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# MASTER DRAINAGE REPORT
## FOR
## THE VILLAGE AT SKYLINE

RICHARDS ENGINEERING AND LAND SURVEYING, INC.

1685 W. Uintah, Suite 103/Colorado Springs, CO 80904/(303) 633-3768

MASTER DRAINAGE REPORT
FOR
THE VILLAGE AT SKYLINE


(Revised June 27, 1985)


Prepared For:
Jensen/Markley Group
1586 South 21st Street, SuiteB
Colorado Springs, Colorado 80904

Prepared By:
Richards Engineering and
Land Surveying, Inc.
1685 W. Uintah, Suite 103
Colroado Springs, Colorado 80904

Job No. 1184-4

June 14, 1985


Mr. Gary Haynes
City Engineer
City of Colorado Springs
30 S. Nevada
Colorado Springs, CO 80903

Dear Mr. Haynes:

RE: Master Drainage Report for the
    Village at Skyline

   Transmitted herewith is a copy of the Master Drainage Report
for the Village at Skyline, for your review and approval.

   If you have any questions, please contact our office.

                              Sincerely,

                              RICHARDS ENGINEERING AND
                              LAND SURVEYING, INC.


                              Michael J. Vinson P.E.
                              Project Engineer

ald

# DRAINAGE CERTIFICATION

## ENGINEER'S CERTIFICATION

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City for drainage reports and said report is in general conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

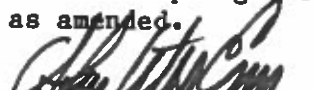Michael J. Vinson P.E. No. 15237
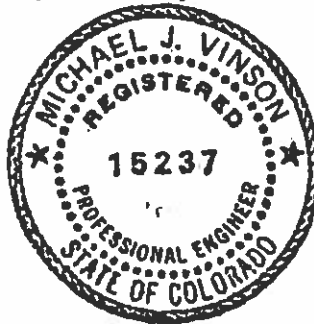
## DEVELOPER'S STATEMENT

The owner/developer and/or his representative has read and will comply with all the requirements specified in this drainage report.

OWNER/DEVELOPER           DATE

## CITY OF COLORADO SPRINGS FILING NOTE

Filed in accordance with section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.
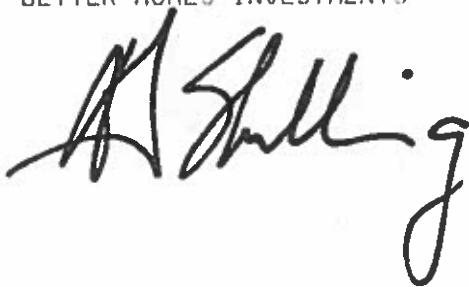
City Engineer         Date   7/31/85

JENSEN/MARKLEY GROUP
C/O RICHARDS ENGINEERING AND
      LAND SURVEYING
1687 W UINTAH SUITE 103
COLORADO SPRINGS,
COLORADO 80904

RE: DRAINAGE ONTO OUR PROPERTY FOR THE VILLAGE AT SKYLINE


SIRS;

We have reviewed the drainage report for thee Village at Skyline with your
Engineer. It is our understanding that the 5-year developed runoff onto our
property will about 6.5 c.f.s. less than the historic runoff, and that there
will be a point discharge of about 4.8 c.f.s. at our South property line.   We
have no objections to this drainage plan . We request that we be kept informed
of any changes that might be made.


Sincerely,
BETTER HOMES INVESTMENTS

*[signature]* → CLAY HAMILTON ←
                A. J. SCHILLING

                JOHN FORMAN.

MASTER DRAINAGE REPORT
FOR
THE VILLAGE AT SKYLINE

INDEX

## I. INTRODUCTION

This report is a master study for the Village at Skyline parcel. It is intended to show the proposed plan for routing storm runoff and its effects on proposed and existing structures. This report is not intended to replace the South 21st Street Master Drainage Basin Study. Certain generalities and assumptions were used to determine the downstream flows, and the adequacy of the downstream system. This report is to be used only if the Village at Skyline site is rezoned to PUD and developed as described herein.

## II. LOCATION

The Village at Skyline is located in the South 21st Street Drainage Basin and consists of approximately 36 acres. The site is bounded on the North by Wheeler Street and Brewster Subdivision; on the East by the Village at Bear Creek; on the South by Lower Gold Camp Road; and on the West by unplatted land. According to the F.E.M.A. Flood Plain Maps, this site is not within a designated flood plain.

## III. METHOD

Any assumed offsite flows stated in this report are from the South 21st Street Master Drainage Basin Study by R. Kieth Hook and Associates, Inc., dated June, 1977. Existing pipe sizes are from the "as built" South 21st Street Drainage Improvements Plans obtain from the Department of Public Works.

The method used for the onsite computations is the USDA/SCS synthetic hydrograph method as prescribed by the City of Colorado Springs. All interior flows are based on the "5-year" rainfall of 2.1 inches in 6 hours. The primary channel flows are based on a "100-year" rainfall of 3.5 inches in 6 hours. All computations are enclosed. Soils classifications were obtained from the SCS maps.

## IV. SOILS

The soils on the project are from the Chaseville-Midway Complex. The Chaseville soil makes up about 70 percent of the complex and the Midway makes up about 20 percent. The Chaseville soil is on the steeper soils and the top of ridges. The Midway soil is usually at the lower part of the areas. The SCS soil survey of the El Paso County area, Colorado, puts the Chaseville soil in the Hydrologic Group "A" and the Midway is Hydrologic

1

Group "D".  This site has been used for a gravel mine in the past.  For runoff computations, a Hydrologic Group "B" was used.

The  offsite areas are on Razor-Midway complex soils. A Hydrologic Group "D" was used for this area.


## V.  ZONING AND LAND USE

A request for rezoning has been submitted to the City to  zone  the property P.U.D.  It is the  intent  of  the owners  to develop the property as a retirement community, with  small  single family lots and  central  multi-family units.


## VI.  LOWER GOLD CAMP ROAD

At this time,  Lower Gold Camp Road is designated as a major arterial roadway.  About half of the length will be graded  for the full width,  while the West half  will  be tapered  back to the existing width.  Flows on Lower Gold Camp  Road  (10.S cfs)  will  be  carried  the  historic direction  to the East.  All the flows up to the 100-year runoff are within the curb capacity.


## VII.  ONSITE FLOWS

BASIN  "A":  Basin "A" consists of about 5 acres  and  is located  in the Southeast portion of the  project.  Flows from  this  basin  (8.1  cfs)  will  discharge  onto  the Community  at  Bear Creek.  These flows are shown  to  be accepted  in  the  drainage  report  by  Monument  Valley Engineering for the Community at Bear Creek.

BASIN "B":  Basin "B" is located in the Northeast  portion of the project and consists of about 8.2 acres.  Developed flows  from this Basin (9.2 cfs,  5-year) will flow to the Northeast.  Flows  from Sub-basin B-1 (4.8  cfs,  5-year) will travel between two lots and dispersed at the lot line by means of a Rip-Rap channel.  Flows from Sub-basin  B-2 (4.4 cfs,  5-year) will sheet flow along historic patterns offsite.  Most  of the historic flow from this site (15.7 cfs,  5-year) discharged in this direction.  Because most of  the  developed flows are being  re-routed (See  Basin "C"),  the new flows represent a reduction of about 41% in the  runoff to the Northeast.  Most of the historic site discharged this direction.  Because most of the developed flows  are  being re-routed,  the new  flows  represent  a reduction in runoff to the Northeast.

2

BASIN "C": Basin "C" is the central and Southwest portion of the project and consists of about 18.7 acres. Flows from this basin (25.9 cfs, 5-year) will be picked up in a private channel and diverted to a proposed inlet in Wheeler Avenue at the Northwest corner of this project. The runoff will then be carried in a proposed 27" RCP to the existing storm sewer system. The size and material for the diversion channel will be determined at the time the final plat is submitted for this area.

BASIN "D": Basin "D" is the portion along Wheeler Avenue and consists of about 4.2 acres. Flows from this area (0.81 cfs) will be picked up in a proposed D10R inlet at the Northwest corner of this project.

## VIII. DOWNSTREAM SYSTEM

Our calculations show that the downstream system is adequate to handle the flows projected in this report. For the most part, the downstream system has been constructed. The system begins with a 27" RCP at the corner of Wheeler and South Street. This pipe will be extended to the Northwest property corner and a 16'D10R inlet will be constructed. The back of the inlet will be open to accept the flows from onsite Basin "C". The runoff calculated by this office was about two-thirds (2/3) the flows shown on the South 21st Street Master Drainage Basin Plan. One reason is that the South 21st Street report assumed that the vacant land would be developed with industrial usages. Instead, in this area the vacant ground at the "Village at Skyline" is being developed as residential. Also, the vacant ground in sub-basins OS-2, OS-3, and OS-4 is considered too steep for industrial usages, but could be developed as multi-family residential with open spaces.

Our calculations show that if the vacant areas do develop with industrial usages, the runoff would increase about 30% and the pipe system would still be adequate.

## IX. PUBLIC AND PRIVATE IMPROVEMENTS

The only public improvements required for this project are the extension of the 27 inch RCP and the 6'D10R inlet in Wheeler Avenue. The cost for the Public Improvements is presented as follows:

80 LF of 27" RCP @ $30.00/LF       = $ 2,400.00

1 ea. of 16'D10R @ $7,000.00/ea.   = $ 7,000.00

                   TOTAL               $ 9,400.00

The private improvements will be determined in the final drainage report for each phase of this project.

X. FEES

This project lays entirely within the South 21st Street Basin. The 1985 fees are presented as follows:

Drainage Fees: 36.6 acres @ 2,143.00/acre = $78,433.80

Bridge Fees: None

The final amount of the drainage fees will be determined at the time of the final plat.

APPENDIX

370 000 FEET

10

2

15

SITE

Creek

23

24

MOUNTAIN

CREEK
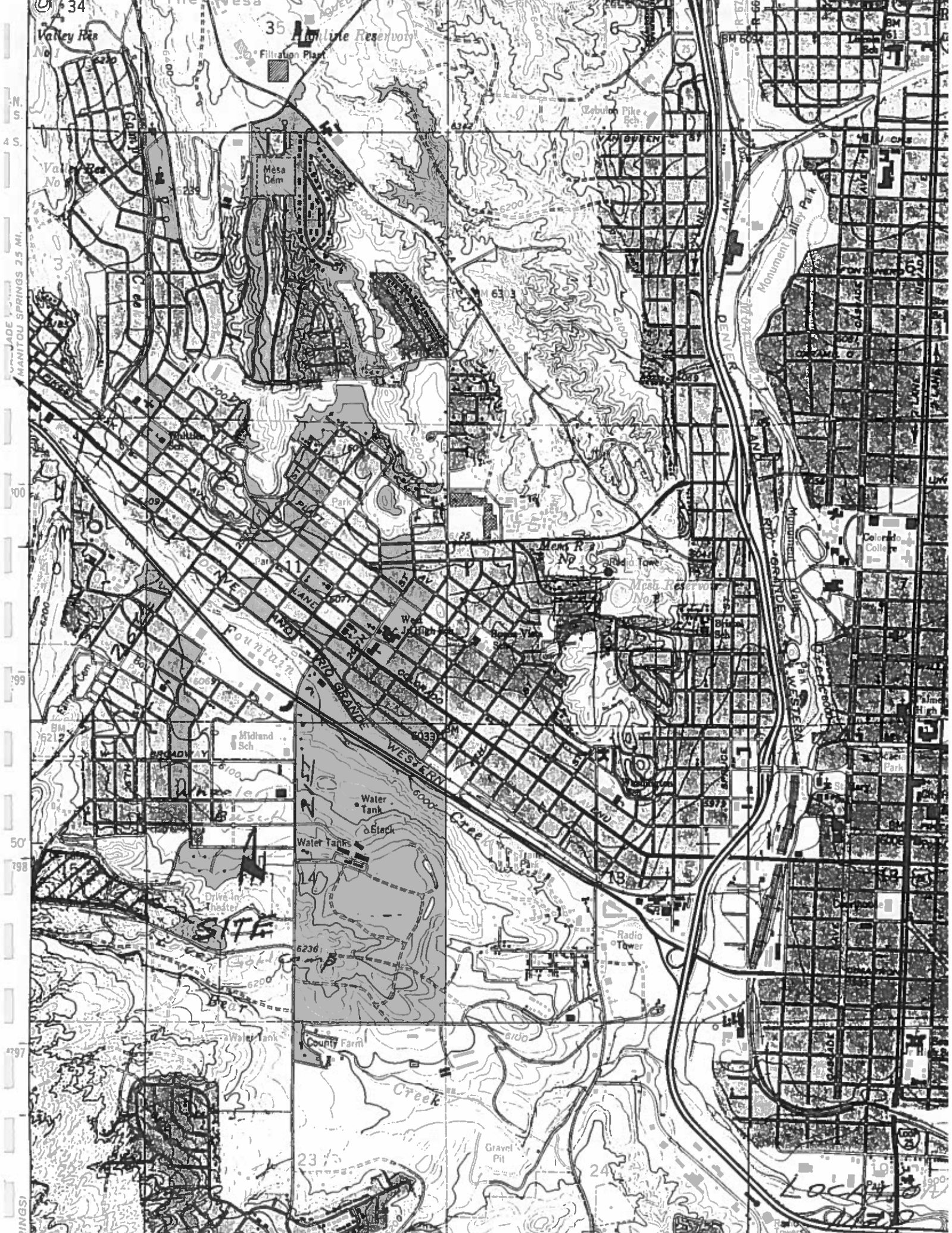
## CURVE NUMBERS
## CALCULATIONS

### Sub-Basins B-2

Total Acreage = 5.44 acres
Res. 3 acres = CN of 85          —          46.88
Open 2.44 acres = CN of 61       —          27.36

                       CN        =          74.23
USE CN = 81

### Sub-Basins C + D

Total Acreage = 22.848 acres
Res. = 18.688 = CN 85            —          69.52
Open = 4.160 = CN 61             —          11.11

                       CN        =          80.63
USE CN = 81

### Sub-Basins OS - 1 + C + D

Total Area = .0411 sq. mi.
Res. = .0346 sq. mi. = CN 85     =          71.56
Open = .0065 sq. mi. = CN 61     =          9.65

                       CN        =          81.20
USE CN = 81

### Sub-Basins C & D thru OS-6

Total area = .0678 sq. mi.
CN 87 = .0046                     =          5.9
CN 61 = .0065                     =          5.8
CN 85 = .0567                     =          71.08

                       CN        =          82.83
USE 85

### Sub-Basin OS-1,2,3,6,7 & C&D

Total Area = .0986
CN 87 = .0354                     =          31.24
CN 61 = .0065                     =          4.02
CN 85 = .0567                     =          48.88

              TOTAL              =          84.14
USE 85

Sub-Basins C&D + OS - 1 thru 7

    Total Area = .1159
    CN 85 = .0567            =       41.58
    CN 61 = .0065            =        3.42
    CN 87 = .0527            =       39.56

                  TOTAL      =       84.60
    USE 85


Sub-Basins C&D + OS - 1 thru 8

    Total Area = .1379
    CN 85 = .0567            =       34.95
    CN 61 = .0065            =        2.88
    CN 87 = .0747            =       47.12

                  TOTAL      =       84.95
    USE 85


Sub-Basins C & D + OS - 1 thru 10

    Total Area = .1604
    CN 85 = .0567            =       30.05
    CN 61 = .0065            =        2.48
    CN 87 = .0972            =       52.72

                  TOTAL      =       85.23
    USE 85


Basins C & D & OS

    Total Area = .19 sq. mi.
    CN 85 = .0567            =       25.37
    CN 61 = .0065            =        2.08
    CN 87 = .1268            =       58.06

                  TOTAL      =       85.51
    USE 86

FIGURE 4

FLOW FOR CIRCULAR PIPE FLOWING FULL
BASED ON MANNING'S EQUATION n=0.012
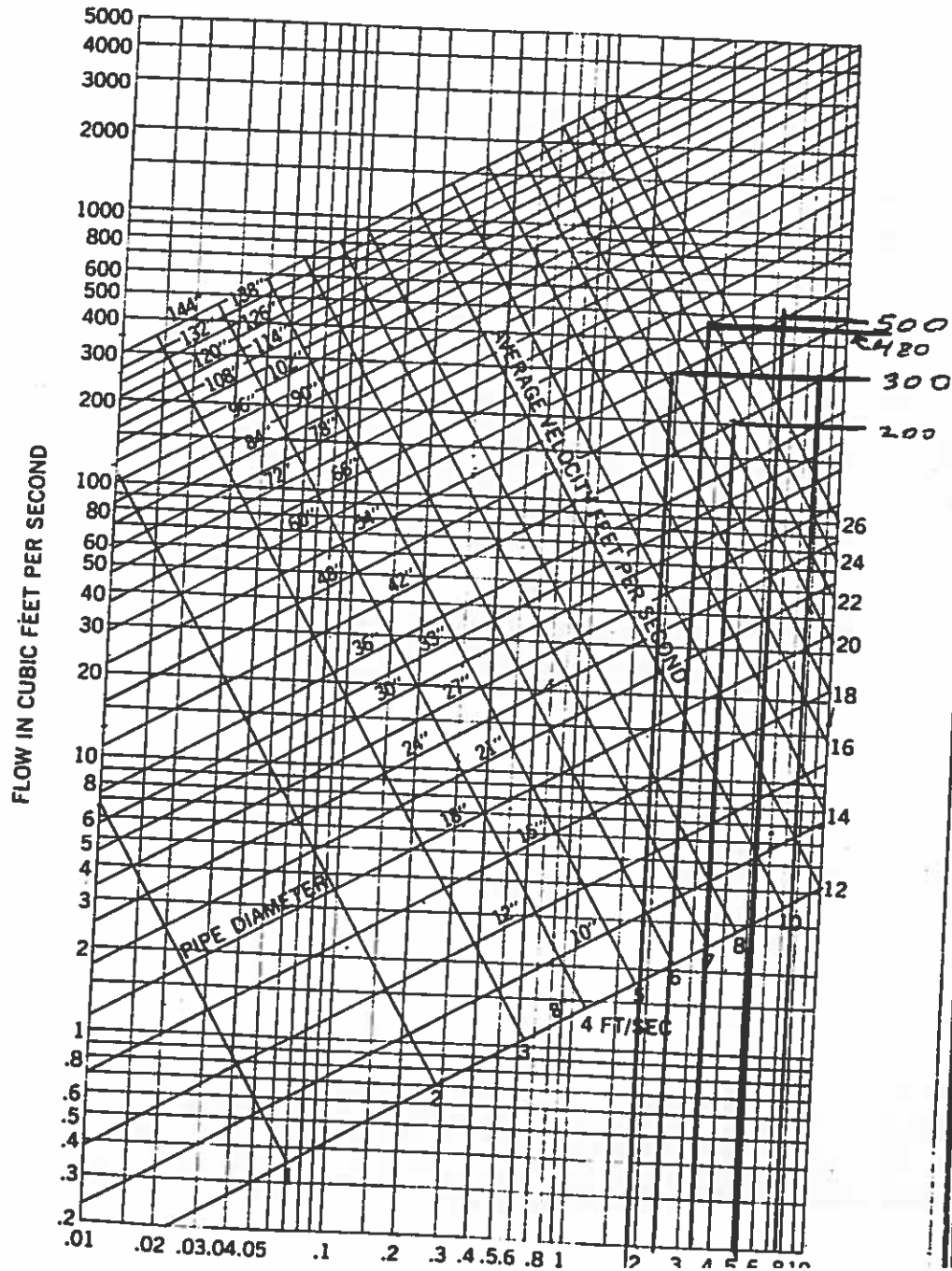
Figure III

| MAJOR BASIN | SUB BASIN | AREA Planim. Read. | AREA MILE | BASIN LENGTH | BASIN HEIGHT | Tc | K | SOIL GROUP | DEV. TYPE | CURVE NO. | FLOW Q | FLOW qp | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC | 1 | . | .0013 | 700 | 26 | .0717 | 1230 | | Road | 98 | 3.1 | 1.87 | 5 yr. |
| | | | | | | | | | | | 5.4 | 3.27 | 100 yr. |
| + | 2 | | .0055 | 3000 | 105 | .2251 | 1020 | | Road | 92 | 10.5 | 1.87 | 5 yr |
| | | | | | | | | | | | 13.3 | 3.27 | 100 yr |
| A | | | .0078 | 1050 | 20 | .127 | 1200 | B | Res | 85 | 2.14 | 0.87 | 5 yr |
| | | | | | | | | | | | 18.90 | 2.02 | 100 yr |
| B | 1 | | .0043 | 500 | 12 | .05 | 1270 | B | Res | 85 | 4.8 | 0.87 | 5 yr |
| | | | | | | | | | | | 11.1 | 2.02 | 100 yr |
| | 2 | | .0085 | 200 | 40 | .014 | 1280 | B | Res & OPEN | 74 | 4.4 | 0.40 | 5 yr |
| | | | | | | | | | | | 13.5 | 1.24 | 100 yr |
| C | | | .0292 | 2500 | 60 | .226 | 1020 | B | Res | 85 | 25.9 | 0.87 | 5-yr. |
| | | | | | | | | | | | 60.2 | 2.02 | 100-yr. |
| D | | | .0065 | 900 | 20 | .1061 | 1250 | B | OPEN | 61 | 0.81 | 0.10 | 5-yr |
| | | | | | | | | | | | 4.6 | 0.57 | 100-yr |
| C + D | | | .0357 | | | .226 | 1020 | B | Res & OPEN | 81 | 26.2 | .72 | 5-yr |
| | | | | | | | | | | | 62.3 | 1.71 | 100 yr |
| Hist A B&C that discharges where Dev. B will | | | .0498 | 1600 | 80 | .12 | 1210 | B | OPEN | 69 | 15.7 | 0.26 | 5-yr |
| | | | | | | | | | | | 57.2 | 0.95 | 100-yr |

HYDROLOGIC COMPUTATION – BASIC DATA

PROJ: Village at Skyline

By: MV

Date: 6/12/85

Page 1 of 4 Pages

| MAJOR BASIN | SUB BASIN | AREA Planim. Read. | AREA MILE | BASIN LENGTH | BASIN HEIGHT | Tc | K | SOIL GROUP | DEV. TYPE | CURVE NO. | FLOW Q | FLOW qp | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OS | 1 | | .0054 | 800 | 40 | .07 | 1280 | B | RES | 25 | 6.01 | 0.87 | 5-yr |
| | | | | | | | | | | | 14.0 | 2.22 | 100-yr |
| +C&D | | | .0411 | | | | 1020 | B | | 81 | 30.2 | 0.72 | 5-yr |
| | | | | | | | | | | | 71.7 | 1.71 | 100-yr |
| | | | | | | | | | | | | | |
| OS | 2 | | .0221 | 1200 | 90 | .13 | 1200 | B | (Assume) Res. | 85 | 23.1 | 0.87 | 5-yr |
| | | | | | | | | | | | 53.6 | 2.02 | 100-yr |
| 1+2+C+D | | | .0632 | | | | 1020 | B | | 25 | 56.1 | 0.87 | 5-yr |
| | | | | | | | | | | | 130.2 | 2.02 | 100-yr |
| | | | | | | | | | | | | | |
| OS | 6 | | .0046 | 700 | 40 | .06 | 1230 | D | | 87 | 5.8 | 0.98 | 5-yr |
| | | | | | | | | | | | 12.9 | 2.19 | 100-yr |
| C&D + OS | | | .0678 | 3200 | 100 | .247 | 1000 | | | 85 | 59.0 | 0.87 | 5-yr |
| | | | | | | | | | | | 137.0 | 2.02 | 100-yr |
| | | | | | | | | | | | | | |
| OS | 7 | | .0082 | 750 | 32 | .09 | 1250 | D | | 87 | 10.3 | 0.98 | 5-yr |
| | | | | | | | | | | | 23.0 | 2.19 | 100-yr |
| | | | | | | | | | | | | | |
| OS | 3 | | .0226 | 1700 | 102 | .13 | 1200 | D | | 87 | 26.6 | 0.98 | 5-yr |
| | | | | | | | | | | | 59.4 | 2.19 | 100-yr |
| | | | | | | | | | | | | | |
| C&D+OS 1,2,3,6&7 | | | .0986 | 4050 | 132 | .29 | 930 | | | 85 | 79.8 | 0.87 | 5yr |
| | | | | | | | | | | | 185.2 | 2.02 | 100yr |
| | | | | | | | | | | | | | |
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HYDROLOGIC COMPUTATION – BASIC DATA

PROJ: *Village at Skyline*   By: MV   Date. 6/12/85

| MAJOR BASIN | SUB BASIN | AREA Planim. Read. | AREA MILE | BASIN LENGTH | BASIN HEIGHT | Tc | K | SOIL GROUP | DEV. TYPE | CURVE NO. | FLOW Q | FLOW qp | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OS | 4 | | 0.0140 | 1000 | 140 | .06 | 1280 | D | Res | 87 | 17.6 / 39.2 | .98 / 2.19 | 5yr / 100yr |
| OS | 5 | | .0033 | 700 | 20 | .03 | 1250 | D | Res | 27 | 4.1 / 9.3 | 0.98 / 2.19 | 5yr / 100yr |
| C&D +OS | 1 thru 7 | | .1159 | 4700 | 150 | .33 | 785 | | | 85 | 89.2 / 207.2 | 2.37 / 2.02 | 5yr / 100yr |
| OS | 8 | | .022 | 1650 | 170 | .09 | 1280 | D | Res | 87 | 27.6 / 51.7 | .98 / 2.19 | 5-yr / 100-yr |
| Total | | | .1379 | 5050 | 164 | .35 | 260 | | | 85 | 103.2 / 239.6 | .87 / 2.02 | 5-yr / 100-yr |
| OS | 10 | | .0125 | 1000 | 150 | .06 | 1280 | D | | 87 | 15.7 / 35.0 | .98 / 2.19 | 5-yr / 100-yr |
| OS | 9 | | .01 | 800 | 26 | .08 | 1280 | D | | 87 | 12.5 / 28.0 | .98 / 2.19 | 5-yr / 100-yr |
| OS | 10+9 | | .0225 | 1700 | 176 | .10 | 1280 | | | | 28.2 / 63.0 | | 5-yr / 100-yr |
| C&D +OS | 1 thru 10 | | .1604 | 5450 | 178 | .37 | 840 | | | 85 | 117.2 / 272.2 | .87 / 2.02 | 5-yr / 100-yr |

**HYDROLOGIC COMPUTATION – BASIC DATA**

PROJ: Village at Skyline

By: M.V.

Date: 6/12/85

| MAJOR BASIN | SUB BASIN | AREA Planim. Read. | AREA MILE | BASIN LENGTH | BASIN HEIGHT | Tc | K | SOIL GROUP | DEV. TYPE | CURVE NO. | FLOW Q | FLOW qp | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OS | 11 | | .0129 | 900 | 36 | .0246 | 1230 | D | Res | 87 | 16.2 | .98 | 5-yr |
| | | | | | | | | | | | 36.2 | 2.19 | 100-yr |
| | 12 | | .0104 | 250 | 26 | .09 | 1280 | D | Res | 87 | 13.0 | .98 | 5-yr |
| | | | | | | | | | | | 29.2 | 2.19 | 100-yr |
| | 13 | | .0063 | 750 | 26 | .09 | 1280 | D | Res | 87 | 7.9 | .98 | 5-yr |
| | | | | | | | | | | | 17.7 | 2.19 | 100-yr |
| | | | | | | | | | | | | | |
| CPO + OS | ALL | | .19 | 6050 | 188 | .40 | 810 | | | 56 | 141.6 | .92 | 5 yr |
| | | | | | | | | | | | 323.2 | 2.10 | 100-yr |
| | | | | | | | | | | | | | |
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**HYDROLOGIC COMPUTATION – BASIC DATA**

PROJ: *Village at Skyline*

By: MV
Date: 6/12/85

Table 1   -- Determination of Runoff Depth in inches for selected
            CN's and rainfall amounts

| Curve [1] Number | (P) Rainfall (Inches) | |
|---|---|---|
| | 2.10 | 3.50 |
| 56 | 0.03 | 0.38 |
| 58 | 0.05 | 0.45 |
| 60 | 0.08 | 0.53 |
| 62 | 0.11 | 0.62 |
| 64 | 0.14 | 0.71 |
| 66 | 0.18 | 0.80 |
| 68 | 0.23 | 0.90 |
| 70 | 0.28 | 1.01 |
| 72 | 0.34 | 1.12 |
| 74 | 0.40 | 1.24 |
| 76 | 0.47 | 1.36 |
| 78 | 0.54 | 1.50 |
| 80 | 0.62 | 1.64 |
| 82 | 0.71 | 1.78 |
| 84 | 0.82 | 1.94 |
| 86 | 0.92 | 2.10 |
| 88 | 1.05 | 2.27 |
| 90 | 1.18 | 2.45 |
| 92 | 1.33 | 2.64 |
| 94 | 1.49 | 2.84 |
| 96 | 1.67 | 3.04 |
| 98 | 1.87 | 3.27 |

1/  To obtain runoff depths for CN's and other rainfall amounts
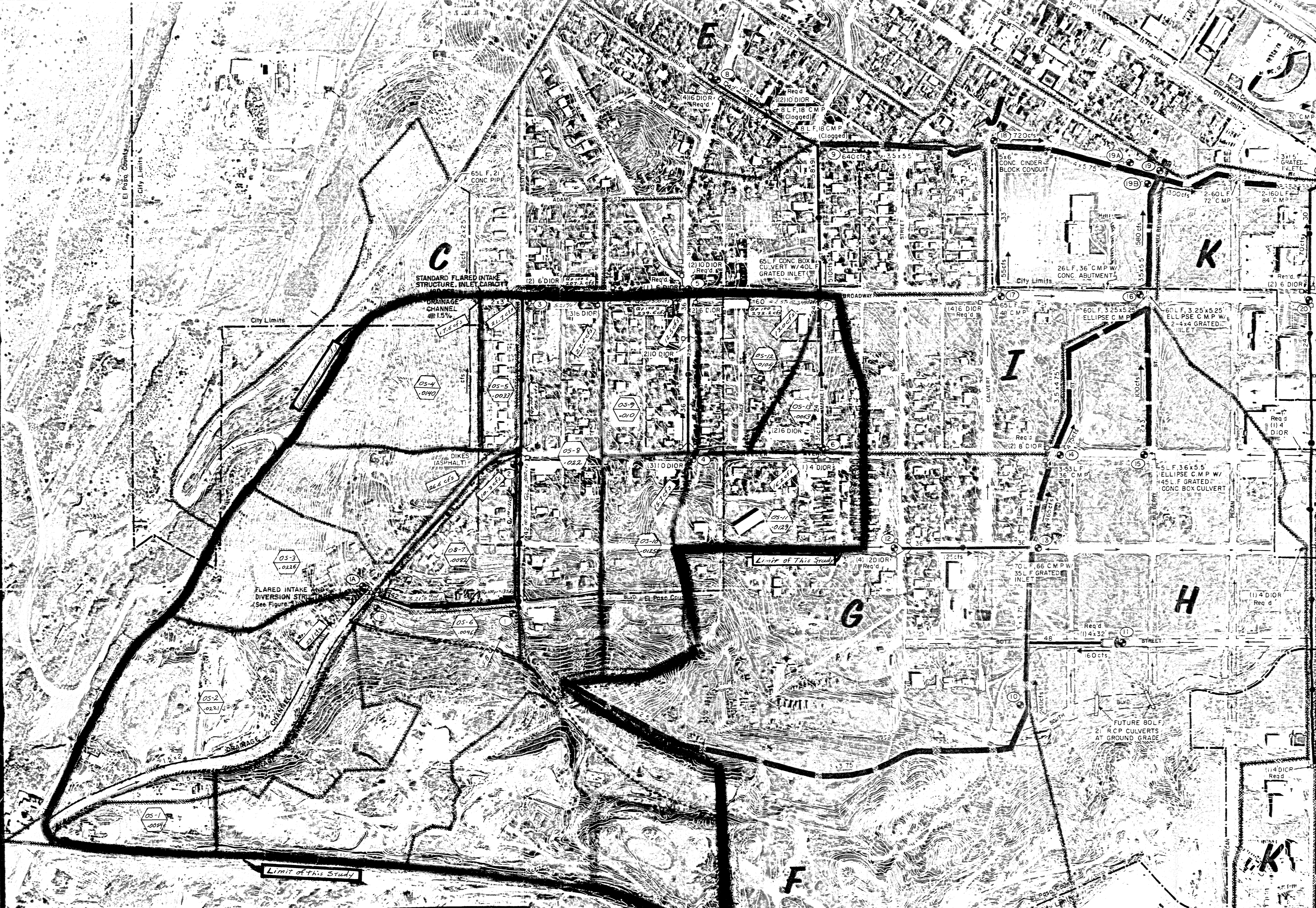    not shown in this table, use arithmetic interpolation or:

$$Q = \frac{CN\ (P + 2)^2 - 400\ (P+2 - \frac{100}{CN})}{CN\ (P - 8) + 800}$$

Figure IV

## CURB OPENING INLET CAPACITIES (cfs)    Table 6

NOTE: This chart reflects approx. 60% pickup of street flows (not full pickup!)

| Opening Length (ft.) | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22. |
|---|---|---|---|---|---|---|---|---|---|---|
| Sump (full pickup) Capacity (cfs) | 7.9 | 12.8 | 18.4 | 23.0 | 27.6 | 34.5 | 39.4 | 44.4 | 49.3 | 54. |

| Street Slope % | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.5 | 6.3 | 6.6 | 6.8 | 8.0 | 8.8 | 9.7 | 10.6 | 11.5 | 12.4 | 13. |
| 1.0 | 8.6 | 8.8 | 9.4 | 10.0 | 10.4 | 11.3 | 12.0 | 12.8 | 13.8 | 14. |
| 1.5 | 7.7 | 10.6 | 10.9 | 11.5 | 12.2 | 12.7 | 13.4 | 14.2 | 15.0 | 15. |
| 2.0 | 6.5 | 12.2 | 12.5 | 12.9 | 13.4 | 14.0 | 14.6 | 15.2 | 16.0 | 16. |
| 2.5 | 6.7 | 14.0 | 13.9 | 14.2 | 14.7 | 15.2 | 15.7 | 16.3 | 17.0 | 17. |
| 3.0 | 5.2 | 12.7 | 14.8 | 15.4 | 15.8 | 16.1 | 16.5 | 17.2 | 17.8 | 18. |
| 3.5 | 4.7 | 11.3 | 16.1 | 16.6 | 16.9 | 17.2 | 17.8 | 18.2 | 18.2 | 19. |
| 4.0 | 4.4 | 10.6 | 17.0 | 17.5 | 17.9 | 18.2 | 18.5 | 19.0 | 19.5 | 20. |
| 4.5 | 4.1 | 9.7 | 18.1 | 18.4 | 18.7 | 19.1 | 19.5 | 20.0 | 20.5 | 21. |
| 5.0 | 3.9 | **9.2** | 17.7 | 19.4 | 19.7 | 20.0 | 20.3 | 20.3 | 21.3 | 21. |
| 5.5 | 3.7 | 8.7 | 16.7 | 20.3 | 20.6 | 20.9 | 21.2 | 21.5 | 22.0 | 22. |
| 6.0 | 3.5 | 8.3 | 15.6 | 20.7 | 21.0 | 21.4 | 21.9 | 22.4 | 22.9 | 23. |
| 6.5 | 3.4 | 7.9 | 14.9 | 21.8 | 22.2 | 22.6 | 23.1 | 23.5 | 24.0 | 24. |
| 7.0 | 3.2 | 7.6 | 14.2 | 22.2 | 22.6 | 23.0 | 23.5 | 23.8 | 24.2 | 25. |
| 7.5 | 3.1 | 7.3 | 13.6 | 22.7 | 23.4 | 23.8 | 24.2 | 24.6 | 25.0 | 25. |
| 8.0 | 3.0 | 7.0 | 13.0 | 21.8 | 24.3 | 24.6 | 24.9 | 25.3 | 25.7 | 26.2 |
| 8.5 | 2.9 | 6.8 | 12.6 | 20.3 | 25.0 | 25.3 | 25.6 | 26.0 | 26.4 | 26.8 |
| 9.0 | 2.8 | 6.5 | 12.1 | 19.9 | 25.7 | 25.9 | 26.3 | 26.6 | 27.0 | 27.4 |
| 9.5 | 2.7 | 6.4 | 11.8 | 19.4 | 26.5 | 26.7 | 27.0 | 27.4 | 27.7 | 28.1 |
| 10.0 | 2.6 | 6.2 | 11.4 | 18.7 | 26.7 | 27.2 | 27.6 | 28.0 | 28.3 | 28.8 |

Revised:   C. Aamold/5-16-74

Figure II

**LEGEND**

| Symbol | Description |
|---|---|
| ≡≡≡ | EXISTING DRAINAGE STRUCTURES |
| | PROPOSED DRAINAGE STRUCTURES |
| 24" | R.C.P. STORM DRAIN PIPE W/SIZE DIA. |
| □− | CATCH BASIN W/CONNECTOR PIPE |
| ● | MANHOLE |
| | GRATED INLET |
| | DRAINAGE CHANNEL |
| | MAJOR DRAINAGE CHANNEL |
| | BASIN BOUNDARY |
| | SUB-BASIN BOUNDARY |
| ③ | HYDROGRAPH POINT |
| 1.3 cfs | POINT FLOW |
| OS-X / .025 | SUB-BASIN No. AREA in Sq. Mi. |

**BASIN DATA**

| Sub-Basin | Acreage | Basin | Acreage |
|---|---|---|---|
| OS-1 | 3.45 | OS-10 | 8.00 |
| OS-2 | 14.17 | OS-11 | 8.25 |
| OS-3 | 14.46 | OS-12 | 6.65 |
| OS-4 | 8.96 | OS-13 | 4.03 |
| OS-5 | 2.11 | | |
| OS-6 | 2.94 | | |
| OS-7 | 5.24 | | |
| OS-8 | 14.08 | | |
| OS-9 | 6.40 | | |

NOTES:
1. All pipe is 45° bend or less.
2. For required improvement to existing drainage structures at hydrograph point location. See chart on page 36-37.

*Limit of This Study*

**VILLAGE AT SKYLINE**

**MASTER DRAINAGE PLAN**
**OFFSITE DRAINAGE PLAN**

RICHARDS ENGINEERING AND LAND SURVEYING
1585 W. UINTAH, SUITE 103
COLORADO SPRINGS, COLORADO 80904

PHONE (303) 633-3768

| | |
|---|---|
| PREPARED BY: | JOB NO. 1184-4 |
| DATE: MAY 31, 1985 | SHEET 1 OF 2 |
| SCALE: HORIZONTAL 1"=50' | REVISION BY DATE |
| VERTICAL 1"=5' | |

FIGURE-A

N

200 100 0 200 400

Scale: 1"=200'
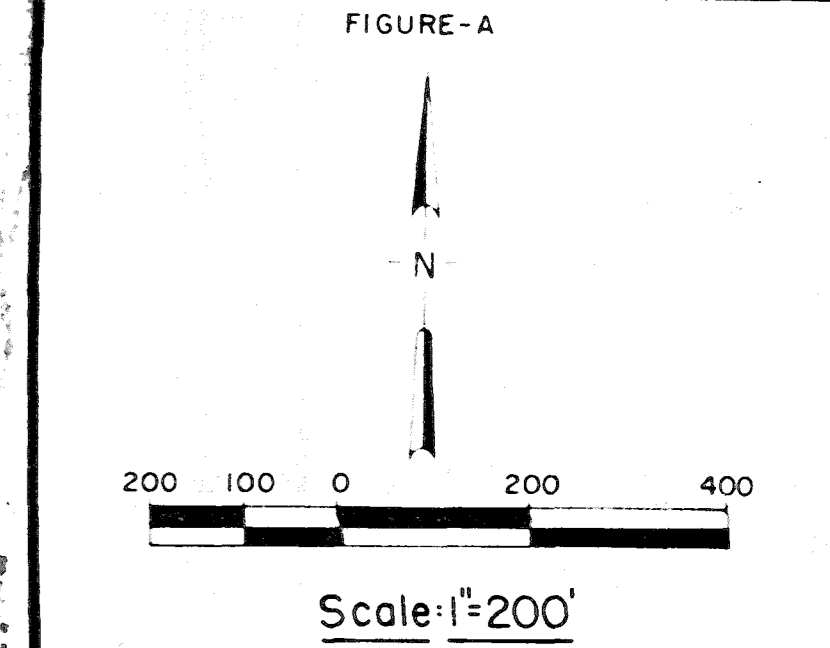
From the
**SOUTH 21st STREET**
**MASTER DRAINAGE BASIN PLAN**

R. KEITH HOOK & ASSOCIATES, INC.
CONSULTING ENGINEERS
COLORADO SPRINGS, COLORADO
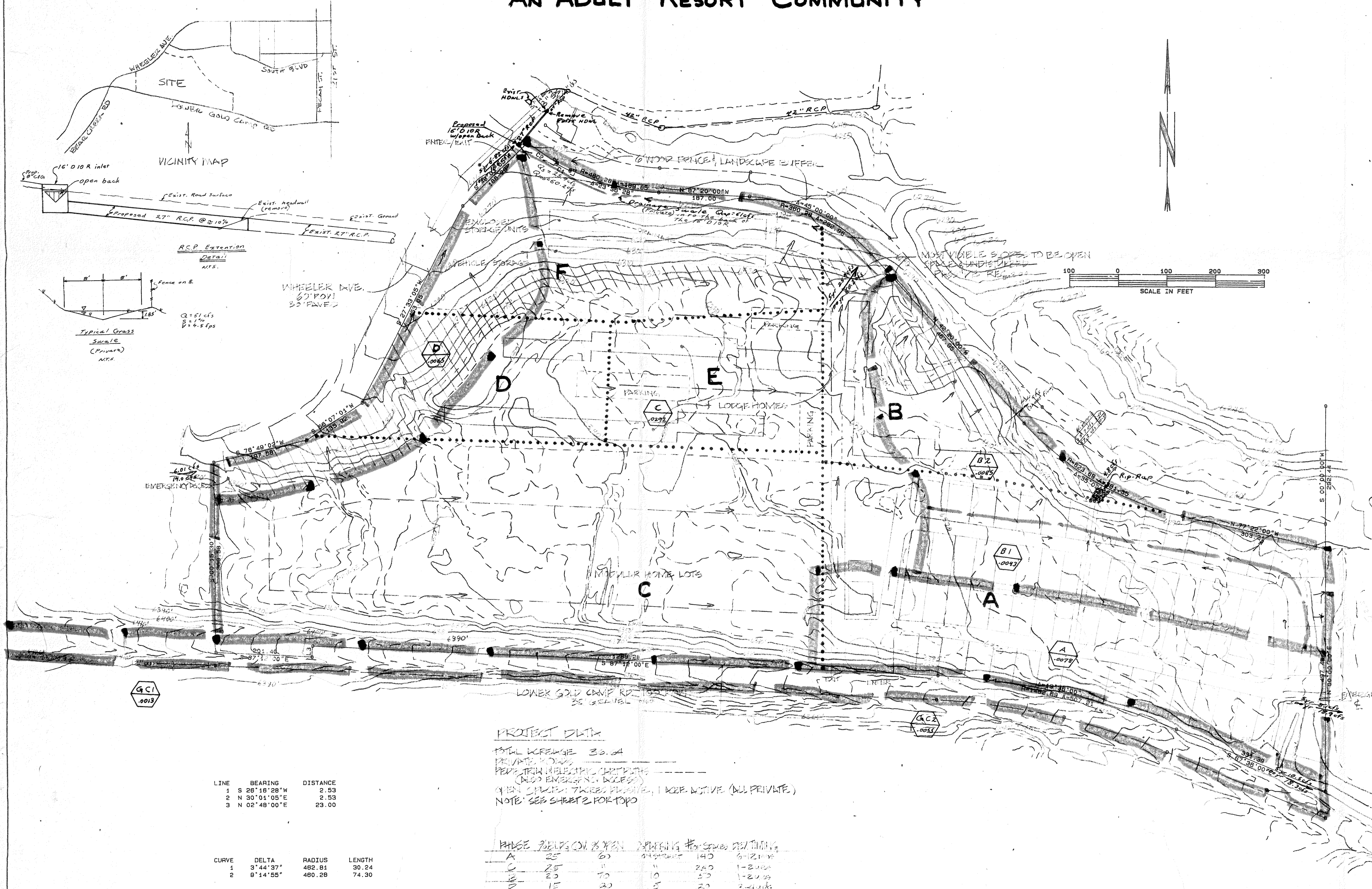
| DRAWN BY | JOB NO 77C083 | FILE NO. 7128 |
|---|---|---|
| CHECKED BY | | |
| REFERENCE | | |

# DRAINAGE PLAN
# THE VILLAGE AT SKYLINE
# An Adult Resort Community

SITE

VICINITY MAP

16" D.I.P. inlet
open back

Exist. Road Surface
Exist. headwall (remove)
Exist. Ground
Proposed 27" R.C.P. @ 2.10%
Exist. 27" R.C.P.

RCP Extension
Detail
N.T.S.

Fence on E
Q = 5 cfs
S = 2%
V = 4.5 fps

Typical Grass
Swale
(Private)
N.T.S.

WHEELER DRIVE
60' ROW
35' PAVED

SCALE IN FEET
100  0  100  200  300

PROJECT DATA

LINE | BEARING | DISTANCE
--- | --- | ---
1 | S 28°18'28"W | 2.53
2 | N 30°01'05"E | 2.53
3 | N 02°48'00"E | 23.00

CURVE | DELTA | RADIUS | LENGTH
--- | --- | --- | ---
1 | 3°44'37" | 482.81 | 30.24
2 | 9°14'55" | 460.28 | 74.30

GC1 .0013

GC2 .0055