HYDROLOGY G21/D13 1 PLAN

G21/D13

1 Plan

December 7, 1964

MEMO:

TO: PLANNING DEPARTMENT

RE: COMMENTS ON PRELIMINARY PLAT OF UNIT NO. 4 - SAN GABRIEL VILLAGE

1. At the south border of the subdivision, the flow from the Board of Education property will concentrate at the south line of Lot 20, Block 4 instead of between Lots 19 & 20, unless the area is graded to channel the drainage to the proposed easement. If this grading is not done, water will collect at the low corner with possible damage to property line walls. It is recommended that the drainage easement be located along the south property line of Lot 20.

2. To allow flow to continue south down Inca Street into the presently developed area will encounter right angle change of directions onto and off of San Gabriel Road. Inca street south of San Gabriel Road has a carrying capacity of 70 cfs which is insufficient for the added flow of 49.5 cfs due to existing flows from the east in the presently developed area.

3. It is recommended that flows be intercepted at "D" Street which will also intercept flow on "A" Street, and all of the flood waters be carried westerly by easement or street channels, along the existing natural channel.

4. Contact Ed Chacon of the City Engineer's Office for street names.

Tom E. Thomas
Chief Construction Inspector

RIO VISTA CENTER,
PARADISE HILLS
TELEPHONE 898-2165
703 CHARLES PLACE, N.W.
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ALBUQUERQUE, NEW MEXICO

LEVERTON ENGINEERING
CONSULTING ENGINEERS

December 4, 1964

Mr. William Stevens
City Engineer, City of Albuquerque
Albuquerque, New Mexico

Subject: Drainage Report
Unit No. 4 of San
Gabriel Village Sub-
division, Albuquerque

Dear Mr. Stevens;

The following storm water drainage report for the subject subdivision under the sponsorship of Roberson Construction Company is hereby submitted for your consideration:

Location:

The subject subdivision is bounded on the north by Montgomery Blvd. N. E. and lies an average of 600' west of Morris Street N. E. .

Reference Map:

Attached is a preliminary plat of the subdivision upon which the existing relief is shown by contour lines. Drainage is shown in both a quantitative and qualitative sense by symbols indicated in the legend.

Computation of Runoff:

The "Rational" formula, Q = CiA, in which Q is the runoff in cubic feet per second, i is the rainfall intensity in inches per hour, A is the contributing drainage area in acres, and C is the coefficient of runoff, was used to compute maximum flow at various critical points. C was assigned the value of 0.50 for the purposes of this study. The rainfall intensity was taken from standard Yarnell curves for the south-western region using the 50 year storm.

Mannings formula, $Q = A \times 1.486/n \times R^{2/3} \times S^{1/2}$, in which Q is the capacity of the section under study in cubic feet per second, A is the area of the section in

square feet, n is the coefficient of roughness, R is the hydraulic radius, and S is the average slope of the section expressed in feet per foot, was used to determine the hydraulic capacity of the streets. n was assigned the value of 0.015 in computations relating to streets and 0.014 for the concrete channel between lots 19 and 20 of block 4.

Offsite Drainage:

Montgomery Blvd. and Morris St. intercept storm water runoff from the areas north and east of the subdivision. The north-south streets lying east of Morris intercept and convey storm water runoff to the south thereby preventing any appreciable concentration on Morris in the reach east of the subject subdivision. The hydraulic capacity of Montgomery is 160 cfs in the vicinity of the subdivision which is more than adequate considering the small area contributing runoff in the reach between the street, Bear Canyon Arroyo, and Glenwood Hills Subdivision.

The area adjecent and immediately east of the subdivision which is undeveloped at this time slopes to the southeast and storm water runoff from this area could enter the subdivision along the rear lot lines of lots 16 through 20 of block 4. This offsite drainage area contains 10.8 acres with an effective length of 1470' and an average slope of 2.4 % . This implies a rainfall intensity of 4.6 inches per hour resulting in a Q of 25 cfs. The attached Drainage Study drawing indicates one possible method of preventing this runoff from damaging properties built on lots 16 through 20. It is reasonable to assume that when this offsite drainage area is developed that at least some of the drainage will be diverted to flow towards Morris St.

Drainage Within The Subdivision:

The total acreage contributing storm water runoff to each significant street intersection within the subdivision is shown on the attached drawing. Subtotal acreages and corresponding runoff quantities are shown as circled figures and total flows (the sum of on and offsite flows)

are shown as squared figures. Using Manning's formula the hydraulic capacities of the streets at these same intersections were calculated. These capacities are tabulated against maximum flow from a 50 year storm as follows:

Intersection	Slope	Paving Width	Maximum 50 Year Flow	Hydraulic Capacity of Street
"A" @ "C"	1.25%	32'	18 cfs	85 cfs
"A" @ Subdivision boundary	1.70%	32'	27.5 cfs	95 cfs
"F" @ "G"	1/90%	32'	12.5 cfs	100 cfs
"F" @ Subdivision boundary	1.90%	32'	49.5 cfs	100.cfs

The above capacities were computed using the tabulated widths with 8" curb heights and crowned paving sections.

Storm Water Outfall:

Storm water outfall is provided for at "A" and "F" Streets at the southern boundary of the subdivision. The capacity of "F" St. is 100 cfs against an anticipated 49.5 cfs runoff from a 50 year storm. The capacity of "A" St. 95 cfs against an anticipated runoff of 27.5 cfs. If necessary in the platting of the area south of Unit No. 4 of San Gabriel these two streets could be combined which would result in a total runoff of 77 cfs which would still be 23 % less than the capacity of the single street.

Conclusions:

The hydraulic capacities of the streets of the subject subdivision are adequate to carry the runoff of a 50 year storm without water damage to the properties that may be built within the subdivision.

Recommendations:

1. Water blocks must be a part of the paving design at "A" and "F" streets at Montgomery as shown on the attached drawing.
2. The finish grade of "A" and "F" streets should be set as low as is practicable considering the outfall elevations so as to minimize the fill required on the low (westerly) side of these streets.

3. The channel shown in Section "A" on the attached drawing must be built with an uniform section and a constant grade throughout it's length.

4. The concrete drainage channel shown between lots 19 and 20 of block 4 must be designed so that the 2% longitudinal slope is realized. This will require particular attention to the grade and elevation of "F" St. and to the grade and elevation of the earth entrance channel. The sidewalk crossing of this concrete channel may be provided for by fairing the channel side slopes over a suitable distance to ease the slope of the sidewalk.

5. Lot and block grading design may provide for some rear yard ponding of water on the low side of the the streets.

If you need further information or clarification of the foregoing please let me know.

John G. Leverton
P.E. & L.S. No. 1874
New Mexico

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