E22/D7C

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 18, 1992

MAR 19 1992

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Ms. Mary Snyder
Centex Real Estate Corporation
10701 Montgomery N.E.
Albuquerque, NM 87111

RE: PROJECT NO. 3749.92, ANTELOPE RUN SUBDIVISION, PHASE III, (MAP NO. E-22)

Dear Ms. Snyder:

This is to certify that the City of Albuquerque accepts Project No. 3749.92 as being completed according to approved plans and construction specifications. If all required rights-of-way and/or easements have been dedicated, the City of Albuquerque will accept for continuous maintenance all public infrastructure improvements constructed as part of Project No. 3749.92. If the required rights-of-way and/or easements have not been dedicated, the City of Albuquerque cannot accept the project for continuous maintenance and said maintenance will be the responsibility of the developer. When a final plat has been filed it will be the developer's responsibility to provide the Construction Management Division with a copy, at which time the City will fully accept Project No. 3749.92.

The project is described as follows:

- Installed 12" water main in Tennyson Road N.E. from Academy to north boundary (290' cap and block). Installed median curb on the west side of median in Tennyson and paved (arterial) southbound lane on Tennyson from north boundary to Academy.

- Connected eight inch (8") PVC sanitary sewer in Caribou to existing stub and laid new main from Antelope Run Street, east to end of cul-de-sac, with three (3) manholes.

  Installed 6" PVC water line from existing valve's stub at Caribou and Antelope Run Street, east to cul-de-sac, then south and east in a twenty foot (20') easement to tie into twelve inch (12") main in Tennyson at north boundary. Installed twenty (20) four inch (4") sanitary sewer services and twenty (20) one inch (1") water services in Caribou. Poured standard curb and gutter from Antelope Run Road, east to end of cul-de-sac, and back to Antelope Run and paved with residential paving.

Connected new 8" sanitary sewer PVC main in Ibex to existing stub at Antelope Run Road, east to Tennyson Street.

Connected new six inch (6") water PVC main to existing stub at Antelope Run east to Tennyson Street with new fire hydrant at northeast corner of Ibex and Tennyson Street. Poured standard curb and gutter north and south side of Ibex to Tennyson and laid residential paving in Ibex from Antelope Run to Tennyson Street with ten (10) four inch (4") sanitary sewer services and ten (10) one inch (1") water services.

Connected new eight inch (8") sanitary sewer PVC main in Gazelle Place and Ibex then south and east in Gazelle Place to east end of Gazelle with three (3) manholes. Connected six inch (6") PVC water main to Ibex. Laid south and east to end of cul-de-sac. Installed fire hydrant approximately middle of run with twenty (20) four inch (4") sanitary sewer services and twenty (20) one inch (1") water services. Residential paving used in Gazelle Place.

- The contractor's correction period begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Brian L. Speicher, P.E.
Chief Construction Engineer
Design/Construction Division
Engineering Group
Public Works Department

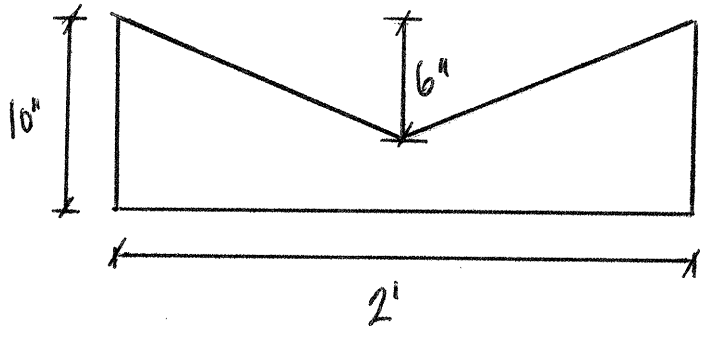
xc: Bohannan-Huston, Inc.
New Concepts, Inc.
Fred Aguirre, Engineering Group, PWD
Phil Fischer, Engineering Group, PWD
Terri Martin, Engineering Group, PWD
Martin Barker, Engineering Group, PWD
Steve Gonzales, Special Assessments
Sam Hall, Operations Group, PWD
A. N. Gaume, Operations Group, PWD
Jim Fink, Operations Group, PWD
Ray Chavez, Engineering Group, PWD
Greg Olson, Water/Wastewater Group, PWD
Dave Parks, Engineering Group, PWD
Tom Kennerly, Engineering Group, PWD
Josie Gutierrez, New Meter Sales, Finance Group, PWD
Claudia Gallegos, Standby Clerk, Finance Group, PWD
Lynda Michelle Devanti, Engineering Group, PWD
Richard Zamora, Engineering Group, PWD
Kelly Trujillo, Engineering Group, PWD
f/Project 3749.92:Warranty:Readers

ANTELOPE RUN, PHASE II DRAINAGE

MANNING'S N = .0130 SLOPE = .0110

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.00	2	1.00	-0.50	3	2.00	0.00

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
-0.4	0.1	0.0	0.0	0.4	1.5	0.4
-0.3	0.2	0.1	0.2	0.9	2.4	0.8
-0.2	0.3	0.2	0.6	1.3	3.1	1.2
-0.1	0.4	0.3	1.2	1.8	3.8	1.6
0.0	0.5	0.5	2.2	2.2	4.4	2.0



PRIVATE REAR YARD CONCRETE PAN DOWN

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

July 22, 1991

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION PHASE III
(E-22/D7C) REVISION DATED JUNE 19, 1991

Dear Mr. Davis:

Based on the information provided on your resubmittal of July 10, 1991, the referenced drainage plan is approved for Final Plat and Work Order.

Please advise your client that a copy of the drainage plan for the lots which involve the turned block concept will be required (Lots 88 - 99 Antelope Run Subdivision, Phase III) to be inserted in each construction set prior to sign off by Hydrology.

If I can be of further assistance, please feel free to contact me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 1, 1991

Kerry Davis
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION
PHASE 3 (E-22/D7C) RECEIVED JUNE 20, 1991

Dear Mr. Davis:

Based on the information provided on your June 20, 1991 resubmittal the following items must be addressed prior to final approval.

1. How did you determine the control rate of .3 cfs per lot? How much ponding will be required? What type of ponding configuration will be needed.

2. Please take into account the setbacks for ponding on rear and side yards.

3. I will need a copy of the infrastructure listing which identifies the proposed retaining walls and the required rundown on the north property line.

4. Also, notation on the plat and plan that indicates that encroachment agreements will be required for the lots within the drainage easement.

5. Please show a detail for the inverted block.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

xc: Lynn Johnson

BJM/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 5, 1991

Kerry L. Davis
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION PHASE 3
(E-22/D7C) REVISION DATED JUNE 3, 1991

Dear Mr. Davis:

Based on the information provided on your resubmittal of May 29, 1991, the referenced drainage plan is approved for final plat, rough grading, and work order.

Please advise your client that on each building permit request, there must be included in the construction sets a copy of this approved drainage plan. Reason for this requirement is to clarify to the contractor as to what the drainage plan requires.

Prior to any development on lots that have infrastructure requirements (private drainage rundowns) all improvements must be in place prior to release of the Building Permit.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

xc: Lynn Johnson, Centex Homes
Larry Caudill, Environmental Health

BJM/bsj

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 17, 1991

Kerry L. Davis
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION PHASE 3
(E-22/D7C) RECEIVED MAY 10, 1991

Dear Mr. Davis:

I am in receipt of the additional information requested for review. The above referenced site is approved for Preliminary Plat.

Please be advised that prior to Final Plat approval, the additional comments found on my comment letter must be addressed.

Also, a notation on the final plan which indicates that encroachment agreements will be required for the lots which encroach into the drainage easement must be included.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

xc: Lynn Johnson, Centex Homes

BJM/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 8, 1991

Guy Jackson
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: RELEASE OF FINANCIAL GUARANTEE FOR ANTELOPE RUN - PHASE II
(E-22/D7C) RECEIVED MAY 1, 1991

Dear Mr. Jackson:

I am in receipt of your letter and as-built plan received on May 1, 1991.

I have advised Roger Green that the as-built plans have been reviewed and accepted. Therefore, I have approved the release of the Financial Guarantees.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

/Bernie J Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+134)

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

May 8, 1991

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION - PHASE III
(E-22/D7C) ENGINEER'S STAMP DATED APRIL 23, 1991

Dear Mr. Davis:

Based on the information provided on your submittal of April 22, 1991, the following comments must be addressed prior to final approval for preliminary plat.

1. More information pertaining to the existing 96" storm drain required.
2. The lots adjacent to the existing sewer easement will require encroachment agreements or a wall at the easement line.
3. I recommend that you talk to Greg Olson pertaining to the sanitary sewer easement.
4. The infrastructure listing will need to be submitted for review prior to preliminary plat approval. Retaining wall must be part of the listing.
5. Prior to any type of approval, we will need AMAFCA's concurrence for their concerns.

Prior to Final Plat approval, the following must be addressed.

1. Top of curb and flow line elevations on Academy Road.
2. Typical detail showing how the lots adjacent to Academy Road will drain.

3. More spot elevations on each lot to clarify how the front and rear yards will be drained.

4. Location, description and elevation of the ACS monument used and also the TBM.

5. Typical detail for required swale to convey runoff around the side yards.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 3, 1990

Kerry Davis
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN PHASE II
(E-22/D7C) REVISION DATED MARCH 19, 1991

Dear Mr. Davis:

Based on the information provided on your resubmittal of March 20, 1991, the referenced site is approved for grading of the specified lots. 53&54 65&66

Please be advised that prior to financial guarantee release, we will required the as-built grades for the lots involved, in which retaining walls have been deleted (grades which guarantee that the retaining walls are not necessary).

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

xc: Alan Martinez
Larry Caudill, Env. Health Dept.

BJM/bsj
(WP+134)

E22/D76

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 5, 1990

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Ms. Lynn Johnson
Centex Real Estate Corporation
10701 Montgomery N.E.
Suite G
Albuquerque, NM 87111

RE: PROJECT NO. 3749.81, ANTELOPE RUN, PHASE II, (MAP NO. E-22)

Dear Ms. Johnson:

This is to certify that the City of Albuquerque accepts Project No. 3749.81 as being completed according to approved plans and construction specifications. The City of Albuquerque will accept for continuous maintenance all public infrastructure improvements constructed as part of Project No. 3749.81.

The project is described as follows:

- Public water line, sanitary sewer, storm drain channel, curb/gutter and asphalt pavement improvements in the following public street rights-of-way: Elkhorn Dr., Puma Pl. and Oryx Pl.

- The contractor's correction period begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Brian L. Speicher, P.E.
Chief Construction Engineer
Design/Construction Division
Engineering Group
Public Works Department

BLS:kt

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 17, 1990

Kerry Davis
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISION TO DRAINAGE PLAN FOR ANTELOPE RUN PHASE II
(E-22/D7C) REVISION DATED 5/90 RECEIVED MAY 9, 1990

Dear Mr. Davis:

Based on the information provided on your resubmittal of May 9, 1990, revisions as indicated are acceptable.

Please be advised that prior to financial guarantee release and the retaining walls shown on the drainage plan must be certified by a registered engineer.

Also, the new outlet location into Lowell Street will need to be covered by; an easement.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Fred J. Aguirre, P.E.
Hydrologist

BJM:FJA/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 24, 1990

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Mr. Johnny Shankle
Centex Homes
10701 Montgomery N.E.
Albuquerque, NM 87111

RE: PROJECT NO. 3749, ANTELOPE RUN, (MAP NO. E-22)

Dear Mr. Shankle:

This is to certify that the City of Albuquerque accepts Project No. 3749 as being completed according to approved plans and construction specifications. The City of Albuquerque will accept for continuous maintenance all public infrastructure improvements constructed as part of Project No. 3749.

The project is described as follows:

- Constructed paving, water, sewer and storm drain improvements to service Lots 1 through 44 in Antelope Run Subdivision located at the northeast corner of Lowell St. and Academy Rd. N.E.

- The contractor's correction period begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Brian L. Speicher, P.E.
Chief Construction Engineer
Design/Construction Division
Engineering Group
Public Works Department

BLS:kt

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

March 5, 1990

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION
(E-22/D7C) RECEIVED MARCH 1, 1990

Dear Mr. Davis:

Based on the information provided on your resubmittal of March 1, 1990, listed are some items of concern that must be addressed prior to final approval.

1. You will need to restamp your resubmittal and include a revision date.

2. It is unclear as to how you propose to direct the runoff from the proposed 2' wide concrete rundown channel towards the proposed 2 - 24" sidewalk culverts on Elkhorn Drive. Please include the hydraulics for the proposed rear yard drainage rundown. Also, include the hydraulics for the proposed 2 - 24" sidewalk culverts.

3. I will need a copy of the proposed final plat to use as a guide to determine if there is any encroachment by the proposed 2' concrete swale.

4. In your presentation as to how you will indicate how you will get the runoff to the proposed culverts, please show details.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+134)

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

January 22, 1990

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: AMENDMENT TO THE GRADING/DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION (E-22/D7C) (WORK ORDER NO. 3749) RECEIVED JANUARY 17, 1990

Dear Mr. Davis:

The referenced amendment, dated January 16, 1990 is approved.

Should you have any questions, feel free to call me at 768-2650.

Cordially,

Carlos A. Montoya, P.E.
C.E./Design Review

CAM/bsj
(WP+134)

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

CLARENCE V. LITHGOW
CHIEF
ADMINISTRATIVE OFFICER

DAN WEAKS
DEPUTY CAO
PUBLIC SERVICES

FRED E. MONDRAGON
DEPUTY CAO
DEVELOPMENT & ENTERPRISE SERVICES

April 18, 1989

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: DRAINAGE PLAN FOR ANTELOPE RUN SUBDIVISION
(E-22/D7C) RECEIVED MARCH 2, 1989

Dear Mr. Davis:

I have reviewed the referenced plan dated February 7, 1989, and find that the following concerns need to be addressed prior to Work Order approval.

1. The private rundown ends at Lot 23. Where will this backyard water be conveyed to? Lots 15 - 25 will be conveyed through the backyard channel. Please address the effects on Lot 25.

2. Lots 43 - 51 have a rear yard rundown. Please address the effects on Lot 51.

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

Cordially,

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

CAM/bsj
(WP+134)

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

CLARENCE V. LITHGOW
CHIEF
ADMINISTRATIVE OFFICER

DAN WEAKS
DEPUTY CAO
PUBLIC SERVICES

FRED E. MONDRAGON
DEPUTY CAO
DEVELOPMENT & ENTERPRISE SERVICES

February 23, 1989

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: DRAINAGE PLAN FOR ANTELOPE RUN
(E-22/D7C) RECEIVED JANUARY 17, 1989

Dear Mr. Davis:

I have reviewed the referenced plan dated January 13, 1989 and forward the following comments:

1. Please address the capacity of the east west streets. The capacity calculations need to include the eastern developed off-site flows.

2. Please address the hydraulics of the street intersection in front of Lots 46 and 47.

3. Please address how the rear yards will be graded. An example would be between Lots 20 and 33.

4. I believe that the rear yard private drainage easement rundowns need to have more outlets to the street. The bottom house could be damaged if too many rear lots drain through this property.

5. Correct spot elevation on Lot 84.

6. The symbol between Lots 54 and 66 is different than between Lots 60 and 61. Both are retaining wall symbols. Please address the difference between them.

7. Please show the sidewalk culverts.

8. The concrete rundown has to be to city standards.

9. Please submit the easement and maintenance agreement for flows north to the golf course pond.

10. Please indicate rundown between Lots 1 and 2.

11. Quantify the off-site flows from the north to the site.

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

Cordially,

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

CAM/bsj
(WP+134)

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

May 28, 1987

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: DRAINAGE REPORT SUBMITTAL OF LA COSTA MEMO RECEIVED MAY 14, 1987 FOR SITE DEVELOPMENT PLAN APPROVAL (E-22/D7C)

Dear Kerry:

The above referenced project, plans dated April 15, 1987, is approved for Site Development Plan sign-off by the City Engineer.

Prior to any plat approval or Hydrology sign-off on Work Order construction drawings, a detailed final Drainage Plan will need to be submitted for review and approval.

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

Cordially,

Roger A. Green, PE

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

cc: Lynn Johnson, Centex Homes

RAG/bsj

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

April 29, 1987

Kerry Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

RE: DRAINAGE REPORT, GRADING & DRAINAGE PLAN OF LA COSTA DEVELOPMENT RECEIVED APRIL 15, 1987 FOR SITE DEVELOPMENT PLAN APPROVAL (E-22/D7C)

Dear Kerry:

I have reviewed the above referenced submittal dated April 15, 1987 and have the following comments to be addressed prior to approval:

1. Sheet 1 of 3 - Under flow computations, you reference use of DPM Plate 22.2 C-1 to determine a "C" value for use in the Rational Formula. This plate was removed from the DPM over one year ago. Values should be determined as a composite "C" value based on the cover types.

2. If the Drainage Report for SAD-205 allows a certain discharge to Academy for the watershed east of Lowell and north of Academy, show the allowed discharge for your development based on a certain cfs per acre so that the entire watershed has the same allowed discharge rate.

3. Provide offsite watershed maps for the areas contributing to your project site.

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
Lynn Johnson, Centex Homes

RAG/bsj

DRAINAGE REPORT
FOR
PHASE III
ANTELOPE RUN
SUBDIVISION

APRIL, 1991

I certify that I am a registered professional engineer in the State of New Mexico and that this report was prepared by me or under my supervision.

Kerry L. Davis, P.E.

4/22/91
Date

KERRY L. DAVIS
NEW MEXICO
9984
REGISTERED PROFESSIONAL ENGINEER

DRAINAGE MANAGEMENT PLAN

PURPOSE

The purpose of this report is to present the drainage management plan for preliminary plat approval for Phase 3 of the Antelope Run Subdivision. The Antelope Run Subdivision was developed in 1989, and a Master Drainage Plan for the project, prepared by Bohannan-Huston, Inc., was approved at that time.

SITE LOCATION AND EXISTING CONDITIONS

The property is located within the Academy/Tramway/Eubank Sector Development Plan Area north of Academy Boulevard between Antelope Run Road and Tennyson Street (refer to the Location Map on Plate 1 in Appendix 1.)

The property falls within the Bear Tributary Arroyo Watershed, within which a 96" diameter diversion storm sewer was constructed by SAD-205, in 1985, to convey runoff from lands east of Tramway Boulevard north into the Tramway Dam Basin on the Pino Arroyo. Another storm sewer diversion was constructed in 1986 with City Project 2492 within Lowell Street, which conveys runoff from Phase 1 of the Antelope Run Subdivision, north into an irrigation pond within the Tanoan Golf Course, which overflows into the Pino Arroyo. These two diversions reduce that portion of the Bear Tributary Watershed lying north of Academy to several small basins which discharge storm runoff into Academy Road, where it is conveyed west to Carruthers Street. A storm sewer was constructed within Carruthers Street to convey this runoff south to the Bear Tributary Storm Sewer constructed within SAD-205.

The parcel consists of slopes from east to west ranging from 1% to 6%. The site vegetation consists of native grasses and weeds, and was partially disturbed during the construction of the first phases of the Antelope Run Projects. Academy Road and Antelope Run Road are in place and complete, and border the site on the south and west. The future extension of Tennyson Street was identified on the most recent version of the sector development plan, and curb returns for its future extension along the east boundary of the site were provided under city project 2356.

HYDROLOGIC ANALYSIS

The new rational method hydrologic procedures identified within the proposed revision to Chapter 22, Section 22.2 of the Development Process Manual (DPM Update), as well as the HYMO computerized hydrologic model presented within that document (version 9/90), have been utilized to determine peak flow rates for comparison with the original approved drainage report for the subdivision and for design of the Lowell Street storm sewer. The HYMO input from the original master drainge report has been utilized and modified to produce hydrograph data for the basins within this watershed at two major analysis points: 1) the total

street flow collected in Academy Road at Lowell Street, which will be conveyed to the Carruthers Lateral of the Bear Trib Storm Sewer, and 2) the inlet structures for the Lowell Street Storm Sewer at the intersection of Caribou Avenue and Elkhorn Drive within Phase 1 of the Antelope Run Subdivision.

The peak flow rate computed by the new rational method identified within the referenced DPM update for all onsite basins is 46.1 CFS, compared to the previously approved drainage report, which identified a peak flow rate of 42 CFS for what were then offsite basins O-2 and O-3. The HYMO computer model produced a peak flow rate of 45.2 CFS for these basins, now identified as basins A-1, A-2, B-1, B-2, and C. Please refer to Table 1 in Appendix 1 for a summary of hydrologic data and computations. The Hymo computer output is included as Appendix 2, excerpts from the approved drainage report are included in Appendix 3, and copies of the construction plans for the existing storm sewer are included in Appendix 4.

The total collected flow in Academy Road at Lowell Street, as identified as analysis point 115 in the HYMO output is 117.1 CFS, compared to 87 CFS in the original report. Plate 2 from that report is included in Appendix 3 for reference. This can be explained due to the loss of the beneficial effects of routing afforded by the previous versions of the HYMO model.

The total design flow identified within the Lowell Street Storm Sewer as shown on the construction plans for that facility is 142 CFS. The previous master drainage study identified a peak discharge from this development to the storm sewer inlet structures of 89 CFS. The HYMO output identifies a total discharge of 68.7 CFS from this project, including offsite flows conveyed to the outlet from basin O-7, which is that portion of the Tanoan Golf Course that discharges into Caribou Avenue through a concrete rundown constructed within Phase 1 of the Antelope Run Subdivision. An error in the original drainage report was identified during analysis of this basin, which caused the basin area to be reduced from 26.8 acres to 5.6 acres. This reduced the discharge from this basin from 35.5 CFS in the original report to 14.6 CFS, which represents the difference between the 89 CFS total discharge and the 68 CFS identified herein.

DRAINAGE MANAGEMENT PLAN

Under developed conditions, the site will be graded to deliver runoff from developed lots into the street sections, which include Ibex Avenue and Caribou Avenue. Manning's analyses of the proposed street sections are provided in the Appendix 1. All of the street sections, existing and proposed, can contain the 100 year flood flows within the right of way sections. Onsite developed runoff generated within Basins A-1 and A-2 identified on the Grading and Drainage Plan, Plate 1 in the Appendix 1, will be conveyed by these streets to the northwest corner of the Phase 1 portion of the development, where these flows will be intercepted by the Lowell Street Storm Sewer.

No offsite flows enter the site from upland basins. Tennyson Street diverts flow from upland basin O-1 as well as conveying flow from onsite Basins B-1 and B-2 south to Academy Road.

CONCLUSIONS

The proposed subdivision of the Antelope Run Phase 3 Project will consist of 52 single family detached residential lots within the R-D zone. Existing streets west of the site will be extended into the project to provide access and utility service to the project, as well as convey runoff to an existing storm sewer that diverts this runoff to the Pino Arroyo. The site was included in an existing, approved drainage management plan which also provided the design computations and justification for that existing storm sewer diversion.

The developed runoff generated by the project is within 10% of the runoff identified within the previously approved drainage master plan for the first two phases of the Antelope Run Subdivision. The design of the Lowell Street Storm Sewer provided for a peak flow rate well in excess of the actual developed runoff reaching that system. Peak flows on Academy Road in excess of the previous drainage report figures are due to changes in hydrologic analysis procedures recently adopted, which remove the beneficial effect of routing of hydrographs due to the expanded shape of the new hydrographs produced by these methods. Developed runoff from this project discharged to Academy Road is less than that allowed under previous drainage submittals.

Infrastructure list for preliminary plat approval

DRAINAGE BASIN ANALYSIS

BASIN	DESCRIPTION
ONSITE:	
A-1	Flows Collected On Caribou Avenue Coveyed To Lowell St. SD
A-2	Flows Collected On Ibex Avenue Conveyed To Lowell St. SD
B-1	Flows Discharged Onto Tennyson St From Antelope Run Phase 3
B-2	Onsite Portion Of The Tennyson Street Right Of Way
C	Backyards Of Lots Along North Side Of Academy Road
OFFSITE:	
O-1	Tract M-1, North Of Academy Between Lowell St And Tramway
O-7	Portion Of Tanoan Golf Course Discharging Into Caribou Ave
O-A	Oryx Place (Phase 2) Discharging To Academy Road
O-B	Puma Place (Phase 2) Discharging To Academy Road
O-C&D	Elkhorn Drive (Phase 2) Discharging To Lowell St at Academy
E-1	Portion of Phase 1 collected in Caribou Ave
E-2	Portion of Phase 1 collected in Ibex Ave
S-1	Academy Road Right of Way (North Half)
S-2	Lowell St Right of Way, north of Academy

ON-SITE HYDROLOGIC DATA

BASIN I.D.	AREA (AC.)	AREA (SQ.MI.)	% LAND TREATMENT A	B	C	D	DISCHARGE (CFS/AC)	Q(R) (CFS)	Q(H) (CFS)
A-1	4.1	0.00635	0	30	10	60	4.26	17.5	17.1
A-2	4.7	0.00727	0	30	10	60	4.26	20.0	19.6
B-1	0.5	0.00083	0	60	10	30	3.47	1.7	---
B-2	0.6	0.00094	0	0	5	95	5.14	3.1	4.7
C	1.2	0.00186	0	75	5	20	3.16	3.8	3.8
TOTAL	11.1							46.1	45.2

OFF-SITE HYDROLOGIC DATA

BASIN I.D.	AREA (AC.)	AREA (SQ.MI.)	% LAND TREATMENT A	B	C	D	DISCHARGE (CFS/AC)	Q(R) (CFS)	Q(H) (CFS)
O-1	11.5	0.01800	0	15	0	85	4.83	55.9	54.7
O-7	5.6	0.00888	0	100	0	0	2.59	14.5	14.6
O-A	2.5	0.00391	0	30	10	60	4.26	10.6	10.5
O-B	1.7	0.00261	0	30	10	60	4.26	7.2	7.0
O-C	1.7	0.00261	0	30	10	60	4.26	7.2	---
O-D	0.5	0.00084	0	30	10	60	4.26	2.1	9.3
E-1	4.7	0.00730	0	30	10	60	4.26	20.0	19.5
E-2	2.4	0.00380	0	30	10	60	4.26	10.2	10.2
S-1	6.0	0.00933	0	5	0	95	5.10	30.6	29.9
S-2	1.4	0.00219	0	5	0	95	5.10	7.1	7.0
TOTAL	59.2							165.4	162.7 1

Notes:

1. QR: rational method runoff computed from DPM Update.
   QH: runoff from HYMO output (version 9/90).
   QA: runoff from approved drainage report (BHI 1989).
2. Tp for all basins was 0.1333 hours, the minimum allowed.

RESIDENTIAL STREET AT 4% SLOPE

MANNING'S N = .0170 SLOPE = .0400

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	4	25.00	0.33	7	50.00	0.87
2	9.00	0.67	5	40.90	0.00			
3	9.10	0.00	6	41.00	0.67			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.1	0.1	0.5	1.1	9.8	2.3	9.7
0.2	0.2	1.9	7.2	19.7	3.7	19.3
0.3	0.3	4.3	21.2	29.5	4.9	29.0
0.4	0.4	7.5	49.2	32.6	6.6	31.9
0.5	0.5	10.7	88.5	32.8	8.3	31.9
0.6	0.6	13.9	136.3	33.0	9.8	32.0
0.7	0.7	17.1	182.9	35.9	10.7	34.7
0.8	0.8	21.0	222.1	44.9	10.6	43.7
0.9	0.9	24.3	259.1	51.2	10.6	50.0

RESIDENTIAL STREET AT 2% SLOPE

MANNING'S N = .0170 SLOPE = .0200

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	4	25.00	0.33	7	50.00	0.87
2	9.00	0.67	5	40.90	0.00			
3	9.10	0.00	6	41.00	0.67			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.1	0.1	0.5	0.8	9.8	1.7	9.7
0.2	0.2	1.9	5.1	19.7	2.6	19.3
0.3	0.3	4.3	15.0	29.5	3.4	29.0
0.4	0.4	7.5	34.8	32.6	4.6	31.9
0.5	0.5	10.7	62.6	32.8	5.9	31.9
0.6	0.6	13.9	96.4	33.0	6.9	32.0
0.7	0.7	17.1	129.4	35.9	7.6	34.7
0.8	0.8	21.0	157.1	44.9	7.5	43.7
0.9	0.9	24.3	183.2	51.2	7.5	50.0

ACADEMY ROAD AT 4.42%

MANNING'S N = .0170 SLOPE = .0442

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	35.10	1.00	9	96.00	0.67
2	10.00	0.67	6	70.90	1.00	10	106.00	0.87
3	10.10	0.00	7	71.00	0.50			
4	35.00	0.50	8	95.90	0.00			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.1	0.1	0.5	1.2	10.2	2.5	10.0
0.2	0.2	2.0	7.8	20.3	3.9	20.0
0.3	0.3	4.5	23.1	30.5	5.1	30.0
0.4	0.4	8.0	49.7	40.7	6.2	40.0
0.5	0.5	12.5	90.0	50.8	7.2	49.9
0.6	0.6	17.5	156.9	51.2	9.0	50.0
0.7	0.7	22.5	229.7	54.6	10.2	53.1
0.8	0.8	28.3	300.2	64.8	10.6	63.1
0.9	0.9	33.0	361.0	71.9	10.9	70.1

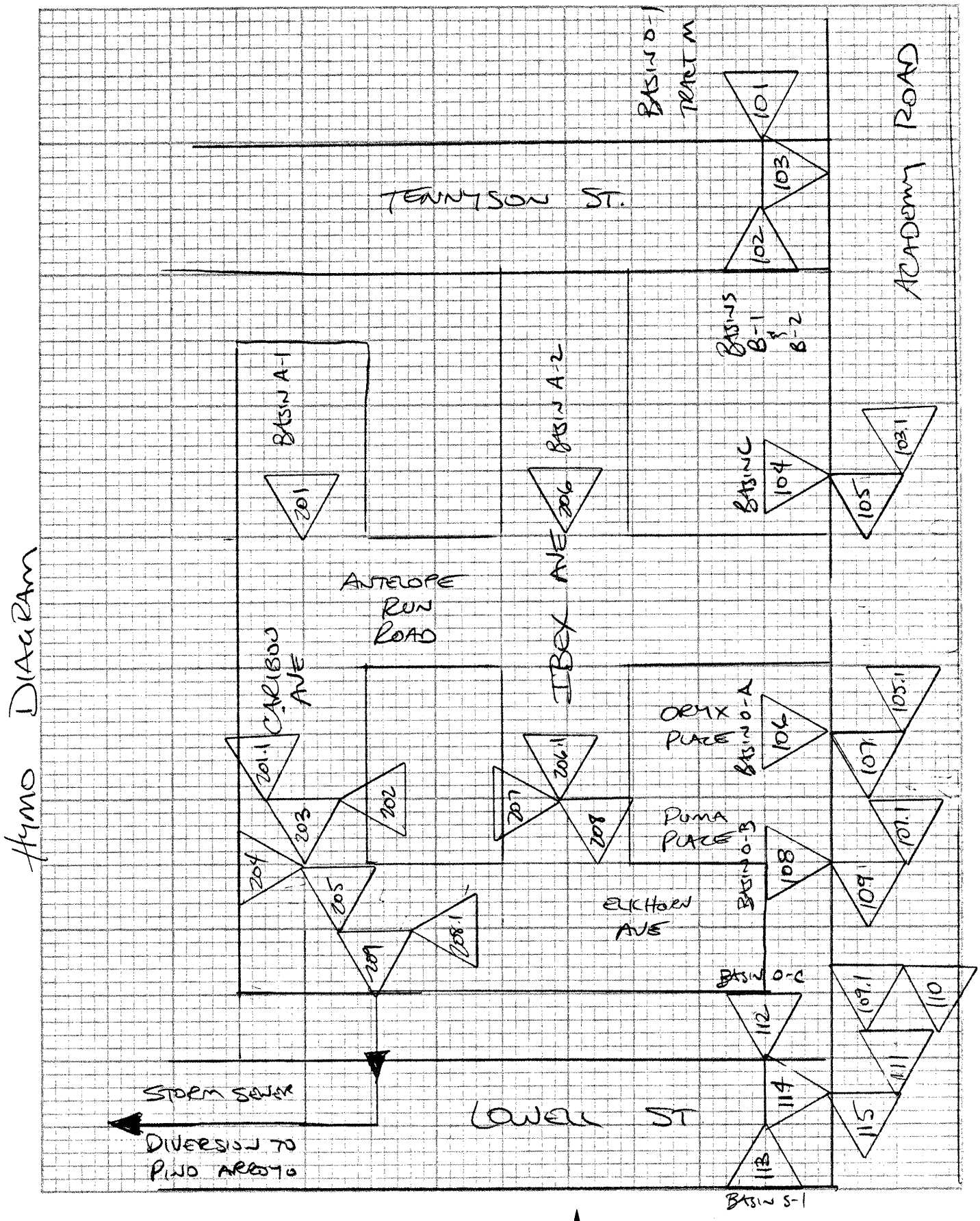
HYMO SUMMARY TABLE

DESCRIPTION	HYDROGRAPH LABEL	FROM ID NO	TO ID NO	AREA SQ MI	DISCHARGE CFS	CURVE NO	TIME TO PEAK HR	CFS PER ACRE
HYDROGRAPH AT	101:O-1	1	-	0.0180	54.7	NA	0.50	4.75
HYDROGRAPH AT	102:B1B2	2	-	0.0017	4.7	NA	0.50	4.32
COMBINED FLOW AT	103:TENN	1& 2	3	0.0197	59.4		0.50	
ROUTED		3	1					
	103:TENN	3		0.0197	59.4		0.50	
	103.1	1		0.0197	57.0		0.53	
HYDROGRAPH AT	104:C	2	-	0.0019	3.8	NA	0.50	3.13
COMBINED FLOW AT	105:ARRD	1& 2	3	0.0216	60.7		0.53	
ROUTED		3	2					
	105:ARRD	3		0.0216	60.7		0.53	
	105.1	2		0.0216	59.7		0.53	
HYDROGRAPH AT	106:O-A	1	-	0.0039	10.5	NA	0.50	4.20
COMBINED FLOW AT	107	1& 2	3	0.0255	69.5		0.53	
ROUTED		3	2					
	107	3		0.0255	69.5		0.53	
	107.1	2		0.0255	69.5		0.53	
HYDROGRAPH AT	108:O-B	1	-	0.0026	7.0	NA	0.50	4.20
COMBINED FLOW AT	109	1& 2	3	0.0281	76.0		0.53	
ROUTED		3	2					
	109	3		0.0281	76.0		0.53	
	109.1	2		0.0281	75.1		0.57	
HYDROGRAPH AT	110:S-1	1	-	0.0093	29.9	NA	0.50	5.01
COMBINED FLOW AT	111	1& 2	3	0.0375	102.1		0.53	
HYDROGRAPH AT	112:O-CD	5	-	0.0035	9.3	NA	0.50	4.20
HYDROGRAPH AT	113:S-2	6	-	0.0022	7.0	NA	0.50	5.02
COMBINED FLOW AT	114	5& 6	1	0.0056	16.3		0.50	
COMBINED FLOW AT	115	1& 3	2	0.0431	117.1		0.53	
HYDROGRAPH AT	201:A1	1	-	0.0064	17.1	NA	0.50	4.20
ROUTED		1	2					
	201:A1	1		0.0064	17.1		0.50	
	201.1	2		0.0064	13.3		0.56	
HYDROGRAPH AT	202:E1	1	-	0.0073	19.5	NA	0.50	4.20
COMBINED FLOW AT	203	1& 2	3	0.0136	31.0		0.52	
HYDROGRAPH AT	204:07	2	-	0.0089	14.6	NA	0.50	2.56
COMBINED FLOW AT	205	2& 3	1	0.0225	45.3		0.52	
HYDROGRAPH AT	206:A2	5	-	0.0073	19.6	NA	0.50	4.20
ROUTED		5	6					
	206:A2	5		0.0073	19.6		0.50	
	206.1	6		0.0073	15.6		0.56	
HYDROGRAPH AT	207:E2	5	-	0.0038	10.2	NA	0.50	4.20
COMBINED FLOW AT	208	5& 6	7	0.0111	24.7		0.54	
ROUTED		7	8					
	208	7		0.0111	24.7		0.54	
	208.1	8		0.0111	24.1		0.56	
COMBINED FLOW AT	209	1& 8	2	0.0336	68.7		0.54	

HYMO SUMMARY TABLE

DESCRIPTION	HYDROGRAPH LABEL	FROM ID NO	TO ID NO	AREA SQ MI	DISCHARGE CFS	CURVE NO	TIME TO PEAK HR	CFS PER ACRE
HYDROGRAPH AT	101:O-1	1	-	0.0180	54.7	NA	0.50	4.75
HYDROGRAPH AT	102:B1B2	2	-	0.0017	4.7	NA	0.50	4.32
HYDROGRAPH AT	104:C	2	-	0.0019	3.8	NA	0.50	3.13
HYDROGRAPH AT	106:O-A	1	-	0.0039	10.5	NA	0.50	4.20
HYDROGRAPH AT	108:O-B	1	-	0.0026	7.0	NA	0.50	4.20
HYDROGRAPH AT	110:S-1	1	-	0.0093	29.9	NA	0.50	5.01
HYDROGRAPH AT	112:O-CD	5	-	0.0035	9.3	NA	0.50	4.20
HYDROGRAPH AT	113:S-2	6	-	0.0022	7.0	NA	0.50	5.02
HYDROGRAPH AT	201:A1	1	-	0.0064	17.1	NA	0.50	4.20
HYDROGRAPH AT	202:E1	1	-	0.0073	19.5	NA	0.50	4.20
HYDROGRAPH AT	204:07	2	-	0.0089	14.6	NA	0.50	2.56
HYDROGRAPH AT	206:A2	5	-	0.0073	19.6	NA	0.50	4.20
HYDROGRAPH AT	207:E2	5	-	0.0038	10.2	NA	0.50	4.20

HYDRO DIAGRAM



BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE RUN PH.3 SHEET _____ OF _____

PROJECT NO. 91149.02 BY _____ DATE _____

SUBJECT HYDROLOGY CH'D _____ DATE _____

```
**********************************************************
* DEVELOPED CONDITIONS FOR ANTELOPE RUN PHASE 3          *
* This program utilized the original input from the Hymo *
* run performed for the original drainage report for the *
* Antelope Run Subdivision, modified for the development *
* of previous offsite basins O-2 and O-3 as Antelope Run *
* Subdivision, Phase 3.                                  *
**********************************************************
*
************* DRAINAGE TO ACADEMY BLVD. *****************
*
SUMMARY             3
START               0.0 HOURS
* ONE HUNDRED YEAR SIX HOUR STORM: ZONE 4, ISOPLUVIAL 2.9"
RAINFALL            TYPE=1  0.0  2.23  2.90  3.65 DT=0.05

               COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATL
               DT =   0.050000 HOURS        END TIME =     6.000000 HOU
                 0.0000   0.0026   0.0151   0.0499   0.1210   0.2433   0.432
                 0.7048   1.0771   1.3708   1.5035   1.6143   1.7113   1.798
                 1.8767   1.9484   2.0142   2.0747   2.1306   2.1822   2.230
                 2.2445   2.2586   2.2723   2.2856   2.2985   2.3111   2.323
                 2.3353   2.3470   2.3583   2.3694   2.3803   2.3909   2.401
                 2.4115   2.4214   2.4311   2.4407   2.4500   2.4592   2.468
                 2.4771   2.4857   2.4943   2.5026   2.5108   2.5189   2.526
                 2.5347   2.5424   2.5499   2.5574   2.5647   2.5719   2.579
                 2.5861   2.5930   2.5998   2.6065   2.6131   2.6196   2.626
                 2.6324   2.6387   2.6449   2.6510   2.6570   2.6630   2.668
                 2.6746   2.6804   2.6861   2.6917   2.6972   2.7027   2.708
                 2.7134   2.7187   2.7239   2.7291   2.7342   2.7393   2.744
                 2.7493   2.7542   2.7590   2.7638   2.7686   2.7733   2.778
                 2.7826   2.7872   2.7917   2.7962   2.8006   2.8050   2.809
                 2.8137   2.8180   2.8223   2.8265   2.8306   2.8348   2.838
                 2.8429   2.8470   2.8510   2.8549   2.8589   2.8628   2.866
                 2.8705   2.8743   2.8780   2.8818   2.8855   2.8892   2.892
                 2.8965   2.9001

* COMPUTE HYD FOR OLD OFFSITE BASIN O1
* TRACT M-1 (NORTHWEST CORNER OF TRAMWAY AND ACADEMY)
COMPUTE NM HYD       ID=1  HYD=101:O-1>P  DA=0.0180
                     %A=0.0  %B=15.0  %C=0.0  %D=85.0  TP=0.133333
                     MASS RAINFALL=-1

 Basin      TP      K      K/TP     N     Unit      B      Area    IA     IF
 Type                                     Peak
            hr      hr                    cfs            sq mi    in     in

mpervious  0.133  0.071  0.534   7.29    61.4  534.98   0.015  0.1   0.04
Pervious   0.133  0.130  0.975   3.62     6.7  329.14   0.003  0.5   1.25
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

* HYD FOR BASIN O1
PRINT HYD            ID=1  code=0

                     HYDROGRAPH NUMBER    101:O-1

      RUNOFF VOLUME =       2.277 ACRE-FT
      PEAK DISCHARGE RATE =       54.7 CFS
      PEAK OCCURRED AT  0.50 HRS.
```

```
*
* THE FOLLOWING DATA IS THE ORIGINAL INPUT
*COMPUTE HYD          ID=1        HYD=100
*                     DT=.03333   AREA=.0180   CN=86
*                     K=-.0495    TP=-.0825
*                     RAINFALL= 0.0 .33 .79 1.21 1.53 1.78 1.94 2.02 2.
*                     2.13 2.16 2.19 2.22 2.25 2.28 2.30
*
*PRINT HYD            ID=1        CODE=0
*
* COMPUTE HYD FOR BASINS B-1 AND B-2
* ONSITE BASINS FOR TENNYSON STREET AND PORTION OF SITE DRAINING TO TE
COMPUTE NM HYD        ID=2  HYD=102:B1B2>P  DA=0.0017
                      %A=0.0  %B=27.3  %C=7.3  %D=65.4  TP=0.133333
                      MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	4.5	534.98	0.001	0.1	0.04
Pervious	0.133	0.125	0.939	3.77	1.5	339.38	0.001	0.5	1.16

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
*HYD FOR BASIN B1 AND B2 (DISCHARGED INTO ACADEMY AT TENNYSON)
PRINT HYD             ID=2  CODE=0
```

HYDROGRAPH NUMBER 102:B1B2

RUNOFF VOLUME = 0.187 ACRE-FT
PEAK DISCHARGE RATE = 4.7 CFS
PEAK OCCURRED AT 0.50 HRS.

```
* ADD TO BASIN O-1 AT THE TENNYSON ST AND ACADEMY ROAD INTERSECTION
ADD HYD               ID=3        HYD=103:TENN
                      ID=1        ID=2
PRINT HYD             ID=3  CODE=0
```

HYDROGRAPH NUMBER 103:TENN

RUNOFF VOLUME = 2.463 ACRE-FT
PEAK DISCHARGE RATE = 59.4 CFS
PEAK OCCURRED AT 0.50 HRS.

```
* ROUTE FLOW THROUGH ACADEMY BLVD.
COMPUTE RATING CURVE RC=1       VS NO=1   NO SEGS=1
                      ELMIN=0.  ELMAX=1.4
                      CH SLP=.033          FP SLP=.033
                      N=.017    DIST=100.
                      DIST      ELEV       DIST      ELEV      DIST
                      0.        .667       9.        .667      9.01
                      34.99     .7         35.       1.367     65.
                      65.01     .7         90.99     0.        91.
                      100.      .667
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.07	0.2	0.3	1.7
0.15	0.8	2.2	2.7
0.22	1.8	6.5	3.6
0.29	3.2	14.0	4.4
0.37	5.0	25.5	5.1
0.44	7.3	41.4	5.7
0.52	9.9	62.4	6.3
0.59	12.9	89.1	6.9
0.66	16.3	122.0	7.5
0.74	21.4	151.8	7.1
0.81	26.5	217.4	8.2
0.88	31.7	291.9	9.2
0.96	36.8	374.8	10.2
1.03	42.0	465.6	11.1
1.11	47.2	564.0	12.0
1.18	52.3	669.6	12.8
1.25	57.5	782.1	13.6
1.33	62.6	901.3	14.4
1.40	68.8	836.1	12.2

COMPUTE TRAVEL TIME ID=1 REACH=1 NO VS=1
L=620. SLP=.033

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.07	0.	0.0997	1.7
0.15	2.	0.0628	2.7
0.22	7.	0.0479	3.6
0.29	14.	0.0396	4.4
0.37	25.	0.0341	5.1
0.44	41.	0.0302	5.7
0.52	62.	0.0272	6.3
0.59	89.	0.0249	6.9
0.66	122.	0.0230	7.5
0.74	152.	0.0242	7.1
0.81	217.	0.0210	8.2
0.88	292.	0.0187	9.2
0.96	375.	0.0169	10.2
1.03	466.	0.0155	11.1
1.11	564.	0.0144	12.0
1.18	670.	0.0135	12.8
1.25	782.	0.0127	13.6
1.33	901.	0.0120	14.4
1.29	836.	0.0123	14.0

ROUTE ID=1 HYD=103.1
INFLOW ID=3 DT=.03333
* HYD FOR ROUTED FLOW FROM BASIN O1 ***
PRINT HYD ID=1 CODE=5

HYDROGRAPH NUMBER 103.1

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.	2.166	2.	4.333	1.

0.167	0.	2.333	1.	4.500	1.
0.333	9.	2.500	1.	4.666	1.
0.500	56.	2.666	1.	4.833	1.
0.667	33.	2.833	1.	4.999	1.
0.833	21.	3.000	1.	5.166	1.
1.000	15.	3.166	1.	5.333	1.
1.167	8.	3.333	1.	5.499	1.
1.333	4.	3.500	1.	5.666	1.
1.500	3.	3.666	1.	5.833	1.
1.666	3.	3.833	1.	5.999	1.
1.833	2.	4.000	1.	6.166	1.
2.000	2.	4.166	1.		

RUNOFF VOLUME = 2.458 ACRE-FT
PEAK DISCHARGE RATE = 57.0 CFS
PEAK OCCURRED AT 0.53 HRS.

```
*
* COMPUTE HYD FOR BASIN C IN ANTELOPE RUN PHASE 3, DISCHARGED TO ACADE
COMPUTE NM HYD       ID=2  HYD=104:C>P  DA=0.0019
                     %A=0.0  %B=75.0  %C=5.0  %D=20.0  TP=0.133333
                     MASS RAINFALL=-1
```

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.071	0.534	7.29	1.5	534.98	0.000	0.1	0.04
Pervious	0.133	0.129	0.964	3.66	3.8	332.10	0.002	0.5	1.22

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
* HYD FOR BASIN C
PRINT HYD            ID=2  CODE=0
```

HYDROGRAPH NUMBER 104:C

RUNOFF VOLUME = 0.128 ACRE-FT
PEAK DISCHARGE RATE = 3.8 CFS
PEAK OCCURRED AT 0.50 HRS.

```
*ADD TO ROUTED FLOW IN ACADEMY ROAD TO OBTAIN TOTAL FLOW ACROSS ANTELO
* RUN ROAD INTERSECTION
ADD HYD              ID=3       HYD=105:ARRD
                     ID=1       ID=2
*HYDROGRAPH FOR ACADEMY ROAD FLOW AT ANTELOPE RUN ROAD
PRINT HYD            ID=3       CODE=5
```

HYDROGRAPH NUMBER 105:ARRD

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.	2.166	2.	4.333	1.
0.167	0.	2.333	1.	4.500	1.
0.333	10.	2.500	1.	4.666	1.
0.500	60.	2.666	1.	4.833	1.
0.667	36.	2.833	1.	4.999	1.
0.833	22.	3.000	1.	5.166	1.
1.000	15.	3.166	1.	5.333	1.

1.167	9.	3.333	1.	5.499	1.
1.333	5.	3.500	1.	5.666	1.
1.500	3.	3.666	1.	5.833	1.
1.666	3.	3.833	1.	5.999	1.
1.833	2.	4.000	1.	6.166	1.
2.000	2.	4.166	1.	6.333	0.

RUNOFF VOLUME = 2.586 ACRE-FT
PEAK DISCHARGE RATE = 60.7 CFS
PEAK OCCURRED AT 0.53 HRS.

*ROUTE FLOW THROUGH ACADEMY BLVD.
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1
ELMIN=0. ELMAX=1.4
CH SLP=.033 FP SLP=.033
N=.017 DIST=100.

DIST	ELEV	DIST	ELEV	DIST
0.	.667	9.	.667	9.01
34.99	.7	35.	1.367	65.
65.01	.7	90.99	0.	91.
100.	.667			

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.07	0.2	0.3	1.7
0.15	0.8	2.2	2.7
0.22	1.8	6.5	3.6
0.29	3.2	14.0	4.4
0.37	5.0	25.5	5.1
0.44	7.3	41.4	5.7
0.52	9.9	62.4	6.3
0.59	12.9	89.1	6.9
0.66	16.3	122.0	7.5
0.74	21.4	151.8	7.1
0.81	26.5	217.4	8.2
0.88	31.7	291.9	9.2
0.96	36.8	374.8	10.2
1.03	42.0	465.6	11.1
1.11	47.2	564.0	12.0
1.18	52.3	669.6	12.8
1.25	57.5	782.1	13.6
1.33	62.6	901.3	14.4
1.40	68.8	836.1	12.2

COMPUTE TRAVEL TIME ID=2 REACH=1 NO VS=1
L=600. SLP=.033

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.07	0.	0.0965	1.7
0.15	2.	0.0608	2.7
0.22	7.	0.0464	3.6
0.29	14.	0.0383	4.4
0.37	25.	0.0330	5.1

```
                              0.44        41.     0.0292       5.7
                              0.52        62.     0.0264       6.3
                              0.59        89.     0.0241       6.9
                              0.66       122.     0.0223       7.5
                              0.74       152.     0.0235       7.1
                              0.81       217.     0.0203       8.2
                              0.88       292.     0.0181       9.2
                              0.96       375.     0.0164      10.2
                              1.03       466.     0.0150      11.1
                              1.11       564.     0.0139      12.0
                              1.18       670.     0.0130      12.8
                              1.25       782.     0.0122      13.6
                              1.33       901.     0.0116      14.4
                              1.29       836.     0.0119      14.0
    ROUTE                 ID=2        HYD=105.1
                          INFLOW ID=3          DT=.03333
    *
    *COMPUTE HYD FOR BASIN O-A: ORYX AVE WITHIN PHASE 2
    COMPUTE NM HYD        ID=1  HYD=106:O-A>P  DA=.00391
                          %A=0.0  %B=30.0  %C=10.0  %D=60.0  TP=0.133333
                          MASS RAINFALL=-1

 Basin       TP       K      K/TP     N       Unit       B       Area      IA      IF
  Type                                         Peak
              hr       hr                      cfs                sq mi     in      in

mpervious    0.133   0.071   0.534    7.29      9.4   534.98     0.002    0.1     0.04
Pervious     0.133   0.124   0.932    3.80      4.0   341.36     0.002    0.5     1.14
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

    * HYD FOR BASIN O-A
    PRINT HYD             ID=1  CODE=0

                        HYDROGRAPH NUMBER     106:O-A


         RUNOFF VOLUME =       0.412 ACRE-FT
         PEAK DISCHARGE RATE =        10.5 CFS
         PEAK OCCURRED AT  0.50 HRS.


    * ADD TO TOTAL FLOW IN ACADEMY ROAD
    ADD HYD               ID=3        HYD=107
                          ID=1        ID=2
    * ROUTE FLOW THROUGH ACADEMY BLVD.
    COMPUTE RATING CURVE RC=1        VS NO=1    NO SEGS=1
                         ELMIN=0.    ELMAX=1.4
                         CH SLP=.033           FP SLP=.033
                         N=.017      DIST=100.
                         DIST        ELEV       DIST        ELEV       DIST
                         0.          .667       9.          .667       9.01
                         34.99       .7         35.         1.367      65.
                         65.01       .7         90.99       0.         91.
                         100.        .667

                              RATING CURVE VALLEY SECTION  1.0
                             WATER      FLOW       FLOW       FLOW
                            SURFACE     AREA       RATE        VEL
                             ELEV       SQ FT      CFS         FPS
                              0.00        0.0        0.0        0.0
                              0.07        0.2        0.3        1.7
```

0.15	0.8	2.2	2.7
0.22	1.8	6.5	3.6
0.29	3.2	14.0	4.4
0.37	5.0	25.5	5.1
0.44	7.3	41.4	5.7
0.52	9.9	62.4	6.3
0.59	12.9	89.1	6.9
0.66	16.3	122.0	7.5
0.74	21.4	151.8	7.1
0.81	26.5	217.4	8.2
0.88	31.7	291.9	9.2
0.96	36.8	374.8	10.2
1.03	42.0	465.6	11.1
1.11	47.2	564.0	12.0
1.18	52.3	669.6	12.8
1.25	57.5	782.1	13.6
1.33	62.6	901.3	14.4
1.40	68.8	836.1	12.2

COMPUTE TRAVEL TIME ID=2 REACH=1 NO VS=1
L=150. SLP=.033

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.07	0.	0.0241	1.7
0.15	2.	0.0152	2.7
0.22	7.	0.0116	3.6
0.29	14.	0.0096	4.4
0.37	25.	0.0082	5.1
0.44	41.	0.0073	5.7
0.52	62.	0.0066	6.3
0.59	89.	0.0060	6.9
0.66	122.	0.0056	7.5
0.74	152.	0.0059	7.1
0.81	217.	0.0051	8.2
0.88	292.	0.0045	0.0
0.96	375.	0.0041	0.0
1.03	466.	0.0038	0.0
1.11	564.	0.0035	0.0
1.18	670.	0.0033	0.0
1.25	782.	0.0031	0.0
1.33	901.	0.0029	0.0
1.29	836.	0.0030	0.0

ROUTE ID=2 HYD=107.1
INFLOW ID=3 DT=.03333

*
**COMPUTE HYD FOR BASIN O-B AT PUMA PLACE WITHIN PHASE 2
COMPUTE NM HYD ID=1 HYD=108:O-B>P DA=.00261
%A=0.0 %B=30.0 %C=10.0 %D=60.0 TP=0.133333
MASS RAINFALL=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.071	0.534	7.29	6.3	534.98	0.002	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	2.7	341.36	0.001	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
* HYD FOR BASIN O-B
PRINT HYD            ID=1   CODE=0

                  HYDROGRAPH NUMBER     108:O-B


     RUNOFF VOLUME =       0.275 ACRE-FT
     PEAK DISCHARGE RATE =         7.0 CFS
     PEAK OCCURRED AT  0.50 HRS.


* ADD TO TOTAL FLOW IN ACADEMY ROAD
ADD HYD              ID=3        HYD=109
                     ID=1        ID=2
* ROUTE FLOW THROUGH ACADEMY BLVD.
COMPUTE RATING CURVE RC=1       VS NO=1    NO SEGS=1
                     ELMIN=0.0  ELMAX=1.4
                     CH SLP=.033          FP SLP=.033
                     N=.017     DIST=100.
                     DIST       ELEV       DIST       ELEV       DIST
                     0.         .667       9.         .667       9.01
                     34.99      .7         35.        1.367      65.
                     65.01      .7         90.99      0.         91.
                     100.       .667
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.07	0.2	0.3	1.7
0.15	0.8	2.2	2.7
0.22	1.8	6.5	3.6
0.29	3.2	14.0	4.4
0.37	5.0	25.5	5.1
0.44	7.3	41.4	5.7
0.52	9.9	62.4	6.3
0.59	12.9	89.1	6.9
0.66	16.3	122.0	7.5
0.74	21.4	151.8	7.1
0.81	26.5	217.4	8.2
0.88	31.7	291.9	9.2
0.96	36.8	374.8	10.2
1.03	42.0	465.6	11.1
1.11	47.2	564.0	12.0
1.18	52.3	669.6	12.8
1.25	57.5	782.1	13.6
1.33	62.6	901.3	14.4
1.40	68.8	836.1	12.2

```
COMPUTE TRAVEL TIME ID=2        REACH=1    NO VS=1
                    L=400.      SLP=.033
```

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.07	0.	0.0643	1.7
0.15	2.	0.0405	2.7

0.22	7.	0.0309	3.6
0.29	14.	0.0255	4.4
0.37	25.	0.0220	5.1
0.44	41.	0.0195	5.7
0.52	62.	0.0176	6.3
0.59	89.	0.0161	6.9
0.66	122.	0.0149	7.5
0.74	152.	0.0156	7.1
0.81	217.	0.0136	8.2
0.88	292.	0.0121	9.2
0.96	375.	0.0109	10.2
1.03	466.	0.0100	11.1
1.11	564.	0.0093	12.0
1.18	670.	0.0087	12.8
1.25	782.	0.0082	13.6
1.33	901.	0.0077	14.4
1.29	836.	0.0079	14.0

```
ROUTE                ID=2        HYD=109.1
                     INFLOW ID=3           DT=.03333

*
* COMPUTE HYD FOR BASIN S-1: ACADEMY ROAD RIGHT OF WAY
COMPUTE NM HYD       ID=1  HYD=110:S-1>P  DA=.00933
                     %A=0.0  %B=5.0  %C=0.0  %D=95.0  TP=0.133333
                     MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	35.6	534.98	0.009	0.1	0.04
Pervious	0.133	0.130	0.975	3.62	1.2	329.14	0.000	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
* HYD FOR BASIN S-1: ACADEMY ROAD RIGHT OF WAY
PRINT HYD            ID=1  CODE=0
```

HYDROGRAPH NUMBER 110:S-1

RUNOFF VOLUME = 1.266 ACRE-FT
PEAK DISCHARGE RATE = 29.9 CFS
PEAK OCCURRED AT 0.50 HRS.

```
* ADD FOR TOTAL FLOW ON ACADEMY AT LOWELL
ADD HYD              ID=3       HYD=111
                     ID=1       ID=2
*
* COMPUTE HYD FOR BASINS O-C AND O-D: PHASE 2
COMPUTE NM HYD       ID=5  HYD=112:O-CD>P  DA=.00345
                     %A=0.0  %B=30.0  %C=10.0  %D=60.0  TP=0.133333
                     MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	8.3	534.98	0.002	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	3.5	341.36	0.001	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

* HYD FOR BASINS O-C AND O-D
PRINT HYD ID=5 CODE=0

HYDROGRAPH NUMBER 112:O-CD

RUNOFF VOLUME = 0.363 ACRE-FT
PEAK DISCHARGE RATE = 9.3 CFS
PEAK OCCURRED AT 0.50 HRS.

*
* COMPUTE HYD FOR BASIN S-2: LOWELL STREET RIGHT OF WAY
COMPUTE NM HYD ID=6 HYD=113:S-2>P DA=.00219
%A=0.0 %B=5.0 %C=0.0 %D=95.0 TP=0.133333
MASS RAINFALL=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.071	0.534	7.29	8.3	534.98	0.002	0.1	0.04
Pervious	0.133	0.130	0.975	3.62	0.3	329.14	0.000	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

* HYD FOR BASIN S-2: LOWELL STREET RIGHT OF WAY
PRINT HYD ID=6 CODE=0

HYDROGRAPH NUMBER 113:S-2

RUNOFF VOLUME = 0.297 ACRE-FT
PEAK DISCHARGE RATE = 7.0 CFS
PEAK OCCURRED AT 0.50 HRS.

* ADD FOR TOTAL FLOW ON LOWELL STREET AT ACADEMY
ADD HYD ID=1 HYD=114
ID=5 ID=6
* ADD BASINS C, D AND S2 TO FLOW IN ACADEMY BLVD.
ADD HYD ID=2 HYD=115
ID=1 ID=3
**************** FINAL OUTFLOW HYDROGRAPH ON ACADEMY BLVD. ***********
********* ALL BASINS EAST OF LOWELL STREET ON ACADEMY BLVD.***********
***** FOR COMPARISON WITH 87 CFS FROM PREVIOUSLY APPROVED REPORT *****
PRINT HYD ID=2 CODE=0

HYDROGRAPH NUMBER 115

RUNOFF VOLUME = 5.193 ACRE-FT
PEAK DISCHARGE RATE = 117.1 CFS
PEAK OCCURRED AT 0.53 HRS.

******************* DRAINAGE TO LOWELL ST. STORM SEWER ***************
* COMPUTE HYD FOR BASIN A-1 IN ANTELOPE RUN PHASE 3
COMPUTE NM HYD ID=1 HYD=201:A1>P DA=0.00635
%A=0.0 %B=30.0 %C=10.0 %D=60.0 TP=0.133333
MASS RAINFALL=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.071	0.534	7.29	15.3	534.98	0.004	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	6.5	341.36	0.003	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

* HYD FOR BASIN A-1
PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER 201:A1

RUNOFF VOLUME = 0.668 ACRE-FT
PEAK DISCHARGE RATE = 17.1 CFS
PEAK OCCURRED AT 0.50 HRS.

* ROUTE FLOW THROUGH CARIBOU AVE
COMPUTE RATING CURVE RC=1 VS NO=1 NO SEGS=1
ELMIN=0. ELMAX=.7
CH SLP=0.04 FP SLP=0.04
N=.037 DIST=40.

DIST	ELEV	DIST	ELEV	DIST
0.	.667	4.	.667	4.01
20.	.32	35.99	0.	36.
40.	.667			

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.04	0.1	0.0	0.6
0.07	0.3	0.2	0.9
0.11	0.6	0.7	1.2
0.15	1.1	1.5	1.4
0.18	1.7	2.7	1.6
0.22	2.4	4.5	1.8
0.26	3.3	6.7	2.0
0.29	4.3	9.6	2.2
0.33	5.5	13.4	2.4
0.37	6.7	18.5	2.8
0.41	7.8	24.3	3.1
0.44	9.0	30.6	3.4
0.48	10.2	37.5	3.7
0.52	11.4	44.9	3.9
0.55	12.6	52.9	4.2
0.59	13.7	61.3	4.5
0.63	14.9	70.2	4.7
0.66	16.1	79.6	4.9
0.70	17.5	79.6	4.5

COMPUTE TRAVEL TIME ID=2 REACH=1 NO VS=1
L=900. SLP=0.004

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH	FLOW RATE	TRAVEL TIME	FLOW VEL

FEET	CFS	HRS	FPS
0.04	0.	0.4521	0.6
0.07	0.	0.2848	0.9
0.11	1.	0.2174	1.2
0.15	2.	0.1794	1.4
0.18	3.	0.1546	1.6
0.22	4.	0.1369	1.8
0.26	7.	0.1236	2.0
0.29	10.	0.1130	2.2
0.33	13.	0.1022	2.4
0.37	19.	0.0899	2.8
0.41	24.	0.0808	3.1
0.44	31.	0.0737	3.4
0.48	38.	0.0680	3.7
0.52	45.	0.0633	3.9
0.55	53.	0.0594	4.2
0.59	61.	0.0560	4.5
0.63	70.	0.0531	4.7
0.66	80.	0.0505	4.9
0.66	80.	0.0506	4.9

```
    ROUTE                ID=2        HYD=201.1
                         INFLOW ID=1           DT=.02082
    * COMPUTE HYD FOR BASIN E (NORTH HALF)
    COMPUTE NM HYD       ID=1  HYD=202:E1>P  DA=0.00727
                         %A=0.0  %B=30.0  %C=10.0  %D=60.0  TP=0.133333
                         MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	17.5	534.98	0.004	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	7.4	341.36	0.003	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
    * HYD FOR BASIN E-1
    PRINT HYD            ID=1  CODE=0

                      HYDROGRAPH NUMBER     202:E1


         RUNOFF VOLUME =       0.765 ACRE-FT
         PEAK DISCHARGE RATE =        19.5 CFS
         PEAK OCCURRED AT  0.50 HRS.


    * ADD TO ROUTED FLOW
    ADD HYD              ID=3        HYD=203
                         ID=1        ID=2
    * COMPUTE HYD FOR BASIN O-7 (GOLF COURSE)
    COMPUTE NM HYD       ID=2  HYD=204:07>P  DA=0.00888
                         %A=0.0  %B=100.0  %C=0.0  %D=0.0  TP=0.133333
                         MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.130	0.975	3.62	21.9	329.14	0.009	0.5	1.25

```
    * HYD FOR BASIN O-7 (GOLF COURSE)
    PRINT HYD            ID=2  CODE=0
```

HYDROGRAPH NUMBER 204:07

RUNOFF VOLUME = 0.428 ACRE-FT
PEAK DISCHARGE RATE = 14.6 CFS
PEAK OCCURRED AT 0.50 HRS.

```
* ADD TO TOTAL FLOW IN CARIBOU AVE
ADD HYD              ID=1      HYD=205
                     ID=2      ID=3
* TOTAL FLOW IN CARIBOU AVE AT ELKHORN
PRINT HYD            ID=1      CODE=0
```

HYDROGRAPH NUMBER 205

RUNOFF VOLUME = 1.779 ACRE-FT
PEAK DISCHARGE RATE = 45.3 CFS
PEAK OCCURRED AT 0.52 HRS.

```
* BEGIN ANALYSIS OF IBEX AVE FLOWS
* COMPUTE HYD FOR BASIN A-2 IN ANTELOPE RUN PHASE 3
COMPUTE NM HYD       ID=5  HYD=206:A2>P  DA=0.0073
                     %A=0.0  %B=30.0  %C=10.0  %D=60.0  TP=0.133333
                     MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	17.6	534.98	0.004	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	7.5	341.36	0.003	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
PRINT HYD            ID=5  CODE=0
```

HYDROGRAPH NUMBER 206:A2

RUNOFF VOLUME = 0.768 ACRE-FT
PEAK DISCHARGE RATE = 19.6 CFS
PEAK OCCURRED AT 0.50 HRS.

```
* HYD FOR BASIN A-2
* ROUTE FLOW THROUGH IBEX AVE
COMPUTE RATING CURVE RC=1      VS NO=1   NO SEGS=1
                     ELMIN=0.  ELMAX=.7
                     CH SLP=0.04        FP SLP=0.04
                     N=.037    DIST=40.
                     DIST      ELEV      DIST      ELEV      DIST
                     0.        .667      4.        .667      4.01
                     20.       .32       35.99     0.        36.
                     40.       .667
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE	FLOW AREA	FLOW RATE	FLOW VEL

ELEV	SQ FT	CFS	FPS
0.00	0.0	0.0	0.0
0.04	0.1	0.0	0.6
0.07	0.3	0.2	0.9
0.11	0.6	0.7	1.2
0.15	1.1	1.5	1.4
0.18	1.7	2.7	1.6
0.22	2.4	4.5	1.8
0.26	3.3	6.7	2.0
0.29	4.3	9.6	2.2
0.33	5.5	13.4	2.4
0.37	6.7	18.5	2.8
0.41	7.8	24.3	3.1
0.44	9.0	30.6	3.4
0.48	10.2	37.5	3.7
0.52	11.4	44.9	3.9
0.55	12.6	52.9	4.2
0.59	13.7	61.3	4.5
0.63	14.9	70.2	4.7
0.66	16.1	79.6	4.9
0.70	17.5	79.6	4.5

```
COMPUTE TRAVEL TIME ID=6        REACH=1    NO VS=1
                    L=900.       SLP=0.04
```

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.4521	0.6
0.07	0.	0.2848	0.9
0.11	1.	0.2174	1.2
0.15	2.	0.1794	1.4
0.18	3.	0.1546	1.6
0.22	4.	0.1369	1.8
0.26	7.	0.1236	2.0
0.29	10.	0.1130	2.2
0.33	13.	0.1022	2.4
0.37	19.	0.0899	2.8
0.41	24.	0.0808	3.1
0.44	31.	0.0737	3.4
0.48	38.	0.0680	3.7
0.52	45.	0.0633	3.9
0.55	53.	0.0594	4.2
0.59	61.	0.0560	4.5
0.63	70.	0.0531	4.7
0.66	80.	0.0505	4.9
0.66	80.	0.0506	4.9

```
ROUTE                ID=6        HYD=206.1
                     INFLOW ID=5              DT=.02082
*
* HYD FOR ROUTED FLOW FROM BASIN A2 AT ELKHORN AVE
PRINT HYD            ID=6        CODE=0
```

HYDROGRAPH NUMBER 206.1

RUNOFF VOLUME = 0.679 ACRE-FT
PEAK DISCHARGE RATE = 15.6 CFS
PEAK OCCURRED AT 0.56 HRS.

```
*
*COMPUTE HYD FOR BASIN E-2 (SOUTH HALF)
COMPUTE NM HYD       ID=5  HYD=207:E2>P  DA=0.0038
                     %A=0.0  %B=30.0  %C=10.0  %D=60.0  TP=0.133333
                     MASS RAINFALL=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.071	0.534	7.29	9.1	534.98	0.002	0.1	0.04
Pervious	0.133	0.124	0.932	3.80	3.9	341.36	0.002	0.5	1.14

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
* HYD FOR BASIN E-2 (SOUTH HALF)
PRINT HYD            ID=5  CODE=0

                     HYDROGRAPH NUMBER      207:E2


     RUNOFF VOLUME =       0.400 ACRE-FT
     PEAK DISCHARGE RATE =        10.2 CFS
     PEAK OCCURRED AT  0.50 HRS.


* ADD TO TOTAL FLOW IN IBEX AVE
ADD HYD              ID=7         HYD=208
                     ID=5         ID=6
PRINT HYD            ID=7        CODE=0

                     HYDROGRAPH NUMBER        208


     RUNOFF VOLUME =       1.079 ACRE-FT
     PEAK DISCHARGE RATE =        24.7 CFS
     PEAK OCCURRED AT  0.54 HRS.


* ROUTE FLOW THROUGH ELKHORN AVE
COMPUTE RATING CURVE RC=1       VS NO=1    NO SEGS=1
                     ELMIN=0.    ELMAX=.7
                     CH SLP=0.00618          FP SLP=0.00618
                     N=.037      DIST=40.
                     DIST        ELEV       DIST       ELEV       DIST
                     0.          .667       4.         .667       4.01
                     20.         .32        35.99      0.         36.
                     40.         .667

                          RATING CURVE VALLEY SECTION  1.0
                       WATER      FLOW       FLOW       FLOW
                      SURFACE     AREA       RATE        VEL
                       ELEV       SQ FT      CFS         FPS
                        0.00        0.0        0.0        0.0
                        0.04        0.1        0.0        0.2
                        0.07        0.3        0.1        0.3
                        0.11        0.6        0.3        0.5
                        0.15        1.1        0.6        0.5
                        0.18        1.7        1.1        0.6
                        0.22        2.4        1.8        0.7
```

```
                          0.26        3.3         2.6        0.8
                          0.29        4.3         3.8        0.9
                          0.33        5.5         5.3        1.0
                          0.37        6.7         7.3        1.1
                          0.41        7.8         9.5        1.2
                          0.44        9.0        12.0        1.3
                          0.48       10.2        14.7        1.4
                          0.52       11.4        17.7        1.6
                          0.55       12.6        20.8        1.7
                          0.59       13.7        24.1        1.8
                          0.63       14.9        27.6        1.9
                          0.66       16.1        31.3        1.9
                          0.70       17.5        31.3        1.8
COMPUTE TRAVEL TIME ID=8        REACH=1    NO VS=1
                    L=200.       SLP=0.00618

                                 TRAVEL TIME TABLE
                                     REACH  1.0

                         WATER      FLOW      TRAVEL      FLOW
                         DEPTH      RATE       TIME       VEL
                         FEET       CFS         HRS       FPS
                          0.04         0.     0.2556       0.2
                          0.07         0.     0.1610       0.3
                          0.11         0.     0.1229       0.5
                          0.15         1.     0.1014       0.5
                          0.18         1.     0.0874       0.6
                          0.22         2.     0.0774       0.7
                          0.26         3.     0.0699       0.8
                          0.29         4.     0.0639       0.9
                          0.33         5.     0.0578       1.0
                          0.37         7.     0.0508       1.1
                          0.41        10.     0.0457       1.2
                          0.44        12.     0.0417       1.3
                          0.48        15.     0.0384       1.4
                          0.52        18.     0.0358       1.6
                          0.55        21.     0.0336       1.7
                          0.59        24.     0.0317       1.8
                          0.63        28.     0.0300       1.9
                          0.66        31.     0.0286       1.9
                          0.66        31.     0.0286       1.9
ROUTE                   ID=8        HYD=208.1
                        INFLOW ID=7           DT=.02082
*
* ADD TO TOTAL FLOW AT INLETS TO LOWELL STREET STORM SEWER
ADD HYD                 ID=2        HYD=209
                        ID=1        ID=8
*
********** FINAL OUTFLOW HYDROGRAPH TO LOWELL ST. STORM SEWER ********
**************************** BASINS O3 AND E ************************
PRINT HYD               ID=2        CODE=0

                         HYDROGRAPH NUMBER        209


     RUNOFF VOLUME =       2.812 ACRE-FT
     PEAK DISCHARGE RATE =        68.7 CFS
     PEAK OCCURRED AT  0.54 HRS.


FINISH
```

IBEX AVENUE INLET ANALYSIS

TOTAL FLOW IN IBEX AVE = 22.5 CFS = Q_P

$\frac{1}{2} Q_P = \frac{22.5}{2} = 11.25$ CFS

SLOPE = 4.5%

D = 0.38' (DPM PLATE 22.3 D1)

INSTALL 2 - TYPE 'A' INLETS, 1 - EACH SIDE

$Q_{REMOVED}$ = 6.5 CFS EACH (DPM PLATE 22.3 D-5)

$Q_{REMAINING} = 22.5 - 2(6.5) = 9.5$ CFS

$\frac{1}{2} Q = 5.25$ CFS

D = 0.30'

INSTALL 2 - TYPE 'C' INLETS, 1 - EACH SIDE

$Q_{REMOVED}$ = 4.0 CFS

$Q_{REMAINING} = 9.5 - 2(4.0) = 1.5$ CFS

CARIBOU AVENUE INLET ANALYSIS

TOTAL FLOW IN CARIBOU = 28.1 + 35.5 = 63.6 CFS

$\frac{1}{2} Q_P = \frac{63.6}{2} = 31.80$ CFS

SLOPE = 5.0%

D = 0.5'

INSTALL 2 - TYPE 'C' INLETS - STA. 2+01 (RT) & 2+10 (LT.)

$Q_{REMOVED}$ = 8.0 CFS EACH

$Q_{REMAINING} = 63.6 - 2(8.0) = 47.6$ CFS

SLOPE = 2.0% (ON VERTICAL CURVE)

D = 0.67'

INSTALL 2 - TYPE 'C' INLETS - STA 2+59 (RT) & 2+27 (LT)

$Q_{REMOVED}$ = 13.0 CFS EACH

$Q_{REMAINING} = 47.6 - 2(13.0) = 21.6$ CFS

REMAINING FLOW IS COLLECTED AT SUMP CONDITION IN ELK HORN DRIVE AT STA 2+70 (RT) & 2+78 (LT.)

BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE RUN SHEET 1 OF

PROJECT NO. 88174.05 BY KLD DATE 1/90

SUBJECT STORM DRAIN INLETS CH'D DATE

ELK HORN AVENUE INLET ANALYSIS

TOTAL FLOW COLLECTED IN SUMP CONDITION AT STA 2+76.73

Q_T = 1.5 CFS (IBEX) + 21.6 CFS (CARIBOU)

Q_P = 23.10 CFS

$\frac{1}{2}Q$ = 11.55 CFS EACH SIDE

INSTALL 2 - TYPE A INLETS STA 2+70 (RT) ; 2+78 (LT)

RT SIDE STA 2+70.46 TC = 15.82 + 0.2 = 16.02

18" CONNECTOR PIPE INV = 10.77 + 0.75 = 11.52

D = 5.05' H = 4.50'

$Q_{CAPACITY} = CA\sqrt{2gH} = (0.6)(1.77)\sqrt{64.4(4.5)}$

$Q_{CAPACITY}$ = 18.08 CFS > 11.55 CFS OK ✓

LT SIDE STA 2+78.60 TC = 16.11 + 0.2 = 16.31

18" CONNECTOR PIPE INV = 12.00 + 0.75 = 12.75

D = 4.11' H = 3.56'

$Q_{CAPACITY} = CA\sqrt{2gH} = (0.6)(1.77)\sqrt{64.4(3.56)}$

$Q_{CAPACITY}$ = 16.08 CFS > 11.55 CFS OK ✓

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

FLOW ON IBEX AVE.

TOTAL FLOW IN IBEX AVE. = 22.5 CFS

Q_P = 22.5 CFS

$\frac{1}{2} Q_P$ = 11.25 CFS

SLOPE = 3%

∴ D = 0.40 (DPM PLATE ZZ.3 D-1)

INSTALL 2 TYPE "A" INLETS, 1 EACH SIDE

Q REMOVED = 6.0 CFS (DPM PLATE ZZ.3 D-5)

Q REMAINING = 22.5 - 2(6.0) = 10.5 CFS

$\frac{1}{2} Q$ = 5.25 CFS

D = 0.31

INSTALL 2 TYPE "B" INLETS, 1 EACH SIDE

Q REMOVED = 4.5 CFS

Q REMAINING = 10.5 - 2(4.5) = 1.5 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE [illegible] SHEET 1 OF 4

PROJECT NO. [illegible] BY [illegible] DATE 2-3-

SUBJECT [illegible] INLETS CH'D DATE

FLOW FROM OFFSITE TO CARIBOU AVE.

TOTAL OFFSITE FLOW = 35.5 CFS

SLOPE = 1%

D = 0.70

INSTALL SINGLE TYPE "A" INLET

Q REMOVED = 12.5 CFS

Q REMAINING = 35.5 − 12.5 = 23.0 CFS

D = 0.68

INSTALL TYPE "B" INLET

Q REMOVED = 20.0 CFS

Q REMAINING = 23.0 − 20.0 = 3.0 CFS

FLOW ON ELKHORN DRIVE

Q OFFSITE = 3.0 CFS

Q CARIBOU AVE. = 28.1 CFS

TOTAL FLOW = 28.1 + 3.0 = 31.1 CFS

½ Q P = 15.55 CFS

SLOPE = 5%

D = 0.40

INSTALL 2 TYPE "A" INLETS, 1 EACH SIDE

Q REMOVED = 7.4 CFS

Q REMAINING = 31.1 − 2(7.4) = 16.3 CFS

½ Q P = 8.15 CFS

D = 0.34

INSTALL 2 TYPE "C" INLETS, 1 EACH SIDE

Q REMOVED = 5.7

Q REMAINING = 16.3 − 2(5.7) = 4.9 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE (UU) SHEET 2 OF 4

PROJECT NO. 98174.25 BY DCF DATE 2/3?

SUBJECT STORM DRAIN INLETS CH'D DATE

FLOW ON ELKHORN DRIVE AT IBEX AVENUE

Q REMAINING = 4.9 CFS

Q FROM SPLIT DRAINED LOTS = 2.9 CFS

Q FROM IBEX AVENUE = 1.5 CFS

FLOW ON EAST SIDE OF STREET

½ Q REMAINING = 2.45 CFS

Q FROM SPLIT DRAINED LOTS = 2.9 CFS

TOTAL Q = 2.45 + 2.9 = 5.35 CFS

S = 5% ⟶ D = 0.30

INSTALL 1 TYPE "A" INLET

Q REMOVED = 4.8 CFS

Q REMAINING = 5.35 - 4.8 = 0.55 CFS

FLOW ON WEST SIDE OF STREET

½ Q REMAINING = 2.45 CFS

Q FROM IBEX AVENUE = 1.5 CFS

Q FROM EAST SIDE = 0.55 CFS

TOTAL Q = 2.45 + 1.5 + 0.55 = 4.5 CFS

ALLOWABLE Q = 4.7 CFS ✓

(SEE PAGE 4.)

CATCH BASIN ON WEST SIDE OF ELKHORN AT IBEX

SD. MANHOLE INVERT = 10.93

SD. INLET

TC = 14.52 FL = 13.85 TP = 12.02

FOR A 10" CONNECTOR PIPE, INV. = 11.19

$Q = CA\sqrt{2gH}$

$C = 0.6$, $g = 32.2$

$A = \pi/4 d^2 = \pi/4 (10/12)^2 = 0.5454$ SF

H = HEAD $= \frac{1}{2}d + 1'10" + 1' = 3.25$ FT

$Q = 0.6(.5454)\sqrt{2(32.2)(3.25)}$

$Q = 4.7$ CFS

BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE PIN SHEET 4 OF 4

PROJECT NO. 93174.05 BY [illegible] DATE 7/92

SUBJECT SIDEWALK DRAIN INLETS CH'D _____ DATE _____

DRAINAGE BASIN A

$I_{10} = .657\ I_{100} = .657(5.3) = 3.48$

$Q_{10} = C I_{10} A = .65(3.48)(2.85) = 6.4$ cfs

$I_{10\,(SCS)} = .657\ I_{100\,(SCS)} = .657(1.28) = 0.84$

$V_{10} = I_{10\,(SCS)}\ A = \frac{0.84(2.85)(43560)(1)}{12} = 8700$ C.F.

POND CONFIGURATION

3:1 SLOPE, 3' HIGH, 50' x 50' BASE,

60' x 60' TOP AREA.

$VOLUME = \frac{1}{2}(20^2 + 60^2)(4.5) = 9000 > V_{10}$ ✓

DRAINAGE BASIN B & C

$Q_{10} = C I_{10} A = .65(3.48)(1.67) = 3.78$ CFS

$V_{10} = I_{10(SCS)}\ A = \frac{0.84(1.67)(43560)}{12} = 5098$ CF.

POND CONFIGURATION

3:1 SLOPE, 3' HIGH, 40' x 40' BASE,

50' x 50' TOP AREA

$V = \frac{1}{2}(15^2 + 45^2)(5) = 5625$ CF. $> V_{10}$ ✓

OUTLET CONFIGURATION

$Q = CA\sqrt{2gH}$

$6.4 = 0.6(A)\sqrt{2(32.2)(2)}$

$A = 0.94 = \pi R^2$

$R = 0.55$

USE A 6" PIPE

BOHANNAN-HUSTON INC.

PROJECT NAME ANTELOPE [illegible]	SHEET	OF	
PROJECT NO. [illegible]4.02	BY [illegible]	DATE [illegible]/99	
SUBJECT [illegible]	CH'D	DATE	

BASIN	HYD NO.	AREA (SQ. MI.)	LENGTH (FT.)	SLOPE	Tc (HRS.)	Tp (HRS.)	K (HRS.)	CN
01	100	0.0180	1300	0.031	0.1237	0.0825	0.0495	86
02	101	0.0060	860	0.034	0.0869	0.0579	0.0348	80
A	102	0.00391	740	0.035	0.0765	0.0510	0.0306	80
B	103	0.00261	450	0.018	0.0674	0.0449	0.0270	80
C	104	0.00261	550	0.020	0.0755	0.0504	0.0302	80
S1	105	0.00933	2600	0.033	0.2060	0.1373	0.0824	89
D	106	0.00084	600	0.025	0.0741	0.0494	0.0296	80
S2	107	0.00219	720	0.020	0.0929	0.0620	0.0372	89
S3	108	0.0109	3050	0.038	0.2206	0.1471	0.0882	89
03	300	0.0131	1000	0.040	0.0916	0.0611	0.0367	80
E	301	0.0111	1090	0.036	0.1020	0.0680	0.0408	80
04	109	0.00781	1050	0.038	0.0971	0.0647	0.0388	77
05	110	0.0100	1200	0.040	0.1055	0.0703	0.0422	70
06	111	0.0250	2050	0.040	0.1593	0.1062	0.0637	82

BOHANNAN-HUSTON INC.

PROJECT NAME Antelope Run SHEET ___ OF ___
PROJECT NO. 85174.02 BY ___ DATE ___
SUBJECT HYMO Analysis Ests CH'D ___ DATE ___

W/ CONCRETE LINED CHANNEL

ENERGY DISSIPATION STRUCTURE

100 YR W.S. EL = 5916.3
REVISED
100 YR W.S. EL = 5970.4
(VOID)

Q = 6 CFS

COMBINED Q 100 (IN) = 5257 CFS
Q 100 (OUT) = 206 CFS

PROPOSED AREA OF RECLAIMED DEVELOPABLE PROPERTY

PERMANENT DRAINAGE EASEMENT

TRAMWAY

TRACT L

LOWELL STREET

Q = 35.5 CFS

07

Q = 24.5 CFS
QT = 89 CFS

E

03

Q = 29 CFS

EASEMENT REQUIRED BY DIVERSION STM. SEWER

01

TRACT M

S2

D

C

B

A

02

Q = 6CFS

Q = 2CFS

Q = 6CFS

Q = 6CFS

Q = 9CFS

Q = 13CFS

Q = 52 CFS

S1

Q = 25CFS
QT = 87CFS

96" DIVERSION STM SEWER (REF #6)

TRIBUTARY

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

1-13-89

File E22/D7C

8901281

9071479

2452

Project: #3749-81

EASEMENT

This grant of Easement, between [state the name of the present real property owner exactly as shown on the real estate document coveying title to the present owner and state the legal status of the owner, for example, "single person," "husband and wife," "corporation of the State of X," "partnership":] Centex Real Estate Corporation ("Grantor"), whose address is 10701 Montgomery Blvd NE, Suite G, Albuquerque, NM 87111, and the City of Albuquerque, a New Mexico municipal corporation ("City"), whose address is P. O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Grantor signs this Easement.

1. Recital. Grantor is the owner of certain real property located at [give general description, for instance, subdivision, lot and block or street address:] Lot 51, Antelope Run Subdivision Phase II in Bernalillo County, New Mexico (the "Property").

2. Grant of Easement. The Grantor grants to the City a permanent easement ("Easement") in, over, upon and across the Property for [state the kind of easement, for example, "public street and highway purposes (including all utilities)," "water line," "sewer line," etc.:] Public Drainage Easement. The Easement is more particularly described in the attached Exhibit A. [State on the exhibit either the metes and bounds description of the Easement or state the exact dimensions and location in a manner which would enable a surveyor to locate the Easement on the ground.]

The grant of the Easement includes the right of the City to enter upon the Easement at any time for inspection, installation, maintenance, repair or modification and the right to remove trees, bushes, undergrowth and any other obstacles if the City determines they interfere with the appropriate use of the Easement. This grant includes the right of access to the easement across the Grantor's adjoining property.

Grantor agrees for itself and its successors in interest that it has been paid in valuable consideration and that the grant of this Easement is not a gift or donation.

This Easement is worded pursuant to the provisions of §§47-1-27 to 47-1-44, NMSA 1978 or successor statutes.

3. Warranty. Grantor covenants and warrants that it is the owner in fee simple of the Property and that it has a good

(Approved by Legal Dept.
as to form only-6/1/86)

lawful right to convey the Property or any part thereof, that the Property is free from all encumbrances except encumbrances of record and taxes due and owing the Treasurer of Bernalillo County, and that the Grantor will forever warrant and defend the title to the Property against all claims from all persons or entities.

4. Binding on Grantor's Property. The grant and other provisions of this Easement constitute covenants running with the land for the benefit of the City and its successors and assigns until terminated.

5. Indemnification. As a part of the consideration for this grant, subject to the provisions of the New Mexico Tort Claims Act and all other applicable New Mexico laws, the City agrees to save Grantor harmless from any and all liability arising from the City's negligent use of the Easement for the purposes set forth herein. The City does not agree to save Grantor harmless from any liability which may arise from Grantor's use of the Easement and the Property.

6. Form Not Changed. Grantor agrees that changes to this form are not binding upon the City unless initialed by the Grantor and approved and signed by the City Legal Deparment in writing on this form.

CITY OF ALBUQUERQUE

Approved:

By: Russell B. Hunter
Title: City Engineer
Dated: 9-4-90

GRANTOR:

By: Richard Mallett
Its: President
Dated: June 22, 1990

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD
90 SEP 12 PM 3:15
BK 908 PG 2452-2454
GLADYS M. DAVIS
CO CLERK & RECORDER
DEPUTY

STATE OF New Mexico)
) ss
COUNTY OF Bernalillo)

The foregoing instrument was acknowledged before me this 22 day of June, 1990, by [name of person signing:] _____, [title or capacity, for instance, "President" or "Owner":] President of [name of the entity which owns the Property if other than the individual signing, for instance, the name of the corporation, partnership, or joint venture:] Center Real Estate Corporation.

Frieda A. Valdez
Notary Public

OFFICIAL SEAL
FRIEDA A. VALDEZ
NOTARY PUBLIC - STATE OF NEW MEXICO
Notary Bond Filed with Secretary of State
My Commission Expires 5/25/92

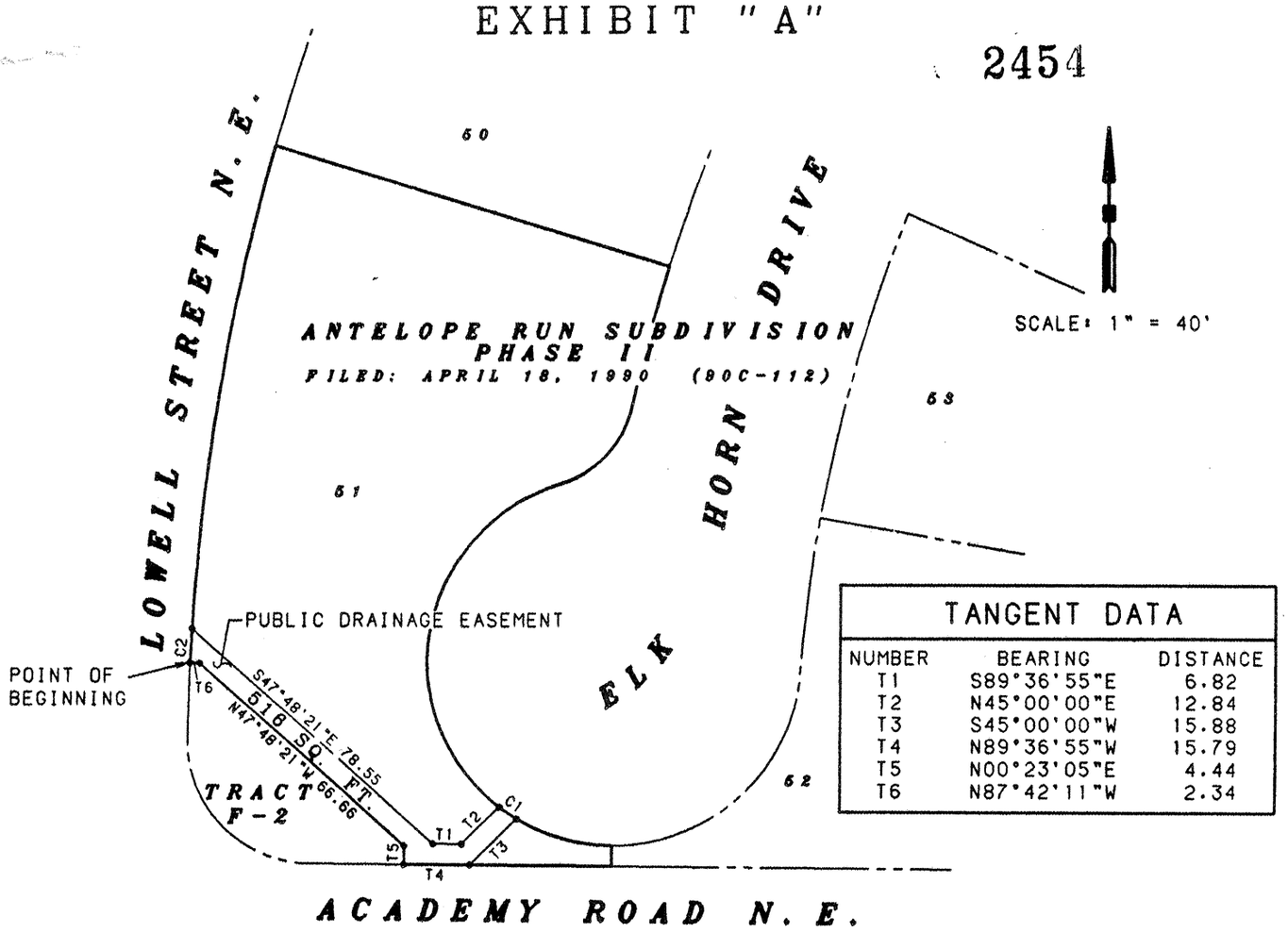
My Commission Expires:
5/25/92

(Approved by Legal Dept.
as to form only-6/1/86)

(EXHIBIT "A" ATTACHED)

EXHIBIT "A"

2454



TANGENT DATA		
NUMBER	BEARING	DISTANCE
T1	S89°36'55"E	6.82
T2	N45°00'00"E	12.84
T3	S45°00'00"W	15.88
T4	N89°36'55"W	15.79
T5	N00°23'05"E	4.44
T6	N87°42'11"W	2.34

CURVE DATA						
NUMBER	ARC	RADIUS	DELTA	CHORD	CHORD BEARING	TANGENT
C1	5.09	45.00	6°28'55"	5.09	S55°41'07"E	2.55
C2	8.42	541.06	0°53'29"	8.42	N02°44'28"E	4.21

PUBLIC DRAINAGE EASEMENT DESCRIPTION

A certain tract of land situate within the Elena Gallegos Grant and also within the east 1/2 of projected Section 27, T11N, R4E, N.M.P.M., City of Albuquerque, Bernalillo County, New Mexico, being a portion of LOT 51, ANTELOPE RUN SUBDIVISION, PHASE II, as the same is shown and designated on the plat thereof filed in the office of the County Clerk of Bernalillo County, New Mexico on April 18, 1990 in Volume 90C, folio 112, and being more particularly described by New Mexico State Plane Grid Bearings (Central Zone) and ground distances as follows:

BEGINNING at the most westerly corner of the tract herein described, also being the most westerly corner of said LOT 51 and a point on the easterly right-of-way line of Lowell Street N.E., thence running along said easterly right-of-way line being the westerly boundary of said LOT 51 and the tract herein described,
8.42 feet along the arc of a curve to the right having a radius of 541.06 feet and a chord bearing N02°44'28"E a distance of 8.42 feet to the northwesterly corner of the tract herein described; thence leaving said right-of-way line and running along the northerly boundary line of the tract herein described,
S47°48'21"E a distance of 78.55 feet to a point; thence,
S89°36'55"E a distance of 6.82 feet to a point; thence,
N45°00'00"E a distance of 12.84 to a point on curve on the southwesterly right-of-way line of the cul-de-sac at the end of Elk Horn Drive N.E.; thence running along said southwesterly right-of-way line,
5.09 feet along the arc of a curve to the left having a radius of 45.00 feet and a chord bearing S55°41'07"E a distance of 5.09 feet to the most easterly corner of the tract herein described; thence leaving said southwesterly right-of-way and line running along the southeasterly boundary line of the tract herein described,
S45°00'00"W a distance of 15.88 feet to a point on the northerly right-of-way line of Academy Road N.E.; thence along said northerly right-of-way line being the southerly boundary line of said LOT 51 and the tract herein described,
N89°36'55"W a distance of 15.79 feet to a point; thence leaving said northerly right-of-way line and running along the southwesterly boundary line of said LOT 51 and the tract herein described,
N00°23'05"E a distance of 4.44 feet to a point; thence,
N47°48'21"W a distance of 66.66 feet to a point; thence,
N87°42'11"W a distance of 2.34 feet to the point and place of [illegible]

Tract contains 516 square feet, more or less.

Thomas G. Klingenhagen

Thomas G. Klingenhagen
N.M. Surveyor No. 5978

Date: 6-8-90

REGISTERED LAND SURVEYOR STATE OF NEW MEXICO 5978 TOM KLINGENHAGEN

JOB NO. 90101.03

BOHANNAN HUSTON INC.

BOHANNAN-HUSTON, INC. ALBUQUERQUE, NEW ME[illegible]

TRACT O

SITE GRADING AND BANK REQUIRED TO DIVERT FLOODWATER AND CONTROL EROSION

100 YR. FLOOD CONTAINED WITHIN PROPOSED PERMANENT EASEMENT W/ CONCRETE LINED CHANNEL

ENERGY DISSIPATION STRUCTURE

100 YR W.S. EL=5973.3 (REVISED)

100 YR W.S. EL=5970.4 (VOID)

COMBINED Q 100 (IN) = 5257 CFS

Q 100 (OUT) = 606 CFS

Q = 6 CFS

PROPOSED AREA OF RESLAIMED DEVELOPED PROPERTY

PERMANENT DRAINAGE EASEMENT

1" = 200'

Q = 150 CFS

SD

TRACT K

TRACT L

LOWELL STREET

Q = 35.5 CFS

07

Q = 24.5 CFS
QT = 89 CFS

E

01
TRACT M

Q = 29 CFS
EASEMENT REQUIRED BY DIVERSION STM SEWER

03

C

B

A

02

Q = 2 CFS

Q = 6 CFS

Q = 6 CFS

Q = 6 CFS

Q = 9 CFS

Q = 52 CFS

S2

S1

96" DIVERSION STM SEWER (REF #6)

Q = 25 CFS
QT = 87 CFS

04

Q = 73 CFS

Q = 14 CFS

05

06

ROAD

Q = 9 CFS

Q = 50 CFS

Q = 28 CFS
QT = 148 CFS

S3

ACADEMY

100 YR. FLOOD CONTAINED WITHIN STORM SEWER CONSTRUCTED UNDER SAD-205 (MAP REVISION PENDING)

Q = 93 CFS

STREET

CANYON

LOWELL

Q = 579 CFS

Q = 243 CFS

Q = 91 CFS

Q = 74 CFS

Q = 120 CFS

HAGEN RD

GREENLY

CARRUTHERS

PLACE

ST

AVE

KIELICH

AVE

COUNTRY CLUB ESTATES

ACADEMY RIDGE EAST

JOAN

COUNTRY

CLUB

EASEMENT

LEGEND

- EXISTING BASIN BOUNDARY
- EXISTING SUB-BASIN BOUNDARY
- PROPOSED SUB-BASIN BOUNDARY
- DIRECTION OF FLOW
- Q — BASIN DISCHARGE
- QT — TOTAL DISCHARGE
- EXISTING STORM DRAIN INLET
- SD — EXISTING STORM DRAIN

F.H.W.A. Region No.		SHEET NO.	TOTAL SHEETS
6	NEW MEXICO		

AS-BUILT INFORMATION

CONTRACTOR — DATE
WORK STAKED BY — DATE
INSPECTOR'S AS-BUILT BY — DATE
FIELD VERIFICATION BY — DATE
AS-BUILT CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES — DATE
NO. — BY

ENGINEER'S SEAL

1-13-89

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	DATE 12/88
			DATE
			DATE

DESIGNED BY JLP
DRAWN BY
CHECKED BY KLD

CITY OF ALBUQUERQUE

APR 22 1991

TITLE: ANTELOPE RUN SUBDIVISION DRAINAGE PLAN

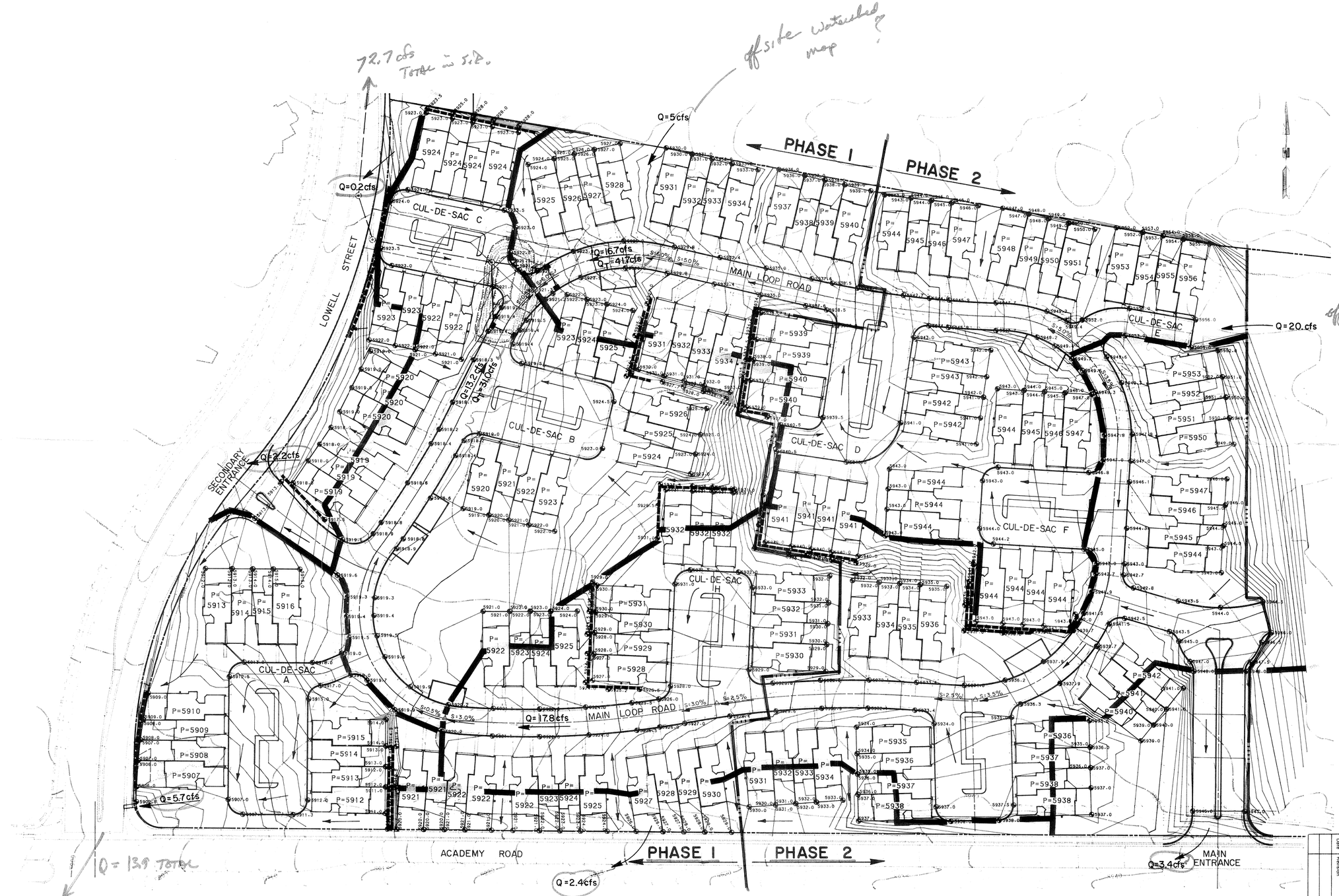
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E. - Design			Traffic		
A.C.E. - Hydrology			Water		

DRAWING NO.

MAP NO. E-22

SHEET OF

BRUNING



LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOUR
- PROPOSED CONTOUR
- 5946.0 PROPOSED SPOT ELEVATION
- P=5944 PAD ELEVATION
- △ CHANGE IN STREET SLOPE
- DIRECTION OF FLOW
- DRAINAGE BASIN BOUNDARY
- PHASE LINE
- EXISTING STORM DRAIN LINE
- EXISTING STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN LINE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED INLETS

RECEIVED
APR 17 1987
HYDROLOGY SECTION

No.	Date	Revision

LA COSTA

Project No.

GRADING / DRAINAGE PLAN

Seal

4-15-87

Job No. 71446 | Sheet 2 Of 3

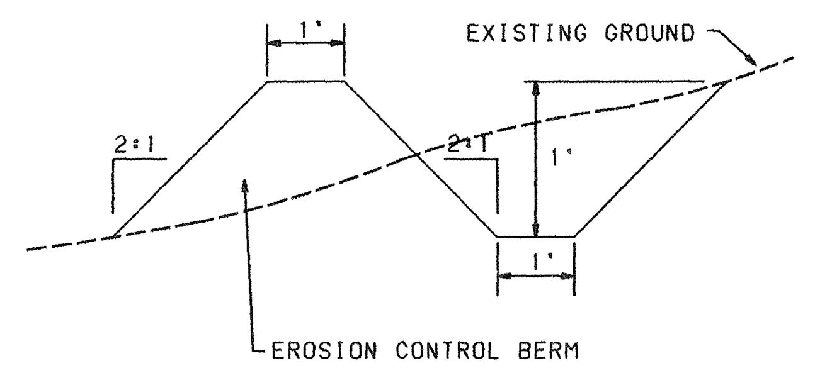
Drawn By: TG | Date: 4/87

Checked By: KLD | Scale: 1" = 50'

RICK ENGINEERING COMPANY INC.

BRUNING 64256

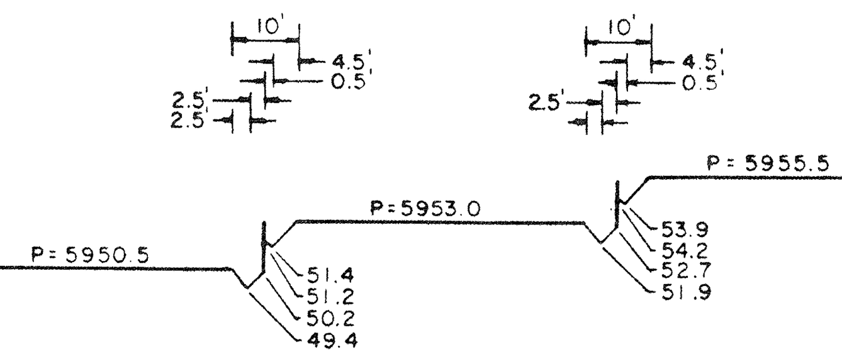

LEGEND
EXISTING CONTOUR
PROPOSED PAD ELEVATION
PROPOSED SPOT ELEVATION
PROPOSED CURB & GUTTER
PROPOSED STORM DRAIN LINE
PROPOSED STORM DRAIN INLET
DRAINAGE BASIN BOUNDARY
FLOW RATE
TOTAL FLOW RATE
PROPOSED DIRECTION OF FLOW
WATER BLOCK
PROPOSED CONCRETE RUNDOWN
PROPOSED RETAINING WALL
PROPOSED EROSION CONTROL BERM
PROPOSED SIDEWALK CULVERT
EXISTING RETAINING WALL
PHASE BOUNDARY
P=5919.0
5940.0
NOTE:
BOHANNAN-HUSTON INC. DID NOT INSPECT THE EARTHWORK OPERATIONS PERFORMED BY CLM INC.
NOTE:
See Paving Plan Sheets 6-8 for As-Built information on Street Grades. This sheet shows As-Built information for Drainage Structures only.
SCALE: 1" = 50'
NOTES:
1. FOR EARTHWORK SPECIFICATIONS, SEE "PRELIMINARY SUBSURFACE INVESTIGATION TANCAN RESIDENTIAL DEVELOPMENT" PREPARED BY FOX CONSULTING ENGINEERS AND GEOLOGISTS ON OCTOBER 22, 1986.
2. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE CITY OF ALBUQUERQUE ENVIRONMENTAL HEALTH DEPARTMENT.
NOTE
RETAINING WALLS AND GARDEN WALLS WILL BE CONSTRUCTED BY SEPARATE CONTRACTOR. UTILITY CONTRACTOR TO COORDINATE CONSTRUCTION OF WALLS IN ORDER TO BUILD CONCRETE RUNDOWN CHANNEL FROM ORYX TO ACADAMY. WALLS MUST BE BUILT AND BACKFILLED BEFORE CONSTRUCTION OF RUNDOWN BEGINS.
SECTION A-A
CONCRETE RUNDOWN
NO SCALE
ACCORDING TO COA. STD DWG 2260.
DRAINAGE EASEMENT
GARDEN WALL BY OTHERS
CONCRETE FILLED, CMU RETAINING WALL BY OTHERS
6" THICK
PLAN VIEW
FOR SECTION A-A
NO SCALE
MATCH EXISTING STREET SLOPE
25' TRANSITION FROM REGULAR INVERT TO CROSS SLOPE
EXISTING CURB LINE IN ACADEMY
RETAINING WALL
2-24" SIDEWALK CULVERTS
SECTION E-E
NO SCALE
MASONRY GARDEN WALL
CMU BOND BEAM (8" x 6" x 16")
2 #4 REBARS IN FILLED CELLS
SECTION B-B
REAR YARD PRIVATE DRAINAGE RUNDOWN DETAIL
NO SCALE
(TO BE CONSTRUCTED BY OTHERS)
2 #4 REBARS IN FILLED CELLS
CMU BOND BEAM
TOP OF CHANNEL
INVERT (MINIMUM SLOPE 1.0%
SECTION C-C
REAR YARD PRIVATE DRAINAGE RUNDOWN DETAIL
NO SCALE
2' WIDE CONCRETE RUNDOWN (SEE DETAIL B-B) WITH MINIMUM SLOPE = 1.0%
PHASE BOUNDARY
BASIN A
BASIN B
BASIN C
BASIN E
EXISTING PHASE
CARIBOU AVENUE
IBEX AVENUE
ORYX PLACE
ELK HORN DRIVE
ANTELOPE RUN ROAD
ACADEMY ROAD
NO RETAINING WALL ON LOT 4
Q=35.5 cfs
Q=28.1 cfs
Q=89 cfs
Q=2.9 cfs
Q=22.5 cfs
Q=14.5 cfs
Q=14.5 cfs
Q=7.5 cfs
Q=15 cfs
Q=8cfs
Q=6 cfs
Q=9 cfs
RETAINING WALL
RETAINING WALL 3
RETAINING WALL 4
TRACT F-2
130'-2' WIDE CONCRETE CHANNEL SEE SECTION H-H
REMOVE EXISTING STANDPIPE & ASPHALT SPILLWAY. FILL IN POND TO MATCH PROPOSED GRADE AND OR PAD ELEVATION. ALL GRADING WILL BE INCIDENTAL TO PAVING ITEMS.
2-24" SIDEWALK CULVERTS SEE DETAIL THIS SHT.
2' WIDE CONCRETE RUNDOWN (SEE DETAIL B-B) WITH MINIMUM SLOPE = 1.0%
JOB NO. 90101 02
CONTRACTOR SHALL LEAVE 24" OPENING FOR INSTALLATION OF RUNDOWN
SIDEWALK CULVERT PLATES TO BE CONTINUOUS FROM CURB TO SIDEWALK
INVERT OF RUNDOWN CHANNEL
PROPERTY LINE
PLAN VIEW
EXISTING CURB & GUTTER IN ACADEMY
PLATE
INVERT OF CONCRETE RUNDOWN CHANNEL TO MATCH SIDEWALK OF SW CULVERT.
CONTRACTOR TO INSTALL 2-#4 4's FOR CONNECTION TO CONCRETE RUNDOWN CHANNEL AS SHOWN.
SECTION G-G
SECTION H-H
2' WIDE, 6" HIGH CONCRETE CHANNEL
6" EXISTING BLOCK WALL
3:1 SIDE SLOPE (MAX.)
SIDEWALK CULVERT PER CITY STND. DETAIL 2236 (NO GRATE)
50' ROW
4' SIDEWALK
32' FF
4' SIDEWALK
STREET SECTION F-F
NO SCALE
TYPICAL LOT GRADING PATTERN
SPLIT DRAINED LOT
NO SCALE
TYPICAL LOT GRADING PATTERN
FRONT DRAINED LOT
NO SCALE
26 3749 910390
NOTE:
PHASE II GRADING HAS BEEN COMPLETED WITH PHASE I CONSTRUCTION. PAD ELEVATIONS ARE FINAL & SHALL NOT BE ADJUSTED.
RECORD DRAWING
DATE 8/90/90
AS BUILT INFORMATION
CONTRACTOR UNIVERSAL
WORK STAKED BY BHI DATE 4/90
INSPECTOR'S ACCEPTANCE BY BHI DATE 7/90
FIELD VERIFICATION BY BHI DATE 7/90
DRAWINGS CORRECTED BY BHI DATE 7/90
MICRO-FILM INFORMATION
RECORDED BY
DATE
NO.
BENCH MARKS
ACS BRASS CAP "4-E22"
LOCATION IS 6.0 MILES NORTH OF THE INTERSECTION OF CENTRAL AVE. AND TRAMWAY BLVD. THE STATION IS THEN 0.63 MILES WEST TO A POINT BETWEEN BEAR CANYON TRIBUTARY AND ARROYO DEL PINO.
ELEVATION = 5909.60
SURVEY INFORMATION
FIELD NOTES
NO. BY DATE
ENGINEER'S SEAL
3-6-90
3-19-91
REVISIONS
NO. | DATE | REMARKS | BY
5/90 | REVISED CUL-DE-SAC TO DRAIN INTO LOWER STREET
5/90 | RETAINING WALLS TO BE BUILT DURING PHASE CONSTRUCTION
3/91 | SIDE RETAINING WALLS 52/53, 54/56, 66/67, 67/68, 68/69 NOT TO BE BUILT. OMIT GARAGE ELEV.
DESIGN
DESIGNED BY KLD/JLP/JS DATE 3/90
DRAWN BY JLP/TG DATE 3/90
CHECKED BY KLD DATE 3/90
CITY OF ALBUQUERQUE
PUBLIC WORKS
ENGINEERING
MAR 20 1991
ANTELOPE RUN SUBDIVISION - PHASE II
FINAL GRADING & DRAINAGE PLAN
APPROVALS | ENGINEER | DATE | APPROVALS | ENGINEER | DATE
DRC CHAIRMAN | | 3/16/90 | WATER | R.W. Kane | 3-15-90
TRANSPORTATION | | 3/15/90 | WASTE WATER | R.W. Kane | 3-15-90
HYDROLOGY | | 3/15/90
DRAWING 3749.91
MAP NO. E-22
SHEET 3 OF 14



EROSION CONTROL PLAN

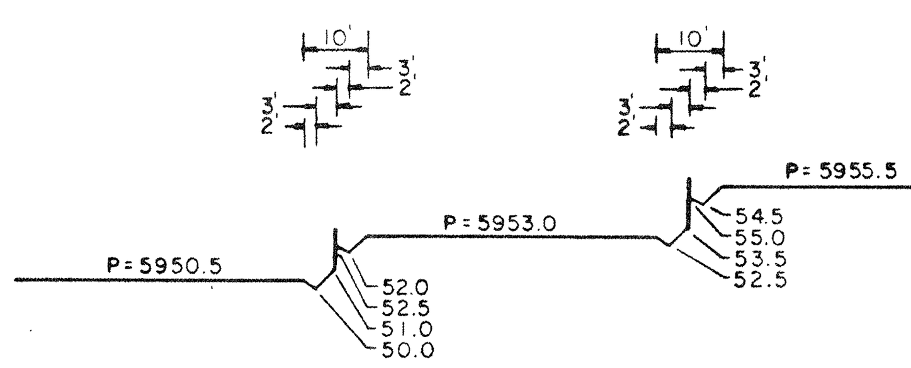
NO SCALE

A BERM WITH THE DIMENSIONS SHOWN SHALL BE MAINTAINED DURING CONSTRUCTION UNTIL COMPLETION OF INDIVIDUAL HOMES WITHIN THE PROJECT.



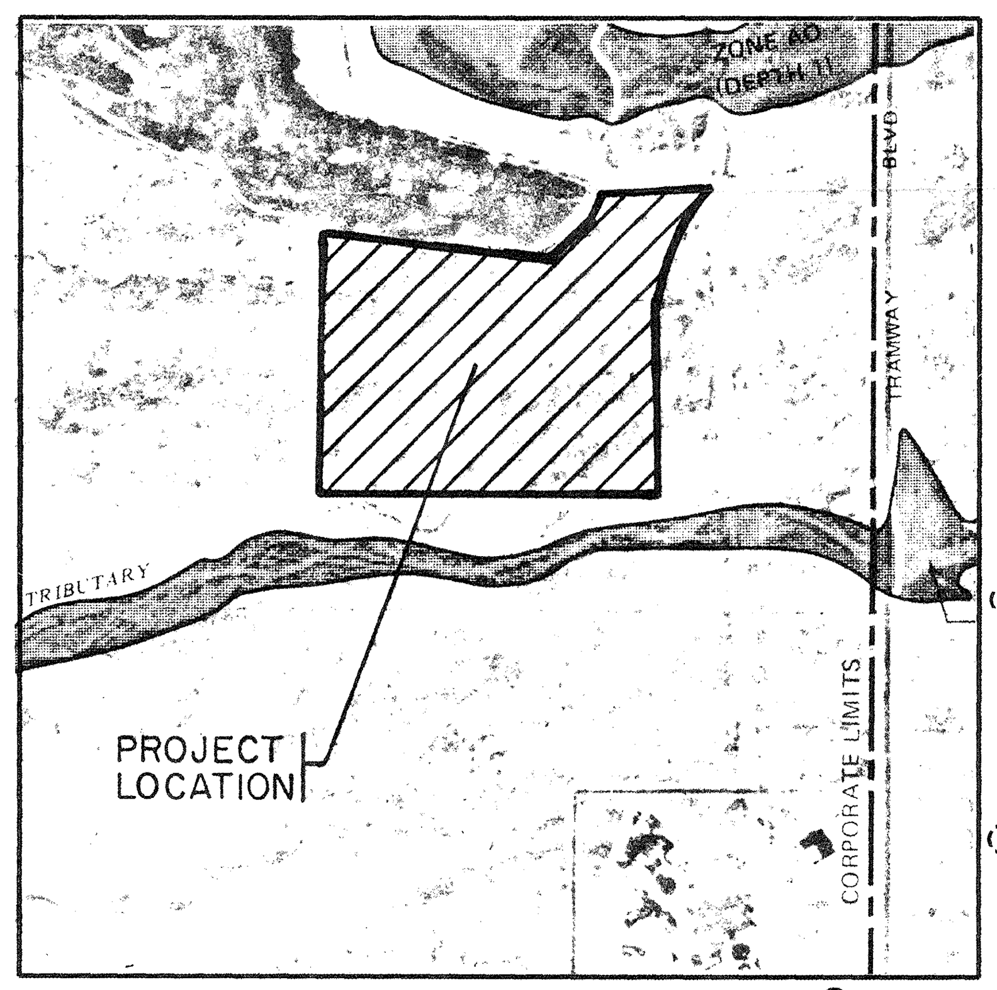
FRONT SIDE TYPICAL SIDELOT GRADING PLAN

NO SCALE



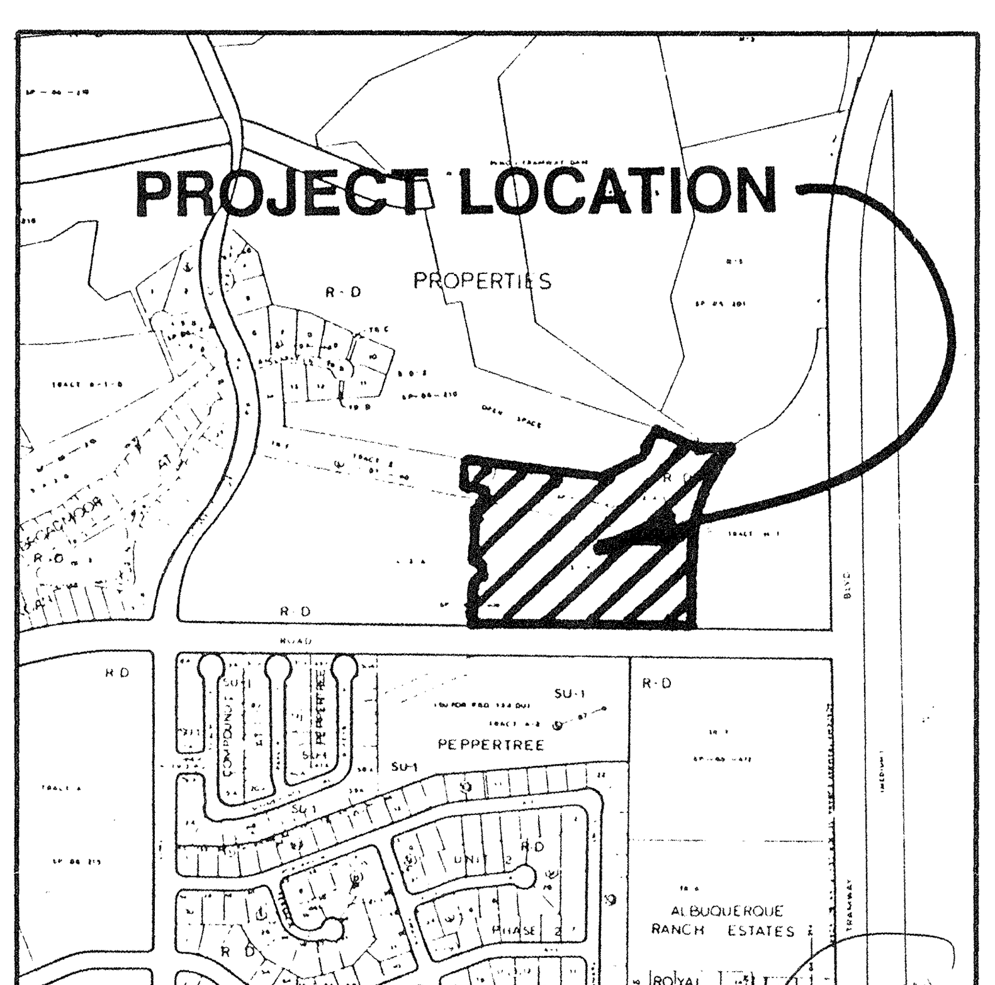
BACK SIDE TYPICAL SIDELOT GRADING PLAN

NO SCALE



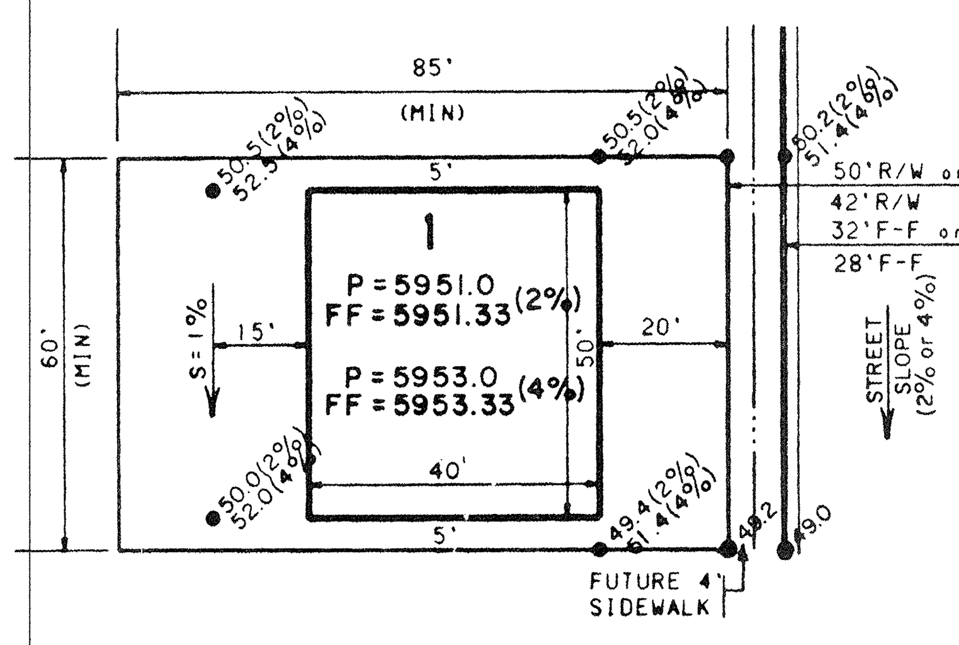
FLOOD HAZARD MAP

REFERENCE: FLOOD INSURANCE STUDY
NO SCALE



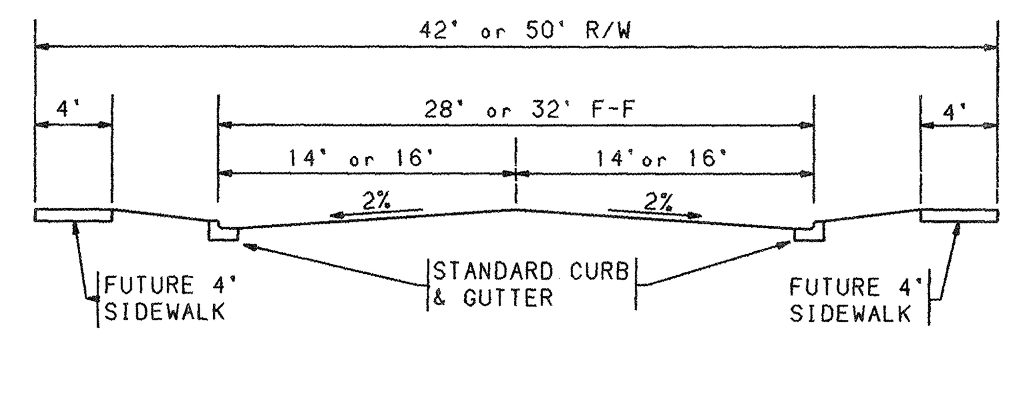
LOCATION MAP

ZONE ATLAS MAP NO. E-22
NO SCALE



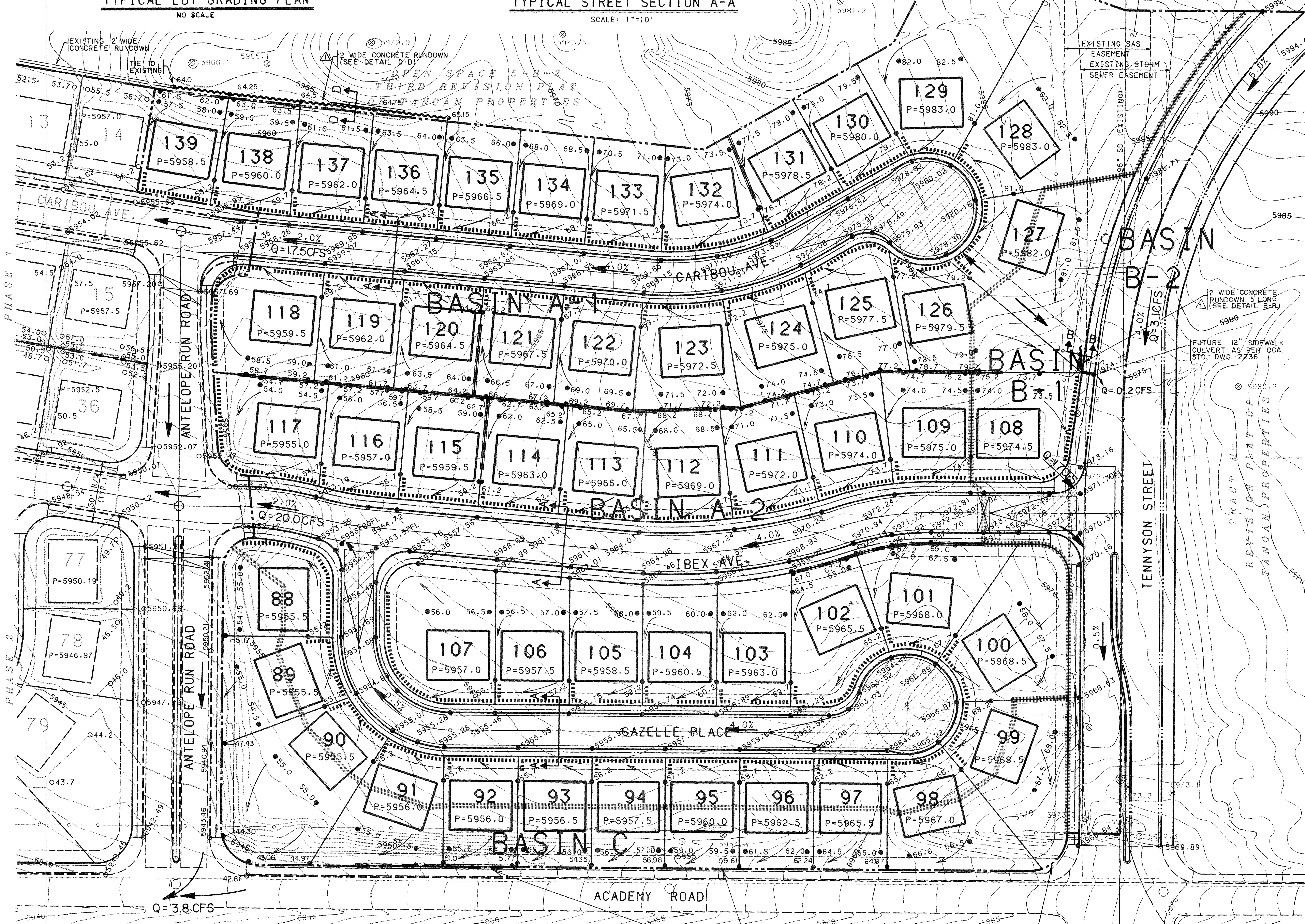
TYPICAL LOT GRADING PLAN

NO SCALE

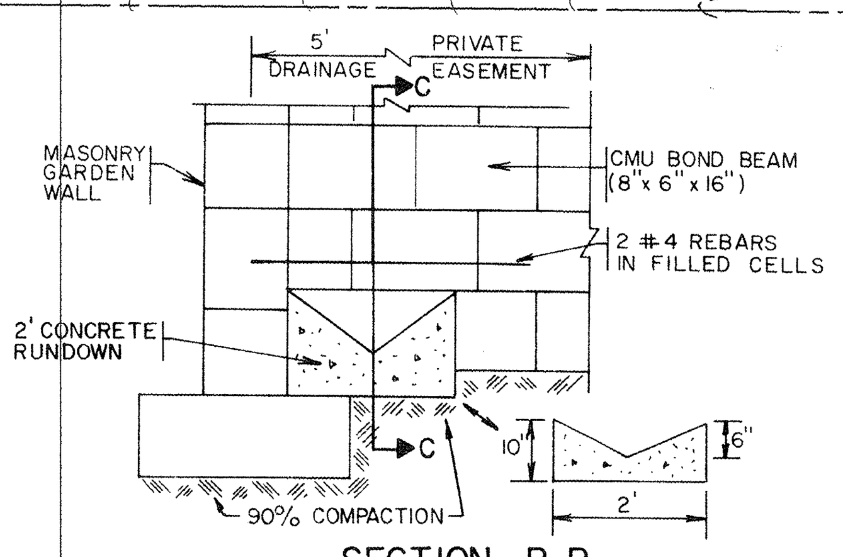


TYPICAL STREET SECTION A-A

SCALE: 1"=10'

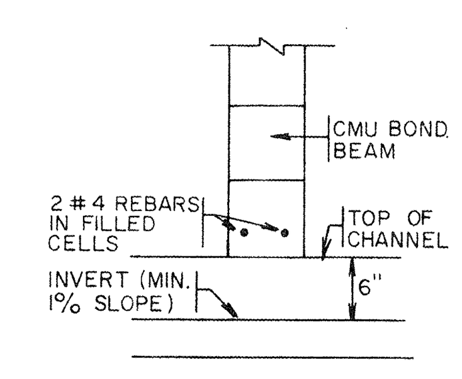


BLOCKS TO BE TURNED ON SIDE(LOTS 88 THROUGH 99), WITH THE BACK OF THESE LOTS TO BE GRADED AS TO CONTROL DEVELOPED DISCHARGE TO 0.3CFS PER LOT AND TO CONTAIN NUISANCE FLOWS(I.E. DRAINAGE FROM IRRIGATION, ECT..) FROM ENTERING PUBLIC RIGHT OF WAY. A COPY OF THIS GRADING PLAN WILL BE SUBMITTED WITH EACH APPLICATION FOR BUILDING PERMIT TO ENSURE CONVEYANCE OF THIS DRAINAGE PLAN FOR LOTS 88 THROUGH 99 ONLY.



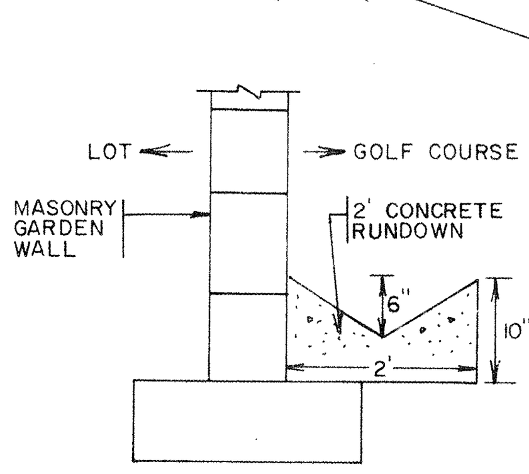
SECTION B-B

NO SCALE



SECTION C-C

NO SCALE



SECTION D-D

NO SCALE

SCALE: 1" = 50'

BHI JOB NO. 91149.01

GENERAL NOTES:

1. CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR IS TO REFER TO EARTHWORK SPECIFICATIONS AS NOTED IN THE SOILS REPORT PREPARED BY FOX & ASSOCIATES DATED OCTOBER 22, 1986.
3. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.
4. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AS PER DETAIL THIS SHEET AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
5. GRADING ON OR ADJACENT TO THE TANOAN GOLF COURSE WILL NOT BE PERMITTED WITHOUT SPECIFIC DIRECTION FROM THE OWNERS AND GOLF COURSE MANAGER. A MINIMUM OF ONE WEEK NOTICE PRIOR TO SUCH GRADING WILL BE REQUIRED TO THOROUGHLY COORDINATE THE CONCERNS AND REQUIREMENTS OF ALL PARTIES.

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOUR
- 5957.20 EXISTING SPOT ELEVATION
- 5970.70 PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- PROPOSED RETAINING WALL
- WATER BLOCK
- EROSION CONTROL BERM
- PROPOSED CONCRETE RUNDOWN

AS BUILT INFORMATION: CONTRACTOR / WORK STAKED BY / DATE / INSPECTOR'S ACCEPTANCE BY / DATE / FIELD VERIFICATION BY / DATE / DRAWINGS CORRECTED BY / DATE

MICRO-FILM INFORMATION: RECORDED BY / DATE / NO.

BENCH MARKS: ACS BRASS TABLET "4-E22" THE STATION IS 0.63 MILES WEST TO A POINT BETWEEN BEAR CANYON TRIBUTARY AND ARROYO DEL PINO. ELEVATION = 5909.60

SURVEY INFORMATION: FIELD NOTES / NO. / BY / DATE

ENGINEER'S SEAL

5-22-91
6-3-91
6-19-91

JUN 20 1991

NO.	DATE	REMARKS	BY
2	6/19/91	DELETE CONCRETE RUNDOWN IN LOTS 88-99 ADDED TURN DOWN BLOCKS IN LOTS 88-99	KLD
1	6/3/91	ADDED CONCRETE RUNDOWN	KLD

REVISIONS

DESIGN		
DESIGNED BY	GJ / KLD	DATE 5/91
DRAWN BY	TSG	DATE 5/91
CHECKED BY	KLD	DATE 5/91

APPROVED FOR ROUGH GRADING (± 1')

HYDROLOGY ENGINEER DATE

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ANTELOPE RUN SUBDIVISION-PHASE III
GRADING AND DRAINAGE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

DRAWING NO.	MAP NO.	SHEET	OF
3749.92	E-22	4	16

USERNAME: CDP:[C9114901.PAD]
FILENAME: ANT3.GRF