

MASTER DEVELOPMENT DRAINAGE PLAN

FOR

POWERWOOD/GREENBRIAR

Prepared For:
Mr. Freid Zarie
480 East Happy Canyon
Castle Rock, CO 80108

And

Holger C. Christiansen & Partners, P.C.
100 East St Vrain Street, Suite 300
Colorado Springs, CO 80903

Prepared By:
Associated Design Professionals, Inc.
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Colorado Springs, Colorado 80918
(719) 266-5212


Revised May 22, 2003
000303MDDP

RETURN WITHIN 2 WEEKS TO:
CITY OF COLORADO SPRINGS
SUBDIVISION ENGINEERING
30 SOUTH NEVADA AVE., SUITE 702
COLORADO SPRINGS, CO 80903
(719) 385-5978



ENGINEERS STATEMENT:

The attached drainage plan and report were prepared under my direction and supervision 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/County for drainage reports and said report is in 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.

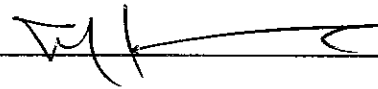

Michael A. Bartusek, P.E., #23329



DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.



Freid Zarie
Business Name

By: 

Title: _____

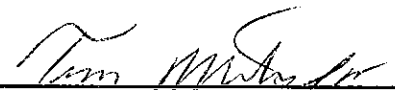
Address: 480 East Happy Canyon
Castle Rock, CO 80108

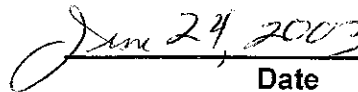
Holger C. Christiansen & Partners, P.C.
Business Name

By: 
Title: 

Address: 100 E. St. Vrain St., Ste 300
Colo. Spgs., CO 80903

Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, Colorado, 1980, as amended.


City Engineer


Date

Conditions:

POWERWOOD/GREENBRIAR MASTER DEVELOPMENT DRAINAGE PLAN

GENERAL

This is a drainage study for the platting and annexation of a 127.97-acre site described as Powerwood Retail Center and Greenbriar Retail Center. The site is located within the Cottonwood Creek Drainage Basin in Colorado Springs, Colorado. The future development of this property consists of a hospital site, medical/office center, commercial retail center, and industrial/office complex. This study will consider the impact, if any, on the existing development and neighboring properties.

This site is located south of Woodman Road between Templeton Gap Road and Powers Boulevard. No portion of the site is within a designated FEMA 100-year floodplain as designated on Map No. 08041C0529F, dated March 17, 1997. According to the El Paso County Area Soil Survey, the soil on the site is classified as a Blakeland Sandy Loam. This soil can be described as having a rapid permeability, slow surface runoff and a moderate hazard of erosion. The soil classification is 'A'; however, a soil classification of 'B' will be used for this study.

This site has been previously studied in the following reports:

- *Cottonwood Creek DBPS*, prepared by URS Consultants, dated June 1994
- *Cottonwood Creek Drainage Basin Planning Study*, prepared by Ayres Associates, dated June 2000
- *Powers Boulevard/Woodmen Road Interchange Preliminary Drainage Report*, prepared by URS Consultants, dated February 2002

METHOD OF COMPUTATIONS:

The Methodology utilized for this report is in accordance with the *City/County Drainage Criteria Manual*. The Rational Method for computation of runoff was used.

$$Q = cia$$

Where Q = maximum rate of runoff in cubic feet per second
c = runoff coefficient representing drainage area characteristics
i = average rainfall intensity, in inches per hour, for the duration
required for the runoff to become established
a = drainage basin size in acres

EXISTING DRAINAGE CHARACTERISTICS

Powerwood

The site is currently an undeveloped vacant area. The slope across the site is predominately four to six percent in a westerly direction. Off-site basins OS1, OS2, OS3, OS4, OS5, and OS6 contribute flows to the drainage. Portions of sub-basins OS4 and OS7 contain the site of the closed landfill.

The existing drainage pattern flows to two different drainage basins (A & B). Drainage Basin A1 is located in the northwestern corner of the property and contains one 60" RCP that flows under Powers Boulevard at Woodmen Road. These flows continue along Woodmen Road in a series of ditches and pipes in Cottonwood Creek. Off-site Basin OS1 contributes to this flow. Drainage Basin B1 is south of the property and flows under Powers Boulevard through three 60-inch CMPs. Sub-Basin B1 flows to the southwestern corner of the property and then to drains south through Sub-Basin OS3. Sub-Basin OS2 also contributes to this flow. Both of these existing drainage facilities take the flows under and to the western side of Powers Boulevard.

Greenbriar

The site is also currently an undeveloped vacant area. The existing terrain has a high point in the eastern center of the property. Flows are directed to the west onto the Powerwood property and to the south. Sub-Basin A2 flows west onto the Powerwood property and is taken to the 60" RCP.

Sub-Basin C2 in the northeastern corner of the property flows along the Templeton Gap Road roadway ditch and combines with flows from OS5 and OS6. These flows cross

Templeton Gap Road through an existing 35" x 24" culvert. These flows continue along the east side of Templeton Gap Road until they head overland and into Sand Creek. The eastern portion of C1 flows toward Templeton Gap Road until it turns westward, entering an existing swale through the property currently owned by Powers Boulevard Associates. The western portion of C1 flows enters a broad swale that flows south through property owned by the Polaceks. This swale crosses onto the Powers Boulevard Associates property, then turns westerly, joining flows from Templeton Gap Road. The existing swale continues to the two 60-inch and one 54" CMP under Powers Boulevard.

Based on the existing conditions of the site, the following storm flows will result:

Sub-Basin	5-Year Flow (CFS)	100-Year Flow (CFS)
OS1	7.3	13.8
OS2	5.2	10.5
OS3	9.3	18.6
OS4	8.5	20.7
OS5	12.4	30.3
OS6	8.0	19.5
OS7	19.2	47.0
A1	8.6	20.9
A2	17.6	42.9
B1	15.2	37.2
C1	33.7	82.4
C2	11.2	27.3
D1	7.3	13.8
DP-1	26.3	61.9
DP-2	20.6	46.8
DP-3	27.3	66.9
DP-4	62.0	151.6
DP-5	80.9	194.6

PROPOSED DRAINAGE CHARACTERISTICS

The proposed development will consist of two developments, Powerwood and Greenbriar Retail Centers. Powerwood Development will consist of a new hospital site. This Lot has two separate sub-basins (A & B). Sub-Basin A carries the drainage flows to the proposed 54-inch RCP storm sewer to be constructed by CDOT at the southeast corner of Woodmen Road and Powers Boulevard (see URS plans in Appendix C). Until the new drainage system is installed

by CDOT the existing 60-inch culvert will carry the developed flows under Woodmen Road and down to Cottonwood Creek.

Under the developed conditions, flows from Woodmen Road (Basin OS1) will combine with flows from the northwest corner of the site (Basins A1 and A2). A 30-inch storm sewer will transport flows from Sub-Basin A2 and intercept flows from Sub-Basin A1 and the hospital building and direct them into the new CDOT storm system. The combined Q_{100} is 138.3 cfs, which is greater than historic flows but within the capacity of the proposed CDOT 54-inch RCP storm sewer at the intersection of Powers Boulevard and Woodmen Road. These flows have been coordinated with CDOT. The final on-site storm sewer design will be coordinated with the final CDOT storm sewer.

Sub-Basin B will intercept flows from the hospital site, as well as from a portion of the medical and commercial developments. These areas will be heavily landscaped to fit into the hospital site plan. Flows from Sub-Basin B2 will be directed to the southwest corner of the sub-basin where they will be collected in a storm sewer and directed to the proposed public detention basin in a protected swale. Sub-Basin B1 will flow to the southwest portion of the hospital site where it will be intercepted by a 30-inch RCP storm sewer and directed into the detention basin through a five-foot lined swale. The proposed public 3.7-acre foot detention basin will reduce developed flows, based on the rational method, from 124.2 cfs to 37.5 cfs. The flows from the detention basin will be directed into a 36-inch RCP to be located within an existing drainage and utility easement along the east side of Powers Boulevard. This system is acceptable to the Colorado Department of Health.

Basin OS5 crosses under Woodmen Road through a 36-inch CMP. No change is planned to this pipe under the upcoming roadway improvements. Basins OS6 and OS5 combine and flow to the roadway ditch and will continue under Templeton Gap Road at the 35" x 24" CMP. These flows will continue along the east side of Templeton Gap Road until they head overland in a swale flowing easterly. These off-site areas are tributary to the Sand Creek Basin.

36"
↙

Most of the Greenbriar development will continue flowing south toward the existing three CMPs that cross Powers Boulevard as described below. Basin C3 will be regarded and directed toward Tutt Boulevard and the southerly road connecting Tutt Boulevard with Templeton Gap Road. This basin will be intercepted by a 30-inch storm sewer and directed west along a proposed interior roadway. The storm sewer will increase in size to a 42-inch storm sewer with the inclusion of Basin C2. The 42-inch storm sewer will turn south along proposed Tutt Boulevard, where flows from Basin C1 will enter the storm sewer. At this point, the storm sewer will turn west and be directed to the public Detention Basin 2. This facility will be located in the southwest corner of the proposed industrial area of the Greenbriar development. The 7.3-acre foot detention basin will reduce developed flows from 262.0 cfs to 81 cfs. These detained flows will be released and spread out into the existing broad swale at historic levels. A drainage easement may still need to be obtained from the Poleceks and Powers Boulevard Associates to transport the flows to Powers Boulevard; however, no improvements are anticipated at this time. The drainage easement will be obtained at the time of platting. This detention basin may also be relocated to a point closer to Powers Boulevard if the Polecek and Powers Boulevard Associates property is annexed into the City.

The Cottonwood Creek DBPS does not detail any improvements within the Powerwood or Greenbriar developments. The only improvement specified in the DBPS is the upgrading of the Powers Boulevard culvert from two 60-inch and one 54" CMP to a DBL 6-foot by 9-foot RCBC. However, as part of the Powers Boulevard improvements for CDOT the existing culvert crossing will be replaced with two 66-inch RCPs. The potential future developed flow at the Powers Boulevard culvert would be 419.4 cfs. However, with the construction of the proposed detention basins, the flows under Powers Boulevard would be limited to the historic rate of 194.6 cfs.

Based on the developed conditions of the site, the following storm flows will result:

Sub-Basin	5-Year Flow (CFS)	100-Year Flow (CFS)
OS1	11.4	21.5
OS2	5.2	10.5
OS3	9.3	18.6
OS4	8.5	20.7
OS5	12.4	30.3
OS6	8.2	20.1
OS7	19.2	47.0
A1	30.4	61.9
A2	37.7	70.3
B1	33.1	65.1
B2	37.6	70.1
C1	94.5	188.7
C2	45.2	78.9
C3	30.1	52.5
D1	40.9	71.5
DP-1	71.5	138.3
DP-2	64.9	124.2
DP-3	18.5	45.1
DP-4	72.0	125.8
DP-5	139.8	262.0
DP-6	181.0	333.9
DP-7	28.0	68.6
DP-8	76.4	147.1
DP-9	223.6	419.4

Although the Cottonwood Creek Drainage Basin plan allows for the release of developed flows, several adjacent landowners along the *historic drainageway* will not accept developed flows as shown in the Cottonwood Creek study. The landowners who will not accept developed flows include the owner of the greenbelt south of the Bridle Pass subdivision and several downstream landowners from Dublin Boulevard to Oakwood and then downstream approximately 2,000 feet. The inability to release developed flows also affects the area west of Powers Boulevard, which also contributes flows to the greenbelt and to additional downstream properties.

In addition, the greenbelt, which is the natural drainageway, has been filled in by the owner, Richard Dalby. Both the city of Colorado Springs and El Paso County have notified Mr.

Dalby that the greenbelt must be restored to its previous condition. Until the greenbelt is restored, flows will be trespassing onto Norwood's property in the proposed open space.

DRAINAGE FEES

Drainage fees for 2003 for the Cottonwood Creek Drainage Basin are as follows:

Powerwood

Drainage Fees:	\$8002/Acre x 35.583 =	\$284,735.17
Bridge Fees:	\$676/Acre x 35.583 =	24,054.11
Total Fees:		\$308,789.28

Greenbriar

Drainage Fees:	\$8002/Acre x 92.383 =	\$739,248.77
Bridge Fees:	\$676/Acre x 92.383 =	62,450.91
Total Fees:		\$801,699.68

Since only historic undeveloped flows will be permitted west of Powers Boulevard at the existing three 54-inch CMPs, the detention ponds are proposed to be permanent public reimbursable structures pending City/County Drainage Board approval. The developer will present the following proposals to the City/County Drainage Board:

1. accept the detention pond as a public reimbursable facility,
 2. exempt the unplatted areas tributary to the pond from paying drainage fees
 3. amend the Cottonwood Creek drainage fee.
- ✓ will not be suggested by the City SRM 6/24/03*

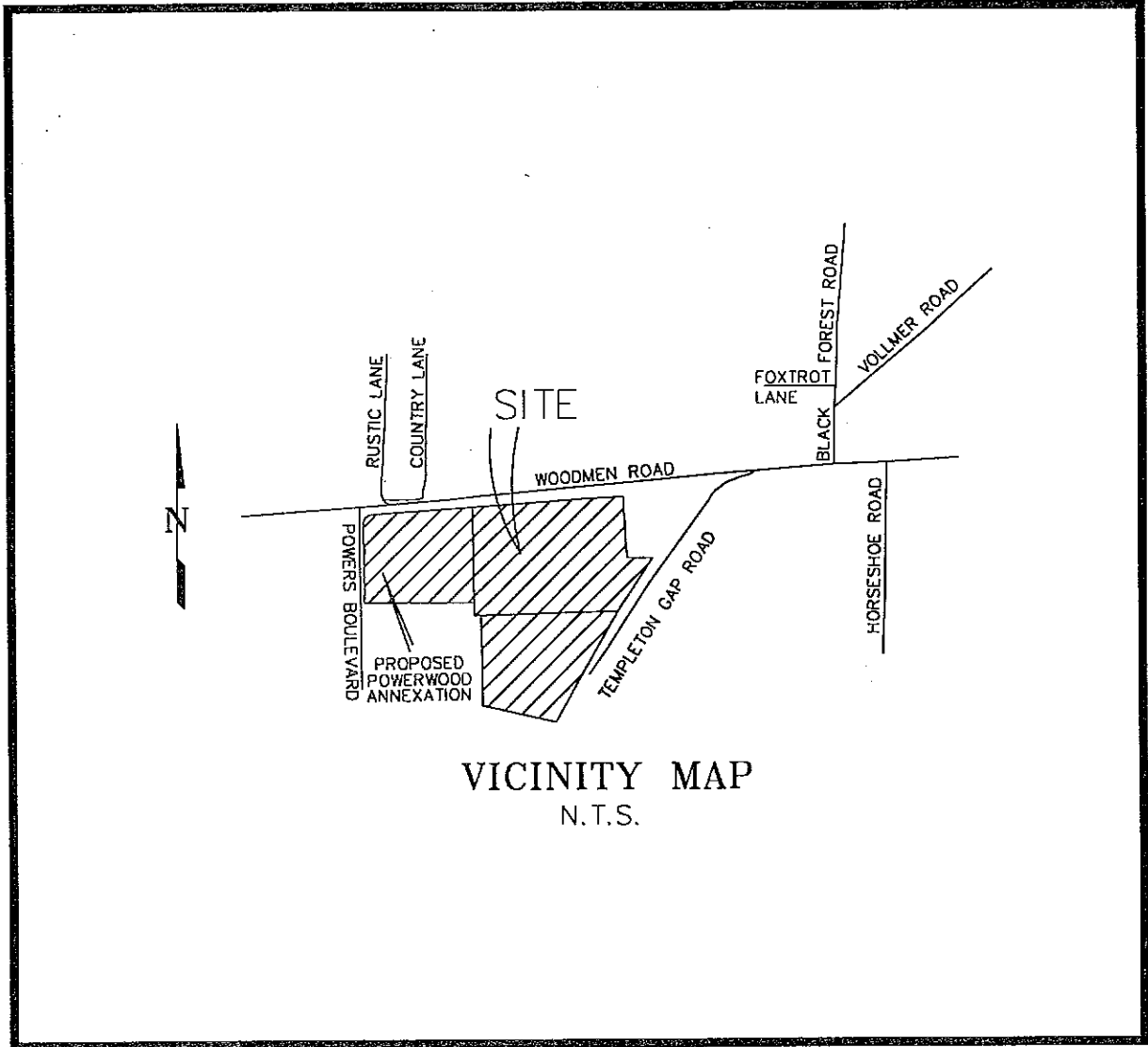
These items will be presented to the Drainage Board with the understanding that this drainage report can be approved and plats can be recorded, pending the Drainage Board's approval.

SUMMARY

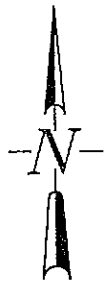
Development of this site will cause no damage to adjacent property owners. The overall drainage pattern is being improved to flow to existing drainage systems that are capable of handling said flows. Fee and detention changes to the Cottonwood Creek Basin will be submitted to the City/County Drainage Board for approval. All areas disturbed by construction will be reseeded and erosion control measures will be installed during construction of the proposed site.

Appendix A

Maps



VICINITY MAP
N.T.S.



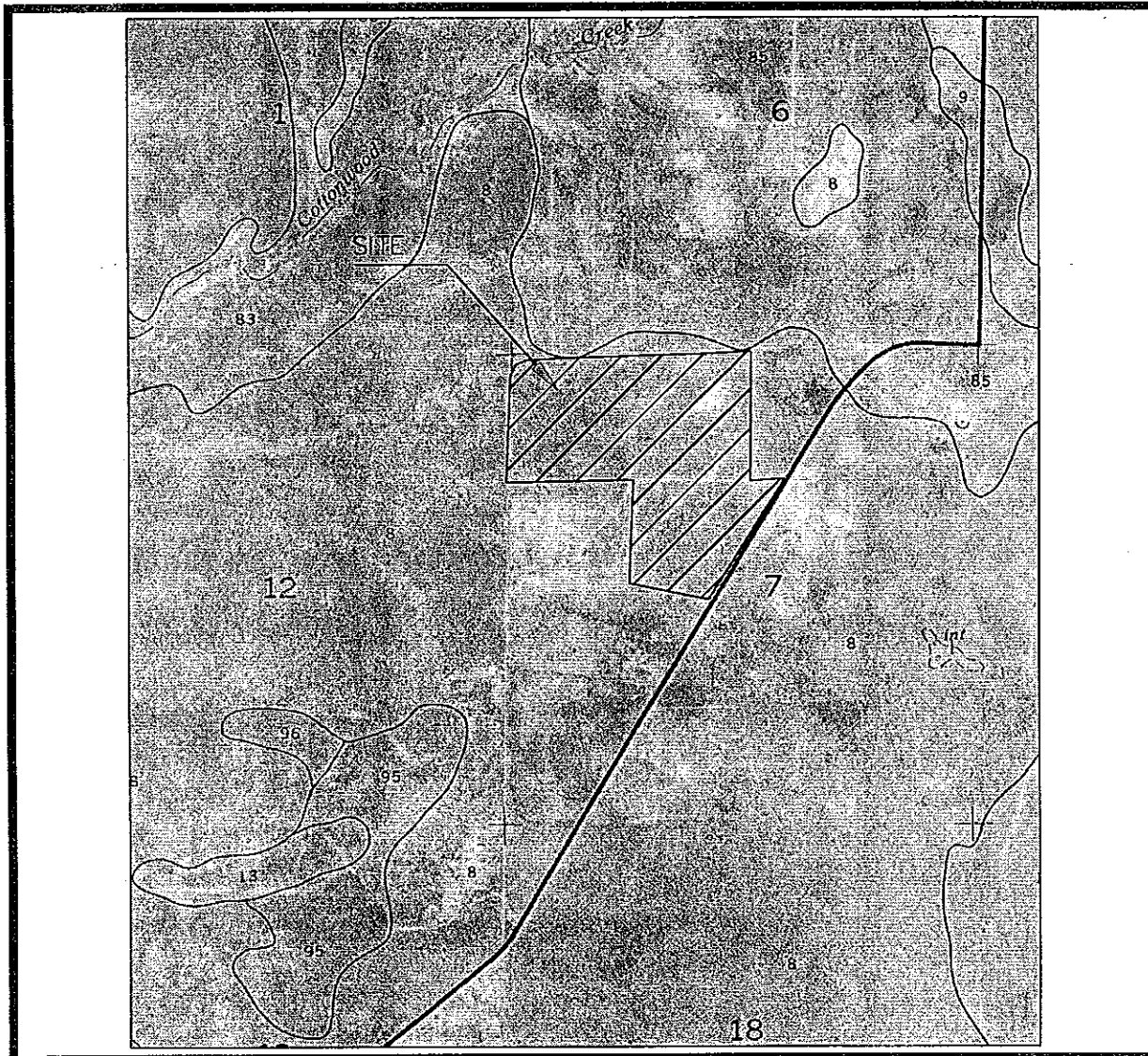
VICINITY MAP
N.T.S.

PREPARED BY:



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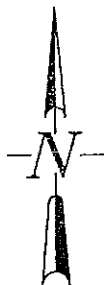
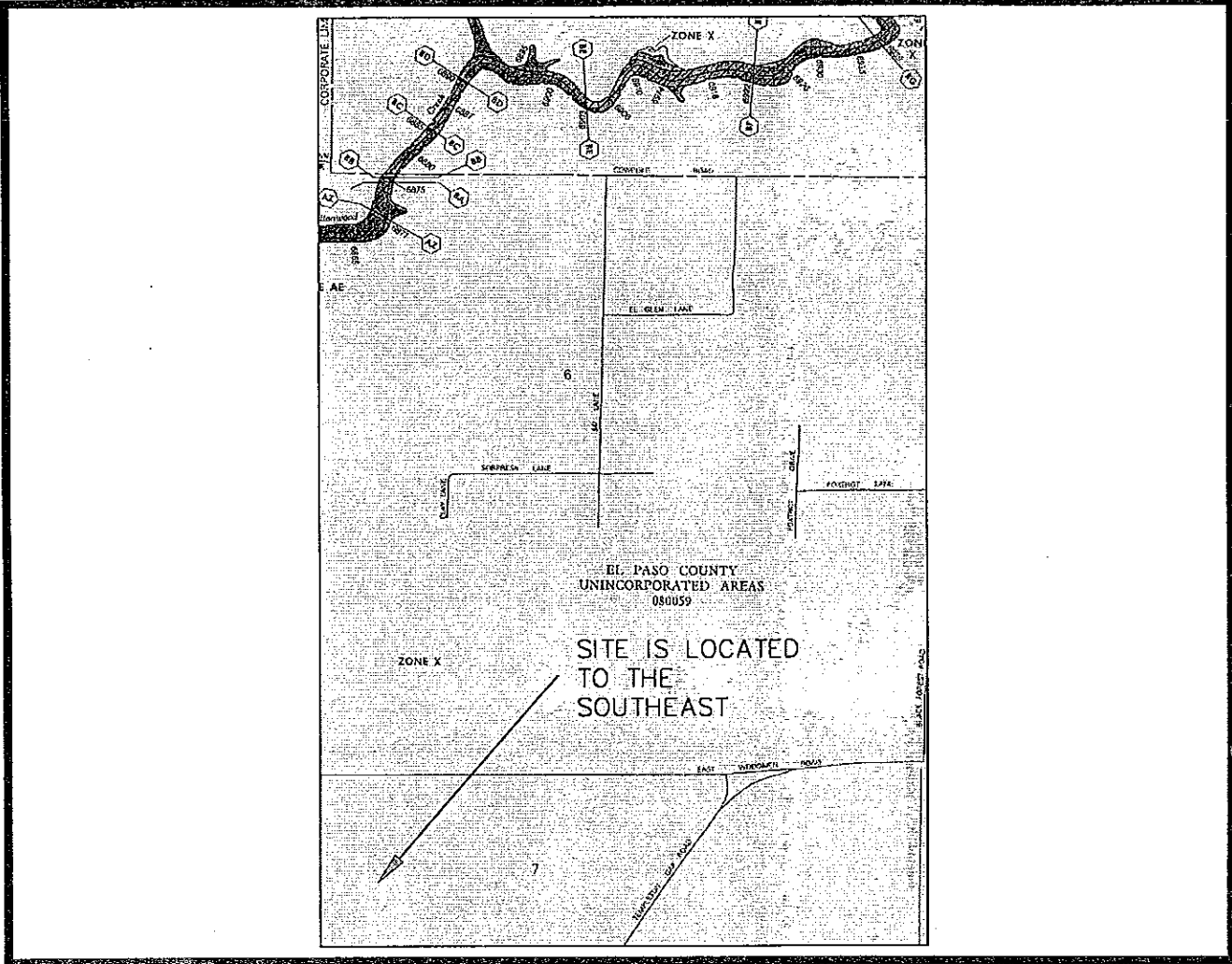


 SOILS MAP
N.T.S.

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FLOODPLAIN MAP

N.T.S.

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NATIONAL FLOOD INSURANCE PROGRAM


FIRM *E6*
 FLOOD INSURANCE RATE MAP
 EL PASO COUNTY,
 COLORADO AND
 UNINCORPORATED AREAS

PANEL 529 OF 1300
 (SEE MAP INDEX FOR PANELS NOT PRINTED)

COUNTY	NUMBER	PANEL	SHEET
COLORADO	SPRINGFIELD CITY OF	0804100529	F
EL PASO COUNTY	UNINCORPORATED AREAS	0804100529	F

MAP NUMBER
 0804100529 F

EFFECTIVE DATE:
 MARCH 17, 1997



Federal Emergency Management Agency

Appendix B

Drainage Calculations

PowerWood - Historic Runoff

RATIONAL METHOD (Q=CiA)

BASIN	TOTAL AREA (acres)	WEIGHTED		OVERLAND FLOW				CHANNEL FLOW				Tc TOTAL (min.)	INTENSITY		PEAK FLOWS	
		C(5)	C(100)	C(5)	Length (feet)	Slope (%)	Ti (min.)	Slope (%)	Length (feet)	Velocity (f.p.s.)	Tt (min.)		I(5) (in./hr.)	I(100) (in./hr.)	Q(5) (c.f.s.)	Q(100) (c.f.s.)
A1	11.99	0.25	0.35	0.25	300	5.3%	15.8	3.8%	900	3.0	5.0	20.8	2.9	5.0 CA(equiv)	8.6 3.00	20.9 4.20
A2	27.45	0.25	0.35	0.25	300	3.3%	18.5	3.1%	1150	2.8	6.8	25.3	2.6	4.5 CA(equiv)	17.6 6.86	42.9 9.61
B1	22.82	0.25	0.35	0.25	300	4.0%	17.3	3.0%	1000	2.7	6.2	23.5	2.7	4.7 CA(equiv)	15.2 5.71	37.2 7.99
C1	50.42	0.25	0.35	0.25	300	6.7%	14.6	4.8%	1750	3.3	8.8	23.4	2.7	4.7 CA(equiv)	33.7 12.61	82.4 17.65
C2	15.77	0.25	0.35	0.25	290	5.0%	15.8	3.0%	850	2.7	5.2	21.1	2.8	4.9 CA(equiv)	11.2 3.94	27.3 5.52
D1	16.50	0.25	0.35	0.25	300	3.0%	19.1	3.0%	1900	2.7	11.7	30.8	2.3	4.0 CA(equiv)	9.4 4.13	23.0 5.78
OS1	3.45	0.60	0.65	0.90	30	2.0%	1.6	3.5%	2700	3.7	12.2	13.8	3.5	6.1 CA(equiv)	7.3 2.07	13.8 2.24
OS2	2.36	0.54	0.62	0.90	50	2.0%	2.1	1.5%	1050	2.3	7.6	9.7	4.1	7.2 CA(equiv)	5.2 1.27	10.5 1.46
OS3	4.35	0.54	0.62	0.90	30	2.0%	1.6	3.1%	1900	3.5	9.0	10.7	3.9	6.9 CA(equiv)	9.3 2.35	18.6 2.70
OS4	17.38	0.25	0.35	0.25	350	1.5%	26.0	3.7%	2400	2.9	13.8	39.8	2.0	3.4 CA(equiv)	8.5 4.35	20.7 6.08
OS5	15.00	0.25	0.35	0.25	250	5.0%	14.7	3.5%	160	2.8	1.0	15.7	3.3	5.8 CA(equiv)	12.4 3.75	30.3 5.25
OS6	11.68	0.25	0.35	0.25	350	4.0%	18.7	2.5%	550	2.4	3.8	22.6	2.7	4.8 CA(equiv)	8.0 2.92	19.5 4.09
OS7	37.91	0.25	0.35	0.25	300	1.2%	25.9	4.2%	2200	3.2	11.5	37.4	2.0	3.5 CA(equiv)	19.2 9.48	47.0 13.27

PowerWood

EXISTING RUNOFF ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent)		Tc (min.)	INTENSITY		TOTAL FLOWS	
		CA(5)	CA(100)		I(5) (in./hr.)	I(100) (in./hr.)	Q(5) (c.f.s)	Q(100) (c.f.s)
DP-1	A1	3.00	4.20	25.3	2.2	3.9	26.3	61.9
	A2	6.86	9.61					
	OS1	2.07	2.24					
		11.93	16.05	Travel Channel	Length 1300	Velocity 3	Tt 7.22	Routed Tc 32.56
DP-2	B1	5.71	7.99	23.5	2.2	3.9	20.6	46.8
	OS2	1.27	1.46					
	OS3	2.35	2.70					
		9.33	12.15	Travel Channel	Length 1900	Velocity 3.5	Tt 9.05	Routed Tc 32.56
DP-3	C2	3.94	5.52	22.6	2.6	4.5	27.3	66.9
	OS5	3.75	5.25					
	OS6	2.92	4.09					
		10.61	14.86	Travel Channel	Length 400	Velocity 2.7	Tt 2.47	Routed Tc 25.02
DP-4	C1	12.61	17.65	37.4	2.0	3.5	62.0	151.6
	D1	4.13	5.78					
	OS4	4.35	6.08					
	OS7	9.48	13.27	Travel Channel	Length 0	Velocity 2.7	Tt 0.00	Routed Tc 37.37
		30.55	42.77					
DP-5	DP-2	9.33	12.15	37.4	2.0	3.5	80.9	194.6
	DP-4	30.55	42.77					
		39.88	54.92					

PowerWood - Developed Runoff

RATIONAL METHOD (Q=CIA)

BASIN	TOTAL AREA (acres)	WEIGHTED		OVERLAND FLOW				STREET FLOW				Tc TOTAL (min.)	INTENSITY		PEAK FLOWS	
		C(5)	C(100)	C(5)	Length (feet)	Slope (%)	Ti (min.)	Slope (%)	Length (feet)	Velocity (f.p.s.)	Tt (min.)		I(5) (in./hr.)	I(100) (in./hr.)	Q(5) (c.f.s.)	Q(100) (c.f.s.)
A1	16.25	0.60	0.70	0.30	200	3.0%	14.7	3.0%	600	3.4	2.9	17.6	3.1	5.4 CA(equiv)	30.4 9.75	61.9 11.38
A2	15.74	0.75	0.80	0.30	100	3.0%	10.4	3.0%	1300	3.4	6.4	16.7	3.2	5.6 CA(equiv)	37.7 11.81	70.3 12.59
B1	16.45	0.60	0.68	0.60	75	3.0%	5.6	3.0%	1000	1.8	9.5	15.1	3.4	5.9 CA(equiv)	33.1 9.87	65.1 11.10
B2	14.33	0.75	0.80	0.30	75	3.0%	9.0	3.0%	1000	3.4	4.9	13.9	3.5	6.1 CA(equiv)	37.6 10.75	70.1 11.46
C1	36.80	0.70	0.80	0.70	100	3.0%	5.2	3.0%	1500	3.4	7.4	12.5	3.7	6.4 CA(equiv)	94.5 25.76	188.7 29.44
C2	16.42	0.90	0.90	0.30	100	2.0%	11.9	3.0%	1300	3.4	6.4	18.2	3.1	5.3 CA(equiv)	45.2 14.78	78.9 14.78
C3	11.08	0.90	0.90	0.30	100	2.0%	11.9	3.0%	1400	3.4	6.9	18.7	3.0	5.3 CA(equiv)	30.1 9.97	52.5 9.97
D1	16.50	0.90	0.90	0.30	100	2.0%	11.9	3.0%	2100	3.4	10.3	22.2	2.8	4.8 CA(equiv)	40.9 14.85	71.5 14.85
OS1	5.40	0.60	0.65	0.90	30	2.0%	1.6	3.5%	2700	3.7	12.2	13.8	3.5	6.1 CA(equiv)	11.4 3.24	21.5 3.51
OS2	2.36	0.54	0.62	0.90	50	2.0%	2.1	1.5%	1050	2.3	7.6	9.7	4.1	7.2 CA(equiv)	5.2 1.27	10.5 1.46
OS3	4.35	0.54	0.62	0.90	30	2.0%	1.6	3.1%	1900	3.5	9.0	10.7	3.9	6.9 CA(equiv)	9.3 2.35	18.6 2.70
OS4	17.38	0.25	0.35	0.25	350	1.5%	26.0	3.7%	2400	2.9	13.8	39.8	2.0	3.4 CA(equiv)	8.5 4.35	20.7 6.08
OS5	15.00	0.25	0.35	0.25	250	5.0%	14.7	3.5%	160	2.8	1.0	15.7	3.3	5.8 CA(equiv)	12.4 3.75	30.3 5.25
OS6	12.04	0.25	0.35	0.25	350	4.0%	18.7	2.5%	550	2.4	3.8	22.6	2.7	4.8 CA(equiv)	8.2 3.01	20.1 4.21
OS7	37.91	0.25	0.35	0.25	300	1.2%	25.9	4.2%	2200	3.2	11.5	37.4	2.0	3.5 CA(equiv)	19.2 9.48	47.0 13.27

PowerWood

DEVELOPED RUNOFF ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent)		Tc (min.)	INTENSITY		TOTAL FLOWS	
		CA(5)	CA(100)		I(5) (in./hr.)	I(100) (in./hr.)	Q(5) (c.f.s.)	Q(100) (c.f.s.)
DP-1	OS1 A1 A2	3.24	3.51	16.7 Travel Pipe	2.9 Length 2200	5.0 Velocity 10	71.5	138.3
		9.75	11.38				Tt 3.67	Routed Tc 20.41
		11.81	12.59					
		24.80	27.48					
DP-2	B1 B2	9.87	11.10	13.9 Travel Ditch	3.1 Length 1000	5.5 Velocity 5	64.9	124.2
		10.75	11.46				Tt 3.33	Routed Tc 17.22
		20.62	22.57					
DP-3	OS5 OS6	3.75	5.25	22.6 Travel Ditch	2.7 Length 0	4.8 Velocity 5.0	18.5	45.1
		3.01	4.21				Tt 0.00	Routed Tc 22.55
		6.76	9.46					
DP-4	C3 C2	9.97	9.97	18.7 Travel Pipe	2.9 Length 790	5.1 Velocity 10	72.0	125.8
		14.78	14.78				Tt 1.32	Routed Tc 20.05
		24.75	24.75					
DP-5	DP-4 C1	24.75	24.75	20.1 Travel Pipe	2.8 Length 1160	4.8 Velocity 10	139.8	262.0
		25.76	29.44				Tt 1.93	Routed Tc 21.99
		50.51	54.19					
DP-6	DP-5 D1	50.51	54.19	22.0 Travel Channel	2.8 Length 2050	4.8 Velocity 3.4	181.0	333.9
		14.85	14.85				Tt 10.05	Routed Tc 32.04
		65.36	69.04					
DP-7	OS4 OS7	4.35	6.08	37.4 Travel Ditch	2.0 Length 0	3.5 Velocity 10	28.0	68.6
		9.48	13.27				Tt 0.00	Routed Tc 37.37
		13.82	19.35					
DP-8	DP-2 OS2 OS3	20.62	22.57	17.2 Travel Pipe	3.1 Length 2000	5.5 Velocity 10	76.4	147.1
		1.27	1.46				Tt 3.33	Routed Tc 20.55
		2.35	2.70					
		24.24	26.73					
DP-9	DP-6 DP-7 DP-8	65.36	69.04	37.4	2.0	3.5	223.6	419.4
		24.24	26.73					
		20.62	22.57					
		110.22	118.34					