HYDROLOGY K23/D7 2 PLANS

K23/D7

2 Plans

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

November 12, 1986

Coda-Roberson
6909 Minehead Ct. NE
Albuquerque, N.M. 87120

Dear Mr. Roberson:

Our office has been contacted by the home buyer at 13819 Grady Ct. NE (City View Estates "B") in reference to a drainage complaint on her property. According to the approved grading plan for that subdivision, it appears that the lot in question was designed to drain entirely onto Grady Ct. after a field inspection it was verified that considerable amount of ponding is taking place in the back yard. I would like to make it perfectly clear that this situation is of a civil nature and the sole intent of this letter is to advise the developer-builder of the problem and to request cooperation in investigating and correcting the problem.

If you have any questions concerning this matter, please feel free to call me at 764-1699.

Thank you,

Richard L. Duran
Drainage Inspector

RLD/cl

cc: Brenda Coffman
13819 Grady Ct. NE
Albuquerque, N.M. 87123

ROBERSON
CONSTRUCTION
COMPANY, INC.
6001 ATRISCO N.W.
ALBUQUERQUE, N.M. 87120
TELEPHONE 505/897-4996

RECEIVED
NOV 09 1987
HYDROLOGY SECTION

November 5, 1987

Steve Lawrence
13918 Troy N.E.
Albuquerque, NM 87123

Dear Mr. Lawrence:

We are in communication with the City of Albuquerque, Hydrology Section, concerning your complaint about drainage from your lot onto the property to the west. As you are aware, we attempted to gain access to your property to rectify the problem on October 8, 1987, at which time you refused us access. You are insisting that we construct a retaining wall to solve a problem where a simple re-grading will suffice. We are once again requesting access to your property so that we may rectify the problem. Please be advised that we do not intend to build a retaining wall, such being unnecessary and uncalled for on the site development plan. Please contact our office as to when we may rectify this situation.

Sincerely,

Michael A. Morse, Superintendent
Roberson Construction Company, Inc.

MAM/og

cc: Richard L. Duran
Drainage Inspector

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

February 8, 1980

K23-D7

Mr. Paul Blanchard
4805 Lomas N.E.
Albuquerque, New Mexico 87110

Subject: Test Turnkey Project Work Authorization #T-48
CITYVIEW ESTATES, UNIT B

Dear Mr. Blanchard:

Under the provisions of the Test Turnkey Project procedures, this letter is the Work Authorization to begin field work on the project.

Sincerely,

Richard S. Heller
City Engineer

RSH/fs

cc - H. R. Orr
Lee Smith
Jose Lopez
Water Resources
Dwayne Sheppard
Bob Kielich
LaMonte Urban
Bruno Conegliano
Traffic Engineering

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

January 9, 1980

Mr. Lee Smith
Inter-West Limited
4004 Carlisle N.E.
Suite-J
Albuquerque, N.M. 87107

Reference: City View Estates Construction Plans

Dear Mr. Smith:

The following is a list of comments regarding the construction plans for the referenced development:

1. Street plans over box structure do not show the same thing on sheets 2 and 13.

2. How will the properties next to the unlined channel be protected?

3. What happens between the park area and the adjoining properties? In most cases there is a 2 ft. to 3 ft. difference in elevation between the park contours and the property line. No retaining walls are shown, nor how the flows in the park will be conveyed to the two easements. No construction details of the rundown from the park are supplied. The construction plans must show what grading will be done in the park and such grading must be acceptable to the Parks Department before the plans are approved. A method must also be devised to prevent silt sediment from reaching the pavement in the subdivision.

4. The drainage rundown between lots 7 and 8 at the east end of Hope Place is directed toward the driveway of lot 9 on the opposite corner.

5. Can the flow be turned 90 degrees from the rundowns shown between lots 39 and 40 and 18 and 19 on Monte Alto Drive (Locations "V" and "K" on sheet 2) without jumping the opposite curb?

6. Plans indicate "see sheet 16 for details." There is no sheet 16.

7. Are rundowns deep enough to require fencing on the sides? None is indicated. How high are the walls? In all cases a profile must show both the flow line and the proposed top of the ground at the property line.

8. The rundowns into the Tramway Channel have changes of slope in them. Is there protection on the sides of the hydraulic jumps that will occur and the increase in depth? What are the proposed depths of flow? Is 8 inches enough for these jumps? The proposed channels are not of standard design which will make it impossible for Street Maintenance to maintain; there are no construction details on how the rundowns will be tied to the lining of the Tramway Blvd. Channel; details and dimensions for the transitions in the rundowns are also missing.

9. Some of the valley gutters appear to be at right angles to the direction of flow. Won't the water flow on across them?

10. Is the northeast corner of the park a ponding area? Some of the areas along the western border of the park look like they might be ponding areas. How will this affect the adjoining properties?

11. The street grades are very deep. Will the cross flow top the mountable curbs? For instance, at the western end of Knox Place, there is a 4 to 5 ft. drop from the east to the west. The water will have a high velocity. Will this water go over the curb into lots 10, 11 and 12, or at least into the driveways?

Since I was absent at the time of the review and approval of the plat for the subdivision, I did not have a chance to make comments regarding the hydrology presented in the drainage report. I made three different estimates for the flows carried by the Copper Channel, and all three gave a discharge value twice as great as the one in the report.

1. The use of the Rational method yielded a value of 1397 c.f.s.;

2. The use of the area discharge curve prepared by the U.S. Corps of Engineers (see enclosure) yielded the value of 1300 c.f.s.;

3. The use of the Soil Conservation approach (ref. "Peak Rates of Discharge For Small Watersheds) yielded a discharge of 1190 c.f.s. per second.

Given the existing structure crossing the Copper Avenue Channel at Jewel Place, and an anticipated flow velocity of 26.5 f.p.s., a hydraulic jump will undoubtedly occur, subjecting this development to innundation.

Therefore, I believe that it is mandatory that the crossing structure at Jewel Place be redesigned and constructed, simultaneously with the development, in order to supply the necessary protection.

Further, in the absence of the necessary improvements in the Copper Ave. channel (concrete lining), all the lots along the South boundary line of City View Estates, Unit B, should be withheld from development at this time. Incidentally, I am not aware of the existence of a City accepted final grade and configuration for the Copper Channel; is this grade available? if so, it should be supplied with the plans (these show the 1977 design by Bohannan and Houston which may not be applicable.)

Finally, the crossing structure on Monte Alto Drive should be built in such a manner as not to cause discontinuities to the flow: a box culvert as proposed, would very likely cause the supercritical flow to jump. The construction plans do not indicate any construction details for the structure which, according to #3 of "Scope of Work" (p. 2 of 15) should be built with this contract.

I believe that these issues must be resolved before the construction plans are signed and development can began.

Very truly yours,

Bruno Conegliano
Assistant City Engineer/Hydrology

BC/lc
attachments
xc: Orland Sedillo, Parks & Rec.
George Rutherford
Drainage file

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

REF. NO._____

January 8, 1980

TO: Richard Heiler, City Engineer, Engineering Division

FROM: W. K. Algire, Superintendent, Design/Development, Parks & Rec.

SUBJECT: City View Estates Park

Since our meeting in Mid-December with Mr. P. Blanchard, Developer of City View Estates Unit 5 and Mr. Lee Smith, Engineering Consultant, representing the Developer, little or no progress has been made to reconcile the earthwork and retaining wall concerns, so that the Parks and Recreation can proceed with advertisement for construction. Items that were referred to at this meeting that restrict this Department from proceeding into construction are as follows:

(1) The Developer illegally removed top soil over the entire acreage of the park area (see attached correspondence), and filled in low areas, thereby, changing contours that were established for which our now nonrepresentative contour drawings indicate.

(2) Based on an agreement established previously with prior developer (Coda Roberson) and Engineering Consultant (Leverton Engineering), the drainage and relative elevations at the joint property lines have changed considerably.

(3) Since the illegal earthwork, no corrective action has been initiated to clarify existing contours, so that corrective recommendations could be made by this Department.

In conclusion, construction is continuing in the subdivision as scheduled, but the park construction schedule has been delayed for over sixty days. This is to request that we be advised as to the proposed timing of the developers' corrective measures so that we may proceed with park development accordingly.

WKA/pal

December 20, 1979

City View Estates

1. Street plans over box structure do not agree on sheets 2 and 13.

2. How is the property line next to the channels being protected?

3. What happens between the park area and the properties adjoining? There is in most cases a 2' to 3' difference in elevation between the property and the park contours at the property line? No retaining walls are shown.

4. The drainage rundown between lots 7 & 8 at the east end of Hope Place is directed toward the driveway of lot 9 on the opposite corner.

5. Can the flow be turned 90 degrees from the rundowns shown between lots 39 and 40 and 18 and 19 on Monte Alto Drive (Locations "V" and "K" on Sheet 2) without jumping opposite curb?

6. Plans indicate see sheet 16 for details. There is no sheet 16.

7. Are rundowns deep enough to require fencing on the sides. None is indicated? How high are the walls?

8. The rundowns into the Tramway Channel have changes of slope in them. Is there protection on the sides for the hydraulic jumps that will occur and the increase in depth? What are the proposed depths of flow? Is 8 inches enough for these jumps?

9. Some of the valley gutters appear to be at right angles to the direction of flow. Won't the water flow on across them?

10. Is the northeast corner of the park a ponding area? Some of the areas along the western border of the park look like they might be ponding areas. How will this affect the adjoining properties?

11. The street grades are very steep. Will the cross flow top the mountable curbs? For instance, at the western end of Knox Place there is a 4 to 5 ft. drop from the east to the west. The water will have a high velocity. Will the water go over the curb into lots 10, 11 and 12 or at least into the driveways?

Billy Goolsby

LEVERTON ENGINEERING

4022-H RIO GRANDE BLVD., N.W.
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-5479

August 3, 1979

Mr. Richard S. Heller
City Engineer
Albuquerque, New Mexico

K23-07

Re: Drainage - City View Estates-Unit B

Dear Mr. Heller;

The following is our response to the points raised in you letter concerning drainage in the captioned subdivision: A copy of your letter is attached for reference.

1) We will redesign the structure at the crossing of the Copper Avenue Drainage channel to a clear span trapazoidal section. We are coordinating this with Bohannon-Huston Engrs.

2) Storm water flow in Monte Alto Drive will be diverted to outfall into the Copper Avenue Channel.

3) The rundowns from the development to the Tramway Channel will be lined with concrete to the flow line of the Channel.

4)The Park within the subdivision has been deeded to The City of Albuquerque. Park improvements and grading within the Park are presently being designed by the Parks and Recreation Department. When we have received this grading plan, which we expect in a short time, we will design the drainage outlets to the subdivision and incorporate it into the construction plans.

John Leverton

John Leverton, PE

Attachment

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

July 30, 1979

Mr. John Leverton
Leverton Engineering
4022-I Rio Grande N.W.
Albuquerque, New Mexico 87107

Re: City View Estates

Dear Mr. Leverton:

The captioned development has been reviewed by staff and the following points need to be addressed:

1) The proposed extension of Monte Alto to Copper Avenue will have to be designed as a clear-span trapazoidal structure across the channel section to eliminate any hydraulic jump from occurring upstream from the crossing.

2) Provisions should be made to divert the flows from Monte Also directly into the channel rather than allow the flows to enter Copper Ave.

3) The proposed rundown from the site into the Tramway Channel will have to be lined to the flowline of the channel. This design will have to be consistant with the Tramway Channel cross-sections and elevations designed by Bohannan-Huston.

4) Details need to be supplied on method of routing offsite flows from the park to the outlet points within the subdivision.

Very truly yours,

Richard S. Heller
City Engineer

RSH/fs

cc - Drainage File

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

MAYOR
David Rusk

June 15, 1979

Mr. John G. Leverton
Leverton Engineering
4022-H Rio Grande Blvd. N.W.
Albuquerque, NM 87107

Re: City View Estates-Unit B Drainage Plans

Dear Mr. Leverton:

Due to the large number of drainage reports received in the past three weeks by the City Engineer's Office and to the limited staff resources, it has not been possible to reply within the time specified by the AMAFCA Res. 72-2. This letter is to acknowledge the reception of your drainage report and assure you that the best efforts will be made to reply in the shortest possible time.

Very truly yours,

Richard S. Heller

Richard S. Heller
City Engineer

BC/RSH/ms

cc-Richard Leonard - AMAFCA
Drainage file
Bruno Conegliano

LEVERTON ENGINEERING

4022-H RIO GRANDE BLVD., N.W.
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-3479

June 11, 1979

Mr. Richard S. Heller
City Engineer
City of Albuquerque, New Mexico

RECEIVED
JUN 11 1979
CITY ENGINEER

Attention: Mr. Bruno Conegliano
Ass't. City Engineer, Hydrology

Re: Drainage Plan
City View Estates- Unit "B"

Gentlemen;

Presented herewith for your review and approval are two copies of the subject drainage plan.

May I suggest we meet at anytime convenient to you to perhaps amplify on the report or discuss it with you in order to facilitate your review.

Please advise.

Respectfully submitted,

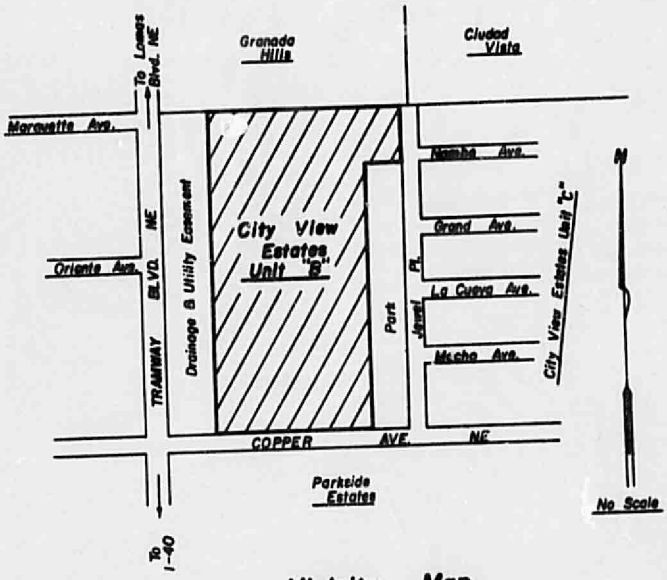
John G. Leverton

John G. Leverton
PE & LS No. 1874
New Mexico

Attachments

DRAINAGE REPORT

CITY VIEW ESTATES
UNIT "B"
ALBUQUERQUE, NEW MEXICO



Vicinity Map
Zone Atlas Map No. K-23

TURNKEY PROJECT CT-28-7

DEVELOPER: CODA ROBERSON CONSTRUCTION CO.

LEVERTON ENGINEERING - JUNE 7, 1979

Drainage Plan
City View Estates Unit "B"
Albuquerque, New Mexico

I N D E X

Narrative Report	Pages 1 - 4
Appendix:	
Upland Drainage, Summary of Factors and Computations	Sheet 1
Peak Runoff in Copper Avenue	Sheet 2
Peak Runoff in Copper Avenue Channel	Sheet 3
Offsite Streets, Sections and Hydraulic Properties	Sheet 4
Typical Drainage Sections And Hydraulic Properties	Sheet 5
Onsite Drainage, Summary of Factors and Computations	Sheet 6
Typical Onsite Street Sections And Hydraulic Properties	Sheets 7 & 8
Onsite Channel Sections And Hydraulic Properties	Sheet 9
Upland Drainage Drawing	Attached
Onsite Drainage Plan	Attached

DRAINAGE REPORT

CITY VIEW ESTATES - UNIT B

Turnkey Project CT-28-7

PURPOSE:

To design a drainage management plan to:

1. To route and control the runoff from a 100 year storm to prevent or minimize damage or injury to property or people.
2. To control the runoff from smaller & more frequently occurring storms to minimize inconvenience or disruption of activity and to route such smaller storms over paths that are confined to the extent that it is economically feasible to surface them with concrete to reduce maintenance costs.

DEVELOPMENT OF RUNOFF QUANTITIES:

The "Rational Formula" was used to evaluate runoff quantities. (Aci)

The runoff coefficient "c" was assigned the value of 0.40 for grassed, landscaped, or other unsurfaced areas within the subdivision and 0.95 for all surfaced areas such as roofs, sidewalks, driveways, and pavement.

For the undeveloped upland drainage areas the runoff coefficient was selected as either 0.50 or 0.65 to reflect the composition of the surface and the topography.

The existing upland subdivisions were evaluated by reference to the respective drainage report for the area and by observation of existing grading and construction.

Time of concentration was determined by using the length and surface characteristics of the watershed as the entrance argument to the nomograph on page 18-01 in Seelye's "Data Book for Civil Engineers."

Rainfall intensity was taken from the 100 year curve on Chart 1 of the "Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963.

"Manning's Formula" was used to compute the hydraulic capacities of the streets, channels, and other sections.

A 2.5" event rainfall was used in all calculations of run-off volume and in construction of "Q" vs. time curves.

OFFSITE OR UPLAND DRAINAGE:

Please refer to the attached drawing, "Upland Drainage", upon which the areas above City View Estates Unit B are outlined with existing storm water routing down slope.

Also, please refer to appendix sheets 1 through 5 for a summary of factors and computations, "Q" vs. time curves for Copper Avenue and the Copper Avenue Channel, and for typical street and other drainage sections with their hydraulic capacities.

Copper Avenue Channel:

Drainage areas 1 through 4, comprising a total of 498 acres, outfall to and are collected in an unimproved channel within a 40' wide drainage easement located between Copper Avenue and City View Estates Unit B. The peak flow resulting from a 100 year storm was computed as 650 cfs within the channel at Monte Alto Drive. The greater part of this peak is comprised of the passage of the peak flow from offsite drainage area 1 within the Cibola National Forest.

The drainage plan evolved for City View Estates Unit B indicates a peak flow of 3.4 cfs from the subdivision to the Copper Avenue Channel. The greater part of this outfalls above Monte Alto Drive resulting in a channel peak flow of 653 cfs. We propose to build the channel section shown on appendix sheet 5 which has a capacity of 675 cfs at a longitudinal grade of 5% which closely approximates the existing grade.

This channel will outfall to the Copper Avenue Channel structure which is now under contract to be constructed by the "Lomas Basin Improvements Project."

A concrete box culvert will be designed in conjunction with the City View Unit B project at Monte Alto Drive at the channel crossing.

COPPER AVENUE:

Upland drainage areas 5, 6, and 7, comprising a total of 71 acres outfall to and are contained within the existing pavement section of 48'.

The peak flow from offsite areas passing Monte Alto Drive was computed as 192 cfs. The drainage plan for City View Estates Unit B indicates the delivery of 8 cfs to Copper Avenue at Monte Alto Drive resulting in a 100 year peak in Copper Avenue of 200 cfs.

The measured typical section of Copper Avenue has the hydraulic capacity of 220 cfs. Please refer to appendix sheet 4.

TURNER DRIVE:

The measured section of Turner Drive which receives the flow from offsite area 5 has a hydraulic capacity of 58 cfs. The 100 year peak in this reach is computed at 50 cfs. Water blocks exist at all streets entering Turner from the west or downstream side so that the area below Turner is not affected by upland runoff.

JEWEL PLACE:

The measured section of Jewel Place near Copper Avenue has a hydraulic capacity of 42 cfs which is less than the peak flow from area 7 at this point computed as 77 cfs.

The flow into Jewel from area 7 is successively less at each intersection of streets entering from the upstream side until at Nambe Avenue it becomes approximately 20 cfs.

Since the capacity of Jewel Place is not sufficient to contain the runoff imposed the drainage plan indicates the finished grade of the Park at the property line be built to at least 8" above the existing west curb on Jewel Place.

As a matter of prudence and for positive control of offsite flows a water block is planned near the entrance of Nambe Avenue in City View Estates Unit B at Jewel Place.

ONSITE DRAINAGE:

Please refer to the attached drawing, "Onsite Drainage," for the drainage plan for City View Estates Unit B. Shown are drainage basin outlines, runoff routing, and peak flows at significant points. This information is overprinted on a Preliminary development plan which indicates streets, rundowns, and valley gutters.

The development plan is based upon the EPC approved plan which indicated standard curb and gutter on Monte Alto Drive and Nambe Avenue and roll over, mountable curbs elsewhere. Our drainage plan was predicated on the use of these sections and our analysis indicates the adequacy of their employment under the conditions imposed by our plan for drainage. However, it may become appropriate in the course of the detailed final design to use standard curb and gutter to effect more positive control of runoff on certain streets.

Also, please refer to attached appendix sheets 5 through 9 which show typical sections of streets and channels and the resultant hydraulic properties of these, and a summary of drainage factors and computations.

As demonstrated previously in this report the subdivision will not be subjected to flows from upland drainage areas.

Therefore, the design of the plan for drainage evolved into dividing and routing the onsite drainage into as many segments as practical consistent with working around and utilizing natural drainage patterns to mininize concentrations of water and to deliver the flow to the Tramway Channel.

The Tramway Channel, a section of the "Lomas Basin Drainage Improvements" project is now under contract for construction.

Roberson Construction Co., Inc. will build the earthwork Channel in the reach into which City View Estates Unit B outfalls as their contribution to the Tramway Channel Project. The earthwork is scheduled to begin during June 1979.

The excavated channel will provide more than sufficient storage for the runoff from City View Unit B if the channel outfall has not been completed by the time the subdivision has been constructed. (± 245,000 cu. ft. of storage vs. 166,000 cu. ft. of runoff)

The drainage plan indicates the subdivision divided into four major routes with these in turn being further divided. This factor reduces the flow over most given routes to the practical minimim up to the four principal discharge points to the Tramway Channel.

CONCLUSIONS:

This drainage management plan for City View Estates Unit B fulfills the objectives previously stated.

And, is an economically feasible method of implementing a subdivision plan characterized by The Environmental Planning Commission as a "quality development."

Drainage Plan
City View Estates Unit "B"
Albuquerque, New Mexico

APPENDIX

Summary of Factors
Computations
Peak Runoff Curves
Sections
Hydraulic Properties

OFF-SITE or UPLAND DRAINAGE

Summary of Factors And Computations

City View Estates Unit "B"

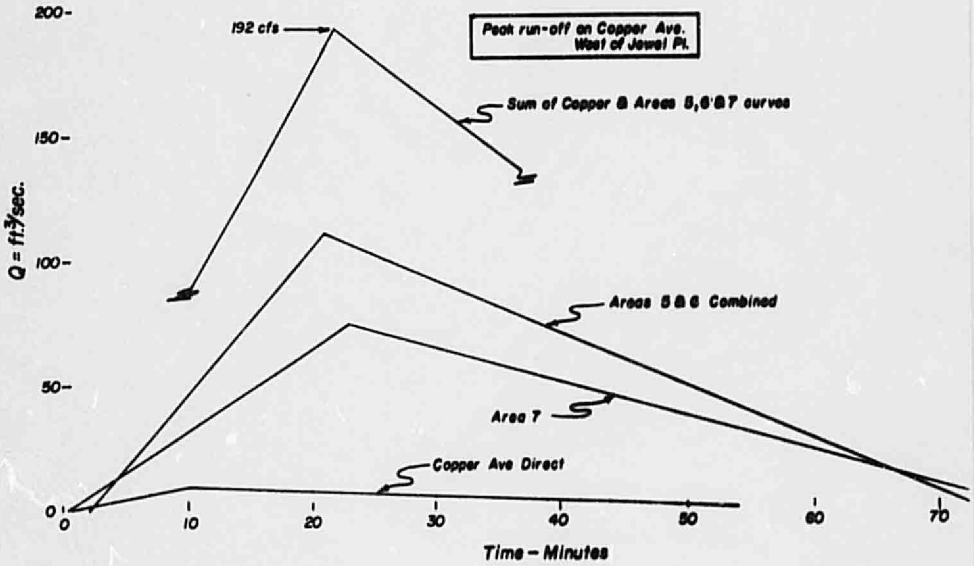
Please refer to attached drawing, "Upland Drainage".

Area Designation	Area in Acres	Coefficient of Runoff - "C"	Length of Water-shed in feet	Slope in ft/ft	Time of concen-tration in minutes	Rainfall Intensity Inches per hour	Peak Runoff "Q" cubic ft per sec.	Duration of Runoff Minutes	Remarks
1	370	0.65	6800	0.23	52	2.4	577	126	"Mountainous topography"
2	92	0.50	2500	0.06	32	3.3	152	92	"Outfall to Copper Avenue Channel.
3	30	0.50	2000	0.07	25	3.8	57	80	"Unit D of City View-runoff restricted by on-site retention
4	6	0.60	1150	0.06	13	5.0	18	61	"Presently undeveloped.

Areas 1,2,3,& 4 above outfall to and within Copper Avenue Channel west of Jewel Place.

5	18	0.65	1820	0.07	19	4.3	50	71	"Outfall along Turner Drive.
6	22	0.65	1700	0.05	19	4.3	61	71	"Outfall along Parkside Dr.
7	29	0.65	2050	0.04	23	3.9	74	77	"Outfall along Jewel Place.
	2	0.85	1160	0.05	10	5.4	9	57	Copper Avenue paving and right of way

Areas 5, 6, & 7 above outfall within Copper Avenue west of Jewel Place.

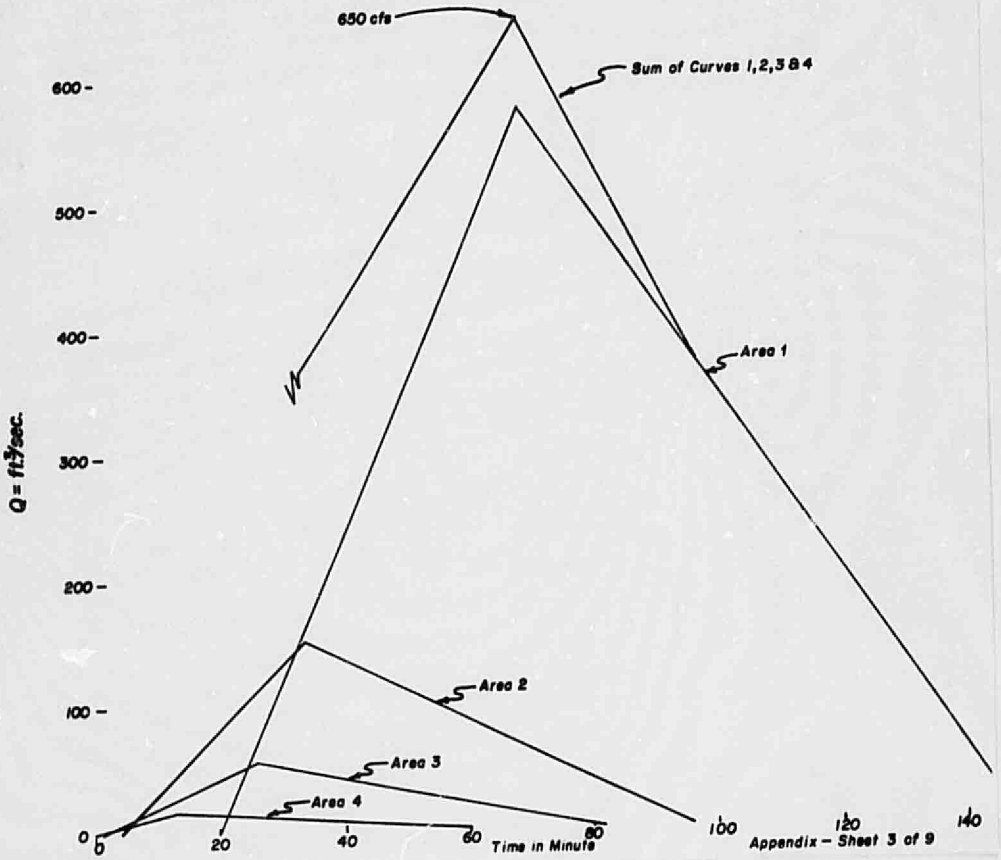


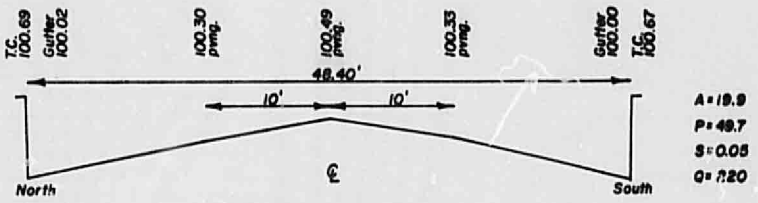
Plotted @ T = 0 on Copper Ave.
West of Jewel Pl.

Peak flow in Copper Ave.
Off-site Drainage
City View Estates Unit "B"

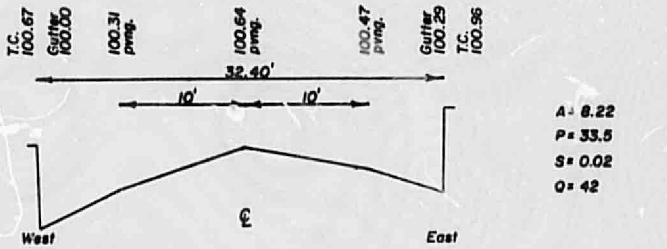
Peak flow in Copper Ave. Channel
Off-site Drainage
City View Estates Unit "B"

Plotted with time = 0 @ Copper Ave. Channel
West of Jewel Pl.

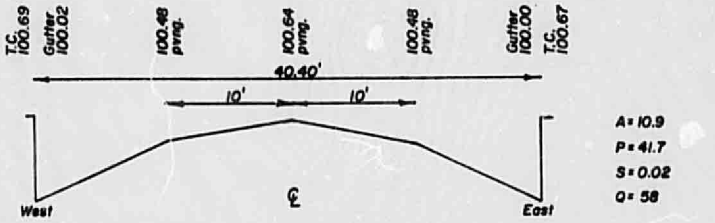




Typ. Copper Ave. Section



Typ. Jewel Pl. Section



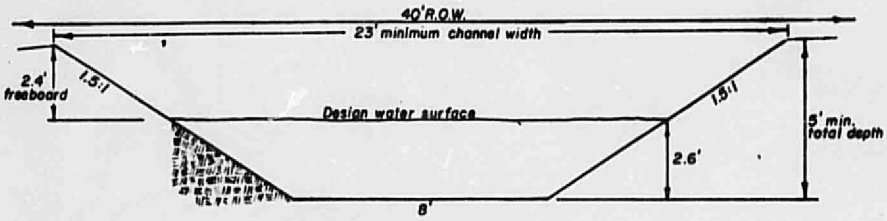
Typ. Turner St. Section

Scale

1" = 10' Horizontal
1" = 1' Vertical

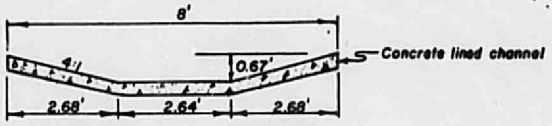
A = Area of Section in sq.ft.
P = Wetted Perimeter in ft.
S = Long. Slope in ft/ft.
Q = Hydraulic Capacity in cfs

Hydraulic Capacities
Existing Streets - Typ. Sections
Off-site Drainage
City View Estates Unit "B"



Longitudinal slope = 0.05 min.
n = 0.022 ; velocity = 21.8 fps ; Q = 675 cfs

Typ. Section – Copper Avenue Channel



n = 0.016
@ Outfall point "S" – min. slope = 0.04 ; v = 10.6 ; Q = 38.4
@ " " "U" – " " = 0.01 ; v = 5.4 ; Q = 19.2
@ " " "M" – " " = 0.03 ; v = 9.2 ; Q = 32.5
@ " " "F" – " " = 0.03 ; v = 9.2 ; Q = 32.5
v in ft./sec. Q in ft.³/sec.

Minimum Sections at Tramway Channel Outfall Points

Drainage Report
Required Hydraulic Sections
City View Estates - Unit "B"

ON - SITE DRAINAGE

Summary of Factors And Computations

City View Estates Unit "B"

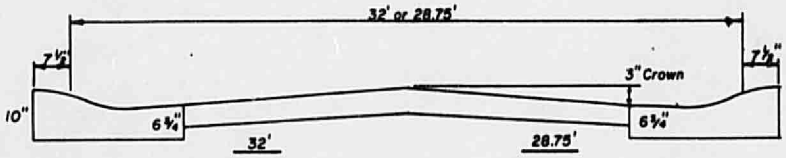
Please refer to attached drawing, "On Site Drainage".

Area Designation	Total Area in Acres	Sub-Area in Acres with "C" = 0.95. Roofs, pavement, sidewalks, drives, and flat-work.	Sub-Area in Acres with "C" = 0.40. Grassed, land-scaped, etc.	Combined "C". Coefficient of Runoff.	Rainfall Intensity Inches/hour	Peak Runoff "Q" Cubic ft. / sec.
A	2.09	1.32	0.77	0.75	5.7	9.0
B	3.11	1.60	1.51	0.68	5.4	11.4
C	0.12	0.09	0.03	0.83	7.3	0.7
D	2.93	1.93	1.00	0.76	5.4	12.1
E	4.15	2.21	1.94	0.69	5.1	14.5
F	7.08	4.14	2.94	0.72	5.1	26.2
G	1.55	0.96	0.59	0.74	5.9	6.8
H	2.02	1.34	0.68	0.75	5.7	8.6
J	3.24	1.03	2.21	0.57	5.1	9.4
K	5.26	2.37	2.89	0.65	5.1	17.4
L	5.67	2.61	3.06	0.65	5.0	18.6
M	6.45	3.13	3.32	0.67	5.1	22.0
N	2.27	1.33	0.94	0.72	5.6	9.1
P	5.64	2.34	3.30	0.63	5.3	18.7
Q	0.55	0.32	0.23	0.71	6.0	2.4
R	1.56	1.01	0.56	0.76	5.7	6.7
S	9.77	4.96	4.81	0.68	4.5	30.1
T	0.49	0.25	0.24	0.69	6.2	2.1
U	1.92	1.22	0.70	0.75	5.7	8.2
V	1.44	0.84	0.60	0.72	5.7	5.9
W	1.89	1.21	0.68	0.75	5.6	8.0

Notes:

1. All areas expressed in acres.
2. "C" is the ratio of runoff to total event rainfall.
3. Rainfall intensity derived using Seely's Design Book with arguments being length of watershed, coefficient of runoff, and slope to determine time of concentration. Intensity then calculated as 189/time of concentration plus 25.
4. Runoff from areas abutting and outfalling directly to the Copper or Tramway Channel computed by multiplying the area by "C" taken as 0.60 and by the intensity used as 7.3 inches per hour.
5. Volume of runoff calculated for points shown as = Area X'c'X 2.5/12. Area in square feet, "c" from above.

Tabulation of Hydraulic Capacities for Roll Type Mountable Curb Street Sections at various Longitudinal Grades.

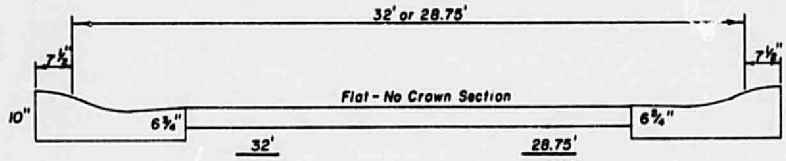


32'	28.75'
A = 4.34	A = 3.90
$R^{2/3}$ = 0.26	$R^{2/3}$ = 0.26

n = 0.017

32' face to face					28.75' face to face			
Long. Slope	Area	$\frac{1.486}{n} \times R^{2/3}$	V	Q	Area	$\frac{1.486}{n} \times R^{2/3}$	V	Q
0.03	4.34	22.72	3.94	17.1	3.90	22.72	3.94	15.4
0.04	"	"	4.54	19.7	"	"	4.54	17.7
0.045	"	"	4.82	20.9	"	"	4.82	18.8
0.05	"	"	5.08	22.0	"	"	5.08	19.8

Case A - 3" Crown



32'	28.75'
A = 8.67	A = 7.79
$R^{2/3}$ = 0.42	$R^{2/3}$ = 0.42

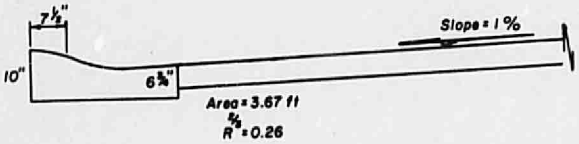
n = 0.017

32' face to face					28.75' face to face			
Long. Slope	Area	$\frac{1.486}{n} \times R^{2/3}$	V	Q	Area	$\frac{1.486}{n} \times R^{2/3}$	V	Q
0.03	8.67	36.71	6.36	55.1	7.79	36.71	6.36	49.5
0.04	"	"	7.32	63.5	"	"	7.32	57.0
0.045	"	"	7.79	67.5	"	"	7.79	60.7
0.05	"	"	8.21	71.2	"	"	8.21	64.0

Case B - Flat Section No Crown

Drainage
Roll Type Mountable Curb Section
City View Estates - Unit "B"

Tabulation of Hydraulic Capacities for Roll Type Mountable Curb Street Sections at various Longitudinal Grades.

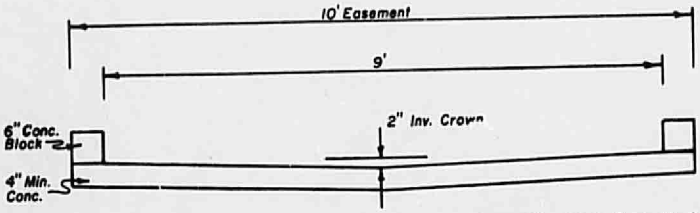


Long. Slope	Area	$\frac{1.486}{n} \times R^{5/3}$	V	Q
0.01	3.67	22.72	2.27	8.3
0.015	"	"	2.78	10.2
0.02	"	"	3.21	11.8
0.025	"	"	3.59	13.2
0.035	"	"	4.25	15.6
0.04	"	"	4.54	16.7

Tabulation of Hydralic capacities for various Roll Type Mountable Curb Sections at various grades.

Case C - Lateral Slope of 1% as in Parking Areas

Drainage
Roll Type Moutable Curb Section
City View Estates-Unit "B"



n = 0.016

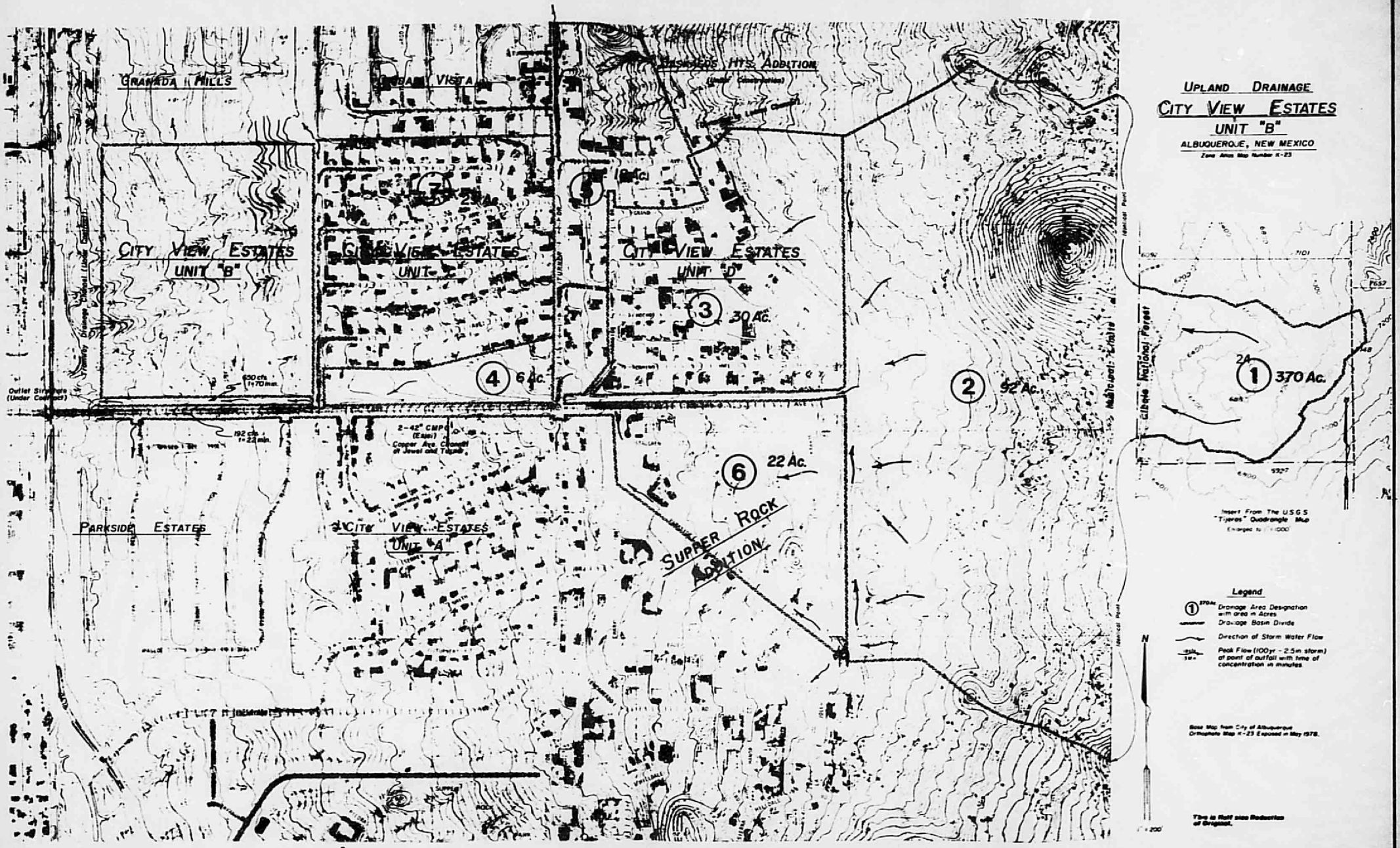
From City Stnd. Dwg. K-1

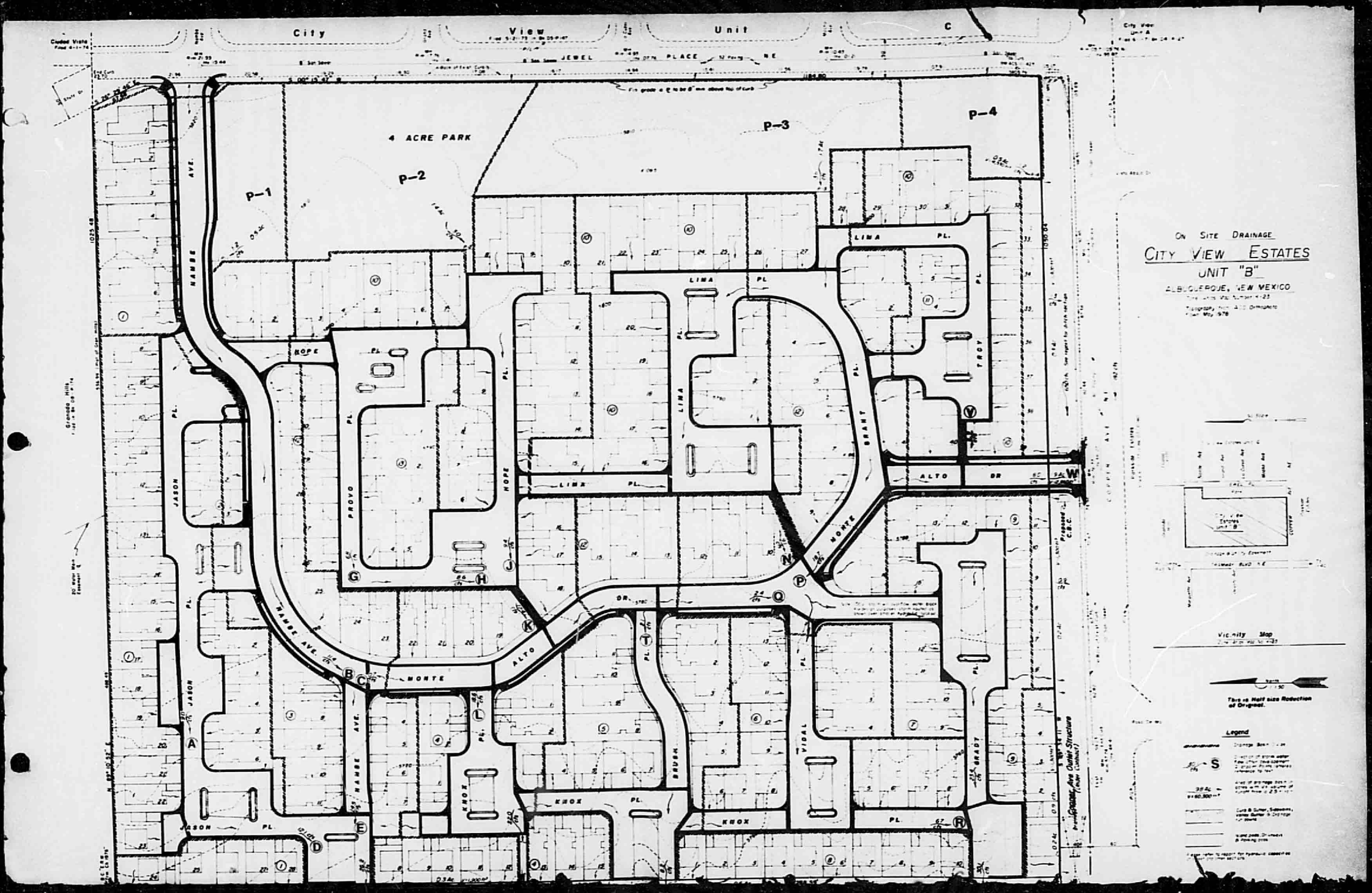
For depth of 2" @ sides - 4" @ ℄

Long. Slope	Velocity in ft./sec.	"Q" in cfs
0.045	7.8	17.6
0.04	7.4	16.7
0.035	7.1	16.0
0.03	6.3	14.2
0.02	5.2	11.7

Tabulation for Designing and Evaluating Outfall Channels at points K, N, & V

City View Estates - Unit "B"


UPLAND DRAINAGE
CITY VIEW ESTATES
UNIT "B"
ALBUQUERQUE, NEW MEXICO
GRANADA HILLS
CITY VIEW ESTATES UNIT "B"
CITY VIEW ESTATES UNIT "C"
CITY VIEW ESTATES UNIT "D"
CITY VIEW ESTATES UNIT "A"
PARKSIDE ESTATES
SUPPER ROCK ADDITION
1 370 Ac.
2 92 Ac.
3 30 Ac.
4 6 Ac.
6 22 Ac.
Cibola National Forest
Insert From The U.S.G.S. "Tijeras" Quadrangle Map
Legend
Drainage Area Designation with area in Acres
Drainage Basin Divide
Direction of Storm Water Flow
Peak Flow (100 yr - 2.5 in storm) at point of outfall with time of concentration in minutes
N


City View Unit C
JEWEL PLACE NE
4 ACRE PARK
P-1
P-2
P-3
P-4
HAMBE AVE.
JASON PL.
HOPE
PROVO PL.
LIMA PL.
TROY
BRANT
MONTE
ALTO DR.
KNOX PL.
BRUSH
VIDAL
BRADY
Proposed C.B.C.
Grades Are Outer Structure (Not Contours)
On Site Drainage
CITY VIEW ESTATES
UNIT "B"
ALBUQUERQUE, NEW MEXICO
Vicinity Map
This is Half size Reduction of Original.
Legend