M09 - D005

WESTGATE HEIGHTS UNIT 2-A

COMPREHENSIVE DRAINAGE REPORT

ALBUQUERQUE, NEW MEXICO

Prepared For

**Property Management Company
of New Mexico
Albuquerque, New Mexico**

Prepared By

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Portions of File
Drainage File
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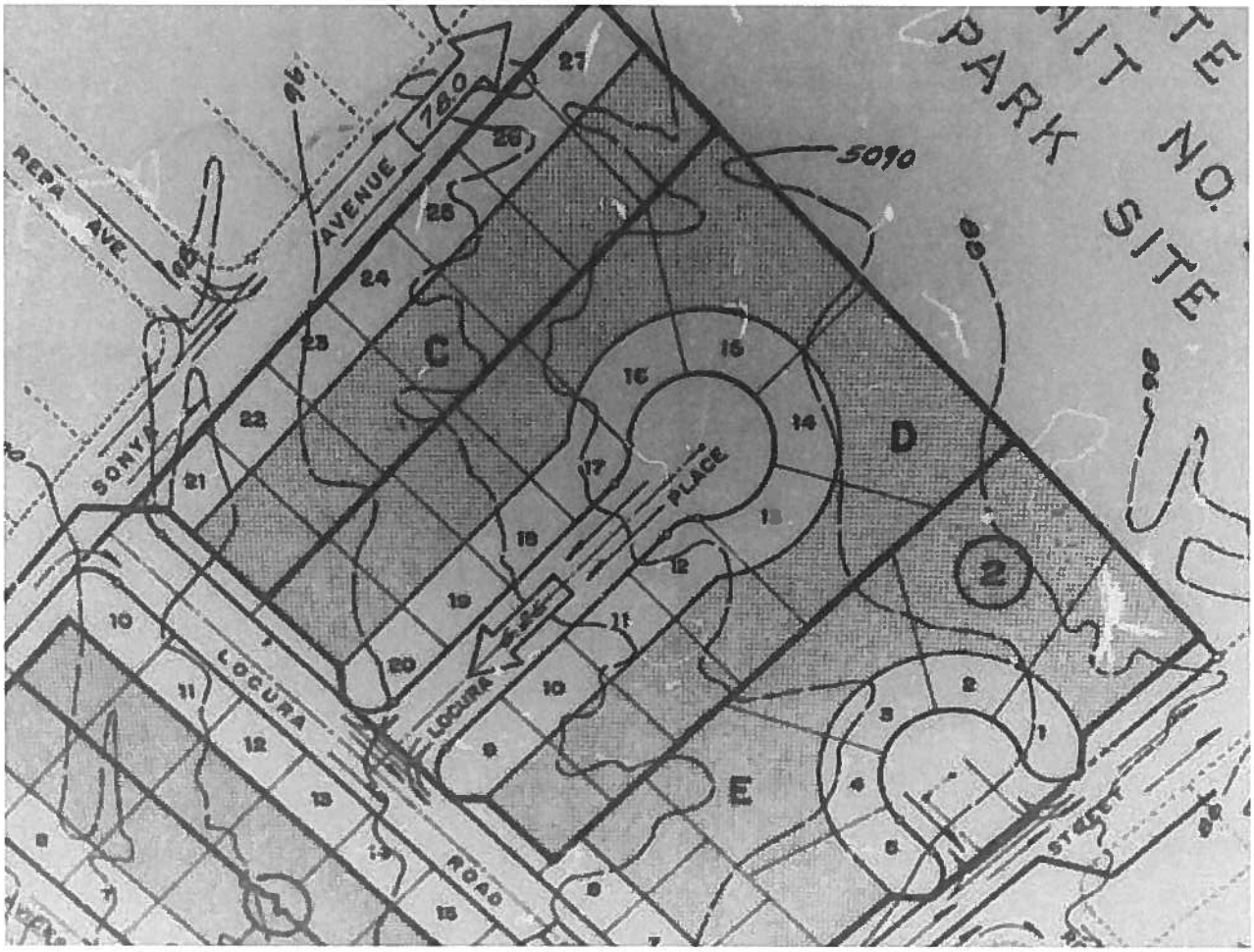

LEGEND

12.8 Q_{100} (QUANITY AND DIRECTION OF FLOW FOR D RUNOFF AT POINT INDICATED IN C.F.S.)

WATERSHED BOUNDARY.

WATER BLOCK OR SUMMIT.

AREA OF WATERSHED DRAINED TO AND ACCUMULATED IN LOT PONDING.

VALLEY GUTTER AND DIRECTION OF FLOW.

MEURER, SERAFINI AND MEURER, INC.
CONSULTING ENGINEERS • SURVEYORS • PLANNERS

Table 1

RUNOFF IN UNDEVELOPED STATE

Elev. Diff.,	Length of Flow	t_c[1],	1100 yr. In./Hr.,	C[2],	Area Acres	Q cfs
14'	620	7	5.4	0.38	10	20.5
			Total Undeveloped Runoff			20.5

ESTIMATED RUNOFF DEVELOPED STATE

As development occurs, the area of impervious surfaces increases and thereby the amount of runoff also increases. To effect this increase, onsite restrictions of flows must be incorporated into the development. While this may take different forms, the most practical solution for this type of development is to utilize on-lot ponding. The contributing area to the backyard ponding includes the backyard, sideyard, and in a majority of cases, one-half the roof area due to the popularity of the pitched roof concept. The area drained to the street includes the front yard, driveway, sidewalk-parkway areas, and one-half the roof area. This approach is to satisfy ANAPCA's requirement that the runoff rate from the developed tract not exceed the runoff rate from the tract in its natural state.

1. See Appendix, Natural Basin Calculations.
2. See Appendix, Composite "C" Computations.

TABLE 2

RUNOFF IN DEVELOPED STATE

Area Designation	Acreage (Ac)	I100 In./Hr.	"C"*3	Qmax (cfs)	Q100 (cfs)
A	0.69	5.4	.69	2.57	
B	1.61	5.4	.69	5.99	
C	0.50	5.4	.69	1.3	
D	1.68	5.4	.69	6.26	
E	.70	5.4	.69	2.61	
Total	5.18	5.4	.69		19.30
COMPOSITE FLOWS					
B + D	3.29	5.4	.69		12.3

SUMMARY OF RESULTS

Total Undeveloped Runoff (See Page 3) 20.5 cfs

Developed Runoff -

Offsite Drainage 0 cfs

Single Family Area 19.3 cfs

Total Developed Runoff 19.3 cfs

As shown above, the development of this project including the lot ponding will not increase the storm runoff over that occurring in the natural state. Further, offsite flows will be intercepted by and conveyed in Sonya Avenue, Benavidez Road, and 86th Street.

RECOMMENDATIONS

The following recommendations regarding the design and implementation of drainage improvements are included to assist the City of Albuquerque, MAFCA, and the developer in the engineering design and implementation of drainage facilities.

1. Flows within the streets of the development are distributed so that Locura Road assumes the major role in conveying onsite flows. These streets should be graded at not less than 0.5% slope in order to insure adequate carrying capacity.
2. The ponding areas at each backyard shown be situated toward the rear of the yards. There should be a minimum of a five foot buffer zone between the rear property lines and the edge of the ponds to protect any walls which might be constructed. In no case should ponded waters be allowed to stand against a wall or house foundation.
3. Ponds should average 6" deep and the minimum surface area should not be less than 15% of the total area drained into the pond. See Appendix, Lot Ponding Calculations.
4. It should be noted that Sonya Avenue and Benavides Road, although not included in the platted area, carry storm waters from areas within Units 2 and 4 of Westgate Heights Subdivision. Although the flows in Benavides Road are minor when compared with total capacity, those of Sonya Avenue at its intersection with Rahn Avenue are of significant magnitude

and it is therefore recommended that the finished floor elevation of Lots 22 through 27 should be set a minimum of 24" above the top of curb.

<u>SUMMARY</u>

The subject property, by utilizing backyard ponding, will contribute no more surface runoff to surrounding areas than that which existed before development.

In conclusion, the development of this site should have a beneficial effect on the drainage characteristics of this area and can be developed safely with no harm to life or property.

Prepared by:

Approved:

Carl A. [illegible]
N.M.P.E. No. 6109

"RATIONAL METHOD"

COMPOSITE RUNOFF COEFFICIENTS

For the purposes of this report the runoff coefficient (C) and Frequency Factor (C_f) are combined in one factor designated (C). Each of the following determinations of composite runoff coefficients is first computed upon the basis of relative percentages of surface characteristics for the individual areas, and coefficients for 2 to 10 year frequency storms. Each is then multiplied by the Frequency Factor (C_f) of 1.25 for 100 year storms.

DEVELOPED LAND

Typical Lot Area - Westgate Heights, Unit 2-A

Gross Area		10.0 Ac.
Less: Area in Streets	1.59 Ac.	
Area in Lots		8.41 Ac.
Average Lot Area (39 Lots)		9,393 Sq.Ft.
Typical Lot Width		65 Ft.

PONDING REQUIREMENTS

Typical Lot Area:

Average Lot Area			9,393 S.F.
Less: Front & Side Yards			3,250 S.F.
Area Draining to Pond			6,143 S.F.
Roof Area	20 x 55		1,100 S.F.
Patio Area			100 S.F.
Lawn Area			4,953 S.F.

Runoff Coefficient:

Impervious Area	1200 S.F.	20% @ 0.80	0.16
Pervious Area	4943 S.F.	80% @ 0.12	0.1
			0.26

$C \times C_1 = 0.26 \times 1.25 = 0.33$

Pond Volume Requirement:

100-year 6-hour precipitation = 2.2 in.

Volume - Runoff coefficient x area x precipitation

V = 0.33 x 6143 x 0.18 = 365 cu.ft.

Depth of pond 0.50 ft. (6")

Minimum area of pond 730 sq.ft.

Pond area as a percentage of area drained = 12% - use 15%

V = 15% x 6143 sq.ft. x 0.5 ft. = 461 cu.ft.

Ponded Lots - Westgate Heights, Unit 2

C = 0.80

Streets & Walk Area	20x65	1,300 S.F.
Roof Area	20x55	1,100 S.F.
Driveway	30x15	450 S.F.
Total Impervious Area		2,850 S.F.

C = 0.12

Front and Side Yards	3,250 S.F.
Less Roof Area	1,100 S.F.
Less Driveway	-450 S.F.
Total Pervious Area	1,700 S.F.

Impervious Area	2,850 Sq.Ft.	63% @ 0.80	0.504
Pervious Area	1,700 Sq.Ft.	37% @ 0.12	0.044
Total Area	4,550 Sq.Ft.	100%	0.548

Composite Runoff Coefficient - $C \times C_f = 0.55 \times 1.25 = 0.69$

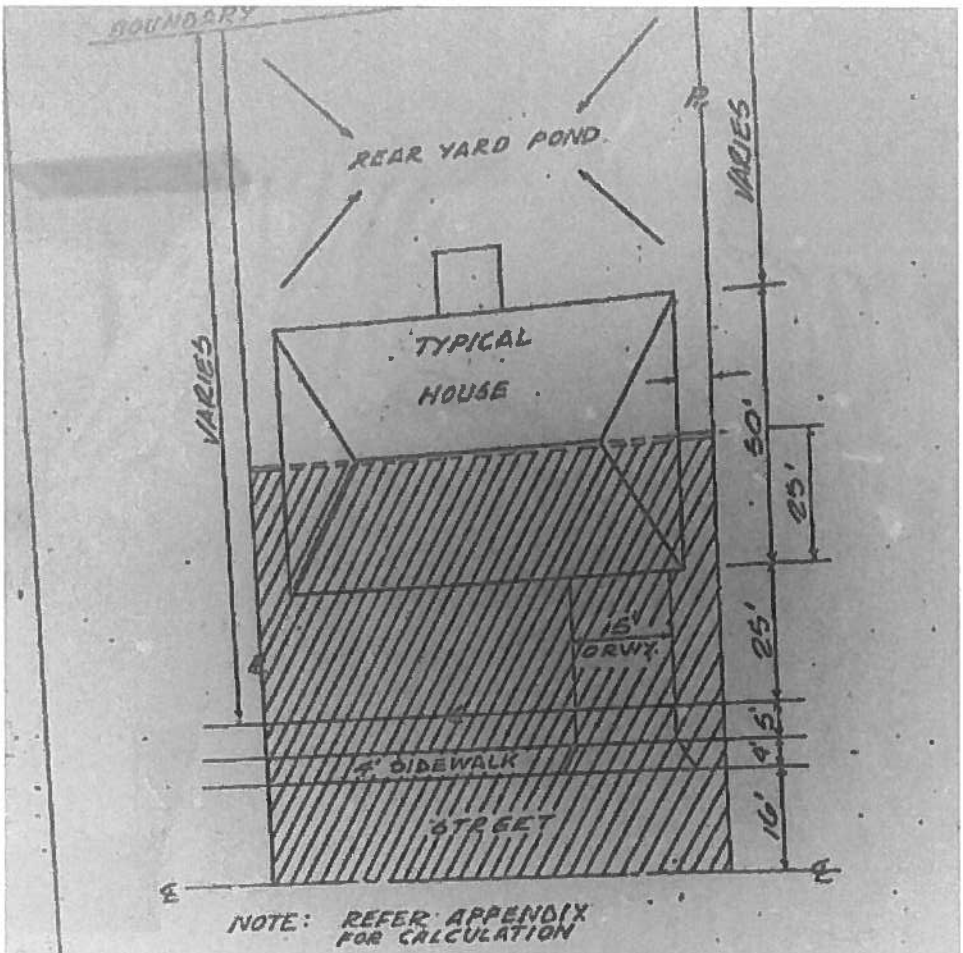

FIGURE - 3
TYPICAL LOT DRAINAGE

MURRAY - McCORMICK, INC.
ENVIRONMENTAL DESIGN
ENGINEERING - PLANNING - SURVEYING

JOB NO. _____ DATE _____
PROJECT WESTGATE HEIGHTS
SCALE _____