DRAINAGE INFORMATION SHEET — C-12/D10

PROJECT TITLE: PRAIRIE RIDGE, UNIT #4 ZONE ATLAS/DRAINAGE FILE # ~~D-12~~

LEGAL DESCRIPTION: RIVERVIEW PARCEL H-21, H-22

CITY ADDRESS: N/A

ENGINEERING FIRM: COMMUNITY SCIENCES CORP. CONTACT: MIKE YOST

ADDRESS: BOX 1328, CORRALES, NM, 87048 PHONE: 897-0000

OWNER: BELLAMAH COMMUNITY DEVELOPMENT CONTACT: BOB RYALS

ADDRESS: BOX 3300, ALBUQUERQUE, NM, 87190 PHONE: 884-6606

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: SAME AS ENGINEER CONTACT: SKIP CARLETON

ADDRESS: _____ PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED
JUL 15 1987
HYDROLOGY SECTION

DRB NO. 87-437

EPC NO. _____

PROJECT NO. 3314

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAIN PLAN

X GRADING PLAN

X EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

X OTHER FINAL GRADING (SPECIFY) FOR W.O.

DATE SUBMITTED: 7/15/87

BY: Michael J. Yost

REV. 10/85

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 23, 1988

Mike Yost, P.E.
Community Sciences Corporation
Post Office Box 1328
Corrales, New Mexico 87058

RE: REVISED PLATE 2 OF THE DRAINAGE MANAGEMENT PLAN FOR PRAIRIE RIDGE UNIT 5, SUBMITTED 26 FEB 88 FOR PRELIMINARY PLAT APPROVAL (C12/D1D)

Dear Mr. Yost:

I have reviewed your submittal with the added 30' drainage easement cross-section, and it is satisfactory. Would you, at your convenience, kindly change the latest revision date to "2/26/88" from "2/26/87"?

With the exception of the letter from Open Space giving the developer permission to use Tract A as an emergency overflow area, and the revision date mentioned above, I think we have all of the items we require for us to sign the final plat.

Thank you for your cooperation.

If you have any questions, please call me at 768.2650.

Cordially,

Stuart Reeder

G. Stuart Reeder, P.E.
C.E./Hydrology Section

GSR/bsj

community sciences corporation

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000

DRAINAGE MANAGEMENT PLAN

FOR

PRAIRIE RIDGE, UNITS 4 AND 5

PREPARED FOR:

BELLAMAH COMMUNITY DEVELOPMENT

PREPARED BY:

COMMUNITY SCIENCES CORPORATION

MAY, 1987

REVISED JULY, 1987

Michael J. Yost 7/13/87

MICHAEL J. YOST, P.E.

SURVEYING
ENGINEERING
LAND PLANNING

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A) Purpose and Scope

Bellamah Community Development is currently planning development of their 56 acre Prairie Ridge Subdivision, Units 4 and 5, in northwest Albuquerque. The Development will consist of approximately 221 R1 lots intended for the tract housing market. The purpose of this report is to present an overall drainage management plan for the project which is based on sound engineering practice and which is acceptable to both the City of Albuquerque and the Albuquerque Metropolitan Arroyo Flood Control Authority.

Development of Prairie Ridge, Unit 4 is to commence immediately. Development of Prairie Ridge, Unit 5 will begin somewhat later. It is for this reason certain interim measures for this phasing of development are specified in this report.

This report presents a site-specific drainage plan for Prairie Ridge, Units 4 and 5. Offsite drainage basins and master plan drainage facilities are discussed ~~in~~ at length in the "Riverview Master Drainage Plan" by Community Sciences Corporation, November, 1985, and "Drainage Management Plan for Shenandoah Unit II and III" by Community Sciences Corporation, December, 1985.

B) Site Location and Topography

Prairie Ridge, Units 4 and 5 is located in parcel H-21 and H-22, Riverview Subdivision. The area is bounded on the east by proposed Golf Course Road, on the north by proposed Butterfield Trail Street, on the west by existing the Homestead Hills East and the Homestead Hills North Subdivisions, on the south by future Homestead Trail Street, as shown on Plate 1. The parcel tends to slope in a southwest to northeast direction.

Soils are primarily gravelly sands and silts falling into the SCS soils hydrologic group B.

C) Design Criteria

1) Engineering Parameters

In accordance with AMAFCA and City of Albuquerque Drainage Criteria all hydrological analysis based on the 100 year frequency - 6 hour duration storm as represented in the NOAA atlas for New Mexico. The rainfall values pertinent to the study are as follows:

	10 Year	100 Year
One Hour	1.25"	1.9"
Six Hour	1.45"	2.2"

? WHERE FROM? CALCULATIONS?

A fraction impervious of 0.57 was selected for the project based on proposed, typical lots, and a curve number of 70 was selected for the previous areas. Developed offsite watersheds were assigned a fraction impervious as specified in the Riverview Master Drainage Plan, and a curve number of 75 was selected for these areas. The proposed open space (Tract A) was assigned a fraction impervious of 0.02.

@ 0.133 AC LOTS (7.5 LOTS/AC), 0% IMPERV, ≈ 65% GP. B), CN≈ 85 (SOIL

2) Flood Control Regulations

The drainage plan presented in this report has been designed to comply with the current City of Albuquerque Drainage Ordinance and associated technical criteria as published in the Development Process Manual. The key elements of the ordinance are as follows:

1) Street flow depths may not exceed a value of 0.2 feet above top of curb for any location for a 100 year event.

2) The product of depth and velocity must be less than or equal to 6.5 for the 10 year event.

D) Computational Procedures

The analysis approach utilized follows standard engineering practice. Key points of confluence were selected, and subsequently the associated individual and aggregate contributing basins were defined.

Hydrological computations were accomplished by means of our MODSCS Computer model. This model is based upon the Soil Conservation Service Triangular unit hydrograph method, but the method has been modified to be more applicable to developed watershed conditions. The model avoids the common pitfall of grappling for an appropriate developed curve number by including percent impervious as an input variable. This fraction of the watershed is then modeled at a curve number of 95. An assigned curve number is applied to the balance of the watershed, and the runoffs are combined to yield the composite hydrograph. In addition the model has the capacity to route hydrographs through reservoirs and channels, or to translate hydrographs in time for summation with other sub-basins.

Times of concentration were estimated by using a combination of approximated street flow velocities and overland flow velocities (as applicable) from the upper subcatchment reaches to the confluence point of interest. A convenient formula for overland flow velocity takes the form:

$$v = KY^{0.5}$$

where V = overland flow velocity

Y = average ground slope in percent

K = a ground cover factor

Street velocities were estimated by use of the Manning equation for uniform flow.

All the characteristic hydrological parameters for each subcatchment of interest and each key point of confluence are contained in Appendix A as part of the computer model output, and a summary of parameters and peak flow rates are given in Table 1.

Following hydrological modeling street flow characteristics were analyzed by various methods. For uniform flow conditions the Manning equation with a roughness factor of 0.017 was used. At intersections the worst of two conditions was considered; the theoretical hydraulic jump depth for upstream flow conditions, and the theoretical pool depth to accelerate the flow to the normal, downstream conditions. The higher value was assumed to be the potential flood depth. It should be noted that this approach is valid only for incoming supercritical flow conditions at tee intersections. Subcritical flow conditions are not considered problematic at intersections unless normal flow depth is above required limits.

E) Offsite Drainage

The storm flows from the Shenandoah Units 1, 2 and 3 subdivisions, along with local flows from Taylor Ranch Drive are to be discharged into the South Branch of the Piedras Marcadas Arroyo west of the project site. These flows will be combined the storm flows from portions of Homestead Hills East and Homestead Hills North, designated as HHE2 and HHN2 respectively

in the Riverview Master Drainage Plan. It is proposed these flows be collected in a storm sewer system at the western boundary of the project site, conveyed through the site, and discharged back into the South Branch of the Piedras Marcadas Arroyo just east of the Golf Course Road right-of-way (see Plate 2). The MODSCS output for this hydrological routing is included in Appendix C of this report.

A portion of Homestead Hills North Drains on to proposed Butterfield Trail at the northwest corner of the project site. This drainage basin was designated HHN1 in the Riverview Master Drainage Plan. These flows are combined with the flows from Riverview Basins L and M and are to be collected in catch basins at the northeast corner of the site before discharge into the South Branch of the Piedras Marcadas Arroyo.

POINTS C1, GCR

F) Onsite Drainage

Plate 2 illustrates the various drainage basins which are internal to the project site.

Basins A1 through A4 are to drain into a catch basin and directed into the storm sewer that is to be placed through the project site.

NO BASINS B1-B4 EXISTING ARE B5-B8

~~Basin B1 through~~ B8 are to drain into a catch basin and are also to be directed into the aforementioned storm sewer.

Basin C1 drains storm flows from the southern portion of Prairie Ridge Unit 4 and the northern portion of Prairie Ridge Unit 3.

The proposed open space (Tract A) is designated drainage basin D10. This basin also includes the backyards of the proposed lots along the east and north edge of the project site.

Table 1 summarizes the input to, and results of the hydrological analysis. Tables 2 and 3 show the hydraulic analysis of street flow characteristics at key conveyance points and intersections respectively.

G) Erosion Control

Control of excessive soil erosion into City Streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. Plate 2 illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to City rights of way or public easement.

TABLE 1
HYDROLOGICAL FLOW PARAMETERS

AREA/ POINT DESIGNATION	AREA (SQ.MI.)	AREAS CONTRIBUTING	GROSS AREA (SQ.MI.)	FRACTION IMPERVIOUS	CN (PERVIOUS)	TC (MINUTES)	Q10 R(1)= 1.25" R(6)= 1.45"	Q100 R(1)= 1.9" R(6)= 2.2"	REMARKS
A1	0.01442	A1	0.01442	0.57	70	9	12.7	23.5	
A2	0.00700	A2	0.00700	0.57	70	7	6.2	11.4	
A3	0.00542	A3	0.00542	0.57	70	6	4.8	8.8	
A4	0.00624	A1-4	0.02746	0.57	70	9	24.3	44.7	
B5	0.00939	B5	0.00939	0.57	70	10	8.3	15.3	
B6	0.00561	B6	0.00561	0.57	70	6	5.0	9.1	
B7	0.00555	B5-7	0.02055	0.57	70	15	14.5	26.7	26.7 + 15 = 41.7
B8	0.01025	B8	0.01025	0.57	70	11	8.1	15.0	
B5-8	0.03080	B5-8	0.03080	0.57	70	15	-	40.1	
D10	0.01695	D10	0.01695	0.02	70	17	-	6.8	
C1	0.01590	C1	0.01590	0.57	70	10	-	25.9	SEE DRAINAGE MANAGEMENT PLAN FOR PRAIRIE RIDGE III BY CSC MAY, 1986
SHEN 2&3	0.1158	SHEN 2&3	0.1158	0.288	75.5	14	-	131.8	SEE DRAINAGE PLAN FOR SHENANDOAH 2 & 3 BY CSC, DECEMBER, 1985.
SHEN 1	0.0269	SHEN 2&3	0.1427	0.38	70	10	-	185.3	
TRD	0.0072	SHEN 1, SHEN 2&3	0.1499	0.80	80	8.5	-	179.8	STREET FLOWS FROM TAYLOR RANCH THAT FLOW TO THE SOUTH BRANCH OF THE PIEDRAS MARCADAS.
HHN2	0.0414	SHEN 1, SHEN 2&3, TRD, HHN2	0.1913	0.45	75	14.2	-	234.0	SEE MASTER DRAINAGE PLAN FOR THE RIVERVIEW SECTOR DEVELOPMENT BY CSC, NOV., 1985
HHE-2	0.0102	SHEN1, SHEN 2&3, TRD, HHN2, HHE2	0.2015	0.45	75	12.9	-	247.3	SEE MASTER DRAINAGE PLAN FOR THE RIVERVIEW SECTOR DEVELOPMENT BY CSC, NOV., 1985
A4	-	SHEN1, SHEN 2&3, TRD, HHN2, HHE2, A4	0.2290	-	-	-	-	279.4	

SHEN 2&3 131.8
SHEN 1 53.5
HHN2 54.2
HHE-2 13.3

TABLE 1 (Continued)
HYDROLOGICAL FLOW PARAMETERS

AREA/ POINT DESIGNATION	AREA (SQ.MI.)	AREAS CONTRIBUTING	GROSS AREA (SQ.MI.)	FRACTION IMPERVIOUS	CN (PERVIOUS)	TC (MINUTES)	Q10 R(1)= 1.25" R(6)= 1.45"	Q100 R(1)= 1.9" R(6)= 2.2"	REMARKS
D10	-	SHEN1, SHEN 263 TRD,HHN2, HHE2, A4, D10	0.2460	-	-	-	-	284.0	
B5-8	-	SHEN1, SHEN 263, TRD,HHN2, HHE2, A4, D10,B5-8	0.2768	-	-	-	-	324.1	
B162	0.0149	C1,B162	0.0308	0.57	70	5	-	50.1	SEE DRAINAGE MANAGEMENT PLAN FOR PRAIRIE RIDGE III BY CSC, MAY, 1986
GCR	0.0049	C1,B162, GCR	0.0357	0.77	70	10	-	57.2	STREET FLOWS FROM GOLF COURSE RD. INTO THE PIEDRAS MARCADAS
GCR	-	ALL OF THE ABOVE	0.3125	-	-	-	-	381.3	
HHN1	0.0326	HHN1	0.0326	0.45	75	10.8	-	45.6	SEE MASTER DRAINAGE PLAN FOR THE RIVERVIEW SECTOR DEVELOPMENT BY CSC, NOV., 1985
L	0.0281	L	0.0281	0.65	70	15	-	40.2	SEE MASTER DRAINAGE PLAN FOR THE RIVERVIEW SECTOR DEVELOPMENT BY CSC, NOV., 1985
L	-	HHN1,L	0.0607	-	-	-	-	85.8	
M	0.0313	M	0.0313	0.65	70	7.8	-	56.0	SEE MASTER DRAINAGE PLAN FOR THE RIVERVIEW SECTOR DEVELOPMENT BY CSC, NOV., 1985
M	-	HHN1,L,M	0.0920	-	-	-	-	126.1	
M	-	ALL OF THE ABOVE	0.4045	-	-	-	-	507.1	

TABLE 2 - STREET FLOW CHARACTERISTICS

THE RIVERSIDE SECTOR DEVELOPMENT

(ASSUMING CURB AND GUTTER AND 2% CROWN)

POINT DESIGNATION	100 YEAR PEAK FLOW	10 YEAR PEAK FLOW	ESTIMATED STREET SLOPE	ASSUMED STREET WIDTH	100 YEAR FLOW DEPTH	10 YEAR FLOW DEPTH	10 YEAR VELOCITY	10 YEAR V X D	REMARKS
A1	23.5	12.7	0.0125	32	0.45	0.38	2.84	1.08	OK
A2	11.4	6.2	0.0005	32	0.42	0.35	1.69	0.59	OK
A3	8.8	4.8	0.0250	32	0.30	0.25	2.99	0.75	OK
B5	15.3	8.3	0.0091	32	0.42	0.35	2.28	0.80	OK
B6	9.1	5.0	0.0050	32	0.39	0.33	1.61	0.53	OK
B7	26.7	14.5	0.0200	32	0.44	0.37	3.51	1.30	OK
B8	15.0	8.1	0.0050	32	0.45	0.38	1.80	0.68	OK

TABLE 3

CRITICAL STREET INTERSECTION ANALYSIS

POINT DESIGNATION	INTERSECTION	LOCATION	Q	STREET WIDTH	SLOPE	Y_1	V_1	Fr_1	Y_c	V_c	JUMP DEPTH = $\frac{Y_1}{2}\left(\sqrt{1+8Fr_1^2}-1\right)$	POOL DEPTH $D+\frac{1.25\,\Delta V^2}{2g}$	SPECIAL REQUIREMENTS
B5	1	UPSTREAM	15.3	32	0.0091	0.42	2.68	1.12	0.43	2.47	0.49		OK
B6		UPSTREAM	9.1	32	0.0050	0.39	1.85	0.816	0.38	2.08	N/A		OK
B(5+6)		DOWNSTREAM	24.4	32	0.0091	0.48	3.23	1.17	0.50	2.89		0.51	OK

100 Year

AREA/POINT DESIGNATION = A1
AREA = .01442 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	23.5

VOL = 36591.36 CF

AREA/POINT DESIGNATION = A2
AREA = .007 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 7 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	11.4

VOL = 17762.8 CF

```
AREA/POINT DESIGNATION = A3
AREA =          .00542  SQ MI
1 HR RAIN =     1.9  INCHES
6 HR RAIN =     2.2  INCHES
TC=  6  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      239           8.8

VOL =  13753.49    CF
```

```
AREA/POINT DESIGNATION = A4
AREA =          .02746  SQ MI
1 HR RAIN =     1.9  INCHES
6 HR RAIN =     2.2  INCHES
TC=  9  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      240          44.7

VOL =  69680.94    CF
```

```
AREA/POINT DESIGNATION = B5
AREA =          9.389999E-03   SQ MI
1 HR RAIN =     1.9   INCHES
6 HR RAIN =     2.2   INCHES
TC=   10   MINUTES
FRAC IMPERV=   .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      240          15.3

VOL =   23827.53    CF




AREA/POINT DESIGNATION = B6
AREA =          .00561   SQ MI
1 HR RAIN =     1.9   INCHES
6 HR RAIN =     2.2   INCHES
TC=   6   MINUTES
FRAC IMPERV=   .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      240          9.1

VOL =   14235.61    CF
```

```
AREA/POINT DESIGNATION = B7
AREA =          .02055  SQ MI
1 HR RAIN =     1.9  INCHES
6 HR RAIN =     2.2  INCHES
TC=   15  MINUTES
FRAC IMPERV=   .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      244          26.7

VOL =   52146.52    CF
```

```
AREA/POINT DESIGNATION = B8
AREA =          .01025  SQ MI
1 HR RAIN =     1.9  INCHES
6 HR RAIN =     2.2  INCHES
TC=   11  MINUTES
FRAC IMPERV=   .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      243          15.0

VOL =   26009.82    CF
```

D10

AREA/POINT DESIGNATION = D10
AREA = .01695 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 16.64 MINUTES
FRAC IMPERV= .02
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
248	6.8

VOL = 13682.4 CF

AREA/POINT DESIGNATION = A4
AREA = .02746 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	44.7

VOL = 69680.94 CF

POINT A4 ADDED TO MAIN FLOWS

TIME	Q(CFS)
190	0.1
195	0.2
200	1.1
205	2.3
210	2.8
215	6.1
220	10.4
225	12.5
230	24.1
235	39.4
240	44.7
245	32.0
250	16.0
255	10.7
260	7.4
265	3.0
270	1.5
275	1.4
280	1.2
285	1.2
290	1.2
295	1.2
300	1.2
305	1.0
310	0.9
315	0.8
320	0.9

325	1.0
330	1.0
335	0.9
340	0.8
345	0.8
350	0.7
355	0.6
360	0.6
365	0.4

AREA/POINT DESIGNATION = B7
AREA = .02055 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 15 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	26.7

VOL = 52146.52 CF

POINT B7 ADDED TO MAIN FLOWS

TIME	Q(CFS)
195	0.1
200	0.3
205	0.8
210	1.5
215	2.7
220	4.5
225	6.8
230	11.1
235	17.9
240	24.8
245	26.7
250	22.9
255	16.8
260	11.1
265	6.5
270	3.6
275	2.2
280	1.3
285	1.0
290	0.9
295	0.9
300	0.9
305	0.8
310	0.8
315	0.7
320	0.7
325	0.7

330	0.7
335	0.7
340	0.7
345	0.6
350	0.6
355	0.5
360	0.5
365	0.4
370	0.3
375	0.2

AREA/POINT DESIGNATION = B5-8
AREA = .0308 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 15 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	40.1

VOL = 78156.34 CF

POINT B5-8 ADDED TO MAIN FLOWS

TIME	Q(CFS)
195	0.2
200	0.5
205	1.3
210	2.3
215	4.0
220	6.8
225	10.2
230	16.6
235	26.8
240	37.2
245	40.1
250	34.3
255	25.2
260	16.6
265	9.7
270	5.5
275	3.3
280	1.9
285	1.4
290	1.4
295	1.3
300	1.3
305	1.3
310	1.2
315	1.1
320	1.0
325	1.0

330	1.0
335	1.0
340	1.0
345	1.0
350	0.9
355	0.8
360	0.8
365	0.6
370	0.4
375	0.2
380	0.1

10 years

AREA/POINT DESIGNATION = A1
AREA = .01442 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	12.7

VOL = 19500.63 CF

AREA/POINT DESIGNATION = A2
AREA = .007 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 7 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	6.2

VOL = 9466.326 CF

AREA/POINT DESIGNATION = A3
AREA = .00542 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 6 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	4.8

VOL = 7329.642 CF

AREA/POINT DESIGNATION = A4
AREA = .02746 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	24.3

VOL = 37135.03 CF

```
AREA/POINT DESIGNATION = B5
AREA =          9.389999E-03  SQ MI
1 HR RAIN =     1.25  INCHES
6 HR RAIN =     1.45  INCHES
TC=  10  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      240           8.3

VOL =  12698.4    CF




AREA/POINT DESIGNATION = B6
AREA =          .00561  SQ MI
1 HR RAIN =     1.25  INCHES
6 HR RAIN =     1.45  INCHES
TC=  6  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      240           5.0

VOL =  7586.585    CF
```

```
AREA/POINT DESIGNATION = B7
AREA =          .02055  SQ MI
1 HR RAIN =     1.25  INCHES
6 HR RAIN =     1.45  INCHES
TC=  15  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      244          14.5

VOL =  27790.42    CF




AREA/POINT DESIGNATION = B8
AREA =          .01025  SQ MI
1 HR RAIN =     1.25  INCHES
6 HR RAIN =     1.45  INCHES
TC=  11  MINUTES
FRAC IMPERV=  .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95


PEAK ONLY OUTPUTTED


     TIME       Q(CFS)

      243          8.1

VOL =  13861.4    CF
```

AREA/POINT DESIGNATION = A4
AREA = .02746 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	24.3

VOL = 37135.03 CF

POINT A4 ADDED TO MAIN FLOWS

TIME	Q(CFS)
200	0.3
205	0.8
210	0.9
215	2.8
220	5.2
225	6.4
230	12.8
235	21.3
240	24.3
245	17.4
250	8.8
255	6.0
260	4.1
265	1.7
270	0.9
275	0.8
280	0.7
285	0.7
290	0.7
295	0.7
300	0.7
305	0.6
310	0.5
315	0.5
320	0.5
325	0.5
330	0.6

335	0.5
340	0.5
345	0.4
350	0.4
355	0.4
360	0.4
365	0.2

AREA/POINT DESIGNATION = B7
AREA = .02055 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 15 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	14.5

VOL = 27790.42 CF

POINT B7 ADDED TO MAIN FLOWS

TIME	Q(CFS)
205	0.3
210	0.5
215	1.1
220	2.1
225	3.4
230	5.7
235	9.5
240	13.4
245	14.5
250	12.5
255	9.2
260	6.1
265	3.6
270	2.0
275	1.2
280	0.7
285	0.5
290	0.5
295	0.5
300	0.5
305	0.5
310	0.4
315	0.4
320	0.4
325	0.4
330	0.4
335	0.4

340	0.4
345	0.4
350	0.3
355	0.3
360	0.3
365	0.2
370	0.2

AREA/POINT DESIGNATION = B5-8
AREA = .0308 SQ MI
1 HR RAIN = 1.25 INCHES
6 HR RAIN = 1.45 INCHES
TC= 15 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	21.7

VOL = 41651.83 CF

POINT B5-8 ADDED TO MAIN FLOWS

TIME	Q(CFS)
200	0.1
205	0.4
210	0.8
215	1.6
220	3.1
225	5.0
230	8.6
235	14.3
240	20.0
245	21.7
250	18.7
255	13.8
260	9.1
265	5.4
270	3.0
275	1.9
280	1.1
285	0.8
290	0.8
295	0.7
300	0.7
305	0.7
310	0.7
315	0.6
320	0.6
325	0.6
330	0.6

335	0.6
340	0.6
345	0.5
350	0.5
355	0.5
360	0.4
365	0.4
370	0.3
375	0.1

Prairie Ridge, Units 4 and 5
May, 1987

1. ANALYZE INTERSECTION NO. 1

   $V = (0.5\ (9.1)(1.85) + 15.3\ (2.68) \div 24.4 = 2.06$ fps

   $\triangle V = 3.23 - 2.06 = 1.17$ fps

2. ANALYZE CAPACITY OF "TRIPLE C" CATCH BASINS

   Use 0.53' as max. depth (sump condition)

   Ave. h for grate = 0.57' (local depression)

   h for curb opening = 0.51' (to mid point of curb opening)

   use 15% clogging factor for grate

   $Q_{grate} = .85\ (.65)(3.2)\sqrt{2g\ (.57)} = 10.71$ cfs

   $Q_{curb} = .65\ (1.5)\sqrt{2g\ (.51)} = 5.59$ cfs

   $Q_{total} = 10.71 + 5.59 = 16.30$ cfs

   For "Triple C" Capacity = 3(16.3) = 48.9 cfs

   $48.9 > 44.7 > 40.1$, OK

Prairie Ridge, Units 4 and 5
May, 1987 - Revised July 10, 1987

1. ANALYZE INTERSECTION NO. 1

   $V = (0.5\ (9.1)(1.85) + 15.3\ (2.68) - 24.4 = 2.06$ fps

   $\Delta V = 3.23 - 2.06 = 1.17$ fps

2. ANALYZE CAPACITY OF "TRIPLE C" CATCH BASINS

   Use 0.53' as max. depth (sump condition)

   Ave. h for grate = 0.57' (local depression)

   h for curb opening = 0.51' (to mid point of curb opening)

   use 15% clogging factor for grate

   $Q_{grate} = .85\ (.65)(3.2)\sqrt{2g\ (.57)} = 10.71$ cfs

   $Q_{curb} = .65\ (1.5)\sqrt{2g\ (.51)} = 5.59$ cfs

   $Q_{total} = 10.71 + 5.59 = 16.30$ cfs

   For "Triple C" Capacity = 3(16.3) = 48.9 cfs

   48.9 > 44.7 > 40.1, OK

3. CHECK REQUIRED HEAD ON STORM SEWER INLET

   $Q = CA\sqrt{2gh}$

   Q = 247 cfs

   $C = \left(1.1 + \frac{.026L}{d^{1.2}}\right)^{-1/2}$

   d = 5'

   L = 50' (Assume "Long" Culvert)

   Solve for h

   h = 3.17'

SOUTH BRANCH 73-38-050

RCP PIPE

ENTRANCE

$Q = Ca\sqrt{2gh}$ $Q = 247$

$C = \left(1.1 + \frac{0.026L}{d^{1.2}}\right)^{-1/2}$ BEVELED LIP ENTRANCE

$d = 5'$ $L = 50'$ (ASSUME LONG CULVERT)

$C = \left(1.1 + \frac{0.026\,(50')}{(5')^{1.2}}\right)^{-1/2} = 0.88$

$Q^2 = C^2a^2 \times 2gh$

$h = \frac{Q^2}{C^2a^2 \times 2g}$

$h = \frac{(247)^2}{(0.88)^2\left(\frac{\pi \times (5)^2}{4}\right)^2 \times 2(32.2)} = 3.17'$

NOTE: Hydraulic GRADE line at Inlet = 117.01
+ 3.17
5120.18 ← 100 yr WATER SURFACE ELEVATION

INVERT of PIPE = 112.00

Top of HEAD WALL = 121.00

Top of EMERGency Spill way = 120.50

To be placed in Appendix B

AREA/POINT DESIGNATION = SHENANDOAH 2 & 3
AREA = .1158 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 14 MINUTES
FRAC IMPERV= .268
CN (PERVIOUS)= 75.5
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
243	131.8

VOL = 219508.8 CF

POINT SHENANDOAH 2 & 3 ADDED TO MAIN FLOWS

TIME	Q(CFS)
180	0.1
185	0.1
190	0.2
195	0.3
200	1.3
205	3.2
210	4.7
215	9.0
220	16.1
225	21.4
230	47.7
235	93.7
240	131.8
245	124.1
250	86.5
255	56.4
260	35.5
265	20.8
270	10.9
275	6.0
280	4.9
285	4.6
290	4.4
295	4.4
300	4.4
305	4.1
310	3.6

315	3.3
320	3.2
325	3.4
330	3.6
335	3.6
340	3.3
345	3.1
350	2.9
355	2.6
360	2.4
365	1.9
370	1.0
375	0.4

AREA/POINT DESIGNATION = SHENANDOAH 1
AREA = .0269 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 10 MINUTES
FRAC IMPERV= .38
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	33.5

VOL = 52180.49 CF

POINT SHENANDOAH 1 ADDED TO MAIN FLOWS

TIME	Q(CFS)
175	0.1
180	0.1
185	0.2
190	0.3
195	0.4
200	2.0
205	4.8
210	6.5
215	13.0
220	22.9
225	29.6
230	65.1
235	122.9
240	165.3

245	148.4
250	99.2
255	65.2
260	41.6
265	23.3
270	12.2
275	7.2
280	5.9
285	5.5
290	5.4
295	5.3
300	5.4
305	5.0
310	4.4
315	4.0
320	4.0
325	4.2
330	4.5
335	4.3
340	4.0
345	3.7
350	3.5
355	3.2
360	3.0
365	2.2
370	1.1
375	0.4

AREA/POINT DESIGNATION = TAYLOR RANCH DRIVE
AREA = .0072 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 8.5 MINUTES
FRAC IMPERV= .8
CN (PERVIOUS)= 60
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	14.5

VOL = 22741.93 CF

POINT TAYLOR RANCH DRIVE ADDED TO MAIN FLOWS

TIME	Q(CFS)
175	0.1
180	0.2
185	0.2
190	0.3
195	0.5
200	2.4
205	5.6
210	7.5
215	15.3
220	26.7
225	34.1
230	73.2
235	135.8
240	179.8
245	158.7
250	104.1
255	68.4
260	43.8
265	24.2
270	12.6
275	7.6
280	6.3
285	5.9
290	5.7
295	5.7
300	5.7
305	5.3
310	4.6
315	4.2
320	4.2
325	4.5
330	4.7
335	4.6
340	4.2
345	4.0
350	3.7
355	3.4
360	3.1
365	2.3
370	1.1
375	0.4

DEPTH-1(GUESS) = .5 FT.
DEPTH-2 = 0 FT.
SIDESLOPE-1 = 2 HORZ/VERT
SIDESLOPE-2 = 2 HORZ/VERT
WIDTH = 30 FT.
N = .022
SLOPE = .03 FT./FT.
REACH LENGTH = 950 FT.

HYDROGRAPH AT POINT TAYLOR RANCH DRIVE TIME TRANSLATED TO POINT HHN2

COMPUTED VELOCITY = 7.739042

TIME	Q(CFS)
175	0.1
180	0.1
185	0.2
190	0.3
195	0.4
200	1.6
205	4.3
210	6.7
215	12.1
220	22.0
225	31.1
230	57.2
235	110.2
240	161.8
245	179.8
250	126.4
255	83.0
260	53.8
265	32.2
270	17.3
275	9.6
280	6.8
285	6.0
290	5.8
295	5.7
300	5.7
305	5.5
310	4.9
315	4.4
320	4.2
325	4.4
330	4.7
335	4.7
340	4.4
345	4.1
350	3.8
355	3.5
360	3.2
365	2.7
370	1.6
375	0.7
380	0.2

AREA/POINT DESIGNATION = HHN2
AREA = .0414 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 14.2 MINUTES
FRAC IMPERV= .45
CN (PERVIOUS)= 75
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
243	57.9

VOL = 98032.98 CF

POINT HHN2 ADDED TO MAIN FLOWS

TIME	Q(CFS)
170	0.1
175	0.2
180	0.2
185	0.3
190	0.4
195	0.6
200	2.4
205	6.3
210	9.6
215	17.5
220	31.5
225	43.6
230	81.0
235	152.8
240	219.6
245	234.0
250	163.6
255	106.5
260	68.2
265	40.5
270	21.7
275	12.0
280	8.8
285	7.9
290	7.5
295	7.4
300	7.4

305	7.1
310	6.3
315	5.7
320	5.5
325	5.8
330	6.1
335	6.1
340	5.7
345	5.3
350	4.9
355	4.5
360	4.2
365	3.4
370	2.0
375	0.8
380	0.2

AREA/POINT DESIGNATION = HHE2
AREA = .0102 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 12.9 MINUTES
FRAC IMPERV= .45
CN (PERVIOUS)= 75
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
243	14.3

VOL = 24153.05 CF

POINT HHE2 ADDED TO MAIN FLOWS

TIME	Q(CFS)
170	0.1
175	0.2
180	0.2
185	0.3
190	0.5
195	0.6
200	2.6
205	6.7
210	10.2
215	18.8
220	33.8

225	46.7
230	86.8
235	163.3
240	233.9
245	247.3
250	172.7
255	112.3
260	71.7
265	42.6
270	22.8
275	12.6
280	9.3
285	8.3
290	7.9
295	7.9
300	7.9
305	7.5
310	6.7
315	6.0
320	5.8
325	6.1
330	6.4
335	6.4
340	6.0
345	5.6
350	5.2
355	4.8
360	4.4
365	3.6
370	2.1
375	0.8
380	0.2

DIAMETER = 5
SLOPE = .015
N = .013
REACH LENGTH = 450 FT.

HYDROGRAPH AT POINT HHE2 TIME TRANSLATED TO POINT A4

COMPUTED VELOCITY = 16.89168

TIME	Q(CFS)
170	0.1
175	0.2
180	0.2
185	0.3
190	0.5
195	0.6
200	2.4
205	6.4
210	9.9
215	18.0
220	32.5
225	45.6

230	83.3
235	156.5
240	227.6
245	247.3
250	179.3
255	117.7
260	75.3
265	45.2
270	24.6
275	13.5
280	9.6
285	8.4
290	8.0
295	7.9
300	7.9
305	7.5
310	6.8
315	6.0
320	5.8
325	6.1
330	6.4
335	6.4
340	6.0
345	5.6
350	5.3
355	4.8
360	4.5
365	3.7
370	2.3
375	1.0
380	0.2

AREA/POINT DESIGNATION = A4
AREA = .02746 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 9 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	44.7

VOL = 69680.94 CF

POINT A4 ADDED TO MAIN FLOWS

TIME	Q(CFS)
170	0.2
175	0.2
180	0.3
185	0.4
190	0.6
195	0.8
200	3.6
205	8.7
210	12.7
215	24.2
220	42.9
225	58.0
230	107.4
235	195.9
240	272.3
245	279.4
250	195.3
255	128.4
260	82.7
265	48.2
270	26.1
275	14.9
280	10.8
285	9.6
290	9.1
295	9.0
300	9.0
305	8.6
310	7.6
315	6.9
320	6.7
325	7.0
330	7.4
335	7.3
340	6.9
345	6.4
350	6.0
355	5.5
360	5.1
365	4.1
370	2.3
375	1.0
380	0.2

DIAMETER = 5
SLOPE = .015
N = .013
REACH LENGTH = 1200 FT.

HYDROGRAPH AT POINT A4 TIME TRANSLATED TO POINT D10

COMPUTED VELOCITY = 17.37341

TIME	Q(CFS)
170	0.1
175	0.2
180	0.3
185	0.4
190	0.5
195	0.8
200	2.9
205	7.5
210	11.8
215	21.5
220	38.6
225	54.5
230	96.0
235	175.5
240	254.7
245	279.4
250	214.7
255	143.8
260	93.3
265	56.2
270	31.2
275	17.5
280	11.7
285	9.8
290	9.2
295	9.1
300	9.0
305	8.7
310	7.8
315	7.0
320	6.7
325	6.9
330	7.3
335	7.3
340	7.0
345	6.5
350	6.1
355	5.6
360	5.2
365	4.3
370	2.7
375	1.3
380	0.4

AREA/POINT DESIGNATION = D10
AREA = .01695 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 24.5 MINUTES
FRAC IMPERV= .02
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
252	5.6

VOL = 13682.4 CF

POINT D10 ADDED TO MAIN FLOWS

TIME	Q(CFS)
170	0.1
175	0.2
180	0.3
185	0.4
190	0.5
195	0.8
200	2.9
205	7.5
210	11.8
215	21.6
220	38.7
225	54.8
230	96.9
235	177.4
240	258.1
245	284.0
250	220.0
255	149.4
260	98.2
265	60.4
270	34.4
275	19.7
280	13.2
285	10.8
290	9.9
295	9.6
300	9.5

305	9.1
310	8.2
315	7.4
320	7.1
325	7.3
330	7.6
335	7.7
340	7.3
345	6.8
350	6.4
355	5.9
360	5.4
365	4.5
370	2.9
375	1.4
380	0.5
385	0.1

AREA/POINT DESIGNATION = B5-8
AREA = .0308 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 15 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	40.1

VOL = 78156.34 CF

POINT B5-8 ADDED TO MAIN FLOWS

TIME	Q(CFS)
165	0.1
170	0.2
175	0.2
180	0.3
185	0.4
190	0.6
195	0.9
200	3.4
205	8.8
210	14.1

215	25.6
220	45.4
225	65.0
230	113.5
235	204.2
240	295.3
245	324.1
250	254.3
255	174.6
260	114.8
265	70.2
270	39.9
275	23.0
280	15.2
285	12.3
290	11.3
295	10.9
300	10.8
305	10.3
310	9.4
315	8.5
320	8.1
325	8.3
330	8.7
335	8.7
340	8.3
345	7.8
350	7.3
355	6.7
360	6.2
365	5.2
370	3.4
375	1.7
380	0.6
385	0.2

**ANALYSIS SHIFTED TO ALTERNATE BRANCH BEGINNING AT AREA/POINT DESIGNATION D10 **

AREA/POINT DESIGNATION = C1
AREA = .0159 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 10 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	25.9

VOL = 40346.93 CF

POINT C1 ADDED TO MAIN FLOWS

TIME	Q(CFS)
195	0.1
200	0.7
205	1.4
210	1.6
215	3.6
220	6.0
225	7.2
230	14.0
235	22.8
240	25.9
245	18.5
250	9.3
255	6.2
260	4.3
265	1.8
270	0.9
275	0.8
280	0.7
285	0.7
290	0.7
295	0.7
300	0.7
305	0.6
310	0.5
315	0.5
320	0.5
325	0.6

330	0.6
335	0.5
340	0.5
345	0.5
350	0.4
355	0.4
360	0.4
365	0.2

AREA/POINT DESIGNATION = B1 & B2
AREA = .0149 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 5 MINUTES
FRAC IMPERV= .57
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
234	24.3

VOL = 37809.4 CF

POINT B1 & B2 ADDED TO MAIN FLOWS

TIME	Q(CFS)
185	0.1
190	0.2
195	0.2
200	1.9
205	2.8
210	3.1
215	9.2
220	12.4
225	13.6
230	35.5
235	47.0
240	50.1
245	27.2
250	15.2
255	12.1
260	5.9
265	2.6
270	1.7
275	1.5

280	1.3
285	1.3
290	1.3
295	1.3
300	1.3
305	1.1
310	0.9
315	0.9
320	1.0
325	1.1
330	1.1
335	1.0
340	0.9
345	0.9
350	0.8
355	0.7
360	0.7
365	0.3

DEPTH-1(GUESS) = .5 FT.
DEPTH-2 = 0 FT.
SIDESLOPE-1 = 0 HORZ/VERT
SIDESLOPE-2 = 50 HORZ/VERT
WIDTH = 0 FT.
N = .017
SLOPE = 5.000001E-03 FT./FT.
REACH LENGTH = 1300 FT.

HYDROGRAPH AT POINT B1 & B2 TIME TRANSLATED TO POINT D10

COMPUTED VELOCITY = 3.044426

TIME	Q(CFS)
195	0.1
200	0.2
205	1.2
210	2.5
215	3.0
220	6.6
225	11.1
230	13.1
235	26.3
240	42.2
245	50.1
250	36.9
255	20.3
260	13.4
265	8.5
270	4.0
275	2.1
280	1.6
285	1.4
290	1.3
295	1.3

300	1.3
305	1.3
310	1.2
315	1.0
320	0.9
325	1.0
330	1.1
335	1.1
340	1.0
345	0.9
350	0.9
355	0.8
360	0.7
365	0.7
370	0.5
375	0.1

AREA/POINT DESIGNATION = GOLF COURSE RD
AREA = .0049 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 10 MINUTES
FRAC IMPERV= .77
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	10.0

VOL = 15517.08 CF

POINT GOLF COURSE RD ADDED TO MAIN FLOWS

TIME	Q(CFS)
190	0.1
195	0.2
200	0.5
205	1.8
210	3.1
215	4.5
220	9.1
225	14.0
230	18.6
235	35.1
240	52.1

245	57.2
250	40.4
255	22.5
260	15.0
265	9.2
270	4.3
275	2.4
280	1.8
285	1.6
290	1.6
295	1.5
300	1.5
305	1.5
310	1.3
315	1.2
320	1.1
325	1.2
330	1.3
335	1.3
340	1.2
345	1.1
350	1.0
355	0.9
360	0.9
365	0.8
370	0.5
375	0.1

BRANCHES AT POINT MERGE MERGED AND FLOWS ADDED

TIME	Q(CFS)
165	0.1
170	0.2
175	0.3
180	0.4
185	0.5
190	0.8
195	1.1
200	3.9
205	10.5
210	17.2
215	30.0
220	54.6
225	79.1
230	132.1
235	239.3
240	347.5
245	381.3
250	294.7
255	197.1
260	129.8
265	79.3
270	44.2
275	25.4
280	17.0
285	13.9

290	12.8
295	12.4
300	12.3
305	11.9
310	10.7
315	9.6
320	9.2
325	9.5
330	9.9
335	10.0
340	9.5
345	8.9
350	8.3
355	7.6
360	7.1
365	6.0
370	3.9
375	1.8
380	0.6
385	0.2

**ANALYSIS SHIFTED TO ALTERNATE BRANCH BEGINNING AT AREA/POINT DESIGNATION BRANCH **

AREA/POINT DESIGNATION = HHN1
AREA = .0326 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 10.8 MINUTES
FRAC IMPERV= .45
CN (PERVIOUS)= 75
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
243	45.6

VOL = 77195.05 CF

POINT HHN1 ADDED TO MAIN FLOWS

TIME	Q(CFS)
190	0.1
195	0.1
200	0.6
205	1.5
210	2.2
215	4.2
220	7.4
225	9.9
230	18.7
235	33.6
240	45.6
245	42.7
250	29.2
255	18.5
260	11.3
265	6.6
270	3.4
275	1.9
280	1.5
285	1.4
290	1.4
295	1.4
300	1.4
305	1.3
310	1.1
315	1.0
320	1.0
325	1.1
330	1.1
335	1.1
340	1.0
345	1.0
350	0.9
355	0.8
360	0.8
365	0.6
370	0.3
375	0.1

DEPTH-1(GUESS) = .87 FT.
DEPTH-2 = -.4 FT.
SIDESLOPE-1 = 0 HORZ/VERT
SIDESLOPE-2 = 0 HORZ/VERT
WIDTH = 40 FT.
N = .017
SLOPE = .035 FT./FT.
REACH LENGTH = 1600 FT.

HYDROGRAPH AT POINT HHN1 TIME TRANSLATED TO POINT M

COMPUTED VELOCITY = 4.990207

TIME	Q(CFS)
200	0.1
205	0.6
210	1.5
215	2.2
220	4.1
225	7.2
230	9.7
235	18.1
240	32.5
245	45.6
250	42.9
255	30.2
260	19.2
265	11.8
270	6.9
275	3.7
280	2.0
285	1.6
290	1.4
295	1.4
300	1.4
305	1.4
310	1.3
315	1.1
320	1.0
325	1.0
330	1.1
335	1.1
340	1.1
345	1.0
350	1.0
355	0.9
360	0.8
365	0.8
370	0.6
375	0.3
380	0.1

AREA/POINT DESIGNATION = L
AREA = .0281 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 15 MINUTES
FRAC IMPERV= .65
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	40.2

VOL = 78377.26 CF

POINT L ADDED TO MAIN FLOWS

TIME	Q(CFS)
185	0.1
190	0.2
195	0.3
200	0.7
205	1.9
210	3.8
215	6.3
220	11.1
225	17.8
230	26.7
235	45.3
240	70.0
245	85.8
250	77.2
255	55.2
260	35.6
265	21.3
270	12.2
275	6.9
280	3.9
285	3.0
290	2.8
295	2.7
300	2.6
305	2.6
310	2.4
315	2.2

320	2.0
325	2.0
330	2.1
335	2.1
340	2.1
345	2.0
350	1.8
355	1.7
360	1.6
365	1.4
370	1.0
375	0.6
380	0.2

AREA/POINT DESIGNATION = M
AREA = .0313 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 7.6 MINUTES
FRAC IMPERV= .65
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
240	56.0

VOL = 87302.78 CF

POINT M ADDED TO MAIN FLOWS

TIME	Q(CFS)
175	0.1
180	0.2
185	0.2
190	0.3
195	0.5
200	2.1
205	4.9
210	7.4
215	14.3
220	24.7
225	33.9
230	57.2
235	94.7
240	126.1

245	125.8
250	96.9
255	68.3
260	44.6
265	25.0
270	14.0
275	8.6
280	5.4
285	4.4
290	4.2
295	4.1
300	4.0
305	3.8
310	3.5
315	3.2
320	3.1
325	3.1
330	3.3
335	3.2
340	3.1
345	2.9
350	2.7
355	2.5
360	2.3
365	1.8
370	1.1
375	0.6
380	0.2

BRANCHES AT POINT MERGE MERGED AND FLOWS ADDED

TIME	Q(CFS)
160	0.1
165	0.2
170	0.3
175	0.4
180	0.5
185	0.8
190	1.1
195	1.7
200	6.0
205	15.5
210	24.6
215	44.3
220	79.2
225	113.0
230	189.3
235	333.9
240	473.5
245	507.1
250	391.5
255	265.4
260	174.4
265	104.3
270	58.2
275	34.0

280	22.3
285	18.3
290	17.0
295	16.5
300	16.3
305	15.7
310	14.2
315	12.8
320	12.2
325	12.6
330	13.2
335	13.2
340	12.6
345	11.8
350	11.0
355	10.1
360	9.4
365	7.8
370	5.0
375	2.4
380	0.9
385	0.2

DEPTH-1(GUESS) = 3 FT.
DEPTH-2 = 0 FT.
SIDESLOPE-1 = 2 HORZ/VERT
SIDESLOPE-2 = 2 HORZ/VERT
WIDTH = 10 FT.
N = .015
SLOPE = .0267 FT./FT.
REACH LENGTH = 1500 FT.

HYDROGRAPH AT POINT MERGE TIME TRANSLATED TO POINT N

COMPUTED VELOCITY = 18.4471

TIME	Q(CFS)
165	0.2
170	0.3
175	0.4
180	0.5
185	0.7
190	1.0
195	1.5
200	4.8
205	12.9
210	22.1
215	39.0
220	69.8
225	103.8
230	168.6
235	294.7
240	435.7
245	507.1

250	422.9
255	299.6
260	199.1
265	123.3
270	70.7
275	40.5
280	25.5
285	19.4
290	17.4
295	16.6
300	16.4
305	15.9
310	14.6
315	13.2
320	12.4
325	12.5
330	13.0
335	13.2
340	12.8
345	12.0
350	11.2
355	10.4
360	9.6
365	8.2
370	5.8
375	3.1
380	1.3
385	0.4

AREA/POINT DESIGNATION = N
AREA = .0625 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 11.3 MINUTES
FRAC IMPERV= .68
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
243	104.1

VOL = 180225.5 CF

POINT N ADDED TO MAIN FLOWS

TIME	Q(CFS)
160	0.1
165	0.2
170	0.3
175	0.5
180	0.7
185	0.9
190	1.3
195	1.9
200	6.6
205	17.3
210	28.5
215	51.1
220	91.1
225	132.1
230	216.5
235	374.1
240	539.8
245	604.1
250	488.4
255	340.0
260	223.1
265	137.2
270	78.0
275	44.5
280	28.7
285	22.4
290	20.2
295	19.5
300	19.2
305	18.6
310	17.0
315	15.3
320	14.5
325	14.7
330	15.4
335	15.6
340	14.9
345	14.0
350	13.1
355	12.1
360	11.2
365	9.5
370	6.4
375	3.3
380	1.3
385	0.4

DEPTH-1(GUESS) = 3 FT.
DEPTH-2 = 0 FT.
SIDESLOPE-1 = 2 HORZ/VERT
SIDESLOPE-2 = 2 HORZ/VERT
WIDTH = 10 FT.
N = .015
SLOPE = .0213 FT./FT.
REACH LENGTH = 750 FT.

HYDROGRAPH AT POINT N TIME TRANSLATED TO POINT DAM

COMPUTED VELOCITY = 17.98558

TIME	Q(CFS)
160	0.1
165	0.2
170	0.3
175	0.5
180	0.6
185	0.9
190	1.3
195	1.8
200	6.0
205	15.8
210	27.0
215	48.0
220	85.6
225	126.4
230	204.7
235	352.2
240	516.8
245	604.1
250	504.5
255	360.6
260	239.4
265	149.2
270	86.2
275	49.2
280	30.9
285	23.3
290	20.5
295	19.6
300	19.3
305	18.7
310	17.2
315	15.5
320	14.6
325	14.7
330	15.3
335	15.5
340	15.0
345	14.2
350	13.2

355	12.2
360	11.3
365	9.7
370	6.8
375	3.8
380	1.6
385	0.5
390	0.1

AREA/POINT DESIGNATION = H2
AREA = .0281 SQ MI
1 HR RAIN = 1.9 INCHES
6 HR RAIN = 2.2 INCHES
TC= 15.9 MINUTES
FRAC IMPERV= .65
CN (PERVIOUS)= 70
CN (IMPERVIOUS)= 95

PEAK ONLY OUTPUTTED

TIME	Q(CFS)
244	40.2

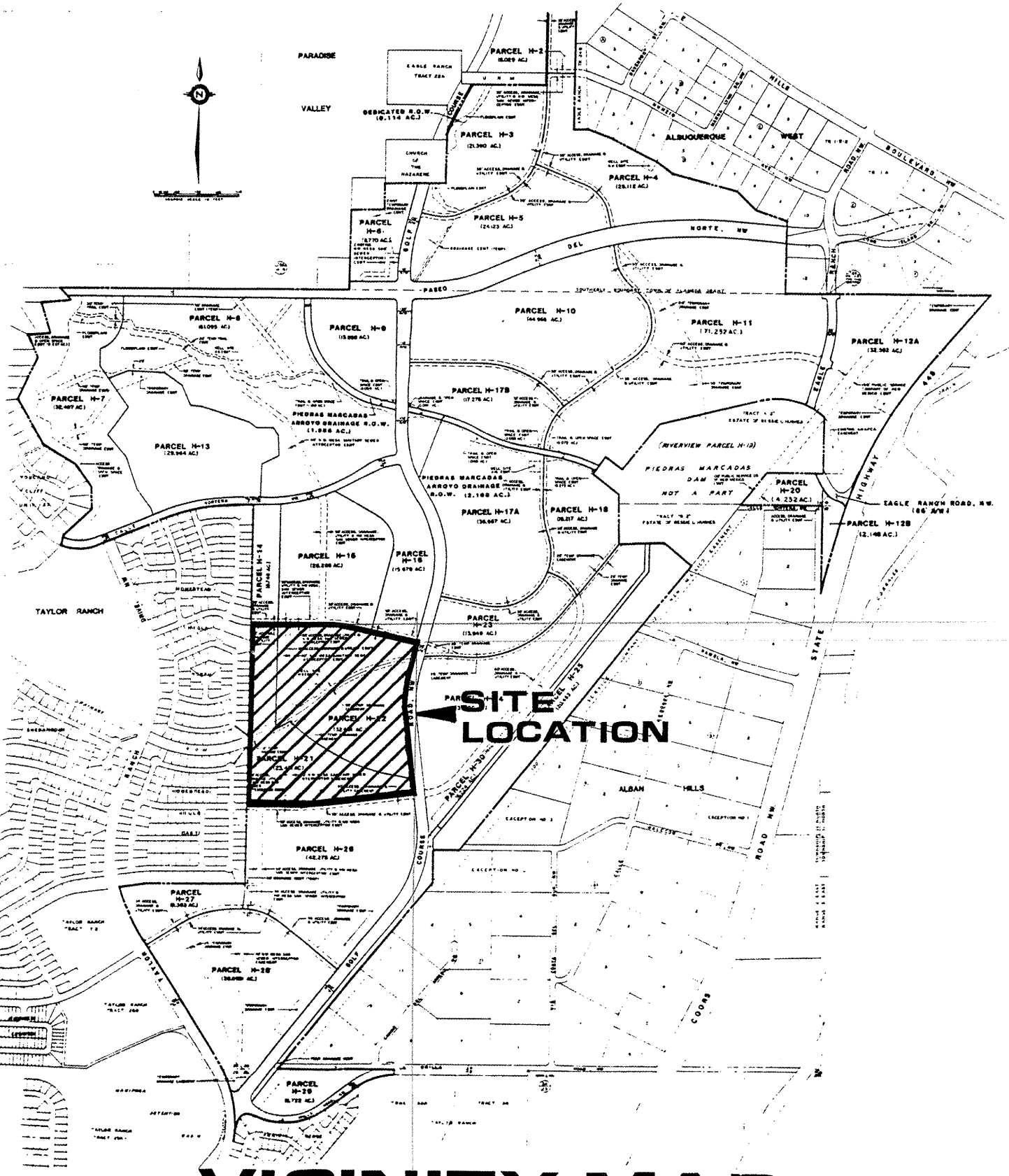
VOL = 78377.26 CF

POINT H2 ADDED TO MAIN FLOWS

TIME	Q(CFS)
160	0.1
165	0.2
170	0.3
175	0.5
180	0.7
185	0.9
190	1.4
195	2.0
200	6.5
205	17.1
210	29.3
215	52.1
220	92.6
225	137.0
230	221.7
235	379.4
240	554.3
245	644.4
250	538.8

255	385.7
260	255.8
265	158.7
270	91.5
275	52.4
280	32.8
285	24.7
290	21.9
295	20.9
300	20.5
305	19.9
310	18.3
315	16.6
320	15.6
325	15.7
330	16.3
335	16.5
340	16.0
345	15.1
350	14.1
355	13.0
360	12.0
365	10.3
370	7.3
375	4.0
380	1.7
385	0.5
390	0.1

PLATE 1



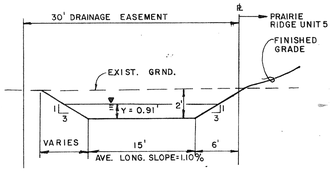
VICINITY MAP

PLATE 2

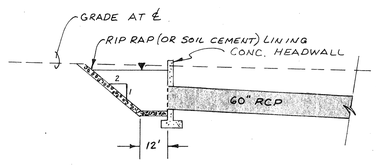
DRAINAGE PLAN

FOR

PRAIRIE RIDGE UNITS 4 & 5



TYPICAL SECTION IN
30' EASEMENT ACROSS OPEN SPACE
N.T.S.



CONCEPTUAL DETAIL FOR 60" RCP INLET
n.t.s.

HHN 1
Q100 = 46cfs

NOTE: FOR BASINS (L) (M) SEE RIVERVIEW MASTER DRAINAGE PLAN, PLATE 4

TRACT A
OPEN SPACE

NOTE: THIS STORM SEWER IS CONCEPTUAL AS SHOWN. SLIGHT VARIATIONS IN SIZE AND MANHOLE LOCATION MAY RESULT FROM FINAL "CONSTRUCTION-QUALITY" DESIGN. IN ANY CASE, SEWER SHALL BE SIZED TO CONVEY THE 100 YR STORM FLOW ONLY. THE EMERGENCY OVERFLOW SPILLWAYS SHOWN ON THIS PLAN SHALL BE CONSTRUCTED TO PASS STORM FLOWS IN CASE SEWER CAPACITY IS REDUCED BECAUSE OF SILT DEPOSITION OR OTHER OBSTRUCTION. THIS STORM SEWER IS TO BE SIZED TO CONVEY THE DESIGN FLOWS UNDER CLOSED CONDUIT CONDITIONS WITH HYDRAULIC GRADE LINE AT OR BELOW FINISHED GRADE.

NOTE: THIS CATCH BASIN & 24" LATERAL WILL NOT BE REQUIRED UNTIL THE DEVELOPMENT OF PRAIRIE RIDGE UNIT 5 COMMENCES. LATERAL SHALL BE STUBBED AND TEMPORARY INLET BUILT W/ THE CONSTRUCTION OF THE PRAIRIE RIDGE UNIT 4 SUBDIVISION. SEE DETAIL THIS PLATE FOR INLET DETAIL.

NOTE: THESE SPILLWAYS SHALL BE SEEDED WITH NATIVE GRASSES AFTER COMPLETION OF SITE CONSTRUCTION. REVEGATATION WILL NOT REQUIRE MAINTENANCE BY THE CITY.

TRACT B
(FUTURE PRAIRIE RIDGE-UNIT 5)

THESE BACKYARDS AND THE ADJACENT 30' DRAINAGE EASEMENT SHALL BE GRADED TO ALLOW PASSAGE OF THE EMERGENCY OVERFLOW FLOWS AS PART OF THE PRAIRIE RIDGE UNIT 5 CONSTRUCTION. SEE TYPICAL SECTION, THIS PLATE.

PRAIRIE RIDGE - UNIT 4

HHN 2
Q100 = 58cfs

HHE 2
Q100 = 14cfs

EXISTING 10' WIDE CONCRETE RUNDOWN
Q100 = 180cfs

20' WIDE VEGETATED EMERGENCY OVERFLOW

20' WIDE VEGETATED EMERGENCY OVERFLOW. THIS OVERFLOW SHALL BE SIZED TO CONVEY 25% OF THE 100 YR. STORM FLOWS, USING THE BROAD CRESTED WEIR FORMULA. THE WATER SURFACE SHALL BE BELOW ADJACENT PROPERTY.

TRASH RACK

RIPRAP

CONC. HEADWALL

TRIPLE "C" TYPE CATCH BASIN Q = 45 cfs

TRIPLE "C" TYPE CATCH BASIN Q = 40 cfs

DRAINAGE R/W

EASEMENT

TRAIL

HOMESTEAD

FULL MAJOR LOCAL STREET SECTION TO BE BUILT W/ PROJECT 2976.

50' NORTHWEST MESA SANITARY SEWER INTERCEPTOR SEWER EASEMENT

25' TEMPORARY DRAINAGE EASEMENT

ROAD

COURSE

EXISTING 100 YR. FLOOD BOUNDARY AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOODWAY MAP FOR THE CITY OF ALBUQUERQUE, NM (PANEL 8 OF 50).

4 LANES OF GOLF COURSE ROAD ADJACENT TO PROJECT SITE TO BE BUILT W/ THIS PROJECT.

FROM PRAIRIE RIDGE UNIT 3 (SEE DRAINAGE MANAGEMENT PLAN FOR PRAIRIE RIDGE, UNIT 3 by COMMUNITY SCIENCES CORP. MAY, 1986)

NOTE: FOR BASIN (C1) SEE PRAIRIE RIDGE UNIT 3 DRAINAGE REPORT, PLATE 3

48" RCP at 2.85%

36" RCP

24" RCP

36" RCP

INV. 5086.0 ±

54" RCP at 0.92% ±

GRADED TEMPORARY EARTH CHANNEL FROM END OF PIPE TO "DAYLIGHT" (SEE PROJECT 2976)

Q = 361cfs

INV. 5084.3 ±

TEMPORARY RIPRAP ANTI-EROSION BLANKET TO BE CONSTRUCTED W/ THIS PROJECT.

66" RCP at 1.49% ±

INV. 5085.3 ±

FUTURE STORM SEWER TO PIEDRAS MARCADAS DAM

Q = 37 cfs

TEMPORARY RIPRAP ANTI-EROSION BLANKET TO BE CONSTRUCTED W/ PRAIRIE RIDGE UNIT 3 (SEE PROJECT 2976).

60" RCP at 1.49%

60" RCP at 1.49%

Q = 324cfs

INV. 5091.2 ±

INV. 5097.3 ±

INV. 5103.5 ±

Q = 264 cfs

60" RCP at 1.49%

66" RCP at 1.79%

42" RCP at 0.0%

60" RCP at 1.79%

Q = 247cfs

INV. 5111.7 ±

INV. 5113.5 ±

27" RCP at 4.13% ±

INV. = 104.2 ±

INV. 106.2 ±

INV. 110.7 ±

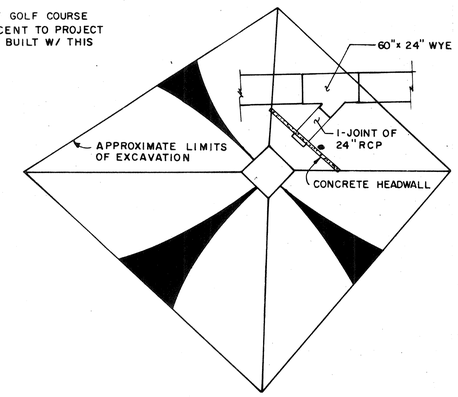
27" RCP

LOT GRADING SPECIFICATIONS

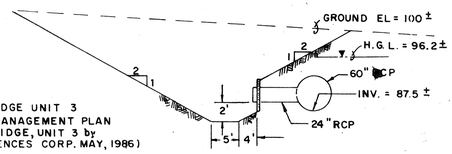
1) CROSS LOT DRAINAGE WILL NOT BE PERMITTED. IF LOCAL CONDITIONS SHOULD DICTATE A RELAXATION OF THIS RULE, THEN THE APPROPRIATE PUBLIC OR PRIVATE DRAINAGE EASEMENTS WILL BE DEDICATED ON THE PLAT.

2) CRITERIA FOR SETTING LOT ELEVATION CONTROL GRADES SHALL INCLUDE THE FOLLOWING:
   A) ALL DRAINAGE SWALES AND YARD AREAS SHALL HAVE MINIMUM SLOPES OF 1% AND MAXIMUM SLOPES OF 3 HORIZONTAL TO 1 VERTICAL.
   B) BUILDING PADS SHALL BE SET AT LEAST 0.2' ABOVE THE HIGHEST ELEVATION OF ADJACENT SWALES.
   C) PAD ELEVATIONS WILL BE ASSUMED TO BE EQUAL TO FINISHED FLOOR OF GARAGE. MINIMUM DRIVEWAY SLOPES SHALL BE 1% AND DRIVEWAY SLOPES SHALL NOT EXCEED 14%.
   D) USABLE YARD AREAS SHALL HAVE MINIMUM DIMENSIONS OF 30' X 70'; SHALL HAVE MINIMUM SLOPES OF 1% AND MAXIMUM SLOPES OF 5%.

3) WHERE YARD GRADES OF ADJACENT LOTS AT PROPERTY LINES CANNOT BE MATCHED USING THE ABOVE CRITERIA, RETAINING WALLS SHALL BE PROVIDED TO ACCOMMODATE GRADE DIFFERENTIALS.

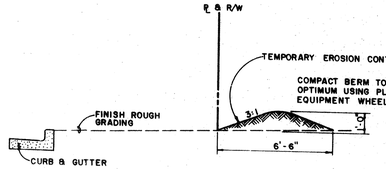


PLAN VIEW



ELEVATION VIEW

CONCEPTUAL DETAIL FOR STORM SEWER INLET FOR PRAIRIE RIDGE - UNIT 4
n.t.s.



TYPICAL SECTION THRU BERM
SCALE: 1" = 4'

LEGEND

- SUBCATCHMENT BOUNDARY
- WATER BLOCK
- (B7) AREA / POINT DESIGNATION
- FLOW LEADER
- SUBDIVISION BOUNDRIES
- STORM SEWER TO BE BUILT WITH FUTURE DEVELOPMENT
- HHE 2 / Q100 = 14cfs — OFFSITE DRAINAGE BASIN - SEE RIVERVIEW MASTER DRAINAGE PLAN, PLATE 3
- STORM SEWER, MANHOLE & CATCH BASIN TO BE BUILT W/ THIS PROJECT
- STORM SEWER, MANHOLE & CATCH BASIN TO BE BUILT W/ PRAIRIE RIDGE UNIT 3 (SEE PROJECT NO. 2976)
- 15 — CONCEPTUAL, PRELIMINARY GUTTER FLOWLINE ELEVATION. ALL LOCAL RESIDENTIAL STREETS TO HAVE MOUNTABLE CURB AND GUTTER

BENCHMARK FOR THIS PLAT IS THE G.L.O. BRASS CAP FOR SECTIONS 23, 24, 25 AND 26, T11N, R2E, N.M.P.M. LOCATED WITHIN RIVERVIEW PARCEL H-28 APPROXIMATELY 250 FEET NORTH OF THE CENTERLINE OF GOLF COURSE ROAD AND LA ORILLA ROAD, N.W. ELEVATION = 5112.83.

ENGINEERS SEAL

5/28/87
DATE

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FEB 26 1988
ALBUQUERQUE, NEW MEXICO
HYDROLOGY SECTION

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REVISED 5/29/87
REVISED 6/24/87

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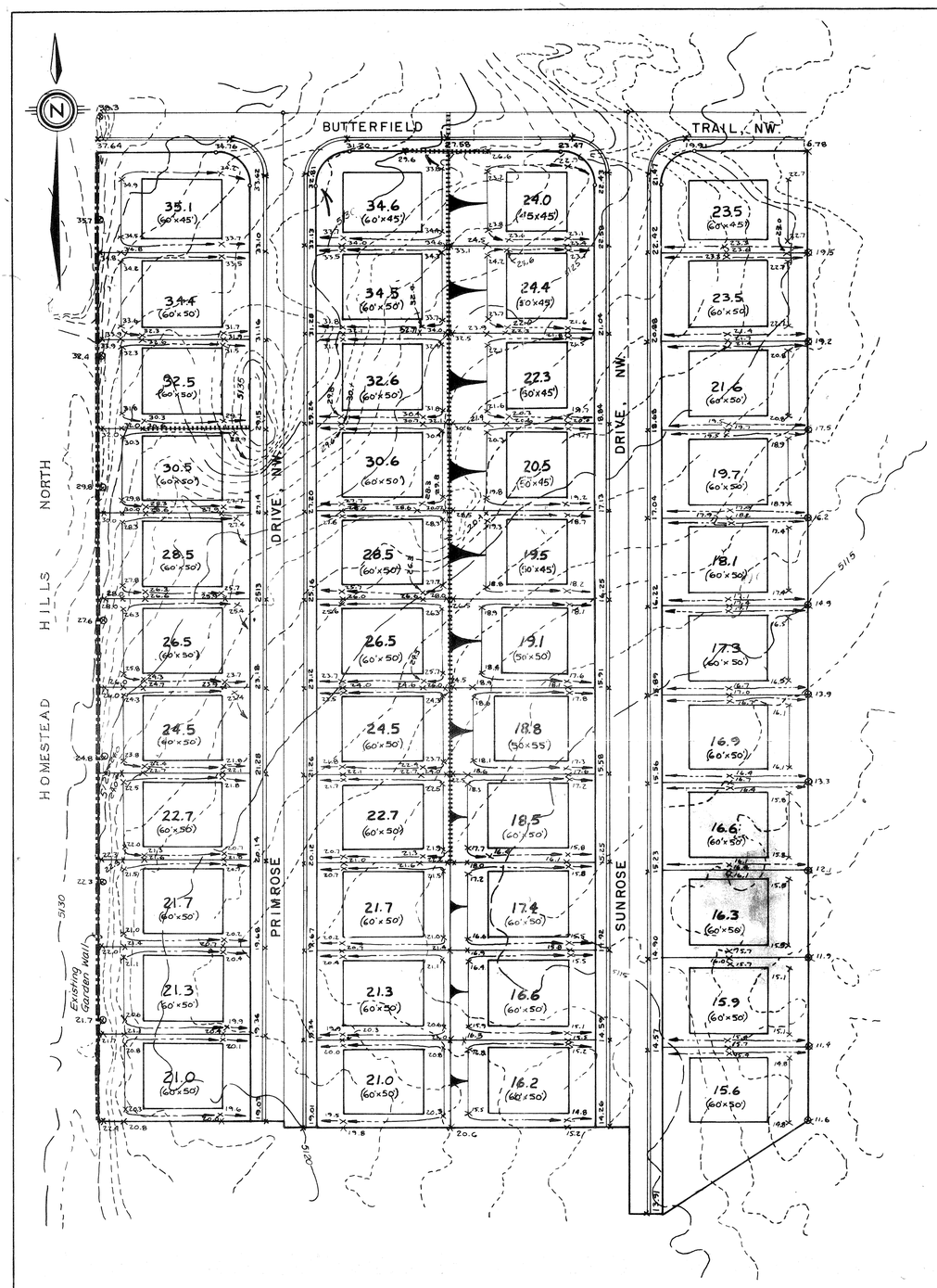
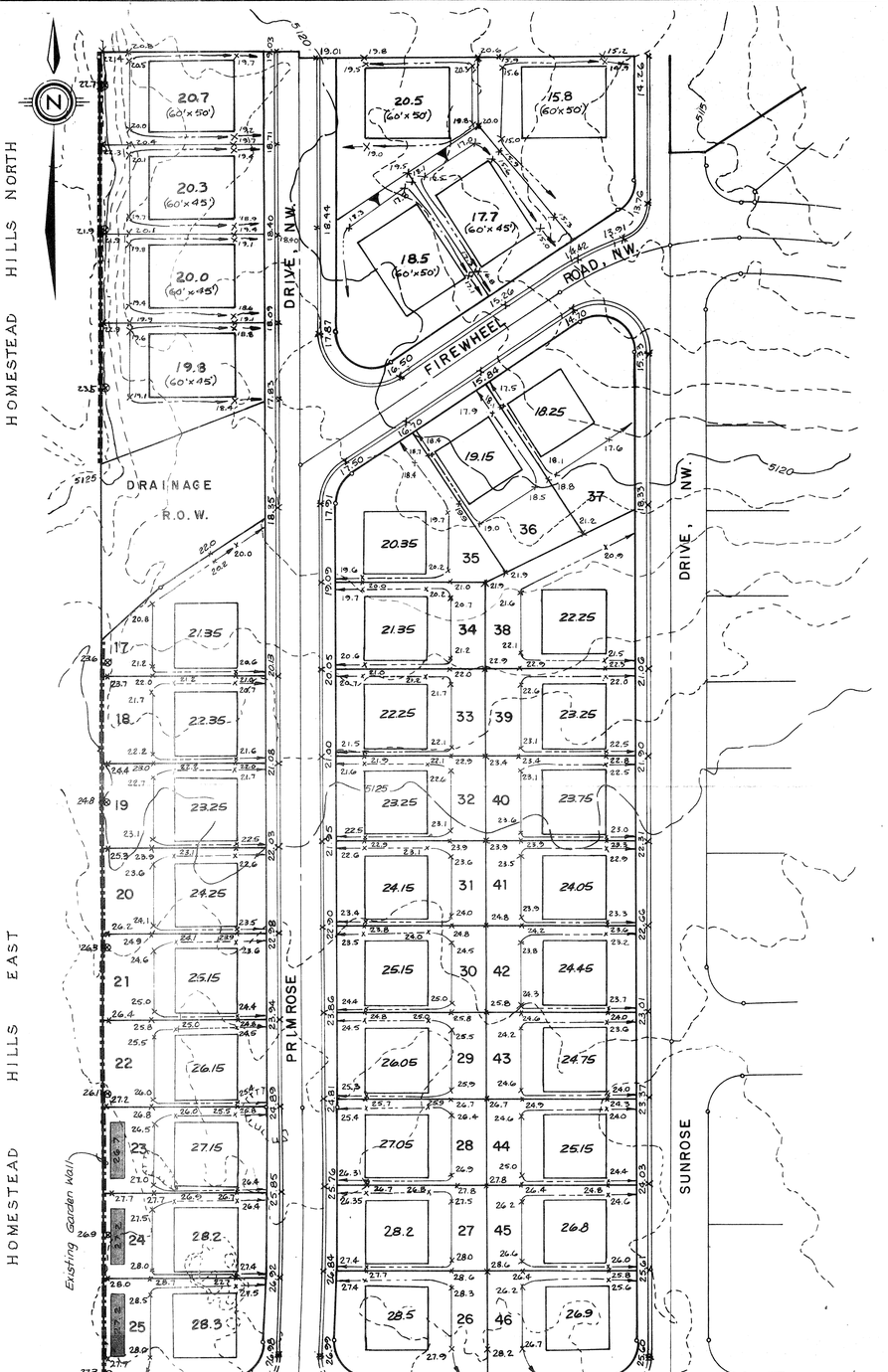
LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1328 Corrales, N.M. 87048





EARTHWORK QUANTITIES

CUT = 60,563 C.Y.
COMPACTED FILL = 43,694 C.Y.
CUT/FILL RATIO = 1.39

KEY MAP

SCALE: 1" = 50'

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING
P.O. BOX 1328

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

G.L.O. BRASS CAP FOR SECTION 23, 24, 25 AND 26, LOCATED WITHIN PARCEL H-28, RIVERVIEW
APPROX. 250' NORTH OF THE INTERSECTION OF GOLF COURSE ROAD, N.W. AND LA ORILLA RD., N.W.
ELEV. = 5112.83.

AS BUILT INFORMATION

CONTRACTOR
WORK STARTED BY — DATE
INSPECTORS
FIELD ACCEPTANCE BY — DATE
FINAL VERIFICATION BY — DATE
AS BUILTS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

ENGINEER'S SEAL

WILLIAM M. WHITMAN NEW MEXICO 5412 REGISTERED PROFESSIONAL ENGINEER
6/15/87

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	DATE 8/87
		DESIGNED BY C.S.C.	DATE 8/87
		DRAWN BY C.S.C.	DATE 8/87
		CHECKED BY W.M.W.	

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: PRAIRIE RIDGE UNIT FOUR
GRADING PLAN

Approved Work Order drawing

RECEIVED
OCT 21 1987
HYDROLOGY SECTION

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.R.C. Chair		9/16/87			
Trans. Dev.		9/16/87			
Utility Dev.					
HYDROLOGY	GSL	10/30/87			

DRAWING NO. 3314 — MAP NO. D-12 — SHEET 4 OF 41

APPROVED FOR ROUGH GRADING (± 1 Ft.)

CITY HYDROLOGY — DATE

ONSITE T.B.M. - RIM OF EXISTING MANHOLE LOCATED APPROXIMATELY 380' EAST OF S.W. PROPERTY CORNER (ELEV. = 5125.32) TO BE USED FOR A GRADING BENCHMARK ONLY.