
**MASTER DEVELOPMENT
DRAINAGE PLAN
FOR
STETSON HILLS ENCLAVE**

September, 2000

***Leigh
& Whitehead
Associates, Inc.***

*CONSULTING CIVIL ENGINEERS & SURVEYORS
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061*

LWA Project No. 99087.61

**RETURN WITHIN 2 WEEKS TO:
CITY OF COLORADO SPRINGS
SUBDIVISION ENGINEERING
30 SOUTH NEVADA AVE., SUITE 702
COLORADO SPRINGS, CO 80903
(719) 385-5979**

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September, 2000

City of Colorado Springs
Stormwater and Subdivision
Engineering Division
101 W. Costilla, Suite 122
Colorado Springs, CO 80922

RE: Stetson Hills Enclave


Dear Representative:

In accordance with the requirements of the City of Colorado Springs Subdivision Ordinance, a master development drainage plan has been prepared for the proposed Stetson Hills Enclave.

This plan has been prepared under the current City of Colorado Springs Drainage Criteria.


Seven (7) complete copies of the master development drainage plan are hereby transmitted for your review and approval. If there are any questions or comments concerning this report, please contact the undersigned.

Sincerely,


Leonard A. Beasley
Project Engineer

9-12-00
Date

Reviewed by:

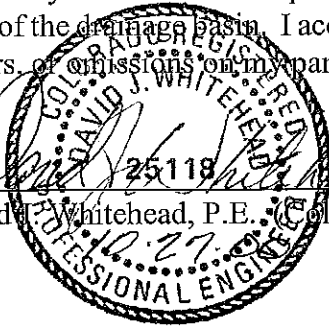

David J. Whitehead, P.E.

cc: L.J. Case
LDC, Inc.

SIGNATURES AND STATEMENTS

Engineer's Statement:

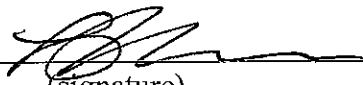
The attached master development drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage plan has been prepared according to the criteria established by the City for master development drainage plans and said plan 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.



David J. Whitehead, P.E. (Colo. 25118)

Developer's Statement:

The Developer has read and will comply with all the requirements specified in this master development drainage plan.

By:  _____ L. J. Case
(signature) Printed Name

102 East Pikes Peak Avenue, Suite 200
Colorado Springs, CO 80903

City of Colorado Springs:

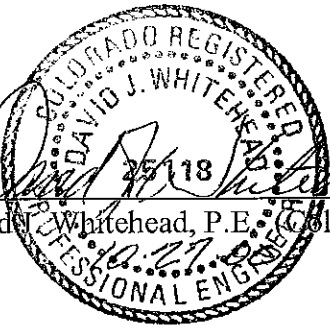
Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

City Engineer  _____ Date 10/26/00

Conditions: _____

FLOODPLAIN STATEMENT

To the best of my knowledge and belief, Stetson Hills Enclave is not located in a F.E.M.A. designated 100-year floodplain, as shown on F.I.R.M. Panel Nos. 08041C0539F and 08041C0543F, both dated March 17, 1997.


David J. Whitehead
David J. Whitehead, P.E. (Colo. 25118)

MASTER DEVELOPMENT DRAINAGE PLAN

Introduction:

Stetson Hills Enclave is located in the southeast quarter of Section 20, Township 13 South, Range 65 West of the 6th P.M. The property is located adjacent to Marksheffel Road on the east and Barnes Road on the south. Stetson Hills Filing No. 9 is located adjacent to this property on the west. Vacant property is located to the north of this site and is located within the County. Stetson Hills Enclave contains approximately 58 acres and is zoned R-1 6000 with conditions of record. This MDDP is being submitted in support of the development plan that is being presented to the City of Colorado Springs and is part of the criteria. The proposed use for this property is multi-family and commercial neighborhood business areas. These are delineated on the attached Proposed Conditions Drainage Plan. The property is located within the Sand Creek Drainage Basin. Preliminary indications show that this property will be phased. Anticipated phasing is that the single family will be developed first. This may develop in three stages, followed by the commercial and multi-family.

Soils:

The soils across the site are Truckton Sandy Loam, a deep well-drained soil formed in alluvial and residuum, derived from arkosic sedimentary rock. The permeability of the Truckton soil is moderately rapid which gives it a Hydrologic Group B rating. The Group B rating will be used for current and developed conditions.

Existing Drainage Conditions:

The majority of this site drains in a southeasterly direction to a natural drainage channel that flows through the center of this property in a southerly direction toward Barnes Road. The south half of Barnes Road is currently developed with curb, gutter and asphalt. Located along the previously mentioned natural drainage channel under Barnes Road is a 6'x8' reinforced concrete box culvert that accepts flows from the north and conveys them southerly within the existing

drainage channel. The site has been divided into three sub-basins and one major basin. They are delineated on the attached Existing Conditions Drainage Plan. Offsite flow enters this site from the north and also from the northwest. These flows are conveyed through the site to the existing low point adjacent to Barnes Road on the south. The location of the basins along with peak 5-year and 100-year flows are shown on the attached existing conditions master development drainage plan. Runoff may also enter the site from the east. The D.B.P.S. for Sand Creek indicates that Basin 38 flows located on the east side of Marksheffel Road are directed to the existing 6'x8' R.C.B. the peak 10-year and 100-year flows obtained from the D.B.P.S. are shown on the Proposed Conditions Drainage Plan.

Offsite Basin OS-A1 is located to the north of this property, contains 45.7 acres, and generates a peak flow of 14.3 cfs for the 5-year event and 34.2 cfs for the 100-year event. The master drainage study for Stetson Hills, prepared by Greiner Engineering in 1985, showing this sub-basin delineated on their plan as OF-1, indicates that runoff enters this site from the east side of Marksheffel Road. Preliminary investigation indicates that flows on the east side of Marksheffel may enter this site. A more detailed analysis will be provided when the preliminary/final drainage report is prepared. Runoff enters this site at the northwest corner from offsite Sub-basin OS-A2. This area contains 3.8 acres and generates a peak flow of 4.1 cfs for the 5-year event and 9.0 cfs for the 100-year event. Located on the northwesterly edge of this property is an existing single family residential area where runoff is directed as sheetflow from the back of these lots onto this site. This area is also included in Sub-basin OS-A2.

Sub-basin OS-A3 contains 63.1 acres and generates a peak flow of 17.0 cfs for the 5-year event and 40.9 cfs for the 100-year event. The combined area confluencing at this location is 112.6 acres. Since this area is larger than 100 acres, the Hydrograph method utilizing the HEC-1 computer program was utilized to determine peak flow at this location. It generates 58.0 cfs for the 5-year event and 99.0 cfs for the 100-year event. Flows located at this point are conveyed southerly under Barnes Road via the previously mentioned 6'x8' reinforced concrete box culvert.

Developed Conditions:

The site contains one major basin which conflues the southerly portion of the property at the existing 6'x8' reinforced concrete box. The site was then divided into eighteen sub-basins which include four offsite basins, OS-A1, OS-A2, OS-A8 and OS-A14. For the purpose of this report, these four offsite basins were anticipated to be developed as an R-1 6000 single-family residential area. The interior site will be developed with a street system and an underground storm system with the peak flow shown at appropriate points to determine the street capacities and the location of proposed inlets that will collect street runoff when it meets the capacity that is allowed by the City of Colorado Springs drainage criteria manual. For the purpose of this report, these pertinent locations will be discussed in greater detail.

Offsite Sub-basin OS-A1 is located to the north of this property. It contains 34.8 acres and generates a peak flow of 69.5 cfs for the 5-year event and 150.4 cfs for the 100-year event. Located at the low point of the north boundary line, a 42" R.C.P. will be constructed to intercept runoff. The pipe system within this development has been sized to accept the 5-year flow and a portion of the 100-year flow. If Sub-basin OS-A1 develops as a higher density, this pipe may be able to intercept the higher 5-year flows. A detailed analysis of the storm drain system will be required when the upstream area develops. Located just south of Sub-basin OS-A1 is Design Point 2 (DP-2) which includes the Sub-basins OS-A1, OS-A2, and A3. It contains 47.91 acres and generates a peak flow of 87.7 cfs for the 5-year event and 190.1 cfs for the 100-year event. A proposed 12' D-10R is planned at this location to accept street runoff and direct it underground to a proposed storm drain system. From this point, a 42" R.C.P. will be proposed to run easterly and then southerly to a pipe approximately 555' south of this location. Two 15' D-10R inlets in a sump condition with a water depth of approximately 1.2' are proposed at this intersection to intercept flow and direct it to the proposed underground storm drain system. Peak runoff at this location, which is delineated on the attached Proposed Conditions Drainage Plan as DP-6 and contains 68.55 acres, is 125.6 cfs for the 5-year event and 266.0 cfs for the 100-year event. These flows will be routed within the street and the proposed 48" R.C.P. to a low point delineated on the attached Proposed Conditions Drainage Plan as DP-12, which contains 129.07

acres and generates a peak flow of 205.0 cfs for the 5-year event and 450.0 cfs for the 100-year event at the existing 6'x8' reinforced concrete box. The approximate capacity of this culvert is 1040 cfs. The location of this 6'x8' R.C.B. is shown on the attached Existing and Proposed Conditions Drainage Plans. The 48" R.C.P. will tie into the 6'x8' R.C.P. with a proposed junction box. The size of this junction box preliminarily is 6'x10'. New flows will then be conveyed southerly within this 6'x8' reinforced concrete box to the existing channel downstream of this area. Pipe size, location and slopes are shown on the attached Proposed Conditions Drainage Plan.

Calculations for existing and proposed conditions and the storm drain system are included in the back of this report along with plans showing existing and proposed peak runoff for this site. A preliminary analysis of the proposed storm drain system has been evaluated for the 5-year flow. This analysis indicates the storm drain can safely convey 5-year runoff. The excess for the 100-year flow can be conveyed within the street system.

Barnes Road is located on the southerly edge of this property. Currently, there are plans to construct this arterial. Also included within this street is an underground storm system and inlets. The location of these future inlets and storm drain pipe is shown on the attached Proposed Conditions Drainage Plan. Peak runoff for Structure 23 that exits this site is 305.1 cfs for the 10-year event and 903.2 cfs for the 100-year event. These flows were obtained from the approved D.B.P.S. for Sand Creek.

Proposed Improvements:

The proposed development of this site is to construct single-family residential, high density multi-family residential, and a neighborhood commercial area. This area is compatible for this type of development. The surface runoff will be directed to the proposed street system and conveyed to a proposed underground storm drain system and then to the existing reinforced concrete box. Overlot grading within this development should be anticipated to direct flow away from all proposed structures through various side lot and rear lot drainage swales conveyed to

the street system and underground storm drain system. Areas with grade or topographic restrictions will direct runoff to the proposed drainage system.

Facilities:

The drainage basin planning study for Sand Creek shows that there are no planned major drainage facilities for this area. Preliminary evaluation of this site indicates that an underground storm system is necessary for a portion of this property. These facilities will be evaluated in greater detail at the preliminary/final drainage report and plan stage.

Public Facilities (Non-Reimbursable):

6' D10R (1 @ \$2,900.00)	\$ 2,900.00
12' D10R (2 @ \$3,900.00)	7,800.00
15' D10R (4 @ \$4,600.00)	18,400.00
20' D10R (1 @ \$5,300.00)	5,300.00
18" R.C.P. (470 LF @ \$25.00/ft.)	11,750.00
30" R.C.P. (355 LF @ \$40.00/ft.)	14,200.00
36" R.C.P. (210 LF @ \$52.00/ft.)	10,920.00
42" R.C.P. (670 LF @ \$59.00/ft.)	39,530.00
48" R.C.P. (890 LF @ \$70.00/ft.)	62,300.00
Manhole (6 @ \$5,100.00 each)	30,600.00
48"x42" R.C.P. Reducer (1 @ L.S.)	1,500.00
6'x10' Junction Structure (1 @ L.S.)	<u>6,000.00</u>
Subtotal:	\$211,200.00
Engineering Contingencies (10%):	<u>21,120.00</u>
TOTAL:	\$232,320.00

Leigh Whitehead & Associates, Inc. cannot and will not guarantee that the actual construction costs will not vary from this estimate of probable costs for constructing these facilities.

Fees:

Stetson Hills Enclave is located in the Sand Creek Drainage Basin. Currently, there is drainage, bridge and pond fee basin. The following is a breakdown of fees required for this development:

Drainage Fee (\$6,394.00/acre)

Bridge Fee (\$381.00/acre)

Pond Fee - Land (\$414.00/acre)

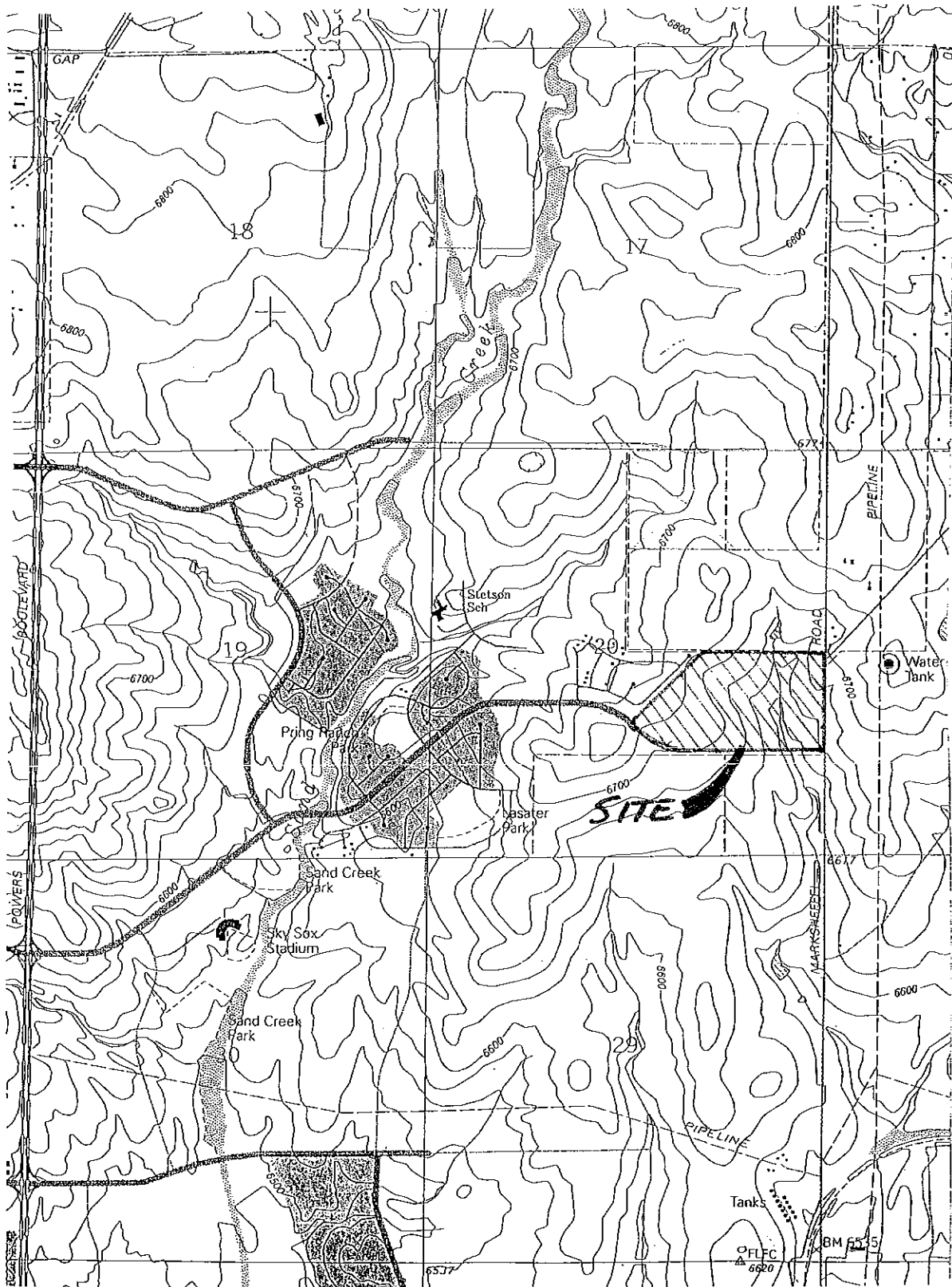
Pond Fee - Facility (\$1,426.00/acre)

Total Fee Per Acre (\$8,615.00/acre)

This MDDP is part of the submittal requirements for the concept plan being submitted to the City of Colorado Springs Engineering Division and Planning Department. Construction of this development will not adversely affect the surrounding developments. With the proper design and construction of this project, runoff should be safely conveyed to the appropriate outlet points.

MAPS AND CALCULATIONS

NORTH



REF: FALCON NW "QUAD"

LOCATION MAP

*Leigh
& Whitehead
Associates, Inc.*

CONSULTING CIVIL ENGINEERS & SURVEYORS
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

NORTH



REF: S.C.S. SH. 909 37

SOILS MAP

Leigh
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2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth In	Hardness	
Omaha: 192, 193: Tomah part-----	B	None-----	---	---	>60	---	Moderate.
Crowfoot part--	B	None-----	---	---	>60	---	Moderate.
Travessilla: 194: Travessilla part-----	D	None-----	---	---	6-20	Hard	Low.
Rock outcrop part-----	D	---	---	---	---	---	---
Truckton: 95, 96, 97-----	B	None-----	---	---	>60	---	Moderate.
198: Truckton part--	B	None-----	---	---	>60	---	Moderate.
Blakeland part-	A	None-----	---	---	>60	---	Low.
199, 100: Truckton part--	B	None-----	---	---	>60	---	Moderate.
Bresser part--	B	None-----	---	---	>60	---	Low.
Istic Torrifluvents: 101-----	B	Occasional--	Very brief--	Mar-Aug	>60	---	Moderate.
Valent: 102, 103-----	A	None-----	---	---	>60	---	Low.
Vona: 104, 105-----	B	None-----	---	---	>60	---	Moderate.
Wigton: 106-----	A	None-----	---	---	>60	---	Low.
Wiley: 107, 108-----	B	None-----	---	---	>60	---	Low.
Yoder: 109, 110-----	B	None-----	---	---	>60	---	Low.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior characteristics of the map unit.

*Leigh
& Whitehead
Associates, Inc.*

CONSULTING CIVIL ENGINEERS & SURVEYORS
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 539 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

<u>CONTAINS:</u> <u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
COLORADO SPRINGS, CITY OF	080060	0539	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0539	F

MAP NUMBER
08041C0539 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 543 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

<u>CONTAINS:</u> <u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
COLORADO SPRINGS, CITY OF	080060	0543	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0543	F

MAP NUMBER
08041C0543 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency

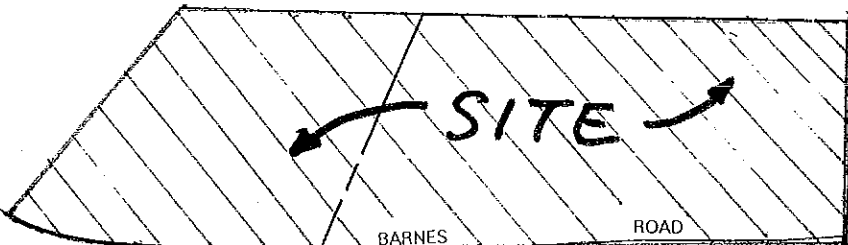
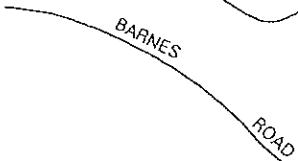
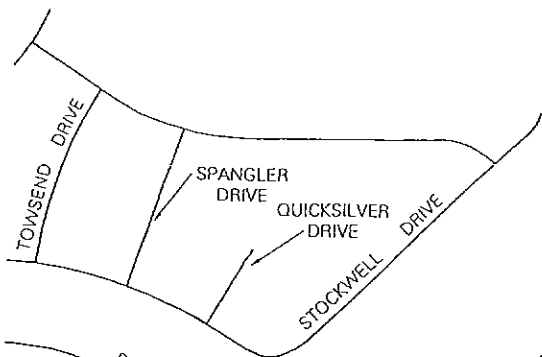
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CONSULTING CIVIL ENGINEERS & SURVEYORS
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

EL PASO COUNTY
UNINCORPORATED AREAS
080059

EL PASO COUNTY
UNINCORPORATED AREAS
080059

NORTH



20

20

ZONE X

FEMA MAP

DATE: MARCH 17, 1997

PLATE NO. 080410539 F
080410543 F

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2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

LEGEND



SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

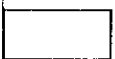


FLOODWAY AREAS IN ZONE AE



OTHER FLOOD AREAS

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



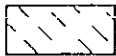
OTHER AREAS

- ZONE X** Areas determined to be outside 500-year floodplain.
- ZONE D** Areas in which flood hazards are undetermined.

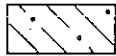
UNDEVELOPED COASTAL BARRIERS



Identified
1983

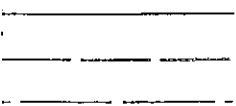


Identified
1990



Otherwise
Protected Areas

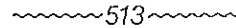
Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.



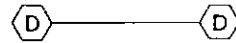
- Flood Boundary
- Floodway Boundary
- Zone D Boundary



Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.



Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.



Cross Section Line

(EL 987)

RM7 X

• M2

Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.

Elevation Reference Mark

River Mile

Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

97°07'30", 32°22'30"

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE DATE shown on this map to determine when actuarial rates apply to structures in zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and/or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY

Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:

MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:

ELEVATION DATUM

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, contact the National Geodetic Survey at the following address:

The Vertical Network Branch, NCG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East West Highway
Silver Spring, Maryland 20910
(301) 713-3191

*Leigh
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CONSULTING CIVIL ENGINEERS & SURVEYORS
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, CO 80909-5061

ZONING MAP

DEPARTMENT OF PLANNING, DEVELOPMENT AND FINANCE



DEVELOPMENT SERVICES AND
COMPREHENSIVE PLANNING DIVISION
Post Office Box 1573 Colorado Springs, CO 80901

ZONING LEGEND

A Agricultural	R1-9 Single-Family Residential - 8,000 sq. ft.
APD Airport Planned Development	R2 Two-Family Residential
C5 Intermediate Business	R4 Eight-Family Residential
C6 General Business	R5 Multi-Family Residential
M1 Light Industrial	SU Special Use
M2 Heavy Industrial	UND Zoning Undetermined at Time of publication
OC Office Complex	/cr Zone Subject To Conditions of Record
OR Office Residential	— Zoning Boundary
PBC Planned Business Center	[X] Conditional Use
PCR Planned Cultural Resort	[V] Use Variance
PF Public Facilities	[Dotted] Design Flexibility Overlay
PIP1 Planned Industrial Park No. 1	[Dotted] Highrise Overlay
PIP2 Planned Industrial Park No. 2	[Dotted] Hillside Overlay
PK Public Park	[Cross-hatched] Historic Preservation Overlay
PUD Planned Unit Development	[Dotted] Navigation Preservation Overlay
R Single-Family Residential - Estate	[Diagonal lines] Planned Provisional Overlay
R1-6 Single-Family Residential - 8,000 sq. ft.	[Dotted] Not in City



1" = 600'

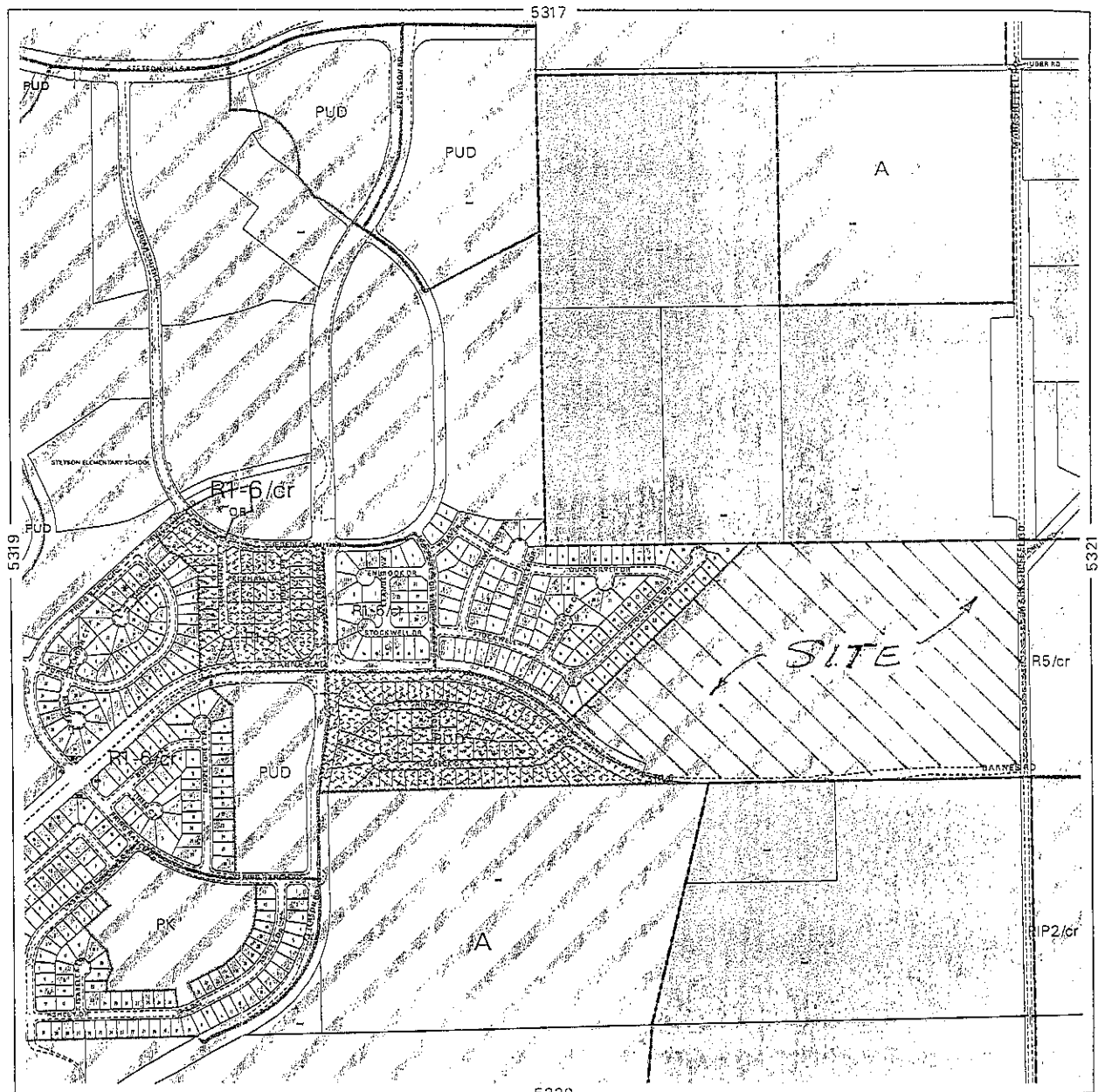
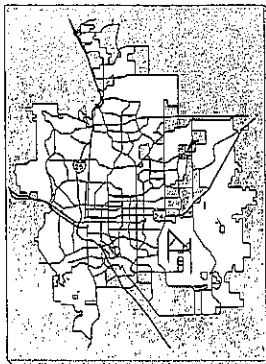
0 600 1200 Feet

Zoning information is current through December 31, 1996.

The Official Zoning Map of the City is maintained in the Development Services Division and is available for inspection during regular business hours. Please be advised that all copies of the Official Zoning Map are hereby deemed unofficial; should not be relied upon, and may not accurately reflect current zoning districts due to zone changes after the effective date of the Official Zoning Map.

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RUNOFF COMPUTATIONS
RATIONAL METHOD

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

TABLE A:
EXISTING CONDITIONS

LWA # 99087.61

14-Feb-2000

BASIN	AREA	SOIL TYPE	C 5 C 100	GEOMETRY		Tt 5 Tt 100	V Tt	tc 5 tc 100	i 5 i 100	Q5	Q100	COMMENTS	
				LENGTH	SLOPE								HEIGHT
OS - A1	45.7	B	0.15	1000.0		56.0	31.82	4.01	35.85	2.08	14.3		
		97	0.20		5.60		30.14	4.03	34.17	3.74		34.2	
OS - A2	3.8	B	0.35	415.0		19.0	17.29	4.22	18.00	3.08	4.1		
		97	0.42		4.58		15.68	0.71	16.39	5.64		9.0	
A3	63.1	B	0.15	1000.0		30.0	39.09	Varies	45.08	1.80	17.0		
		97	0.20		3.00		37.04	5.99	43.03	3.24		40.9	
A	112.6	B	0.16	1000.0		56.0	31.48	Varies	32.19	2.22	40.0		Rational Method
		97	0.21		5.60		29.81	0.71	30.52	4.01		94.8	
A	112.6 Ac.			69.4					37.35		99		HEC - I Flows
	0.18 S.M.			69.4					37.35			58	

RUNOFF COMPUTATIONS

99087C.WK4

WEIGHTED RUNOFF COEFFICIENT ("C")

LEIGH WHITEHEAD & ASSOCIATES, INC.
 Engineers, Surveyors & Planners
 2720 EAST YAMPA STREET, SUITE 1
 COLORADO SPRINGS, COLORADO
 (719) 636-5179

STETSON HILLS ENCLAVE M.D.D.P.
 BARNES ROAD, & MARKSHEFFEL ROAD
 COLORADO SPRINGS, COLORADO

14-Feb-2000

EXISTING CONDITIONS

LWA #99087.61

SHT. 1 of 1

BASIN	AREA	TOTAL AREA	PERCENT COVER	"C5"	WEIGHTED "C5"	"C100"	WEIGHTED "C100"	TYPE OF COVER
OS - A1	1.7	3.8	44.74%	0.60	0.27	0.70	0.31	Single Family (6000 SF)
	2.1	3.8	55.26%	0.15	0.08	0.20	0.11	Natural / Undisturbed
	3.8		100.00%		0.35		0.42	
A	0.2	110.7	0.18%	0.90	0.00	0.95	0.00	Existing Pavement
	1.7	112.4	1.51%	0.60	0.01	0.70	0.01	Single Family (6000 SF)
	110.7	112.4	98.49%	0.15	0.15	0.20	0.20	Natural / Undisturbed
	112.4		100.00%		0.16		0.21	Rational Coefficient
BASIN	AREA	TOTAL AREA	PERCENT COVER	"CN5"	WEIGHTED "CN5"	"CN100"	WEIGHTED "CN100"	TYPE OF COVER
A	0.2	110.7	0.18%	84	0.15	84	0.15	Existing Pavement
	1.7	112.4	1.51%	98	1.48	98	1.48	Single Family (6000 SF)
	110.7	112.4	98.49%	69	67.96	69	67.96	Natural / Undisturbed
	112.4		100.00%		69.44		69.44	HEC - 1 Curve Number

RUNOFF COMPUTATIONS

99087TC.WK4

RUNOFF COMPUTATIONS TRAVEL TIME CALCULATIONS (TR-55)

LEIGH WHITEHEAD & ASSOCIATES, INC.
 Engineers, Surveyors & Planners
 2720 EAST YAMPA STREET, SUITE 1
 COLORADO SPRINGS, COLORADO
 (719) 636-5179

EXISTING CONDITIONS

LWA #99087.61

14-Feb-2000

SHT. 1 of 1

BASIN	"n"	"P" In Inches	"K"	HIGH ELEV.	LOW ELEV.	LENGTH	HEIGHT	SLOPE	"V"	"TT" (MIN.)	COMMENTS
OS - A1			2.0	6712.0	6673.0	970.0	39.0	4.02%	4.01	4.03	Rational tc
OS - A2			2.0	6719.0	6711.0	180.0	8.0	4.44%	4.22	0.71	Rational tc
A3			2.0	6696.0	6658.0	620.0	38.0	6.13%	4.95	2.09	
			2.0	6658.0	6643.0	690.0	15.0	2.17%	2.95	3.90	
					1310.0					5.99	Rational tc
A			2.0	6712.0	6673.0	970.0	39.0	4.02%	4.01	4.03	
			2.0	6673.0	6654.0	800.0	19.0	2.38%	3.08	4.33	
			2.0	6654.0	6643.0	490.0	11.0	2.24%	3.00	2.73	
					2260.0					11.08	Rational tc
A	0.15	2.10		6768.0	6751.0	300.0	17.0	5.67%	0.26	19.20	
			0.7	6751.0	6712.0	700.0	39.0	5.57%	1.65	7.06	
			2.0	6712.0	6673.0	970.0	39.0	4.02%	4.01	4.03	
			2.0	6673.0	6654.0	800.0	19.0	2.38%	3.08	4.33	
			2.0	6654.0	6643.0	490.0	11.0	2.24%	3.00	2.73	
					3260.0					37.35	HEC - 1 tc
				* = TT = (11.9*L^0.385)*60							
				H							

 * FLOOD HYDROGRAPH PACKAGE (HEC-1) *
 * MAY 1991 *
 * VERSION 4.0.1E *
 * RUN DATE 02/14/2000 TIME 14:00:02 *

 * U.S. ARMY CORPS OF ENGINEERS *
 * HYDROLOGIC ENGINEERING CENTER *
 * 609 SECOND STREET *
 * DAVIS, CALIFORNIA 95616 *
 * (916) 756-1104 *

HEC-1 INPUT

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	Stetson Hills Enclave, Existing 5 Yr. & 100 Yr. Flows									
2	IT	20				300					
3	IO	5	0								
4	JR	FLOW	1.0000	0.5909							
5	KK	A									
6	KM	Basin A, Confluence @ Barnes Road									
7	KO						22				
8	BA	0.1759									
9	PB	4.4									
10	IN	20									
11	PC	0.0	0.0005	0.0015	0.003	0.0045	0.006	0.008	0.01	0.012	0.0143
12	PC	0.0165	0.0188	0.021	0.0233	0.0255	0.0278	0.032	0.039	0.046	0.053
13	PC	0.06	0.075	0.1	0.4	0.7	0.725	0.75	0.765	0.78	0.79
14	PC	0.8	0.81	0.82	0.825	0.83	0.835	0.84	0.845	0.85	0.855
15	PC	0.86	0.8638	0.8675	0.8713	0.875	0.8788	0.8825	0.8863	0.89	0.8938
16	PC	0.8975	0.9013	0.905	0.9083	0.9115	0.9148	0.918	0.921	0.924	0.927
17	PC	0.93	0.9325	0.935	0.9375	0.94	0.9425	0.945	0.9475	0.95	0.9525
18	PC	0.955	0.9575	0.96	0.9625	0.965	0.9675	0.97	0.9725	0.975	0.9775
19	PC	0.98	0.9813	0.9825	0.9838	0.985	0.9863	0.9875	0.9888	0.99	0.9913
20	PC	0.9925	0.9938	0.995	0.9963	0.9975	0.9988	1.0	1.0	1.0	1.0
21	LS		69.44								
22	UD	0.3735									
23	ZZ										

Stetson Hills Enclave, Existing 5 Yr. & 100 Yr. Flows

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS	
				RATIO 1	RATIO 2
				1.00	0.59
HYDROGRAPH AT	A	0.18	1	99.	58.
			TIME	8.33	8.33

*** NORMAL END OF HEC-1 ***

RUNOFF COMPUTATIONS
RATIONAL METHOD

99087PR.WK4

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

TABLE A:
PROPOSED CONDITIONS

LWA # 99087.61

17-May-2000

SHEET 1 OF 3

BASIN	AREA	SOIL TYPE	GEOMETRY			Tt 5 Tt 100	V Tt	tc 5 tc 100	l 5 l 100	Q5	Q100	COMMENTS
			C 5 C 100	LENGTH SLOPE	HEIGHT							
OS - A1	34.8	B	0.60	300.0	17.0	9.14	4.43	15.42	3.33	69.5	150.4	
		97	0.70		5.67		7.31	6.28	13.59			
OS - A2	3.80	B	0.60	300.0	14.0	9.74	3.68	11.08	3.88	8.8	19.5	
		97	0.70		4.67		7.79	1.34	9.13			
A3	9.33	B	0.60	300.0	11.0	10.55	Varies	18.34	3.05	17.1	37.0	
		97	0.70		3.67		8.44	7.79	16.23			
DP - 1	13.13	B	0.60	300.0	11.0	10.55	Varies	18.34	3.05	24.0	52.1	OS - A2 & A3
		97	0.70		3.67		8.44	7.79	16.23			
DP - 2	47.91	B	0.60	300.0	11.0	10.55	Varies	18.34	3.05	87.7	190.1	OS - A1 through A3
		97	0.70		3.67		8.44	7.79	16.23			
A4	5.81	B	0.60	210.0	10.0	8.10	5.72	10.24	4.01	14.0	30.6	
		97	0.70		4.76		6.48	2.14	8.62			
A5	3.72	B	0.60	85.0	2.0	6.50	5.59	9.04	4.22	9.4	20.4	
		97	0.70		2.35		5.20	2.54	7.74			
DP - 3	9.53	B	0.60	210.0	4.0	10.95	Varies	13.82	3.51	20.1	44.2	A4 & A5
		97	0.70		1.90		8.76	2.87	11.63			
A6	3.66	B	0.60	100.0	2.0	7.44	4.49	10.33	4.00	8.8	19.1	
		97	0.70		2.00		5.95	2.89	8.84			
A7	8.10	B	0.60	220.0	6.0	9.96	Varies	12.68	3.65	17.7	39.0	
		97	0.70		2.73		7.97	2.72	10.69			
DP - 4	11.76	B	0.60	220.0	6.0	9.96	Varies	12.68	3.65	25.8	56.6	A6 & A7
		97	0.70		2.73		7.97	2.72	10.69			
OS - A8	9.55	B	0.60	300.0	12.0	10.25	4.65	15.87	3.28	18.8	41.0	
		97	0.70		4.00		8.20	5.62	13.82			
A9	1.56	B	0.75	60.0	4.0	2.71	4.43	5.25	5.11	6.0	11.4	
		97	0.80		6.67		2.32	2.54	4.86			
DP - 5	11.11	B	0.63	300.0	12.0	9.63	Varies	17.79	3.10	21.7	44.8	OS - A8 & A9
		97	0.71		4.00		7.99	8.16	16.15			

RUNOFF COMPUTATIONS
RATIONAL METHOD

99087PR.WK4

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

TABLE A:
PROPOSED CONDITIONS

LWA # 99087.61

07-Aug-2000

SHEET 2 OF 3

BASIN	AREA	SOIL TYPE	C 5 C 100	GEOMETRY		Tt 5 Tt 100	V Tt	tc 5 tc 100	i 5 i 100	Q5	Q100	COMMENTS
				LENGTH	HEIGHT							
				SLOPE								
DP - 6	68.55	B	0.61	300	11.0	10.34	Varies	18.87	3.00	125.6	266.0	OS - A1 through A5, OS - A8 & A9
		97	0.70	3.67%		8.44	8.53	16.97	5.54			
DP - 7	80.31	B	0.60	300	11.0	10.55	Varies	19.24	2.97	143.3	316.5	OS - A1 through A9
		97	0.71	3.67%		8.23	8.69	16.92	5.55			
A10	7.48	B	0.75	90	16.0	2.40	2.15	11.18	3.86	21.7	40.9	
		97	0.80	17.78%		2.06	8.78	10.84	6.84			
DP - 8	87.79	B	0.62	300	11.0	10.13	Varies	19.11	2.99	162.5	343.0	OS - A1 through A10
		97	0.71	3.67%		8.23	8.98	17.21	5.50			
A11	4.40	B	0.90	50	4.0	1.33	2.71	6.34	4.81	19.0	33.3	
		97	0.90	8.00%		1.33	5.01	6.34	8.40			
A12	1.91	B	0.90	110	13.0	1.74	2.66	4.94	5.20	8.9	15.5	
		97	0.90	11.82%		1.74	3.20	4.94	9.00			
DP - 9	94.10	B	0.63	300	11.0	9.91	Varies	19.09	2.99	177.0	380.6	OS - A1 through A12
		97	0.73	3.67%		7.81	9.18	16.99	5.54			
A13	4.08	B	0.90	30	6.0	0.76	3.18	3.04	5.20	19.1	33.0	
		97	0.90	20.00%		0.76	2.28	3.04	9.00			
OS - A14	27.55	B	0.75	300	5.0	9.58	Varies	15.74	3.30	68.1	132.6	
		97	0.80	1.67%		8.21	6.16	14.37	6.02			
A15	3.34	B	0.90	25	0.5	1.49	7.77	3.57	5.69	17.1	32.4	
		97	0.95	2.00%		1.12	2.08	3.20	10.21			
DP - 10	30.89	B	0.77	300	5.0	9.03	Varies	15.53	3.32	78.9	153.4	OS - A14 & A15
		97	0.82	1.67%		7.66	6.50	14.16	6.06			
DP - 11	34.97	B	0.78	300	5.0	8.76	Varies	15.56	3.31	90.4	175.7	A13 through A15
		97	0.8	1.67%		7.39	6.80	14.19	6.05			
DP - 12	129.07	B	0.68	300	11.0	8.86	Varies	18.61	3.03	265.6	544.5	OS - A1 through A15 Rational Flows
		97	0.76	3.67%		7.17	9.75	16.92	5.55			
DP - 12 (HEC -1)	0.20 sm	B		300	3.0					205.0	450.0	OS - A1 through A15 HEC-1 Flows
		97	86.6	1.00%								

RUNOFF COMPUTATIONS
WEIGHTED RUNOFF COEFFICIENT (C)

99087PR.WK4

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

TABLE A:
PROPOSED CONDITIONS

LWA # 99087.61

25-May-2000

SHT. 1 of 2

Basin	Area	Total Area	Percent Cover	C5"	Wtd. "C5"	C100"	Wtd. "C100"	Type Of Cover
DP - 5	1.56	11.11	14.04%	0.75	0.11	0.80	0.11	Multi - Family
	9.55	11.11	85.96%	0.60	0.52	0.70	0.60	Single Family
	11.11		100.00%		0.62		0.71	
DP - 6	1.56	68.55	0.02	0.75	0.02	0.80	0.02	Multi - Family
	66.99	68.55	0.98	0.60	0.59	0.70	0.68	Single Family
	68.55		100.00%		0.60		0.70	
DP - 7	1.56	80.31	1.94%	0.75	0.01	0.80	0.02	Multi - Family
	78.75	80.31	98.06%	0.60	0.59	0.70	0.69	Single Family
	80.31		100.00%		0.60		0.70	
DP - 8	9.04	87.79	10.30%	0.75	0.08	0.80	0.08	Multi - Family
	78.75	87.79	89.70%	0.60	0.54	0.70	0.63	Single Family
	87.79		100.00%		0.62		0.71	
DP - 9	6.31	94.10	6.71%	0.90	0.06	0.90	0.06	Commercial
	9.04	94.10	9.61%	0.75	0.07	0.80	0.08	Multi - Family
	78.75	94.10	83.69%	0.60	0.50	0.70	0.59	Single Family
	94.10		100.00%		0.63		0.72	
DP - 10	3.34	30.89	10.81%	0.90	0.10	0.95	0.10	Road
	27.55	30.89	89.19%	0.75	0.67	0.80	0.71	Multi - Family
	30.89		100.00%		0.77		0.82	
DP - 11	3.34	34.97	9.55%	0.90	0.09	0.95	0.09	Road
	4.08	34.97	11.67%	0.90	0.11	0.90	0.11	Commercial
	27.55	34.97	78.78%	0.75	0.59	0.80	0.63	Multi - Family
	34.97		100.00%		0.78		0.83	
DP - 12	13.73	129.07	10.64%	0.90	0.10	0.90	0.10	Commercial
	36.59	129.07	28.35%	0.75	0.21	0.80	0.23	Multi - Family
	78.75	129.07	61.01%	0.60	0.37	0.70	0.43	Single Family
	129.07		100.00%		0.67		0.75	
DP - 14	1.67	11.37	14.69%	0.90	0.13	0.95	0.14	Road
	9.70	11.37	85.31%	0.60	0.51	0.70	0.60	Single Family
	11.37		100.00%		0.64		0.74	
DP - 15	1.67	140.44	1.19%	0.90	0.01	0.95	0.01	Road
	13.73	140.44	9.78%	0.90	0.09	0.90	0.09	Commercial
	36.59	140.44	26.05%	0.75	0.20	0.80	0.21	Multi - Family
	88.45	140.44	62.98%	0.60	0.38	0.70	0.44	Single Family
	140.44		100.00%		0.67		0.75	

RUNOFF COMPUTATIONS
TRAVEL TIME CALCULATIONS

99087PR.WK4

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD, & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

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2720 EAST YAMPA STREET, SUITE 1
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(719) 636-5179

LWA # 99087.61

TABLE A:
PROPOSED CONDITIONS

23-May-2000

SHT. 1 of 3

BASIN	"P" or "K" (TR-55)	"n"	Area	"WP" or "Pipe Dia."	HIGH ELEV.	LOW ELEV.	LENGTH	HEIGHT	SLOPE	"V"	"TT" (min.)	COMMENTS
OS - A1	2.0				6751.0	6669.0	1670	82.0	4.91%	4.43	6.28	
OS - A2	2.0				6721.0	6711.0	295	10.0	3.39%	3.68	1.34	
A3		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
							1920				7.79	
DP - 1		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
							1920				7.79	
DP - 2		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
							1920				7.79	
A4		0.016	3.19	18.46	6688.0	6659.0	735	29.0	3.95%	5.72	2.14	Street Flow
A5		0.016	3.19	18.46	6686.0	6654.0	850	32.0	3.76%	5.59	2.54	Street Flow
DP - 3		0.016	3.19	18.46	6688.0	6659.0	735	29.0	3.95%	5.72	2.14	Street Flow
		0.016	3.19	18.46	6659.0	6654.0	200	5.0	2.50%	4.55	0.73	Street Flow
							935				2.87	
A6		0.016	3.19	18.46	6710.0	6691.0	780	19.0	2.44%	4.49	2.89	Street Flow
A7		0.016	3.19	18.46	6701.0	6677.0	630	24.0	3.81%	5.62	1.87	Street Flow
		0.016	8.50	29.67	6677.0	6660.0	415	17.0	4.10%	8.17	0.85	Street Flow
							1045				2.72	
DP - 4		0.016	3.19	18.46	6701.0	6677.0	630	24.0	3.81%	5.62	1.87	Street Flow
		0.016	8.50	29.67	6677.0	6660.0	415	17.0	4.10%	8.17	0.85	Street Flow
							1045				2.72	
OS - A8	2.0				6755.0	6670.0	1570	85.0	5.41%	4.65	5.62	
A9		0.016	3.19	18.46	6670.0	6654.0	675	16.0	2.37%	4.43	2.54	Street Flow
DP - 5	2.0				6755.0	6670.0	1570	85.0	5.41%	4.65	5.62	
		0.016	3.19	18.46	6670.0	6654.0	675	16.0	2.37%	4.43	2.54	Street Flow
							2245				8.16	
DP - 6		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
							2560.0				8.53	
DP - 7		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
							2710.0				8.69	
A10		0.016	1.44	24.00	6680.0	6654.0	1135	26.0	2.29%	2.15	8.78	
V =		1.486	A ^{0.67}	S ^{0.5}								
		n	P									

RUNOFF COMPUTATIONS
TRAVEL TIME CALCULATIONS

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LWA # 99087.61

99087PR.WK4
LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

TABLE A:
PROPOSED CONDITIONS

25-May-2000

SHT. 2 of 3

BASIN	"P" or "K" (TR-55)	"n"	Area	"WP" or "Pipe Dia."	HIGH ELEV.	LOW ELEV.	LENGTH	HEIGHT	SLOPE	"V"	"TT" (min.)	COMMENTS
DP - 8		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
		0.013		4.5	6646.0	6644.0	210	2.0	0.95%	12.07	0.29	4.5' Dia. RCP
						2920					8.98	
A11	2.0				6666.0	6651.0	815	15.0	1.84%	2.71	5.01	
A12	2.0				6660.0	6651.0	510	9.0	1.76%	2.66	3.20	
DP - 9		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
		0.013		4.5	6646.0	6644.0	210	2.0	0.95%	12.07	0.29	4.5' Dia. RCP
						160	1.5	0.94%	12.84	0.21	5' Dia. RCP	
						3080					9.18	
A13	2.0				6660.0	6649.0	435	11.0	2.53%	3.18	2.28	
OS-A14	2.0				6725.0	6700.0	900	25.0	2.78%	3.33	4.50	
		0.035	30.00	30.27	6700.0	6662.0	875	38.0	4.34%	8.80	1.66	Borrow Ditch
						1775					6.16	
A15		0.016	8.50	29.67	6694.0	6658.0	970	36.0	3.71%	7.77	2.08	Street Flow
DP - 10	2.0				6725.0	6700.0	900	25.0	2.78%	3.33	4.50	
		0.035	30.00	30.27	6700.0	6662.0	875	38.0	4.34%	8.80	1.66	Borrow Ditch
		4.0			6662.0	6660.0	110	2.0	1.82%	5.39	0.34	
						1885					6.50	
DP - 11	2.0				6725.0	6700.0	900	25.0	2.78%	3.33	4.50	
		0.035	30.00	30.27	6700.0	6662.0	875	38.0	4.34%	8.80	1.66	Borrow Ditch
		4.0			6662.0	6660.0	110	2.0	1.82%	5.39	0.34	
						375	15.0	4.00%	20.91	0.30	3.5' Dia. RCP	
						2260					6.80	
DP - 12		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
		0.013		4.5	6646.0	6644.0	210	2.0	0.95%	12.07	0.29	4.5' Dia. RCP
		0.013		5.0	6644.0	6642.5	160	1.5	0.94%	12.84	0.21	5' Dia. RCP
		0.013		5.5	6642.5	6638.0	470	4.5	0.96%	13.83	0.57	5' Dia. RCP
						3550					9.75	
A16		0.016	8.50	29.67	6720.0	6706.0	580	14.0	2.41%	6.27	1.54	Street Flow
A17		0.016	8.50	29.67	6702.0	6672.0	830	30.0	3.61%	7.67	1.80	Street Flow
DP - 13		0.016	8.50	29.67	6720.0	6706.0	580	14.0	2.41%	6.27	1.54	Street Flow
		0.016	8.50	29.67	6702.0	6672.0	830	30.0	3.61%	7.67	1.80	Street Flow
						1410					3.35	
A18		0.016	8.50	29.67	6670.0	6654.0	550.0	16.0	2.91%	6.88	1.33	Street Flow
V =		1.486	$\frac{A^{0.67}}{n}$		$S^{0.5}$							

RUNOFF COMPUTATIONS
TRAVEL TIME CALCULATIONS

STETSON HILLS ENCLAVE M.D.D.P.
BARNES ROAD. & MARKSHEFFEL ROAD
COLORADO SPRINGS, COLORADO

LWA # 99087.61

LEIGH WHITEHEAD & ASSOCIATES, INC.
Engineers, Surveyors & Planners
2720 EAST YAMPA STREET, SUITE 1
COLORADO SPRINGS, COLORADO
(719) 636-5179

99087PR.WK4

TABLE A:
PROPOSED CONDITIONS

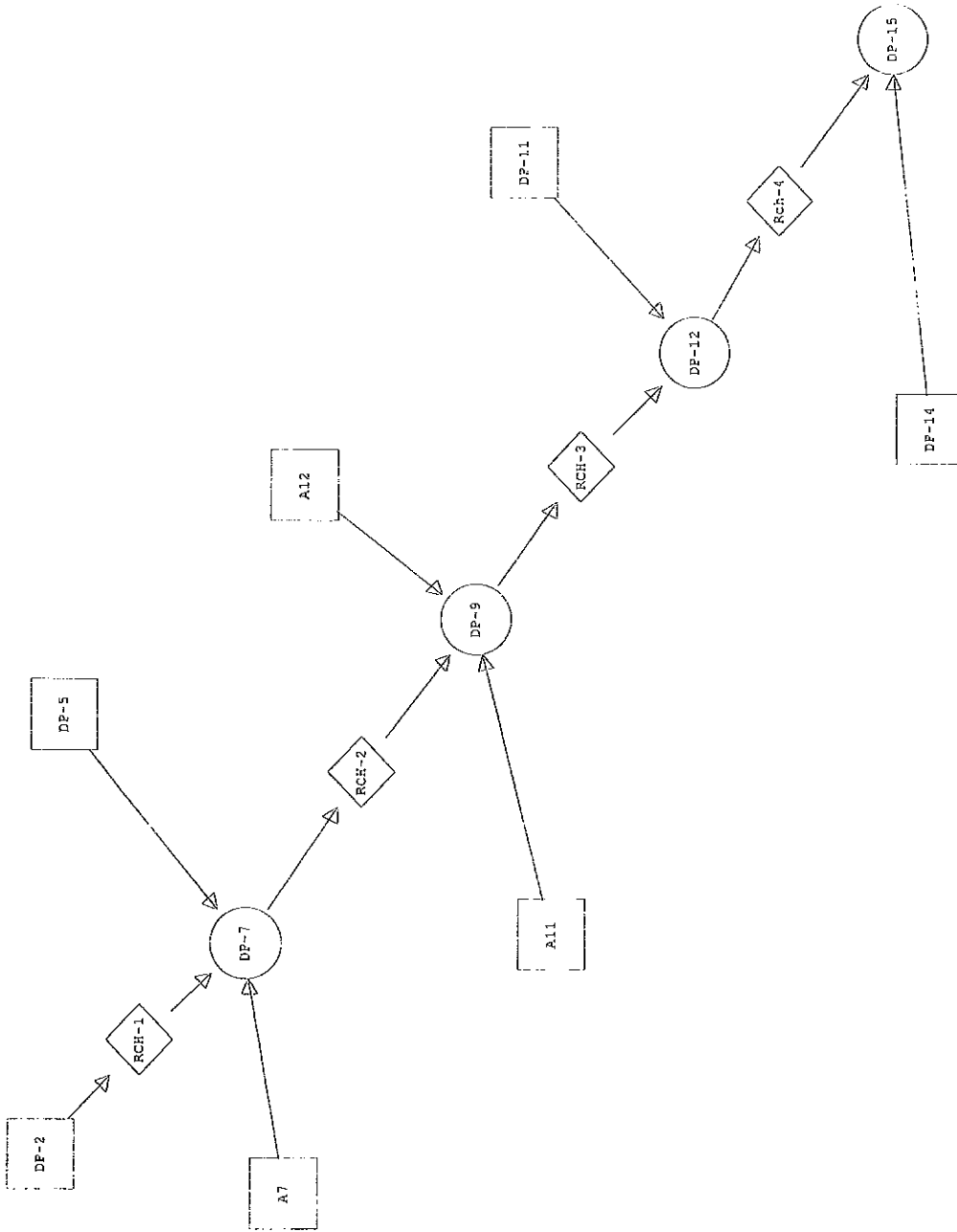
25-May-2009

SHT. 3 of 3

BASIN	"P" or "K" (TR-55)	"n"	Area	"WP" or "Pipe Dia."	HIGH ELEV.	LOW ELEV.	LENGTH	HEIGHT	SLOPE	"V"	"TT" (min.)	COMMENTS
DP - 14		0.016	8.50	29.67	6720.0	6706.0	580	14.0	2.41%	6.27	1.54	Street Flow
		0.016	8.50	29.67	6702.0	6672.0	830	30.0	3.61%	7.67	1.80	Street Flow
		0.016	8.50	29.67	6672.0	6654.0	600	18.0	3.00%	6.99	1.43	Street Flow
							2010				4.78	
DP - 15		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
		0.013		3.5	6661.0	6649.0	640	12.0	1.88%	14.32	0.74	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
		0.013		4.5	6646.0	6644.0	210	2.0	0.95%	12.07	0.29	4.5' Dia. RCP
		0.013		5.0	6644.0	6642.5	160	1.5	0.94%	12.84	0.21	5' Dia. RCP
		0.013		5.5	6642.5	6638.0	470	4.5	0.96%	13.83	0.57	5.5' Dia. RCP
		0.013	31.15	16.23	6637.6	6634.8	280	2.8	1.00%	17.65	0.25	Exist. 6' x 10' RCB
						3830				10.01		

TIME OF CONCENTRATION CALCULATIONS FOR HEC-1 MODEL

DP - 2	2.10	0.15			6725.0	6714.0	300	11.0	3.67%	0.22	22.86	
		0.016	3.19	18.46	6714.0	6690.0	1470	24.0	1.63%	3.68	6.66	Street Flow
		0.016	3.19	18.46	6690.0	6666.0	450	24.0	5.33%	6.65	1.13	Street Flow
							2220				30.64	
A7	2.10	0.15			6694.0	6688.0	300	6.0	2.00%	0.17	29.13	
		0.016	3.19	18.46	6688.0	6659.0	735	29.0	3.95%	5.72	2.14	Street Flow
		0.016	3.19	18.46	6659.0	6654.0	200	5.0	2.50%	4.55	0.73	Street Flow
		0.013		2.0	6649.3	6649.0	15	0.3	2.00%	10.18	0.02	3.5' Dia. RCP
		0.013		4.0	6649.0	6646.0	150	3.0	2.00%	16.17	0.15	4' Dia. RCP
						1400				32.18		
DP - 5	2.10	0.15			6767.0	6755.0	300	12.0	4.00%	0.23	22.07	
		2.0			6755.0	6670.0	1570	85.0	5.41%	4.65	5.62	
		0.016	3.19	18.46	6670.0	6654.0	675	16.0	2.37%	4.43	2.54	Street Flow
						2545				30.23		
A11	2.10	0.15			6670.0	6666.0	50	4.0	8.00%	0.21	3.99	
		2.0			6755.0	6670.0	1570	85.0	5.41%	4.65	5.62	
							1620				9.61	
A12	2.10	0.15			6696.0	6680.0	90	16.0	17.78%	0.32	4.64	
		0.016	1.44	24.00	6680.0	6654.0	1135	26.0	2.29%	2.15	8.78	Swale Flow
		0.013		5.0	6644.0	6642.5	160	1.5	0.94%	12.84	0.21	5' Dia. RCP
						1385				13.63		
DP - 11	2.10	0.15			6730.0	6725.0	300	5.0	1.67%	0.16	31.33	
		2.0			6725.0	6700.0	900	25.0	2.78%	3.33	4.50	
		0.035	30.00	30.27	6700.0	6662.0	875	38.0	4.34%	8.80	1.65	Borrow Ditch
		4.0			6662.0	6660.0	110	2.0	1.82%	5.39	0.34	
		0.013		3.5	6660.0	6645.0	375	15.0	4.00%	20.91	0.30	3.5' Dia. RCP
						2560				38.13		
DP - 14	2.10	0.15			6723.0	6720.0	160	3.0	1.88%	0.15	18.08	
		0.016	8.50	29.67	6720.0	6702.0	580	16.0	3.10%	7.11	1.35	Street Flow
		0.016	8.50	29.67	6702.0	6672.0	830	30.0	3.61%	7.67	1.80	Street Flow
		0.016	8.50	29.67	6672.0	6654.0	600	18.0	3.00%	6.99	1.43	Street Flow
						2170				22.67		
V =		1.486 n	A ^{0.67} P		S ^{0.5}							



HEC1 S/N: 1343001909

HMVersion: 6.33

Data File: C:\WINDOWS\TEMP\~vbh153F.TMP

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*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* MAY 1991 *
* VERSION 4.0.1E *
*
* RUN DATE 05/26/2000 TIME 09:27:31 *
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*****
*
* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*
*****

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:::
::: Full Microcomputer Implementation :::
::: by :::
::: Haestad Methods, Inc. :::
:::
::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::

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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 ID Stetson Hills Enclave, Proposed 5 Yr. & 100 Yr. Flows
2 IT 2 300

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3	IO	5	0								
4	JR	PREC	1.0000	0.5909							
5	KK	DP-2									
6	KM	Basins OS-A1 through A3									
7	KO										22
8	BA	0.0749									
9	PB	4.4									
10	IN	15									
11	PC	0.0	0.0005	0.0015	0.003	0.0045	0.006	0.008	0.01	0.012	0.0143
12	PC	0.0165	0.0188	0.021	0.0233	0.0255	0.0278	0.032	0.039	0.046	0.053
13	PC	0.06	0.075	0.1	0.4	0.7	0.725	0.75	0.765	0.78	0.79
14	PC	0.8	0.81	0.82	0.825	0.83	0.835	0.84	0.845	0.85	0.855
15	PC	0.86	0.8638	0.8675	0.8713	0.875	0.8788	0.8825	0.8863	0.89	0.8938
16	PC	0.8975	0.9013	0.905	0.9083	0.9115	0.9148	0.918	0.921	0.924	0.927
17	PC	0.93	0.9325	0.935	0.9375	0.94	0.9425	0.945	0.9475	0.95	0.9525
18	PC	0.955	0.9575	0.96	0.9625	0.965	0.9675	0.97	0.9725	0.975	0.9775
19	PC	0.98	0.9813	0.9825	0.9838	0.985	0.9863	0.9875	0.9888	0.99	0.9913
20	PC	0.9925	0.9938	0.995	0.9963	0.9975	0.9988	1.0	1.0	1.0	1.0
21	LS		85								
22	UD	0.3064									
23	KK	RCH-1									
24	KM	Reach 1, 42" RCP									
25	KO										22
26	RK	790	0.019	0.013		CIRC	3.5				
27	KK	A7									
28	KM	Sub-Basins A4 through A7									
29	KO										22
30	BA	0.0333									
31	LS		85								85
32	UD	0.4212									
33	KK	DP-5									
34	KM	Sub-Basins OS-A8 & A9									
35	KO										22
36	BA	0.0174									
37	LS		85.42								85.42
38	UD	0.3023									
39	KK	DP-7									
40	KM	Sub-Basins OS-A1 through A9									
41	KO										22
42	HC	3									
43	KK	RCH-2									
44	KM	Reach 2, 54" & 60" RCP									
45	KO										22
46	RK	370	0.0095	0.013		CIRC	4.75				
47	KK	A11									
48	KM	Sub-Basin A11									
49	KO										22
50	BA	0.0069									
51	LS		92								92
52	UD	0.0961									
53	KK	A12									
54	KM	Sub-Basins A10 & A12									
55	KO										22
56	BA	0.0147									
57	LS		88.81								88.81
58	UD	0.1363									
59	KK	DP-9									
60	KM	Sub-Basins OS-A1 through A12									

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61	KO							
62	HC	3			22			
63	KK	RCH-3						
64	KM	Reach 3, 60" RCP						
65	KO				22			
66	RK	470	0.0096	0.013	CIRC	5.0		
67	KK	DP-11						
68	KM	Sub-Basins A13 through A15						
69	KO				22			
70	BA	0.0546						
71	LS		89.42		89.42			
72	UD	0.3813						
73	KK	DP-12						
74	KM	Sub-Basins OS-A1 through A15						
75	KO				22			
76	HC	2						
77	KK	Rch-4						
78	KM	Reach 4, 6' x 10' RCBC						
79	KO				22			
80	RK	280	0.010	0.013	DEEP	6.0	0	
81	KK	DP-14						
82	KM	Sub-Basins A16 through A18						
83	KO				22			
84	BA	0.0178						
85	LS		86.91		86.91			
86	UD	0.2267						
87	KK	DP-15						
88	KM	Sub-Basins OS-A1 through A18						
89	KO				22			
90	HC	2						
91	ZZ							

Stetson Hills Enclave, Proposed 5 Yr. & 100 Yr. Flows

3 IO

OUTPUT CONTROL VARIABLES
 IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

IT

HYDROGRAPH TIME DATA
 NMIN 2 MINUTES IN COMPUTATION INTERVAL
 IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 1 0 ENDING DATE
 NDTIME 0958 ENDING TIME
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
 TOTAL TIME BASE 9.97 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET

SURFACE AREA ACRES
 TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 1.00 0.59

*** **

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION		
					RATIO 1	RATIO 2
					1.00	0.59
HYDROGRAPH AT	DP-2	0.07	1	FLOW	178.	80.
				TIME	6.17	6.17
ROUTED TO	RCH-1	0.07	1	FLOW	178.	79.
				TIME	6.17	6.17
HYDROGRAPH AT	A7	0.03	1	FLOW	66.	29.
				TIME	6.27	6.27
HYDROGRAPH AT	DP-5	0.02	1	FLOW	42.	19.
				TIME	6.13	6.17
3 COMBINED AT	DP-7	0.13	1	FLOW	282.	125.
				TIME	6.17	6.20
ROUTED TO	RCH-2	0.13	1	FLOW	282.	125.
				TIME	6.17	6.20
HYDROGRAPH AT	A11	0.01	1	FLOW	26.	14.
				TIME	6.00	6.00
HYDROGRAPH AT	A12	0.01	1	FLOW	49.	25.
				TIME	6.03	6.03
3 COMBINED AT	DP-9	0.15	1	FLOW	324.	144.
				TIME	6.10	6.13
ROUTED TO	RCH-3	0.15	1	FLOW	324.	144.
				TIME	6.10	6.13
HYDROGRAPH AT	DP-11	0.05	1	FLOW	133.	64.
				TIME	6.20	6.23
2 COMBINED AT	DP-12	0.20	1	FLOW	450.	205.

				TIME		
ROUTED TO	Rch-4	0.20	1	FLOW TIME	450. 6.13	205. 6.17
HYDROGRAPH AT	DP-14	0.02	1	FLOW TIME	51. 6.10	24. 6.10
2 COMBINED AT	DP-15	0.22	1	FLOW TIME	499. 6.13	228. 6.17

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL				
						DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	
FOR PLAN = 1	RATIO= 1.00									
RCH-1	MANE	0.29	177.79	369.87	2.78	2.00	177.79	370.00	2.78	
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1111E+02 EXCESS=0.0000E+00 OUTFLOW=0.1110E+02 BASIN STORAGE=0.5528E-02 PERCENT ERROR= 0.0										
FOR PLAN = 1	RATIO= 0.59									
RCH-1	MANE	0.37	79.51	370.59	1.24	2.00	79.33	370.00	1.24	
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4950E+01 EXCESS=0.0000E+00 OUTFLOW=0.4947E+01 BASIN STORAGE=0.3296E-02 PERCENT ERROR= 0.0										
FOR PLAN = 1	RATIO= 1.00									
RCH-2	MANE	0.18	282.03	370.25	2.78	2.00	281.71	370.00	2.78	
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1864E+02 EXCESS=0.0000E+00 OUTFLOW=0.1863E+02 BASIN STORAGE=0.4966E-02 PERCENT ERROR= 0.0										
FOR PLAN = 1	RATIO= 0.59									
RCH-2	MANE	0.26	125.26	372.20	1.24	2.00	125.25	372.00	1.24	
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8310E+01 EXCESS=0.0000E+00 OUTFLOW=0.8307E+01 BASIN STORAGE=0.2773E-02 PERCENT ERROR= 0.0										
FOR PLAN = 1	RATIO= 1.00									
RCH-3	MANE	0.27	324.28	366.33	2.85	2.00	323.81	366.00	2.85	
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2240E+02 EXCESS=0.0000E+00 OUTFLOW=0.2239E+02 BASIN STORAGE=0.6941E-02 PERCENT ERROR= 0.0										
FOR PLAN = 1	RATIO= 0.59									
RCH-3	MANE	0.30	144.10	368.12	1.29	2.00	144.07	368.00	1.29	

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1015E+02 EXCESS=0.0000E+00 OUTFLOW=0.1015E+02 BASIN STORAGE=0.4159E-02 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 1.00

Rch-4	MANE	0.10	450.15	368.16	2.94	2.00	449.86	368.00	2.94
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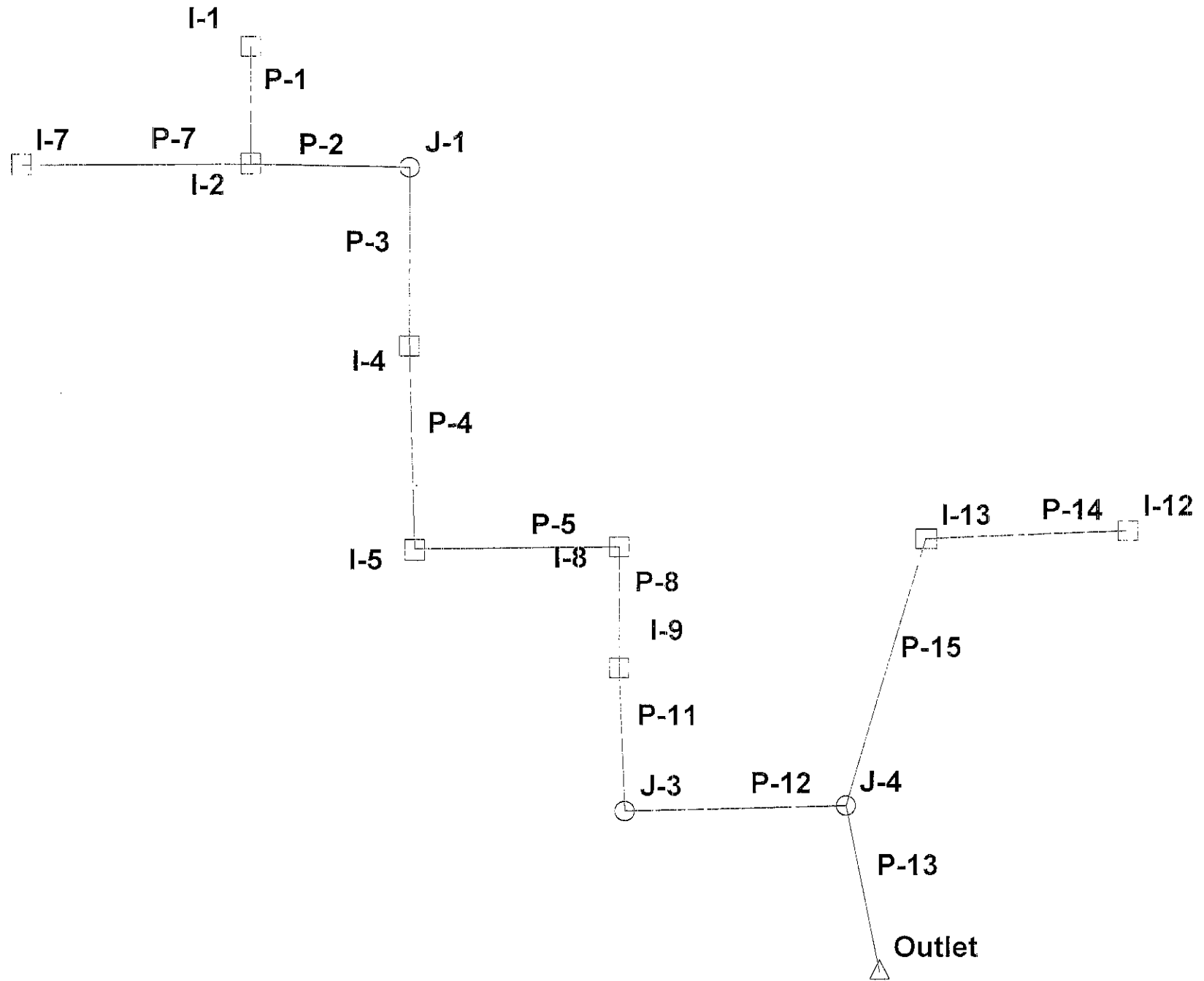
CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3169E+02 EXCESS=0.0000E+00 OUTFLOW=0.3169E+02 BASIN STORAGE=0.7292E-02 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.59

Rch-4	MANE	0.24	205.37	370.15	1.36	2.00	205.32	370.00	1.36
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CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1466E+02 EXCESS=0.0000E+00 OUTFLOW=0.1466E+02 BASIN STORAGE=0.3989E-02 PERCENT ERROR= 0.0

*** NORMAL END OF HEC-1 ***



----- Beginning Calculation Cycle -----

Discharge: 69.50 cfs at node I-1
 Discharge: 7.80 cfs at node I-7
 Discharge: 87.70 cfs at node I-2
 Discharge: 87.70 cfs at node J-1
 Discharge: 125.60 cfs at node I-4
 Discharge: 143.30 cfs at node I-5
 Discharge: 162.50 cfs at node I-8
 Discharge: 177.00 cfs at node I-9
 Discharge: 177.00 cfs at node J-3
 Discharge: 78.90 cfs at node I-12
 Discharge: 90.40 cfs at node I-13
 Discharge: 267.40 cfs at node J-4
 Discharge: 267.40 cfs at node Outlet

Beginning iteration 1

Discharge: 69.50 cfs at node I-1
 Discharge: 7.80 cfs at node I-7
 Discharge: 87.70 cfs at node I-2
 Discharge: 87.70 cfs at node J-1
 Discharge: 125.60 cfs at node I-4
 Discharge: 143.30 cfs at node I-5
 Discharge: 162.50 cfs at node I-8
 Discharge: 177.00 cfs at node I-9
 Discharge: 177.00 cfs at node J-3
 Discharge: 78.90 cfs at node I-12
 Discharge: 90.40 cfs at node I-13
 Discharge: 267.40 cfs at node J-4
 Discharge: 267.40 cfs at node Outlet

Discharge Convergence Achieved in 1 iterations: relative error: 0.0

Warning: No Duration data exists in IDF Table

Information: P-11 Surcharged condition
 Information: P-8 Surcharged condition
 Information: P-5 Surcharged condition
 Information: P-4 Surcharged condition

----- Calculations Complete -----

** Analysis Options **

Friction method: Manning's Formula
 HGL Convergence Test: 0.001000
 Maximum Network Traversals: 5
 Number of Pipe Profile Steps: 5
 Discharge Convergence Test: 0.001000
 Maximum Design Passes: 3

----- Network Quick View -----

Label	Length	Size	Discharge	Hydraulic Grade	
				Upstream	Downstream
P-4	150.00	48 inch	125.60	6,656.97	6,655.82
P-5	240.00	48 inch	143.30	6,655.22	6,652.83
P-1	115.00	42 inch	69.50	6,666.61	6,665.59
P-2	85.00	42 inch	87.70	6,664.61	6,662.49
P-3	555.00	42 inch	87.70	6,662.41	6,658.21
P-7	470.00	18 inch	7.80	6,686.28	6,665.59
P-8	120.00	48 inch	162.50	6,651.53	6,649.99
P-11	220.00	48 inch	177.00	6,647.53	6,644.18
P-12	160.00	48 inch	177.00	6,643.88	6,641.36
P-13	270.00	10 x 6 ft	267.40	6,640.41	6,636.79
P-14	300.00	30 inch	78.90	6,662.46	6,648.33

P-15 210.00 36 inch 90.40 6,646.75 6,640.69

Label	Discharge	Elevations		
		Ground	Upstream HGL	Downstream HGL
I-4	125.60	6,659.00	6,658.21	6,656.97
I-5	143.30	6,662.00	6,655.82	6,655.22
I-8	162.50	6,654.00	6,652.83	6,651.53
I-1	69.50	6,668.00	6,666.61	6,666.61
I-2	87.70	6,667.00	6,665.59	6,664.61
J-1	87.70	6,667.50	6,662.49	6,662.41
I-7	7.80	6,690.00	6,686.28	6,686.28
I-9	177.00	6,651.00	6,649.99	6,647.53
J-3	177.00	6,656.00	6,644.18	6,643.88
J-4	267.40	6,657.00	6,640.69	6,640.41
Outlet	267.40	6,658.00	6,636.79	6,636.79
I-12	78.90	6,666.00	6,662.46	6,662.46
I-13	90.40	6,649.50	6,648.33	6,646.75

Elapsed: 0 minute(s) 5 second(s)

PIPE HYDRAULIC REPORT

Pipe	-Node- Up Dn	-Invert- Up Dn (ft)	Length (ft)	S (ft/ft)	-Section- Shape Size	Q (cfs)	Cap (cfs)	-Depth- Up Dn (ft)	-HGL- Up Dn (ft)	-EGL- Up Dn (ft)	-Ground- Up Dn (ft)	V avg (ft/s)	Roughness
P-14	I-12	6,660.00	300.00	0.053667	Circular 30 inch	78.90	95.02	2.46	6,662.46	6,666.50	6,666.00	16.10	0.013
	I-13	6,643.90						4.43	6,648.33	6,652.35	6,649.50		
P-15	I-13	6,643.90	210.00	0.030000	Circular 36 inch	90.40	115.52	2.85	6,646.75	6,649.39	6,649.50	12.91	0.013
	J-4	6,637.60						3.09	6,640.69	6,643.23	6,657.00		
P-7	I-7	6,685.20	470.00	0.050000	Circular 18 inch	7.80	23.49	1.08	6,686.28	6,686.79	6,690.00	5.06	0.013
	I-2	6,661.70						3.89	6,665.59	6,665.89	6,667.00		
P-1	I-1	6,664.00	115.00	0.020000	Circular 42 inch	69.50	142.28	2.61	6,666.61	6,667.88	6,668.00	8.12	0.013
	I-2	6,661.70						3.89	6,665.59	6,666.40	6,667.00		
P-2	I-2	6,661.70	85.00	0.025882	Circular 42 inch	87.70	161.85	2.91	6,664.61	6,666.25	6,667.00	10.13	0.013
	J-1	6,659.50						2.99	6,662.49	6,664.05	6,667.50		
P-3	J-1	6,659.50	555.00	0.019099	Circular 42 inch	87.70	139.03	2.91	6,662.41	6,664.05	6,667.50	9.68	0.013
	I-4	6,648.90						9.31	6,658.21	6,659.50	6,659.00		
P-4	I-4	6,648.90	150.00	0.020000	Circular 48 inch	125.60	203.13	8.07	6,656.97	6,658.52	6,659.00	9.99	0.013
	I-5	6,645.90						9.92	6,655.82	6,657.37	6,662.00		
P-5	I-5	6,645.90	240.00	0.010833	Circular 48 inch	143.30	149.50	9.32	6,655.22	6,657.24	6,662.00	11.40	0.013
	I-8	6,643.30						9.53	6,652.83	6,654.85	6,654.00		
P-8	I-8	6,643.00	120.00	0.008333	Circular 48 inch	162.50	131.12	8.53	6,651.53	6,654.13	6,654.00	12.93	0.013
	I-9	6,642.00						7.99	6,649.99	6,652.59	6,651.00		
P-11	I-9	6,642.00	220.00	0.011364	Circular 48 inch	177.00	153.12	5.53	6,647.53	6,650.61	6,651.00	14.09	0.013
	J-3	6,639.50						4.68	6,644.18	6,647.27	6,656.00		
P-12	J-3	6,639.50	160.00	0.011875	Circular 48 inch	177.00	156.52	4.38	6,643.88	6,646.96	6,656.00	14.26	0.013
	J-4	6,637.60						3.76	6,641.36	6,644.60	6,657.00		
P-13	J-4	6,637.60	270.00	0.010000	Box 10 x 6 ft	267.40	1,042.81	2.81	6,640.41	6,641.82	6,657.00	11.82	0.013
	Outlet	6,634.90						1.89	6,636.79	6,639.89	6,658.00		

STETSON HILLS ENCLAVE M.D.D.P.
 BARNES ROAD & MARKSHEFFEL ROAD
 COLORADO SPRINGS, COLORADO

99087PR.WK4

LEIGH WHITEHEAD & ASSOCIATES
 ENGINEERS, SURVEYORS & PLANNERS
 2720 EAST YAMPA STREET, SUITE 1
 COLORADO SPRINGS, CO. 80909
 (719) 636-5179

LWA # 99087.61

07-Aug-2000

SHT. 1 of 2

CATCH BASIN SIZE CALCULATIONS
 Curb Inlet (Sump Condition)

Basin No.	Inlet Size	Depth	Clog Factor	Intercepted Flow (Weir)	Intercepted Flow (Orifice)	Intercepted Flow (Cb Opening.)	Control Factor	5 Yr. Flow (cfs)	100 Yr. Flow (cfs)	Flowby	DESCRIPTION
DP - 1	12.0	0.53	1.25	16.2	23.3	16.2	WEIR	16.2		0.0	USE 12' D10R
DP - 1	12.0	1.43	1.25	60.1	40.1	40.1	ORIFICE		40.1	0.0	USE 12' D10R
DP - 3	15.0	0.55	1.25	20.1	29.7	20.1	WEIR	20.1		0.0	USE 15' D10R
DP - 3	15.0	1.13	1.25	50.6	44.2	44.2	ORIFICE		44.2	0.0	USE 15' D10R
DP - 5	15.0	0.59	1.25	21.7	30.9	21.7	WEIR	21.7		0.0	USE 15' D10R
DP - 5	15.0	1.16	1.25	52.6	44.8	44.8	ORIFICE		44.8	0.0	USE 15' D10R
DP - 4	20.0	0.56	1.25	25.8	39.8	25.8	WEIR	25.8		0.0	USE 20' D10R
DP - 4	20.0	1.05	1.25	57.9	56.6	56.6	ORIFICE		56.6	0.0	USE 20' D10R
A10	15.0	0.59	1.25	21.7	30.9	21.7	WEIR	21.7		0.0	USE 15' D10R
A10	15.0	0.98	1.25	41.4	40.9	40.9	ORIFICE		40.9	0.0	USE 15' D10R
A11	12.0	0.61	1.25	19.0	25.2	19.0	WEIR	19.0		0.0	USE 12' D10R
A11	12.0	1.01	1.25	36.3	33.3	33.3	ORIFICE		33.3	0.0	USE 12' D10R
A12	6.0	0.48	1.25	8.9	11.0	8.9	WEIR	8.9		0.0	USE 6' D10R
A12	6.0	1.23	1.25	29.5	18.5	18.5	ORIFICE		18.5	0.0	USE 6' D10R
A13	12.0	0.61	1.25	19.1	25.3	19.1	WEIR	19.1		0.0	USE 12' D10R
A13	12.0	1.01	1.25	36.4	33.3	33.3	ORIFICE		33.3	0.0	USE 12' D10R

WEIR FLOW = (1.7*Li+6.12) (Dmax + 0.25) ^1.85/CLOG, FOR DEPTHS < 0.67'
 ORIFICE FLOW = (3.60*Li) D-0.08^0.5/CLOG , FOR DEPTHS > 0.94'

