HYDROLOGY K16/D4 NO PLANS

K16/D4

NO PLANS

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

May 7, 1976

Ralph K. Hicks and Associates
4000 San Pedro Drive N.E.
Albuquerque, New Mexico 87110

RE: DRAINAGE REPORT, MOUNTAIN STATES AGENCY PARKING ON GIRARD

Dear Mr. Hicks:

The subject drainage report is approved. Paving of the parking lot may proceed.

Very Truly Yours,

Kleston H Laws

Kleston H. Laws
Asst. City Engineer-Hydrology

KHL/tl

cc: John Robert
C.A. Coonce

Public Works Department

Director – Erwin F. Hensch, P. E. 766-7467
Engineering 766-7441 – V. M. Kimmick, P. E.
Street Maint. 766-7755 – G. E. Paul, P. E.

Ass't. Director – Harold R. Orr, Jr. P. E.
Liquid Waste 766-7535 – R. P. Lowe, P. E.
Water 765-7437 – W. H. Otto, P. E.

RALPH K. HICKS and Associates, Inc.

REGISTERED LAND SURVEYORS
LAND PLANNING CONSULTANTS

4000 SAN PEDRO DRIVE, N.E. • PHONE (505) 881-0012 • ALBUQUERQUE, NEW MEXICO 87110

APRIL 27, 1976

DEPARTMENT OF PUBLIC WORKS
CITY OF ALBUQUERQUE

ATTN: MR. KLESTON LAWS
ASSISTANT CITY ENGINEER - HYDROLOGY

RE: OFF-SITE PARKING FACILITY
MOUNTAIN STATES AGENCIES BLDG.

GENTLEMEN:

SUBMITTED HEREWITH IS THE DRAINAGE STUDY ON THE CAPTIONED SITE PREPARED BY C.A. COONCE & ASSOCIATES.

THE REPORT IS SUBMITTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPOSED CHANGE IN ZONING, FOR THE SUBJECT PARCEL AND AS THE OWNERS ARE ANXIOUS TO BEGIN THEIR IMPROVEMENTS, YOUR EARLY REVIEW AND APPROVAL WOULD BE APPRECIATED.

SHOULD YOU HAVE ANY QUESTIONS REGARDING THE ENCLOSED MATERIAL PLEASE CONTACT MR. C.A. "PAT" COONCE AT 296-9519 OR THOMAS J. HAACK OF THIS OFFICE.

THANKING YOU FOR YOUR CO-OPERATION, I REMAIN

VERY TRULY YOURS.
RALPH K. HICKS

Ralph K. Hicks

RALPH K. HICKS & ASSOC.

CC: MR. ROBERT FOSNAUGH
MR. LEONARD GOODELL
MR. C.A. COONCE
FILE

DRAINAGE STUDY
FOR
PROPOSED
OFF-SITE PARKING FACILITY
MOUTAIN STATES AGENCIES BLDG.
2814 CENTRAL AVE. S.E.
APRIL 1976

PREPARED BY:

C.A. COONCE & ASSOCIATES,
CONSULTING ENGINEERS
300 WYOMING BLVD., N.E
ALBUQUERQUE, NEW MEXICO 8712

IN ASSOCIATION WITH:
RALPH K. HICKS & ASSOC. INC.
SURVEYORS & PLANNERS
4000 SAN PEDRO DR. N.E.
ALBUQUERQUE, NEW MEXICO 87110

C.A. COONCE
NEW MEXICO P.E. #2934

DESCRIPTION OF PROJECT

LOCATION:

THE TRACT OF LAND CONSIDERED IN THIS REPORT IS COMPRISED OF LOTS 19 & 20, BLOCK 25 OF THE UNIVERSITY HEIGHTS ADDITION TO THE CITY OF ALBUQUERQUE, NEW MEXICO. THE TWO LOTS WITH AN AREA OF 14,200 S.F. (0.326 ACRES) ARE SITUATED ON THE WEST SIDE OF GIRARD AVE. S.E. APPROXIMATELY 200 FT. SOUTH OF CENTRAL AVE. S.E. AND BOUNDED ON THE NORTH BY A COMMERCIAL BUILDING, ON THE WEST BY A 16.0 FT. PUBLIC ALLEY, AND ON THE SOUTH BY SINGLE FAMILY RESIDENTIAL HOMES. THE PROPERTY IS CURRENTLY IN USE AS A PARKING FACILITY WITH CRUSHED STONE BASE COURSE AND PRE-CAST CONCRETE BUMPERS.

EXISTING DRAINAGE PATTERN:

THE SUBJECT TRACT IS CURRENTLY GRADED TO DRAIN FROM BOTH NORTH AND SOUTH PROPERTY LINES TO A SWALE MID - WAY BETWEEN THESE LIMITS AND THEN TO THE WEST WHERE STORM WATER IS THEN DISCHARGED TO THE EXISTING ALLEY AND THEN SOUTH IN THIS ALLEY.

IN LIGHT OF THE SURFACE CHARACTERISTICS OF THIS PROPERTY ALONG WITH IT'S DRAINAGE PATTERN, THE PRESENT RUN - OFF CO-EFFICIENT IS CONSIDERED TO BE 0.35 I.E. $C_E = 0.35$.

CURRENT RUN-OFF:

TIME OF CONCENTRATION AS CALCULATED FROM FIGURE 3-1 "OVERLAND TIME OF FLOW CURVES (7)", AN EXHIBIT TO THIS REPORT IS CALCULATED AT 15 MIN.

$$T.C._{E.} = 15 \text{ MIN.}$$

$$\text{THEREFORE: } I_E = \frac{189}{T+25} = 4.73 \text{ IN. PER HOUR}$$

THEREFORE: EMPLOYING THE "RATIONAL METHOD," PRESENT RUN-OFF IS CALCULATED TO BE:

$$Q_E = C_E \; I_E \; A.$$

$$Q_E = 0.35 \times 4.73 \times 0.33$$

$$Q_E = 0.55 \text{ C.F.S.}$$

IMPROVEMENTS PROPOSED:

IT IS PROPOSED BY THE OWNER OF THIS TRACT TO CONSTRUCT A PRIVATE PAVED, STRIPED & LANDSCAPED PARKING FACILITY FOR 46 AUTOMOBILES IN ACCORDANCE WITH THE LAYOUT & GRADING PLAN ATTACHED TO THIS REPORT. IN LIGHT OF THE PROPOSED GRADING CHARACTERISTICS AND BITUMINOUS CONCRETE PAVING MATERIALS. THE RUN-OFF CO-EFFICIENT IS CONSIDERED TO BE 0.90 I.E. $C_I = 0.90$.

IMPROVED RUN-OFF: (CRITICAL STORM)

TIME OF CONCENTRATION AS CALCULATED FROM FIGURE 3-1 "OVERLAND TIME OF FLOW CURVES (7)" AN EXHIBIT TO THIS REPORT IS CALCULATED AT 4 MIN.

$$T.C._I = 4$$

THEREFORE: $I_I = \frac{189}{T+25} = 6.52$ IN. PER HOUR.

THEREFORE: EMPLOYING THE "RATIONAL METHOD" IMPROVED RUN-OFF IS CALCULATED TO BE:

$$Q_I = C_I \; I_I \; A$$

$$Q_I = 0.70 \times 6.52 \times 0.33$$

$$Q_I = 1.93 \text{ C.F.S. (USE 2.0)}$$

CONCLUSIONS & RECOMEDATIONS:

THE PROPOSED IMPROVEMENT FOR THIS TRACT WILL INCREASE THE RUN-OFF BY 1.45 C.F.S. THEREFORE, IN ORDER TO CONFORM TO SECTION 3.B. OF AMAFCA RESOLUTION NO. 72-2, THE ADDITIONAL STORM FLOW IS TO BE RETAINED IN THE SOUTHWEST CORNER OF THE FACILITY AND DISCHARGED VIA A 4" WIDE WEIR OPENING AT GRADE (0.55 C.F.S.) TO THE ALLEY. THE VOLUME OF DETENTION REQUIRED IS: 1171 CUBIC FEET.

DUE TO THE NATURE OF EXISTING ELEVATIONS ON THE PERIMETER OF THE PROPERTY, IT IS NECESSARY TO CONSTRUCT A "SPEED BUMP" ALONG THE WEST LINE OF THE TRACT TO DIVERT WATER INTO THE RETENTION AREA. THIS THEN RESULTS IN AN OVERFLOW ELEVATION OF 99.50 THUS RESULTING IN A PONDING AREA OF 3,612 S.F. AN AVERAGE OF 4" DEEP THUS RETAINING 1,192 CUBIC FEET OF WATER.

ANALYSIS:

RETENTION VOLUME CALCULATION:

THE FOLLOWING FORMULAE ARE TAKEN FROM "A SIMPLE METHOD FOR RETENTION BASIN DESIGN", WATER & SEWAGE WORKS, DECEMBER, 197 WHEREIN THE FORMULA DERIVATION AND SUPPORTING LOGIC CAN BE FOUND. CERTAIN CONSTANT VALUES HAVE BEEN MODIFIED TO FIT RAIN FALL-INTENSITY DURATION CHARACTERISTICS OF THE ALBUQUERQUE METROPOLITAN AREA.

$$Q_O = \frac{\text{ALLOWABLE DISCHARGE}}{X\ C_I}$$

$$Q_O = \frac{0.55}{0.33\ X\ 0.90}$$

$$Q_O = 1.85$$

TIME OF MAXIMUM STORAGE.

$$T = -25 + \frac{7087.5}{Q_O}$$

$$T = 36.86 \text{ MINUTES}$$

VOLUME OF STORAGE PER ACRE IMPERVIOUSNESS.

$$V_S = \frac{11340T}{T+25} -- 40\ Q_O T$$

$$V_S = \frac{11340\ (36.86)}{36.86 + 25} - 40(1.85)\ (36.86)$$

$$V_S = 4029\ FT^3/\text{ACRE IMPERVIOUSNESS}$$

TOTAL VOLUME OF STORAGE REQUIRED.

$$V_T = V_S\ (A\ X\ C_I)$$

$$V_T = 4029\ (0.33\ X\ 0.90)$$

$$V_T = 1196\ FT^3$$

DISCHARGE WEIR.

$$Q = C_W\ LH\ 3/2$$

WHERE $C_W = 3$ AND FULL 8" STORAGE AND H = 0.67 FT.

$$L = \frac{Q}{C_W\ X\ L\ 3/2}$$

$$L = \frac{0.55}{3\ X\ 0.673/2}$$

$$L = 0.33 \text{ FT.}$$

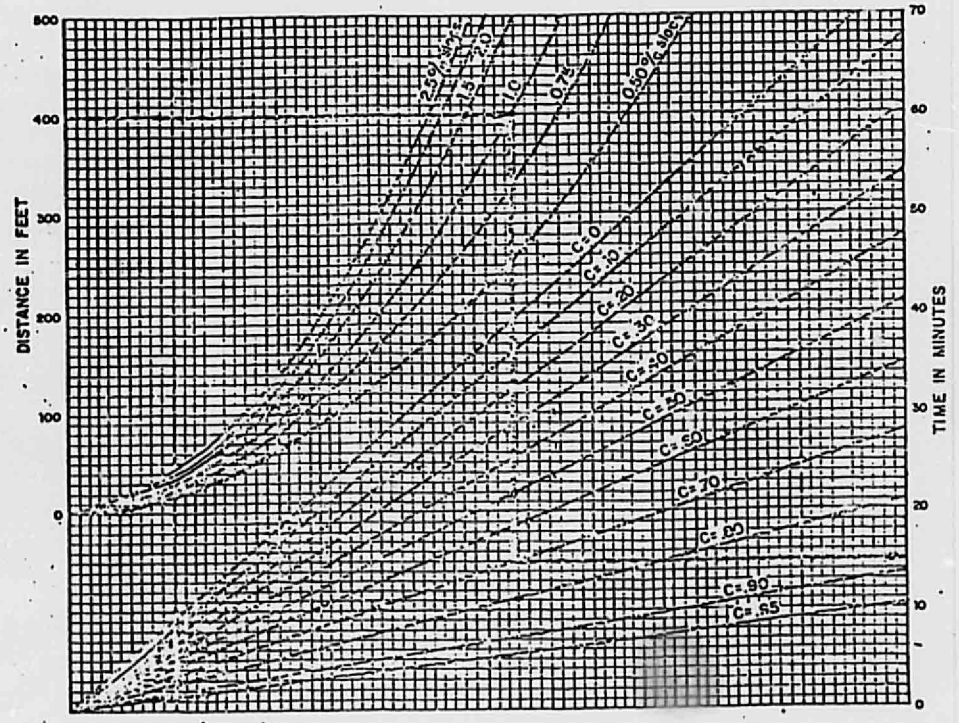
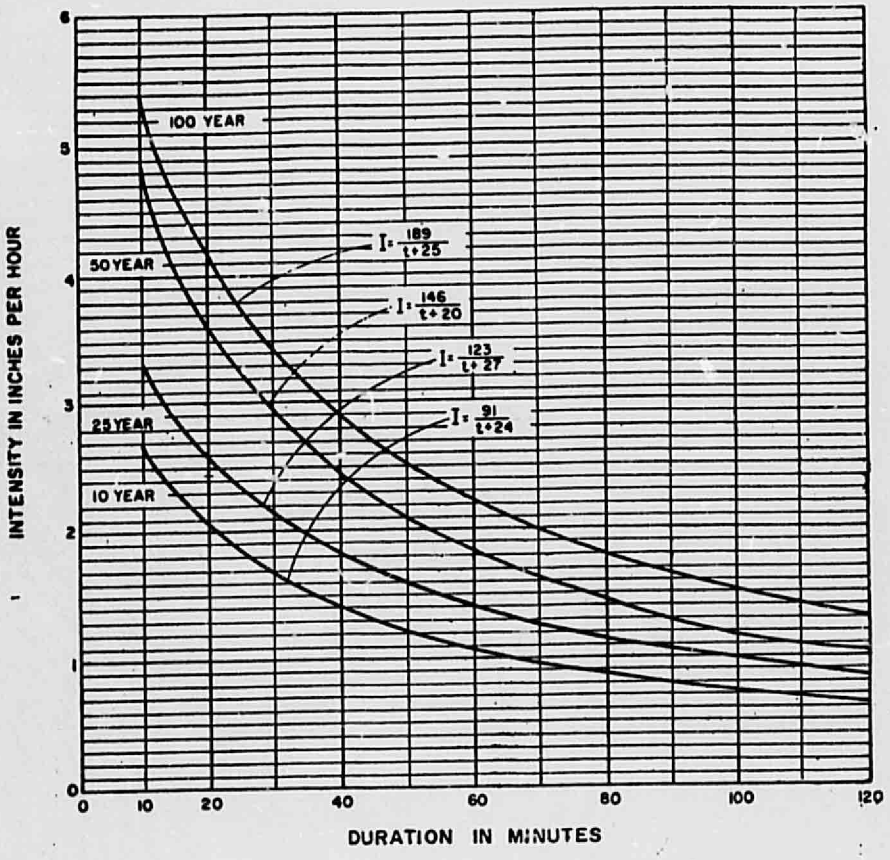


FIGURE 3-1. OVERLAND TIME OF FLOW CURVES(7)



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

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA - 1961)

GORDON HERKENHOFF & ASSOC
CONSULTING ENGINEERS
ALBUQUERQUE, NEW MEXICO

CHART 1

UNIVERSITY
OF
NEW MEXICO
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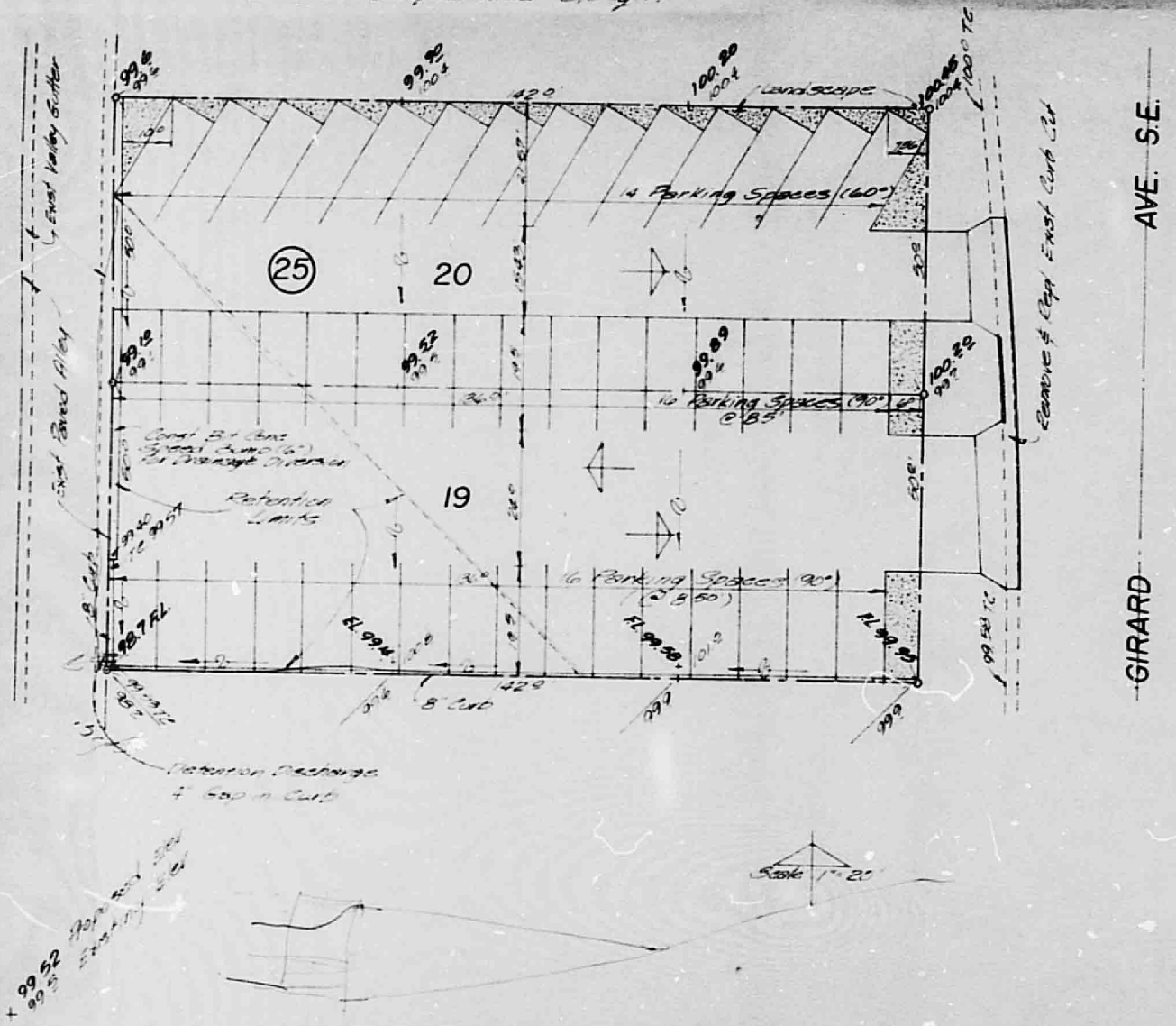

PROPOSED

OFF-SITE PARKING FACILITY

MOUNTAIN STATES AGENCIES BLDG.

2814 CENTRAL AVE. S.E.

APRIL 1976

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
NO. 2934
CARROLL A. COONCE

PREPARED BY:

C. A. COONCE & ASSOCIATES

IN ASSOCIATION WITH:

RALPH K. HICKS & ASSOC., INC.

76-3-