CITY OF ALBUQUERQUE

Planning Department
Transportation Development Services Section

ALBUQUERQUE
Making History

April 11, 2005

John Briscoe , Registered Architect
2001 Carlisle Blvd NE, Ste. A
Albuquerque, NM 87110

Re: Certification Submittal for Final Building Certificate of Occupancy for
Eastmoon Properties, [M-21 / D13]
10501 Research Road SE
Architect's Stamp Dated 04/08/05

Dear Mr. Briscoe:

The TCL / Letter of Certification submitted on April 8, 2005 is sufficient for acceptance by this office for final Certificate of Occupancy (C.O.). Notification has been made to the Building and Safety Section.

Sincerely,

Nilo E. Salgado-Fernandez, P.E
Senior Traffic Engineer
Development and Building Services
Planning Department

c: Engineer
Hydrology file
CO Clerk

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

EASTMOON PROPERTIES (REV. 1/28/2003rd)

PROJECT TITLE: FINAL MOON PRELIMINARIES ZONE MAP/DRG. FILE #: M.21/D13
DRB #: 02 DRB 01292 EPC#: 02 EPC 00829 WORK ORDER#:

LEGAL DESCRIPTION: LOT 6 BLK 3 SANDIA RESEARCH PARK
CITY ADDRESS: ~~10501~~ RESEARCH ROAD SE
10501

ENGINEERING FIRM: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

OWNER: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

ARCHITECT: BRISCOE ARCHITECTS CONTACT: John Briscoe
ADDRESS: 2061 CHARLEVILLE AVE Suite A PHONE: 262-0193
CITY, STATE: ALBU. 87110 ZIP CODE: 87110

SURVEYOR: CONTACT:
ADDRESS PHONE:
CITY, STATE: ZIP CODE:

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

CHECK TYPE OF SUBMITTAL:

_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEERS CERTIFICATION (TCL)
__X__ 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
__X__ 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: 4.1.05 BY: John Briscoe

RECEIVED
APR 0 8 2005
HYDROLOGY SECTION

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

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

Briscoe Architects, p.c.

April 1, 2005

Nilo Salgado-Fernandez
Public Works Department
City of Albuquerque

Re 10201 Research Road SE
→ 10501

Nilo,

I am the project architect for the reference building project, this letter is to certify that the project was completed in substantial compliance with the plans as approved by DRB in September of 2002. Two copies of that approval are attached for your use.

Please call if there are questions.

Sincerely,

John Briscoe AIA

STATE OF NEW MEXICO
JOHN A. BRISCOE
REGISTERED ARCHITECT
4-8-05

RECEIVED
APR 0 8 2005
HYDROLOGY SECTION

2001 CARLISLE BLVD NE SUITE A • ALBUQUERQUE, N M 87110
PHONE 505-262-0193 • FAX 505-881-9114 • EMAIL BRISCOE@MSN.COM

CITY OF ALBUQUERQUE

March 30, 2005

Mr. Shahab Biazar, P.E.
ADVANCED ENGINEERING AND CONSULTING, LLC
4416 Anaheim Ave. NE
Albuquerque, NM 87113

Re: EASTMOON PROPERTIES, LLC
10501 Research Road SE
Approval of Certificate of Occupancy (C.O.)
Engineer's Stamp dated 08/25/2002 (M-21/D13)
Certification dated 02/28/2005

Dear Dan:

Based upon the information provided in your submittal received 03/30/2005, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

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

Sincerely,

Arlene V. Portillo
Plan Checker, Planning Dept. - Hydrology
Development and Building Services

C: Phyllis Villanueva
File

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

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: EASTMOON PROPERTIES, LLC ZONE ATLAS/DRG. FILE #: M21 / D13

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

LEGAL DESCRIPTION: LOT 6, BLOCK 3, SANDIA RESEARCH PARK

CITY ADDRESS: 10501 Research Rd. SE

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar

ADDRESS: 4416 Anaheim Ave., NE PHONE: (505) 899-5570

CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87113

OWNER: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

CITY, STATE: ZIP CODE:

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1ST SUBMITTAL, REQUIRES TCL OR EQUAL
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR / LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER'S CERTIFICATION (TCL)
- ____ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

SO-19 approved as per Matt Cline 3/30/05 Amp

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
- X CERTIFICATE OF OCCUPANCY (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
MAR 30 2005
HYDROLOGY SECTION

DATE SUBMITTED: 02 / 28 / 2005 BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5)
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 containing five (5) acres or more

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

February 28, 2005

Mr. Bradley L. Bingham, P.E.
Sr. Engineer, Planing Dept.
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: GRADING AND DRAINAGE CERTIFICATION FOR LOT 6, BLOCK 3, SANDIA RESEARCH PARK (M21 / D13)

Dear Mr. Bingham:

This submittal is for the certification of the grades for the above mentioned project. The location of the entrance and sidewalk culvert is slightly shifted to the east. The site was approved for grading and drainage plan with stamp date of 08/25/2002. The site is drains out to Britt Street and Research Road through sidewalk culverts as it was intended on the grading plan. See attached as-built grading plan. Attached is also a copy of the signed plan from the City Inspector who recently has inspected the sidewalk culverts. We are requesting approval for the Certification of Occupancy.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

RECEIVED
MAR 30 2005
HYDROLOGY SECTION

4416 Anaheim Ave., N.E., Albuquerque, NM 87113 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 10, 2002

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
10205 Snowflake Ct. NW
Albuquerque, NM 87114

Re: Eastmoon Properties LLC Grading & Drainage Plan, with Engineer's stamp dated 8/25/02 **(M21/D13)**

Dear Mr. Biazar,

Based on the information that you provided in your submittal dated August 26, 2002, Hydrology approves the above referenced plan for Grading Permit, Building Permit, and SO-19.

- Bring in the grading plan mylar for Rough Grading approval signature to obtain grading permit prior to Building Permit.

- For the Building Permit, please attach a copy of this approved plan to the construction sets before sign-off by Hydrology.

- For the SO-19, which is required for construction within the City right-of-way, submit a copy of this approval letter when applying for the excavation permit.

- Before release of the Certificate of Occupancy, the following are required:
  (1) Engineer's Certification of the grading and drainage plan per the DPM checklist, and
  (2) A copy of the grading and drainage plan with approval sign-off by the City's field inspector for the SO-19.

If you have any questions, please call me at 924-3988.

Sincerely,

Nancy Musinski, P.E.
Hydrology/Utility Development
City of Albuquerque Public Works

cc: Matt Cline, Drainage Inspector (letter w/plan)
Pam Lujan, Permits (letter only)
file

DRAINAGE INFORMATION SHEET

(REV. 11/01/2001)

PROJECT TITLE: EASTMOON PROPERTIES, LLC ZONE ATLAS/DRG. FILE #: M21 / D13

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

LEGAL DESCRIPTION: LOT 6, BLOCK 3, SANDIA RESEARCH PARK

CITY ADDRESS: 1420 BRITT ST. SW

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar

ADDRESS: 10205 Snowflake Ct. NW PHONE: (505) 899-5570

CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87114

OWNER: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

____	DRAINAGE REPORT
____	DRAINAGE PLAN
____	CONCEPTUAL GRADING & DRAINAGE PLAN
X	GRADING PLAN
____	EROSION CONTROL PLAN
____	ENGINEER'S CERTIFICATION (HYDROLOGY)
____	CLOMR / LOMR
____	TRAFFIC CIRCULATION LAYOUT (TCL)
____	ENGINEER'S CERTIFICATION (TCL)
____	ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
X	DRAINAGE CALCULATIONS

CHECK TYPE OF APPROVAL SOUGHT:

____	SIA / FINANCIAL GUARANTEE RELEASE
____	PRELIMINARY PLAT APPROVAL
____	S. DEV. PLAN FOR SUB'D. APPROVAL
X	S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
____	SECTOR PLAN APPROVAL
____	FINAL PLAT APPROVAL
____	FOUNDATION PERMIT APPROVAL
X	BUILDING PERMIT APPROVAL
____	CERTIFICATE OF OCCUPANCY (PERM.)
____	CERTIFICATE OF OCCUPANCY (TEMP.)
X	GRADING PERMIT APPROVAL
____	PAVING PERMIT APPROVAL
____	WORK ORDER APPROVAL
X	SO-19

WAS A PRE-DESIGN CONFERENCE ATTENDED:

____	YES
X	NO
____	COPY PROVIDED

RECEIVED
AUG 26 2002
HYDROLOGY SECTION

DATE SUBMITTED: 08 / 25 / 2002 BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

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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 containing five (5) acres or more

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

August 25, 2002

Ms. Nancy Musinski, P.E.
City of Albuquerque Public Works Department
Hydrology/Utility Development
Plaza Del Sol-2nd Floor West
600 2nd Street NW
Albuquerque, NM 87102

RE: Eastmoon Properties LLC, Grading and Drainage Plan, M21 / D13

Dear Ms. Musinski:

The following are responses to comments in your letter received dated August 9, 2002.

1. A copy of the Master Drainage Plan (M21/D5) is enclosed with this submittal. Originally we were not able to find a copy of the Master Drainage Plan, and we were free discharging based on our conversation with one of the City Hydrology Engineers and the notes from other grading and drainage submittal within the Sandia Research Park. We have reviewed the master drainage plan, and the drainage number were based on the old hydrology design. Therefore, the flow numbers are a lot less than new hydrology design. Enclosed please find the original maps for the on site and the offsite basin layouts. Lot 6 falls within Basin D-1 of the master plan, and drains west on Research Road. Offsite Basin Area B, along with Basin D-1 drain to 6 existing inlets located at the west end of the Research Road. The drainage analysis point (E) was a total runoff of 52.30 cfs. Using the new hydrology the flow number at this point is 108.00 cfs. Under the City Drainage Number (M21/7A) Sandia Science and Technology Park Bohannan Huston is proposing to divert the offsite runoff south to Innovation Parkway and then west to Eubank Boulevard via storm sewer pipe (See enclosed proposed Basin Map from Bohannan Huston). Therefore, we could assume that the inlets at the west end of Research Road will have capacity of a total runoff of 52.3 cfs. Based on this assumption, the allowable discharge per acre is (52.30 cfs / 17.56 ac) 3.56 cfs/ac. This means that we are allowed to discharge at a flow rate of (3.56 cfs/ac x 1.0216 ac) 3.67 cfs. The site drains out under the drainage basins A and B. The runoff is discharge (controlled at the back of the sidewalk culverts) at the total discharge of 3.48 cfs which is less than allowable discharge.

2. Since the Master Drainage Plan was done based on the old hydrology the inlets were only designed to intercept 52.3 cfs. Therefore, we are discharging the runoff at a confined discharge rate of 3.56 cfs/ac.

10205 Snowflake Court N.W., Albuquerque, N.M. 87114 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

3. Based on the Master Drainage Plan an offsite Basin area of 14.50 acres drains (Offsite Basin Area B) to Research road at a flow rate of 27.14 cfs (using the new hydrology design). See attached basin map from the Master Drainage Plan. There is a positive flow from north to south on the east side of our project. The owners are building a header wall or retaining wall one foot higher than the existing grad to assure that no offsite runoff will enter the site from the east.

4. The connection to the north of the trash enclosure is not for certain. But the runoff to the north of the driveway drains west to Britt Street. The header wall or retaining wall being place on the property line will be built higher than the existing grade to assure that no runoff will enter from the north until an actual design is submitted for the adjoining property.

5. The City Bench Mark information is added to the plan as requested.

6. The owners are not sure that a header wall or retaining wall will be built based on the sections A, B, and C. The walls will be designed and permitted through the building permit under a separate contract. We have added a note on the plans that the curbs for sections C and D will be built to City Standard Drawing 2415. Pavement section is also shown on the sections C and D.

7. The index contours are labeled on the plan.

8. The owners are aware that the planters could overflow during an intense rain.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

DRAINAGE CALCULATIONS
FOR

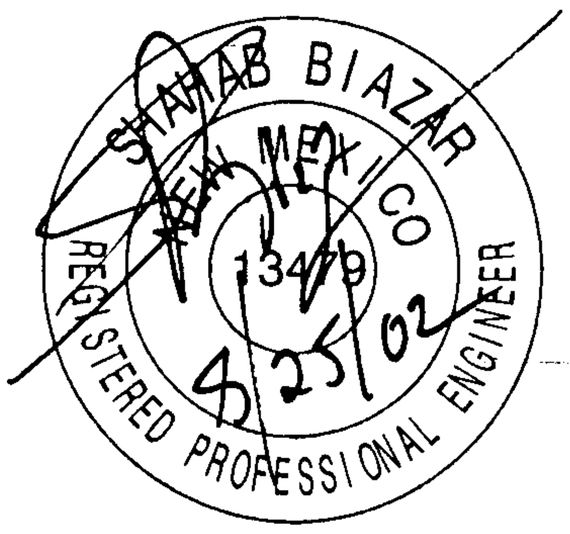
LOT 6, BLOCK 3, SANDIA RESEARCH PARK
1420 BRITT ST. SW

Prepared by:

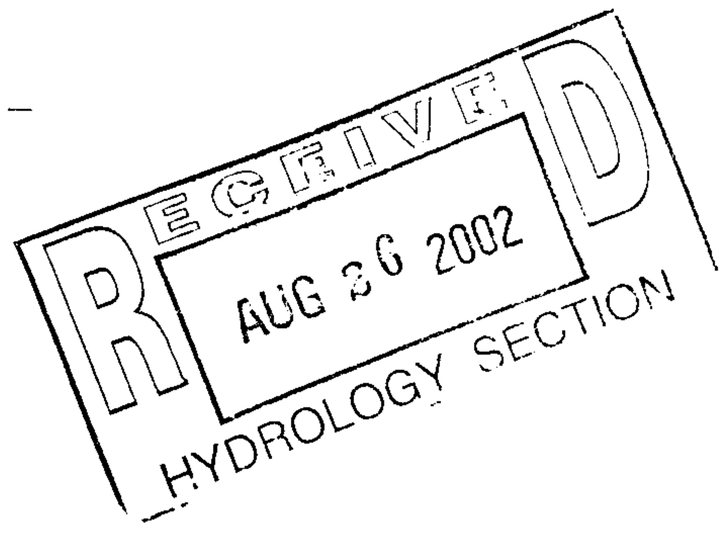
ADVANCED
ENGINEERING
and CONSULTING, LLC

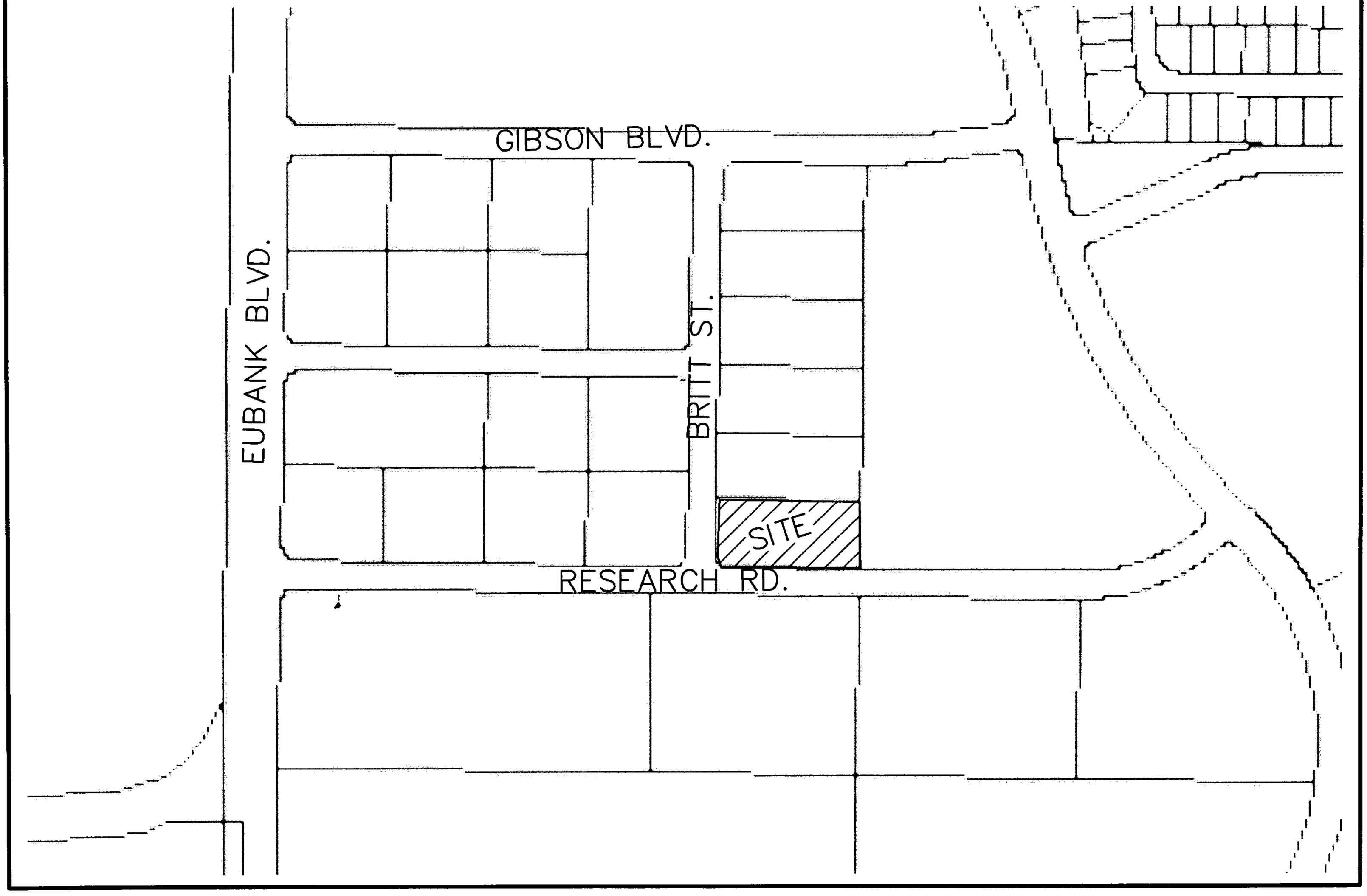
10205 Snowflake Ct. NW
Albuquerque, New Mexico 87114

August, 2002



Shahab Biazar
PE NO. 13479





VICINITY MAP:

M–21–Z

BASINS A & B PONDING CONDITIONS (INPUT FILE)

```
**********************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)           *
**********************************************************************
*
* ON-SITE BAISN A
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.000766 SQ MI
                      PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
* PONDING
*
ROUTE RESERVOIR       ID=10 HYD NO=500.0 INFLOW ID=1 CODE=24
                      OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                           0.00               0.00000          81.75
                           0.68               0.00001          81.85
                           0.97               0.00026          81.95
                           1.18               0.00105          82.05
                           1.37               0.00235          82.15
                           1.53               0.00419          82.25
                           1.67               0.00654          82.35
                           1.77               0.00850          82.42
**********************************************************************
*
* ON-SITE BASIN B
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=2 HYD NO=101.0 AREA=0.000830 SQ MI
                      PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
* PONDING
*
ROUTE RESERVOIR       ID=20 HYD NO=501.0 INFLOW ID=2 CODE=24
                      OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                           0.00               0.00000          79.64
                           0.68               0.00001          79.74
                           0.96               0.00027          79.84
                           1.18               0.00108          79.94
                           1.36               0.00244          80.04
                           1.52               0.00433          80.14
                           1.67               0.00677          80.24
                           1.80               0.00975          80.34
                           1.92               0.01327          80.44
**********************************************************************
*
ADD HYD               ID=30 HYD NO=103.0 ID=10 ID=20
*
FINISH
```

ON-SITE BASINS A & B PONDING CONDITIONS (INPUT FILE)

```
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
*
* ON-SITE BAISN A
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.000766 SQ MI
                      PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
* PONDING
*
ROUTE RESERVOIR       ID=10 HYD NO=500.0 INFLOW ID=1 CODE=24
                      OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                           0.00               0.00000          81.75
                           0.68               0.00001          81.85
                           0.97               0.00026          81.95
                           1.18               0.00105          82.05
                           1.37               0.00235          82.15
                           1.53               0.00419          82.25
                           1.67               0.00654          82.35
                           1.77               0.00850          82.42
**********************************************************************
*
* ON-SITE BASIN B
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=2 HYD NO=101.0 AREA=0.000830 SQ MI
                      PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
* PONDING
*
ROUTE RESERVOIR       ID=20 HYD NO=501.0 INFLOW ID=2 CODE=24
                      OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                           0.00               0.00000          79.64
                           0.68               0.00001          79.74
                           0.96               0.00027          79.84
                           1.18               0.00108          79.94
                           1.36               0.00244          80.04
                           1.52               0.00433          80.14
                           1.67               0.00677          80.24
                           1.80               0.00975          80.34
                           1.92               0.01327          80.44
**********************************************************************
*
ADD HYD               ID=30 HYD NO=103.0 ID=10 ID=20
*
FINISH
```

SUMMARY OUTPUT FILE
ON-SITE BASINS A & B PONDING CONDITIONS

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =08/24/2002
INPUT FILE = 200220PD USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	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	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	100.00	-	1	.00077	2.24	.084	2.05176	1.500	4.577	PER IMP=	76.00
ROUTE RESERVOIR	500.00	1	10	.00077	1.71	.084	2.05141	1.600	3.481	AC-FT=	.007
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	101.00	-	2	.00083	2.43	.091	2.05176	1.500	4.574	PER IMP=	76.00
ROUTE RESERVOIR	501.00	2	20	.00083	1.78	.091	2.05148	1.600	3.344	AC-FT=	.009
ADD HYD	103.00	10&20	30	.00160	3.48	.175	2.05145	1.600	3.410		

FINISH

AHYMO OUTPUT FILE
ON-SITE BASINS A & B PONDING CONDITIONS

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          RUN DATE (MON/DAY/YR) = 08/24/2002
          START TIME (HR:MIN:SEC) = 16:26:10     USER NO.= AHYMO-I-9702c01000R31-AH
          INPUT FILE = 200220PD

**************************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)              *
**************************************************************************
*
* ON-SITE BAISN A
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR

                    COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                    DT =     .033330 HOURS        END TIME =     5.999400 HOURS
                       .0000   .0027   .0055   .0084   .0113   .0143   .0173
                       .0204   .0236   .0269   .0302   .0337   .0372   .0408
                       .0445   .0484   .0523   .0564   .0606   .0649   .0694
                       .0741   .0789   .0839   .0892   .0946   .1003   .1063
                       .1126   .1192   .1262   .1322   .1385   .1452   .1597
                       .1922   .2422   .3139   .4119   .5407   .7049   .9093
                      1.1588  1.3904  1.4871  1.5687  1.6414  1.7074  1.7683
                      1.8247  1.8775  1.9270  1.9735  2.0174  2.0589  2.0982
                      2.1354  2.1707  2.2041  2.2359  2.2661  2.2737  2.2807
                      2.2875  2.2939  2.3001  2.3060  2.3117  2.3172  2.3226
                      2.3277  2.3328  2.3376  2.3423  2.3470  2.3514  2.3558
                      2.3601  2.3643  2.3683  2.3723  2.3762  2.3801  2.3838
                      2.3875  2.3911  2.3947  2.3982  2.4016  2.4050  2.4083
                      2.4115  2.4147  2.4179  2.4210  2.4241  2.4271  2.4301
                      2.4330  2.4359  2.4388  2.4416  2.4444  2.4472  2.4499
                      2.4526  2.4553  2.4579  2.4605  2.4631  2.4656  2.4681
                      2.4706  2.4731  2.4755  2.4779  2.4803  2.4827  2.4850
                      2.4873  2.4896  2.4919  2.4942  2.4964  2.4986  2.5008
                      2.5030  2.5052  2.5073  2.5094  2.5115  2.5136  2.5157
                      2.5177  2.5198  2.5218  2.5238  2.5258  2.5277  2.5297
                      2.5317  2.5336  2.5355  2.5374  2.5393  2.5412  2.5430
                      2.5449  2.5467  2.5486  2.5504  2.5522  2.5540  2.5557
                      2.5575  2.5593  2.5610  2.5627  2.5645  2.5662  2.5679
                      2.5696  2.5713  2.5729  2.5746  2.5762  2.5779  2.5795
                      2.5811  2.5828  2.5844  2.5860  2.5876  2.5891  2.5907
                      2.5923  2.5938  2.5954  2.5969  2.5984  2.6000

COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.000766 SQ MI
                      PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                      TP=0.1333 HR MASS RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   2.2984    CFS   UNIT VOLUME =    .9941       B =   526.28      P60 = 2.1400
     AREA =       .000582 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .121284HR    TP =   .133300HR    K/TP RATIO =   .909858     SHAPE CONSTANT, N =  3.892621
     UNIT PEAK =   .47987    CFS   UNIT VOLUME =    .9735       B =   347.95      P60 = 2.1400
     AREA =       .000184 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
*
* PONDING
*
ROUTE RESERVOIR      ID=10 HYD NO=500.0 INFLOW ID=1 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                          0.00              0.00000          81.75
                          0.68              0.00001          81.85
                          0.97              0.00026          81.95
                          1.18              0.00105          82.05
                          1.37              0.00235          82.15
                          1.53              0.00419          82.25
                          1.67              0.00654          82.35
                          1.77              0.00850          82.42

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

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

     .00          .00       81.75         .000        .00
     .80          .00       81.75         .000        .00
    1.60         1.57       82.38         .007       1.71
    2.40          .09       81.76         .000        .09
    3.20          .02       81.75         .000        .02
    4.00          .02       81.75         .000        .02
    4.80          .02       81.75         .000        .01
    5.60          .02       81.75         .000        .02
    6.40          .00       81.75         .000        .00
 PEAK DISCHARGE =          1.707 CFS - PEAK OCCURS AT HOUR    1.60
 MAXIMUM WATER SURFACE ELEVATION =       82.376
 MAXIMUM STORAGE =           .0073 AC-FT      INCREMENTAL TIME=     .033330HRS

**********************************************************************
*
* ON-SITE BASIN B
*
START
RAINFALL             TYPE=1 RAIN QUARTER=0.0 IN
                     RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                     RAIN DELAY=3.10 IN DT=0.03333 HR

                  COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                  DT =     .033330 HOURS        END TIME =     5.999400 HOURS
                     .0000   .0027   .0055   .0084   .0113   .0143   .0173
                     .0204   .0236   .0269   .0302   .0337   .0372   .0408
                     .0445   .0484   .0523   .0564   .0606   .0649   .0694
                     .0741   .0789   .0839   .0892   .0946   .1003   .1063
                     .1126   .1192   .1262   .1322   .1385   .1452   .1597
                     .1922   .2422   .3139   .4119   .5407   .7049   .9093
                    1.1588  1.3904  1.4871  1.5687  1.6414  1.7074  1.7683
                    1.8247  1.8775  1.9270  1.9735  2.0174  2.0589  2.0982
                    2.1354  2.1707  2.2041  2.2359  2.2661  2.2737  2.2807
                    2.2875  2.2939  2.3001  2.3060  2.3117  2.3172  2.3226
                    2.3277  2.3328  2.3376  2.3423  2.3470  2.3514  2.3558
                    2.3601  2.3643  2.3683  2.3723  2.3762  2.3801  2.3838
                    2.3875  2.3911  2.3947  2.3982  2.4016  2.4050  2.4083
                    2.4115  2.4147  2.4179  2.4210  2.4241  2.4271  2.4301
                    2.4330  2.4359  2.4388  2.4416  2.4444  2.4472  2.4499
                    2.4526  2.4553  2.4579  2.4605  2.4631  2.4656  2.4681
                    2.4706  2.4731  2.4755  2.4779  2.4803  2.4827  2.4850
                    2.4873  2.4896  2.4919  2.4942  2.4964  2.4986  2.5008
                    2.5030  2.5052  2.5073  2.5094  2.5115  2.5136  2.5157
                    2.5177  2.5198  2.5218  2.5238  2.5258  2.5277  2.5297
                    2.5317  2.5336  2.5355  2.5374  2.5393  2.5412  2.5430
                    2.5449  2.5467  2.5486  2.5504  2.5522  2.5540  2.5557
                    2.5575  2.5593  2.5610  2.5627  2.5645  2.5662  2.5679
                    2.5696  2.5713  2.5729  2.5746  2.5762  2.5779  2.5795
                    2.5811  2.5828  2.5844  2.5860  2.5876  2.5891  2.5907
                    2.5923  2.5938  2.5954  2.5969  2.5984  2.6000
```

```
COMPUTE NM HYD       ID=2 HYD NO=101.0 AREA=0.000830 SQ MI
                     PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                     TP=0.1333 HR MASS RAINFALL=-1

     K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =   2.4904    CFS   UNIT VOLUME =    .9949       B =   526.28       P60 = 2.1400
     AREA =       .000631 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


     K =   .121284HR    TP =   .133300HR    K/TP RATIO =   .909858     SHAPE CONSTANT, N =  3.892621
     UNIT PEAK =   .51996    CFS   UNIT VOLUME =    .9735       B =   347.95       P60 = 2.1400
     AREA =       .000199 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

*
* PONDING
*
ROUTE RESERVOIR      ID=20 HYD NO=501.0 INFLOW ID=2 CODE=24
                     OUTFLOW(CFS)       STORAGE(AC-FT)   ELEVATION(FT)
                         0.00               0.00000          79.64
                         0.68               0.00001          79.74
                         0.96               0.00027          79.84
                         1.18               0.00108          79.94
                         1.36               0.00244          80.04
                         1.52               0.00433          80.14
                         1.67               0.00677          80.24
                         1.80               0.00975          80.34
                         1.92               0.01327          80.44

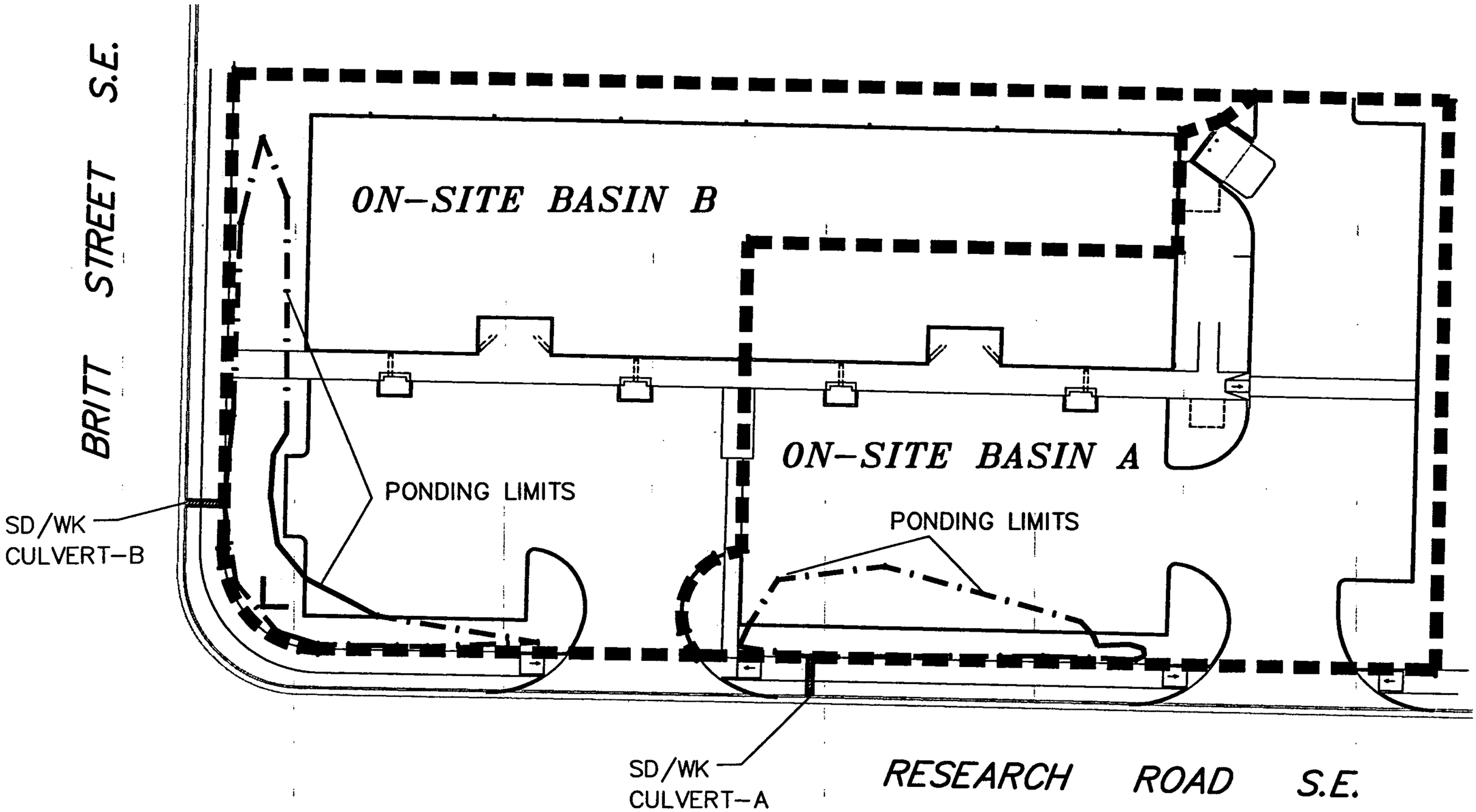
  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *

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

     .00         .00      79.64        .000        .00
     .80         .00      79.64        .000        .00
    1.60        1.70      80.32        .009       1.78
    2.40         .10      79.66        .000        .11
    3.20         .02      79.64        .000        .03
    4.00         .02      79.64        .000        .02
    4.80         .02      79.64        .000        .02
    5.60         .02      79.64        .000        .02
    6.40         .00      79.64        .000        .00
 PEAK DISCHARGE =         1.776 CFS - PEAK OCCURS AT HOUR    1.60
 MAXIMUM WATER SURFACE ELEVATION =       80.322
 MAXIMUM STORAGE =          .0092 AC-FT      INCREMENTAL TIME=      .033330HRS

**********************************************************************
*
ADD HYD              ID=30 HYD NO=103.0 ID=10 ID=20
*
FINISH

     NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 16:26:10
```



ON-SITE BASIN LAYOUT

VOLUME CALCULATIONS

DETENTION POND - A

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

$$Volume = Ab * D + 0.5 * C * D^2$$

$$C = (At - Ab) / Dt$$

Ab =	0.00
At =	1,527.21
Dt =	0.67
C =	2279.41

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
81.75	0	0	0.0000
81.85	0.10	0.00000	0.6835
81.95	0.20	0.00026	0.9666
82.05	0.30	0.00105	1.1839
82.15	0.40	0.00235	1.3670
82.25	0.50	0.00419	1.5284
82.35	0.60	0.00654	1.6742
82.42	0.67	0.00850	1.7692

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6	8" W X 8" H opening
Area (ft^2)=	0.45	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

VOLUME CALCULATIONS

DETENTION POND - B

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2

C = (At - Ab) / Dt

Ab =	0.00
At =	1,887.07
Dt =	0.80
C =	2358.83

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
79.64	0	0	0.0000
79.74	0.10	0.00000	0.6801
79.84	0.20	0.00027	0.9618
79.94	0.30	0.00108	1.1780
80.04	0.40	0.00244	1.3602
80.14	0.50	0.00433	1.5208
80.24	0.60	0.00677	1.6659
80.34	0.70	0.00975	1.7994
80.44	0.80	0.01327	1.9236

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6	← 6.7" W X 9.6" H opening
Area (ft^2)=	0.45	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

RUNOFF CALCULATION RESULTS

ON-SITE BASIN

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
ON-SITE	44500.49	1.0216	0.001596

BASINS FROM THE MASTER DRAINAGE PLAN

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
D-1	764,913.60	17.5600	0.027438
AREA B/OFFISTE	631,620.00	14.5000	0.022656

ON-SITE BASIN / PROPOSED CONDITIONS

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
ON-SITE	4.65	2.97	0%, 12%, 12%, 76%

ON-SITE BASIN / EXISITING CONDITIONS

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
ON-SITE	1.92	0.58	100%, 0%, 0%, 0%

FLOWS FOR BASINS FROM THE MASTER DRAINAGE PLAN
USING NEW HYDROLOGY (UDNER DEVELOPED CONDITIONS)

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
D-1	81.09	52.18	0%, 10%, 10%, 80%
AREA B/OFFISTE	27.14	8.13	100%, 0%, 0%, 0%

LOT 6, BLOCK 3, SANDIA RESEARCH PARK

```
**************************************************************
*         100-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)  *
**************************************************************
*
START
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                        RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=100.0 AREA=0.001596 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
**************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)  *
**************************************************************
*
START
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                        RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=101.0 AREA=0.001596 SQ MI
                        PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
**************************************************************
*          10-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)  *
**************************************************************
*
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                        RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=110.0 AREA=0.001596 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
**************************************************************
*          10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)  *
**************************************************************
*
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                        RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD          ID=1 HYD NO=111.0 AREA=0.001596 SQ MI
                        PER A=0.00 PER B=12.00 PER C=12.00 PER D=76.00
                        TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*
FINISH
```

SUMMARY OUTPUT FILE
LOT 6, BLOCK 3, SANDIA RESEARCH PARK

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =08/24/2002
INPUT FILE = 200220 USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	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	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	100.00	-	1	.00160	1.92	.056	.65514	1.533	1.880	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	101.00	-	1	.00160	4.65	.175	2.05176	1.500	4.555	PER IMP=	76.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	110.00	-	1	.00160	.58	.016	.18834	1.533	.563	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	111.00	-	1	.00160	2.97	.106	1.24846	1.500	2.910	PER IMP=	76.00
FINISH											

BASINS FROM MASTER DRAINAGE PLAN

```
**************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)  *
**************************************************************
START
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                        RAIN DELAY=3.10 IN DT=0.03333 HR
* BASIN D-1
COMPUTE NM HYD          ID=1 HYD NO=100.0 AREA=0.027438 SQ MI
                        PER A=0.00 PER B=10.00 PER C=10.00 PER D=80.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
* BASIN AREA B / OFFSITE
*
COMPUTE NM HYD          ID=2 HYD NO=101.0 AREA=0.022656 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
* TOTAL FLOW AT ANALYSIS POINT E (BASIN D-1 + OFFISTE AREA B)
*
ADD HYD                 ID=3 HYD NO=102.0 ID=1 ID=2
*
**************************************************************
*         10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)   *
**************************************************************
START                   TIME=0.0
RAINFALL                TYPE=1 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                        RAIN DAY=2.07 IN DT=0.03333 HR
* BASIN D-1
COMPUTE NM HYD          ID=1 HYD NO=110.0 AREA=0.027438 SQ MI
                        PER A=0.00 PER B=10.00 PER C=10.00 PER D=80.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
* BASIN AREA B / OFFSITE
*
COMPUTE NM HYD          ID=2 HYD NO=111.0 AREA=0.022656 SQ MI
                        PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                        TP=0.1333 HR MASS RAINFALL=-1
*
ADD HYD                 ID=3 HYD NO=112.0 ID=1 ID=2
*
FINISH
```

SUMMARY OUTPUT FILE
BASINS FROM MASTER DRAINAGE PLAN

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =08/24/2002
INPUT FILE = 200220OV USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	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	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	100.00	-	1	.02744	81.09	3.076	2.10235	1.500	4.618	PER IMP=	80.00
COMPUTE NM HYD	101.00	-	2	.02266	27.14	.792	.65514	1.533	1.872	PER IMP=	.00
ADD HYD	102.00	1& 2	3	.05009	108.00	3.868	1.44781	1.500	3.369		
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	110.00	-	1	.02744	52.18	1.887	1.28966	1.500	2.971	PER IMP=	80.00
COMPUTE NM HYD	111.00	-	2	.02266	8.13	.228	.18834	1.533	.561	PER IMP=	.00
ADD HYD	112.00	1& 2	3	.05009	60.11	2.115	.79156	1.500	1.875		
FINISH											

DRAINAGE REPORT

for

SANDIA RESEARCH PARK
Albuquerque, New Mexico

January, 1988

1-20-88

Prepared by
Andrews, Asbury & Robert, Inc.
Consulting Engineers
Albuquerque, New Mexico

TABLE OF CONTENTS

I

INTRODUCTION

A. GENERAL

This report, with the enclosed maps, provides a Drainage Plan for the Sandia Research Park Subdivision. The project is located in the Southeast Quadrant of the Albuquerque Metropolitan Area. The subdivision consists of approximately 40 acres that lies approximately one mile south of Central Avenue and directly east of Eubank Boulevard SE. (See enclosed Location Map, Map No. 1, Zone Atlas Map M-21.)

Kirtland Air Force Base is located west of the subdivision. An Industrial Park type of development is proposed for this tract and it is the intent of this report to provide a drainage plan for the development of the 40 acre site.

Guidelines for the analysis included herein are based on the City of Albuquerque's Development Process Manual, Volume 2, Design Criteria, Section 22.

II

EXISTING CONDITIONS

A. GENERAL

The subject property is presently undeveloped with a general slope from northeast to southwest of slightly more than one percent (1%).

The site has previously been utilized as a dirt race track for racing cars and was known as Speedway Park. However, all improvements were removed several years ago.

The tract is bounded on the west by Eubank Boulevard SE which has been improved with a four lane paved roadway without curb and gutter and is one of the main accesses to Kirtland Air Force Base.

Along the north side of the site a bladed dirt road exists and was formerly known as Gibson Boulevard; however, with the platting of the property for this development, the street has been named Opportunity Avenue.

Adjacent property to the northeast and south is presently undeveloped.

B. OFFSITE AND ONSITE DRAINAGE

Presently the adjacent offsite areas to the east of subject property flow across the east boundary of the property as generally sheet flow. (See Map No. 2 enclosed and Table No. 1 of the Drainage Analysis.)

The storm water runoff from Area A offsite and Area E-1 and E-2 onsite flows to the westerly boundary of the property and the east side of Eubank Boulevard where it is directed southerly to the southwest corner of the site and away from the site.

Storm water runoff from Area B offsite and Area E-3 onsite flows to the southerly boundary of the site then continues southwesterly away from the site.

III

DEVELOPED CONDITIONS

A. OFFSITE

Flows from offsite Area A will be directed northerly by raising the grade along the east boundary of the subdivision slightly. This water will be received by Opportunity Avenue which will be paved and curbed and guttered on the southerly half of the street.

Flows from offsite Area B will be directed to Research Road again by raising the grade along the easterly boundary of the subdivision slightly. Research Road will be paved and curb and gutter installed.

See Map No. 3 enclosed.

B. ONSITE

This subdivision is to be developed as an Industrial Park; however, it is not known at the time of the writing of this report what the actual type, size or location of the buildings will be or the actual type ground cover proposed in the ultimate development. It was therefore assumed that in the final developed conditions the subdivision will have a coefficient of runoff of 0.80 and it is proposed to allow for total runoff from the developed lots without detention of waters on individual lots.

The runoff generated from the site will be conveyed in the streets to a site retention pond located at the southwest corner of the subdivision. (See Map No. 3 enclosed.)

The initial phase of development will consist of improvements to the streets and public drainage easements only. Street improvements will include the construction of curb and gutter and pavement and the installation of water and sewer lines. Drainage improvements include the construction of a retention pond on Lot 1, Block 4; the installation of a storm drain system on Research Road to collect and direct the flows on Research Road to the retention pond; and a concrete rundown near the south end of Eubank Boulevard to direct the flows on Eubank to the retention pond. This concrete rundown will also act as an overflow from the retention pond when the pond becomes full.

The drainage plan as provided herein provides for conveyance of storm waters from all developed lots except for the lot to be used as a retention pond, and is to be used as a basis for drainage plans of individual sites as the area develops.

As site development occurs, drainage plans for each specific development site will be required.

IV

FUTURE STORM DRAIN CONSTRUCTION

As shown on Map No. 3, a future major storm drain is proposed to be constructed by the City, located east and parallel to Eubank Boulevard. It is proposed that at the time this storm drain is constructed, catch basins and piping will be installed in Opportunity Avenue and Development Road to collect and carry the flows from these streets to the proposed storm drain. The outlet from the storm drain system installed under this development in Research Road can be redirected to this proposed storm drain.

Upon completion of construction of this future storm drain by the City the retention pond can be eliminated by filling, and the lot on which the retention pond is located will be developed.

V

EROSION CONTROL

The contractor for the project will be responsible for soil migration during the construction phase. This can be accomplished by the grading of windrows in a north-south direction.

After development of the individual tracts, erosion will be controlled by landscaping of all areas not covered by buildings and pavement.

MANZANO

MESA

SU-1

FUTURES INC.

SITE

TRACT

RECO

CORR

TRACTS

FOUR HILLS MOBILE HOME PARK

UNIT B

R-D

FOUR HILLS WEST

MUNICIPAL LIMITS

BLVD.

EUBANK

PNM SUBSTATION

SANDIA RESEARCH PA

LOCATION MA

MAP No. 1

M-21-Z

VI

DRAINAGE ANALYSIS

Following is the Drainage Analysis (computations) for the subject property.

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
149 Jackson, N.E., Albuquerque, N.M. 87108
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Project SANDIA RESEARCH PARK Sheet 1 of 1
Job No. 458
By JA Chk'd — Date 12-10-84

DRAINAGE ANALYSIS.

CRITERIA

City of Albuquerque
Develepment Process Manual
Volume 2 - Section 22

DESIGN PARAMETERS

Peak Runoff Rate
Rational Formula. $Q = CIA$

Assume Developed Conditions and allowing total Runoff
"C" = 0.80

For Existing Conditions -
"C" = 0.40

$I_{100} = (2.4)(6.84)(t_c)^{-0.51}$

$I_{10} = 0.657 \times I_{100}$

Travel time determined from Plates 22.2 B-1 & 22.2 B-2

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TABLE 1

EXISTING CONDITIONS - See MAP No. 2

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (T_c) (Mins.)	C	I_{10} (IN/Hr)	I_{100} (IN/Hr)	Q_{10} (CFS)	Q_{100} (CFS)
(1)	A OFFSITE	21.1	1300	1.31	0.66 overland	32.83	0.40	1.82	2.77	15.4	23.4
	E-1 ON SITE	18.4 0.9-offsite	1350	1.15	0.62 Overland	36.29	0.40	1.73	2.63	12.7	19.4
	From A.P. (1) to A.P. (2)		1250' - channel 350' - Ditch	1.12 0.45	3.5 2.5	5.95 2.33 } 8.28					
(2)	A & E-1	39.5	—	—	—	32.83+8.28 = 41.11	0.40	1.62	2.47	25.6	39.0
	E-2 ON-SITE	15.8	1500	1.53	0.73 Overland	34.25	0.40	1.78	2.71	11.2	17.1
	From A.P. (2) to A.P (3)		1000' Ditch.	0.45	2.5	6.67					
(3)	A, E-1 & E-2	55.3	—	—	—	41.11+6.67 47.78	0.40	1.50	2.28	33.1	50.4

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TABLE 1- Cont'd.

EXISTING CONDITIONS - Cont'd.

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (Tc) (Mins.)	C	I_{10} (IN/Hr)	I_{100} (IN/Hr)	Q_{10} (CFS)	Q_{100} (CFS)
4	B OFFSITE	14.5	1230	1.38	0.68 Overland	30.14	0.40	1.90	2.89	11.0	16.8
	E-3 ON SITE	7.2	750	1.27	0.65 Overland	19.23	0.40	2.38	3.63	6.9	10.5
5	B & E-3	21.7	—	—	—	30.14+19.23 49.37	0.40	1.48	2.25	12.8	19.5

TABLE 2

ONSITE - DEVELOPED CONDITIONS - See Map No. 3

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (Tc) (Mins.)	C	I 10 (IN/Hr)	I 100 (IN/Hr)	Q 10 (CFS)	Q 100 (CFS)
(A)	C-1	8.21	310' Overland 450' st. 140' st.	1.61 0.50 0.82	1.75 1.90 2.45	2.95 3.95 6.39 } 13.29	0.80	2.88	4.39	18.9	28.8
	C-2	1.27	250' Overland 120' st.	1.68 0.30	1.77 1.50	2.35 1.33 } Use 10	0.80	3.33	5.07	3.4	5.2
	System to AP (B)	AP (A)	330' st.	0.30	1.50	3.67					
(B)	C-1 & C-2	9.48	--	--	--	13.29 3.67 } 16.96	0.80	2.54	3.87	19.3	29.4
	C-3	8.54	380 Overland 80 st. 600 st.	0.85 1.60 1.10	0.55 3.30 2.80	11.51 0.40 3.57 } 15.48	0.80	2.67	4.06	18.2	27.7
	System to AP-	AP (B) (C)	150' st.	0.54	2.0	1.25					
(C)	C-1 thru C-3	18.02	--	--	--	16.96 1.25 } 18.44	0.80	2.44	3.71	35.1	53.5

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Project Sandia Resort Park Job No. 458
By JA Chk'd Date 12-8-86 Sheet 1 of 1

TABLE 2 Cont'd.

ONSITE - DEVELOPED CONDITIONS - Cont'd.

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (Tc) (MINS.)	C	I10 (IN/Hr)	I100 (IN/Hr)	Q10 (CFS)	Q100 (CFS)
	C-4	2.54	240' Overland 440' St.	2.30 0.54	2.0 2.0	2.00 3.67 } Use 10	0.80	3.33	5.07	6.8	10.3
	System-to AP.	AP (C) (D)	630' St.	0.54	2.0	5.25					
(D)	C-1 thru C-4	20.56	— —	— —	— —	18.46 5.25 } 23.71	0.80	2.15	3.27	35.3	53.8
(E)	D-1	17.56	430' Overland 400' Overland 470' St.	1.38 0.67 1.25	1.60 1.15 3.00	4.48 5.80 3.72 } 14.0	0.80	2.80	4.27	39.4	60.0
		38.12									

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Project Sandia Research Park Job No. 458
By JA Ch'd Date 12-8-86 Sheet 2 of

TABLE 3

ON-SITE - DEVELOPED & OFFSITE UNDEVELOPED - See Map No. 2 & 3

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (T_c) (Mins.)	C	I_{10} (IN/Hr)	I_{100} (IN/Hr)	Q_{10} (CFS)	Q_{100} (CFS)
(1)	A OFFSITE	21.1	See existing Conditions			32.83	0.40	1.82	2.77	15.4	23.4
	System from A.P. (1) to A.P. (A)		320' st. 940' st.	- 1.3 0.82	- 3.1 2.45	1.72 6.39 } 8.11					
(A)	A & C-1	29.31	—	—	—	32.83 8.11 } 40.94	0.51	1.62	2.47	24.2	36.9
	System AP (A) to AP (B)		See On-Site Developed Conditions			3.67					
(B)	A, C-1 & C-2	30.58				40.94 3.67 } 44.61	0.53	1.56	2.37	25.2	38.4
	System AP (B) to AP (C)					1.25					
(C)	A & C-1 thru C-3	39.12				44.61 1.25 } 45.86	0.58	1.53	2.33	34.8	52.9
	System AP (C) to AP (D)					5.25					
(D)	A & C-1 thru C-4	41.66				45.86 5.25 } 51.11	0.60	1.45	2.21	36.3	55.2

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Project Sandia Research Park — Sheet 1 of 16 — Job No. 458
By JA — Chk'd — — Date 12-10-86

TABLE 3 Cont'd.

ON SITE DEVELOPED & OFF SITE UNDEVELOPED Cont'd.

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FEET)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (Tt) (MINS.)	C	I_{10} (IN/HR)	I_{100} (IN/HR)	Q_{10} (CFS)	Q_{100} (CFS)
				Existing Conditions							
④	B OFFSITE	14.5	See exhibit	1.50	3.3	1,62	0.40	1.90	2.89	11.0	16.8
				1.25	3.0	4.44					
	System AP④ to AP⑤	From AP⑤	320' st.	--	--	30.14					
			800' st.			6.06					
⑤	B # D-1	32.06	--	--	--	30.14	0.62	1.73	2.63	34.4	52.3
						6.06					
						36.20					

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Project Sandia Research Park Sheet 5 of 16
Job No. 458
By JA Chk'd Date 12-12-8(

CONDITIONS- ONSITE DEVELOPED & OFFSITE UNDEVELOPE

Determine if proposed streets will have capacity to carry runoff flows for on site developed conditions & offsite undeveloped conditions

Opportunity Ave. @ A.P. (A)

From Table 3, Q = 36.9 cfs.

Temporary street Section is Std. curb & gutter and 22 ft. of paving. (½ street)

Street Area @ 0.20' above Top of Curb = 13.40ft²

Street Slope = 0.82%, $R = \frac{13.4}{25.8} = 0.53$

$V = (99)(0.53)^{2/3}(.0082)^{1/2} = 5.87$ fps

Street Capacity = $Q = AV = (13.40)(5.87) = 78.7$ cfs

OK

Eubank Blvd @ A.P. (B)

From Table 3; Q = 38.4 CFS

Temporary street section is Std. Curb & Gutter and 22' of paving adjacent & Connected to existing 48' Wide paved Roadwa

Street Area@0.20' above Top of Curb = 15.80

Street Slope = 0.30%, $R = \frac{15.80}{40.80} = 0.39$

$V = (99)(0.39)^{2/3}(.003)^{1/2} = 2.90$ fps

Street Capacity = $Q = AV = (15.80)(2.90) = 45.8$ cfs

OK

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Eubank Blvd @ A.P. (D)

From Table 3, Q = 55.2 cfs

Temporary street Section - Same as at A.P. (B).

Street Area @ 0.20' above Top of Curb = 15.80

Street Slope = 0.54%, $R = \frac{15.80}{40.80} = 0.39$

$V = (99)(.39)^{2/3}(.0054)^{1/2} = 3.88$ fps

Street Capacity = $Q = AV = (15.80)(3.88) =$ 61.3 cfs

ok

Research Road @ A.P. (E)

From Table 3, Q = 52.3 cfs

street Section is Std. 40 ft wide street

street Area @ 0.20' above Top of Curb = 24.00 ft

street Slope = 1.25%, $R = \frac{24.00}{42.58} = 0.56$

$V = (99)(.56)^{2/3}(.0125)^{1/2} = 7.52$ fps

Street Capacity = $Q = AV = (24.00)(7.52) =$ 180.5 cfs

ok

TABLE 4

ON SITE DEVELOPED CONDITIONS + OFF SITE DEVELOPED CONDITIONS
(See Map No. 2 & 3)

ANALYSIS POINT	DRAINAGE AREA DESIGNATION	AREA (Ac)	LENGTH OF TRAVEL (FT)	SLOPE (%)	VELOCITY (FPS)	TRAVEL TIME (T_c) (Mins.)	C	I_{10} (IN/Hr)	I_{100} (IN/Hr)	Q_{10} (CFS)	Q_{100} (CFS)
(1)	A	21.1	450' Overland 600' Street 750' Street	1.44 0.50 1.23	1.65 1.9 3.0	4.55 5.26 4.17 } 13.98	0.80	2.81	4.28	47.4	72.2
	AP (1) to	AP (A)				8.11					
(A)	A & C-1	29.31	--	--	--	13.98 8.11 } 22.09	0.80	2.23	3.39	52.2	79.5
(4)	B	14.5	450' Overland 300' Street 750' Street	1.44 0.50 1.40	1.65 1.9 3.2	4.55 2.63 3.91 } 11.09	0.80	3.16	4.81	36.7	55.8
	AP (4) to	AP (E)				6.06					
(E)	B & D-1	32.06	---	---	---	11.09 6.06 } 17.15	0.80	2.53	3.85	64.8	98.7

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Proj. Park Job No. 458
By JA Ch'd — Date 12-10-8
Sheet ___ of ___

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CONDITIONS - ONSITE DEVELOPED & FUTURE OFFSITE DEVELOPED

Determine if proposed streets will have capacity to carry runoff flows for on-site developed conditions & "future" off site developed conditions

Opportunity Ave. @ A.P. (A)

From Table 4; Q = 79.5 cfs.

Assume full street section is constructed with Std. 40' street.

Street Area @ 0.20' above Top of Curb = 24.00 ft²

Street Slope = 0.82%, $R = \frac{24}{42.58} = 0.56$

$V = (99)(0.57)^{2/3}(0.0082)^{1/2} = 6.09$ fps

Street Capacity = $Q = AV = (24.00)(6.09) = 146.2$ cfs

OK

Research Road @ A.P. (E)

From Table 4, Q = 98.7 cfs

Street section is Std. 40' wide street

Street Area @ 0.20' above Top of Curb = 24.00

Street Slope = 1.25%, $R = \frac{24.00}{42.58} = 0.56$

$V = (99)(0.56)^{2/3}(0.0125)^{1/2} = 7.52$ fps

Street Capacity = $Q = AV = (24.00)(7.52) = 180.5$ cfs

OK

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CONDITIONS - ONSITE DEVELOPED & FUTURE OFFSITE DEVELOPED - Cont'd,

Only the Street Capacities at Analysis Point (A) on Opportunity Ave and at Analysis Point (E) on Research Road were checked for capacity because:

1. Prior to the time that offsite developed flows will be allowed to flow through the Sandia Reseach Park subdivision the proposed major storm Drain Line will be installed in the Drainage Easement located east of Eubank Blvd.

2. The installation of this Major Storm Drain will collect the flows on Opportunity Ave and on Research Road East of Eubank Blvd. Therefore, the flows on these streets will not flow onto Eubank Blvd.

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Project Sandia Research Park Sheet 13 of 16
Job No. 458
By JA Chk'd Date 12-13-86

VOLUME OF TEMPORARY RETENTION POND REQUIRED

CONDITIONS - ONSITE DEVELOPED & OFFSITE UNDEVELOPED

CRITERIA

1. Develop Inflow hydrograph to Retention Pond for above Conditions
2. Allow offsite flow rates, under existing conditions, to flow through the Retention Pond.- Area "A" = 23.4 + Area "B" = 16.8 = 40.2 Ac
3. Determine total Area contributing to volume & runoff rate, & "C" value

Offsite	Area "A"	= 21.1 Acres	C = 0.40
"	Area B	= 14.5 Acres	C = 0.40
Sub-Total		35.6 Acres	@ C = 0.40
Onsite	Area E-1	8.21 Acres	C = 0.80
	E-2	1.27 "	C = 0.80
	E-3	8.54 "	C = 0.80
	E-4	2.54 "	C = 0.80
	D-1	17.56 "	C = 0.80
	E-1	1.92 "	C = 0.40
	F-1	0.40 "	C = 0.80
Subtotal		40.44 "	@ C = 0.78

Total Area = 76.04

Combined "C"

$= (35.6)(0.40)/76.04 + (40.44)(.78)/76.04$

$= 0.60$

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Project Sandia Research Park — Sheet 14 of 16 — Job No. 458 — By JA — Chk'd — Date 12-13-86

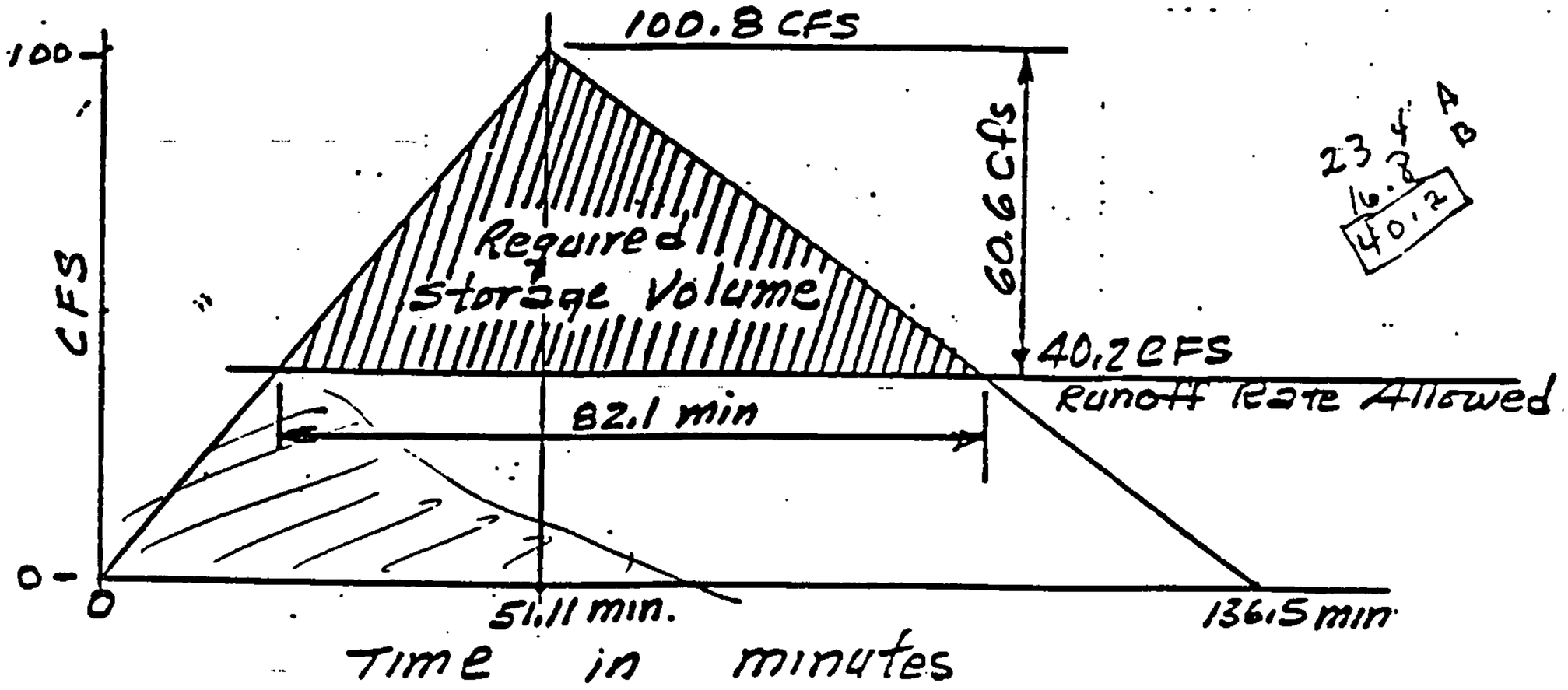
4. Use T_c for Analysis Point "D" (51.11 min. see Table 3, as this is the time required for runoff flows to reach the ponding area from the most remote point of the overall combined drainage areas.

Therefore $I = 2.21$ - See Table 3

$Q = CIA = (0.60)(2.21)(76.04) = 100.8$ CFS

From USDA - Soil Conservation Service
National Engineering Handbook,
Section 4, Hydrology
Supplemental A, "The Hydrology Guide"

Triangular Hydrograph Base = $2.67(T_p)$
$= 2.67(51.11) = 136.5$ min



Volume of Storage Req'd.

$= 82.1 \text{ min} \times 60 \times 60.6'' / 2 = 149,258 \text{ ft}^3 = 3.43 \text{ AF}$

Need for Volume calculations

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Project Eubank Research Sheet 15 of 16
Park Job No. 458
By JA Chk'd ✓ Date 12-13-86

RESEARCH AVENUE - STORM DRAIN

A storm drain with inlets will need to be installed in Research Avenue, East of Eubank Blvd. to Collect the Flows from Drainage Area D-1 and OFFSITE AREA B.

This storm drain is required to divert the flows on Research Ave to the Temporary Retention Pond.

From Table 3- Q = 52.3 cfs.

Use 6- Curb inlets - Ea. to collect 10cfs±

4- Inlets upstrem to Collect 40cfs.

Pipe size Req'd = 30" @ 1.2%±; Q= 42cfs
OK

From 6- Inlets to Pond -

Pipe Size Req'd = 36" @ 1.0%±; Q=65 CFS
OK

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Project Sandia Research Park — Sheet 16 of 16
Job No. 45[illegible]
By JM — Chk'd ______ — Date 01.20.88

SUMMARY OF HYDRAULIC CALCULATIONS

STAT.	STRUC	D	Q	A	V	K	S_f	L	Δ	JUNCTION D	JUNCTION θ	LOSSES h_f	h_b	h_j	h_{MH}	h_T	h_{MIS}	Σ	EG	h_v	HG
2+46	Outlet	36"	53.2	6.75	7.88	1.00											0.96	0.96	66.00	0	66.00
2+46	Outlet	36"	53.2	6.25	7.88							0.28						0.28	66.96	0.96	66.00
2+96	45° MH	36"	53.2	5.58	9.53	0.14			45°				0.20					0.20	67.24	1.4	67.31
																			67.44		
		Free Discharge Into MH Yc upstream																			
2+96	MH	30"	40	4.62	8.67			40'				0.34						0.34	67.57	1.17	66.40
3+36	MH	30"	40	4.91	8.15														67.91	1.03	67.02

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
KEN SCHULTZ

CHIEF ADMINISTRATIVE OFFICER
GENE ROMO

DEPUTY CAO DEVELOPMENT & ENTERPRISE SERVICES
LARRY LARRANAGA

DEPUTY CAO PUBLIC SERVICES
DAN WEAKS

July 6, 1988

John Andrews, P.E.
Andrews, Asbury & Robert, Inc.
149 Jackson, NE
Albuquerque, New Mexico 87108

RE: SANDIA RESEARCH PARK RETENTION POND SIZING CALCULATIONS
(M-21/D5) (CITY PROJECT NO. 3325)

Dear Mr. Andrews:

It has recently come to my attention that the Drainage Report for Sandia Research Park, dated January 1988, uses an improper method to determine the minimum volume of storage required for the retention pond.

Sheet 14 of 16 of the above referenced report uses a SCS triangular hydrograph and routing techniques to determine the required storage volume. The flaw with this is that it assumes an outflow simultaneous with inflow with a maximum outflow being allowed. This application is correct when there is a detention pond with a riser type or staged weir outlet, which is not the case with this project. The other problem is that a volume of runoff greater than the off-site volume is allowed to pass by the retention pond. Normally with a retention pond condition, we must provide storage volume equal to the runoff from the entire project site.

Please reanalyze the retention pond design requirements and make any recommendations as to the adequacy of the current design or required changes.

I apologize for not recognizing this discrepancy earlier, and please contact me to further discuss this.

Cordially,

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

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S. (1915 - 1984)
James E. Millington, P.E. - V.P.

February 9, 1988

Mr. Roger Green
Hydrology Section
Public Works Department
Engineering Group
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

HAND DELIVERED

SUBJECT: SANDIA RESEARCH PARK
CITY PROJECT NO. 3325

Dear Mr. Green:

Transmitted herewith are the pond volume calculations for the subject project.

Very truly yours,

ROBERT S. FOGLESONG, P.E. & L.S.

kat/458
Enclosure

No written response required
RFoglesong 2/24/88

PROJECT TITLE: Sandia Research Park ZONE ATLAS/DRNG. FILE #: M-21 / U 5

LEGAL DESCRIPTION: Sandia Research Park

CITY ADDRESS:

ENGINEERING FIRM: Andrews, Asbury & Robert, Inc CONTACT: James E. Millington,

ADDRESS: 149 Jackson NE, Alb. NM, 87108 PHONE: 265-6631

OWNER: Opportunity Research Park Partnership CONTACT:

ADDRESS PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

RECEIVED
FEB 09 1988
HYDROLOGY SECTION

X YES

____ NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 86-284

EPC NO.

PROJECT NO. 3325

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAIN. PLAN

X GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

X ROUGH GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

OTHER

DATE SUBMITTED: February 9, 1988

BY:

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S. (1915 - 1984)
James E. Millington, P.E. - V.P.

February 8, 1988

Mr. Rodger Green
Hydrology Section
Public Works Department
Engineering Group
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: SANDIA RESEARCH PARK
CITY PROJECT NO. 3325

Dear Mr. Green:

Research in the NOAA Atlas indicates that the precipitation for a 24 hour - 100 year storm is 2.8 inches for the subject project. The precipitation for a 6 hour - 100 year storm is 2.4 inches. The volume of runoff during a 24 hr. precipitation vs. a 6 hr. precipitation would be approximately 16.6 percent larger.

The volume of runoff for a 6 hr. - 100 year storm for the subject project is 3.43 acre feet, from the drainage report. The volume of runoff for a 24 hour precipitation is approximately 4.00 acre feet. The retention pond will be enlarged to accommodate 4.00 acre feet.

Very truly yours,

ROBERT S. FOGLESONG, P.E. & L.S.

kat/458

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
KEN SCHULTZ

CHIEF ADMINISTRATIVE OFFICER
GENE ROMO

DEPUTY CAO PUBLIC SERVICES
FRANK MARTINEZ

DEPUTY CAO PLANNING/DEVELOPMENT
BILL MUELLER

February 2, 1988

John Andrews, P.E.
Andrews, Asbury & Robert, Inc.
149 Jackson, NE
Albuquerque, New Mexico 87108

RE: DRAINAGE REPORT SUBMITTAL OF SANDIA RESEARCH PARK RECEIVED JANUARY 20, 1988 FOR ROUGH GRADING PERMIT AND FINAL PLAT APPROVAL (M-21/D5) (W.O.#3325)

Dear Mr. Andrews:

I have the following comments in regard to the above referenced submittal revised on January 29, 1988.

1. The Drainage Ordinance requires that all detention ponds not drained within 6 hours be sized to hold the runoff from the 24 hour duration storm, not the 6 hour. This requirement was overlooked in my previous review and approval. An alternative to calculating the volume of runoff by a hydrograph, is to determine a composite runoff curve number (RCN) for the site and calculate the direct runoff value with the SCS formula or Plate 22.2 C-4 of the DPM.

2. The site can be approved for rough grading with the addition of construction notes referencing earthwork specifications, and the requirement that the contractor obtain a "Topsoil Disturbance Permit". Bring in the grading plan mylars for approval signature with the above notes added.

3. Final Plat may be signed off by the City Engineer after execution of a Subdivision Improvements Agreement, and Drainage Covenant for the retention pond.

Specific design details and street grades will be reviewed and commented on by the DRC.

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

Cordially,

Roger A. Green PE

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

RAG/bsj

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

149 Jackson, NE. Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S. (1915 - 1984)
James E. Millington, P.E. - V.P.

January 19, 1988

Mr. Roger Green
Public Works Department
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: SANDIA RESEARCH PARK

Dear Mr. Green:

Attached is a revised Drainage Report for Sandia Research Park for your review and approval.

If you need any further information, please contact me.

Very truly yours,

JAMES E. MILLINGTON, P.E.

kat/458
Enclosure
cc: Don Morgan

PROJECT TITLE: Sandia Research Park ZONE ATLAS/DRNG. FILE #: M-21 / D5

LEGAL DESCRIPTION: Sandia Research Park

CITY ADDRESS:

ENGINEERING FIRM: Andrews, Asbury & Robert, In CONTACT: John A. Andrews

ADDRESS: 149 Jackson NE PHONE: 265-6631

OWNER: Opportunity Research Park Partnership CONTACT:

ADDRESS PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

X YES

____ NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED
JAN 20 1988
HYDROLOGY SECTION

DRB NO. 86-284

EPC NO.

PROJECT NO. 3325

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAIN. PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

X FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

X ROUGH GRADING PERMIT APPROVAL

X GRADING/PAVING PERMIT APPROVAL

OTHER _____ (SPECIFY)

DATE SUBMITTED: January 20, 1988

BY:

Rev 11/84

FILE CC

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

April 28, 1987

John Andrews, P.E.
Andrews, Asbury & Robert, Inc.
149 Jackson, NE
Albuquerque, New Mexico 87108

RE: DRAINAGE REPORT SUBMITTAL OF SANDIA RESEARCH PARK RECEIVED APRIL 13, 1987 FOR FINAL PLAT AND ROUGH GRADING PERMIT APPROVAL (M-21/D5)

Dear John:

The above referenced submittal dated April 13, 1987, is approved for Final Plat purposes. Prior to Final Plat sign-off by the City Engineer, an executed Subdivision Improvements agreement is required.

A Grading Permit can be issued by this office after submittal, review, and approval of a detailed Grading Plan in accordance with the DPM outline. Earthwork specifications and note to contractor requiring a Topsoil Disturbance Permit should be included.

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

Cordially,

Roger A. Green PE

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

cc: M.B. Ford, Theatre Joint Venture

RAG/bsj

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S. (1915 - 1984)
James E. Millington, P.E. - V.P.

April 10, 1987

Mr. Fred Aguirre
Utility Development Division
Hydrology Section
Public Works Department
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

ATTN: ROGER GREEN

SUBJECT: SANDIA RESEARCH PARK
DRAINAGE REPORT

Dear Mr. Aguirre:

Transmitted herewith is a drainage report for subject project for review.

The initial review of drainage for this project was made with Billy Goolsby; however, I have had detailed discussions with Roger Green relative to the drainage requirements for the development of this subdivision.

Your early review of this report will be appreciated.

Very truly yours,

JOHN A. ANDREWS, P.E.

caf-458
Enclosure
cc: Mr. M. B. "Pete" Ford

PROJECT TITLE: Sandia Research Park ZONE ATLAS/DRNG. FILE #: [illegible]

LEGAL DESCRIPTION: Sandia Research Park Subdivision

CITY ADDRESS: Eubank Boulevard, SE

ENGINEERING FIRM: Andrews, Asbury & Robert, Inc. CONTACT: John Andrews

ADDRESS: 149 Jackson NE Albuquerque, NM 87108 PHONE: (505) 265-6631

OWNER: Theatre Joint Venture CONTACT: M. B. "Pete" Ford

ADDRESS: 707 Broadway NE, Suite 303 Albuquerque, NM 87102 PHONE: (505) 242-5241

ARCHITECT: N/A CONTACT:

ADDRESS: PHONE:

SURVEYOR: Andrews, Asbury & Robert, Inc. CONTACT: Gayle Jewell

ADDRESS: 149 Jackson NE Albuquerque, NM 87108 PHONE: (505) 265-6631

CONTRACTOR: New Concepts Inc. & Interwest Ltd. A Joint Venture CONTACT: Tom Lakeman

ADDRESS: P.O. Box 6128 Albuquerque, NM 87197 PHONE: (505) 821-9504

PRE-DESIGN MEETING:

X YES w/ Billy Goolsby and Roger Green DRB NO. 86-284

____ NO EPC NO.

____ COPY OF CONFERENCE RECAP SHEET PROVIDED PROJECT NO.

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAIN. PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

X FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

X ROUGH GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

OTHER ____ (SPECIFY)

DATE SUBMITTED: April 10, 1987

BY:

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

November 19, 1986

Charles T. Asbury, P.E.
Andrews, Asbury & Robert, Inc.
149 Jackson, NE
Albuquerque, New Mexico 87108

RE: CONCEPTUAL GRADING & DRAINAGE PLAN SUBMITTAL OF SANDIA RESEARCH PARK RECEIVED NOVEMBER 10, 1986 FOR PRELIMINARY PLAT APPROVAL (M-21/D5)

Dear Ted:

I have reviewed the above referenced submittal dated July 1986 and have the following comments to be addressed before review can continue:

1. Provide a complete watershed map to verify the off-site watershed drainage areas.

2. Off-site flows from the intersection of Eubank and Gibson must be accounted for in the existing and future conditions.

3. No reference is made to the proposed AMDS drainage channel within the existing 40' wide drainage easement. After discussions with Dwayne Sheppard, it appears that the City may propose a storm drain in this easement in lieu of an open channel. This item should be further coordinated with Dwayne Sheppard in Special Projects Hydrology Section of PWD Planning Division, with your plans reflecting some type of future facilities.

4. Your Grading Plan implies that in the developed condition the project site may discharge 59.9 cfs.

4. (cont'd.)

This is incorrect since the Drainage Ordinance allows no discharge with developed conditions unless downstream drainage facilities exist and capacity is available, which is not the case for this site. 100% of the runoff must be retained until downstream facilities are in place.

5. This office does not recognize calculating volumes of runoff using the Rational Method. I recommend that DPM plates 22.2 C-2, C-3 and C-4 be used to calculate the volume of direct runoff for ponding requirement. You will find that the method you are using is very conservative and requires much greater pond volumes.

6. Offsite drainage basins must also have runoff calculations for the developed condition with the onsite facilities, such as the streets, analyzed for capacity with developed offsite flows. This would not apply if, under developed conditions, the offsite flows would be diverted away from your project site, but your Grading Plan does not imply this.

7. Provide the following information on the Grading and Drainage Plan as required by the DPM submittal check list to increase clarity:

   A. Legal description.
   B. Flood Hazard map or reference.
   C. Date with the Engineer's stamp.

A Conceptual Grading and Drainage Plan is not usually of enough detail to determine all the infrastructure requirements for an Infrastructure Listing for sign-off by the DRB. Your Grading and Drainage Plan must have adequate Hydrologic and Hydraulic calculations to demonstrate that all required infrastructures are identified and sized adequately. The only information not needed is design details which are reviewed at DRC for Work Order purposes.

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

Cordially,

Roger A. Green, PE

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

Standard Form Letter to:

Pete Ford, Theatre Joint Venture

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

149 Jackson, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S. (1915 - 1984)
James E. Millington, P.E. - V.P.

October 23, 1986

Mr. Fred Aguirre
Hydrology Section
Public Works Department
Engineering Group
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

SUBJECT: PRELIMINARY DRAINAGE PLAN

Dear Mr. Aguirre:

Recently, you and I informally discussed the general requirements for hydrology sign-off for Preliminary Plat approval.

I am enclosing a copy of the conceptual grading and drainage plan which depicts onsite, offsite, undeveloped and developed conditions, which I hope is suitable for your concurrence for preliminary plat approval.

If additional information is required, please contact me.

Very truly yours,

CHARLES TED ASBURY

jtg-458
Enclosure: Sheet 3

DRAINAGE INFORMATION SHEET

M21/D5

PROJECT TITLE: SANDIA RESEARCH PARK ZONE ATLAS/DRNG. FILE #: DRB 86-284

LEGAL DESCRIPTION: _____

CITY ADDRESS: SOUTH EUBANK BLVD.

ENGINEERING FIRM: ANDREWS ASBURY & ROBERTS CONTACT: TED ASBURY

ADDRESS: 149 JACKSON NE PHONE: 265-6631

OWNER: THEATRE JOINT VENTURE CONTACT: PETE FORD

ADDRESS: 707 BROADWAY N.W. PHONE: 242-5241

ARCHITECT: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: AA&R CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

RECEIVED
NOV 10 1986
HYDROLOGY SECTION

PRE-DESIGN MEETING:

____ YES

____ NO

____ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 86-284 - 7/2919

EPC NO. _____

PROJ. NO. _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

X PRELIMINARY PLAT APPROVAL

____ SITE DEVELOPMENT PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ BUILDING PERMIT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ ROUGH-GRADING PERMIT APPROVAL

____ GRADING/PAVING PERMIT APPROVAL

____ OTHER _____ (SPECIFY)

DATE SUBMITTED: NOV 10, 1986

BY: Thos. T Asbury

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION/DESIGN HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NO.: M-21 DATE: 5/8/86 @ 10:00 a.m.

PLANNING DIVISION NOS: EPC: _____ DRB: 86-284

SUBJECT: Sandia Research Park

STREET ADDRESS (IF KNOWN): NW Corner of NW ¼ Sec 33 T 10 N R 4E

SUBDIVISION NAME: \

APPROVAL REQUESTED:

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

ATTENDANCE: WHO	REPRESENTING
~~Gayle Jewett~~ Jim Millington	Andrew, Asbury & Robert
Billy Goolsby	Hydrology Section
Ted Asbury	A A & R

FINDINGS:

- Interim solution will need to be presented to address the ultimate drainage scheme and show how the runoff will be controlled until the ultimate outfall becomes available
- Individual Tract Drainage Plans will be required for approval of future building permits.
- Control of small frequency storm on-site with emergency ponding in the dedicated drainage easements will be entertained with encroachment agreements for maintenance responsibilities.

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

SIGNED: Billy J. Goolsby	SIGNED: Thos. T. Asbury
TITLE: CE/Utility Hydrology	TITLE: Agent for Owner
DATE: 5/8/86	DATE: 5/8/86

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 9, 2002

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
10205 Snowflake Ct. NW
Albuquerque, NM 87114

Re: Eastmoon Properties LLC Conceptual Grading & Drainage Plan, with Engineer's stamp dated 7/24/02 (M21/D13)

Dear Mr. Biazar,

Based on the information contained in your submittal dated July 24, 2002, Hydrology approves the above referenced plan for Site Plan for Building Permit. However, before you re-submit for the Building Permit, Grading Permit, and SO-19 approvals, please remove "conceptual" from the title and address the following comments:

1. Your submittal letter states that the existing Sandia Research Park Master Drainage Plan by Brasher & Lorenz allows free discharge on the site. Please submit a copy of the document to back up this statement, and disclose the runoff quantity in cubic feet per second per acre (cfs/ac) allowed to discharge freely per the master plan.
2. I am aware of the large diameter storm drain in Eubank Blvd. Please verify that there are enough inlets to accommodate all the flows from Research Road.
3. Please address if there are any offsite flows to the site, and note the quantity on the plan.
4. It appears that there is a 24-ft wide opening in the curb just north of the refuse enclosure to permit automobile access to the adjoining lot to the north. How do you prevent runoff and sediment from entering your site through the opening?
5. The general notes call out a City control station, but you omitted the name of the station. Please identify the station and state whether the vertical reference datum used is 1929 or 1988.
6. Please show dimensions, thickness, steel on the header wall in Section A-A and B-B, and for the curb in Sections C-C and D-D. Show pavement in Sections C-C and D-D.
7. Please label the existing index contours.
8. I assume the tiny square notches on the building (4 in front, six at rear) are roof drains. It appears there are culverts from the downspouts in front to convey flow under the sidewalk, then to planting boxes. Does it matter if the boxes overflow when there is intense rainfall?

If you have any questions, please call me at 924-3988.

Sincerely,

Nancy Musinski, P.E.
Hydrology/Utility Development
City of Albuquerque Public Works

cc: file

DRAINAGE INFORMATION SHEET

(REV. 11/01/2001)

M-21|D13

PROJECT TITLE: EASTMOON PROPERTIES, LLC ZONE ATLAS/DRG. FILE #: M21

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

LEGAL DESCRIPTION: LOT 6, BLOCK 3, SANDIA RESEARCH PARK

CITY ADDRESS: 1420 BRITT ST. SW

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar

ADDRESS: 10205 Snowflake Ct. NW PHONE: (505) 899-5570

CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87114

OWNER: CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

_____ DRAINAGE REPORT

_____ DRAINAGE PLAN

_____ CONCEPTUAL GRADING & DRAINAGE PLAN

__X__ GRADING PLAN

_____ EROSION CONTROL PLAN

_____ ENGINEER'S CERTIFICATION (HYDROLOGY)

_____ CLOMR / LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ ENGINEER'S CERTIFICATION (TCL)

_____ ENGINEER'S 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

__X__ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

_____ SECTOR PLAN APPROVAL

_____ FINAL PLAT APPROVAL

_____ FOUNDATION PERMIT APPROVAL

__X__ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY (PERM.)

_____ CERTIFICATE OF OCCUPANCY (TEMP.)

__X__ GRADING PERMIT APPROVAL

_____ PAVING PERMIT APPROVAL

_____ WORK ORDER APPROVAL

__X__ SO-19

RECEIVED
JUL 24 2002
HYDROLOGY SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED:

_____ YES

__X__ NO

_____ COPY PROVIDED

DATE SUBMITTED: 07 / 24 / 2002 BY: Shahab Biazar, P.E.

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 submittals may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5)
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 containing five (5) acres or more

ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection

July 24, 2002

Mr. Bradley L. Bingham, P.E.
Sr. Engineer, PWD
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: GRADING PLAN FOR EASTMOON PROPERTIES, LLC, LOT 6, BLOCK 3, SANDIA RESEARCH PARK

Dear Mr. Bingham:

This letter is in reference to above mentioned project. Eastmoon Properties, LLC site is located at 1420 Britt St. SW and contains approximately 1.00 acre. The site falls within the Sandia Research Park Master Drainage Plan, City Drainage Number M21/5D, prepared by Brasher & Lorenz. Based on this master plan the site is designed for free discharge. The site drains out to Research Road and Britt Street from the south and the west side of the property via two sidewalk culverts. The sidewalk culverts each drain 50% of developed runoff generated from the site, but they have a higher drainage capacity. See the attached sheet for the drainage calculations. Also see the enclosed grading and drainage plan for the drainage pattern on site.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

10205 Snowflake Court N.W., Albuquerque, N.M. 87114 PH (505) 899-5570 FAX (505) 897-4996 EMAIL AECLLC@aol.com

Sidewalk Culvert Flow Calculations

Orifice Equation: $Q=CA\sqrt{(2gh)}$

Q = 2.96 cfs (maximum runoff directed to each sd/wk culvert on site is no more than 60% of total runoff generated from the site)

C = 0.6
g = 32.20
h = 0.50'
SD/WK Culvert = 2.00'
A= 2.00 x 0.50 = 1.00 sf

$Q = 0.60 \times 1.00\sqrt{(2 \times 32.2 \times 0.5)}$
Q = 3.41 cfs > 2.96 cfs

Therefore, use two 2'-side walk culverts, one on Britt Street and another one on Research Road. See Grading and Drainage Plan for the location of the sidewalk culverts.

RUNOFF CALCULATION RESULTS

BASIN	AREA (SF)	AREA (AC)	AREA (MI^2)
ON-SITE	44500.49	1.0216	0.001596

PROPOSED

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
ON-SITE	4.94	3.23	0%, 5%, 5%, 90%

EXISTING

BASIN	Q-100 CFS	Q-10 CFS	TREATMENT A, B, C, D
ON-SITE	1.92	0.58	100%, 0%, 0%, 0%

RUNOFF DRAINAGE DATA

The site is @ Zone 3

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.14 inches

P_{360} = 2.60 inches

P_{1440} = 3.10 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.14 x 0.667
= 1.43 inches

P_{360} = 1.73

P_{1440} = 2.07

See the summary output from AHYMO calculations.

Also see the following summary tables.

```
*
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)          *
**********************************************************************
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=100.0 AREA=0.001596 SQ MI
                      PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*         100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
*
START
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.14 IN RAIN SIX=2.60 IN
                      RAIN DELAY=3.10 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=101.0 AREA=0.001596 SQ MI
                      PER A=0.00 PER B=5.00 PER C=5.00 PER D=90.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*          10-YEAR,  6-HR STORM (UNDER EXISTING CONDITIONS)          *
**********************************************************************
*
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                      RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=110.0 AREA=0.001596 SQ MI
                      PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                      TP=0.1333 HR MASS RAINFALL=-1
*
**********************************************************************
*          10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)          *
**********************************************************************
*
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.43 IN RAIN SIX=1.73 IN
                      RAIN DAY=2.07 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=111.0 AREA=0.001596 SQ MI
                      PER A=0.00 PER B=5.00 PER C=5.00 PER D=90.00
                      TP=0.1333 HR MASS RAINFALL=-1
**********************************************************************
*
FINISH
```

SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =07/23/2002
INPUT FILE = 200212 USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	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	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	100.00	-	1	.00160	1.92 Ex.	.056	.65514	1.533	1.880	PER IMP=	.00
START					100yr 6hr					TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.600
COMPUTE NM HYD	101.00	-	1	.00160	4.94 Dev	.190	2.22881	1.500	4.837	PER IMP=	90.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	110.00	-	1	.00160	10yr 6hr .58 Ex	.016	.18834	1.533	.563	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.730
COMPUTE NM HYD	111.00	-	1	.00160	3.23 Dev.	.119	1.39263	1.500	3.163	PER IMP=	90.00
FINISH											