HYDROLOGY K23/D13 2 PLANS

K23/D13

2 Plans

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

September 18, 1981

REF. NO._____

TO: Memo to File

FROM: Bruno Conegliano, Assistant Hydrology Engineer

SUBJECT: Claim for Drainage at 616 Vista Abajo N.E.

Ms. Karen E. Abernathy with the Claims Division, has notified our office of a complaint for damages to the referenced property. The drainage report for Parkside Estates was approved by Mr. Kimmick, former City Engineer (see attachment). In that report a problem was recognized regarding the flood flows from the east, which potentially affect the Linda Vista Pump Station, after jumping the curb of Mel Smith Dr. Since no steps were taken to follow up on the recommendation of the report (see attachment), this spring the problem was brought to the attention of the Water Resources Department for a resolution. It was anticipated that the problem would be resolved and no follow up from this office was considered necessary.

The above notwithstanding, the fact remains that it was the responsibility of the engineer for the developer, Mr. Jake Bordenave, to provide for protection against external flow, to the lots in the proposed subdivision (i.e. retaining or diversionary walls). From the photographs supplied by Mr. Villani it is apparent that this had not been the case. The privacy walls along the eastern boundary line of the subdivison appear to have been built with less than adequate foundation. Further, wall construction seems to have been inadequate, and water is reported to have flown through the joints of the lowermost course of cement blocks. Since the mortar is shown missing in the photographs provided, it is my opinion that Mr. Villani has a legitimate complaint, but against the builder and the developer who, did not provide satisfactory protection; certainly not against the City. Nevertheless, the concern of Mr. Bordenave should have been taken care of. The problem of the runoff generated by the pump station site was inappropiately overlooked.

Without a firm committment from the City (nothing is on record in the drainage files) the developer should either have provided for the offsite flows to be conveyed to the west, in a controlled manner, or built diversionary walls capable of diverting the flow to the south. A third option would have been to request from the City permission to enter the pump station and storage tank site and to construct the needed diversion. To make the assumption that the City would automatically perform the diversion is obviously in error.

BC/fs
8431A
Enclosure

cc: C. M. Easterling
C. D. Sheppard
Water Resources Department
Claims

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE REF. NO._____

September 15, 1981

TO: Fred Aguirre Municipal Development

FROM: Karen E. Abernathy Risk Management KEA

SUBJECT: Claim for damage at 616 Vista Abajo N.E.

Mr. Villani has put the City on notice of a claim for flood damage occurring in August 1980 and August 21, 1981. Some water is apparently flowing across land owned by the City. One of the City's resovoirs occupies the land in question.

I am requesting that your office look into the situation further. I would like to know if the flow across the City's land is natural or if it was created by construction. Did the resovoir exist prior to the development of the area where Mr. Villani's house sits? How much did the housing development contribute to its own flooding problem? Also were the rains at the time the damage occurred normal?

Your assistance in this matter is appreciated.

cc: Raymond Villani

RECEIVED

August 31/81

Re Claim 81-L-2-122 8-80

Dear Karen Abernathy

On August 21/80 and again on August 14/80 my backyard at 616 Vista Abajo was flooded.

I took some pictures of a portion of the soil bank that was washed out. It appears that my cinderblock fence is eroded where the arroya ends. The pattern of washout clearly shows it is the arroya washing into my yard.

You mentioned in our last phone conversation that the City may not own the vacant land North of the watertank I question that because then that land is landlocked.

I must resolve this matter soon as it is a continuing problem so I wonder if you could give me a written status

of my claim at this time

Please advise

Sincerely Yours

Ray Villani

An inch of rain fell in the NE heights

ty.

Over One Inch of Rain Dumped on NE Heights

A thunderstorm rolled [illegible] the Sandias Thursday night, [illegible] more than one inch of rain [illegible] Northeast Heights and causing [illegible] flooding.

A National Weather Service spokesman said the storm, which started about 10 p.m., dropped 1.05 inches of rain in the 9100 block of Galaxy NE — in the far Northeast Heights. [illegible] State Police said there was heavy rainfall in the Tijeras Canyon area [illegible] some flooding. [illegible] The Albuquerque Fire Department said it had received reports of flooding in the Northeast Height, concentrated in the area near Spain and Eubank NE. The sheriff's station in Cedar Crest said that area had received a lot of rain, but reported no flooding.

7-1-81

of my claim at this time

Please advise

Sincerely Yours

Ray Villani

An inch of rain fell in the NE heights

Over One Inch [illegible] Dumped on NE [illegible]

A thunderstorm rolled [illegible] the Sandias Thursday night, [illegible] more than one inch of rain [illegible] Northeast Heights and causing [illegible] flooding.

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The department's station in Cedar Crest said that area had received a lot of rain, but reported no flooding.

8-31-81

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

Sept 4/81

R. Villani 8-80 81 L 2 122

RECEIVED
SEP 08 1981

Dear Karen Abernathy

Enclosed please find some photos taken after the recent rainfall.

The arroyo ends at my backyard wall and the only place I have soil erosion is where the arroya emptys into my wall.

You can see marks of the water undermining the wall and washing soil down the bank into my yard

Sincerely Yours
R. Villani

Four Photos Enclosed

T. T. Burnett Engineering, Inc.

Consulting Engineers

120 MORNINGSIDE N.E.

ALBUQUERQUE, NEW MEXICO 87108

TELEPHONE (505) 255-7345

Oct. 18, 1977

Mr. Kleston Laws, Vice President
Presley Co. of New Mexico
P.O. Box 11152
Albuquerque, New Mexico 87112

Re; Parkside Estates Subdivision

Dear Kleston:

Earthwork for the Tramway Channel as needed for your ponding has been accomplished according to line and grade set by this firm. Ponding capacity is sufficient to impound the 100 year storm as determined by the drainage report submitted in the early part of the year for the subdivision. Embankment has been placed along the southern and southwestern sides of the channel to provide approximately 3' of freeboard. To the best of our knowledge a decision has not yet been made as to the scheduling of construction for the Tramway Channel.

Sincerely,
T.T. Burnett Engineering, Inc.

J.J. Bordenave, President

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

August 5, 1977

Mr. Kleston Laws
Vice President
Presley Company of New Mexico
P. O. Box 11152
Albuquerque, New Mexico 87112

SUBJECT: PARKSIDE ESTATES

Dear Kleston,

Thank you for the notification in your letter of August 4, 1977. There is no question the City channel would have provided a better drainage solution, but we are experiencing continued delays in the project. It would be appreciated if the excavated material were placed within the right-of-way.

I regret our delay in furnishing an outlet for your storm drainage.

Sincerely,

V. M. Kimmick
City Engineer

VMK/fs

cc - Bohannan-Huston
Bob Kielich
Dwayne Sheppard
Bruno Conegliano

AN EQUAL OPPORTUNITY EMPLOYER

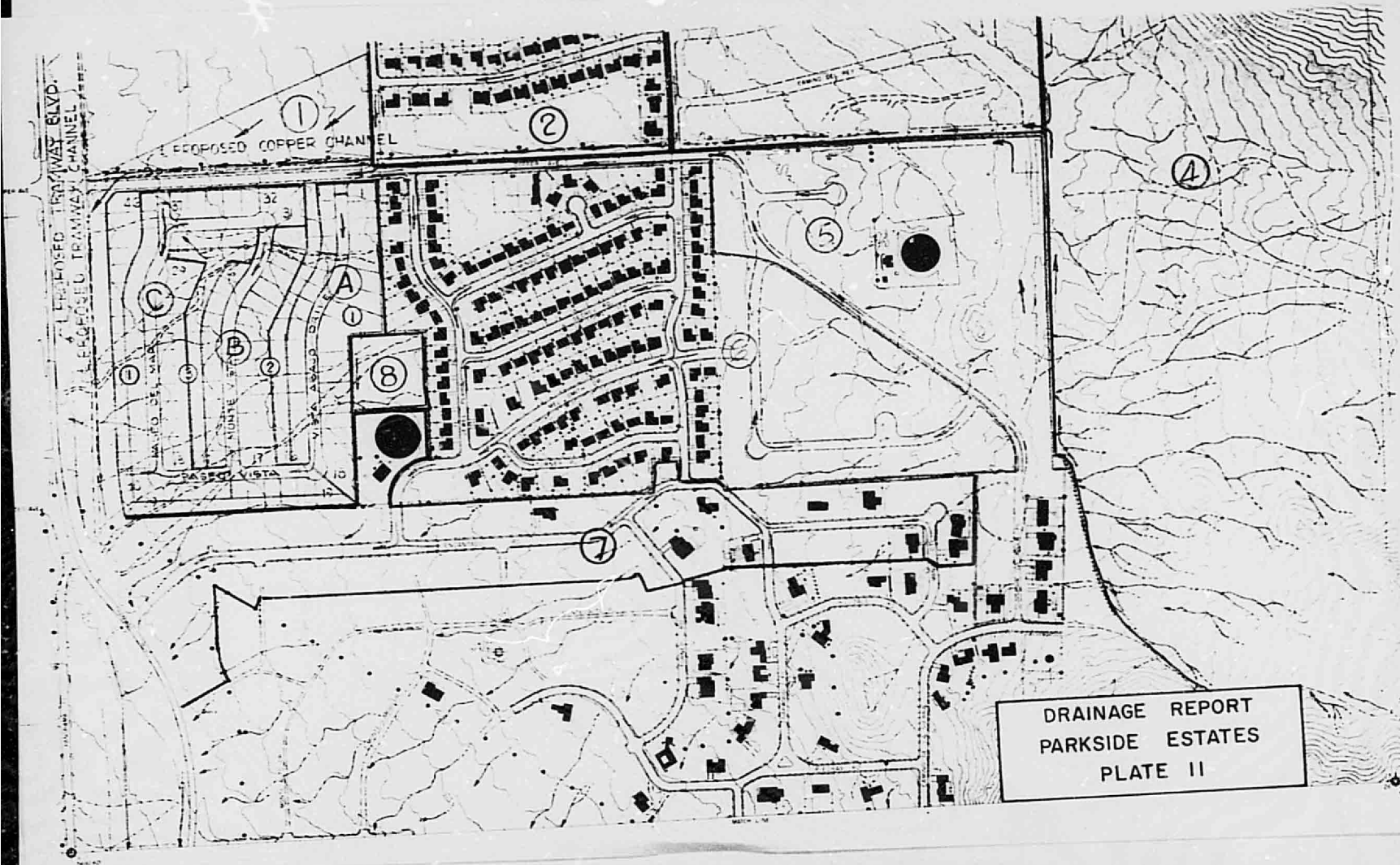
AREA # 8 City of Albuquerque - Linda Vista Reservoir. A portion of the reservoir site is presently draining through the proposed subdivision.

UPLAND DRAINAGE - DISCUSSION

Runoff from area numbers 1, 3 & 4 is intercepted by the Copper Channel and does not approach the proposed subdivision.

Runoff from area numbers 2 & 5 is directed by Copper Ave. along the north boundary of the proposed subdivision. The contributing area of approximately 66 acres with a resulting runoff flow of 164 cfs in Copper Ave. at the northeast corner of the proposed subdivision is somewhat less than the capacity of Copper Ave., at curb depth plus 0.2 feet, computed at 334 cfs. Waterblocks will be placed in proposed streets at their intersection with Copper Ave. (See Appendix A, sheets 2 & 3 for computations)

Runoff from area numbers 6 & 7 is carried by Mel Smith Dr. and Encantado Rd. and does not approach the proposed subdivision. A sharp curve in Mel Smith Dr. near it's intersection with Encantado Rd, was investigated for flows 'jumping' the west curb and entering the proposed subdivision via the Linda Vista Reservoir site. Mel Smith Dr. is superelevated through the curve at a rate of 0.003 ft./ft. This rate is not adequate to prevent ' jumping' of the curb and approximately 72 cfs 'jumps' the curb and travels westerly to the pump building which then directs the flow southwesterly toward Lot 9, Block H of the Cenaroca Addition. In addition there is a small dike along the west boundary of the reservoir site to prevent flow from entering the proposed subdivision. It is suggested, however, that the City of Albuquerc build a ditch and dike section to prevent flooding of pumping station.



DRAINAGE REPORT
PARKSIDE ESTATES
PLATE II

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

March 1, 1977

Mr. Kleston Laws
Vice President
Presley Co. of New Mexico
P. O. Box 11152
Albuquerque, New Mexico 87112

121-2227

SUBJECT: DRAINAGE REPORT FOR PARKSIDE ESTATES

Dear Kleston:

The drainage report submitted by T. T. Burnett Engineering, Inc. on February 2, 1977 has been reviewed and the following are comments:

1. Depending upon the timing of construction of this subdivision, it may be possible to utilize Tramway Channel for runoff. This matter needs to be carefully coordinated. In addition, provision needs to be made for entry of flows into Tramway Channel. At this time, it appears the channel construction will commence in about July 1977, however, the procurement of right-of-way will dictate when construction may begin, a matter which is being handled by the New Mexico State Highway Department.

2. Since the site is adjacent to a channel which will be able to carry the 100 year storm, no on-site ponding will be required. Site drainage should be placed directly in the channel.

3. Should the channel construction be delayed, the temporary use of an appropriately sized portion of the channel as

Public Works Department

Director – Erwin F. Hensch, P. E. 766-7467
Engineering 766-7441 – V. M. Kimmick, P. E.
Street Maint. 766-7755 – G. E. Paul, P. E.
Ass't. Director – Harold R. Orr, Jr. P. E.
Liquid Waste 766-7535 – R. P. Lowe, P. E.
Water 766-7437 – W. H. Otto, P. E.

AN EQUAL OPPORTUNITY EMPLOYER

a ponding area is approved.

Therefore, this drainage report is approved subject possibly to a later submission of a pond if required as indicated in Paragraph 3.

Sincerely,

V. M. Kimmick
City Engineer

VMK/fs

cc: Jim Smith, AMAFCA
Dwayne Sheppard
Bob Kielich
Drainage File

DRAINAGE REPORT

FOR

PARKSIDE ESTATES

Feb. 1977

T. T. BURNETT ENGINEERING INC.

120 MORNINGSIDE DR. N.E.
ALBUQUERQUE, NEW MEXICO 87108
PHONE 505-255-7545

DRAINAGE REPORT

FOR

PARKSIDE ESTATES

Feb. 1977

Prepared By

T.T. BURNETT ENGR., INC.
120 Morningside Dr. NE
Albuquerque, New Mexico 87108

Prepared For

PRESLEY CO. OF NEW MEXICO
7301 Beck NE
Albuquerque, New Mexico 87109

Jean J. Bordenave, N.M.P.E.&L.S. # 5110

TABLE OF CONTENTS

	PAGE
PURPOSE	1
LOCATION AND TERRAIN	1
PROPOSED DEVELOPMENT	2
UPLAND DRAINAGE	
DESCRIPTION	2
DISCUSSION	4
INTERNAL DRAINAGE	6
CONCLUSIONS	6
APPENDIX A	
METHODS AND EQUATIONS USED	
UPLAND DRAINAGE COMPUTATIONS	
APPENDIX B	
INTERNAL DRAINAGE COMPUTATIONS	
PLATES	
PLATE I - LOCATION MAP	
PLATE II -DRAINAGE BEFORE AND AFTER DEVELOPMENT	

DRAINAGE REPORT
FOR
PARKSIDE ESTATES

PURPOSE

The purpose of this report is to present to governing agencies a reasonable method of controlling runoff, resulting from the 100 year storm, within, and exiting from the proposed development of "Parkside Estates Subdivision", thereby providing protection to the subdivision and to downstream areas. Also presented is a narrative of existing conditions and their effect on upland flows as they approach the proposed subdivision.

LOCATION AND TERRAIN

The proposed subdivision is bounded on the west by Tramway Channel and Tramway Blvd., on the north by Copper Ave. and the Copper Channel, on the east by City of Albuquerque Linda Vista Reservoir Site and Block A, Unit A of City View Estates, and on the south by Block H of the Cenaroca Addition, and has an area of approximately 29 acres. (See Plate I for exact location.)

The property slopes in a west-southwesterly direction at a rate of 5.5 percent. There is one small arroyo on the property and several small swales. The soil is composed primarily of granular decomposed granite and the area is sparsely grassed.

PROPOSED DEVELOPEMENT

The subdivision will be developed as R-1 single family residences. The lots will have 60 feet to 70 feet frontages in general and will range from 110 feet to 150 feet deep. There are four lots that are in excess of 200 feet deep. Streets will be constructed 32 feet face to face of curb and have a total length of approximately 4,150 feet. Square footage of covered area for homes will vary from 1,900 to 2,500 and the front set back will vary from 20 to 25 feet.

Those lots facing down hill will be drainea to the street and those lots facing uphill will be provided with rear yard ponding. On those lots utilizing rear yard ponding, at least half the water falling on the lot will be infiltrated on site and will not contribute to subdivision generated runoff.

UPLAND DRAINAGE - DESCRIPTION (See Plate II)

AREA # 1. This property not developed at present and will drain south-westerly to be intercepted by the Copper and Tramway Channels.

AREA # 2 City View Estates, Unit C. This area is fully developed with residential streets as the drainage system transporting runoff westerly. Large waterblocks on the east end of east-west streets prevent runoff from entering the area from the east. Jewel Place, a north-south collector street, on the west boundary of the area serves as an interceptor and directs all runoff from the area southerly, toward Copper Ave. There is a small (1 foot wide) rundown on the east side of Jewel Place which is capable of diverting nuisance flows. Runoff from the

area will proceed southerly to Copper Ave. thence westerly on the street along the north boundary of the proposed subdivision.

AREA # 3 City View Estates, Unit D. City services are presently under construction in this area. The entire area is diverted to the Copper Channel via Turner Ave. and the first street east of Turner Ave. (See Drainage Report "City View Estates - Unit D", Oct., 1975)

AREA # 4 This area is not developed and extends beyond the City Limits. Runoff from the area is diverted by ditches and dikes to the Copper Channel. (See Drainage Report "City View Estates - Unit D", Oct., 1975)

AREA # 5 Portion of Supper Rock Addition. This area is under construction. The northeast corner of the area is drained via Supper Rock Dr. to Copper Ave. and then westward along the north boundary of the proposed subdivision. Flows from southerly Supper Rock Dr. and Stalgren Ct. are intercepted by Parkside Dr. and directed to Copper Ave. and then westward along the north boundary of the proposed subdivision.

AREA # 6 City View Estates - Unit A and a portion of Supper Rock Addition. All streets in this area drain to Mel Smith Dr. and from there to Encantado Rd. which is one tier of lots south of the proposed subdivision.

AREA # 7 Portions of Cenaroca Addition and Sandia Manor. Encantado Rd. traverses and drains the entire area. This street is located one tier of lots south of the proposed subdivision.

AREA # 8 City of Albuquerque - Linda Vista Reservoir. A portion of the reservoir site is presently draining through the proposed subdivision.

UPLAND DRAINAGE - DISCUSSION

Runoff from area numbers 1, 3 & 4 is intercepted by the Copper Channel and does not approach the proposed subdivision.

Runoff from area numbers 2 & 5 is directed by Copper Ave. along the north boundary of the proposed subdivision. The contributing area of approximately 66 acres with a resulting runoff flow of 164 cfs in Copper Ave. at the northeast corner of the proposed subdivision is somewhat less than the capacity of Copper Ave., at curb depth plus 0.2 feet, computed at 334 cfs. Waterblocks will be placed in proposed streets at their intersection with Copper Ave.(See Appendix A, sheets 2 & 3 for computations)

Runoff from area numbers 6 & 7 is carried by Mel Smith Dr. and Encantado Rd. and does not approach the proposed subdivision. A sharp curve in Mel Smith Dr. near it's intersection with Encantado Rd, was investigated for flows 'jumping' the west curb and entering the proposed subdivision via the Linda Vista Reservoir site. Mel Smith Dr. is superelevated through the curve at a rate of 0.003 ft./ft. This rate is not adequate to prevent ' jumping' of the curb and approximately 72 cfs 'jumps' the curb and travels westerly to the pump building which then directs the flow southwesterly toward Lot 9, Block H of the Cenaroca Addition. In addition there is a small dike along the west boundary of the reservoir site to prevent flow from entering the proposed subdivision. It is suggested, however, that the City of Albuquerque build a ditch and dike section to prevent flooding of pumping station.

Area number 8 is planned, by the City of Albuquerque, to drain to a recently constructed drainage inlet located in the southwest corner of the reservoir site. Therefore, runoff presently entering the proposed subdivision from this area will be diverted and no action need be taken by the developer.

INTERNAL DRAINAGE (See Plate II)

The internal drainage has been analyzed for three areas as defined on Plate II. It is proposed that streets be used to carry drainage with an outlet in the southwest corner of the proposed subdivision to the Tramway Channel. Maximum flow in the streets will be 65 cfs with an estimated depth of 0.5 feet at the intersection of Paseo del Mar and Paseo Vista. Computed quantities, velocities and depths of flow for street intersections are shown on sheet B4 of the computations. The outlet channel as shown on sheet B4 of the computations is located within a 25 foot drainage and utility easement at the southwest corner of the proposed subdivision.

CONCLUSIONS

UPLAND DRAINAGE Runoff from a 100 year frequency storm is diverted through existing channels, streets or closed conduits such that the proposed subdivision is adequately protected from outside areas.

INTERNAL DRAINAGE Planned streets are adequate to carry a 100 year frequency storm at less than curb depth. Provision of an outlet channel to the proposed Tramway Channel protects downstream developments from flows generated within the proposed subdivision. The flow exiting

the proposed subdivision is 13 cfs is excess of the 100 year storm for the property in its existing state, and is 14 cfs less than the computed flow for the Standard Project Flood for which the Tramway Channel is designed.

A commitment on the part of the City of Albuquerque as to the date of construction of the Tramway Channel is necessary for the Developer to prepare a schedule of development. Should it not be feasible for the Developer to wait for the construction of the channel it is proposed the Developer excavate a portion of the channel to form a basin (See sheet B6 for computations) for runoff storage. It is proposed that the earth excavated be used as required in the grading of the proposed subdivision and that any excess material, if any, be stockpiled adjacent to the proposed channel to be used as fill in the construction of Tramway Blvd.

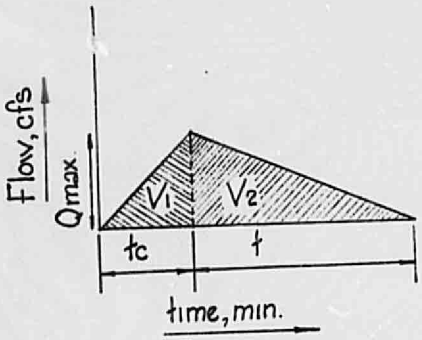
BY L.L.B. DATE 2.2.77 SUBJECT Drainage Report SHEET NO. A1 OF 4
CHKD. BY ____ DATE ____ Parkside Estates JOB NO. 7702
Equations Used

Rainfall Intensity
from "Master Plan of Drainage - Albuquerque, New Mexico and Environs, 1963"

$i_{100} = 189/(t_c+25)$, in./hr.
where t_c = time of concentration - minutes

Runoff Rate
Rational Formula
$Q = Ci\,A$
where C is a runoff coefficient from tables
where i is as defined above
where A is area contributing to runoff in acres

Urban Hydrograph



$V_1 = 30\,Q_{max}\,t_c$
$V_T = V_1 + V_2 \quad 3630\,ACX$
$V_2 = V_T - V_1$
$t = V_2/30\,Q_{max}$
where Qmax is determined by Rational Formula
where tc is as defined above
where A is as defined above
where C is as defined above
where X is the amount of rainfall in inches/ft^2 for 1 hour rainfall. (Use: 2"/ft.^{2})

Velocity and Depth of Flow in Streets
from graphs developed by T.T. Burnett Engr., 1976 based on Manning's Equation
$Q = 1.486\,A\,R^{2/3}\,S^{1/2}/n$, cfs
where A = cross sectional area of flow - ft.^{2}
where R = hydraulic radius = A/P - feet
where S = hydraulic gradient - ft./ft.
where n = coefficient for roughness
= 0.021 for asphalt pavement
= 0.013 for concrete

BY JJB DATE 1/28/77 SUBJECT Drainage Report SHEET NO. A2 OF A
CHKD. BY DATE PARKSIDE ESTATES JOB NO. 7702
Upland Flows - External

FLOWS IN COPPER AVE

AREA 2

900' @ 6% Nambe
1100' @ 1.5% Jewel
Area = 35 Acres = 1524,600 ft²

trial t_c = 2000/(1×60)+2 = 10.3 use 10
i = 5.4 in/hr
Q = (0.5)(5.4)(35) = 95 cfs
Q_{NAMBE} = (0.5)(5.4)(7) = 19 cfs

@2-19 cfs ; V_{ave} for 6% = 3.8 fps
@19-95cfs ; V_{ave} for 1.5% = 4.3 fps

t_c = 2 + (900/3.8 + 1100/4.3)/60 = 10.2min
Use Trial Values
V_1 = (95)(10)(30) = 28500ft³, V_T = (1,524,600)(.5)(2)/12 = 127050 ft³
V_2 = 98550 ft³ t = 98550/(30)(95) = 35 min

AREA 5

700' @ 2% } Parkside south
1200' @ 5% } mid
400' @ 2% } north
1400' @ 5% Copper
Area = 31 acres = 1,332,500

trial t_c = 2300/(4)(60) + 2 = 9.6 use 10
i = 5.4 in/hr
Q = = (.5)(5.4)(31) = 84 cfs
Q_{south} = (.5)(5.4)(6) = 14
Q_{mid} = (.5)(5.4)(10) = 27
Q_{north} = (.5)(5.4)(5) = 14

BY JJR DATE 1/28/77 SUBJECT Drainage Report — Parkside Estates — Upland Flows - External SHEET NO. A3 OF 4
CHKD. BY ____ DATE ____ JOB NO. 7707

FLOWS IN COPPER AVE (cont.)

Area 5 (cont.)

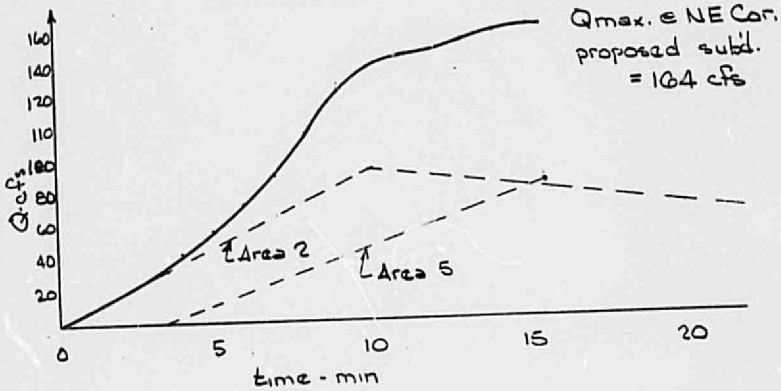
@ 2-14 cfs; Vave. for 2% = 2.4 fps
@ 14-41 cfs; Vave for 5% = 5.1 fps
@ 41-55 cfs; Vave for 2% = 4.7 fps

$t_c = 2 + (700/2.4 + 1200/5.7 + 400/4.7)/60 = 11.8$ min

Use Trial Values with $t_c = 12$

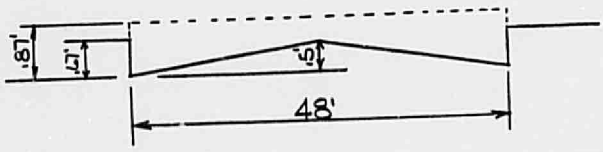
Flow time in Copper @ 84 cfs
$d = 0.62'$, $v = 6.5$ fps

$1400/(6.5)(60) = 3.5$ min



Capacity of Copper Ave @ NE Cor. Proposed Sub'd

@ d = 0.67; Q = 176 cfs
@ d = 0.87; Q = 334 cfs



BY JJB DATE 1/28/77 SUBJECT Drainage Report SHEET NO. A4 OF 4
CHKD. BY DATE PARKSIDE ESTATES JOB NO. 7702
Upland Flows-Extras

FLOWS IN MEL SMITH DR.

AREA G

Area = 55 acres , slope = 5%

Use t_c = 2800/(5.0)(60)+2 = 11 min.

i = 5.25 in/hr

Q = (0.5)(5.25)(55) = 144 cfs

d = 0.41' , V = 8.7 fps

d_c = 0.74 ∴ supercritical

superelevation of water surface

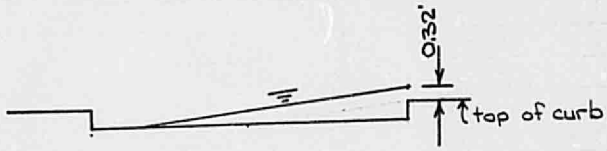
radius of street 150' ±

$\tan\theta = 8.7^2/(32.2)(150) = 0.016'/'$

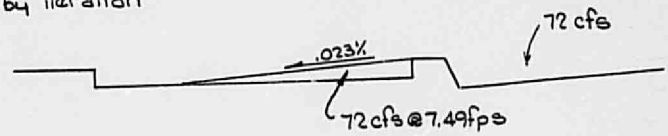
superelevation rate ≈ 0.032'/'

depth @ outside curb

d = 0.40 + 20(0.032) = 1.04' above ℄ street



by iteration



BY NJB DATE 1/31/77 SUBJECT Drainage Report SHEET NO. B1 OF 6
CHKD. BY ____ DATE ____ Parkside Estates JOB NO. 7702
Developed - Internal Drainage

AREA A

Point of Interest - Inter^n Vista Abajo - Paseo Vista

Contributing Area

	① description	② Area	③ C	② x ③
	Block 1, lots 1-18 (168300)	122,364	0.20	24473
	roofs (18)(2200)	39,600	0.95	37,620
	drives (18)(16)(22)	6336	1.00	6,336
(rear lot pond)	Block 2, lots 1-16 (89,500)	44,668	0.20	8,934
	roofs (16)(2200)	35,200	0.95	33,440
	drives (16)(16)(22)	5,632	1.00	5,632
	Street (40)(1160)	46,400	0.90	41,760
		300,200		158,195

composite C = 0.53 , Area = 6.9 Acres

street grade ≈ 2.8 % assume velocity = 3 fps ave

trial t_c = 2 + 1200/(3)(60) = 9 min

i = 189/(25+9) = 5.6 in/hr

Q = (0.53)(5.6)(6.9) = 20.5 cfs

V_{ave} = (2.1 + 3.7)/2 = 2.9

Use trial

V_1 = (20.5)(9)(30) = 5535 ft³ , V_T = (300,200)(.53)(2)/12 = 26518 ft³

V_2 = 20983 ft³ , t = 20983/(30)(20.5) = 34 min

AREA B

Point of Interest - Inter^n Monte Vista - Paseo Vista

	① description	② Area	③ C	② x ③
(rear lot pond)	Block 1, Lots 19-24 (32250)	16,932	0.20	3388
	roofs (6)(2200)	13,200	0.95	12,540
	drives (6)(16)(22)	2,112	1.00	2,112
	Block 2, Lots 17-30 (129,400)	93,672	0.20	18,737
	roofs (14)(2200)	30,800	0.95	29,260
	drives (14)(16)(22)	4,928	1.00	4,928
(rear lot pond)	Block 3, Lots 6-17 (61,500)	30,876	0.20	6,175
	roofs (12)(2200)	26,400	0.95	25,080
	drives (12)(16)(22)	4,224	1.00	4,224
	Street (40)(1200)	57,000	0.90	51,300

AREA B (Cont.)

	② Area	③ C	②x③
Σ	275,150		153,244

Composite C = 0.56, Area = 6.3 acres
Street grade ~1.5%, assume v = 2.4 fps
trial t_c = 2 + 900/(2.4)(60) = 8 min.
i = 189/(25+8) = 5.7 in/hr
Q = (0.56)(5.7)(6.3) = 20.1 cfs
V_{ave} = (1.7 + 3.0)/2 = 2.35 fps ∴ USE TRIAL VALUES
V_1 = (20.1)(8)(30) = 4824 ft³, V_T = (275,150)(2)(.56)/12 = 25,051 ft³
V_2 = 20,857 ft³, t = 20,857/(30)(20.1) = 35 min

AREA C

Point of interest - Intersection Paseo del Mar - Paseo Vista

① Description	② Area	③ C	②x③
(rear lot pond) Block 1, Lots 25-46 (116,250)	60,106	0.20	12,021
roofs (22)(2200)	48,400	0.95	45,980
drives (22)(16)(22)	7,744	1.00	7,744
Block 2, Lots 31-37 (62,850)	44,986	0.20	8,997
roofs (7)(2200)	15,400	0.95	14,630
drives (7)(16)(22)	2,464	1.00	2,464
(rear lot pond) Block 3, Lots 1-5 (26,260)	13,490	0.20	2,698
Lots 18-29 (97,975)	80,111	0.20	16,022
roofs (12)(2200)	26,400	0.95	25,080
drives (12)(16)(22)	4,224	1.00	4,224
Street (40)(1800)	72,000	0.90	64,800
	375,325		201,962

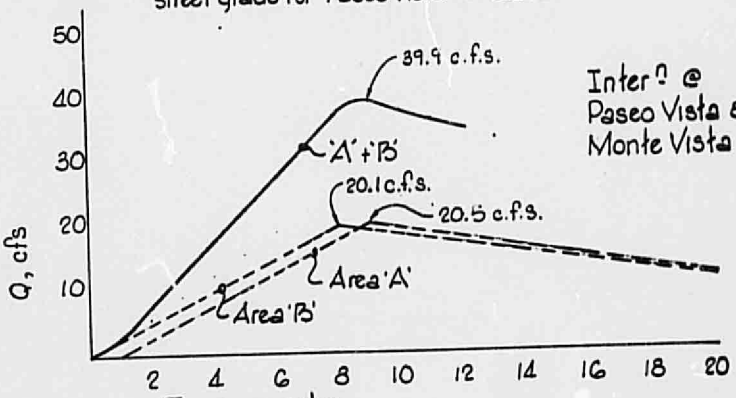
Composite C = 0.54, Area = 8.6 acres

Street Grade 400' @ 6%, v = 3.5 fps; 1000' @ 1.6%, v = 2.7 fps
trial t_c = 2 + 400/(3.5)(60) + 1000/(2.7)(60) = 10 min.
i = 189/(25+10) = 5.4 in/hr
Q = (0.54)(5.4)(8.6) = 25.1 cfs
$Q_{2.4}$ = (0.54)(5.4)(2.4) = 7 cfs
t_c = 400/(2.8+3.5)(30) + 1000/(2.3+3.4)(30) + 2 = 10 min
∴ Use trial values
V_1 = (25.1)(10)(60) = 15,060 ft³, V_T = (375,325)(2)(.54)/12 = 33,779 ft³
V_2 = 18,719 ft³, t = 18,719/(30)(25.1) = 25 min.

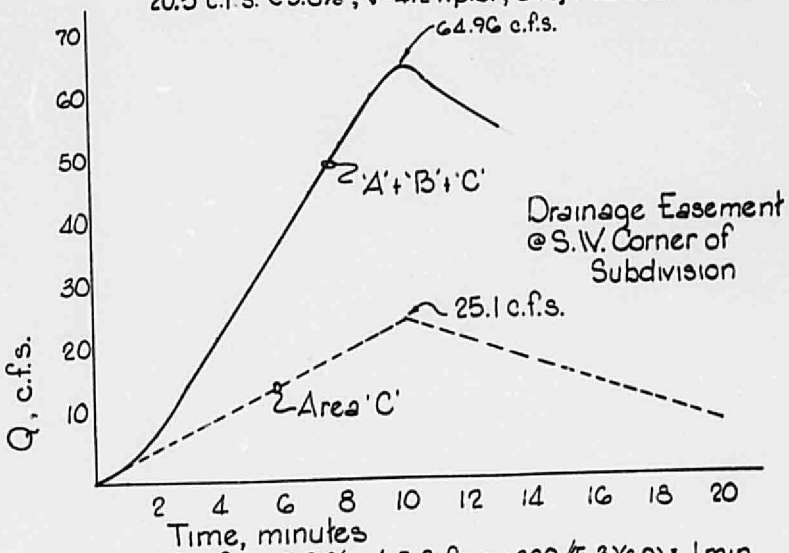
BY J.J.B. DATE 2-2-77 SUBJECT Drainage Report SHEET NO. B-3 OF G
CHKD. BY ____ DATE ____ Parkside Estates JOB NO. 7702
Developed - Internal Drainage

DRAINAGE EASEMENT @ SOUTHWEST CORNER OF SUBDIVISION

Hydrograph for Street Inter^ns @ Paseo Vista
street grade for Paseo Vista ≈ 3.8%



20.5 c.f.s. @3.8% ; V=4.2 f.p.s. ; 340/(4.2)(60)=1 min.



39.9 c.f.s. @3.8% ; V=5.3 f.p.s. ; 320/(5.3)(60)=1 min.

BY NJB DATE 2/1/77 SUBJECT Drainage Report SHEET NO. B4 OF 6
CHKD. BY DATE PARKSIDE ESTATES JOB NO.
Developed Internal Drainage

STREET FLOWS

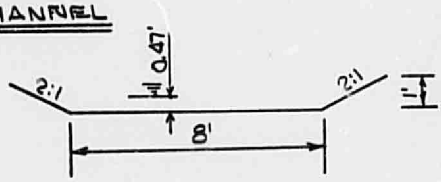
Pasco Vista ~ 4% Grade

@ Vista Abajo		@ Monte Vista
20.5 cfs	Q	39.9 cfs
4.2 fps	✓	5.6 fps
0.33 ft.	d @ Curb	0.41 ft.

Vista Abajo @ Pasco Vista		Monte Vista @ Pasco Vista
20.5 cfs	Q	20.1 cfs
3.8 fps	✓	2.7 fps
0.35 ft	d @ Curb	0.41 ft
~ 3%	Grade	~ 1 %

Pasco del Mar @ Pasco Vista		Outlet Channel
25.1 cfs	Q	65 cfs
2.3 fps	✓	15.6 fps
0.52 ft	@Curb d @ ℄	0.47 ft
~ 0.4 %	Grade	~ 6 %

OUTLET CHANNEL



In drainage easment
easement to be 25' wide

BY JJB DATE 1/31/77 SUBJECT Drainage Report SHEET NO. B.5 OF 6
CHKD. BY DATE PARKSIDE ESTATES JOB NO.
Existing - Internal Drainage

RUNOFF FOR EXISTING CONDITIONS

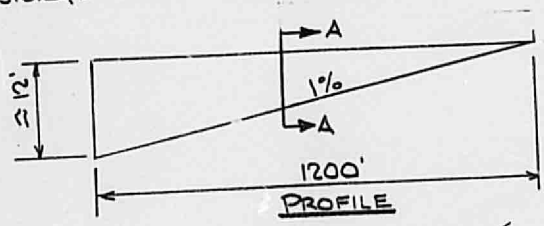
Overland Flow L = 400' overland, 850 channel ; Grade ~5%
Sparse Grass t_c = 17 min
C = 0.40 , Area = 29 Acres
i = 189/(25+17) = 4.5 in/hr
100 year Q = (0.40)(4.5)(29) = 52 cfs

SPF (1750)(29/240) = 79 cfs

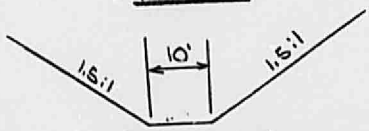
BY NB DATE 1/31/77 SUBJECT Drainage Report SHEET NO. B.6 OF 6
CHKD. BY ____ DATE ____ Parkside Estates JOB NO. ____
Storage - Internal Drainage

VOLUME OF STORAGE - No Outlet

assume percolation of 1/4 in/hr
storage basin (use planned TRAMWAY CHANNEL)



PROFILE



SECTION A-A

max. Volume $= (10)(12)(1200)(1.5) + (12)(18)(1200)/3$
$= 158{,}400\ ft^3 = 5{,}867\ C.Y.$

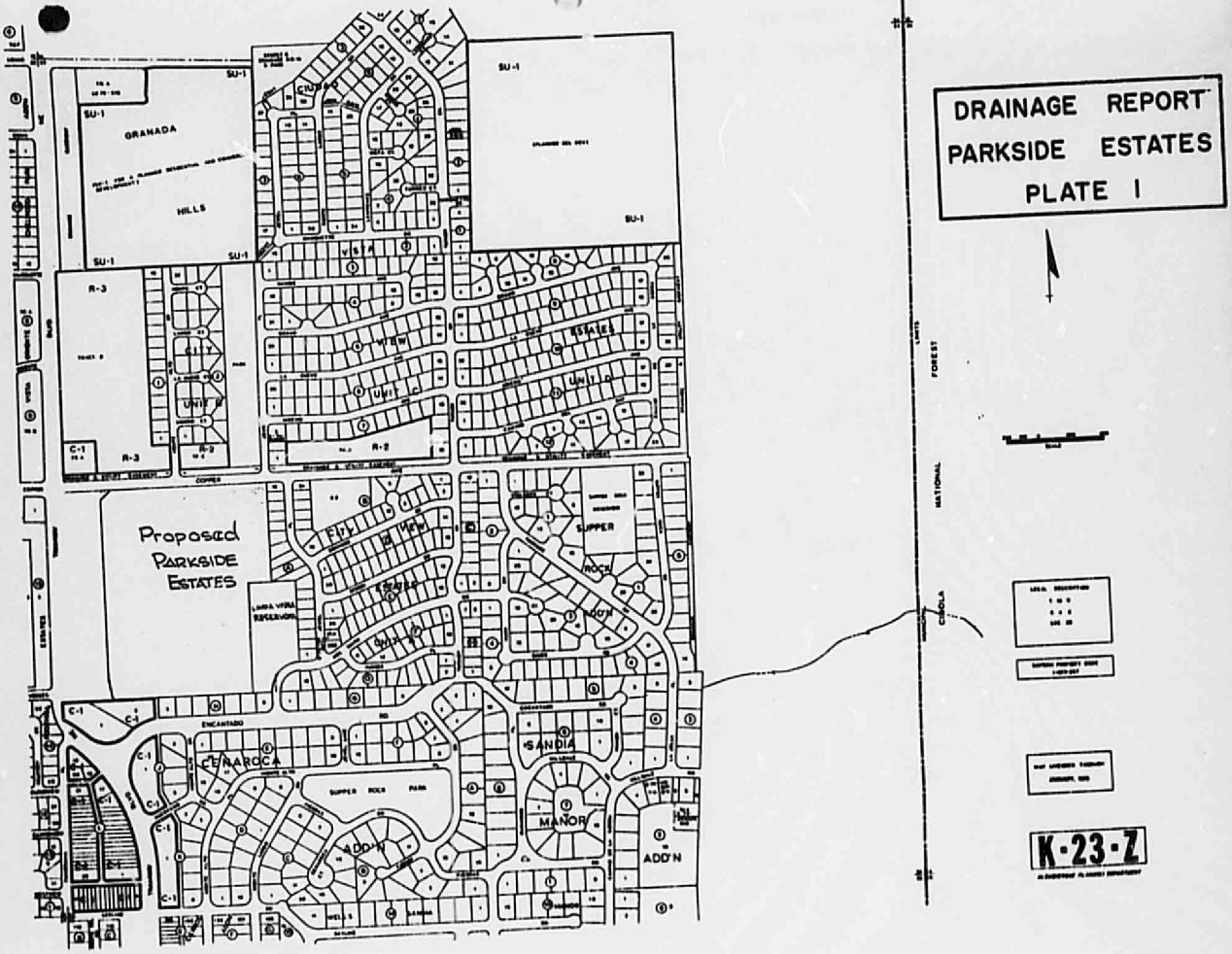
surface area / ft of depth
$(10+3d)(100d) = 1000d + 300d^2$
volume / ft. of depth
$(10)(100d)(d) + (d)(1.5d)(100d)/3 = 1000d^2 + 50d^3$

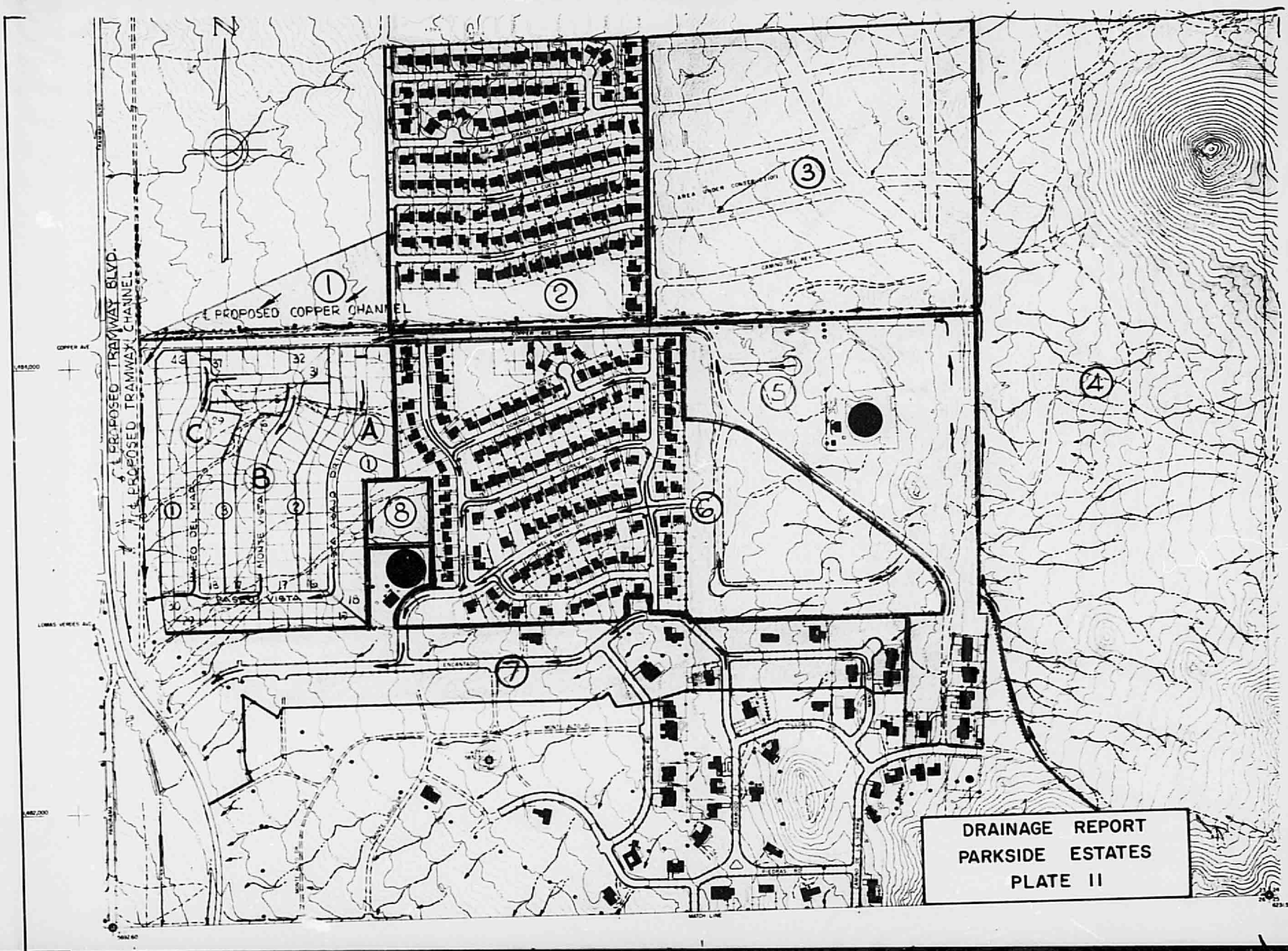
for a runoff area of 22.5 Ac. and coefficient of 0.54

time	total rainfall	Volume	d.	Area	Perc.	Volume
20 min	1.20 in.	62,926 ft³	6.34 ft	18,399 ft²	0 ft³	18,399 ft³
40	1.58	69,685	7.16	22,540 (22,410)	142	69,543
60	1.80	79,388	7.59	24,872 (21,636)	428	78,960
2 hr	2.13	93,943	8.17	28,195 (23,397)	809	93,134
4	2.52	111,143	8.79	31,955 (26,177)	1,923	109,220
6	2.80	123,493	9.20	34,578 (26,488)	3,679	119,814
22	3.27	144,222	9.83	38,836 (28,607)	12,918	131,304
23	3.29	145,103	9.86	39,018 (28,708)	13,557	131,546
24	3.30	145,545	9.87	39,104 (28,752)	14,176	131,368

drainage time percolation only ; for volume = 131,546 , d = 9.45'
9.45/(.25) = 38 hours

Note: total rainfall data from NOAA Atlas #2 . New Mexico


DRAINAGE REPORT
PARKSIDE ESTATES
PLATE I
Proposed
PARKSIDE
ESTATES
GRANADA
HILLS
CITY
VIEW
ESTATES
UNIT
SUPPER
ROCK
SANDIA
MANOR
ADD'N
CERRAROCA
ENCANTADO
LINDA VISTA
RESERVOIR
SUPPER ROCK PARK
FOREST
NATIONAL
CIBOLA
K-23-Z



DRAINAGE REPORT
PARKSIDE ESTATES
PLATE II

DRAINAGE REPORT

FOR

PARKSIDE ESTATES

FEB. 1977

T. T. BURNETT ENGINEERING INC.

120 MORNINGSIDE DR. N.E.
ALBUQUERQUE, NEW MEXICO 87108
PHONE 505-255 7545

DRAINAGE REPORT

FOR

PARKSIDE ESTATES

Feb. 1977

Prepared By

T.T. BURNETT ENGR., INC.
120 Morningside Dr. NE
Albuquerque, New Mexico 87108

Prepared For

PRESLEY CO. OF NEW MEXICO
7301 Beck NE
Albuquerque, New Mexico 87109

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR NEW MEXICO JEAN J. BORDENAVE

Jean J. Bordenave, N.M.P.E.&L.S. # 5110

TABLE OF CONTENTS

	PAGE
PURPOSE	1
LOCATION AND TERRAIN	1
PROPOSED DEVELOPMENT	2
UPLAND DRAINAGE	
DESCRIPTION	2
DISCUSSION	4
INTERNAL DRAINAGE	6
CONCLUSIONS	6
APPENDIX A	
METHODS AND EQUATIONS USED	
UPLAND DRAINAGE COMPUTATIONS	
APPENDIX B	
INTERNAL DRAINAGE COMPUTATIONS	
PLATES	
PLATE I - LOCATION MAP	
PLATE II -DRAINAGE BEFORE AND AFTER DEVELOPMENT	

DRAINAGE REPORT
FOR
PARKSIDE ESTATES

PURPOSE

The purpose of this report is to present to governing agencies a reasonable method of controlling runoff,resulting from the 100 year storm, within, and exiting from the proposed development of "Parkside Estates Subdivision", thereby providing protection to the subdivision and to downstream areas. Also presented is a narrative of existing conditions and their effect on upland flows as they approach the proposed subdivision.

LOCATION AND TERRAIN

The proposed subdivision is bounded on the west by Tramway Channel and Tramway Blvd., on the north by Copper Ave. and the Copper Channel, on the east by City of Albuquerque Linda Vista Reservoir Site and Block A, Unit A of City View Estates, and on the south by Block H of the Cenaroca Addition, and has an area of approximately 29 acres. (See Plate I for exact location.)

The property slopes in a west-southwesteriy direction at a rate of 5.5 percent. There is one small arroyo on the property and several small swales. The soil is composed primarily of granular decomposed granite and the area is sparsely grassed.

PROPOSED DEVELOPEMENT

The subdivision will be developed as R-1 single family residences. The lots will have 60 feet to 70 feet frontages in general and will range from 110 feet to 150 feet deep. There are four lots that are in excess of 200 feet deep. Streets will be constructed 32 feet face to face of curb and have a total length of approximately 4,150 feet. Square footage of covered area for homes will vary from 1,900 to 2,500 and the front set back will vary from 20 to 25 feet.

Those lots facing down hill will be drained to the street and those lots facing uphill will be provided with rear yard ponding. On those lots utilizing rear yard ponding, at least half the water falling on the lot will be infiltrated on site and will not contribute to subdivision generated runoff.

UPLAND DRAINAGE - DESCRIPTION (See Plate II)

AREA # 1. This property not developed at present and will drain south-westerly to be intercepted by the Copper and Tramway Channels.

AREA # 2 City View Estates, Unit C. This area is fully developed with residential streets as the drainage system transporting runoff westerly. Large waterblocks on the east end of east-west streets prevent runoff from entering the area from the east. Jewel Place, a north-south collector street, on the west boundary of the area serves as an interceptor and directs all runoff from the area southerly, toward Copper Ave. There is a small (1 foot wide) rundown on the east side of Jewel Place which is capable of diverting nuisance flows. Runoff from the

area will proceed southerly to Copper Ave. thence westerly on the street along the north boundary of the proposed subdivision.

AREA # 3 City View Estates, Unit D. City services are presently under construction in this area. The entire area is diverted to the Copper Channel via Turner Ave. and the first street east of Turner Ave. (See Drainage Report "City View Estates - Unit D", Oct., 1975)

AREA # 4 This area is not developed and extends beyond the City Limits. Runoff from the area is diverted by ditches and dikes to the Copper Channel. (See Drainage Report "City View Estates - Unit D", Oct., 1975)

AREA # 5 Portion of Supper Rock Addition. This area is under construction. The northeast corner of the area is drained via Supper Rock Dr. to Copper Ave. and then westward along the north boundary of the proposed subdivision. Flows from southerly Supper Rock Dr. and Stalgren Ct. are intercepted by Parkside Dr. and directed to Copper Ave. and then westward along the north boundary of the proposed subdivision.

AREA # 6 City View Estates - Unit A and a portion of Supper Rock Addition. All streets in this area drain to Mel Smith Dr. and from there to Encantado Rd. which is one tier of lots south of the proposed subdivision.

AREA # 7 Portions of Cenaroca Addition and Sandia Manor. Encantado Rd. traverses and drains the entire area. This street is located one tier of lots south of the proposed subdivision.

AREA # 8 City of Albuquerque - Linda Vista Reservoir. A portion of the reservoir site is presently draining through the proposed subdivision.

UPLAND DRAINAGE - DISCUSSION

Runoff from area numbers 1, 3 & 4 is intercepted by the Copper Channel and does not approach the proposed subdivision.

Runoff from area numbers 2 & 5 is directed by Copper Ave. along the north boundary of the proposed subdivision. The contributing area of approximately 66 acres with a resulting runoff flow of 164 cfs in Copper Ave. at the northeast corner of the proposed subdivision is somewhat less than the capacity of Copper Ave., at curb depth plus 0.2 feet, computed at 334 cfs. Waterblocks will be placed in proposed streets at their intersection with Copper Ave.(See Appendix A, sheets 2 & 3 for computations)

Runoff from area numbers 6 & 7 is carried by Mel Smith Dr. and Encantado Rd. and does not approach the proposed subdivision. A sharp curve in Mel Smith Dr. near it's intersection with Encantado Rd, was investigated for flows 'jumping' the west curb and entering the proposed subdivision via the Linda Vista Reservoir site. Mel Smith Dr. is superelevated through the curve at a rate of 0.003 ft./ft. This rate is not adequate to prevent ' jumping' of the curb and approximately 72 cfs 'jumps' the curb and travels westerly to the pump building which then directs the flow southwesterly toward Lot 9, Block H of the Cenaroca Addition. In addition there is a small dike along the west boundary of the reservoir site to prevent flow from entering the proposed subdivision. It is suggested, however, that the City of Albuquerque build a ditch and dike section to prevent flooding of pumping station.

Area number 8 is planned, by the City of Albuquerque, to drain to a recently constructed drainage inlet located in the southwest corner of the reservoir site. Therefore, runoff presently entering the proposed subdivision from this area will be diverted and no action need be taken by the developer.

INTERNAL DRAINAGE (See Plate II)

The internal drainage has been analyzed for three areas as defined on Plate II. It is proposed that streets be used to carry drainage with an outlet in the southwest corner of the proposed subdivision to the Tramway Channel. Maximum flow in the streets will be 65 cfs with an estimated depth of 0.5 feet at the intersection of Paseo del Mar and Paseo Vista. Computed quantities, velocities and depths of flow for street intersections are shown on sheet B4 of the computations. The outlet channel as shown on sheet B4 of the computations is located within a 25 foot drainage and utility easement at the southwest corner of the proposed subdivision.

CONCLUSIONS

UPLAND DRAINAGE Runoff from a 100 year frequency storm is diverted through existing channels, streets or closed conduits such that the proposed subdivision is adequately protected from outside areas.

INTERNAL DRAINAGE Planned streets are adequate to carry a 100 year frequency storm at less than curb depth. Provision of an outlet channel to the proposed Tramway Channel protects downstream developments from flows generated within the proposed subdivision. The flow exiting

the proposed subdivision is 13 cfs is excess of the 100 year storm for the property in its existing state, and is 14 cfs less than the computed flow for the Standard Project Flood for which the Tramway Channel is designed.

A commitment on the part of the City of Albuquerque as to the date of construction of the Tramway Channel is necessary for the Developer to prepare a schedule of development. Should it not be feasible for the Developer to wait for the construction of the channel it is proposed the Developer excavate a portion of the channel to form a basin (See sheet B6 for computations) for runoff storage. It is proposed that the earth excavated be used as required in the grading of the proposed subdivision and that any excess material, if any, be stockpiled adjacent to the proposed channel to be used as fill in the construction of Tramway Blvd.

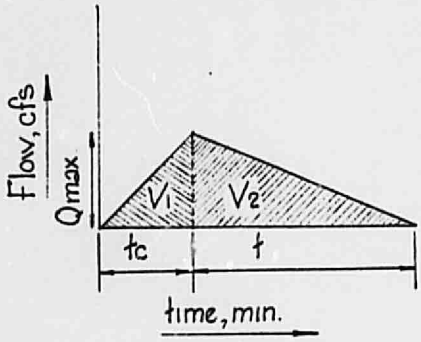
BY J.J.B. DATE 2-3-77 SUBJECT Drainage Report SHEET NO. A1 OF A
CHKD. BY ____ DATE ____ Parkside Estates JOB NO. 7702
Equations Used

Rainfall Intensity
from "Master Plan of Drainage - Albuquerque, New Mexico and Environs, 1963"

$i_{100} = 189/(t_c+25)$, in./hr.
where t_c = time of concentration - minutes

Runoff Rate
Rational Formula
$Q = C i A$
where C is a runoff coefficient from tables
where i is as defined above
where A is area contributing to runoff in acres

Urban Hydrograph



$V_1 = 30 Q_{max} t_c$
$V_T = V_1 + V_2 \quad 3630 ACX$
$V_2 = V_T - V_1$
$t = V_2/30 Q_{max}$
where Qmax is determined by Rational Formula
where tc is as defined above
where A is as defined above
where C is as defined above
where X is the amount of rainfall in inches/ft^2 for 1 hour rainfall. (Use: 2"/ft.^{2})

Velocity and Depth of Flow in Streets
from graphs developed by T.T. Burnett Engr., 1976 based on Manning's Equation
$Q = 1.486 A R^{2/3} S^{1/2} n$, cfs
where A = cross sectional area of flow - ft.^{2}
where R = hydraulic radius = A/P - feet
where S = hydraulic gradient - ft./ft.
where n = coefficient for roughness
= 0.021 for asphalt pavement
= 0.013 for concrete

BY JJB DATE 1/28/77 SUBJECT Drainage Report SHEET NO. A2 OF A
CHKD. BY DATE Parkside Estates JOB NO. 7702
Upland Flows - External

FLOWS IN COPPER AVE

AREA 2

900' @ 6% Nambe
1100' @ 1.5% Jewel
Area = 35 Acres = 1524,600 ft²

trial t_c = 2000/(4×60) + 2 = 10.3 use 10
i = 5.4 in/hr
Q = (0.5)(5.4)(35) = 95 cfs
Q_{NAMBE} = (0.5)(5.4)(7) = 19 cfs

@ 2-19 cfs ; V_{ave} for 6% = 3.8 fps
@ 19-95 cfs ; V_{ave} for 1.5% = 4.3 fps

t_c = 2 + (900/3.8 + 1100/4.3)/60 = 10.2 min
Use Trial Values
V_1 = (95)(10)(30) = 28500 ft³, V_T = (1,524,600)(.5)(2)/12 = 127050 ft³
V_2 = 98550 ft³ t = 98550/(30)(95) = 35 min

AREA 5

700' @ 2% } Parkside south
1200' @ 5% } mid
400' @ 2% } north
1400' @ 5% Copper
Area = 31 acres = 1,332,500

trial t_c = 2300/(4)(60) + 2 = 9.6 use 10
i = 5.4 in/hr
Q = = (.5)(5.4)(31) = 84 cfs
Q_{south} = (.5)(5.4)(5) = 14
Q_{mid} = (.5)(5.4)(10) = 27
Q_{north} = (.5)(5.4)(5) = 14

FLOWS IN COPPER AVE (cont.)

Area 5 (cont.)

@ 2-14 cfs; Vave. for 2% = 2.4 fps
@ 14-41 cfs; Vave for 5% = 5.1 fps
@ 41-55 cfs; Vave for 2% = 4.7 fps

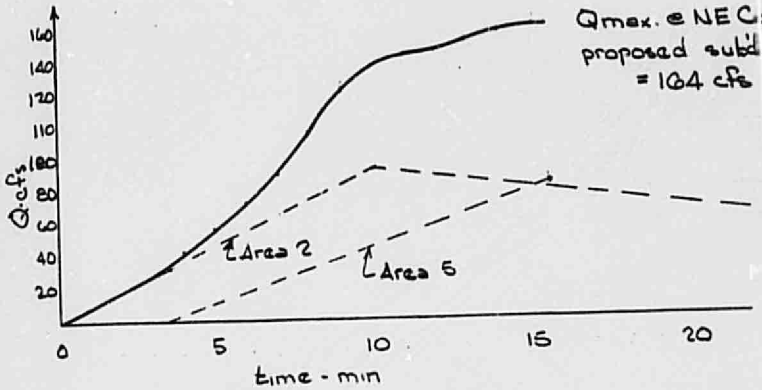
$t_c = 2 + (700/2.4 + 1200/5.7 + 400/4.7)/60 = 11.8$ min

Use Trial Values with $t_c = 12$

flow time in Copper @ 84 cfs

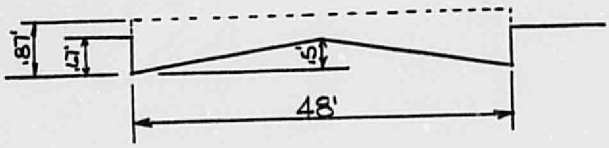
$d = 0.62'$, $v = 6.5$ fps

$1400/(6.5)(60) = 3.5$ min



Capacity of Copper Ave @ NE Cor. Proposed Sub'd

@ d = 0.67; Q = 176 cfs
@ d = 0.87; Q = 334 cfs



BY JJB DATE 1/28/77 SUBJECT Drainage Report SHEET NO. AA OF A
CHKD. BY DATE PARKSIDE ESTATES JOB NO. 7702
Upland Flows - Extras

FLOWS IN MEL SMITH DR.

AREA G

Area = 56 acres , slope = 5%

Use t_c = 2800/(5.0)(60)+2 = 11 min.

i = 5.25 in/hr

Q = (0.5)(5.25)(56) = 144 cfs

d = 0.41' , V = 8.7 fps

d_c = 0.74 ∴ supercritical

superelevation of water surface

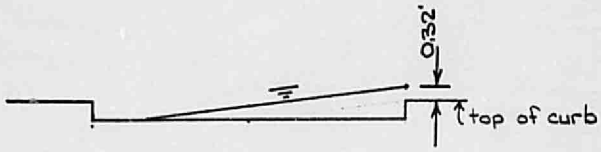
radius of street 150' ±

$\tan\theta = 8.7^2/(32.2)(150) = 0.016$

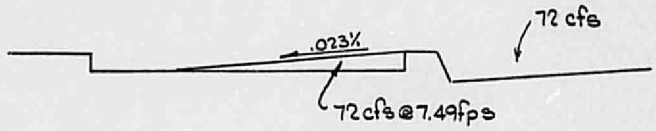
superelevation rate ≈ 0.032'/'

depth @ outside curb

d = 0.40 + 20(0.032) = 1.04' above ℄ street



by iteration



BY JJB DATE 1/31/07 SUBJECT Drainage Report SHEET NO. B1 OF 6
CHKD. BY DATE PARKSIDE ESTATES JOB NO. 7702
Developed - Internal Drainage

AREA A

Point of Interest - Inter^n Vista Abajo - Paseo Vista

Contributing Area

	① description	② Area	③ C	②×③
	Block1, lots 1-18 (168300)	122,364	0.20	24,473
	roofs (18)(2200)	39,600	0.95	37,620
	drives (18)(16)(22)	6,336	1.00	6,336
(rear lot pond)	Block2, lots 1-16 (85,500)	44,668	0.20	8,934
	roofs (16)(2200)	35,200	0.95	33,440
	drives (16)(16)(22)	5,632	1.00	5,632
	Street (40)(1160)	46,400	0.90	41,760
		300,200		158,195

composite C = 0.53 , Area = 6.9 Acres

street grade ≈ 2.8 % assume velocity = 3 fps ave

trial t_c = 2 + 1200/(3)(60) = 9 min

i = 189/(25+9) = 5.6 in/hr

Q = (0.53)(5.6)(6.9) = 20.5 cfs

V_{ave} = (2.1 + 3.7)/2 = 2.9

Use trial

V_1 = (20.5)(9)(30) = 5535 ft³ , V_T = (300,200)(.53)(2)/12 = 26518 ft³

V_2 = 20983 ft³ , t = 20983/(30)(20.5) = 34 min

AREA B

Point of Interest - Inter^n Monta Vista - Paseo Vista

	① description	② Area	③ C	②×③
(rear lot pond)	Block1, Lots 19-24 (32250)	16,938	0.20	3,388
	roofs (6)(2200)	13,200	0.95	12,540
	drives (6)(16)(22)	2,112	1.00	2,112
	Block2, Lots 17-30 (129,400)	93,672	0.20	18,737
	roofs (14)(2200)	30,800	0.95	29,260
	drives (14)(16)(22)	4,928	1.00	4,928
(rear lot pond)	Block3, Lots 6-17 (61,500)	30,876	0.20	6,175
	roofs (12)(2200)	26,400	0.95	25,080
	drives (12)(16)(22)	4,224	1.00	4,224
	Street [illegible]	[illegible]	[illegible]	[illegible]

AREA B (Cont.)

	① Area	② C	①×②
Σ	275,150		153,244

Composite C = 0.56, Area = 6.3 acres

Street grade ~1.5%, assume v = 2.4 fps

trial t_c = 2 + 900/(2.4)(60) = 8 min.

i = 189/(25+8) = 5.7 in/hr

Q = (0.56)(5.7)(6.3) = 20.1 cfs

V_{ave} = (1.7 + 3.0)/2 = 2.35 fps ∴ USE TRIAL VALUES

V_1 = (20.1)(8)(30) = 4824 ft³, V_T = (275,150)(2)(.56)/12 = 25,081 ft³

V_2 = 20,857 ft³, t = 20,857/(30)(20.1) = 35 min

AREA C

Point of interest - Intersection Paseo del Mar - Paseo Vista

① Description	① Area	② C	①×②
(rear lot pond) Block 1, Lots 25-46 (116,250)	60,106	0.20	12,021
roofs (22)(2200)	48,400	0.95	45,980
drives (22)(16)(22)	7,744	1.00	7,744
Block 2, Lots 31-37 (62,860)	44,986	0.20	8,997
roofs (7)(2200)	15,400	0.95	14,630
drives (7)(16)(22)	2,464	1.00	2,464
(rear lot pond) Block 3, Lots 1-5 (26,250)	13,490	0.20	2,698
Lots 18-29 (97,976)	80,111	0.20	16,022
roofs (12)(2200)	26,400	0.95	25,080
drives (12)(16)(22)	4,224	1.00	4,224
Street (40)(1800)	72,000	0.90	64,800
	375,325		201,962

Composite C = 0.54, Area = 8.6 acres

Street Grade 400' @ 6%, v = 3.5 fps; 1000' @ 1.6%, v = 2.7 fps

trial t_c = 2 + 400/(3.5)(60) + 1000/(2.7)(60) = 10 min.

i = 189/(25+10) = 5.4 in/hr

Q = (0.54)(5.4)(8.6) = 25.1 cfs

$Q_{2.4}$ = (0.54)(5.4)(2.4) = 7 cfs

t_c = 400/(2.8+3.5)(30) + 1000/(2.3+3.4)(30) + 2 = 10 min

∴ Use trial values

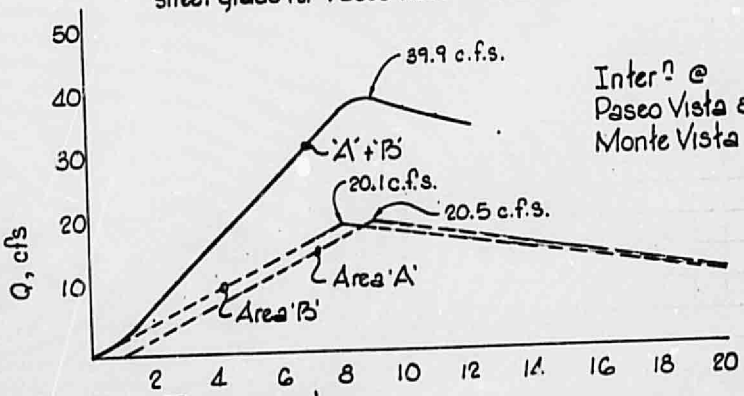
V_1 = (25.1)(10)(60) = 15,060 ft³, V_T = (375,325)(2)(.54)/12 = 33,779 ft³

V_2 = 18,719 ft³, t = 18,719/(30)(25.1) = 25 min.

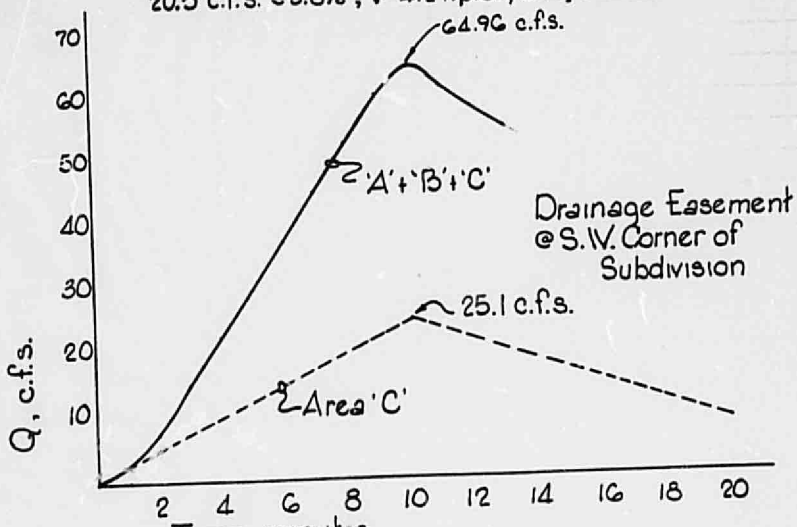
BY J.J.B. DATE 2.2.77 SUBJECT Drainage Report SHEET NO. B-3 OF C
CHKD. BY DATE Parkside Estates JOB NO. 7702
Developed - Internal Drainage

DRAINAGE EASEMENT @ SOUTHWEST CORNER OF SUBDIVISION

Hydrograph for Street Inter^ns @ Paseo Vista
street grade for Paseo Vista ≈ 3.8%



20.5 c.f.s. @3.8% ; V = 4.2 f.p.s. ; 340/(4.2)(60) = 1 min.



39.9 c.f.s. @3.8% ; V = 5.3 f.p.s. ; 320/(5.3)(60) = 1 min.

BY JJB DATE 2/1/77 SUBJECT Drainage Report SHEET NO. B4 OF 6
CHKD. BY DATE PARKSIDE ESTATES JOB NO.
Developed Internal Drainage

STREET FLOWS

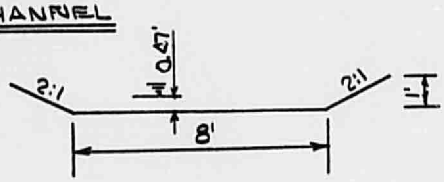
Pasco Vista ~ 4% Grade

@ Vista Abajo		@ Monta Vista
20.5 cfs	Q	39.9 cfs
4.2 fps	✓	5.6 fps
0.33 ft.	d @ Curb	0.41 ft.

Vista Abajo @ Pasco Vista		Monta Vista @ Pasco Vista
20.5 cfs	Q	20.1 cfs
3.8 fps	✓	2.7 fps
0.35 ft	d @ Curb	0.41 ft
~ 3%	Grade	~ 1 %

Pasco del Mar @ Pasco Vista		Outlet Channel
25.1 cfs	Q	65 cfs
2.3 fps	✓	15.0 fps
0.52 ft	@Curb d @ ℄	0.47 ft
~ 0.4 %	Grade	~ 6 %

OUTLET CHANNEL



In drainage easment
easement to be 25' wide

BY JLB DATE 1/31/77 SUBJECT Drainage Report SHEET NO. B5 OF 6
CHKD. BY ____ DATE ____ PARKSIDE ESTATES JOB NO. ____
Existing - Internal Drainage

RUNOFF FOR EXISTING CONDITIONS

Overland Flow L = 400' overland, 850 channel ; Grade ~5%
Sparse Grass t_c = 17 min
C = 0.40 , Area = 29 Acres

i = 189/(25+17) = 4.5 in/hr

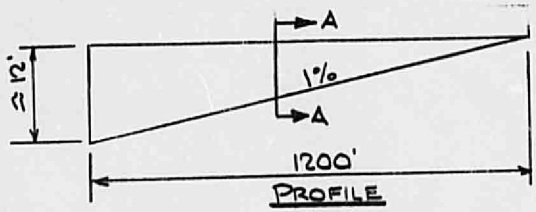
100 year Q = (0.40)(4.5)(29) = 52 cfs

SPF (1750)(29/240) = 79 cfs

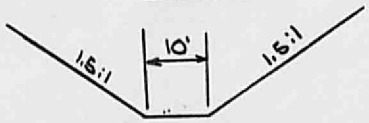
BY JJB DATE 1/31/22 SUBJECT Drainage Report SHEET NO. B.6 OF 6
CHKD. BY DATE PARKSIDE ESTATES JOB NO.
Storage - Internal Drainage

VOLUME OF STORAGE - No Outlet

assume percolation of 1/4 in/hr
storage basin (use planned TRAMWAY CHANNEL)



PROFILE



SECTION A-A

max. Volume = (10)(12)(1200)(.5) + (12)(18)(1200)/3
= 158,400 ft³ = 5,867 C.Y.

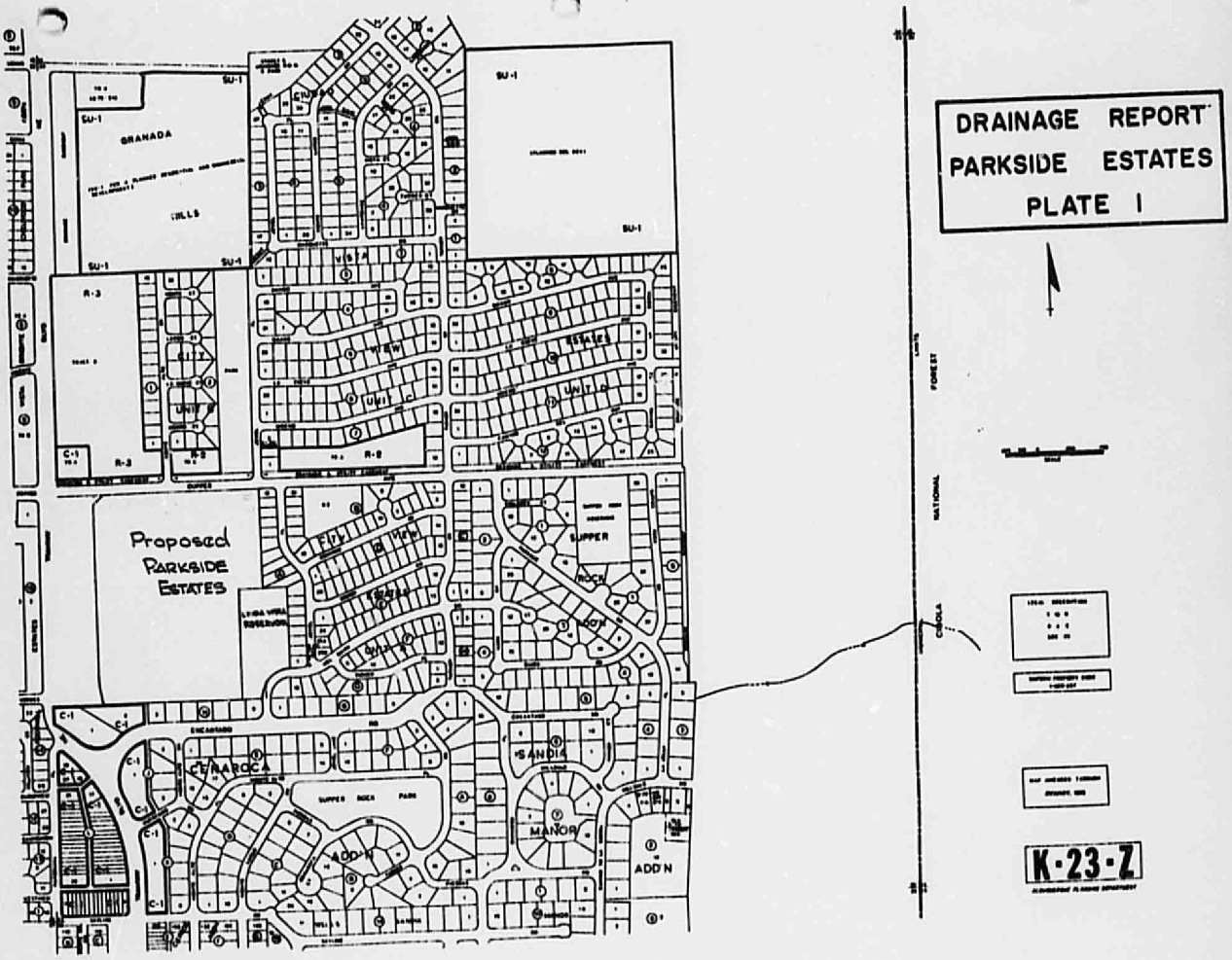
surface area / ft of depth
$(10+3d)(100d) = 1000d + 300d^2$
volume / ft. of depth
$(10)(100d)(d) + (d)(1.5d)(100d)/3 = 1,000d^2 + 50d^3$

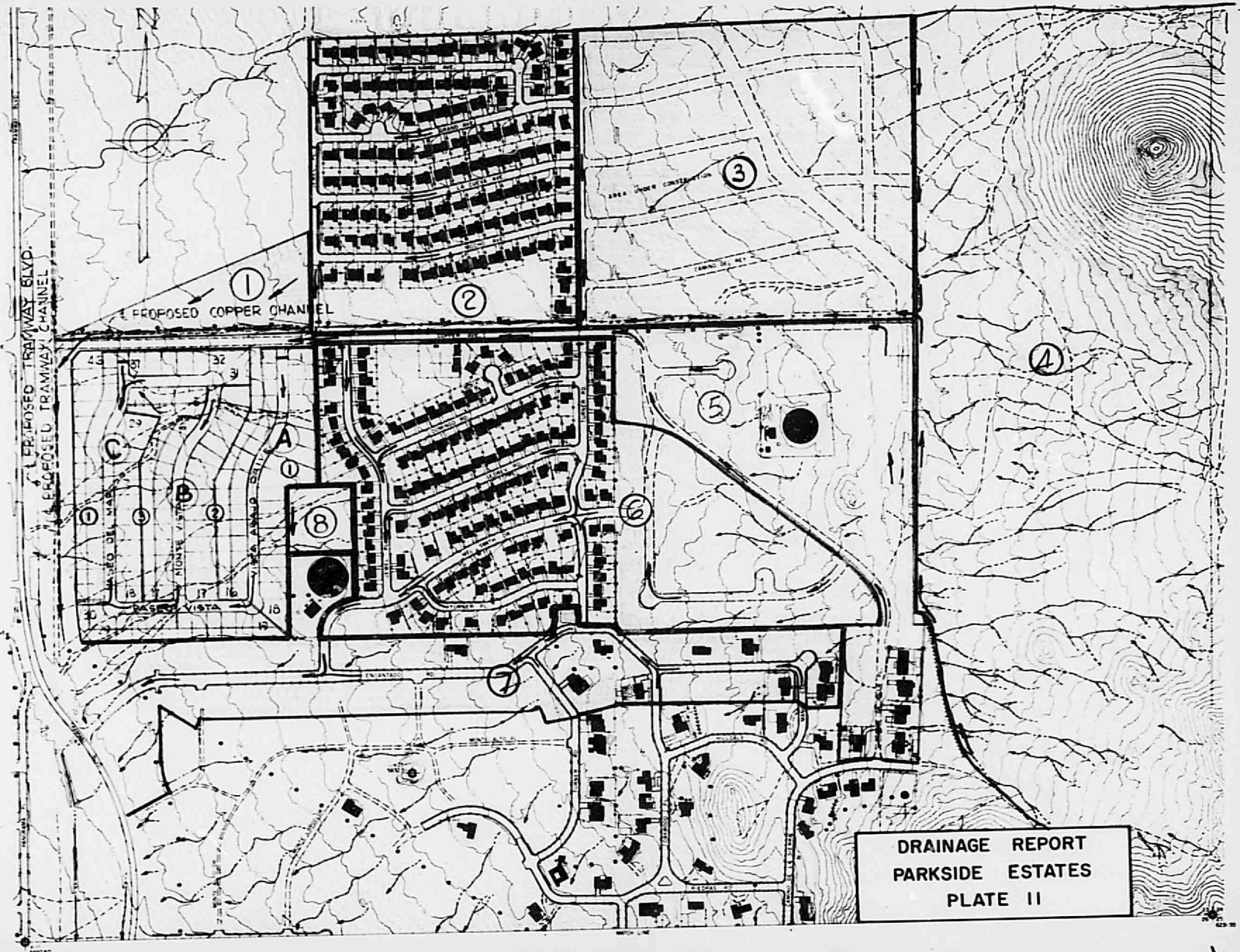
for a runoff area of 22.5 Ac. and coefficient of 0.54

time	total rainfall	Volume	d.	Area	Perc.	Volume
20 min	1.20 in.	52,926 ft³	6.34 ft	18,399 ft²	0 ft³	18,399 ft³
40	1.58	69,685	7.16	22,540 (22,470)	142	69,543
60	1.80	79,388	7.59	24,872 (24,636)	428	78,960
2 hr	2.13	93,943	8.17	28,195 (28,297)	809	93,134
4	2.52	111,143	8.79	31,956 (28,177)	1,923	109,220
6	2.80	123,493	9.20	34,575 (26,466)	3,679	119,814
22	3.27	144,222	9.83	38,836 (28,671)	12,918	131,304
23	3.29	145,103	9.86	39,018 (28,708)	13,557	131,546
24	3.30	145,545	9.87	39,104 (28,752)	14,176	131,368

drainage time percolation only ; for volume = 131,546 , d = 9.45'
9.45/(.25) = 38 hours

Note: total rainfall data from NOAA Atlas #2, New Mexico


DRAINAGE REPORT
PARKSIDE ESTATES
PLATE I
Proposed
PARKSIDE
ESTATES
GRANADA
HILLS
SU-1
R-3
R-2
C-1
UNIT
VIEW
ESTATES
SUPPER
ROCK
CLARAROCA
SANDIA
MANOR
ADD'N
FOREST
NATIONAL
COBOLA
K-23-Z


PROPOSED COPPER CHANNEL
PROPOSED TRAMWAY BLVD.
PROPOSED TRAMWAY CHANNEL
RASEL VISTA
VIA ALMO DRIVE
DRAINAGE REPORT
PARKSIDE ESTATES
PLATE II