HYDROLOGY M16/D8 3 PLANS

M16/D8

3 Plans

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

MAYOR
David Rusk

May 8, 1979

Michael's V. R. Construction Co.
2820 Casa Del Norte Dr. N.E.
Albuquerque, N.M.

Ref: Construction Plans for 2525 Alamos S.E.
(Warehouses for John Lorenzo)

Gentlemen:

A drainage report was submitted for the referenced project by Engineering Associates, Inc., without a topographic map and a site grading plan to allow the verification of the adequacy of the proposal submitted. The report did not acknowledge the existence of a ponding area which will be obliterated by the proposed new construction (see attached drawing).

The topography supplied with the construction plans for the referenced project conflicts with the topography supplied by another engineer for an earlier phase of the development. If the topography supplied with the development plan submitted reflects existing conditions, a retaining wall must be constructed along the north side of the property. It also appears that a retaining wall is necessary for the southwest corner of the property to retain the runoff in the proposed ponding area. The grading plan must also contain sufficient information regarding the retaining walls that must be constructed, particularly in terms of the elevation of the foundation and the top of the walls.

As submitted the plan does not allow the verification of the amount of water that would be retained on the site as specified in the drainage report. The drainage report and the construction plans submitted can not therefore be approved.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

Enclosures

BC/ms

cc- Richard Heller, City Engineer
Rich Leonard, AMAFCA
August Mossman
Drainage file

DRAINAGE STUDY

for

A WAREHOUSE FOR JOHN LORENZO

RECEIVED
MAR 26 1979
CITY ENGINEERS

AUGUST F. MOSIMANN
STATE OF
NO. 6148
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

ALBUQUERQUE
BLDG. DEPT.
JAN 4 1979
U.B.C.
PLAN CHECK
SECTION

Engineering Associates, Inc.
August F. Mosimann, P.E.
2819 Claremont Place, N.E.
Albuquerque, New Mexico 87110

December 8, 1978

Design Guidelines

The site is located at the corner of Alamo Street and Columbia Avenue southeast.

The following formulas are used throughout this study:

Rational Formula $Q = CIA$

and

Runoff Volume Formula $V = CPA$

Where

Q = Runoff Rate (CFS)

I = Intensity (IN/HR)

A = Area (Acres or ft^2)

V = Volume (Cu. Ft.)

C = Runoff Coefficient

P = Precipitation (in)

The precipitation amount for this area is 2.3 in. for the 100 year - 6 hour storm. (See Fig. I).

The assumed runoff coefficients (C) are as follows:

Area Type	C
Paved	.90
Roof	.90
Landscaped	.40
Unimproved	.40

Existing Site Study

The southern portion of the existing site consists of a warehouse surrounded by a paved driving strip. The northern half is undeveloped. One half of the roof and the east drive strip are collected in a depressed area at the southeast corner. The remaining runoff flows to the undeveloped land where it is percolated into the ground.

The runoff from the undeveloped portion is toward the west boundary.

There are no significant offsite flows affecting the property.

The runoff coefficient "C" for the portion of the developed site which runs onto the undeveloped land is as follows:

Portion	Area (S.F.)	C	C x Area
½ of Roof	2592	.9	2333
Parking	7229	.9	6506
Totals	9821		8839

$$C = \frac{8839}{9821} = .90$$

The landslope is less than one percent.
The runoff length is 60 ft.
The concentration time is 10 min. (See Fig. 3).
The intensity is 189/(10 + 25) = 5.40 in/hr (See Fig. 2).

The runoff flow is

$$Q = CIA = .9 \cdot 5.40 \cdot \frac{9821}{43560} = 1.10 \text{ CFS}$$

The runoff Volume is

$$V = CPA = .9 \cdot 2.30 \cdot \frac{9821}{12} = 1694 \text{ Cu.Ft.}$$

This runoff will be ponded in a new landscaped area along the west boundary.

The runoff coefficient "C" for the undeveloped portion is .40.
The slope is less than one percent.
The runoff length is 150 ft.
The concentration time is 10 min. (See Fig. 4).
The intensity is 189/(10 + 25) = 5.40 in/hr.
The area is 21264 S.F.
The runoff flow is

$$Q = CIA = .40 \cdot 5.40 \cdot \frac{21264}{43560} = 1.05 \text{ CFS}$$

The runoff volume is

$$V = CPA = .4 \cdot 2.3 \cdot \frac{21264}{12} = 1630 \text{ Cu.Ft.}$$

Developed Site Study

The development consists of a new warehouse, paved driveway, and a landscaped area. The landscaped area will be used to pond additional runoff due to the new development and also the runoff from the existing development which is not routed to the existing ponding area.

The runoff coefficient "C" for the new development is as follows:

Portion	Area (S.F.)	C	C x Area
Paving	10603	.9	9543
Roof	7280	.9	6552
Landscaped	3381	.4	1352
Totals	21264		17447

$$C = \frac{17447}{21264} = .82$$

The land slope is less than 1%.
The length of runoff is 150 ft.
The concentration time is 10 min. (See Fig. 5).
The intensity is 189/(10 + 25) = 5.4 in/hr.
The runoff flow is

$$Q = CIA = .82 \cdot 5.40 \cdot \frac{21264}{43560} = 2.16 \text{ CFS}$$

The runoff volume is

$$V = CPA = .82 \cdot 2.3 \cdot \frac{21264}{12} = 3342 \text{ Cu.Ft.}$$

The calculation for the pond size to be provided in the landscaped area is as follows:

Existing Development Runoff		1694 Cu.Ft.
New Development Runoff		3342 Cu.Ft.
Runoff From Undeveloped Land	less	1630 Cu.Ft.
Net Pond Size		3406 [illegible]t.

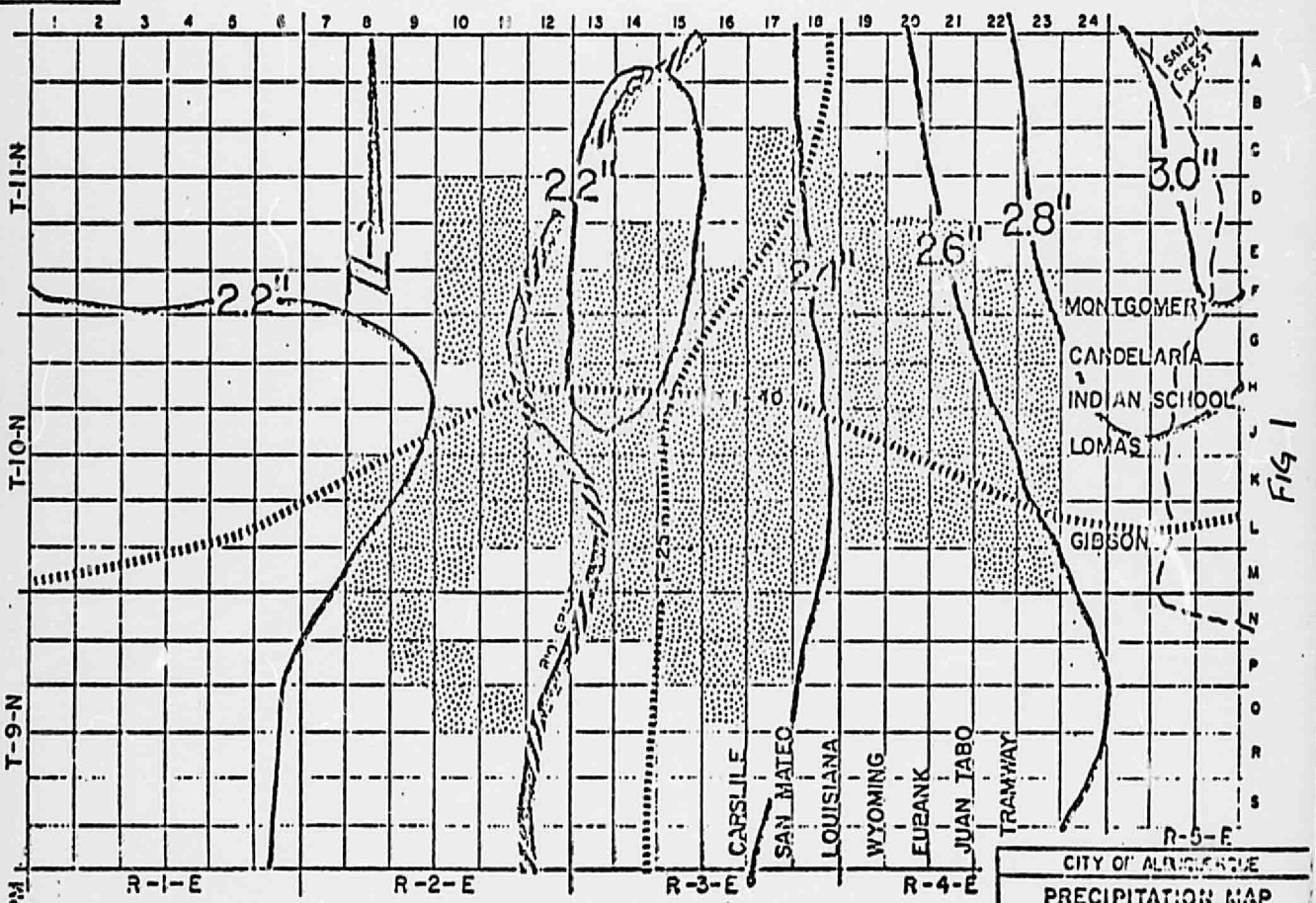
Recommendations and Conclusions

Grade the site so that the runoff from the west half of the existing building and from the existing north and west parking strips is routed into the new landscaped area. Also route the new development into the landscaped area. Provide a pond in

the landscaped area which will hold a volume 3554 Cu.Ft.

These recommendations will insure that the existing runoff conditions will not be altered by the new development.

DWG NO D1



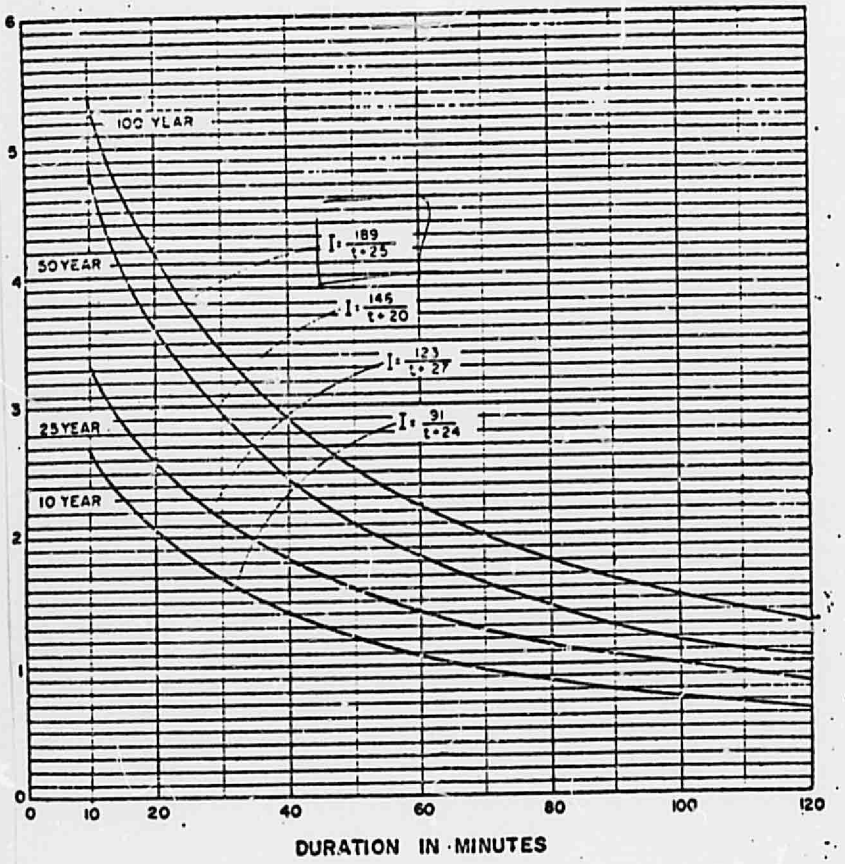
SOURCE: 1973, NOAA ATLAS 2, VOLUME IV.

MARCH 1976

CITY OF ALBUQUERQUE

PRECIPITATION MAP
100 YR 6 HOUR

DWG NO D



MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE - NEW MEXICO
AND ENVIRONS

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA - 1951)

GORDON HERKENHOFF & ASSOC
CONSULTING ENGINEERS
ALBUQUERQUE, NEW MEXICO

CHART 1

FIG. 2

DRAINAGE — RUNOFF — I

FIG A. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 2 YEARS.

FIG B. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 10 YEARS.

FIG C. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 50 YEARS.

FIG D. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 5 YEARS.

FIG E. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 25 YEARS.

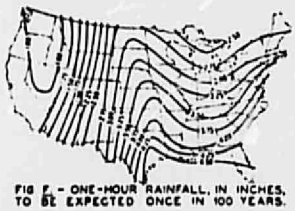


FIG F. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 100 YEARS.

COMPUTATION OF i IN RATIONAL FORMULA.

EXAMPLE: Assume expectancy period = 5 years, See Fig. D, assume locality, find 1 hour intensity = 1.75 in. per hour.

FIG. G-INTENSITY EXPECTATION FOR ONE-HOUR RAINFALL.*

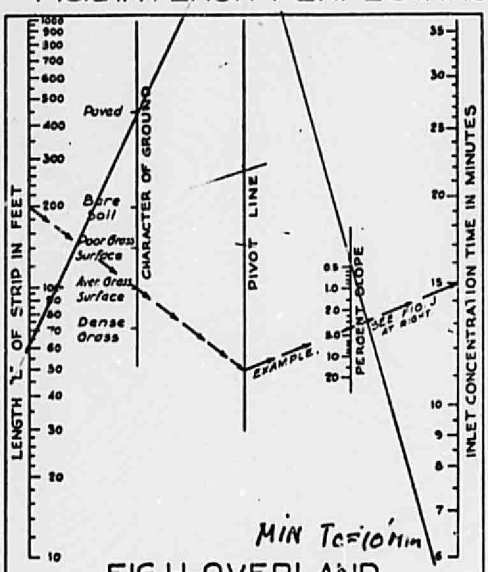


FIG. H-OVERLAND FLOW TIME.

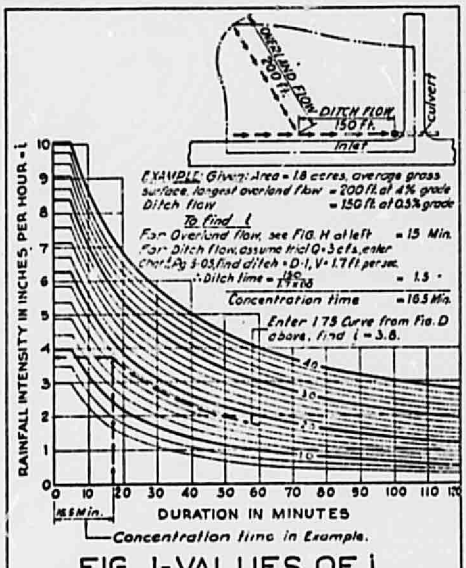


FIG. J-VALUES OF i
RAINFALL INTENSITY-DURATION.†

*Reproduced from Miscellaneous Publication No. 204, U.S. Dept. of Agriculture, by David L. Yarnell.
†Adopted from Engineering Manual of the War Department, Part XIII, Chap I, Dec. 45

FIG 3

DRAINAGE — RUNOFF — I

FIG. A - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 2 YEARS.

FIG. B - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 10 YEARS.

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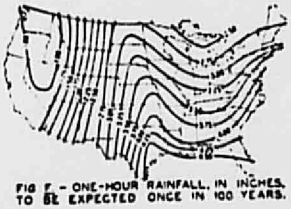

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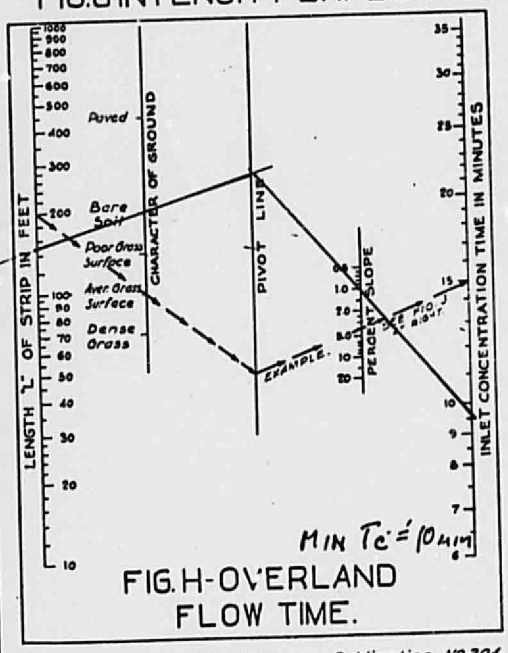

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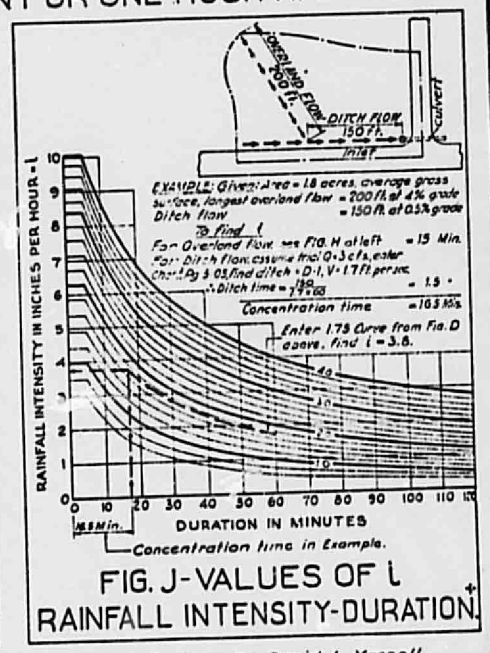

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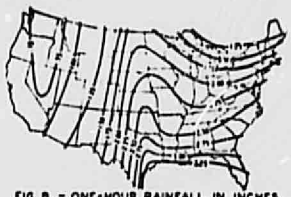
FIG 4

DRAINAGE — RUNOFF — I

FIG. A. - ONE-HOUR RAINFALL, IN INCHES, TO BE EXPECTED ONCE IN 2 YEARS.



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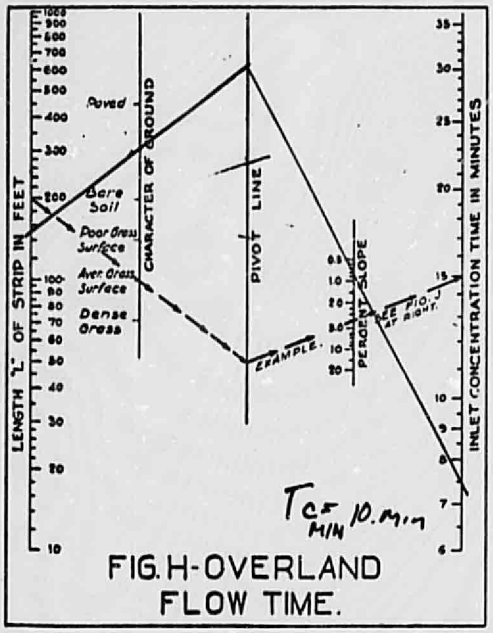

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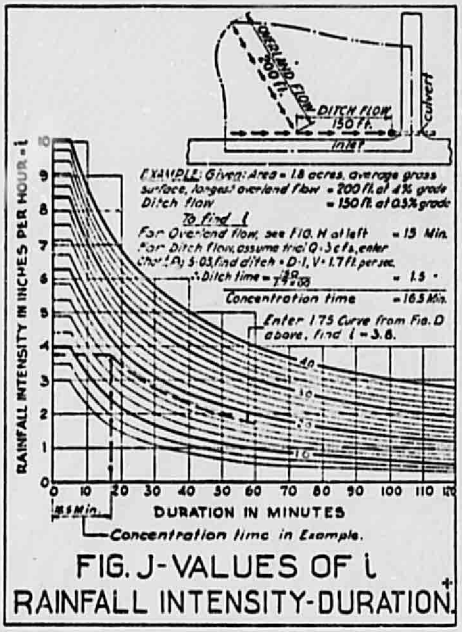

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FIG 5

7 5 2