HYDROLOGY G22/D5 1 PLAN

G22/D5

1 PLAN

Bob
file
WA

Drainage

El Dorado Heights

January 24, 1973

ENCHANTMENT ENGINEERING

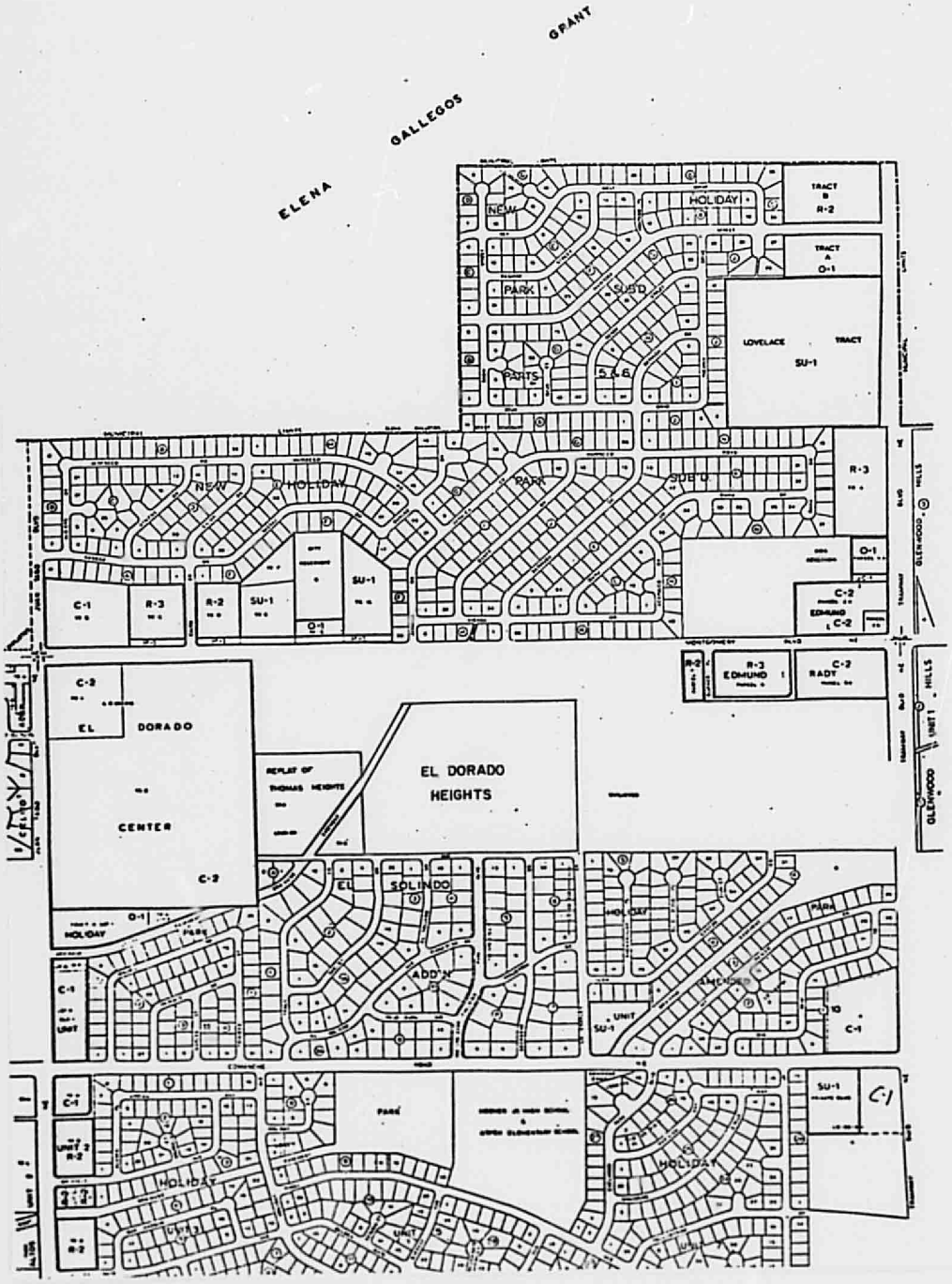
DESCRIPTION OF AREA

EL DORADO HEIGHTS IS A 29.35 ACRE TRACT OF LAND LOCATED ROUGHLY 2300 FT. WEST OF TRAMWAY, 2000 FT. EAST OF JAUN TABO AND 500 FT. SOUTH OF MONTGOMERY.

RUNOFF FROM OUTSIDE PROPERTY EXISTS ON THE NORTH AND EAST BOUNDARY LINES OF THE PROPERTY IN QUESTION. AN EXISTING EARTH DRAINAGE CHANNEL ON THE EAST boundary lines PREVENTS WATER FROM ENTERING ON THE EAST, AND ELEVATION DIFFERENCES KEEP WATER FROM ENTERING ON THE SOUTH. It is ASSUMED THAT THE AREA DRAINING TO THE NORTH OF MONTGOMERY is CAUGHT BY MONTGOMERY AND CHANNELED AWAY FROM THE PROPERTY. THEREFORE, THE ONLY DRAINAGE AREAS AFFECTING THE PROPERTY ON THE NORTH IS THE LAND BETWEEN MONTGOMERY AND THE NORTH LINE OF THE SUBDIVISION. A similiar ASSUMPTION WAS MADE FOR THE AREAS DRAINING TO THE EAST FROM TRAMWAY.

It is THE PLAN OF THIS REPORT TO SHOW THAT RUNOFF AFTER DEVELOPMENT WILL NOT BE GREATER THAN THE NATURAL RUNOFF FROM THE LAND. This WILL BE ACCOMPLISHED by

PONDING THE RUNOFF FROM THE ROOFS OF EACH LOT ON EACH INDIVIDUAL LOT ALONG WITH THE RUNOFF FROM THE LOT ITSELF. ALL OTHER AREAS, SUCH AS DRIVEWAYS, STREET WALKS, AND CURBS WILL BE DRAINED OFF. RUNOFF FROM OUTSIDE PROPERTY WILL BE TRANSFERED THROUGH THE PROPERTY TO AN EXISTING EARTH DRAINAGE CHANNEL ON THE EAST OF THE PROPERTY, ALONG WITH THE RUNOFF FROM THE STREETS AND DRIVES.


GRANT
GALLEGOS
ELENA
NEW
HOLIDAY
PARK
SUBD
PARTS
S.A.6
TRACT B R-2
TRACT A O-1
LOVELACE TRACT
SU-1
R-3
O-1
C-2
EDMUND
C-2
C-1
R-3
R-2
SU-1
O-1
R-2
R-3 EDMUND
C-2 RADT
GLENWOOD HILLS
UNIT 1
C-2
EL DORADO
CENTER
C-2
REPLAT OF THOMAS HEIGHTS
EL DORADO HEIGHTS
EL SOLINDO
ADD'N
HOLIDAY
PARK
O-1
C-1
UNIT
UNIT
SU-1
C-1
PARK
HOLIDAY
UNIT
UNIT
HOLIDAY
SU-1
C-1
UNIT 2
R-2
R-2

NATURAL RUNOFF FROM THE PROPERTY

$I = 4.1$ in/hr
$C = 0.283$
$A = 29.35$ ACRES

$Q_{100} = CIA = 34.05$ CFS

RUNOFF AFTER DEVELOPMENT

ROADS
$I = 6.0$ in/hr
$C = 0.92$
$A = 4.11$ ACRES

$Q_{100} = CIA = 22.69$ CFS

DRIVES
$I = 6.0$ in/hr
$C = 0.92$
$A = 1.33$ ACRES

$Q_{100} = CIA = 7.34$ CFS

WALKS

$I = 6.0$ in/hr

$C = 0.92$

$A = 0.74$ ACRES

$Q_{100} = CIA = 3.89$ CFS

TOTAL RUNOFF AFTER DEVELOPMENT = 33.92 cfs

PONDING ON LOTS

ASSUMED ROOF AREA = 1700 FT^2
= 0.04 ACRES

AMOUNT OF WATER = $0.04 \times 3.0^* \times \frac{1 FT}{12 IN}$ = 0.01 AC-FT.

PONDING AREA PER LOT = 2800 FT^2
= 0.064 ACRES

W_{MAX} = 0.064 ACRES × 0.16 FT = 0.01 AC-FT.

WITH AN AVERAGE DROP OF .16 FT IN THE PONDING AREA WATER FROM EACH UNIT WILL POND ON ITSELF. SEE DRAINAGE PLAN FOR DETAIL OF LOT GRADING.

*RAINFALL FOR AREA 100 YEAR STORM 6 HOUR PRECIPITATION

OUTSIDE DRAINAGE

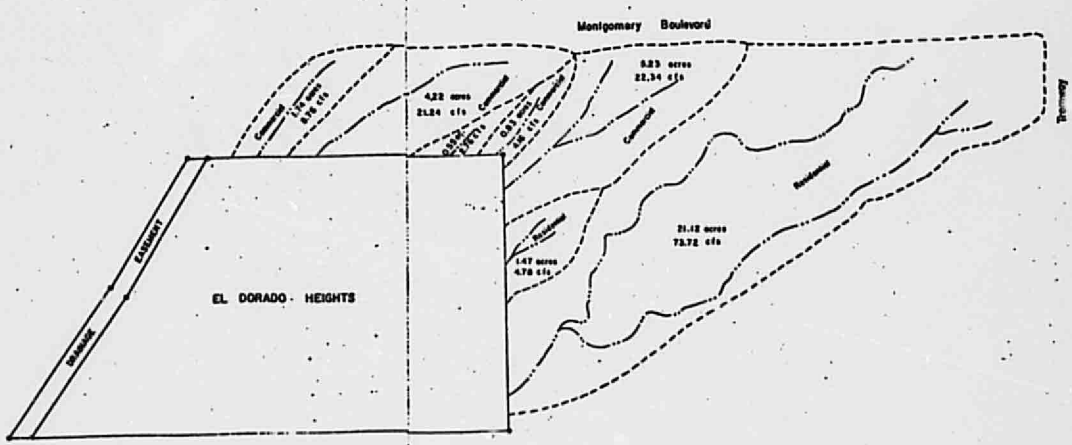
DRAINAGE AREAS FROM OUTSIDE THE PROPERTY ARE SHOWN ON THE ACCOMPANYING DETAIL. THESE AREAS WERE ARRIVED AT BY USE OF AN AERIAL PHOTOGRAPH. THE DISCHARGE FROM THESE AREAS WERE COMPUTED BY ASSUMING THAT THE LAND HAS ALREADY BEEN DEVELOPED INTO COMMERCIAL AND RESIDENTIAL SITES. THE INTENSITY AND RUNNOFF COEFFICIENTS ARE SHOWN ON THE FOLLOWING PAGE. THE TOTAL OUTSIDE DRAINAGE COMPRIZES AN AREA OF 35.16 ACRES AND HAS A RUNOFF OF 137.76 CFS FOR A 100 YEAR STORM.

ENTERANCE OF THE OUTSIDE DRAINAGE ONTO THE PROPERTY IS SHOWN ON THE DRAINAGE PLAN, AND THE ACCOMPANYING SKETCH.

ENCHANTMENT ENGINEERING INC.

EL DORADO HEIGHTS

OUTSIDE DRAINAGE



Commercial

TYPE OF SURFACE	PERCENT OF TOTAL SURFACE	RUNOFF COEFFICIENT
Roof	25 %	0.925
Paving	64 %	0.920
Unscarified	9 %	0.250

i = 6.0 in/hr

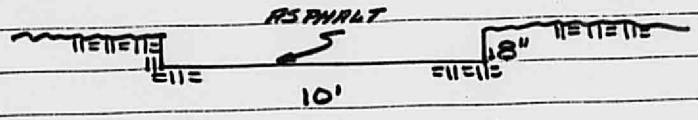
Residential

TYPE OF SURFACE	PERCENT OF TOTAL SURFACE	RUNOFF COEFFICIENT
Roof	21 %	0.920
Paving	42 %	0.920
Unwatted Lawns	11 %	0.150
Unscarified	26 %	0.250

i = 6.0 in/hr

Channels

Channel R



$$Q = \frac{1.49}{n} R^{2/3} S^{1/2} A$$

$A = 6.66 \text{ ft}^2$

$p = 11.33 \text{ ft}$

$R = 0.587 \text{ ft}$

$R^{2/3} = 0.701$

$S = 20\%$ 3

$S^{1/2} = 0.447$ .14

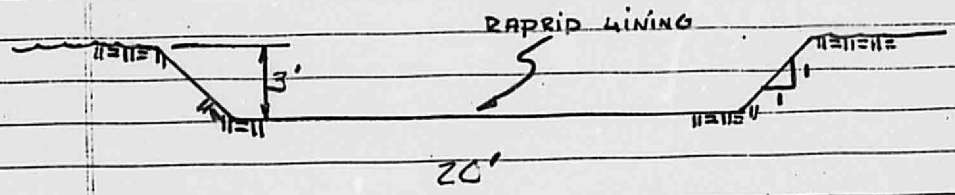
$n = 0.022$

$Q = 141 \text{ cfs}$ 6.6 fps

44 cfs

675

SECTION B-B' SHOWS THE CROSS-SECTION FOR THE 60' DRAINAGE EASEMENT. ACCORDING TO THE CORPS OF ENGINEERS, FLOOD PLAIN DATA, THIS CHANNEL MUST CARRY 600 CFS. CALCULATIONS FOR SECTION B-B' ARE AS FOLLOWS.



$$Q = \frac{1.49}{n} R^{2/3} S^{1/2} A$$

$A = 69 \text{ FT}^2$

$p = 28.48$

$R = 2.42$

$R^{2/3}$ 1.804

$S = 3.2\%$

$S^{1/2} = 0.178$

$n = 0.02$

$\therefore$

$Q = 1650$ CFS.

BIBLIOGRAPHY

1. DATA BOOK FOR CIVIL ENGINEERS, DESIGN Vol. 1; SEELYE, ELWYN E. 1948 p 5-00 - 5-25

2. 1963 MASTER PLAN OF DRAINAGE FOR CITY OF ALBUQUERQUE AND ITS ENVIRONS; HORKENHOFF AND ASSOCIATES, GORDEN. 1963

ENGINEERS & PHOTOGRAMMETRISTS

BOHANNAN WESTMAN HUSTON & ASSOCIATES INC.

4125 CARLISLE BLVD., N.E.
ALBUQUERQUE, NEW MEXICO 87107
PHONE 505 881-2000

July 16, 1975

Mr. Kleston Laws
Assistant City Engineer, Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Drainage Easement West of Eldorado Heights Subdivision

Dear Mr. Laws:

Enclosed are three copies of the preliminary designs for the subject drainage easement. The channel grade line will be lowered, if required, to match the 36-inch storm sewer invert from LaCharles Avenue. The slope water depth velocity and Froude number given on the sheet is the data for the eroded conditions of the channel, assuming a 2-foot drop below each erosion check. Comparable data for the as-constructed conditions before erosion occurs is as follows:

Slope - 3.7%
Depth - 1.37 feet
Velocity - 10.47 feet per second
Froude Number - 1.71

We will be anxious to receive your approval for the construction of the channel in this configuration. We plan to begin construction on Monday, July 21, 1975. If you have any questions, please feel free to contact this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery
Chief Design Engineer

Enclosures

cc: Mr. Bill Biffel, Hooten & Stahl

MME/rak
Job No. 75-159

Bob

file with El Dorado Hts. drainage study.

Jim

9510 Euclid Avenue N.E.
Albuquerque, New Mexico
March 23, 1973

Mr. Vern Kimmick, City Engineer
City of Albuquerque
400 Marquette N.E.
Albuquerque, New Mexico

Dear Mr. Kimmick:

This is to advise that we, the property owners, will dedicate to the City of Albuquerque, New Mexico, a utility easement for water and sewer services only, and should said easement not be utilized for said purposes, then said easement property would revert back to Thompsons or their assigns without cost to them.

The dedicated easement of fifteen feet (15 feet) will begin on the West side of the center line of proposed Bermuda Drive N.E., and will extend Southward from Montgomery Boulevard N.E. to the Northerly property line of the proposed subdivision known as El Dorado Heights.

George Gordon Thompson, Owner

Marjorie Edythe Thompson, Owner

HYDROLOGY G22/D5 1 PLAN

G22/D5

1 PLAN

Bob

Drainage

El Dorado Heights

January 24, 1973

ENCHANTMENT ENGINEERING

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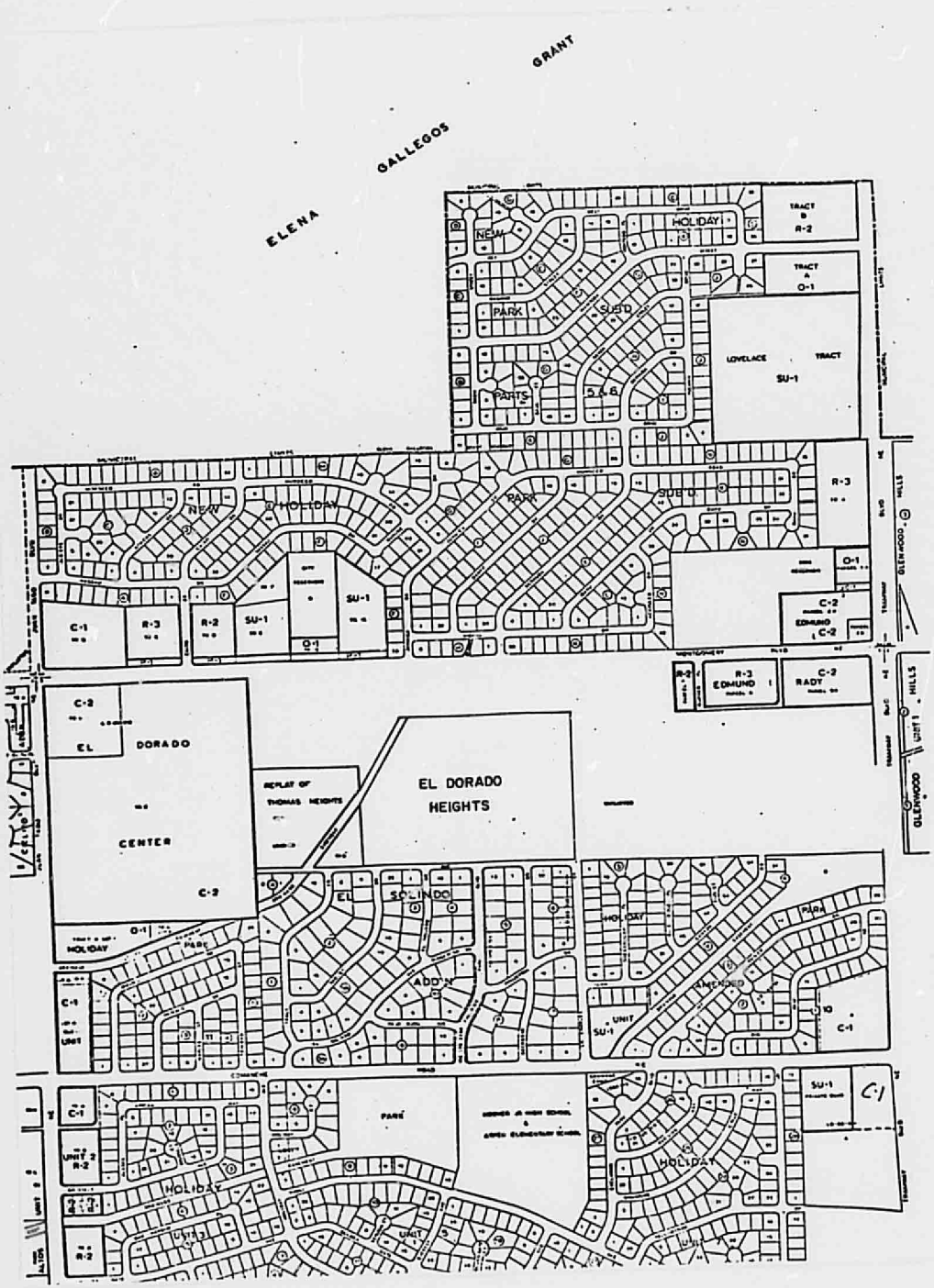
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C-2
R-3
EDMUND
C-2
RADY
OLENWOOD HILLS
UNIT 1
C-1
R-3
R-2
SU-1
O-1
C-2
EL
DORADO
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REPLAT OF THOMAS HEIGHTS
EL DORADO HEIGHTS
EL SOLINDO ADD'N
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PARK
AMENDED
UNIT
SU-1
C-1
C-1
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R-2
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EMCHART HEIGHT ENGINEERING INC.

EL DORADO HEIGHTS

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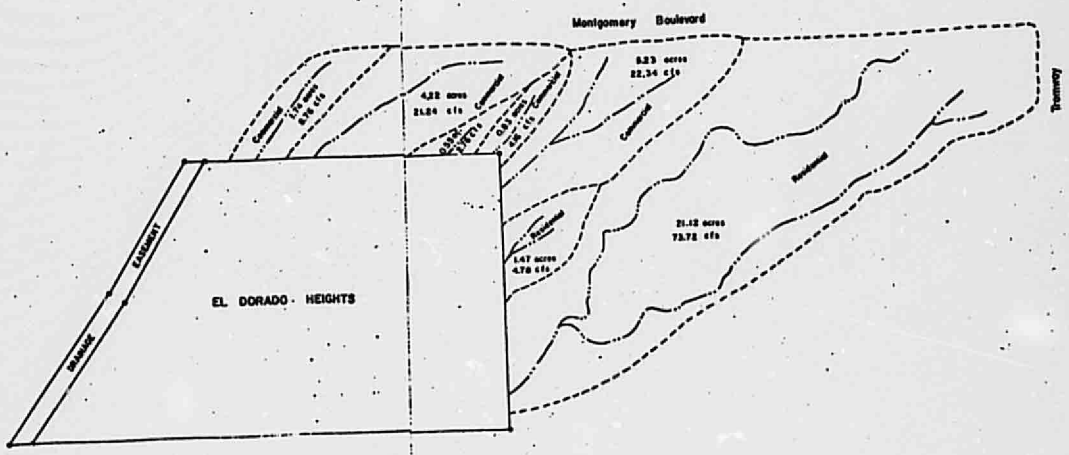

Commercial

TYPE OF SURFACE	PERCENT OF TOTAL SURFACE	RUNOFF COEFFICIENT
Roof	28 %	0.925
Paving	64 %	0.920
Unscoaded	8 %	0.250

1 = 6.0 m/hr

Residential

TYPE OF SURFACE	PERCENT OF TOTAL SURFACE	RUNOFF COEFFICIENT
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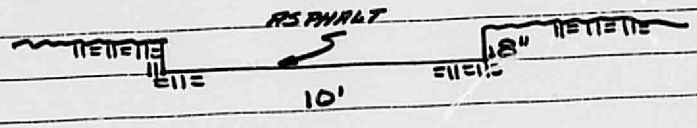
Channel A



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$Q = 141$ cfs

6.6 FPS

44 CFS

6.75

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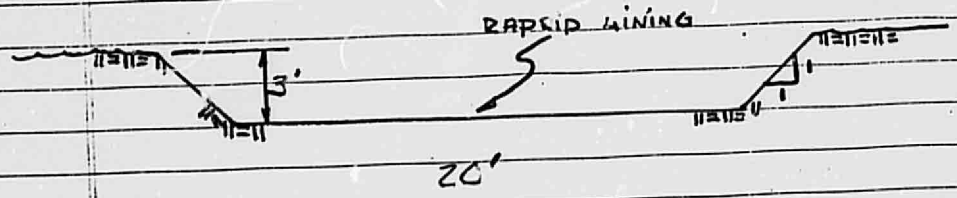

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ENGINEERS & PHOTOGRAMMETRISTS

BOHANNAN WESTMAN HUSTON & ASSOCIATES INC.

4125 CARLISLE BLVD. N.E.
ALBUQUERQUE, NEW MEXICO 87107
PHONE 505 881-2000

July 16, 1975

Mr. Kleston Laws
Assistant City Engineer, Hydrology
City of Albuquerque
P.O. Box 1293
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Chief Design Engineer

Enclosures

cc: Mr. Bill Biffel, Hooten & Stahl

MME/rak
Job No. 75-159

Bob —

Fold with El Dorado Hts. drainage study.

Sin

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Albuquerque, New Mexico
March 23, 1973

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