HYDROLOGY E11/D9 SAGECREST SUBDIVISION

E11/D9

SAGECREST

SUBDIVISION

2 PLANS

1. Eff on pond decrease infiltration.
2. Safety & health
3. AMNFCA 72-2

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

A. Matoian Hydrology.

September 7, 1976

RECEIVED
SEP 09 1976
CITY ENGINEERS

Mr. Kleston Laws
Drainage Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Tract 18 (Sagecrest Subdivision) Drainage Report

Dear Mr. Laws:

As you know, Dale Bellamah Corporation owns Tract 18, and they have authorized us to proceed with the engineering plans for development. In preliminary discussion with Mr. Joe Shipley, we learned that these lots will be sold to individual builders of custom homes. Because of the nature of the homes involved, Mr. Shipley requested that we develop the drainage study along the no-ponding concept.

To support this request, we offer the following preliminary data. The undeveloped site will contribute 32 cfs of runoff. The developed site will have a peak runoff rate of 39 cfs, all of which will be routed thru La Mariposa Subdivision to the temporary ponds located within the drainage channel R/W. The increase in runoff rate is not significant to overload downstream facilities. The routing streets within La Mariposa Subdivision have a minimum grade of 0.3%, which with an 8" curb and 4" crown, n = 0.015, will carry 54 cfs, flowing at curb depth. The velocity will be below 4 ft./sec. The same street with a 0.2 overflow will carry approximately 80 cfs, which should handle flows originating within La Mariposa Subdivision. With the velocity below 3.6 ft./sec., the routing of these flows would cause a minimum of inconvenience and trouble to the surrounding areas.

We, therefore, would appreciate your consideration and approval to proceed with the Tract 18 Drainage Study on a non-ponding concept.

Very truly yours,

Bo K. Johnson

Bo K. Johnson, P.E.
Vice President

2601 WYOMING BLVD., NE. SUITE F/ALBUQUERQUE, NEW MEXICO 87110/505-292-1936
CALIFORNIA ALASKA OREGON WASHINGTON TEXAS GEORGIA FLORIDA COLORADO

LETTER OF TRANSMITTAL

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

Date 9-13-76

To City Engineer's Office
City of Albuquerque

Attn. Mr. Laws

Re: Sagecrest Sub'd.

Comments: For your review and comment. Format of report is based on backyard ponding.

Enclosures:

Quantity	Type of Enclosure and Description
2	Sagecrest Sub'd Drainage Reports

Signed: Chris

Copy to:

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

525
575
1100

1616
55
221

September 16, 1976

E11-D9

Murray-McCormick Inc.
2601 Wyoming Blvd. N.E., Suite F
Albuquerque, New Mexico 87110

RE: SAGECREST SUBDIVISION

Dear Mr. Johnson:

Your letter requesting approval of ponding in the existing ponds raises the following questions:

1. As silt continues to wash into the ponds, will the infiltration rate be adversely affected?

2. Will safety and health become more of a problem?

3. Has the requirements of AMAFCA Drainage Resolution of 1972.2 been met?

Since the Matotan hydrology assumed the implementation of the AMAFCA Resolution and the present pond will become the future diversion channel, it does not appear the concept of your letter would meet the criteria.

Very truly yours,

KHL/fs

Kleston H. Laws
Assistant City Engineer-Hydrology

Kle

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

September 21, 1976

Mr. V. M. Kimmick
City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

file 22 Sept 76

Re: Sagecrest Subdivision

Dear Mr. Kimmick:

Dale Bellamah Corporation, Inc., has retained us to prepare the complete set of improvement plans for the above mentioned subdivision.

In accordance with the City's procedural requirements for processing improvement plans prepared by a private consulting engineering office, we hereby request your approval to proceed.

Very truly yours,

Bo K. Johnson, P.E.
Vice President

CLW:dw

Approved by:

V. M. Kimmick
City Engineer

9-22-76
Date

2501 WYOMING BLVD. NE. SUITE F/ALBUQUERQUE, NEW MEXICO 87110/505-292-1935
CALIFORNIA ALASKA OREGON WASHINGTON TEXAS GEORGIA FLORIDA COLORADO

September 24, 1976

E11-D9

Murray-McCormick Inc.
2601F Wyoming Blvd. N.E.
Albuquerque, New Mexico 87110

RE: SAGECREST SUBDIVISION

Dear Mr. Johnson:

I have reviewed the drainage report for the subject subdivision. It cannot be approved for the following reasons:

1. The dike system you mentioned, which protects this natural ponding area, is not complete. The approval by the City and AMAFCA of the dike system indicated the unknowns of such a system, and since then the State Engineer has required different consideration which in my opinion do not agree with the intent of the AMAFCA drainage resolution. In any event, neither system is constructed.

The alternate would be the construction of the La Mariposa diversion. The City is currently in the process of selecting a design engineer for this project. If a selection is made in early November, plans would not be available until March or April at the earliest. Funds are not available for construction.

2. The flows from O-S-A-1 are diverted out of the natural ponding area, down Montano Road to the river valley which has no outlet. This clearly seems to violate the AMAFCA drainage resolution.

3. The drainage easement from Mariah Rd. to College Street is unacceptable. Such easements are a constant problem to the City.

Alternate solutions seem to be:

a) Pond all water as was occurring in the natural ponding area.

b) Reconstruct Valle Vista Drive to convey the flows south.

c) Take flows to Montano Road. Since there is no outlet for Montano Road and the street must be closed when it rains, this does not appear to be a solution at this time. I have discussed this with some members of City staff and cannot get a concurrance. I would suggest if you prefer, this alternate, you schedule time in Mr. Kimmick's Wednesday staff sessions to get permission to proceed.

4. I question "C" values of 0.2 when the developer cannot guarantee lawns will be installed.

5. Areas and flows do not seem to be added to the sums shown and do not agree throughout the report.

6. Area 5 drains to an unimproved street with associated difficulties. Will the street be improved with this project?

7. A pond area of 30 percent of the drained area does not give guidance to future builders of depths, sizes and etc. Presumably the grading plan will provide tighter controls.

Very truly yours,

Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs

cc: John Robert
Dale Bellemah Corp.

CITY OF ALBUQUERQUE, NEW MEXICO
CITY ENGINEER'S OFFICE

E11-D9

MEMORANDUM - October 5, 1976

TO: Mrs. Celia Tomlinson, Design Engineer
FROM: Kleston H. Laws, Assist. City Engineer-Hydrology
SUBJECT: SAGECREST

On September 24, 1976, the engineer was sent a letter disapproving the drainage study for Sagecrest Subdivision, (copy attached).

The procedures for design and construction states a submittal to the City Engineer will include the approved drainage plan and a grading plan. Neither are included in the submittal of Sagecrest. I don't intend to review the street plans until a drainage report is approved and a grading plan is submitted in accordance with the procedure.

KHL/fs
Enclosure

0 4 8 1

CITY OF ALBUQUERQUE, NEW MEXICO
CITY ENGINEER'S OFFICE

MEMORANDUM - 10-11-76

FROM: V. M. Kimmick, City Engineer

TO: Bob Fosnaugh
Bob Kielich
Bob Lowe
Bob Burgan
Bill Otto
Dwayne Sheppard
Kleston Laws
LaMonte Urban
Phil Garcia
Celia Tomlinson
Wes Trask

SUBJECT: PRE-PLAT MEETING

Please attend a pre-plat review meeting, Wednesday, Oct. 13 at 4:00 P.M. to discuss the following items:

Larry Strong - Sagecrest drainage

Proceed with review. Plat will not be signed until 1 Jan 1977. at that time duke will be constructed or Mariposa diversion underway!

KHL
13 Oct 76

16 Sept 76

MURRAY-McCORMICK, INC.
ENVIRONMENTAL DESIGN
ECOSYSTEMS ANALYSIS • PLANNING • LAND SURVEYS • ENGINEERING

2601 WYOMING BLVD., NE. SUITE F / ALBUQUERQUE, N.M. 87110 / 505-292-1936

DRAINAGE REPORT
FOR

SAGECREST SUBDIVISION

ALBUQUERQUE, NEW MEXICO

FOR

DALE BELLAMAH CORPORATION
6400 Uptown Blvd. NE
Albuquerque, New Mexico

PREPARED BY

MURRAY-McCORMICK, INC.
2601-F WYOMING BLVD., N.E.
ALBUQUERQUE, NEW MEXICO

(505) 292-1936

August 12, 1976

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Summary	9

APPENDIX

Calculations for Rational Formula

Figure I - Location Map Plat E-11

Figure IA - Topo Map Scale 1" = 500'

Figure II - Location and Drainage Map Scale 1" = 200'

Figure III - Site Plan in Developed State

Figure IV - Intensity - Duration Frequency Curves

Figure H - Overload Flow Time

Sagecrest

Drainage Report

PURPOSE

The purpose of this report is to analyze the drainage characteristics of the site in its proposed developed state. Recommendations for controlling this runoff will be presented.

INTRODUCTION

The subject property, a proposed R-1 development, is located in the northwest heights of Albuquerque, south of Montano Road and east of Valle Vista Drive. More particularly, it is located within the NE 1/4 of the SE 1/4 of Section 26, R 2 E., T 11 N., N.M.P.M. (Zone Atlas E-11).

Undeveloped land borders the site on the east and College Heights Subdivision borders the south side. The downward slope of the land is in a westerly direction with the east boundary on the approximate crest of a ridge which breaks the slope easterly down towards Coors Road.

The site used to be part of a natural drainage ponding area, but because of man-made improvements, i.e., Montano Road and Valle Vista Drive, and the La Mariposa Dike System north of Montano Road, the area is effectively no longer a ponding area and is isolated from any off-site drainage from the north and west. The east side of the site has a small area which could contribute off-site flows, but a major thoroughfare will border the east side of

Not complete yet.

the site and route these flows either north or south, depending on the final design of the street.

Thus the drainage area under consideration will be primarily concerned with the area within the subdivision.

Precipitation falling directly on the site will be routed to the west to Valle Vista Drive, thru La Mariposa subdivision to the temporary ponding areas located within the drainage channel right-of-way. These ponding areas were originally sized to include the area occupied by Sagecrest subdivision in its undeveloped state. Additionally, the street system within La Mariposa subdivision has the capacity to transmit the undeveloped flow rate to the pond. Thus the design criteria for the site will be to reduce the developed flows to equal the undeveloped runoff rates. This will be accomplished by on-site ponding of as many lots as the grading will allow.

DESIGN CRITERIA

In analyzing the storm runoff to determine the runoff basis of the undeveloped site, the Rational Formula, Q = CIA, 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 Figure V - Intensity Duration Frequency Curves (Albuquerque Area - 1961). (Note: Where a Time of Concentration (Tc) is less than 10 minutes from Figure IV, the

intensity value equal to 10 minutes was used as shown on the curve for a 100 year storm in Figure V.)

C = Runoff coefficient (no unit). 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.

For the proposed developed areas, it was desirable to develop a composite runoff coefficient based on the percentage of different types of surface in each sub-drainage area. Different coefficients with respect to surface type are given below.[1]

Streets, walls and drives	C = 0.90
Roofs	C = 0.90
Lawns, sandy soils, average 2 to 7% slope	C = 0.20

What about SW landscaping?

The following table is a summary of these values. Refer to the appendix for an example of the calculations.

Sub-Drainage Section	Area	By Area C=0.20	By Area C=0.90	Composite "C" Factor
1	5.47	2.84	2.63	0.54
2	0.90	0.67	0.23	0.38
3 to S-1	6.15	4.70	1.45	0.43
4	0.46	-	0.46	0.70
5	3.16	1.43	1.73	0.58

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

1. Table 3-2, Urban Storm Drainage Criteria Manual Vol. I, Denver Regional Council of Governments

PHASE I

Phase I consists of analyzing the site in the undeveloped form. As stated before, the site was originally in a natural ponding area, but because of a land filling operation, the site now has a gentle slope upward to the east from Valle Vista Drive. Therefore, runoff was based on a general path traversing the center of the site from the crest to Valle Vista Drive. The runoff coefficient used for undeveloped areas = 0.35.[2]

TABULATION OF RESULTS - PHASE I

ESTIMATED FLOWS - UNDEVELOPED SITE

Elev. Diff. (feet)	Length of Flow (feet)	Tc (min)	I ("/m)	C	Area (Ac)	Q (c.f.s.)
6'	1350	16	4.61	0.35	19.777	32

17.5
2.6 acres ponded?

PHASE II

Phase II consists of analyzing the site in its developed state. Only internal flows were considered in this phase. The resulting runoff flows and area contributing to this runoff are shown for each area on Figure III. Calculations for each area are shown in the appendix.

2. Table XII, Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963, G. Herkenhoff & Associates.

TABULATION OF RESULTS - PHASE II

ESTIMATED FLOWS - DEVELOPED SITE

Sub-Drain. Area	Area (Ac)	"C"	Length & Time Overland Flow		Length & Time Channel Flow		Total Time (Min.)	Intens. "/hr.	Q cfs
O-S-A-1 + Area 3	6.147 4.7 4.45	0.43	676	21	650	1.3	22.3	4.0	10.5 24
1 ~~11.5~~	5.474	0.54	95	12.6	880	3.7	16.3	4.58	13.5
2 ~~12.4~~	0.897	0.38	54	8.5	805	3.4	11.9	5.12	1.7 2.57
3 ~~13.8~~	~~1.445~~	0.70	-	-	650	10.0	10.0	5.40	5.5
4 ~~14.7~~	0.456	0.70	-	-	185	10.0	10.0	5.40	1.7 2.14
5 ~~12.3~~ 16.0	3.164	0.58	105	12.3	840	3.5	15.8	4.63	8.5 5.7

$\Sigma Q = 30.9$ 35.9 1.2 37.2

SUMMARY OF RESULTS

The following is a breakdown of the individual areas and their relationship to the overall drainage picture (See Figure III).

AREA 1. Flows originating within this area will flow to the west and be routed south thru a lined drainageway prior to reaching the intersection of Valle Vista Drive. The reason for this recommended flow pattern is because a high point in Valle Vista Drive, just south of the intersection of Mariah Road will cause flows to drain north to Montano Road. This would be an unacceptable routing of flows because of a difficult drainage problem on Montano Road west of the intersection of Valle Vista Drive. Yes but Belhumah is suppose to fix.

However, the recommended flow routing will divert flows thru the drainageway to College Street, then west thru La Mariposa subidivsion to the temporary retention pond located on the west side of said subdivision.

Area 2 - Flows from this area will follow the same pattern as flows from Area 1, as concerns the routing thru La Mariposa subdivision to the retention pond. Total flows from Areas 1 and 2 entering College Street will equal 15 c.f.s., for a 100 year storm.

Areas 3 & 4 - Areas 3 & 4, as shown on Figure III, encompass the arterial bordering the east side of the site. This street will act as an interceptor for flows originating from off-site Area 1 (O-S-A-1) (See Figure II). The arterial is high-pointed at the natural ridge line, with Area 3 flowing to the north to Montano Road, and Area 4 flowing south. O-S-A-1, defined by the ridge line on the east side, slopes toward the arterial. Both areas, O-S-A-1 and 3, contribute a total flow of 10.5 c.f.s., at the intersection of Montano Road, which slopes to the east. Area 4 will drain 1.7 c.f.s., to the southeast over undeveloped land.

Area 5 - Flows from Area 5 will follow the street pattern to the south before turning west and leaving the site.

Summing up the above, it can be shown that:

A. Total runoff - undeveloped state = 32 c.f.s.

B. Total runoff - developed state = 30.9 c.f.s.

The net result is a reduction of the runoff rate by 1.1 c.f.s.

Offsite doesn't use to go down Montano which is bad. No outlet.

RECOMMENDATIONS

The following recommendations are made to enable the developer of Sagecrest subdivision to complete this project within the design framework stated above:

1. It is recommended that all streets, assuming a 32' FF with a 4" crown, be sloped at a minimum grade of 0.5% in the directions shown on Figure III. It is recommended that high points in the streets be constructed where shown to carry out the routing concept. The entire site will be a land fill operation to raise it above the original level. Therefore, these flow patterns in the streets can easily be obtained.
2. The flows from Area 1 will enter a lined drainageway to move the flows south to College Street. A 10' wide drainage right-of-way is designated on the plat for this purpose. It is recommended that said drainageway be constructed as per City of Albuquerque standards, Dwg. No. P-17, Type A, at a minimum slope of 0.5%.
3. The assumption was made that one-half College Street, adjacent to the south side of the site, would be improved in conjunction with this project. If for some reason this assumption isn't valid, the developer should grade the unimproved road to drain onto Valle Vista Drive. A typical section would be a 24' wide, no crown road, with a 1'-0" high, 3:1 S.S., dirt berm along the south side.

as a condition of approval.

4. Areas 3 and 4, or the arterial street on the east side, face the same amount of uncertainty as regards the extent of

0493

25
25
50

70X85 = 5950

30% = 1785

$\frac{1090 \text{ grain}}{1785}$ = .61 = 7 1/3 inches

improvements. The assumption was made that only the west half of the street will be improved at this time. This will be more than sufficient to handle the 100 year flows from O-S-A-1, Area 3 and 4. The final cross section of the street will be 25' FF on the west side, 35' FF on the east side with a 16' median. Minimum slope should equal 0.5%. (Note: Composite "C" factor computed on full development of street.)

again unimproved drainage

5. Area 5 will drain its runoff to College Heights Drive. This street, between Valle Vista Drive and the site, is in an unimproved state. It is recommended that the developer grade this unimproved road at a constant grade to Valle Vista Drive, minimum slope of 0.5%, to channel the runoff from Area 5 to the west. A typical section would be 24' wide with 1' high dirt berm located on each side to contain the flows.

6. Lots designed as having ponding areas should have an area equal to 30% of the drained area. The drained area would typically start at the midpoint of the roof, assuming a pitched roof, one half the side yards and the entire rear yard. These lots have been planned as "estate" lots, typical size 85' x 120'. It is recommended that the ponding areas be incorporated into the landscaping of each lot, rather than fit the landscaping and contouring to the pond.

how deep if 30% used?

SUMMARY

The subject property, by utilizing backyard ponding where possible, should be a benefit to the drainage characteristics of the area.

Respectfully submitted,

Bo K. Johnson
N.M.P.E. No. 5922

APPENDIX

COMPOSITE "C" FACTOR CALCULATIONS

Example Area 1

C = 0.90 - Impervious Areas

Street & Sidewalk = 40' wide x 1550' = 62,000 ft^2

Roofs (50 x 40) x 6 = 12,000 ft^2

Roofs (50 x 20) x 23 = 23,000 ft^2

Driveways (18 x 34) x 29 = 17,748 ft^2

1 = 114,748 ft^2

= 2.63 Ac.

C = 0.20 - Pervious Areas

Area = 2.84

Total Area of Area 1 = 5.474

Composite "C" factor:

$$\frac{2.63}{5.474}(0.90) + \frac{2.84}{5.47}(0.20) = 0.54$$

RUNOFF COMPUTATIONS

Sheet No. 1

Project: Sagecrest Sub'd.

Drainage Area No. 1

Area = 5.474 acres

Maximum Overland Flow: L = 95 S = 2%

Maximum Channel Flow:

Channel No. 1 L = 880 S = 0.5%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow or Inlet Time: 12.6 min.

Channel No. 1 Flow:

Velocity = 3.98 ft/sec; Time = $\frac{880}{3.98 \times 60}$ = 3.7 min.

Channel No. 2 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\quad \times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\quad \times 60}$ = _____ min.

Total Accumulation Time: T = 16.3 min.

$I = \frac{189}{t+25} = \frac{189}{41.3} = 4.58$

$Q = CIA = (0.54)\ (4.58)\ (5.474) =$ 13.5 c.f.s.

Date: 8/4/76

Comp. by: CLW

Checked by: _____

RUNOFF COMPUTATIONS

Sheet No. 2

Project: Sagecrest Sub'd.

Drainage Area No. 2

Area = 0.897 acres

Maximum Overland Flow: L = 54 S = 4%

Maximum Channel Flow:

Channel No. 1 L = 805 S = 0.5%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow or Inlet Time: 8.5 min.

Channel No. 1 Flow:

Velocity = 3.98 ft/sec; Time = $\frac{805}{3.98 \times 60}$ = 3.4 min.

Channel No. 2 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 11.9 min.

$I = \frac{189}{t+25} = \frac{189}{36.9} = 5.12$

Q = CIA = (0.38) (5.12) (0.897) = 1.7 c.f.s.

Date: 8/4/76

Comp. by: CLW

Checked by: _____

RUNOFF COMPUTATIONS

Sheet No. 2

Project: Sagewood Subd

Drainage Area No. 4

Area = 0.456 acres

Maximum Overland Flow: L = – S = –

Maximum Channel Flow:

Channel No. 1 L = 185 S = 1%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow or Inlet Time: – min.

Channel No. 1 Flow:

Velocity = 8.5 ft/sec; Time = $\frac{185}{8.5 \times 60}$ = 0.4 min.

Channel No. 2 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = Use 10 min.

$i = \frac{189}{t+25} = \frac{189}{35} = 5.4$

Q = CIA = (0.70) (5.4) (0.456) = 1.7 c.f.s.

Date: 8/4/76

Comp. by: CLW

Checked by: _____

RUNOFF COMPUTATIONS

Sheet No. 4

Project: Sagecrest Sub'd

Drainage Area No. 5

Area = 3.164 acres

Maximum Overland Flow: L = 105 S = 3%

Maximum Channel Flow:

Channel No. 1 L = 840 S = 0.5%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow or Inlet Time: 12.3 min.

Channel No. 1 Flow:

Velocity = 3.98 ft/sec; Time = $\frac{840}{3.98 \times 60}$ = 3.5 min.

Channel No. 2 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 15.8 min.

$I = \frac{189}{t+25} = \frac{189}{40.8} = 4.63$

Q = CIA = (0.58) (4.63) (3.164) = 8.5 c.f.s.

Date: 8/4/76

Comp. by: CLW

Checked by: _____

RUNOFF COMPUTATIONS

Sheet No. 5

Project: Saggewest Sub'd

Drainage Area No. 3 and O-S-A-1

Area = 1.445 + 4.70 acres

Maximum Overland Flow: L = 676 S = 2%

Maximum Channel Flow:

Channel No. 1 L = 650 S = 1%

Channel No. 2 L = _____ S = _____

Channel No. 3 L = _____ S = _____

Accumulation Time

Overland Flow or Inlet Time: 21 min.

Channel No. 1 Flow:

Velocity = 8.5 ft/sec; Time = $\frac{650}{8.5 \times 60}$ = 1.3 min.

Channel No. 2 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Channel No. 3 Flow:

Velocity = _____ ft/sec; Time = $\frac{\quad}{\times 60}$ = _____ min.

Total Accumulation Time: T = 22.3 min.

$I = \frac{189}{t+25} = \frac{189}{47.3} = 4.0$

$Q = CIA = (0.43)\ (4.0)\ (6.145) =$ 10.5 c.f.s.

Date: 8/4/76

Comp. by: CLW

Checked by: _____

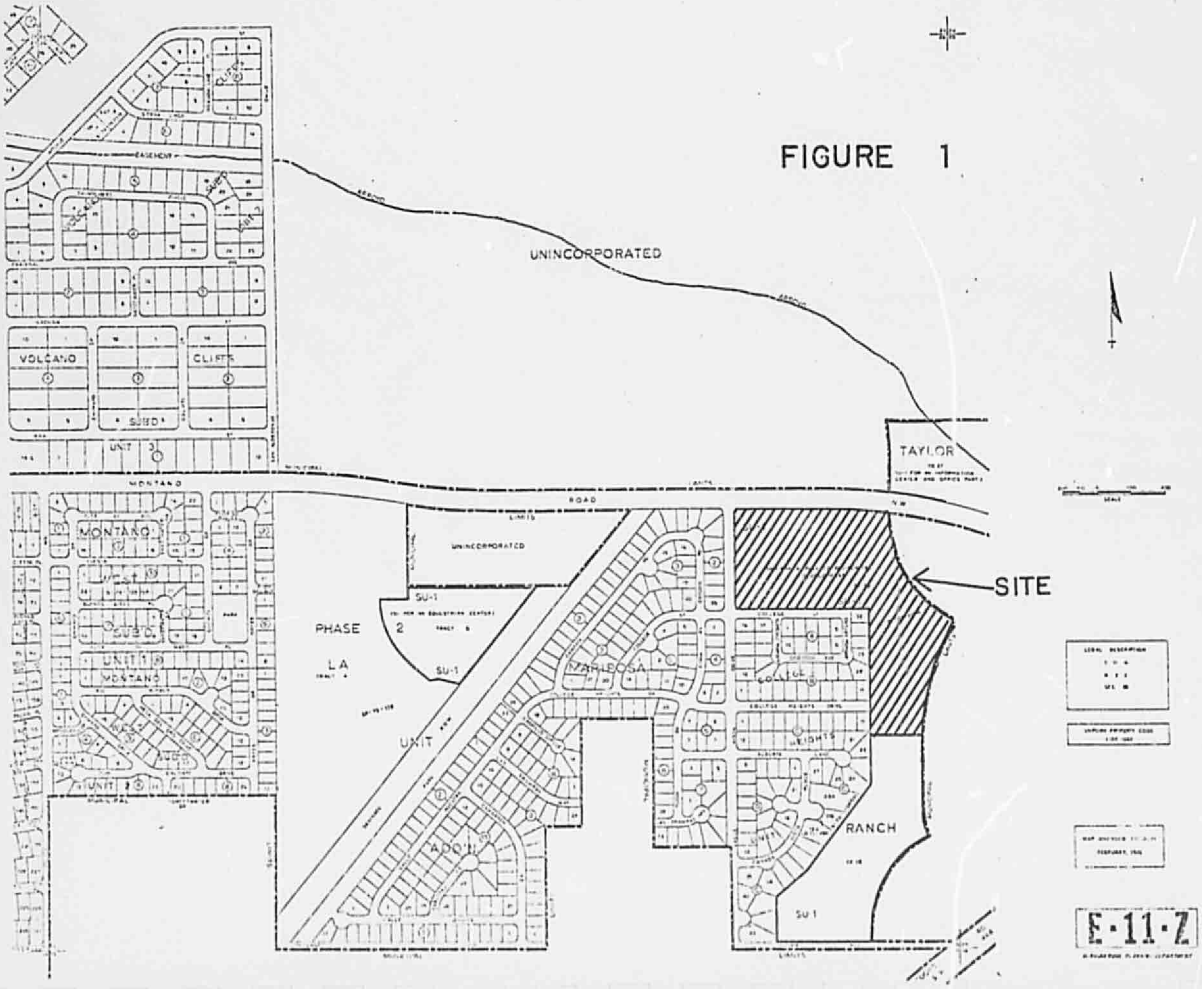
FIGURE 1
UNINCORPORATED
VOLCANO
CLIFFS
SUBD.
UNIT 3
MONTANO
ROAD
TAYLOR
UNINCORPORATED
SITE
PHASE
2
LA
SU-1
SU-1
UNIT
MONTANO
SUBD.
UNIT 3
MONTANO
UNIT 3
ADDN.
VARILOSA
SUBD.
HEIGHTS
RANCH
SU-1
E-11-Z

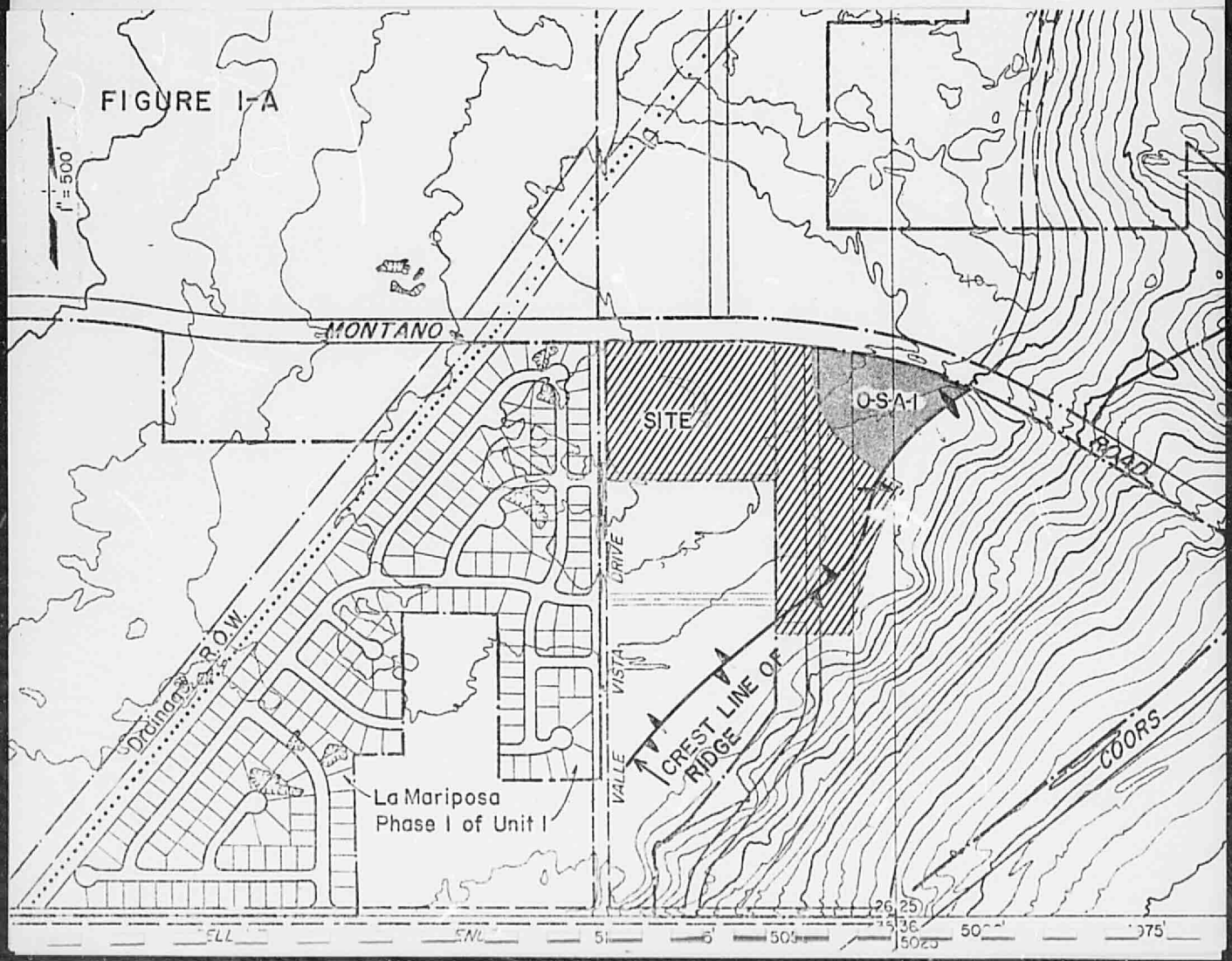
FIGURE I-A
1" = 500'
MONTANO
SITE
O-S-A-1
ROAD
DRIVE
VISTA
VALLE
CREST LINE OF RIDGE
COORS
Drainage R.O.W.
La Mariposa
Phase I of Unit I

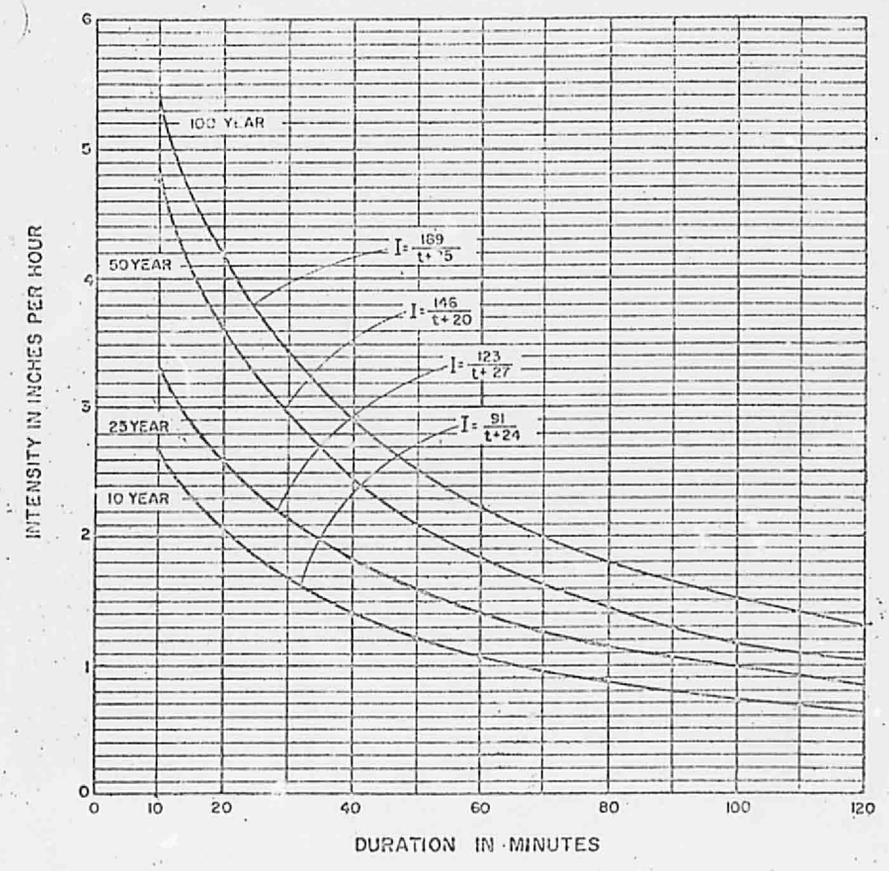

FIGURE IV

INTENSITY DURATION FREQUENCY CURVES

(ALBUQUERQUE AREA - 1961)

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

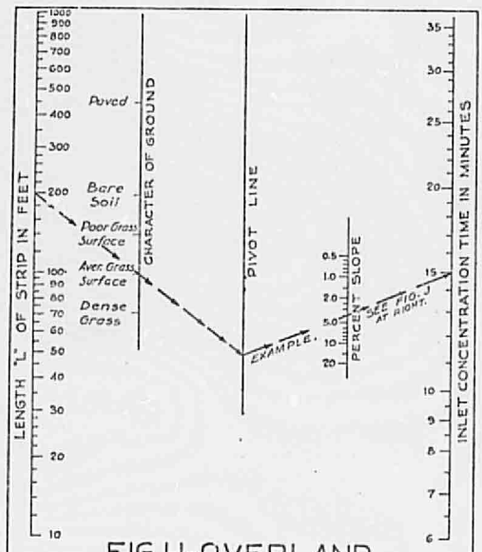

FIG. H-OVERLAND FLOW TIME.

FIGURE H