5600 Sunset Gardens

STORM DRAINAGE STUDY
RELATIVE TO DEVELOPMENT OF LOT 208
UNIT 6, TOWN OF ATRISCO
ALBUQUERQUE, NEW MEXICO

1. PURPOSE:

This report is to transmit the findings of a study of storm runoff drainage conditions in an area proposed for development described as Lot 208, Unit 6, Town of Atrisco.

2. LOCATION:

The area proposed for development is located in Sections 23 and 26 of Township 10 North, Range 2 East, N.M.P.M. The area is bounded on the north by Sunset Gardens Road, SW, and on the south by Salvador Road, SW, and is located 50 feet east of Coors Boulevard on its northern boundary. Total land area of the tract is approximately 4.69 acres.

K&L, II

3. EXISTING DRAINAGE CONDITIONS:

A. General: The tract under consideration is presently undeveloped. Areas upslope of the site are presently only partially developed. There are no major drainage problems within the site. shown in 100yr FP of Phase A

B. Topography: The land is located on the West Mesa in an area of low gradiant sandy surfaces. The elevation of the land ranges from 5001 to 5015 MSL, with a natural slope downward to the southeast. The area is covered

with sparse vegetation.

C. Drainage Areas: Upslope watershed areas consist of partially developed land, 1.6 acres immediately west and 2.0 acres immediately north of the property under consideration. Runoff from these areas crosses the property from the northwest to the southeast in a natural swale, having an average slope of less than 1 percent. Slopes as high as 13 percent along the east and southern boundaries drain excessive runoff to nearby natural ponding areas, or to the area of the Arenal Canal.

4. PROPOSED DRAINAGE PLANS:

A. Criteria:

1) General: Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.

2) Project Storm: 100-year intensity; frequency-duration as shown in Fig. III-8, "Western Albuquerque Metropolitan Area Drainage Management Plan", as prepared by William Matotan & Associates, Inc., Consulting Engineers.

3) Aerial Data: Orthophoto Topographic Map Portion of West Mesa, Bernalillo County, New Mexico, for AMAFCA, 1973.

B. Hydrologic Features:

1) Existing Conditions: Area - 4.7 Acres

1) Existing Conditions (Con't.): Length - 714 feet

Slope - .7 percent

Character - Sparse vegetation to bare

Runoff - 2.6 cfs

2) Future Condition: Development of the property will include both a mobile home parking facility and an access road with corresponding increases in site runoff. Adjacent upslope drainage areas have been included in the analysis, and the recommendations will allow for transportation of runoff across the property in question. To comply with AMAFCA Resolution No. 1972-2, the calculated increase in site runoff will be retained on the site for percolation into the sub-surface.

5. CONCLUSIONS AND RECOMMENDATIONS:

On the basis of the study of this report, the following recommendations are proposed:

A. Provide site grading on each individual lot, such that detention ponds will maintain the existing flow rates and total runoff volumes. Each detention pond must be capable of storing one hundred and eleven (111) cubic feet. (Example: 40' x 20' x .14')

B. Provide access road grading to match existing grades of

Sunset Gardens Road and Salvador Road, with drainage capacities to handle both on-site and upslope drainage.

C. Align facilities such that location of runoff does not change.

Provided that the above listed recommendations are implemented concurrent with the development of the tract, it is concluded that such development will not create flood hazard to surrounding properties, nor will the property itself be in danger of flooding.

MacCORNACK & BURNS
Consulting Engineers, Inc.

Fred Burns

Fred Burns
New Mexico Registration No. 4000

MacCORNACK & BURNS
CONSULTING ENGINEERS, INC.
1721 GIRARD BLVD., N.E.
ALBUQUERQUE, NEW MEXICO 87106
(505) 266-7789

September 12, 1975

TYREE SURVEYING COMPANY
201 Eubank, NE
Albuquerque, N. M. 87123

Re: Storm Drainage Study
Lot 208, Unit 6
Town of Atrisco

Gentlemen:

Attached is the revised Drainage Plan drawing incorporating your typical street section. Drainage capacity of the revised section is approximately 37 cfs at a slope of 0.0025.

Also included are revisions to the final grading plan which will insure flow from trailer roofs and driveways to the planned ponding areas. Typical ponds are to be forty (40) by thirty (30) feet with a maximum depth of 2.5 inches.

Your help in resolving these questions is appreciated. Please feel free to call us at any time.

Very truly yours,

MacCORNACK & BURNS, INC.

Fred Burns

Fred Burns

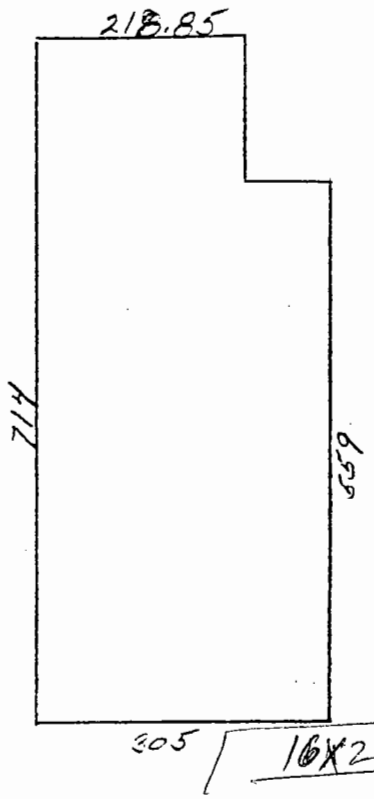
JFB:mt
Encls.

Job Tyree Drainage Study — Sheet No. 1 of ____

Subject ____ — Job No. 75-60

Client ____ — By MC Date 6/75

MAC CORNACK & BURNS Consulting Engineers, Inc., Albuquerque, NM



Total Area = 305(714) − (155)(56.15)
= 204,362 ft²
= 4.7 Ac.

$T_c = .00013\left(\frac{714^{.77}}{.007^{.385}}\right) = 8.5$ min.

For 100 yr. storm I = 5.5 inches/hr.

C (undeveloped) = .1

C (developed) = .4

Q exist. = .1 (5.5) 4.7 = 2.6 cfs.

Calculation for Developed Coeff. of Runoff.

	Area.	Coeff.	Prod
Trailors	26460	.9	23814
Roadway	21140	.9	19026
16X20 Driveways	8640	.9 small	7776
50 % Grass	74061 ~~ACRE~~	.07 ~~.13~~	5184
50 % Sandy	74061	.1	7406
			63206

Dev Coeff. of Runoff = $63206/204362$ = .31

Q dev. = .31 (5.5) (4.7) = 8.0 cfs.

Q_{10} = 7.3 9.2

Q_{15} = 6.2 7.8

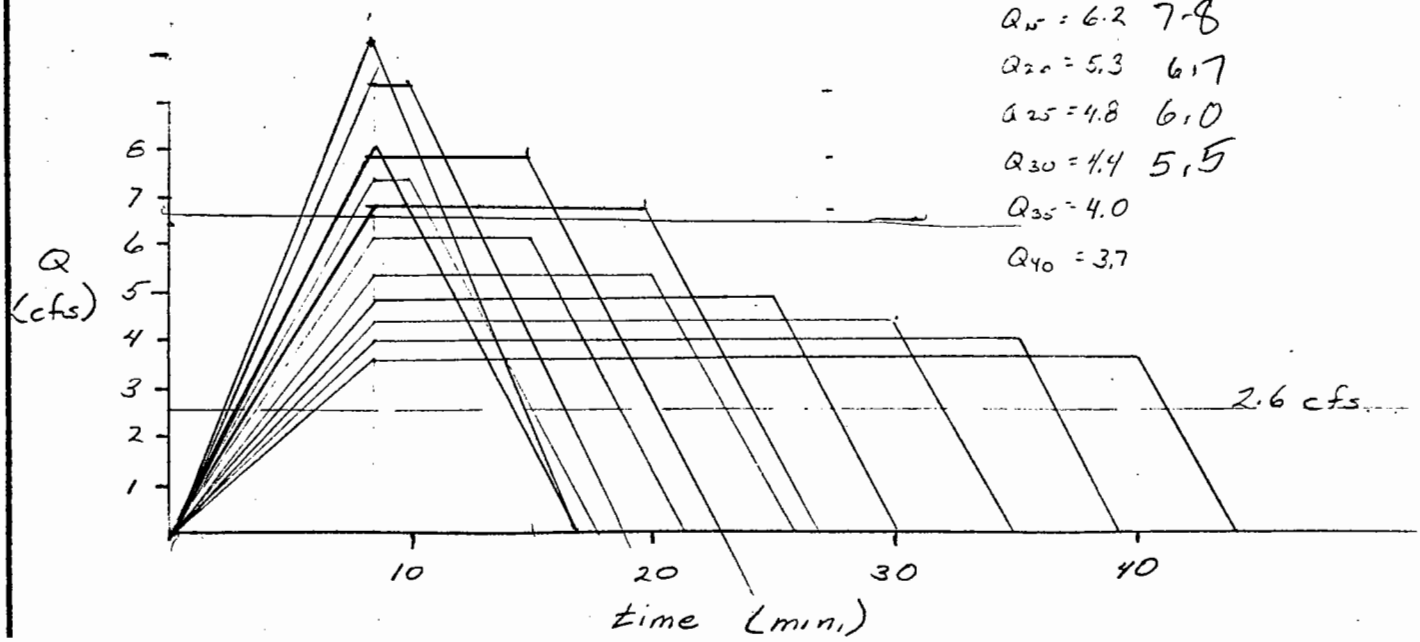
Q_{20} = 5.3 6.7

Q_{25} = 4.8 6.0

Q_{30} = 4.4 5.5

Q_{35} = 4.0

Q_{40} = 3.7



Required Storage Volume to maintain 2.6 cfs runoff.

$V_{10} = \left(\frac{8.5}{1.3}\right)(7.3-2.6)^2/2 + (7.3-2.6)(1.5) + (1.06)(7.3-2.6)^2/2 = 31.62$

$V_{15} = \left(\frac{8.5}{6.2}\right)(3.6)^2/2 + 3.6(6.5) + 1.06(3.6)^2/2 = 39.15$

$V_{20} = \left(\frac{8.5}{5.3}\right)(2.7)^2/2 + 2.7(11.5) + 1.06(2.7)^2/2 = 49.95$ ←

$V_{20'} = \left(\frac{8.5}{4.8}\right)(2.2)^2/2 + 2.2(16.5) + 1.06(2.2)^2/2 = 43.15$

$V_{30} = \left(\frac{8.5}{4.4}\right)(1.8)^2/2 + 1.8(21.5) + 1.06(1.8)^2/2 = 43.54$

$V_{35} = \left(\frac{8.5}{4}\right)(1.4)^2/2 + 1.4(26.5) + 1.06(1.4)^2/2 = 40.2$

Max. Req. Storage = 49.95 (60) = 2997 ft^3 ←

Orig. Vol Runoff = 8.5(2.6)(60) = 1326 ft^3

Dev. Vol Runoff = 8.5(8)(60) = 4080 ft^3

Retention Vol. is greater than the increased flow ∴ total runoff will not be increased.

Ck. Road Section.

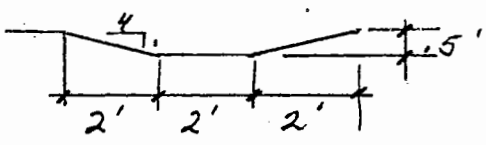
$Q = K/n\ D^{8/3}\ S^{1/2}$ (King's Handbook of Hydraulics)

Min. S = .0017 $S^{1/2}$ = .0422

b = 2 D = .5

K = 8.95 n = .025

$Q = \frac{8.95}{.025}(.5)^{2.66}(.0422) = 2.38$ cfs.



Typ. gutter

Total Q = 2 (2.38) = 4.76 > 4.3 Ok.

How will you drive across?

Job Granada View - Lot 208 Sheet No. R-1 of

Subject Drainage Study Job No.

Client Tyree Surveying By DJC Date 8/75

MAC CORNACK & BURNS Consulting Engineers, Inc., Albuquerque, NM

Outlet Elevation = 7.1'

Ponding Area 1 - Surface Area = 1960 ft²

Vol = (7.1 - 6.9)(.33)(1960) = ~~392~~ 130 ft³

Ponding Area 2 - Surface Area ≈ 8000 ft²

Vol. = (7.1 - 6.75)(.33)(8000) = 924 ft³

Total Ponding = ~~1376~~ 1053 ft³

Existing runoff = (.1)(5.5)(4.7 area)(43560)/12 = 9384 ft³

Existing Coefficient of Runoff = .25 (Revised from .1)

Source - Design by Seelye R-18-02

Existing Runoff = .25(5.5)(4.7) = 6.46 ✓

Developed Coefficient of Runoff

739.99' x 40 = 29599

	Area	Coeff.	Prod	
Trailons	26460	(.9)	23814	23814
Roadway	21140 ✓	(.9)	19026	26639
Driveways	8640 ✓	(.9)	7776	7776
50% Grass	7406 / ~~1998~~	(.07)	518	4888 ~~5026~~
50% Sandy	7406 / 69831	(.25)	1851.5	17458 ~~17957~~
	~~20~~ 362		74315 / 80575 / 204362	.36

Developed Runoff = .36(5.5)(4.7) = 9.3 cfs ✓ (10 ~~20~~ 2)

To determine effect of existing storage on runoff use 39

$I = \frac{189}{t+25}$ and calculate time req. to fill existing ponding.

See Sheet R-2 for calculation of ponded volume.

Ten minutes into the storm, storage will no longer effect runoff

∴ Q_i = .25(5.4)(4.7) = 6.35

Job Granada View - Lot 208 Sheet No. R2 of

Subject Drainage Study Job No.

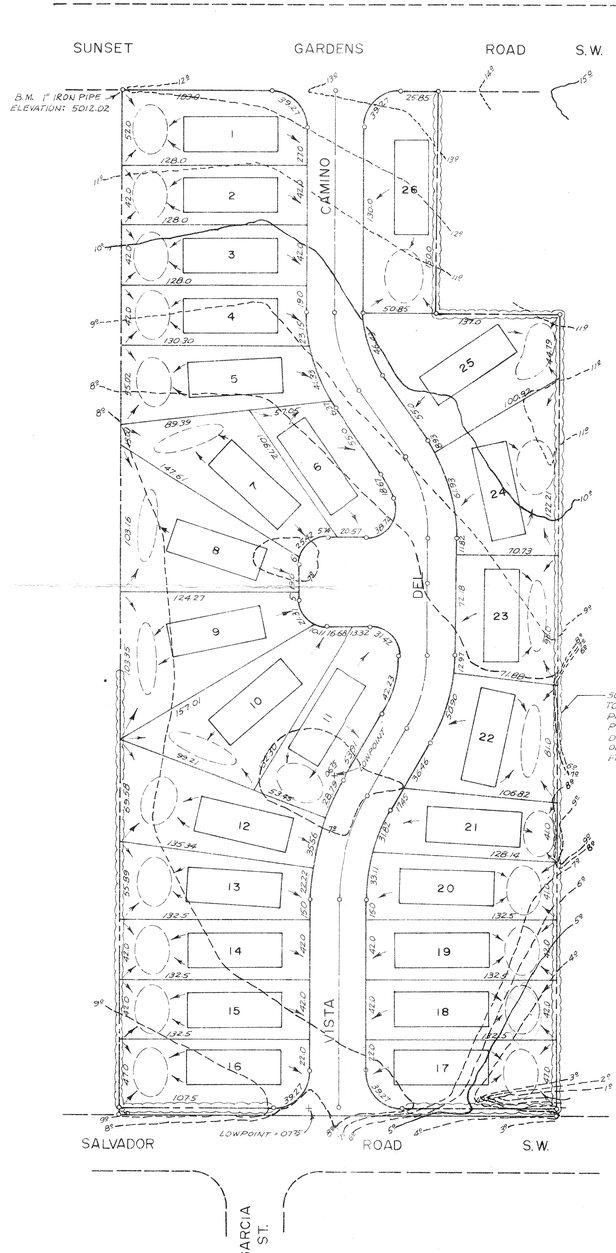
Client Tyree Surveying By JJC Date 8/75

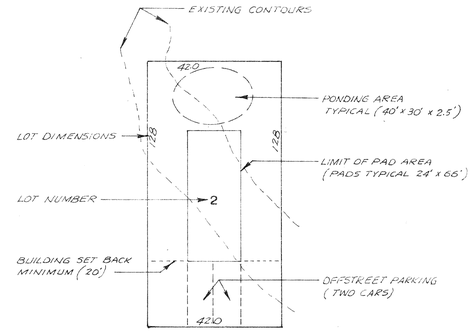
MAC CORNACK & BURNS Consulting Engineers, Inc., Albuquerque, NNM

Time	i	Q	Q Δt (t/tc)	Vol.	Σ Vol.
0	7.56	8.88			
1	7.27	8.54	8.71 (60) 1/8.5	61.5	61.5
2	7.0	8.22	8.38 (60)(2/8.5)	118.3	179.8
3	6.75	7.93	8.08 (60)(3/8.5)	171.0	350.8
4	6.51	7.65	7.79 (60)(4/8.5)	220.0	571.0
5	6.3	7.40	7.52 (60)(5/8.5)	265.4	836.0
6	6.1	7.17	7.28 (60)(6/8.5)	308.3	1144.0
7	5.91	6.94	7.05 (60)(7/8.5)	348	1492.0
8	5.73	6.73	6.83 (60)(8/8.5)		
9	5.56	6.53	6.63 (60)		
10	5.4	6.35			
11	4.72	5.55			

Ponding area will fill in less than the time of concentration. A ten minute rain intensity has been used to compensate for areas that will not drain into existing ponds.

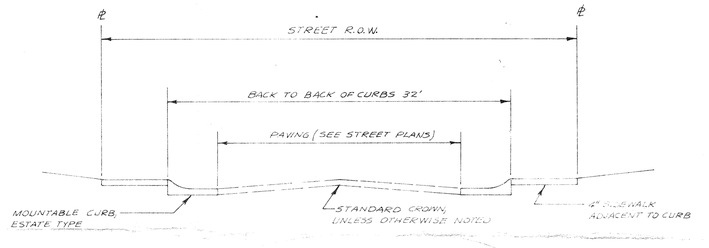
Superimposing the new undeveloped runoff rate on the original graph indicated by inspection that ponding areas as outlined will be adequate.





TYPICAL LOT PLAN

NO SCALE



TYPICAL STREET GRADING SECTION

NO SCALE

GENERAL NOTES:

1. Sewer, water and gas lines shall be located in the street right-of-way.
2. All elevations shown are Albuquerque Datum Topography prepared for A.M.A.F.C.A.
3. Street and sewer grades will be designed by the City of Albuquerque.
4. Lot grading shall be in accordance with storm drainage study relative to development of GRANADA VIEW, prepared by MacCormack & Burns Consulting Engineers, Inc. Albuquerque, New Mexico dated June, 1975.

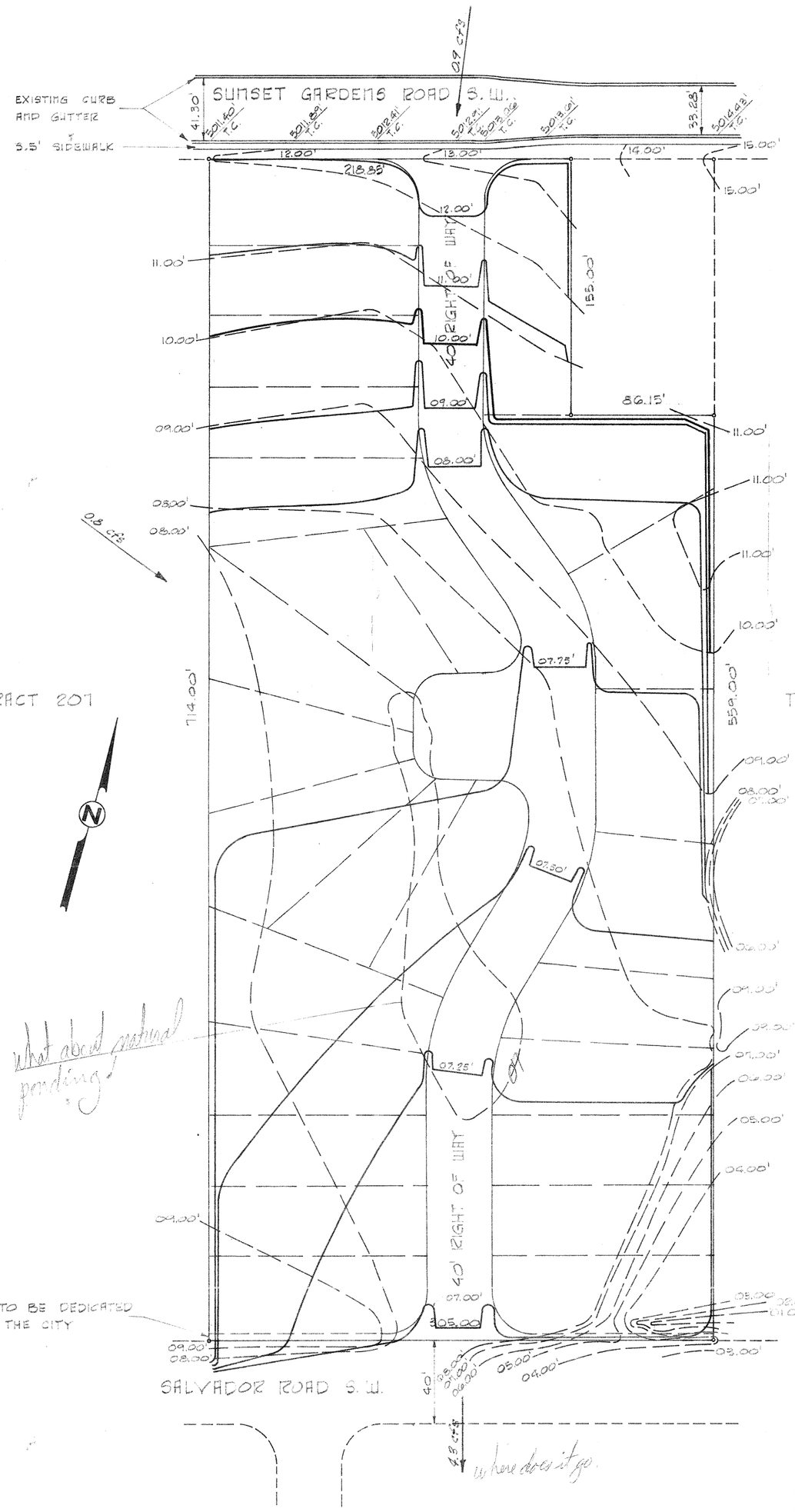
PRINTED
AUG 27 '75

TYREE SURVEYING COMPANY
201 EUBANK N.E. ALBUQUERQUE, NEW MEXICO

GRANADA VIEW

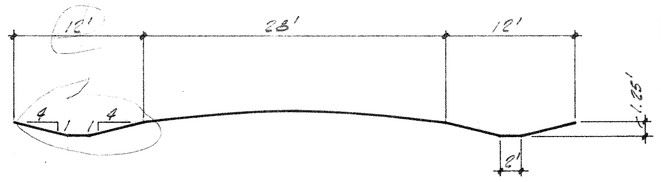
GRADING PLAN

DATE: 8/75	SCALE: 1" = 50'	DRAWN: A.D.W. CHECKED: R.E.T.	SHEET 1 OF 1



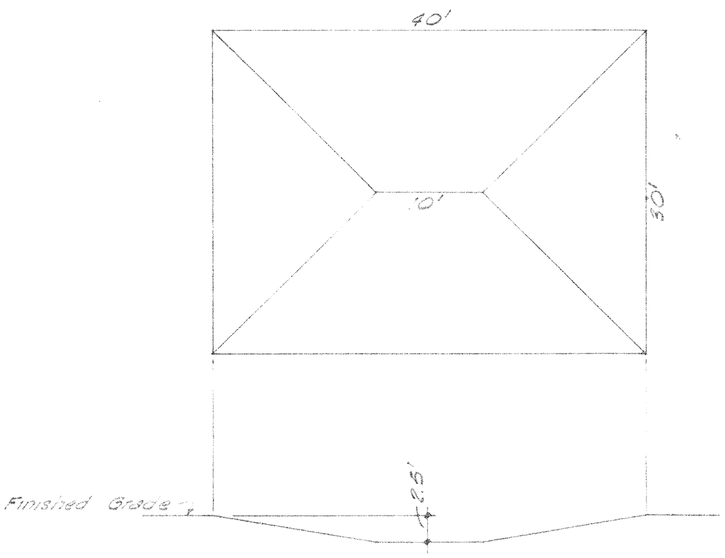
DRAINAGE PLAN 1" = 50'

how will you drive across? does not agree with text. 40' row per plat



Note: Minimum elevation at property line to be equivalent to ℄ elevation of street section.

TYPICAL STREET SECTION.



TYPICAL RETENTION POND.

MacCORNACK & BURNS
CONSULTING ENGINEERS, INC.
1721 GIRARD BLVD., N.E.
ALBUQUERQUE, NEW MEXICO 87106

REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO NO. 4000 JAMES F. BURNS

TRAILER COURT
DRAINAGE PLAN
for
TYREE SURVEYING COMPANY

Job Number	Date	Drawn: HCH-TH	Sheet 1
75-60	July 7, 1975	Checked: F.B.	Of 1.