HYDROLOGY K22/D4 1 PLAN

K22/D4

1 Plan

LETTER OF TRANSMITTAL

Genge/Murray-McCormick

2601 Wyoming Blvd., N.E. Suite F
Albuquerque, N.M. 87110/505 292-1936

Date December 2, 1977

To City of Albuquerque

P. O. Box 1293

Albuquerque, New Mexico 87103

Attn. Mr. V. M. Kimmick, City Engineer

Re: Copperwood Park Apartment Complex

Comments: The attached Drainage Report for the above mentioned project is being transmitted for your review and approval. Your immediate attention to this matter would be greatly appreciated. Please feel free to contact us if any problems should arise.

Enclosures:

Quantity	Type of Enclosure and Description
1 ea	Drainage Report for Copperwood Park

Signed: Douglas A Wood

Copy to: Bruno Conegliano ✓ w/attachment
Sheila Sweenhart, w/2cy. attachment

If enclosures are not as noted, kindly notify us at once.

DRAINAGE REPORT

FOR

COPPERWOOD PARK
ALBUQUERQUE, NEW MEXICO

Prepared By

Meurer, Serafini, and Meurer, Inc.
2601 Wyoming Boulevard N.E.
Albuquerque, New Mexico 87110
(505) 292-1936
November 1977

DRAINAGE REPORT

COPPERWOOD PARK
ALBUQUERQUE, NEW MEXICO

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APPENDIX

Appendix 1	Composite Runoff Coefficient
Appendix 2	Runoff Computations
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Figure III	Intensity Duration Frequency Curves
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DRAINAGE REPORT

PURPOSE AND SCOPE

The Dale Bellamah Land Co., Inc., is proposing to develop a 2.7 acre parcel of land called Copperwood Park, located in the northeast quadrant of the Albuquerque area. This parcel will be developed into a multi-family subdivision consisting of one triplex and eleven fourplexes.

The purpose of this report is to present a plan for controlling surface runoff from the said subdivision in a manner acceptable to the Albuquerque Metropolitan Arroyo Flood Control Authority and the Albuquerque City Engineer's office.

SITE LOCATION AND TOPOGRAPHY

The said parcel of land is bounded on the east by Chelwood Boulevard N.E., and on the west by Copper Avenue N.E. The surrounding terrain is generally improved land on all sides.

The soil of the site is generally comprised of SM sand and silt. The natural ground slopes from northeast to southwest at an average of 3%.

DESIGN CRITERIA

In analyzing the storm runoff, the Rational Formula, $Q = CIA\ C_f$ is used.[1].

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1. See Bibliography, Item (2), Paragraph 3.7 - Appendix-3.

Where:

Q = Runoff quantity in cubic feet/second.

A = Contributing area in acres.

C_f = Frequency factor for Rational Formula.

I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Figure IV, Intensity Duration Frequency Curves, Albuquerque Area 1961. (Note: Where a Time of Concentration [Tc] is less than ten minutes from Figure III, the intensity value derived from a Tc of ten minutes is employed.)

C = Runoff Coefficient (No Units). This coefficient represents the integrated effects of infiltration, detention storage, evaporation, retention, flow routing, and interception which all affect the time distribution and peak rate of runoff.

ESTIMATED RUNOFF UNDEVELOPED STATE

Drainage within the boundary of the site is in the form of sheet flow exiting the site at the southwest boundary.

The total runoff in the undeveloped state forms the basis for comparison with the flow in the developed state. See Table I for a listing of undeveloped runoff.

TABLE I

RUNOFF IN UNDEVELOPED STATE

Drainage Basin	Elev. Diff.	Length of Flow	Tc (Min.)	I 100 yr. In./Hr.	C[2]	Area (Ac)	Q (cfs)
A-1	16.0	480'	10	5.4	.38	1.37	2.81
A-2	16.0	480'	10	5.4	.38	1.37	2.81
≦A-1 - A-2			10	5.4	.38	2.74	5.62
Total							5.62

ESTIMATED RUNOFF DEVELOPED STATE

As development occurs, the area of impervious surfaces increases and thereby the amount of runoff usually increases. In order to offset this increase, onsite restrictions of flows must be incorporated into the development. While this can take different forms, the usual solution for this type of development is to utilize on-lot ponding.

The runoff coefficient for various surfaces prior to adjusting C_f is as follows:

Streets, Walks and Drives	C = 0.80
Roofs	C = 0.80
Lawns, Sandy Soil (Average 2 to 7% slope)	C = 0.30

See Appendix-1 for computations on composite runoff coefficients.

EXPLANATION OF RESULTS

OFFSITE FLOW

According to the Manzano Manor Drainage Report, the expected flows down Chelwood are expected to reach 564 cfs during a 100-year

2. See Appendix-1.

storm. Such a flow would overtop the 8 inch curb approximately six inches in the area of Copperwood Park. It appears, however, that the majority of this flow will not reach Copperwood Park, since many of the properties along the west side of Chelwood do not have adequate provisions to contain the full 564 cfs in Chelwood. If the 100 year storm were to occur today, then, it is unlikely that the flow would overtop the curbs in Chelwood at Copperwood Park.

Provisions have been made, however, in the design of Copperwood Park to assure that the full 564 cfs will be contained within the street right-of-way. This will be done by construction of two foot high reinforced masonry diversion wall along the property line bordering Chelwood Boulevard and a second two foot diversion along the north property line starting at the Chelwood diversion and continuing 148 feet west.

These two walls together will form a protective barricade sufficiently high to divert the predicted 100 year runoff around Copperwood Park.

Use of the diversion walls to protect living units from all off-site runoff will effectively remove Copperwood Park from the designated flood plain area, as shown in the A.M.A.F.C.A. report prepared by the Army Corps of Engineers.

HISTORIC RUNOFF

Runoff from the project in the undeveloped state is generally in sheet flow and can be divided loosely into one drainage area. Due to steepness of the terrain, and the undiverted path of the runoff, the times of concentration are low, 10.0 minutes, resulting in a total historic drainage for the area of 5.62 cfs.

DEVELOPED RUNOFF

Runoff in the developed state varies from that in the historic state in that most of the runoff is intercepted by ponds located between the units and a pond at the downhill end of the project. Water from the sloped parking lots drains into Copperwood Drive and will be conveyed to Copper Avenue. All the runoff from the building roofs and areas in front of the buildings will be ponded, thus decreasing the area and total volume of runoff. These ponds will be non-discharging, thus allowing no more volume of runoff to leave the site than left in the historic state. As a result, the total 100 year flood runoff from the developed site is 5.46 cfs, less than the 5.62 cfs undeveloped runoff.

RECOMMENDATIONS

The following recommendations are made to enable the developer of this site and the local government to complete this project within the design criteria:

1. Any overflow from Chelwood Boulevard will be kept within right-of-way or diverted around property by use of two foot diversion walls built along north and west property lines.
2. Runoff from the buildings will be ponded in the yards of each lot. Pond depths of 1.1 feet will be sufficient to retain the amount of developed volume of runoff which is greater than the undeveloped runoff volume on the site.
3. Runoff from the sloped parking will drain onto Copperwood Drive then down into Copper Avenue. The developed runoff will not exceed the historic runoff.

SUMMARY

The subject property will have ponded lots. All the developed runoff not ponded will be carried by Copperwood Drive.

In conclusion, the development of this site should have a beneficial effect on the drainage characteristics of the area, and the site can be developed without harm to life or property.

Respectfully submitted,

Carl A. Tebbens
N.M.P.E. No. 6309

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

December 21, 1977

Meurer, Serafini, and Meurer, Inc.
Carl A. Tebbens, P.E.
2601 Wyoming Blvd., NE
Albuquerque, New Mexico 87110

RE: Copperwood Park

Dear Mr. Tebbens:

This letter is to signify the acceptance for the City of the drainage report for Copperwood Park.

Sincerely yours,

David O. Quintana ACE

David O. Quintana
Acting Asst. City Engineer-Hydrology

DOQ/gm