amended Site Development Plan for Building Permit and Building Permit. Please include a copy in the construction sets prior to signoff by Hydrology.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Public Works Hydrology section at 768-3654 (Charles Caruso) or 768-3645 (Brian Wolfe).

Also, 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 924-3986.

Sincerely,

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

C: Chuck Caruso, CoA
file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE MAP/DRG. FILE #: G10. D29F
DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: TR 5A1.3 VOLCANO BUSINESS PARK
CITY ADDRESS: 3501 PAINTED ROCK DR NW

ENGINEERING FIRM: BRASHER + LORENZ
ADDRESS: 2201 SAN PEDRO NE
CITY, STATE: ALBUQUERQUE NM

CONTACT: D. LORENZ
PHONE: 888-6088
ZIP CODE: 87110

OWNER: GE CAPITAL MODULAR SPACE
ADDRESS: 426 WEST LANCASTER AVE
CITY, STATE: DEVON, PA

CONTACT: K. MACKENZIE
PHONE: 610.648.6622
ZIP CODE: 19333

ARCHITECT: NA
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

SURVEYOR: NA
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CONTRACTOR: NA
ADDRESS: _____
CITY, STATE: _____

CONTACT: _____
PHONE: _____
ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

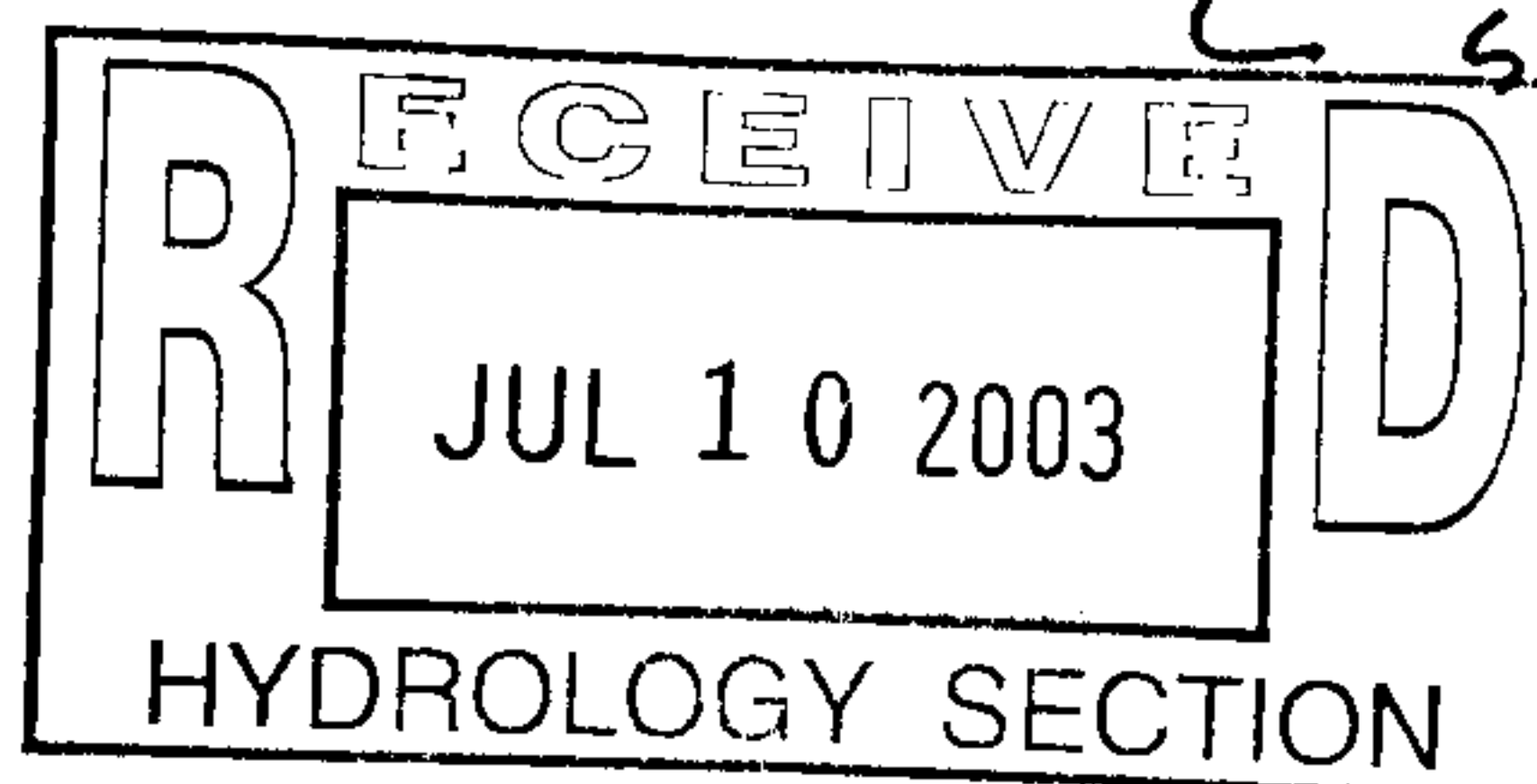
- ☐ DRAINAGE REPORT
- ☒ DRAINAGE PLAN 1st SUBMITTAL, *REQUIRES TCL or equal*
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☒ YES
- ☐ NO
- ☐ COPY PROVIDED



DATE SUBMITTED: 7.9.03 BY: DENNIS LORENZ

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 (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.



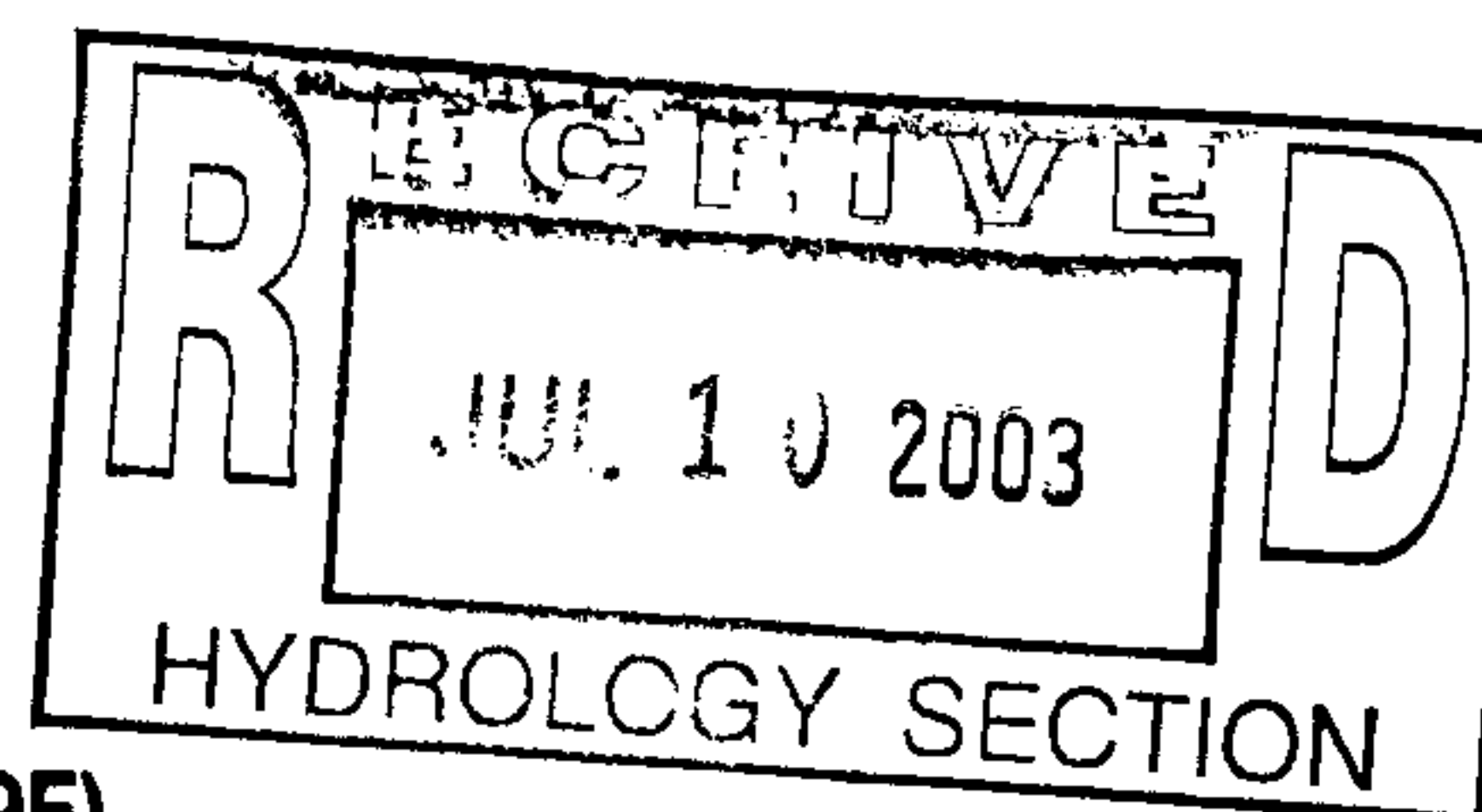
BRASHER & LORENZ, INC.

CONSULTING ENGINEERS

2201 San Pedro NE Bldg 1 Suite 1200 • Albuquerque, NM 87110 • Phone (505) 888-6088 • Fax (505) 888-6188 • www.brasherlorenz.com

July 10, 2003

Bradley L. Bingham PE
Hydrology Review Engineer
City of Albuquerque
PO Box 1293
Albuquerque, New Mexico 87102



SUBJECT: GE CAPITAL MODULAR SPACE (G10/D29F)

Dear Brad:

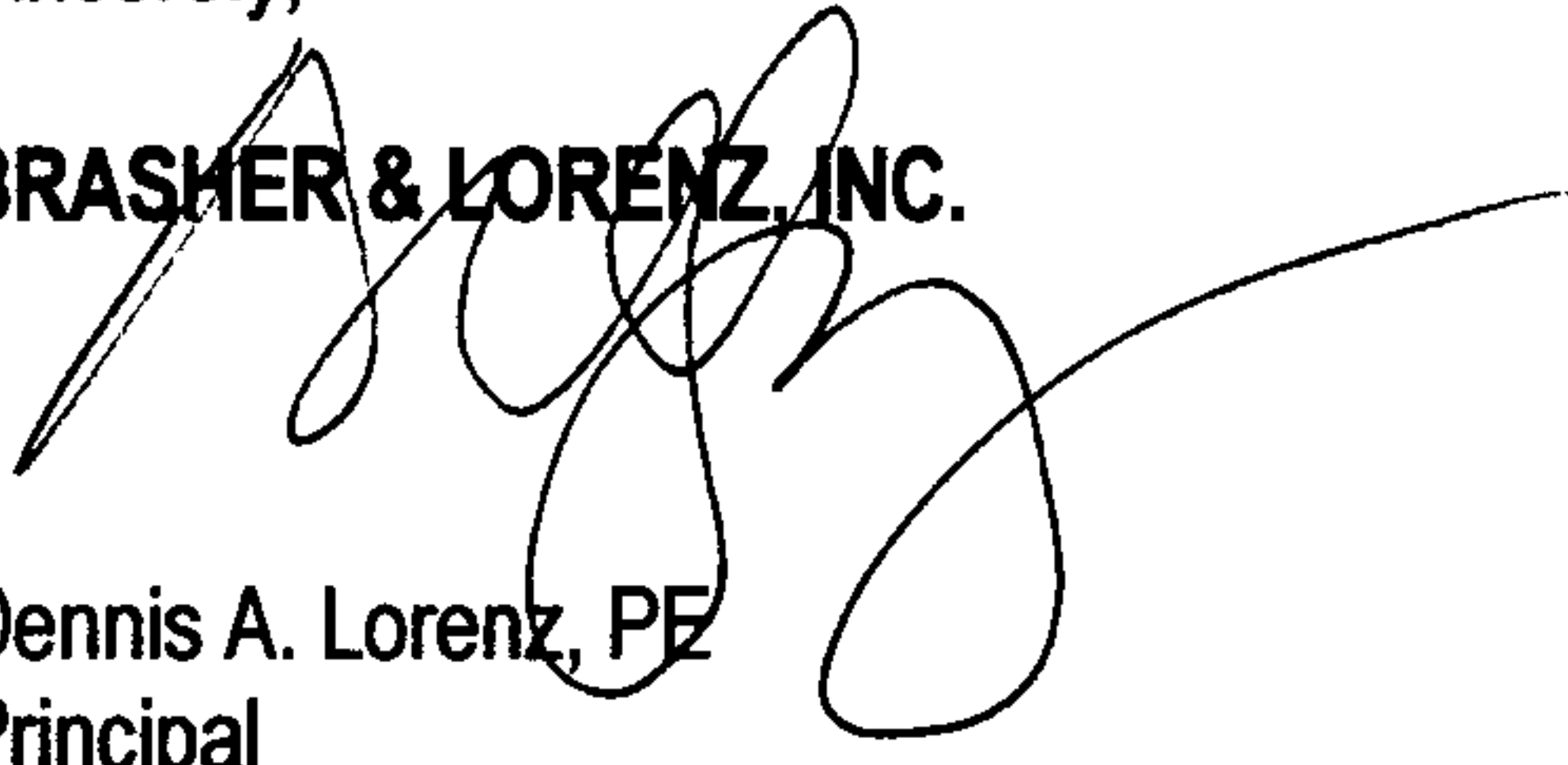
Submitted herewith for review and approval is one copy of the updated Drainage Report for the subject project. The Plan is updated to reflect the revised impacts due to the recent development of West Ridge Subdivision, located adjacent to the subject site on the west. The GE site had previously anticipated accepting developed off-site flows from the properties located west of the site. The previous Drainage Plan and Site Plan recommended the storm drainage improvements required to manage these flows, and as a result, public drainage easements were granted. The development of West Ridge changed the off-site conditions by constructing a public detention pond, and draining all developed flows north to the existing 60-inch storm drain located in Ouray Road. Tract 5A1-A, which was originally within the GE site plan area, was re-platted as Tracts B & C, West Ridge Subdivision with the dedication of public right-of-way for Twin Oaks Drive. Per the report for West Ridge, Tracts B & C are to drain to public storm drains in Twin Oaks or Ouray.

As a result, the infrastructure demand on the GE site has been reduced. The updated Plan recommends improvements to expand the GE site by 4.29-acres. The on-site detention pond and storm drains previously required to manage developed off-site flows have been eliminated from the Plan. The expanded area will now drain through existing improvements constructed by GE with the initial development of the site. A portion of the expanded area drains to an existing detention pond located along Painted Rock Drive. The remainder of the expanded site drains to the existing 11-foot channel located along the south side of the existing GE site. The resulting discharge from the GE site is approximately 37.2 cfs less that was previously anticipated, due to the upstream diversions.

Please review the plan update at your earliest opportunity. If you need additional information, or if I can be of any assistance, please feel free to call.

Sincerely,

BRASHER & LORENZ, INC.

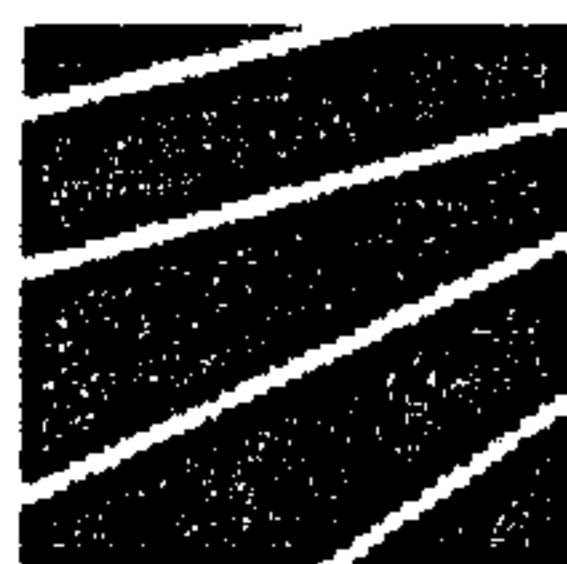

Dennis A. Lorenz, PE
Principal

/dl/02542

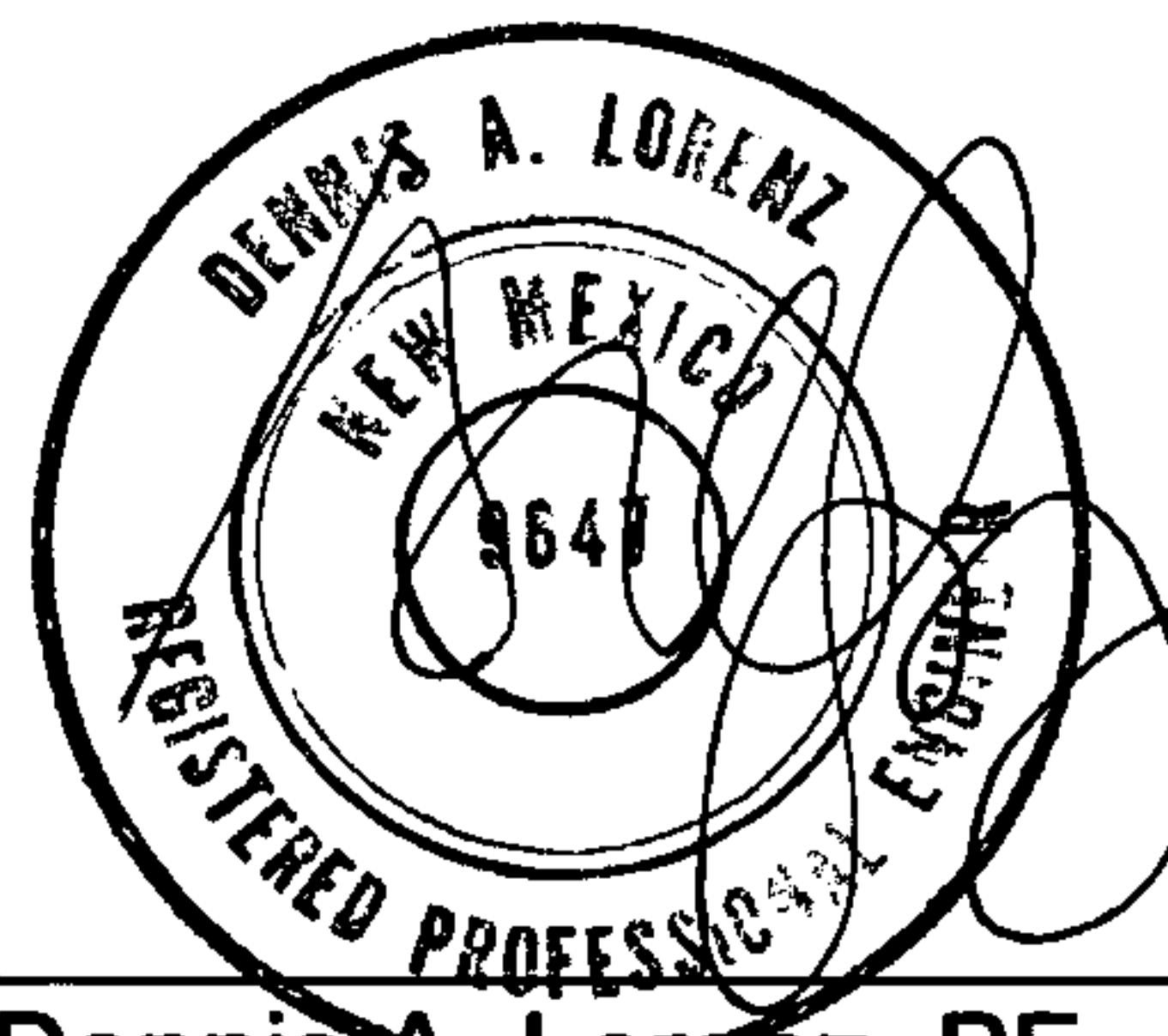
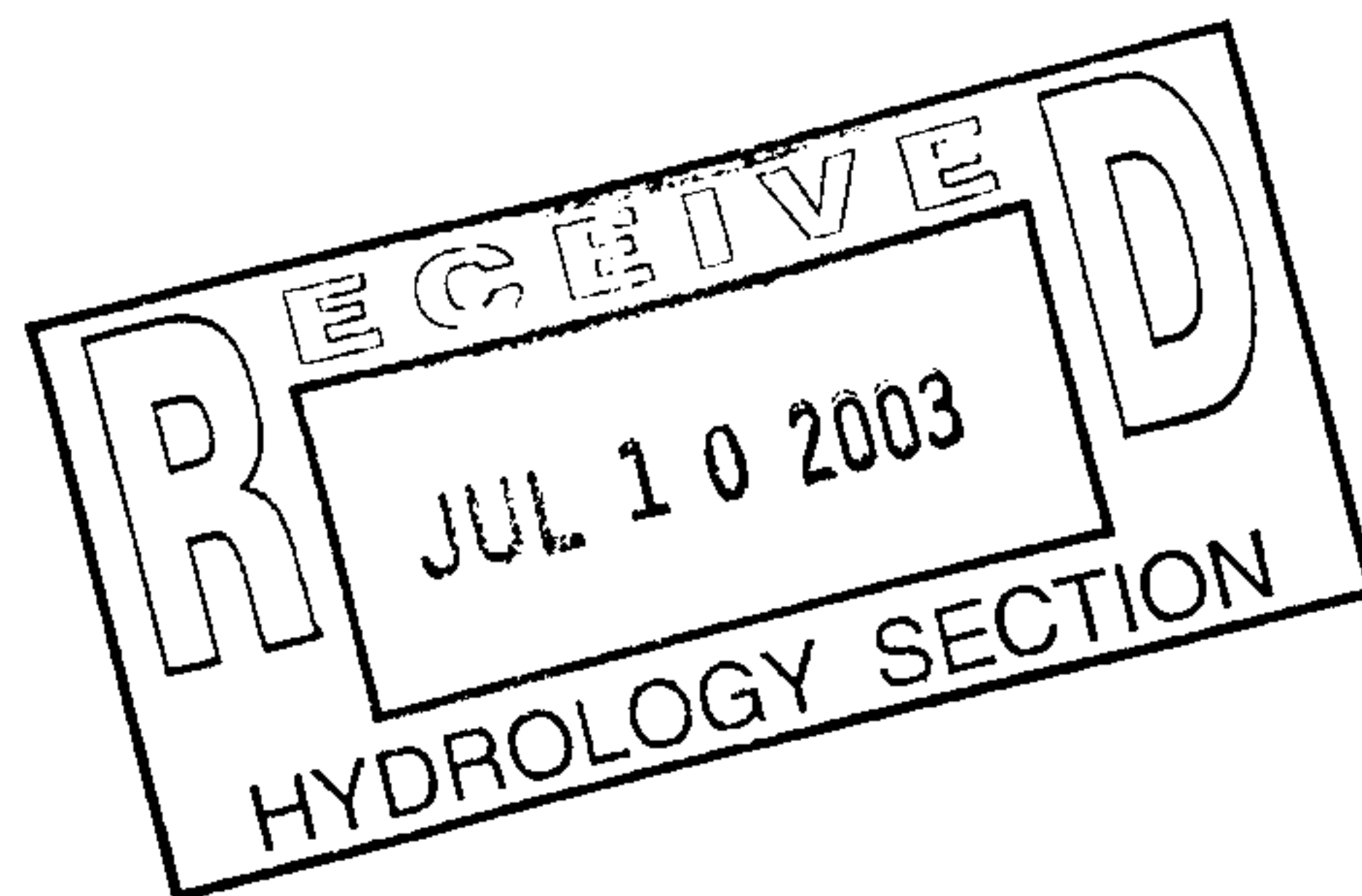
encl

DRAINAGE REPORT
FOR
GE CAPITAL MODULAR SPACE
Tract 5A1-B, Volcano Business Park
Albuquerque, New Mexico

Prepared By:



BRASHER AND LORENZ, INC.
Consulting Engineers
2201 San Pedro NE, Building 1, Suite 1200
Albuquerque, New Mexico 87110



Dennis A. Lorenz, PE
Principal 6.30.03

June 2003

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PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The project consists of the development of the property for GE Capital Modular Space. Paving, landscaping, utility, grading, and drainage improvements will be provided to support the project. The scope of this plan is to provide drainage criteria for the safe management of excess runoff. The report is presented to obtain Amended Site Plan approval, and building Permit approval.

This report is also revised to reflect the impact of the off-site development of the West Ridge Subdivision, Unit1, located west of the site.

SITE DESCRIPTION

The project site is approximately 11-acres in size and is located on Painted Rock Drive NW, at Ouray Road NW (See Figure 1). Site terrain slopes west to east at approximately 2 percent. The site is presently described as a Tract 5A1-B, Volcano Business Park. The site is bounded on the north by Ouray Road, Painted Rock Drive on the east, on the south by a PNM switching Station, and on the west by the West Ridge Subdivision, which is under construction.

The project site consists of the existing GE Capital Modular Space facility a 4.29-acre expansion of the existing GE Capital Modular Space facility.

EXISTING CONDITIONS

The site presently drains easterly to the Ouray Road storm system as follows:

1. Basin "A" represents a gore area between the site and Twin Oaks Drive that drains onto the site to the existing Basin "D" detention pond.
2. Basin "B" drains east into an existing private concrete channel located along the south side of the GE Capital site to Painted Rock Drive. Flows are then conveyed by street improvements to the Ouray storm drain.
3. Basin "C" represents a portion of the GE Capital site. This basin flows east to an existing detention pond that drains at a controlled rate of 7.3 cfs to Ouray Road NW near the intersection of Ouray. Runoff from this pond is intercepted by the Ouray storm drain.
4. Basin "D" represents the southern portion of the GE Capital site. This basin flows east to an existing detention pond that drains at a controlled rate of 3.8 cfs to an existing concrete channel at the east end of the property line. Runoff from this pond will drain east within Todos Santos and intercepted by an existing

storm drain which connect to the Ouray storm drain.

As shown by the attached FIRM Panel (Figure 3) this site does not lie within a designated flood hazard zone.

SUMMARY OF EXISTING DRAINAGE PLANS

Per the **Drainage Masterplan for Volcano Business Park, Phase II (G-10/D29)**, prepared by Brasher & Lorenz, Inc., 1-20-98, the site is required to implement on-site detention ponding.

The DMP recommended the construction of certain infrastructure improvements to support the subdivision of Tract 5A1-A1 (DRB 97-450). Improvements to Ouray Road and Painted Rock Drive were constructed by public work order, City Project No. 5856.81. On-site improvements included an improved private channel along the south property line of the GE Capital site.

The **Grading and Drainage Plan for GE Capital**, prepared by Brasher & Lorenz, Inc., 7-8-98, was prepared for building permit purposes to support the GE Capital Modular Space project. Typical site improvements were recommended, along with 2 on-site detention ponds that limit developed discharge from the site to the limits established by the **Drainage Masterplan for Volcano Business Park, Phase II**.

The **Drainage Report for GE Capital**, prepared by Brasher & Lorenz, Inc., 5-4-2002, was prepared for Site Plan, Subdivision Plat and building permit purposes to support the expansion of the GE Capital Modular Space facility. Typical site improvements were recommended, along with storm drains and an on-site detention pond designed to convey undeveloped off-site runoff Painted Rock Drive.

The **Drainage Report for West Ridge Subdivision**, prepared by Mark Goodwin & Associates, 1-02-2003, was prepared to support the development of a 24-acre residential subdivision, located immediately west of GE Capital Modular Space. This report outlined criteria for diversion of all runoff from West Ridge, north to existing storm improvements located in Ouray Road. A total of 37.2 cfs was diverted north to an existing storm drain located in Ouray Road from a public detention pond and storm drain within West Ridge. This runoff was previously programmed to drain through the GE site.

The 5.78-acre Tract 5A1-A was re-platted into Tracts B & C, West Ridge with the creation of public right-of-way for Twin Oaks Drive. Flows from this basin will utilize existing public storm drainage improvements per the Report for West Ridge.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the site for GE Capital Modular Space, a facility for lease and maintenance of portable buildings. The

southerly 4.29-acres of the GE site will be developed thereby expanding the existing facility. Development will include paving, utility landscaping and drainage improvements.

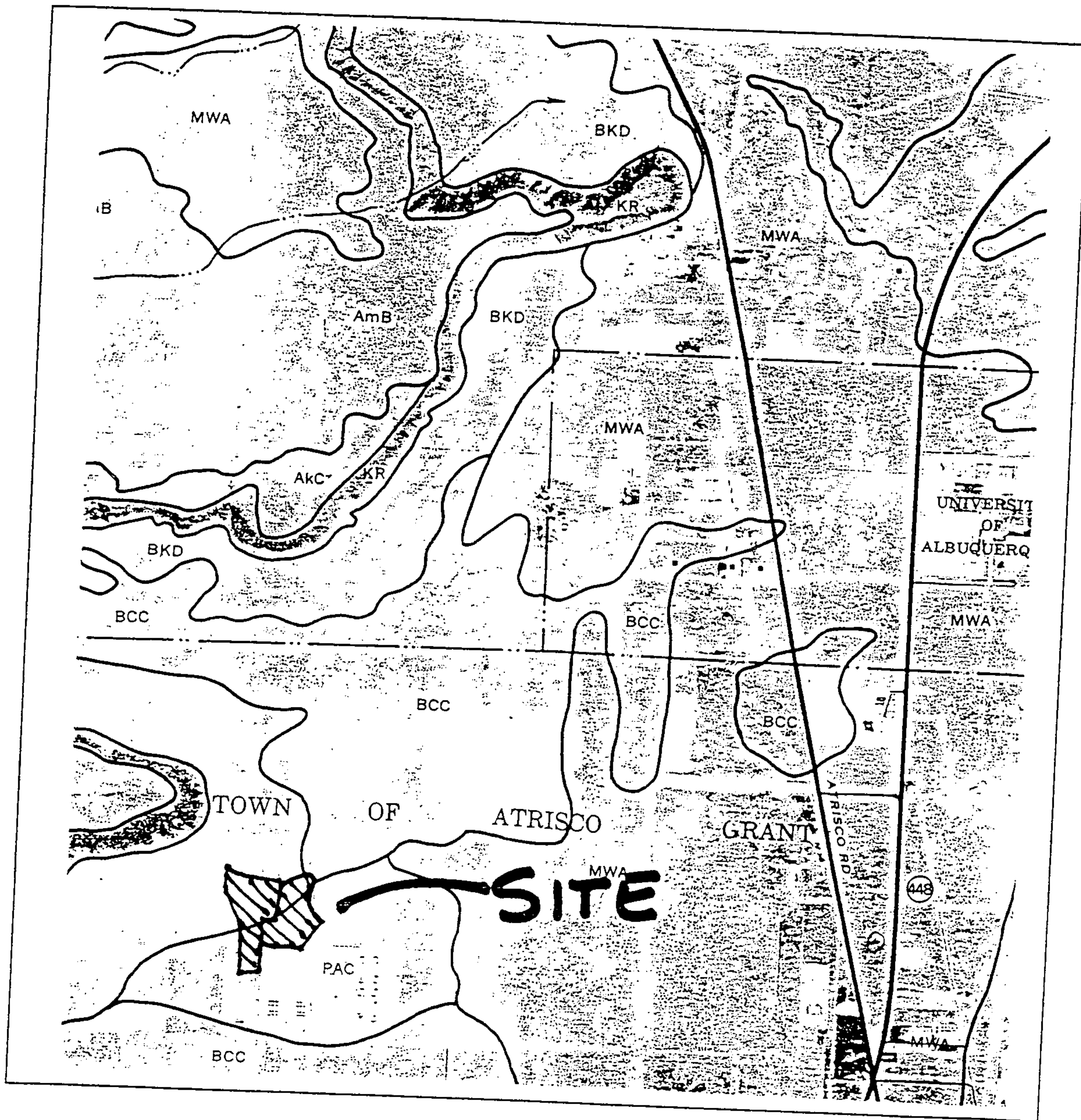
In accordance with the approved Masterplans, the site will drain to on-site detention ponds. The ponds will rout all excess runoff to Painted Rock Drive and Ouray Road as follows:

1. Basin "A" will drain through the site to the existing Basin "D" detention pond.
2. Basin "B-1" will drain overland to the existing Basin "D" detention pond located on the existing developed GE site at Painted Rock Drive. The existing pond will safely manage the increased developed flows as demonstrated by the pond routing calculation provided in this report.
3. Basin B-2 will drain to the existing 11-foot wide improved channel located along the south of the GE site. The channel drains east to Painted Rock Drive. This channel was designed to convey 55.6 cfs from the undeveloped off-site basins. West Ridge Subdivision has diverted these basins (approx 37.2 cfs) north to Ouray Road; creating capacity for the free discharge of Basin B-2..
4. Basins "C" and "D" represent the existing developed GE Capital site. Each basin routs developed runoff through existing detention ponds as described above.

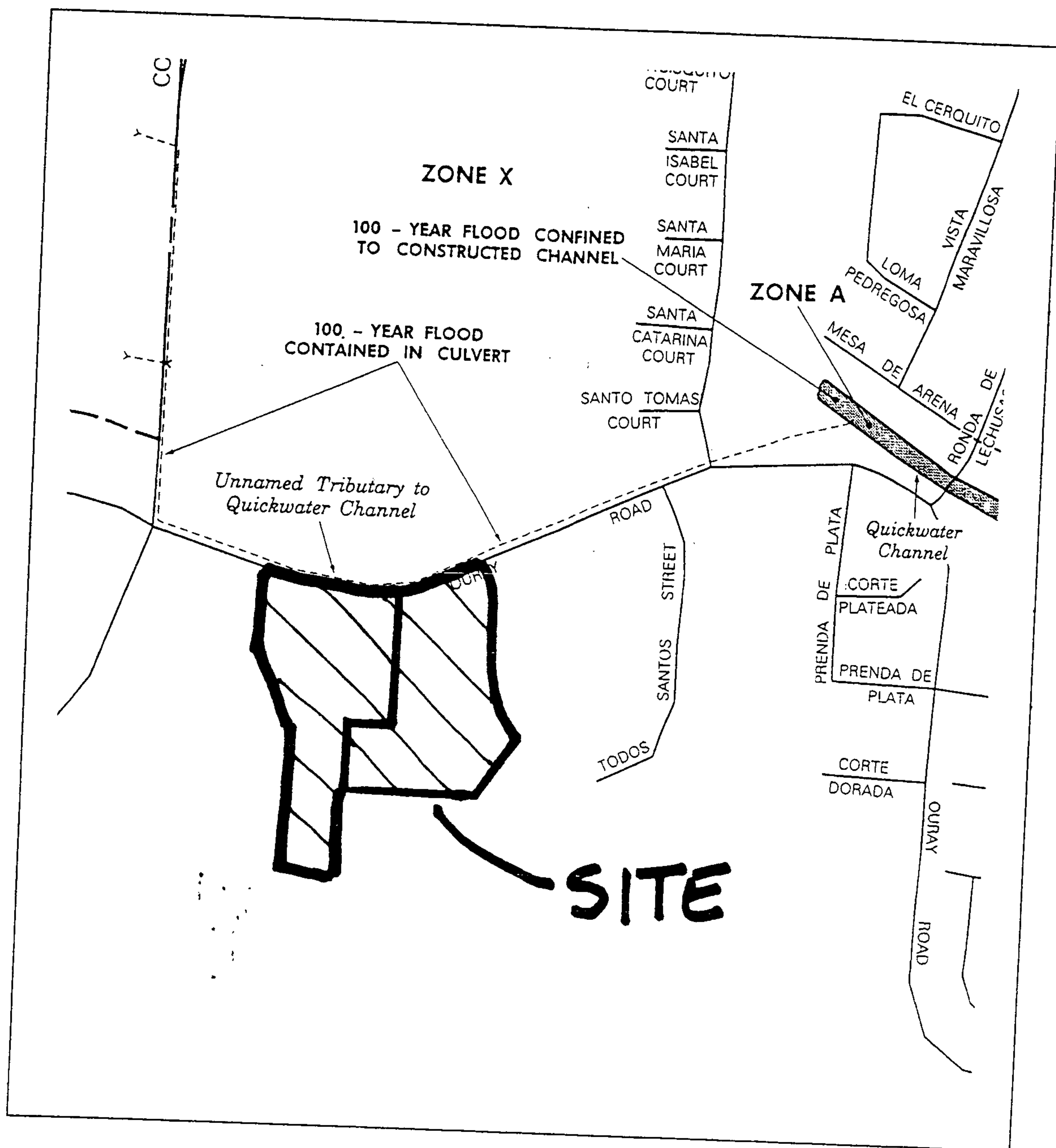
STORM WATER POLLUTION PREVENTION PLAN

A Storm Water Pollution Prevention Plan is provided to outline the criteria for controlling short and long-term erosion and the discharge of pollutants from the site. See Sheet C-3 for details.

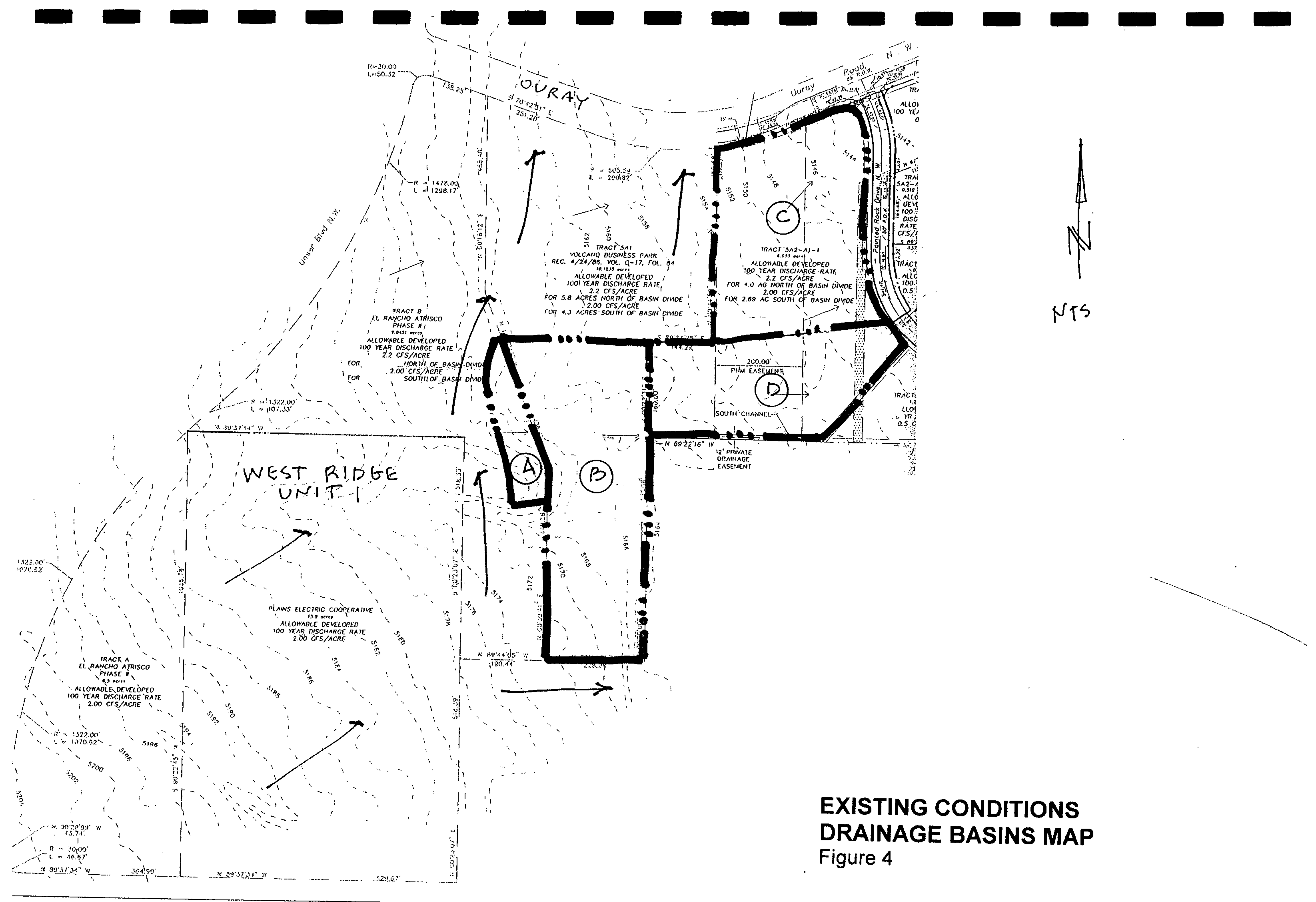
MAPS

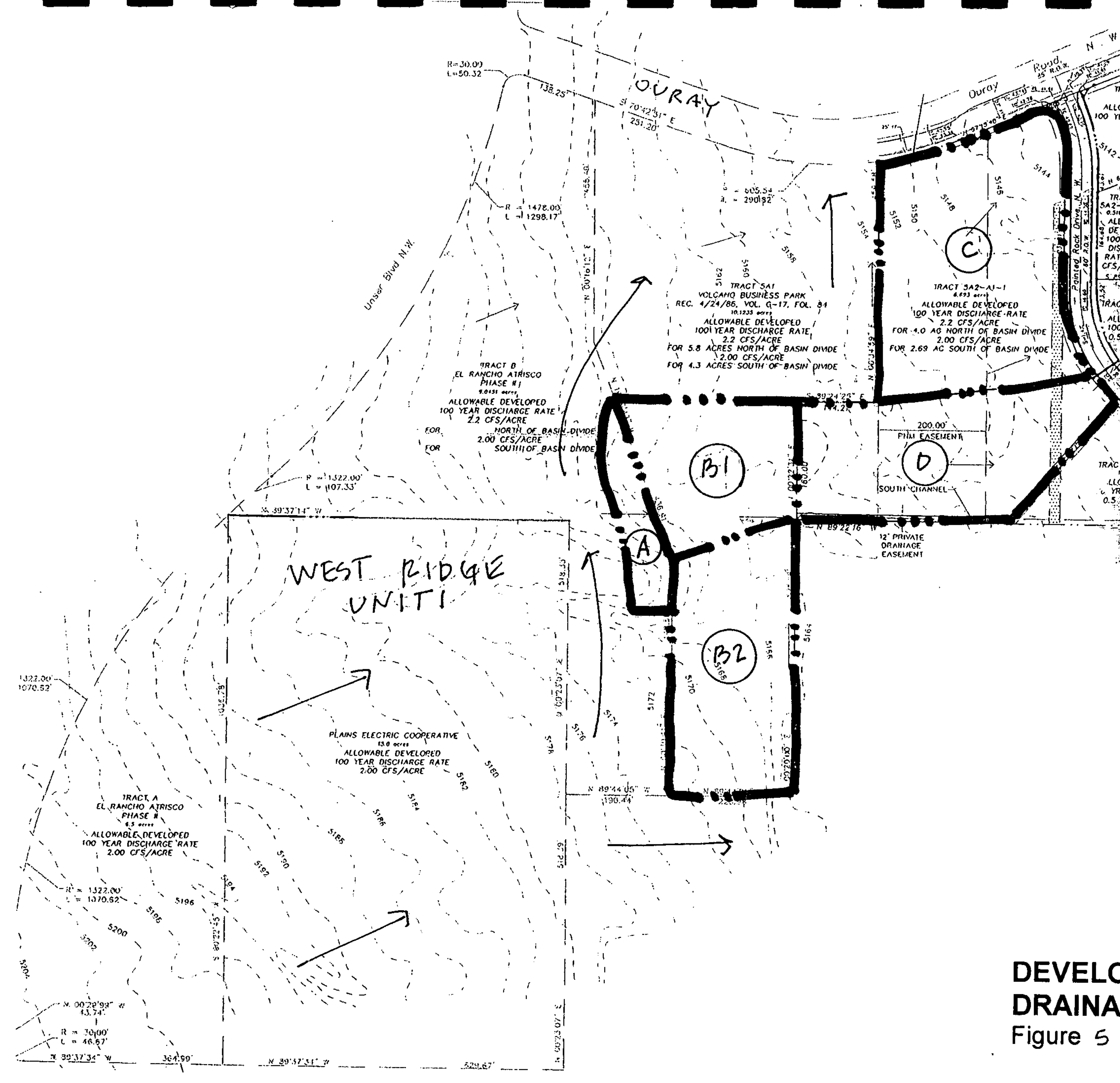


SOILS MAP
Figure 2



FLOOD INSURANCE RATE MAP
Figure 3





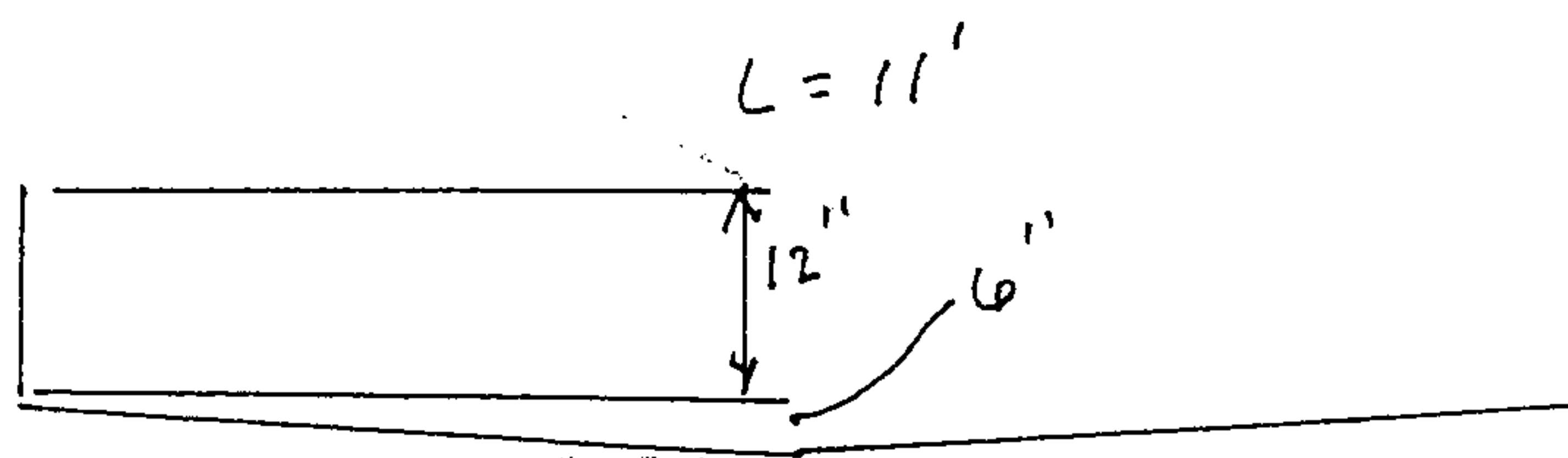
**DEVELOPED CONDITIONS
DRAINAGE BASINS MAP**
Figure 5

CALCULATIONS

① CHECK EXIST 12' CHANNEL

$Q_{100} = 11 \text{ CFS}$ - BASIN B.2

PER DMP CHANNEL DESIGNED
FOR 55.6 CFS



SECTION

② WEIR ENTRY

FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
11.00	8.0	2.500	0.67 ✓

③ CHANNEL FLOW

VARIABLES LIST:

Y - FLOW ELEVATION

Q - FLOWRATE

S - CHANNEL SLOPE

VARIABLE TO BE SOLVED (Y, Q OR S) ? Y

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

Q (CFS) ? 11
S (FT/FT) ? .01

CROSS-SECTION POINTS					
DIST	ELEV	COEFF	DIST	ELEV	COEFF
0	1.50	.017			
0	1.00	.017			
5.5	0.00	.017			
11	1.00	.017			
11	1.50	.017			

RESULTS

===== ✓
Y= 0.69 FT
A= 2.59 SF
P= 7.68 FT
V= 4.24 FPS
F= 1.28 SUPER-CRITICAL FLOW

② DEVELOP POND ROUTING DATA FOR
EXIST BASIN "b" POND @ PAINTED ROCK

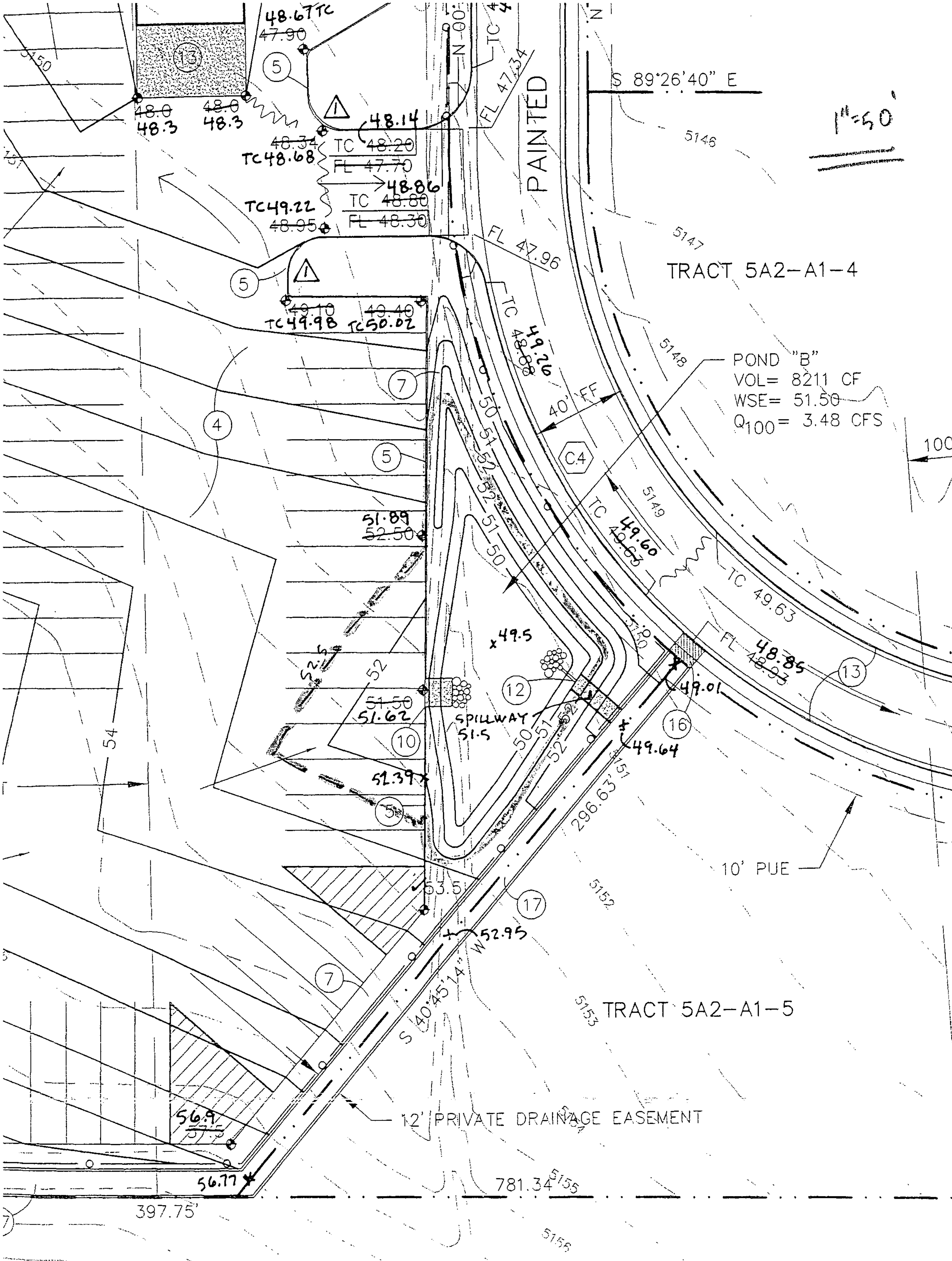
	<u>ELEV</u>	<u>A SF</u>	<u>VOL AF</u>	<u>HW/b</u>	<u>* Q_{OUT}</u>
INV.	49.5	0	0	0	0 cfs
	50	3575	0.0205	0.3	1.0
	51	5425	0.1238	1.3	3.0
SPILLWAY	51.5	7210	0.1963	1.8	4.0
	52	9000	0.2893	2.3	5.0 (9.4)
BERM	52.5	12025	0.4100	2.8	6.0 (18.5)

* 12" OUTLET

RATING CURVE FOR SPILLWAY

<u>ELEV</u>	<u>Q WEIR</u>
51.5	0
52	4.4 cfs
52.5	12.5

EXISTING BASIN 'D' POND DETAILS



S 89°26'40" E

1"=50'

TRACT 5A2-A1-4

POND "B"
VOL= 8211 CF
WSE= 51.50
Q100= 3.48 CFS

TRACT 5A2-A1-5

12' PRIVATE DRAINAGE EASEMENT

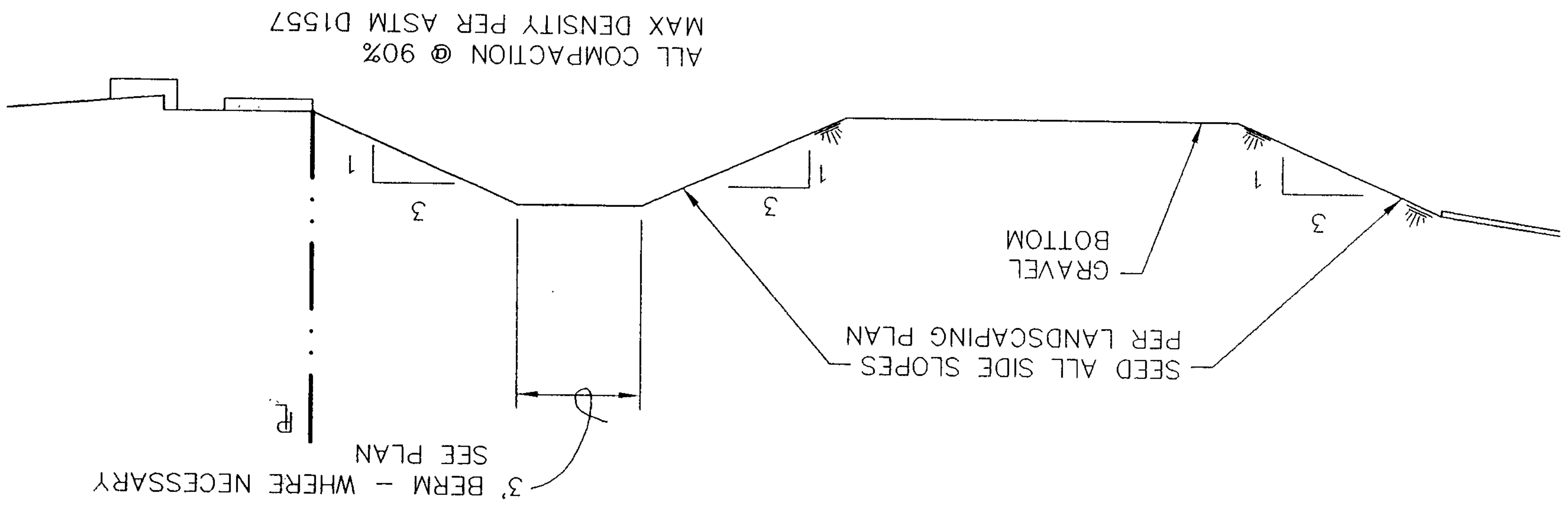
10' PUE

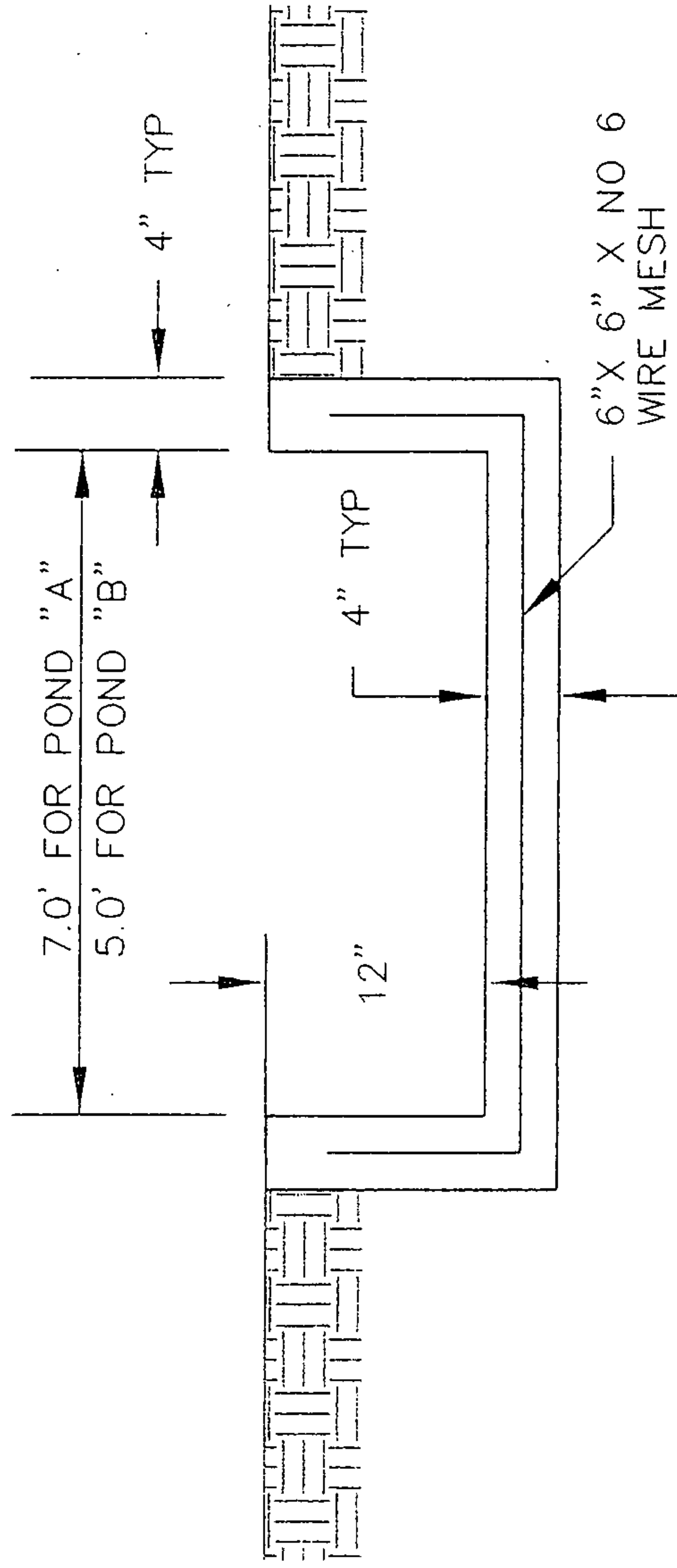
PAINTED

C-5
1

TYPICAL DETENTION POND SECTION

NTS

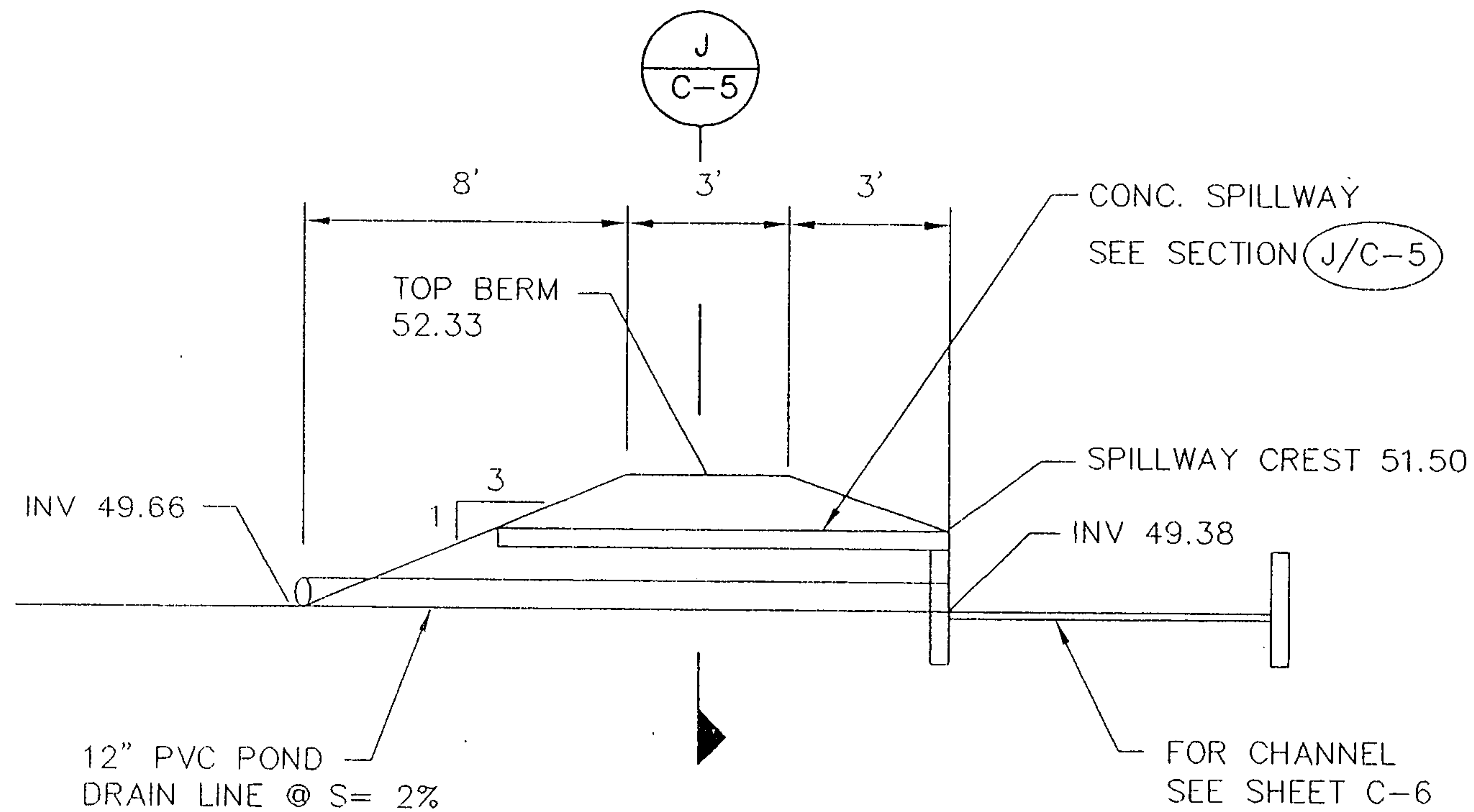




SPILLWAY SECTION

NTS

J
C-5



POND "B" OVERFLOW SPILLWAY SECTION

NTS

D
C-5

AHYMO OUTPUT FILES

RUN DATE (MON/DAY/YR) =07/09/2003
USER NO.= AHYMO-I-9702c01000T35-AH

	TIME=	.00
	RAIN6=	2.200
2	PER IMP=	.00
3	PER IMP=	.00
3	PER IMP=	85.00
9	PER IMP=	85.00
5	PER IMP=	.00
3	PER IMP=	85.00
3	PER IMP=	85.00
0	PER IMP=	85.00
5		
4		
2	AC-FT=	.199
3	AC-FT=	.284

AHYMO PROGRAM (AHYMO_97) - - Version: 1997.02d
RUN DATE (MON/DAY/YR) =
START TIME (HR:MIN:SEC) = 14:06:13 USER NO.= AHYMO-I-9702c01000T35-AH
INPUT FILE = C:\02542\02542.DAT

* GE CAPITAL MODULAR SPACE
* PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033330 HOURS	END TIME =	5.999400 HOURS
.0000	.0016	.0033	.0050
.0122	.0141	.0160	.0180
.0266	.0289	.0312	.0337
.0443	.0472	.0502	.0534
.0675	.0715	.0758	.0809
.1334	.1771	.2398	.3254
.9780	1.1804	1.2649	1.3363
1.5600	1.6061	1.6493	1.6900
1.8314	1.8623	1.8915	1.9193
1.9630	1.9682	1.9732	1.9780
1.9953	1.9993	2.0031	2.0068
2.0207	2.0240	2.0272	2.0303
2.0420	2.0448	2.0475	2.0502
2.0605	2.0629	2.0653	2.0677
2.0768	2.0790	2.0812	2.0833
2.0916	2.0936	2.0956	2.0976
2.1051	2.1070	2.1088	2.1106
2.1176	2.1193	2.1210	2.1227
2.1292	2.1308	2.1324	2.1340
2.1401	2.1416	2.1431	2.1446
2.1504	2.1518	2.1532	2.1546
2.1600	2.1614	2.1627	2.1640
2.1692	2.1705	2.1718	2.1731
2.1780	2.1792	2.1804	2.1817
2.1864	2.1876	2.1887	2.1899
2.1944	2.1956	2.1967	2.1978

* EXISTING CONDITIONS

* UNDEVELOPED BASIN A - 0.40 ACRES
COMPUTE NM HYD ID=1 HYD NO=A.EX DA=0.000625 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764

UNIT PEAK = 1.2826 CFS UNIT VOLUME = .9881 B = 273.54 P60 = 1.8700
 AREA = .000625 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=20

HYDROGRAPH FROM AREA A.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	.667	.0	1.333	.0	2.000	.0	2.666	.0

RUNOFF VOLUME = .43925 INCHES = .0146 ACRE-FEET
 PEAK DISCHARGE RATE = .52 CFS AT 1.533 HOURS BASIN AREA = .0006 SQ. MI.

* UNDEVELOPED BASIN B - 4.29 ACRES
 COMPUTE NM HYD ID=2 HYD NO=B.EX DA=0.006703 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
 UNIT PEAK = 13.755 CFS UNIT VOLUME = .9986 B = 273.54 P60 = 1.8700
 AREA = .006703 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=20

HYDROGRAPH FROM AREA B.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.1	4.000	.0		
.667	.0	2.000	.5	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .1570 ACRE-FEET
 PEAK DISCHARGE RATE = 5.57 CFS AT 1.533 HOURS BASIN AREA = .0067 SQ. MI.

* EXISTING DEVELOPED BASIN C - 4.00 ACRES
 COMPUTE NM HYD ID=3 HYD NO=C.EX DA=0.006250 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 20.974 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005313 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 2.5086 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
AREA = .000938 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=3 CODE=20

HYDROGRAPH FROM AREA C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.6	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .5982 ACRE-FEET
PEAK DISCHARGE RATE = 16.35 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* EXISTING DEVELOPED BASIN D - 2.69 ACRES
COMPUTE NM HYD ID=4 HYD NO=D.EX DA=0.004633 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 15.548 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
AREA = .003938 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 1.8596 CFS UNIT VOLUME = .9932 B = 356.70 P60 = 1.8700
AREA = .000695 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=20

HYDROGRAPH FROM AREA D.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	2.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	3.4	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4434 ACRE-FEET
PEAK DISCHARGE RATE = 12.12 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*DEVELOPED CONDITIONS

* DEVELOPED BASIN A - 0.40 ACRES

COMPUTE NM HYD ID=5 HYD NO=A.DEV DA=0.000625 SQ MI
PER A=0 PER B=0 PER C=100 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .105867HR TP = .133300HR K/TP RATIO = .794199 SHAPE CONSTANT, N = 4.514851
UNIT PEAK = 1.8199 CFS UNIT VOLUME = .9934 B = 388.14 P60 = 1.8700
AREA = .000625 SQ MI IA = .35000 INCHES INF = .83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=20

HYDROGRAPH FROM AREA A.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	.667	.0	1.333	.1	2.000	.1	2.666	.0

RUNOFF VOLUME = .99441 INCHES = .0331 ACRE-FEET
PEAK DISCHARGE RATE = 1.16 CFS AT 1.500 HOURS BASIN AREA = .0006 SQ. MI.

* DEVELOPED BASIN B - 4.29 ACRES

COMPUTE NM HYD ID=6 HYD NO=B.DEV DA=0.006273 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 21.051 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .005332 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 2.5179 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
AREA = .000941 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA B.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.9	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.7	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .6004 ACRE-FEET

PEAK DISCHARGE RATE = 16.41 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* DEVELOPED BASIN B-1 - 1.61 ACRES
COMPUTE NM HYD ID=7 HYD NO=B-1.DEV DA=0.002516 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 8.4433 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
AREA = .002139 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 1.0099 CFS UNIT VOLUME = .9877 B = 356.70 P60 = 1.8700
AREA = .000377 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA B-1.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	1.5	4.000	.0	5.999	.0		
.667	.0	2.666	.1	4.666	.0	6.666	.0		
1.333	1.9	3.333	.0	5.333	.0				

RUNOFF VOLUME = 1.79461 INCHES = .2408 ACRE-FEET
PEAK DISCHARGE RATE = 6.59 CFS AT 1.500 HOURS BASIN AREA = .0025 SQ. MI.

* DEVELOPED BASIN B-2 - 2.68 ACRES - FREE DISCHARGE THRU EXISTING 12'
* CHANNEL TO PAINTED ROCK
COMPUTE NM HYD ID=8 HYD NO=B-2.DEV DA=0.004188 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 14.054 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
AREA = .003560 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 1.6810 CFS UNIT VOLUME = .9925 B = 356.70 P60 = 1.8700
AREA = .000628 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=8 CODE=20

HYDROGRAPH FROM AREA B-2.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	2.6	4.000	.1	5.999	.1		
.667	.0	2.666	.2	4.666	.1	6.666	.0		
1.333	3.1	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4008 ACRE-FEET
PEAK DISCHARGE RATE = 10.96 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

* TOTAL FLOW AT EXISTING BASIN D POND
ADD HYD ID=9 HYD NO=A&B-1.DEV ID I=5 ID II=7
PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA A&B-1.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	1.7	4.000	.0	5.999	.0		
.667	.0	2.666	.1	4.666	.0	6.666	.0		
1.333	2.0	3.333	.0	5.333	.0				

RUNOFF VOLUME = 1.63526 INCHES = .2739 ACRE-FEET
PEAK DISCHARGE RATE = 7.75 CFS AT 1.500 HOURS BASIN AREA = .0031 SQ. MI.

ADD HYD ID=10 HYD NO=A&B-1&D.DEV ID I=9 ID II=4
PRINT HYD ID=10 CODE=20

HYDROGRAPH FROM AREA A&B-1&D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	4.5	4.000	.1	5.999	.1		
.667	.0	2.666	.4	4.666	.1	6.666	.0		
1.333	5.4	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.73019 INCHES = .7174 ACRE-FEET
PEAK DISCHARGE RATE = 19.87 CFS AT 1.500 HOURS BASIN AREA = .0078 SQ. MI.

* EXISTING GE CAPITAL DETENTION PONDS (BASINS C&D)

* ROUTE EXISTING BASIN C THROUGH DETENTION POND TO OURAY ROAD PER DMP.

* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 8.8 CFS FOR BASIN

ROUTE RESERVOIR ID=11 HYD NO=POND'C'.OUT INFLOW ID=3 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 43.5
 1.48 0.0262 44.0
 5.45 0.0968 45.0
 7.57 0.2125 46.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	43.50	.000	.00
.33	.00	43.50	.000	.00
.67	.00	43.50	.000	.00
1.00	.00	43.50	.000	.00
1.33	4.64	43.86	.019	1.06
1.67	8.31	45.87	.198	7.30
2.00	3.84	45.51	.156	6.53
2.33	.82	44.52	.063	3.53
2.67	.34	43.88	.020	1.12
3.00	.17	43.64	.007	.41
3.33	.12	43.56	.003	.19
3.67	.10	43.54	.002	.12
4.00	.09	43.53	.002	.10
4.33	.08	43.53	.002	.09
4.67	.08	43.53	.002	.08
5.00	.09	43.53	.002	.09
5.33	.09	43.53	.002	.09
5.67	.10	43.53	.002	.10
6.00	.11	43.53	.002	.10
6.33	.01	43.52	.001	.05
6.67	.00	43.51	.000	.02
7.00	.00	43.50	.000	.00

PEAK DISCHARGE = 7.328 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 45.886
 MAXIMUM STORAGE = .1993 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=11 CODE=20

HYDROGRAPH FROM AREA POND'C'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.5	4.000	.1	5.999	.1
.667	.0	2.666	1.1	4.666	.1	6.666	.0
1.333	1.1	3.333	.2	5.333	.1		

RUNOFF VOLUME = 1.79456 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 7.33 CFS AT 1.700 HOURS BASIN AREA = .0063 SQ. MI.

 * ROUTE BASINS A,B-1&D THROUGH EXISTING DETENTION POND TO PAINTED ROCK PER DMP
 * ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 9.40 CFS

 ROUTE RESERVOIR ID=12 HYD NO=POND'D'.OUT INFLOW ID=10 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0	49.5
1.00	0.0205	50.0
3.00	0.1238	51.0
4.00	0.1963	51.5
9.40	0.2893	52.0
18.50	0.4100	52.5

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	49.50	.000	.00
.33	.00	49.50	.000	.00
.67	.00	49.50	.000	.00
1.00	.00	49.50	.000	.00
1.33	5.40	50.02	.022	1.03
1.67	10.12	51.97	.283	9.05
2.00	4.54	51.74	.242	6.63
2.33	.98	51.34	.173	3.68
2.67	.39	50.80	.103	2.61
3.00	.19	50.32	.053	1.64
3.33	.13	50.01	.022	1.02
3.67	.11	49.68	.007	.36
4.00	.10	49.59	.003	.17
4.33	.10	49.56	.002	.12
4.67	.10	49.55	.002	.10
5.00	.10	49.55	.002	.10
5.33	.11	49.55	.002	.10
5.67	.11	49.55	.002	.11
6.00	.12	49.56	.002	.12
6.33	.01	49.53	.001	.07
6.67	.00	49.51	.000	.02
7.00	.00	49.50	.000	.01
7.33	.00	49.50	.000	.00

PEAK DISCHARGE = 9.121 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 51.974
 MAXIMUM STORAGE = .2845 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=12 CODE=20

HYDROGRAPH FROM AREA POND'D'.OUT

RUNOFF VOLUME = 1.73019 INCHES = .7174 ACRE-FEET
PEAK DISCHARGE RATE = 9.12 CFS AT 1.700 HOURS BASIN AREA = .0078 SQ. MI.

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 14:06:13

APPENDIX

DRAINAGE REPORT
for
WEST RIDGE SUBDIVISION

Prepared For

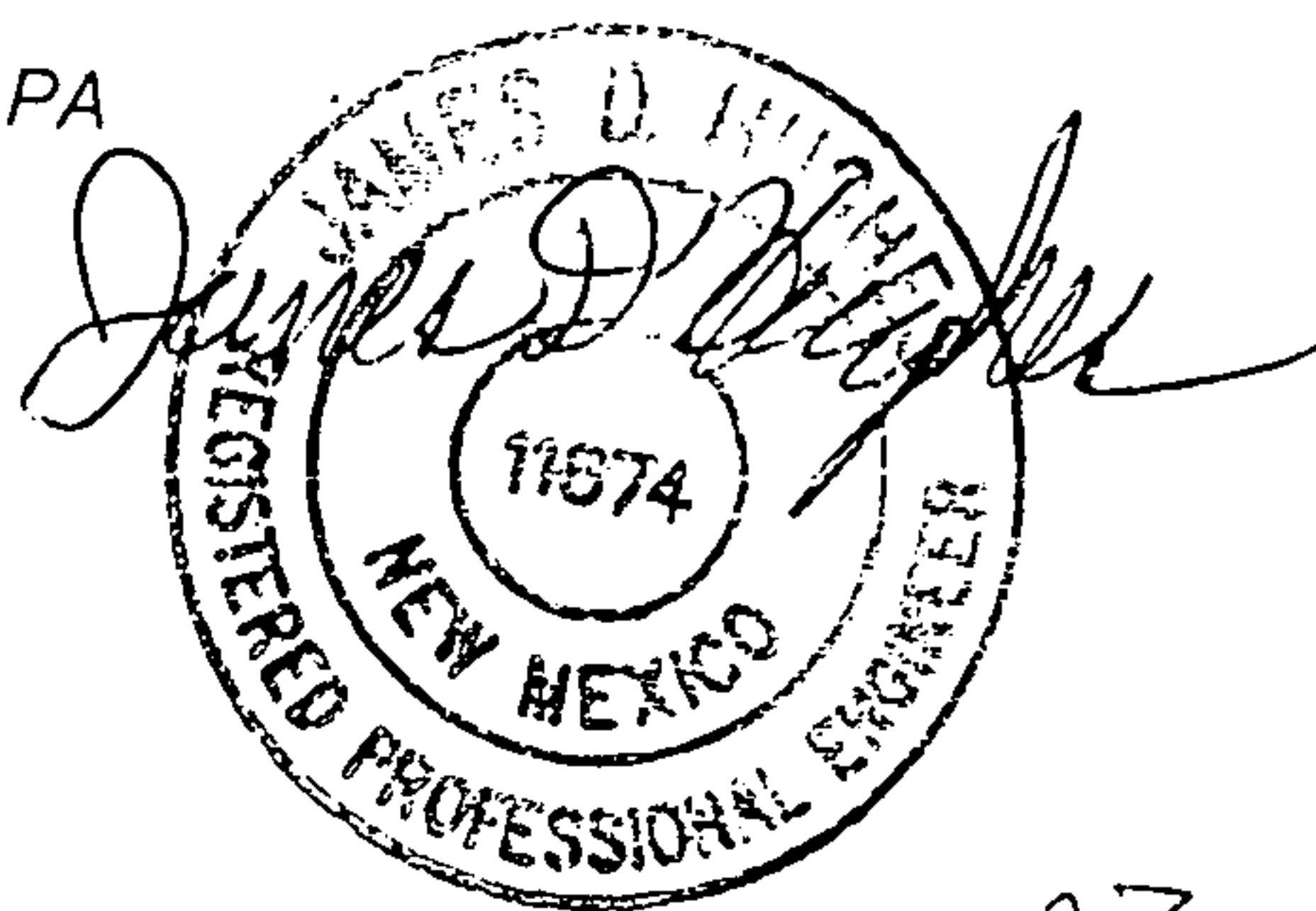
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September 2002

Revision January 2003



1-02-03

PURPOSE

The purpose of this report is to document the adequacy of the proposed drainage infrastructure as immediately proposed for the development of this 24 acre Residential Subdivision..

EXISTING CONDITIONS

This 24 acre site slopes from southwest to northeast at about 3%. Off-site drainage is prevented from entering the site on the west by Unser Blvd. and on the south by the Ladera Channel, an unlined AMAFCA facility and a private access driveway at the old Ouray Rd. location.

In 1985 both the residential portion of this site (24 acres) and the commercial parcels (11 acres) on the north side of this development were master planned to drain east through Volcano Business Park, by Easterling and Associates Inc. The 24 acres residential portion of this development was zoned for private commercial development until the recent zone change in 2002. The easements down stream of the residential portion of this development are private and the improvements in them do not meet public standards. In 1998 the commercial parcels (11 acres) on the north side of the development were master planned to drain north to New Ouray Rd. by Brasher & Lorenz Inc., in association with the development of Volcano Business Park Phase II, Tract 5A2-A1, Lots 1-6 as it exists today. In 2002 the grading and drainage plan for the "Expanded Area" of GE Capital Modular Space was approved but has not yet been constructed.

All of these Master plans propose limited discharge from ponds from all parts of this site. The 1998 Master plan refers to a separate report prepared by Community Sciences Corporation (CSC), and dated 8/17/95, for Rinconada Point Unit 3, and stated "that report identifies 42 cfs excess capacity in the Ouray Rd. 60" storm drain. However, "Rinconada Report only documented capacity for Rinconada Point, not for any portion of the 1998 Master Plan Drainage Area. While it appears from the 1995 CSC report that the 60" Storm drain has some excess capacity, the amount of the excess capacity has never been verified by any of these reports.

PROPOSED MANAGEMENT PLAN

The Appendix to this report verifies that the Ouray Rd. 60" Storm Sewer has capacity for both the 24 ac residential part and the commercial lots provided that the residential part is ponded onsite. This 24 acre residential development produces 87.06 cfs but will have limited discharge (12.61 cfs) through an on-site public detention pond into the existing 60" stormdrain in Ouray Rd. The remaining on-site commercial lots and public road (11.17 acres) on the north side of this site will free discharge (47.48 cfs developed) also to the Ouray Road 60" storm sewer. This project provides inlets and storm sewer to serve Twin Oaks Drive and peak flow from the commercial property west of Twin Oaks Drive. This report further demonstrates that the commercial property east of Twin Oaks Drive may free discharge developed drainage directly into the 60" Storm Sewer in Ouray Rd. without exceeding capacity there.

METHODOLOGY

On site drainage capacity of streets and inlets was determined in the 9-27-02 version of this report and remains essentially unchanged. Appendix A was added with the 01-02-03 revision to demonstrate capacity in the Ouray Rd. Storm sewer and to present the redesigned onsite pond and outfall pipe in Twin Oaks Drive. Both the hydrology (AHYMO) and the hydraulics (Storm Plus) from the May 1995 "LOMR Request for SAD-215 and Unser Blvd. " Case NO. 95-06-404P, were reproduced and then modified as follows.

- 1. Basin, 114.02 and 116 in Rinconada Point developed at a lower density than planned in the May 95 report. Basin 116 does not drain to Ouray Rd. Instead it surface drains directly into the Rinconada Point Pond North of Ouray.*
- 2. Basin 115 was developed at a lower density than planned in the May 95 report.*
- 3. Onsite hydrology was inserted into the offsite hydrology and the pond grading and volume calculations were revised to accommodate a landscape buffer and flatter slopes in the pond.*
- 4. The duplicated effective hydraulic model (Storm Plus) was modified with the new flows, and the segments in Twin Oaks Drive were added to the model.*

The new flows in Ouray Rd. Were nearly the same as they were in the May 1995 report because Rinconada Pointe (north of Ouray Rd.) Developed at much lower densities than planned. So the addition of the new flows from this development did not significantly change the HGL in Ouray Rd.

TABLE 1 - SUMMARY OF HYDROLOGY

(See Drainage Basin Map)

Description	Basin ID	Area Acres	Area Sq. Mi.	Land Treatment				Hr. T	100-YR Peak Flow	
				A	B	C	D		Inc. (cfs)	Cumm
On-site residential	1-12	24.00	0.03750	0	14	29	57	0.13	87.06	
On-site pond	33	0.72	0.00113	0	50	50	0	0.13	1.79	88.85 9.43 ⁽¹⁾
Off-site Commercial	34	3.16	0.00494	0	0	10	90	0.13	13.44	17.14
On-site Commercial	20	5.12	0.00800	0	0	10	90	0.13	21.76	
On-site Commercial	21	1.57	0.00245	0	0	10	90	0.13	6.67	28.43
Twin Oaks	22	0.83	0.00130	0	0	10	90	0.13	3.55	31.98
On-site Commercial	23	3.65	0.00570	0	0	10	90	0.13	15.50	47.48

100 YEAR PRECIPITATION (From Figures D, E and F, and Eq. 28 of DPM 22.2)

$$P_{60}=1.88", P_{360}=2.22", P_{1440}=2.66", P_{10 \text{ days}}=10.0-[24.9/(2.665")^{1.4}] = 3.70"$$

⁽¹⁾ Peak flow after pond routing.

TABLE 2 - STREET DRAINAGE CAPACITIES

Basin No.	Area Ac.	% of Total	Flow		Curb Type/Slope	Flow Depth ft ⁽¹⁾	Velocity fps	Energy Depth ft ⁽²⁾	Location
			Incr. (cfs)	Cumm. (cfs)					
100 Year Capacity in Local Streets									
1	3.68	15.33	13.35		roll 26' 2.38%	0.30	3.8	0.52	Kyle Rd. sta 14 +00
2	1.50	6.25	5.44		roll 26' 1.89%	0.23	2.7	0.34	Woodhill Dr. sta 12+50
3	0.77	3.21	2.79	21.58	std 26' 1.89%	0.43	4.0	0.68	Woodhill Dr. sta 15+00
4	2.15	8.96	7.80	29.38	std 28' 2.38%	0.62	3.9	0.86	Burkett Ave. sta 14+00
5	2.33	9.71	8.45		roll 26' 2.37%	0.26	3.3	0.43	Austin Ave. sta 17+00
6	3.38	14.08	12.26	20.71	std 28' 3.0%	0.40	4.4	0.70	Bixby St. sat 15+00
7	1.01	4.21	3.66	39.16 ⁽³⁾	std 28' 0.83%	0.68	4.2	0.95	Burkett Ave sta. 16+50
8	2.08	8.67	7.55		roll 28' 2.38%	0.26	3.3	0.43	Angel Dr. sta. 15+50
9	0.60	2.50	2.18	9.72	roll 28' 2.3%	0.27	3.3	0.44	Angel Dr. sta. 17+50
10	4.35	18.13	15.78	25.50	std 28' 2.48%	0.44	4.5	0.75	Brady Rd. sta. 12+15
11	1.24	5.17	4.50	27.46 (3)	std 28' 1.22%	0.50	3.9	0.74	Twin Oaks Dr. sta. 12+00
12	0.91	3.79	3.30	28.80	std 28 0.5%	0.25	1.6	0.29	Twin Oaks Dr. sta. 13+ 00
Total 1-12	24.00	100.00	87.06	56.26 ⁽³⁾					

Basin No.	Area Ac.	% of Total	Flow		Curb Type/Slope	Flow Depth ft ⁽¹⁾	Velocity fps	Energy Depth ft ⁽²⁾	Location
			Incr. (cfs)	Cumm. (cfs)					
33	0.72	100.00	1.79	88.85					N/A
34	3.16	100.00	13.44	17.14					N/A
20	5.12	100.00	21.76						N/A
21	1.57	100.00	6.67	28.43					N/A
22	0.83	100.00	3.55	31.98	Std. 32' 2.02%	0.46	4.4	0.74	Twin Oaks Dr. sta 21+00
23	3.65	100.00	15.50	47.48					

⁽¹⁾ Flow depths are taken from Plate 22.3 D-1 and 22.3 D-2 of the DPM and reduced by 3/4" for roll curb types to account for the differences in gutter depression. Allowable depths may not exceed curb heights which are 0.33' for roll curb and gutter, and 0.67' for standard curb and gutter.

⁽²⁾ Energy depth is calculated as flow depth plus energy head. Allowable depths are 0.20' above top of curb.

⁽³⁾ Flow reduced to account for inlet interception.

Capacity of Inlets

Burkett Ave Station 14+00

Inlets # 1 & 2

Inlets #1 and # 2 are single grates on a 2.38% grade flowing at a depth of 0.46'. Each inlet intercepts 7.3 cfs where the approaching flow is 29.38 cfs leaving 14.78 cfs bypass flow which is joins by 24.38 cfs from basins 5, 6 and 7 for a total flow in Riley Ave. Just east of Sunset St. of 39.16 cfs.

Burkett Ave. Station 16 + 50

Inlets # 3 & 4

Inlets # 3 & 4 are single grates on a 0.83% grade flowing at a depth of 0.62'. Each inlet intercepts 8.1 cfs where the approaching flow is 39.16 cfs leaving 22.96 cfs. bypass flow which joins the 4.50 cfs from basin #11 for a total of 27.46 cfs flowing north in Sundance Drive, approaching the sump there.

Twin Oaks Drive Sump

Inlets # 5, 6 & 7

Capacity is measured by the weir equation at the lip of the gutter assuming an allowable ponding elevation equal to the lowest adjacent right-of-way elevations. The length of the double grate facing the street is 6.5'± and the depth is 0.745 at the lip of the gutter. The sides are each 2' long (4' total) and the average depth is 0.912". From the weir equation:

$$\text{(Front)} \quad Q \text{ cap} = 3.0 \times 6.5 \times 0.745'^{1.5} = 12.54 \text{ cfs}$$

$$\text{(Sides)} \quad Q \text{ cap} = 3.0 \times 4.0' \times 0.912'^{1.5} = 10.45 \text{ cfs}$$

$$\text{(Total)} \quad Q \text{ cap} = 12.54 \text{ cfs} + 10.45 \text{ cfs} = 22.99 \text{ cfs}$$

NOTE: these depths assume standard 8" curb with the right-of-way 9' behind the curb and 0.20 above the top of the curb.

The 100-year flow to the sump inlets 5, 6 , & 7 is 56.26 cfs. There are three sump inlets (inlets # 5, 6 & 7) with a combined capacity of 68.97 cfs thus providing a safety factor that would allow 18% of the inlets to clog without exceeding the normal design criteria. For HGL Calculations, each inlet is assumed to take one third of the 100-yr flow (18.75 cfs each). Emergency overflow goes into the pond.

Twin Oaks Drive at Ouray Road

Inlets #8, 9, 10 and 11

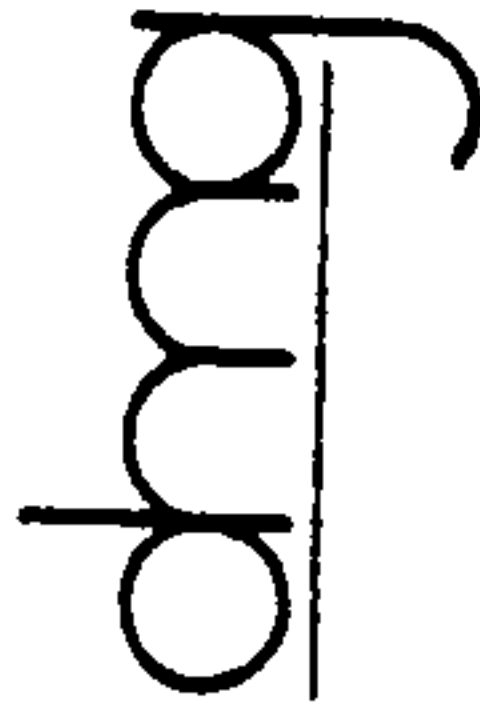
Inlets #8 and #9 are single grates on a 2.02% grade flowing at a depth of 0.46'. Each inlet intercepts 7.1 cfs where the approaching flow is 31.98 cfs, leaving 17.78 cfs bypass flow approaching the next pair of single grate inlets (#10 and #11) at 0.39' flow depth. Each inlet intercepts 5.0 cfs, leaving 7.78 cfs to flow into Ouray Rd. Additional inlets in OUray Rd. may be required in the future prior to any commercial development.

EROSION CONTROL BERM DETAIL

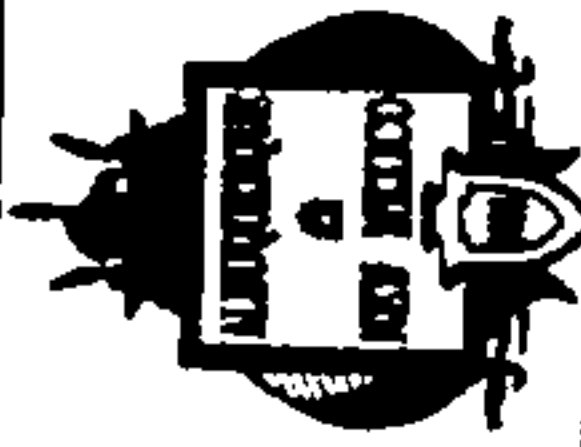
N.T.S.

EROSION CONTROL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL SEDIMENT OUT OF EXISTING RIGHT-OF-WAY.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING UP ANY SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. EROSION CONTROL BERMS ARE REQUIRED AROUND EACH BLOCK.



MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539



CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:

WEST RIDGE SUBDIVISION
GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE

CITY ENGINEER APPROVAL

LAST DESIGN UPDATE

MO./DAY/YR.

MO./DAY/YR.

CITY PROJECT NO.

ZONE MAP NO.

-1/01-03-03/ACH DER

SHEET

H-9 & 10

OF

1

2

50' 100'

1" = 50'



RECEIVED
JAN 06 2003

HYDROLOGY SECTION

NO. DATE

REMARKS

REVISIONS

DESIGN

DESIGNED BY

JDH

DATE

08/0

DRAWN BY

ACH

DATE

08/0

CHECKED BY

DMG

DATE

08/0

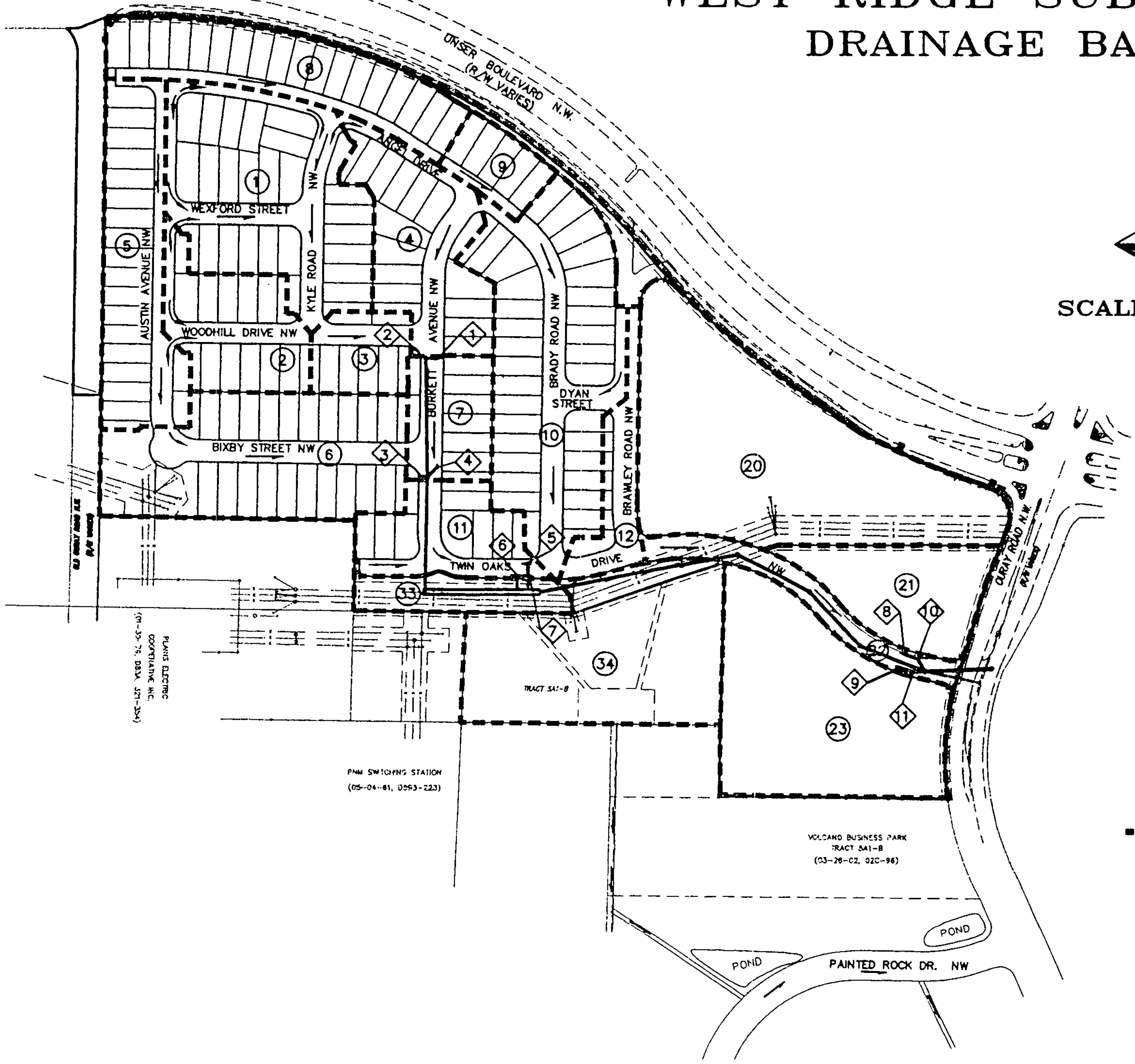
WEST RIDGE SUBDIVISION DRAINAGE BASIN MAP



SCALE: 1" = 300'

LEGEND

- ②③ DRAINAGE BASIN ID
- ◇① INLET NO.
- BASIN BOUNDARY
- FLOW ARROW



UPDATED PLAN

UPDATED PLAN

MASTER PLANS
APPROVED PLANS
CERTS

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE MAP/DRG. FILE #: G10-D29F
 DRB #: 1001175 EPC#: 01/28-01555 WORK ORDER#: —

LEGAL DESCRIPTION: TRACT 5A1-B VOLCANO BUSINESS PARK
 CITY ADDRESS: 3501 PAINTED ROCK DR NW

ENGINEERING FIRM: BRASHER + LORENZ
 ADDRESS: 2201 SAN PEDRO NE
 CITY, STATE: ALBUQUERQUE NM 87110

CONTACT: D. LORENZ
 PHONE: 888-6088
 ZIP CODE: 87110

OWNER: CORPORATE SITE CONSULTANTS
 ADDRESS: 161 WOODLAWN DR
 CITY, STATE: DEPEW, NY

CONTACT: L. KUHN
 PHONE: 716-685-1660
 ZIP CODE: 14043

ARCHITECT: NA
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

SURVEYOR: PRECISION SURVEYS
 ADDRESS: 8414-D JEFFERSON NE
 CITY, STATE: ALBUQUERQUE, NM

CONTACT: L. MEDRANO
 PHONE: 856-5700
 ZIP CODE: 87113

CONTRACTOR: NA
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

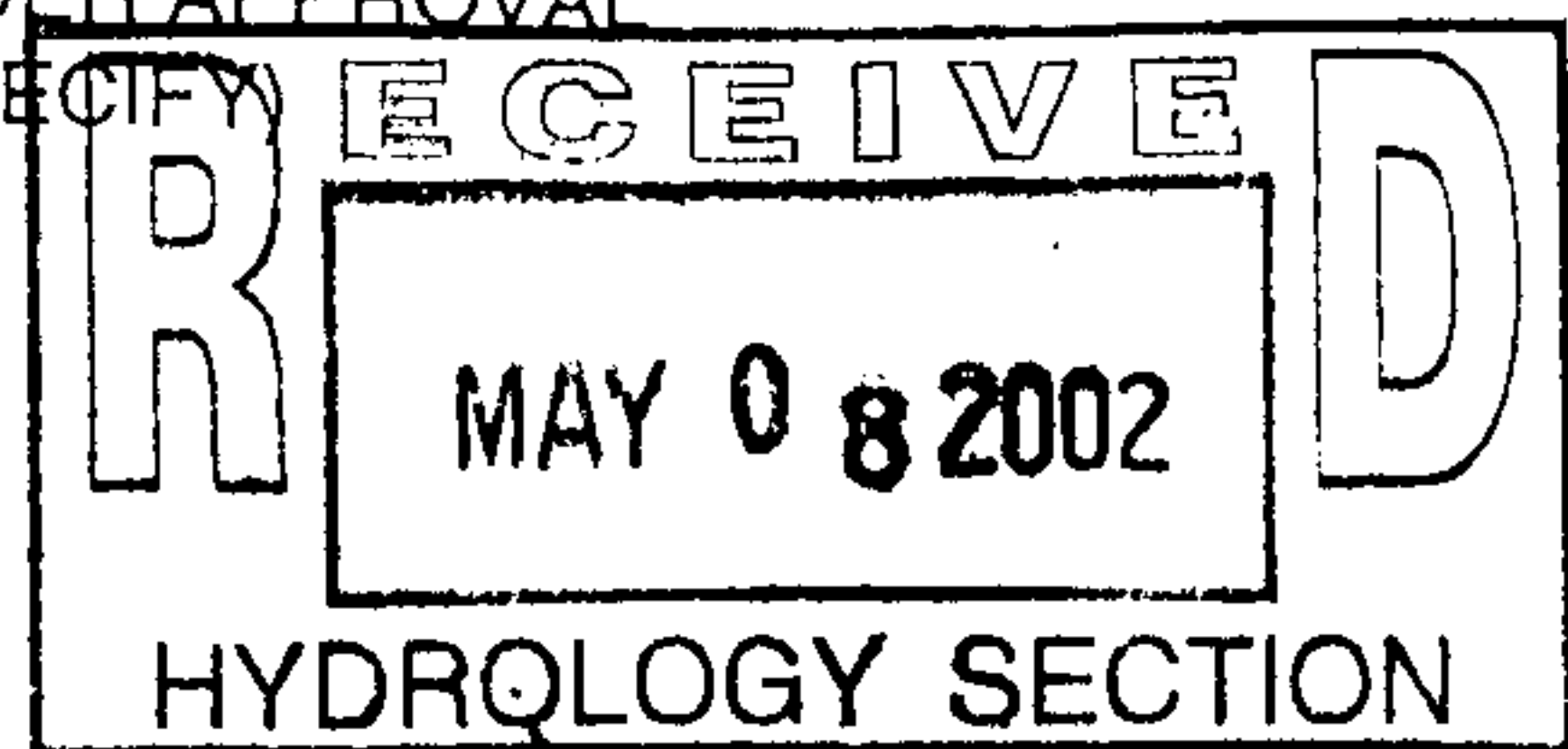
- ☒ DRAINAGE REPORT
- ☐ DRAINAGE PLAN
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☒ FOUNDATION PERMIT APPROVAL
- ☒ 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: 5.7.02 BY: DENNIS LORENZ

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 ten (10) lots or constituting five (5) acres or more.



BRASHER & LORENZ, INC.
CONSULTING ENGINEERS

2201 San Pedro NE Bldg 1 Suite 1200 • Albuquerque, NM 87110 • Phone (505) 888-6088 • Fax (505) 888-6188 • www.brasherlorenz.com

May 7, 2002

Carlos Montoya, PE
Hydrology Section
City of Albuquerque
Plaza Del Sol
Albuquerque, New Mexico 87102

SUBJECT: GE CAPITAL MODULAR SPACE
Tract 5A1-A, Volcano Business Park
Drainage File G10/D29F

Dear Carlos:

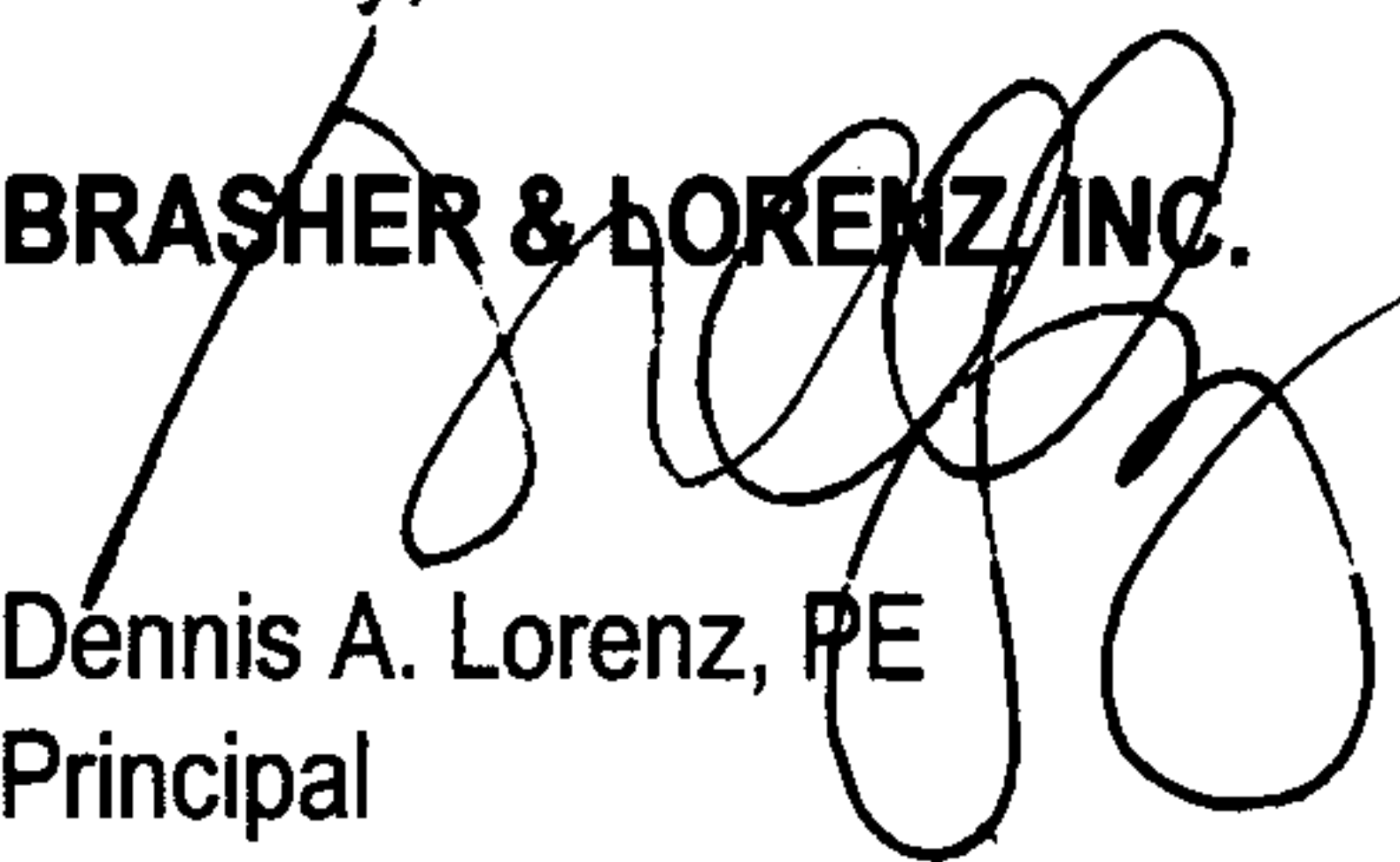
Submitted herewith for review and approval for building permit is one copy of the Grading and Drainage Plan for the subject project. The Plan has been revised to address your concerns, as discussed at our May 1, 2002 meeting. The Plan has been revised as follows:

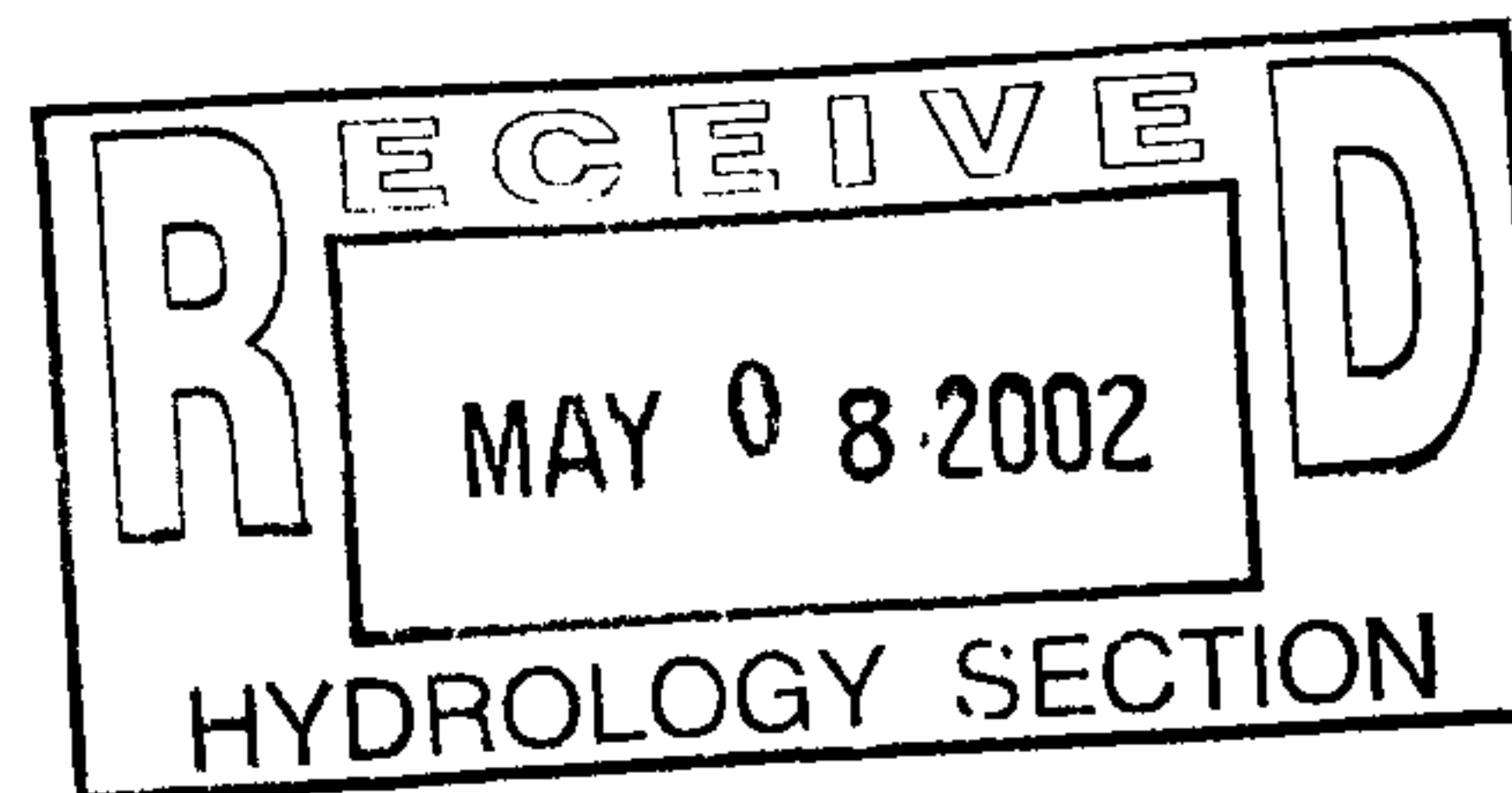
1. The off-site drainage basins have been verified, and revised as necessary. Figures 4 and 5 delineate the existing and developed off-site basins.
2. Ahymo and the infrastructure calculations have been revised to reflect the off-site basin adjustments. All ponds and drainage improvements function as intended.
3. The area drain details have been revised to recommend rural gratings to mitigate potential clogging (See Section "F" sheet C-2). The inlet calculations reflect the new grating design.
4. Landscaped swales are recommended to convey undeveloped off-site flows to the area drains (see Section "A", sheet C-1)

I hope this submittal adequately addresses your concerns. If you have any questions, or if I can be of any assistance, please feel free to call.

Sincerely,

BRASHER & LORENZ, INC.


Dennis A. Lorenz, PE
Principal



/dl/01512
encl

DRAINAGE REPORT

FOR

GE CAPITAL MODULAR SPACE

Tract 5A1, Volcano Business Park, Phase I, and
Tract 5A2-A1-1, Volcano Business Park, Phase II

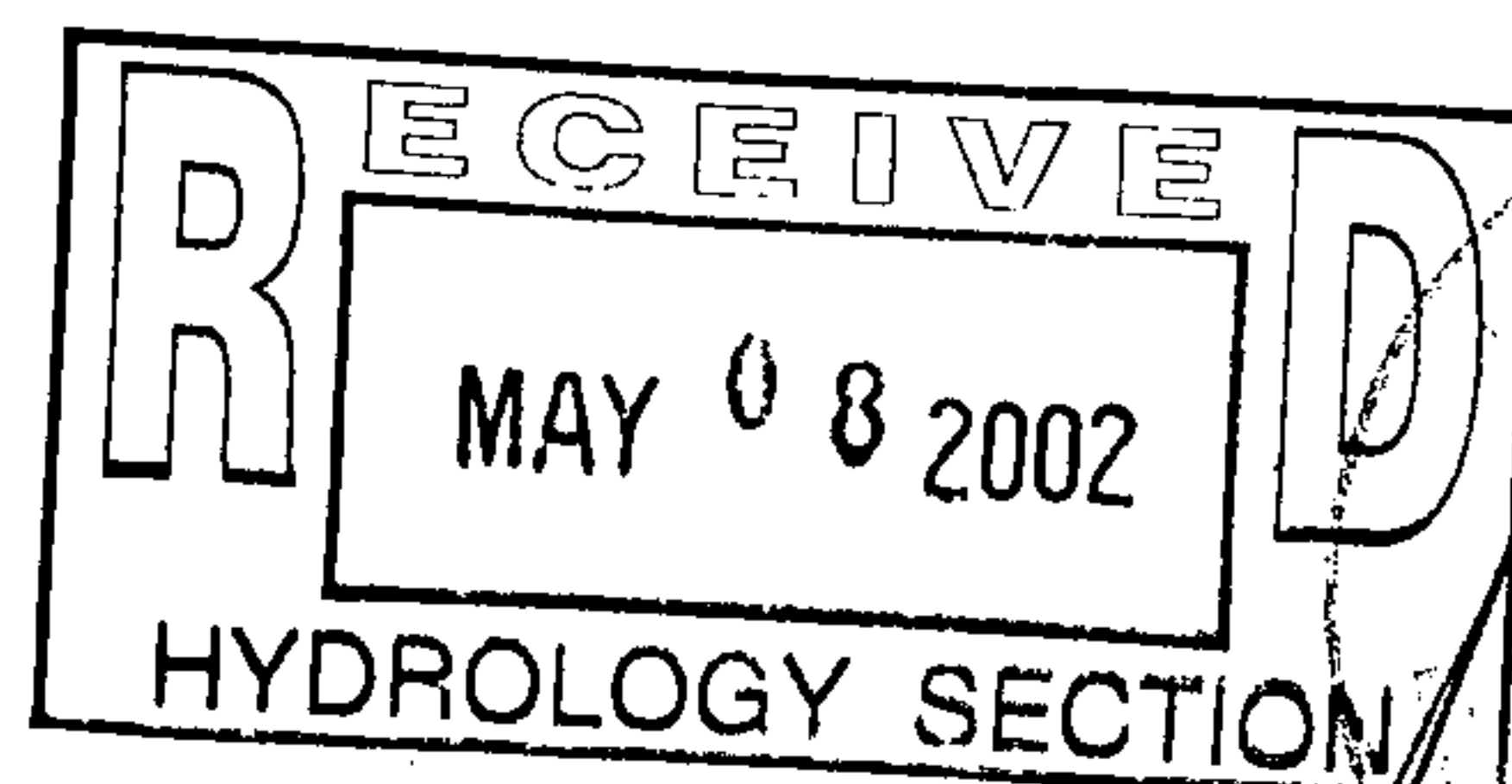
Albuquerque, New Mexico

Prepared By:

BRASHER & LORENZ, INC.

Consulting Engineers

2201 San Pedro NE, Building No. 1, Suite 220
Albuquerque, New Mexico 87110



Dennis A. Lorenz, PE
Principal

5.4.02

May 2002

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AHYMO OUTPUT FILES	
EXHIBITS	
GRADING AND DRAINAGE PLAN	POCKET
APPROVED DRAINAGE MASTERPLAN	POCKET
APPROVED GRADING AND DRAINAGE PLAN FOR GE CAPITAL MODULAR SPACE	POCKET

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The project consists of the development of the property for GE Capital Modular Space. Paving, landscaping, utility, grading, and drainage improvements will be provided to support the project. The scope of this plan is to provide drainage criteria for the safe management of excess runoff. The report is presented to obtain Site Plan for Subdivision approval, Amended Site Plan approval, and building Permit approval.

SITE DESCRIPTION

The project site is approximately 16.8 acres in size and is located on Painted Rock Drive NW, at Ouray Road NW (See Figure 1). Site terrain slopes west to east at approximately 2 percent. The site is presently described as a Tract 5A1, Volcano Business Park, Phase I and Tract 5A2-A1-1, Volcano Business Park, Phase II. The site is bounded on the north by Ouray Road, Painted Rock Drive, and on the south by a PNM switching Station, and on the west by undeveloped properties.

The project site consists of the existing GE Capital Modular Space facility, described as Tract 5A2-A1-1, Volcano Business Park, Phase II, and Tract 5A1, Volcano Business Park, Phase I, which is presently undeveloped. Tract 5A1 is to be subdivided into 2 tracts. The southerly 4.29-acre tract will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility.

EXISTING CONDITIONS

The site presently drains easterly to the Ouray Road storm system as follows:

1. Basin "A" is undeveloped and drains northeasterly through Basin "E" to Ouray Road. *Off-site drain*
2. Basins "B", "C" and "D" drain east into an existing private concrete channel located along the south side of the GE Capital site to Painted Rock Drive. Flows are then conveyed by street improvements to the Ouray storm drain.
3. Basin "E" drains northeasterly to Ouray Road.
4. Basin "F" represents a portion of the GE Capital site. This basin flows east to an existing detention pond that drains at a controlled rate of 7.3 cfs to Ouray Road NW near the intersection of Ouray. Runoff from this pond is intercepted by the Ouray storm drain.
5. Basin "G" represents the southern portion of the GE Capital site. This basin

flows north to an existing detention pond that drains at a controlled rate of 3.8 cfs to an existing concrete channel at the east end of the property line. Runoff from this pond will drain east within Todos Santos and intercepted by an existing storm drain which connects to the Ouray storm drain.

As shown by the attached FIRM Panel (Figure 3) this site does not lie within a designated flood hazard zone.

SUMMARY OF EXISTING DRAINAGE PLANS

Per the **Drainage Masterplan for Volcano Business Park, Phase II (G-10/D29)**, prepared by Brasher & Lorenz, Inc., 1-20-98, the site is required to implement on-site detention ponding. Per the DMP, the Basins "A", and "E" are limited to 2.2 cfs/acre, and Basins "B", "C", "D" and the GE Capital site are limited to 2.0 cfs/acre.

The DMP recommended the construction of certain infrastructure improvements to support the subdivision of Tract 5A1-A1 (DRB 97-450). Improvements to Ouray Road and Painted Rock Drive were constructed by public work order, City Project No. 5856.81. On-site improvements included an improved private channel along the south property line of the GE Capital site.

The **Grading and Drainage Plan for GE Capital**, prepared by Brasher & Lorenz, Inc., 7-8-98, was prepared for building permit purposes to support the GE Capital Modular Space project. Typical site improvements were recommended, along with 2 on-site detention ponds that limit developed discharge from the site to the limits established by the **Drainage Masterplan for Volcano Business Park, Phase II**.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the site for GE Capital Modular Space, a facility for lease and maintenance of portable buildings. Tract 5A1 is to be subdivided into 2 tracts. The southerly Tract 5A1-B, a 4.29-acre tract, will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility. Development will include paving, utility landscaping and drainage improvements. Tract 5A1-A, a 5.78-acre tract, will not be developed at this time.

In accordance with the approved Masterplans, the site will drain to on-site detention ponds. The ponds will route all excess runoff to Painted Rock Drive and Ouray Road at controlled rates established by the DMP, as follows:

1. Basin "A" will drain through the future access and drainage easement on Tract 5A1-A to Ouray Road. Developed discharge will be limited to 2.2 cfs/acre.
2. Basin "D", the GE Capital expansion site will route all flows through a detention

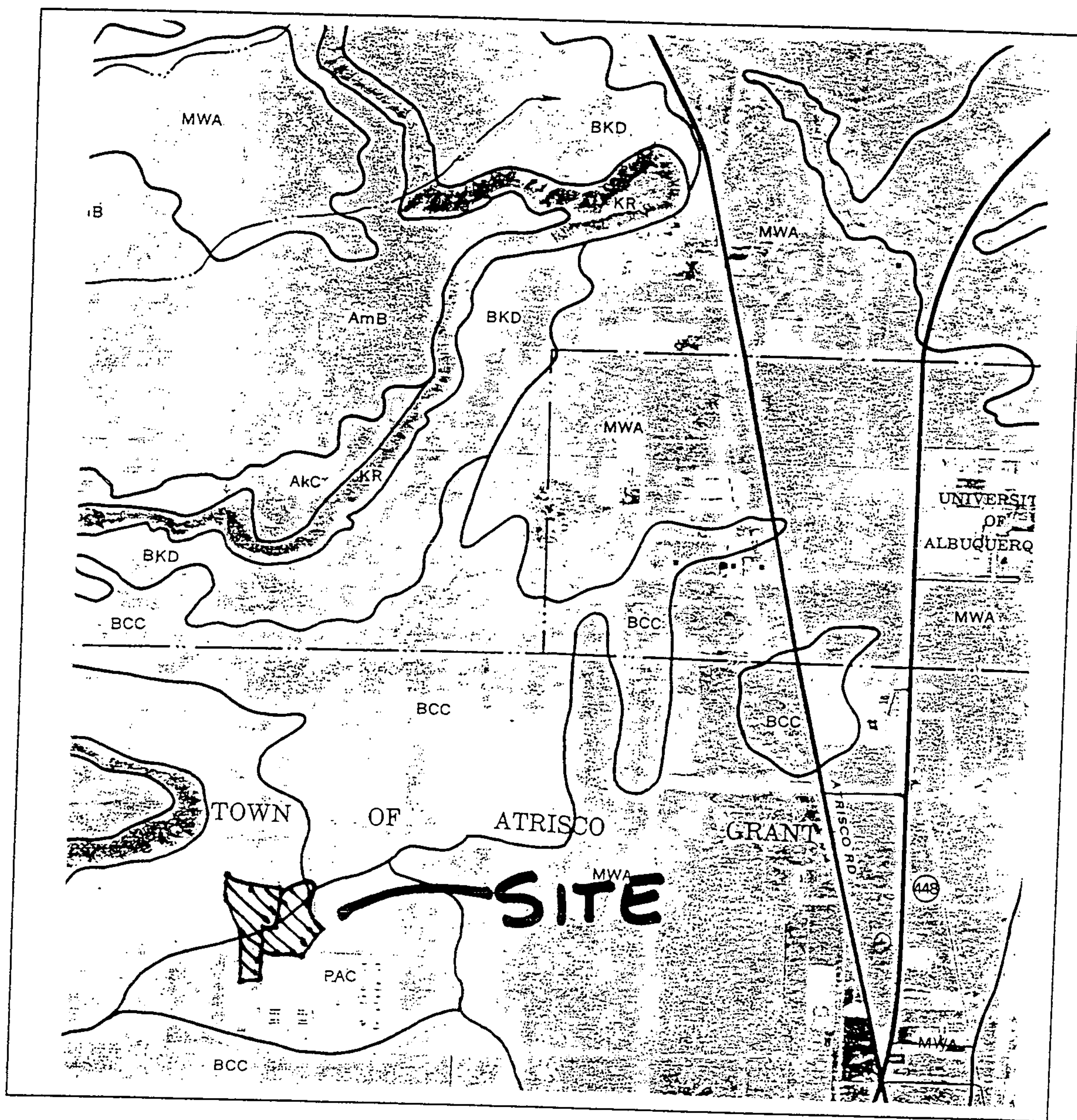
pond that drains to an existing private concrete channel at a controlled rate not to exceed 45.8 cfs. The channel drains to Painted Rock Drive, east to Todos Santos, then to the Ouray system. Per the DMP, the Basin "D" pond will accept developed flows from off-site Basins "B" and "C". Developed discharge from Basins "B" and "C" is limited to 2.0 cfs/acre.

3. Basin "E" will drain to a future detention pond to be located near the northeast tract corner. Developed discharge is limited to 2.2 cfs/acre.
4. Basins "F" and "G" represent the existing developed GE Capital site. Each basin routs developed runoff through existing detention ponds as described above.

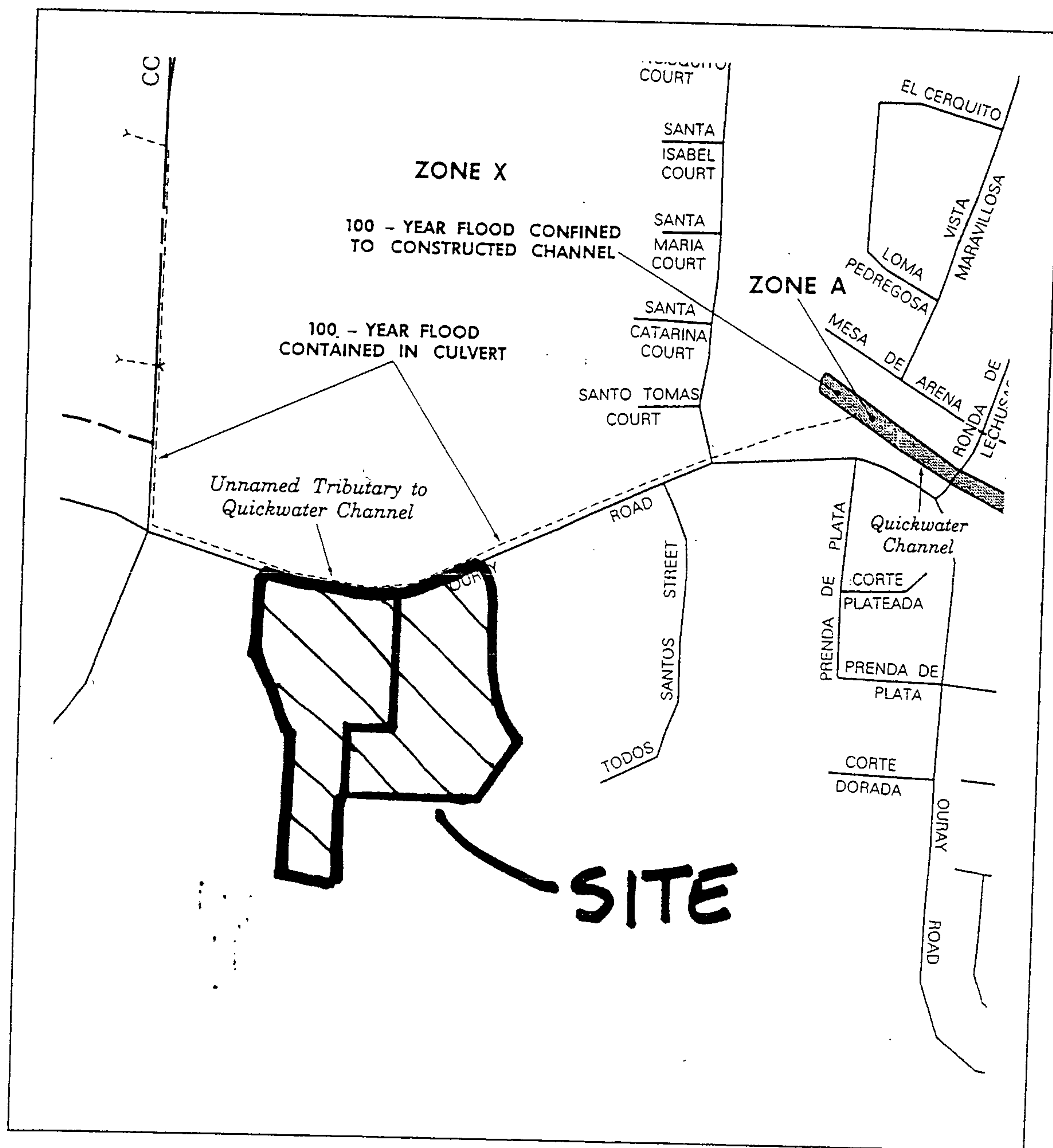
TEMPORARY EROSION CONTROL PLAN

1. The intent of the Temporary Erosion Control Plan is to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction. After the initial site clearing, the temporary erosion control facilities should be constructed to direct excess runoff and sediment to the detention pond sites. Earthen erosion control berms or silt fencing should then be placed along the downstream project boundaries to direct runoff to the project outfall.
2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.
3. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

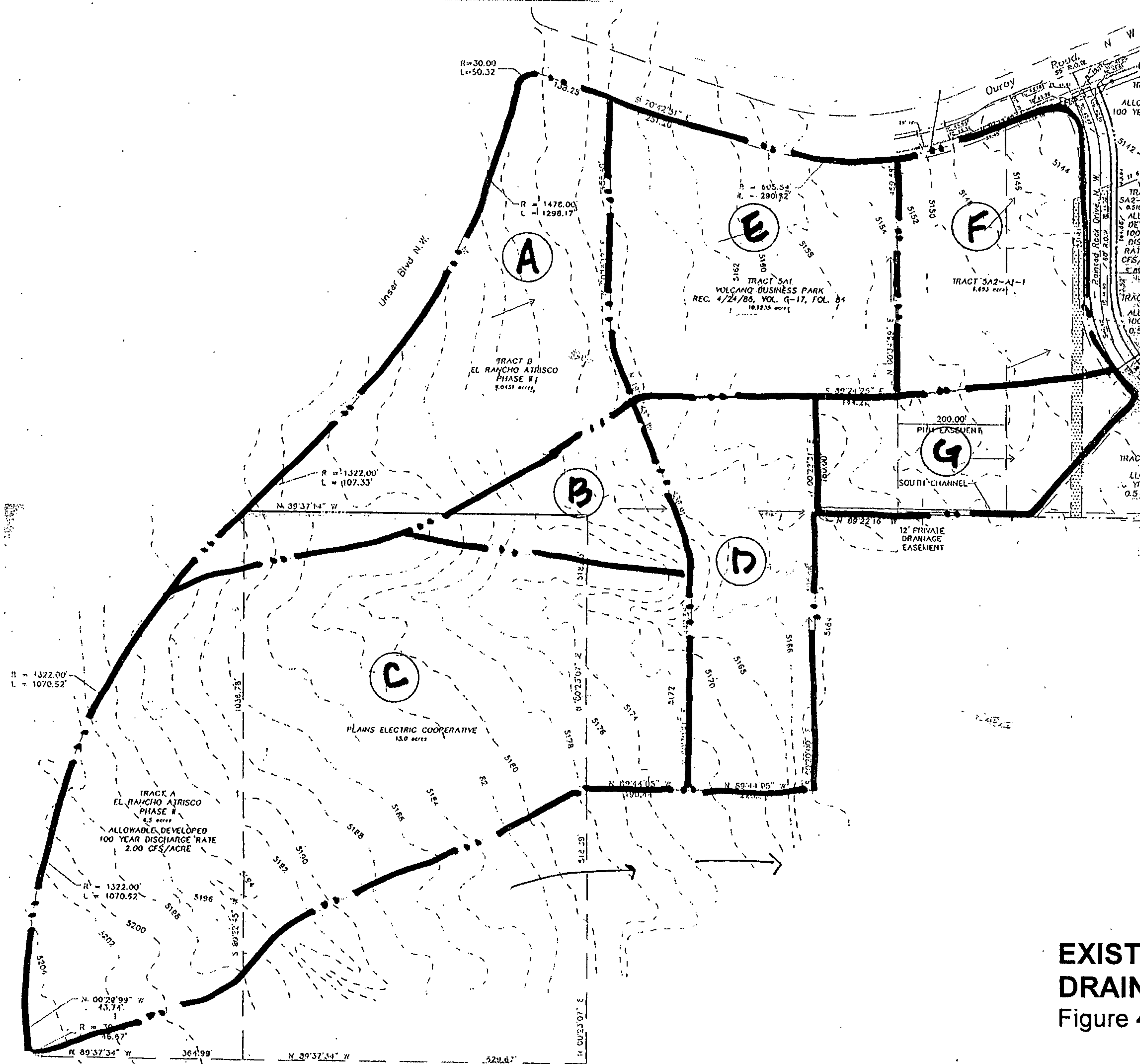
MAPS



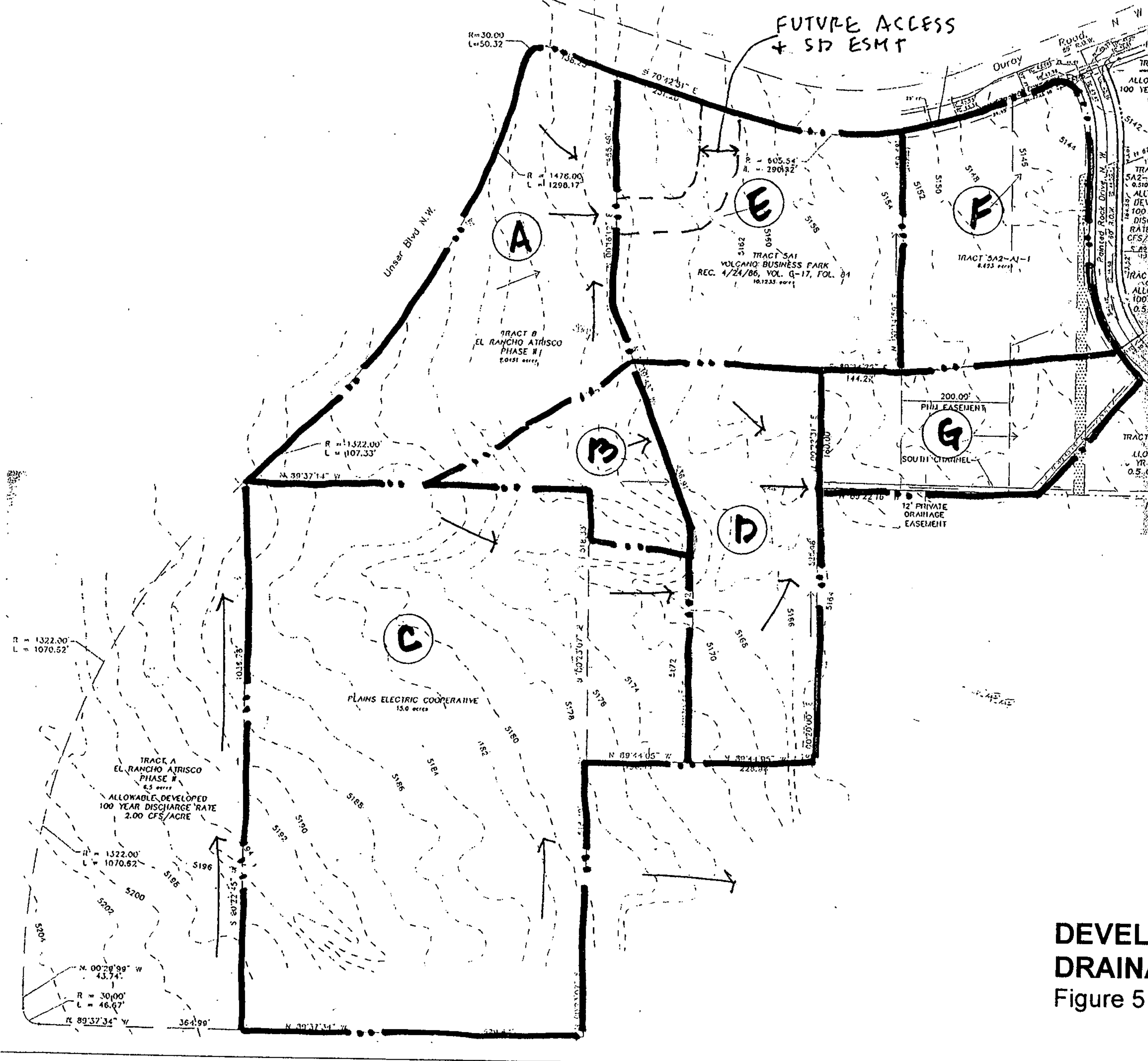
SOILS MAP
Figure 2



FLOOD INSURANCE RATE MAP
Figure 3



**EXISTING CONDITIONS
DRAINAGE BASINS MAP**
Figure 4



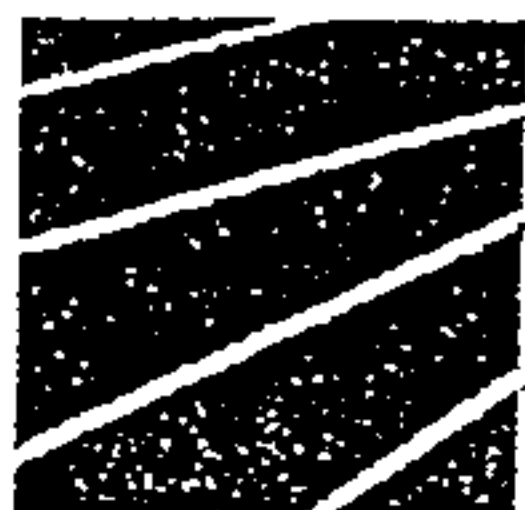
**DEVELOPED CONDITIONS
DRAINAGE BASINS MAP**
Figure 5

CALCULATIONS

INFRASTRUCTURE CAPACITIES

GE CAPITAL MODULAR SPACE
HYDROLOGY SUMMARY

BASIN	AREA	Aa	Ab	Ac	Ad	Q100	q allow	Q allow
	area	%	%	%	%	cfs	cfs/ac	cfs
EXISTING CONDITIONS								
A	6.70	100	0	0	0	8.7	NA	NA
B	2.10	100	0	0	0	2.7	NA	NA
C	17.10	100	0	0	0	22.2	NA	NA
D	4.29	100	0	0	0	5.6	NA	NA
E	5.78	100	0	0	0	7.5	NA	NA
F	4.00	0	7	8	85	16.4	2.2	8.8
G	2.69	0	7	8	85	12.1	2.0	5.4
DEVELOPED CONDITIONS								
A	6.30	0	7	8	85	25.7	2.2	13.9
B	1.70	0	7	8	85	7.0	2.0	3.4
C	16.90	0	7	8	85	69.0	2.0	33.8
D	4.29	0	7	8	85	16.4	2.0	8.6
E	5.78	0	7	8	85	23.6	2.2	12.7
F	4.00	0	7	8	85	16.4	2.2	8.8
G	2.69	0	7	8	85	12.1	2.0	5.4



① BASIN 'B' DROP INLET + SD.

(A) DROP INLET

$$Q_{100} = 2.7 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 7.0 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (1.7 AC)} = 3.4 \text{ CFS}$$

$$\text{DESIGN FOR } Q_{ALLOW} = 3.4 \text{ CFS}$$

USE SINGLE "B" INLET - CAPACITY $\gg$ 3.4 CFS

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 3.4 \text{ CFS}$$

USE 18" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD

② BASIN 'C' DROP INLET + SD

(A) DROP INLET

$$Q_{100} = 22.2 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 69.0 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (16.9 AC)} = 33.8 \text{ CFS}$$

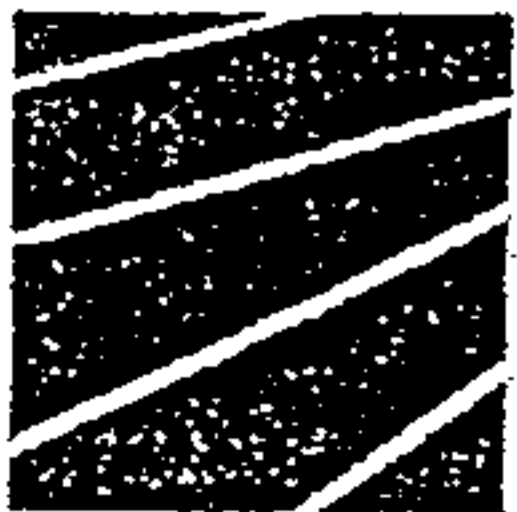
$$\text{DESIGN FOR } Q_{ALLOW} = 33.8 \text{ CFS}$$

USE DOUBLE "D" INLET - CAPACITY $\gg$ CFS

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 33.8 \text{ CFS}$$

USE 30" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD



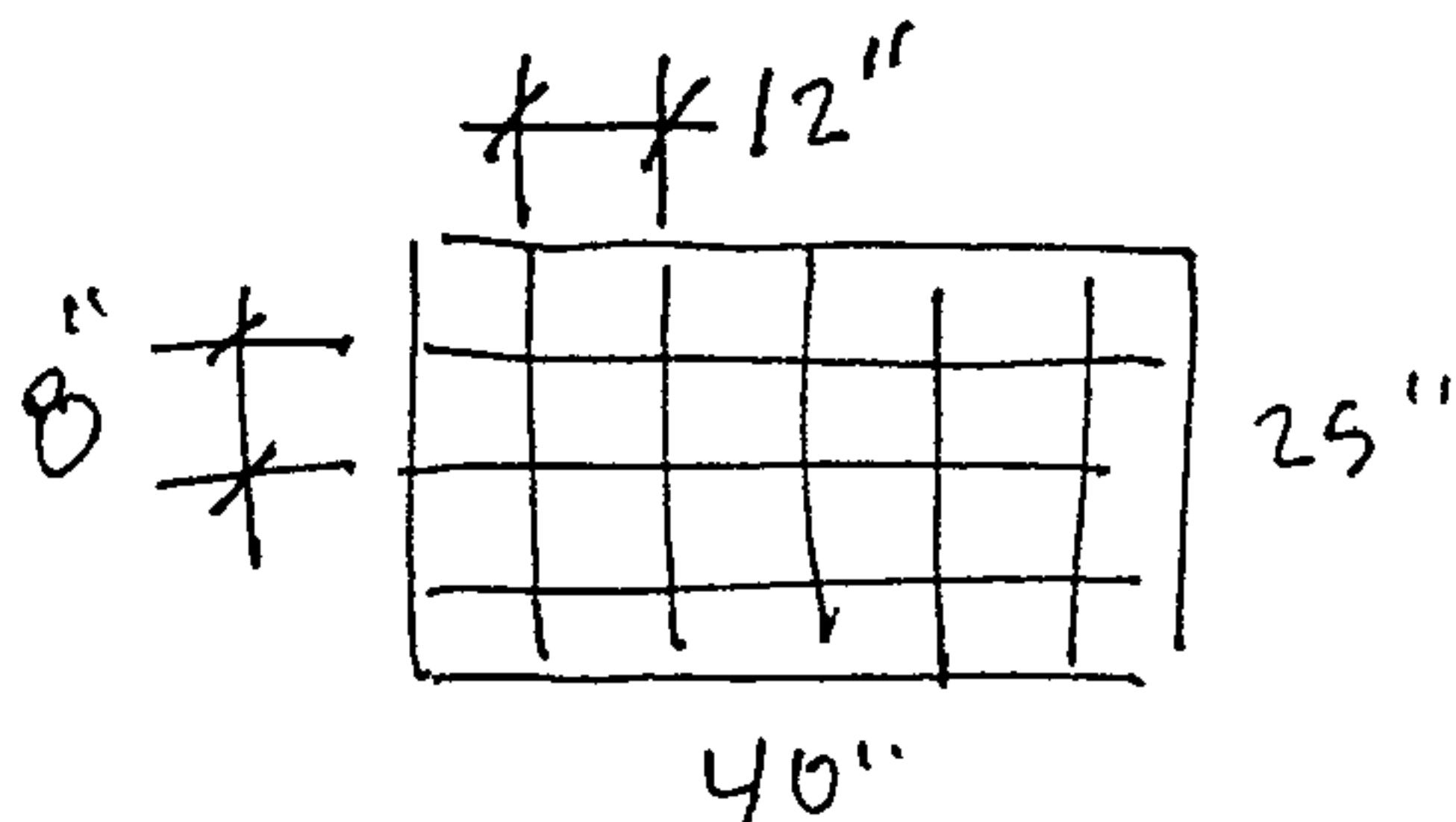
BRASHER & LORENZ
CONSULTING ENGINEERS

2201 San Pedro NE Building 1 Suite 220
Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

PROJECT GE CAPITAL
DATE 10.23.01 PAGE 2

(3) TYPE "D" GRATINGS CAPACITY
VERIFY 1.A + 2.A

PER COA STD DETAILS



MODIFIED
SINGLE GRATE
 $P = 130'' = 10.83'$
OPEN $A = 6.42$ SF

FIND MAX Q AT $H = 1'$ OVER GRATE:

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

$$h = 1.0'$$
$$g = 32.2 \text{ F/s}^2$$
$$A = 6.42 \text{ SF}$$
$$C = 0.60$$

$$Q = 0.6(4.31) \sqrt{2g(0.5)}$$
$$= 30.9 \text{ CFS / GRATE}$$

⇒ FOR BASIN (B) USE SINGLE "D"
BASIN (C) USE DOUBLE "D"



(3A) TYPE 'D' INLET GRATING CAPACITY.
- CONTINUED -

VERIFY BY WEIR: $Q = CLH^{3/2}$

$$C = 2.70$$

$$L = P = 10.83 \text{ D.S.}$$

$$17.50 \text{ D.DBL}$$

BASIN	Q_{100}	INLET	P	H	H _{AVAIL}
B	3.4	D.S	10.83'	0.24'	1.00'
C	33.8	D.DBL	17.50'	0.80'	1.00'

OK IN EA CASE

CHECK FOR CLOGGING:

AT $H_{MAX} \Rightarrow Q_{MAX} = 29.2 \text{ cfs}$ D.S. BASIN B
 47.3 cfs D.DBL BASIN C

FACTOR OF SAFETY AGAINST CLOGGING

(1) ^{DEV} COMB. USE 25% REDUCTION

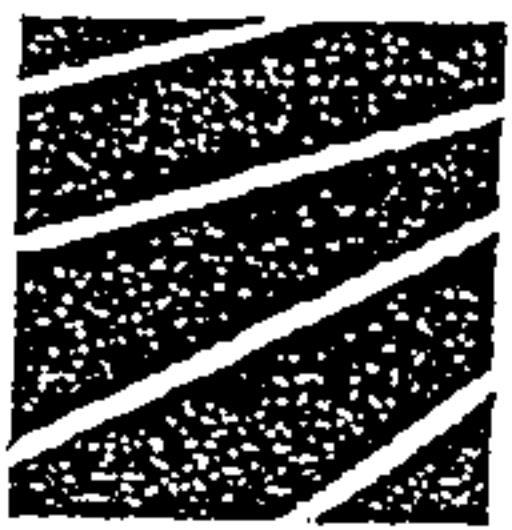
$$\Rightarrow \text{BASIN 'B'} \quad Q_{INLET} = 0.75(29.2) = 21.9 \text{ cfs} > Q_{100}$$

$$\text{BASIN 'C'} \quad Q_{INLET} = 0.75(47.3) = 35.5 \text{ cfs} > Q_{100}$$

(2) ^{UNDEV} COMB. USE 50% REDUCTION

$$\Rightarrow \text{BASIN 'B'} \quad Q_{INLET} = 0.50(29.2) = 14.6 \text{ cfs} > Q_{100}$$

$$\text{BASIN 'C'} \quad Q_{INLET} = 0.50(47.3) = 23.7 \text{ cfs} > Q_{100}$$



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Albuquerque, New Mexico 87110
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PROJECT GE CAPITAL
DATE 10.23.01 PAGE 3

(14) SD CAPACITY

SEWER PIPES

Enter up to 10 pipes.

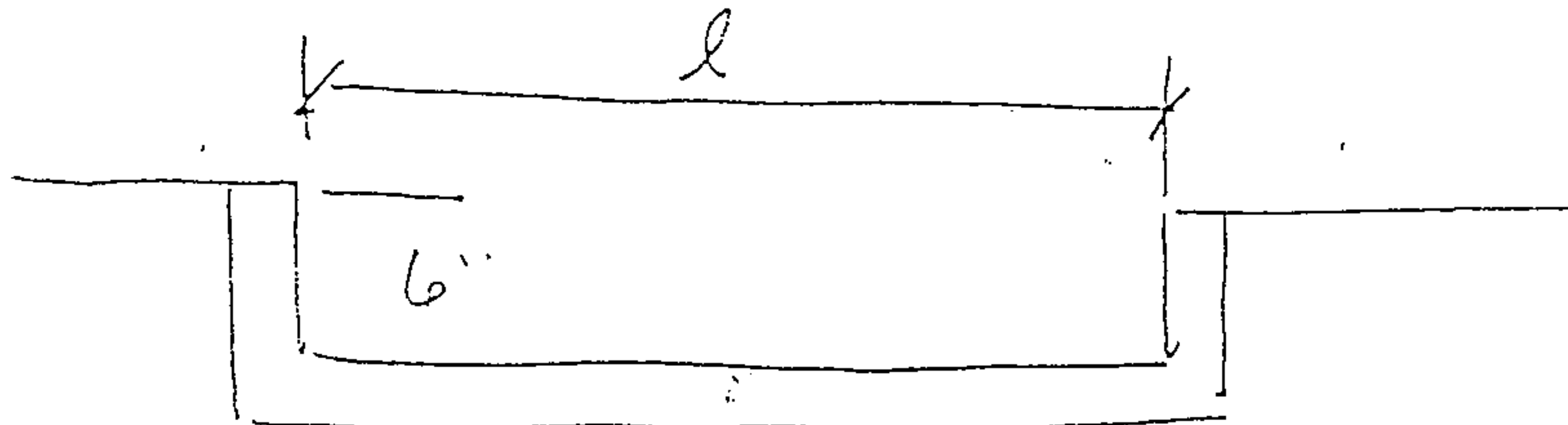
Enter <Return> only for flowrate and diameter to end.

	FLOWRATE (CFS)	DIAMETER (IN)	FRICTION (FT ^{1/6})	SLOPE (%)	VELOCITY (FPS)
BASIN 'B'	3.40	13.59	0.0120	0.40	3.38
BASIN 'C'	33.80	29.80	0.0120	0.60	6.98

USE 18" SD BASIN 'B'
30" SD BASIN 'C'

(5) POMS INLET RUNDOWN

$Q_{100} = 16.4$ CFS BASIN "D"

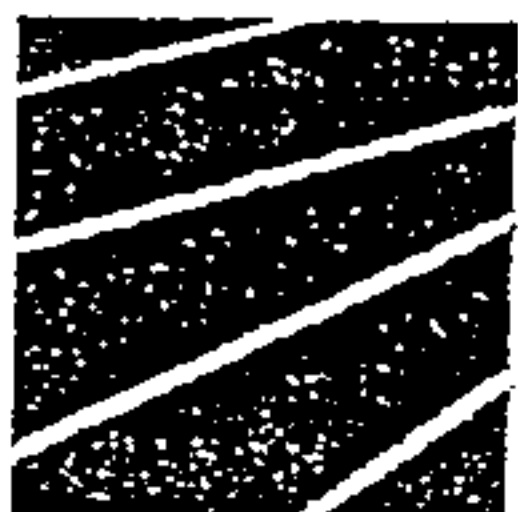


WEIRS

Enter up to 10 weirs.

Enter <Return> only for flowrate and length to end.

FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
16.40	15.5	3.000	0.50



BRASHER & LORENZ
CONSULTING ENGINEERS

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Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

PROJECT GE CAPITAL
DATE 10-23-01 PAGE 4

⑥ POND ROUTING

① BASIN "b"

SIZE POND FOR OFF-SITE BASINS B+C

$$Q_{\text{ALLOW}} = 2.0 \text{ CFS/AC} \\ = 2.0 (1.7 + 16.9) = 37.2 \text{ CFS}$$

$$+ Q_{\text{ALLOW}} \text{ BASIN "b"} \\ = 2.0 (4.29) = 8.6 \text{ CFS}$$

$$\text{TOTAL } Q_{\text{ALLOW}} = 45.8 \text{ CFS}$$

USE 2.10" OUTLET PIPES THAT DRAIN TO
EXIST CONC CHANNEL:

ROUTE RES TABLE

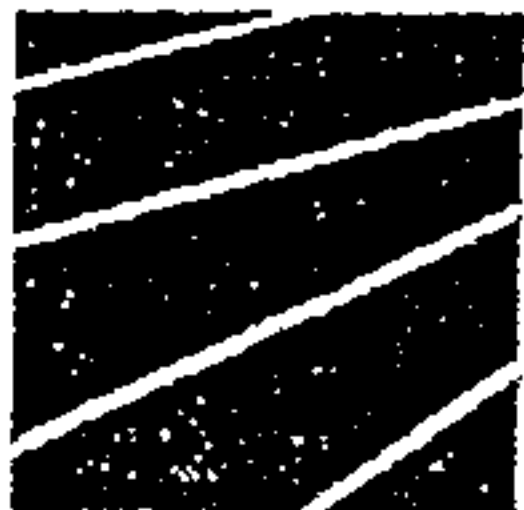
ELEV	HW/D	Q _{OUT}	VOL
62	0	0 CFS	0 AC·FT
63	0.67	7	0.0777
64	1.33	18	0.1774
65	2.00	24	0.3017
66	2.67	32	0.4529

PER ATTY MO:

$$Q_{\text{OUT}} = 20.4 \text{ CFS}$$

$$VOL = 18,348 \text{ CF}$$

$$WSE = 65.8$$



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PROJECT
DATE

GE CAPITAL

10.23.01

PAGE 5

(B) BASIN "E"

SIZE CONCEPTUAL POMS FOR FUTURE
DEVELOPMENT.

$$Q_{ALLOW} = 2.2 \text{ CFS/AC} \\ = 2.2 (5.78) = 12.7 \text{ CFS}$$

USE 15" PIPE THAT DRAINS TO OURAY.

ELEV	HW/D	Q _{OUT}	VOL
50	0	0 CFS	0 AC-FT
51	0.8	3	0.12
52	1.6	7	0.24
53	2.4	10	0.36
54	3.2	12	0.48

PER ALTYMO:

$$Q_{OUT} = 9.7 \text{ CFS}$$

$$VOL = 15,080 \text{ CF}$$

$$WSE = 52.9$$

trol were developed. These nomographs give headwater-discharge relationships for most conventional culverts flowing with inlet control through a range of headwater depths or discharges. An example of these nomographs is shown in Figure 3.25.

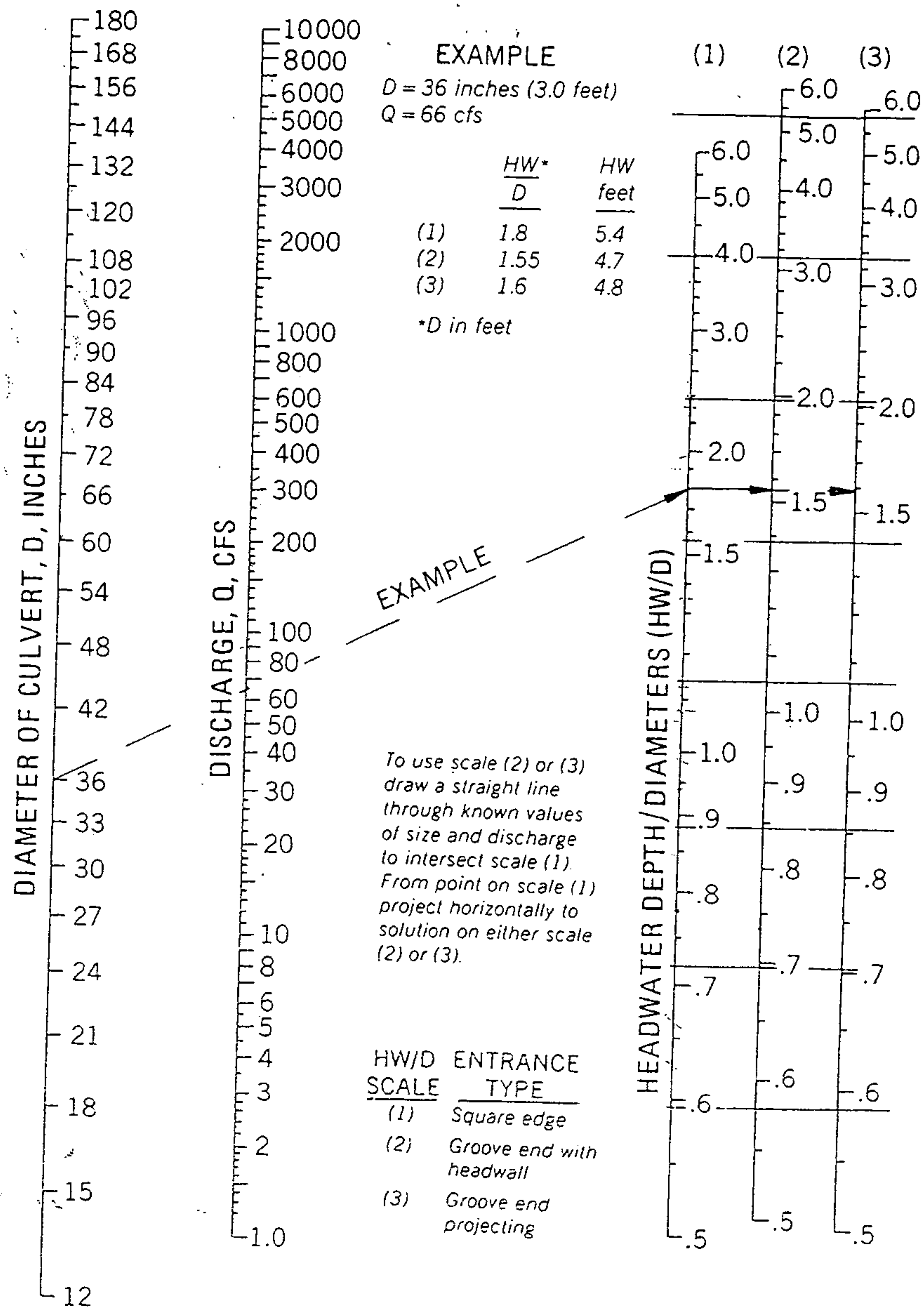
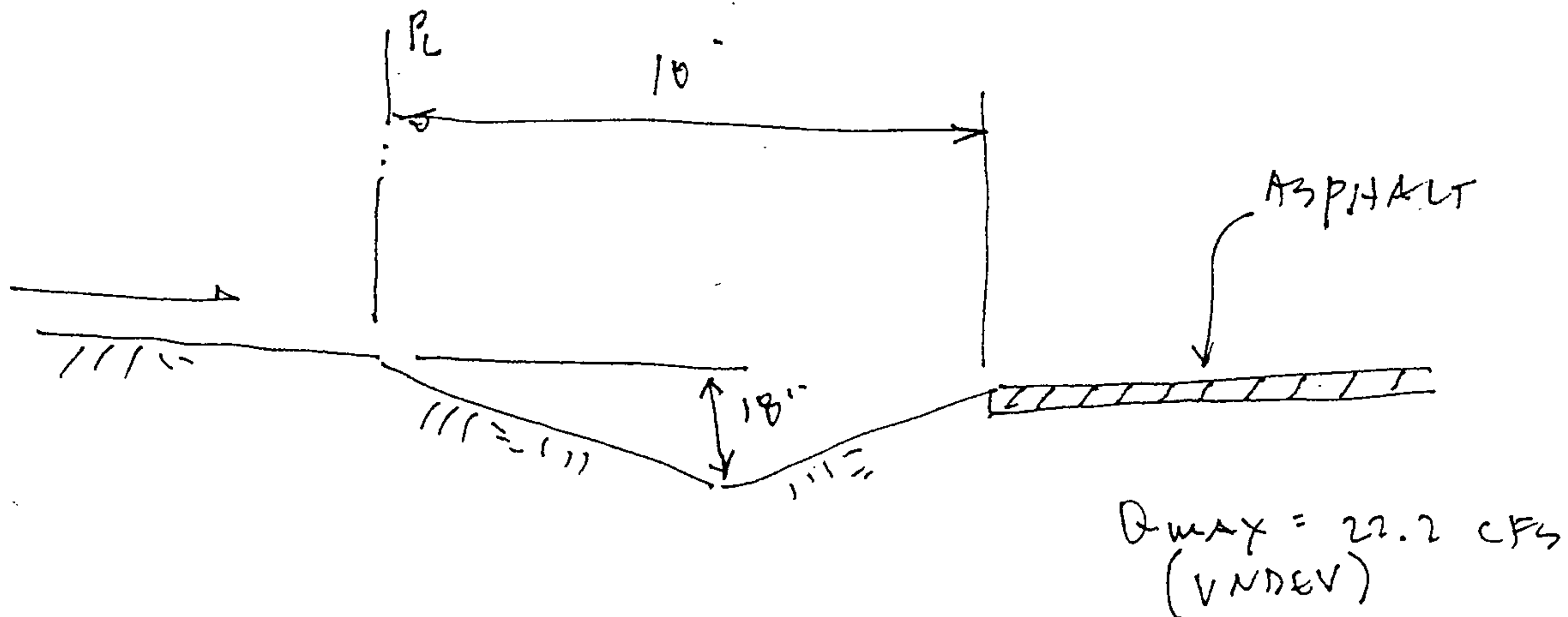


Figure 3.25. Headwater Depth for Circular Concrete Pipe Culverts with Inlet Control.



- ⑦ INTERIM SWALE @ W. P_L
CONSTRUCT SWALE TO CONVEY UNDEV
OFF-SITE FLOWS TO AREA DRAINS



SECTION

NATURAL CHANNELS

VARIABLES LIST:

Y - FLOW ELEVATION

Q - FLOWRATE

S - CHANNEL SLOPE

VARIABLE TO BE SOLVED (Y, Q OR S) ? Y

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

Q (CFS) ? 22.2
S (FT/FT) ? .01

CROSS-SECTION POINTS

DIST	ELEV	COEFF	DIST	ELEV	COEFF
0	101.5	.025			
5	100	.025			
10	101.5	.025			

RESULTS

=====

Y= 101.25 FT
A= 5.25 SF
P= 8.73 FT
V= 4.23 FPS
F= 0.94 SUB-CRITICAL FLOW

AHYMO OUTPUT FILES

```
*****
*          GE CAPITAL MODULAR SPACE
*          PROJECT HYDROLOGY
*****
START      TIME=0.0 PUNCH CODE=0
RAINFALL   TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
           RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS
*****
* EXISTNG CONDITIONS
*****
* UNDEVELOPED BASIN A - 6.7 ACRES
COMPUTE NM HYD ID=1 HYD NO=A.EX DA=0.010467 SQ MI
           PER A=100 PER B=0 PER C=0 PER D=0
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=1 CODE=20
* UNDEVELOPED BASIN B - 2.1 ACRES
COMPUTE NM HYD ID=2 HYD NO=B.EX DA=0.003281 SQ MI
           PER A=100 PER B=0 PER C=0 PER D=0
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=2 CODE=20
* UNDEVELOPED BASIN C - 17.1 ACRES
COMPUTE NM HYD ID=3 HYD NO=C.EX DA=0.02672 SQ MI
           PER A=100 PER B=0 PER C=0 PER D=0
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=3 CODE=20
* UNDEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD ID=4 HYD NO=D.EX DA=0.006703 SQ MI
           PER A=100 PER B=0 PER C=0 PER D=0
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=4 CODE=20
* UNDEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD ID=5 HYD NO=E.EX DA=0.009031 SQ MI
           PER A=100 PER B=0 PER C=0 PER D=0
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=5 CODE=20
* EXISTING DEVELOPED BASIN F - 4.00 ACRES
COMPUTE NM HYD ID=6 HYD NO=F.EX DA=0.006250 SQ MI
           PER A=0 PER B=7 PER C=8 PER D=85
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=6 CODE=20
* EXISTING DEVELOPED BASIN G - 2.69 ACRES
COMPUTE NM HYD ID=7 HYD NO=G.EX DA=0.004633 SQ MI
           PER A=0 PER B=7 PER C=8 PER D=85
           TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=7 CODE=20
*****
*DEVELOPED CONDITIONS
```

* DEVELOPED BASIN A - 6.3 ACRES

COMPUTE NM HYD ID=8 HYD NO=A.DEV DA=0.009844 SQ MI

PER A=0 PER B=7 PER C=8 PER D=85

TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=8 CODE=20

* DEVELOPED BASIN B - 1.7 ACRES

COMPUTE NM HYD ID=9 HYD NO=B.DEV DA=0.002656 SQ MI

PER A=0 PER B=7 PER C=8 PER D=85

TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=9 CODE=20

* DEVELOPED BASIN C - 16.9 ACRES

COMPUTE NM HYD ID=10 HYD NO=C.DEV DA=0.02641 SQ MI

PER A=0 PER B=7 PER C=8 PER D=85

TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=10 CODE=20

* DEVELOPED BASIN D - 4.29 ACRES

COMPUTE NM HYD ID=11 HYD NO=D.DEV DA=0.006273 SQ MI

PER A=0 PER B=7 PER C=8 PER D=85

TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=11 CODE=20

* DEVELOPED BASIN E - 5.78 ACRES

COMPUTE NM HYD ID=12 HYD NO=E.DEV DA=0.009031 SQ MI

PER A=0 PER B=7 PER C=8 PER D=85

TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=12 CODE=20

ADD HYD ID=13 HYD NO=B&C.EX ID I=2 ID II=3

PRINT HYD ID=13 CODE=20

ADD HYD ID=14 HYD NO=B&C&D.DEV ID I=11 ID II=13

PRINT HYD ID=14 CODE=20

* ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO

* EXISTING CHANNEL PER DMP. ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 45.8 CFS

ROUTE RESERVOIR ID=15 HYD NO=POND'D'.OUT INFLOW ID=14 CODE=10

OUT (CFS) STORAGE (AC-FT) ELEV (FT)

0 0 62.0

7.50 0.0777 63.0

13.5 0.1774 64.0

18.0 0.3017 65.0

21.0 0.4529 66.0

PRINT HYD ID=15 CODE=20

* ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP

* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN

* THIS IS AN EXAMPLE CALCULATION. EXACT POND DESIGN TO BE DETERMINED AT

* TIME OF DEVELOPMENT

ROUTE RESERVOIR ID=16 HYD NO=POND'E'.OUT INFLOW ID=12 CODE=10

OUT (CFS) STORAGE (AC-FT) ELEV (FT)

0	0	50.0
3.00	0.1200	51.0
7.00	0.2400	52.0
10.0	0.3600	53.0
12.0	0.4800	54.0

PRINT HYD ID=16 CODE=20

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)

* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.

* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 8.8 CFS FOR BASIN

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10

OUT (CFS) STORAGE (AC-FT) ELEV (FT)

0	0	43.5
1.48	0.0262	44.0
5.45	0.0968	45.0
7.57	0.2125	46.0

PRINT HYD ID=17 CODE=20

* ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP

* ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10

OUT (CFS) STORAGE (AC-FT) ELEV (FT)

0	0	50.0
2.69	0.1271	51.0
4.59	0.2772	52.0

PRINT HYD ID=18 CODE=20

FINISH

RUN DATE (MON/DAY/YR) =05/06/2002
USER NO.= AHYMO-I-9702c01000T35-AH

TIME=	.00
RAIN6=	2.200
PER IMP=	.00
PER IMP=	.00
PER IMP=	.00
PER IMP=	.00
PER IMP=	.00
PER IMP=	85.00
PER IMP=	85.00
PER IMP=	85.00
PER IMP=	85.00
PER IMP=	85.00
PER IMP=	85.00
PER IMP=	85.00
AC-FT=	.421
AC-FT=	.346
AC-FT=	.199
AC-FT=	.210

AHYMO PROGRAM (AHYMO_97) -

- Version: 1997.02d

RUN DATE (MON/DAY/YR) = 05/06/2002

START TIME (HR:MIN:SEC) = 11:12:06

USER NO.= AHYMO-I-9702c01000T35-AH

INPUT FILE = C:\AHYMO\01512-D.TXT

* GE CAPITAL MODULAR SPACE
* PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033330 HOURS	END TIME =	5.999400 HOURS
.0000	.0016	.0033	.0050
.0122	.0141	.0160	.0180
.0266	.0289	.0312	.0337
.0443	.0472	.0502	.0534
.0675	.0715	.0758	.0809
.1334	.1771	.2398	.3254
.9780	1.1804	1.2649	1.3363
1.5600	1.6061	1.6493	1.6900
1.8314	1.8623	1.8915	1.9193
1.9630	1.9682	1.9732	1.9780
1.9953	1.9993	2.0031	2.0068
2.0207	2.0240	2.0272	2.0303
2.0420	2.0448	2.0475	2.0502
2.0605	2.0629	2.0653	2.0677
2.0768	2.0790	2.0812	2.0833
2.0916	2.0936	2.0956	2.0976
2.1051	2.1070	2.1088	2.1106
2.1176	2.1193	2.1210	2.1227
2.1292	2.1308	2.1324	2.1340
2.1401	2.1416	2.1431	2.1446
2.1504	2.1518	2.1532	2.1546
2.1600	2.1614	2.1627	2.1640
2.1692	2.1705	2.1718	2.1731
2.1780	2.1792	2.1804	2.1817
2.1864	2.1876	2.1887	2.1899
2.1944	2.1956	2.1967	2.1978
			2.1989
			2.2000

* EXISTNG CONDITIONS

* UNDEVELOPED BASIN A - 6.7 ACRES
COMPUTE NM HYD ID=1 HYD NO=A.EX DA=0.010467 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764

UNIT PEAK = 21.479 CFS UNIT VOLUME = .9990 B = 273.54 P60 = 1.8700
AREA = .010467 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=20

HYDROGRAPH FROM AREA A.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.8	3.333	.1				

RUNOFF VOLUME = .43925 INCHES = .2452 ACRE-FEET
PEAK DISCHARGE RATE = 8.69 CFS AT 1.533 HOURS BASIN AREA = .0105 SQ. MI.

* UNDEVELOPED BASIN B - 2.1 ACRES

COMPUTE NM HYD ID=2 HYD NO=B.EX DA=0.003281 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 6.7329 CFS UNIT VOLUME = .9975 B = 273.54 P60 = 1.8700
AREA = .003281 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=20

HYDROGRAPH FROM AREA B.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.1	4.000	.0		
.667	.0	2.000	.3	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .0769 ACRE-FEET
PEAK DISCHARGE RATE = 2.73 CFS AT 1.533 HOURS BASIN AREA = .0033 SQ. MI.

* UNDEVELOPED BASIN C - 17.1 ACRES

COMPUTE NM HYD ID=3 HYD NO=C.EX DA=0.02672 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 54.832 CFS UNIT VOLUME = .9994 B = 273.54 P60 = 1.8700
AREA = .026720 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=3 CODE=20

HYDROGRAPH FROM AREA C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.5	4.000	.0		
.667	.0	2.000	2.1	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .6260 ACRE-FEET
PEAK DISCHARGE RATE = 22.18 CFS AT 1.533 HOURS BASIN AREA = .0267 SQ. MI.

* UNDEVELOPED BASIN D - 4.29 ACRES

COMPUTE NM HYD ID=4 HYD NO=D.EX DA=0.006703 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 13.755 CFS UNIT VOLUME = .9986 B = 273.54 P60 = 1.8700
AREA = .006703 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=4 CODE=20

HYDROGRAPH FROM AREA D.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.1	4.000	.0		
.667	.0	2.000	.5	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .1570 ACRE-FEET
PEAK DISCHARGE RATE = 5.57 CFS AT 1.533 HOURS BASIN AREA = .0067 SQ. MI.

* UNDEVELOPED BASIN E - 5.78 ACRES

COMPUTE NM HYD ID=5 HYD NO=E.EX DA=0.009031 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 18.533 CFS UNIT VOLUME = .9989 B = 273.54 P60 = 1.8700
AREA = .009031 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=5 CODE=20

HYDROGRAPH FROM AREA E.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.7	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .2116 ACRE-FEET
 PEAK DISCHARGE RATE = 7.50 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING DEVELOPED BASIN F - 4.00 ACRES
 COMPUTE NM HYD ID=6 HYD NO=F.EX DA=0.006250 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 20.974 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005313 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.5086 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
 AREA = .000938 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA F.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.6	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 16.35 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* EXISTING DEVELOPED BASIN G - 2.69 ACRES
 COMPUTE NM HYD ID=7 HYD NO=G.EX DA=0.004633 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 15.548 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
 AREA = .003938 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 1.8596 CFS UNIT VOLUME = .9932 B = 356.70 P60 = 1.8700
AREA = .000695 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA G.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	2.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	3.4	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4434 ACRE-FEET
PEAK DISCHARGE RATE = 12.12 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*DEVELOPED CONDITIONS

* DEVELOPED BASIN A - 6.3 ACRES
COMPUTE NM HYD ID=8 HYD NO=A.DEV DA=0.009844 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 33.035 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
AREA = .008367 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 3.9512 CFS UNIT VOLUME = .9970 B = 356.70 P60 = 1.8700
AREA = .001477 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=20

HYDROGRAPH FROM AREA A.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.0	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	7.3	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .9422 ACRE-FEET
PEAK DISCHARGE RATE = 25.74 CFS AT 1.500 HOURS BASIN AREA = .0098 SQ. MI.

* DEVELOPED BASIN B - 1.7 ACRES
 COMPUTE NM HYD ID=9 HYD NO=B.DEV DA=0.002656 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 8.9131 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
 AREA = .002258 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 1.0661 CFS UNIT VOLUME = .9877 B = 356.70 P60 = 1.8700
 AREA = .000398 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA B.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	1.6	4.000	.0	5.999	.0		
.667	.0	2.666	.1	4.666	.0	6.666	.0		
1.333	2.0	3.333	.0	5.333	.0				

RUNOFF VOLUME = 1.79461 INCHES = .2542 ACRE-FEET
 PEAK DISCHARGE RATE = 6.96 CFS AT 1.500 HOURS BASIN AREA = .0027 SQ. MI.

* DEVELOPED BASIN C - 16.9 ACRES
 COMPUTE NM HYD ID=10 HYD NO=C.DEV DA=0.02641 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 88.628 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
 AREA = .022449 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 10.601 CFS UNIT VOLUME = .9992 B = 356.70 P60 = 1.8700
 AREA = .003962 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=20

HYDROGRAPH FROM AREA C.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	16.2	4.000	.4	5.999	.5		
.667	.0	2.666	1.4	4.666	.4	6.666	.0		
1.333	19.6	3.333	.5	5.333	.4				

RUNOFF VOLUME = 1.79461 INCHES = 2.5278 ACRE-FEET
 PEAK DISCHARGE RATE = 69.04 CFS AT 1.500 HOURS BASIN AREA = .0264 SQ. MI.

* DEVELOPED BASIN D - 4.29 ACRES
 COMPUTE NM HYD ID=11 HYD NO=D.DEV DA=0.006273 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 21.051 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005332 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.5179 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
 AREA = .000941 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=11 CODE=20

HYDROGRAPH FROM AREA D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.9	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.7	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .6004 ACRE-FEET
 PEAK DISCHARGE RATE = 16.41 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* DEVELOPED BASIN E - 5.78 ACRES
 COMPUTE NM HYD ID=12 HYD NO=E.DEV DA=0.009031 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 30.307 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
 AREA = .007676 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 3.6249 CFS UNIT VOLUME = .9967 B = 356.70 P60 = 1.8700
 AREA = .001355 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=20

HYDROGRAPH FROM AREA E.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	5.5	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	6.7	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .8644 ACRE-FEET
 PEAK DISCHARGE RATE = 23.62 CFS AT 1.500 HOURS BASIN AREA = .0090 SQ. MI.

ADD HYD ID=13 HYD NO=B&C.EX ID I=2 ID II=3
 PRINT HYD ID=13 CODE=20

HYDROGRAPH FROM AREA B&C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.6	4.000	.0		
.667	.0	2.000	2.3	3.333	.2	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .7028 ACRE-FEET
 PEAK DISCHARGE RATE = 24.91 CFS AT 1.533 HOURS BASIN AREA = .0300 SQ. MI.

ADD HYD ID=14 HYD NO=B&C&D.DEV ID I=11 ID II=13
 PRINT HYD ID=14 CODE=20

HYDROGRAPH FROM AREA B&C&D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.2	4.000	.1	5.999	.1		
.667	.0	2.666	.9	4.666	.1	6.666	.0		
1.333	4.7	3.333	.3	5.333	.1				

RUNOFF VOLUME = .67363 INCHES = 1.3032 ACRE-FEET
 PEAK DISCHARGE RATE = 40.78 CFS AT 1.500 HOURS BASIN AREA = .0363 SQ. MI.

 * ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO
 * EXISTING CHANNEL PER DMP. ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 45.8 CFS

ROUTE RESERVOIR ID=15 HYD NO=POND'D'.OUT INFLOW ID=14 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 62.0
 7.50 0.0777 63.0
 13.5 0.1774 64.0
 18.0 0.3017 65.0
 21.0 0.4529 66.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	62.00	.000	.00
.33	.00	62.00	.000	.00
.67	.00	62.00	.000	.00
1.00	.00	62.00	.000	.00
1.33	4.66	62.21	.017	1.60
1.67	22.50	65.78	.420	20.35
2.00	6.20	64.40	.227	15.30
2.33	2.00	62.66	.052	4.97
2.67	.94	62.19	.015	1.45
3.00	.47	62.09	.007	.65
3.33	.27	62.05	.004	.34
3.67	.17	62.03	.002	.21
4.00	.13	62.02	.001	.14
4.33	.10	62.01	.001	.11
4.67	.09	62.01	.001	.10
5.00	.09	62.01	.001	.09
5.33	.09	62.01	.001	.09
5.67	.10	62.01	.001	.10
6.00	.11	62.01	.001	.11
6.33	.01	62.00	.000	.04
6.67	.00	62.00	.000	.01

PEAK DISCHARGE = 20.371 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 65.790
 MAXIMUM STORAGE = .4212 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=15 CODE=20

HYDROGRAPH FROM AREA POND'D'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	15.3	4.000	.1	5.999	.1
.667	.0	2.666	1.4	4.666	.1	6.666	.0
1.333	1.6	3.333	.3	5.333	.1		

RUNOFF VOLUME = .67363 INCHES = 1.3032 ACRE-FEET
 PEAK DISCHARGE RATE = 20.37 CFS AT 1.700 HOURS BASIN AREA = .0363 SQ. MI.

 * ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP
 * ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN
 * THIS IS AN EXAMPLE CALCULATION. EXACT POND DESIGN TO BE DETERMINED AT
 * TIME OF DEVELOPMENT

ROUTE RESERVOIR ID=16 HYD NO=POND'E'.OUT INFLOW ID=12 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 50.0
 3.00 0.1200 51.0
 7.00 0.2400 52.0
 10.0 0.3600 53.0
 12.0 0.4800 54.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	6.71	50.25	.030	.75
1.67	12.00	52.83	.340	9.50
2.00	5.55	52.53	.303	8.59
2.33	1.19	51.57	.188	5.28
2.67	.49	50.88	.106	2.65
3.00	.26	50.50	.060	1.50
3.33	.17	50.28	.034	.85
3.67	.14	50.17	.020	.50
4.00	.13	50.11	.013	.32
4.33	.12	50.07	.009	.22
4.67	.12	50.06	.007	.17
5.00	.13	50.05	.006	.15
5.33	.14	50.05	.006	.14
5.67	.14	50.05	.006	.14
6.00	.16	50.05	.006	.15
6.33	.02	50.04	.004	.11
6.67	.00	50.02	.002	.06
7.00	.00	50.01	.001	.03
7.33	.00	50.01	.001	.02
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 9.654 CFS - PEAK OCCURS AT HOUR 1.73
 MAXIMUM WATER SURFACE ELEVATION = 52.885

MAXIMUM STORAGE = .3462 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=16 CODE=20

HYDROGRAPH FROM AREA POND'E'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	8.6	4.000	.3	5.999	.1	7.999	.0
.667	.0	2.666	2.6	4.666	.2	6.666	.1		
1.333	.8	3.333	.9	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79458 INCHES = .8644 ACRE-FEET
PEAK DISCHARGE RATE = 9.65 CFS AT 1.733 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)
* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 43.5
1.48 0.0262 44.0
5.45 0.0968 45.0
7.57 0.2125 46.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	43.50	.000	.00
.33	.00	43.50	.000	.00
.67	.00	43.50	.000	.00
1.00	.00	43.50	.000	.00
1.33	4.64	43.86	.019	1.06
1.67	8.31	45.87	.198	7.30
2.00	3.84	45.51	.156	6.53
2.33	.82	44.52	.063	3.53
2.67	.34	43.88	.020	1.12
3.00	.17	43.64	.007	.41
3.33	.12	43.56	.003	.19
3.67	.10	43.54	.002	.12
4.00	.09	43.53	.002	.10
4.33	.08	43.53	.002	.09
4.67	.08	43.53	.002	.08
5.00	.09	43.53	.002	.09
5.33	.09	43.53	.002	.09

5.67 .10 43.53 .002 .10
 6.00 .11 43.53 .002 .10
 6.33 .01 43.52 .001 .05
 6.67 .00 43.51 .000 .02
 7.00 .00 43.50 .000 .00
 PEAK DISCHARGE = 7.328 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 45.886
 MAXIMUM STORAGE = .1993 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=17 CODE=20

HYDROGRAPH FROM AREA POND'F'.OUT

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	6.5	4.000	.1	5.999	.1		
.667	.0	2.666	1.1	4.666	.1	6.666	.0		
1.333	1.1	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79456 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 7.33 CFS AT 1.700 HOURS BASIN AREA = .0063 SQ. MI.

 * ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP
 * ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 50.0
 2.69 0.1271 51.0
 4.59 0.2772 52.0

* * * * *

TIME	INFLOW	ELEV	VOLUME	OUTFLOW
(HRS)	(CFS)	(FEET)	(AC-FT)	(CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	3.44	50.12	.016	.33
1.67	6.16	51.44	.194	3.53
2.00	2.85	51.52	.205	3.68
2.33	.61	51.17	.153	3.02
2.67	.25	50.74	.094	1.99
3.00	.12	50.44	.056	1.19
3.33	.09	50.26	.033	.71
3.67	.07	50.16	.020	.43
4.00	.06	50.10	.013	.27

4.33	.06	50.07	.008	.18
4.67	.06	50.05	.006	.13
5.00	.06	50.04	.005	.10
5.33	.07	50.03	.004	.09
5.67	.07	50.03	.004	.08
6.00	.08	50.03	.004	.08
6.33	.01	50.02	.003	.06
6.67	.00	50.01	.002	.04
7.00	.00	50.01	.001	.02
7.33	.00	50.00	.001	.01
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 3.743 CFS - PEAK OCCURS AT HOUR 1.87
 MAXIMUM WATER SURFACE ELEVATION = 51.554
 MAXIMUM STORAGE = .2103 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=18 CODE=20

HYDROGRAPH FROM AREA POND'G'.OUT

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	3.7	4.000	.3	5.999	.1	7.999	.0
.667	.0	2.666	2.0	4.666	.1	6.666	.0	8.666	.0
1.333	.3	3.333	.7	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79455 INCHES = .4434 ACRE-FEET
 PEAK DISCHARGE RATE = 3.74 CFS AT 1.866 HOURS BASIN AREA = .0046 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:12:06



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 18, 1999

Dennis Lorenz, P.E.
Brasher & Lorenz
2201 San Pedro NE
Bldg 1 - Suite 210
Albuquerque, NM 87110

***RE: GE CAPITAL MODULAR SPACE, VOLCANO BUSINESS PARK, PHASE II
(G10-D29F). DRAINAGE REPORT FOR BUILDING PERMIT APPROVAL.
ENGINEER'S STAMP DATED NOVEMBER 2, 1998.***

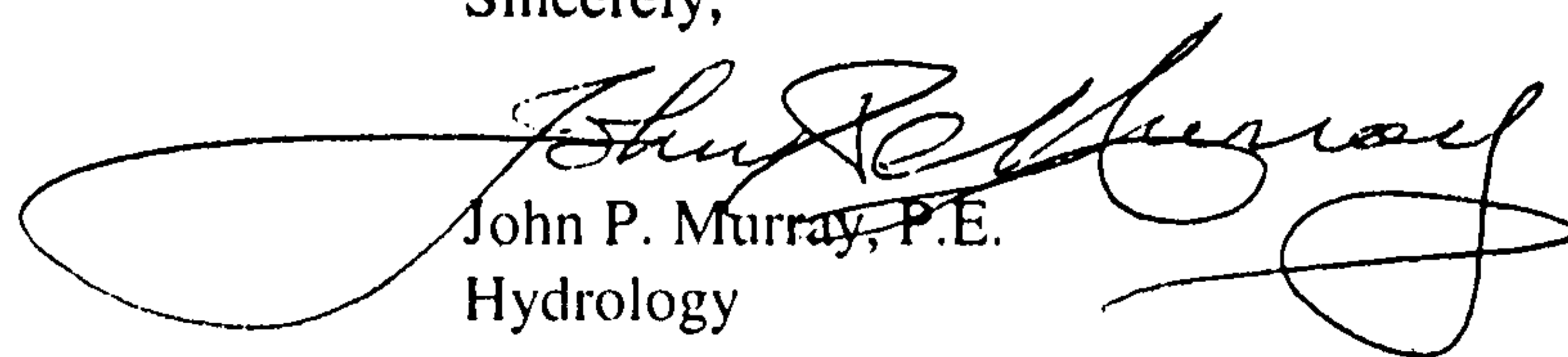
Dear Mr. Lorenz:

Based on the information provided on your November 5, 1998 submittal, City Hydrology has the following comment:

See City Consultant's letter of January 30, 1999 (copy enclosed). Questions on the hydraulics of the channel and street (Todos Santos), especially at potential problem reaches, are a concern which remains to be addressed herein and for the Drainage Master Plan.

If Mr. Aguirre or I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,


John P. Murray, P.E.
Hydrology

C: Andrew Garcia
✓ File



January 30, 1999

Mr. Fred Aguirre, P.E.
Hydrologist
City of Albuquerque
Public Works Department
P.O. Box 1293
Albuquerque, NM 87103

RE: GE Capital Modular Space

Drainage Report for GE Capital Modular Space, May 1998. (Stamped 7-8-1998 by Dennis A. Lorenz, P.E.)

And ALSO INCLUDED with this submittal IS A REVISED COPY OF THE

**"Drainage Master Plan for Volcano Business Park, Phase II Tract 5A2-A1, Lots 1-6 ,
Revised October 1998. Brasher & Lorenz, Inc. (Stamped 11-2-98 by Dennis A. Lorenz, P.E.)**

Brief History of Project Submittals and Reviews

The previous report was approved with the exception of two items that needed to be addressed. See copy of letter from Fred Aguirre to Paul Brasher, PE dated July 14, 1998 (attached to this 1-8-1999 review letter).

Current date of the Grading and Drainage Plan is May 1998, and is stamped and signed 7- 8- 1998, by Dennis A. Lorenz, P.E.

Date Stamped Received in Hydrology Section - November 5, 1998

Drainage File : G10 - 29F

Legal Description - Tract 5A2-A1-1 Volcano Business Park Phase 2

Address - 3051 Painted Rock NW

Request Approvals for : Building Permit

SEC Job # 198624.B9



Dear Mr. Aguirre,

Smith Engineering Company (SEC) is pleased to review the referenced submittal. The letter attached with this current submittal (November 4, 1998 from Dennis A. Lorenz) indicates that the consultant did not changed the report that you and Steve Kemna had reviewed before, but instead changed the Drainage Master Plan for Volcano Business Park, Phase II (Revised October 1998) to address your review letter (July 14, 1998) comments.

My review comments:

1. The appendix with the Drainage Master Plan for Volcano Business Park (revised October 1998) contain for the easement channel that indicate that the 100-yr. freeboard is 0.55 feet for a Q_p of 55.6 cfs. This may be adequate (if the flow is "uniform flow") but is your decision according to the DPM page 22-129.

However, 2 items concern me regarding the hydraulics of this channel.

- A. The channel has a sharp angle of about 40 degrees as shown on the Master Plan. Therefore, calculations must be provided that show the flow will be contained in the channel at the angle point.
 - B. Also, the sharp angle will surely generate waves that will propagate for some distance down the channel. Calculations must be provided to show that :
 - a) the waves will be contained within the channel.
 - b) the minimum freeboard remaining after considering the maximum wave height that will be generated
2. The appendix with the Drainage Master Plan for Volcano Business Park (revised October 1998) contains some street hydraulic calculations for Todos Santos Street that indicate that for the 100-yr Q_p of 72.5 cfs, the depth is 0.58 and the curb height is 0.67 feet. If the flow remains uniform, this depth is acceptable. However, there is a possibility of a hydraulic jump at two locations, and an analysis of those possibilities has not been presented.
 - A. One is the outfall of the private easement channel at Todos Santos Street. It would seem that the possibility of a hydraulic jump exists there and must be investigated and calulations presented. In addition, what is the possibility that the flow from this channel could shoot across the street and flood the opposite lot. That must also be investigated and calculations presented.
 - B. It appears that the potential for a hydraulic jump occurs in Todos Santos Street near the storm drain inlets as the street slope will decrease near the sag curve in the street.



The velocity given for Todos Santos Street is 5.36 ft/sec and therefore I computed the velocity head to be 0.45 ft. If a hydraulic jump was to occur, the maximum flow depth would therefore be $0.58 + 0.45 = 1.03$ feet. That exceeds the maximum allowable depth of 0.2 ft + 0.67 ft (curb height) per the DPM (page 22-156, 2b). The possibility of a hydraulic jump must be considered and documented, and proved to be within acceptable street depth criteria as specified in the DPM.

3. I am wondering if the Drainage Master Plan for Volcano Business Park, Phase II (revised October 1998, (stamped November 11, 1998 by Dennis Lorenz, P.E.) has been formally submitted to the City for review, or at least to be logged in as the current Master Plan for that area?

** Nov 2, 1998.*

CONCLUSION - The comments that you requested be addressed have been addressed, although not addressed in the report for which the comments were made for, but in the Drainage Master Plan for Volcano Business Park, Phase II (revised October 1998).

Please call me if you have any questions or want to review this comments together.

Sincerely,

Smith Engineering Company
Pat Stovall, P.E.

O:\100\198625b\b9-1-7.doc

DRAINAGE INFORMATION SHEET

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE ATLAS/DRNG. FILE #: G10-D29F
 DRB #: 97.450 EPC #: NA WORK ORDER #: NA
 LEGAL DESCRIPTION: TRACT 5A2-A1-1, VOLCANO BUS PARK, PHASE 1
 CITY ADDRESS: 3051 PAINTED ROCK NW

ENGINEERING FIRM: Brasher & Lorenz, Inc. CONTACT: Dennis A. Lorenz
2201 San Pedro NE Bldg. 1 Suite 210
 ADDRESS: Albuquerque, New Mexico 87110 PHONE: 888-6088

OWNER: CORPORATE SITE CONSULTANT CONTACT: LEN KUHN
 ADDRESS: 4955 BROADWAY DEPEW PHONE: 1.716.685-1660
NY 14043

ARCHITECT: NA CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: SOUTHWEST SURVEYING CONTACT: D. GRAINEY

ADDRESS: 333 LOMAS NE PHONE: 998.0303

CONTRACTOR: MARATHON BUILDERS CONTACT: LARRY FRANKLIN

ADDRESS: _____ PHONE: 1.405.202.4661

TYPE OF SUBMITTAL:

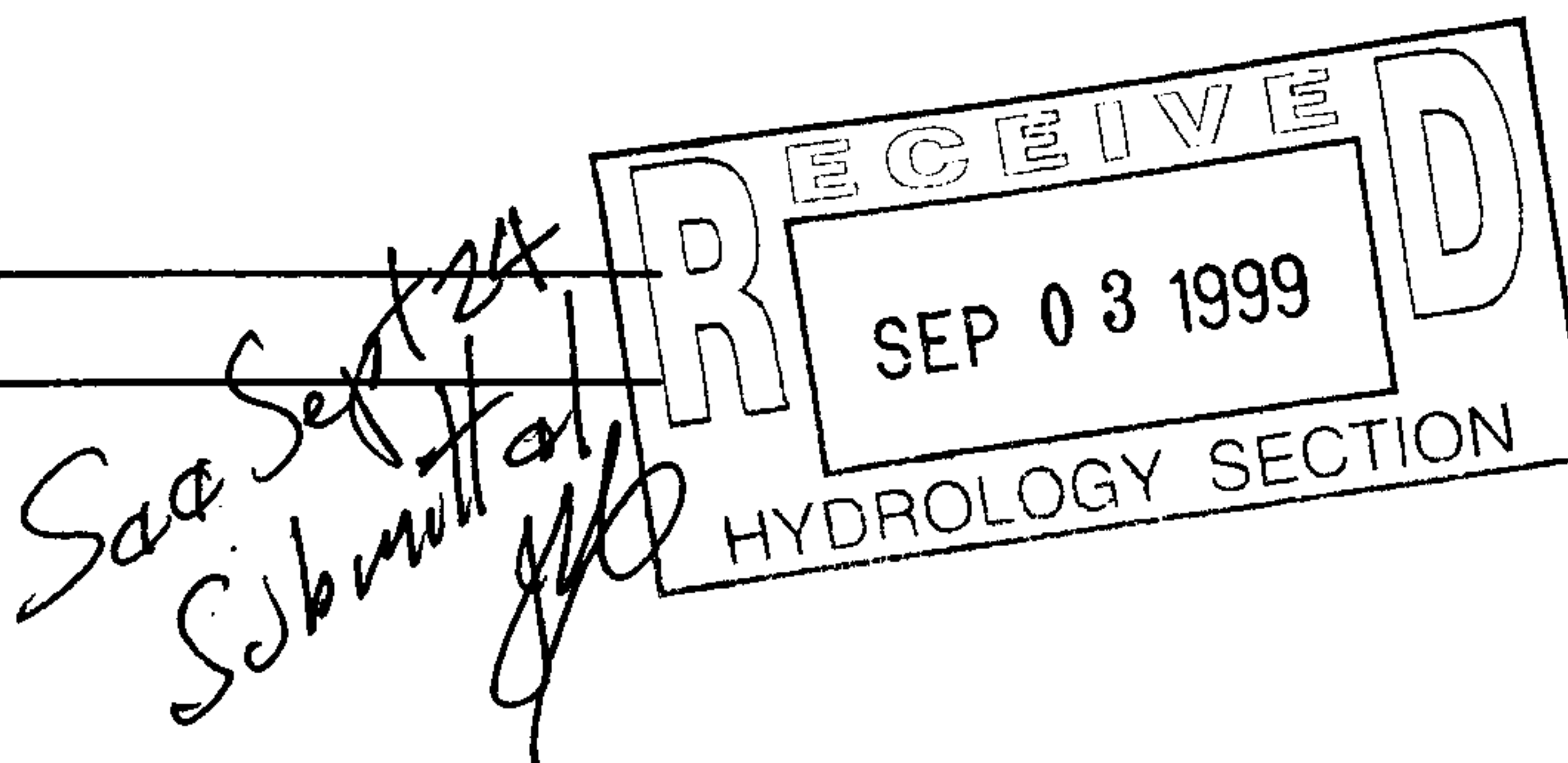
- ____ DRAINAGE REPORT
 ____ DRAINAGE PLAN
 ____ CONCEPTUAL GRADING & DRAINAGE PLAN
 ____ GRADING PLAN
 ____ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION
 ____ OTHER _____

PRE-DESIGN MEETING:

- ☒ YES
 ____ NO
 ____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 9.3.99BY: Dennis A. Lorenz

9/17
30 Day
Tamp ^{C.O.}
~~1/10~~



City of Albuquerque

October 13, 1999

Dennis Lorenz, P.E.
Brasher & Lorenz, Inc.
2201 San Pedro NE
Building #1 - Suite 210
Albuquerque, NM 87110

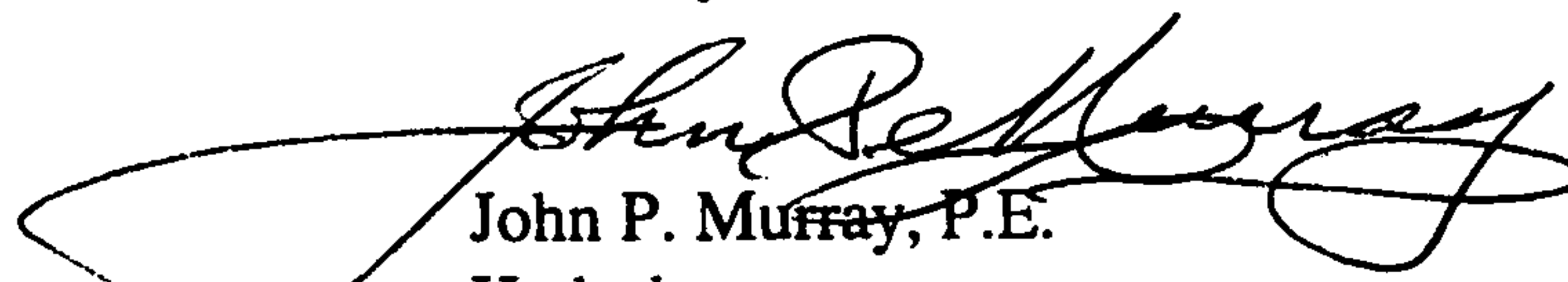
**RE: GE CAPITAL MODULAR SPACE, VOLCANO BUSINESS PARK (G10-D29F).
ENGINEER'S CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
APPROVAL. ENGINEER'S STAMP DATED SEPTEMBER 3, 1999 and UPDATED
SEPTEMBER 23, 1999. G&D PLAN DATED JULY 8, 1998.**

Dear Mr. Lorenz:

Based on the information provided on your September 24, 1999 submittal, the above referenced project is approved for Certificate of Occupancy.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,


John P. Murray, P.E.
Hydrology

c: WR
✓ File

DRAINAGE INFORMATION SHEET

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE ATLAS/DRNG. FILE #: G10-D29F
 DRB #: 97-450 EPC #: NA WORK ORDER #: NA
 LEGAL DESCRIPTION: TRACT 5A2-A1-1, VOLCANO BUS PARK, PHASE 1
 CITY ADDRESS: 3051 PAINTED ROCK NW
 ENGINEERING FIRM: Brasher & Lorenz, Inc. CONTACT: Dennis A. Lorenz
2201 San Pedro NE Bldg. 1 Suite 210
 ADDRESS: Albuquerque, New Mexico 87110 PHONE: 888-6088
 OWNER: CORPORATE SITE CONSULTANT CONTACT: LEN KUHN
 ADDRESS: 4955 BROADWAY DEPEW PHONE: 1.716.685-1660
NY 14043
 ARCHITECT: NA CONTACT: _____
 ADDRESS: _____ PHONE: _____
 SURVEYOR: SOUTHWEST SURVEYING CONTACT: D. GRAINEY
 ADDRESS: 333 LOMAS NE PHONE: 998-0303
 CONTRACTOR: MARATHON BUILDERS CONTACT: LARRY FRANKLIN
 ADDRESS: _____ PHONE: 1.405.202.4661

TYPE OF SUBMITTAL:

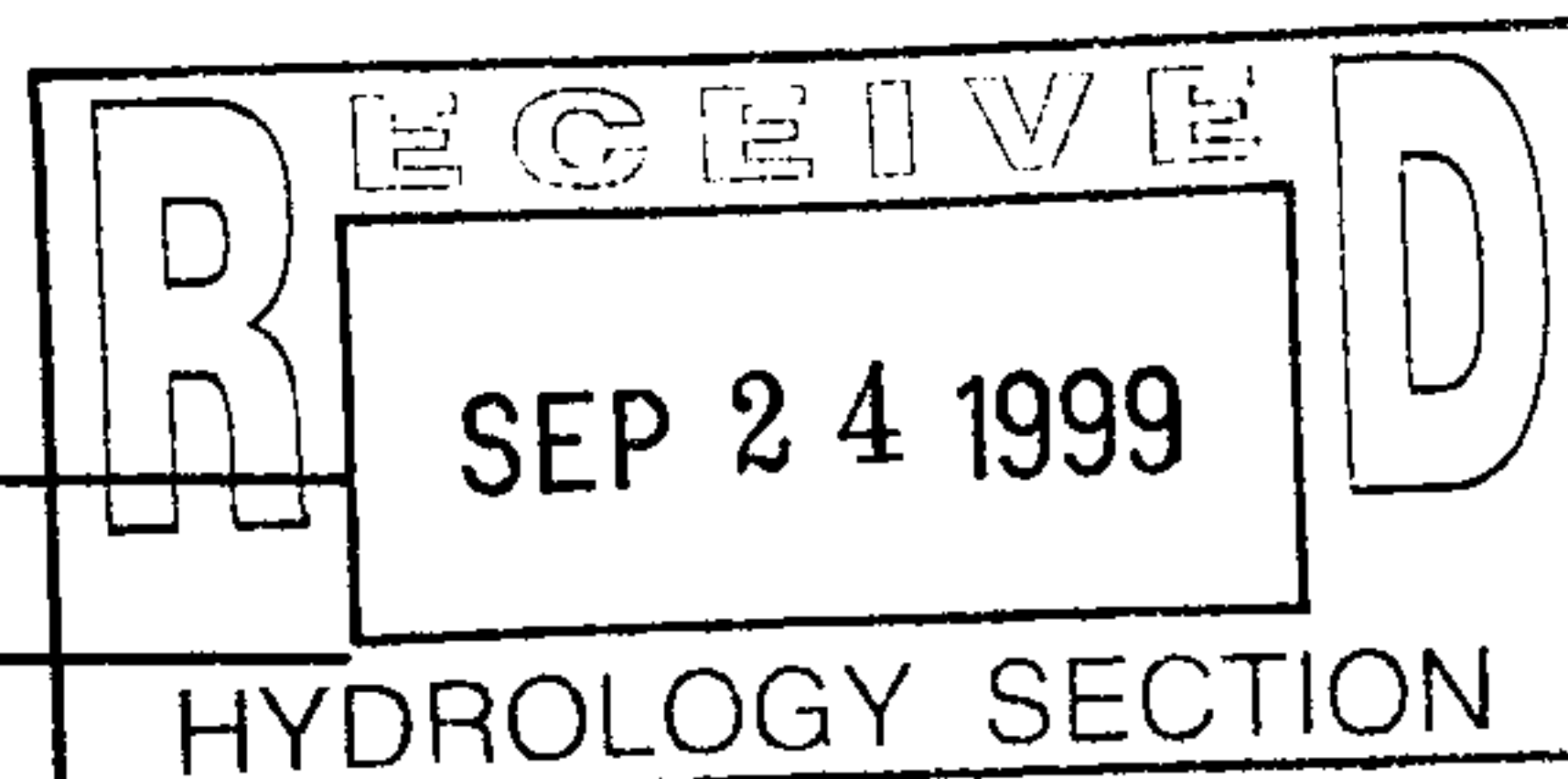
☐ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION
☐ OTHER _____

PRE-DESIGN MEETING:

☒ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 9.23.99BY: Dennis A. Lorenz



BRASHER & LORENZ, INC.
CONSULTING ENGINEERS

2201 San Pedro NE Bldg 1 Suite 1200 • Albuquerque, NM 87110 • Phone (505) 888-6088 • Fax (505) 888-6188 • www.brasherlorenz.com

April 24, 2002

Carlos Montoya, PE
Hydrology Section
City of Albuquerque
Plaza Del Sol
Albuquerque, New Mexico 87102

SUBJECT: GE CAPITAL MODULAR SPACE
Tract 5A1-B, Volcano Business Park
Drainage File G10/D29F

Dear Carlos:

Submitted herewith for review and approval for building permit are the additional inlet calculations, as requested. The calculations confirm that the proposed inlets have capacity to manage the estimated off-site flows. I have not submitted the complete report, so please insert these calculations into your copy. The other concerns require further explanation.

All off-site basins and flows are illustrated on the Drainage Masterplan for Volcano Business Park, dated 11-2-98, and the Grading and Drainage Plan for GE Capital Modular Space, dated 10-24-01, provided in the back pocket of the report. Since the sole purpose of the subject Grading and Drainage Plan is to provide detail to facilitate construction, I do not feel it is necessary to provide this information again. If you do not have the Masterplans in your file, please let me know and I will supply additional copies.

Enclosed is a copy of the record plat showing the existing drainage easements from the west property line of the site, east to Painted Rock Drive. All downstream drainage improvements and easements are in place, as provided by the initial development of GE Capital Modular Space.

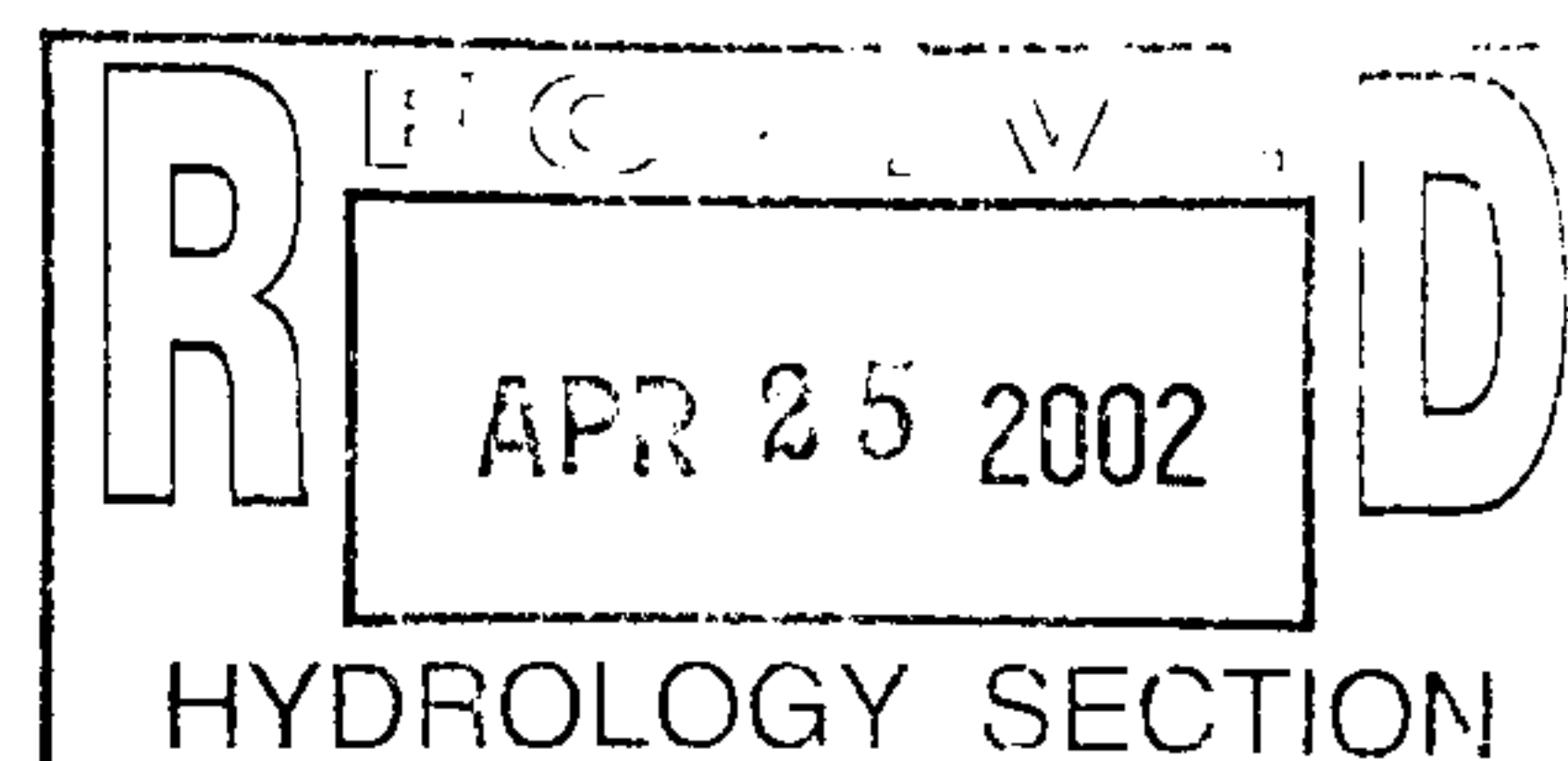
I hope this additional information addresses your concerns. If you have any questions, or if I can be of any assistance, please feel free to call.

Sincerely,

BRASHER & LORENZ, INC.

Dennis A. Lorenz, PE
Principal

/dl/01512
encl





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 9, 2002

Dennis A. Lorenz, P.E.
Brasher & Lorenz, Inc.
2201 San Pedro NE
Bldg. 1, Suite 1200
Albuquerque, New Mexico 87102

**RE: Drainage and Grading Plan for GE Capital Modular Space (C19-D27) Dated
May 4, 2002**

Dear Mr. Lorenz:

The above referenced drainage plan received May 8, 2002 is approved. However, prior to the release of the paving permit the private drainage easement needs to be corrected.

If you have any questions please contact me 924-3982.

Sincerely,

Carlos A. Montoya
City Floodplain Administrator

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/11/2002)

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE MAP/DRG. FILE #: G10-D29F
DRB #: 1001175 EPC#: 01/28-01555 WORK ORDER#: _____
LEGAL DESCRIPTION: TRACT 5A1-B VOLCANO BUSINESS PARK
CITY ADDRESS: 3501 PAINTED ROCK DR NW
ENGINEERING FIRM: BRASHER + LORENZ CONTACT: D. LORENZ
ADDRESS: 2201 SAN PEDRO NE PHONE: 888-6088
CITY, STATE: ALB NM 87110 ZIP CODE: 87110
OWNER: CORPORATE SITE CONSULTANTS CONTACT: L. KUHN
ADDRESS: 161 WOODLAWN DR PHONE: 716-685-1660
CITY, STATE: DEPEW, NY ZIP CODE: 14043
ARCHITECT: NA CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____
SURVEYOR: PRECISION SURVEYS CONTACT: L. MEDRANO
ADDRESS: 8414-D JEFFERSON NE PHONE: 856-5700
CITY, STATE: ALB, NM ZIP CODE: 87113
CONTRACTOR: NA CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

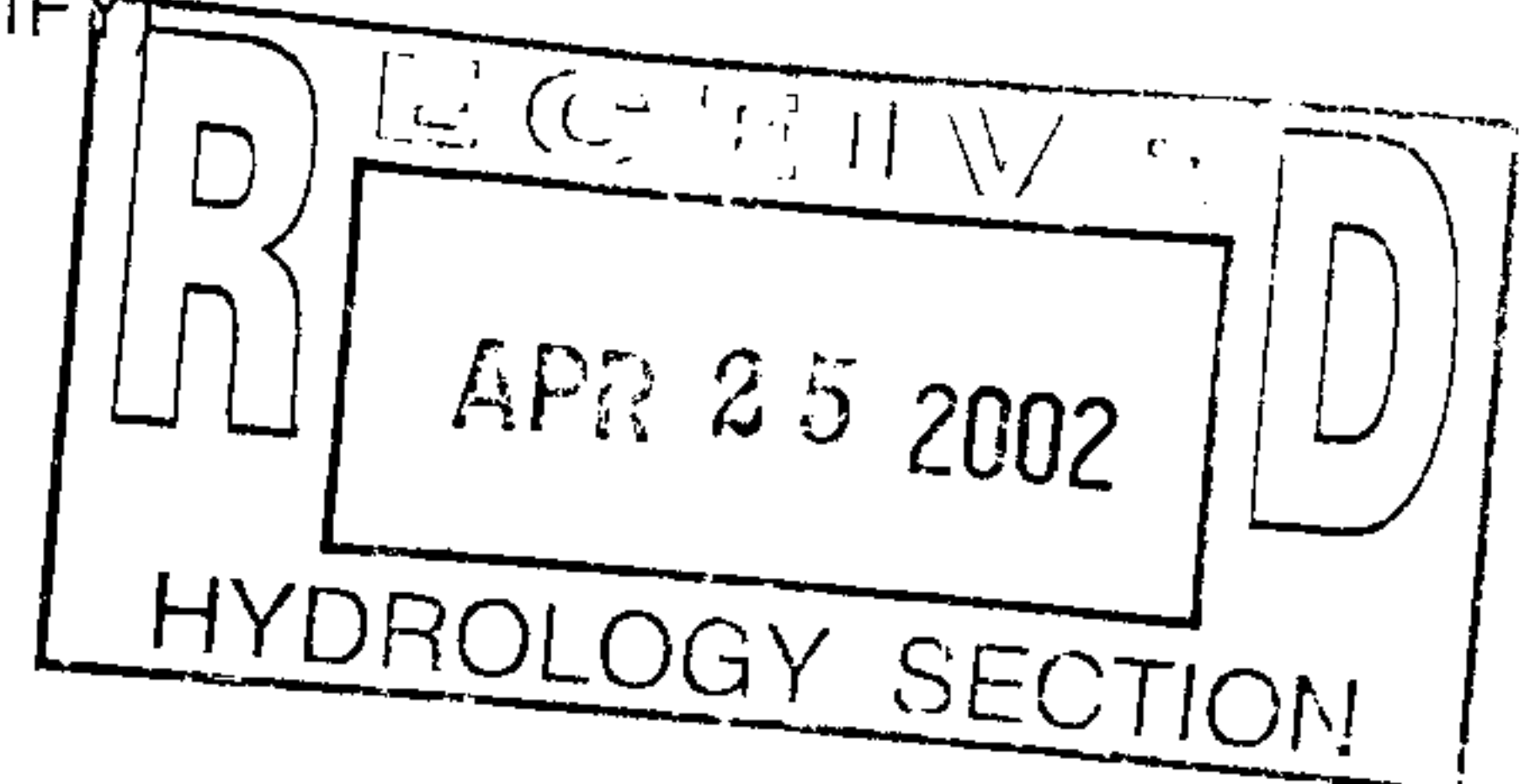
- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEERS CERTIFICATION (TCL)
☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
☐ PRELIMINARY PLAT APPROVAL
☐ S. DEV. PLAN FOR SUB'D. APPROVAL
☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
☐ SECTOR PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☒ FOUNDATION PERMIT APPROVAL
☒ 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: 4.25.02 BY: DENNIS LORENZ

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 ten (10) lots or constituting five (5) acres or more.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 15, 2002

Dennis A. Lorenz, PE
Brasher & Lorenz, Inc.
2201 San Pedro NE
Bldg. 1, Suite 1200
Albuquerque, NM 87102

**Re: GE Capital Modular Space Grading and Drainage Plan
Engineer's Stamp Dated 4-09-02, (G10/D29F)**

Dear Mr. Lorenz,

Based on the information submitted on 4-11-02, the above referenced plan is not approved for Building Permit until the following comments are addressed:

- Please show all undeveloped and developed offsite flow drainage basins for El Rancho Atrisco and Plains Electric Cooperative.
- Revise the inlet design using a weir equation instead of an orifice. Also, consider clogging.
- Please submit a private easement across the pond. A private easement will also be required downstream of the pond.

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

Sincerely,

Carlos A. Montoya, PE
City Floodplain Administrator, PWD
Development and Building Services

C: Terri Martin, Hydrology
File (2)



BRASHER & LORENZ, INC.
CONSULTING ENGINEERS

2201 San Pedro NE Bldg 1 Suite 1200 • Albuquerque, NM 87110 • Phone (505) 888-6088 • Fax (505) 888-6188 • www.brasherlorenz.com

April 10, 2002

Bradley Bingham, PE
Hydrology Section
City of Albuquerque
Plaza Del Sol
Albuquerque, New Mexico 87102

SUBJECT: GE CAPITAL MODULAR SPACE
Tract 5A1-A, Volcano Business Park
Map Zone G/H-10
Drainage File G10/D29F

Dear Brad:

Submitted herewith for review and approval for building permit is one copy of the Grading and Drainage Plan for the subject project. The project consists of the expansion of the existing GE Capital Modular Space facility located at 3051 Painted Rock Drive NW. The Drainage report for the project was approved to facilitate Site Plan and Subdivision Plat approval. This Plan provides the detail necessary for construction. All grading and drainage aspects of the plan are in accordance with the approved report.

The approved report has been revised only to edit the exact design basin areas in the Ahymo run, which had little or no effect on the pond routing results. No other changes were made.

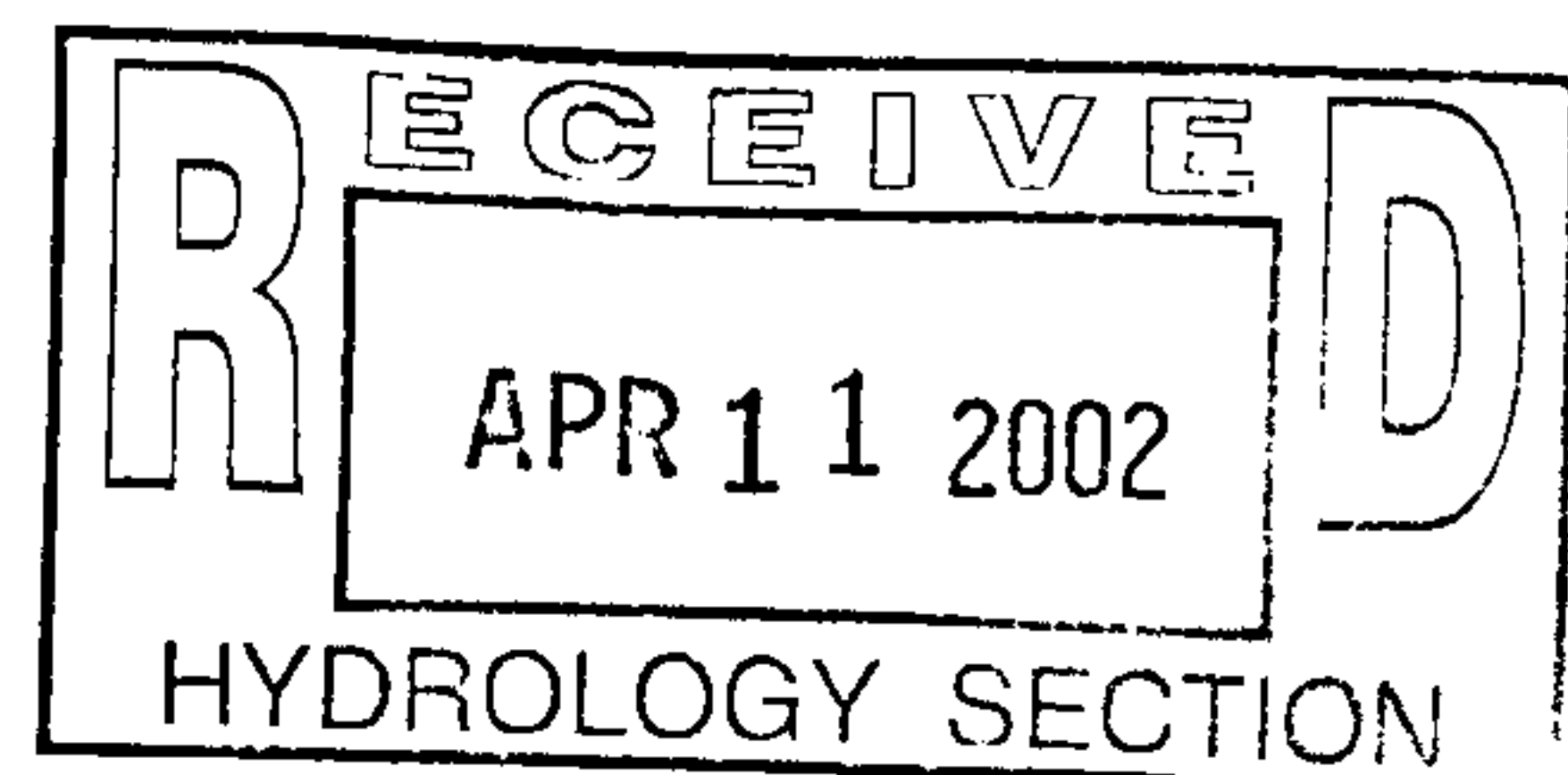
If you have any questions, or if I can be of any assistance, please feel free to call.

Sincerely,

BRASHER & LORENZ, INC.

Dennis A. Lorenz, PE
Principal

/dl/01512
encl



DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE MAP/DRG. FILE #: G10-D29F
 DRB #: 1001175 EPC#: 01/28-01535 WORK ORDER#: —

LEGAL DESCRIPTION: TRACT VOLCANO BUSINESS PARK
 CITY ADDRESS: 3501 PAINTED ROCK DR NW

ENGINEERING FIRM: BRASHER + LORENZ CONTACT: D. LORENZ
 ADDRESS: 2201 SAN PEDRO NE PHONE: 888-6088
 CITY, STATE: ALB NM 87110 ZIP CODE: 87110

OWNER: CORPORATE SITE CONSULTANTS CONTACT: L. KUHN
 ADDRESS: 161 WOODLAWN DR PHONE: 716-685-1660
 CITY, STATE: DEPEW, NY ZIP CODE: 14043

ARCHITECT: NA CONTACT: _____
 ADDRESS: _____ PHONE: _____
 CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: PRECISION SURVEYS CONTACT: L. MEDRANO
 ADDRESS: 8414-D JEFFERSON NE PHONE: 856-5700
 CITY, STATE: ALB, NM ZIP CODE: 87113

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

CHECK TYPE OF SUBMITTAL:

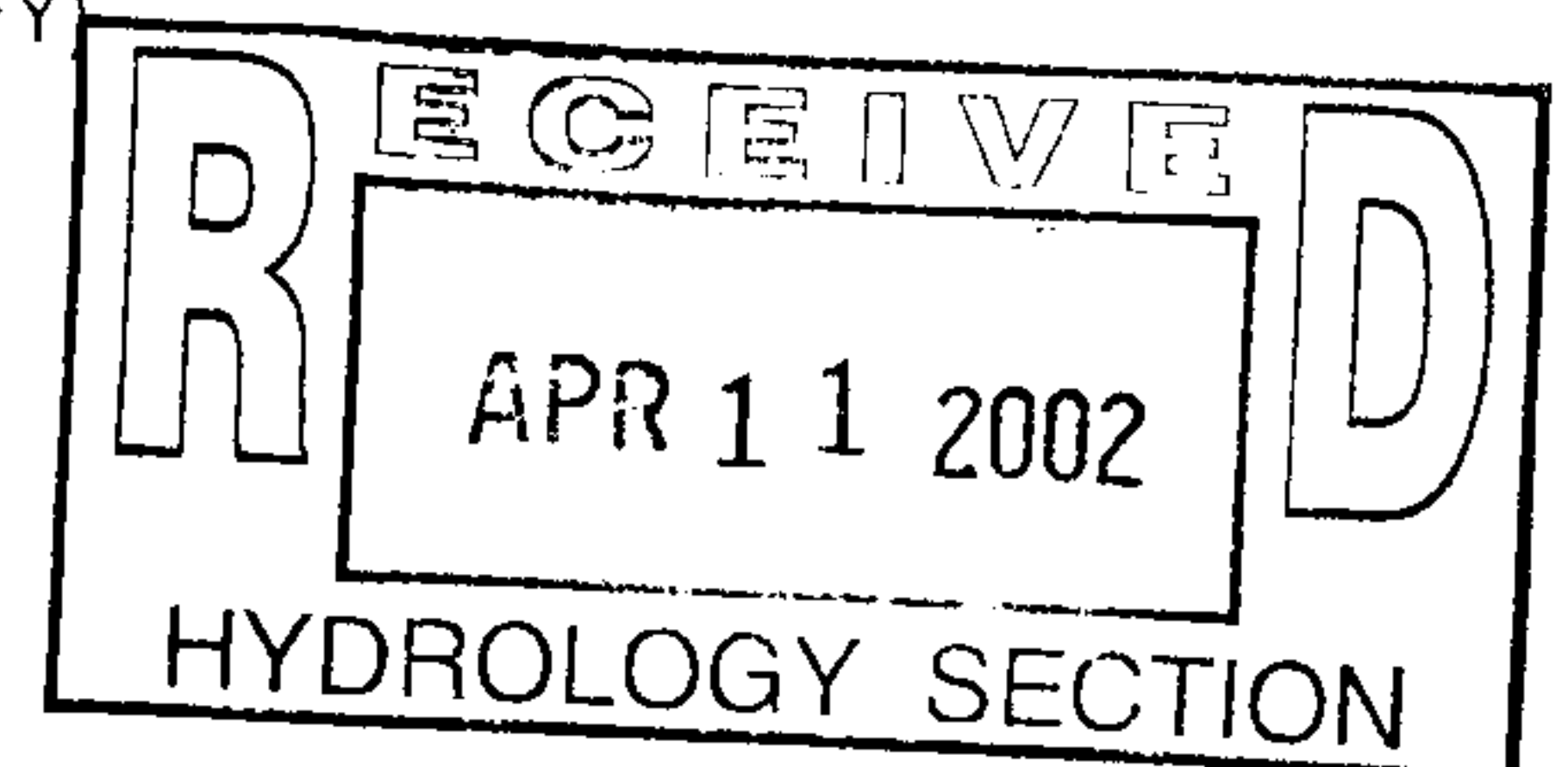
- ☒ DRAINAGE REPORT
- ☐ DRAINAGE PLAN
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☒ FOUNDATION PERMIT APPROVAL
- ☒ 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: 4.10.02 BY: DENNIS LORENZ

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 ten (10) lots or constituting five (5) acres or more.

DRAINAGE REPORT

FOR

GE CAPITAL MODULAR SPACE

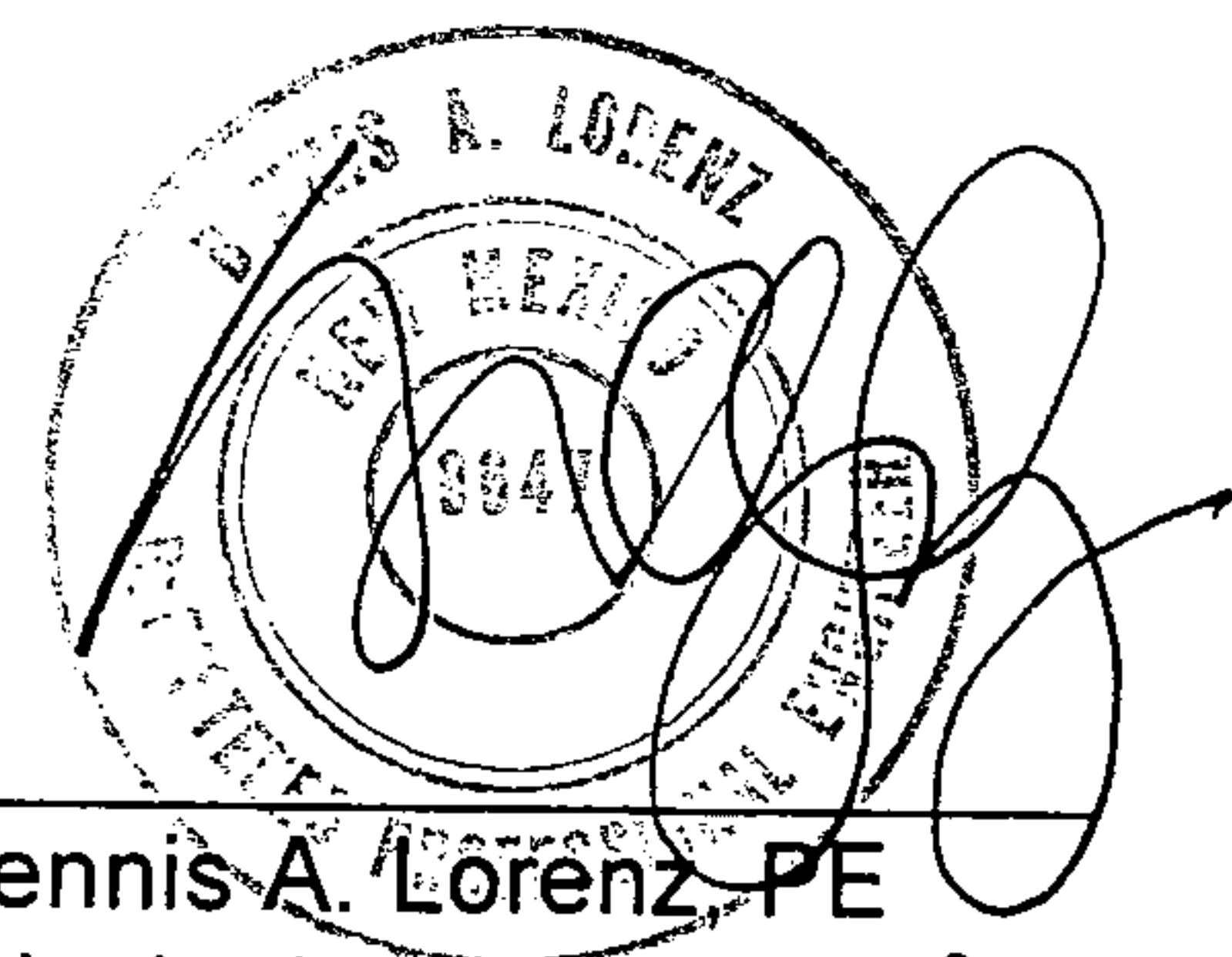
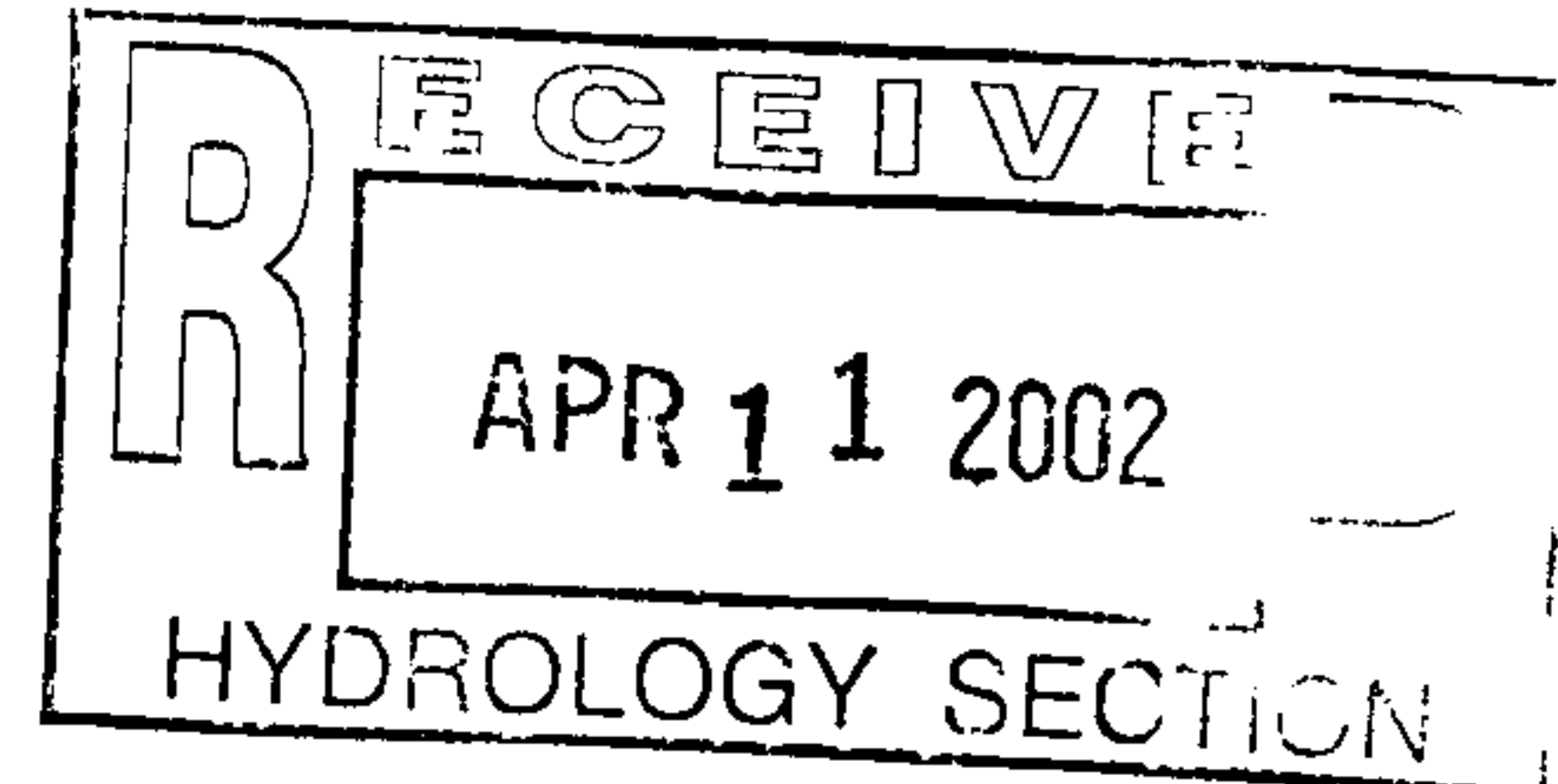
**Tract 5A1, Volcano Business Park, Phase I, and
Tract 5A2-A1-1, Volcano Business Park, Phase II**

Albuquerque, New Mexico

Prepared By:

**BRASHER & LORENZ, INC.
Consulting Engineers**

2201 San Pedro NE, Building No. 1, Suite 220
Albuquerque, New Mexico 87110



Dennis A. Lorenz, PE
Principal

10-23-01
4-9-02

OCTOBER 2001

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POND ROUTING	
AHYMO OUTPUT FILES	
EXHIBITS	
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APPROVED DRAINAGE MASTERPLAN	POCKET
APPROVED GRADING AND DRAINAGE PLAN FOR GE CAPITAL MODULAR SPACE	POCKET

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The project consists of the development of the property for GE Capital Modular Space. Paving, landscaping, utility, grading, and drainage improvements will be provided to support the project. The scope of this plan is to provide drainage criteria for the safe management of excess runoff. The report is presented to obtain Site Plan for Subdivision approval, Amended Site Plan approval, and building Permit approval.

SITE DESCRIPTION

The project site is approximately 16.8 acres in size and is located on Painted Rock Drive NW, at Ouray Road NW (See Figure 1). Site terrain slopes west to east at approximately 2 percent. The site is presently described as a Tract 5A1, Volcano Business Park, Phase I and Tract 5A2-A1-1, Volcano Business Park, Phase II. The site is bounded on the north by Ouray Road, Painted Rock Drive, and on the south by a PNM switching Station, and on the west by undeveloped properties.

The project site consists of the existing GE Capital Modular Space facility, described as Tract 5A2-A1-1, Volcano Business Park, Phase II, and Tract 5A1, Volcano Business Park, Phase I, which is presently undeveloped. Tract 5A1 is to be subdivided into 2 tracts. The southerly 4.29-acre tract will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility.

EXISTING CONDITIONS

The site presently drains easterly to the Ouray Road storm system as follows:

1. Basin "A" is undeveloped and drains northward to Ouray Road.
2. Basins "B", "C" and "D" drain east into an existing private concrete channel located along the south side of the GE Capital site to Painted Rock Drive. Flows are then conveyed by street improvements to the Ouray storm drain.
3. Basin "E" drains northeasterly to Ouray Road.
4. Basin "F" represents a portion of the GE Capital site. This basin flows east to an existing detention pond that drains at a controlled rate of 7.3 cfs to Ouray Road NW near the intersection of Ouray. Runoff from this pond is intercepted by the Ouray storm drain.

5. Basin "G" represents the southern portion of the GE Capital site. This basin flows north to an existing detention pond that drains at a controlled rate of 3.8 cfs to an existing concrete channel at the east end of the property line. Runoff from this pond will drain east within Todos Santos and intercepted by an existing storm drain which connects to the Ouray storm drain.

As shown by the attached FIRM Panel (Figure 3) this site does not lie within a designated flood hazard zone.

SUMMARY OF EXISTING DRAINAGE PLANS

Per the **Drainage Masterplan for Volcano Business Park, Phase II (G-10/D29)**, prepared by Brasher & Lorenz, Inc., 1-20-98, the site is required to implement on-site detention ponding. Per the DMP, the Basins "A", and "E" are limited to 2.2 cfs/acre, and Basins "A", "B", "D" and the GE Capital site are limited to 2.0 cfs/acre.

The DMP recommended the construction of certain infrastructure improvements to support the subdivision of Tract 5A1-A1 (DRB 97-450). Improvements to Ouray Road and Painted Rock Drive were constructed by public work order, City Project No. 5856.81. On-site improvements included an improved private channel along the south property line of the GE Capital site.

The **Grading and Drainage Plan for GE Capital**, prepared by Brasher & Lorenz, Inc., 7-8-98, was prepared for building permit purposes to support the GE Capital Modular Space project. Typical site improvements were recommended, along with 2 on-site detention ponds that limit developed discharge from the site to the limits established by the **Drainage Masterplan for Volcano Business Park, Phase II**.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the site for GE Capital Modular Space, a facility for lease and maintenance of portable buildings. Tract 5A1 is to be subdivided into 2 tracts. The southerly Tract 5A1-B, a 4.29-acre tract, will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility. Development will include paving, utility landscaping and drainage improvements. Tract 5A1-A, a 5.78-acre tract, will not be developed at this time.

In accordance with the approved Masterplans, the site will drain to on-site detention ponds. The ponds will route all excess runoff to Painted Rock Drive and Ouray Road at controlled rates established by the DMP, as follows:

1. Basin "A" will continue to drain north to Ouray Road. Developed discharge will be limited to 2.2 cfs/acre.
2. Basin "D", the GE Capital expansion site will route all flows through a detention

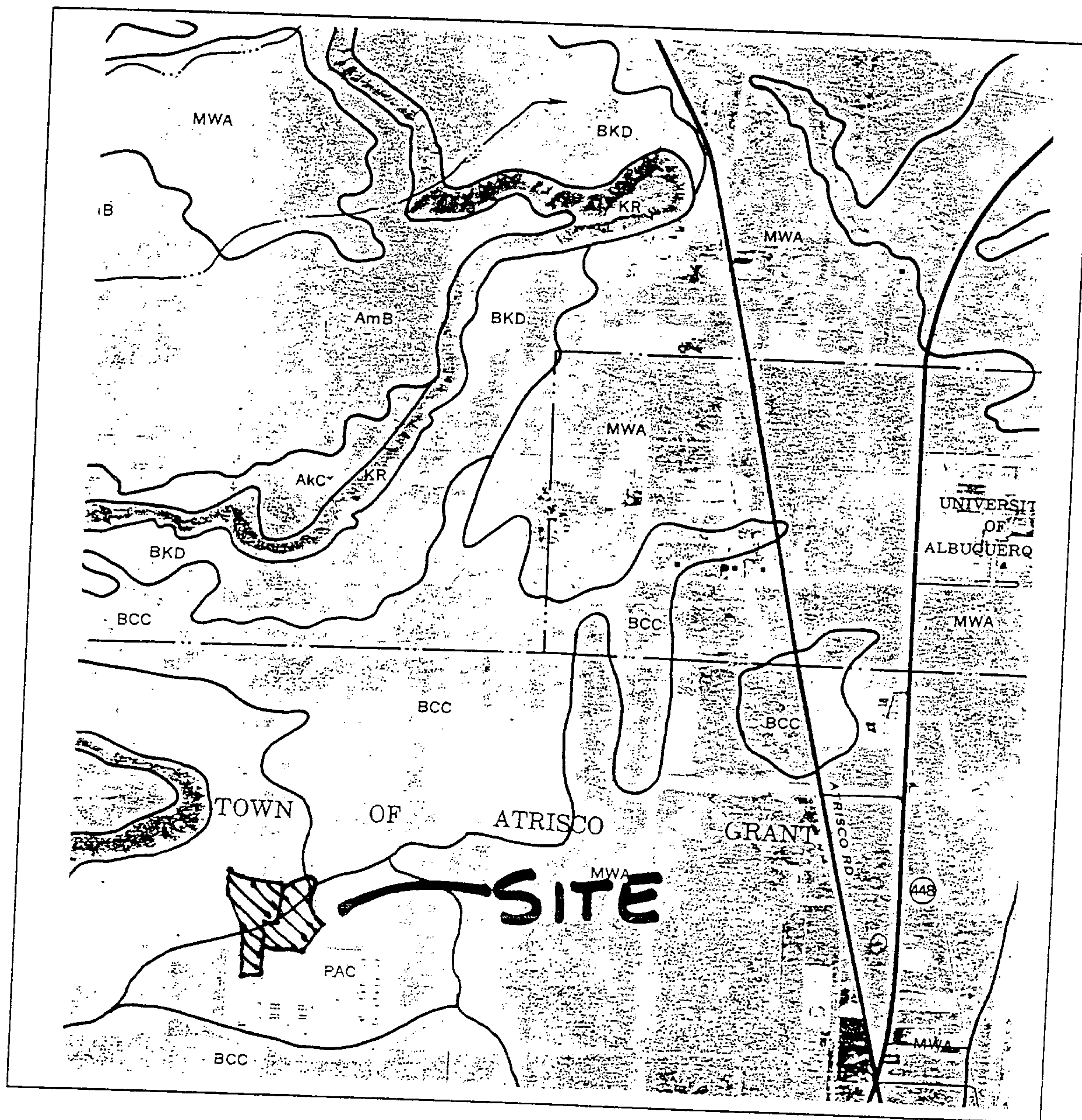
pond that drains to an existing private concrete channel at a controlled rate not to exceed 34.7 cfs. The channel drains to Painted Rock Drive, east to To-dos Santos, then to the Ouray system. Per the DMP, the Basin "D" pond will accept developed flows from off-site Basins "B" and "C". Developed discharge from Basins "B" and "C" is limited to 2.0 cfs/acre.

3. Basin "E" will drain to a future detention pond to be located near the northeast tract corner. Developed discharge is limited to 2.2 cfs/acre.
4. Basins "F" and "G" represent the existing developed GE Capital site. Each basin routes developed runoff through existing detention ponds as described above.

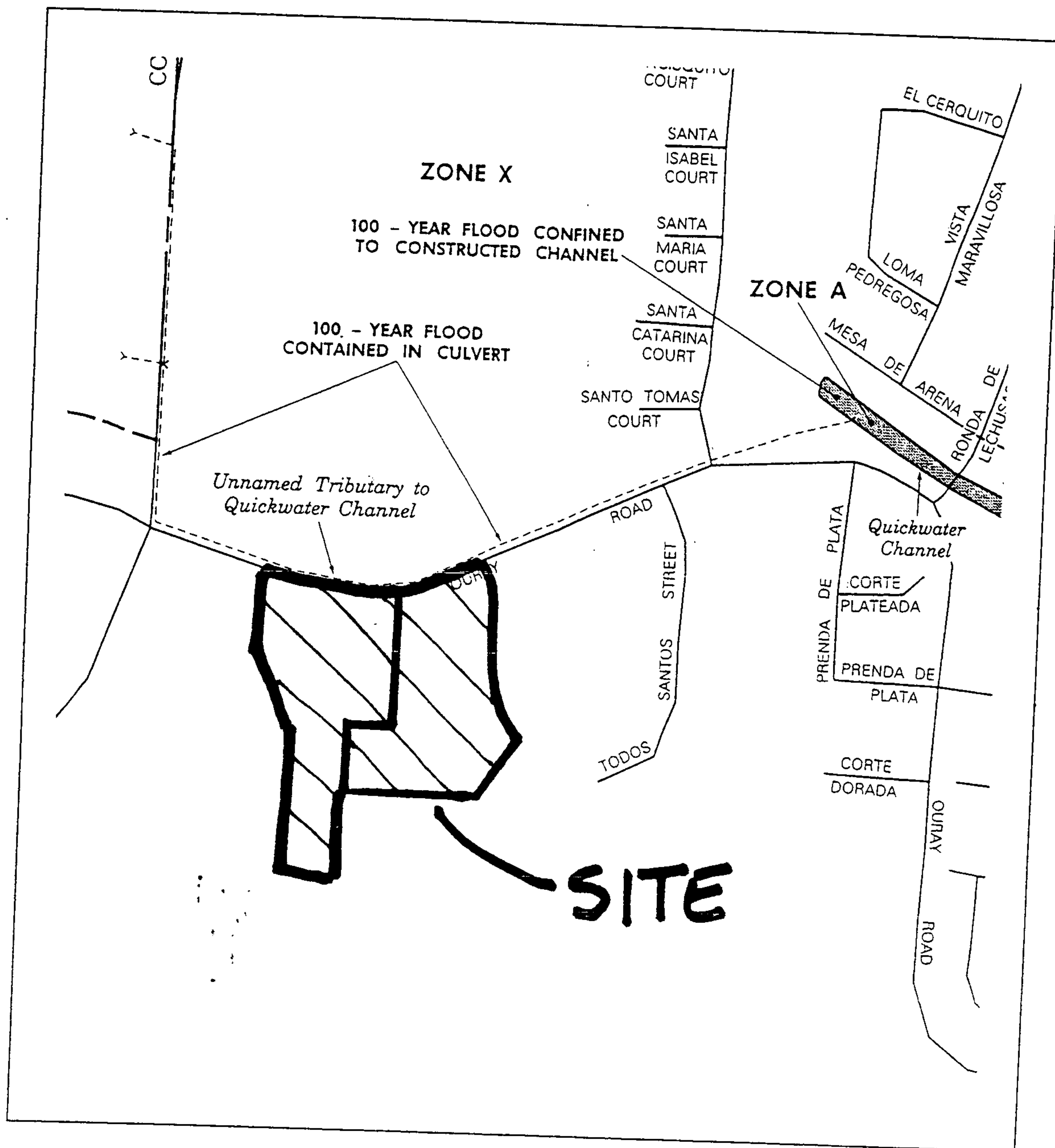
TEMPORARY EROSION CONTROL PLAN

1. The intent of the Temporary Erosion Control Plan is to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction. After the initial site clearing, the temporary erosion control facilities should be constructed to direct excess runoff and sediment to the detention pond sites. Earthen erosion control berms or silt fencing should then be placed along the downstream project boundaries to direct runoff to the project outfall.
2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.
3. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

MAPS



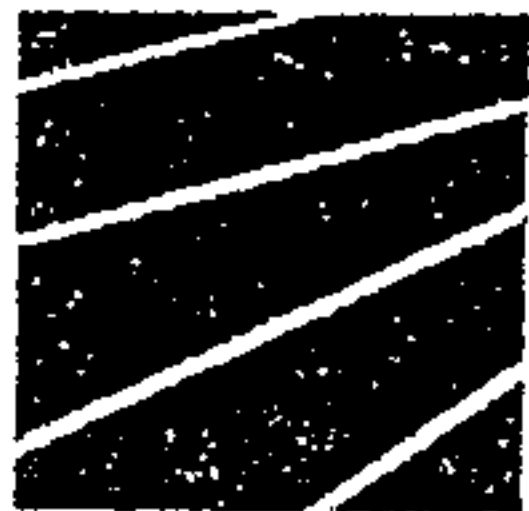
SOILS MAP
Figure 2



FLOOD INSURANCE RATE MAP
Figure 3

CALCULATIONS

INFRASTRUCTURE CAPACITIES



① BASIN 'B' DROP INLET + SD.

(A) DROP INLET

$$Q_{100} = 2.0 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 6.3 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (1.53 AC)} = 3.1 \text{ CFS}$$

DESIGN FOR $Q_{ALLOW} = 3.1 \text{ CFS}$

USE SINGLE "D" INLET - CAPACITY $\gg 3.1 \text{ CFS}$

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 3.1 \text{ CFS}$$

USE 18" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD

② BASIN 'C' DROP INLET + SD

(A) DROP INLET

$$Q_{100} = 14.9 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 47.0 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (11.51 AC)} = 23.0 \text{ CFS}$$

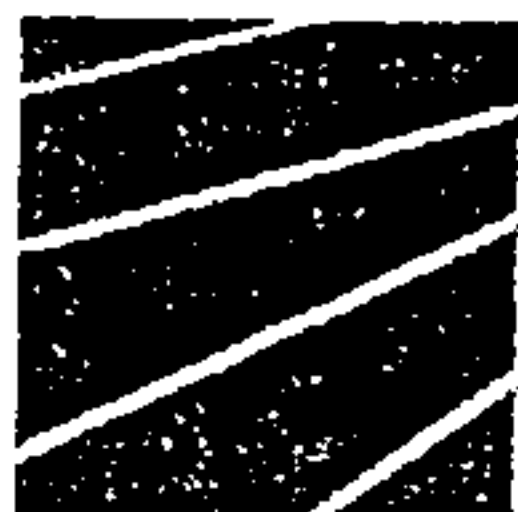
DESIGN FOR $Q_{ALLOW} = 23.0 \text{ CFS}$

USE DOUBLE "D" INLET - CAPACITY $\gg 23.0 \text{ CFS}$

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 23.0 \text{ CFS}$$

USE 30" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD

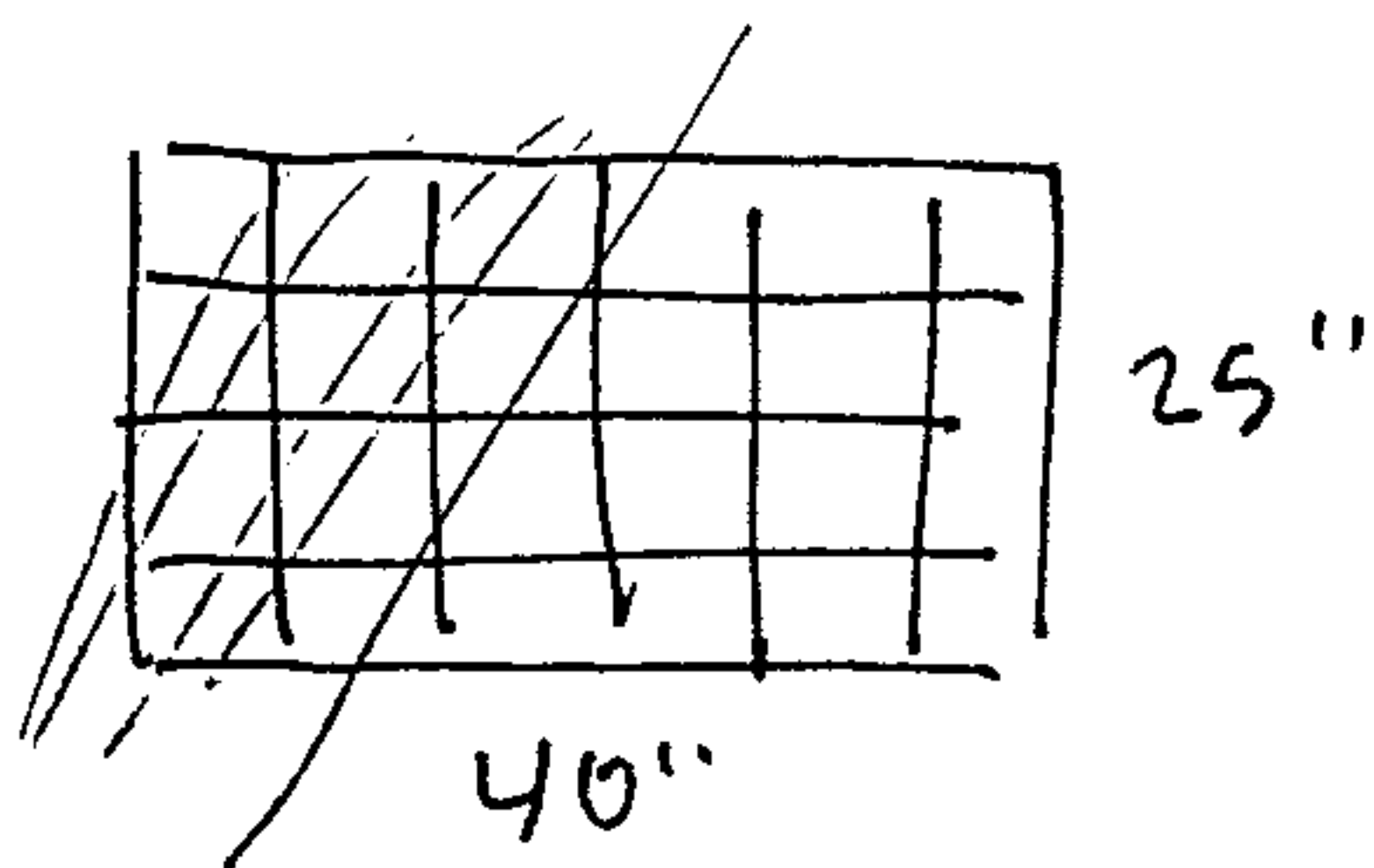


BRASHER & LORENZ
CONSULTING ENGINEERS

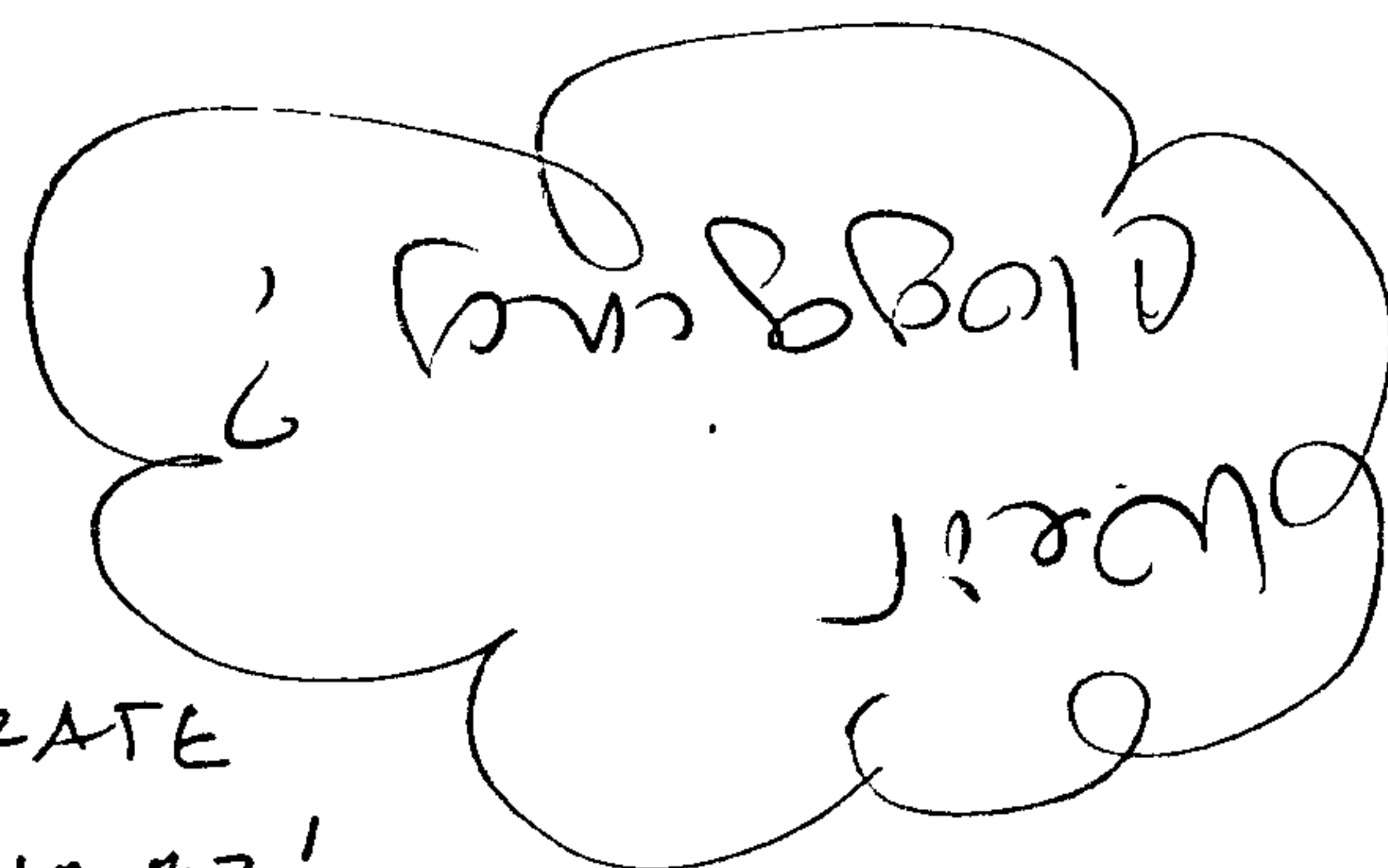
2201 San Pedro NE Building 1 Suite 220
Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

PROJECT GE CAPITAL
DATE 10.23.01 PAGE 2

- ③ TYPE "B" GRATINGS CAPACITY
VERIFY 1.A + 2.A
PER CWA STD DETAILS



SINGLE GRATE
 $P = 130'' = 10.83'$
OPEN $A = 4.31 \text{ SF}$



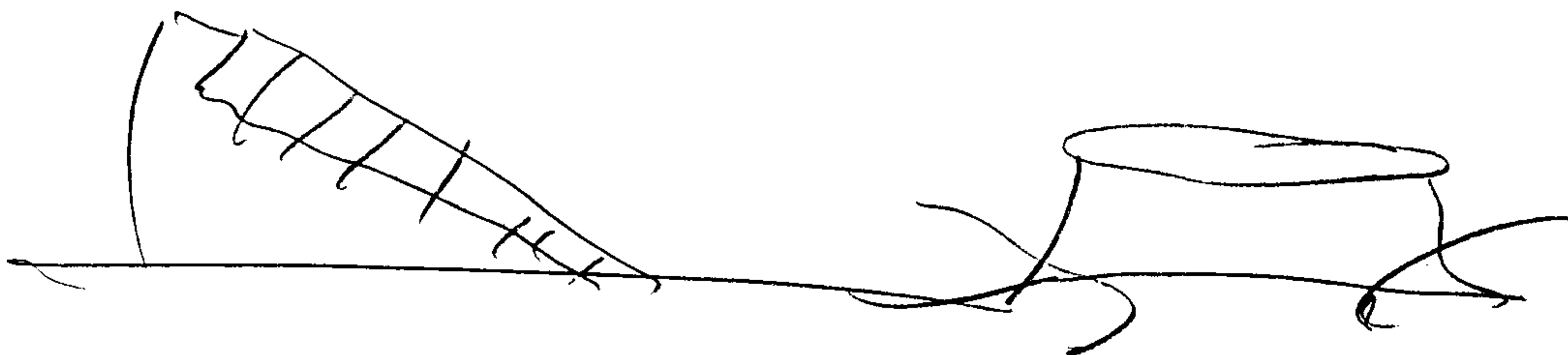
FIND MAX Q AT $H = 6''$ OVER GRATE:

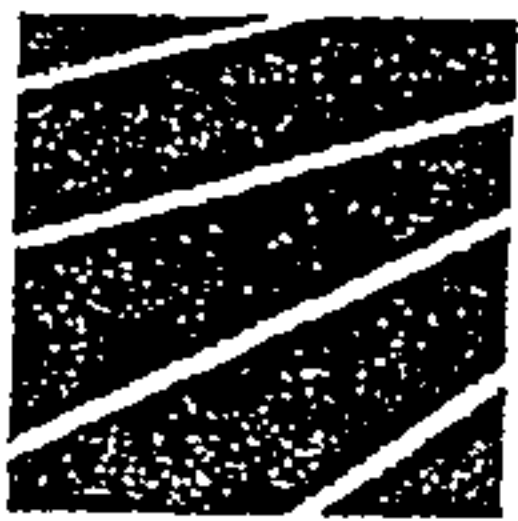
$$Q = CA \sqrt{2gh}$$

$$\begin{aligned} h &= 0.5' \\ g &= 32.2 \text{ F/s}^2 \\ A &= 4.31 \text{ SF} \\ C &= 0.60 \end{aligned}$$

$$\begin{aligned} Q &= 0.6(4.31) \sqrt{2(32.2)(0.5)} \\ &= 14.67 \text{ CFS / GRATE} \end{aligned}$$

⇒ FOR BASIN (B) USE SINGLE "B"
BASIN (C) USE DOUBLE "B"





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④ SD CAPACITY

SEWER PIPES

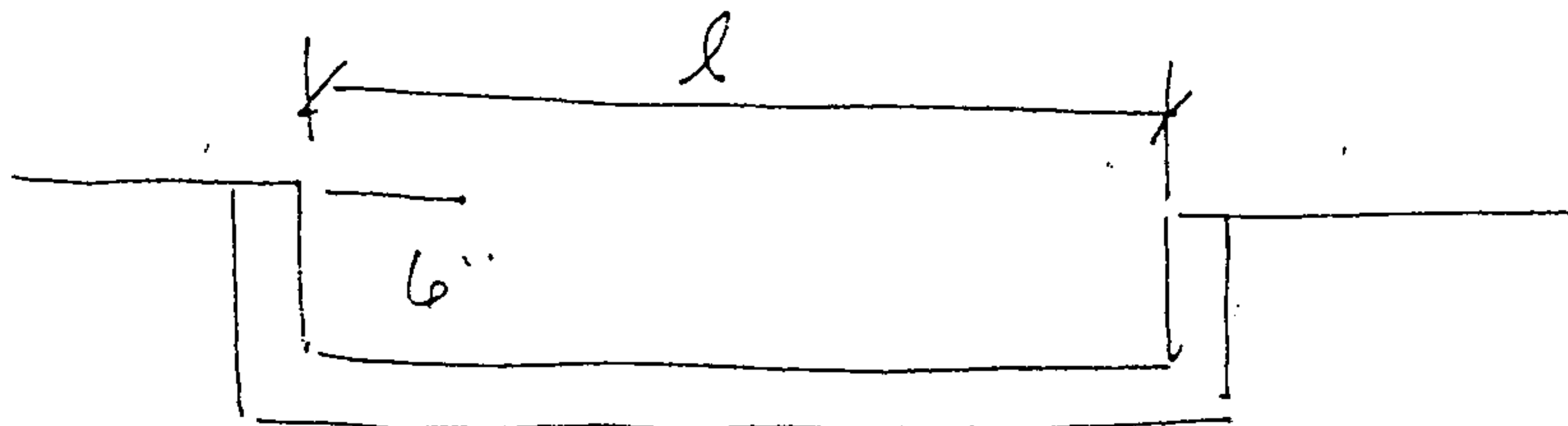
Enter up to 10 pipes.

Enter <Return> only for flowrate and diameter to end.

	FLOWRATE (CFS)	DIAMETER (IN)	FRICTION (FT ^{1/6})	SLOPE (%)	VELOCITY (FPS)
BASIN B	3.10	13.12	0.0120	0.40	3.30
BASIN C	23.00	26.69	0.0120	0.50	5.92

⑤ POMS INLET RUNDOWN

$Q_{100} = 17.5$ CFS BASIN "D"

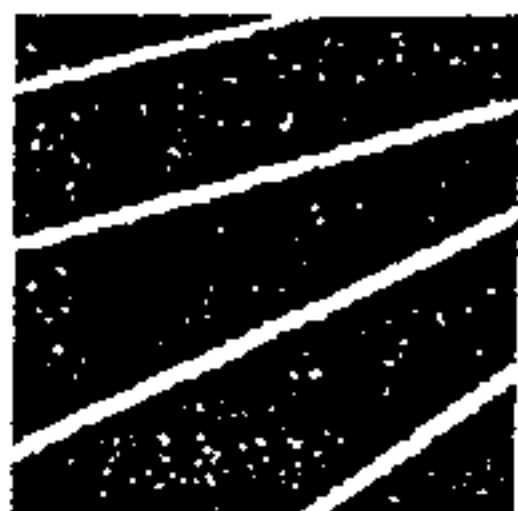


WEIRS

Enter up to 10 weirs.

Enter <Return> only for flowrate and length to end.

FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
18.00	<u>17.0</u>	3.000	0.50



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(6) POND ROUTING

(A) BASIN "b"

SIZE POND FOR OFF-SITE BASINS B+C

$$Q_{ALLOW} = 2.0 \text{ CFS/AC} \\ = 2.0 (1.53 + 11.51) = 26.1 \text{ CFS}$$

$$+ Q_{ALLOW} \text{ BASIN "b"} \\ = 2.0 (4.29) = 8.6 \text{ CFS}$$

$$\text{TOTAL } Q_{ALLOW} = 34.7 \text{ CFS}$$

USE 2.10" OUTLET PIPE THAT DRAIN TO
EXIST CONC CHANNEL:

ROUTE RES TABLE

ELEV	HW/D	Q _{OUT}	VOL
62	0	0 CFS	0 AC·FT
63	0.67	7	0.0777
64	1.33	18	0.1774
65	2.00	24	0.3017
66	2.67	32	0.4529

PER ATTY MO:

$$Q_{OUT} = 22.5 \text{ CFS} \\ VOL = 11,744 \text{ CF} \\ WSE = 64.7$$



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(B) BASIN "E"

SIZE CONCEPTUAL POMS FOR FUTURE
DEVELOPMENT.

$$Q_{\text{ALLOW}} = 2.2 \text{ CFS/AC} \\ = 2.2 (5.78) = 12.7 \text{ CFS}$$

USE " PIPE THAT DRAINS TO OURAY.

ELEV	HW/D	Q _{OUT}	VOL
50	0	0 CFS	0 AC-FT
51	0.8	3	0.12
52	1.6	7	0.24
53	2.4	10	0.36
54	3.2	12	0.48

PER ATTYMO:

$$Q_{\text{OUT}} = 9.7 \text{ CFS}$$

$$VOL = 15,080 \text{ CF}$$

$$WSE = 52.9$$

trol were developed. These nomographs give headwater-discharge relationships for most conventional culverts flowing with inlet control through a range of headwater depths or discharges. An example of these nomographs is shown in Figure 3.25.

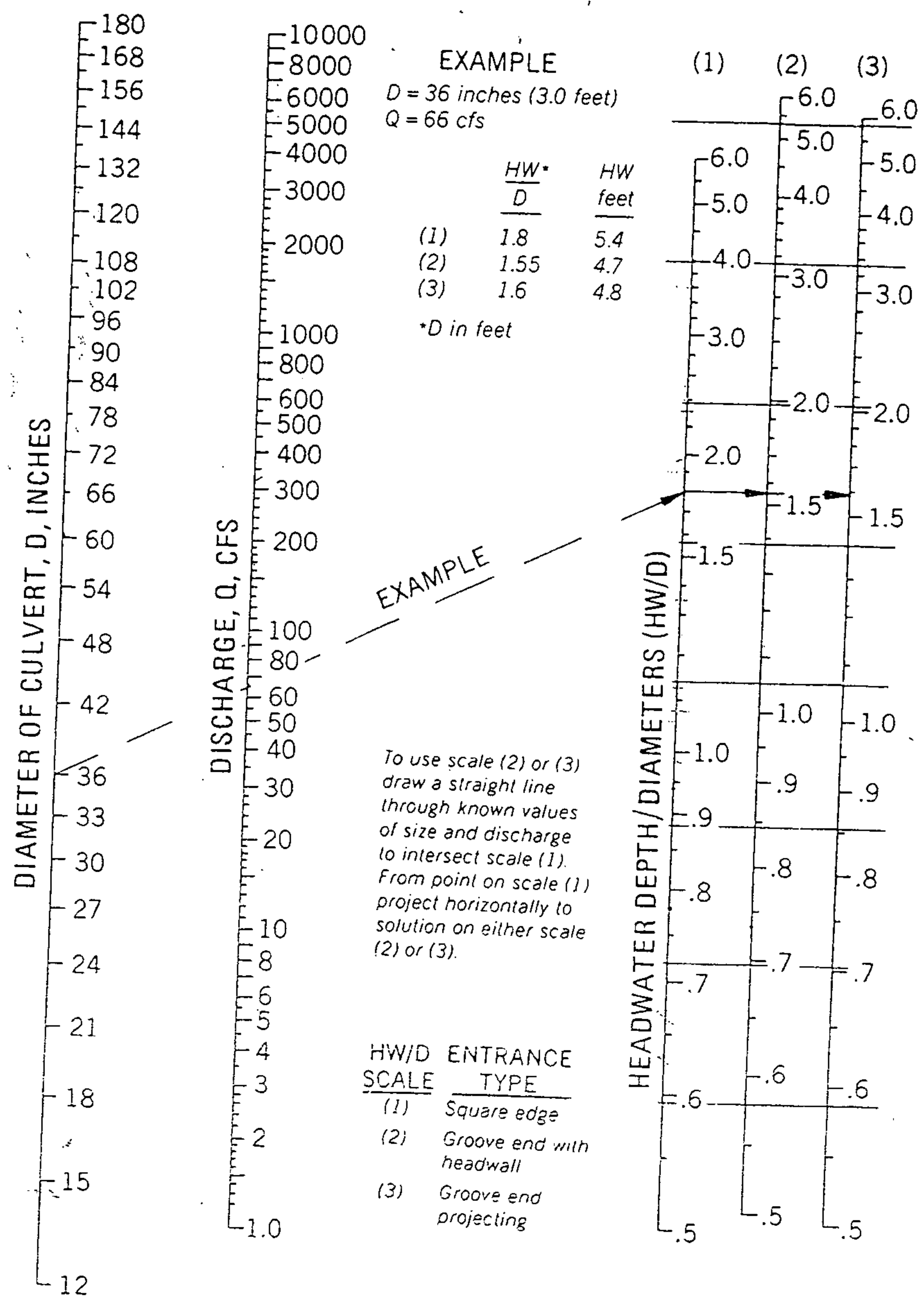


Figure 3.25. Headwater Depth for Circular Concrete Pipe Culverts with Inlet Control.

AHYMO OUTPUT FILES

```

*****
*                                     GE CAPITAL MODULAR SPACE
*                                     PROJECT HYDROLOGY
*****
START          TIME=0.0  PUNCH CODE=0
RAINFALL       TYPE=1  RAIN QUARTER=0.0  RAIN ONE=1.87
               RAIN SIX=2.20  RAIN DAY=2.66  DT=0.03333 HRS
*****
* EXISTNG CONDITIONS
*****
* UNDEVELOPED BASIN A - 6.41 ACRES
COMPUTE NM HYD  ID=1  HYD NO=A.EX  DA=0.01002 SQ MI
                PER A=100  PER B=0  PER C=0  PER D=0
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=1  CODE=20
* UNDEVELOPED BASIN B - 1.53 ACRES
COMPUTE NM HYD  ID=2  HYD NO=B.EX  DA=0.00239 SQ MI
                PER A=100  PER B=0  PER C=0  PER D=0
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=2  CODE=20
* UNDEVELOPED BASIN C - 11.51 ACRES
COMPUTE NM HYD  ID=3  HYD NO=C.EX  DA=0.01798 SQ MI
                PER A=100  PER B=0  PER C=0  PER D=0
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=3  CODE=20
* UNDEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD  ID=4  HYD NO=D.EX  DA=0.006703 SQ MI
                PER A=100  PER B=0  PER C=0  PER D=0
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=4  CODE=20
* UNDEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD  ID=5  HYD NO=E.EX  DA=0.009031 SQ MI
                PER A=100  PER B=0  PER C=0  PER D=0
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=5  CODE=20
* EXISTING DEVELOPED BASIN F - 4.00 ACRES
COMPUTE NM HYD  ID=6  HYD NO=F.EX  DA=0.006250 SQ MI
                PER A=0  PER B=7  PER C=8  PER D=85
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=6  CODE=20
* EXISTING DEVELOPED BASIN G - 2.69 ACRES
COMPUTE NM HYD  ID=7  HYD NO=G.EX  DA=0.004633 SQ MI
                PER A=0  PER B=7  PER C=8  PER D=85
                TP=0.1333 HR  MASS RAIN=-1

PRINT HYD       ID=7  CODE=20
*****
*DEVELOPED CONDITIONS
*****
* DEVELOPED BASIN A - 6.41 ACRES
COMPUTE NM HYD  ID=8  HYD NO=A.DEV  DA=0.01002 SQ MI
                PER A=0  PER B=7  PER C=8  PER D=85
                TP=0.1333 HR  MASS RAIN=-1

```

```

PRINT HYD          ID=8  CODE=20
* DEVELOPED BASIN B - 1.53 ACRES
COMPUTE NM HYD     ID=9  HYD NO=B.DEV  DA=0.00239 SQ MI
                  PER A=0 PER B=7  PER C=8  PER D=85
                  TP=0.1333 HR  MASS RAIN=-1

PRINT HYD          ID=9  CODE=20
* DEVELOPED BASIN C - 11.51 ACRES
COMPUTE NM HYD     ID=10  HYD NO=C.DEV  DA=0.01798 SQ MI
                  PER A=0 PER B=7  PER C=8  PER D=85
                  TP=0.1333 HR  MASS RAIN=-1

PRINT HYD          ID=10  CODE=20
* DEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD     ID=11  HYD NO=D.DEV  DA=0.006273 SQ MI
                  PER A=0 PER B=7  PER C=8  PER D=85
                  TP=0.1333 HR  MASS RAIN=-1

PRINT HYD          ID=11  CODE=20
* DEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD     ID=12  HYD NO=E.DEV  DA=0.009031 SQ MI
                  PER A=0 PER B=7  PER C=8  PER D=85
                  TP=0.1333 HR  MASS RAIN=-1

PRINT HYD          ID=12  CODE=20
ADD HYD            ID=13  HYD NO=B&C.EX ID I=2 ID II=3
PRINT HYD          ID=13  CODE=20
ADD HYD            ID=14  HYD NO=B&C&D.DEV  ID I=11 ID II=13
PRINT HYD          ID=14  CODE=20
*****
* ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO
DISCHARGE IS 2.0 CFS/AC OR 34.7 CFS
*****
ROUTE RESERVOIR    ID=15  HYD NO=POND'D'.OUT  INFLOW ID=14  CODE=10
                  OUT (CFS)  STORAGE (AC-FT)  ELEV (FT)
                  0          0                62.0
                  7.50       0.0777           63.0
                  13.5       0.1774           64.0
                  18.0       0.3017           65.0
                  21.0       0.4529           66.0

PRINT HYD          ID=15  CODE=20
*****
* ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP
* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN
* THIS IS AN EXAMPLE CALCULATION.  EXACT POND DESIGN TO BE DETERMINED AT
* TIME OF DEVELOPMENT
*****
ROUTE RESERVOIR    ID=16  HYD NO=POND'E'.OUT  INFLOW ID=12  CODE=10
                  OUT (CFS)  STORAGE (AC-FT)  ELEV (FT)
                  0          0                50.0
                  3.00       0.1200           51.0
                  7.00       0.2400           52.0
                  10.0       0.3600           53.0
                  12.0       0.4800           54.0

PRINT HYD          ID=16  CODE=20
*****

```

* EXISTING CHANNEL PER DMP. ALLOWABLE

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)
* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.
CFS FOR BASIN

* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 8.8

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 43.5
1.48 0.0262 44.0
5.45 0.0968 45.0
7.57 0.2125 46.0

PRINT HYD ID=17 CODE=20

* ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP
* ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 50.0
2.69 0.1271 51.0
4.59 0.2772 52.0

PRINT HYD ID=18 CODE=20

FINISH

RUN DATE (MON/DAY/YR) =04/10/2002
USER NO.= AHYMO-I-9702C01000T35-AH

HYDROGRAPH IDENTIFICATION		FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1
										NOTATION
START										
RAINFALL TYPE= 1										TIME= .00
										RAIN6= 2.200
COMPUTE NM HYD	A.EX	-	1	.01002	8.32	.235	.43925	1.533	1.298	PER IMP= .00
COMPUTE NM HYD	B.EX	-	2	.00239	1.99	.056	.43925	1.533	1.301	PER IMP= .00
COMPUTE NM HYD	C.EX	-	3	.01798	14.93	.421	.43925	1.533	1.297	PER IMP= .00
COMPUTE NM HYD	D.EX	-	4	.00670	5.57	.157	.43925	1.533	1.298	PER IMP= .00
COMPUTE NM HYD	E.EX	-	5	.00903	7.50	.212	.43925	1.533	1.298	PER IMP= .00
COMPUTE NM HYD	F.EX	-	6	.00625	16.35	.598	1.79461	1.500	4.088	PER IMP= 85.00
COMPUTE NM HYD	G.EX	-	7	.00463	12.12	.443	1.79461	1.500	4.089	PER IMP= 85.00
COMPUTE NM HYD	A.DEV	-	8	.01002	26.20	.959	1.79461	1.500	4.086	PER IMP= 85.00
COMPUTE NM HYD	B.DEV	-	9	.00239	6.26	.229	1.79461	1.500	4.094	PER IMP= 85.00
COMPUTE NM HYD	C.DEV	-	10	.01798	47.01	1.721	1.79461	1.500	4.085	PER IMP= 85.00
COMPUTE NM HYD	D.DEV	-	11	.00627	16.41	.600	1.79461	1.500	4.088	PER IMP= 85.00
COMPUTE NM HYD	E.DEV	-	12	.00903	23.62	.864	1.79461	1.500	4.087	PER IMP= 85.00
ADD HYD	B&C.EX	2& 3	13	.02037	16.92	.477	.43925	1.533	1.298	
ADD HYD	B&C&D.DEV	11&13	14	.02664	32.96	1.078	.75835	1.500	1.933	
ROUTE RESERVOIR	POND'D'.OUT		14	.02664	18.25	1.078	.75835	1.667	1.070	AC-FT= .314
ROUTE RESERVOIR	POND'E'.OUT		12	.00903	9.65	.864	1.79458	1.733	1.670	AC-FT= .346
ROUTE RESERVOIR	POND'F'.OUT		6	.00625	7.33	.598	1.79456	1.700	1.832	AC-FT= .199
ROUTE RESERVOIR	POND'G'.OUT		7	.00463	3.74	.443	1.79455	1.866	1.262	AC-FT= .210
FINISH										

AHYMO PROGRAM (AHYMO_97) -

- Version: 1997.02d

RUN DATE (MON/DAY/YR) = 04/10/2002

START TIME (HR:MIN:SEC) = 11:39:04

USER NO.= AHYMO-I-9702c01000T35-AH

INPUT FILE = C:\AHYMO\01512-C.TXT

*
* GE CAPITAL MODULAR SPACE
* PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
DT = .033330 HOURS END TIME = 5.999400 HOURS

.0000	.0016	.0033	.0050	.0067	.0085	.0103
.0122	.0141	.0160	.0180	.0201	.0222	.0243
.0266	.0289	.0312	.0337	.0362	.0388	.0415
.0443	.0472	.0502	.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809	.0865	.0924	.1050
.1334	.1771	.2398	.3254	.4379	.5814	.7600
.9780	1.1804	1.2649	1.3363	1.3997	1.4575	1.5106
1.5600	1.6061	1.6493	1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193	1.9456	1.9518	1.9576
1.9630	1.9682	1.9732	1.9780	1.9825	1.9869	1.9912
1.9953	1.9993	2.0031	2.0068	2.0104	2.0140	2.0174
2.0207	2.0240	2.0272	2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502	2.0528	2.0554	2.0580
2.0605	2.0629	2.0653	2.0677	2.0700	2.0723	2.0746
2.0768	2.0790	2.0812	2.0833	2.0855	2.0875	2.0896
2.0916	2.0936	2.0956	2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106	2.1124	2.1141	2.1159
2.1176	2.1193	2.1210	2.1227	2.1244	2.1260	2.1276
2.1292	2.1308	2.1324	2.1340	2.1355	2.1371	2.1386
2.1401	2.1416	2.1431	2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546	2.1560	2.1573	2.1587
2.1600	2.1614	2.1627	2.1640	2.1654	2.1667	2.1680
2.1692	2.1705	2.1718	2.1731	2.1743	2.1756	2.1768
2.1780	2.1792	2.1804	2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899	2.1910	2.1922	2.1933
2.1944	2.1956	2.1967	2.1978	2.1989	2.2000	

* EXISTNG CONDITIONS

* UNDEVELOPED BASIN A - 6.41 ACRES

COMPUTE NM HYD ID=1 HYD NO=A.EX DA=0.01002 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764

UNIT PEAK = 20.562 CFS UNIT VOLUME = .9989 B = 273.54 P60 = 1.8700
 AREA = .010020 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=20

HYDROGRAPH FROM AREA A.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.8	3.333	.1				

RUNOFF VOLUME = .43925 INCHES = .2347 ACRE-FEET
 PEAK DISCHARGE RATE = 8.32 CFS AT 1.533 HOURS BASIN AREA = .0100 SQ. MI.

* UNDEVELOPED BASIN B - 1.53 ACRES
 COMPUTE NM HYD ID=2 HYD NO=B.EX DA=0.00239 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
 UNIT PEAK = 4.9045 CFS UNIT VOLUME = .9967 B = 273.54 P60 = 1.8700
 AREA = .002390 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=20

HYDROGRAPH FROM AREA B.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.0				
.667	.0	2.000	.2	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .0560 ACRE-FEET
 PEAK DISCHARGE RATE = 1.99 CFS AT 1.533 HOURS BASIN AREA = .0024 SQ. MI.

* UNDEVELOPED BASIN C - 11.51 ACRES
 COMPUTE NM HYD ID=3 HYD NO=C.EX DA=0.01798 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
 UNIT PEAK = 36.897 CFS UNIT VOLUME = .9993 B = 273.54 P60 = 1.8700
 AREA = .017980 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=3 CODE=20

HYDROGRAPH FROM AREA C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.4	4.000	.0		
.667	.0	2.000	1.4	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .4212 ACRE-FEET
PEAK DISCHARGE RATE = 14.93 CFS AT 1.533 HOURS BASIN AREA = .0180 SQ. MI.

* UNDEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD ID=4 HYD NO=D.EX DA=0.006703 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 13.755 CFS UNIT VOLUME = .9986 B = 273.54 P60 = 1.8700
AREA = .006703 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=4 CODE=20

HYDROGRAPH FROM AREA D.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.1	4.000	.0		
.667	.0	2.000	.5	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .1570 ACRE-FEET
PEAK DISCHARGE RATE = 5.57 CFS AT 1.533 HOURS BASIN AREA = .0067 SQ. MI.

* UNDEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD ID=5 HYD NO=E.EX DA=0.009031 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 18.533 CFS UNIT VOLUME = .9989 B = 273.54 P60 = 1.8700
AREA = .009031 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD

ID=5 CODE=20

HYDROGRAPH FROM AREA E.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.7	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .2116 ACRE-FEET
 PEAK DISCHARGE RATE = 7.50 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING DEVELOPED BASIN F - 4.00 ACRES
 COMPUTE NM HYD ID=6 HYD NO=F.EX DA=0.006250 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 20.974 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005313 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.5086 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
 AREA = .000938 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA F.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.6	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 16.35 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* EXISTING DEVELOPED BASIN G - 2.69 ACRES
 COMPUTE NM HYD ID=7 HYD NO=G.EX DA=0.004633 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 15.548 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
 AREA = .003938 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 1.8596 CFS UNIT VOLUME = .9932 B = 356.70 P60 = 1.8700
 AREA = .000695 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA G.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	2.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	3.4	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4434 ACRE-FEET
 PEAK DISCHARGE RATE = 12.12 CFS AT 1.500 HOURS BASIN AREA = .0046 SQ. MI.

*DEVELOPED CONDITIONS

* DEVELOPED BASIN A - 6.41 ACRES

COMPUTE NM HYD ID=8 HYD NO=A.DEV DA=0.01002 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 33.626 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
 AREA = .008517 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 4.0219 CFS UNIT VOLUME = .9970 B = 356.70 P60 = 1.8700
 AREA = .001503 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=20

HYDROGRAPH FROM AREA A.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.2	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	7.4	3.333	.2	5.333	.2				

RUNOFF VOLUME = 1.79461 INCHES = .9590 ACRE-FEET
 PEAK DISCHARGE RATE = 26.20 CFS AT 1.500 HOURS BASIN AREA = .0100 SQ. MI.

* DEVELOPED BASIN B - 1.53 ACRES
 COMPUTE NM HYD ID=9 HYD NO=B.DEV DA=0.00239 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 8.0205 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
 AREA = .002032 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = .95931 CFS UNIT VOLUME = .9864 B = 356.70 P60 = 1.8700
 AREA = .000359 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA B.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	1.8	2.666	.1	4.000	.0	5.333	.0
.667	.0	2.000	1.5	3.333	.0	4.666	.0	5.999	.0

RUNOFF VOLUME = 1.79461 INCHES = .2288 ACRE-FEET
 PEAK DISCHARGE RATE = 6.26 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

* DEVELOPED BASIN C - 11.51 ACRES
 COMPUTE NM HYD ID=10 HYD NO=C.DEV DA=0.01798 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 60.338 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
 AREA = .015283 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 7.2169 CFS UNIT VOLUME = .9985 B = 356.70 P60 = 1.8700
 AREA = .002697 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=20

HYDROGRAPH FROM AREA C.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	11.0	4.000	.2	5.999	.3		
.667	.0	2.666	1.0	4.666	.2	6.666	.0		
1.333	13.3	3.333	.3	5.333	.3				

RUNOFF VOLUME = 1.79461 INCHES = 1.7209 ACRE-FEET
 PEAK DISCHARGE RATE = 47.01 CFS AT 1.500 HOURS BASIN AREA = .0180 SQ. MI.

* DEVELOPED BASIN D - 4.29 ACRES
 COMPUTE NM HYD ID=11 HYD NO=D.DEV DA=0.006273 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 21.051 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005332 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.5179 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
 AREA = .000941 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=11 CODE=20

HYDROGRAPH FROM AREA D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.9	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.7	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .6004 ACRE-FEET
 PEAK DISCHARGE RATE = 16.41 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* DEVELOPED BASIN E - 5.78 ACRES
 COMPUTE NM HYD ID=12 HYD NO=E.DEV DA=0.009031 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 30.307 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
 AREA = .007676 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 3.6249 CFS UNIT VOLUME = .9967 B = 356.70 P60 = 1.8700
 AREA = .001355 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=20

HYDROGRAPH FROM AREA E.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	5.5	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	6.7	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .8644 ACRE-FEET
 PEAK DISCHARGE RATE = 23.62 CFS AT 1.500 HOURS BASIN AREA = .0090 SQ. MI.

ADD HYD ID=13 HYD NO=B&C.EX ID I=2 ID II=3
 PRINT HYD ID=13 CODE=20

HYDROGRAPH FROM AREA B&C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.4	4.000	.0		
.667	.0	2.000	1.6	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .4772 ACRE-FEET
 PEAK DISCHARGE RATE = 16.92 CFS AT 1.533 HOURS BASIN AREA = .0204 SQ. MI.

ADD HYD ID=14 HYD NO=B&C&D.DEV ID I=11 ID II=13
 PRINT HYD ID=14 CODE=20

HYDROGRAPH FROM AREA B&C&D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	5.4	4.000	.1	5.999	.1		
.667	.0	2.666	.7	4.666	.1	6.666	.0		
1.333	4.7	3.333	.2	5.333	.1				

RUNOFF VOLUME = .75835 INCHES = 1.0776 ACRE-FEET
 PEAK DISCHARGE RATE = 32.96 CFS AT 1.500 HOURS BASIN AREA = .0266 SQ. MI.

 * ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO

ROUTE RESERVOIR ID=15 HYD NO=POND'D'.OUT INFLOW ID=14 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0	62.0
7.50	0.0777	63.0
13.5	0.1774	64.0
18.0	0.3017	65.0
21.0	0.4529	66.0

* * * * *

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

.00	.00	62.00	.000	.00
.33	.00	62.00	.000	.00
.67	.00	62.00	.000	.00
1.00	.00	62.00	.000	.00
1.33	4.66	62.21	.017	1.60
1.67	17.96	65.08	.314	18.25
2.00	5.45	63.70	.148	11.73
2.33	1.62	62.46	.035	3.41
2.67	.75	62.15	.012	1.12
3.00	.38	62.07	.005	.51
3.33	.22	62.04	.003	.28
3.67	.15	62.02	.002	.17
4.00	.11	62.02	.001	.12
4.33	.10	62.01	.001	.10
4.67	.09	62.01	.001	.09
5.00	.09	62.01	.001	.09
5.33	.09	62.01	.001	.09
5.67	.10	62.01	.001	.10
6.00	.11	62.01	.001	.11
6.33	.01	62.00	.000	.04
6.67	.00	62.00	.000	.01

PEAK DISCHARGE = 18.247 CFS - PEAK OCCURS AT HOUR 1.67

MAXIMUM WATER SURFACE ELEVATION = 65.082

MAXIMUM STORAGE = .3142 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=15 CODE=20

HYDROGRAPH FROM AREA POND'D'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	11.7	4.000	.1	5.999	.1
.667	.0	2.666	1.1	4.666	.1	6.666	.0
1.333	1.6	3.333	.3	5.333	.1		

RUNOFF VOLUME = .75835 INCHES = 1.0776 ACRE-FEET

PEAK DISCHARGE RATE = 18.25 CFS AT 1.667 HOURS BASIN AREA = .0266 SQ. MI.

* ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP
* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN
* THIS IS AN EXAMPLE CALCULATION. EXACT POND DESIGN TO BE DETERMINED AT
* TIME OF DEVELOPMENT

ROUTE RESERVOIR ID=16 HYD NO=POND'E'.OUT INFLOW ID=12 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 50.0
3.00 0.1200 51.0
7.00 0.2400 52.0
10.0 0.3600 53.0
12.0 0.4800 54.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	6.71	50.25	.030	.75
1.67	12.00	52.83	.340	9.50
2.00	5.55	52.53	.303	8.59
2.33	1.19	51.57	.188	5.28
2.67	.49	50.88	.106	2.65
3.00	.26	50.50	.060	1.50
3.33	.17	50.28	.034	.85
3.67	.14	50.17	.020	.50
4.00	.13	50.11	.013	.32
4.33	.12	50.07	.009	.22
4.67	.12	50.06	.007	.17
5.00	.13	50.05	.006	.15
5.33	.14	50.05	.006	.14
5.67	.14	50.05	.006	.14
6.00	.16	50.05	.006	.15
6.33	.02	50.04	.004	.11
6.67	.00	50.02	.002	.06
7.00	.00	50.01	.001	.03
7.33	.00	50.01	.001	.02
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 9.654 CFS - PEAK OCCURS AT HOUR 1.73
MAXIMUM WATER SURFACE ELEVATION = 52.885
MAXIMUM STORAGE = .3462 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD

ID=16 CODE=20

HYDROGRAPH FROM AREA POND'E'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	8.6	4.000	.3	5.999	.1	7.999	.0
.667	.0	2.666	2.6	4.666	.2	6.666	.1		
1.333	.8	3.333	.9	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79458 INCHES = .8644 ACRE-FEET
PEAK DISCHARGE RATE = 9.65 CFS AT 1.733 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)
* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 43.5
1.48 0.0262 44.0
5.45 0.0968 45.0
7.57 0.2125 46.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	43.50	.000	.00
.33	.00	43.50	.000	.00
.67	.00	43.50	.000	.00
1.00	.00	43.50	.000	.00
1.33	4.64	43.86	.019	1.06
1.67	8.31	45.87	.198	7.30
2.00	3.84	45.51	.156	6.53
2.33	.82	44.52	.063	3.53
2.67	.34	43.88	.020	1.12
3.00	.17	43.64	.007	.41
3.33	.12	43.56	.003	.19
3.67	.10	43.54	.002	.12
4.00	.09	43.53	.002	.10
4.33	.08	43.53	.002	.09
4.67	.08	43.53	.002	.08
5.00	.09	43.53	.002	.09
5.33	.09	43.53	.002	.09
5.67	.10	43.53	.002	.10
6.00	.11	43.53	.002	.10

6.33 .01 43.52 .001 .05
 6.67 .00 43.51 .000 .02
 7.00 .00 43.50 .000 .00
 PEAK DISCHARGE = 7.328 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 45.886
 MAXIMUM STORAGE = .1993 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=17 CODE=20

HYDROGRAPH FROM AREA POND'F'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.5	4.000	.1	5.999	.1		
.667	.0	2.666	1.1	4.666	.1	6.666	.0		
1.333	1.1	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79456 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 7.33 CFS AT 1.700 HOURS BASIN AREA = .0063 SQ. MI.

 * ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP
 * ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 50.0
 2.69 0.1271 51.0
 4.59 0.2772 52.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	3.44	50.12	.016	.33
1.67	6.16	51.44	.194	3.53
2.00	2.85	51.52	.205	3.68
2.33	.61	51.17	.153	3.02
2.67	.25	50.74	.094	1.99
3.00	.12	50.44	.056	1.19
3.33	.09	50.26	.033	.71
3.67	.07	50.16	.020	.43
4.00	.06	50.10	.013	.27
4.33	.06	50.07	.008	.18
4.67	.06	50.05	.006	.13

5.00	.06	50.04	.005	.10
5.33	.07	50.03	.004	.09
5.67	.07	50.03	.004	.08
6.00	.08	50.03	.004	.08
6.33	.01	50.02	.003	.06
6.67	.00	50.01	.002	.04
7.00	.00	50.01	.001	.02
7.33	.00	50.00	.001	.01
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 3.743 CFS - PEAK OCCURS AT HOUR 1.87
 MAXIMUM WATER SURFACE ELEVATION = 51.554
 MAXIMUM STORAGE = .2103 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=18 CODE=20

HYDROGRAPH FROM AREA POND'G'.OUT

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	3.7	4.000	.3	5.999	.1	7.999	.0
.667	.0	2.666	2.0	4.666	.1	6.666	.0	8.666	.0
1.333	.3	3.333	.7	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79455 INCHES = .4434 ACRE-FEET
 PEAK DISCHARGE RATE = 3.74 CFS AT 1.866 HOURS BASIN AREA = .0046 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:39:04



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 8, 2001

Dennis Lorenz, P.E.
Brasher & Lorenz, Inc.
2201 San Pedro NE
Building #1 - Suite 210
Albuquerque, NM 87110

RE: GE CAPITAL MODULAR SPACE, TR 5A1 VOLCANO BUSINESS PARK, PHASE I and TR 5A2-A1-1, PHASE II (G10-D29F). DRAINAGE REPORT FOR SITE DEVELOPMENT PLAN FOR SUBDIVISION AND SITE DEVELOPMENT PLAN FOR BUILDING PERMIT APPROVALS. ENGINEER'S STAMP DATED OCTOBER 23, 2001.

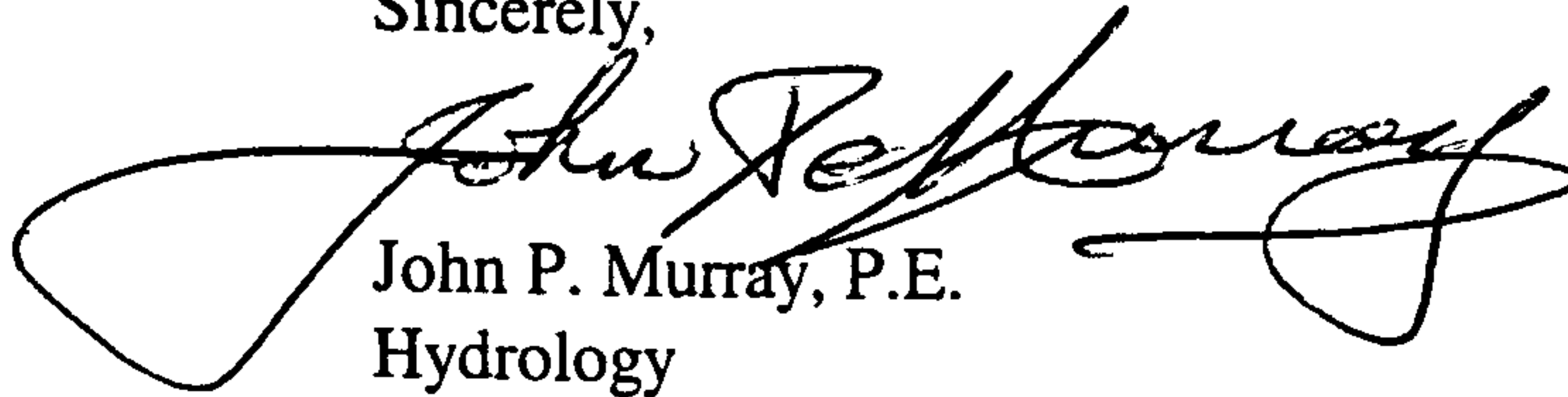
Dear Mr. Lorenz:

Based on the information provided on your October 24, 2001 submittal, the above referenced project is approved for Site Development Plan for Subdivision and for Site Development Plan for Building Permit.

Subsequent submittals will be required for the Building Permits themselves.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,



John P. Murray, P.E.
Hydrology

c: Terri Martin
✓ File

DRAINAGE INFORMATION SHEET

G-10/D29F

PROJECT TITLE: GE CAPITAL MODULAR SPACE ZONE MAP/DRG. FILE #: ~~G-10/D29F~~
 DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: TR SAI VOLCANO BUSINESS PARK PHASE I
 CITY ADDRESS: OURAY RD NW

ENGINEERING FIRM: BRASHER + LORENZ
 ADDRESS: 2201 SAN PEDRO NE
 CITY, STATE: ABQ NM

CONTACT: D. LORENZ
 PHONE: 888 6088
 ZIP CODE: 87110

OWNER: CORPORATE SITE CONSULTANTS
 ADDRESS: 161 WOODLAWN DR
 CITY, STATE: DEPEW, NY

CONTACT: L. KUHN
 PHONE: 716-685-1660
 ZIP CODE: 14043

ARCHITECT: NA
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

SURVEYOR: PRECISION SURVEYS
 ADDRESS: 8414-D JEFFERSON NE
 CITY, STATE: ABQ NM

CONTACT: L. MEDRANO
 PHONE: 856-5700
 ZIP CODE: 87113

CONTRACTOR: NA
 ADDRESS: _____
 CITY, STATE: _____

CONTACT: _____
 PHONE: _____
 ZIP CODE: _____

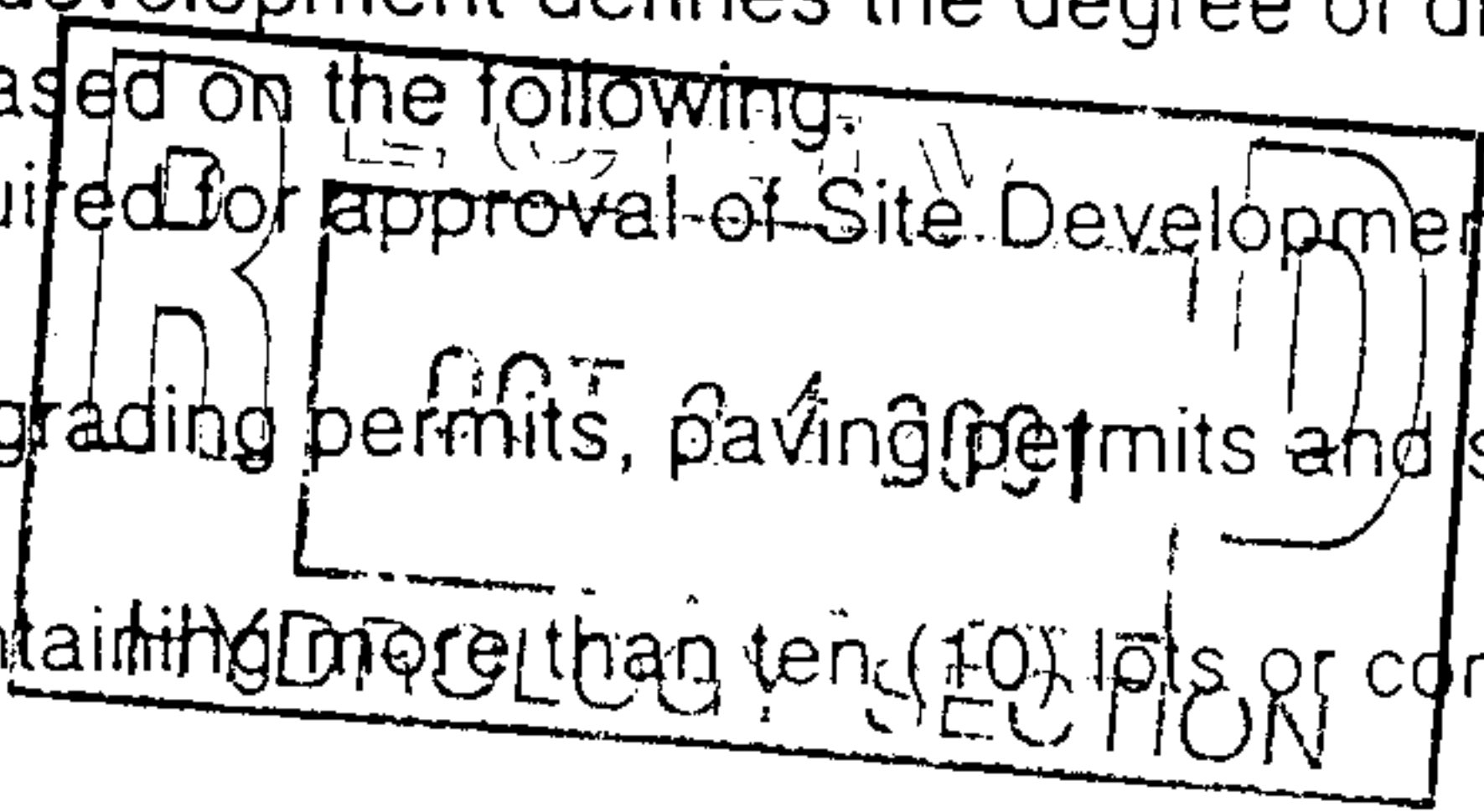
- TYPE OF SUBMITTAL:
- ☐ DRAINAGE REPORT
 - ☒ DRAINAGE PLAN
 - ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
 - ☐ GRADING PLAN
 - ☐ EROSION CONTROL PLAN
 - ☐ ENGINEER'S CERTIFICATION
 - ☐ CLOMR/LOMR
 - ☐ OTHER
- WAS A PRE-DESIGN CONFERENCE ATTENDED:
- ☒ YES
 - ☐ NO
 - ☐ COPY PROVIDED

- 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 APPROVAL
 - ☐ GRADING PERMIT APPROVAL
 - ☐ PAVING PERMIT APPROVAL
 - ☐ WORK ORDER APPROVAL
 - ☐ OTHER (SPECIFY)

DATE SUBMITTED: 10.24.01 BY: DENNIS LORENZ

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 (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.



DRAINAGE REPORT

FOR

GE CAPITAL MODULAR SPACE

**Tract 5A1, Volcano Business Park, Phase I, and
Tract 5A2-A1-1, Volcano Business Park, Phase II**

Albuquerque, New Mexico

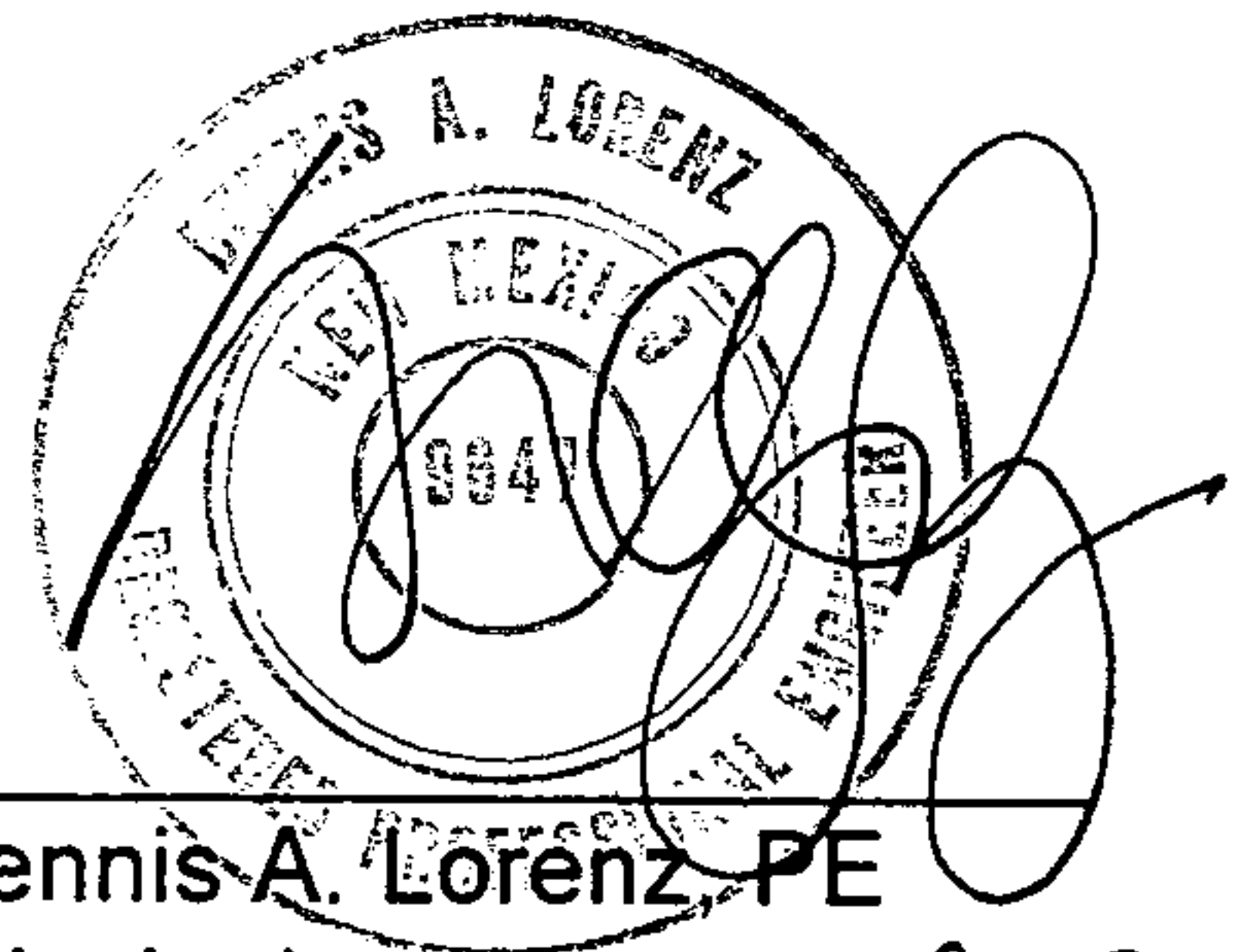
Prepared By:

BRASHER & LORENZ, INC.

Consulting Engineers

2201 San Pedro NE, Building No. 1, Suite 220

Albuquerque, New Mexico 87110



Dennis A. Lorenz, PE
Principal

10-23-01

OCTOBER 2001

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GRADING AND DRAINAGE PLAN	POCKET
APPROVED DRAINAGE MASTERPLAN	POCKET
APPROVED GRADING AND DRAINAGE PLAN FOR GE CAPITAL MODULAR SPACE	POCKET

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The project consists of the development of the property for GE Capital Modular Space. Paving, landscaping, utility, grading, and drainage improvements will be provided to support the project. The scope of this plan is to provide drainage criteria for the safe management of excess runoff. The report is presented to obtain Site Plan for Subdivision approval, Amended Site Plan approval, and building Permit approval.

SITE DESCRIPTION

The project site is approximately 16.8 acres in size and is located on Painted Rock Drive NW, at Ouray Road NW (See Figure 1). Site terrain slopes west to east at approximately 2 percent. The site is presently described as a Tract 5A1, Volcano Business Park, Phase I and Tract 5A2-A1-1, Volcano Business Park, Phase II. The site is bounded on the north by Ouray Road, Painted Rock Drive, and on the south by a PNM switching Station, and on the west by undeveloped properties.

The project site consists of the existing GE Capital Modular Space facility, described as Tract 5A2-A1-1, Volcano Business Park, Phase II, and Tract 5A1, Volcano Business Park, Phase I, which is presently undeveloped. Tract 5A1 is to be subdivided into 2 tracts. The southerly 4.29-acre tract will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility.

EXISTING CONDITIONS

The site presently drains easterly to the Ouray Road storm system as follows:

1. Basin "A" is undeveloped and drains northward to Ouray Road.
2. Basins "B", "C" and "D" drain east into an existing private concrete channel located along the south side of the GE Capital site to Painted Rock Drive. Flows are then conveyed by street improvements to the Ouray storm drain.
3. Basin "E" drains northeasterly to Ouray Road.
4. Basin "F" represents a portion of the GE Capital site. This basin flows east to an existing detention pond that drains at a controlled rate of 7.3 cfs to Ouray Road NW near the intersection of Ouray. Runoff from this pond is intercepted by the Ouray storm drain.

5. Basin "G" represents the southern portion of the GE Capital site. This basin flows north to an existing detention pond that drains at a controlled rate of 3.8 cfs to an existing concrete channel at the east end of the property line. Runoff from this pond will drain east within Todos Santos and intercepted by an existing storm drain which connects to the Ouray storm drain.

As shown by the attached FIRM Panel (Figure 3) this site does not lie within a designated flood hazard zone.

SUMMARY OF EXISTING DRAINAGE PLANS

Per the **Drainage Masterplan for Volcano Business Park, Phase II (G-10/D29)**, prepared by Brasher & Lorenz, Inc., 1-20-98, the site is required to implement on-site detention ponding. Per the DMP, the Basins "A", and "E" are limited to 2.2 cfs/acre, and Basins "A", "B", "D" and the GE Capital site are limited to 2.0 cfs/acre.

The DMP recommended the construction of certain infrastructure improvements to support the subdivision of Tract 5A1-A1 (DRB 97-450). Improvements to Ouray Road and Painted Rock Drive were constructed by public work order, City Project No. 5856.81. On-site improvements included an improved private channel along the south property line of the GE Capital site.

The **Grading and Drainage Plan for GE Capital**, prepared by Brasher & Lorenz, Inc., 7-8-98, was prepared for building permit purposes to support the GE Capital Modular Space project. Typical site improvements were recommended, along with 2 on-site detention ponds that limit developed discharge from the site to the limits established by the **Drainage Masterplan for Volcano Business Park, Phase II**.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the site for GE Capital Modular Space, a facility for lease and maintenance of portable buildings. Tract 5A1 is to be subdivided into 2 tracts. The southerly Tract 5A1-B, a 4.29-acre tract, will be combined with Tract 5A2-A1-1, the GE Capital Modular Space site, to form a new 10.98-acre parcel, allowing GE Capital to expand its facility. Development will include paving, utility landscaping and drainage improvements. Tract 5A1-A, a 5.78-acre tract, will not be developed at this time.

In accordance with the approved Masterplans, the site will drain to on-site detention ponds. The ponds will route all excess runoff to Painted Rock Drive and Ouray Road at controlled rates established by the DMP, as follows:

1. Basin "A" will continue to drain north to Ouray Road. Developed discharge will be limited to 2.2 cfs/acre.
2. Basin "D", the GE Capital expansion site will route all flows through a detention

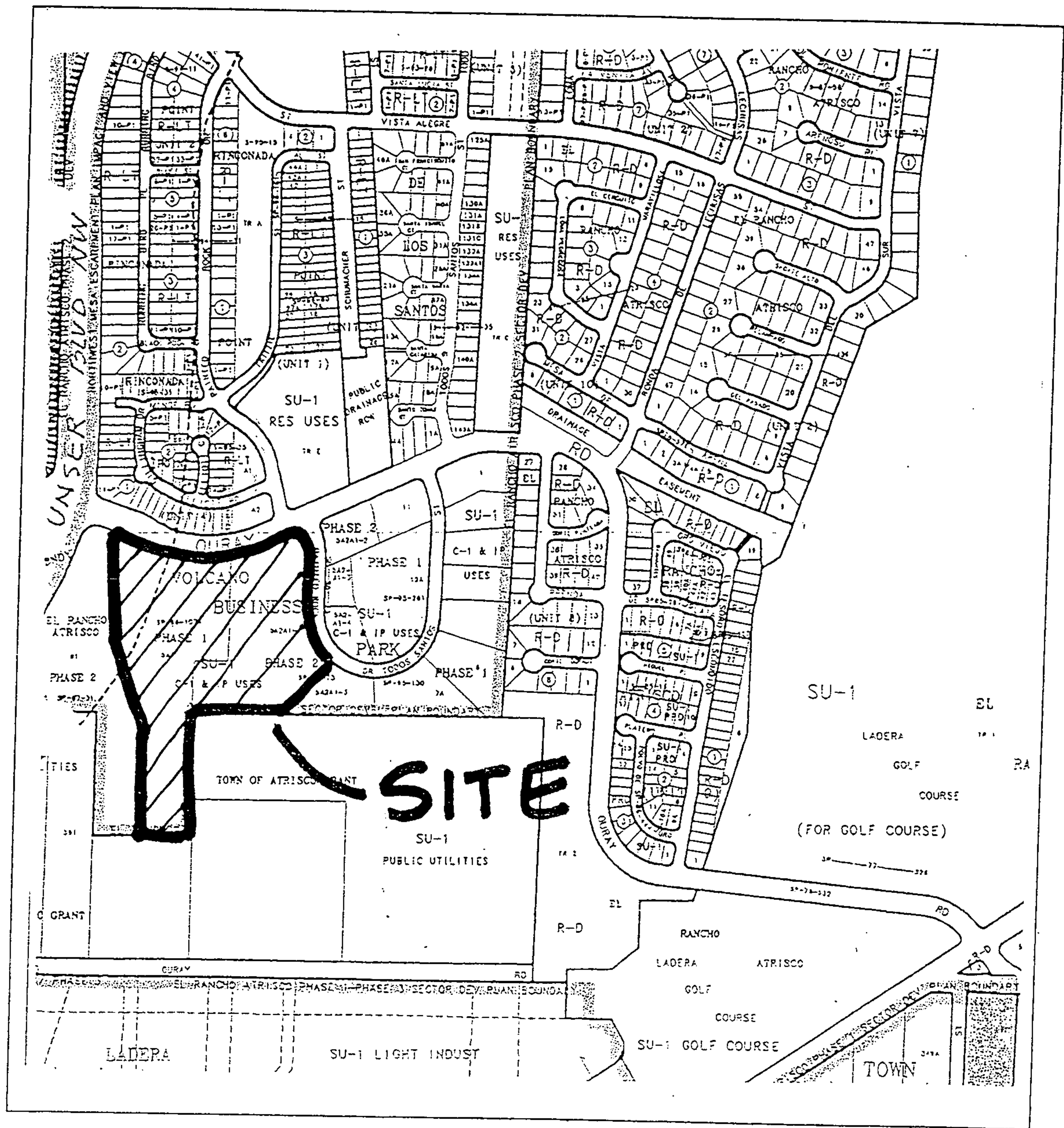
pond that drains to an existing private concrete channel at a controlled rate not to exceed 34.7 cfs. The channel drains to Painted Rock Drive, east to To-dos Santos, then to the Ouray system. Per the DMP, the Basin "D" pond will accept developed flows from off-site Basins "B" and "C". Developed discharge from Basins "B" and "C" is limited to 2.0 cfs/acre.

3. Basin "E" will drain to a future detention pond to be located near the northeast tract corner. Developed discharge is limited to 2.2 cfs/acre.
4. Basins "F" and "G" represent the existing developed GE Capital site. Each basin routs developed runoff through existing detention ponds as described above.

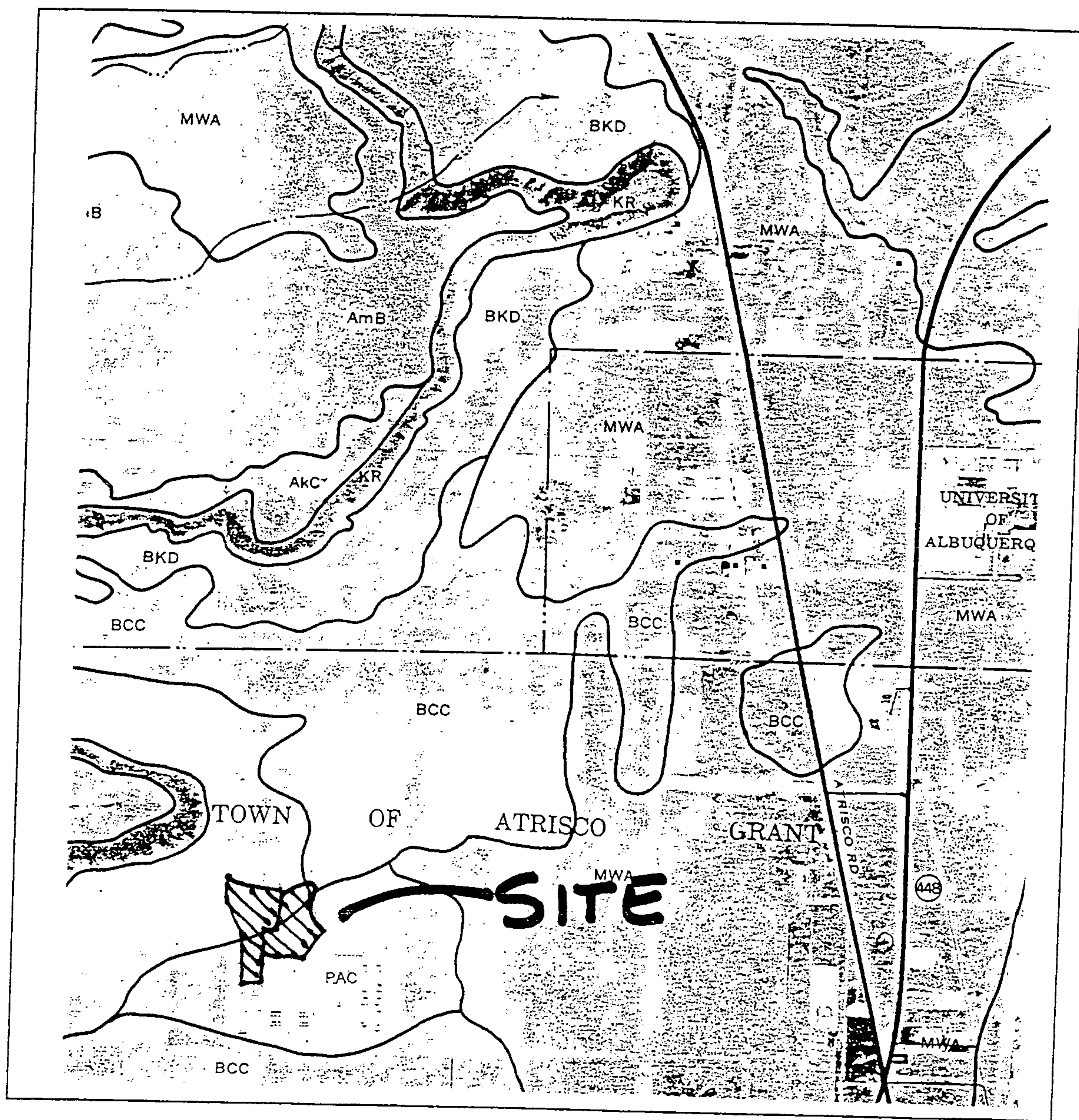
TEMPORARY EROSION CONTROL PLAN

1. The intent of the Temporary Erosion Control Plan is to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction. After the initial site clearing, the temporary erosion control facilities should be constructed to direct excess runoff and sediment to the detention pond sites. Earthen erosion control berms or silt fencing should then be placed along the downstream project boundaries to direct runoff to the project outfall.
2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.
3. It is the Contractor's responsibility to properly maintain all temporary erosion control facilities during the construction phase of the project.

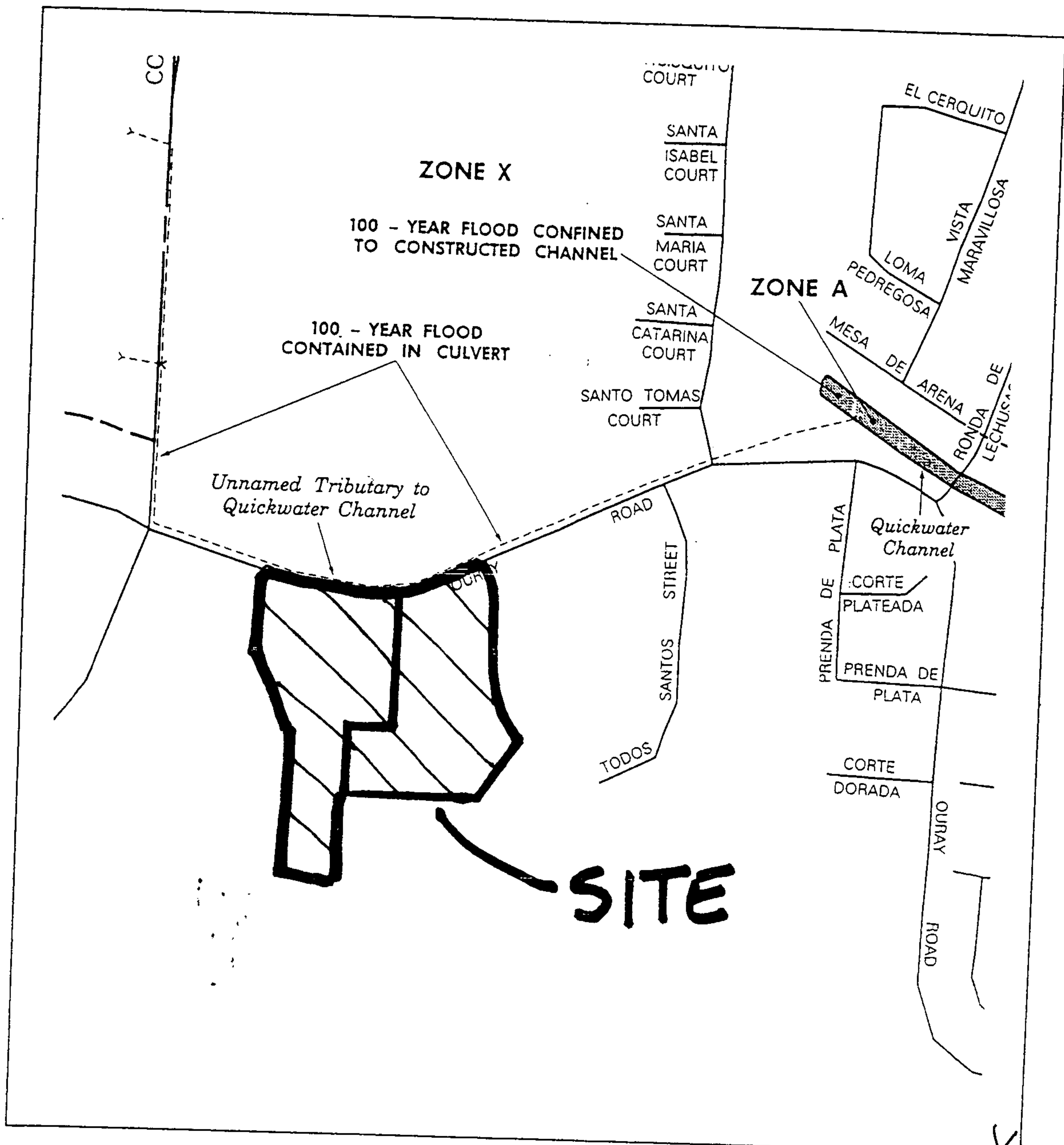
MAPS



LOCATION MAP
Figure 1



SOILS MAP
Figure 2

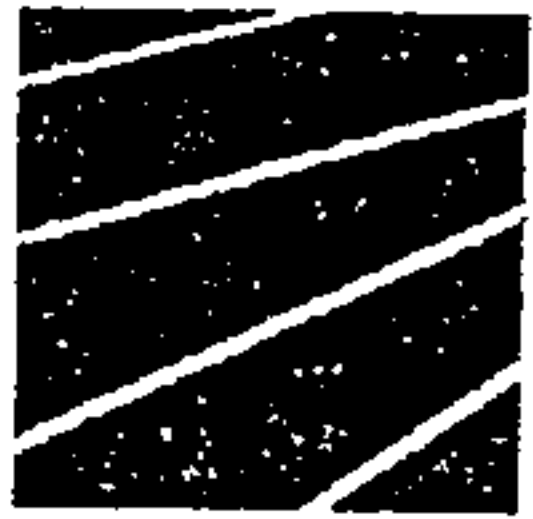


FLOOD INSURANCE RATE MAP
Figure 3

FIRM MAP #

CALCULATIONS

INFRASTRUCTURE CAPACITIES



① BASIN 'B' DROP INLET + SD.

(A) DROP INLET

$$Q_{100} = 2.0 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 6.3 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (1.53 AC)} = 3.1 \text{ CFS}$$

$$\text{DESIGN FOR } Q_{ALLOW} = 3.1 \text{ CFS}$$

USE SINGLE "B" INLET - CAPACITY > 3.1 CFS

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 3.1 \text{ CFS}$$

USE 18" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD

② BASIN 'C' DROP INLET + SD

(A) DROP INLET

$$Q_{100} = 14.9 \text{ CFS (UNDEVELOPED)}$$

$$Q_{100} = 47.0 \text{ CFS (DEVELOPED)}$$

$$Q_{ALLOW} = 2.0 \text{ CFS/AC (11.51 AC)} = 23.0 \text{ CFS}$$

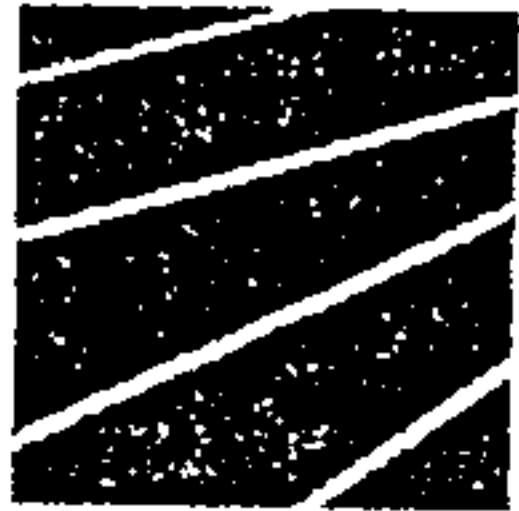
$$\text{DESIGN FOR } Q_{ALLOW} = 23.0 \text{ CFS}$$

USE DOUBLE "D" INLET - CAPACITY > 23.0 CFS

(B) STORM DRAIN TO POND

$$Q_{ALLOW} = 23.0 \text{ CFS}$$

USE 30" SD (OVERSIZE FOR POTENTIAL)
SEDIMENT LOAD



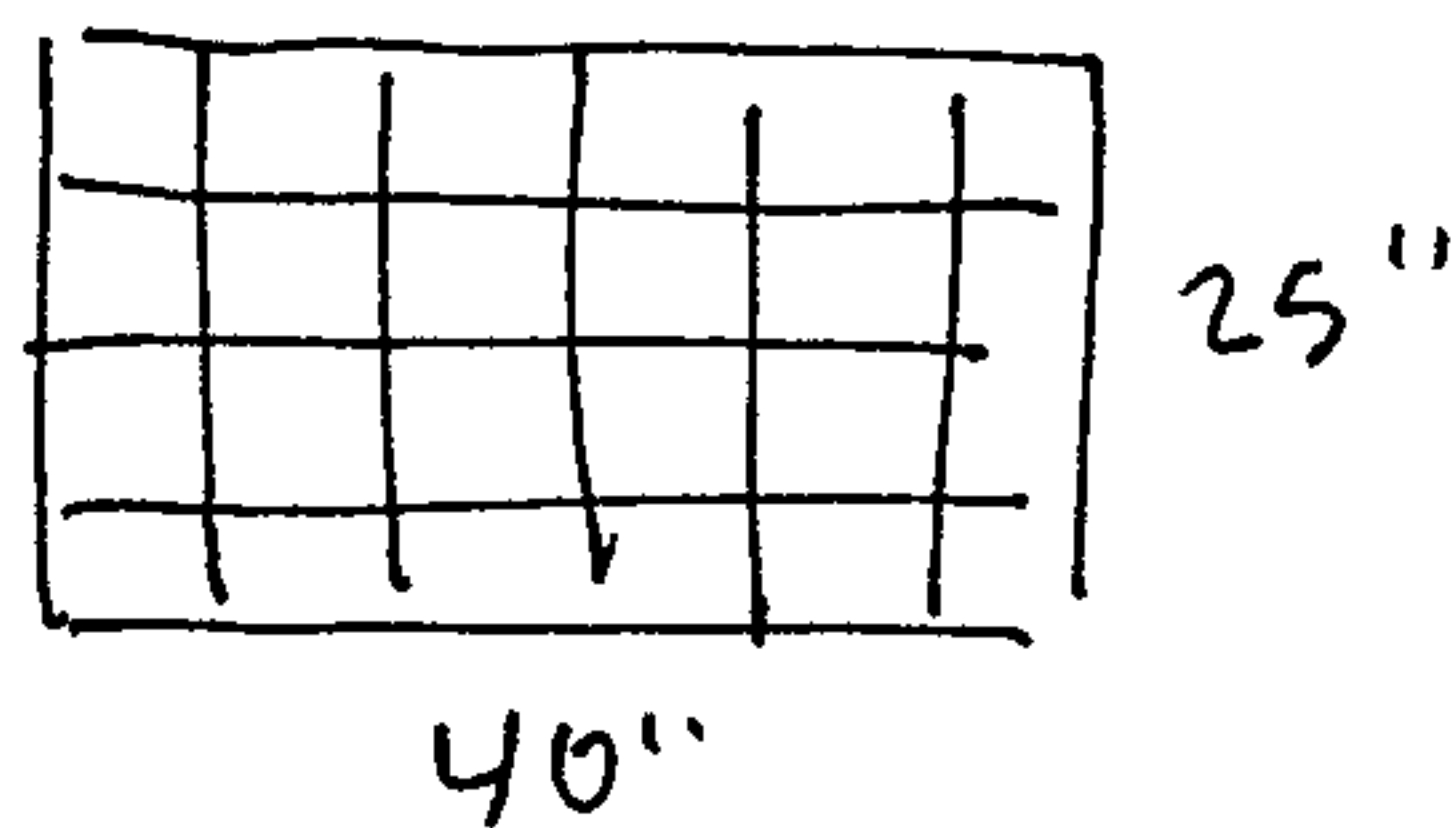
BRASHER & LORENZ
CONSULTING ENGINEERS

2201 San Pedro NE Building 1 Suite 220
Albuquerque, New Mexico 87110
Ph: 505-888-6088 Fax: 505-888-6188

PROJECT GE CAPITAL
DATE 10.23.01 PAGE 2

③ TYPE "D" GRATINGS CAPACITY
VERIFY 1.A + 2.A

PER COA STD DETAILS



SINGLE GRATE
 $P = 130'' = 10.83'$
OPEN $A = 4.31 \text{ SF}$

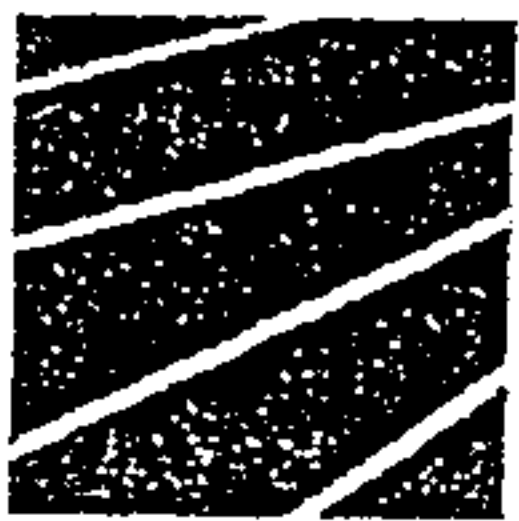
FIND MAX Q AT $H = 6''$ OVER GRATE:

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

$$\begin{aligned} h &= 0.5' \\ g &= 32.2 \text{ F/s}^2 \\ A &= 4.31 \text{ SF} \\ C &= 0.60 \end{aligned}$$

$$\begin{aligned} Q &= 0.6(4.31) \sqrt{2g(0.5)} \\ &= 14.67 \text{ CFS / GRATE} \end{aligned}$$

⇒ FOR BASIN (B) USE SINGLE "D"
BASIN (C) USE DOUBLE "D"



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CONSULTING ENGINEERS

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PROJECT GE CAPITAL
DATE 10.23.01 PAGE 3

④ SD CAPACITY

SEWER PIPES

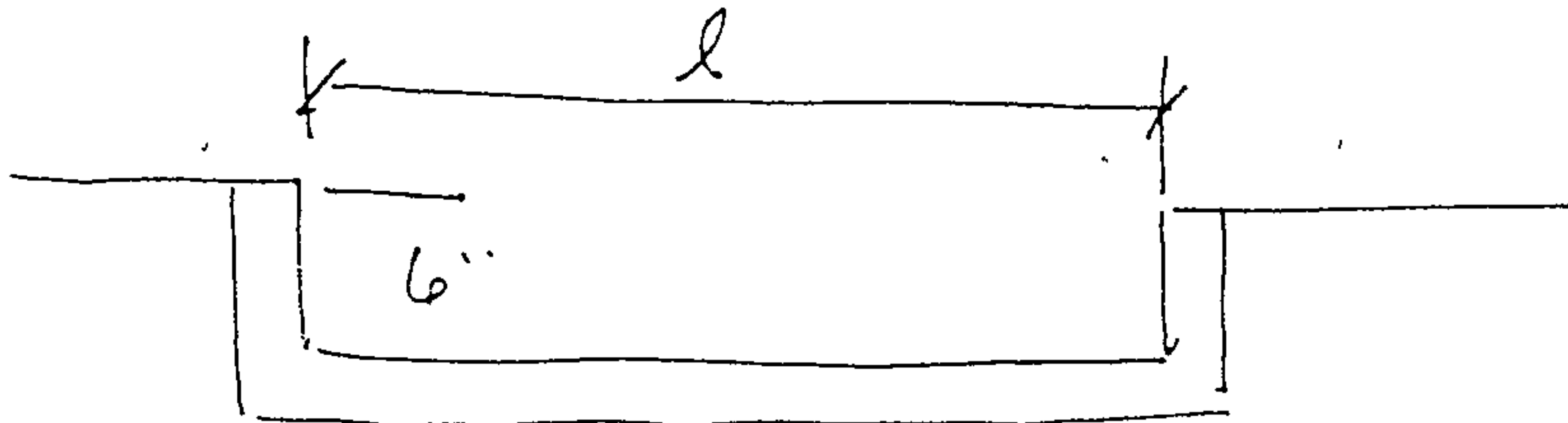
Enter up to 10 pipes.

Enter <Return> only for flowrate and diameter to end.

FLOWRATE (CFS)	DIAMETER (IN)	FRICTION (FT ^{1/6})	SLOPE (%)	VELOCITY (FPS)
BASIN B 3.10	13.12	0.0120	0.40	3.30
BASIN C 23.00	26.69	0.0120	0.50	5.92

⑤ POND INLET RUNDOWN

$Q_{100} = 17.9$ CFS BASIN "D"

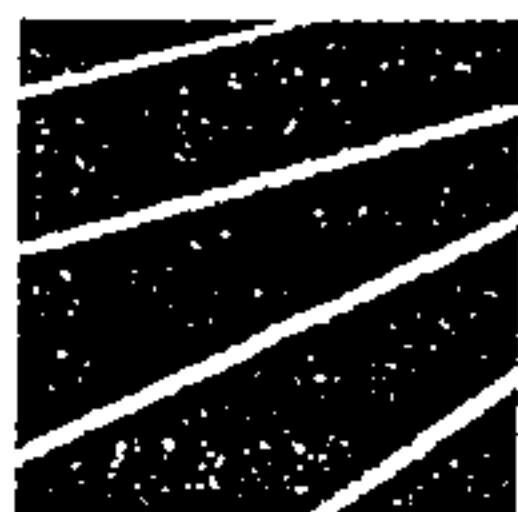


WEIRS

Enter up to 10 weirs.

Enter <Return> only for flowrate and length to end.

FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
18.00	<u>17.0</u>	3.000	0.50



⑥ POND ROUTING

① BASIN "b"

SIZE POND FOR OFF-SITE BASINS B+C

$$Q_{ALLOW} = 2.0 \text{ CFS/AC} \\ = 2.0 (1.53 + 11.51) = 26.1 \text{ CFS}$$

$$+ Q_{ALLOW} \text{ BASIN "b"} \\ = 2.0 (4.29) = 8.6 \text{ CFS}$$

$$\text{TOTAL } Q_{ALLOW} = 34.7 \text{ CFS}$$

USE 2.10" OUTLET PIPE THAT DRAIN TO
EXIST CONC CHANNEL:

ROUTE RES TABLE

ELEV	HW/D	Q _{OUT}	VOL
62	0	0 CFS	0 AC·FT
63	0.67	7	0.0777
64	1.33	18	0.1774
65	2.00	24	0.3017
66	2.67	32	0.4529

PER ATTY MO:

$$Q_{OUT} = 22.5 \text{ CFS} \\ VOL = 11,744 \text{ CF} \\ WSE = 64.7$$

(B) Basin "E"

size conceptual pump for future development.

$$Q_{max} = 2.2 \text{ cfs/ft}$$

$$= 2.2 (5.78) = 12.7 \text{ cfs}$$

use " " pipe that repairs to outlay.

ELEV	HW/B	Qout	Vol
50	0	0 cfs	0 ac-ft
51	0.8	3	0.12
52	1.6	7	0.24
53	2.4	10	0.36
54	3.2	12	0.48

per Amwmd:

$$Q_{out} = 9.7 \text{ cfs}$$

$$Vol = 15,080 \text{ cf}$$

$$WSE = 52.9$$

trol were developed. These nomographs give headwater-discharge relationships for most conventional culverts flowing with inlet control through a range of headwater depths or discharges. An example of these nomographs is shown in Figure 3.25.

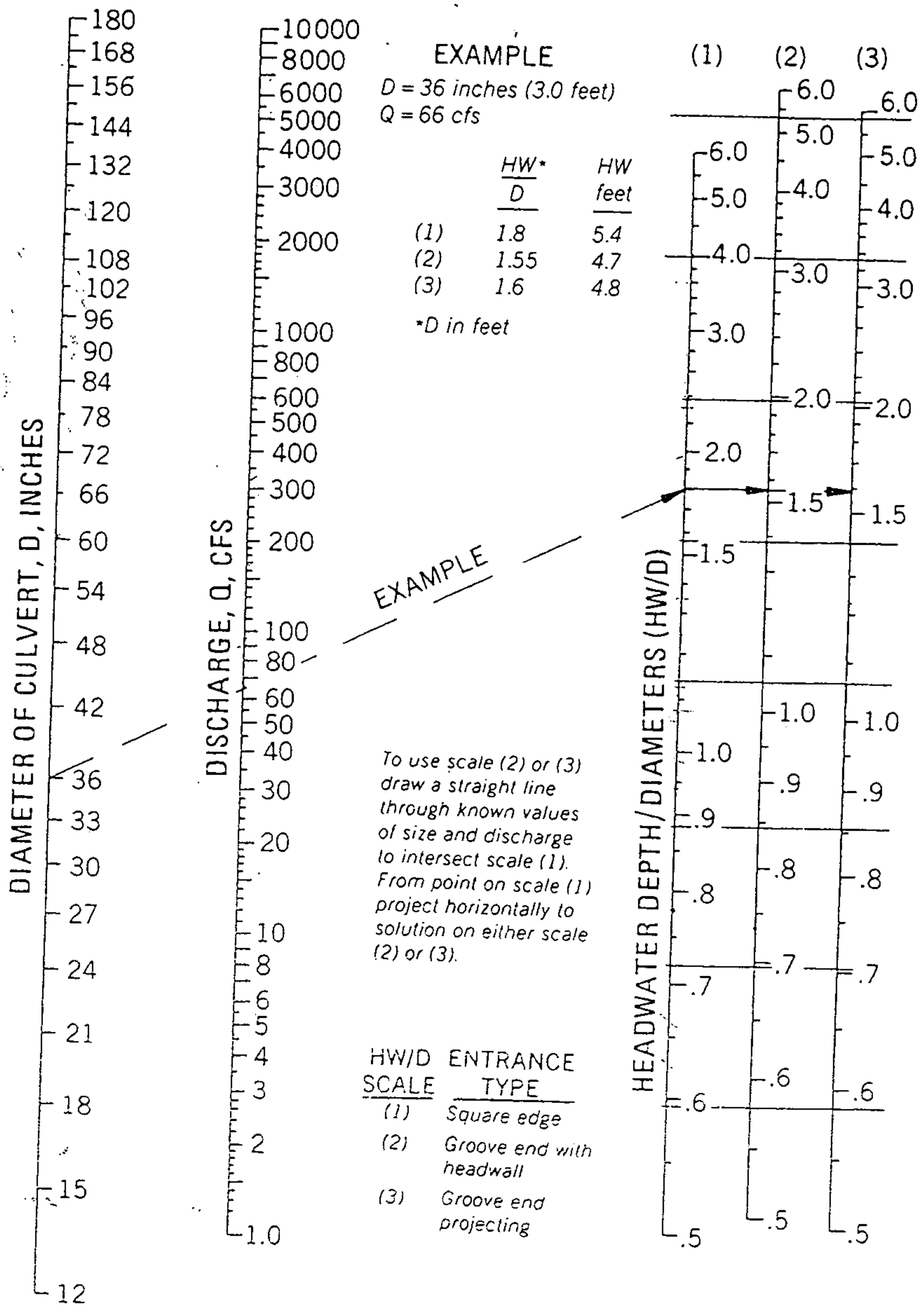


Figure 3.25. Headwater Depth for Circular Concrete Pipe Culverts with Inlet Control.

AHYMO OUTPUT FILES

```

*****
*
*               GE CAPITAL MODULAR SPACE
*               PROJECT HYDROLOGY
*****
START          TIME=0.0  PUNCH CODE=0
RAINFALL       TYPE=1  RAIN QUARTER=0.0  RAIN ONE=1.87
               RAIN SIX=2.20  RAIN DAY=2.66  DT=0.03333 HRS
*****
* EXISTNG CONDITIONS
*****
* UNDEVELOPED BASIN A - 6.41 ACRES
COMPUTE NM HYD  ID=1  HYD NO=A.EX  DA=0.01002 SQ MI
               PER A=100  PER B=0  PER C=0  PER D=0
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=1  CODE=20
* UNDEVELOPED BASIN B - 1.53 ACRES
COMPUTE NM HYD  ID=2  HYD NO=B.EX  DA=0.00239 SQ MI
               PER A=100  PER B=0  PER C=0  PER D=0
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=2  CODE=20
* UNDEVELOPED BASIN C - 11.51 ACRES
COMPUTE NM HYD  ID=3  HYD NO=C.EX  DA=0.01798 SQ MI
               PER A=100  PER B=0  PER C=0  PER D=0
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=3  CODE=20
* UNDEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD  ID=4  HYD NO=D.EX  DA=0.006703 SQ MI
               PER A=100  PER B=0  PER C=0  PER D=0
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=4  CODE=20
* UNDEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD  ID=5  HYD NO=E.EX  DA=0.009031 SQ MI
               PER A=100  PER B=0  PER C=0  PER D=0
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=5  CODE=20
* EXISTING DEVELOPED BASIN F - 4.00 ACRES
COMPUTE NM HYD  ID=6  HYD NO=F.EX  DA=0.006250 SQ MI
               PER A=0  PER B=7  PER C=8  PER D=85
               TP=0.1333 HR  MASS RAIN=-1
PRINT HYD      ID=6  CODE=20
* EXISTING DEVELOPED BASIN G - 2.69 ACRES
COMPUTE NM HYD  ID=7  HYD NO=G.EX  DA=0.004203 SQ MI

```

PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1
PRINT HYD ID=7 CODE=20

*DEVELOPED CONDITIONS

* DEVELOPED BASIN A - 6.41 ACRES

COMPUTE NM HYD ID=8 HYD NO=A.DEV DA=0.01002 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=8 CODE=20

* DEVELOPED BASIN B - 1.53 ACRES

COMPUTE NM HYD ID=9 HYD NO=B.DEV DA=0.00239 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=9 CODE=20

* DEVELOPED BASIN C - 11.51 ACRES

COMPUTE NM HYD ID=10 HYD NO=C.DEV DA=0.01798 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=10 CODE=20

* DEVELOPED BASIN D - 4.29 ACRES

COMPUTE NM HYD ID=11 HYD NO=D.DEV DA=0.006703 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=11 CODE=20

* DEVELOPED BASIN E - 5.78 ACRES

COMPUTE NM HYD ID=12 HYD NO=E.DEV DA=0.009031 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=12 CODE=20

ADD HYD ID=13 HYD NO=B&C.EX ID I=2 ID II=3

PRINT HYD ID=13 CODE=20

ADD HYD ID=14 HYD NO=B&C&D.DEV ID I=11 ID II=13

PRINT HYD ID=14 CODE=20

* ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO
CHANNEL PER DMP. ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 34.7 CFS

* EXISTING

ROUTE RESERVOIR ID=15 HYD NO=POND'D'.OUT INFLOW ID=14 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 62.0

7.00	0.0777	63.0
18.0	0.1774	64.0
24.0	0.3017	65.0
32.0	0.4529	66.0

PRINT HYD ID=15 CODE=20

* ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP

* ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN

* THIS IS AN EXAMPLE CALCULATION. EXACT POND DESIGN TO BE DETERMINED AT

* TIME OF DEVELOPMENT

ROUTE RESERVOIR ID=16 HYD NO=POND'E'.OUT INFLOW ID=12 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0	50.0
3.00	0.1200	51.0
7.00	0.2400	52.0
10.0	0.3600	53.0
12.0	0.4800	54.0

PRINT HYD ID=16 CODE=20

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)

* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.

DISCHARGE IS 2.2 CFS/AC OR 8.8 CFS FOR BASIN

* ALLOWABLE

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0	43.5
1.48	0.0262	44.0
5.45	0.0968	45.0
7.57	0.2125	46.0

PRINT HYD ID=17 CODE=20

* ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP

* ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0	0	50.0
2.69	0.1271	51.0
4.59	0.2772	52.0

PRINT HYD
FINISH

ID=18 CODE=20

RUN DATE (MON/DAY/YR) =10/23/2001
USER NO.= AHYMO-I-9702c01000T35-AH

TIME=	.00
RAIN6=	2.200
8 PER IMP=	.00
1 PER IMP=	.00
7 PER IMP=	.00
8 PER IMP=	.00
8 PER IMP=	.00
8 PER IMP=	85.00
0 PER IMP=	85.00
6 PER IMP=	85.00
4 PER IMP=	85.00
5 PER IMP=	85.00
7 PER IMP=	85.00
7 PER IMP=	85.00
8	
7	
6 AC-FT=	.270
0 AC-FT=	.346
2 AC-FT=	.199
9 AC-FT=	.188

AHYMO PROGRAM (AHYMO_97) -

- Version: 1997.02d

RUN DATE (MON/DAY/YR) = 10/23/2001

START TIME (HR:MIN:SEC) = 12:59:14

USER NO.= AHYMO-I-9702c01000T35-AH

INPUT FILE = C:\AHYMO\01512.DAT

*
* GE CAPITAL MODULAR SPACE
* PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT =	.033330 HOURS	END TIME =	5.999400 HOURS
.0000	.0016	.0033	.0050
.0067	.0085	.0103	.0122
.0141	.0160	.0180	.0201
.0222	.0243	.0266	.0289
.0312	.0337	.0362	.0388
.0415	.0443	.0472	.0502
.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809
.0865	.0924	.1050	.1334
.1771	.2398	.3254	.4379
.5814	.7600	.9780	1.1804
1.2649	1.3363	1.3997	1.4575
1.5106	1.5600	1.6061	1.6493
1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193
1.9456	1.9518	1.9576	1.9630
1.9682	1.9732	1.9780	1.9825
1.9869	1.9912	1.9953	1.9993
2.0031	2.0068	2.0104	2.0140
2.0174	2.0207	2.0240	2.0272
2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502
2.0528	2.0554	2.0580	2.0605
2.0629	2.0653	2.0677	2.0700
2.0723	2.0746	2.0768	2.0790
2.0812	2.0833	2.0855	2.0875
2.0896	2.0916	2.0936	2.0956
2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106
2.1124	2.1141	2.1159	2.1176
2.1193	2.1210	2.1227	2.1244
2.1260	2.1276	2.1292	2.1308
2.1324	2.1340	2.1355	2.1371
2.1386	2.1401	2.1416	2.1431
2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546
2.1560	2.1573	2.1587	2.1600
2.1614	2.1627	2.1640	2.1654
2.1667	2.1680	2.1692	2.1705
2.1718	2.1731	2.1743	2.1756
2.1768	2.1780	2.1792	2.1804
2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899
2.1910	2.1922	2.1933	2.1944
2.1956	2.1967	2.1978	2.1989
2.2000			

* EXISTNG CONDITIONS

* UNDEVELOPED BASIN A - 6.41 ACRES
COMPUTE NM HYD ID=1 HYD NO=A.EX DA=0.01002 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764

UNIT PEAK = 20.562 CFS UNIT VOLUME = .9989 B = 273.54 P60 = 1.8700
AREA = .010020 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=20

HYDROGRAPH FROM AREA A.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.8	3.333	.1				

RUNOFF VOLUME = .43925 INCHES = .2347 ACRE-FEET
PEAK DISCHARGE RATE = 8.32 CFS AT 1.533 HOURS BASIN AREA = .0100 SQ. MI.

* UNDEVELOPED BASIN B - 1.53 ACRES

COMPUTE NM HYD ID=2 HYD NO=B.EX DA=0.00239 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 4.9045 CFS UNIT VOLUME = .9967 B = 273.54 P60 = 1.8700
AREA = .002390 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=20

HYDROGRAPH FROM AREA B.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.0				
.667	.0	2.000	.2	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .0560 ACRE-FEET
PEAK DISCHARGE RATE = 1.99 CFS AT 1.533 HOURS BASIN AREA = .0024 SQ. MI.

* UNDEVELOPED BASIN C - 11.51 ACRES

COMPUTE NM HYD ID=3 HYD NO=C.EX DA=0.01798 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 36.897 CFS UNIT VOLUME = .9993 B = 273.54 P60 = 1.8700
AREA = .017980 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=3 CODE=20

HYDROGRAPH FROM AREA C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.4	4.000	.0		
.667	.0	2.000	1.4	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .4212 ACRE-Feet
PEAK DISCHARGE RATE = 14.93 CFS AT 1.533 HOURS BASIN AREA = .0180 SQ. MI.

* UNDEVELOPED BASIN D - 4.29 ACRES
COMPUTE NM HYD ID=4 HYD NO=D.EX DA=0.006703 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 13.755 CFS UNIT VOLUME = .9986 B = 273.54 P60 = 1.8700
AREA = .006703 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=20

HYDROGRAPH FROM AREA D.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.1	4.000	.0		
.667	.0	2.000	.5	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .1570 ACRE-Feet
PEAK DISCHARGE RATE = 5.57 CFS AT 1.533 HOURS BASIN AREA = .0067 SQ. MI.

* UNDEVELOPED BASIN E - 5.78 ACRES
COMPUTE NM HYD ID=5 HYD NO=E.EX DA=0.009031 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 18.533 CFS UNIT VOLUME = .9989 B = 273.54 P60 = 1.8700
AREA = .009031 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=20

HYDROGRAPH FROM AREA E.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0		
.667	.0	2.000	.7	3.333	.0				

RUNOFF VOLUME = .43925 INCHES = .2116 ACRE-FEET
 PEAK DISCHARGE RATE = 7.50 CFS AT 1.533 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING DEVELOPED BASIN F - 4.00 ACRES
 COMPUTE NM HYD ID=6 HYD NO=F.EX DA=0.006250 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 20.974 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005313 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.5086 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
 AREA = .000938 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA F.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.6	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 16.35 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* EXISTING DEVELOPED BASIN G - 2.69 ACRES
 COMPUTE NM HYD ID=7 HYD NO=G.EX DA=0.004203 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 14.105 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
 AREA = .003573 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 1.6870 CFS UNIT VOLUME = .9925 B = 356.70 P60 = 1.8700
 AREA = .000630 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA G.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	2.6	4.000	.1	5.999	.1		
.667	.0	2.666	.2	4.666	.1	6.666	.0		
1.333	3.1	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4023 ACRE-Feet
 PEAK DISCHARGE RATE = 11.00 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

*DEVELOPED CONDITIONS

* DEVELOPED BASIN A - 6.41 ACRES

COMPUTE NM HYD ID=8 HYD NO=A.DEV DA=0.01002 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 33.626 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
 AREA = .008517 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 4.0219 CFS UNIT VOLUME = .9970 B = 356.70 P60 = 1.8700
 AREA = .001503 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=20

HYDROGRAPH FROM AREA A.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.2	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	7.4	3.333	.2	5.333	.2				

RUNOFF VOLUME = 1.79461 INCHES = .9590 ACRE-Feet
 PEAK DISCHARGE RATE = 26.20 CFS AT 1.500 HOURS BASIN AREA = .0100 SQ. MI.

* DEVELOPED BASIN B - 1.53 ACRES
 COMPUTE NM HYD ID=9 HYD NO=B.DEV DA=0.00239 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 8.0205 CFS UNIT VOLUME = .9981 B = 526.28 P60 = 1.8700
 AREA = .002032 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = .95931 CFS UNIT VOLUME = .9864 B = 356.70 P60 = 1.8700
 AREA = .000359 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA B.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	1.8	2.666	.1	4.000	.0	5.333	.0
.667	.0	2.000	1.5	3.333	.0	4.666	.0	5.999	.0

RUNOFF VOLUME = 1.79461 INCHES = .2288 ACRE-FEET
 PEAK DISCHARGE RATE = 6.26 CFS AT 1.500 HOURS BASIN AREA = .0024 SQ. MI.

* DEVELOPED BASIN C - 11.51 ACRES
 COMPUTE NM HYD ID=10 HYD NO=C.DEV DA=0.01798 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 60.338 CFS UNIT VOLUME = .9992 B = 526.28 P60 = 1.8700
 AREA = .015283 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 7.2169 CFS UNIT VOLUME = .9985 B = 356.70 P60 = 1.8700
 AREA = .002697 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=10 CODE=20

HYDROGRAPH FROM AREA C.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	11.0	4.000	.2	5.999	.3		
.667	.0	2.666	1.0	4.666	.2	6.666	.0		
1.333	13.3	3.333	.3	5.333	.3				

RUNOFF VOLUME = 1.79461 INCHES = 1.7209 ACRE-FEET
 PEAK DISCHARGE RATE = 47.01 CFS AT 1.500 HOURS BASIN AREA = .0180 SQ. MI.

* DEVELOPED BASIN D - 4.29 ACRES
 COMPUTE NM HYD ID=11 HYD NO=D.DEV DA=0.006703 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 22.494 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
 AREA = .005698 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 2.6905 CFS UNIT VOLUME = .9955 B = 356.70 P60 = 1.8700
 AREA = .001005 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=11 CODE=20

HYDROGRAPH FROM AREA D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	4.1	4.000	.1	5.999	.1		
.667	.0	2.666	.4	4.666	.1	6.666	.0		
1.333	5.0	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .6416 ACRE-FEET
 PEAK DISCHARGE RATE = 17.53 CFS AT 1.500 HOURS BASIN AREA = .0067 SQ. MI.

* DEVELOPED BASIN E - 5.78 ACRES
 COMPUTE NM HYD ID=12 HYD NO=E.DEV DA=0.009031 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 30.307 CFS UNIT VOLUME = .9990 B = 526.28 P60 = 1.8700
 AREA = .007676 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 3.6249 CFS UNIT VOLUME = .9967 B = 356.70 P60 = 1.8700
 AREA = .001355 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=12 CODE=20

HYDROGRAPH FROM AREA E.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	5.5	4.000	.1	5.999	.2		
.667	.0	2.666	.5	4.666	.1	6.666	.0		
1.333	6.7	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .8644 ACRE-FEET
 PEAK DISCHARGE RATE = 23.62 CFS AT 1.500 HOURS BASIN AREA = .0090 SQ. MI.

ADD HYD ID=13 HYD NO=B&C.EX ID I=2 ID II=3
 PRINT HYD ID=13 CODE=20

HYDROGRAPH FROM AREA B&C.EX

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.333	.0	2.666	.4	4.000	.0		
.667	.0	2.000	1.6	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .4772 ACRE-FEET
 PEAK DISCHARGE RATE = 16.92 CFS AT 1.533 HOURS BASIN AREA = .0204 SQ. MI.

ADD HYD ID=14 HYD NO=B&C&D.DEV ID I=11 ID II=13
 PRINT HYD ID=14 CODE=20

HYDROGRAPH FROM AREA B&C&D.DEV

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	5.7	4.000	.1	5.999	.1		
.667	.0	2.666	.8	4.666	.1	6.666	.0		
1.333	5.0	3.333	.2	5.333	.1				

RUNOFF VOLUME = .77481 INCHES = 1.1187 ACRE-FEET
 PEAK DISCHARGE RATE = 34.09 CFS AT 1.500 HOURS BASIN AREA = .0271 SQ. MI.

 * ROUTE UNDEVELOPED BASINS C&D, DEVELOPED BASIN D THROUGH DETENTION POND TO

ROUTE RESERVOIR ID=15 HYD NO=POND'D'.OUT INFLOW ID=14 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 62.0
 7.00 0.0777 63.0
 18.0 0.1774 64.0
 24.0 0.3017 65.0
 32.0 0.4529 66.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	62.00	.000	.00
.33	.00	62.00	.000	.00
.67	.00	62.00	.000	.00
1.00	.00	62.00	.000	.00
1.33	4.98	62.23	.018	1.62
1.67	18.53	64.70	.264	22.17
2.00	5.71	63.18	.095	8.96
2.33	1.68	62.43	.034	3.04
2.67	.77	62.17	.013	1.16
3.00	.39	62.08	.006	.54
3.33	.23	62.04	.003	.29
3.67	.16	62.03	.002	.18
4.00	.12	62.02	.001	.13
4.33	.10	62.02	.001	.11
4.67	.10	62.01	.001	.10
5.00	.09	62.01	.001	.09
5.33	.10	62.01	.001	.10
5.67	.11	62.01	.001	.10
6.00	.12	62.02	.001	.11
6.33	.01	62.01	.000	.04
6.67	.00	62.00	.000	.01
7.00	.00	62.00	.000	.00

PEAK DISCHARGE = 22.450 CFS - PEAK OCCURS AT HOUR 1.63
 MAXIMUM WATER SURFACE ELEVATION = 64.742
 MAXIMUM STORAGE = .2696 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=15 CODE=20

HYDROGRAPH FROM AREA POND'D'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	9.0	4.000	.1	5.999	.1
.667	.0	2.666	1.2	4.666	.1	6.666	.0
1.333	1.6	3.333	.3	5.333	.1		

RUNOFF VOLUME = .77481 INCHES = 1.1187 ACRE-FEET
 PEAK DISCHARGE RATE = 22.45 CFS AT 1.633 HOURS BASIN AREA = .0271 SQ. MI.

 * ROUTE DEVELOPED BASIN E THROUGH DETENTION POND TO OURAY ROAD PER DMP
 * ALLOWABLE DISCHARGE IS 2.2 CFS/AC OR 12.7 CFS FOR BASIN
 * THIS IS AN EXAMPLE CALCULATION. EXACT POND DESIGN TO BE DETERMINED AT
 * TIME OF DEVELOPMENT

ROUTE RESERVOIR ID=16 HYD NO=POND'E'.OUT INFLOW ID=12 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 50.0
 3.00 0.1200 51.0
 7.00 0.2400 52.0
 10.0 0.3600 53.0
 12.0 0.4800 54.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	6.71	50.25	.030	.75
1.67	12.00	52.83	.340	9.50
2.00	5.55	52.53	.303	8.59
2.33	1.19	51.57	.188	5.28
2.67	.49	50.88	.106	2.65
3.00	.26	50.50	.060	1.50
3.33	.17	50.28	.034	.85
3.67	.14	50.17	.020	.50
4.00	.13	50.11	.013	.32
4.33	.12	50.07	.009	.22
4.67	.12	50.06	.007	.17
5.00	.13	50.05	.006	.15
5.33	.14	50.05	.006	.14
5.67	.14	50.05	.006	.14
6.00	.16	50.05	.006	.15
6.33	.02	50.04	.004	.11
6.67	.00	50.02	.002	.06
7.00	.00	50.01	.001	.03
7.33	.00	50.01	.001	.02
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 9.654 CFS - PEAK OCCURS AT HOUR 1.73
 MAXIMUM WATER SURFACE ELEVATION = 52.885
 MAXIMUM STORAGE = .3462 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD

ID=16 CODE=20

HYDROGRAPH FROM AREA POND'E'.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	8.6	4.000	.3	5.999	.1	7.999	.0
.667	.0	2.666	2.6	4.666	.2	6.666	.1		
1.333	.8	3.333	.9	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79458 INCHES = .8644 ACRE-FEET
PEAK DISCHARGE RATE = 9.65 CFS AT 1.733 HOURS BASIN AREA = .0090 SQ. MI.

* EXISTING GE CAPITAL DETENTION PONDS (BASINS F&G)
* SHOWN FOR INFORMATION ONLY

* ROUTE EXISTING BASIN F THROUGH DETENTION POND TO OURAY ROAD PER DMP.

ROUTE RESERVOIR ID=17 HYD NO=POND'F'.OUT INFLOW ID=6 CODE=10
OUT (CFS) STORAGE (AC-FT) ELEV (FT)
0 0 43.5
1.48 0.0262 44.0
5.45 0.0968 45.0
7.57 0.2125 46.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	43.50	.000	.00
.33	.00	43.50	.000	.00
.67	.00	43.50	.000	.00
1.00	.00	43.50	.000	.00
1.33	4.64	43.86	.019	1.06
1.67	8.31	45.87	.198	7.30
2.00	3.84	45.51	.156	6.53
2.33	.82	44.52	.063	3.53
2.67	.34	43.88	.020	1.12
3.00	.17	43.64	.007	.41
3.33	.12	43.56	.003	.19
3.67	.10	43.54	.002	.12
4.00	.09	43.53	.002	.10
4.33	.08	43.53	.002	.09
4.67	.08	43.53	.002	.08
5.00	.09	43.53	.002	.09
5.33	.09	43.53	.002	.09
5.67	.10	43.53	.002	.10

6.00 .11 43.53 .002 .10
 6.33 .01 43.52 .001 .05
 6.67 .00 43.51 .000 .02
 7.00 .00 43.50 .000 .00
 PEAK DISCHARGE = 7.328 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 45.886
 MAXIMUM STORAGE = .1993 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=17 CODE=20

HYDROGRAPH FROM AREA POND'F'.OUT

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	6.5	4.000	.1	5.999	.1		
.667	.0	2.666	1.1	4.666	.1	6.666	.0		
1.333	1.1	3.333	.2	5.333	.1				

RUNOFF VOLUME = 1.79456 INCHES = .5982 ACRE-FEET
 PEAK DISCHARGE RATE = 7.33 CFS AT 1.700 HOURS BASIN AREA = .0063 SQ. MI.

 * ROUTE EXISTING BASIN G THROUGH DETENTION POND TO PAINTED ROCK PER DMP
 * ALLOWABLE DISCHARGE IS 2.0 CFS/AC OR 5.4 CFS FOR BASIN

 ROUTE RESERVOIR ID=18 HYD NO=POND'G'.OUT INFLOW ID=7 CODE=10
 OUT (CFS) STORAGE (AC-FT) ELEV (FT)
 0 0 50.0
 2.69 0.1271 51.0
 4.59 0.2772 52.0

* * * * *

TIME	INFLOW	ELEV	VOLUME	OUTFLOW
(HRS)	(CFS)	(FEET)	(AC-FT)	(CFS)
.00	.00	50.00	.000	.00
.33	.00	50.00	.000	.00
.67	.00	50.00	.000	.00
1.00	.00	50.00	.000	.00
1.33	3.12	50.11	.014	.30
1.67	5.59	51.32	.175	3.29
2.00	2.58	51.37	.183	3.40
2.33	.55	51.05	.135	2.78
2.67	.23	50.65	.082	1.74
3.00	.11	50.39	.049	1.04
3.33	.08	50.23	.029	.62
3.67	.07	50.14	.018	.38
4.00	.06	50.09	.011	.24
4.33	.06	50.06	.007	.16

4.67	.06	50.04	.005	.11
5.00	.06	50.03	.004	.09
5.33	.06	50.03	.004	.08
5.67	.07	50.03	.003	.07
6.00	.07	50.03	.003	.07
6.33	.01	50.02	.003	.05
6.67	.00	50.01	.002	.03
7.00	.00	50.01	.001	.02
7.33	.00	50.00	.000	.01
7.67	.00	50.00	.000	.01
8.00	.00	50.00	.000	.00

PEAK DISCHARGE = 3.467 CFS - PEAK OCCURS AT HOUR 1.83
 MAXIMUM WATER SURFACE ELEVATION = 51.409
 MAXIMUM STORAGE = .1885 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=18 CODE=20

HYDROGRAPH FROM AREA POND'G'.OUT

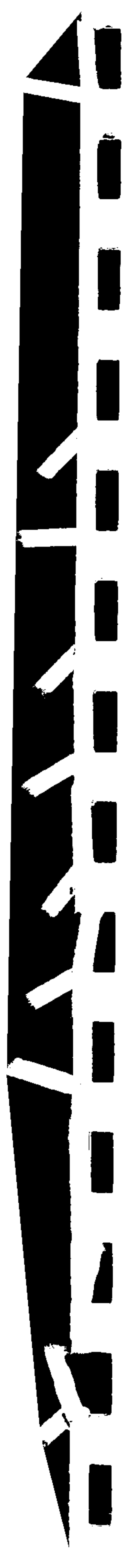
TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.4	4.000	.2	5.999	.1	7.999	.0
.667	.0	2.666	1.7	4.666	.1	6.666	.0		
1.333	.3	3.333	.6	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79454 INCHES = .4023 ACRE-FEET
 PEAK DISCHARGE RATE = 3.47 CFS AT 1.833 HOURS BASIN AREA = .0042 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 12:59:14

GRADING & DRAINAGE PLAN



APPROVED MASTER PLANS

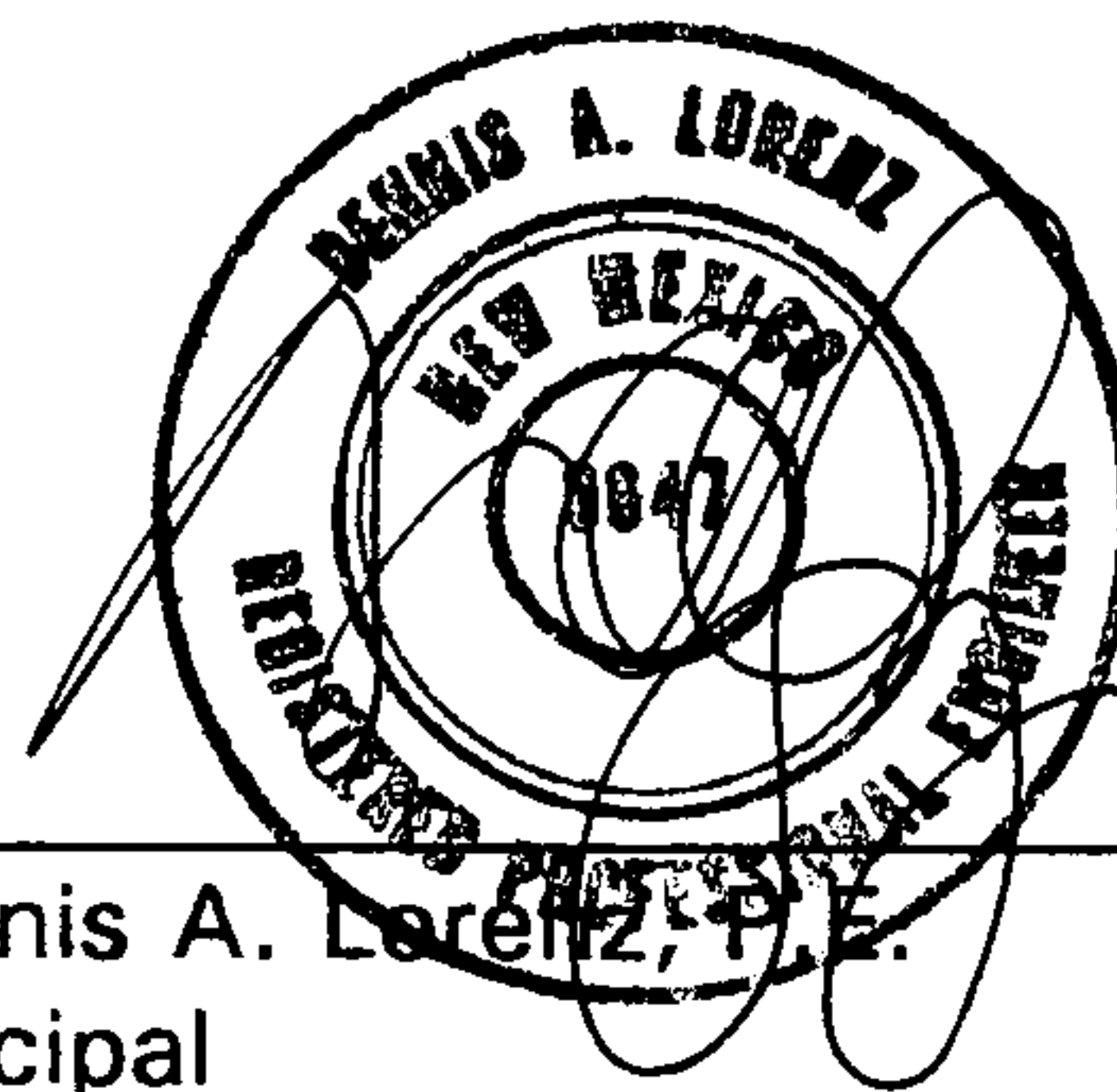
DRAINAGE REPORT
FOR
GE CAPITAL MODULAR SPACE

Albuquerque, New Mexico

Prepared By:

BRASHER & LORENZ, INC.
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May 1998



Dennis A. Lorenz, P.E.
Principal

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APPROVED DRAINAGE MASTERPLAN	POCKET

PURPOSE AND SCOPE

Pursuant to the established Drainage Ordinance for the City of Albuquerque and the Development Process Manual, this Drainage Report outlines the drainage management criteria for controlling developed runoff from the project site. The project consists of the development of the property for GE Capital Modular Space. Paving, landscaping, utility, grading, and drainage improvements will be provided to support the project. The scope of this plan is to provide drainage criteria for the safe management of excess runoff. The report is presented to obtain Site Plan and Building Permit approval.

SITE DESCRIPTION

The project site is approximately 6.69 acres in size and is located on Painted Rock Drive NW, at Ouray Road NW (See Figure 1). Site terrain slopes west to east at approximately 2 percent. The site is presently described as a Tract 5A2-A1-1, Volcano Business Park, Phase II. The site is bounded on the north by Ouray Road, on the east by Painted Rock Drive, on the south by a PNM Switching Station, and on the west by undeveloped properties.

EXISTING CONDITIONS

The site presently drains easterly to an existing earthen berm located along the east property line. The berm directs undeveloped runoff to an existing private drainage easement which drains along the common property line of Tracts 5A2-A1-2 and 5A2-A1-3. The easement conveys flows east to an existing private channel which outfalls into Todos Santos Street NW. At Todos Santos an existing public storm drain conveys all flows to a concrete channel which drains to the Ladera System.

The site is impacted by undeveloped off-site flows from the west which originate from the property located west of the site and east of Unser Boulevard. No off-site flows enter the site from the south, east or north.

As shown by the attached FIRM Panel (Figure 3) this site does not lie within a designated flood hazard zone.

SUMMARY OF EXISTING DRAINAGE PLANS

Per the **Drainage Masterplan for Volcano Business Park, Phase II (G-10/D29)**, prepared by Brasher & Lorenz, Inc., 1-20-98, the site is required to implement on-site detention ponding. Per the DMP, the north 4.0 acres is limited to 2.2 cfs/acre, and the south 2.69 acres is limited to 2.0 cfs/acre.

The DMP recommended the construction of certain infrastructure improvements to support the subdivision of Tract 5A1-A1 (DRB 97-450). Improvements to Ouray Road and Painted Rock Drive will be constructed by public work order, City Project No. 5856.81. On-site improvements include an improved private channel along the south property line.

PROPOSED CONDITIONS

As shown by the Plan, the project consists of the development of the site for GE Capital Modular Space, a facility for lease and maintenance of portable buildings. Development will include paving, utility, landscaping and drainage improvements. The Plan shows the elevations required to properly grade and construct the recommended improvements. The direction of drainage flows are given by flow arrows and on-site drainage basins are identified.

In accordance with the approved Masterplan, the site will drain to 2 detention ponds to be located along Painted Rock Drive. The ponds will rout all excess runoff through outlet pipes to Painted Rock Drive at controlled rates established by the DMP, as follows:

1. Pond "A" will drain at a controlled rate of 7.3 cfs to Painted Rock Drive, near the intersection of Ouray. Runoff from this pond will be intercepted by the Ouray storm drain.
2. Pond "B" will discharge at a controlled rate of 3.8 cfs to Painted Rock Drive near the south property line. Runoff from this pond will drain east within Todos Santos and intercepted by an existing storm drain which connects to the Ouray storm drain.
3. The easement channel will convey undeveloped and anticipate future developed flows. The channel will outfall to Painted Rock Drive near the Pond "B" outfall, and drain to the Todos Santos storm drain.

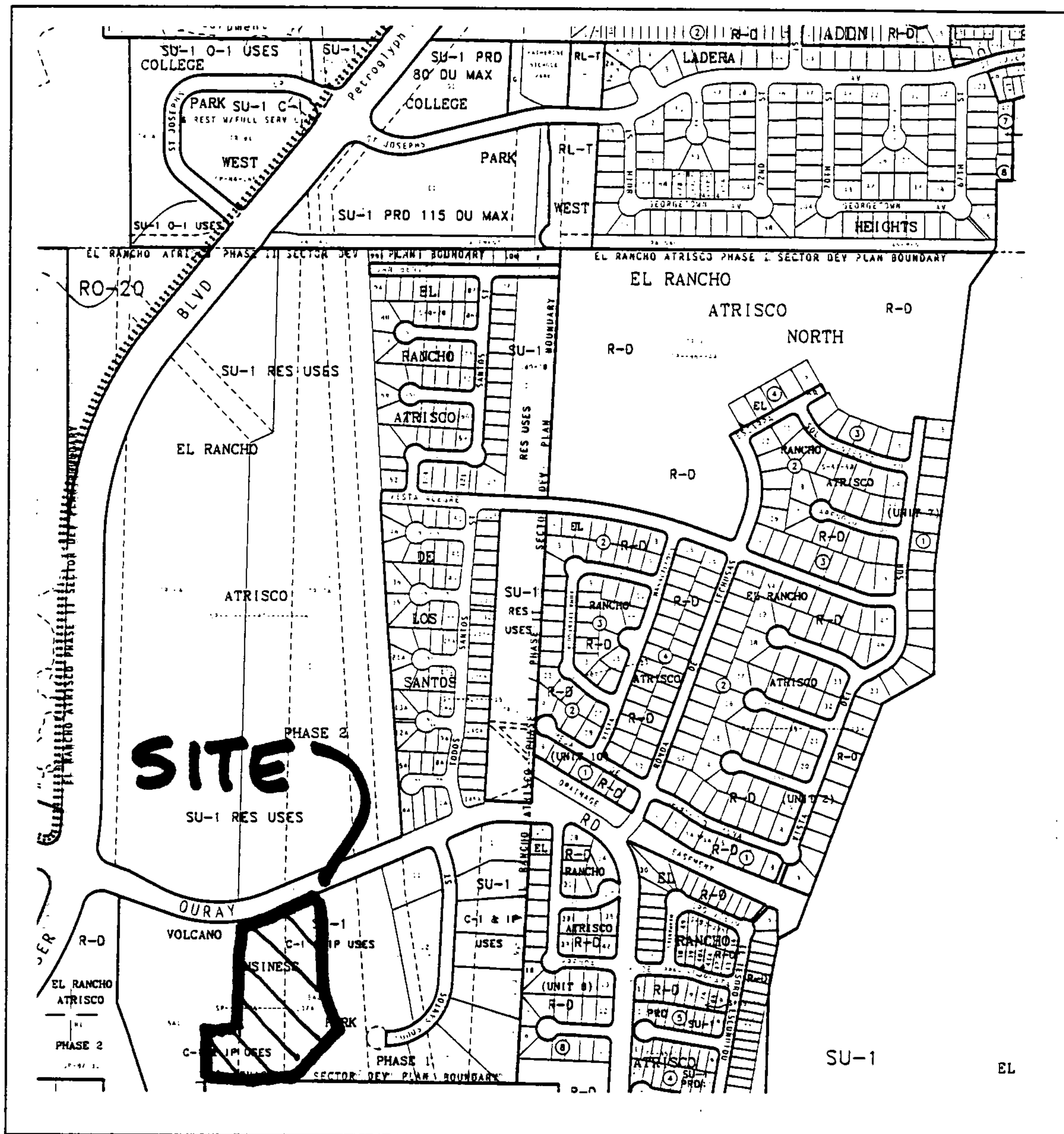
Improvements are recommended along the west property line to control undeveloped runoff from off-site basins originating west of the site. Earthen berms and block walls will be constructed as detailed on the Plan to direct undeveloped flows to improved outfall locations. Off-site properties will be required to manage excess runoff internally per the DMP. The property line improvements may remain without alteration, but will no longer function as drainage improvements.

TEMPORARY EROSION CONTROL PLAN

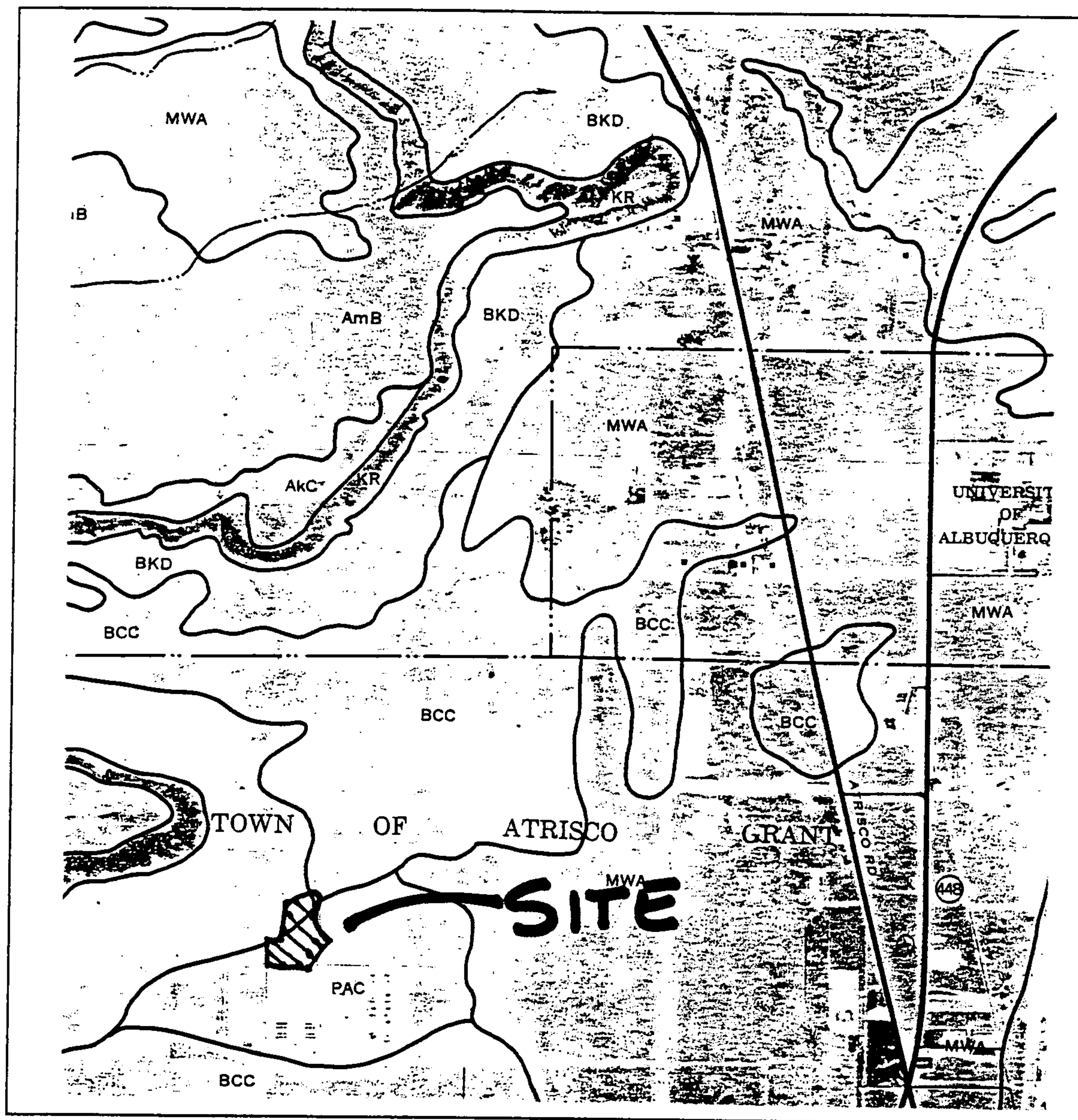
1. Temporary Erosion Control is required to limit the discharge of sediment into the public street and/or storm drainage system and to protect adjacent properties from excess runoff during construction. After the initial site clearing, the temporary erosion control facilities should be constructed to direct excess runoff and sediment to the detention pond sites. Earthen erosion control berms or silt fencing should then be placed along the downstream project boundaries to direct runoff to the project outfall.
2. The Contractor shall obtain a Top Soil Disturbance Permit from Environmental Health prior to performing any earthwork related operations.
3. It is the Contractor's responsibility to properly maintain all temporary erosion

control facilities during the construction phase of the project.

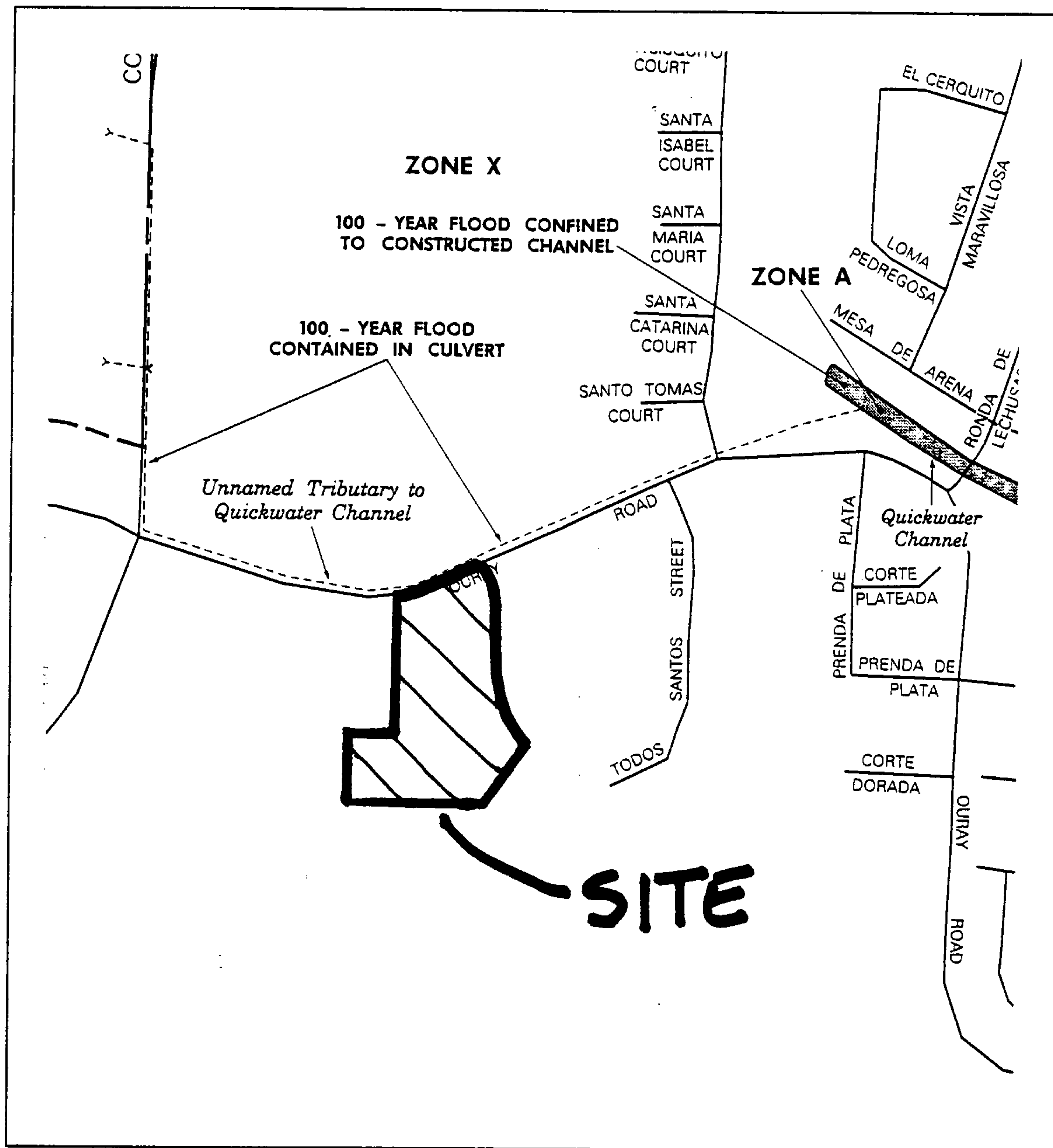
MAPS



LOCATION MAP
Figure 1



SOILS MAP
Figure 2



FLOOD INSURANCE RATE MAP
Figure 3

CALCULATIONS

INFRASTRUCTURE CAPACITIES

GE CAPITAL

7081

1/

POND ROUTING

PER APPROVED DMP THE SITE MUST
 DETAIN RUNOFF. ALLOWABLE DISCHARGE
 IS 2.2 CFS/AC FOR NORTH 4.00 ACRES,
 AND 2.0 CFS/AC FOR SOUTH 2.69 ACRES.

① POND "A"

ROUT BASIN 101.1 THRU POND. $Q_{OUT} = 2.2 \text{ CFS/AC}$
 OR 8.80 CFS.

② SIZE OUTLET

$$Q_{OUT} = 8.8 \text{ CFS}$$

ASSUME $h_{MAX} = 2.5 \text{ FT}$

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

$$C = 0.6$$

$$g = 32.2 \text{ f/s}^2$$

DIA	AREA (SF)	Q (CFS)
8"	0.34	2.4
10"	0.55	3.8
12"	0.79	5.3

TRY 2-10" PIPES $Q_{OUT} \approx 7.6 \text{ CFS}$ @ $h = 2.5 \text{ FT}$

③ ROUT RESERVIOR TABLE

ELEV	AREA (SF)	VOL (AF)	h (FT)	Q_{OUT} (CFS)
43.5	2175	0	0	0
44	2385	0.0262	0.08	1.48
45	3767	0.0968	1.08	5.45
46	6315	0.2125	2.08	7.57

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2/

POND ROUTING

PER AHYMO:

$$Q_{OUT} = 7.33 \text{ CFS}$$

$$VOL = 0.1993 \text{ AF}$$

$$= 8682 \text{ CF}$$

$$MAX \text{ WSE} = 45.89$$

SPILLWAY @ 46.00

$$VOL \text{ PROVIDED BY DESIGN} = 0.2125 \text{ AF}$$

$$= 9257 \text{ CF}$$

② POND "B"

ROUT BASIN 101.2 THRU POND. $Q_{OUT} = 2.0 \text{ CFS/AC}$

OR 5.38 CFS.

① SIZE OUTLET

PER TABLE

①.A TRY 12" PIPE

$$Q_{OUT} \sim 5.3 \text{ CFS @ } h = 2.5 \text{ FT}$$

③ ROUT RESERVOIR TABLE

ELEV	AREA(SE)	VOL(AF)	h(FT)	Q_{OUT} (CFS)
50	5192	0	0	0
51	5877	0.1271	0.50	2.69
52	7200	0.2772	1.50	4.59

PER AHYMO

$$Q_{OUT} = 3.48 \text{ CFS}$$

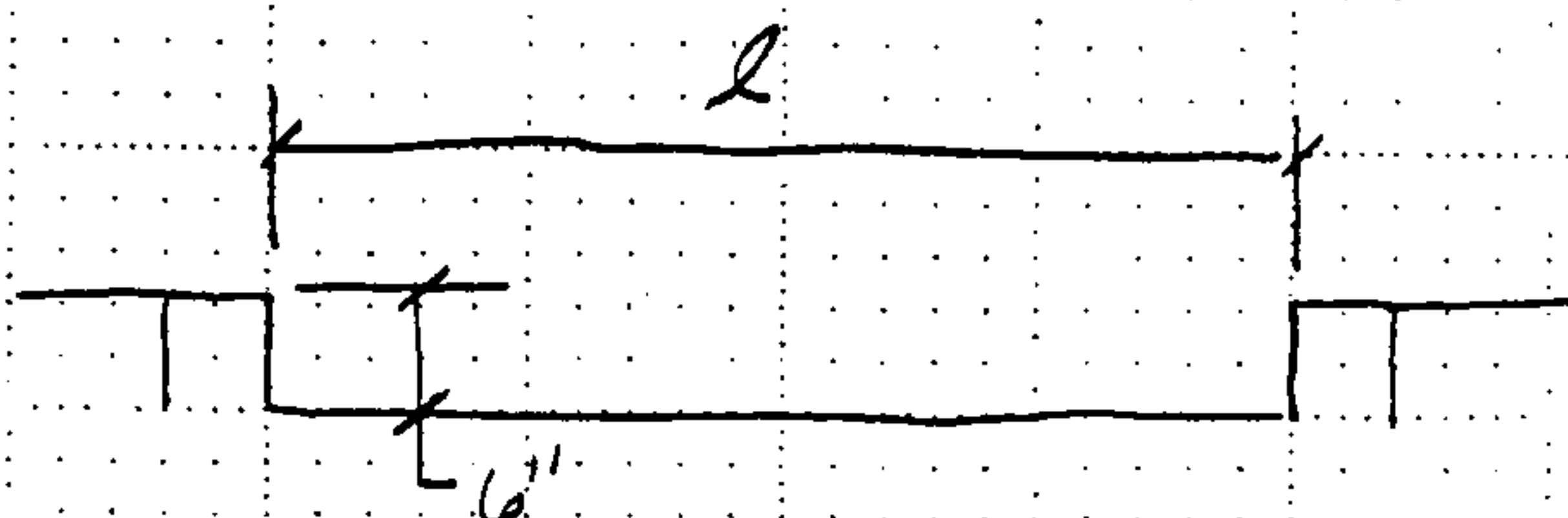
$$VOL = 0.1885 \text{ AF} = 8211 \text{ CF}$$

$$MAX \text{ WSE} = 51.41$$

SPILLWAY @ 51.50

$$VOLUME \text{ BY DESIGN} = 0.1984 \text{ AF} = 8640 \text{ CF}$$

③ POND INLET RUNDOWNS



Enter up to 10 weirs.

Enter <Return> only for flowrate and length to end.

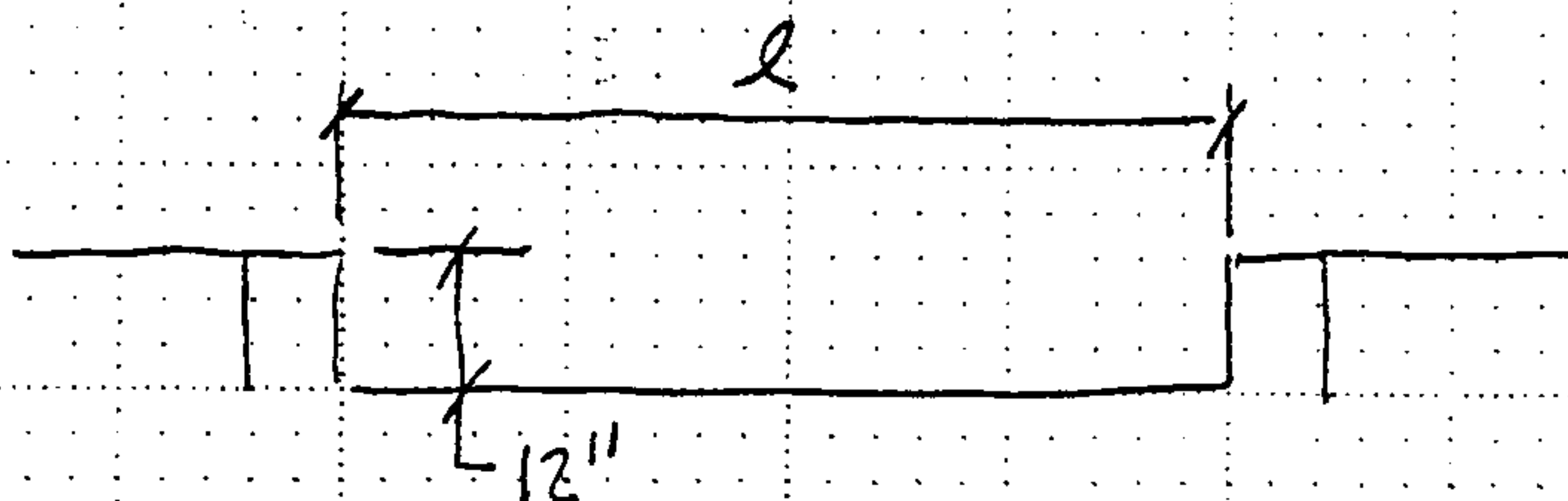
FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
11.00	12.4	2.500	0.50
0.41	0.5	2.500	0.50

POND 'B'

POND 'A'

USE 12" FOR POND 'A'
13' FOR POND 'B'

④ POND SPILLWAYS



Enter up to 10 weirs.

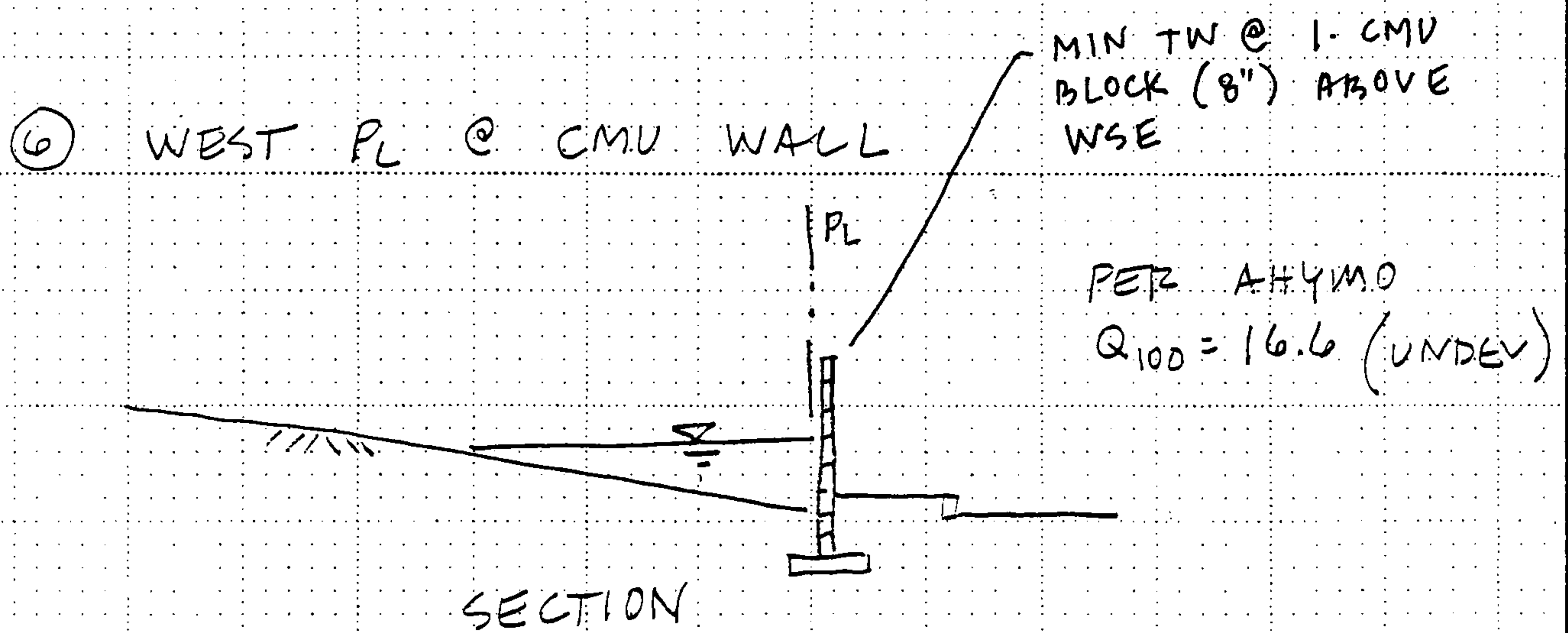
Enter <Return> only for flowrate and length to end.

FLOWRATE (CFS)	LENGTH (FT)	COEFF (-)	HEAD (FT)
16.35	6.5	2.500	1.00
11.00	4.4	2.500	1.00

POND 'A'

POND 'B'

USE 7' FOR POND 'A'
5' FOR POND 'B'



Q (CFS) ? 16.6
S (FT/FT) ? .02

RESULTS

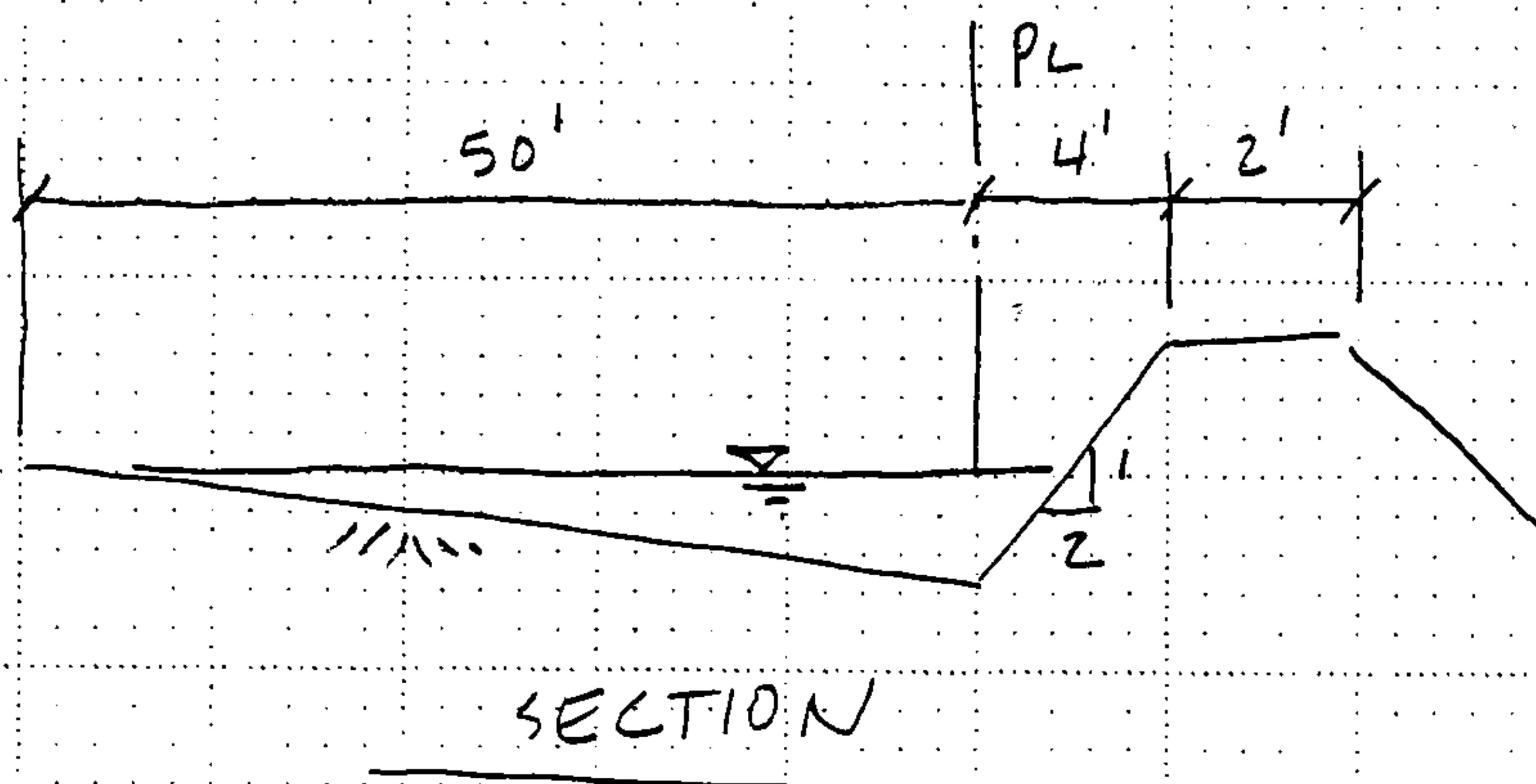
=====

Y= 100.60 FT
A= 4.43 SF
P= 15.49 FT
V= 3.75 FPS
F= 1.21 SUPER-CRITICAL FLOW

CROSS-SECTION POINTS

DIST	ELEV	COEFF	DIST	ELEV	COEFF
0	102	.025			
50	100	.025			
50	102	.025			

⑦ WEST PL BERM



PER AHYMO Q OFFSITE = 36.1 (UNDEV)

VARIABLE TO BE SOLVED (Y, Q OR S) ? Y

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

Q (CFS) ? 36.1

S (FT/FT) ? .005

CROSS-SECTION POINTS

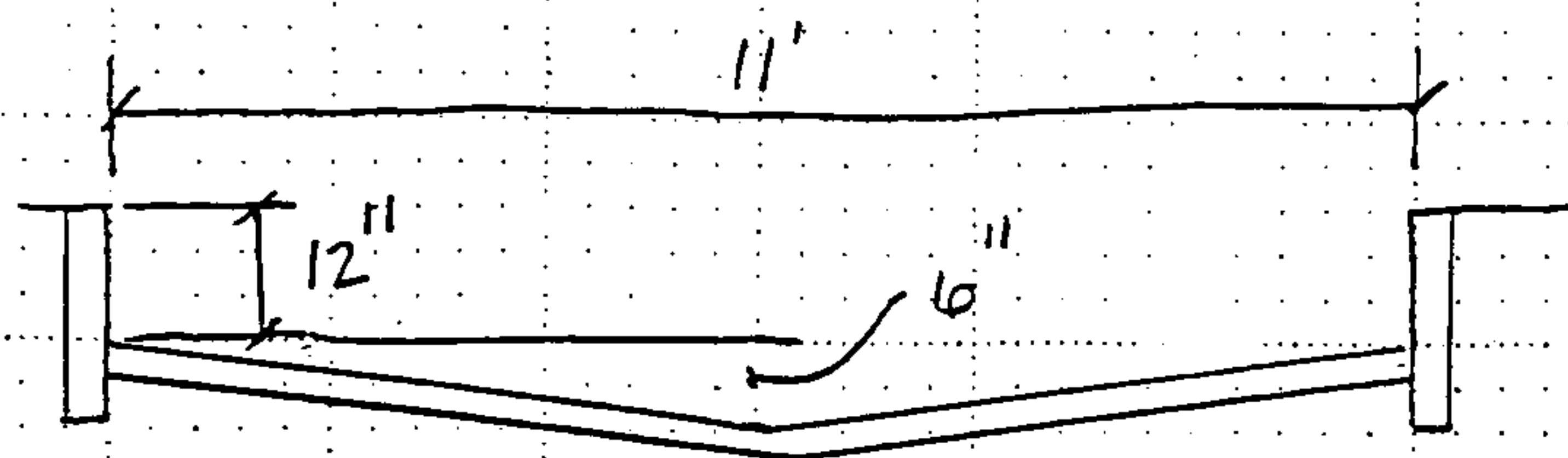
DIST	ELEV	COEFF	DIST	ELEV	COEFF
0	102	.025			
50	100	.025			
54	102	.025			

RESULTS

=====

Y= 101.01 FT
 A= 13.66 SF
 P= 27.42 FT
 V= 2.64 FPS
 F= 0.66 SUB-CRITICAL FLOW

⑧ EASEMENT CHANNEL @ SD PL



SECTION A

VARIABLE TO BE SOLVED (Y, Q OR S) ? Y

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

Q (CFS) ? 55.4

S (FT/FT) ? .007

CROSS-SECTION POINTS

DIST ELEV COEFF DIST ELEV COEFF

0 101.5 .013

0 100.5 .013

5.5 100 .013

11 100.5 .013

11 101.5 .013

RESULTS

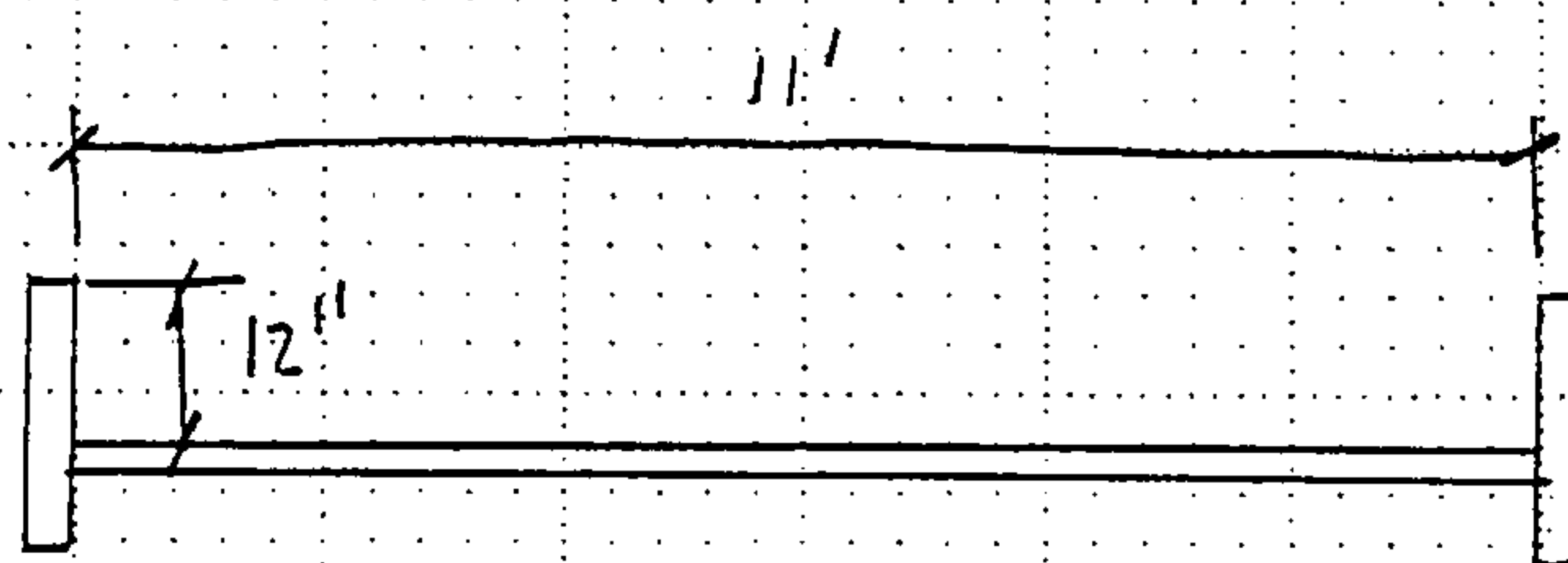
Y= 100.93 FT

A= 7.50 SF

P= 11.91 FT

V= 7.39 FPS

F= 1.58 SUPER-CRITICAL FLOW



SECTION B

VARIABLES LIST:

Y - FLOW DEPTH

B - CHANNEL BOTTOM WIDTH

S - CHANNEL SLOPE

Q - FLOWRATE

M - CHANNEL SIDE SLOPE

N - CHANNEL ROUGHNESS

VARIABLE TO BE SOLVED (Y, Q, B, M, S OR N) ? Y

Q (CFS) ? 55.5

B (FT) ? 11

M (FT/FT) ? 0

S (FT/FT) ? .03

N (FT^{1/6}) ? .013

RESULTS

Y= 0.45 FT

A= 5.00 SF

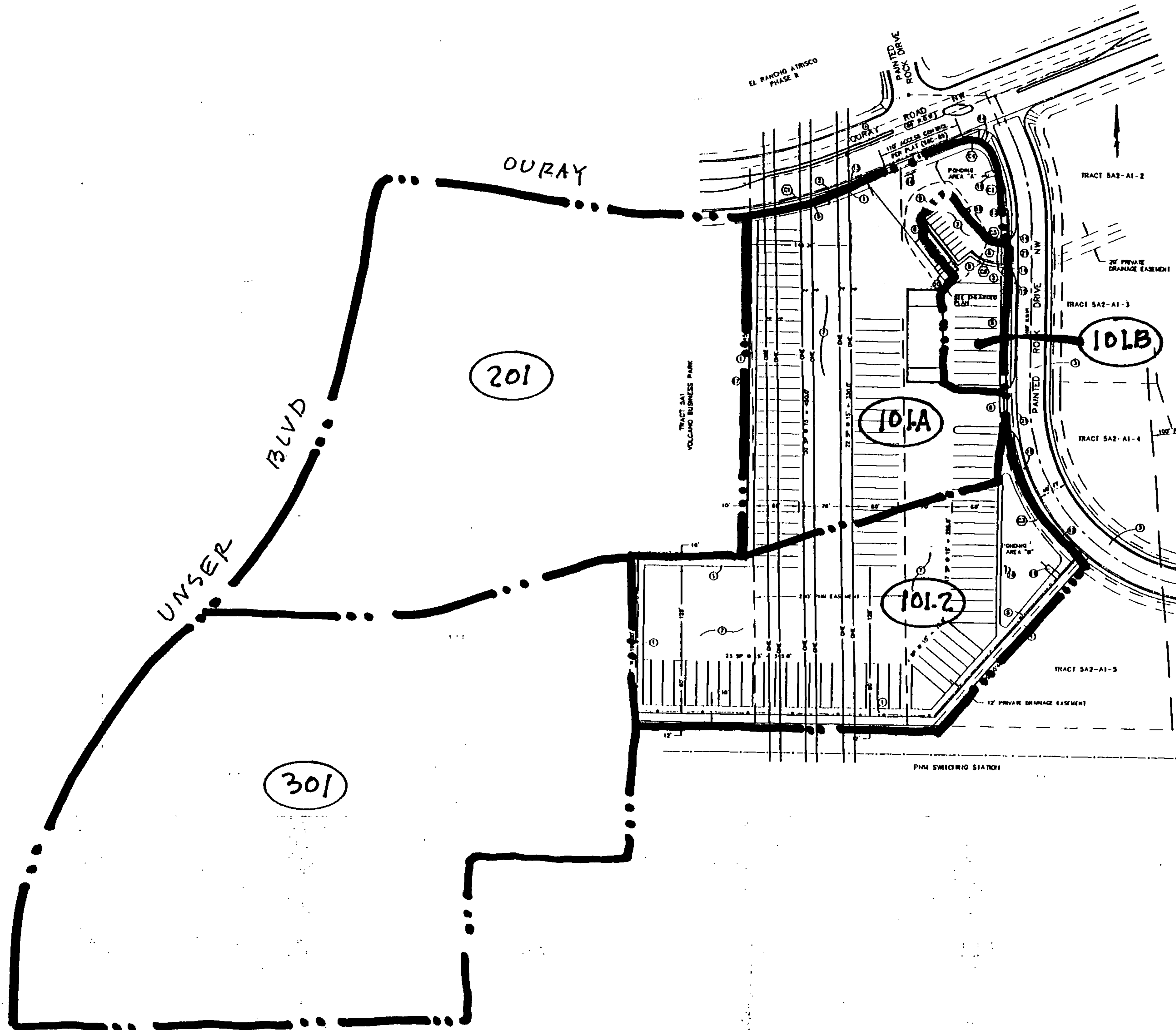
P= 11.91 FT

V= 11.10 FPS

F= 2.90

SUPER-CRITICAL FLOW

AHYMO OUTPUT FILES



 * GE CAPITAL MODULAR SPACE
 * PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
 RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
 RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

* UNDEVELOPED SITE - BASIN 101.0 - 6.69 ACRES

COMPUTE NM HYD ID=1 HYD NO=101.0 DA=0.010453 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=1 CODE=20

* DEVELOPED BASIN 101.1 - 4.00 ACRES

COMPUTE NM HYD ID=2 HYD NO=101.1 DA=0.006250 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=2 CODE=20

* DEVELOPED BASIN 101.1A - 1.75 ACRES

COMPUTE NM HYD ID=3 HYD NO=101.1A DA=0.004813 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=3 CODE=20

* DEVELOPED BASIN 101.1B - 2.25 ACRES

COMPUTE NM HYD ID=4 HYD NO=101.1B DA=0.001437 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=4 CODE=20

* DEVELOPED BASIN 101.2 - 2.69 ACRES

COMPUTE NM HYD ID=5 HYD NO=101.2 DA=0.004203 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=5 CODE=20

 * ROUTE DEVELOPED BASIN 101.1 THROUGH DETENTION POND TO OURAY PER DMP
 * ALLOWABLE DISCHARGE IS 2.20 CFS/AC OR 8.80 CFS FOR BASIN

ROUTE RESERVOIR	ID=6	HYD NO=101.1A	INFLOW ID=2	CODE=10
OUT (CFS)		STORAGE (AC-FT)		ELEV (FT)
0		0		43.5
1.48		0.0262		44.0
5.45		0.0968		45.0
7.57		0.2125		46.0

PRINT HYD ID=6 CODE=20

 * ROUTE DEVELOPED BASIN 101.2 THROUGH DETENTION POND TO PAINTED ROCK PER DMP
 * ALLOWABLE DISCHARGE IS 2.00 CFS/AC OR 5.38 CFS FOR BASIN

ROUTE RESERVOIR	ID=7	HYD NO=101.2A	INFLOW ID=5	CODE=10
OUT (CFS)		STORAGE (AC-FT)		ELEV (FT)
0		0		50.0
2.69		0.1271		51.0
4.59		0.2772		52.0

PRINT HYD ID=7 CODE=20

* UNDEVELOPED OFF-SITE BASIN 201.0 - 12.8 ACRES

COMPUTE NM HYD ID=8 HYD NO=201.0 DA=0.0200 SQ MI
 PER A=100 PER B=0 PER C=0 PER D=0
 TP=0.1333 HR MASS RAIN=-1

PRINT HYD ID=8 CODE=20

* UNDEVELOPED OFF-SITE BASIN 301.0 - 27.8 ACRES

COMPUTE NM HYD ID=9 HYD NO=301.0 DA=0.04343 SQ MI

PER A=100 PER B=0 PER C=0 PER D=0

TP=0.1333 HR MASS RAIN=-1

ID=9 CODE=20

PRINT HYD
FINISH

RUN DATE (MON/DAY/YR) =07/06/1998
USER NO.= BRASHERE.I01

RUN DATE (MON/DAY/YR) =07/06/1998
USER NO.= BRASHERE.I01

AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
RUN DATE (MON/DAY/YR) = 07/06/1998
START TIME (HR:MIN:SEC) = 14:21:26 USER NO.= BRASHERE.I01
INPUT FILE = 7081.dat

* GE CAPITAL MODULAR SPACE
* PROJECT HYDROLOGY

START TIME=0.0 PUNCH CODE=0
RAINFALL TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87
RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333 HRS

COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = .033330 HOURS BND TIME = 5.999400 HOURS

.0000	.0016	.0033	.0050	.0067	.0085	.0103
.0122	.0141	.0160	.0180	.0201	.0222	.0243
.0266	.0289	.0312	.0337	.0362	.0388	.0415
.0443	.0472	.0502	.0534	.0567	.0601	.0637
.0675	.0715	.0758	.0809	.0865	.0924	.1050
.1334	.1771	.2398	.3254	.4379	.5814	.7600
.9780	1.1804	1.2649	1.3363	1.3997	1.4575	1.5106
1.5600	1.6061	1.6493	1.6900	1.7284	1.7646	1.7989
1.8314	1.8623	1.8915	1.9193	1.9456	1.9518	1.9576
1.9630	1.9682	1.9732	1.9780	1.9825	1.9869	1.9912
1.9953	1.9993	2.0031	2.0068	2.0104	2.0140	2.0174
2.0207	2.0240	2.0272	2.0303	2.0333	2.0363	2.0392
2.0420	2.0448	2.0475	2.0502	2.0528	2.0554	2.0580
2.0605	2.0629	2.0653	2.0677	2.0700	2.0723	2.0746
2.0768	2.0790	2.0812	2.0833	2.0855	2.0875	2.0896
2.0916	2.0936	2.0956	2.0976	2.0995	2.1014	2.1033
2.1051	2.1070	2.1088	2.1106	2.1124	2.1141	2.1159
2.1176	2.1193	2.1210	2.1227	2.1244	2.1260	2.1276
2.1292	2.1308	2.1324	2.1340	2.1355	2.1371	2.1386
2.1401	2.1416	2.1431	2.1446	2.1460	2.1475	2.1489
2.1504	2.1518	2.1532	2.1546	2.1560	2.1573	2.1587
2.1600	2.1614	2.1627	2.1640	2.1654	2.1667	2.1680
2.1692	2.1705	2.1718	2.1731	2.1743	2.1756	2.1768
2.1780	2.1792	2.1804	2.1817	2.1829	2.1840	2.1852
2.1864	2.1876	2.1887	2.1899	2.1910	2.1922	2.1933
2.1944	2.1956	2.1967	2.1978	2.1989	2.2000	

* UNDEVELOPED SITE - BASIN 101.0 - 6.69 ACRES
COMPUTE NM HYD ID=1 HYD NO=101.0 DA=0.010453 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 21.451 CFS UNIT VOLUME = .9990 B = 273.54 P60 = 1.8700
AREA = .010453 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=1 CODE=20

PARTIAL HYDROGRAPH 101.00

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.333	.0	2.666	.2	4.000	.0

.000	.0	2.000	3.0	4.000	.1	5.999	.1
.667	.0	2.666	.3	4.666	.1	6.666	.0
1.333	3.6	3.333	.1	5.333	.1		

RUNOFF VOLUME = 1.79461 INCHES = .4607 ACRE-FEET
 PEAK DISCHARGE RATE = 12.59 CFS AT 1.500 HOURS BASIN AREA = .0048 SQ. MI.

* DEVELOPED BASIN 101.1B - 2.25 ACRES

COMPUTE NM HYD ID=4 HYD NO=101.1B DA=0.001437 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 4.8223 CFS UNIT VOLUME = .9969 B = 526.28 P60 = 1.8700
 AREA = .001221 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = .57679 CFS UNIT VOLUME = .9779 B = 356.70 P60 = 1.8700
 AREA = .000216 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=4 CODE=20

HYDROGRAPH FROM AREA 101.1B

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.333	1.1	2.666	.1	4.000	.0	5.333	.0
.667	.0	2.000	.9	3.333	.0	4.666	.0	5.999	.0

RUNOFF VOLUME = 1.79461 INCHES = .1375 ACRE-FEET
 PEAK DISCHARGE RATE = 3.77 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

* DEVELOPED BASIN 101.2 - 2.69 ACRES

COMPUTE NM HYD ID=5 HYD NO=101.2 DA=0.004203 SQ MI
 PER A=0 PER B=7 PER C=8 PER D=85
 TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
 UNIT PEAK = 14.105 CFS UNIT VOLUME = .9985 B = 526.28 P60 = 1.8700
 AREA = .003573 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
 UNIT PEAK = 1.6870 CFS UNIT VOLUME = .9925 B = 356.70 P60 = 1.8700
 AREA = .000630 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=5 CODE=20

PARTIAL HYDROGRAPH 101.20

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
------	------	------	------	------	------	------	------	------	------

.667 .0 2.000 .8 3.333 .1

RUNOFF VOLUME = .43925 INCHES = .2449 ACRE-FEET
PEAK DISCHARGE RATE = 8.68 CFS AT 1.533 HOURS BASIN AREA = .0105 SQ. MI.

* DEVELOPED BASIN 101.1 - 4.00 ACRES

COMPUTE NM HYD ID=2 HYD NO=101.1 DA=0.006250 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 20.974 CFS UNIT VOLUME = .9988 B = 526.28 P60 = 1.8700
AREA = .005313 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 2.5086 CFS UNIT VOLUME = .9950 B = 356.70 P60 = 1.8700
AREA = .000938 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=2 CODE=20

PARTIAL HYDROGRAPH 101.10

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	3.8	4.000	.1	5.999	.1		
.667	.0	2.666	.3	4.666	.1	6.666	.0		
1.333	4.6	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .5982 ACRE-FEET
PEAK DISCHARGE RATE = 16.35 CFS AT 1.500 HOURS BASIN AREA = .0063 SQ. MI.

* DEVELOPED BASIN 101.1A - 1.75 ACRES

COMPUTE NM HYD ID=3 HYD NO=101.1A DA=0.004813 SQ MI
PER A=0 PER B=7 PER C=8 PER D=85
TP=0.1333 HR MASS RAIN=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 16.152 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 1.8700
AREA = .004091 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

K = .117592HR TP = .133300HR K/TP RATIO = .882159 SHAPE CONSTANT, N = 4.022934
UNIT PEAK = 1.9319 CFS UNIT VOLUME = .9938 B = 356.70 P60 = 1.8700
AREA = .000722 SQ MI IA = .42000 INCHES INF = 1.02600 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=3 CODE=20

HYDROGRAPH FROM AREA 101.1A

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS

HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	2.000	2.6	4.000	.1	5.999	.1		
.667	.0	2.666	.2	4.666	.1	6.666	.0		
1.333	3.1	3.333	.1	5.333	.1				

RUNOFF VOLUME = 1.79461 INCHES = .4023 ACRE-FEET
 PEAK DISCHARGE RATE = 11.00 CFS AT 1.500 HOURS BASIN AREA = .0042 SQ. MI.

* ROUTE DEVELOPED BASIN 101.1 THROUGH DETENTION POND TO OURAY PER DMP
 * ALLOWABLE DISCHARGE IS 2.20 CFS/AC OR 8.80 CFS FOR BASIN

ROUTE RESERVOIR	ID=6	HYD NO=101.1A	INFLOW ID=2	CODE=10
	OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)	
	0	0	43.5	
	1.48	0.0262	44.0	
	5.45	0.0968	45.0	
	7.57	0.2125	46.0	

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	43.50	.000	.00
.33	.00	43.50	.000	.00
.67	.00	43.50	.000	.00
1.00	.00	43.50	.000	.00
1.33	4.64	43.86	.019	1.06
1.67	8.31	45.87	.198	7.30
2.00	3.84	45.51	.156	6.53
2.33	.82	44.52	.063	3.53
2.67	.34	43.88	.020	1.12
3.00	.17	43.64	.007	.41
3.33	.12	43.56	.003	.19
3.67	.10	43.54	.002	.12
4.00	.09	43.53	.002	.10
4.33	.08	43.53	.002	.09
4.67	.08	43.53	.002	.08
5.00	.09	43.53	.002	.09
5.33	.09	43.53	.002	.09
5.67	.10	43.53	.002	.10
6.00	.11	43.53	.002	.10
6.33	.01	43.52	.001	.05
6.67	.00	43.51	.000	.02
7.00	.00	43.50	.000	.00

PEAK DISCHARGE = 7.328 CFS - PEAK OCCURS AT HOUR 1.70
 MAXIMUM WATER SURFACE ELEVATION = 45.886
 MAXIMUM STORAGE = .1993 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA 101.1A

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	6.5	4.000	.1	5.999	.1		
.667	.0	2.666	1.1	4.666	.1	6.666	.0		

1.333 1.1 3.333 .2 5.333 .1

RUNOFF VOLUME = 1.79456 INCHES = .5982 ACRE-FEET
PEAK DISCHARGE RATE = 7.33 CFS AT 1.700 HOURS BASIN AREA = .0063 SQ. MI.

* ROUTE DEVELOPED BASIN 101.2 THROUGH DETENTION POND TO PAINTED ROCK PER DMP

* ALLOWABLE DISCHARGE IS 2.00 CFS/AC OR 5.38 CFS FOR BASIN

ROUTE RESERVOIR ID=7 HYD NO=101.2A INFLOW ID=5 CODE=10

OUT (CFS) STORAGE (AC-FT) ELEV (FT)

0 0 50.0

2.69 0.1271 51.0

4.59 0.2772 52.0

* * * * *

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

.00	.00	50.00	.000	.00
-----	-----	-------	------	-----

.33	.00	50.00	.000	.00
-----	-----	-------	------	-----

.67	.00	50.00	.000	.00
-----	-----	-------	------	-----

1.00	.00	50.00	.000	.00
------	-----	-------	------	-----

1.33	3.12	50.11	.014	.30
------	------	-------	------	-----

1.67	5.59	51.32	.175	3.29
------	------	-------	------	------

2.00	2.58	51.37	.183	3.40
------	------	-------	------	------

2.33	.55	51.05	.135	2.78
------	-----	-------	------	------

2.67	.23	50.65	.082	1.74
------	-----	-------	------	------

3.00	.11	50.39	.049	1.04
------	-----	-------	------	------

3.33	.08	50.23	.029	.62
------	-----	-------	------	-----

3.67	.07	50.14	.018	.38
------	-----	-------	------	-----

4.00	.06	50.09	.011	.24
------	-----	-------	------	-----

4.33	.06	50.06	.007	.16
------	-----	-------	------	-----

4.67	.06	50.04	.005	.11
------	-----	-------	------	-----

5.00	.06	50.03	.004	.09
------	-----	-------	------	-----

5.33	.06	50.03	.004	.08
------	-----	-------	------	-----

5.67	.07	50.03	.003	.07
------	-----	-------	------	-----

6.00	.07	50.03	.003	.07
------	-----	-------	------	-----

6.33	.01	50.02	.003	.05
------	-----	-------	------	-----

6.67	.00	50.01	.002	.03
------	-----	-------	------	-----

7.00	.00	50.01	.001	.02
------	-----	-------	------	-----

7.33	.00	50.00	.000	.01
------	-----	-------	------	-----

7.67	.00	50.00	.000	.01
------	-----	-------	------	-----

8.00	.00	50.00	.000	.00
------	-----	-------	------	-----

PEAK DISCHARGE = 3.467 CFS - PEAK OCCURS AT HOUR 1.83

MAXIMUM WATER SURFACE ELEVATION = 51.409

MAXIMUM STORAGE = .1885 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA 101.2A

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.000	3.4	4.000	.2	5.999	.1	7.999	.0
.667	.0	2.666	1.7	4.666	.1	6.666	.0		
1.333	.3	3.333	.6	5.333	.1	7.333	.0		

RUNOFF VOLUME = 1.79454 INCHES = .4023 ACRE-FEET
PEAK DISCHARGE RATE = 3.47 CFS AT 1.833 HOURS BASIN AREA = .0042 SQ. MI.

* UNDEVELOPED OFF-SITE BASIN 201.0 - 12.8 ACRES
COMPUTE NM HYD ID=8 HYD NO=201.0 DA=0.0200 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 41.042 CFS UNIT VOLUME = .9993 B = 273.54 P60 = 1.8700
AREA = .020000 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=8 CODE=20

PARTIAL HYDROGRAPH 201.00

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.333	.0	2.666	.4	4.000	.0		
.667	.0	2.000	1.6	3.333	.1	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = .4685 ACRE-FEET
PEAK DISCHARGE RATE = 16.61 CFS AT 1.533 HOURS BASIN AREA = .0200 SQ. MI.

* UNDEVELOPED OFF-SITE BASIN 301.0 - 27.8 ACRES
COMPUTE NM HYD ID=9 HYD NO=301.0 DA=0.04343 SQ MI
PER A=100 PER B=0 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = .163684HR TP = .133300HR K/TP RATIO = 1.227936 SHAPE CONSTANT, N = 2.899764
UNIT PEAK = 89.123 CFS UNIT VOLUME = .9995 B = 273.54 P60 = 1.8700
AREA = .043430 SQ MI IA = .65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA 301.00

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
.000	.0	1.333	.0	2.666	.9	4.000	.1		
.667	.0	2.000	3.4	3.333	.2	4.666	.0		

RUNOFF VOLUME = .43925 INCHES = 1.0174 ACRE-FEET
PEAK DISCHARGE RATE = 36.05 CFS AT 1.533 HOURS BASIN AREA = .0434 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:21:28