HYDROLOGY E18/D3 2 PLANS

E18/D3

2 Plans

CAMPBELL-HICKS and ASSOCIATES, Inc.
Soils Testing Laboratory
Consulting Civil Engineers
232 Muriel Street, N.E. • Phone (505) 296-7139 • Albuquerque, New Mexico 87123

STORM DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF ACADEMY ACRES, UNIT 3 ALBUQUERQUE, NEW MEXICO

MARCH 1972

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STORM DRAINAGE STUDY RELATIVE TO THE DEVELOPMENT OF ACADEMY ACRES, UNIT 3

I. GENERAL

This report has been prepared to present findings of a study of storm drainage conditions in an area proposed for development as Academy Acres, Unit 3, and to describe proposed methods for providing adequate storm drainage in the area.

II. LOCATION

The area considered in this report is bounded on the west, north and east by unplatted land and partially on the south by Unit 1 of Academy Acres. It is situated mainly in the north-central portion of Section 25, Township 25 North, Range 3 East, N.M.P.M.

III. EXISTING DRAINAGE CONDITIONS

A. General

This undeveloped area lies south of the Arroyo del Pino. The Arroyo del Pino is at the present time contributing to this area because of the sanitary fill placed to the north, diverting the flow into this area. It is ribbed by four minor drainage channels as shown on Exhibit "A". The Arroyo del Pino is to be channelized by the City of Albuquerque at a later date.

B. Topography

The area of the proposed development is in a semi-arid climate. It is marked by minor arroyos as shown in Exhibit "A" of this report. There are six contributing channels to this area. Vegetation is sparce.

C. Drainage Areas and Channels

At the present time there are six contributing channels in this area. The Arroyo del Pino is contributing to this area due to the sanitary fill to the north of this area as shown on Exhibit "B" of this report which is a master drainage study complied by Basil Smith Engineering Company. All channels flow in a general east-west direction. See CONCLUSIONS AND RECOMMENDATIONS of this report for the recommendations on the conditions mentioned above regarding the Arroyo del Pino.

IV. PROPOSED DRAINAGE PLANS

A. General

In order to provide an adequate system of storm drainage for this proposed development, it was necessary to:

(1) Determine the drainage areas which can and will contribute storm runoff during a 100 year design storm.

(2) Determine the amount of runoff which could be expected after the entire area is developed.

(3) Prepare a table of street carrying capacities for use in sizing streets and overflow sections (section above high curb to property line).

(4) Determine the points where storm runoff will concentrate.

(5) Determine the ability of each of the drainage channels, streets plus overflow sections, and structures to handle the runoff that may concentrate on them.

(6) Determine and recommend the means by which the expected runoff can be carried by the master planned area.

(7) Design additional channels and structures to simulate and distribute the expected runoff in a manner similar to the existing terrain at the outlet end.

B. Drainage Areas

This study was compiled by determining contributing channels and areas through field inspection and by the study of Exhibit "A", a photograph (dated 1-31-72) of this area by Koogle and Pouls Engineerir , Inc., and Exhibit "B". From this study it was determined that in addition to the Arroyo del Pino there are six contributing areas.

C. Runoff Quantities

The quantities of storm runoff to be expected from each drainage area were determined using the Rational Formula, Q=CIA, where Q=quantity of storm runoff in cubic feet per second; C=coefficient of runoff dependend upon the type of surface drained; I=intensity of rainfall in inches per hour for a duration equal to the total accumulation time in minutes; and A=area of contributing watershed in acres.

The area (A) of each separate contributing area was determined by outlining the watershed on a scale photograph or the contour map and measuring the area (by planimeter) in acres.

The intensity of rainfall (I) was determined by assuming a 100 year frequency rainfall and then utilizing Intensity Duration Frequency Curves (Chart I) for the Albuquerque Area, "Master Plan of Drainage - City of Albuquerque, New Mexico and Environs," 1963, prepared by Gordon Herkenhoff and Associates, Consulting Engineers, together with expected accumulation of runoff from each of the areas. The total accumulation times are determined by a combination of Yarnell's Method and probable future streets and drainage channel alignments and grades, as shown, assuming overland flows to be across either poor grass, asphalt pavement or bare soil surfaces, depending upon the probable type of development in each area and estimating the probable type of grading to be done in each area; assuming future streets to be asphalt paved with concrete curbs and crowned with either full crown (8") 3/4 crown (6"), 1/2 crown (4"). These times of flow were calculated by use of tables on pages 5.00, 5.04, and 5.05 of Design by E.E. Seelye.

The coefficient of runoff (C) was determined by assuming the maximum possible development in the areas under consideration. A coefficient of 0.65 is used for areas where dense residential development was most probable. A coefficient of 0.70 should be used for commercial areas or where a large amount of the exposed surface is impermeable.

The quantities of runoff are shown along with the areas after development on Exhibit "C", the drainage plan for this subdivision.

D. Drainage Channels and Facilities

All existing structure capacities, as well as any future proposed structures, were verified from computer output sheets which form a part of Exhibit "E" and are based on Manning's Equation, $Q = AV$, where $V = \frac{1.486}{n} R^{2/3} S^{1/2}$ when A = cross-sectional area of the channel or structure; R = hydraulic radius of channel or area divided by wetted perimeter; S = slope of channel or facility in feet per foot; and "n" values of 0.015 for concrete and asphalt surfaces, 0.013 for concrete pipes, 0.0225 for dirt lined channels or a composite "n" value based on proportional wetted surfaces with different values.

V. CONCLUSIONS AND RECOMMENDATIONS

On the basis of this study and its calculations, it is concluded that after the Arroyo del Pino has been properly channelized this subdivision will satisfactorily carry the designed runoff. The following recommendations will make possible properly handling the runoff without further construction to the east:

A. Construct all streets at least to the minimum requirements set forth in the Recommended Street Grades - Exhibit "F".

B. Construct a temporary ditch and dike or construct Mckinney Drive in such a manner as to divert the runoff into Harper Drive at Mckinney Drive until the remaining area east of Unit 3 is developed.

C. Buildings should not be constructed until the Arroyo del Pino is channelized.

D. When the area east of Unit 3 is developed the grading should be accomplished in such a manner as to divert at least a portion of the runoff southerly into the channel adjacent to Burlison Drive along the east edge of Unit 1.

E. Provide lined drainage easements as indicated on Exhibit "C" at grades suitable for the expected runoff as given in Exhibit "E". The 30 foot easement and lined channel from the cul-de-sac at the west end of Harper Drive, N.E., to the double 4'X8' CBCs at the San Mateo interchange must have a minimum grade of about 2.5% prior to or at least concurrently with the construction of Unit 5 in this subdivision. It is possible this area will not be excessively flooded after remaining subdivisions east of Units 3 and 1 are constructed.

F. If further development east of Unit 3 is not contemplated at this time, a protective berm along Lots 26 and 27, Block 21, and a lined ten foot drainage easement between Lots 27 and 28, Block 21, is required to properly drain the runoff from area "C".

When all of the above recommendations are complied with, satisfactory drainage of this subdivision will be accomplished. A general conclusion is that as the area east of Unit 1 and Unit 3 is constructed this area can handle the runoff with a much greater factor of safety as may be seen from Exhibit "B".

This subdivision is a major step in solving the drainage

problems along Interstate 25 from the San Mateo interchange to San Antonio. It will simplify modifications required by others to the structures under the freeway and future channelization to the Albuquerque Metropolitan Arroyo Flood Control Authority's North Diversion Channel.

Respectfully submitted,

Donald L. Campbell

Donald L. Campbell
P.E. & L.S. No. 3633

THIS MICROIMAGE IS THE BEST POSSIBLE
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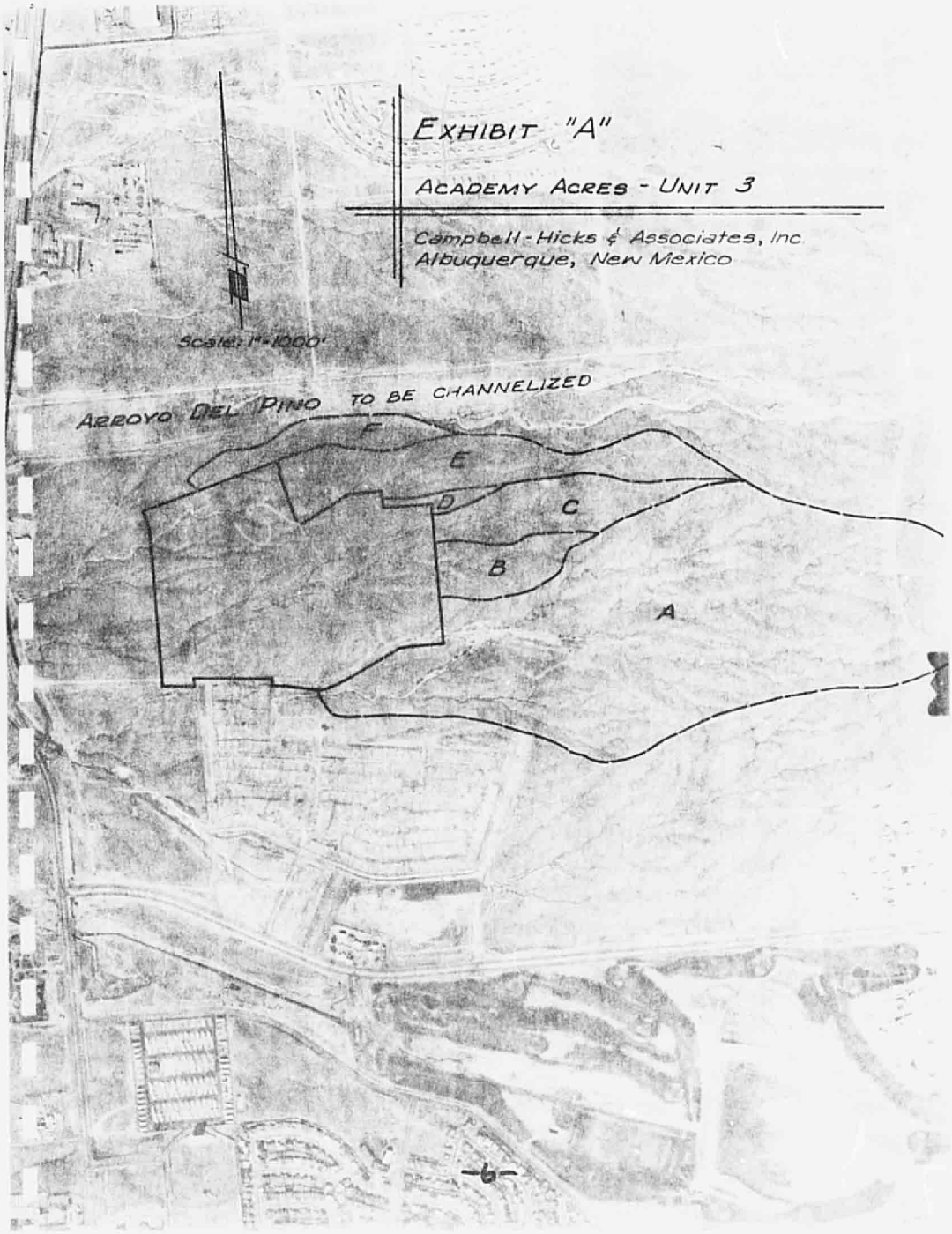
OF THE ORIGINAL DOCUMENT



CITY OF ALBUQUERQUE, NEW MEXICO
CITY ENGINEER'S OFFICE

MEMORANDUM - September 3, 1975

TO: Mr. V. M. Kimmick, City Engineer
FROM: Jerry DeMerritt
SUBJECT: HARPER AND MCKINNEY N.E.

I have inspected the intersection in question and reported my findings to Kleston. It seems as though a bust was made either in staking or design and the current problem is the result.

The only solution to solve the problem completely and not have any reoccurence would be to remove the pavement and curb and gutter in each direction for 50' to 100' and replace with new curbing and pavement to a new grade that will allow the water to flow without causing anymore problems.

There are solutions like buying the house of Gary Keegan or installing a wall but these will not get rid of the problem.

JD/fs

RECEIVED
SEP 2 1975
MAYOR'S
OFFICE

Gary Keegan
6501 McKinney Dr. N.E.
Albuquerque, New Mexico 87109
Tel. 821-6750

Frank Kleinheinz
Office of the Mayor
400 Marquette N.W.
Albuquerque, New Mexico

Dear Mr. Kleinheinz:

I have had repeated floodings on my property this summer from the water runoffs from Harper Street during many recent rainstorms. I wrote letters to both the V.A. and Wood Brothers Homes who concurred that this was a city problem because of street design. I immediately got in touch with your enginering dept on July 28, I spoke to Jerry Demaret and he an one of his superiors have been out to inspect this situation and during the last five weeks have been unable to come up with any solution.

I then went to see Mr. Rubio in your office on Aug. 25, he then said he would look into the problem. During the meantime he said he would have some dirt hauled to my property to fill in the holes around my fence,city sidewalks and parts of my lawn that had been torn out. Some workmen brought the dirt out Thursday, Aug. 28th and dumped it all over my grass and ran over it with a heavy duty vehicle. This all happened while I was at work and although my wife was home she was unable to direct these men to my instruction, so now I have a worse mess than before. I am attempting to put my home up for sale and must have this situation corrected.

I hope you will take an interest in having this matter corrected as I will take legal action if necessary.

You might also inform Mr. Tom Hoover of this situation as he has not returned any of my phone messages during the week of Aug. 25-29.

Sincerely,

Gary Keegan

Gary Keegan
(821-6750)

THIS MICROIMAGE IS THE BEST POSSIBLE
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OF THE ORIGINAL DOCUMENT

CAMPBELL-HICKS and ASSOCIATES, Inc.
Soils Testing Laboratory

232 Muriel Street, N.E. • Phone (505) 296-7139 • Albuquerque, New Mexico 87123

December 22, 1972

RECEIVED
DEC 27
CITY ENGINEER

Bob
Put with Academy
MS
Mr. Hardy

Executive Engineer
Albuquerque Metropolitan Arroyo
Flood Control Authority
Post Office Box 241
Albuquerque, New Mexico 87103

Dear Sir:

The following solution is offered as a temporary protective measure to the Academy Acres, Unit 3 flooding problem.

A dike which might form the south side of a channel to possibly channelize the Arroyo Del Pino is recommended. This temporary dike must maintain a height of at least 2.5 feet above the existing adjacent fill to the north and have a 10 foot top width and 2:1 side slopes. The material for this dike may be borrowed from the right-of-way for Forest Hills Drive. A profile will be furnished at a later date if required.

It is certified that this dike will properly protect against flooding by a Standard Project Flood as given in a report entitled Albuquerque Arroyos - Part I, Corps of Engineers, Plate E, dated June 1970.

Respectfully submitted,

Donald L. Campbell
P.E. & L.S. No. 3633

DLC/dc
cc. Federal Housing Administration
Property Management Company
Home Planning Development Company
City Engineer
Ralph K. Hicks & Associates, Inc.

Frances
file academy acres
units 3
Drainage Study

CITY HALL 400 MARQUETTE, N.W. RM. 103
P. O. BOX 1293, ALBUQUERQUE, NEW MEXICO 87103 TELEPHONE (505) 842-7411

May 12, 1972

MAY 15 REC'D

TO: E. F. Hensch, Director of Public Works

FROM: Patrick L. McDonald, Assistant City Attorney

RE: UNITS 3, 4, 5, 6, 7, 8 and 9 ACADEMY ACRES

In your letter of May 8, 1972 to Mr. Horan, you inquired as to the legal limits of a letter from Ralph K. Hicks and Associates, Inc., dated April 11, 1972, which contains the following statement:

> "We hereby certify to the City of Albuquerque that Property Management Company of New Mexico, Inc. in order to expedite the filing of these plats will do the following...."

In the absence of any information concerning the relationship between Ralph K. Hicks and Associates, Inc. and Property Management Company of New Mexico, Inc., it is impossible to determine if Hicks had authority to make such assurances on behalf of Property Management.

Therefore, it is my opinion that it would be inappropriate for the City to rely on these assurances, without written confirmation by an appropriate corporate officer of Property Management Company.

Patrick L. McDonald
Assistant City Attorney

PLMcD;b

LEGAL DEPARTMENT
CITY ATTORNEY — Frank L. Horan
ASSISTANT CITY ATTORNEYS — Harley A. Lanning - Frank M. Mims - Thomas J. McMahon - Lynn D. Smith, Jr.
Patrick L. McDonald - Edward R. Ziegler - Don J. Steel

CITY OF ALBUQUERQUE, NEW MEXICO
PUBLIC WORKS DEPARTMENT

RECEIVED
APR 1
CITY ENGINEER

April 19, 1972

TO: V. Kimmick, City Engineer

FROM: E. F. Hensch, Director, Public Works Department

SUBJECT: ACADEMY ACRES, UNITS 3, 4, 5, 6, 7, 8 & 9

Before requesting information from the City Attorney's Office regarding this matter, I think it appropriate to resolve several questions within this department:

1. Does Mr. Hicks have the authority to make the assurances stated in his letter of April 11, 1972?

2. Are the hydrologic figures stated in Item 3 of his letter accurate as far as the City Engineer is concerned?

3. Is it reasonable to assume that Item 1C can be resolved by any assurance from Mr. Hicks or other parties when, in fact, the resolution of this problem involved the New Mexico State Highway Department?

Once these questions are answered, it would be appropriate to request the City Attorney's Office to prepare the necessary Agreement to consummate the assurances required by the City Engineer's Office to affix its approval to the drainage plan.

E. F. Hensch
Director, Public Works Department

EFH:rs

RALPH K. HICKS and Associates, Inc.
REGISTERED LAND SURVEYORS
1504-B WYOMING BLVD., N.E. • PHONE (505) 296-0739 • ALBUQUERQUE, NEW MEXICO 87112

April 11, 1972

file
MB

City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Attention: V. M. Kimmick
City Engineer

Re. Units No. 3, 4, 5, 6, 7, 8 and 9
Academy Acres and Arroyo del Pino
Albuquerque, New Mexico

Dear Mr. Kimmick:

For some weeks we have discussed the drainage problems for the captioned subdivisions and the Arroyo del Pino. These problems are basically lack of adequate structures at Interstate 25 and the Arroyo del Pino, lack of city funds to channelize the Arroyo del Pino, and the close proximity of the sanitary fill immediately north of our two subdivision.

We hereby certify to the City of Albuquerque that Property Management Company of New Mexico, Inc. in order to expedite the filing of these plats will do the following:

1. Reinforce the Pino Dam which lies immediately north of the Boys Academy to your office's satisfaction which include the following:

   A. Install a culvert type overflow structure equal in area to the 6-36 inch concrete pipes that are currently under Interstate 25 at the centerline of the Arroyo del Pino.

   B. Provide asphaltic pavement at the existing overflow area to stabilize earthen structure.

   C. It is understood that the reinforcing of the Pino Dam is of a temporary nature, until such funds are available, from whom ever makes them available, and the intent of this letter is to indicate that the dam will be reinforced and so constructed to allow storm water to pass through the dam and under Interstate 25 with a quantity that will have no adverse effect on the subdivision, Units No. 3 and No. 5 Academy Acres.

2. Further, it is understood that no permanent vertical structures will be constructed on the northerly 100 feet of Tracts "A" and "B" of the plat of Academy Acres Subdivision Unit No. 5. Further, no permanent vertical structures will be constructed on Lots 1 and 2, Block 14, Lots 10 thru 18 inclusive, Block 18, Lots 11 thru 27 inclusive, Block 19, Lots 1, 2, 40 and 41, Block 19, Lots 1 thru 7 inclusive and 12 thru 28 inclusive, Block 20, Lots 1 thru 26 inclusive, Block 21 and Lots 1 thru 14, Block 22, Academy Acres Unit No. 3. The aforementioned lots are defined by a green cross-hatched line delineated on the master plan of drainage for Academy Acres Subdivision, said master plan of drainage is the attached to this letter and is made a condition of this letter and the aforementioned lots in general, define said cross-hatched line.

3. This office has computed the storage capacity of the Pino Dam and find that it will store 480,000 cubic yards of water. The Corps of Engineers report of 4710 c.f.s. for a 100 year storm would in 1 hour require 628,000 cubic yards of storage, assuming 780 c.f.s. runoff thru the culvert type overflow structure reduces the necessary storage by 104,000 cubic yards or 529,000 cubic yards. Therefore the existing dam will store 92% of a 100 year storm.

This office would like to take this opportunity to express our deep appreciation for the cooperation received from the City Engineer's Department, yourself and Mr. Kielich in particular.

Very truly yours,

RALPH K. HICKS AND ASSOCIATES, INC.

Ralph K. Hicks

Ralph K. Hicks

RKH/jl

cc. Property Management Company of New Mexico
Ed Leslie
Donald Campbell

CITY OF ALBUQUERQUE
STATE OF NEW MEXICO

May 3, 1972

RECEIVED
MAY 03
CITY ENGINEER

RE: ACADEMY ACRES, UNITS 3, 4, 5, 6, 7, 8 & 9

FILE NOTE--

1. Pino Dam controlled overflow is key to resolving the drainage on an interim basis.

2. Kim work with City Attorney in drafting agreement which provides:

   (a) Applicant will modify dam and obtain necessary easements, etc. from land owner for construction and future maintenance.

   (b) Provide thru-flow (controlled) which will not exceed capacity of the existing culverts at I-25.

   (c) The thru-flow from the dam must follow the alignment of the natural drainage courses to the structures at I-25.

   (d) The dam must remain functional until structures at I-25 are increased in capacity.

E.F.H.

cc: Kimmick
Kielich
Hensch

COPY

RALPH K. HICKS and Associates, Inc.
REGISTERED LAND SURVEYORS

1504-B WYOMING BLVD., N.E. • PHONE (505) 296-0739 • ALBUQUERQUE, NEW MEXICO 87112

April 11, 1972

Bob

MS

City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Attention: V. M. Kimmick
City Engineer

Re. Units No. 3, 4, 5, 6, 7, 8 and 9
Academy Acres and Arroyo del Pino
Albuquerque, New Mexico

Dear Mr. Kimmick:

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1. Reinforce the Pino Dam which lies immediately north of the Boys Academy to your office's satisfaction which include the following:

   A. Install a culvert type overflow structure equal in area to the 6-36 inch concrete pipes that are currently under Interstate 25 at the centerline of the Arroyo del Pino.

   B. Provide asphaltic pavement at the existing overflow area to stabilize earthen structure.

   C. It is understood that the reinforcing of the Pino Dam is of a temporary nature, until such funds are available, from whom ever makes them available, and the intent of this letter is to indicate that the dam will be reinforced and so constructed to allow storm water to pass through the dam and under Interstate 25 with a quantity that will have no adverse effect on the subdivision, Units No. 3 and No. 5 Academy Acres.

2. Further, it is understood that no permanent vertical structures will be constructed on the northerly 100 feet of Tracts "A" and "B" of the plat of Academy Acres Subdivision Unit No. 5. Further, no permanent vertical structures will be constructed on Lots 1 and 2, Block 14, Lots 10 thru 18 inclusive, Block 18, Lots 11 thru 27 inclusive, Block 19, Lots 1, 2, 40 and 41, Block 19, Lots 1 thru 7 inclusive and 12 thru 28 inclusive, Block 20, Lots 1 thru 26 inclusive, Block 21 and Lots 1 thru 14, Block 22, Academy Acres Unit No. 3. The aforementioned lots are defined by a green cross-hatched line delineated on the master plan of drainage for Academy Acres Subdivision, said master plan of drainage is the attached to this letter and is made a condition of this letter and the aforementioned lots in general, define said cross-hatched line.

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This office would like to take this opportunity to express our deep appreciation for the cooperation received from the City Engineer's Department, yourself and Mr. Kielich in particular.

Very truly yours,

RALPH K. HICKS AND ASSOCIATES, INC.

Ralph K. Hicks

Ralph K. Hicks

RKH/jl

cc. Property Management Company of New Mexico
Ed Leslie
Donald Campbell

CITY OF ALBUQUERQUE, NEW MEXICO
PUBLIC WORKS DEPARTMENT

File
Academy Acres
Unit 3
Drainage Study

May 8, 1972

TO: Frank Horan, Legal Department

FROM: E. F. Hensch, Director of Public Works

SUBJECT: UNITS 3, 4, 5, 6, 7, 8, and 9 ACADEMY ACRES

As you know, due to the action of the Commission the plats for Units 3 and 5, Academy Acres were signed, but there exists a danger to the public due to the inadequate capacity of the culverts at I-25 at the downstream end of the Arroyo del Pino.

Since the City is now left with the problem, essentially at its expense, the enclosed signed agreement is forwarded for your review. It is believed the agreement was signed by a person acting as an agent for the Property Management Company of New Mexico and Mr. Ed Leslie. Your advice is solicited regarding the legal limits of this letter.

/S/ E. F. Hensch
E. F. Hensch
Director of Public Works

EFH:ds
cc: V. M. Kimmick
Q. R. Kielich

Attachment