HYDROLOGY K10/D7 3 PLANS

K10/D7

3 Plans

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

April 1, 1980

Gerald R. Herr
Michael Baker, Jr., Inc.
Box 3225
North Fourth Street
Harrisburg, Pennsylvania 17105

K10-07

Reference: Skyview West Unit II

Dear Mr. Herr:

I just received the information requested of Mr. John Bettis, for the referenced Subdivision.

I hope that you will be able to confirm of the removal of these properties from the Flood Hazard designations.

Very truly yours,

Bruno Conegliano
Assistant City Engineer/Hydrology

BC/lc
encl.

MUNICIPAL DEVELOPMENT DEPARTMENT
Richard S. Heller, P.E., City Engineer
ENGINEERING DIVISION
Telephone (505) 766-7467

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

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Bruno

1313 SAN PEDRO N.E.
ALBUQUERQUE, N. M. 87110

Phone
(505) 266-4475

G. & R. BUILDERS, INC.

August 9, 1979

Department of Engineering
City of Albuquerque
Albuquerque, New Mexico 87103

~~K10~~
K10-D7

Sir:

In and for consideration of a final approval of Skyview West Unit II G. & R. Builders, Inc. guarantees to the City of Albuquerque to re-work paving to provide for the proper drainage at the intersection of Churchill Lane and Judith Lane SW.

This work will commence immediately upon engineering data to be provided by Mr. John Bettis of Enchantment Engineering.

Thank you for your attention in this matter.

RECEIVED
AUG 10 1979
CITY ENGINEER

Sincerely,

Patrick O. Russell

Patrick O. Russell, President
G. & R. BUILDERS, INC.

APPROVED:

C. D. Sheppard, P.E.

C. Dwayne Sheppard
Assistant City Engineer-Field

August 10, 1979

C.C. R. Heller
E. Hargett
R. Dawson
G. & R. Builders, Inc.
HL Martinez

Copy Skyview West —
Copy in Request
for Map Amend file
orig letter in
Cert rec file
letter filed

1313 SAN PEDRO N.E.
ALBUQUERQUE, N. M. 87110

Phone
(505) 266-4475

G. & R. BUILDERS, INC.

June 25, 1979

Mr. Bruno Consgliano
Asst. City Engineer - Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, N. M. 87103

K10-07

Dear Sir:

We respectfully request a release to purchase building permits at the following properties in Skyview West Unit II Subdivision.

420 Sesame Street - Lot 1 Block 13
7300 Grover Ct. - Lot 1 Block 12
7308 Grover Ct. - Lot 3 Block 12
7312 Grover Ct. - Lot 4 Block 12

It is our understanding that John Bettis of Enchantment Engineering Co. has prepared necessary documentation for the purpose of requesting these properties be released from the flood hazard area and that the information has been forwarded to Flood Insurance Administration/HUD by Mr. Heller. We have been informed that this may take approximately two to three weeks. In the meantime we are enclosing copies of flood insurance on the afore-mentioned properties in the hope that we may be allowed to purchase building permits and commence construction.

We will comply with required retaining walls along the western and southern boundry lines if necessary.

Truly Yours

Helen M. Fuge

Helen M. Fuge, Agent
G. & R. BUILDERS, INC.

City of Albuquerque

December 11, 1978

G & R Builders
1313 San Pedro N.E.
Albuquerque, New Mexico 87110

RE: FLOODING ON SKYVIEW WEST UNIT 2

Gentlemen:

Since lots on the South side of Grover Ct. and on the East side of Sesame St. are shown to lie in the flood hazard area according to exhibit Flood Hazard Boundary Map 20 for the City of Albuquerque published by the F.I.A., building permits cannot be granted.

Specifically, the lots affected bear the addresses Grover Ct. 7300 through 7312 and Sesame St. 416 & 420. Variance may be granted if the Engineer for the Developer can convincingly evaluate the 100 yrs. frequency flood elevation and demonstrate to the City Engineer's Office that the finished floor elevation is above the flood level. The lots in question cannot receive variance if they lie within the floodway.

Sincerely,

Bruno Conegliano
Asst. City Engineer Hydrology

BC/tl

cc: Rick Leonard, AMAFCA
Richard Heller, City Engineer
Charles Volz, Supt., Building Inspection
Fred Aguirre, Asst. Hydrology Engineer
John Bettis, Enchantment Engineering
Dr. File

LETTER OF TRANSMITTAL

CHAMBERS-CAMPBELL-ISAACSON-CHAPLIN, INC.
3500 Indian School Road, N.E.
Albuquerque, New Mexico 87106
Phone: (505) 266-5521

DATE 10-3-73 JOB NO.
ATTENTION: Don Campbell
RE: Sleepview West # 2

TO
City Eng.

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following:

☐ Plans ☐ Specifications ☐ Copy of Letter ☐ Prints

☐ Weekly Inspection Report ☒ Drainage Report

COPIES	DATE	NO.	DESCRIPTION
1	10-2-73		Sleepview West # 2 Drainage Report

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit ___ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit ___ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return ___ corrected prints

☒ For review and comment ☐ _____

REMARKS
We are submitting this report for your review and comment prior to requesting signatures from the City Engineer for the City Commission Meeting on Oct 29th

COPY TO _____

SIGNED: Clio Wain

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE.

DRAINAGE STUDY

FOR

SKYVIEW WEST SUBDIVISION

UNIT NO. 2

SEPTEMBER 1973

APPROVED FOR DRAINAGE

10-11-73
DATE

HYDROLOGIST
TITLE

SIGNATURE

CONTINGENCIES

DRAINAGE STUDY

FOR

SKYVIEW WEST SUBDIVISION

UNIT NO. 2

SEPTEMBER 1973

APPROVED FOR DRAINAGE

10-11-73
DATE

Hydrologist
TITLE

SIGNATURE

CONTINGENCIES

DRAINAGE STUDY

FOR

SKYVIEW WEST SUBDIVISION

UNIT #2

SEPTEMBER 1973

PREPARED BY:
CHAMBERS, CAMPBELL, ISAACSON & CHAPLIN, INC.
3500 INDIAN SCHOOL ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87106

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Plat A	Site Map Scale 1" = 4740'	
Plat B	Site Map Scale 1" = 2000'	
Plat C	Topography Map and Drainage of Site in Undeveloped Stage Scale 1" = 200'	
Plat D	Topography Map and Drainage of Site in Developed Stage Scale 1" = 50'	
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Figure I

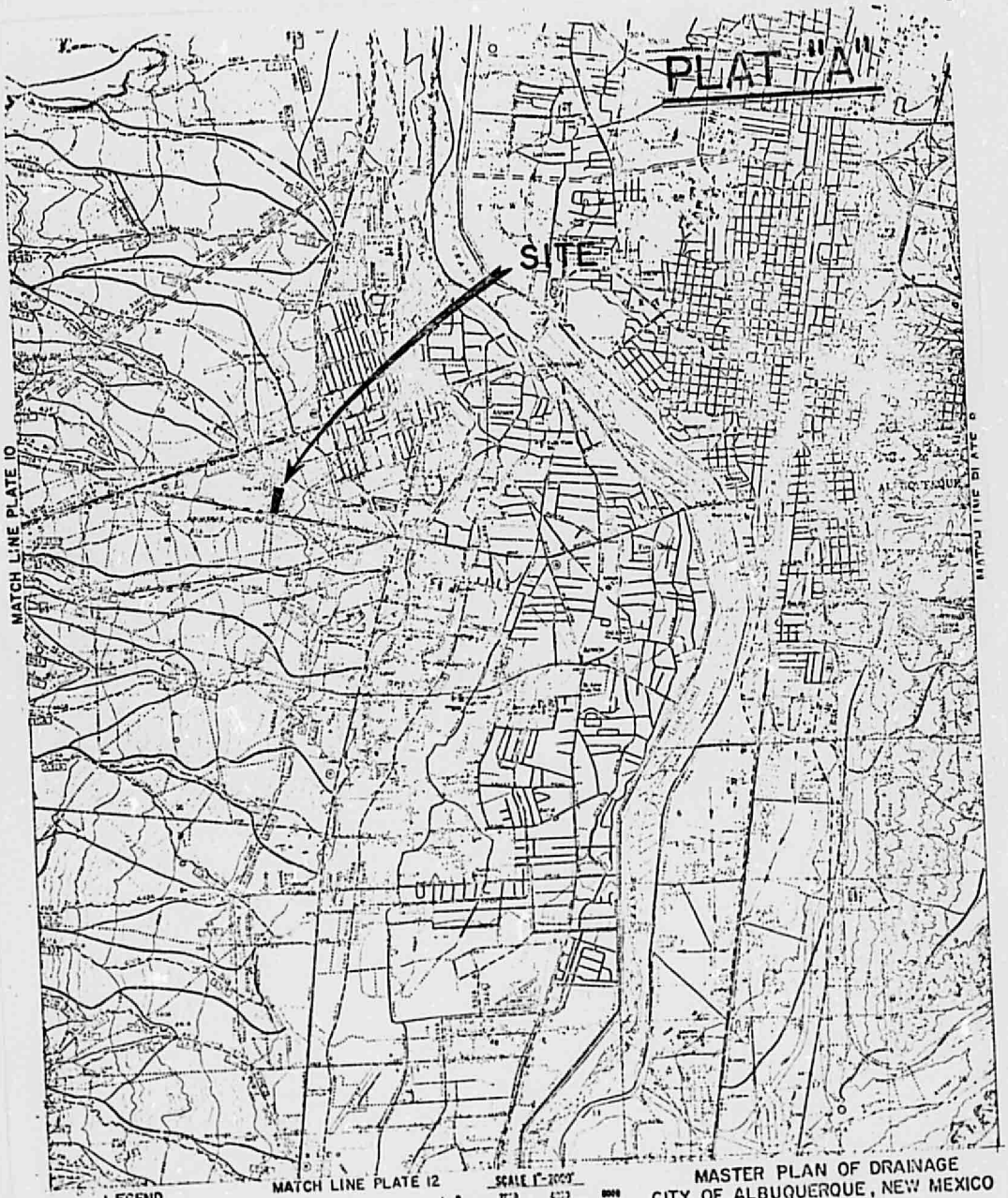
Calculation Sheet I

Plat E Time of Concentration of Small Drainage Basins

Plat F Intensity Duration Frequency Curve

Table IV Street Carrying Capacities

Bibliography of References



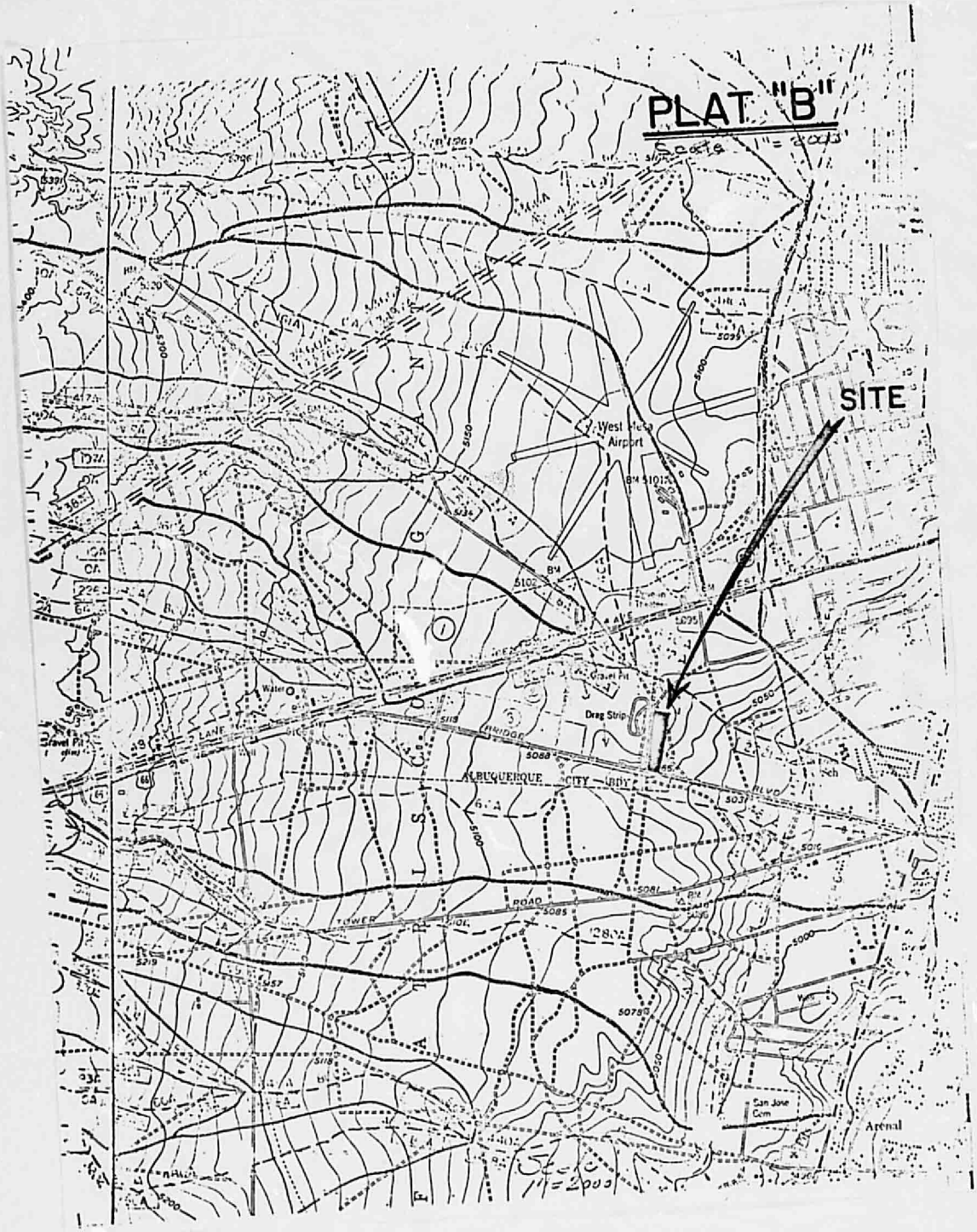
LEGEND

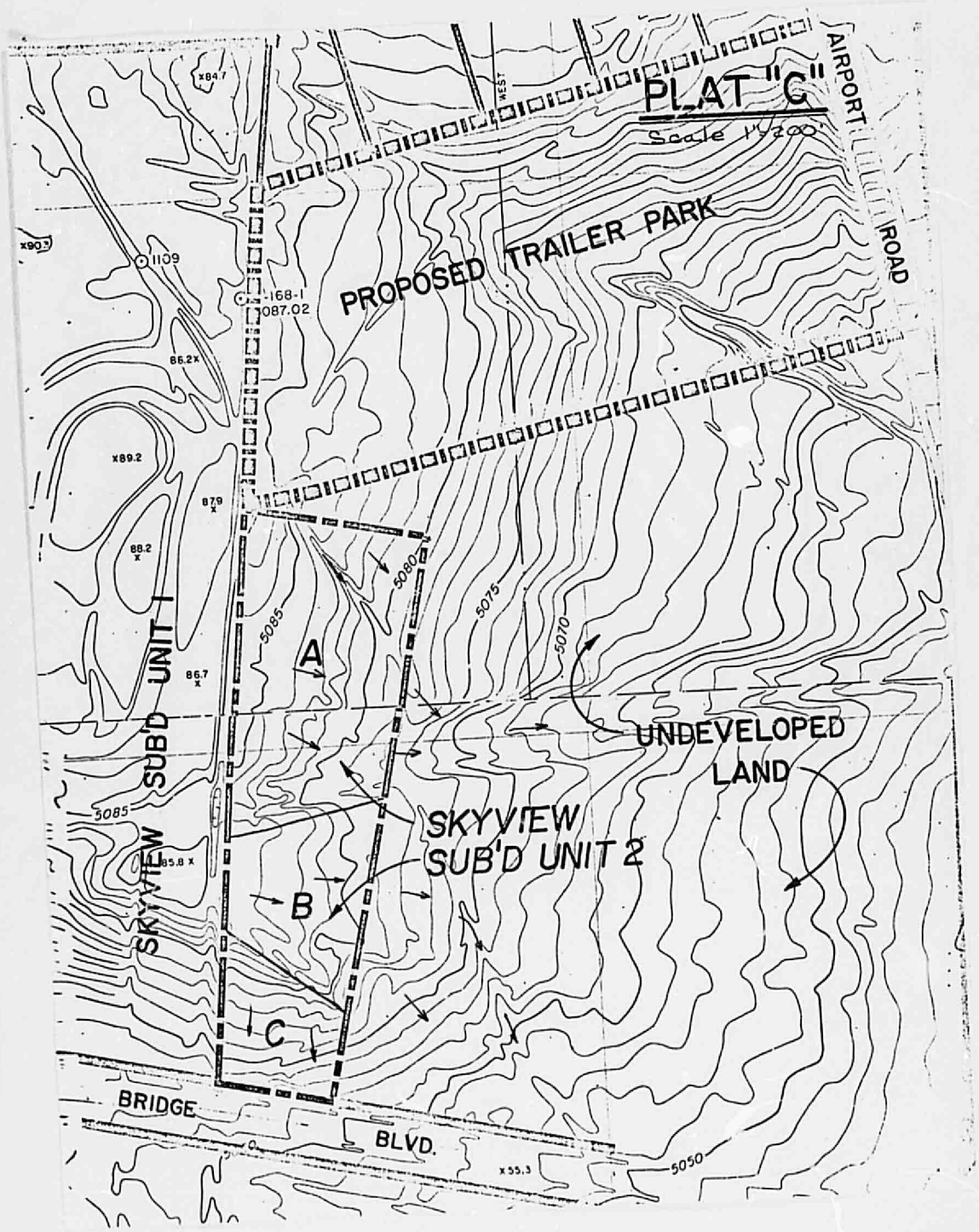
LIMIT OF DRAINAGE AREA
LIMIT OF SUB-DRAINAGE AREA
DRAINAGE EASEMENT
NATURAL DRAINAGE AREA
DRAINAGE AREA AFTER DEVELOPMENT

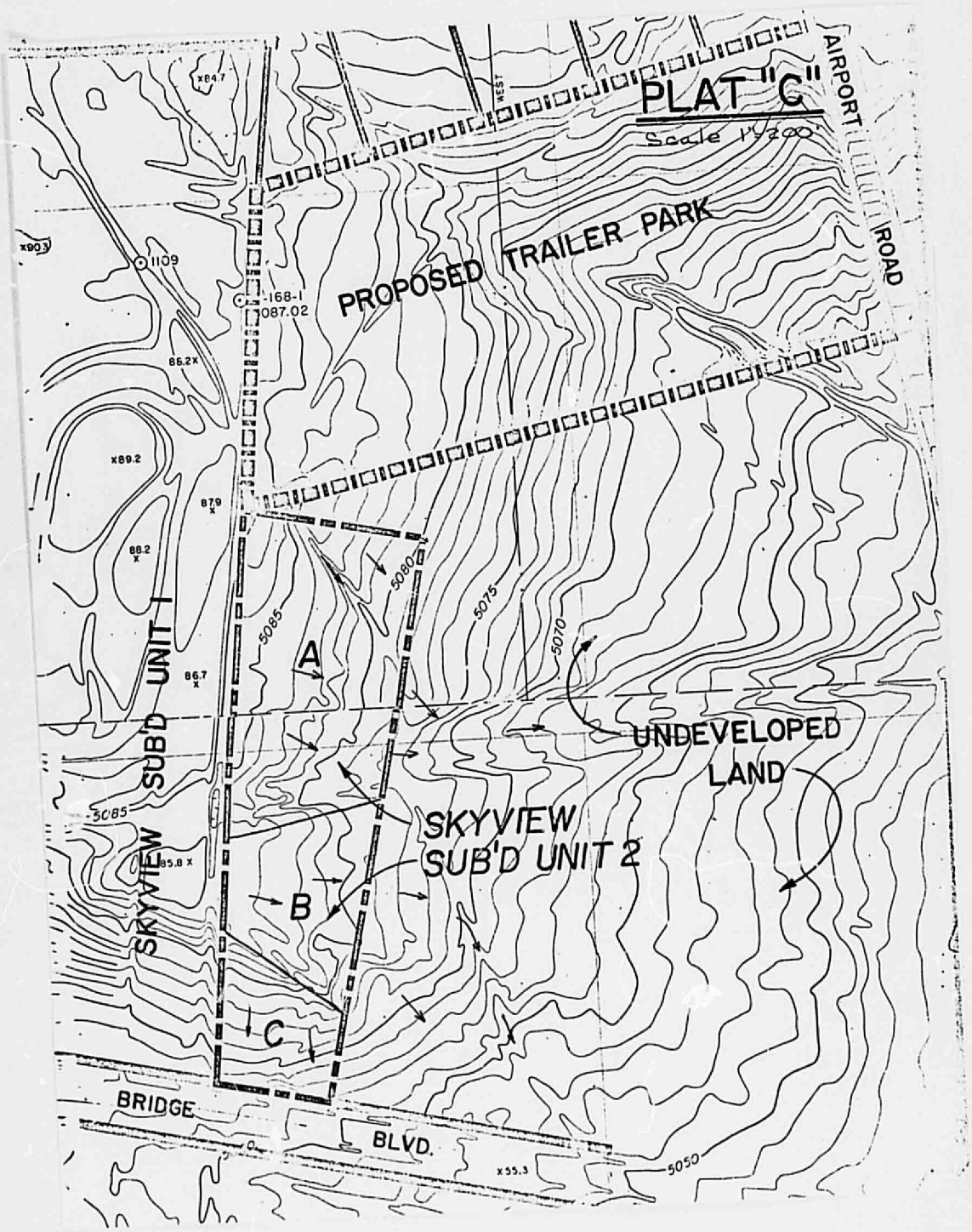
MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE, NEW MEXICO
AND ENVIRONS

PLAT "B"

Scale 1" = 2000'




PLAT "G"
Scale 1"=200'
AIRPORT ROAD
PROPOSED TRAILER PARK
SKYVIEW SUB'D UNIT 1
SKYVIEW SUB'D UNIT 2
UNDEVELOPED LAND
A
B
C
BRIDGE BLVD.
5085
5080
5075
5070
5050
WEST


PLAT "C"
Scale 1"=200'
PROPOSED TRAILER PARK
AIRPORT ROAD
WEST
SKYVIEW SUB'D UNIT 1
SKYVIEW SUB'D UNIT 2
UNDEVELOPED LAND
A
B
C
BRIDGE BLVD.
5085
5080
5075
5070
5050
1109
168-1
087.02
86.2
89.2
87.9
88.2
86.7
85.8
84.7
90.3
55.3

PURPOSE

The purpose of this report is to analyze the drainage characteristics of this subdivision in two forms: the undeveloped stage and the developed stage. The base runoff was established from the subdivision in its undeveloped form. This quantity established the maximum runoff allowed in the developed form. By using back yard ponding, it will be shown how the flow from the developed subdivision will not exceed the base runoff.

INTRODUCTION

Skyview West Subdivision Unit #2 is located southwest of Albuquerque, in the southeast corner of Section 22, and the northeast corner of Section 27, T10N, R2E, N.M.P.M. (See Plat A & B)

The subdivision lies under the shadow of its big brother, Skyview West #1, which is to the west. No flow from Skyview West #1 enters Skyview West #2*. To the north of Skyview West #2 is a proposed trailer park. No flow enters Skyview West #2 from this area in its present undeveloped state because the topography dictates that the drainage flows to the east (See Plat C). When the trailer park is eventually developed, it will be self contained to the extent that the only external drainage that will be contributed to surrounding areas will be onto

*Skyview West #1 Drainage Report by Chambers-Campbell-Isaacson & Chaplin, Inc.

Airport Road*. The area east of Skyview #2 is undeveloped land at present, which slopes away to the east. (See Plat C)

There are no natural drainage swales passing through the subdivision, thus the development of this subdivision will not cause any rerouting of flows from their natural state.

CALCULATIONS

In analyzing the storm runoff, the Rational Formula, Q= AIR, was used. Where:

Q = Runoff quantity in cubic feet/second

A = Contributing area in acres

I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Chart 1, Appendix A, the "Master Plan of Drainage, City of Albuquerque, New Mexico" by Herkenhoff & Associates. (Where a Time of Concentration [Tc] is less than ten minutes, the Intensity value equal to ten minutes was used.)

R = Runoff coefficient (no unit)

Quantities of runoff were computed on a 100 year storm frequency for both the undeveloped condition and for the proposed final developed form.

PHASE I

Phase I consisted of analyzing the subdivision in the undeveloped form. The resulting flow was broken down into

*Drainage Report for Dick Burmeister, by Chambers, Campbell, Isaacson & Chaplin, Inc.

three (3) areas, A, B, and C. (See Plat C)

In Area A, the flow is in an easterly direction, with sheet flow accumulating in a natural swale to the southeast of this area, which empties onto Airport Road. (See Plat C).

Area B also has sheet flow across the subdivision with general accumulations in a natural swale to the east of this area, which empties onto Bridge Boulevard. (See Plat C)

In Area C, the runoff is sheet flow which accumulates on Bridge Boulevard.

The runoff coefficient used for undeveloped areas equals 0.45. (Table XII, Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963, G. Herkenhoff and Associates.)

TABULATION OF RESULTS - PHASE I

Drainage Areas	ELEV. DIFF. FT.	LENGTH OF FLOW FT.	Tc Min.	I "/Hr.	R No Unit	AREA ACRES	Q cfs
A	7	420	3.8 (10)	5.4	0.45	3.71	9.02
B	5	250	2.5 (10)	5.4	0.45	1.65	4.01
C	11	270	2.1 (10)	5.4	0.45	1.10	2.67

Total of runoff flows from undeveloped subdivision = 15.70

PHASE II

Phase II consisted of analyzing the subdivision in its developed form. The resulting runoff flow and area contributing to the internal flow is shown at the intersection of O'Sullivan Lane and the west boundary. (Plat D)

For Skyview West Subdivision Unit #2, the back yard

ponding concept was incorporated into the design as the most economical alternative for reducing the flow below the base runoff. (See Figure I)

The area ponding includes the side yard areas, starting at the middle of the house, and sloping to the rear. Because the majority of houses built today utilize pitch roof design, the assumption was made that one-half (1/2) the roof area flows to the rear yard while the other half flows to the front.

In this design, it was desirable to develop a composite runoff coefficient based on the percentage of different types of surface in the drainage area. This procedure was applied to a typical "sample" block to arrive at a reasonable value of the coefficient for the non-ponding areas. (See Calculation Sheet I). The runoff coefficients used are as follows- (Table 3-2, Urban Storm Drainage Criteria Manual, Volume I, Denver Regional Council of Governments).

Streets, Walks & Drives	R = 0.90
Roofs	R = 0.90
Lawns, Sandy Soils: Avg., 2 to 7%	R = 0.15

Because the above values are only applicable for storms of five to ten year frequencies, the Rational Formula can be adjusted by a frequency factor C_f, which is used to account for antecedent precipitation conditions. A C_f factor of 1.25 for a 100 recurrence interval was used and this adjustment was

reflected in the composite runoff coefficient. (Section 3.7 and Table 3-3, Urban Storm Drainage Criteria Manual, Volume I, Denver Regional Council of Governments.) (See Calcualtion Sheet I)

TABULATION OF RESULTS - PHASE II - PLAT D

DRAINAGE BASINS	ELEV. DIFF. FT.	LENGTH OF FLOW FT.	Tc Min.	I "/Hr.	R No Unit	AREA ACRES	Q cfs
SW #II	10.4	1025	9.8 (10)	5.4	0.76	3.18	13.05

SUMMARY

Skyview West Subdivision Unit #2, by utilizing back yard ponding, after development will have less internal runoff than that which existed before development; i.e. 13.05 cfs developed vs. 15.70 cfs undeveloped.

Although the runoff before development was generally sheet flow, the development of the subdivision, and consequently the concentration of these flows, will not overburden any of the street systems of the adjoining area. To insure that the flow coming down O'Sullivan Lane can make the turn to the west without overtopping the south curb, from Point I to Point II (See Plat D), the street will have a constant 2% cross slope with the high side on the south curb. Additionally, Aster Road will be at the minimum slope which will help reduce the velocity of runoff from the Skyview West #2.

In final analysis, the development of Skyview West Subdivision Unit #2, should have a beneficial effect on the drainage characteristics of this area.

Respectfully Submitted,

Thomas O. Isaacson, for

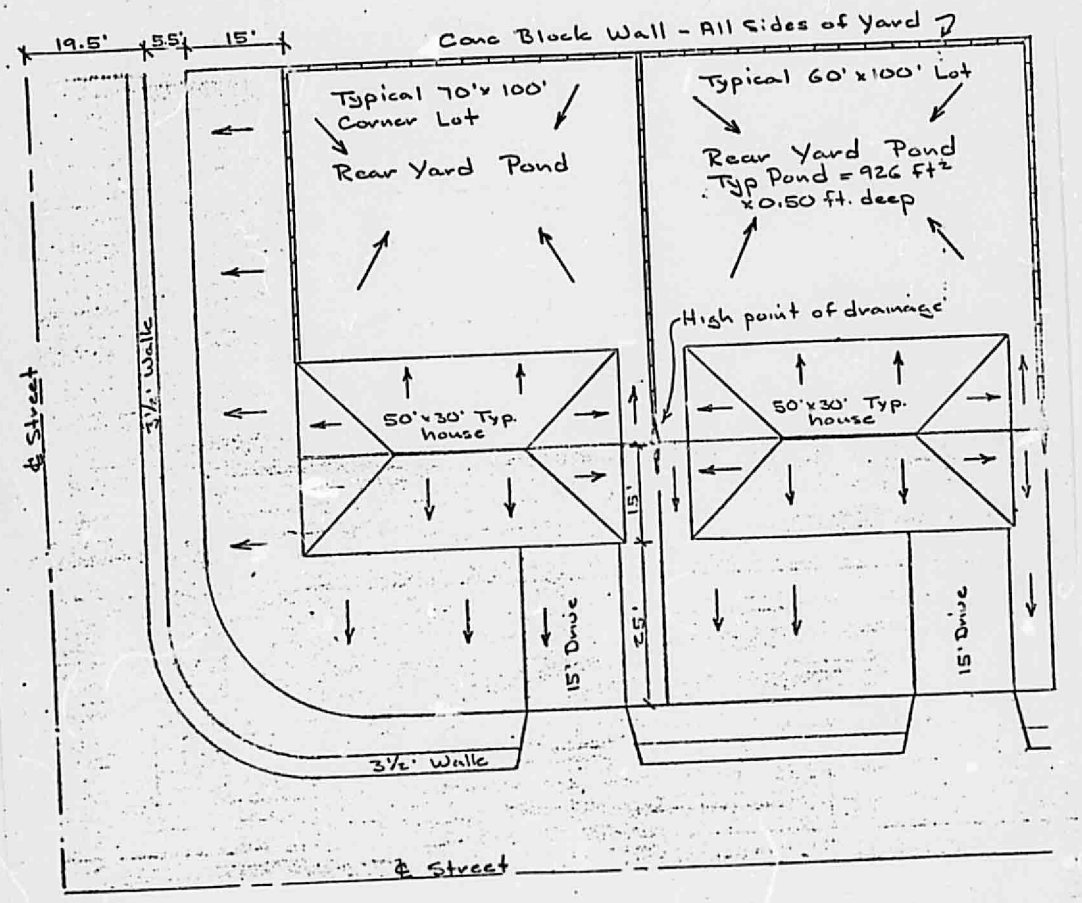
CHAMBERS, CAMPBELL
ISAACSON & CHAPLIN, INC.

TOI:dd

REGISTERED PROFESSIONAL ENGINEER
LAND SURVEYOR
NO. 3895
NEW MEXICO
THOMAS O. ISAACSON

FIGURE I

Typical Lot Drainage



Shaded Area = Runoff Area for Composite Runoff Coefficient

Pond Area for 60'x100' Lot

R = 0.15 classification Vol = 285 ft³ Runoff

R = 0.90 classification Vol = 178 ft³ Runoff

≤ = 463 ft³/6hr-100 yr.

Data - 3"/6hr-100 yr Storm Technical Paper No 40-U.S. Dept. of Commerce.

CHAMBERS, CAMPBELL, ISAACSON & CHAPLIN
ENGINEER-ARCHITECT-PLANNERS
ALBUQUERQUE, NEW MEXICO

SUBJECT Skyview West Subdivision #II

CLIENT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. ____ OF ____

Typical 60'x100' Runoff Area Breakdown

R = 0.90

Street & Walk Area (19.5'x60') = 1170 ft²
Roof Area (15.0'x50') = 750 "
Driveway (30.5'x15') = 458 "
Σ = 2378 ft²

R = 0.15

Front & Side Yard - Minus Driveway & ½ Roof Area
(45.5 x 60) - 1208 ft² = 1522 ft²
Σ = 1522 ft²

Total Area Drained = 3900 ft²

Typical 70'x100' Runoff Area Breakdown

R = 0.90

Street & Walk Area (19.5 x 200.5) = 3910 ft²
Roof Area (50.0 x 15) = 750 "
Driveway (30.5 x 15) = 458 "
Σ = 5118 ft²

R = 0.15

Front & Side Yard Areas - Minus Driveway & ½ Roof Area
(75.5 x 45.5) + (20.5 x 60) - 1208 ft² = 3457 ft²

Total Area Drained = 8575 ft²

Assuming a typical Block consisting of 12 lots, 2 of which are side street lots - total area drained for the Block is -

(3900 x 10) = 39,000
(8575 x 2) = 17,150
Σ = 56,150 ft² Drained Area

1) Total Area Drained under the 0.90 classification
= (23,780 + 10,236) = $\frac{34,016}{56,150}$ = 61% of Area Drained

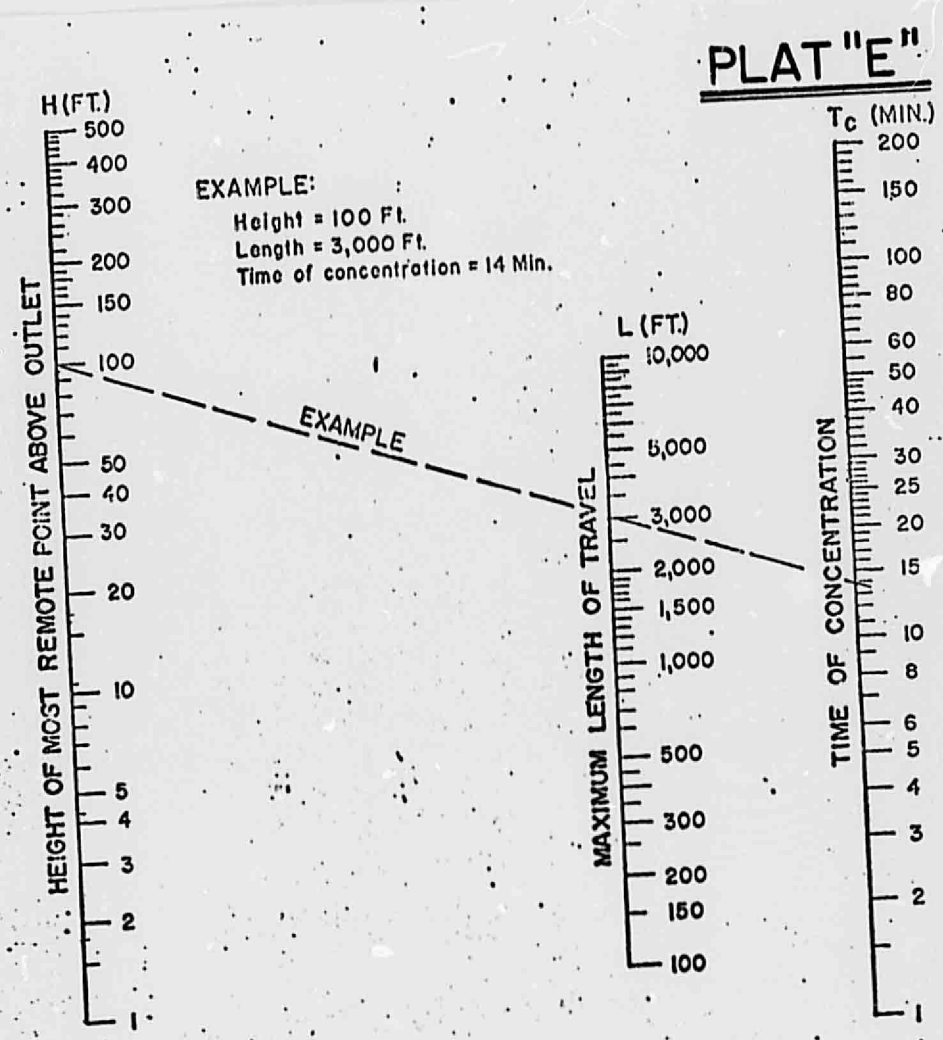
2) Total Area Drained under the 0.15 classification
= (15,220 + 6914) = $\frac{22,134}{56,150}$ = 39% of Area Drained

Composite Runoff Coefficient = (0.61)(0.90) = 0.55
(0.39)(0.15) = 0.06
Σ = 0.61

Adjusted Factor = (0.61)(Cf) = (0.61)(1.25) = 0.76

CHAMBERS, CAMPBELL, ISAACSON & CHAPLIN
ENGINEER-ARCHITECT-PLANNERS
ALBUQUERQUE, NEW MEXICO

SUBJECT Sky View West Subd. Unit # II
CLIENT _____ JOB NO. ____
BY _____ DATE _____ SHEET NO. ____ OF ____

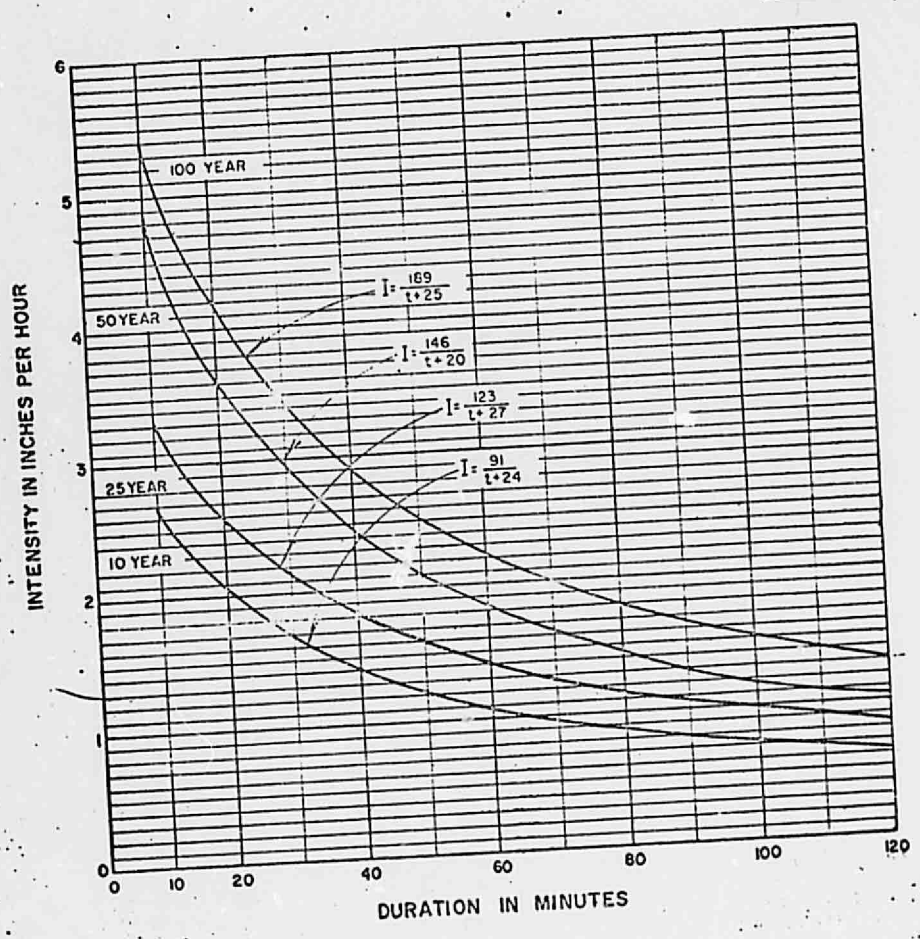


Based on study by P. Z. Kirpich,
Civil Engineering, Vol. 10, No. 6, June 1940, p. 332

FIG. 1 TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

Reprinted from "Design of Roadside Drainage Channels - Hydraulic Engineering Circular No. 6" April 1962 U. S. Dept

PLAT "F"



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

TABLE IV

STREET CARRYING CAPACITIES
(CFS)

Slope	32' Street 6" Crown at center line or 6" sidehill with no crown	32' Street Flat Cross-section	32' Street 6" Inverted crown at center line	32' Street with 8" sidehill with no crown	32' Street with 12" sidehill with no crown	40' Street 6" Crown at center-line or 6" sidehill with no crown	44' Street 6" Crown at center-line or 6" sidehill with no crown	48' Street 6" Crown at center-line or 6" sidehill with no crown
0.0025	37	78	133	25	17	47	51	56
0.0050	53	111	189	36	23	66	72	79
0.0075	65	136	231	44	29	81	89	97
0.0100	75	156	267	51	33	93	102	112
0.0125	84	175	299	57	37	104	115	125
0.0150	92	193	328	62	41	114	126	138
0.0175	99	207	352	67	44	123	135	148
0.0200	105	221	376	71	47	131	144	153
0.0225	112	235	400	76	50	139	154	168
0.0250	118	247	422	80	52	147	162	177
0.0275	124	260	444	84	55	155	170	185
0.0300	129	271	462	88	57	161	177	193
0.0325	134	282	480	92	59	167	184	202
0.0350	139	293	499	95	62	174	191	209
0.0375	145	304	518	98	64	180	199	217
0.0400	149	313	534	101	66	186	205	224
0.0425	154	322	550	104	68	192	211	231
0.0450	158	332	566	107	70	197	217	237
0.0475	163	341	582	110	72	203	225	244
0.0500	167	350	598	113	74	208	230	251

Coefficient of Roughness = n = 0.015 for all streets.
Carrying Capacity Given in Cubic Feet per Second (C.F.S.)
Arterial Design (Stage & Final) has a +2% Slope from the Top of Curb to the top of Median Curb.
Curb Height = 8"

BIBLIOGRAPHY OF REFERENCES

Butler, Stanley S., Engineering Hydrology. New Jersey: Prentice-Hall, Inc., 1959.

Herkenhoff, Gordon & Associates, "Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963," Albuquerque; Gordon Herkenhoff & Associates, Consulting Engineers.

King, H.W., and Brater, E.F., Handbook of Hydraulics. New York: McGraw-Hill Book Company, 1963.

U.S. Department of Commerce, "Technical Paper, No. 40, Rainfall Frequency Atlas of the United States," Washington, D.C., U.S. Government Printing Office, 1963.

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