HYDROLOGY E17/D13 ONE PLAN

E 17/D 14

1 PLAN

1656-1440.12-78

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0295

September 7, 1978

City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87102

RE: DRAINAGE REPORT FOR GULTON COURT

ATTN: Mr. Bruno Conegliano

Transmitted herewith for your files are two (2) copies of the drainage report for Gulton Court.

Very truly yours,

Wain Cooper

WAIN COOPER

WC/ad

Enclosures:

cc: Mr. Mike Callahan

JACK M. CLIFFORD & COMPANY
TWO SAN PEDRO PARK, SUITE 201
2201 SAN PEDRO DRIVE NE
ALBUQUERQUE, NEW MEXICO 87110
PHONE (505) 266-5573

September 5, 1978

Mr. Bruno Conegliano
Drainage Engineer
AMAFCA
City of Albuquerque
City Hall
Albuquerque, NM 87102

Dear Mr. Conegliano:

Jack M. Clifford & Company hereby agrees to construct a temporary ponding area on Lot 3-B, Block A, Unit 2, Interstate Industrial Tract, for the purpose of detaining water from flowing onto Gulton Court. It is understood that when a development plan for Lot 3-B is available, alternative drainage procedures will prevail.

Very truly yours,

Jack M. Clifford

Jack M. Clifford

JMC:mhs

DRAINAGE REPORT

FOR

GULTON COURT NE
(LOCATED SOUTH OF OSUNA AND WEST OF KIRCHER)

AUGUST, 1978

WAIN COOPER
NEW MEXICO
5532
REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

Prepared by:

Gordon Herkenhoff and Associates, Inc.
302 Eighth Street, NW
Albuquerque, New Mexico 87102

PURPOSE AND SCOPE: The purpose of this report is to investigate the storm water runoff that could be expected as the result of constructing Gulton Court, NE.

STUDY AREA: Gulton Court, NE, is a new public street, proposed to be constructed by Jack M. Clifford and Company. This street is located south of Osuna Road and approximately 2000 feet west of Kircher Boulevard. The drainage areas affecting the runoff are shown on an accompanying map .

HYDROLOGY: This analysis calculates the storm water flows that could be expected in Osuna, assuming that Gulton Court is constructed. This runoff flow is then compared to the flow capacity of Osuna, assuming it is flowing to the top of the curb.

The rational formula, Q = CIA is used to determine the storm water runoff that could be expected from a 100 year frequency storm. In this formula, Q = peak flow (cfs), A = area in acres, I = rainfall intensity (in/hr) and K = runoff factor. The 100 year storm curve from the intensity duration frequency curves from the Mater Plan of Drainage for Albuquerque and Environs, is used in determining rainfall intensity. The runoff coefficients used are 1.0 for hard surfaced areas and 0.40 for undeveloped areas. When a combination of these areas are used, a weighted coefficient is calculated. The time of concentration was calculated from the enclosed nomograph. The drainage areas are shown on the enclosed map, and was prepared from a topographic or the photo map, obtained from the City of Albuquerque. The hydraulic analysis for storm water carriers is based on Manning's formula:

$$Q = \frac{1.486}{n} S^{1/2} R^{2/3} A,$$

with n = 0.015 for the paved areas. Calculations are included that use this formula.

RESULTS AND RECOMMENDATIONS: From the calculations made, it appears that the storm water runoff collected by the eastbound lanes of Osuna Boulevard will be flowing over the top of the curb. Therefore, this drainage report investigates the increased flow due to this construction, and makes recommendations for development of tracts 3A and 3B, that will not increase the overall runoff.

1. The City of Albuquerque and the Jack M. Clifford Company adopt this report and the recommendations contained herein.

2. A temporary structure be constructed on Lot 3B prior to the Gulton Court being built, that will detain water from entering Osuna Boulevard.

3. A detailed drainage report for Lots 3A and 3B be submitted to the City of Albuquerque for their review and approval as a condition of development.

| GORDON HERKENHOFF & ASSOCIATES<br>ALBUQUERQUE SANTA FE<br>ENGINEERING COMPUTATIONS | NAME OF PROJECT Gulton Court | | | SHEET NUMBER<br>OF |
|---|---|---|---|---|
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Summary of flows

1. Flow ocurring in east bound lanes of Osuna Blvd East of North Division Channel: Q = 203 cfs

2. Capacity, using typical section, of East Bound Lanes = 82 cfs

3. Historical flow entering Osuna from lots 3A, 3B, 3C : 41 cfs

4. Flow entering Osuna from Gulton Court after construction : 7.8 cfs

5. Difference between historical flow from lots 3A, 3B, 3C ; and flow resulting after construction of Gulton Court but before development of lots 3A & 3B : 33.2 cfs

6. Conclusion : After development of lots 3A & 3B, runoff should equal or be less than 33.2 cfs.

| GORDON HERKENHOFF & ASSOCIATES<br>ALBUQUERQUE SANTA FE<br>ENGINEERING COMPUTATIONS | NAME OF PROJECT Bolton Court | | | SHEET NUMBER<br>OF |
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Calculation of Storm Water Runoff

Osuna Blvd:

Area = 99.4 acres

Length of longest watercourse = 7000'

difference in elevation = 5186-5092 = 94'

$T_c$ = .4(30) = 12 min (from nomograph)

$I = \frac{189}{t+25} = \frac{189}{12+25} = 5.11$

$Q = CIA = (.4)(5.11)(99.4) = 203$ cfs

Calculation of stormwater runoff from Tracts 3A, 3B, 3C (before development)

A = 17.9 Ac

L = 1000', $\Delta H$ = 5124 - 5106 = 18

$T_c$ = 7.4 min

$I = \frac{189}{25+7.4} = 5.83$

$Q = CIA = (.4)(7.4)(17.9) = 41$ cfs

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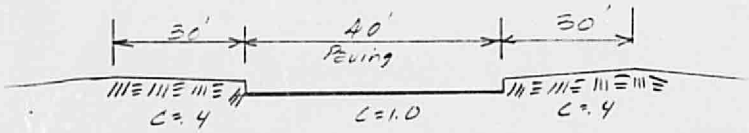
## Calculation of Runoff from Gulton Ct.

after construction




$$C = \frac{.4(60) + 1.0(40)}{100} = \frac{64}{100} = .64$$

A= 1.8 Acres

L= 1000', ΔH= 18'

$T_c = .4(7.2) = 2.88$

$I = \frac{189}{25+2.88} = 6.78$

$$\boxed{Q = (.64)(6.78)(1.8) = 7.8 \text{ cfs}}$$

before construction

$T_c = 7.2$, $I = \frac{189}{25+7.2} = 5.87$

$Q = (.4)(5.87)(1.8) = 4.23$ cfs

increased runoff due to construction of Gulton Ct. = 7.8 - 4.2 = 3.6 cfs

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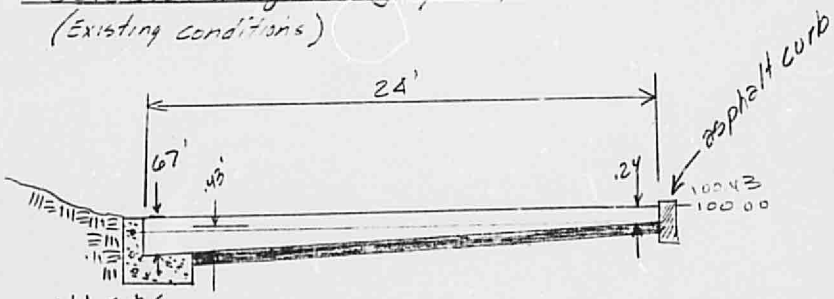
|---|---|---|---|---|
| | COMPUTED BY | CHECKED BY<br>Cooper | JOB NUMBER | DATE<br>8-28-78 |

Calculation of carrying Capacity for Osuna Rd
(Existing conditions)




Assume flowing full to top of curb

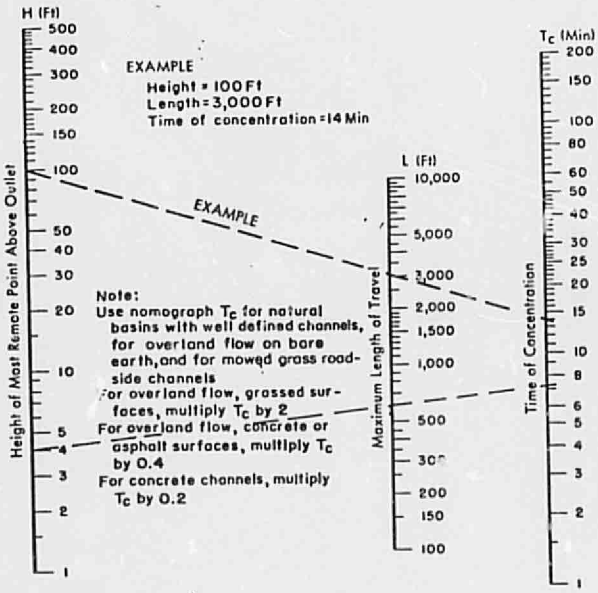
Area = $.24(\overset{5.76}{24}) + 1/2(24)(\overset{5.16}{.43}) = 10.92$

Per. = $24 + .67 + .24 = 24.91$

R = $10.92/24.92 = .44$

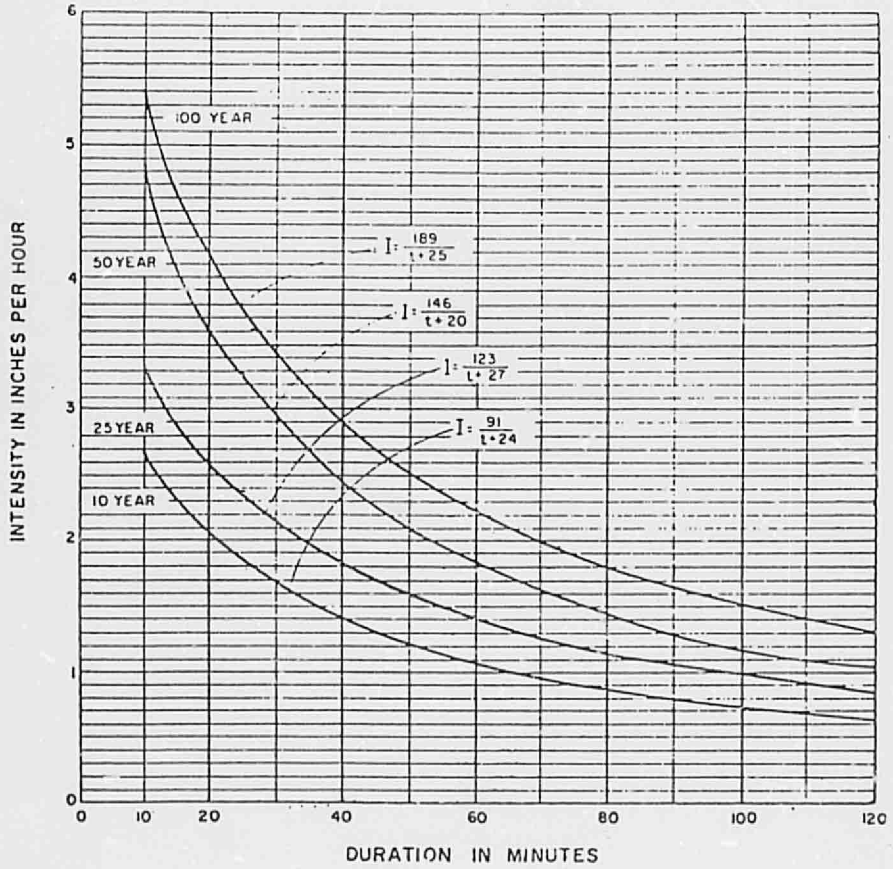
avg slope = 1.5%

$Q = \frac{1.486}{.014}(\overset{.1224}{.015})^{1/2}(\overset{.54}{.44})^{2/3}(10.92) = 82$ cfs




Based on study by P. Z. Kirpich,
Civil Engineering, Vol. 10, No. 6, June 1940, p. 362

Plate 2




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
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