HYDROLOGY E18/D2a 1 PLAN

E18/D2A

1 Plan

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DRAINAGE REPORT

FOR

TRACT A, UNIT 2
ACADEMY ACRES SUBDIVISION
ALBUQUERQUE, NEW MEXICO

1. PURPOSE

The purpose of this study is to determine the storm run-off characteristics of the referenced site under both existing conditions (undeveloped) and under proposed improvement (developed). The study was conducted within the guidelines established in Drainage Resolution 1972-2 of the Albuquerque Metropolitan Arroyo Flood Control Authority.

2. LOCATION

The drainage study contained herein is for Tract A, Unit 2 of Academy Acres Subdivision located in Albuquerque, New Mexico. The property is bounded on the north by a 6' + deep trapezoidal shaped arroyo which has been lined with concrete at several locations and which flows in a westerly direction. It is bounded on the south and west by developed land consisting of one story storage buildings and asphalt paving and on the east by McKinney Drive, N.E. Information regarding existing top of curb elevations and top of asphalt elevations along McKinney Drive, N.E., was used in the preparation of this report as well as top of slab and invert elevations for several sections of the arroyo.

3. HYDROLOGY

The Rationale Formula was used in calculating peak flow rates based on the 100 year storm. The Manning Formula for open channel flow was used to size the concrete lined channels located in the northeast and northwest portions of the developed site. A roughness coefficient (n) of 0.0013 was used in solving the Manning Formula for slope and/or velocity. Design aids used in the analysis included the following:

A. Intensity Duration Frequency Curves for the City of Albuquerque area as developed by Gordon Herkenhoff and Associates.

B. 100-year 6-Hour Precipitation Map for the City of Albuquerque (June, 1967).

C. Charts, graphs and nomographs as illustrated in the Data Book for Civil Engineers, Volume I, 3rd edition (1960) by Elwyn E. Seelye.

D. Run-off coefficients (C and C') and frequency factor coefficients (C_f) contained in the Urban Storm Drainage Criteria Manual, Volume 1, March, 1969, by Wright-McLaughlin Engineers.

4. PROJECT DESCRIPTION

A. Existing Condition: The section of property under study slopes in general from east to west at a grade of between 2% and 5%. Run-off appears to traverse the site as sheet flow as there are no apparent indications of arroyos or natural channels crossing the site. All site run-off appears to empty into a partially concrete lined arroyo which extends along the entire northerly property line from McKinney Drive N.E. to the west property line. Channel slope is roughly 2.5% between McKinney and the west property line. There are no existing improvements on the site. Several stock piles of dirt (similar to existing site material) are located along the southerly side of the site and appear to be excess excavated material from property development to the south. This material will be utilized for fill as needed in the proposed development.

Soil borings have been taken at five locations on the site and indicate existing surface soils to be mainly alluvial depositions of decomposed granite. Particle size ranges from fine to coarse grained sand with slight clay deposits.

Based upon several site visits, it does not appear that run-off from improved areas to the northwest or south enters the subject site. Therefore, no provision for handling "off-site" run-off was either investigated or provided.

B. Proposed Development: Plans call for locating 2-story 8-plex units on the 5.18 ± acre site. Asphalt paving, walks and roofed areas amount to approximately 125,888 SF (2.89 acres). Ponds, grassed areas and landscaped areas amount to approximately 99,752 SF (2.29 acres).

Paved areas will be sloped or swaled at a slope between 1.5% and 4.5% to either holding ponds or to the existing lined arroyo sections along the northerly side of the property. Roofed areas will be drained to either holding ponds or to swales in paved areas for subsequent discharge into the paved sections of the existing arroyo.

The developed site has been divided into ten drainage areas. Each area will drain either to a holding pond or to paved or grass area swales for subsequent discharge into the paved arroyo sections. A total of approximately 11,799 SF of ponding area (measured at bottom of pond elevation) will be provided with a storage capacity in excess of 17,303 cubic feet. Ponds in general are 1.5 feet deep and are sized in area to hold more run-off than that required by analysis. Surplus run-off amounting to approximately 17,445 cubic feet (CF) will be discharged into the arroyo at three locations at a combined rate of approximately 12.14 cubic feet per second (CFS). An analysis of the existing site indicates that current run-off volume is approximately 23,504 CF and that the current run-off rate into the arroyo is approximately 12.26 CFS. Surplus run-off due to the proposed development will therefore neither exceed the current volume of run-off nor the current rate of run-off.

One gravel storage bed will be provided at the southeast end of the property. The maximum free-standing water depth in the pond will be 1.5 feet and the depth of gravel will be 2.0 feet. It is recommended that a fabric drainage liner be installed at the sides and bottom of the gravel bed to separate the gravel from the surrounding soil. A product similar to Mirafi 140 or 140S as manufactured by Celanese Fibers Marketing Company would be suitable for this installation.

A 6" thick bed of gravel or a 4" thick reinforced concrete "chute" is recommended at the point where swales empty into several of the holding ponds in order to limit erosion and to avoid decay of grass at the bottom of the ponds. A gravel bed is also recommended for the discharge end of several of the corrugated metal pipe (CMP) used to carry run-off below sidewalks in order to curtail erosion. CMP underdrains range in diameter from 4" to 12".

Listed below is a summary of the anticipated run-off from each of the drainage areas together with ponding requirements and discharge rates for the areas. The remarks column indicates special requirements at two areas.

SUMMARY TABLE

DRAINAGE AREA		PONDS			RUN-OFF TO ARROYO		REMARKS
	Total Run-Off (Ft^3)	Bottom Area (Ft^2)	Depth (Ft)	Capacity (Ft^3)	Q (Ft^3/Sec)	Vol. (Ft^3)	
A	2578.	1942.	1.5	2912.	0.	0.	
B	2416.	1217.	3.5	2556.	0.	0.	Includes 2' gravel bed
C	4333.	2965.	1.5	4448.	0.	0.	
D	2859.	1906.	1.5	2859.	0.	0.	
E	1280.	854.	1.5	1280.	0.	0.	
F & G	4296.	2249.	1.5	2249.	2.55	2047.	Overflows @ depth = 1.0'
H	770.	0.	-	0.	0.59	770.	
I	4139.	0.	-	0.	2.50	4139.	
J	6198.	0.	-	0.	3.69	6198.	
K	5290.	666.	1.5	999.	2.81	4291.	
TOTALS	34159.	11799.	-	17303.	12.41	17445.	

Based upon the drainage analysis presented herein, the proposed development complies with the requirements of Drainage Resolution 1972-2.

Drainage file

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE June 19, 1979 REF. NO._____

TO: Charles Volz, Chief Building Official

FROM: Bruno Conegliano, Assistant City Engineer-Hydrology BC

SUBJECT: Drainage Report, Tract A, Unit 2 of Academy Acres Subdivision

This memo is to request that a copy of the enclosed letter be attached to the construction plans for the referenced project in order to prevent the Certificate of Occupancy to be granted before certification by the engineer that the ponding requirements have been complied with.

BC/fs
Enclosure

cc - Dick Heller, City Engineer
Rich Leonard, AMAFCA
Fred Aguirre, Asst. Hydrology Engineer
Drainage File

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
David Rusk

May 31, 1979

RECEIVED
JUN 01 1979
CITY ENGINEER

Mr. Richard H. Allen
Design Professionals Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, N.M. 87107

Ref: Drainage Report Tract A - Unit 2 Academy Acres Subdivision

Dear Mr. Allen:

The drainage report for the referenced development has been reviewed and the method of handling the internal drainage is acceptable in concept. Nevertheless, before approval is granted to the development plan, the question of the protection of the south bank of the arroyo bordering the property must be resolved in a satisfactory manner as discussed by Mr. Bruno Conegliano, of our office, with your Mr. G. Bolling. Either an amendment to the drainage report will be supplied indicating that erosion protection acceptable to this Office will be provided along the north boundary of this property, or an agreement acceptable to the City Attorney's Office will have been recorded, indicating the owners will contribute 50% of the cost of the channel protection at the time of construction of the improvements by the City. In the first case, it will be required that standard plans be submitted to all City Departments for review and an AHBA contract will have to be entered into by the Developer, to insure that the construction will be executed in conformance to City standards.

At the time of submission of the construction plans, site grading plans will have to be submitted at a scale no smaller than 1"=10', with sufficient details of the ponding areas, in terms of dimensions and configuration, to allow verification of the computation submitted, correctness of execution, and ease of inspection.

If you have any questions on these matters, please do not hesitate to call on me.

Very truly yours,

Richard Heller
City Engineer

BC/RH/ms
Richard Heller
cc - Bruno Conegliano, Assistant City Eng-Hyrdrology
Drainage File
Richard Leonard - AMAFCA

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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Very truly yours,

Richard Heller
City Engineer

BC/RH/ms
Richard Heller
cc - Bruno Conegliano, Assistant City Eng-hyrdrology
Drainage File
Richard Leonard - AMAFCA

RSA

Drainage File

DESIGN PROFESSIONALS, INC.
4125 CARLISLE BOULEVARD, NE/ALBUQUERQUE, NEW MEXICO 87107/(505) 881-6336

RECEIVED

JUN 18 1979

CITY ENGINEER

June 18, 1979

Mr. Richard Heller, City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Subject: Drainage Report, Track A, Unit 2 of Academy Acres Subdivision

Dear Mr. Heller:

Per your request of this date, DPI agrees to certify at the completion of construction that the as-built retention ponds for Unit 2 of the Academy Acres Subdivision will retain the quantity of water stated in the drainage report referenced above. It is hoped that this will assist your office in the review and approval of the drainage report for this project.

Please advise if you have any questions.

Sincerely,

DESIGN PROFESSIONALS, INC.

Richard H. Allen

Richard H. Allen, P.E.
Vice President

RHA:dm

cc: Bruno Conegliano

ARCHITECTS / ENGINEERS

GEORGE H. BOLLING
ROBERT L. ROCHELEAU
JOHN PETER VARSA

RICHARD H. ALLEN
HOWARD S. COTTRELL
RICHARD G. VAUGHAN