Les Schwab Tire Center
Storm Report

7105 Old Meridian RD.
Falcon Colorado

Prepared For:

SFP-E, LLC
PO Box 5350
20900 Cooley Road
Bend, OR 97701

Prepared By:

Cushing Terrell

Zack Graham, PE
411 E Main ST #101
Bozeman, MT 59715
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Cushing Terrell Project No. LSCO_21WIN
PCD FILLING NO. : PPR-21-023
JULY, 21, 2021

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1.0 CONTENTS

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APPENDICES

Design Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable 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.

Digitally signed by Zack Graham
Date: 2021.10.11 12:56:02 -06'00'

10/11/21

[Zack Graham, PE #39039] Date

Owner/Developer's Statement:

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

DocuSigned by:
George Bunting
603618E0C89B42D...

10/11/21

George Bunting, Date

SFP-E, LLC

P.O. BOX 5350 Bend OR 97708

El Paso County:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

APPROVED
Engineering Department
10/18/2021 4:23:50 PM
dsdnijkamp
EPC Planning & Community Development Department

Jennifer Irvine, P.E.

County Engineer / ECM Administrator

Conditions:

2.0 GENERAL LOCATION AND DESCRIPTION

2.1 Location

The project site is located at 7105 N Meridian Rd, Falcon, Colorado and falls within El Paso County. The parcel is part of the larger Meridian Crossing Development, which includes the existing stormwater system infrastructure, including the treatment pond to the south. The site is located on the northeast side of the intersection of Meridian Rd and N Meridian Rd. The site is located to north of the existing storm water treatment facilities maintained by the Meridian Crossing Development and an existing storm line runs along the south west property line of the site. The property lies within the NE ¼ of Section 12, Township 13 S, Range 65 West of the Sixth Principal Meridian.

2.2 Description of Property

The existing site consists of an undeveloped 2.48 acre lot covered with native grasses and shrubs. In areas taken from the ALTA Survey the site consists of roughly 12% impervious road and sidewalk area with the remaining 88% being the native vegetation. There are no stream crossings or significant waterways located within the area being developed by this project. The site is accessed via the existing private roads that are centered on the north east and south east property lines of the site. These roads will provide means of vehicular ingress and egress. The site falls entirely with the Falcon Major Drainage Basin as identified by the Falcon Drainage Basin Planning Study dated September 2015.

The topography of the existing site consists of a roughly consistent grade which directs flow from the north of the site towards the south at slopes ranging from 2-5%. There is an existing storm PLD pond located to the south of the neighboring lot that ultimately then out falls to the existing detention pond WU. The site is not located in a floodway or flood plain and is designated as area of minimal flood hazard (Zone X) per FEMA FIRM panel 08041C0561G.

2.3 Existing PLD Condition Assessment

Runoff from this site will be collected via proposed curb and gutter and be routed overland to the existing Porous Landscape Detention pond. In field observations on 1/5/2021 and 06/18/2021 this pond has been determined to need maintenance as prescribed in the operation and maintenance manual that is included as appendix H of the Meridian Crossing Final Drainage Report (MCFDR). This full report is located as appendix E of this report. Specifically, we recommend the pond should be cleared of Debris and Litter and that landscaping should be removed and replaced for portions of the pond where the existing landscaping is failing. Photos showing the condition for this PLD are included in Appendix F of this report.

3.0 DRAINAGE BASINS

3.1 Reference Reports and Manuals

- Meridian Crossing Final Drainage Report (MCFDR)
- Colorado Springs Drainage Criteria (CSDC)
- El Paso County Drainage Criteria Manual (EPCSCM)
- Mile High Flood Control District Criteria Manual (MHFC)

3.2 Existing Drainage Basins

See appendix B for drainage maps showing basin locations, and appendix A for full drainage calculation sheets.

3.2.1 BASIN X

Basin X is the sole existing basin that consists of the entire 2.48 acres site. The flow path of this basin is from north to south into the existing private drive at design points 1 and 2. Once leaving the property across the existing private drive runoff enters the adjacent lot. The groundcover of this basin is primarily native grasses but also contains a portion of the private drive. After flowing across the southern property, the runoff enters the PLD (porous landscape detention) before being captured by the existing outlet structure and being routed to detention pond WU. The rational calculation for the basin is shown below in table 3.1

Table 3.1

RATIONAL CALC EXISTING									
Basin	% Impervious	C5	C100	Area	TC	I 5 year	I 100 yesr	Q 5	Q 100
X	12	0.28	0.42	2.48	25	2.6	4.5	1.81	4.69
TOTAL	12	0.28	0.42	2.48				1.81	4.69

3.3 Proposed Drainage Basins

See appendix B for drainage maps showing basin locations, and appendix A for full drainage calculation sheets. In general, all basins flow to the south and outlet on the existing private road. These basins then flow through the neighboring property to the south and outfall at the existing PLD pond following the historic route. The exception to this being basin A which follows the historic drainage pattern for this area of the site and flows to Old Meridian Road where it is captured by existing storm infrastructure.

3.3.1 BASIN A

Basin A consists of the proposed sidewalk connection and the landscaping along old meridian road. The runoff for this basin is captured by the curb and gutter and directed to the existing curb inlets in Old Meridian Road following the historic route.

3.3.2 BASIN B

Basin B consists of a portion of the building roof flows which are released at grade via downspouts along the rear of the structure and the south west portion of the side parking and drive aisles. These flows are then conveyed to the private road on the south of the site at design point 1. The flows then follow the historic path across the private drive into the neighboring site and ultimately the PLD pond.

3.3.3 BASIN C

Basin C consists of the parking, and drive aisles located along a portion of the front and east sides of the building. The flows are collected by curb and gutter and directed via a curb cut and concrete channel to the sidewalk chase at design point 3. The flows then follow the historic path across the private drive into the neighboring site and ultimately the PLD pond.

3.3.4 BASIN D

Basin D consists of the remainder of the roof flows which are released at grade via downspouts along the rear of the structure and the drive aisle and parking off the rear of the building. These flows are captured by curb and gutter and directed to the sidewalk chase at design point 2. The flows then follow the historic path across the private drive into the neighboring site and ultimately the PLD pond.

3.3.5 BASIN E

Basin E consists of the existing private drive on the north east edge of the site and a small portion on the landscaping adjacent to it. These flows are captured in the existing curb and gutter and are routed to the PLD through this existing curb.

Table 3.2

RATIONAL CALC PROPOSED									
Basin	% Impervious	C5	C100	Area	TC*	I 5 year	I 100 year	Q 5	Q 100
A	8	0.15	0.4	0.20	5	5.2	9	0.16	0.72
B	88	0.80	0.89	0.54	6	5	8.8	2.16	4.23
C	54	0.52	0.68	1.01	11	3.7	7	1.94	4.81
D	90	0.82	0.9	0.56	5	5.2	9	2.39	4.54
E	87	0.79	0.88	0.17	5	5.2	9	0.70	1.35
TOTAL	68			2.48				7.35	15.64

*Minimum value of 5 min used

4.0 DRAINAGE DESGIN CRITERIA

4.1 Development Criteria Reference

This report was prepared using the City of Colorado Springs Drainage Criteria (CSDC) chapter 6 and the Mile High Flood District Criteria Manual. In creating this report reference was made to the “Meridian Crossing Final Drainage Report” which is included in Appendix E and describes the existing stormwater quality treatment and detention facilities that will be used by this project.

4.2 Hydrologic Criteria

Because the site in question is under 100 acres, the rational method was used to determine the peak stormwater runoff for all basins. For the purposes of sizing proposed stormwater structures, the major 100-year storm as described in the CSDC was used. The rational method coefficients for these calculations were selected from Table 6-6 of the CSDC. Time of concentration was calculated per CSDC section 3.2 (See appendix A for calculation). All rainfall values were taken from Figure 6-6 of the CSDC.

5.0 DRAINAGE FACILITY DESIGN

The drainage facilities proposed for this project consist of curb and gutter, concrete channels, and sidewalk chases designed to collect the additional flows generated by development of the site. These facilities flow south following the historic route to the existing western PLD treatment facility. This PLD consists of a grassy swale and contains and outlet structure which outlets into a storm network under old meridian road that then discharges into a swale located to the west. This swale conveys water to the detention pond known as pond WU (page 11 of MCFDR).

The design and calculations of this existing stormwater treatment and detention facility are not within the scope of this report and can be found in the “Meridian Crossing Final Drainage Report” which is included in Appendix E.

The treatment facility is described as a “Porous Landscape Detention” (PLD) and is described in detail on page 16 of the referenced report. This facility was sized to include flows created by the future development we are now proposing. The proposed Les Schwab site can be described as the northern half of basin D-2 using the terminology of the referenced report. The assumed imperviousness for the tributary area to the PLD used in the referred report was 82% (see appendix E of MCFDR) our proposed design has a percent imperviousness of 68%. For the entire D-2 basin as described in the referenced report the assumed post development flows generated are 23.4 CFS for the minor event and 43.9 CFS for the major event (page 11). The Les Schwab site makes up roughly half of this basin (49%) and generates 7.35 CFS in the minor event and 15.64 CFS in the major event. These flows are well within the expected values for 49% of the basin which would be 11.5 CFS for minor and 21.5 CFS for major storm. No improvements are proposed for this PLD or detention pond WU which are both owned and maintained by Park Place Enterprises, LLC.

6.0 FOUR STEP PROCESS

6.1 Step 1 Employ Runoff Reduction Methods

To reduce runoff peak flows and volume our site discharges to the preexisting grass lined PLD pond that infiltrates / treats the stormwater. Our site also uses a compact design for impervious areas with a total percent imperviousness of 68% which is 14% lower than design imperviousness used by the "Meridian Crossing Final Drainage Report" which sized the facilities for this project.

6.2 Step 2 Stabilize Drainageways

The internal drainageways to the Les Schwab site are stabilized via the use of concrete curb and gutter, concrete channels, and sidewalk chases. Once water leaves the site it flows overland to the existing PLD channel and ultimately to the existing pond WU through storm sewer and a grass lined swale.

Because the design for the overall development calls for overland flow from the Les Schwab site across the adjacent property to the southeast and ultimately to the water quality treatment pond on that property, we evaluated the erosion potential due to runoff across the adjacent property. The adjacent property is characterized by fine to course sandy loam soils with sparce native prairie grasses as indicated in the photo below:

In the existing condition, the existing road separating the two lots tends to concentrate runoff from the Les Schwab site at the approaches to the adjacent property such that the existing condition for runoff from the Les Schwab site should be considered shallow/concentrated flow as it flows through the adjacent property. Signs of light erosion are evident where runoff transitions from shallow/concentrated flow into the existing pond as indicated in the photo below:

This also shows that the vegetation in this pond could use maintenance to increase the overall density and efficacy of the growth.

While the proposed development will increase peak runoff flowrates and overall runoff volume, based on TR-55, the velocity of the shallow/concentrated condition does not increase, rather the flow widens over a larger area. The average slope across the adjacent lot is 1.5%. Based on Figure 3-1 of TR-55, this correlates to a velocity of 2 ft/sec. The maximum permissible velocity, for non-colloidal (assumed conservative condition) sandy loam, is 1.75 ft/s per Table 7-3 of Chow. However, because of the vegetative condition, the direction of flow is not direct across the gradually sloped surface resulting in a slower than 2 ft/s velocity. This is evidenced by lack of erosion in the existing condition. Based on the above analysis, I do not expect a general increase in erosion on the adjacent property beyond what might occur in the existing condition.

6.3 Step 3 Provide Water Quality Capture Volume

Water quality Capture Volume is provided by the existing southern Porous Landscape Detention. The design of this facility is not within the scope of this report but in summary the pond has a design capacity of 4,568 CF and is sized to provide water quality treatment for a post development basin D-2 with an 82% imperviousness. Please see the “Meridian Crossing Final Drainage Report” located in appendix E for more information regarding this pond.

6.4 Step 4 Consider Need for Industrial and Commercial BMPs

No industrial or commercial BMPs are proposed for this site. Potential pollutants such as oil fluids etc. are stored and handled inside the building and captured by floor drains directed to a sand oil separator before being outlet to the sanitary system. The outdoor storage of the site contains only used car tires which do not present the need for spill prevention or a roofed enclosure any more than a typical parking lot. The proposed CMU walls serve solely for visual screening / theft prevention.

7.0 CONCLUSIONS

The proposed design meets the design assumptions utilized in the "Meridian Crossing Final Drainage Report" that is included in Appendix E. The "West PLD", which this site is drains to, assumed a developed condition with a percent impervious area of 82%. The proposed design has a percent impervious area of 68%. Therefore, the anticipated peak runoff and water quality volume is less than what the PLD "West PLD" was originally designed to detain and treat from this development and no additional stormwater quality treatment or detention volume is required for this project.

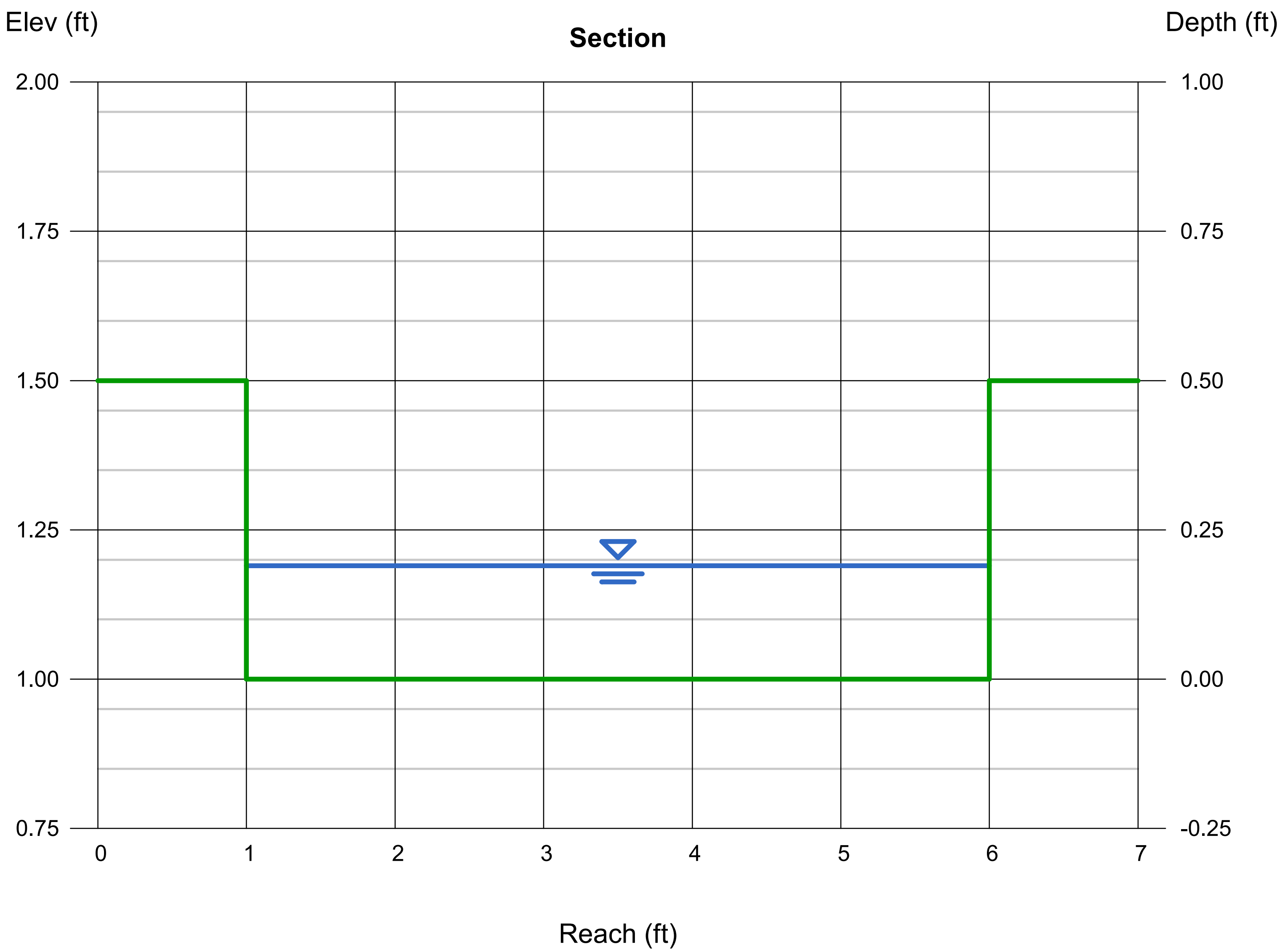
Cushing Terrell

APPENDIX A: HYDROLOGIC AND HYDRAULIC CALCULATIONS

Channel Report

5 YEAR CONC CHANNEL

Rectangular		**Highlighted**	
Bottom Width (ft)	= 5.00	Depth (ft)	= 0.19
Total Depth (ft)	= 0.50	Q (cfs)	= 1.940
		Area (sqft)	= 0.95
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.04
Slope (%)	= 0.50	Wetted Perim (ft)	= 5.38
N-Value	= 0.016	Crit Depth, Yc (ft)	= 0.17
		Top Width (ft)	= 5.00
Calculations		EGL (ft)	= 0.25
Compute by:	Known Q		
Known Q (cfs)	= 1.94		



Channel Report

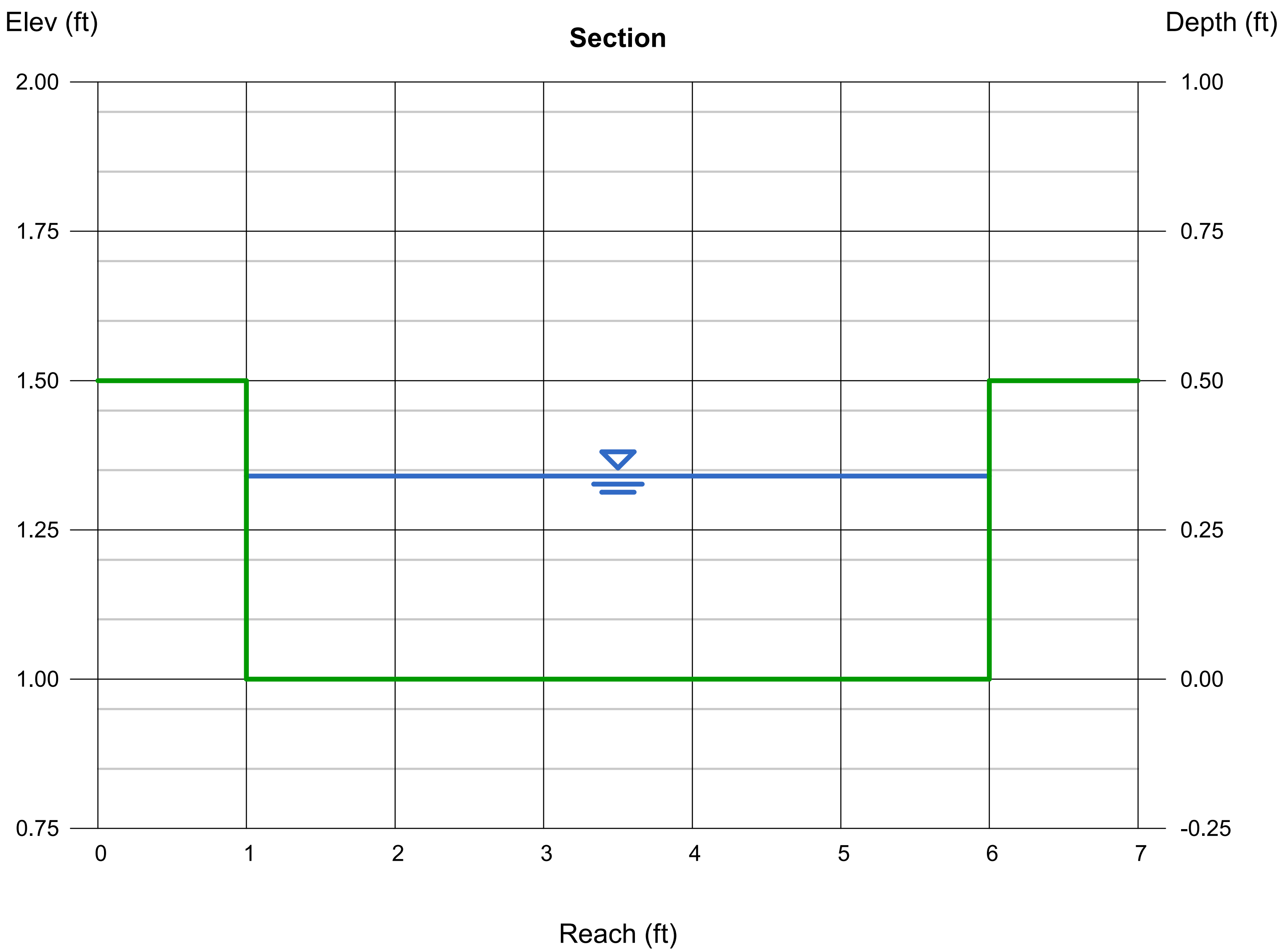
100 YEAR CONC CHANNEL

Rectangular
Bottom Width (ft) = 5.00
Total Depth (ft) = 0.50

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.016

Calculations
Compute by: Known Q
Known Q (cfs) = 4.81

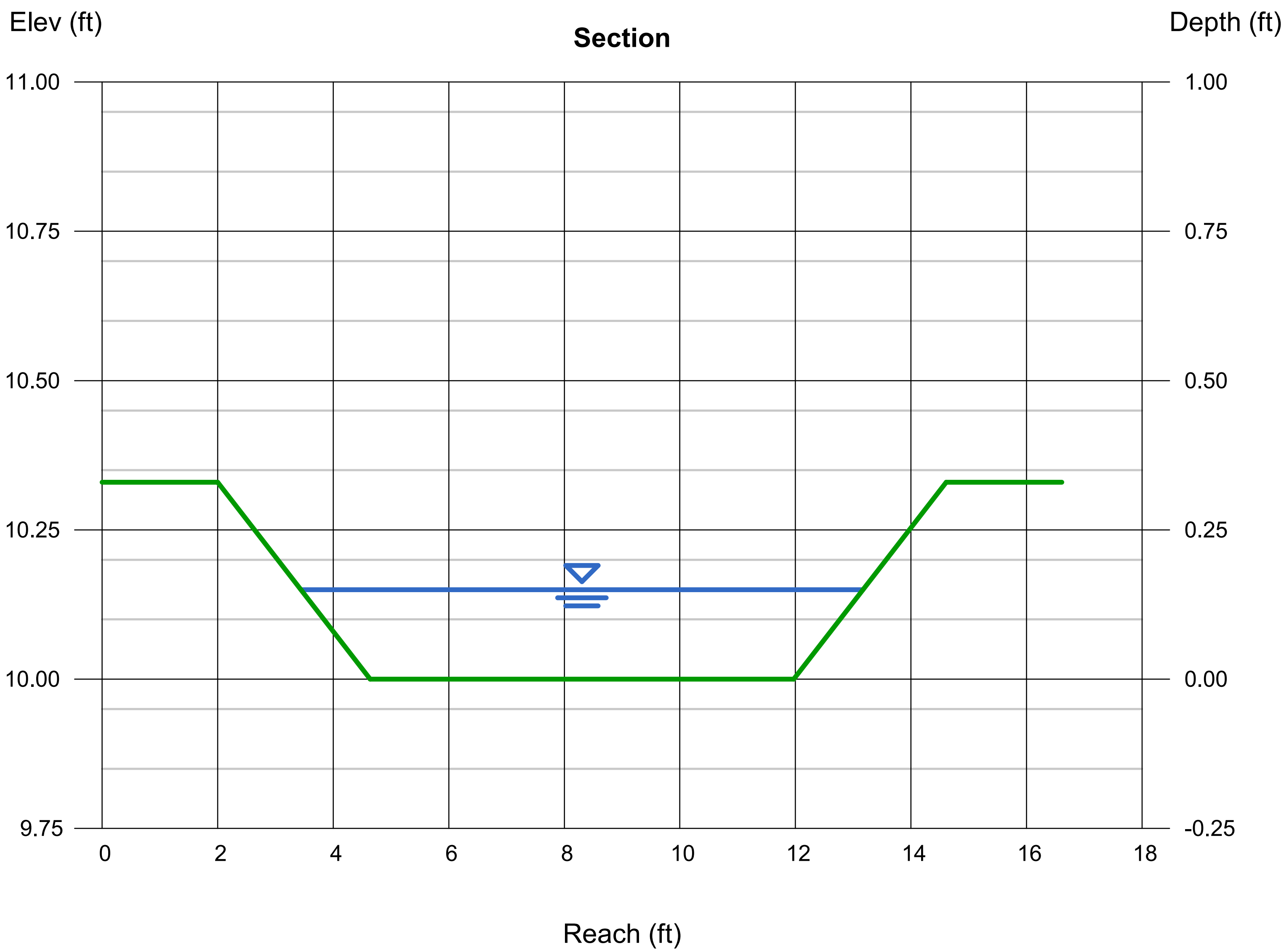
Highlighted
Depth (ft) = 0.34
Q (cfs) = 4.810
Area (sqft) = 1.70
Velocity (ft/s) = 2.83
Wetted Perim (ft) = 5.68
Crit Depth, Yc (ft) = 0.31
Top Width (ft) = 5.00
EGL (ft) = 0.46



Channel Report

CROSS PAN 5 YEAR

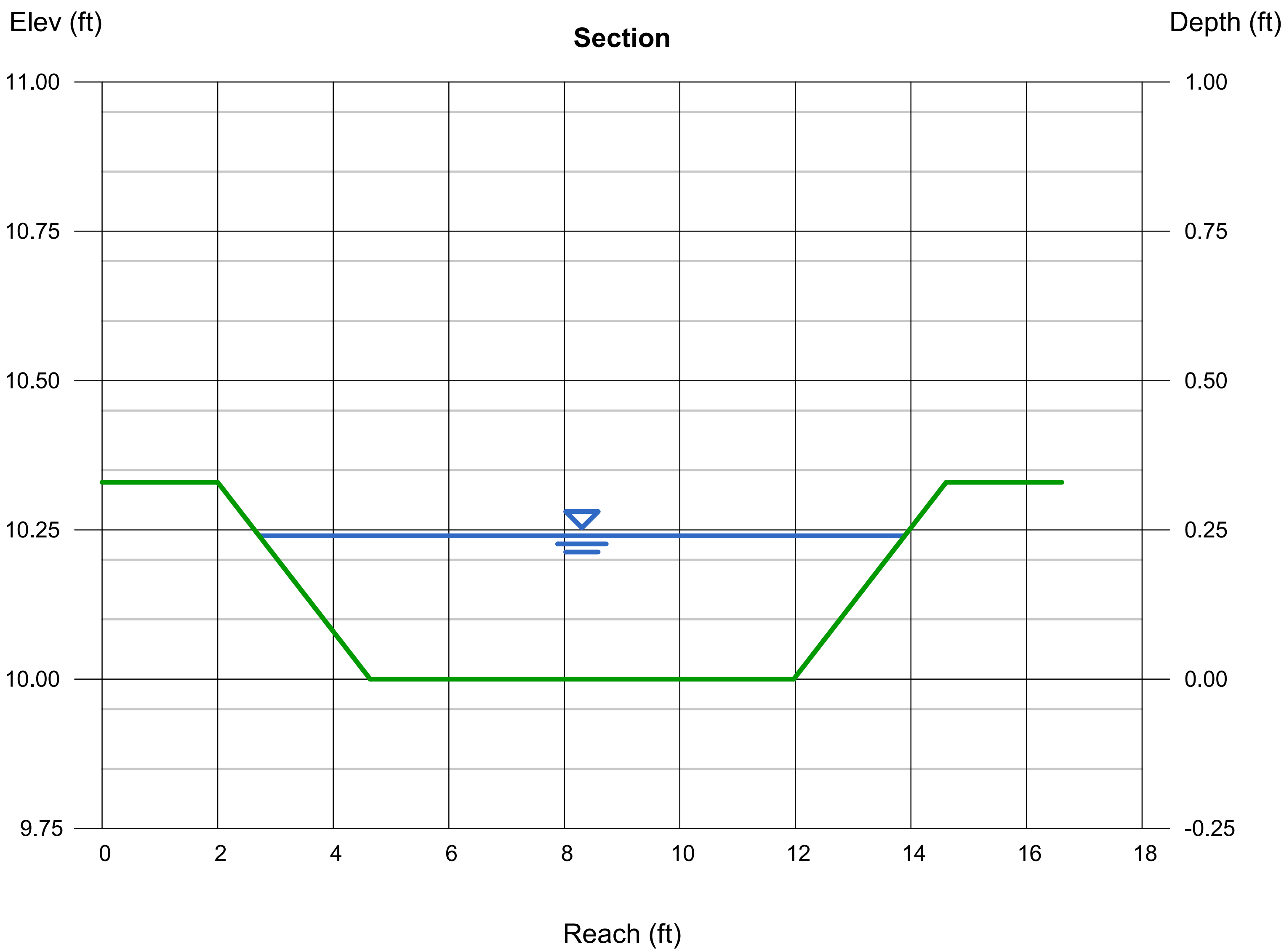
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 7.33	Depth (ft)	= 0.15
Side Slopes (z:1)	= 8.00, 8.00	Q (cfs)	= 1.940
Total Depth (ft)	= 0.33	Area (sqft)	= 1.28
Invert Elev (ft)	= 10.00	Velocity (ft/s)	= 1.52
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.75
N-Value	= 0.016	Crit Depth, Yc (ft)	= 0.13
		Top Width (ft)	= 9.73
Calculations		EGL (ft)	= 0.19
Compute by:	Known Q		
Known Q (cfs)	= 1.94		



Channel Report

CROSS PAN 100 YEAR

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 7.33	Depth (ft)	= 0.24
Side Slopes (z:1)	= 8.00, 8.00	Q (cfs)	= 4.810
Total Depth (ft)	= 0.33	Area (sqft)	= 2.22
Invert Elev (ft)	= 10.00	Velocity (ft/s)	= 2.17
Slope (%)	= 0.50	Wetted Perim (ft)	= 11.20
N-Value	= 0.016	Crit Depth, Yc (ft)	= 0.22
		Top Width (ft)	= 11.17
Calculations		EGL (ft)	= 0.31
Compute by:	Known Q		
Known Q (cfs)	= 4.81		

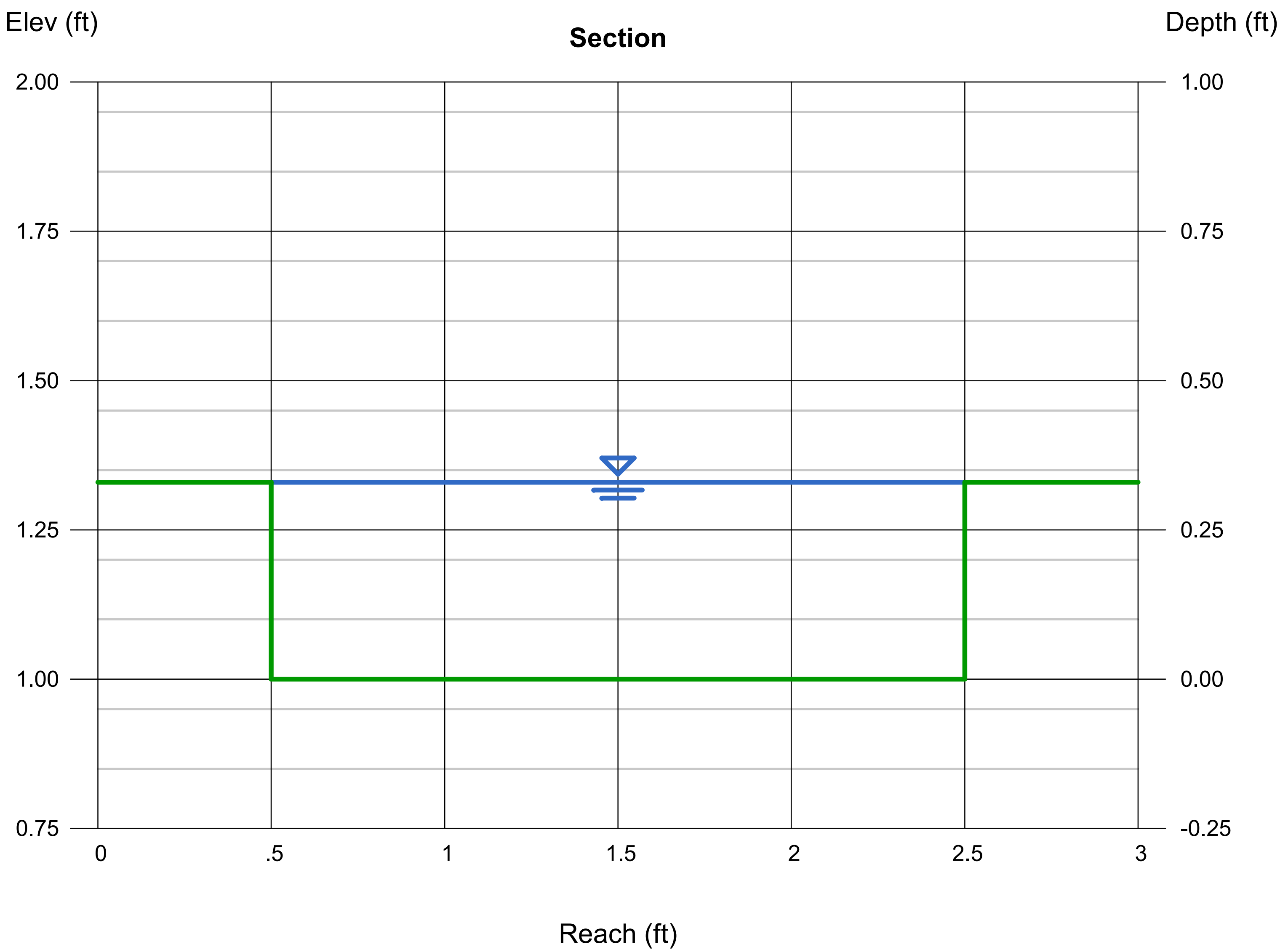


Channel Report

SINGLE SIDEWALK CHASE CAPACITY

Rectangular

Bottom Width (ft)	= 2.00		**Highlighted**	
Total Depth (ft)	= 0.33		Depth (ft)	= 0.33
			Q (cfs)	= 1.711
Invert Elev (ft)	= 1.00		Area (sqft)	= 0.66
Slope (%)	= 0.50		Velocity (ft/s)	= 2.59
N-Value	= 0.016		Wetted Perim (ft)	= 2.66
			Crit Depth, Yc (ft)	= 0.29
Calculations			Top Width (ft)	= 2.00
Compute by:	Q vs Depth		EGL (ft)	= 0.43
No. Increments	= 1			



Cushing Terrell	Subject:	RUSLE Calculation			Page:	1
	Project No.	LSCO_20FAL	By:	RW	Date:	7.15.2021
	Project Name	LES SCHWAB TIRE CENTER				

Overland Velocity Calc	
SLOPE	VELOCITY
0.015	1.98

Figure 3-1 (average velocities for estimating travel time for shallow concentrated flow):

Unpaved $V = 16.1345\,(s)^{0.5}$

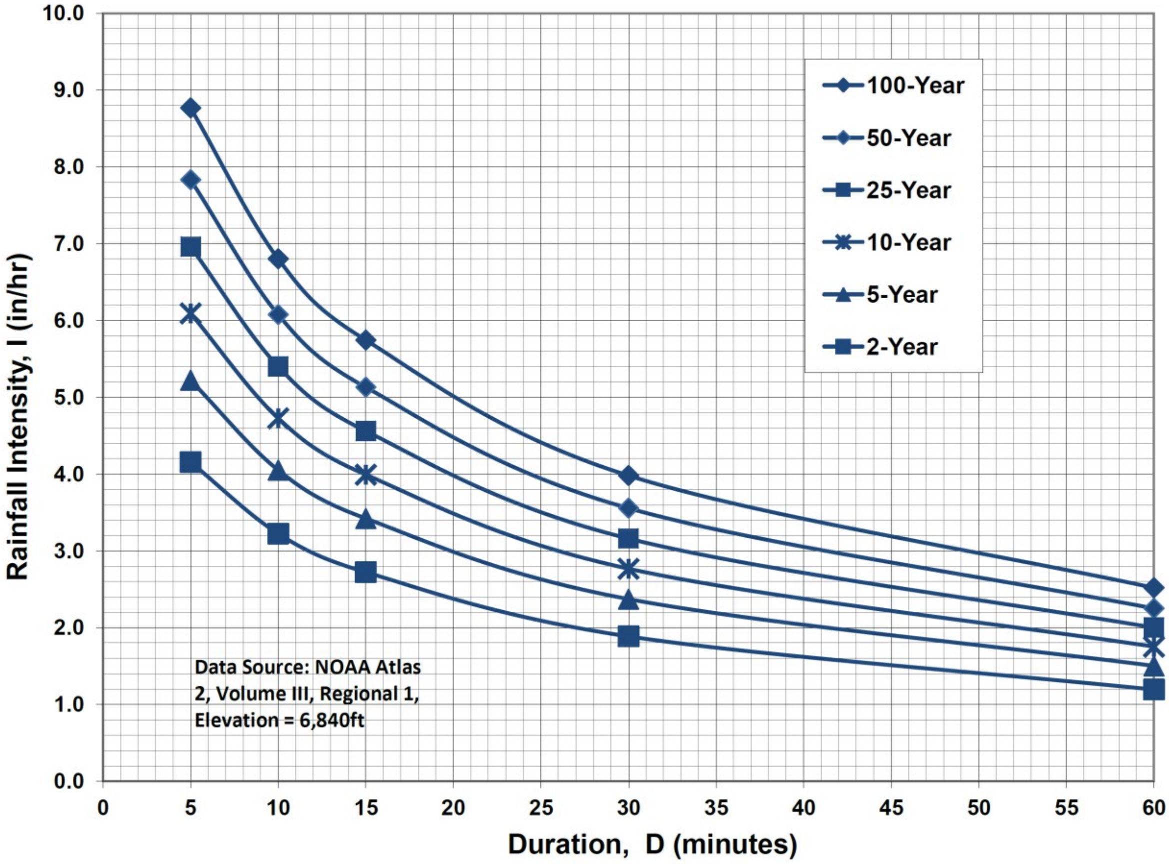
Paved $V = 20.3282\,(s)^{0.5}$

where

V= average velocity (ft/s)

s = slope of hydraulic grade line (watercourse slope, ft/ft)

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$I_{100} = -2.52 \ln(D) + 12.735$

$I_{50} = -2.25 \ln(D) + 11.375$

$I_{25} = -2.00 \ln(D) + 10.111$

$I_{10} = -1.75 \ln(D) + 8.847$

$I_5 = -1.50 \ln(D) + 7.583$

$I_2 = -1.19 \ln(D) + 6.035$

Note: Values calculated by equations may not precisely duplicate values read from figure.

Cushing Terrell

Subject: RATIONAL METHOD CALCULATIONS Page: 1
Project No. LSCO_20FAL By: RW Date: 7.15.2021
Project Nam LES SCHWAB TIRE CENTER

RATIONAL CALC EXISTING									
Basin	% Impervious	C5	C100	Area	TC	I 5 year	I 100 yesr	Q 5	Q 100
X	12	0.28	0.42	2.48	25	2.6	4.5	1.81	4.69
TOTAL	12	0.28	0.42	2.48				1.81	4.69

RATIONAL CALC PROPOSED									
Basin	% Impervious	C5	C100	Area	TC*	I 5 year	I 100 year	Q 5	Q 100
A	8	0.15	0.4	0.20	5	5.2	9	0.16	0.72
B	88	0.80	0.89	0.54	6	5	8.8	2.16	4.23
C	54	0.52	0.68	1.01	11	3.7	7	1.94	4.81
D	90	0.82	0.9	0.56	5	5.2	9	2.39	4.54
E	87	0.79	0.88	0.17	5	5.2	9	0.70	1.35
TOTAL	68		0.77	2.48				7.35	15.64

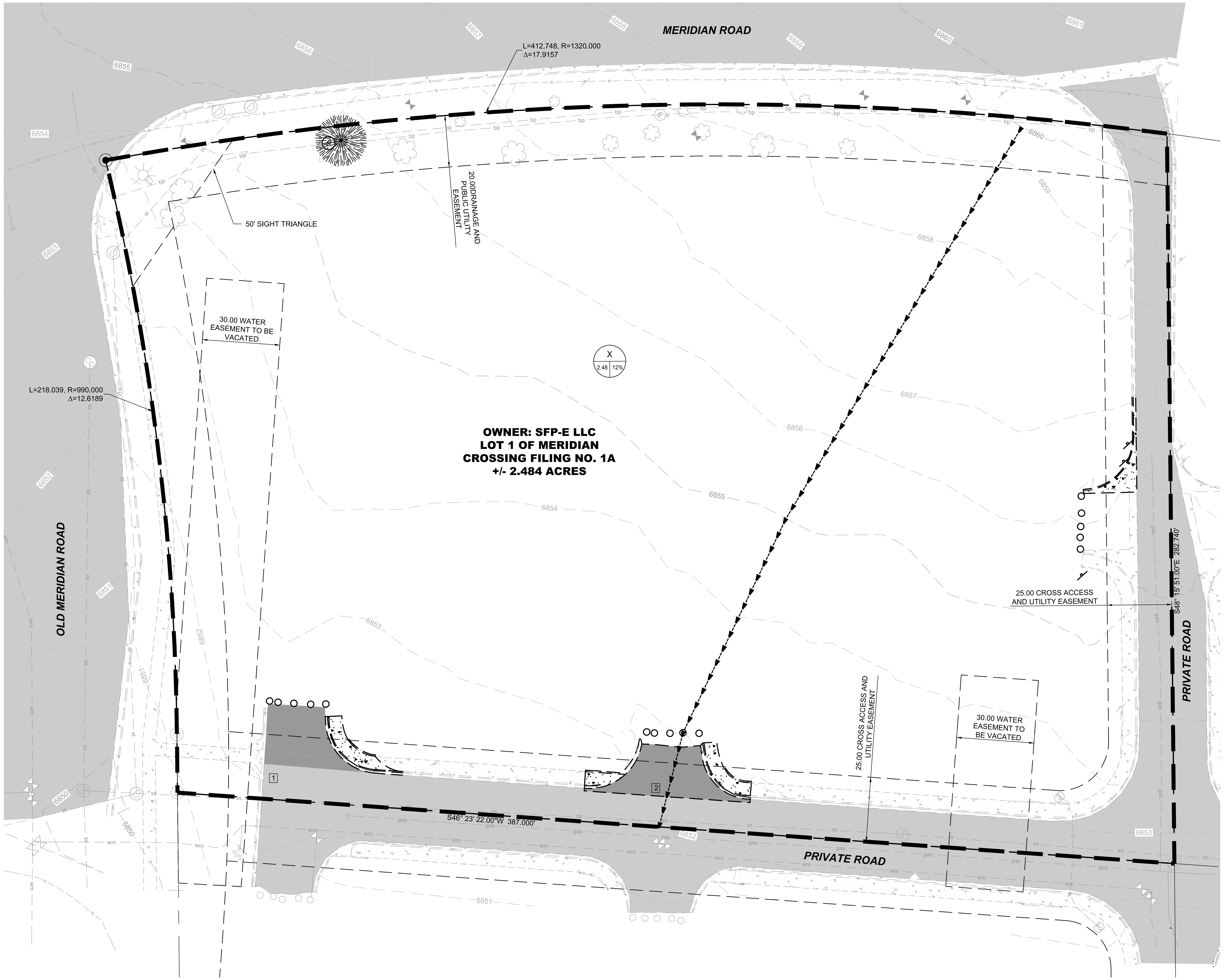
*Minimum value of 5 min used

Proposed Time of Concentration											
	OVERLAND				Concentrated Flow						
BASIN	C5	L	S	ti	N	S	R	V	L	tc	Tc
A	0.15	33	9	4.9	0	0	0	0	0	0	5
B	0.80	51	0.5	5.0	0.016	0.005	0.5	4.15	297	1.2	6
C	0.52	51	0.5	9.7	0.016	0.005	0.5	4.15	418	1.7	11
D	0.82	161	3.5	4.4	0.016	0.005	0.5	4.15	101	0.4	5
E	0.79	30	4	2.0	0.016	0.025	0.5	9.28	100	0.2	2

Existing Time of Concentration											
	OVERLAND				Concentrated Flow						
BASIN	C5	L	S	ti	N	S	R	V	L	tc	Tc
X	0.28	307	3	25.1	0	0	0	0	0	0	25

Cushing Terrell

APPENDIX B: BASIN MAPS



LEGEND

TIME OF CONCENTRATION FLOW PATH

BASIN LIMITS

1 C001 EXISTING CONDITIONS PLAN

NORTH

0 10 20 40

SCALE: 1" = 20'

BASIN DESIGNATION

% IMPERVIOUS

BASIN AREA IN ACRES

DESIGN POINT

Cushing Terrell.

cushingterrell.com

800.757.9522

Tires LES SCHWAB

LES SCHWAB TIRE CENTER

7105 N MERIDIAN RD.
FALCON, CO

NOT FOR CONSTRUCTION - PRELIMINARY DESIGN

SITE DEVELOPMENT PLANS

07.21.2021
DRAWN BY | WALKER
CHECKED BY | GRAHAM
REVISIONS
-

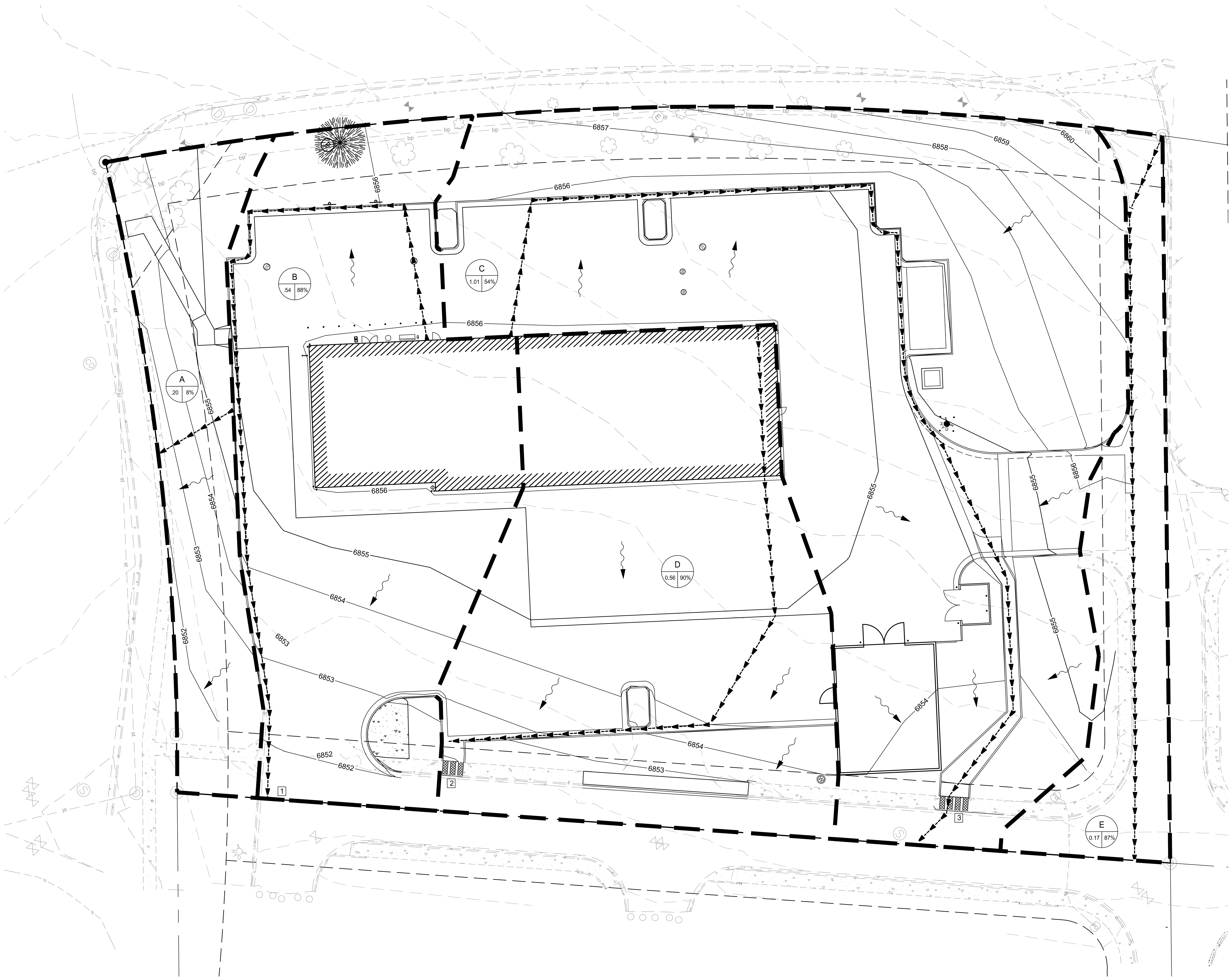
EXISTING BASIN MAP

PCD FILE NO. PPR-21-023

D.1

LEGEND

- TIME OF CONCENTRATION FLOW PATH
- BASIN LIMITS



1 / C200 GRADING PLAN

NORTH

0 10 20 40

SCALE: 1" = 20'

- BASIN DESIGNATION
- % IMPERVIOUS
- BASIN AREA IN ACRES
- 3 DESIGN POINT

Cushing Terrell.

cushingterrell.com
800.757.9522

Tires LES SCHWAB

7105 N MERIDIAN RD.
FALCON, CO

LES SCHWAB TIRE CENTER

SITE DEVELOPMENT PLANS

09.01.2021
DRAWN BY | WALKER
CHECKED BY | GRAHAM
REVISIONS
-

EXISTING BASIN MAP

PCD FILE NO. PPR-21-023

D.2

9/2/2021 11:09 AM | L:\LesSchwab\New\LSCO_20FAL\BIMCAD\Civil\LSCO_20FAL_D.2.dwg

APPENDIX C: FEMA FIRMETTE

National Flood Hazard Layer FIRMette

FEMA

104°36'53"W 38°56'17"N

104°36'15"W 38°55'49"N

Feet 0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- (B) 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/14/2021 at 9:15 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D: WEB SOIL SURVEY

Map Scale: 1:1,160 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 15, 30, 60, 90

Feet: 0, 50, 100, 200, 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 18, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	0.3	13.1%
9	Blakeland-Fluvaquentic Haplaquolls	A	2.2	86.9%
Totals for Area of Interest			**2.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Cushing Terrell

APPENDIX E: MERIDIAN CROSSING STORM REPORT

MERIDIAN CROSSING
FINAL DRAINAGE REPORT
EL PASO COUNTY, COLORADO

July 2008

PREPARED FOR:

Park Place Enterprises
15 Miranda Road
Colorado Springs, CO 80906

PREPARED BY:

Springs Engineering
31 N. Tejon, Suite 315
Colorado Springs, CO 80903
719.227.7388

PROJECT NO. 057-07-032

CERTIFICATIONS

Engineer's Statement:

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

Charlene M. Sammons

Charlene M. Sammons, P.E. #36727

COLORADO REGISTERED
CHARLENE M. SAMMONS
Seal
36727
PROFESSIONAL ENGINEER

Developer's Statement:

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

By (signature): [signature]

Park Place Enterprises, LLC

Title: Managing Member

Address: 15 Mirada Rd.

Colorado Springs, CO 80906

El Paso County's Statement:

Filed in accordance with Section 51.1 of the El Paso Land Development Code, as amended.

for [signature]

John McCarty, County Engineer/Director

8-19-08

Date

Conditions:

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Appendix

EXECUTIVE SUMMARY

The purpose of this Preliminary Drainage Report (PDR) and Final Drainage Report (FDR) is to present final drainage design and improvements for Meridian Crossing, located at the northeast corner of Meridian Road and Old Meridian Road, in the Falcon Highlands development. Runoff quantities and proposed facilities have been calculated using the current City of Colorado Springs/El Paso County Drainage Criteria Manual (DCM). Existing facilities have been analyzed to ensure they are able to function as designed with the new facilities and construction.

This report encompasses approximately 9.5 acres of proposed commercial development in the southeast corner of the Falcon Highlands development. A proposed collector (Flower Road) will traverse the site, connecting Meridian Road to McLaughlin Road. This development will also include improvements to McLaughlin Road.

Flower Road and McLaughlin Road are to be designed as Non-Residential Collectors, per the El Paso County Criteria Manual, with a design speed of 40 miles per hour (mph) and a posted speed of 35 mps. Curb and gutter will be installed along both of these roads.

INTRODUCTION

The Meridian Crossing subdivision is a 9.5 acre commercial development located on the northwest side of the Town of Falcon. Meridian Crossing is located east and south of Falcon Highlands Market Place Filing No. 1 and adjacent to the southeast side of the "New" Meridian Road alignment. Existing development occurring in the area includes the Falcon Highlands subdivision to the west, the Beckett at Woodmen Hills development to the east and the Falcon Highlands Market Place to the west.

The area containing Meridian Crossing has been studied as part of the Falcon Area Drainage Basin Planning Study (DBPS)-Preliminary Design Report by URS, dated December 15, 2000 and Falcon Highlands Master Drainage and Development Plan (MDDP) by URS, dated October 2004.

Purpose

The purpose of the following Final Drainage Report (FDR) is to present the final design drainage improvements for the Meridian Crossing commercial development. Drainage improvements will include curb inlets, roadside ditches, and Water Quality Capture Ponds.

Runoff quantities and proposed facilities have been calculated using the current City of Colorado Springs/El Paso County Drainage Criteria Manual (DCM) Volumes I and II.

Limits of Study

The Meridian Crossing FDR details the hydrology and hydraulics for the West Tributary of the Falcon Basin. Storm flow is routed by and from the proposed site and then directed through the proposed and future developments to US Highway 24. This includes an analysis of the storm systems, which includes the culverts and inlets along Meridian Road and Rolling Thunder Way. The area of study is bounded by Flower Road to the north and east, Meridian Road to the north and west, Old Meridian Road to the west and McLaughlin Road on the south

EXISTING CONDITIONS

General Location

The proposed Meridian Crossing is approximately 9.5 acres and is located at the southeast corner of Meridian Road and Old Meridian Road in Falcon, Colorado, Section 12, Township 13 South, Range 65 West of the 6th Principal Meridian. Currently, the site is zoned CR.

Falcon Highlands, Woodmen Hills, Falcon Vista, Meridian Ranch, Elkhorn Estates and Falcon Hills are all developments within a 5-mile radius of the site.

Land Use

The proposed site has just recently been rezoned to a Commercial Regional (CR) zone.

Topography and Floodplains

The topography of the surrounding area is typical of a high desert, short prairie grass with relatively flat slopes generally ranging from 2% to 4%. The area generally drains to the south. The site combines with the outlet flow of Detention Pond WU prior to crossing through the existing box culverts at Highway 24. Existing drainage swales convey these flows.

The Flood Insurance Rate Map (FIRM No. 08041C0575-F dated 3/17/99) indicates that there is a floodplain north and east of the proposed site (Falcon Basin Middle Tributary). FEMA has approved a LOMR for the Middle Tributary Floodplain (Case No. 06-08-B427P, with an effective date of November 3, 2006). This flow will now be contained within a storm drainage system and detention pond, which realigns the floodplain to the east of the site. (See Figure 3: Floodplain Map) The floodplain ties in with the FIRM after the detention pond at McLaughlin Road.

Geology

Soil Conservation Service soil survey records indicate the project area is covered by soils classified in the Blakeland Series, which are categorized in the Hydrological Group B.

The Blakeland (8) loamy sand is a deep, excessively drained soil that can exceed depths of 60 inches. Permeability of this soil is rapid with an effective rooting depth of 60 inches. This soil has good potential for urban development. The available water capacity is moderate to low. Surface runoff is slow, and the hazard of erosion is moderate.

The Blakeland (9) complex soil is comprised of approximately 60 percent Blakeland loamy sand, 30 percent Fluvaquentic Haplaquolls and 10 percent other soils. This soil is found more in sloping areas. It is deep and somewhat excessively drained. It formed in sandy alluvium and eolian material derived from arkosic sedimentary rock. Permeability of Blakeland soils is rapid, with an effective rooting depth of 60 inches. The available water capacity is moderate to low. Surface runoff is slow, and the hazard of erosion is moderate. The Fluvaquentic Haplaquolls are generally located in swale areas, and are deep, poorly drained soils. They formed in alluvium derived from arkosic sedimentary rock.

The Blakeland soil is well suited to wildlife habitat, home sites, streets and roads. This soil needs to be protected from erosion when vegetation has been removed from building sites. The Fluvaquentic Haplaquolls soil is good for wetlands. This soil has poor potential for home sites. The main limitation of this soil is the high water table and potential for flooding.

Note: (#) indicated Soil Conservation Survey soil classification number. See Figure 2: SCS Soils Map.

Climate

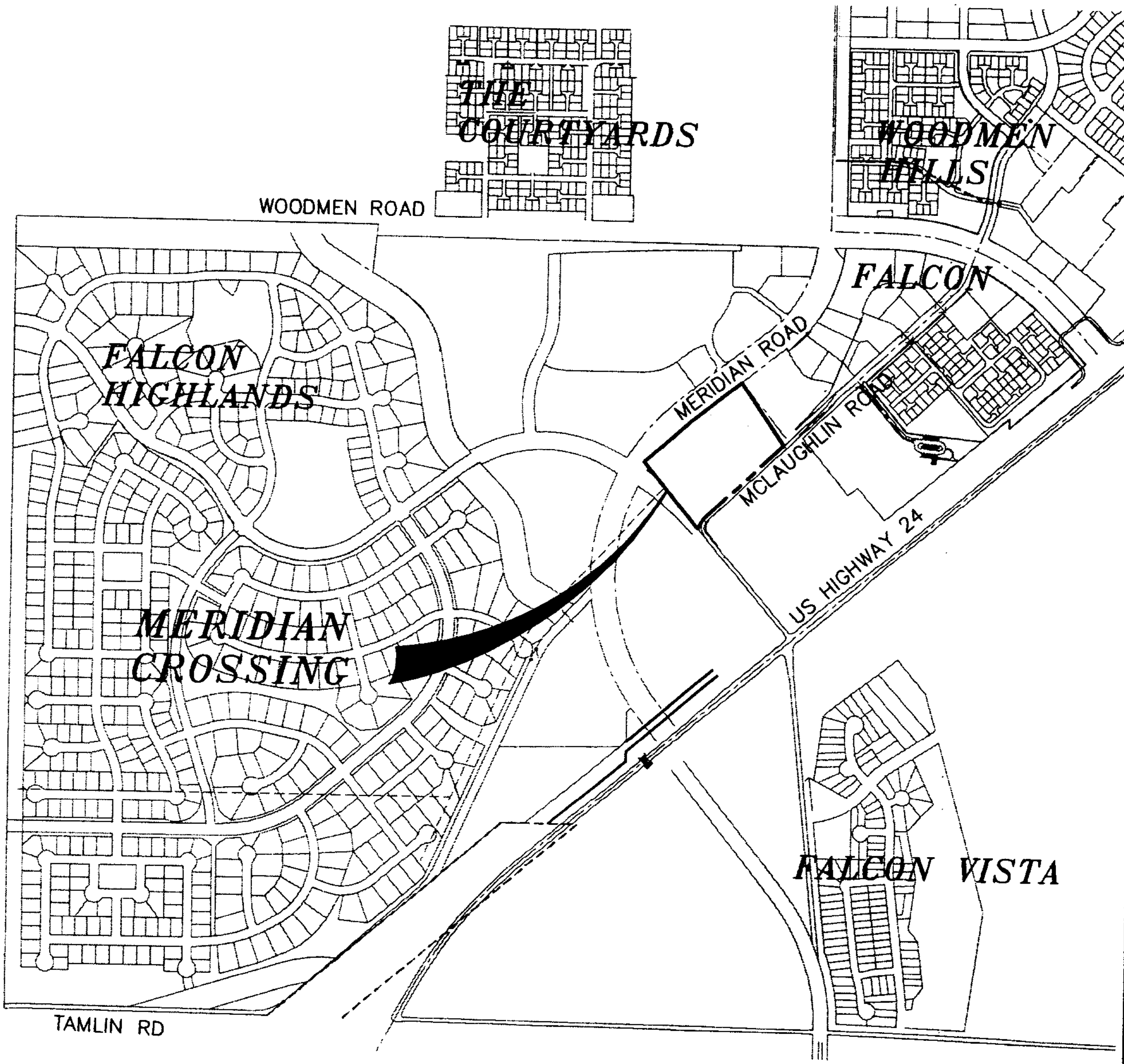
Mild summers and winters, light precipitation; high evaporation and moderately high wind velocities characterize the climate of the study area.

The average annual monthly temperature is 48.4 F with an average monthly low of 30.3 F in the winter and an average monthly high of 68.1 F in the summer. Two years in ten will have a maximum temperature higher than 98 F and a minimum temperature lower than –16 F. Precipitation averages 15.73 inches annually, with 80% of this occurring during the months of April through September. The average annual Class A pan evaporation is 45 inches.

Natural Hazards Analysis

Natural hazards analysis indicates that there is high ground water, potentially expansive claystone bedrock and wetlands located on or near the proposed site. Refer to the Geologic Hazards Evaluation Retail Site Woodmen Road and Meridian Road report by Entech Engineering. Usually, in areas where high ground water is an issue, underdrains are built to help alleviate the problem. However, since the proposed site is a commercial development, construction will be done as slab-on-grade and no basements. If lower levels are built, an underdrain system would be required. Wetland areas in the site have been identified and approved by Corps of Engineers. A mitigation plan for the site has been approved and implementation began in the fall of 2005. A copy of this plan is on file with the Falcon Highlands Metropolitan District.

Soils in this area are cohesionless, sloughing of steep banks during drilling and/or excavation could occur. By siting improvements in a manner that provides an opportunity to lay the banks of excavations back at a 1:1 slope during construction, the problems associated with sloughing soils can be minimized.

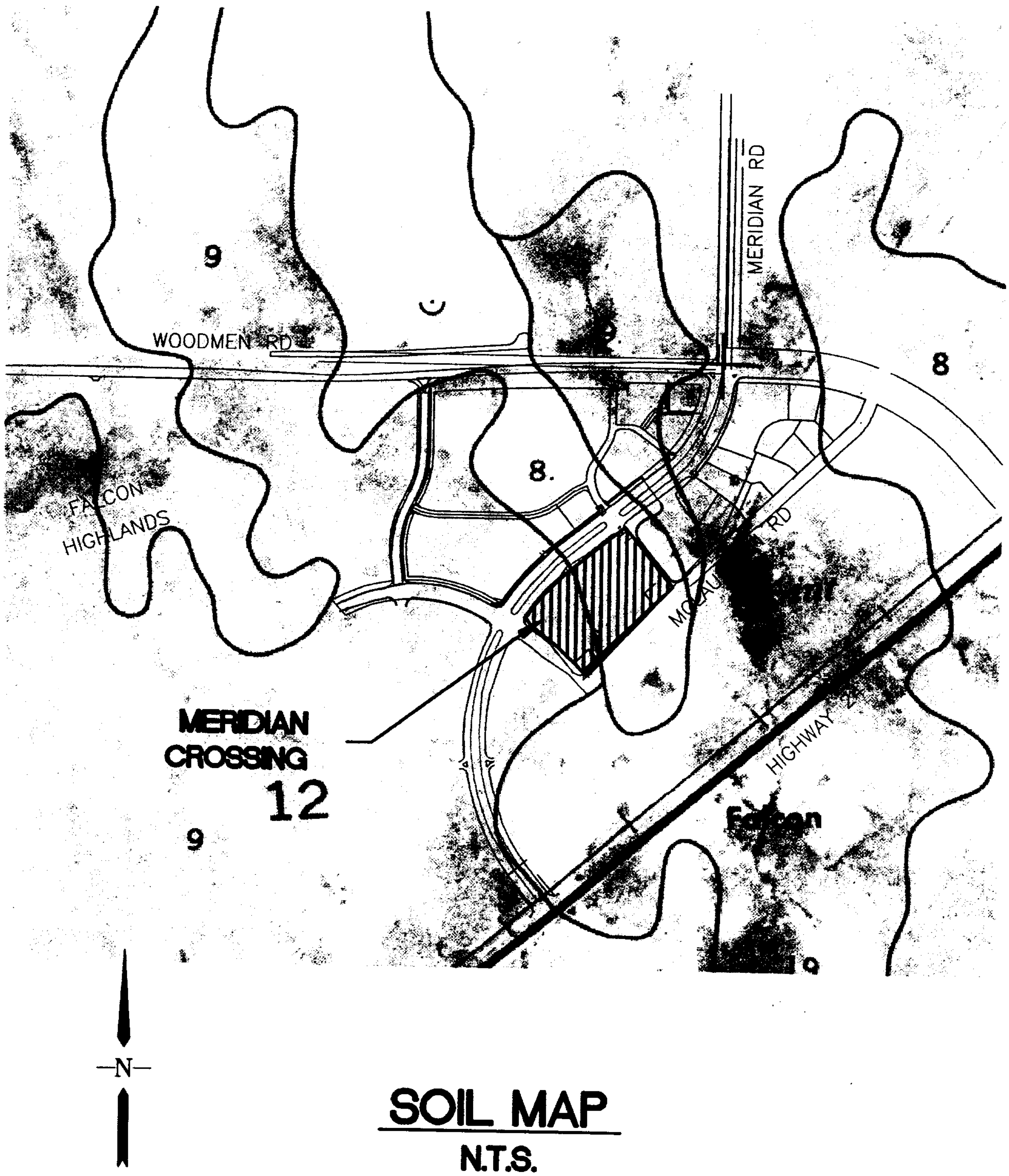


VICINITY MAP

N.T.S.

MERIDIAN CROSSING	SE Springs Engineering 31 NORTH TEJON, SUITE 315 COLORADO SPRINGS, CO 80903 TEL: (719) 227-7388 FAX: (719) 227-7392
VICINITY MAP	FIGURE 1

PROJECT NO. 057-07-032



SOIL MAP

N.T.S.

MERIDIAN CROSSING	SE Springs Engineering 31 NORTH TEJON, SUITE 315 COLORADO SPRINGS, CO 80903 TEL: (719) 227-7388 FAX: (719) 227-7392
SCS Soils Map	FIGURE 2
	PROJECT NO. 057-07-032

DRAINAGE DESIGN CRITERIA

SCS Hydrograph Method

Hydrologic modeling was used to the West Tributary of the Falcon Basin, which routes through Meridian Crossing. Modeling was completed using The United States Army Corps of Engineers Hydrologic Engineering Center-HEC-1 version 4.1. The Soil Conservation Service (SCS) (since renamed National Resources Conservation Service (NRCS)) curve number method was selected for calculating the runoff volume from the drainage basins per the Drainage Criteria Manual (DCM). The precipitation data, basin delineation, CN runoff coefficients, and time of concentrations were taken from the Falcon Basin DBPS. Modifications have been performed on the original data, as new developments have been built and boundary lines have changed. The model has been updated to reflect the most current changes occurring in the Falcon area. The existing models in the appendix are those which were included in the FDR for Pond WU, as this report updated and modified the existing conditions of the West Tributary as originally analyzed in the Falcon Basin DBPS. Below is a summary of major design points entering the Falcon Highlands development, through the site, and where the flows exit the Falcon Highlands site. The Falcon Highlands Master Drainage Development Plan (MDDP) corrected an area in the volume of the Woodmen Hills detention pond (Pond W).

The West Tributary was analyzed in the MDDP/PDR/FDR for Falcon Highlands Filing No. 1. This report made the assumption that Pond WU would capture flows from Basins W-39, W-40, W-41 and W-42. With the construction of Meridian Road, flows from Basin W-42 do not release into the detention pond and instead combine with the outflow from the pond. With this change in routing, actual design point locations have changed slightly. The existing DBPS analysis and this report show design point WU as the flow at Highway 24 as it passes through the existing box culverts. The proposed DBPS analysis and the Market Place report have Design Point WU as the flows entering the pond with the pond release flows as the Highway 24 flows. This report made the change, as stated previously, Basin W-42 no longer enters the pond, but combines at Highway 24 and a design point was needed to evaluate flows at this location. See the table below for a summary of major design points through the West Tributary in the Falcon Highlands development. Pond WU will release at less than historic rates for both, the 5-year and 100-year events.

Design Point	Existing*		Proposed		Location
	5-Yr	100-Yr	5-Yr	100-Yr	
WS	137	1575	145	1705	Woodmen
WT	143	1621	244	1867	Tamlin Road (Removed)
Pond WU			118	1313	Highway 24/Pond Outlet
WU	148	1648	135	1339	Highway 24 (Pr Condition)
WV	149	1640	135	1338	Falcon Highway

*Existing flows have been modified per the approved Falcon Highlands Final Drainage Report for Regional Detention Pond WU. This report adjusted routing for Basin W-42 and has modified the existing flows at Design Point WU. The "existing" flows which will be the target in this report are those existing flows which have been identified in the previous mentioned report, not those which were stated in the DBPS.

Rational Method

Because the Meridian Crossing is less than 100 acres, the rational method was used to estimate stormwater runoff for basins, and to size inlets, culverts and ditches, as required by the current

City of Colorado Springs/El Paso County Drainage Criteria Manual (DCM). The rational method coefficients "C" were selected from Table 5-1 of the DCM, the time of concentration was calculated per DCM requirements and intensities for each basin were calculated from storm intensity curve formulas provided by the City of Colorado Springs. The rational method was used to determine onsite flows. Rational Method results are shown in Appendix B and C.

Water Quality Criteria

The water quality capture volume (WQCV) was calculated based on equations found in the Drainage Criteria Manual Volume 2, Stormwater quality Policies, Procedures and Best Management Practices (BMP's). The WQCV allows suspended sediment and absorbed pollutants to settle out of the water and improve the overall quality of runoff leaving the facility and reduce the potential for erosion. The positive impact on water quality is significant see appendix for proposed pond calculations.

Street Capacity

Street capacity is based on the DCM criteria, as stated in Chapter 6. Capacity of the streets (Flower Road and McLaughlin Road) will be based on the minor and major storms. Minor storm criteria is based on pavement encroachment and the major storm criteria is based on allowable depth and pavement encroachment. In all cases, flow encroachment shall not extend past the right-of-way (R.O.W.). Mannings equation will be used to determine the street capacity based on the following criteria from the DCM. Flower and McLaughlin Roads are both collector roads. Both streets shall meet the following criteria from the Table 6-1 in the DCM:

Roadway	**Use of street in storm**		**Cross flow in streets for storm**	
Classification	**Initial**	**Major**	**Initial**	**Major**
Collector	No curb overtopping. Flow spread must be limited to a max. 20 foot spread from each curb face	Residential dwellings, public, commercial and industrial buildings shall not be inundated at the ground line. The depth of water at the gutter flow line shall not exceed 12 inches.	Where cross pans are allowed, depth of flow shall not exceed 6 inches at flow line.	12 inches of depth at gutter flow line.

DRAINAGE BASINS

Existing Drainage Analysis

Since the site is currently undeveloped, the existing drainage analysis was determined by analyzing existing runoff quantities and patterns. The site is covered predominantly with grasses. Existing storm runoff is generally from the north to the south through natural drainage swales, as well as gutter flow in a previously constructed roadway (Meridian Road). (See Figure 5: Existing Drainage Plan) On-site basins, being smaller than 100 acres, were analyzed using the rational method. See below for a brief discussion of each of these basins.

- Basin E-1 (2.18 acres) consists of the southeast half of Meridian Road, at a high point in the road adjacent to Pond MN. Basin E-1 slopes to the south to design point 1. An existing at grade inlet intercepts this flow. Any flow-by from this inlet will be directed onto Old Meridian Road. The remainder of the flow will continue east along Old Meridian Road, which allows street flow to runoff into an existing roadside ditch. This flow then enters a temporary culvert under Old Meridian Road. Basin E-1 produces runoff quantities of 9.4 cfs and 17.6 cfs for the 5-year and 100-year storms.

- Basin E-2 (8.76 acres) consists of an area just east of Old Meridian Road and between Meridian Road and McLaughlin Road. This area is currently undeveloped. Basin E-2 slopes to the southwest to design point 2. Currently, a temporary culvert exists to transfer flow from the east side of Old Meridian Road to the south side. An estimated 13.7 cfs and 31.4 cfs are produced for the 5-year and 100-year storms.

- Basin E-3 (13.96 acres) consists of an area northeast of Old Meridian and McLaughlin Roads in the "Town of Falcon". The flow from this basin will be directed towards the intersection of State Highway 24 and Meridian Road, where it is conveyed under an existing culvert under Old Meridian Road. This flow is directed towards the existing structure at Design Point 6. The basin generates 16.4 cfs and 37.5 cfs for the 5-year and 100-year storms.

- Basin E-4 (2.15 acres) consists of the east half of Meridian Road from Old Meridian Road to the right-in access point to the south. Basin E-4 slopes to the south. Flow from this basin will be conveyed through curb and gutter to the right in access drive, where a sump inlet intercepts the flow. An 18-inch rcp will then release into a temporary channel along Meridian Road, which conveys the flow to design point 6. An estimated 9.3 cfs and 17.5 cfs are produced for the 5-year and 100-year storms.

- Basin E-5 (9.41 acres) consists of an undeveloped native area just east and south of the Falcon Highlands detention pond (Pond WU). Runoff from this basin combines with flows from design point 7 and the detention pond outlet and crosses under US Highway 24 through existing culverts at design point 8. Basin E-5 generates 12.1 cfs and 27.8 cfs for the 5-year and 100-year storms.

- Basin E-6 (2.62 acres) consists of the west half of Meridian Road from the right-in access point to Highway 24. Basin E-6 slopes to the south to design point 4. Runoff will flow south via curb and gutter along this section of Meridian Road. A sump inlet at the low point, just before Highway 24, intercepts the runoff. This inlet connects to the box culvert under Meridian Road. This flow will continue to the existing box culverts at Highway 24. The Falcon Highlands detention pond also discharges to the existing culvert at Highway 24. However, the detention pond was designed to release flows at 80% of historic flow. The existing culvert under Highway 24 will have enough capacity, because the peak discharge from design point 7 will occur long before the peak discharge of the pond. An estimated 11.6 cfs and 21.7 cfs are produced for the 5-year and 100-year storms.

- Basin E-7 (2.32 acres) consists of the east half of Meridian Road from the right-in access point south to Highway 24. Basin E-7 slopes to the south to design point 15. Runoff will flow south through curb and gutter along this section of Meridian Road. A sump inlet intercepts this flow and connects to the box culvert under Meridian Road. An estimated 10.5 cfs and 19.7 cfs are produced from Basin E-7 for the 5-year and 100-year storms.

- Basin E-8 (23.89 acres) consists of the area south of Old Meridian Road and east of Meridian Road. This area is currently undeveloped. This flow sheetflows across the basin to design point 6. A concrete box culvert conveys the flow under Meridian Road to the existing culvert under Highway 24. An estimated 32.2 cfs and 73.7 cfs are produced for the 5-year and 100-year storms.

Existing Design Points

- Design Point 1 is an existing 15' on-grade inlet in Meridian Road, north of Old Meridian Road. This inlet intercepts flow from Basin E-1, street flow from Meridian Road, south of Pond MN to Old Meridian Road. The inlet releases the flow into a temporary ditch along Old Meridian Road, which conveys the flow to Design Point 2. Flows at this location are 9.4 and 17.6 cfs.

- Design Point 2 collects flow from Basin E-2 and combines it with the flow in the temporary channel from DP-1. A temporary 24-inch culvert under Old Meridian Road conveys the flow to the south towards Design Point 6. This design point has flows of 22.9 and 48.7 cfs.

- Design Point 3 is an existing 20' sump inlet that intercepts the street flow in Meridian Road from Basin D-4. The inlet releases flows into an existing temporary roadside ditch along Meridian Road to Design Point 6. Flows at this location are 9.3 and 17.5 cfs.

- Design Point 4 is an existing 25' sump inlet used to intercept the west side of Meridian Road, north of Highway 24 (Basin E-6). This flow enters the existing storm system and is conveyed to Design Point 7. This design point has flows of 11.6 and 21.7 cfs.

- Design Point 5 is an existing 20' sump inlet in Meridian Road opposite Design Point 4. This inlet intercepts street flow from Basin E-7 and combines with flows in the storm system under Meridian Road. Flows are released at Design Point 7. The design point generates flows of 10.5 and 19.7 cfs.

- Design Point 6 combines flows from Basins E-3 and E-8 with flows from Design Points 2 and 3. Two 12' (W) x 3' (H) reinforced concrete box culverts (RCBC's) convey the flow under Meridian Road to Design Point 7. Flows generated at this design point are 67.8 and 149.7 cfs.

- Design Point 7 is the location where the storm system releases flows. It is the combined flow from Design Points 4, 5 and 6. Once released, flows will continue through an existing ditch to Design Point 8 at Highway 24. Flows at this location are 67.0 and 148.5 cfs.

- Design Point 8 combines the flow from Basin E-5 with flows from Design Point 7 and Detention Pond WU. There are three 12' (W) x 6' (H) RCBC's under Highway 24 to convey flows. These flows will continue towards the south, in a FEMA floodplain, along their existing paths. Flows generated at this location are 147.7 and 1286.1 cfs. This design point corresponds to Design Point WU in the HEC models.

Developed Drainage Analysis

The proposed site was studied in the Falcon Basin DBPS. Efforts have been made to comply with the recommendations set forth in the approved DBPS. The flows in the commercial development will combine with the outlet flows of Detention Pond WU and continue under Highway 24 through the existing box culverts. Figure 6: Developed Drainage Plan illustrates the basin boundaries used for the rational hydrologic model.

Basins D-1 and D-4 through D-7 do not have any changes from the corresponding, existing basins (E-1 and E-4 through E-7), as they have already been developed and the drainage structures have been designed. Basin E-2, a proposed commercial site (Meridian Crossing, whose preliminary plan has been approved by the Board of County Commissioners (BOCC)), the proposed site and adjacent roadways, has been divided into five new developed basins. Changes to Basins D-3 and D-8, is the assumption that these basins will be developed in the future as commercial use. The description of these basins follows.

- Basin D-2 (5.14 acres) consists of approximately the south half of the Meridian Crossing commercial development. It is anticipated for this basin to drain towards the south, where it will be intercepted by a proposed water quality facility (Porous Landscape Detention – PLD). This storm system will release flows into a temporary drainage swale through Basin D-8. This drainage pattern is consistent with the approved Master Drainage Development Plan Amendment to Falcon Highlands, which shows these flows reaching the existing box culvert under Highway 24 at design point 8. This basin generates 23.4 cfs and 43.9 cfs for the 5-year and 100-year storm events.

- Basin D-3 (11.49 acres) consists of an area northeast of Old Meridian Road and McLaughlin Road in the "Town of Falcon". It is assumed that this area will be developed as commercial use in the future. The flow from this basin will be directed towards the intersection of Highway 24 and Meridian Road, where it is conveyed under a proposed culvert under Old Meridian Road. The flow is directed towards the existing structure at DP-6. The basin generates 34.7 and 65.1 cfs for the 5 and 100-year events.

intercepted by the temporary grated lid on the proposed manhole at DP-Z This flow will ultimately reach Highway 24. Flows at this location are 4.7 and 8.9 cfs.

- Design Point X is the released flow from the East PLD. Flow from this area combines with a storm system in Old Meridian Road via a 30" rcp. Flows generated in this location are 16.9 cfs and 31.8 cfs.

- Design Point Z is the flow from DP-B, DP-X intercepted flow from inlet 1 and the flow-by from inlet 1 combined with the released flow from the West PLD (Basin D-2). A 36" rcp connects and conveys this flow to a temporary culvert under Old Meridian Road which will release flows into a temporary ditch. Flows at this junction are 44.6 cfs and 83.8 cfs.

- Design Point Y is a proposed 54" rcp which releases flows across Old Meridian Road. The proposed pipe will replace an existing culvert, which is currently undersized, and intercepts flows from D-3. This design point has a flow of 34.7 cfs and 65.1 cfs. There is no corresponding design point in the Market Place Filing No. 1 drainage report.

- Design Point 3 is an existing 20' sump inlet that intercepts the street flow in Meridian Road from Basin D-4. The inlet currently combines with DP-Z and flows into an existing temporary roadside ditch along Meridian Road to Design Point 6. Flows at this location are 9.3 and 17.5 cfs. This design point corresponds to Design Point 13 in the Market Place FDR.

- Design Point E is the combination of D-3 and DP-Z. Flows are released into a temporary channel which conveys flows to a roadside ditch along Meridian Road. This flow is conveyed all the way to Design Point DP-8 at Highway 24 where flows are released from the Falcon Highlands site. Flows intercepted at this location are 46.938.3 cfs and 58.2 cfs. The Market Place Filing No. 1 report does not have any corresponding design points.

- Design Point 4 is an existing 25' sump inlet used to intercept the west side of Meridian Road, north of Highway 24 (Basin D-6). This flow enters the existing storm system and is conveyed to Design Point 7. This design point has flows of 11.6 and 21.7 cfs. This design point corresponds to Design Point 16 in the Market Place FDR. There is no difference in the drainage flows.

- Design Point 5 is an existing 20' sump inlet in Meridian Road opposite Design Point 4. This inlet intercepts street flow from Basin D-7 and combines with flows in the storm system under Meridian Road. Flows are released at Design Point 7. The design point generates flows of 10.5 and 19.7 cfs. This location corresponds to Design Point 15 in the Market Place FDR. There are no changes in the flows.

- Design Point 6 combines flow from Basin D-8 with DP-E and DP-Y. Two 12' (W) x 3' (H) reinforced concrete box culverts (RCBC's) convey the flow under Meridian Road to Design Point 7. Flows generated at this design point are 127.7 and 239.9 cfs. This location corresponds to Design Point 17 in the Market Place FDR. This report calculated flows to be 157.9 and 300.6 cfs.

DRAINAGE FACILITY DESIGN

General Concept

Meridian Crossing is located completely within the West Tributary of the Falcon Drainage Basin. The site drains towards the southwest where it is directed towards an existing drainage structure under Highway 24. This structure has been analyzed to ensure it still properly functions with the developed flow released here. The flow from these structures will continue along an existing swale to the south. There are two water quality facilities proposed for the site, prior to flows exiting.

Storm Systems

There has been one storm system previously installed with the construction of Meridian Road. This system was designed in the Market Place Filing No. 1 FDR. One new culvert and a temporary culvert have been proposed with the development of this site. StormCAD and CulvertMaster calculations have been included at the end of the report analyzing all of these facilities to ensure they are still adequate for the developed flow associated with this development.

The first system is an existing system located at the intersection of Meridian Road and Highway 24. This system was initially designed in the Market Place Filing No. 1 FDR. The system has been analyzed to ensure it will still function properly with the development of The Shoppes at Falcon. A 20-foot sump inlet is located at DP-5 in Meridian Road. This inlet intercepts 10 cfs and 19 cfs. A 25-foot sump inlet is located on the other side of Meridian Road at DP-4. This inlet intercepts 12 and 22 cfs. Both of these inlets connect to an existing 12'(W) x 3' (H) box culvert under Meridian Road via 24-inch rcp's. This structure intercepts a total flow of 127.7 and 239.9 cfs. This system releases flows into an existing channel parallel to Highway 24 at DP-7. Flows at this location are 140.2 cfs and 264.8 cfs. The channel conveys this flow to DP-8 at Highway 24, where the flow exits Falcon Highlands and continues on its existing path to the south.

Channel Improvements

The temporary channel from DP-Z has a 100-year flow of 73.3 cfs from the proposed storm system. The channel will be shaped similarly to the roadside ditch along the southeast side of Meridian Road, which it connects to. Velocity is this channel is 3.2 ft/s with a flow depth of 1.8 feet. A temporary drainage easement will be recorded on the final plat to accommodate this channel.

The existing roadside ditch along Basin D-7 is located east of Meridian Road from the right-in access point south to Highway 24. The ditch will carry the 100-year storm (88.2 cfs) at a depth of 1.8 feet to DP-6. The velocity in this channel is 5.5 fps. This channel will also be removed upon development of Basin D-8 and the construction of an internal storm drain system.

There is a series of onsite temporary swales in lots 3, 4 and 5. These swales will be utilized to ensure flows are conveyed to the west PLD. Once these lots develop, the swales will no longer be necessary and will be removed. Also, located outside of the Meridian Crossing right-of-way along Old Meridian Road are 3 temporary swales, which convey flows to storm inlets. These swales will be removed upon the construction of Old Meridian Road.

Detention Pond WU

Based on the current configuration of the basins, Pond WU does work as intended. The 5-year release rate is less than the existing flow rate. Refer to the table earlier in the report for flow rates at major design points. Based on the current analysis of the hydrology for the area no modifications will be necessary to the outlet structure of the detention pond as previously assumed. The 100-year storm also functions properly and has a release rate lower than the existing flows.

Proposed Water Quality Pond

Based on the City of Colorado Springs/El Paso County DCM Volume 2, a water quality pond is needed, as the development area is greater than 1.0 acre. There will be two water quality capture ponds (WQCP), which will be porous landscape detention (PLD). Both ponds structures will be located between the northern right of way of McLaughlin road and the proposed curb and gutter for lots 5 and 6. This will enable the ponds to be used for final construction of each of the building sites. The east and west pond combine for a total 8200 square feet.

Ultimate Design

Currently, there is evidence that Old Meridian Road will be improved. If this situation does not happen, there is an "ultimate design" scenario to account for this. Meridian Crossing will be responsible for installing curb and gutter and sidewalk for the portion of Old Meridian Road which fronts their property. The rcp stub behind inlet DP-1 will be extended via 18"rcp to the existing culvert under Old Meridian Road. A 5' type R inlet will be installed to catch the flows of Old Meridian Road (see appendix item I for StormCAD calculations). A 5' manhole will be installed to connect the new and existing pipes. The existing culvert will continue to convey the flow through an existing swale, which releases flows into the roadside swale along Meridian Road. This flow still reaches an ultimate location of DP-8, where all flows leave the Falcon Highlands development.

Downstream Facilities

<u>Falcon West Tributary</u>

Detention Pond WU discharges below the historical rate as described in the Falcon Highlands Filing No. 1 PDR and the Falcon Basin DBPS. Just downstream of Pond WU outlet works is an existing bridge at SH 24. At Highway 24 near Pond WU, triple 12' x 6' RCBC's were installed in 1999. This facility conveys the 1239 cfs 100-year design flow. An analysis of these structures in included in the appendix. The DBPS recommended installing a lined channel with geotextile fabric and grade control drop structures. Currently, this area has no real definable channels, but flows are allowed to spread once they are released through the structure at SH 24. This area is within a FEMA designated floodplain. Historic flows as stated in the DBPS are 1518 cfs.

Downstream of SH 24, flows follow a FEMA floodplain to Falcon Highway. At Falcon Highway there is a 36-inch cmp culvert that is inadequate to carry the 100-year design flow.

DRAINAGE FEES, COST ESTIMATE & MAINTENANCE

Maintenance

The streets and major improvements within this site will be maintained by the Meridian Crossing Property Owners Association (POA) for ownership and maintenance. This includes the roads, drainage facilities, and water quality ponds. The Falcon Highlands Metropolitan District will own and operate water and wastewater systems. The remaining utilities (gas, phone, electric, cable, etc) will be owned and maintained by their respective companies. Easements will be issued to ensure each entity is able to access and maintain their facilities.

Drainage Fees

The proposed development is located within the Falcon Basin. The proposed commercial site encompasses approximately 9.5 acres. Fees will be based on 9.0 acres (95% imperviousness due to commercial development).

Drainage fees in the Falcon Basin are $6,925 and bridge fees are $2,659. Based on these numbers and an impervious area of 9.0 acres fees for this development are $62,325 for drainage and $25,261 for bridge fees. This gives a total fee of $87,586.

Proposed Facilities Estimate

ITEM	UNITS	UNIT COST	QUANTITY	ITEM COST
DRAINAGE				
5' STORM MANHOLE	EA	2,800	1	2,800
30" RCP	LF	55	435	23,925
36" RCP	LF	65	60	3,900
42" RCP	LF	80	105	8,400
RIPRAP	CY	45	30	1,350
SUBTOTAL DRAINAGE				*$40,375*
GRADING AND EROSION CONTROL				
CLEARING AND GRUBBING	AC	$800	9.5	$7,600
EARTHWORK	CY	3.50	13300	46,550
WATER QUALITY PONDS	EA	3,000	2	6,000
CURB BACKFILL	LF	2.50	3200	8,000
MISC SEEDING AND MULCH	AC	3,500	6	21,000
HAY BALE CHECKS	EA	10	37	370
INLET PROTECTORS	EA	200	4	800
VEHICLE TRACKING CONTROL	EA	1,500	1	1,500
SILT FENCING	LF	5	1800	9,000
SUBTOTAL GRADING & EROSION CONTROL				*$100,770*
ULTIMATE DRAINAGE				
5' STORM MANHOLE	EA	2,800	1	2,800
30" RCP	LF	40	259	10,360
5' TYPE R INLET	EA	3,500	1	3,500
SUBTOTAL ULTIMATE DRAINAGE				*$16,660*
SUBTOTAL DRAINAGE & EROSION CONTROL				***$157,805***
Engineering (10%)				$15,781

Contingency (10%)				
				$15,781
TOTAL				
				$189,367

EROSION CONTROL

General Concept

During construction, best management practices for erosion control will be employed based on El Paso County criteria and the erosion control plan.

Ditches will be designed to meet El Paso County criteria for slope and velocity, keeping velocities below scouring levels.

During construction, best management practices (BMP) for erosion control will be employed based on El Paso County Criteria. BMP's will be utilized as deemed necessary by the contractor and/or engineer and are not limited to measures shown on the construction drawing set. The contractor shall minimize the amount of area disturbed during all construction activities.

In general the following shall be applied in developing the sequence of major activities:

- Install downslope and sideslope perimeter BMP's before land disturbing activity occurs.
- Do not disturb an area until it is necessary for construction activity to proceed.
- Cover or stabilize as soon as possible.
- Time the construction activities to reduce the impacts from seasonal climatic changes or weather events.
- The construction of filtration BMP's should wait until the end of the construction project when upstream drainage areas have been stabilized.
- Do not remove temporary perimeter controls until after all upstream areas are stabilized.

Silt Fence

Silt fence will be placed along downstream limits of disturbed areas. This will prevent suspended sediment from leaving the site during infrastructure construction. Silt fencing is to remain in place until vegetation is reestablished.

Erosion Bales

Erosion bales will be placed ten (10) feet from the inlet of all culverts and inlets during construction to prevent culverts from filling with sediment. Erosion bales will remain in place until vegetation is reestablished in graded roadside ditches and channels. Erosion bale ditch checks will be used on slopes greater than 1% to reduce flow velocities until vegetation is reestablished.

Vehicle Tracking Control

This BMP is used to stabilize construction entrances, roads, parking areas and staging areas to prevent the tracking of sediment from the construction site. A vehicle tracking control (VIC) is to be used at all locations where vehicles exit the construction site onto public roads, loading and unloading areas, storage and staging areas, where construction trailers are to be located, any construction area that receives high vehicular traffic, construction roads and parking areas. VTC's should not be installed in areas where soils erode easily or are wet.

Sedimentation Pond

This BMP is used to detain runoff which has become laden with sediment long enough to allow the sediment to settle out. As the construction area is larger than 1 acre, a temporary sediment basin is required per Volume 2 of the Drainage Criteria Manual. The basin will be located in the area of the proposed water quality pond, as this area will need to be excavated and an embankment built. A temporary 8" pvc underdrain will be installed to drain this basin during construction.

REFERENCE MATERIALS

1. "City of Colorado Springs/El Paso County Drainage Criteria Manual" September 1987, Revised November 1991, Revised October 1994.

2. "City of Colorado Springs/El Paso County Drainage Criteria Manual, Volume 2: Stormwater Quality Policies, Procedures and Best Management Practices" November 1, 2002.

3. Soils Survey of El Paso County Area, Natural Resources Conservation Services of Colorado.

4. Flood Insurance Rate Study for El Paso County, Colorado and Incorporated Areas. Federal Emergency Management Agency, Revised March 17, 1997.

5. Falcon Area Drainage Basin Planning Study Preliminary Design Report, December 2000. Prepared by URS Corp.

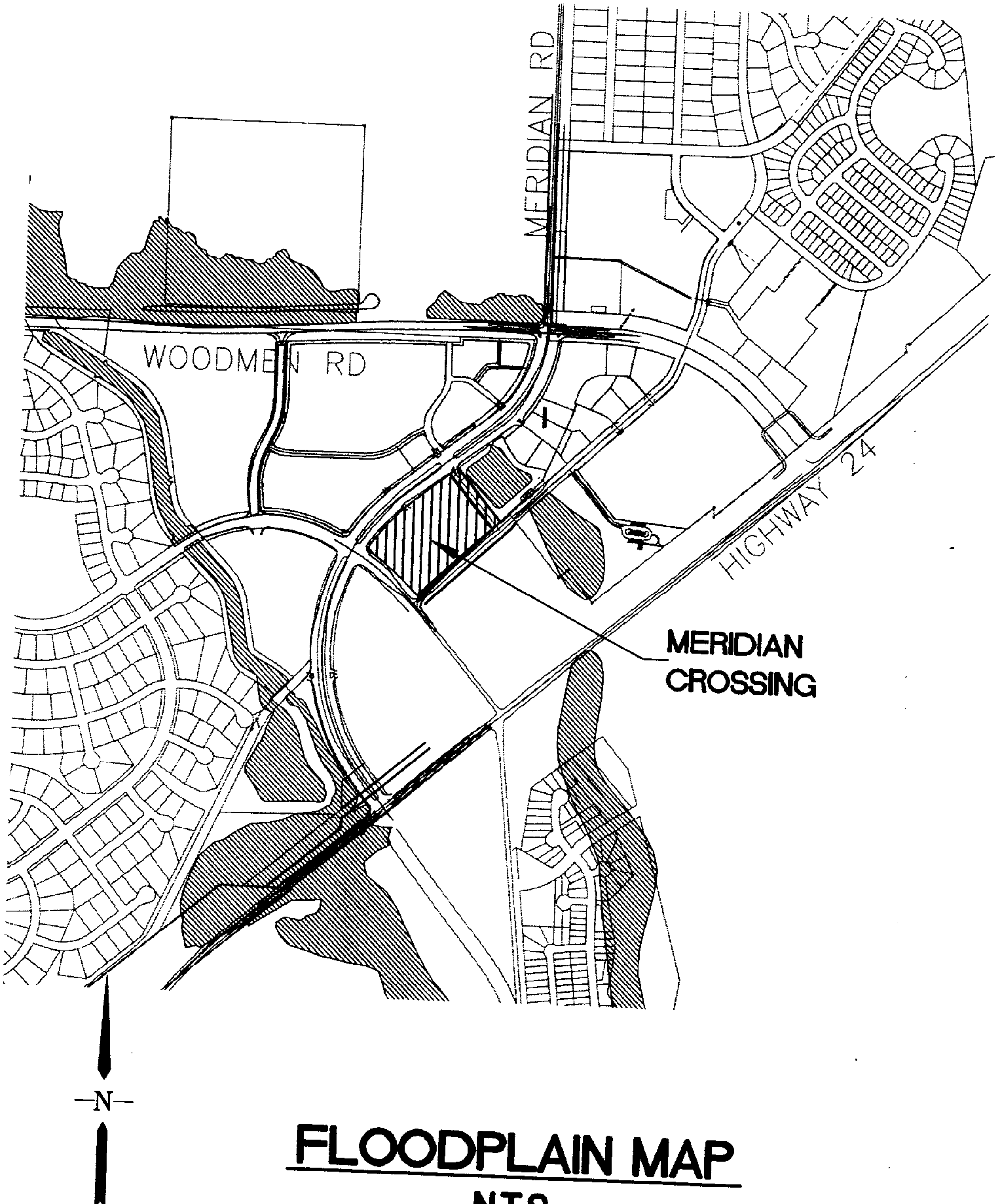
6. Master Development Drainage Plan, and Preliminary Drainage Report and Final Drainage Report for Falcon Highland Filing No. 1, October 2004. Prepared by URS Corp.

7. Floodplain Modification Study and Application for Conditional Letter of Map Revision for the Middle Tributary of the Falcon Basin-Regency Center, January 2005. Prepared by URS Corp.

8. Amendment to Falcon Highlands Master Drainage Development Plan, September 2005. Prepared by URS Corp.

9. Falcon Highlands Market Place Filing No. 1 Preliminary and Final Drainage Report, December 22, 2005. Prepared by URS Corp.

Figure 3: FEMA Floodplain Map



FLOODPLAIN MAP

N.T.S.

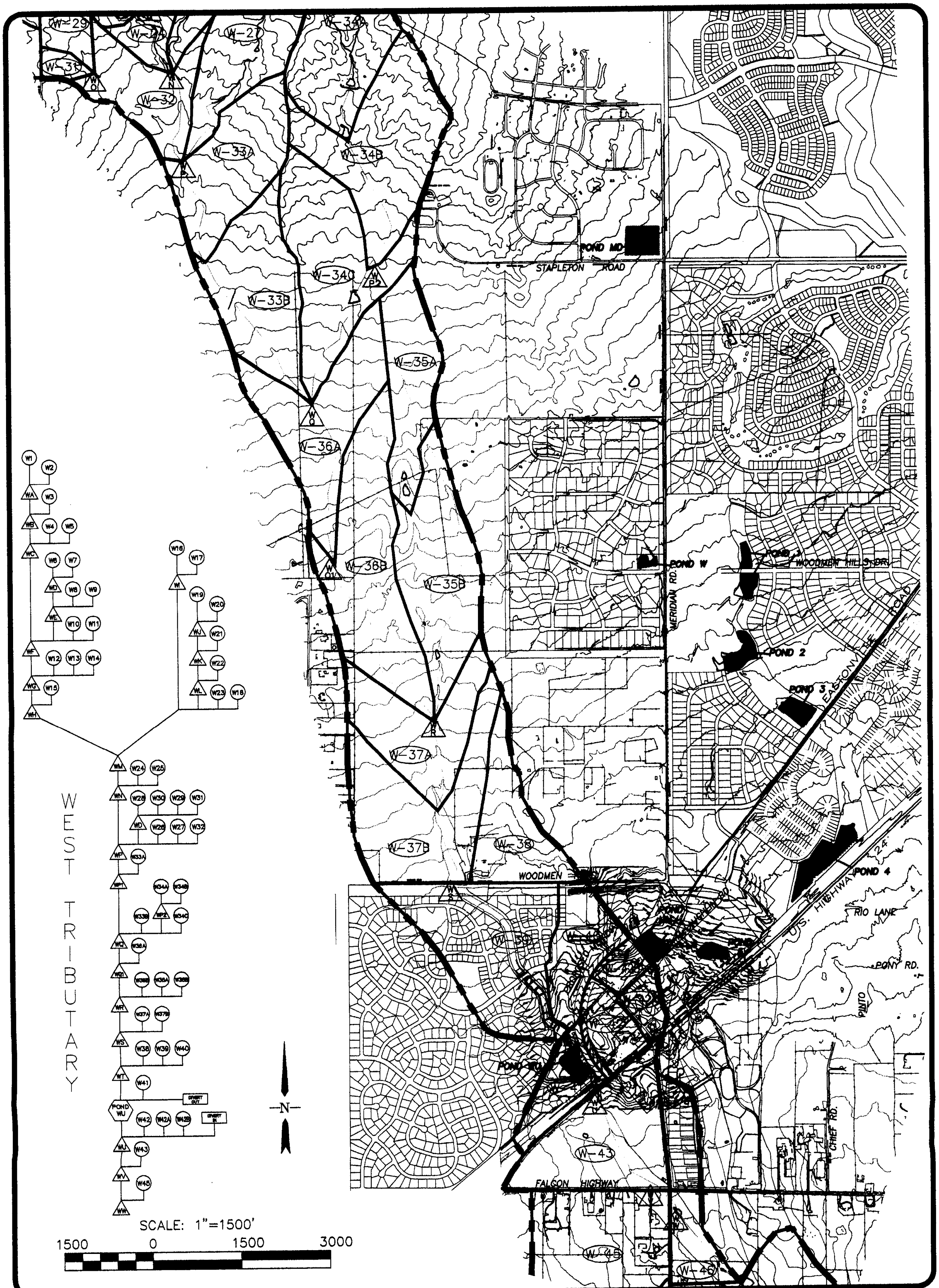
MERIDIAN CROSSING

FIRM MAP 08041C0575 REV 11/26/03

SE Springs Engineering
31 NORTH TEJON, SUITE 315
COLORADO SPRINGS, CO 80903
TEL: (719) 227-7388
FAX: (719) 227-7392

FIGURE 3

PROJECT NO. 057-07-032



MERIDIAN CROSSING

HEC-1 HYDROLOGIC MODEL

SE Springs Engineering
31 NORTH TEJON, SUITE 315
COLORADO SPRINGS, COLORADO 80903
TEL: (719) 227-7388 FAX: (719) 227-7392

FIGURE 4

PROJECT NO. 06-0033

Appendix A: Existing HEC-1 Calculations

```
1***************************************                                        ***************************************
 *                                      *                                       *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                       *   U.S. ARMY CORPS OF ENGINEERS      *
 *            JUN   1998                *                                       *   HYDROLOGIC ENGINEERING CENTER     *
 *          VERSION 4.1                 *                                       *       609 SECOND STREET             *
 *                                      *                                       *     DAVIS, CALIFORNIA 95616         *
 * RUN DATE   28SEP07  TIME  11:57:06   *                                       *        (916) 756-1104               *
 *                                      *                                       *                                     *
 ****************************************                                       ***************************************
```

```
X     X  XXXXXXX   XXXXX         X
X     X  X        X     X       XX
X     X  X        X              X
XXXXXXX  XXXX     X      XXXXX   X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX        XXX
```

```
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
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1          ID     FALCON BASIN 5-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
   2          ID          UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
   3          ID          INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
   4          ID          NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR
   5          ID                DETENTION POND AT MC
   6          ID          NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN
   7          ID                DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)
              *DIAGRAM
   8          IT        5 14JUL99     800     300
   9          IO        5

  10          KK       W1
  11          KM
  12          BA    .0479
  13          PB      2.6
  14          IN       15
  15          PC    .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143   .0165
  16          PC    .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530   .0600
  17          PC    .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900   .8000
  18          PC    .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550   .8600
  19          PC    .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938   .8975
  20          PC    .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270   .9300
  21          PC    .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525   .9550
  22          PC    .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775   .9800
  23          PC    .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913   .9925
  24          PC    .9938   .9950   .9963   .9975   .9988   1.000
  25          LS               60
  26          UD     .097

  27          KK
  28          KM
  29          RK     1519   .0263    .035            TRAP       5       4

  30          KK       W2
  31          KM
  32          BA    .0278
  33          LS               60
  34          UD     .160

  35          KK       WA
  36          KM
  37          HC        2

  38          KK
  39          KM
  40          RK      464   .0151    .035            TRAP       5       4

  41          KK       W3
  42          KM
  43          BA    .0498
  44          LS               61
  45          UD     .139


  46          KK       WB
  47          KM
  48          HC        2

  49          KK
  50          KM
  51          RK      823   .0279    .035            TRAP       5       4                54

  52          KK       W4
  53          KM
  54          BA    .0054
  55          LS               62
  56          UD     .044

  57          KK
  58          KM
  59          RK     1078   .0482    .035            TRAP       5       4

  60          KK       W5
  61          KM
  62          BA    .0159
  63          LS               60
  64          UD     .075

  65          KK       WC
  66          KM
  67          HC        3

  68          KK
  69          KM
  70          RK      557   .0449    .035            TRAP      10       4

  71          KK       W6
  72          KM
  73          BA    .0486
  74          LS               60
  75          UD     .085
```

```
KK
KM
RK     592   .0372    .035            TRAP       5         4

KK     W7
KM
BA   .0217
LS              60
UD    .074

KK
KM
RK     464   .1466    .035            TRAP       5         4

KK     WD
KM
HC       2

KK     D-E
KM
RK    1044   .0479    .035            TRAP       5         4

KK     W8
KM
BA   .0286
LS              60
UD    .069

KK
KM
RK    1449   .0504    .035            TRAP       5         4

KK     W9
KM
BA   .0402
LS              61
UD    .097

KK     WE
KM
HC       3

KK     E-F
KM
RK     789   .0038    .035            TRAP       5         4

KK     W10
KM
BA   .0431
LS              61
UD    .096

KK
KM
RK     824   .0388    .035            TRAP       5         4

KK     W11
KM
BA   .0314
LS              60
UD    .077

KK     WF
KM
HC       4

KK     F-G
KM
RK    2319   .0211    .035            TRAP      10         4

KK     W12
KM
BA   .0398
LS              60
UD    .095

KK
KM
RK    2478   .0307    .035            TRAP       5         4

KK     W14
KM
BA   .0473
LS              61
UD    .135

KK
KM
RK      81  0.0001    .035            TRAP       5         4

KK     W13
KM
BA   .1123
LS              61
```

151	UD	.182					
152	KK	WG					
153	KM						
154	HC	4					
155	KK	G-H					
156	KM						
157	RK	2632	.0217	.035	TRAP	15	4
158	KK						
159	KM						
160	RK	2447	.0372	.035	TRAP	5	4
161	KK	W15					
162	KM						
163	BA	.0881					
164	LS		61				
165	UD	.141					
166	KK						
167	KM						
168	RK	1763	.0289	.035	TRAP	5	4
169	KK	WH					
170	KM						
171	HC	2					
172	KK	W16					
173	KM						
174	BA	.0292					
175	LS		61				
176	UD	.092					
177	KK						
178	KM						
179	RK	1345	.0260	.035	TRAP	5	4
180	KK	W17					
181	KM						
182	BA	.0184					
183	LS		60				
184	UD	.085					
185	KK	WI					
186	KM						
187	HC	2					
188	KK	I-M					
189	KM						
190	RK	2650	.0370	.035	TRAP	15	4
191	KK	W19					
192	KM						
193	BA	.0428					
194	LS		61				
195	UD	.083					
196	KK						
197	KM						
198	RK	881	.0329	.035	TRAP	5	4
199	KK	W20					
200	KM						
201	BA	.0315					
202	LS		61				
203	UD	.071					
204	KK	WJ					
205	KM						
206	HC	2					
207	KK						
208	KM						
209	RK	3061	.0235	.035	TRAP	5	4
210	KK	W21					
211	KM						
212	BA	.1347					
213	LS		60				
214	UD	.156					
215	KK	WK					
216	KM						
217	HC	2					
218	KK						
219	KM						
220	RK	487	.0246	.035	TRAP	5	4
221	KK	W22					
222	KM						
223	BA	.0086					
224	LS		63				
225	UD	.055					

```
226   KK    WL
227   KM
228   HC     2

229   KK
230   KM
231   RK   1786  .0297  .035        TRAP    5    4

232   KK    W23
233   KM
234   BA  .0244
235   LS           60
236   UD   .112

237   KK    W18
238   KM
239   BA  .1251
240   LS           60
241   UD   .189

242   KK    WM
243   KM
244   HC     5

245   KK    M-N
246   KM
247   RK   1345  .0149  .035        TRAP   20    4

248   KK    W24
249   KM
250   BA  .0442
251   LS           60
252   UD   .140

253   KK    W25
254   KM
255   BA  .0957
256   LS           61
257   UD   .197

258   KK    WN
259   KM
260   HC     3

261   KK    N-P
262   KM
263   RK   1589   .017  .035        TRAP   20    4

264   KK    W28
265   KM
266   BA  .0397
267   LS           63
268   UD   .128

269   KK
270   KM
271   RK   1345  .0208  .035        TRAP    5    4

272   KK    W30
273   KM
274   BA  .0509
275   LS           63
276   UD   .123

277   KK
278   KM
279   RK   1078  .0074  .035        TRAP    5    4

280   KK    W29
281   KM
282   BA  .0409
283   LS           63
284   UD   .145

285   KK    W31
286   KM
287   BA  .0123
288   LS           63
289   UD   .073

290   KK    WO
291   KM
292   HC     4

293   KK    O-P
294   KM
295   RK   2169  .0226  .035        TRAP    5    4

296   KK    W26
297   KM
298   BA  .0301
299   LS           63
300   UD   .062
```

301	KK							
302	KM							
303	RK	4662	.0225	.035		TRAP	5	4
304	KK	W27						
305	KM							
306	BA	.1633						
307	LS		60					
308	UD	.253						
309	KK	W32						
310	KM							
311	BA	.0890						
312	LS		60					
313	UD	.170						
314	KK	WP						
315	KM							
316	HC	5						
317	KK	P-Q						
318	KM							
319	RK	1925	.0182	.035		TRAP	25	4
320	KK	W33A						
321	KM							
322	BA	.1261						
323	LS		60					
324	UD	.186						
325	KK	WP1						
326	KM							
327	HC	2						
328	KK	P1-Q						
329	KM							
330	RK	3000	.020	.035		TRAP	25	4
331	KK	W33B						
332	KM							
333	BA	.1360						
334	LS		60					
335	UD	.225						
336	KK	W34A						
337	KM							
338	BA	.1261						
339	LS		60					
340	UD	.173						
341	KK	34A-P2						
342	KM							
343	RK	2550	.0176	.035		TRAP	25	4
344	KK	W34B						
345	KM							
346	BA	.1766						
347	LS		60					
348	UD	.224						
349	KK	WP2						
350	KM							
351	HC	2						
352	KK	P2-Q						
353	KM							
354	RK	2640	.021	.035		TRAP	25	4
355	KK	W34C						
356	KM							
357	BA	.1625						
358	LS		60					
359	UD	.244						
360	KK	WQ						
361	KM							
362	HC	4						
363	KK	Q-Q1						
364	KM							
365	RK	2940	.022	.035		TRAP	25	4
366	KK	W36A						
367	KM							
368	BA	.1429						
369	LS		60					
370	UD	.234						
371	KK	WQ1						
372	KM							
373	HC	2						
374	KK	Q1-R						
375	KM							
376	RK	3400	.022	.035		TRAP	25	4

```
377     KK    W36B
378     KM
379     BA   .1918
380     LS              60
381     UD    .306

382     KK    W35A
383     KM
384     BA   .0958
385     LS              60
386     UD    .187

387     KK  35A-WR
388     KM
389     RK    3715   .023    .035           TRAP     25      4

390     KK    W35B
391     KM
392     BA   .1507
393     LS       0      60
394     UD    .259

395     KK      WR
396     KM
397     HC       4

398     KK    WR-S
399     KM
400     RK    2922  .0168    .035           TRAP     25      4

401     KK    W37A
402     KM
403     BA   .1138
404     LS              60
405     UD    .185

406     KK   37A-S
407     KM
408     RK    1430   .014    .035           TRAP     25      4

409     KK    W37B
410     KM
411     BA   .1636
412     LS              61
413     UD    .218

414     KK      WS
415     KM
416     HC       3

417     KK     S-T
418     KM
419     RK    3653  .0164    .035           TRAP     25      4

420     KK     W38
421     KM
422     BA   .0907
423     LS              62
424     UD    .190

425     KK
426     KM
427     RK    2922  .0171    .035           TRAP      5      4

428     KK     W39
429     KM
430     BA   .1833
431     LS              60
432     UD    .251

433     KK     W40
434     KM
435     BA   .0964
436     LS              60
437     UD    .165

438     KK      WT
439     KM
440     HC       4

441     KK     T-U
442     KM
443     RK    1125  .0098    .035           TRAP     25      4

444     KK     W41
445     KM
446     BA   .0601
447     LS              60
448     UD    .117

449     KK     W42
450     KM
451     BA   .0581
452     LS              81
```

453	UD	.127						
454	KK	U-V						
455	KM							
456	RK	2656	.0184	.035		TRAP	5	4
457	KK	WU						
458	KM							
459	HC	3						
460	KK							
461	KM							
462	RK	2215	.0181	.035		TRAP	25	4
463	KK	W43						
464	KM							
465	BA	.1457						
466	LS		61					
467	UD	.169						
468	KK	WV						
469	KM							
470	HC	2						
471	KK	V-W						
472	KM							
473	RK	487	.0103	.035		TRAP	25	4
474	KK	W45						
475	KM							
476	BA	.1931						
477	LS		61					
478	UD	.189						
479	KK	WW						
480	KM							
481	HC	2						
482	KK	W-X						
483	KM							
484	RK	1542	.0149	.035		TRAP	5	4
485	KK	M1						
486	KM							
487	BA	.0665						
488	LS		60					
489	UD	.108						
490	KK							
491	KM							
492	RK	650	.0308	.035		TRAP	5	4
493	KK	M2						
494	KM							
495	BA	.0273						
496	LS		60					
497	UD	.114						
498	KK	MB						
499	KM							
500	HC	2						
501	KK							
502	KM							
503	RK	928	.0302	.035		TRAP	5	4
504	KK	M4						
505	KM							
506	BA	.0346						
507	LS		60					
508	UD	.121						
509	KK							
510	KM							
511	RK	406	.0197	.02		TRAP	40	0
512	KK	M3						
513	KM							
514	BA	.0149						
515	LS		60					
516	UD	.076						
517	KK	MC						
518	KM							
519	HC	3						
520	KK							
521	KM							
522	RK	1902	.0231	.035		TRAP	5	4
523	KK	M5						
524	KM							
525	BA	.0176						
526	LS		69					
527	UD	.108						

```
528        KK
529        KM
530        RK    1717   .0186    .02          TRAP      40      0

531        KK      M6
532        KM
533        BA   .0637
534        LS             65
535        UD    .233

536        KK      MD
537        KM
538        HC       3

539        KK
540        KM
541        RK    2841    .019   .035          TRAP       5      4

542        KK      M7
543        KM
544        BA   .0524
545        LS             69
546        UD    .170

547        KK
548        KM
549        RK    1044   .0268    .02          TRAP      40      0

550        KK      M8
551        KM
552        BA   .0370
553        LS             61
554        UD    .126

555        KK      ME
556        KM
557        HC       2

558        KK
559        KM
560        RK    2992   .0187   .035          TRAP       5      4

561        KK      M9
562        KM
563        BA   .0169
564        LS             69
565        UD    .087

566        KK
567        KM
568        RK    3433   .0253    .03          TRAP       5      4

569        KK    M12A
570        KM
571        BA   .0658
572        LS             60
573        UD    .159

574        KK    M12B
575        KM
576        BA   .1481
577        LS             60
578        UD    .219

579        KK      MF
580        KM
581        HC       5

582        KK
583        KM
584        RK    2586   .0224   .035          TRAP      10      4

585        KK     M13
586        KM
587        BA   .0614
588        LS             64
589        UD    .165

590        KK
591        KM
592        RK    1700     .01   .035          TRAP       6      4

593        KK     M14
594        KM
595        BA   .1624
596        LS             64
597        UD    .228

598        KK      MG
599        KM
600        HC       2

601        KK   PONDW
602        KM         WOODMEN HILLS DETENTION POND WEST (FROM FDR WH FLG F4)
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```
SV        0     .68     1.5     235     3.6     4.9     6.3    7.34    7.34
SE      968     969     970     971     972     973     974     975     976
SQ        0       8    15.5      41    84.4     110     138     152     205
RS        1    ELEV     968

KK       MH
KM
HC        2

KK
KM
RK     1276   .0212    .035            TRAP      15       4

KK    MH-P2
KM          DIVERT FLOW TO POND 2 VIA TWIN 23x47 ARCH CMPS UNDER MERIDIAN
DT   DIVRT1      90
DI        0      39      72     152     263     318     377     442     591
DQ        0      39      70      80      80      80      85      85      90

KK      M15
KM
BA    .1242
LS               64
UD     .203

KK       MI
KM
HC        2

KK
KM
RK     1995   .0165    .035            TRAP      15       4

KK      M19
KM
BA    .0499
LS               61
UD     .159

KK       MJ
KM
HC        2

KK
KM
RK     2215   .0158    .035            TRAP      15       4

KK      M10
KM
BA    .0581
LS               62
UD     .102

KK    M10-K
KM
RK     3150   .0255     .03            TRAP       5       4

KK     M11A
KM
BA    .1067
LS               61
UD     .231

KK       MK
KM
HC        2

KK    MK-K1
KM
RK     2300    .260     .03            TRAP       5       4

KK     M11B
KM
BA    .0879
LS               60
UD     .150

KK   11B-K1
KM
RK     2400    .025     .03            TRAP       5       4

KK     M11C
KM
BA    .0933
LS               60
UD     .160

KK      MK1
KM
HC        3

KK    K1-ML
KM
RK     1821    .028    .035            TRAP       5       4
```

678	KK	M16					
679	KM						
680	BA	.042					
681	LS		60				
682	UD	.139					
683	KK	ML					
684	KM						
685	HC	2					
686	KK						
687	KM						
688	RK	2099	.02	.035	TRAP	5	4
689	KK	M17					
690	KM						
691	BA	.0765					
692	LS		61				
693	UD	.133					
694	KK	MM					
695	KM						
696	HC	2					
697	KK						
698	KM						
699	RK	2320	.0121	.035	TRAP	10	4
700	KK	M18					
701	KM						
702	BA	.061					
703	LS		61				
704	UD	.142					
705	KK						
706	KM						
707	RK	2122	.017	.035	TRAP	5	4
708	KK	M20					
709	KM						
710	BA	.1341					
711	LS		61				
712	UD	.211					
713	KK	MN					
714	KM						
715	HC	4					
716	KK						
717	KM						
718	RK	1531	.0202	.035	TRAP	25	4
719	KK	M21					
720	KM						
721	BA	.0241					
722	LS		61				
723	UD	.125					
724	KK						
725	KM						
726	RK	1322	.0212	.035	TRAP	5	4
727	KK	M23					
728	KM						
729	BA	.0461					
730	LS		60				
731	UD	.120					
732	KK	MO					
733	KM						
734	HC	3					
735	KK						
736	KM						
737	RK	974	.0133	.035	TRAP	25	4
738	KK	M24					
739	KM						
740	BA	.0776					
741	LS		60				
742	UD	.125					
743	KK	MP					
744	KM						
745	HC	2					
746	KK						
747	KM						
748	RK	290	.0138	.035	TRAP	25	4
749	KK	M25					
750	KM						
751	BA	.0105					
752	LS		60				
753	UD	.130					

754	KK	MQ					
755	KM						
756	HC	2					
757	KK						
758	KM						
759	RK	3305	.0136	.035	TRAP	25	4
760	KK	M26					
761	KM						
762	BA	.1779					
763	LS		65				
764	UD	.250					
765	KK	MR					
766	KM						
767	HC	2					
768	KK	W44					
769	KM						
770	BA	.0384					
771	LS		60				
772	UD	.141					
773	KK						
774	KM						
775	RK	2029	.0148	.035	TRAP	5	4
776	KK	W47					
777	KM						
778	BA	.0541					
779	LS		60				
780	UD	.148					
781	KK						
782	KM						
783	RK	1438	.0223	.035	TRAP	5	4
784	KK	W46					
785	KM						
786	BA	.0418					
787	LS		61				
788	UD	.154					
789	KK	M27					
790	KM						
791	BA	.0528					
792	LS		60				
793	UD	.132					
794	KK	WX					
795	KM						
796	HC	6					
797	KK						
798	KM						
799	RK	2563	.0125	.035	TRAP	40	4
800	KK	W48					
801	KM						
802	BA	.1179					
803	LS		61				
804	UD	.091					
805	KK						
806	KM						
807	RK	2400	.0188	.035	TRAP	5	4
808	KK	W49					
809	KM						
810	BA	.2651					
811	LS		61				
812	UD	.181					
813	KK	WZ					
814	KM						
815	HC	3					
816	KK						
817	KM						
818	RK	800	.0125	.035	TRAP	40	4
819	KK	W50					
820	KM						
821	BA	.1061					
822	LS		61				
823	UD	.145					
824	KK	WAB					
825	KM						
826	HC	2					
827	KK						
828	KM						

829	RK	742	.0108	.035	TRAP	40	4
830	KK	W51					
831	KM						
832	BA	.0546					
833	LS		63				
834	UD	.172					
835	KK	WAC					
836	KM						
837	HC	2					
838	KK						
839	KM						
840	RK	638	.0345	.035	TRAP	40	4
841	KK	W52					
842	KM						
843	BA	.0499					
844	LS		63				
845	UD	.109					
846	KK						
847	KM						
848	RK	1171	.0205	.035	TRAP	5	4
849	KK	W53					
850	KM						
851	BA	.0531					
852	LS		63				
853	UD	.156					
854	KK	WAD					
855	KM						
856	HC	2					
857	KK						
858	KM						
859	RK	290	.0310	.035	TRAP	10	4
860	KK	W54					
861	KM						
862	BA	.0078					
863	LS		60				
864	UD	.050					
865	KK	WAE					
866	KM						
867	HC	3					
868	KK						
869	KM						
870	RK	1925	.0052	.035	TRAP	40	4
871	KK	W56					
872	KM						
873	BA	.1831					
874	LS		60				
875	UD	.191					
876	KK	WAF					
877	KM						
878	HC	2					
879	KK						
880	KM						
881	RK	1032	.0155	.035	TRAP	40	4
882	KK	W62					
883	KM						
884	BA	.0750					
885	LS		60				
886	UD	.090					
887	KK						
888	KM						
889	RK	2169	.0203	.035	TRAP	5	4
890	KK	W63					
891	KM						
892	BA	.047					
893	LS		60				
894	UD	.109					
895	KK						
896	KM						
897	RK	1450	.0131	.035	TRAP	5	4
898	KK	W61					
899	KM						
900	BA	.192					
901	LS		60				
902	UD	.251					
903	KK	WAH					

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904          KM
905          HC      3

906          KK
907          KM
908          RK   1241   .0153    .035          TRAP       5       4

909          KK    W57
910          KM
911          BA  .0732
912          LS             60
913          UD   .140

914          KK
915          KM
916          RK   5903   .0254    .035          TRAP       5       4

917          KK    W58
918          KM
919          BA  .2296
920          LS             60
921          UD   .251

922          KK    WAI
923          KM
924          HC      3

925          KK
926          KM
927          RK    232   .0086    .035          TRAP      15       4

928          KK    E1A
929          KM
930          BA  .1151
931          LS      0      60
932          UD   .234

933          KK E1A-EA
934          KM
935          RK   4000    .022    .035          TRAP       5       4

936          KK    E1B
937          KM
938          BA  .1665
939          LS      0      60
940          UD   .233

941          KK     EA
942          KM
943          HC      2

944          KK  EA-EB
945          KM
946          RK   1900    .022    .035          TRAP       5       4

947          KK     E2
948          KM
949          BA   .104
950          LS      0      60
951          UD   .149

952          KK     EB
953          KM
954          HC      2

955          KK  POND1
956          KM       ROUTE FLOW THROUGH SCS POND 1
957          SV      0     .01     .28    1.12    2.70    5.18    6.00    6.94
958          SE  945.5     946     948     950     952     954   954.5     955
959          SQ      0       0       0       0       0    48.5   176.4   351.4
960          RS      1    ELEV   945.5

961          KK
962          KM
963          RK   1300   .0192    .035          TRAP       5       4

964          KK     E3
965          KM
966          BA   .090
967          LS             60
968          UD   .128

969          KK  MH-P2
970          KM       RETRIEVE DIVERSION FROM W. MERIDIAN RD DITCH
971          DR DIVRT1

972          KK     EC
973          KM
974          HC      3

975          KK  POND2
976          KM       ROUTE FLOW THROUGH SCS POND 2
977          SV      0     .21    1.11    3.19    6.89    9.52   11.08   12.82   14.72   16.70
978          SE    920     922     924     926     928     929   929.5     930   930.5     931
979          SQ      0       0       0       0       0       0      25    86.5   186.2   308.4
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980	RS	1	ELEV	920			
981	KK						
982	KM						
983	RK	1700	.0141	.035	TRAP	5	4
984	KK	E1C					
985	KM						
986	BA	.0845					
987	LS		60				
988	UD	.200					
989	KK	1C-ED1					
990	KM						
991	RK	3450	.022	.035	TRAP	5	4
992	KK	E4					
993	KM						
994	BA	.127					
995	LS		60				
996	UD	.200					
997	KK	ED1					
998	KM						
999	HC	2					
1000	KK	ED1-ED					
1001	KM						
1002	RK	450	.0178	.03	TRAP	5	4
1003	KK	E5					
1004	KM						
1005	BA	.094					
1006	LS		60				
1007	UD	.160					
1008	KK	ED					
1009	KM						
1010	HC	3					
1011	KK						
1012	KM						
1013	RK	950	.0211	.035	TRAP	10	4
1014	KK	E8					
1015	KM						
1016	BA	.0446					
1017	LS		60				
1018	UD	.139					
1019	KK	EE					
1020	KM						
1021	HC	2					
1022	KK						
1023	KM						
1024	RK	1500	.0127	.035	TRAP	10	4
1025	KK	E10					
1026	KM						
1027	BA	.029					
1028	LS		60				
1029	UD	.158					
1030	KK	EF					
1031	KM						
1032	HC	2					
1033	KK	F-G					
1034	KM						
1035	RK	950	.0074	.035	TRAP	15	4
1036	KK	E6					
1037	KM						
1038	BA	.119					
1039	LS		60				
1040	UD	.228					
1041	KK	E7					
1042	KM						
1043	BA	.031					
1044	LS		60				
1045	UD	.082					
1046	KK						
1047	KM						
1048	RK	1100	.0100	.035	TRAP	5	4
1049	KK	EG1					
1050	KM						
1051	HC	2					
1052	KK	G1-G					
1053	KM						
1054	RK	1650	.0176	.035	TRAP	5	4

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1055    KK    E9
1056    KM
1057    BA    .077
1058    LS            60
1059    UD    .207

1060    KK
1061    KM
1062    RK    1500  .0080     .03           TRAP      5      4

1063    KK    E11
1064    KM
1065    BA    .045
1066    LS            60
1067    UD    .195

1068    KK    E12
1069    KM
1070    BA    .092
1071    LS            60
1072    UD    .156

1073    KK    EG
1074    KM
1075    HC       5

1076    KK    E13
1077    KM
1078    BA   .0165
1079    LS            60
1080    UD    .252

1081    KK    E14
1082    KM
1083    BA   .0051
1084    LS            60
1085    UD    .153

1086    KK
1087    KM
1088    RK     279  .0108     .03           TRAP      5      4

1089    KK    EH
1090    KM
1091    HC       3

1092    KK
1093    KM
1094    RK    2400  .0204    .035           TRAP     10      4

1095    KK    E19
1096    KM
1097    BA   .0406
1098    LS            62
1099    UD    .127

1100    KK    EJ1
1101    KM
1102    HC       2

1103    KK    J1-K
1104    KM
1105    RK    4013   .013    .035           TRAP     10      4

1106    KK    E15
1107    KM
1108    BA   .0355
1109    LS            63
1110    UD    .097

1111    KK
1112    KM
1113    RK     951  .0189    .035           TRAP      5      4

1114    KK    E16
1115    KM
1116    BA   .0307
1117    LS            63
1118    UD    .100

1119    KK    EI
1120    KM
1121    HC       2

1122    KK
1123    KM
1124    RK    1334  .0105    .035           TRAP      5      4

1125    KK    E17
1126    KM
1127    BA   .0312
1128    LS            63
1129    UD    .097
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1130    KK
1131    KM
1132    RK    1728   .0145   .035         TRAP    5    4

1133    KK     E18
1134    KM
1135    BA   .0488
1136    LS             63
1137    UD    .180

1138    KK     EJ2
1139    KM
1140    HC       3

1141    KK
1142    KM
1143    RK    4221   .0123   .035         TRAP   20    4

1144    KK     E23
1145    KM
1146    BA   .1683
1147    LS             62
1148    UD    .250

1149    KK     E24
1150    KM
1151    BA    .140
1152    LS             63
1153    UD    .371

1154    KK      EK
1155    KM
1156    HC       4

1157    KK
1158    KM
1159    RK    2817   .0149   .035         TRAP   25    4

1160    KK     E21
1161    KM
1162    BA   .0873
1163    LS             60
1164    UD    .183

1165    KK
1166    KM
1167    RK    1647   .0121   .035         TRAP    5    4

1168    KK     E20
1169    KM
1170    BA   .0771
1171    LS             62
1172    UD    .219

1173    KK
1174    KM
1175    RK     569   .0141   .035         TRAP    5    4

1176    KK     E22
1177    KM
1178    BA   .0677
1179    LS             61
1180    UD    .240

1181    KK      EL
1182    KM
1183    HC       3

1184    KK
1185    KM
1186    RK    2041   .0162   .035         TRAP   25    4

1187    KK     E25
1188    KM
1189    BA   .1665
1190    LS             61
1191    UD    .176

1192    KK      EM
1193    KM
1194    HC       3

1195    KK
1196    KM
1197    RK     928   .0108   .035         TRAP   40    4

1198    KK     E26
1199    KM
1200    BA   .0361
1201    LS             63
1202    UD    .096

1203    KK      EN
1204    KM
1205    HC       2
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1206  KK
1207  KM
1208  RK    1832   .0126   .035        TRAP   40   4

1209  KK     E27
1210  KM
1211  BA   .1236
1212  LS             63
1213  UD    .172

1214  KK      EO
1215  KM
1216  HC       2

1217  KK
1218  KM
1219  RK    1625   .0133   .035        TRAP    5   3

1220  KK     W55
1221  KM
1222  BA   .0452
1223  LS             60
1224  UD    .093

1225  KK     WAG
1226  KM
1227  HC       2

1228  KK
1229  KM
1230  RK    2025   .0109   .035        TRAP    5   4

1231  KK     W59
1232  KM
1233  BA   .0705
1234  LS             60
1235  UD    .200

1236  KK     WAJ
1237  KM
1238  HC       4

1239  KK
1240  KM
1241  RK    1450   .0124   .035        TRAP   40   4

1242  KK     E28
1243  KM
1244  BA   .0718
1245  LS             61
1246  UD    .223

1247  KK
1248  KM
1249  RK    2064   .0165   .035        TRAP   40   4

1250  KK     E29
1251  KM
1252  BA   .0465
1253  LS             61
1254  UD    .166

1255  KK     EZZ
1256  KM       COMBINE E29 & E30 AT DP ZZ
1257  HC       2

1258  KK     W60
1259  KM
1260  BA   .0711
1261  LS             60
1262  UD    .182

1263  KK      ZZ
1264  KM       COMBINE ALL AT DP ZZ
1265  HC       3
1266  ZZ
```

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                            V
                .           V
  136           .
                .           .
                .           .
  139           .           .         W14
                .           .           V
                .           .           V
  144           .           .
                .           .           .
                .           .           .
  147           .           .           .         W13
                .           .           .           .
                .           .           .           .
  152          WG ...................................
                V
                V
  155         G-H
                V
                V
  158
                .
                .
  161           .         W15
                .           V
                .           V
  166           .
                .           .
                .           .
  169          WH ...........
                .
                .
  172           .         W16
                .           V
                .           V
  177           .
                .           .
                .           .
  180           .           .         W17
                .           .           .
                .           .           .
  185           .          WI ...........
                .           V
                .           V
  188           .         I-M
                .           .
                .           .
  191           .           .         W19
                .           .           V
                .           .           V
  196           .           .
                .           .           .
                .           .           .
  199           .           .           .         W20
                .           .           .           .
                .           .           .           .
  204           .           .          WJ ...........
                .           .           V
                .           .           V
  207           .           .
                .           .           .
                .           .           .
  210           .           .           .         W21
                .           .           .           .
                .           .           .           .
  215           .           .          WK ...........
                .           .           V
                .           .           V
  218           .           .
                .           .           .
                .           .           .
  221           .           .           .         W22
                .           .           .           .
                .           .           .           .
  226           .           .          WL ...........
                .           .           V
                .           .           V
  229           .           .
                .           .           .
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  232           .           .           .         W23
                .           .           .           .
                .           .           .           .
  237           .           .           .           .         W18
                .           .           .           .           .
                .           .           .           .           .
  242          WM ...............................................
                V
                V
  245         M-N
                .
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  248           .         W24
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                    .
 377                .         W36B
                    .           .
                    .           .
 382                .           .         W35A
                    .           .           V
                    .           .           V
 387                .           .        35A-WR
                    .           .           .
                    .           .           .
 390                .           .           .          W35B
                    .           .           .            .
                    .           .           .            .
 395               WR .....................................
                    V
                    V
 398               WR-S
                    .
                    .
 401                .         W37A
                    .           V
                    .           V
 406                .         37A-S
                    .           .
                    .           .
 409                .           .         W37B
                    .           .           .
                    .           .           .
 414               WS .........................
                    V
                    V
 417               S-T
                    .
                    .
 420                .         W38
                    .           V
                    .           V
 425                .
                    .           .
                    .           .
 428                .           .         W39
                    .           .           .
                    .           .           .
 433                .           .           .          W40
                    .           .           .            .
                    .           .           .            .
 438               WT .....................................
                    V
                    V
 441               T-U
                    .
                    .
 444                .         W41
                    .           .
                    .           .
 449                .           .         W42
                    .           .           V
                    .           .           V
 454                .           .          U-V
                    .           .           .
                    .           .           .
 457               WU .........................
                    V
                    V
 460
                    .
                    .
 463                .         W43
                    .           .
                    .           .
 468               WV ............
                    V
                    V
 471               V-W
                    .
                    .
 474                .         W45
                    .           .
                    .           .
 479               WW............
                    V
                    V
 482               W-X
                    .
                    .
 485                .         M1
                    .           V
                    .           V
 490                .
                    .           .
                    .           .
 493                .           .         M2
                    .           .           .
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 498                .         MB ............
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            .         V
            .         V
 501        .
            .         .
            .         .
 504        .         .        M4
            .         .          V
            .         .          V
 509        .         .
            .         .          .
            .         .          .
 512        .         .          .         M3
            .         .          .          .
            .         .          .          .
 517        .       MC .......................
            .         V
            .         V
 520        .
            .         .
            .         .
 523        .         .        M5
            .         .          V
            .         .          V
 528        .         .
            .         .          .
            .         .          .
 531        .         .          .         M6
            .         .          .          .
            .         .          .          .
 536        .       MD .......................
            .         V
            .         V
 539        .
            .         .
            .         .
 542        .         .        M7
            .         .          V
            .         .          V
 547        .         .
            .         .          .
            .         .          .
 550        .         .          .         M8
            .         .          .          .
            .         .          .          .
 555        .         .        ME ............
            .         .          V
            .         .          V
 558        .         .
            .         .          .
            .         .          .
 561        .         .          .         M9
            .         .          .          V
            .         .          .          V
 566        .         .          .
            .         .          .          .
            .         .          .          .
 569        .         .          .          .        M12A
            .         .          .          .          .
            .         .          .          .          .
 574        .         .          .          .          .        M12B
            .         .          .          .          .          .
            .         .          .          .          .          .
 579        .       MF ...............................................
            .         V
            .         V
 582        .
            .         .
            .         .
 585        .         .        M13
            .         .          V
            .         .          V
 590        .         .
            .         .          .
            .         .          .
 593        .         .          .         M14
            .         .          .          .
            .         .          .          .
 598        .         .        MG.............
            .         .          V
            .         .          V
 601        .         .       PONDW
            .         .          .
            .         .          .
 607        .       MH ............
            .         V
            .         V
 610        .
            .         .
            .         .
 615        .         .-------> DIVRT1
 613        .     MH-P2
            .         .
            .         .
 618        .         .        M15
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623            .         MI ............
               .           V
               .           V
626            .
               .           .
               .           .
629            .           .         M19
               .           .           .
               .           .           .
634            .         MJ ............
               .           V
               .           V
637            .
               .           .
               .           .
640            .           .         M10
               .           .           V
               .           .           V
645            .           .      M10-K
               .           .           .
               .           .           .
648            .           .           .        M11A
               .           .           .           .
               .           .           .           .
653            .           .          MK............
               .           .           V
               .           .           V
656            .           .       MK-K1
               .           .           .
               .           .           .
659            .           .           .        M11B
               .           .           .           V
               .           .           .           V
664            .           .           .      11B-K1
               .           .           .           .
               .           .           .           .
667            .           .           .           .        M11C
               .           .           .           .           .
               .           .           .           .           .
672            .           .         MK1.........................
               .           .           V
               .           .           V
675            .           .       K1-ML
               .           .           .
               .           .           .
678            .           .           .         M16
               .           .           .           .
               .           .           .           .
683            .           .         ML ............
               .           .           V
               .           .           V
686            .           .
               .           .           .
               .           .           .
689            .           .           .         M17
               .           .           .           .
               .           .           .           .
694            .           .         MM ............
               .           .           V
               .           .           V
697            .           .
               .           .           .
               .           .           .
700            .           .           .         M18
               .           .           .           V
               .           .           .           V
705            .           .           .
               .           .           .           .
               .           .           .           .
708            .           .           .           .         M20
               .           .           .           .           .
               .           .           .           .           .
713            .         MN ....................................
               .           V
               .           V
716            .
               .           .
               .           .
719            .           .         M21
               .           .           V
               .           .           V
724            .           .
               .           .           .
               .           .           .
727            .           .           .         M23
               .           .           .           .
               .           .           .           .
732            .         MO ........................
               .           V
               .           V
735            .
               .           .
               .           .
738            .           .         M24
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860           .           .        W54
              .           .           .
              .           .           .
865        WAE.........................
              V
              V
868
              .
              .
871           .        W56
              .           .
              .           .
876        WAF.............
              V
              V
879
              .
              .
882           .        W62
              .           V
              .           V
887           .
              .           .
              .           .
890           .           .        W63
              .           .           V
              .           .           V
895           .           .
              .           .           .
              .           .           .
898           .           .           .        W61
              .           .           .           .
              .           .           .           .
903           .         WAH........................
              .           V
              .           V
906           .
              .           .
              .           .
909           .           .        W57
              .           .           V
              .           .           V
914           .           .
              .           .           .
              .           .           .
917           .           .           .        W58
              .           .           .           .
              .           .           .           .
922           .         WAI........................
              .           V
              .           V
925           .
              .           .
              .           .
928           .           .        E1A
              .           .           V
              .           .           V
933           .           .      E1A-EA
              .           .           .
              .           .           .
936           .           .           .        E1B
              .           .           .           .
              .           .           .           .
941           .           .          EA............
              .           .           V
              .           .           V
944           .           .       EA-EB
              .           .           .
              .           .           .
947           .           .           .        E2
              .           .           .           .
              .           .           .           .
952           .           .         EB ............
              .           .           V
              .           .           V
955           .           .       POND1
              .           .           V
              .           .           V
961           .           .
              .           .           .
              .           .           .
964           .           .           .         E3
              .           .           .           .
              .           .           .           .
971           .           .           .           .           .<-------  DIVRT1
969           .           .           .           .       MH-P2
              .           .           .           .           .
              .           .           .           .           .
972           .           .         EC ........................
              .           .           V
              .           .           V
975           .           .       POND2
              .           .           V
              .           .           V
981           .           .
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  984            .           .           .         E1C
                 .           .           .           V
                 .           .           .           V
  989            .           .           .      1C-ED1
                 .           .           .           .
                 .           .           .           .
  992            .           .           .           .          E4
                 .           .           .           .           .
                 .           .           .           .           .
  997            .           .           .         ED1............
                 .           .           .           V
                 .           .           .           V
 1000            .           .           .      ED1-ED
                 .           .           .           .
                 .           .           .           .
 1003            .           .           .           .          E5
                 .           .           .           .           .
                 .           .           .           .           .
 1008            .           .         ED ........................
                 .           .           V
                 .           .           V
 1011            .           .
                 .           .           .
                 .           .           .
 1014            .           .           .          E8
                 .           .           .           .
                 .           .           .           .
 1019            .           .         EE ............
                 .           .           V
                 .           .           V
 1022            .           .
                 .           .           .
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 1025            .           .           .         E10
                 .           .           .           .
                 .           .           .           .
 1030            .           .         EF ............
                 .           .           V
                 .           .           V
 1033            .           .         F-G
                 .           .           .
                 .           .           .
 1036            .           .           .          E6
                 .           .           .           .
                 .           .           .           .
 1041            .           .           .           .          E7
                 .           .           .           .           V
                 .           .           .           .           V
 1046            .           .           .           .
                 .           .           .           .           .
                 .           .           .           .           .
 1049            .           .           .         EG1............
                 .           .           .           V
                 .           .           .           V
 1052            .           .           .        G1-G
                 .           .           .           .
                 .           .           .           .
 1055            .           .           .           .          E9
                 .           .           .           .           V
                 .           .           .           .           V
 1060            .           .           .           .
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                 .           .           .           .           .
 1063            .           .           .           .           .         E11
                 .           .           .           .           .           .
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 1068            .           .           .           .           .           .         E12
                 .           .           .           .           .           .           .
                 .           .           .           .           .           .           .
 1073            .           .         EG ............................................................
                 .           .           .
                 .           .           .
 1076            .           .           .         E13
                 .           .           .           .
                 .           .           .           .
 1081            .           .           .           .         E14
                 .           .           .           .           V
                 .           .           .           .           V
 1086            .           .           .           .
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                 .           .           .           .           .
 1089            .           .         EH ........................
                 .           .           V
                 .           .           V
 1092            .           .
                 .           .           .
                 .           .           .
 1095            .           .           .         E19
                 .           .           .           .
                 .           .           .           .
 1100            .           .         EJ1............
                 .           .           V
                 .           .           V
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1103           .           .        J1-K
               .           .           .
               .           .           .
1106           .           .           .         E15
               .           .           .           V
               .           .           .           V
1111           .           .           .
               .           .           .           .
               .           .           .           .
1114           .           .           .           .         E16
               .           .           .           .           .
               .           .           .           .           .
1119           .           .           .         EI ............
               .           .           .           V
               .           .           .           V
1122           .           .           .
               .           .           .           .
               .           .           .           .
1125           .           .           .           .         E17
               .           .           .           .           V
               .           .           .           .           V
1130           .           .           .           .
               .           .           .           .           .
               .           .           .           .           .
1133           .           .           .           .           .         E18
               .           .           .           .           .           .
               .           .           .           .           .           .
1138           .           .           .         EJ2........................
               .           .           .           V
               .           .           .           V
1141           .           .           .
               .           .           .           .
               .           .           .           .
1144           .           .           .           .         E23
               .           .           .           .           .
               .           .           .           .           .
1149           .           .           .           .           .         E24
               .           .           .           .           .           .
               .           .           .           .           .           .
1154           .           .         EK ....................................
               .           .           V
               .           .           V
1157           .           .
               .           .           .
               .           .           .
1160           .           .           .         E21
               .           .           .           V
               .           .           .           V
1165           .           .           .
               .           .           .           .
               .           .           .           .
1168           .           .           .           .         E20
               .           .           .           .           V
               .           .           .           .           V
1173           .           .           .           .
               .           .           .           .           .
               .           .           .           .           .
1176           .           .           .           .           .         E22
               .           .           .           .           .           .
               .           .           .           .           .           .
1181           .           .           .         EL ........................
               .           .           .           V
               .           .           .           V
1184           .           .           .
               .           .           .           .
               .           .           .           .
1187           .           .           .           .         E25
               .           .           .           .           .
               .           .           .           .           .
1192           .           .         EM ........................
               .           .           V
               .           .           V
1195           .           .
               .           .           .
               .           .           .
1198           .           .           .         E26
               .           .           .           .
               .           .           .           .
1203           .           .         EN ............
               .           .           V
               .           .           V
1206           .           .
               .           .           .
               .           .           .
1209           .           .           .         E27
               .           .           .           .
               .           .           .           .
1214           .           .         EO ............
               .           .           V
               .           .           V
1217           .           .
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1220           .           .           .         W55
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                 .            .           .            .
1225             .            .         WAG.............
                 .            .           V
                 .            .           V
1228             .            .
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1231             .            .           .          W59
                 .            .           .            .
                 .            .           .            .
1236           WAJ......................................
                 V
                 V
1239

                 .
                 .
1242             .          E28
                 .            V
                 .            V
1247             .
                 .            .
                 .            .
1250             .            .         E29
                 .            .           .
                 .            .           .
1255             .          EZZ...........
                 .            .
                 .            .
1258             .            .         W60
                 .            .           .
                 .            .           .
1263            ZZ........................

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
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1***************************************                              ***************************************
 *                                     *                              *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                              *   U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN  1998              *                              *   HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1              *                              *        609 SECOND STREET            *
 *                                     *                              *     DAVIS, CALIFORNIA 95616         *
 * RUN DATE   28SEP07  TIME  11:57:06  *                              *       (916) 756-1104                *
 *                                     *                              *                                     *
 ***************************************                              ***************************************


                        FALCON BASIN 5-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
                            UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
                            INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
                            NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR
                                  DETENTION POND AT MC
                            NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN
                                  DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)

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

      IT          HYDROGRAPH TIME DATA
                         NMIN          5  MINUTES IN COMPUTATION INTERVAL
                        IDATE    14JUL99  STARTING DATE
                        ITIME       0800  STARTING TIME
                           NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE    15JUL99  ENDING DATE
                       NDTIME       0855  ENDING TIME
                        ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL    .08 HOURS
                       TOTAL TIME BASE  24.92 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

1

                                                   RUNOFF SUMMARY
                                            FLOW IN CUBIC FEET PER SECOND
                                         TIME IN HOURS,  AREA IN SQUARE MILES

                                          PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD        BASIN     MAXIMUM     TIME OF
            OPERATION         STATION     FLOW     PEAK                                              AREA      STAGE     MAX STAGE
+                                                              6-HOUR      24-HOUR      72-HOUR

            HYDROGRAPH AT
+                               W1          5.     5.83           1.           0.           0.        .05

            ROUTED TO
+                                           4.     5.92           1.           0.           0.        .05

            HYDROGRAPH AT
+                               W2          2.     5.83           0.           0.           0.        .03

            2 COMBINED AT
+                               WA          6.     5.92           1.           0.           0.        .08

            ROUTED TO
+                                           6.     5.92           1.           0.           0.        .08

            HYDROGRAPH AT
+                               W3          5.     5.83           1.           0.           0.        .05

            2 COMBINED AT
+                               WB         11.     5.92           2.           1.           1.        .13

            ROUTED TO
+                                          10.     5.92           2.           1.           1.        .13

            HYDROGRAPH AT
+                               W4          1.     5.75           0.           0.           0.        .01

            ROUTED TO
+                                           1.     5.83           0.           0.           0.        .01

            HYDROGRAPH AT
+                               W5          2.     5.75           0.           0.           0.        .02

            3 COMBINED AT
+                               WC         11.     5.92           2.           1.           1.        .15

            ROUTED TO
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+			11.	5.92	2.	1.	1.	.15
+	HYDROGRAPH AT	W6	5.	5.83	1.	0.	0.	.05
+	ROUTED TO		5.	5.83	1.	0.	0.	.05
+	HYDROGRAPH AT	W7	2.	5.75	0.	0.	0.	.02
+	ROUTED TO		2.	5.83	0.	0.	0.	.02
+	2 COMBINED AT	WD	7.	5.83	1.	0.	0.	.07
+	ROUTED TO	D-E	6.	5.83	1.	0.	0.	.07
+	HYDROGRAPH AT	W8	3.	5.75	0.	0.	0.	.03
+	ROUTED TO		3.	5.83	0.	0.	0.	.03
+	HYDROGRAPH AT	W9	5.	5.83	1.	0.	0.	.04
+	3 COMBINED AT	WE	14.	5.83	2.	1.	1.	.14
+	ROUTED TO	E-F	13.	5.92	2.	1.	1.	.14
+	HYDROGRAPH AT	W10	5.	5.83	1.	0.	0.	.04
+	ROUTED TO		5.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	W11	3.	5.75	0.	0.	0.	.03
+	4 COMBINED AT	WF	29.	5.92	5.	2.	2.	.36
+	ROUTED TO	F-G	28.	6.00	5.	2.	2.	.36
+	HYDROGRAPH AT	W12	4.	5.83	1.	0.	0.	.04
+	ROUTED TO		4.	5.92	1.	0.	0.	.04
+	HYDROGRAPH AT	W14	5.	5.83	1.	0.	0.	.05
+	ROUTED TO		5.	5.92	1.	0.	0.	.05
+	HYDROGRAPH AT	W13	10.	5.92	2.	1.	1.	.11
+	4 COMBINED AT	WG	43.	6.00	8.	3.	3.	.56
+	ROUTED TO	G-H	41.	6.08	8.	3.	3.	.56
+	ROUTED TO		39.	6.17	8.	3.	3.	.56
+	HYDROGRAPH AT	W15	10.	5.83	1.	1.	1.	.09
+	ROUTED TO		9.	5.92	1.	1.	1.	.09
+	2 COMBINED AT	WH	43.	6.17	9.	4.	4.	.65
+	HYDROGRAPH AT	W16	4.	5.83	0.	0.	0.	.03
+	ROUTED TO		3.	5.92	0.	0.	0.	.03
+	HYDROGRAPH AT	W17	2.	5.83	0.	0.	0.	.02
+	2 COMBINED AT	WI	5.	5.83	1.	0.	0.	.05

+	ROUTED TO	I-M	5.	6.00	1.	0.	0.	.05
+	HYDROGRAPH AT	W19	5.	5.75	1.	0.	0.	.04
+	ROUTED TO		5.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	W20	5.	5.75	0.	0.	0.	.03
+	2 COMBINED AT	WJ	9.	5.83	1.	0.	0.	.07
+	ROUTED TO		9.	6.00	1.	0.	0.	.07
+	HYDROGRAPH AT	W21	11.	5.83	2.	1.	1.	.13
+	2 COMBINED AT	WK	18.	5.92	3.	1.	1.	.21
+	ROUTED TO		16.	5.92	3.	1.	1.	.21
+	HYDROGRAPH AT	W22	2.	5.75	0.	0.	0.	.01
+	2 COMBINED AT	WL	17.	5.92	3.	1.	1.	.22
+	ROUTED TO		17.	6.00	3.	1.	1.	.22
+	HYDROGRAPH AT	W23	2.	5.83	0.	0.	0.	.02
+	HYDROGRAPH AT	W18	9.	5.92	2.	1.	1.	.13
+	5 COMBINED AT	WM	66.	6.08	15.	6.	6.	1.06
+	ROUTED TO	M-N	65.	6.17	15.	6.	6.	1.06
+	HYDROGRAPH AT	W24	4.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	W25	8.	5.92	1.	1.	1.	.10
+	3 COMBINED AT	WN	70.	6.17	17.	7.	7.	1.20
+	ROUTED TO	N-P	67.	6.25	16.	7.	7.	1.20
+	HYDROGRAPH AT	W28	7.	5.83	1.	0.	0.	.04
+	ROUTED TO		6.	5.92	1.	0.	0.	.04
+	HYDROGRAPH AT	W30	9.	5.83	1.	0.	0.	.05
+	ROUTED TO		8.	5.92	1.	0.	0.	.05
+	HYDROGRAPH AT	W29	6.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	W31	3.	5.75	0.	0.	0.	.01
+	4 COMBINED AT	WO	20.	5.92	3.	1.	1.	.14
+	ROUTED TO	O-P	20.	6.00	3.	1.	1.	.14
+	HYDROGRAPH AT	W26	7.	5.75	1.	0.	0.	.03
+	ROUTED TO		6.	6.08	1.	0.	0.	.03
+	HYDROGRAPH AT	W27	10.	6.00	2.	1.	1.	.16
+	HYDROGRAPH AT	W32	7.	5.92	1.	0.	0.	.09

+	5 COMBINED AT	WP	88.	6.17	23.	10.	9.	1.63
+	ROUTED TO	P-Q	87.	6.25	23.	10.	9.	1.63
+	HYDROGRAPH AT	W33A	9.	5.92	2.	1.	1.	.13
+	2 COMBINED AT	WP1	91.	6.25	24.	10.	10.	1.75
+	ROUTED TO	P1-Q	90.	6.33	24.	10.	10.	1.75
+	HYDROGRAPH AT	W33B	9.	5.92	2.	1.	1.	.14
+	HYDROGRAPH AT	W34A	9.	5.92	2.	1.	1.	.13
+	ROUTED TO	34A-P2	9.	6.08	2.	1.	1.	.13
+	HYDROGRAPH AT	W34B	11.	5.92	2.	1.	1.	.18
+	2 COMBINED AT	WP2	18.	6.00	4.	2.	2.	.30
+	ROUTED TO	P2-Q	18.	6.17	4.	2.	2.	.30
+	HYDROGRAPH AT	W34C	10.	6.00	2.	1.	1.	.16
+	4 COMBINED AT	WQ	114.	6.25	32.	13.	13.	2.36
+	ROUTED TO	Q-Q1	113.	6.33	32.	13.	13.	2.36
+	HYDROGRAPH AT	W36A	9.	5.92	2.	1.	1.	.14
+	2 COMBINED AT	WQ1	118.	6.33	33.	14.	14.	2.50
+	ROUTED TO	Q1-R	117.	6.42	33.	14.	14.	2.50
+	HYDROGRAPH AT	W36B	10.	6.00	2.	1.	1.	.19
+	HYDROGRAPH AT	W35A	7.	5.92	1.	1.	1.	.10
+	ROUTED TO	35A-WR	6.	6.25	1.	1.	1.	.10
+	HYDROGRAPH AT	W35B	9.	6.00	2.	1.	1.	.15
+	4 COMBINED AT	WR	131.	6.42	38.	17.	16.	2.94
+	ROUTED TO	WR-S	130.	6.50	38.	16.	16.	2.94
+	HYDROGRAPH AT	W37A	8.	5.92	1.	1.	1.	.11
+	ROUTED TO	37A-S	8.	6.00	1.	1.	1.	.11
+	HYDROGRAPH AT	W37B	13.	5.92	2.	1.	1.	.16
+	3 COMBINED AT	WS	137.	6.50	42.	18.	17.	3.21
+	ROUTED TO	S-T	134.	6.67	42.	18.	17.	3.21
+	HYDROGRAPH AT	W38	10.	5.92	2.	1.	1.	.09
+	ROUTED TO		9.	6.08	2.	1.	1.	.09
+	HYDROGRAPH AT	W39	11.	6.00	2.	1.	1.	.18
	HYDROGRAPH AT							

+		W40	7.	5.83	1.	1.	1.	.10
+	4 COMBINED AT	WT	143.	6.58	46.	20.	19.	3.59
+	ROUTED TO	T-U	142.	6.67	46.	20.	19.	3.59
+	HYDROGRAPH AT	W41	6.	5.83	1.	0.	0.	.06
+	HYDROGRAPH AT	W42	50.	5.75	5.	2.	2.	.06
+	ROUTED TO	U-V	49.	5.83	5.	2.	2.	.06
+	3 COMBINED AT	WU	148.	6.67	51.	22.	21.	3.70
+	ROUTED TO		146.	6.75	51.	22.	21.	3.70
+	HYDROGRAPH AT	W43	13.	5.83	2.	1.	1.	.15
+	2 COMBINED AT	WV	149.	6.75	53.	23.	22.	3.85
+	ROUTED TO	V-W	148.	6.75	53.	23.	22.	3.85
+	HYDROGRAPH AT	W45	17.	5.92	3.	1.	1.	.19
+	2 COMBINED AT	WW	152.	6.75	56.	24.	23.	4.04
+	ROUTED TO	W-X	149.	6.83	55.	24.	23.	4.04
+	HYDROGRAPH AT	M1	7.	5.83	1.	0.	0.	.07
+	ROUTED TO		6.	5.83	1.	0.	0.	.07
+	HYDROGRAPH AT	M2	3.	5.83	0.	0.	0.	.03
+	2 COMBINED AT	MB	9.	5.83	1.	1.	0.	.09
+	ROUTED TO		8.	5.92	1.	1.	0.	.09
+	HYDROGRAPH AT	M4	3.	5.83	0.	0.	0.	.03
+	ROUTED TO		3.	5.83	0.	0.	0.	.03
+	HYDROGRAPH AT	M3	2.	5.75	0.	0.	0.	.01
+	3 COMBINED AT	MC	11.	5.83	2.	1.	1.	.14
+	ROUTED TO		11.	6.00	2.	1.	1.	.14
+	HYDROGRAPH AT	M5	6.	5.75	1.	0.	0.	.02
+	ROUTED TO		6.	5.92	1.	0.	0.	.02
+	HYDROGRAPH AT	M6	10.	5.92	2.	1.	1.	.06
+	3 COMBINED AT	MD	26.	5.92	4.	2.	2.	.22
+	ROUTED TO		25.	6.08	4.	2.	2.	.22
+	HYDROGRAPH AT	M7	16.	5.83	2.	1.	1.	.05
+	ROUTED TO		15.	5.92	2.	1.	1.	.05
+	HYDROGRAPH AT	M8	4.	5.83	1.	0.	0.	.04

+	2 COMBINED AT	ME	18.	5.83	2.	1.	1.	.09		
+	ROUTED TO		18.	6.00	2.	1.	1.	.09		
+	HYDROGRAPH AT	M9	7.	5.75	1.	0.	0.	.02		
+	ROUTED TO		6.	5.92	1.	0.	0.	.02		
+	HYDROGRAPH AT	M12A	5.	5.83	1.	0.	0.	.07		
+	HYDROGRAPH AT	M12B	10.	5.92	2.	1.	1.	.15		
+	5 COMBINED AT	MF	59.	6.00	10.	4.	4.	.54		
+	ROUTED TO		57.	6.08	10.	4.	4.	.54		
+	HYDROGRAPH AT	M13	10.	5.83	1.	1.	0.	.06		
+	ROUTED TO		9.	6.00	1.	1.	0.	.06		
+	HYDROGRAPH AT	M14	22.	5.92	4.	1.	1.	.16		
+	2 COMBINED AT	MG	30.	5.92	5.	2.	2.	.22		
+	ROUTED TO	PONDW	9.	6.50	5.	2.	2.	.22		
+									969.11	6.50
+	2 COMBINED AT	MH	64.	6.08	14.	6.	5.	.77		
+	ROUTED TO		62.	6.17	14.	6.	5.	.77		
+	DIVERSION TO	DIVRT1	61.	6.17	14.	6.	5.	.77		
+	HYDROGRAPH AT	MH-P2	1.	6.17	0.	0.	0.	.77		
+	HYDROGRAPH AT	M15	18.	5.92	3.	1.	1.	.12		
+	2 COMBINED AT	MI	18.	5.92	3.	1.	1.	.89		
+	ROUTED TO		17.	6.00	3.	1.	1.	.89		
+	HYDROGRAPH AT	M19	5.	5.83	1.	0.	0.	.05		
+	2 COMBINED AT	MJ	20.	6.00	3.	1.	1.	.94		
+	ROUTED TO		20.	6.08	3.	1.	1.	.94		
+	HYDROGRAPH AT	M10	8.	5.83	1.	0.	0.	.06		
+	ROUTED TO	M10-K	8.	5.92	1.	0.	0.	.06		
+	HYDROGRAPH AT	M11A	8.	5.92	2.	1.	1.	.11		
+	2 COMBINED AT	MK	16.	5.92	3.	1.	1.	.16		
+	ROUTED TO	MK-K1	16.	6.00	3.	1.	1.	.16		
+	HYDROGRAPH AT	M11B	7.	5.83	1.	0.	0.	.09		
+	ROUTED TO	11B-K1	7.	6.00	1.	0.	0.	.09		
+	HYDROGRAPH AT	M11C	7.	5.83	1.	1.	0.	.09		
	3 COMBINED AT									

+		MK1	27.	6.00	5.	2.	2.	.35
+	ROUTED TO	K1-ML	26.	6.00	5.	2.	2.	.35
+	HYDROGRAPH AT	M16	4.	5.83	1.	0.	0.	.04
+	2 COMBINED AT	ML	28.	6.00	5.	2.	2.	.39
+	ROUTED TO		28.	6.08	5.	2.	2.	.39
+	HYDROGRAPH AT	M17	9.	5.83	1.	0.	0.	.08
+	2 COMBINED AT	MM	31.	6.08	7.	3.	3.	.46
+	ROUTED TO		29.	6.17	7.	3.	3.	.46
+	HYDROGRAPH AT	M18	7.	5.83	1.	0.	0.	.06
+	ROUTED TO		6.	6.00	1.	0.	0.	.06
+	HYDROGRAPH AT	M20	11.	5.92	2.	1.	1.	.13
+	4 COMBINED AT	MN	57.	6.17	13.	5.	5.	1.60
+	ROUTED TO		55.	6.25	13.	5.	5.	1.60
+	HYDROGRAPH AT	M21	3.	5.83	0.	0.	0.	.02
+	ROUTED TO		3.	5.92	0.	0.	0.	.02
+	HYDROGRAPH AT	M23	4.	5.83	1.	0.	0.	.05
+	3 COMBINED AT	MO	57.	6.25	14.	6.	5.	1.67
+	ROUTED TO		56.	6.25	14.	6.	5.	1.67
+	HYDROGRAPH AT	M24	7.	5.83	1.	0.	0.	.08
+	2 COMBINED AT	MP	58.	6.25	15.	6.	6.	1.75
+	ROUTED TO		57.	6.25	15.	6.	6.	1.75
+	HYDROGRAPH AT	M25	1.	5.83	0.	0.	0.	.01
+	2 COMBINED AT	MQ	58.	6.25	15.	6.	6.	1.76
+	ROUTED TO		57.	6.42	15.	6.	6.	1.76
+	HYDROGRAPH AT	M26	26.	5.92	4.	2.	2.	.18
+	2 COMBINED AT	MR	66.	6.42	18.	8.	7.	1.94
+	HYDROGRAPH AT	W44	3.	5.83	1.	0.	0.	.04
+	ROUTED TO		3.	6.00	1.	0.	0.	.04
+	HYDROGRAPH AT	W47	4.	5.83	1.	0.	0.	.05
+	ROUTED TO		4.	5.92	1.	0.	0.	.05
+	HYDROGRAPH AT	W46	4.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	M27	5.	5.83	1.	0.	0.	.05

+	6 COMBINED AT	WX	192.	6.75	76.	33.	31.	6.17
+	ROUTED TO		191.	6.83	76.	32.	31.	6.17
+	HYDROGRAPH AT	W48	14.	5.83	2.	1.	1.	.12
+	ROUTED TO		14.	5.92	2.	1.	1.	.12
+	HYDROGRAPH AT	W49	24.	5.92	4.	2.	2.	.27
+	3 COMBINED AT	WZ	199.	6.83	81.	35.	34.	6.55
+	ROUTED TO		196.	6.92	81.	35.	34.	6.55
+	HYDROGRAPH AT	W50	11.	5.83	2.	1.	1.	.11
+	2 COMBINED AT	WAB	198.	6.92	83.	35.	34.	6.66
+	ROUTED TO		198.	6.92	83.	35.	34.	6.66
+	HYDROGRAPH AT	W51	7.	5.83	1.	0.	0.	.05
+	2 COMBINED AT	WAC	199.	6.92	83.	36.	34.	6.71
+	ROUTED TO		198.	6.92	83.	36.	34.	6.71
+	HYDROGRAPH AT	W52	9.	5.83	1.	0.	0.	.05
+	ROUTED TO		8.	5.83	1.	0.	0.	.05
+	HYDROGRAPH AT	W53	8.	5.83	1.	0.	0.	.05
+	2 COMBINED AT	WAD	16.	5.83	2.	1.	1.	.10
+	ROUTED TO		14.	5.83	2.	1.	1.	.10
+	HYDROGRAPH AT	W54	1.	5.75	0.	0.	0.	.01
+	3 COMBINED AT	WAE	200.	6.92	85.	37.	35.	6.82
+	ROUTED TO		199.	7.00	85.	36.	35.	6.82
+	HYDROGRAPH AT	W56	13.	5.92	2.	1.	1.	.18
+	2 COMBINED AT	WAF	202.	7.00	87.	37.	36.	7.01
+	ROUTED TO		200.	7.00	87.	37.	36.	7.01
+	HYDROGRAPH AT	W62	7.	5.83	1.	0.	0.	.08
+	ROUTED TO		7.	5.92	1.	0.	0.	.08
+	HYDROGRAPH AT	W63	5.	5.83	1.	0.	0.	.05
+	ROUTED TO		4.	5.92	1.	0.	0.	.05
+	HYDROGRAPH AT	W61	11.	6.00	3.	1.	1.	.19
+	3 COMBINED AT	WAH	22.	5.92	4.	2.	2.	.31
+	ROUTED TO		21.	6.00	4.	2.	2.	.31
+	HYDROGRAPH AT	W57	6.	5.83	1.	0.	0.	.07

+	ROUTED TO		6.	6.25	1.	0.	0.	.07		
+	HYDROGRAPH AT	W58	13.	6.00	3.	1.	1.	.23		
+	3 COMBINED AT	WAI	35.	6.00	8.	3.	3.	.62		
+	ROUTED TO		34.	6.00	8.	3.	3.	.62		
+	HYDROGRAPH AT	E1A	7.	5.92	2.	1.	1.	.12		
+	ROUTED TO	E1A-EA	7.	6.17	1.	1.	1.	.12		
+	HYDROGRAPH AT	E1B	10.	5.92	2.	1.	1.	.17		
+	2 COMBINED AT	EA	13.	6.17	4.	2.	1.	.28		
+	ROUTED TO	EA-EB	13.	6.25	4.	2.	1.	.28		
+	HYDROGRAPH AT	E2	9.	5.83	1.	1.	1.	.10		
+	2 COMBINED AT	EB	16.	6.25	5.	2.	2.	.39		
+	ROUTED TO	POND1	2.	14.92	2.	1.	1.	.39		
+									952.08	14.92
+	ROUTED TO		2.	15.00	2.	1.	1.	.39		
+	HYDROGRAPH AT	E3	8.	5.83	1.	0.	0.	.09		
+	HYDROGRAPH AT	MH-P2	61.	6.17	14.	6.	5.	.00		
+	3 COMBINED AT	EC	64.	6.17	15.	7.	7.	.48		
+	ROUTED TO	POND2	6.	19.83	6.	2.	2.	.48		
+									929.13	19.83
+	ROUTED TO		6.	20.00	6.	2.	2.	.48		
+	HYDROGRAPH AT	E1C	6.	5.92	1.	0.	0.	.08		
+	ROUTED TO	1C-ED1	5.	6.17	1.	0.	0.	.08		
+	HYDROGRAPH AT	E4	9.	5.92	2.	1.	1.	.13		
+	2 COMBINED AT	ED1	10.	6.17	3.	1.	1.	.21		
+	ROUTED TO	ED1-ED	10.	6.17	3.	1.	1.	.21		
+	HYDROGRAPH AT	E5	7.	5.83	1.	1.	0.	.09		
+	3 COMBINED AT	ED	15.	5.92	7.	4.	3.	.78		
+	ROUTED TO		14.	5.92	7.	4.	3.	.78		
+	HYDROGRAPH AT	E8	4.	5.83	1.	0.	0.	.04		
+	2 COMBINED AT	EE	18.	5.92	7.	4.	4.	.83		
+	ROUTED TO		17.	6.00	7.	4.	4.	.83		
+	HYDROGRAPH AT	E10	2.	5.83	0.	0.	0.	.03		
+	2 COMBINED AT	EF	19.	6.00	7.	4.	4.	.85		

+	ROUTED TO	F-G	18.	6.08	7.	4.	4.	.85
+	HYDROGRAPH AT	E6	7.	5.92	2.	1.	1.	.12
+	HYDROGRAPH AT	E7	3.	5.75	0.	0.	0.	.03
+	ROUTED TO		3.	5.92	0.	0.	0.	.03
+	2 COMBINED AT	EG1	10.	5.92	2.	1.	1.	.15
+	ROUTED TO	G1-G	10.	6.00	2.	1.	1.	.15
+	HYDROGRAPH AT	E9	5.	5.92	1.	0.	0.	.08
+	ROUTED TO		5.	6.00	1.	0.	0.	.08
+	HYDROGRAPH AT	E11	3.	5.92	1.	0.	0.	.05
+	HYDROGRAPH AT	E12	7.	5.83	1.	1.	0.	.09
+	5 COMBINED AT	EG	37.	6.08	10.	6.	6.	1.22
+	HYDROGRAPH AT	E13	1.	6.00	0.	0.	0.	.02
+	HYDROGRAPH AT	E14	0.	5.83	0.	0.	0.	.01
+	ROUTED TO		0.	5.92	0.	0.	0.	.01
+	3 COMBINED AT	EH	39.	6.00	10.	6.	6.	1.24
+	ROUTED TO		38.	6.17	10.	6.	6.	1.24
+	HYDROGRAPH AT	E19	6.	5.83	1.	0.	0.	.04
+	2 COMBINED AT	EJ1	39.	6.17	10.	6.	6.	1.28
+	ROUTED TO	J1-K	39.	6.25	10.	6.	6.	1.28
+	HYDROGRAPH AT	E15	6.	5.83	1.	0.	0.	.04
+	ROUTED TO		6.	5.83	1.	0.	0.	.04
+	HYDROGRAPH AT	E16	5.	5.83	1.	0.	0.	.03
+	2 COMBINED AT	EI	11.	5.83	1.	0.	0.	.07
+	ROUTED TO		10.	5.92	1.	0.	0.	.07
+	HYDROGRAPH AT	E17	5.	5.83	1.	0.	0.	.03
+	ROUTED TO		5.	5.92	1.	0.	0.	.03
+	HYDROGRAPH AT	E18	6.	5.92	1.	0.	0.	.05
+	3 COMBINED AT	EJ2	22.	5.92	3.	1.	1.	.15
+	ROUTED TO		19.	6.25	3.	1.	1.	.15
+	HYDROGRAPH AT	E23	15.	5.92	3.	1.	1.	.17
+	HYDROGRAPH AT	E24	11.	6.08	3.	1.	1.	.14
	4 COMBINED AT							

+		EK	76.	6.25	18.	10.	9.	1.74
+	ROUTED TO		69.	6.42	18.	9.	9.	1.74
+	HYDROGRAPH AT	E21	6.	5.92	1.	0.	0.	.09
+	ROUTED TO		6.	6.00	1.	0.	0.	.09
+	HYDROGRAPH AT	E20	8.	5.92	1.	1.	1.	.08
+	ROUTED TO		7.	6.00	1.	1.	1.	.08
+	HYDROGRAPH AT	E22	5.	5.92	1.	0.	0.	.07
+	3 COMBINED AT	EL	18.	6.00	3.	1.	1.	.23
+	ROUTED TO		17.	6.08	3.	1.	1.	.23
+	HYDROGRAPH AT	E25	15.	5.92	3.	1.	1.	.17
+	3 COMBINED AT	EM	85.	6.33	24.	12.	11.	2.13
+	ROUTED TO		84.	6.42	24.	12.	11.	2.13
+	HYDROGRAPH AT	E26	6.	5.83	1.	0.	0.	.04
+	2 COMBINED AT	EN	85.	6.42	25.	12.	12.	2.17
+	ROUTED TO		84.	6.50	24.	12.	12.	2.17
+	HYDROGRAPH AT	E27	17.	5.83	2.	1.	1.	.12
+	2 COMBINED AT	EO	87.	6.50	26.	13.	13.	2.29
+	ROUTED TO		84.	6.58	26.	13.	12.	2.29
+	HYDROGRAPH AT	W55	5.	5.83	1.	0.	0.	.05
+	2 COMBINED AT	WAG	85.	6.58	27.	13.	13.	2.34
+	ROUTED TO		84.	6.58	27.	13.	13.	2.34
+	HYDROGRAPH AT	W59	5.	5.92	1.	0.	0.	.07
+	4 COMBINED AT	WAJ	269.	7.00	122.	54.	52.	10.03
+	ROUTED TO		267.	7.00	122.	54.	52.	10.03
+	HYDROGRAPH AT	E28	6.	5.92	1.	0.	0.	.07
+	ROUTED TO		6.	6.17	1.	0.	0.	.07
+	HYDROGRAPH AT	E29	4.	5.83	1.	0.	0.	.05
+	2 COMBINED AT	EZZ	7.	6.17	2.	1.	1.	.12
+	HYDROGRAPH AT	W60	5.	5.92	1.	0.	0.	.07
+	3 COMBINED AT	ZZ	271.	7.00	125.	55.	53.	10.22

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

```
1***************************************                                   ***************************************
 *                                     *                                   *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1) *                                   *   U.S. ARMY CORPS OF ENGINEERS      *
 *             JUN   1998              *                                   *   HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1               *                                   *          609 SECOND STREET          *
 *                                     *                                   *       DAVIS, CALIFORNIA 95616       *
 * RUN DATE   28SEP07  TIME  11:49:21  *                                   *          (916) 756-1104             *
 *                                     *                                   *                                     *
***************************************                                   ***************************************


                        X     X  XXXXXXX   XXXXX           X
                        X     X  X        X     X         XX
                        X     X  X        X                X
                        XXXXXXX  XXXX     X         XXXXX  X
                        X     X  X        X                X
                        X     X  X        X     X          X
                        X     X  XXXXXXX   XXXXX          XXX


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
```

```
ID    FALCON BASIN 100-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
ID         UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
ID         INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
ID         NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR
ID                DETENTION POND AT MC
ID         NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN
ID                DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)
*DIAGRAM
IT        5 14JUL99     800      300
IO        5

KK       W1
KM
BA    .0479
PB      4.4
IN       15
PC    .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143   .0165
PC    .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530   .0600
PC    .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900   .8000
PC    .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550   .8600
PC    .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938   .8975
PC    .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270   .9300
PC    .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525   .9550
PC    .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775   .9800
PC    .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913   .9925
PC    .9938   .9950   .9963   .9975   .9988   1.000
LS               60
UD     .097

KK
KM
RK     1519   .0263    .035            TRAP        5        4

KK       W2
KM
BA    .0278
LS               60
UD     .160

KK       WA
KM
HC        2

KK
KM
RK      464   .0151    .035            TRAP        5        4

KK       W3
KM
BA    .0498
LS               61
UD     .139

KK       WB
KM
HC        2

KK
KM
RK      823   .0279    .035            TRAP        5        4                 54

KK       W4
KM
BA    .0054
LS               62
UD     .044

KK
KM
RK     1078   .0482    .035            TRAP        5        4

KK       W5
KM
BA    .0159
LS               60
UD     .075

KK       WC
KM
HC        3

KK
KM
RK      557   .0449    .035            TRAP       10        4

KK       W6
KM
BA    .0486
LS               60
UD     .085

KK
KM
RK      592   .0372    .035            TRAP        5        4
```

79	KK	W7					
80	KM						
81	BA	.0217					
82	LS		60				
83	UD	.074					
84	KK						
85	KM						
86	RK	464	.1466	.035	TRAP	5	4
87	KK	WD					
88	KM						
89	HC	2					
90	KK	D-E					
91	KM						
92	RK	1044	.0479	.035	TRAP	5	4
93	KK	W8					
94	KM						
95	BA	.0286					
96	LS		60				
97	UD	.069					
98	KK						
99	KM						
100	RK	1449	.0504	.035	TRAP	5	4
101	KK	W9					
102	KM						
103	BA	.0402					
104	LS		61				
105	UD	.097					
106	KK	WE					
107	KM						
108	HC	3					
109	KK	E-F					
110	KM						
111	RK	789	.0038	.035	TRAP	5	4
112	KK	W10					
113	KM						
114	BA	.0431					
115	LS		61				
116	UD	.096					
117	KK						
118	KM						
119	RK	824	.0388	.035	TRAP	5	4
120	KK	W11					
121	KM						
122	BA	.0314					
123	LS		60				
124	UD	.077					
125	KK	WF					
126	KM						
127	HC	4					
128	KK	F-G					
129	KM						
130	RK	2319	.0211	.035	TRAP	10	4
131	KK	W12					
132	KM						
133	BA	.0398					
134	LS		60				
135	UD	.095					
136	KK						
137	KM						
138	RK	2478	.0307	.035	TRAP	5	4
139	KK	W14					
140	KM						
141	BA	.0473					
142	LS		61				
143	UD	.135					
144	KK						
145	KM						
146	RK	81	0.0001	.035	TRAP	5	4
147	KK	W13					
148	KM						
149	BA	.1123					
150	LS		61				
151	UD	.182					
152	KK	WG					
153	KM						
154	HC	4					

```
155     KK    G-H
156     KM
157     RK    2632   .0217   .035       TRAP    15    4

158     KK
159     KM
160     RK    2447   .0372   .035       TRAP     5    4

161     KK     W15
162     KM
163     BA   .0881
164     LS             61
165     UD    .141

166     KK
167     KM
168     RK    1763   .0289   .035       TRAP     5    4

169     KK      WH
170     KM
171     HC       2

172     KK     W16
173     KM
174     BA   .0292
175     LS             61
176     UD    .092

177     KK
178     KM
179     RK    1345   .0260   .035       TRAP     5    4

180     KK     W17
181     KM
182     BA   .0184
183     LS             60
184     UD    .085

185     KK      WI
186     KM
187     HC       2

188     KK     I-M
189     KM
190     RK    2650   .0370   .035       TRAP    15    4

191     KK     W19
192     KM
193     BA   .0428
194     LS             61
195     UD    .083

196     KK
197     KM
198     RK     881   .0329   .035       TRAP     5    4

199     KK     W20
200     KM
201     BA   .0315
202     LS             61
203     UD    .071

204     KK      WJ
205     KM
206     HC       2

207     KK
208     KM
209     RK    3061   .0235   .035       TRAP     5    4

210     KK     W21
211     KM
212     BA   .1347
213     LS             60
214     UD    .156

215     KK      WK
216     KM
217     HC       2

218     KK
219     KM
220     RK     487   .0246   .035       TRAP     5    4

221     KK     W22
222     KM
223     BA   .0086
224     LS             63
225     UD    .055

226     KK      WL
227     KM
228     HC       2
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```
KK
KM
RK     1786   .0297    .035              TRAP         5         4

KK      W23
KM
BA    .0244
LS                60
UD     .112

KK      W18
KM
BA    .1251
LS                60
UD     .189

KK       WM
KM
HC        5

KK      M-N
KM
RK     1345   .0149    .035              TRAP        20         4

KK      W24
KM
BA    .0442
LS                60
UD     .140

KK      W25
KM
BA    .0957
LS                61
UD     .197

KK       WN
KM
HC        3

KK      N-P
KM
RK     1589    .017    .035              TRAP        20         4

KK      W28
KM
BA    .0397
LS                63
UD     .128

KK
KM
RK     1345   .0208    .035              TRAP         5         4

KK      W30
KM
BA    .0509
LS                63
UD     .123

KK
KM
RK     1078   .0074    .035              TRAP         5         4

KK      W29
KM
BA    .0409
LS                63
UD     .145

KK      W31
KM
BA    .0123
LS                63
UD     .073

KK       WO
KM
HC        4

KK      O-P
KM
RK     2169   .0226    .035              TRAP         5         4

KK      W26
KM
BA    .0301
LS                63
UD     .062

KK
KM
RK     4662   .0225    .035              TRAP         5         4

KK      W27
```

305	KM						
306	BA	.1633					
307	LS		60				
308	UD	.253					
309	KK	W32					
310	KM						
311	BA	.0890					
312	LS		60				
313	UD	.170					
314	KK	WP					
315	KM						
316	HC	5					
317	KK	P-Q					
318	KM						
319	RK	1925	.0182	.035	TRAP	25	4
320	KK	W33A					
321	KM						
322	BA	.1261					
323	LS		60				
324	UD	.186					
325	KK	WP1					
326	KM						
327	HC	2					
328	KK	P1-Q					
329	KM						
330	RK	3000	.020	.035	TRAP	25	4
331	KK	W33B					
332	KM						
333	BA	.1360					
334	LS		60				
335	UD	.225					
336	KK	W34A					
337	KM						
338	BA	.1261					
339	LS		60				
340	UD	.173					
341	KK	34A-P2					
342	KM						
343	RK	2550	.0176	.035	TRAP	25	4
344	KK	W34B					
345	KM						
346	BA	.1766					
347	LS		60				
348	UD	.224					
349	KK	WP2					
350	KM						
351	HC	2					
352	KK	P2-Q					
353	KM						
354	RK	2640	.021	.035	TRAP	25	4
355	KK	W34C					
356	KM						
357	BA	.1625					
358	LS		60				
359	UD	.244					
360	KK	WQ					
361	KM						
362	HC	4					
363	KK	Q-Q1					
364	KM						
365	RK	2940	.022	.035	TRAP	25	4
366	KK	W36A					
367	KM						
368	BA	.1429					
369	LS		60				
370	UD	.234					
371	KK	WQ1					
372	KM						
373	HC	2					
374	KK	Q1-R					
375	KM						
376	RK	3400	.022	.035	TRAP	25	4
377	KK	W36B					
378	KM						
379	BA	.1918					
380	LS		60				

```
381     UD    .306

382     KK    W35A
383     KM
384     BA   .0958
385     LS            60
386     UD    .187

387     KK  35A-WR
388     KM
389     RK    3715   .023    .035          TRAP      25      4

390     KK    W35B
391     KM
392     BA   .1507
393     LS       0    60
394     UD    .259

395     KK      WR
396     KM
397     HC       4

398     KK    WR-S
399     KM
400     RK    2922  .0168    .035          TRAP      25      4

401     KK    W37A
402     KM
403     BA   .1138
404     LS            60
405     UD    .185

406     KK   37A-S
407     KM
408     RK    1430   .014    .035          TRAP      25      4

409     KK    W37B
410     KM
411     BA   .1636
412     LS            61
413     UD    .218

414     KK      WS
415     KM
416     HC       3

417     KK     S-T
418     KM
419     RK    3653  .0164    .035          TRAP      25      4

420     KK     W38
421     KM
422     BA   .0907
423     LS            62
424     UD    .190

425     KK
426     KM
427     RK    2922  .0171    .035          TRAP       5      4

428     KK     W39
429     KM
430     BA   .1833
431     LS            60
432     UD    .251

433     KK     W40
434     KM
435     BA   .0964
436     LS            60
437     UD    .165

438     KK      WT
439     KM
440     HC       4

441     KK     T-U
442     KM
443     RK    1125  .0098    .035          TRAP      25      4

444     KK     W41
445     KM
446     BA   .0601
447     LS            60
448     UD    .117

449     KK     W42
450     KM
451     BA   .0581
452     LS            81
453     UD    .127

454     KK     U-V
455     KM
456     RK    2656  .0184    .035          TRAP       5      4
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 457      KK    WU
 458      KM
 459      HC     3

 460      KK
 461      KM
 462      RK   2215  .0181   .035        TRAP     25      4

 463      KK    W43
 464      KM
 465      BA  .1457
 466      LS           61
 467      UD   .169

 468      KK    WV
 469      KM
 470      HC     2

 471      KK   V-W
 472      KM
 473      RK    487  .0103   .035        TRAP     25      4

 474      KK    W45
 475      KM
 476      BA  .1931
 477      LS           61
 478      UD   .189

 479      KK    WW
 480      KM
 481      HC     2

 482      KK   W-X
 483      KM
 484      RK   1542  .0149   .035        TRAP      5      4

 485      KK    M1
 486      KM
 487      BA  .0665
 488      LS           60
 489      UD   .108

 490      KK
 491      KM
 492      RK    650  .0308   .035        TRAP      5      4

 493      KK    M2
 494      KM
 495      BA  .0273
 496      LS           60
 497      UD   .114
```



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LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 498      KK    MB
 499      KM
 500      HC     2

 501      KK
 502      KM
 503      RK    928  .0302   .035        TRAP      5      4

 504      KK    M4
 505      KM
 506      BA  .0346
 507      LS           60
 508      UD   .121

 509      KK
 510      KM
 511      RK    406  .0197    .02        TRAP     40      0

 512      KK    M3
 513      KM
 514      BA  .0149
 515      LS           60
 516      UD   .076

 517      KK    MC
 518      KM
 519      HC     3

 520      KK
 521      KM
 522      RK   1902  .0231   .035        TRAP      5      4

 523      KK    M5
 524      KM
 525      BA  .0176
 526      LS           69
 527      UD   .108
```

```
528   KK
529   KM
530   RK    1717   .0186    .02          TRAP     40      0

531   KK    M6
532   KM
533   BA   .0637
534   LS            65
535   UD    .233

536   KK    MD
537   KM
538   HC       3

539   KK
540   KM
541   RK    2841    .019    .035         TRAP      5      4

542   KK    M7
543   KM
544   BA   .0524
545   LS            69
546   UD    .170

547   KK
548   KM
549   RK    1044   .0268    .02          TRAP     40      0

550   KK    M8
551   KM
552   BA   .0370
553   LS            61
554   UD    .126

555 - KK    ME
556   KM
557   HC       2

558   KK
559   KM
560   RK    2992   .0187    .035         TRAP      5      4

561   KK    M9
562   KM
563   BA   .0169
564   LS            69
565   UD    .087

566   KK
567   KM
568   RK    3433   .0253    .03          TRAP      5      4

569   KK    M12A
570   KM
571   BA   .0658
572   LS            60
573   UD    .159

574   KK    M12B
575   KM
576   BA   .1481
577   LS            60

579   KK    MF
580   KM
581   HC       5

582   KK
583   KM
584   RK    2586   .0224    .035         TRAP     10      4

585   KK    M13
586   KM
587   BA   .0614
588   LS            64
589   UD    .165

590   KK
591   KM
592   RK    1700    .01     .035         TRAP      6      4

593   KK    M14
594   KM
595   BA   .1624
596   LS            64
597   UD    .228

598   KK    MG
599   KM
600   HC       2

601   KK    PONDW
602   KM          WOODMEN HILLS DETENTION POND WEST  (FROM FDR WH FLG F4)
603   SV       0    .68     1.5     235     3.6     4.9     6.3    7.34    7.34
604   SE     968    969     970     971     972     973     974     975     976
```

680	BA	.042					
681	LS		60				
682	UD	.139					
683	KK	ML					
684	KM						
685	HC	2					
686	KK						
687	KM						
688	RK	2099	.02	.035	TRAP	5	4
689	KK	M17					
690	KM						
691	BA	.0765					
692	LS		61				
693	UD	.133					
694	KK	MM					
695	KM						
696	HC	2					
697	KK						
698	KM						
699	RK	2320	.0121	.035	TRAP	10	4
700	KK	M18					
701	KM						
702	BA	.061					
703	LS		61				
704	UD	.142					
705	KK						
706	KM						
707	RK	2122	.017	.035	TRAP	5	4
708	KK	M20					
709	KM						
710	BA	.1341					
711	LS		61				
712	UD	.211					
713	KK	MN					
714	KM						
715	HC	4					
716	KK						
717	KM						
718	RK	1531	.0202	.035	TRAP	25	4
719	KK	M21					
720	KM						
721	BA	.0241					
722	LS		61				
723	UD	.125					
724	KK						
725	KM						
726	RK	1322	.0212	.035	TRAP	5	4
727	KK	M23					
728	KM						
729	BA	.0461					
730	LS		60				
731	UD	.120					
732	KK	MO					
733	KM						
734	HC	3					
735	KK						
736	KM						
737	RK	974	.0133	.035	TRAP	25	4
738	KK	M24					
739	KM						
740	BA	.0776					
741	LS		60				
742	UD	.125					
743	KK	MP					
744	KM						
745	HC	2					
746	KK						
747	KM						
748	RK	290	.0138	.035	TRAP	25	4
749	KK	M25					
750	KM						
751	BA	.0105					
752	LS		60				
753	UD	.130					
754	KK	MQ					

```
KM
HC      2

KK
KM
RK   3305   .0136   .035          TRAP     25     4

KK    M26
KM
BA  .1779
LS             65
UD   .250

KK     MR
KM
HC      2

KK    W44
KM
BA  .0384
LS             60
UD   .141

KK
KM
RK   2029   .0148   .035          TRAP      5     4

KK    W47
KM
BA  .0541
LS             60
UD   .148

KK
KM
RK   1438   .0223   .035          TRAP      5     4

KK    W46
KM
BA  .0418
LS             61
UD   .154

KK    M27
KM
BA  .0528
LS             60
UD   .132

KK     WX
KM
HC      6

KK
KM
RK   2563   .0125   .035          TRAP     40     4

KK    W48
KM
BA  .1179
LS             61
UD   .091

KK
KM
RK   2400   .0188   .035          TRAP      5     4

KK    W49
KM
BA  .2651
LS             61
UD   .181

KK     WZ
KM
HC      3

KK
KM
RK    800   .0125   .035          TRAP     40     4

KK    W50
KM
BA  .1061
LS             61
UD   .145

KK    WAB
KM
HC      2

KK
KM
RK    742   .0108   .035          TRAP     40     4
```

```
830   KK    W51
831   KM
832   BA  .0546
833   LS            63
834   UD   .172

835   KK    WAC
836   KM
837   HC      2

838   KK
839   KM
840   RK    638  .0345   .035        TRAP    40     4

841   KK    W52
842   KM
843   BA  .0499
844   LS            63
845   UD   .109

846   KK
847   KM
848   RK   1171  .0205   .035        TRAP     5     4

849   KK    W53
850   KM
851   BA  .0531
852   LS            63
853   UD   .156

854   KK    WAD
855   KM
856   HC      2

857   KK
858   KM
859   RK    290  .0310   .035        TRAP    10     4

860   KK    W54
861   KM
862   BA  .0078
863   LS            60
864   UD   .050

865   KK    WAE
866   KM
867   HC      3

868   KK
869   KM
870   RK   1925  .0052   .035        TRAP    40     4

871   KK    W56
872   KM
873   BA  .1831
874   LS            60
875   UD   .191

876   KK    WAF
877   KM
878   HC      2

879   KK
880   KM
881   RK   1032  .0155   .035        TRAP    40     4

882   KK    W62
883   KM
884   BA  .0750
885   LS            60
886   UD   .090

887   KK
888   KM
889   RK   2169  .0203   .035        TRAP     5     4

890   KK    W63
891   KM
892   BA   .047
893   LS            60
894   UD   .109

895   KK
896   KM
897   RK   1450  .0131   .035        TRAP     5     4

898   KK    W61
899   KM
900   BA   .192
901   LS            60
902   UD   .251

903   KK    WAH
904   KM
905   HC      3
```

```
 906          KK
 907          KM
 908          RK    1241   .0153    .035            TRAP       5       4

 909          KK     W57
 910          KM
 911          BA   .0732
 912          LS              60
 913          UD    .140

 914          KK
 915          KM
 916          RK    5903   .0254    .035            TRAP       5       4

 917          KK     W58
 918          KM
 919          BA   .2296
 920          LS              60
 921          UD    .251

 922          KK     WAI
 923          KM
 924          HC       3

 925          KK
 926          KM
 927          RK     232   .0086    .035            TRAP      15       4

 928          KK     E1A
 929          KM
 930          BA   .1151
 931          LS       0      60
 932          UD    .234

 933          KK  E1A-EA
 934          KM
 935          RK    4000    .022    .035            TRAP       5       4

 936          KK     E1B
 937          KM
 938          BA   .1665
 939          LS       0      60
 940          UD    .233

 941          KK      EA
 942          KM
 943          HC       2

 944          KK   EA-EB
 945          KM
 946          RK    1900    .022    .035            TRAP       5       4
1                                          HEC-1 INPUT                                          PAGE. 24

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 947          KK      E2
 948          KM
 949          BA    .104
 950          LS       0      60
 951          UD    .149

 952          KK      EB
 953          KM
 954          HC       2

 955          KK   POND1
 956          KM        ROUTE FLOW THROUGH SCS POND 1
 957          SV       0     .01     .28    1.12    2.70    5.18    6.00    6.94
 958          SE   945.5     946     948     950     952     954   954.5     955
 959          SQ       0       0       0       0       0    48.5   176.4   351.4
 960          RS       1    ELEV   945.5

 961          KK
 962          KM
 963          RK    1300   .0192    .035            TRAP       5       4

 964          KK      E3
 965          KM
 966          BA    .090
 967          LS              60
 968          UD    .128

 969          KK   MH-P2
 970          KM        RETRIEVE DIVERSION FROM W. MERIDIAN RD DITCH
 971          DR  DIVRT1

 972          KK      EC
 973          KM
 974          HC       3

 975          KK   POND2
 976          KM        ROUTE FLOW THROUGH SCS POND 2
 977          SV       0     .21    1.11    3.19    6.89    9.52   11.08   12.82   14.72   16.70
```

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 978   SE      920     922     924     926     928     929   929.5     930   930.5     931
 979   SQ        0       0       0       0       0       0      25    86.5   186.2   308.4
 980   RS        1    ELEV     920

 981   KK
 982   KM
 983   RK     1700   .0141    .035            TRAP       5       4

 984   KK      E1C
 985   KM
 986   BA    .0845
 987   LS               60
 988   UD     .200

 989   KK   1C-ED1
 990   KM
 991   RK     3450    .022    .035            TRAP       5       4

 992   KK       E4
 993   KM
 994   BA     .127
 995   LS               60
 996   UD     .200

 997   KK      ED1
 998   KM
 999   HC        2

1000   KK   ED1-ED
1001   KM
1002   RK      450   .0178     .03            TRAP       5       4

1003   KK       E5
1004   KM
1005   BA     .094
1006   LS               60
1007   UD     .160

1008   KK       ED
1009   KM
1010   HC        3

1011   KK
1012   KM
1013   RK      950   .0211    .035            TRAP      10       4

1014   KK       E8
1015   KM
1016   BA    .0446
1017   LS               60
1018   UD     .139

1019   KK       EE
1020   KM
1021   HC        2

1022   KK
1023   KM
1024   RK     1500   .0127    .035            TRAP      10       4

1025   KK      E10
1026   KM
1027   BA     .029
1028   LS               60
1029   UD     .158

1030   KK       EF
1031   KM
1032   HC        2

1033   KK      F-G
1034   KM
1035   RK      950   .0074    .035            TRAP      15       4

1036   KK       E6
1037   KM
1038   BA     .119
1039   LS               60
1040   UD     .228

1041   KK       E7
1042   KM
1043   BA     .031
1044   LS               60
1045   UD     .082

1046   KK
1047   KM
1048   RK     1100   .0100    .035            TRAP       5       4

1049   KK      EG1
1050   KM
1051   HC        2

1052   KK     G1-G
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```
1204          KM
1205          HC       2

1206          KK
1207          KM
1208          RK    1832   .0126   .035        TRAP     40     4

1209          KK     E27
1210          KM
1211          BA   .1236
1212          LS             63
1213          UD    .172

1214          KK     EO
1215          KM
1216          HC       2

1217          KK
1218          KM
1219          RK    1625   .0133   .035        TRAP      5     3

1220          KK     W55
1221          KM
1222          BA   .0452
1223          LS             60
1224          UD    .093

1225          KK     WAG
1226          KM
1227          HC       2

1228          KK
1229          KM
1230          RK    2025   .0109   .035        TRAP      5     4

1231          KK     W59
1232          KM
1233          BA   .0705
1234          LS             60
1235          UD    .200

1236          KK     WAJ
1237          KM
1238          HC       4

1239          KK
1240          KM
1241          RK    1450   .0124   .035        TRAP     40     4

1242          KK     E28
1243          KM
1244          BA   .0718
1245          LS             61
1246          UD    .223

1247          KK
1248          KM
1249          RK    2064   .0165   .035        TRAP     40     4

1250          KK     E29
1251          KM
1252          BA   .0465
1253          LS             61
1254          UD    .166

1255          KK     EZZ
1256          KM        COMBINE E29 & E30 AT DP ZZ
1257          HC       2

1258          KK     W60
1259          KM
1260          BA   .0711
1261          LS             60
1262          UD    .182

1263          KK      ZZ
1264          KM        COMBINE ALL AT DP ZZ
1265          HC       3
1266          ZZ
```

```
1
                  SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

 NO.      (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

  10      W1
            V
            V
  27
            .
            .
  30        .         W2
            .           .
            .           .
  35      WA ............
            V
            V
  38
            .
            .
  41        .         W3
            .           .
            .           .
  46      WB ............
            V
            V
  49
            .
            .
  52        .         W4
            .           V
            .           V
  57        .
            .           .
            .           .
  60        .           .         W5
            .           .           .
            .           .           .
  65      WC ........................
            V
            V
  68
            .
            .
  71        .         W6
            .           V
            .           V
  76        .
            .           .
            .           .
  79        .           .         W7
            .           .           V
            .           .           V
  84        .           .
            .           .           .
            .           .           .
  87        .         WD ............
            .           V
            .           V
  90        .         D-E
            .           .
            .           .
  93        .           .         W8
            .           .           V
            .           .           V
  98        .           .
            .           .           .
            .           .           .
 101        .           .           .         W9
            .           .           .           .
            .           .           .           .
 106        .         WE ........................
            .           V
            .           V
 109        .         E-F
            .           .
            .           .
 112        .           .         W10
            .           .           V
            .           .           V
 117        .           .
            .           .           .
            .           .           .
 120        .           .           .         W11
            .           .           .           .
            .           .           .           .
 125      WF ....................................
            V
            V
 128      F-G
            .
            .
 131        .         W12
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```
            .         V
            .         V
501         .
            .         .
            .         .
504         .         .       M4
            .         .         V
            .         .         V
509         .         .
            .         .         .
            .         .         .
512         .         .         .         M3
            .         .         .           .
            .         .         .           .
517         .       MC .......................
            .         V
            .         V
520         .
            .         .
            .         .
523         .         .       M5
            .         .         V
            .         .         V
528         .         .
            .         .         .
            .         .         .
531         .         .         .         M6
            .         .         .           .
            .         .         .           .
536         .       MD .......................
            .         V
            .         V
539         .
            .         .
            .         .
542         .         .       M7
            .         .         V
            .         .         V
547         .         .
            .         .         .
            .         .         .
550         .         .         .         M8
            .         .         .           .
            .         .         .           .
555         .         .       ME ...........
            .         .         V
            .         .         V
558         .         .
            .         .         .
            .         .         .
561         .         .         .         M9
            .         .         .           V
            .         .         .           V
566         .         .         .
            .         .         .           .
            .         .         .           .
569         .         .         .           .        M12A
            .         .         .           .           .
            .         .         .           .           .
574         .         .         .           .           .        M12B
            .         .         .           .           .           .
            .         .         .           .           .           .
579         .       MF .........................................
            .         V
            .         V
582         .
            .         .
            .         .
585         .         .       M13
            .         .         V
            .         .         V
590         .         .
            .         .         .
            .         .         .
593         .         .         .         M14
            .         .         .           .
            .         .         .           .
598         .         .        MG...........
            .         .         V
            .         .         V
601         .         .      PONDW
            .         .         .
            .         .         .
607         .       MH ..........
            .         V
            .         V
610         .
            .         .
            .         .
615         .         .-------> DIVRT1
613         .      MH-P2
            .         .
            .         .
618         .         .       M15
            .         .         .
```

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                        .                   .
 623         .         MI ............
             .          V
             .          V
 626         .
             .          .
             .          .
 629         .          .        M19
             .          .         .
             .          .         .
 634         .         MJ ............
             .          V
             .          V
 637         .
             .          .
             .          .
 640         .          .        M10
             .          .         V
             .          .         V
 645         .          .      M10-K
             .          .         .
             .          .         .
 648         .          .         .        M11A
             .          .         .         .
             .          .         .         .
 653         .          .        MK............
             .          .         V
             .          .         V
 656         .          .      MK-K1
             .          .         .
             .          .         .
 659         .          .         .        M11B
             .          .         .         V
             .          .         .         V
 664         .          .         .      11B-K1
             .          .         .         .
             .          .         .         .
 667         .          .         .         .        M11C
             .          .         .         .         .
             .          .         .         .         .
 672         .          .        MK1.......................
             .          .         V
             .          .         V
 675         .          .       K1-ML
             .          .         .
             .          .         .
 678         .          .         .        M16
             .          .         .         .
             .          .         .         .
 683         .          .        ML ............
             .          .         V
             .          .         V
 686         .          .
             .          .         .
             .          .         .
 689         .          .         .        M17
             .          .         .         .
             .          .         .         .
 694         .          .        MM ............
             .          .         V
             .          .         V
 697         .          .
             .          .         .
             .          .         .
 700         .          .         .        M18
             .          .         .         V
             .          .         .         V
 705         .          .         .
             .          .         .         .
             .          .         .         .
 708         .          .         .         .        M20
             .          .         .         .         .
             .          .         .         .         .
 713         .         MN ..................................
             .          V
             .          V
 716         .
             .          .
             .          .
 719         .          .        M21
             .          .         V
             .          .         V
 724         .          .
             .          .         .
             .          .         .
 727         .          .         .        M23
             .          .         .         .
             .          .         .         .
 732         .         MO .......................
             .          V
             .          V
 735         .
             .          .
 738         .          .        M24
```

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860         .         .       W54
            .         .         .
            .         .         .
865       WAE....................
            V
            V
868
            .
            .
871         .       W56
            .         .
            .         .
876       WAF..........
            V
            V
879
            .
            .
882         .       W62
            .         V
            .         V
887         .
            .         .
            .         .
890         .         .       W63
            .         .         V
            .         .         V
895         .         .
            .         .         .
            .         .         .
898         .         .         .       W61
            .         .         .         .
            .         .         .         .
903         .       WAH....................
            .         V
            .         V
906         .
            .         .
            .         .
909         .         .       W57
            .         .         V
            .         .         V
914         .         .
            .         .         .
            .         .         .
917         .         .         .       W58
            .         .         .         .
            .         .         .         .
922         .       WAI....................
            .         V
            .         V
925         .
            .         .
            .         .
928         .         .       E1A
            .         .         V
            .         .         V
933         .         .    E1A-EA
            .         .         .
            .         .         .
936         .         .         .       E1B
            .         .         .         .
            .         .         .         .
941         .         .       EA...........
            .         .         V
            .         .         V
944         .         .     EA-EB
            .         .         .
            .         .         .
947         .         .         .       E2
            .         .         .         .
            .         .         .         .
952         .         .       EB ..........
            .         .         V
            .         .         V
955         .         .     POND1
            .         .         V
            .         .         V
961         .         .
            .         .         .
            .         .         .
964         .         .         .       E3
            .         .         .         .
            .         .         .         .
971         .         .         .         .         .<-------  DIVRT1
969         .         .         .         .     MH-P2
            .         .         .         .         .
            .         .         .         .         .
972         .         .       EC .....................
            .         .         V
            .         .         V
975         .         .     POND2
            .         .         V
            .         .         V
981         .         .
```

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1103         .         .      J1-K
             .         .         .
             .         .         .
1106         .         .         .       E15
             .         .         .         V
             .         .         .         V
1111         .         .         .
             .         .         .         .
             .         .         .         .
1114         .         .         .         .       E16
             .         .         .         .         .
             .         .         .         .         .
1119         .         .         .       EI ..........
             .         .         .         V
             .         .         .         V
1122         .         .         .
             .         .         .         .
             .         .         .         .
1125         .         .         .         .       E17
             .         .         .         .         V
             .         .         .         .         V
1130         .         .         .         .
             .         .         .         .         .
             .         .         .         .         .
1133         .         .         .         .         .       E18
             .         .         .         .         .         .
             .         .         .         .         .         .
1138         .         .         .       EJ2.....................
             .         .         .         V
             .         .         .         V
1141         .         .         .
             .         .         .         .
             .         .         .         .
1144         .         .         .         .       E23
             .         .         .         .         .
             .         .         .         .         .
1149         .         .         .         .         .       E24
             .         .         .         .         .         .
             .         .         .         .         .         .
1154         .         .      EK ...............................
             .         .         V
             .         .         V
1157         .         .
             .         .         .
             .         .         .
1160         .         .         .       E21
             .         .         .         V
             .         .         .         V
1165         .         .         .
             .         .         .         .
             .         .         .         .
1168         .         .         .         .       E20
             .         .         .         .         V
             .         .         .         .         V
1173         .         .         .         .
             .         .         .         .         .
             .         .         .         .         .
1176         .         .         .         .         .       E22
             .         .         .         .         .         .
             .         .         .         .         .         .
1181         .         .         .       EL .....................
             .         .         .         V
             .         .         .         V
1184         .         .         .
             .         .         .         .
             .         .         .         .
1187         .         .         .         .       E25
             .         .         .         .         .
             .         .         .         .         .
1192         .         .      EM .....................
             .         .         V
             .         .         V
1195         .         .
             .         .         .
             .         .         .
1198         .         .         .       E26
             .         .         .         .
             .         .         .         .
1203         .         .      EN ..........
             .         .         V
             .         .         V
1206         .         .
             .         .         .
             .         .         .
1209         .         .         .       E27
             .         .         .         .
             .         .         .         .
1214         .         .      EO ..........
             .         .         V
             .         .         V
1217         .         .
             .         .         .
             .         .         .
1220         .         .         .       W55
             .         .         .         .
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                .           .           .              .
 1225           .           .         WAG...........
                .           .           V
                .           .           V
 1228           .           .
                .           .           .
                .           .           .
 1231           .           .           .          W59
                .           .           .             .
                .           .           .             .
 1236         WAJ.....................................
                V
                V
 1239

                .
                .
 1242           .         E28
                .           V
                .           V
 1247           .
                .           .
                .           .
 1250           .           .         E29
                .           .           .
                .           .           .
 1255           .         EZZ...........
                .           .
                .           .
 1258           .           .         W60
                .           .           .
                .           .           .
 1263          ZZ.......................
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1***************************************                    ***************************************
*                                      *                    *                                     *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *  U.S. ARMY CORPS OF ENGINEERS       *
*             JUN   1998               *                    *  HYDROLOGIC ENGINEERING CENTER      *
*          VERSION 4.1                 *                    *        609 SECOND STREET            *
*                                      *                    *     DAVIS, CALIFORNIA 95616         *
*  RUN DATE   28SEP07  TIME  11:49:21  *                    *        (916) 756-1104               *
*                                      *                    *                                     *
***************************************                     ***************************************
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```
                      FALCON BASIN 100-YR/ 24-HOUR FLOOD/ EXISTING CONDITIONS
                          UPPER EAST TRIBUTARY (WOODMEN HILLS) BASED ON CLOMR APPROVED 2/2/99
                          INCLUDING 2 EXISTING SCS STOCK PONDS, WEST WOODMEN HILLS POND
                          NOTE: M1-M4 (PAINT BRUSH HILLS) MODELED AS HISTORIC TO ACCOUNT FOR
                                DETENTION POND AT MC
                          NOTE: NO CULVERT AT STAPLETON & MERIDIAN, TEMP CULVERTS AT MERIDIAN
                                DOWNSTREAM OF WOODMEN HILLS DRIVE (DIVERSION)

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

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE     14JUL99  STARTING DATE
                      ITIME        0800  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     15JUL99  ENDING DATE
                     NDTIME        0855  ENDING TIME
                      ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 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
```

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+					6-HOUR	24-HOUR	72-HOUR			
+	HYDROGRAPH AT	W1	40.	5.75	4.	1.	1.	.05		
+	ROUTED TO		37.	5.83	4.	1.	1.	.05		
+	HYDROGRAPH AT	W2	20.	5.83	2.	1.	1.	.03		
+	2 COMBINED AT	WA	57.	5.83	6.	2.	2.	.08		
+	ROUTED TO		55.	5.83	6.	2.	2.	.08		
+	HYDROGRAPH AT	W3	39.	5.83	4.	1.	1.	.05		
+	2 COMBINED AT	WB	95.	5.83	10.	3.	3.	.13		
+	ROUTED TO		91.	5.83	10.	3.	3.	.13		
+	HYDROGRAPH AT	W4	6.	5.75	0.	0.	0.	.01		
+	ROUTED TO		6.	5.75	0.	0.	0.	.01		
+	HYDROGRAPH AT	W5	15.	5.75	1.	0.	0.	.02		
+	3 COMBINED AT	WC	105.	5.83	11.	4.	4.	.15		
+	ROUTED TO		103.	5.83	11.	4.	4.	.15		
+	HYDROGRAPH AT	W6	43.	5.75	4.	1.	1.	.05		
+	ROUTED TO		40.	5.75	4.	1.	1.	.05		
+	HYDROGRAPH AT	W7	20.	5.75	2.	1.	1.	.02		
+	ROUTED TO		20.	5.75	2.	1.	1.	.02		
+	2 COMBINED AT	WD	60.	5.75	5.	2.	2.	.07		
+	ROUTED TO	D-E	55.	5.75	5.	2.	2.	.07		
+	HYDROGRAPH AT	W8	27.	5.75	2.	1.	1.	.03		
+	ROUTED TO		24.	5.75	2.	1.	1.	.03		
+	HYDROGRAPH AT	W9	36.	5.75	3.	1.	1.	.04		
+	3 COMBINED AT	WE	114.	5.75	11.	4.	4.	.14		
+	ROUTED TO	E-F	108.	5.83	11.	4.	4.	.14		
+	HYDROGRAPH AT	W10	39.	5.75	3.	1.	1.	.04		
+	ROUTED TO		36.	5.75	4.	1.	1.	.04		
+	HYDROGRAPH AT	W11	29.	5.75	2.	1.	1.	.03		
+	4 COMBINED AT	WF	265.	5.83	28.	10.	9.	.36		
	ROUTED TO									

+		F-G	255.	5.83	28.	10.	9.	.36
+	HYDROGRAPH AT	W12	33.	5.75	3.	1.	1.	.04
+	ROUTED TO		32.	5.83	3.	1.	1.	.04
+	HYDROGRAPH AT	W14	38.	5.83	4.	1.	1.	.05
+	ROUTED TO		37.	5.83	4.	1.	1.	.05
+	HYDROGRAPH AT	W13	80.	5.83	9.	3.	3.	.11
+	4 COMBINED AT	WG	403.	5.83	44.	15.	14.	.56
+	ROUTED TO	G-H	382.	5.92	44.	15.	14.	.56
+	ROUTED TO		368.	5.92	44.	15.	14.	.56
+	HYDROGRAPH AT	W15	70.	5.83	7.	2.	2.	.09
+	ROUTED TO		66.	5.83	7.	2.	2.	.09
+	2 COMBINED AT	WH	428.	5.92	51.	17.	17.	.65
+	HYDROGRAPH AT	W16	27.	5.75	2.	1.	1.	.03
+	ROUTED TO		24.	5.83	2.	1.	1.	.03
+	HYDROGRAPH AT	W17	16.	5.75	1.	0.	0.	.02
+	2 COMBINED AT	WI	38.	5.75	4.	1.	1.	.05
+	ROUTED TO	I-M	37.	5.83	4.	1.	1.	.05
+	HYDROGRAPH AT	W19	41.	5.75	3.	1.	1.	.04
+	ROUTED TO		37.	5.75	3.	1.	1.	.04
+	HYDROGRAPH AT	W20	32.	5.75	3.	1.	1.	.03
+	2 COMBINED AT	WJ	69.	5.75	6.	2.	2.	.07
+	ROUTED TO		65.	5.83	6.	2.	2.	.07
+	HYDROGRAPH AT	W21	96.	5.83	10.	3.	3.	.13
+	2 COMBINED AT	WK	161.	5.83	16.	6.	5.	.21
+	ROUTED TO		156.	5.83	16.	6.	5.	.21
+	HYDROGRAPH AT	W22	10.	5.75	1.	0.	0.	.01
+	2 COMBINED AT	WL	161.	5.83	17.	6.	6.	.22
+	ROUTED TO		147.	5.83	17.	6.	6.	.22
+	HYDROGRAPH AT	W23	19.	5.75	2.	1.	1.	.02
+	HYDROGRAPH AT	W18	80.	5.83	9.	3.	3.	.13
+	5 COMBINED AT	WM	690.	5.92	83.	28.	27.	1.06
+	ROUTED TO	M-N	673.	5.92	83.	28.	27.	1.06

+	HYDROGRAPH AT	W24	33.	5.83	3.	1.	1.	.04
+	HYDROGRAPH AT	W25	64.	5.83	8.	3.	3.	.10
+	3 COMBINED AT	WN	756.	5.92	94.	32.	31.	1.20
+	ROUTED TO	N-P	722.	5.92	94.	32.	31.	1.20
+	HYDROGRAPH AT	W28	36.	5.83	4.	1.	1.	.04
+	ROUTED TO		35.	5.83	4.	1.	1.	.04
+	HYDROGRAPH AT	W30	46.	5.83	5.	2.	2.	.05
+	ROUTED TO		46.	5.83	5.	2.	2.	.05
+	HYDROGRAPH AT	W29	37.	5.83	4.	1.	1.	.04
+	HYDROGRAPH AT	W31	14.	5.75	1.	0.	0.	.01
+	4 COMBINED AT	WO	127.	5.83	13.	4.	4.	.14
+	ROUTED TO	O-P	118.	5.83	13.	4.	4.	.14
+	HYDROGRAPH AT	W26	36.	5.75	3.	1.	1.	.03
+	ROUTED TO		35.	5.92	3.	1.	1.	.03
+	HYDROGRAPH AT	W27	89.	5.92	12.	4.	4.	.16
+	HYDROGRAPH AT	W32	61.	5.83	7.	2.	2.	.09
+	5 COMBINED AT	WP	1012.	5.92	128.	44.	43.	1.63
+	ROUTED TO	P-Q	950.	5.92	128.	44.	43.	1.63
+	HYDROGRAPH AT	W33A	82.	5.83	10.	3.	3.	.13
+	2 COMBINED AT	WP1	1023.	5.92	138.	47.	46.	1.75
+	ROUTED TO	P1-Q	1007.	6.00	137.	47.	46.	1.75
+	HYDROGRAPH AT	W33B	78.	5.92	10.	4.	3.	.14
+	HYDROGRAPH AT	W34A	86.	5.83	10.	3.	3.	.13
+	ROUTED TO	34A-P2	82.	5.92	9.	3.	3.	.13
+	HYDROGRAPH AT	W34B	101.	5.92	13.	5.	4.	.18
+	2 COMBINED AT	WP2	183.	5.92	23.	8.	8.	.30
+	ROUTED TO	P2-Q	175.	6.00	23.	8.	8.	.30
+	HYDROGRAPH AT	W34C	90.	5.92	12.	4.	4.	.16
+	4 COMBINED AT	WQ	1325.	6.00	181.	63.	61.	2.36
+	ROUTED TO	Q-Q1	1284.	6.00	181.	63.	60.	2.36
+	HYDROGRAPH AT	W36A	81.	5.92	11.	4.	4.	.14
+	2 COMBINED AT	WQ1	1352.	6.00	191.	66.	64.	2.50

+	ROUTED TO	Q1-R	1311.	6.08	190.	66.	64.	2.50
+	HYDROGRAPH AT	W36B	91.	6.00	14.	5.	5.	.19
+	HYDROGRAPH AT	W35A	62.	5.83	7.	2.	2.	.10
+	ROUTED TO	35A-WR	58.	6.00	7.	2.	2.	.10
+	HYDROGRAPH AT	W35B	81.	5.92	11.	4.	4.	.15
+	4 COMBINED AT	WR	1497.	6.08	222.	78.	75.	2.94
+	ROUTED TO	WR-S	1475.	6.08	222.	77.	75.	2.94
+	HYDROGRAPH AT	W37A	74.	5.83	9.	3.	3.	.11
+	ROUTED TO	37A-S	71.	5.92	9.	3.	3.	.11
+	HYDROGRAPH AT	W37B	102.	5.92	13.	5.	4.	.16
+	3 COMBINED AT	WS	1575.	6.08	242.	85.	82.	3.21
+	ROUTED TO	S-T	1522.	6.17	242.	85.	81.	3.21
+	HYDROGRAPH AT	W38	67.	5.83	8.	3.	3.	.09
+	ROUTED TO		66.	5.92	8.	3.	3.	.09
+	HYDROGRAPH AT	W39	100.	5.92	14.	5.	5.	.18
+	HYDROGRAPH AT	W40	67.	5.83	7.	3.	2.	.10
+	4 COMBINED AT	WT	1621.	6.17	269.	95.	91.	3.59
+	ROUTED TO	T-U	1613.	6.17	269.	95.	91.	3.59
+	HYDROGRAPH AT	W41	45.	5.83	5.	2.	2.	.06
+	HYDROGRAPH AT	W42	125.	5.75	13.	4.	4.	.06
+	ROUTED TO	U-V	122.	5.83	13.	4.	4.	.06
+	3 COMBINED AT	WU	1648.	6.17	285.	100.	96.	3.70
+	ROUTED TO		1612.	6.17	285.	100.	96.	3.70
+	HYDROGRAPH AT	W43	108.	5.83	12.	4.	4.	.15
+	2 COMBINED AT	WV	1640.	6.17	296.	104.	100.	3.85
+	ROUTED TO	V-W	1621.	6.17	296.	104.	100.	3.85
+	HYDROGRAPH AT	W45	134.	5.83	16.	5.	5.	.19
+	2 COMBINED AT	WW	1663.	6.17	311.	109.	105.	4.04
+	ROUTED TO	W-X	1621.	6.25	311.	109.	105.	4.04
+	HYDROGRAPH AT	M1	52.	5.75	5.	2.	2.	.07
+	ROUTED TO		50.	5.83	5.	2.	2.	.07
	HYDROGRAPH AT							

+		M2	21.	5.75	2.	1.	1.	.03		
+	2 COMBINED AT	MB	70.	5.83	7.	2.	2.	.09		
+	ROUTED TO		70.	5.83	7.	2.	2.	.09		
+	HYDROGRAPH AT	M4	26.	5.83	3.	1.	1.	.03		
+	ROUTED TO		26.	5.83	3.	1.	1.	.03		
+	HYDROGRAPH AT	M3	14.	5.75	1.	0.	0.	.01		
+	3 COMBINED AT	MC	105.	5.83	11.	4.	4.	.14		
+	ROUTED TO		102.	5.83	11.	4.	4.	.14		
+	HYDROGRAPH AT	M5	24.	5.75	2.	1.	1.	.02		
+	ROUTED TO		23.	5.83	2.	1.	1.	.02		
+	HYDROGRAPH AT	M6	51.	5.92	7.	2.	2.	.06		
+	3 COMBINED AT	MD	175.	5.83	20.	7.	6.	.22		
+	ROUTED TO		170.	5.92	20.	7.	6.	.22		
+	HYDROGRAPH AT	M7	63.	5.83	7.	2.	2.	.05		
+	ROUTED TO		61.	5.83	7.	2.	2.	.05		
+	HYDROGRAPH AT	M8	30.	5.83	3.	1.	1.	.04		
+	2 COMBINED AT	ME	91.	5.83	10.	3.	3.	.09		
+	ROUTED TO		89.	5.92	10.	3.	3.	.09		
+	HYDROGRAPH AT	M9	25.	5.75	2.	1.	1.	.02		
+	ROUTED TO		23.	5.83	2.	1.	1.	.02		
+	HYDROGRAPH AT	M12A	47.	5.83	5.	2.	2.	.07		
+	HYDROGRAPH AT	M12B	86.	5.92	11.	4.	4.	.15		
+	5 COMBINED AT	MF	401.	5.92	47.	16.	15.	.54		
+	ROUTED TO		388.	5.92	47.	16.	15.	.54		
+	HYDROGRAPH AT	M13	56.	5.83	6.	2.	2.	.06		
+	ROUTED TO		53.	5.92	6.	2.	2.	.06		
+	HYDROGRAPH AT	M14	122.	5.92	16.	5.	5.	.16		
+	2 COMBINED AT	MG	176.	5.92	22.	7.	7.	.22		
+	ROUTED TO	PONDW	16.	7.00	16.	7.	7.	.22		
+									970.02	7.00
+	2 COMBINED AT	MH	403.	5.92	63.	23.	22.	.77		
+	ROUTED TO		385.	6.00	63.	23.	22.	.77		
+	DIVERSION TO	DIVRT1	85.	6.00	43.	18.	18.	.77		

+	HYDROGRAPH AT	MH-P2	300.	6.00	20.	5.	5.	.77
+	HYDROGRAPH AT	M15	101.	5.83	12.	4.	4.	.12
+	2 COMBINED AT	MI	388.	5.92	32.	9.	9.	.89
+	ROUTED TO		378.	6.00	32.	9.	9.	.89
+	HYDROGRAPH AT	M19	38.	5.83	4.	1.	1.	.05
+	2 COMBINED AT	MJ	397.	6.00	36.	10.	10.	.94
+	ROUTED TO		381.	6.00	36.	10.	10.	.94
+	HYDROGRAPH AT	M10	54.	5.75	5.	2.	2.	.06
+	ROUTED TO	M10-K	53.	5.83	5.	2.	2.	.06
+	HYDROGRAPH AT	M11A	65.	5.92	9.	3.	3.	.11
+	2 COMBINED AT	MK	115.	5.83	14.	5.	4.	.16
+	ROUTED TO	MK-K1	111.	5.92	14.	5.	4.	.16
+	HYDROGRAPH AT	M11B	64.	5.83	7.	2.	2.	.09
+	ROUTED TO	11B-K1	58.	5.92	7.	2.	2.	.09
+	HYDROGRAPH AT	M11C	66.	5.83	7.	2.	2.	.09
+	3 COMBINED AT	MK1	230.	5.83	27.	9.	9.	.35
+	ROUTED TO	K1-ML	225.	5.92	27.	9.	9.	.35
+	HYDROGRAPH AT	M16	31.	5.83	3.	1.	1.	.04
+	2 COMBINED AT	ML	247.	5.92	30.	10.	10.	.39
+	ROUTED TO		240.	5.92	30.	10.	10.	.39
+	HYDROGRAPH AT	M17	61.	5.83	6.	2.	2.	.08
+	2 COMBINED AT	MM	282.	5.92	36.	13.	12.	.46
+	ROUTED TO		268.	6.00	36.	12.	12.	.46
+	HYDROGRAPH AT	M18	48.	5.83	5.	2.	2.	.06
+	ROUTED TO		45.	5.92	5.	2.	2.	.06
+	HYDROGRAPH AT	M20	85.	5.83	11.	4.	4.	.13
+	4 COMBINED AT	MN	747.	6.00	88.	28.	27.	1.60
+	ROUTED TO		724.	6.00	88.	28.	27.	1.60
+	HYDROGRAPH AT	M21	19.	5.83	2.	1.	1.	.02
+	ROUTED TO		19.	5.83	2.	1.	1.	.02
+	HYDROGRAPH AT	M23	34.	5.83	3.	1.	1.	.05
	3 COMBINED AT							

+		MO	747.	6.00	93.	30.	29.	1.67
+	ROUTED TO		724.	6.00	93.	30.	29.	1.67
+	HYDROGRAPH AT	M24	58.	5.83	6.	2.	2.	.08
+	2 COMBINED AT	MP	744.	6.00	99.	32.	31.	1.75
+	ROUTED TO		736.	6.00	99.	32.	31.	1.75
+	HYDROGRAPH AT	M25	8.	5.83	1.	0.	0.	.01
+	2 COMBINED AT	MQ	739.	6.00	100.	32.	31.	1.76
+	ROUTED TO		734.	6.08	99.	32.	31.	1.76
+	HYDROGRAPH AT	M26	139.	5.92	18.	6.	6.	.18
+	2 COMBINED AT	MR	825.	6.08	117.	38.	37.	1.94
+	HYDROGRAPH AT	W44	28.	5.83	3.	1.	1.	.04
+	ROUTED TO		27.	5.92	3.	1.	1.	.04
+	HYDROGRAPH AT	W47	39.	5.83	4.	1.	1.	.05
+	ROUTED TO		36.	5.83	4.	1.	1.	.05
+	HYDROGRAPH AT	W46	32.	5.83	3.	1.	1.	.04
+	HYDROGRAPH AT	M27	39.	5.83	4.	1.	1.	.05
+	6 COMBINED AT	WX	2398.	6.17	442.	153.	147.	6.17
+	ROUTED TO		2323.	6.25	441.	152.	147.	6.17
+	HYDROGRAPH AT	W48	108.	5.75	10.	3.	3.	.12
+	ROUTED TO		102.	5.83	10.	3.	3.	.12
+	HYDROGRAPH AT	W49	189.	5.83	21.	7.	7.	.27
+	3 COMBINED AT	WZ	2392.	6.17	471.	163.	157.	6.55
+	ROUTED TO		2383.	6.25	471.	163.	157.	6.55
+	HYDROGRAPH AT	W50	83.	5.83	9.	3.	3.	.11
+	2 COMBINED AT	WAB	2399.	6.25	480.	166.	160.	6.66
+	ROUTED TO		2396.	6.25	480.	166.	160.	6.66
+	HYDROGRAPH AT	W51	46.	5.83	5.	2.	2.	.05
+	2 COMBINED AT	WAC	2406.	6.25	484.	168.	161.	6.71
+	ROUTED TO		2402.	6.25	485.	168.	161.	6.71
+	HYDROGRAPH AT	W52	48.	5.75	5.	2.	1.	.05
+	ROUTED TO		46.	5.83	5.	2.	1.	.05
+	HYDROGRAPH AT	W53	47.	5.83	5.	2.	2.	.05

+	2 COMBINED AT	WAD	92.	5.83	9.	3.	3.	.10		
+	ROUTED TO		92.	5.83	9.	3.	3.	.10		
+	HYDROGRAPH AT	W54	8.	5.75	1.	0.	0.	.01		
+	3 COMBINED AT	WAE	2419.	6.25	494.	171.	165.	6.82		
+	ROUTED TO		2396.	6.25	493.	171.	164.	6.82		
+	HYDROGRAPH AT	W56	116.	5.83	14.	5.	5.	.18		
+	2 COMBINED AT	WAF	2426.	6.25	506.	175.	169.	7.01		
+	ROUTED TO		2405.	6.25	506.	175.	169.	7.01		
+	HYDROGRAPH AT	W62	64.	5.75	6.	2.	2.	.08		
+	ROUTED TO		61.	5.83	6.	2.	2.	.08		
+	HYDROGRAPH AT	W63	36.	5.75	4.	1.	1.	.05		
+	ROUTED TO		36.	5.83	4.	1.	1.	.05		
+	HYDROGRAPH AT	W61	105.	5.92	14.	5.	5.	.19		
+	3 COMBINED AT	WAH	190.	5.83	24.	8.	8.	.31		
+	ROUTED TO		183.	5.92	24.	8.	8.	.31		
+	HYDROGRAPH AT	W57	54.	5.83	6.	2.	2.	.07		
+	ROUTED TO		51.	6.00	6.	2.	2.	.07		
+	HYDROGRAPH AT	W58	126.	5.92	17.	6.	6.	.23		
+	3 COMBINED AT	WAI	345.	5.92	46.	16.	15.	.62		
+	ROUTED TO		341.	5.92	47.	16.	15.	.62		
+	HYDROGRAPH AT	E1A	65.	5.92	9.	3.	3.	.12		
+	ROUTED TO	E1A-EA	64.	6.00	9.	3.	3.	.12		
+	HYDROGRAPH AT	E1B	94.	5.92	13.	4.	4.	.17		
+	2 COMBINED AT	EA	147.	5.92	21.	7.	7.	.28		
+	ROUTED TO	EA-EB	145.	6.00	21.	7.	7.	.28		
+	HYDROGRAPH AT	E2	75.	5.83	8.	3.	3.	.10		
+	2 COMBINED AT	EB	187.	5.92	29.	10.	10.	.39		
+	ROUTED TO	POND1	101.	6.25	23.	9.	8.	.39		
+									954.20	6.25
+	ROUTED TO		95.	6.25	23.	9.	8.	.39		
+	HYDROGRAPH AT	E3	67.	5.83	7.	2.	2.	.09		
+	HYDROGRAPH AT	MH-P2	85.	5.92	43.	18.	18.	.00		
	3 COMBINED AT									

+		EC	187.	6.25	72.	29.	28.	.48		
+	ROUTED TO	POND2	95.	7.17	55.	24.	23.	.48		
+									930.04	7.17
+	ROUTED TO		94.	7.25	55.	24.	23.	.48		
+	HYDROGRAPH AT	E1C	52.	5.83	6.	2.	2.	.08		
+	ROUTED TO	1C-ED1	50.	6.00	6.	2.	2.	.08		
+	HYDROGRAPH AT	E4	78.	5.83	10.	3.	3.	.13		
+	2 COMBINED AT	ED1	123.	5.92	16.	5.	5.	.21		
+	ROUTED TO	ED1-ED	121.	5.92	16.	6.	5.	.21		
+	HYDROGRAPH AT	E5	66.	5.83	7.	2.	2.	.09		
+	3 COMBINED AT	ED	174.	5.92	72.	32.	31.	.78		
+	ROUTED TO		172.	5.92	72.	32.	31.	.78		
+	HYDROGRAPH AT	E8	33.	5.83	3.	1.	1.	.04		
+	2 COMBINED AT	EE	196.	5.92	75.	33.	32.	.83		
+	ROUTED TO		192.	5.92	75.	33.	32.	.83		
+	HYDROGRAPH AT	E10	21.	5.83	2.	1.	1.	.03		
+	2 COMBINED AT	EF	208.	5.92	77.	34.	33.	.85		
+	ROUTED TO	F-G	199.	5.92	77.	34.	33.	.85		
+	HYDROGRAPH AT	E6	68.	5.92	9.	3.	3.	.12		
+	HYDROGRAPH AT	E7	28.	5.75	2.	1.	1.	.03		
+	ROUTED TO		25.	5.83	2.	1.	1.	.03		
+	2 COMBINED AT	EG1	89.	5.83	11.	4.	4.	.15		
+	ROUTED TO	G1-G	87.	5.92	11.	4.	4.	.15		
+	HYDROGRAPH AT	E9	46.	5.83	6.	2.	2.	.08		
+	ROUTED TO		46.	5.92	6.	2.	2.	.08		
+	HYDROGRAPH AT	E11	28.	5.83	3.	1.	1.	.05		
+	HYDROGRAPH AT	E12	66.	5.83	7.	2.	2.	.09		
+	5 COMBINED AT	EG	409.	5.92	103.	43.	42.	1.22		
+	HYDROGRAPH AT	E13	9.	5.92	1.	0.	0.	.02		
+	HYDROGRAPH AT	E14	4.	5.83	0.	0.	0.	.01		
+	ROUTED TO		4.	5.83	0.	0.	0.	.01		
+	3 COMBINED AT	EH	421.	5.92	105.	44.	42.	1.24		
+	ROUTED TO		398.	5.92	105.	44.	42.	1.24		

+	HYDROGRAPH AT	E19	35.	5.83	4.	1.	1.	.04
+	2 COMBINED AT	EJ1	421.	5.92	108.	45.	43.	1.28
+	ROUTED TO	J1-K	411.	6.00	107.	45.	43.	1.28
+	HYDROGRAPH AT	E15	36.	5.75	3.	1.	1.	.04
+	ROUTED TO		33.	5.83	3.	1.	1.	.04
+	HYDROGRAPH AT	E16	31.	5.75	3.	1.	1.	.03
+	2 COMBINED AT	EI	63.	5.75	6.	2.	2.	.07
+	ROUTED TO		61.	5.83	6.	2.	2.	.07
+	HYDROGRAPH AT	E17	32.	5.75	3.	1.	1.	.03
+	ROUTED TO		31.	5.83	3.	1.	1.	.03
+	HYDROGRAPH AT	E18	40.	5.83	4.	2.	1.	.05
+	3 COMBINED AT	EJ2	132.	5.83	13.	4.	4.	.15
+	ROUTED TO		119.	6.00	13.	4.	4.	.15
+	HYDROGRAPH AT	E23	108.	5.92	14.	5.	5.	.17
+	HYDROGRAPH AT	E24	74.	6.00	13.	4.	4.	.14
+	4 COMBINED AT	EK	698.	6.00	147.	59.	56.	1.74
+	ROUTED TO		671.	6.08	146.	58.	56.	1.74
+	HYDROGRAPH AT	E21	57.	5.83	7.	2.	2.	.09
+	ROUTED TO		55.	5.92	7.	2.	2.	.09
+	HYDROGRAPH AT	E20	51.	5.92	7.	2.	2.	.08
+	ROUTED TO		51.	5.92	7.	2.	2.	.08
+	HYDROGRAPH AT	E22	41.	5.92	5.	2.	2.	.07
+	3 COMBINED AT	EL	147.	5.92	19.	6.	6.	.23
+	ROUTED TO		140.	6.00	19.	6.	6.	.23
+	HYDROGRAPH AT	E25	121.	5.83	13.	5.	4.	.17
+	3 COMBINED AT	EM	845.	6.00	177.	69.	67.	2.13
+	ROUTED TO		834.	6.08	177.	69.	67.	2.13
+	HYDROGRAPH AT	E26	37.	5.75	3.	1.	1.	.04
+	2 COMBINED AT	EN	840.	6.08	180.	70.	68.	2.17
+	ROUTED TO		826.	6.08	179.	70.	68.	2.17
+	HYDROGRAPH AT	E27	104.	5.83	11.	4.	4.	.12
	2 COMBINED AT							

+		EO	863.	6.08	189.	74.	71.	2.29
	ROUTED TO							
+			835.	6.08	189.	74.	71.	2.29
	HYDROGRAPH AT							
+		W55	38.	5.75	3.	1.	1.	.05
	2 COMBINED AT							
+		WAG	841.	6.08	192.	75.	72.	2.34
	ROUTED TO							
+			833.	6.17	192.	75.	72.	2.34
	HYDROGRAPH AT							
+		W59	43.	5.83	5.	2.	2.	.07
	4 COMBINED AT							
+		WAJ	3321.	6.25	749.	268.	259.	10.03
	ROUTED TO							
+			3310.	6.25	749.	268.	259.	10.03
	HYDROGRAPH AT							
+		E28	44.	5.92	6.	2.	2.	.07
	ROUTED TO							
+			44.	6.00	6.	2.	2.	.07
	HYDROGRAPH AT							
+		E29	35.	5.83	4.	1.	1.	.05
	2 COMBINED AT							
+		EZZ	69.	5.92	9.	3.	3.	.12
	HYDROGRAPH AT							
+		W60	47.	5.83	5.	2.	2.	.07
	3 COMBINED AT							
+		ZZ	3350.	6.25	763.	274.	263.	10.22

1

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

Appendix B: Proposed HEC-1 Calculations

```
1****************************************                                      ****************************************
 *                                      *                                      *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                      *  U.S. ARMY CORPS OF ENGINEERS        *
 *             JUN   1998               *                                      *  HYDROLOGIC ENGINEERING CENTER       *
 *           VERSION 4.1                *                                      *       609 SECOND STREET              *
 *                                      *                                      *    DAVIS, CALIFORNIA 95616           *
 * RUN DATE   20MAY08  TIME  08:48:57   *                                      *       (916) 756-1104                 *
 *                                      *                                      *                                      *
****************************************                                      ****************************************


                          X       X  XXXXXXX   XXXXX           X
                          X       X  X        X     X         XX
                          X       X  X        X                X
                          XXXXXXX  XXXX       X         XXXXX  X
                          X       X  X        X                X
                          X       X  X        X     X          X
                          X       X  XXXXXXX   XXXXX          XXX


          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

1                                                   HEC-1 INPUT                                            PAGE  1

          LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            1        ID    FALCON HIGHLANDS PRELIMINARY DRAINAGE PLAN - BASED ON DBPS MODEL F100FNLQ
            2        ID        ** DETENTION POND AT WU (BETWEEN SH 24 AND TAMLIN RD)
            3        ID        ** 2 Year, 5 Year and 100 Year Storm Events (24hr Storm)
            4        ID        **Basins W40 & W42 revised due to Meridian Crossing development
                     *DIAGRAM
            5        IT       5 25MAY05     800     300
            6        IO       5
            7        JR    PREC       1  1.2381  2.0952

            8        KK      W1
            9        KM
           10        BA   .0479
           11        PB     2.1
           12        IN      15
           13        PC   .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143   .0165
           14        PC   .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530   .0600
           15        PC   .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900   .8000
           16        PC   .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550   .8600
           17        PC   .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938   .8975
           18        PC   .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270   .9300
           19        PC   .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525   .9550
           20        PC   .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775   .9800
           21        PC   .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913   .9925
           22        PC   .9938   .9950   .9963   .9975   .9988   1.000
           23        LS              60
           24        UD    .097

           25        KK
           26        KM
           27        RK    1519   .0263    .035            TRAP       5       4

           28        KK      W2
           29        KM
           30        BA   .0278
           31        LS              60
           32        UD    .160

           33        KK      WA
           34        KM
           35        HC       2

           36        KK
           37        KM
           38        RK     464   .0151    .035            TRAP       5       4

           39        KK      W3
           40        KM
           41        BA   .0498
           42        LS              61
           43        UD    .139
1                                                   HEC-1 INPUT                                            PAGE  2

          LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


           44        KK      WB
           45        KM
```

```
  46          HC        2

  47          KK
  48          KM
  49          RK      823   .0279    .035           TRAP       5       4                   54

  50          KK       W4
  51          KM
  52          BA    .0054
  53          LS                62
  54          UD     .044

  55          KK
  56          KM
  57          RK     1078   .0482    .035           TRAP       5       4

  58          KK       W5
  59          KM
  60          BA    .0159
  61          LS                60
  62          UD     .075

  63          KK       WC
  64          KM
  65          HC        3

  66          KK
  67          KM
  68          RK      557   .0449    .035           TRAP      10       4

  69          KK       W6
  70          KM
  71          BA    .0486
  72          LS                60
  73          UD     .085

  74          KK
  75          KM
  76          RK      592   .0372    .035           TRAP       5       4

  77          KK       W7
  78          KM
  79          BA    .0217
  80          LS                60
  81          UD     .074

  82          KK
  83          KM
  84          RK      464   .1466    .035           TRAP       5       4
```



```
  85          KK       WD
  86          KM
  87          HC        2

  88          KK      D-E
  89          KM
  90          RK     1044   .0479    .035           TRAP       5       4

  91          KK       W8
  92          KM
  93          BA    .0286
  94          LS                60
  95          UD     .069

  96          KK
  97          KM
  98          RK     1449   .0504    .035           TRAP       5       4

  99          KK       W9
 100          KM
 101          BA    .0402
 102          LS                61
 103          UD     .097

 104          KK       WE
 105          KM
 106          HC        3

 107          KK      E-F
 108          KM
 109          RK      789   .0038    .035           TRAP       5       4

 110          KK      W10
 111          KM
 112          BA    .0431
 113          LS                61
 114          UD     .096

 115          KK
 116          KM
 117          RK      824   .0388    .035           TRAP       5       4
```

```
     118          KK     W11
     119          KM
     120          BA   .0314
     121          LS             60
     122          UD    .077

     123          KK     WF
     124          KM
     125          HC       4
1                                            HEC-1 INPUT                                        PAGE  4

    LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


     126          KK     F-G
     127          KM
     128          RK    2319   .0211    .035          TRAP      10       4

     129          KK     W12
     130          KM
     131          BA   .0398
     132          LS             60
     133          UD    .095

     134          KK
     135          KM
     136          RK    2478   .0307    .035          TRAP       5       4

     137          KK     W14
     138          KM
     139          BA   .0473
     140          LS             61
     141          UD    .135

     142          KK
     143          KM
     144          RK      81  0.0001    .035          TRAP       5       4

     145          KK     W13
     146          KM
     147          BA   .1123
     148          LS             61
     149          UD    .182

     150          KK     WG
     151          KM
     152          HC       4

     153          KK     G-H
     154          KM
     155          RK    2632   .0217    .035          TRAP      15       4

     156          KK
     157          KM
     158          RK    2447   .0372    .035          TRAP       5       4

     159          KK     W15
     160          KM
     161          BA   .0881
     162          LS             61
     163          UD    .141

     164          KK
     165          KM
     166          RK    1763   .0289    .035          TRAP       5       4
1                                            HEC-1 INPUT                                        PAGE  5

    LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


     167          KK     WH
     168          KM
     169          HC       2

     170          KK     W16
     171          KM
     172          BA   .0292
     173          LS             61
     174          UD    .092

     175          KK
     176          KM
     177          RK    1345   .0260    .035          TRAP       5       4

     178          KK     W17
     179          KM
     180          BA   .0184
     181          LS             60
     182          UD    .085

     183          KK     WI
     184          KM
     185          HC       2
```

```
 186          KK     I-M
 187          KM
 188          RK    2650   .0370   .035          TRAP      15      4

 189          KK     W19
 190          KM
 191          BA   .0428
 192          LS              61
 193          UD    .083

 194          KK
 195          KM
 196          RK     881   .0329   .035          TRAP       5      4

 197          KK     W20
 198          KM
 199          BA   .0315
 200          LS              61
 201          UD    .071

 202          KK      WJ
 203          KM
 204          HC       2

 205          KK
 206          KM
 207          RK    3061   .0235   .035          TRAP       5      4
1                                        HEC-1 INPUT                                          PAGE  6

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 208          KK     W21
 209          KM
 210          BA   .1347
 211          LS              60
 212          UD    .156

 213          KK      WK
 214          KM
 215          HC       2

 216          KK
 217          KM
 218          RK     487   .0246   .035          TRAP       5      4

 219          KK     W22
 220          KM
 221          BA   .0086
 222          LS              63
 223          UD    .055

 224          KK      WL
 225          KM
 226          HC       2

 227          KK
 228          KM
 229          RK    1786   .0297   .035          TRAP       5      4

 230          KK     W23
 231          KM
 232          BA   .0244
 233          LS              60
 234          UD    .112

 235          KK     W18
 236          KM
 237          BA   .1251
 238          LS              60
 239          UD    .189

 240          KK      WM
 241          KM
 242          HC       5

 243          KK     M-N
 244          KM
 245          RK    1345   .0149   .035          TRAP      20      4

 246          KK     W24
 247          KM
 248          BA   .0442
 249          LS              60
 250          UD    .140
1                                        HEC-1 INPUT                                          PAGE  7

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 251          KK     W25
 252          KM
 253          BA   .0957
 254          LS              61
 255          UD    .197
```

```
 256          KK     WN
 257          KM
 258          HC      3

 259          KK    N-P
 260          KM
 261          RK   1589   .017    .035           TRAP       20        4

 262          KK    W28
 263          KM
 264          BA  .0397
 265          LS            63
 266          UD   .128

 267          KK
 268          KM
 269          RK   1345  .0208    .035           TRAP        5        4

 270          KK    W30
 271          KM
 272          BA  .0509
 273          LS            63
 274          UD   .123

 275          KK
 276          KM
 277          RK   1078  .0074    .035           TRAP        5        4

 278          KK    W29
 279          KM
 280          BA  .0409
 281          LS            63
 282          UD   .145

 283          KK    W31
 284          KM
 285          BA  .0123
 286          LS            63
 287          UD   .073

 288          KK     WO
 289          KM
 290          HC      4
1                                         HEC-1 INPUT                                        PAGE  8

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 291          KK    O-P
 292          KM
 293          RK   2169  .0226    .035           TRAP        5        4

 294          KK    W26
 295          KM
 296          BA  .0301
 297          LS            63
 298          UD   .062

 299          KK
 300          KM
 301          RK   4662  .0225    .035           TRAP        5        4

 302          KK    W27
 303          KM
 304          BA  .1633
 305          LS            60
 306          UD   .253

 307          KK    W32
 308          KM
 309          BA  .0890
 310          LS            60
 311          UD   .170

 312          KK     WP
 313          KM
 314          HC      5

 315          KK    P-Q
 316          KM
 317          RK   1925  .0182    .035           TRAP       25        4

 318          KK   W33A
 319          KM
 320          BA  .1261
 321          LS            60
 322          UD   .186

 323          KK    WP1
 324          KM
 325          HC      2

 326          KK   P1-Q
 327          KM
```

```
   328          RK    3000   .020    .035          TRAP      25      4

   329          KK    W33B
   330          KM
   331          BA   .1360
   332          LS            60
   333          UD    .225
1                                              HEC-1 INPUT                                             PAGE  9

 LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


   334          KK    W34A
   335          KM
   336          BA   .1418
   337          LS            60
   338          UD    .173

   339          KK  34A-P2
   340          KM
   341          RK    2550  .0176    .035          TRAP      25      4

   342          KK    W34B
   343          KM
   344          BA   .1766
   345          LS            60
   346          UD    .224

   347          KK     WP2
   348          KM
   349          HC       2

   350          KK    P2-Q
   351          KM
   352          RK    2640   .021    .035          TRAP      25      4

   353          KK    W34C
   354          KM
   355          BA   .1625
   356          LS            60
   357          UD    .244

   358          KK      WQ
   359          KM
   360          HC       4

   361          KK    Q-Q1
   362          KM
   363          RK    2940   .022    .035          TRAP      25      4

   364          KK    W36A
   365          KM
   366          BA   .1429
   367          LS            60
   368          UD    .234

   369          KK     WQ1
   370          KM
   371          HC       2

   372          KK    Q1-R
   373          KM
   374          RK    3400   .022    .035          TRAP      25      4
1                                              HEC-1 INPUT                                             PAGE 10

 LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


   375          KK    W36B
   376          KM
   377          BA   .1918
   378          LS            60
   379          UD    .306

   380          KK    W35A
   381          KM
   382          BA   .0958
   383          LS            60
   384          UD    .187

   385          KK  35A-WR
   386          KM
   387          RK    3715   .023    .035          TRAP      25      4

   388          KK    W35B
   389          KM
   390          BA   .1507
   391          LS       0    60
   392          UD    .259

   393          KK      WR
   394          KM
   395          HC       4

   396          KK    WR-S
```

```
 397          KM
 398          RK    2922   .0168    .035            TRAP       25        4

 399          KK    W37A
 400          KM
 401          BA   .1138
 402          LS              60
 403          UD    .185

 404          KK   37A-S
 405          KM
 406          RK    1430    .014    .035            TRAP       25        4

 407          KK    W37B
 408          KM
 409          BA   .1636
 410          LS              90
 411          UD    .218

 412          KK     WS
 413          KM
 414          HC       3
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 415          KK     S-T
 416          KM
 417          RK    3653   .0164    .035            TRAP       25        4

 418          KK     W38
 419          KM
 420          BA   .0907
 421          LS              62
 422          UD    .190

 423          KK
 424          KM
 425          RK    2922   .0171    .035            TRAP        5        4

 426          KK     W39
 427          KM
 428          BA   .1833
 429          LS              76
 430          UD    .251

 431          KK     W40
 432          KM
 433          BA   .0706
 434          LS              92
 435          UD    .165

 436          KK     WT
 437          KM
 438          HC       4

 439          KK  T-U
 440          KM
 441          RK    1125   .0098    .035            TRAP       25        4

 442          KK     W41
 443          KM
 444          BA   .0601
 445          LS              83
 446          UD    .117

 447          KK    POND
 448          KM
 449          HC       2

 450          KK   DIVOUT
 451          KM   DIVERT 35.8 CFS (2-YR HISTORIC FLOW) FROM DETENTION POND
 452          DT  DIVERT       0     35.8
 453          DI       0    35.8
 454          DQ       0    35.8
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 455          KK  PONDWU
 456          KM        REGIONAL DETENTION POND  Q5=94, Q100=1214
 457          SV     0.0   0.006     .09     .40    1.19    3.31    7.12   11.50   16.05
 458          SV   20.76   25.61   30.61   35.77   40.99
 459          SE    16.5      17      18      19      20      21      22      23      24
 460          SE      25      26      27      28      29
 461          SQ       0       0   27.40   46.66   67.77   81.84  249.51  544.89  923.33
 462          SQ  1090.5 1212.93 1323.91 1426.18 1521.53
 463          RS       1    ELEV    16.5

 464          KK   B-WU
 465          KM
 466          RK    2215   .0181    .035            TRAP       25        4
```

```
 467          KK   DIVIN
 468          KM   RETRIEVE 35.8 CFS DIVERTED IN CHANNEL
 469          DR  DIVERT

 470          KK    W42A
 471          KM
 472          BA   .0127
 473          LS            92
 474          UD    .180

 475          KK  42A-WU
 476          KM
 477          RK    1970  .0090   .013          TRAP       4        4

 478          KK     W42
 479          KM
 480          BA   .0519
 481          LS            92
 482          UD    .127

 483          KK    W42B
 484          KM
 485          BA   .0195
 486          LS            92
 487          UD    .180

 488          KK  42B-WU
 489          KM
 490          RK    2770  .0100    .013          TRAP       4        4

 491          KK      WU
 492          KM
 493          HC       5

 494          KK   U-V
 495          KM
 496          RK    2200   .0145   .035          TRAP      25        4
1                                            HEC-1 INPUT                                       PAGE 13

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 497          KK     W43
 498          KM
 499          BA   .1457
 500          LS            64
 501          UD    .169

 502          KK      WV
 503          KM
 504          HC       2

 505          KK     V-W
 506          KM
 507          RK     487   .0103   .035          TRAP      25        4

 508          KK     W45
 509          KM
 510          BA   .1931
 511          LS            61
 512          UD    .189

 513          KK      WW
 514          KM
 515          HC       2
 516          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   8       W1
            V
            V
  25
            .
            .
  28        .          W2
            .           .
            .           .
  33       WA ...........
            V
            V
  36
            .
            .
  39        .          W3
            .           .
            .           .
  44       WB ...........
            V
            V
  47
```

```
               .
               .
  50           .         W4
               .           V
               .           V
  55           .
               .           .
               .           .
  58           .           .        W5
               .           .          .
               .           .          .
  63         WC .......................
               V
               V
  66
               .
               .
  69           .         W6
               .           V
               .           V
  74           .
               .           .
               .           .
  77           .           .        W7
               .           .          V
               .           .          V
  82           .           .
               .           .          .
               .           .          .
  85           .         WD ...........
               .           V
               .           V
  88           .         D-E
               .           .
               .           .
  91           .           .        W8
               .           .          V
               .           .          V
  96           .           .
               .           .          .
               .           .          .
  99           .           .          .         W9
               .           .          .           .
               .           .          .           .
 104           .         WE .......................
               .           V
               .           V
 107           .         E-F
               .           .
               .           .
 110           .           .        W10
               .           .          V
               .           .          V
 115           .           .
               .           .          .
               .           .          .
 118           .           .          .         W11
               .           .          .           .
               .           .          .           .
 123         WF ...................................
               V
               V
 126         F-G
               .
               .
 129           .         W12
               .           V
               .           V
 134           .
               .           .
               .           .
 137           .           .        W14
               .           .          V
               .           .          V
 142           .           .
               .           .          .
               .           .          .
 145           .           .          .         W13
               .           .          .           .
               .           .          .           .
 150         WG ...................................
               V
               V
 153         G-H
               V
               V
 156
               .
               .
 159           .         W15
               .           V
               .           V
 164           .
               .           .
               .           .
```

```
167       WH ..........
            .
170         .       W16
            .         V
            .         V
175         .
            .         .
            .         .
178         .         .       W17
            .         .         .
            .         .         .
183         .       WI ..........
            .         V
            .         V
186         .       I-M
            .         .
            .         .
189         .         .       W19
            .         .         V
            .         .         V
194         .         .
            .         .         .
            .         .         .
197         .         .         .       W20
            .         .         .         .
            .         .         .         .
202         .         .       WJ ..........
            .         .         V
            .         .         V
205         .         .
            .         .         .
            .         .         .
208         .         .         .       W21
            .         .         .         .
            .         .         .         .
213         .         .       WK ..........
            .         .         V
            .         .         V
216         .         .
            .         .         .
            .         .         .
219         .         .         .       W22
            .         .         .         .
            .         .         .         .
224         .         .       WL ..........
            .         .         V
            .         .         V
227         .         .
            .         .         .
            .         .         .
230         .         .         .       W23
            .         .         .         .
            .         .         .         .
235         .         .         .         .       W18
            .         .         .         .         .
            .         .         .         .         .
240       WM ........................................
            V
            V
243       M-N
            .
            .
246         .       W24
            .         .
            .         .
251         .         .       W25
            .         .         .
            .         .         .
256       WN ....................
            V
            V
259       N-P
            .
            .
262         .       W28
            .         V
            .         V
267         .
            .         .
            .         .
270         .         .       W30
            .         .         V
            .         .         V
275         .         .
            .         .         .
            .         .         .
278         .         .         .       W29
            .         .         .         .
            .         .         .         .
283         .         .         .         .       W31
            .         .         .         .         .
            .         .         .         .         .
288         .       WO ..............................
            .         V
```

```
               .           V
291            .         O-P
               .           .
               .           .
294            .           .         W26
               .           .           V
               .           .           V
299            .           .
               .           .           .
               .           .           .
302            .           .           .         W27
               .           .           .           .
               .           .           .           .
307            .           .           .           .         W32
               .           .           .           .           .
               .           .           .           .           .
312         WP .................................................
               V
               V
315          P-Q
               .
               .
318            .        W33A
               .           .
               .           .
323         WP1.............
               V
               V
326         P1-Q
               .
               .
329            .        W33B
               .           .
               .           .
334            .           .        W34A
               .           .           V
               .           .           V
339            .           .      34A-P2
               .           .           .
               .           .           .
342            .           .           .        W34B
               .           .           .           .
               .           .           .           .
347            .           .        WP2.............
               .           .           V
               .           .           V
350            .           .        P2-Q
               .           .           .
               .           .           .
353            .           .           .        W34C
               .           .           .           .
               .           .           .           .
358         WQ .....................................
               V
               V
361         Q-Q1
               .
               .
364            .        W36A
               .           .
               .           .
369         WQ1.............
               V
               V
372         Q1-R
               .
               .
375            .        W36B
               .           .
               .           .
380            .           .        W35A
               .           .           V
               .           .           V
385            .           .      35A-WR
               .           .           .
               .           .           .
388            .           .           .        W35B
               .           .           .           .
               .           .           .           .
393         WR .....................................
               V
               V
396         WR-S
               .
               .
399            .        W37A
               .           V
               .           V
404            .       37A-S
               .           .
               .           .
407            .           .        W37B
               .           .           .
               .           .           .
412         WS .........................
```

```
               V
               V
415          S-T
               .
               .
418            .         W38
               .           V
               .           V
423            .
               .           .
               .           .
426            .           .         W39
               .           .           .
               .           .           .
431            .           .           .         W40
               .           .           .           .
               .           .           .           .
436          WT ....................................
               V
               V
439       T-U
               .
               .
442            .         W41
               .           .
               .           .
447         POND............
               .
               .
452            .------->  DIVERT
450        DIVOU
               V
               V
455       PONDWU
               V
               V
464        B-WU
               .
               .
469            .           .<-------  DIVERT
467            .       DIVIN
               .           .
               .           .
470            .           .        W42A
               .           .           V
               .           .           V
475            .           .      42A-WU
               .           .           .
               .           .           .
478            .           .           .         W42
               .           .           .           .
               .           .           .           .
483            .           .           .           .        W42B
               .           .           .           .           V
               .           .           .           .           V
488            .           .           .           .      42B-WU
               .           .           .           .           .
               .           .           .           .           .
491           WU................................................
               V
               V
494        U-V
               .
               .
497            .         W43
               .           .
               .           .
502          WV ............
               V
               V
505          V-W
               .
               .
508            .         W45
               .           .
               .           .
513          WW ............
```

```
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                        *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*              JUN   1998                *
*            VERSION 4.1                 *
*                                        *
*  RUN DATE   20MAY08  TIME  08:48:57    *
*                                        *
******************************************
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```
***************************************
*                                     *
*   U.S. ARMY CORPS OF ENGINEERS      *
*   HYDROLOGIC ENGINEERING CENTER     *
*         609 SECOND STREET           *
*      DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104             *
*                                     *
***************************************
```

FALCON HIGHLANDS PRELIMINARY DRAINAGE PLAN - BASED ON DBPS MODEL F100FNLQ
** DETENTION POND AT WU (BETWEEN SH 24 AND TAMLIN RD)

```
            ** 2 Year, 5 Year and 100 Year Storm Events (24hr Storm)
            **Basins W40 & W42 revised due to Meridian Crossing development

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

    IT        HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                    IDATE     25MAY 5  STARTING DATE
                    ITIME        0800  STARTING TIME
                       NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE     26MAY 5  ENDING DATE
                   NDTIME        0855  ENDING TIME
                    ICENT          19  CENTURY MARK

               COMPUTATION INTERVAL     .08 HOURS
                    TOTAL TIME BASE   24.92 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      1.24      2.10

       *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


       *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

1

          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 1.00	RATIO 2 1.24	RATIO 3 2.10
HYDROGRAPH AT +	W1	.05	1	FLOW	1.	5.	40.
				TIME	5.83	5.83	5.75
ROUTED TO +		.05	1	FLOW	0.	4.	37.
				TIME	6.00	5.92	5.83
HYDROGRAPH AT +	W2	.03	1	FLOW	0.	2.	20.
				TIME	5.92	5.83	5.83
2 COMBINED AT +	WA	.08	1	FLOW	1.	6.	57.
				TIME	6.00	5.92	5.83
ROUTED TO +		.08	1	FLOW	1.	6.	55.
				TIME	6.08	5.92	5.83
HYDROGRAPH AT +	W3	.05	1	FLOW	1.	5.	39.
				TIME	5.83	5.83	5.83
2 COMBINED AT +	WB	.13	1	FLOW	1.	11.	95.
				TIME	6.08	5.92	5.83
ROUTED TO +		.13	1	FLOW	1.	10.	91.
				TIME	6.17	5.92	5.83
HYDROGRAPH AT +	W4	.01	1	FLOW	0.	1.	6.
				TIME	5.75	5.75	5.75
ROUTED TO +		.01	1	FLOW	0.	1.	6.
				TIME	5.92	5.83	5.75

HYDROGRAPH AT +	W5	.02	1	FLOW TIME	0. 5.83	2. 5.75	15. 5.75
3 COMBINED AT +	WC	.15	1	FLOW TIME	1. 6.17	11. 5.92	105. 5.83
ROUTED TO +		.15	1	FLOW TIME	1. 6.25	11. 5.92	103. 5.83
HYDROGRAPH AT +	W6	.05	1	FLOW TIME	1. 5.83	5. 5.83	43. 5.75
ROUTED TO +		.05	1	FLOW TIME	0. 5.92	5. 5.83	40. 5.75
HYDROGRAPH AT +	W7	.02	1	FLOW TIME	0. 5.83	2. 5.75	20. 5.75
ROUTED TO +		.02	1	FLOW TIME	0. 5.83	2. 5.83	20. 5.75
2 COMBINED AT +	WD	.07	1	FLOW TIME	1. 5.83	7. 5.83	60. 5.75
ROUTED TO +	D-E	.07	1	FLOW TIME	1. 5.92	6. 5.83	55. 5.75
HYDROGRAPH AT +	W8	.03	1	FLOW TIME	0. 5.83	3. 5.75	27. 5.75
ROUTED TO +		.03	1	FLOW TIME	0. 5.92	3. 5.83	24. 5.75
HYDROGRAPH AT +	W9	.04	1	FLOW TIME	1. 5.83	5. 5.83	36. 5.75
3 COMBINED AT +	WE	.14	1	FLOW TIME	1. 5.92	14. 5.83	114. 5.75
ROUTED TO +	E-F	.14	1	FLOW TIME	1. 6.08	13. 5.92	108. 5.83
HYDROGRAPH AT +	W10	.04	1	FLOW TIME	1. 5.83	5. 5.83	39. 5.75
ROUTED TO +		.04	1	FLOW TIME	1. 5.92	5. 5.83	36. 5.75
HYDROGRAPH AT +	W11	.03	1	FLOW TIME	0. 5.83	3. 5.75	29. 5.75
4 COMBINED AT +	WF	.36	1	FLOW TIME	3. 6.08	29. 5.92	265. 5.83
ROUTED TO +	F-G	.36	1	FLOW TIME	3. 6.25	28. 6.00	255. 5.83
HYDROGRAPH AT +	W12	.04	1	FLOW TIME	0. 5.83	4. 5.83	33. 5.75
ROUTED TO +		.04	1	FLOW TIME	0. 6.17	4. 5.92	32. 5.83
HYDROGRAPH AT +	W14	.05	1	FLOW TIME	1. 5.83	5. 5.83	38. 5.83
ROUTED TO +		.05	1	FLOW TIME	1. 5.92	5. 5.92	37. 5.83
HYDROGRAPH AT +	W13	.11	1	FLOW	2.	10.	80.

HYDROGRAPH AT +	W33B	.14	1	FLOW TIME	1. 6.33	9. 5.92	78. 5.92
HYDROGRAPH AT +	W34A	.14	1	FLOW TIME	1. 6.33	10. 5.92	96. 5.83
ROUTED TO +	34A-P2	.14	1	FLOW TIME	1. 6.33	10. 6.08	93. 5.92
HYDROGRAPH AT +	W34B	.18	1	FLOW TIME	1. 6.33	11. 5.92	101. 5.92
2 COMBINED AT +	WP2	.32	1	FLOW TIME	2. 6.33	20. 6.00	195. 5.92
ROUTED TO +	P2-Q	.32	1	FLOW TIME	2. 6.75	19. 6.17	186. 6.00
HYDROGRAPH AT +	W34C	.16	1	FLOW TIME	1. 6.33	10. 6.00	90. 5.92
4 COMBINED AT +	WQ	2.37	1	FLOW TIME	19. 6.92	115. 6.25	1336. 6.00
ROUTED TO +	Q-Q1	2.37	1	FLOW TIME	19. 7.08	114. 6.33	1294. 6.00
HYDROGRAPH AT +	W36A	.14	1	FLOW TIME	1. 6.33	9. 5.92	81. 5.92
2 COMBINED AT +	WQ1	2.51	1	FLOW TIME	20. 7.08	118. 6.33	1363. 6.00
ROUTED TO +	Q1-R	2.51	1	FLOW TIME	20. 7.25	117. 6.42	1320. 6.08
HYDROGRAPH AT +	W36B	.19	1	FLOW TIME	1. 6.42	10. 6.00	91. 6.00
HYDROGRAPH AT +	W35A	.10	1	FLOW TIME	1. 6.33	7. 5.92	62. 5.83
ROUTED TO +	35A-WR	.10	1	FLOW TIME	1. 6.92	6. 6.25	58. 6.00
HYDROGRAPH AT +	W35B	.15	1	FLOW TIME	1. 6.42	9. 6.00	81. 5.92
4 COMBINED AT +	WR	2.95	1	FLOW TIME	22. 7.17	132. 6.42	1506. 6.08
ROUTED TO +	WR-S	2.95	1	FLOW TIME	22. 7.33	131. 6.50	1485. 6.08
HYDROGRAPH AT +	W37A	.11	1	FLOW TIME	1. 6.33	8. 5.92	74. 5.83
ROUTED TO +	37A-S	.11	1	FLOW TIME	1. 6.58	8. 6.00	71. 5.92
HYDROGRAPH AT +	W37B	.16	1	FLOW TIME	145. 5.83	201. 5.83	410. 5.83
3 COMBINED AT +	WS	3.23	1	FLOW TIME	145. 5.83	201. 5.83	1705. 6.08
ROUTED TO +	S-T	3.23	1	FLOW TIME	140. 5.92	197. 5.92	1632. 6.17
HYDROGRAPH AT +	W38	.09	1	FLOW TIME	2. 5.92	10. 5.92	67. 5.83

```
 ROUTED TO
+                           .09     1   FLOW          2.       9.      66.
                                        TIME       6.25     6.08     5.92

 HYDROGRAPH AT
+                  W39      .18     1   FLOW         49.      85.     251.
                                        TIME       5.92     5.92     5.92

 HYDROGRAPH AT
+                  W40      .07     1   FLOW         76.     102.     201.
                                        TIME       5.75     5.75     5.75

  4 COMBINED AT
+                  WT      3.57     1   FLOW        244.     359.    1867.
                                        TIME       5.92     5.83     6.08

 ROUTED TO
+               T-U        3.57     1   FLOW        243.     358.    1821.
                                        TIME       5.92     5.92     6.17

 HYDROGRAPH AT
+                  W41      .06     1   FLOW         40.      60.     142.
                                        TIME       5.75     5.75     5.75

  2 COMBINED AT
+                 POND     3.63     1   FLOW        264.     392.    1839.
                                        TIME       5.92     5.83     6.17

 DIVERSION TO
+               DIVERT     3.63     1   FLOW         36.      36.      36.
                                        TIME       5.58     5.50     5.42

 HYDROGRAPH AT
+   -            DIVOU     3.63     1   FLOW        229.     356.    1804.
                                        TIME       5.92     5.83     6.17

 ROUTED TO
+               PONDWU     3.63     1   FLOW        118.     223.    1313.
                                        TIME       6.17     6.08     6.33

                                 ** PEAK STAGES IN FEET **
                                    1   STAGE     20.68     7.42    26.90
                                        TIME       5.92     6.08     6.33

 ROUTED TO
+               B-WU       3.63     1   FLOW        116.     219.    1298.
                                        TIME      10.58     9.92     8.75

 HYDROGRAPH AT
+                DIVIN      .00     1   FLOW         36.      36.      36.
                                        TIME       5.58     5.50     5.42

 HYDROGRAPH AT
+                 W42A      .01     1   FLOW         13.      18.      35.
                                        TIME       5.83     5.83     5.75

 ROUTED TO
+               42A-WU      .01     1   FLOW         13.      18.      35.
                                        TIME       6.17     6.17     6.08

 HYDROGRAPH AT
+                  W42      .05     1   FLOW         60.      81.     156.
                                        TIME       5.75     5.75     5.75

 HYDROGRAPH AT
+                 W42B      .02     1   FLOW         21.      28.      54.
                                        TIME       5.83     5.83     5.75

 ROUTED TO
+               42B-WU      .02     1   FLOW         20.      27.      54.
                                        TIME       5.92     5.92     5.83

  5 COMBINED AT
+                   WU     3.72     1   FLOW        135.     256.    1339.
                                        TIME      10.58     9.92     8.75

 ROUTED TO
+               U-V        3.72     1   FLOW        135.     253.    1333.
                                        TIME      10.67    10.00     8.75

 HYDROGRAPH AT
+                  W43      .15     1   FLOW          7.      24.     132.
                                        TIME       5.92     5.83     5.83

  2 COMBINED AT
+                  WV      3.86     1   FLOW        135.     254.    1338.
                                        TIME      10.67    10.00     8.75

 ROUTED TO
+                  V-W     3.86     1   FLOW        133.     249.    1334.
                                        TIME      10.75    10.00     8.75

 HYDROGRAPH AT
+                  W45      .19     1   FLOW          3.      17.     134.
```

MERIDIAN CROSSING FILING NO. 1 - FDR - EXISTING CONDITIONS SURFACE ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent) CA(5)	CA(100)	Tc (min.)	INTENSITY I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(5) (cfs)	Q(100) (cfs)
1	E-1	1.96	2.07	6.4	4.8	8.5	9.4	17.6
				TRAVEL TIME				
		1.96	2.07	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					265	4.2	1.1	7.4
2	DP-1	1.96	2.07	7.4	4.6	8.1	22.9	48.7
	E-2	3.07	3.94	TRAVEL TIME				
		5.03	6.01	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					1500	4.7	5.3	12.7
3	E-4	1.94	2.04	6.3	4.8	8.5	9.3	17.5
				TRAVEL TIME				
		1.94	2.04	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					900	4.1	3.7	9.9
5	E-7	2.09	2.20	5.4	5.0	8.9	10.5	19.7
				TRAVEL TIME				
		2.09	2.20	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					347	2.0	2.9	8.3
4	E-6	2.36	2.49	5.8	4.9	8.7	11.6	21.7
				TRAVEL TIME				
		2.36	2.49	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					62	9.0	0.1	5.9
6	DP-2	5.03	6.01	16.1	3.4	6.0	67.8	149.7
	DP-3	1.94	2.04					
	E-8	8.36	10.75					
	E-3	4.89	6.28	TRAVEL TIME				
		20.21	25.09	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					36	1.5	0.4	16.5
7	DP-6	20.21	25.09	16.5	3.3	5.9	67.0	148.5
	DP-5 (INLET)	0.00	0.08					
	DP-4 (INLET)	0.00	0.00	TRAVEL TIME				
		20.21	25.17	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					139	8.4	0.3	16.8
8	DP-7	20.21	25.17	16.8	3.3	5.9	147.7	1286.1
	POND WU*	19.44	188.25					
	WEST TRIB CHAN.*	1.96	2.07					
	E-5	3.29	4.23					
				TRAVEL TIME				
		44.91	219.72	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					83	5.8	0.2	17.0

* VALUES WERE OBTAINED FROM THE APPROVED MARKET PLACE FILING NO. 1 DRAINAGE REPORT

MERIDIAN CROSSING FILING NO. 1 - FDR - EXISTING CONDITIONS
INLET CALCULATIONS

							Q_5						Q_{100}					
DP	Inlet size L(i)	INLET TYPE	CROSS SLOPE	STREET SLOPE	Q(5)	Q(100)	Qi	CA(eqv.)	FB	CA(eqv.)	DEPTH (max)	SPREAD	Qi	CA(eqv.)	FB	CA(eqv.)	DEPTH (max)	SPREAD
1	15	FLOW-BY	2.0%	1.0%	9	18	6.4	1.34	3	0.62	0.42	16.7	10.8	1.27	7	0.80	0.51	21.1
3	20	SUMP	2.0%	SAG	9	17	9.3	1.94	0	0.00	0.50		17.5	2.04	0	0.00	0.50	
4	25	SUMP	2.0%	SAG	12	22	11.6	2.36	0	0.00	0.50		21.7	2.49	0	0.00	0.50	
5	20	SUMP	2.0%	SAG	10	20	10.5	2.09	0	0.00	0.50		18.9	2.12	1	0.08	0.50	

Appendix D: Proposed Rational Calculations

MERIDIAN CROSSING - FDR - PROPOSED CONDITIONS
(RATIONAL METHOD Q=CIA)

BASIN	TOTAL FLOWS				AREA	WEIGHTED		OVERLAND				CHANNEL				Tc	INTENSITY		COMMENTS
	Q_5	Q_{100}	CA(equiv.)		TOTAL	C_5	C_{100}	C_5	Length	Slope	Tco	Length	Slope	Velocity	Tcc	TOTAL	I_5	I_{100}	
	(c.f.s.)	(c.f.s.)	5 YR	100 YR	(Ac)				(ft)	(ft)	(min)	(ft)	(%)	(fps)	(min)	(min)	(in/hr)	(in/hr)	
D-1	9.4	17.6	1.96	2.07	2.18	0.90	0.95	0.90	5	2.0%	0.7	867	1.6%	2.5	5.7	6.4	4.8	8.5	
D-2	23.4	43.9	4.63	4.88	5.14	0.90	0.95	0.90	10	2.0%	0.9	675	1.8%	2.6	4.3	5.2	5.1	9.0	
D-3	34.7	65.1	10.34	10.92	11.49	0.90	0.95	0.25	20	2.0%	5.7	1,370	1.2%	2.2	10.4	16.1	3.4	6.0	
D-4	9.3	17.5	1.94	2.04	2.15	0.90	0.95	0.90	5	2.0%	0.7	848	1.6%	2.5	5.6	6.3	4.8	8.5	
D-5	12.1	27.8	3.29	4.23	9.41	0.35	0.45	0.25	60	10.0%	5.8	1,020	1.4%	2.3	7.3	13.0	3.7	6.6	
D-6	11.6	21.7	2.36	2.49	2.62	0.90	0.95	0.90	5	2.0%	0.7	873	2.0%	2.8	5.1	5.8	4.9	8.7	
D-7	10.5	19.7	2.09	2.20	2.32	0.90	0.95	0.90	5	2.0%	0.7	797	2.0%	2.8	4.7	5.4	5.0	8.9	
D-8	82.8	155.5	21.50	22.70	23.89	0.90	0.95	0.25	10	2.0%	4.0	1,315	2.0%	2.8	7.7	11.7	3.8	6.9	
D-9	16.9	31.8	3.31	3.50	3.68	0.90	0.95	0.90	5	2.0%	0.7	525	1.2%	2.2	4.0	5.0	5.1	9.1	
D-10	1.9	3.6	0.38	0.40	0.42	0.90	0.95	0.90	5	2.0%	0.7	400	4.0%	4.0	1.7	5.0	5.1	9.1	
D-11	1.8	3.4	0.35	0.37	0.39	0.90	0.95	0.90	5	2.0%	0.7	400	4.0%	4.0	1.7	5.0	5.1	9.1	
D-12	1.8	3.3	0.43	0.45	0.48	0.90	0.95	0.90	5	2.0%	0.7	800	0.5%	1.4	9.4	10.1	4.1	7.3	
D-20	5.9	11.2	1.47	1.55	1.63	0.90	0.95	0.90	10	2.0%	0.9	800	0.5%	1.4	9.4	10.4	4.0	7.2	
Formula:	C*I*A	C*I*A	Q/I	Q/I	65.80						*1			*2 20	*3	Tco+Tcc	*4 1.5	*6 2.67	

1* Tco = 1.87*(1.1-C5)*(L^0.5)*((S*100)^-0.33) (DCM page 5-11)
2* Vc = 20*S^0.5 (USDCM RO-4)
3* Tcc = 1/V*L/60
4* I_5 = (26.65*1.50)/(10+Tc)^0.76 (City Letter of 1/7/2003)
6* I_{100} =(26.65*2.67)/(10+Tc)^0.76 (City Letter of 1/7/2003)

MERIDIAN CROSSING - FDR - PROPOSED CONDITIONS
SURFACE ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent) CA(5)	CA(100)	Tc (min.)	INTENSITY I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(5) (cfs)	Q(100) (cfs)
1	D-1	1.96	2.07	6.4	4.8	8.5	9.4	17.6
				TRAVEL TIME				
		1.96	2.07	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					250	4.2	1.0	7.4
J	D-10	0.38	0.40	5.0	5.1	9.1	3.7	7.0
	D-11	0.35	0.37	TRAVEL TIME				
		0.73	0.77	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Gutter	820	5.0	2.7	7.7
B	D-12	0.43	0.45	10.1	4.1	7.3	4.7	8.9
	DP-J	0.73	0.77					
				TRAVEL TIME				
		1.16	1.22	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Channel	40	1.8	0.4	10.5
X	D-9	3.31	3.50	5.0	5.1	9.1	16.9	31.8
				TRAVEL TIME				
		3.31	3.50	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Pipe	420	7.9	0.9	5.9
Z	D-2	4.63	4.88	10.5	4.0	7.2	44.6	83.8
	DP-X	3.31	3.50					
	Inlet 1 Flowby	0.62	0.80					
	Inlet 1	1.34	1.27					
	DP-B	1.16	1.22	TRAVEL TIME				
		11.06	11.67	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Channel	725	3.8	3.2	13.6
Y	D-3	10.34	10.92	16.1	3.4	6.0	34.7	65.1
				TRAVEL TIME				
		10.34	10.92	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Channel	895	2.4	6.2	22.3
3	D-4	1.94	2.04	6.3	4.8	8.5	9.3	17.5
				TRAVEL TIME				
		1.94	2.04	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
						0.0	0.0	6.3

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent) CA(5)	CA(100)	Tc (min.)	INTENSITY I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(5) (cfs)	Q(100) (cfs)
E	DP-3	1.94	2.04	13.6	3.6	6.4	46.9	88.2
	DP-Z	11.06	11.67	TRAVEL TIME				
		12.99	13.71	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Channel	750	5.8	2.1	15.8
5	D-7	2.09	2.20	5.4	5.0	8.9	10.5	19.7
				TRAVEL TIME				
		2.09	2.20	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					150	2.0	1.3	6.6
4	D-6	2.36	2.49	5.8	4.9	8.7	11.6	21.7
				TRAVEL TIME				
		2.36	2.49	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					85	9.0	0.2	6.0
6	D-8	21.50	22.70	22.3	2.8	5.1	127.7	239.9
	DP-E	12.99	13.71					
	DP-Y	10.34	10.92	TRAVEL TIME				
		44.83	47.33	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Pipe	36	10.0	0.1	22.4
7	DP-6	44.83	47.33	22.4	2.8	5.1	140.2	264.8
	DP-5 (INLET)	2.09	2.49					
	DP-4 (INLET)	2.36	2.49	TRAVEL TIME				
		49.28	52.30	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				Channel	110	8.4	0.2	22.6
8	DP-7	49.28	52.30	22.6	2.8	5.0	209.4	1243.5
	POND WU*	19.44	188.25					
	WEST TRIB CHAN.*	1.96	2.07					
	D-5	3.29	4.23	TRAVEL TIME				
		73.98	246.86	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
					83	5.8	0.2	22.8

* VALUES WERE OBTAINED FROM THE APPROVED MARKET PLACE FILING NO. 1 DRAINAGE REPORT

** VALUES WERE OBTAINED FROM LOWES DRAINAGE REPORT

MERIDIAN CROSSING - FDR - PROPOSED CONDITIONS
INLET CALCULATIONS

							Q_5						Q_{100}					
DP	Inlet size L(i)	INLET TYPE	CROSS SLOPE	STREET SLOPE	Q(5)	Q(100)	Qi	CA(eqv.)	FB	CA(eqv.)	DEPTH (max)	SPREAD	Qi	CA(eqv.)	FB	CA(eqv.)	DEPTH (max)	SPREAD
1	15	FLOW-BY	2.0%	1.0%	9	18	6.4	1.34	3	0.62	0.42	16.7	10.8	1.27	7	0.80	0.51	21.1
3	20	SUMP	2.0%	SAG	9	17	9.3	1.94	0	0.00	0.50		17.5	2.04	0	0.00	0.50	
4	25	SUMP	2.0%	SAG	12	22	11.6	2.36	0	0.00	0.50		21.7	2.49	0	0.00	0.50	
5	20	SUMP	2.0%	SAG	10	20	10.5	2.09	0	0.00	0.50		18.9	2.12	0.7	0.08	0.50	

MERIDIAN CROSSING - FDR - PROPOSED CONDITIONS
PIPE ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA(equivalent) CA(5)	CA(100)	Tc (min.)	INTENSITY I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(5) (cfs)	Q(100) (cfs)
1	INLET DP-1	1.34	1.27	6.4	4.8	8.5	6	11
				TRAVEL TIME				
		1.34	1.27	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				18" RCP	270	7.1	0.6	7.0
X	DP-X	3.31	3.50	5.0	5.1	9.1	17	32
				TRAVEL TIME				
		3.31	3.50	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				30" RCP	400	7.1	0.9	5.9
Z	DP-B	1.16	1.22	10.5	4.0	7.2	37	69
	DP-2	4.63	4.88					
	DP-X	3.31	3.50	TRAVEL TIME				
		9.10	9.60	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
				36" RCP	400	7.1	0.9	11.4

STREET CAPACITY
VERTICAL CURB
FOR 1/2 STREET SECTION

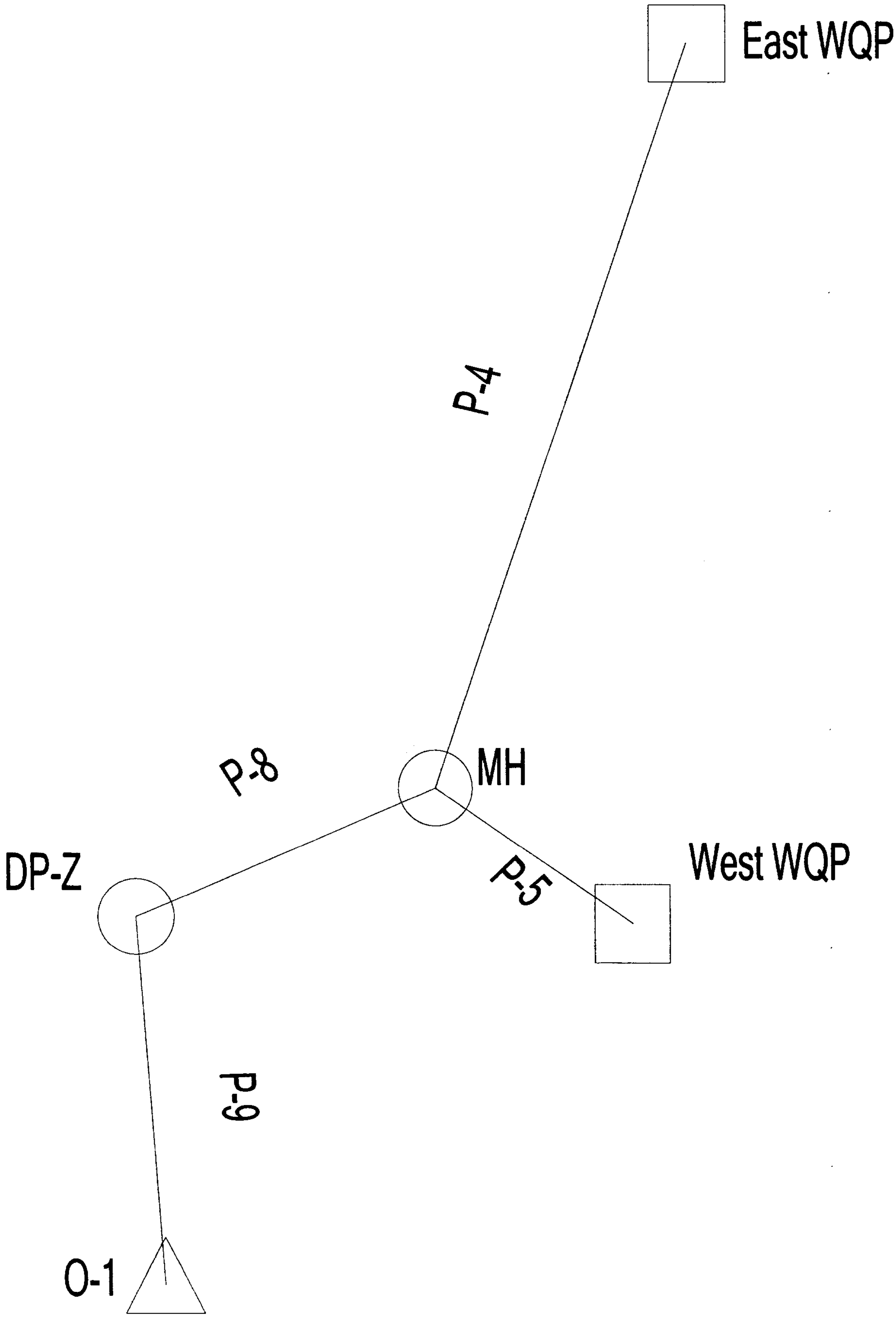
	Formula	Slope	Slope	n	Type	flow	Q_{max}	Q	Comments
Residential	$Q=171.7\ S^{1/2}$	0.5%	0.02	0.016	V	0.5	34	12.0	
		1.0%					34	17.0	
		1.5%					34	20.8	
		2.0%					34	24.1	
		2.5%					34	26.9	
		3.0%					34	29.5	
		3.5%					34	31.8	
		4.0%					34	34.0	
Collector/Arterial	$Q=171.7\ S^{1/2}$	0.5%	0.02	0.016	V	0.5	34	12.0	
		1.0%					34	17.0	
		1.5%					34	20.8	
		2.0%					34	24.1	
		2.5%					34	26.9	
		3.0%					34	29.5	
		3.5%					34	31.8	
		4.0%					34	34.0	

STREET CAPACITY
RAMP CURB
FOR 1/2 STREET SECTION

	Formula	Slope	Slope	n	Type	flow	Q_{max}	Q	Comments
Residential	$Q=112.6\ S^{1/2}$	0.5%	0.02	0.016	R	0.5	20	8.0	County ramp curb is 6"
		1.0%					20	11.3	
		1.5%					20	13.8	
		2.0%					20	15.9	
		2.5%					20	17.8	
		3.0%					20	19.5	
		3.15%					20	20.0	

Appendix E: StormCAD Calculations

Scenario: 100-year



Analysis Results
Scenario: 100-year

Note:
The input data may have been modified since the last calculation was performed.
The calculated results may be outdated.

Title:	Old Meridian Road
Project Engineer:	Charlene Sammons
Project Date:	11/14/07
Comments:	Storm in Old Meridian Road for Meridian Crossing Storm Sewer

Scenario Summary

Scenario	100-year
Physical Properties Alternat	Base-Physical Properties
Catchments Alternative	Catchments-100-year
System Flows Alternative	Base-System Flows
Structure Headlosses Alterr	Base-Structure Headlosses
Boundary Conditions Altern	Base-Boundary Conditions
Design Constraints Alternat	Base-Design Constraints
Capital Cost Alternative	Base-Cost
User Data Alternative	Base-User Data

Network Inventory

Number of Pipes	4	Number of Inlets	2
- Circular Pipes:	4	- Grate Inlets:	0
- Box Pipes:	0	- Curb Inlets:	0
- Arch Pipes:	0	- Combination Inlets:	0
- Vertical Elliptical Pipes:	0	- Slot Inlets:	0
- Horizontal Elliptical Pipes:	0	- Grate Inlets in Ditch:	0
Number of Junctions	2	- Generic Inlets:	2
Number of Outlets	1		

Circular Pipes Inventory

30 inch	426.11 ft	42 inch	167.58 ft
36 inch	5.58 ft		
Total Length	599.27 ft		

Generic Inlet Inventory

Default 100%	2

Junction elements for network with outlet: O-1

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
DP-Z	5,841.13	5,840.07	1.06	Standa	0.00	0.00	72.94	8.64	6.22	8.38
MH	5,842.25	5,841.42	0.83	Standa	0.00	0.00	73.34	8.68	6.09	8.38

Inlet elements for network with outlet: O-1

Label	Inlet	Total System Flow (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Capture Efficiency (%)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method
East WQP	Generic Default 1	32.00	32.00	0.00	N/A	100.0	5,844.85	5,844.85	0.00	Absolut
West WQP	Generic Default 1	44.27	44.27	0.00	N/A	100.0	5,842.28	5,842.28	0.00	Absolut

Analysis Results
Scenario: 100-year

Outlet: O-1

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
O-1	5,836.40	5,836.40	0.00	0.00	0.00	72.41	8.57	6.40	8.38

Pipe elements for network with outlet: O-1

Label	Section Shape	Section Size	Length (ft)	Number of Sections	Constructed Slope (ft/ft)	Energy Slope (ft/ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-4	Circular	30 inch	426.11	1	0.008	0.006	32.00	6.52	5,842.25	6,839.05	5,844.85	5,842.25
P-5	Circular	36 inch	5.58	1	0.047	0.004	44.27	6.26	5,839.11	6,838.85	5,842.28	5,842.25
P-8	Circular	42 inch	60.40	1	0.011	0.005	73.34	7.67	5,838.05	6,837.39	5,841.42	5,841.13
P-9	Circular	42 inch	107.18	1	0.009	0.008	72.94	10.03	5,837.39	6,836.40	5,840.07	5,838.71

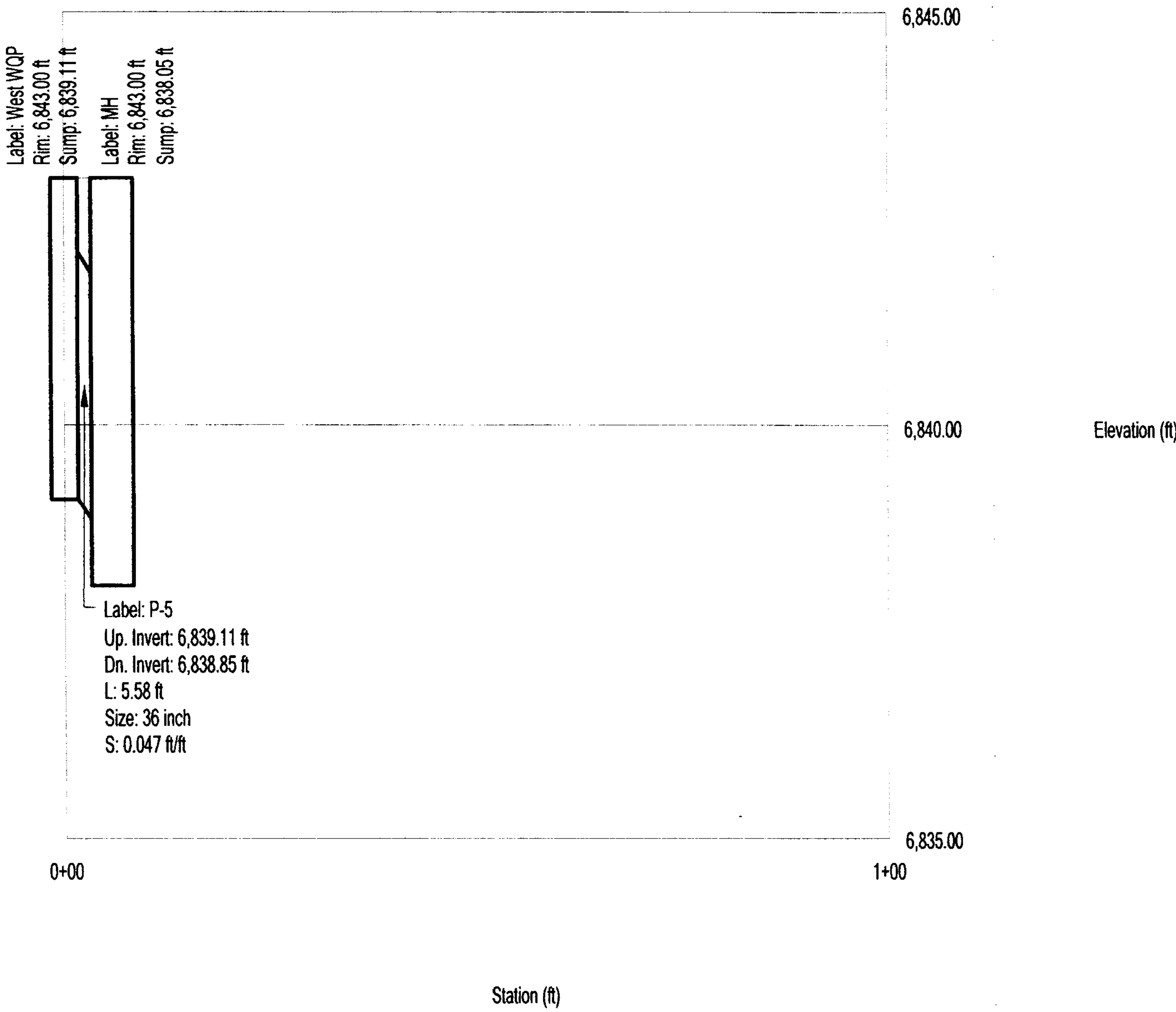
Scenario: 100-year

Combined Pipe\Node Report

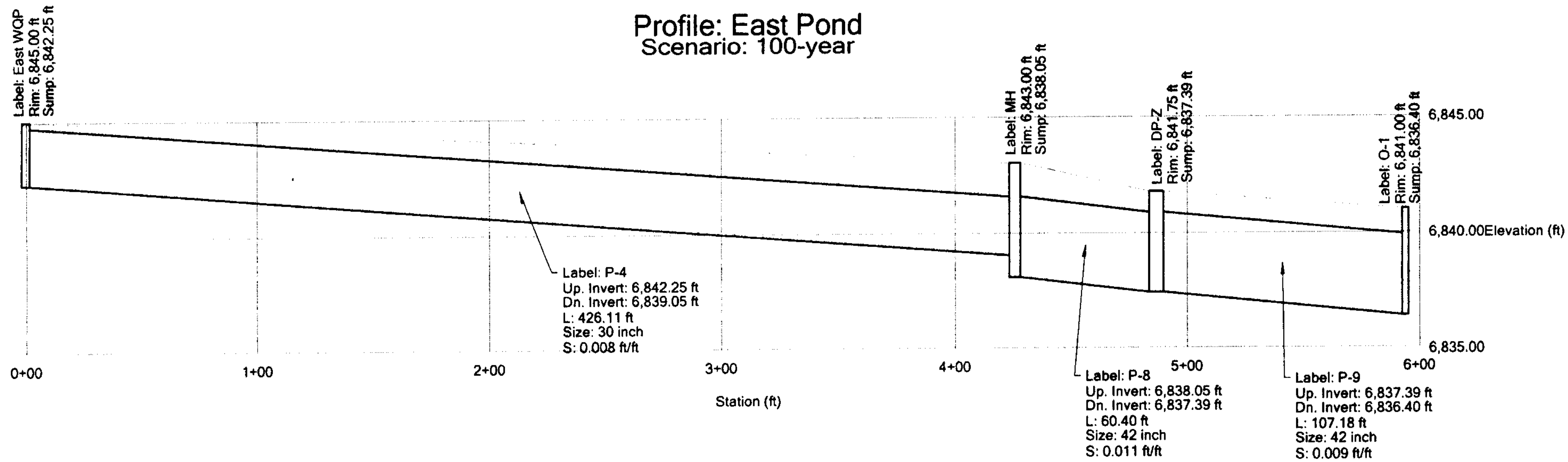
Label	Up. Node	Dn. Node	L (ft)	Up. Inlet Area (acres)	Up. Inlet Rat. Coef.	Up. Inlet Area (acres)	Up. Calc. Sys. CA (acres)	Up.Inlet Rat. Q (cfs)	Size	Q Full (cfs)	Avg. v (ft/s)	Up. Gr Elev. (ft)	HGL In (ft)	Up. Invert (ft)	Dn. Gr. Elev. (ft)	HGL Out (ft)	Dn. Invert (ft)	S (ft/ft)
P-4	East WQF	MH	426.11	3.50	1.00	3.50	3.50	32.00	30 inch	35.54	6.52	6,845.00	6,844.85	6,842.25	6,843.00	6,842.25	6,839.05	0.008
P-5	West WQI	MH	5.58	4.88	1.00	4.88	4.88	44.27	36 inch	143.97	6.26	6,843.00	6,842.28	6,839.11	6,843.00	6,842.25	6,838.85	0.047
P-8	MH	DP-Z	60.40	N/A	N/A	N/A	8.38	N/A	42 inch	105.16	7.67	6,843.00	6,841.42	6,838.05	6,841.75	6,841.13	6,837.39	0.011
P-9	DP-Z	O-1	107.18	N/A	N/A	N/A	8.38	N/A	42 inch	96.69	10.03	6,841.75	6,840.07	6,837.39	6,841.00	6,838.71	6,836.40	0.009

Profile: West Pond

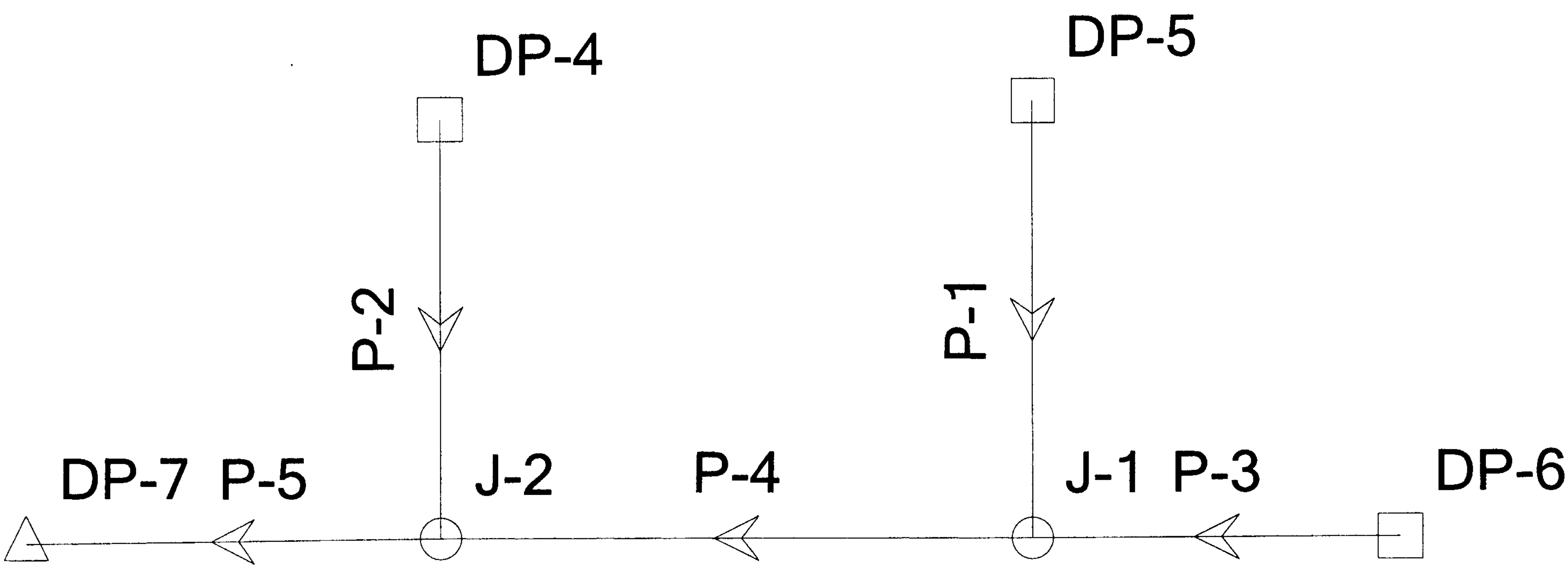
Scenario: 100-year



Profile
Scenario: 100-year



Scenario: 100-year



Analysis Results
Scenario: 100-year

Title: Meridian Crossing
Project Engineer: Charlene Sammons
Project Date: 01/31/05
Comments: Analysis of existing storm system downstream of Meridian Crossing Project in Falcon, CO

Scenario Summary	
Scenario	100-year
Physical Properties Alternat	Base-Physical Properties
Catchments Alternative	Catchments-100-year
System Flows Alternative	Base-System Flows
Structure Headlosses Alterr	Base-Structure Headlosses
Boundary Conditions Altern	Base-Boundary Conditions
Design Constraints Alternat	Base-Design Constraints
Capital Cost Alternative	Base-Cost
User Data Alternative	Base-User Data

Network Inventory			
Number of Pipes	5	Number of Inlets	3
- Circular Pipes:	2	- Grate Inlets:	0
- Box Pipes:	3	- Curb Inlets:	2
- Arch Pipes:	0	- Combination Inlets:	0
- Vertical Elliptical Pipes:	0	- Slot Inlets:	0
- Horizontal Elliptical Pipes:	0	- Grate Inlets in Ditch:	0
Number of Junctions	2	- Generic Inlets:	1
Number of Outlets	1		

Circular Pipes Inventory	
24 inch	185.50 ft
Total Length	185.50 ft

Box Pipes Inventory	
6 x 3 ft	366.02 ft
Total Length	366.02 ft

Curb Inlet Inventory	
Type R 10'	2

Generic Inlet Inventory	
Default 100%	1

Inlet elements for network with outlet: DP-7

Label	Inlet	Total System Flow (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Capture Efficiency (%)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method
DP-4	Curb Type R 10'	22.05	22.05	0.00	N/A	100.0	3,818.78	3,818.78	0.00	Absolut
DP-5	Curb Type R 10'	19.80	19.80	0.00	N/A	100.0	3,818.70	3,818.70	0.00	Absolut
DP-6	Generic Default 1	50.69	250.69	0.00	N/A	100.0	3,817.78	3,817.78	0.00	Absolut

Analysis Results
Scenario: 100-year

Outlet: DP-7

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
DP-7	6,814.44	6,814.44	0.00	0.00	0.00	273.30	5.21	22.65	52.02

Junction elements for network with outlet: DP-7

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
J-1	6,817.71	6,817.71	0.00	Absolut	0.00	0.00	262.00	5.25	22.36	49.53
J-2	6,817.08	6,817.08	0.00	Absolut	0.00	0.00	273.54	5.22	22.61	52.02

Pipe elements for network with outlet: DP-7

Label	Section Shape	Section Size	Length (ft)	Number of Sections	Constructed Slope (ft/ft)	Energy Slope (ft/ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-1	Circular	24 inch	94.00	1	0.009043	008925	19.80	7.56	6,817.10	6,816.25	6,818.70	6,817.76
P-2	Circular	24 inch	91.50	1	0.016940	014085	22.05	8.96	6,817.10	6,815.55	6,818.78	6,816.86
P-3	Box	6 x 3 ft	28.85	2	0.005199	005093	:50.69	8.63	6,815.40	6,815.25	6,817.78	6,817.71
P-4	Box	6 x 3 ft	33.50	2	0.005243	005221	:62.00	8.76	6,815.25	6,814.55	6,817.71	6,817.08
P-5	Box	6 x 3 ft	20.66	2	0.005324	004607	:73.54	9.31	6,814.55	6,814.44	6,817.08	6,816.82

Scenario: 100-year

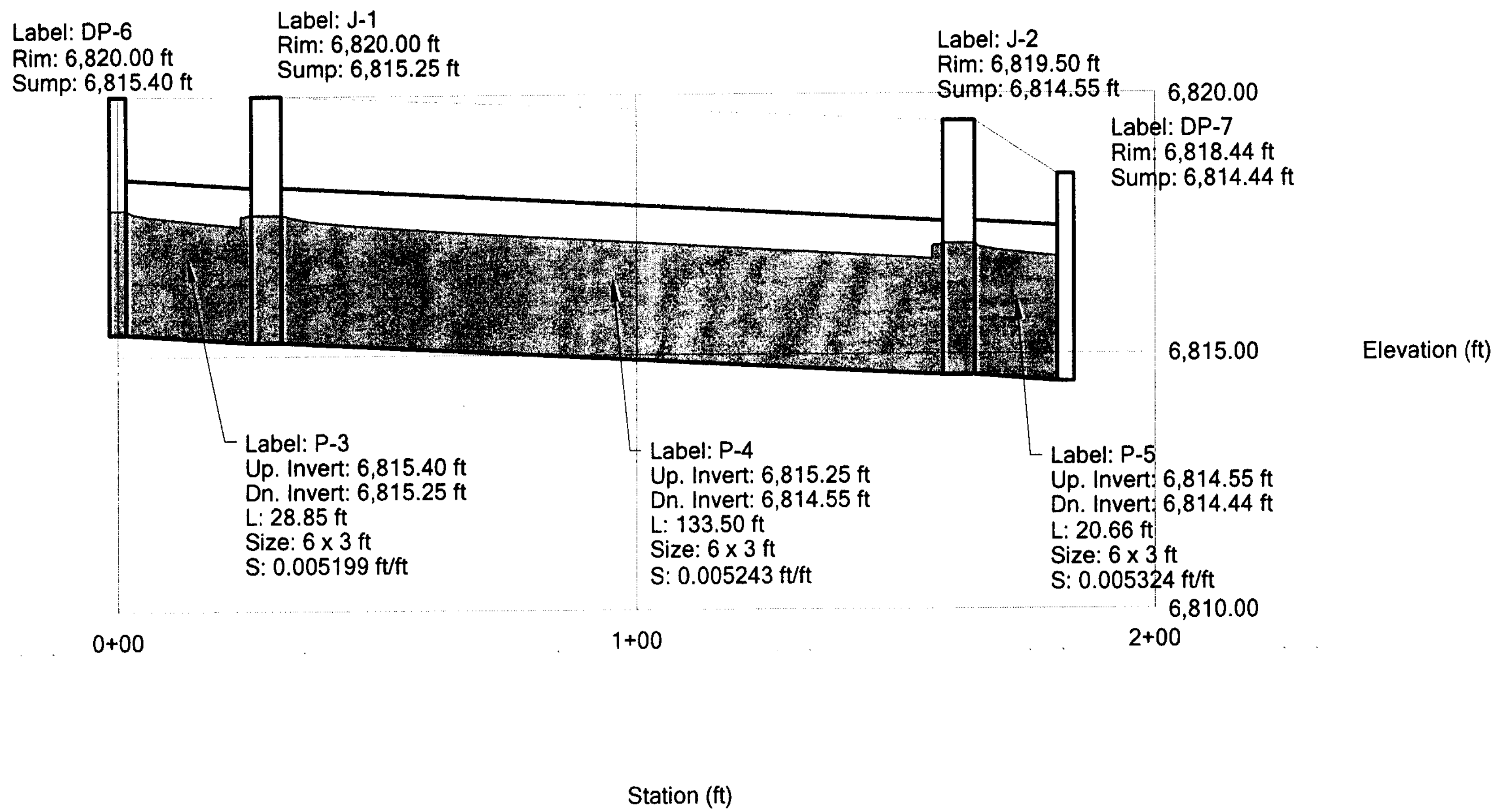
Combined Pipe\Node Report

Label	Up. Node	Dn. Node	L (ft)	Up. Inlet Area (acres)	Up. Inlet Rat. Coef.	Up. Inlet Area (acres)	Up. Calc. Sys. CA (acres)	Up.Inlet Rat. Q (cfs)	Size	Q Full (cfs)	Avg. v (ft/s)	Up. Gr Elev. (ft)	HGL In (ft)	Up. Invert (ft)	Dn. Gr. Elev. (ft)	HGL Out (ft)	Dn. Invert (ft)	S (ft/ft)
P-2	DP-4	J-2	91.50	2.49	1.00	2.49	2.49	22.05	24 inch	29.44	8.96	6,821.16	6,818.78	6,817.10	6,819.50	6,816.86	6,815.55	.016940
P-1	DP-5	J-1	94.00	2.20	1.00	2.20	2.20	19.80	24 inch	21.51	7.56	6,821.16	6,818.70	6,817.10	6,820.00	6,817.76	6,816.25	.009043
P-3	DP-6	J-1	28.85	47.33	1.00	47.33	47.33	250.69	6 x 3 ft	296.71	8.63	6,820.00	6,817.78	6,815.40	6,820.00	6,817.71	6,815.25	.005199
P-4	J-1	J-2	133.50	N/A	N/A	N/A	49.53	N/A	6 x 3 ft	297.96	8.76	6,820.00	6,817.71	6,815.25	6,819.50	6,817.08	6,814.55	.005243
P-5	J-2	DP-7	20.66	N/A	N/A	N/A	52.02	N/A	6 x 3 ft	300.25	9.31	6,819.50	6,817.08	6,814.55	6,818.44	6,816.82	6,814.44	.005324

Profile
Scenario: 100-year

Profile: RCB @ Highway 24

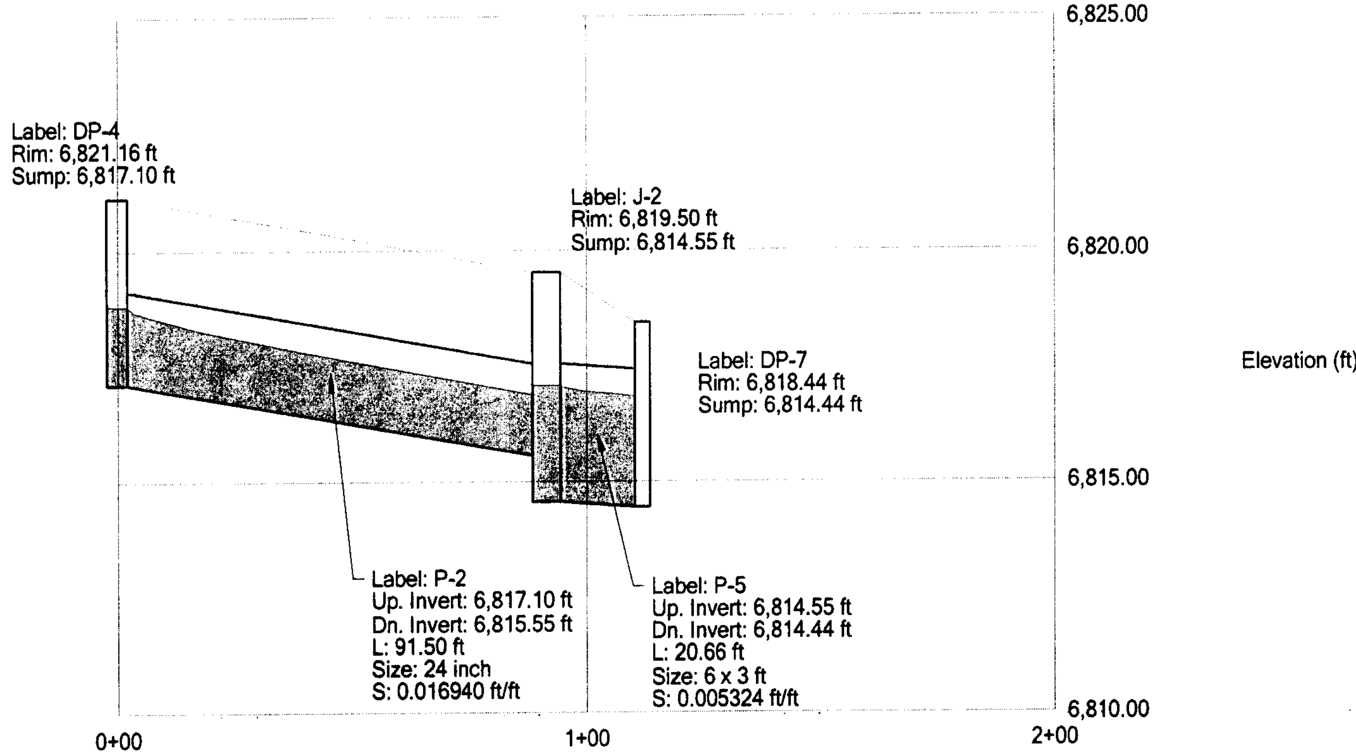
Scenario: 100-year



Profile
Scenario: 100-year

Profile: Sump Inlet Left

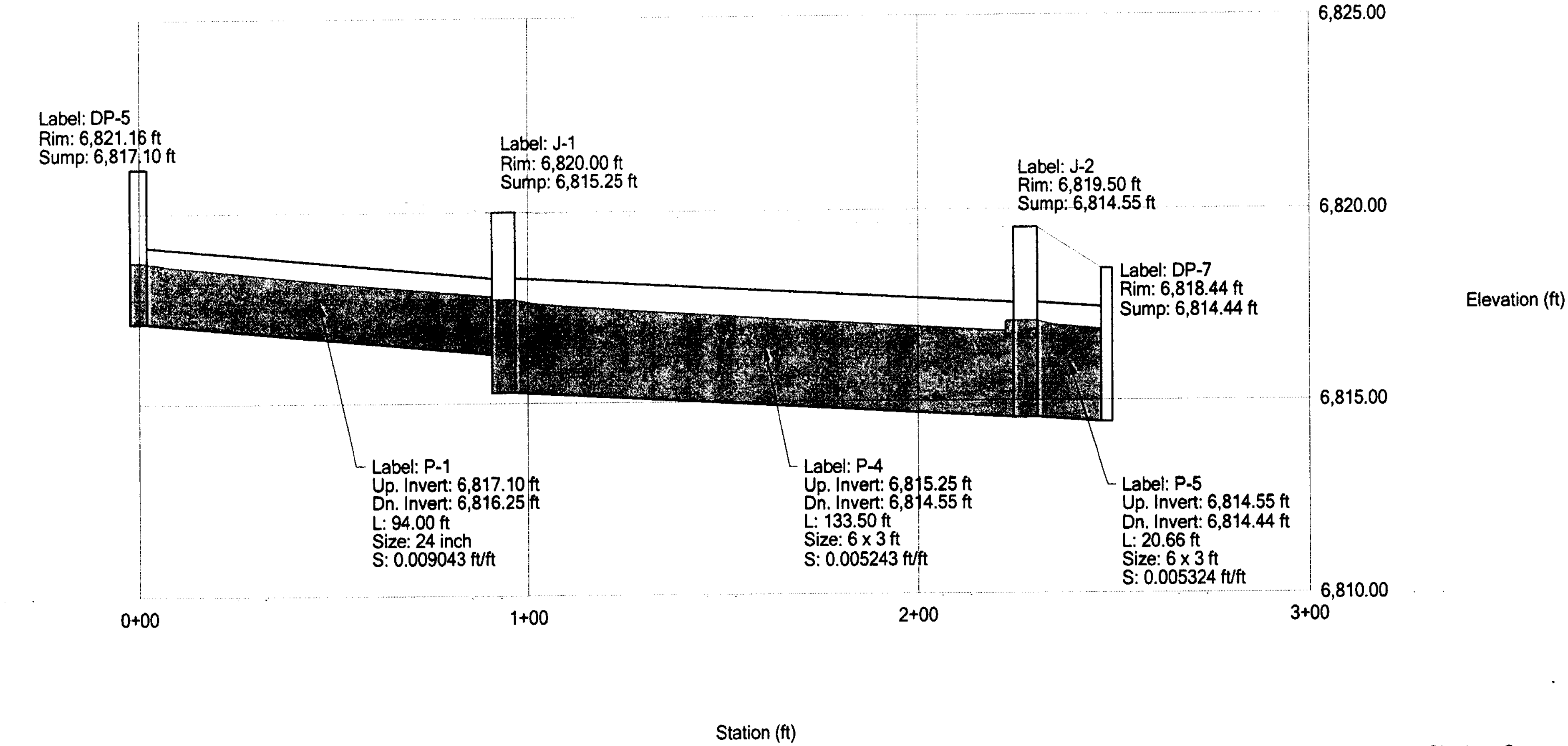
Scenario: 100-year



Profile
Scenario: 100-year

Profile: Sump Inlet Right

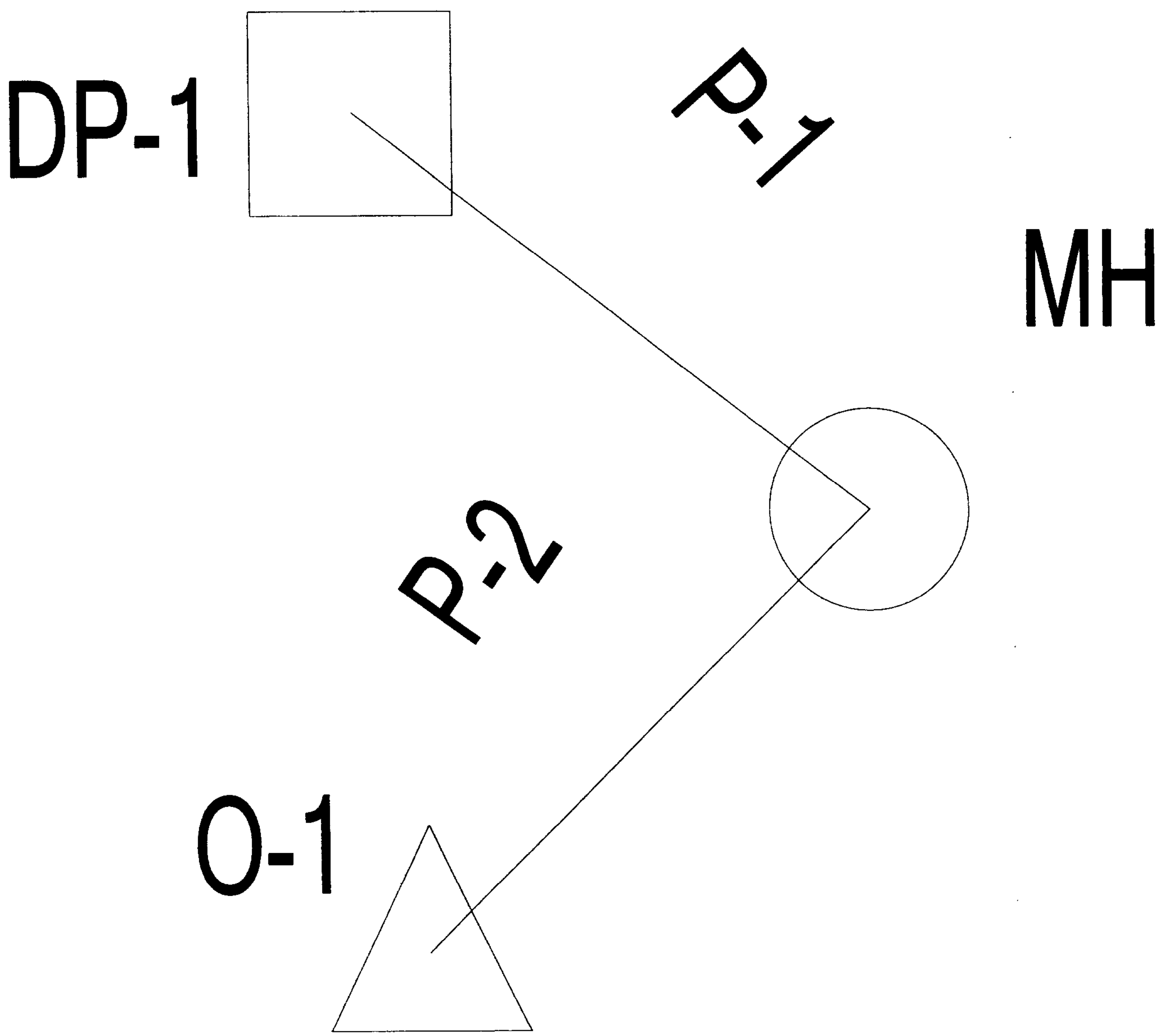
Scenario: 100-year



Title: Meridian Crossing
z:\...\fdr\calcs\storm cad\meridian rd-sta 200.stm
07/23/08 03:57:20 PM

Project Engineer: Charlene Sammons
StormCAD v5.6 [05.06.012.00]

Scenario: 100-year



Analysis Results
Scenario: 100-year

Outlet: O-1

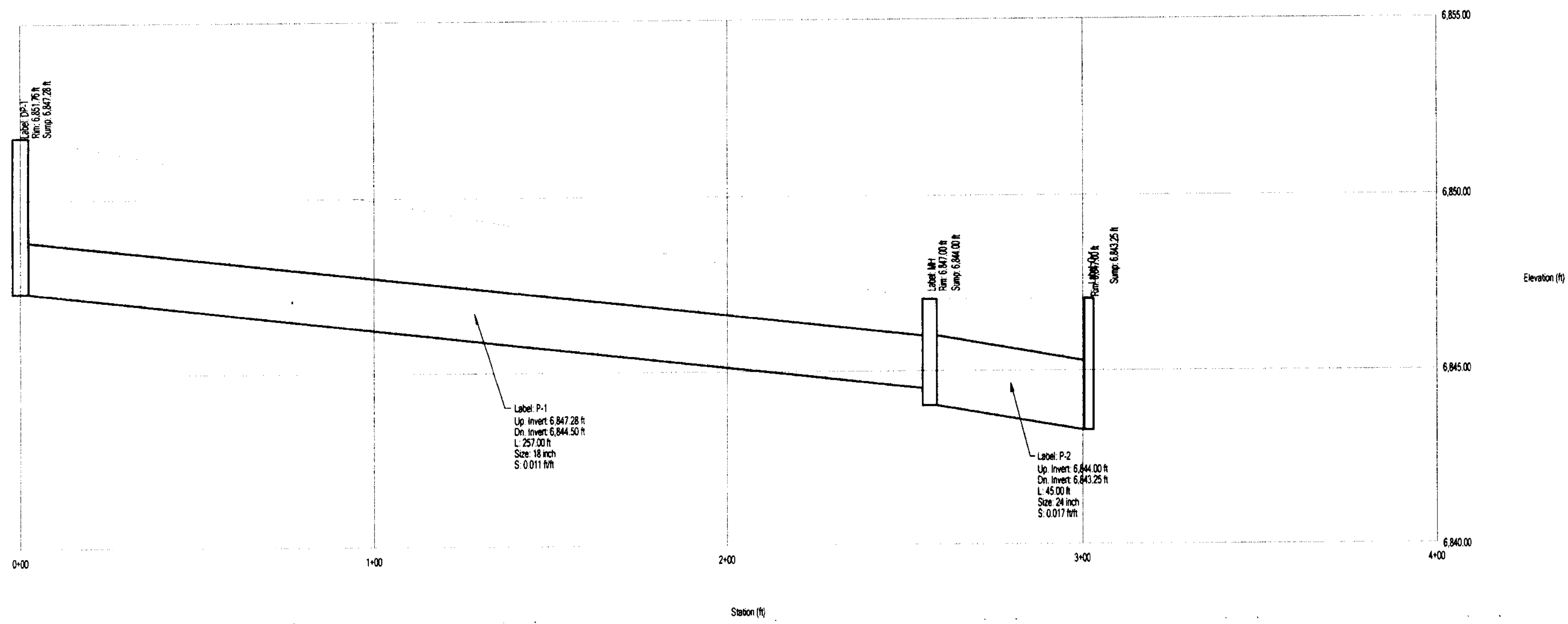
Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
O-1	6,843.25	6,843.25	0.00	0.00	0.00	7.35	8.28	7.22	0.88

Pipe elements for network with outlet: O-1

Label	Section Shape	Section Size	Length (ft)	Number of Sections	Constructed Slope (ft/ft)	Energy Slope (ft/ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-1	Circular	18 inch	:57.00	1	0.011	0.011	7.61	6.16	6,847.28	6,844.50	6,848.35	6,845.42
P-2	Circular	24 inch	45.00	1	0.017	0.012	7.39	6.17	6,844.00	6,843.25	6,844.97	6,843.96

Profile
Scenario: 100-year

Profile: Ultimate Design
Scenario: 100-year



Existing Channel along Highway 24 ROW

Channel Calculator

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	65.1000 cfs
Slope	0.0090 ft/ft
Manning's n	0.0350
Height	36.0000 in
Bottom width	480.0000 in
Left slope	0.2500 ft/ft (V/H)
Right slope	0.2500 ft/ft (V/H)

Computed Results:

Depth	6.8903 in
Velocity	2.6805 fps
Full Flowrate	1129.3728 cfs
Flow area	24.2864 ft2
Flow perimeter	536.8189 in
Hydraulic radius	6.5148 in
Top width	535.1224 in
Area	156.0000 ft2
Perimeter	776.8636 in
Percent full	19.1397 %

Critical Information

Critical depth	5.1448 in
Critical slope	0.0241 ft/ft
Critical velocity	3.6400 fps
Critical area	17.8847 ft2
Critical perimeter	522.4254 in
Critical hydraulic radius	4.9297 in
Critical top width	521.1587 in
Specific energy	0.6859 ft
Minimum energy	0.6431 ft
Froude number	0.6404
Flow condition	Subcritical

Existing Temporary Channel along Meridian Road (DP-E)

Channel Calculator

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	88.2000 cfs
Slope	0.0200 ft/ft
Manning's n	0.0350
Height	36.0000 in
Bottom width	0.0000 in
Left slope	0.2500 ft/ft (V/H)
Right slope	0.1667 ft/ft (V/H)

Computed Results:

Depth	21.4874 in
Velocity	5.5023 fps
Full Flowrate	349.2362 cfs
Flow area	16.0296 ft2
Flow perimeter	219.2720 in
Hydraulic radius	10.5269 in
Top width	214.8480 in
Area	44.9946 ft2
Perimeter	367.3687 in
Percent full	59.6872 %

Critical Information

Critical depth	21.7023 in
Critical slope	0.0190 ft/ft
Critical velocity	5.3939 fps
Critical area	16.3519 ft2
Critical perimeter	221.4655 in
Critical hydraulic radius	10.6322 in
Critical top width	216.9973 in
Specific energy	2.2611 ft
Minimum energy	2.7128 ft
Froude number	1.0252
Flow condition	Supercritical

Proposed Temporary Channel from Old Meridian Road (DP-Z)

Channel Calculator

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	73.3000 cfs
Slope	0.0050 ft/ft
Manning's n	0.0350
Height	36.0000 in
Bottom width	60.0000 in
Left slope	0.2500 ft/ft (V/H)
Right slope	0.2500 ft/ft (V/H)

Computed Results:

Depth	21.9888 in
Velocity	3.2444 fps
Full Flowrate	219.3674 cfs
Flow area	22.5927 ft2
Flow perimeter	241.3242 in
Hydraulic radius	13.4813 in
Top width	235.9103 in
Area	51.0000 ft2
Perimeter	356.8636 in
Percent full	61.0800 %

Critical Information

Critical depth	16.0014 in
Critical slope	0.0192 ft/ft
Critical velocity	5.3195 fps
Critical area	13.7795 ft2
Critical perimeter	191.9505 in
Critical hydraulic radius	10.3373 in
Critical top width	188.0108 in
Specific energy	1.9960 ft
Minimum energy	2.0002 ft
Froude number	0.5336
Flow condition	Subcritical

Culvert Designer/Analyzer Report
Highway 24 - DP WU

Analysis Component			
Storm Event	Check	Discharge	1,241.00 cfs

Peak Discharge Method: User-Specified			
Design Discharge	1,241.00 cfs	Check Discharge	1,241.00 cfs

Tailwater properties: Trapezoidal Channel

Tailwater conditions for Check Storm.			
Discharge	1,241.00 cfs	Bottom Elevation	6,813.00 ft
Depth	3.82 ft	Velocity	7.78 ft/s

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	3-12 x 6 ft Box	1,240.93 cfs	6,818.87 ft	8.71 ft/s
Weir	Roadway (Constant Elevation)	0.00 cfs	6,818.87 ft	N/A
Total	---------------	1,240.93 cfs	6,818.87 ft	N/A

Culvert Designer/Analyzer Report
Highway 24 - DP WU

Component:Culvert-1

Culvert Summary

Computed Headwater Eleva	6,818.87 ft	Discharge	1,240.93 cfs
Inlet Control HW Elev.	6,818.37 ft	Tailwater Elevation	6,816.82 ft
Outlet Control HW Elev.	6,818.87 ft	Control Type	Outlet Control
Headwater Depth/Height	0.96		

Grades

Upstream Invert	6,813.10 ft	Downstream Invert	6,812.87 ft
Length	47.00 ft	Constructed Slope	0.005000 ft/ft

Hydraulic Profile

Profile	S1	Depth, Downstream	3.96 ft
Slope Type	Steep	Normal Depth	2.78 ft
Flow Regime	Subcritical	Critical Depth	3.33 ft
Velocity Downstream	8.71 ft/s	Critical Slope	0.002971 ft/ft

Section

Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 6 ft	Rise	6.00 ft
Number Sections	3		

Outlet Control Properties

Outlet Control HW Elev.	6,818.87 ft	Upstream Velocity Head	1.54 ft
Ke	0.50	Entrance Loss	0.77 ft

Inlet Control Properties

Inlet Control HW Elev.	6,818.37 ft	Flow Control	N/A
Inlet Type	45° wingwall flares - offset	Area Full	216.0 ft2
K	0.49700	HDS 5 Chart	13
M	0.66700	HDS 5 Scale	1
C	0.03020	Equation Form	2
Y	0.83500		

Culvert Designer/Analyzer Report
McLaughlin Bridge

Component:Culvert-1

Culvert Summary			
Computed Headwater Elev:	104.17 ft	Discharge	623.40 cfs
Inlet Control HW Elev.	104.17 ft	Tailwater Elevation	N/A ft
Outlet Control HW Elev.	103.98 ft	Control Type	Inlet Control
Headwater Depth/Height	1.39		

Grades			
Upstream Invert	100.00 ft	Downstream Invert	100.00 ft
Length	50.00 ft	Constructed Slope	0.010000 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	1.99 ft
Slope Type	Steep	Normal Depth	1.76 ft
Flow Regime	Supercritical	Critical Depth	2.49 ft
Velocity Downstream	11.21 ft/s	Critical Slope	0.003719 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	7.00 ft
Section Size	7 x 3 ft	Rise	3.00 ft
Number Sections	4		

Outlet Control Properties			
Outlet Control HW Elev.	103.98 ft	Upstream Velocity Head	1.24 ft
Ke	0.20	Entrance Loss	0.25 ft

Inlet Control Properties			
Inlet Control HW Elev.	104.17 ft	Flow Control	N/A
Inlet Type	90° headwall w 45° bevels	Area Full	84.0 ft2
K	0.49500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	2
C	0.03140	Equation Form	2
Y	0.82000		

Culvert Designer/Analyzer Report
Old Meridian Road - DP Y

Analysis Component			
Storm Event	Check	Discharge	65.10 cfs

Peak Discharge Method: User-Specified			
Design Discharge	34.70 cfs	Check Discharge	65.10 cfs

Tailwater properties: Trapezoidal Channel

Tailwater conditions for Check Storm.			
Discharge	65.10 cfs	Bottom Elevation	6,813.00 ft
Depth	0.89 ft	Velocity	3.45 ft/s

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-54 inch Circular	65.11 cfs	6,824.75 ft	9.95 ft/s
Weir	Roadway (Constant Elevation)	0.00 cfs	6,824.75 ft	N/A
Total	--------------	65.11 cfs	6,824.75 ft	N/A

Culvert Designer/Analyzer Report
Old Meridian Road - DP Y

Component:Culvert-1

Culvert Summary

Computed Headwater Elev:	6,824.75 ft	Discharge	65.11 cfs
Inlet Control HW Elev.	6,824.43 ft	Tailwater Elevation	6,813.89 ft
Outlet Control HW Elev.	6,824.75 ft	Control Type	Entrance Control
Headwater Depth/Height	0.83		

Grades

Upstream Invert	6,821.00 ft	Downstream Invert	6,820.50 ft
Length	50.00 ft	Constructed Slope	0.010000 ft/ft

Hydraulic Profile

Profile	S2	Depth, Downstream	1.94 ft
Slope Type	Steep	Normal Depth	1.78 ft
Flow Regime	Supercritical	Critical Depth	2.35 ft
Velocity Downstream	9.95 ft/s	Critical Slope	0.003794 ft/ft

Section

Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	4.50 ft
Section Size	54 inch	Rise	4.50 ft
Number Sections	1		

Outlet Control Properties

Outlet Control HW Elev.	6,824.75 ft	Upstream Velocity Head	0.93 ft
Ke	0.50	Entrance Loss	0.47 ft

Inlet Control Properties

Inlet Control HW Elev.	6,824.43 ft	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	15.9 ft2
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Designer/Analyzer Report
Old Meridian Road - DP Y

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)					
Discharge	0.00	cfs	Allowable HW Elevation	6,824.75	ft
Roadway Width	44.00	ft	Overtopping Coefficient	2.90	US
Length	150.00	ft	Crest Elevation	6,825.35	ft
Headwater Elevation	N/A	ft	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00				

Sta (ft)	Elev. (ft)
0.00	6,825.35
150.00	6,825.35

Culvert Outlet Protection

Meridian Crossing - Final Drainage Report

Culvert	Diameter	No of Barrels	Slope	Velocity	Riprap Width	Riprap Length		Riprap Size
	(in)		(%)	ft/s	ft	ft		
DP-Y	54	1	1.20%	10.5	13.5	21.5	3.78	L
DP-Z	42	1	0.90%	10.0	10.5	18.5	3.44	L

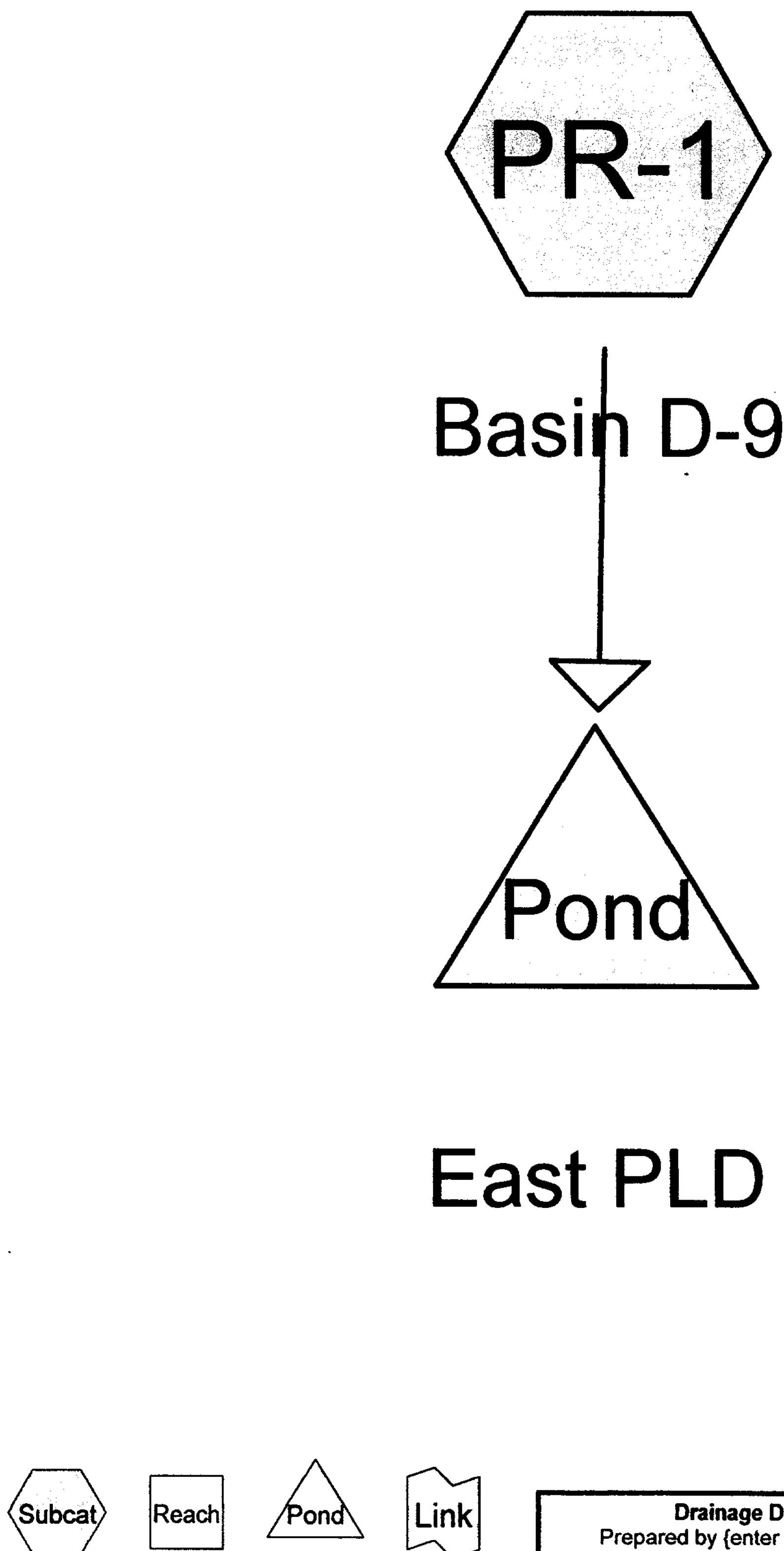
Appendix G: Water Quality Pond Calculations

Design Procedure Form: Porous Landscape Detention (PLD)

Designer:	Thomas Roberts
Company:	Springs Engineering
Date:	July 23, 2008
Project:	Merdian Crossing East Pond
Location:	Falcon, CO

1. Basin Storage Volume (I_a = 100% if all paved and roofed areas u/s of PLD) A) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	I_a = 79.00 % i = 0.79
B) Contributing Watershed Area Including the PLD (Area)	Area = 167,616 square feet
C) Water Quality Capture Volume (WQCV) ($WQCV = 0.8 * (0.91 * I^3 - 1.19 * I^2 + 0.78 * I)$)	WQCV = 0.26 watershed inches
D) Design Volume: Vol_{PLD} = (WQCV / 12) * Area	Vol = 3,600 cubic feet
2. PLD Surface Area (A_{PLD}) and Average Depth (d_{av}) (from 3600.24 square feet to 7200.48 square feet)	A_{PLD} = 3,600 square feet
(d_{av}: = (Vol / A_{PLD}), Min=0.5', Max=1.0')	d_{av} = 1.00 feet
3. Draining of PLD (Check A, **or** B, **or** C, **answer** D) Based on answers to 3A through 3D, check the appropriate method	___ Infiltration to Subgrade with Permeable Membrane: 3(C) checked and 3(E) = no
A) Check box if subgrade is heavy or expansive clay [ ] B) Check box if subgrade is silty or clayey sand [ ] C) Check box if subgrade is well-draining soil [X]	___ Underdrain with Impermeable Liner: 3(A) checked or 3(E) = yes
D) Check box if underdrains are not desirable or if underdrains are not feasible at this site. [ ]	___ Underdrain with Non-Woven Geotextile Fabric: 3(B) checked and 3(E) = no
E) Does tributary catchment contain land uses that may have petroleum products, greases, or other chemicals present, such as gas station, hardware store, restaurant, etc.? yes [X] no [ ]	___ 16-Mil. Impermeable Membrane with No Underdrain: 3(D) checked - Evapotranspiration only x Other: Type D Inlet
4. Sand/Peat Mix and Gravel Subbase (See Figure PLD-1)	
A) Heavy or Expansive Clay (NRCS Group D Soils) Present; Perforated HDPE Underdrain Used.	___ 18" Minimum Depth Sand-Peat Mix with 8" Gravel Layer. 16-Mil. Impermeable Liner and a 3" to 4" Perforated HDPE Underdrain.
B) Silty or Clayey Sand (NRCS Group C Soils) Present; Perforated HDPE Underdrain Used.	___ 18" Minimum Depth Sand-Peat Mix with 8" Gravel Layer and a 3" to 4" Perforated HDPE Underdrain w/ Non-Woven Pemeable Membrane.
C) No Potential For Contamination And Well-Draining (NRCS Group A or B Soils) Are Present; Underdrains Elliminated.	___ 18" Minimum Depth Sand-Peat Mix with Non-Woven Pemeable Membrane and No Underdrain (Direct Infiltration).
D) Underdrains Are Not Desirable Or Are Not Feasible At This Site.	___ 18" Minimum Depth Sand-Peat Mix with An Additional 18" Minimum Layer Sand-Peat Mix or Sand-Class 'A' Compost Bottom Layer (Total Sand-Peat Depth of 36"). 16-Mil. Impermeable Liner Used.
E) Other:	x Other: See Detail on Sheet 8

Notes:



Drainage Diagram for east pond-PLD Sizing
Prepared by {enter your company name here} 7/23/2008

Pond Pond: East PLD

Inflow Area =	3.680 ac,	Inflow Depth = 0.56"	for 2-Year event	
Inflow =	8.32 cfs @	0.09 hrs, Volume=	0.172 af	
Outflow =	6.50 cfs @	0.27 hrs, Volume=	0.134 af,	Atten= 22%, Lag= 10.7 min
Primary =	6.50 cfs @	0.27 hrs, Volume=	0.134 af	

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,844.47' @ 0.27 hrs Surf.Area= 3,394 sf Storage= 4,371 cf

Plug-Flow detention time= 12.8 min calculated for 0.134 af (78% of inflow)
Center-of-Mass det. time= 10.8 min (20.9 - 10.0)

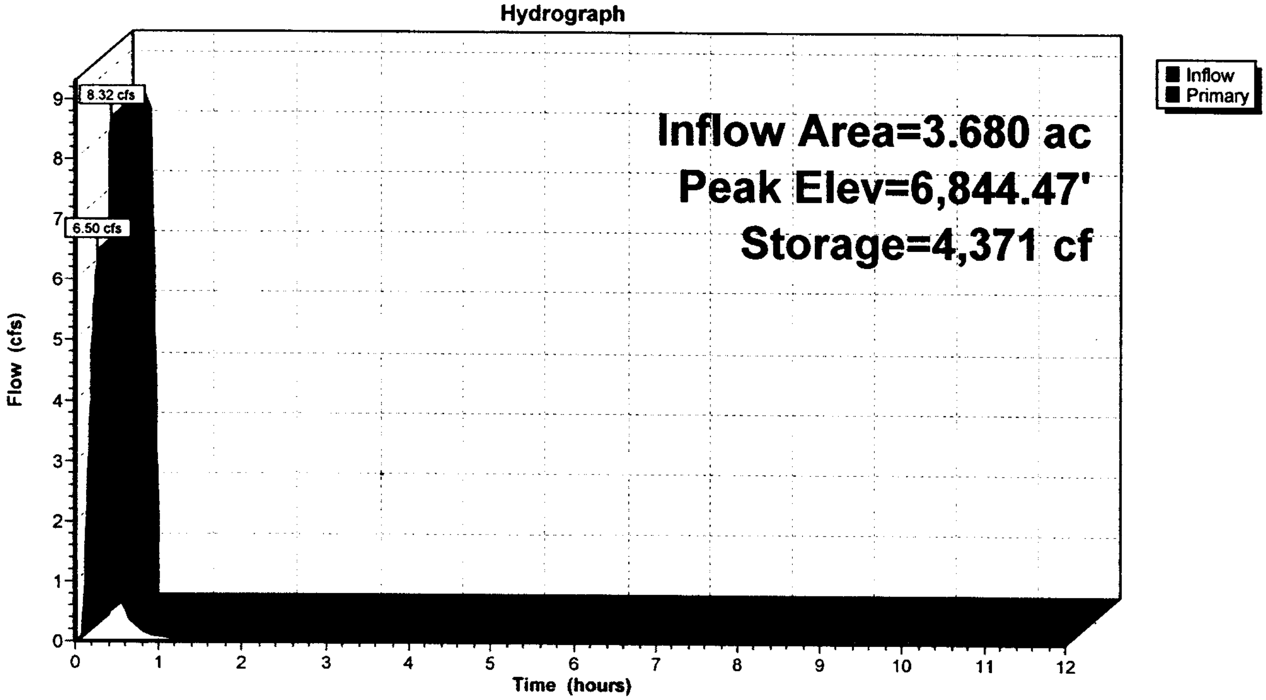
Volume	Invert	Avail.Storage	Storage Description
#1	6,843.00'	9,728 cf	**Custom Stage Data (Pyramidal)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6,843.00	2,200	0	0	2,200
6,844.00	3,300	2,731	2,731	3,320
6,846.00	3,700	6,996	9,728	3,939

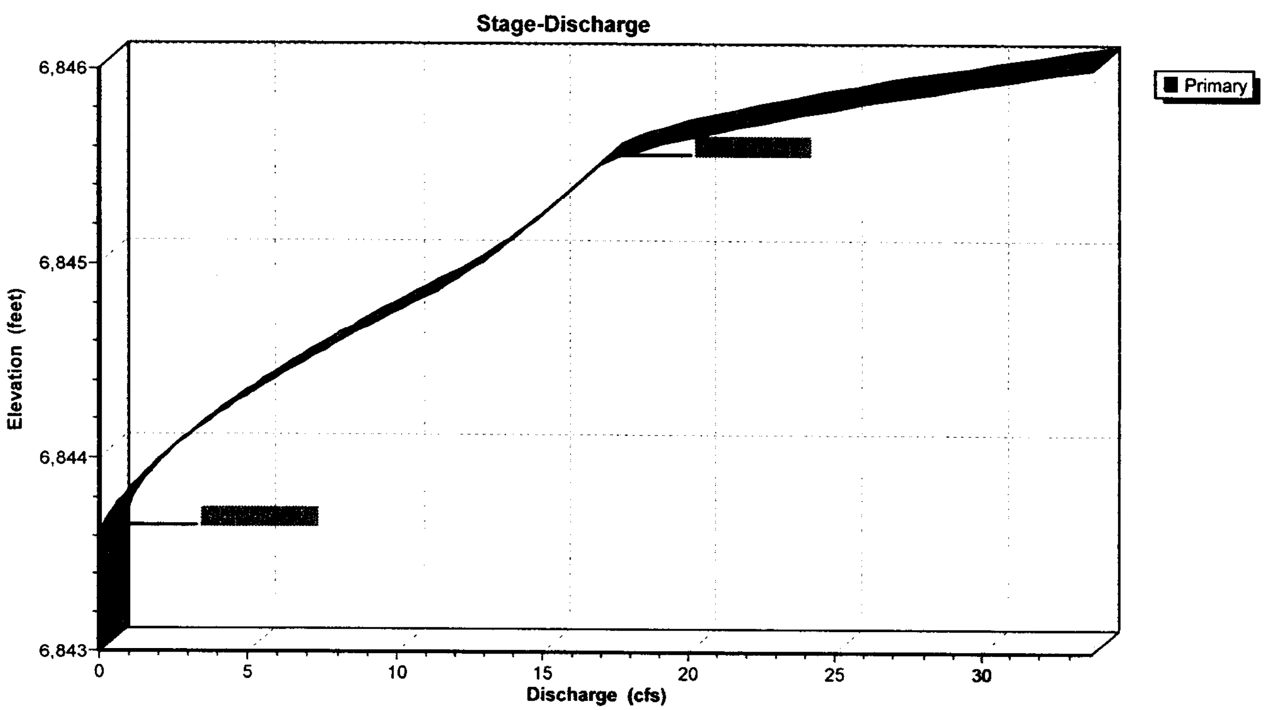
Device	Routing	Invert	Outlet Devices
#1	Primary	6,845.50'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,843.60'	**2.50' W x 1.25' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.49 cfs @ 0.27 hrs HW=6,844.47' (Free Discharge)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 6.49 cfs @ 2.99 fps)

Pond Pond: East PLD



Pond Pond: East PLD



Pond Pond: East PLD

Inflow Area = 3.680 ac, Inflow Depth = 0.77" for 5-Year event
Inflow = 11.42 cfs @ 0.09 hrs, Volume= 0.236 af
Outflow = 9.65 cfs @ 0.26 hrs, Volume= 0.198 af, Atten= 16%, Lag= 10.4 min
Primary = 9.65 cfs @ 0.26 hrs, Volume= 0.198 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,844.73' @ 0.26 hrs Surf.Area= 3,446 sf Storage= 5,288 cf

Plug-Flow detention time= 10.5 min calculated for 0.198 af (84% of inflow)
Center-of-Mass det. time= 9.4 min (19.4 - 10.0)

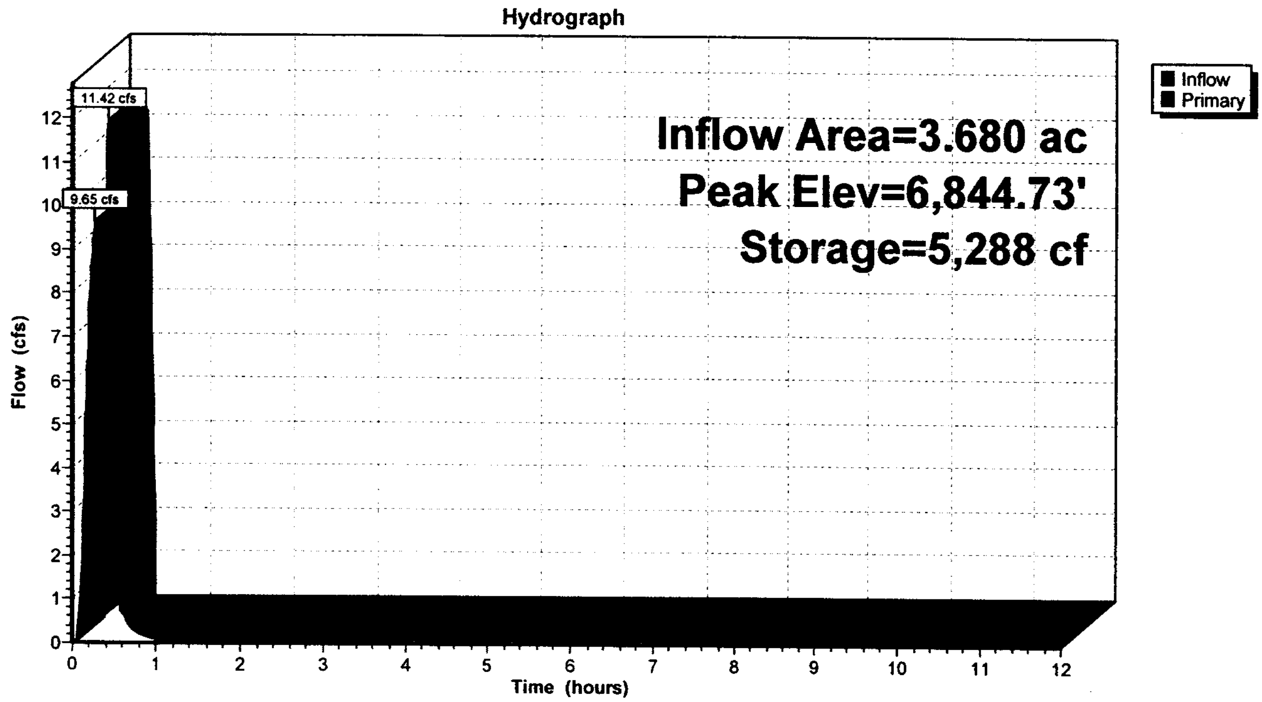
Volume	Invert	Avail.Storage	Storage Description
#1	6,843.00'	9,728 cf	**Custom Stage Data (Pyramidal)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6,843.00	2,200	0	0	2,200
6,844.00	3,300	2,731	2,731	3,320
6,846.00	3,700	6,996	9,728	3,939

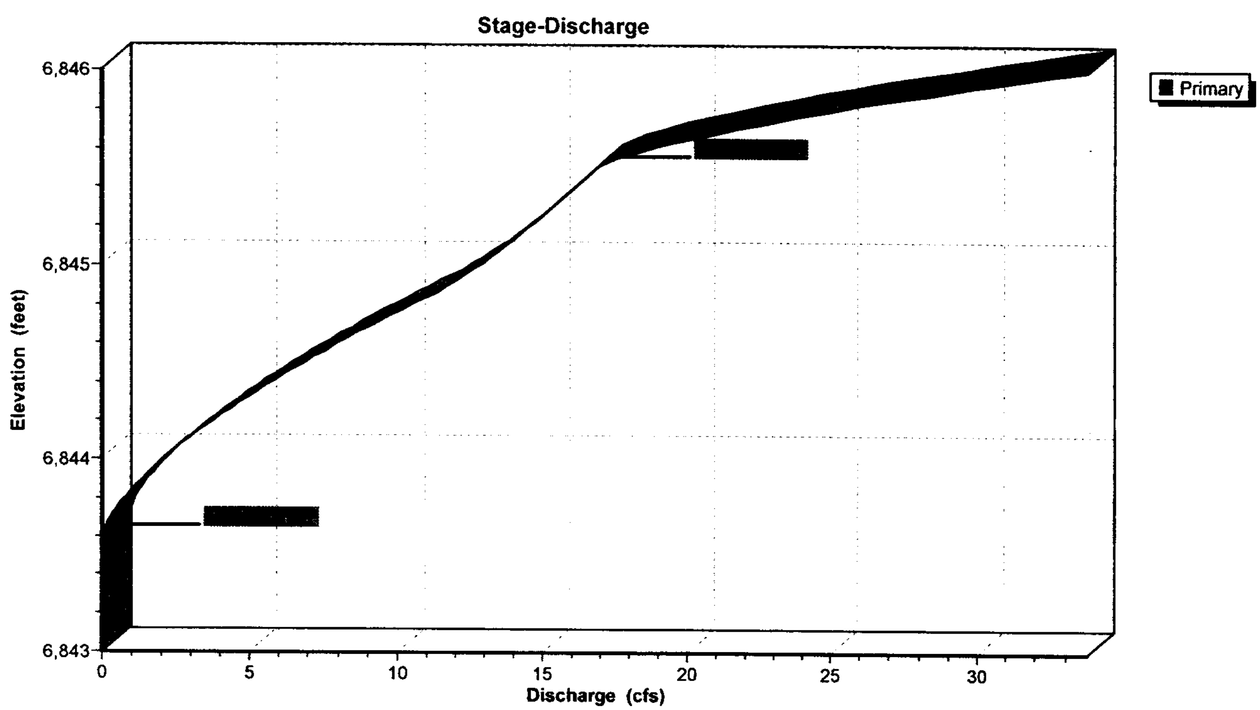
Device	Routing	Invert	Outlet Devices
#1	Primary	6,845.50'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,843.60'	**2.50' W x 1.25' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=9.63 cfs @ 0.26 hrs HW=6,844.73' (Free Discharge)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 9.63 cfs @ 3.41 fps)

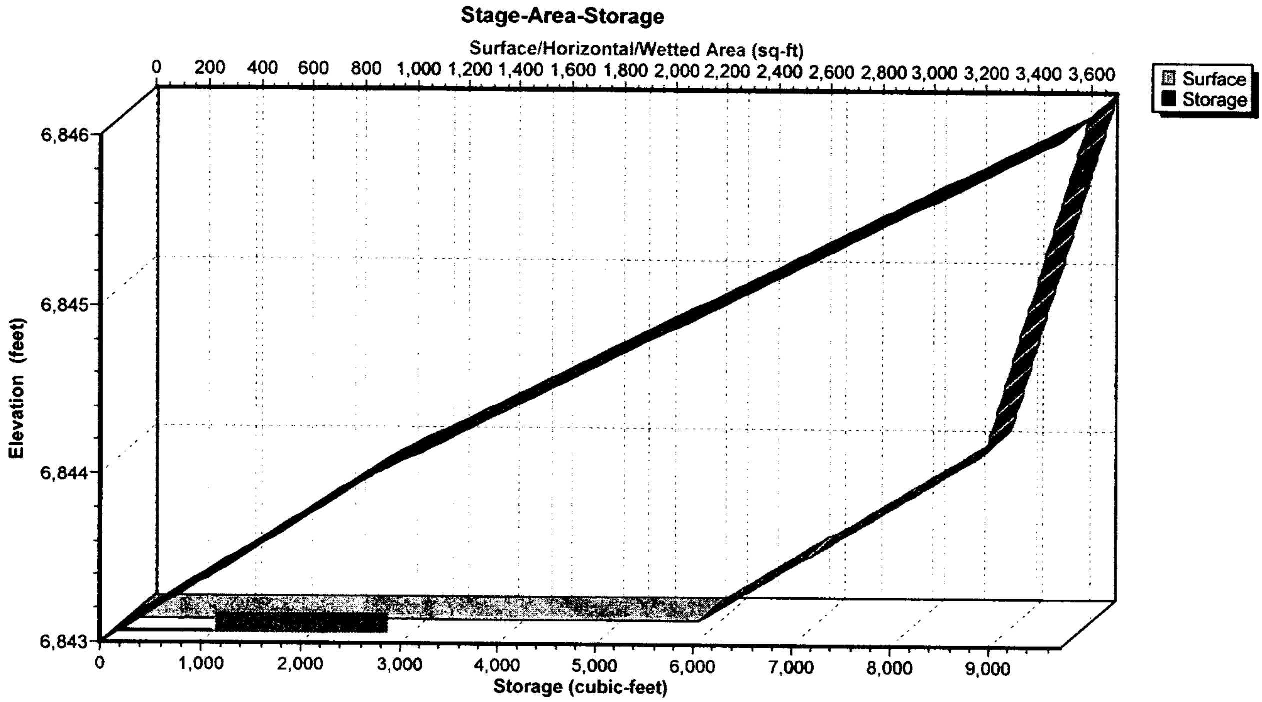
Pond Pond: East PLD



Pond Pond: East PLD



Pond Pond: East PLD



Pond Pond: East PLD

Inflow Area =	3.680 ac, Inflow Depth = 1.37"	for 100-Year event	
Inflow =	20.30 cfs @	0.09 hrs, Volume=	0.420 af
Outflow =	16.97 cfs @	0.26 hrs, Volume=	0.382 af, Atten= 16%, Lag= 10.4 min
Primary =	16.97 cfs @	0.26 hrs, Volume=	0.382 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,845.51' @ 0.26 hrs Surf.Area= 3,603 sf Storage= 8,024 cf

Plug-Flow detention time= 8.7 min calculated for 0.382 af (91% of inflow)
Center-of-Mass det. time= 7.8 min (17.8 - 10.0)

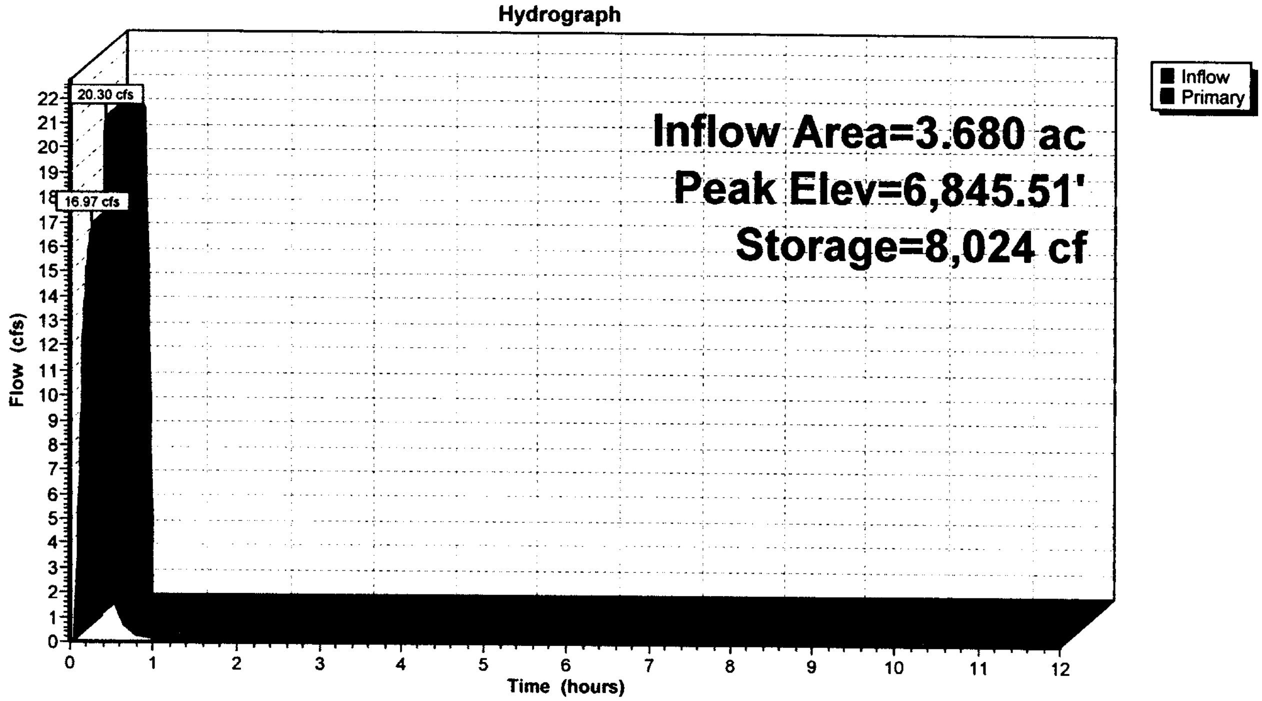
Volume	Invert	Avail.Storage	Storage Description
#1	6,843.00'	9,728 cf	**Custom Stage Data (Pyramidal)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6,843.00	2,200	0	0	2,200
6,844.00	3,300	2,731	2,731	3,320
6,846.00	3,700	6,996	9,728	3,939

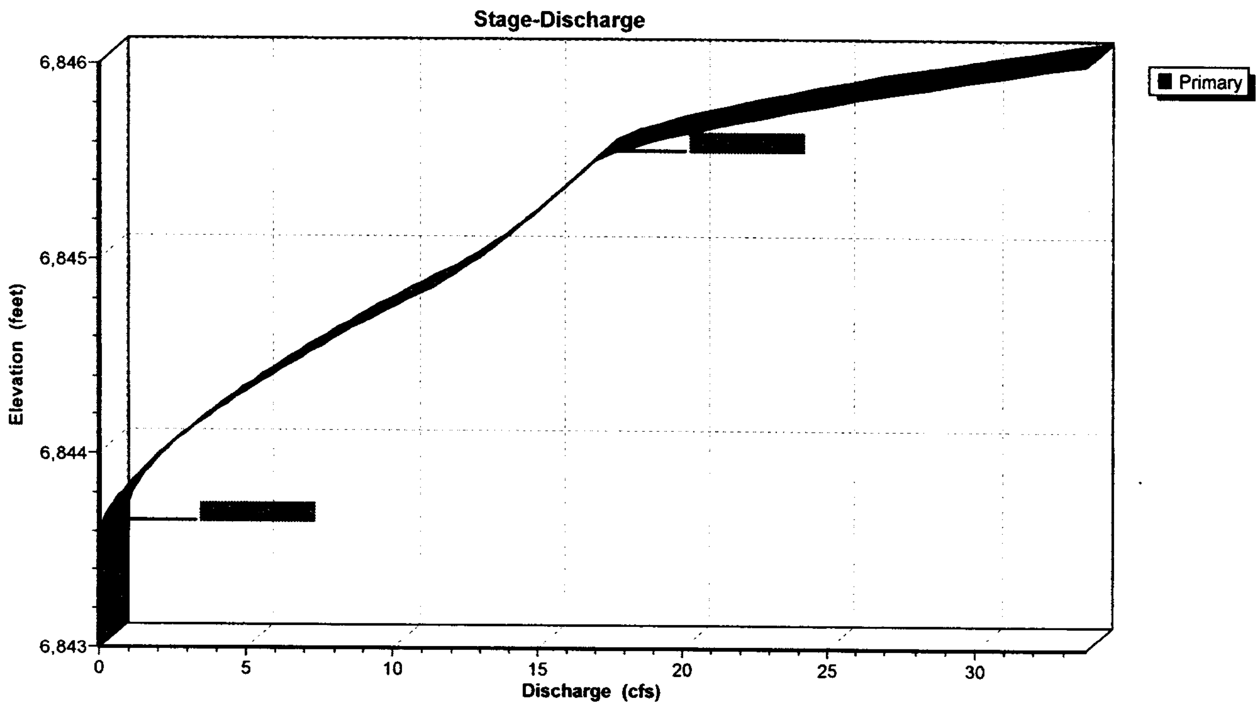
Device	Routing	Invert	Outlet Devices
#1	Primary	6,845.50'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,843.60'	**2.50' W x 1.25' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=16.92 cfs @ 0.26 hrs HW=6,845.51' (Free Discharge)
—**1=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.33 fps)
—**2=Orifice/Grate** (Orifice Controls 16.88 cfs @ 5.40 fps)

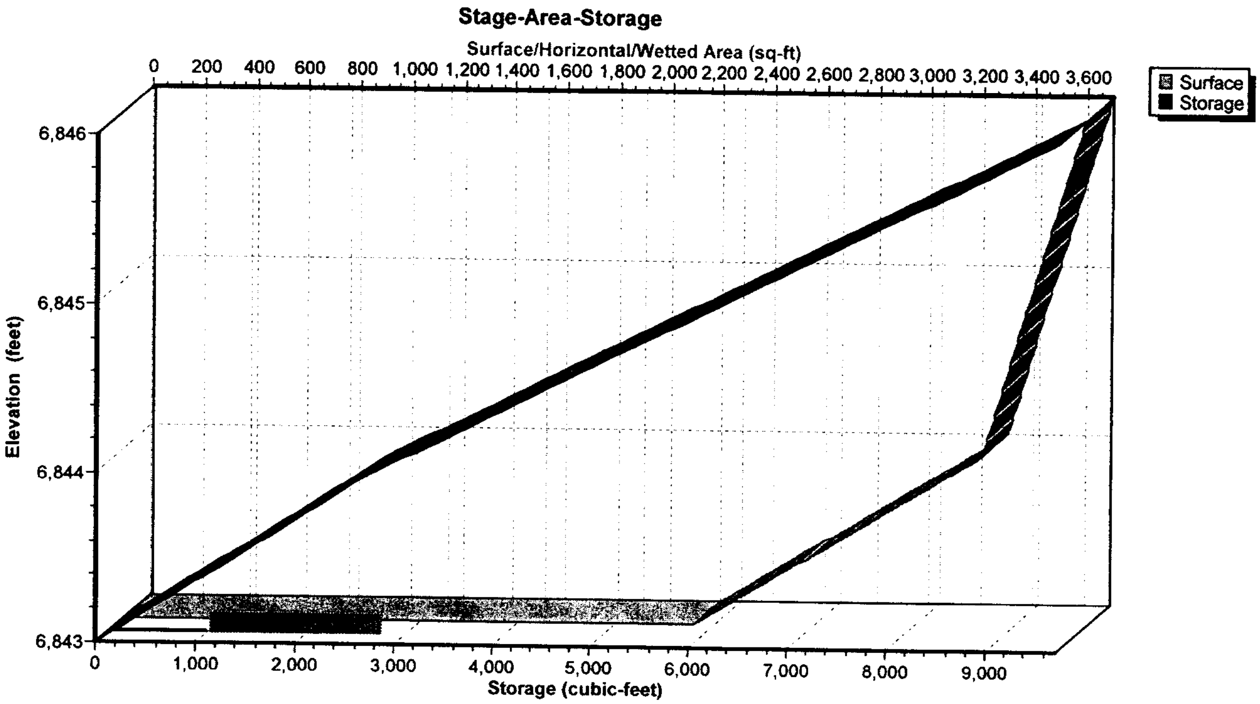
Pond Pond: East PLD



Pond Pond: East PLD



Pond Pond: East PLD

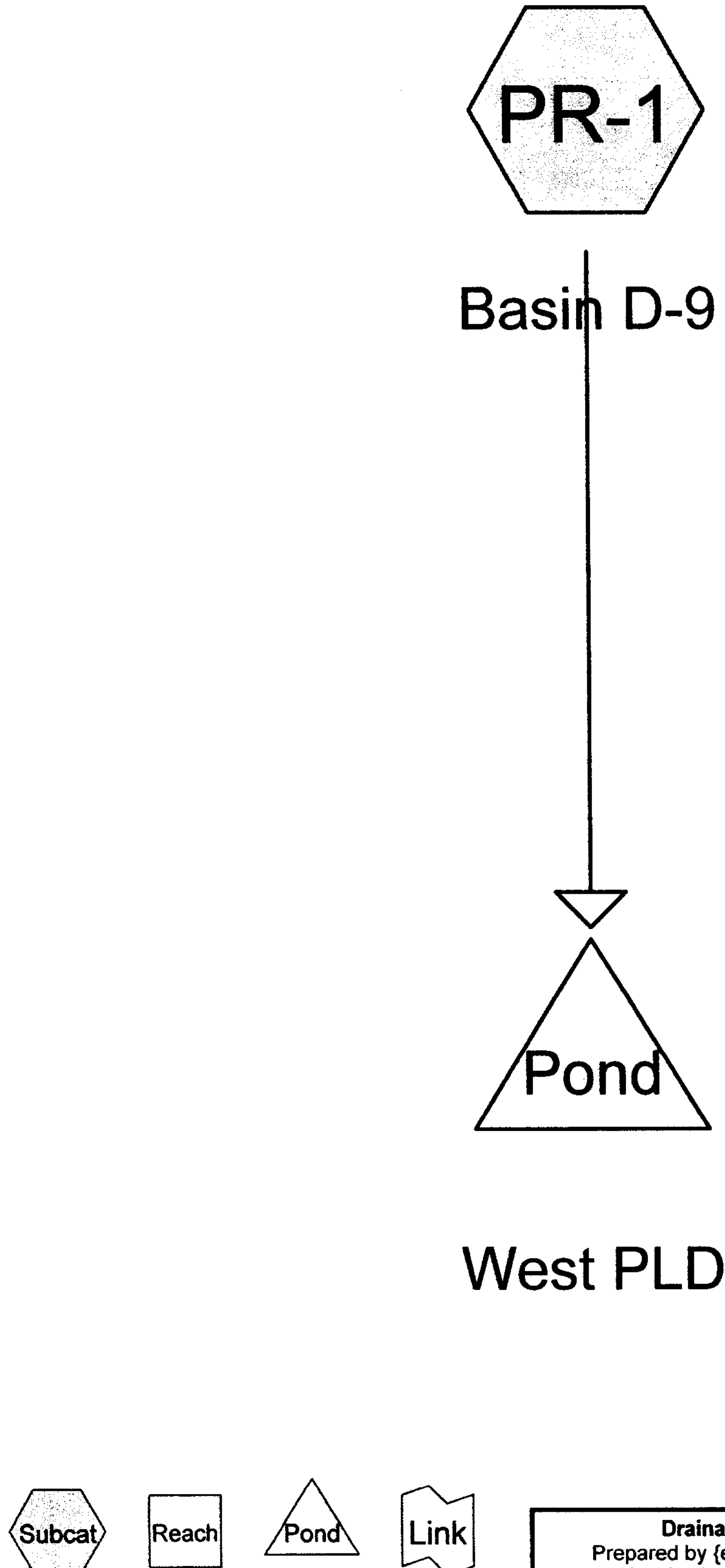


Design Procedure Form: Porous Landscape Detention (PLD)

Designer:	**Thomas Roberts**
Company:	**Springs Engineering**
Date:	**July 23, 2008**
Project:	**Meridian Crossing West Pond**
Location:	**Falcon, CO**

1. Basin Storage Volume (I_a = 100% if all paved and roofed areas u/s of PLD) A) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	I_a = 82.00 % i = 0.82
B) Contributing Watershed Area Including the PLD (Area)	Area = 200,821 square feet
C) Water Quality Capture Volume (WQCV) ($WQCV = 0.8 * (0.91 * I^3 - 1.19 * I^2 + 0.78 * I)$)	WQCV = 0.27 watershed inches
D) Design Volume: Vol_{PLD} = (WQCV / 12) * Area	Vol = 4,568 cubic feet
2. PLD Surface Area (A_{PLD}) and Average Depth (d_{av}) (from 4567.86 square feet to 9135.72 square feet)	A_{PLD} = 4,600 square feet
(d_{av}: = (Vol / A_{PLD}), Min=0.5', Max=1.0')	d_{av} = 0.99 feet
3. Draining of PLD (Check A, **or** B, **or** C, **answer** D) Based on answers to 3A through 3D, check the appropriate method	_____ Infiltration to Subgrade with Permeable Membrane: 3(C) checked and 3(E) = no
A) Check box if subgrade is heavy or expansive clay [ ] B) Check box if subgrade is silty or clayey sand [ ] C) Check box if subgrade is well-draining soil [x]	_____ Underdrain with Impermeable Liner: 3(A) checked or 3(E) = yes
D) Check box if underdrains are not desirable or if underdrains are not feasible at this site. [ ]	_____ Underdrain with Non-Woven Geotextile Fabric: 3(B) checked and 3(E) = no
E) Does tributary catchment contain land uses that may have petroleum products, greases, or other chemicals present, such as gas station, hardware store, restaurant, etc.? yes [x] no [ ]	_____ 16-Mil. Impermeable Membrane with No Underdrain: 3(D) checked - Evapotranspiration only x Other: Type D Inlet
4. Sand/Peat Mix and Gravel Subbase (See Figure PLD-1)	
A) Heavy or Expansive Clay (NRCS Group D Soils) Present; Perforated HDPE Underdrain Used.	_____ 18" Minimum Depth Sand-Peat Mix with 8" Gravel Layer. 16-Mil. Impermeable Liner and a 3" to 4" Perforated HDPE Underdrain.
B) Silty or Clayey Sand (NRCS Group C Soils) Present; Perforated HDPE Underdrain Used.	_____ 18" Minimum Depth Sand-Peat Mix with 8" Gravel Layer and a 3" to 4" Perforated HDPE Underdrain w/ Non-Woven Pemeable Membrane.
C) No Potential For Contamination And Well-Draining (NRCS Group A or B Soils) Are Present; Underdrains Elliminated.	_____ 18" Minimum Depth Sand-Peat Mix with Non-Woven Pemeable Membrane and No Underdrain (Direct Infiltration).
D) Underdrains Are Not Desirable Or Are Not Feasible At This Site.	_____ 18" Minimum Depth Sand-Peat Mix with An Additional 18" Minimum Layer Sand-Peat Mix or Sand-Class 'A' Compost Bottom Layer (Total Sand-Peat Depth of 36"). 16-Mil. Impermeable Liner Used.
E) Other:	x Other: See Detail on Sheet 8

Notes:



Drainage Diagram for west pond-PLD Sizing
Prepared by {enter your company name here} 7/23/2008
HydroCAD® 8.00 s/n 004515 © 2006 HydroCAD Software Solutions LLC

Pond Pond: West PLD

Inflow Area =	3.680 ac,	Inflow Depth = 0.32"	for 2-Year event	
Inflow =	11.93 cfs @	0.10 hrs, Volume=	0.098 af	
Outflow =	11.81 cfs @	0.10 hrs, Volume=	0.098 af,	Atten= 1%, Lag= 0.2 min
Primary =	11.81 cfs @	0.10 hrs, Volume=	0.098 af	

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,841.48' @ 0.10 hrs Surf.Area= 148 sf Storage= 133 cf

Plug-Flow detention time= 0.2 min calculated for 0.098 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (5.7 - 5.5)

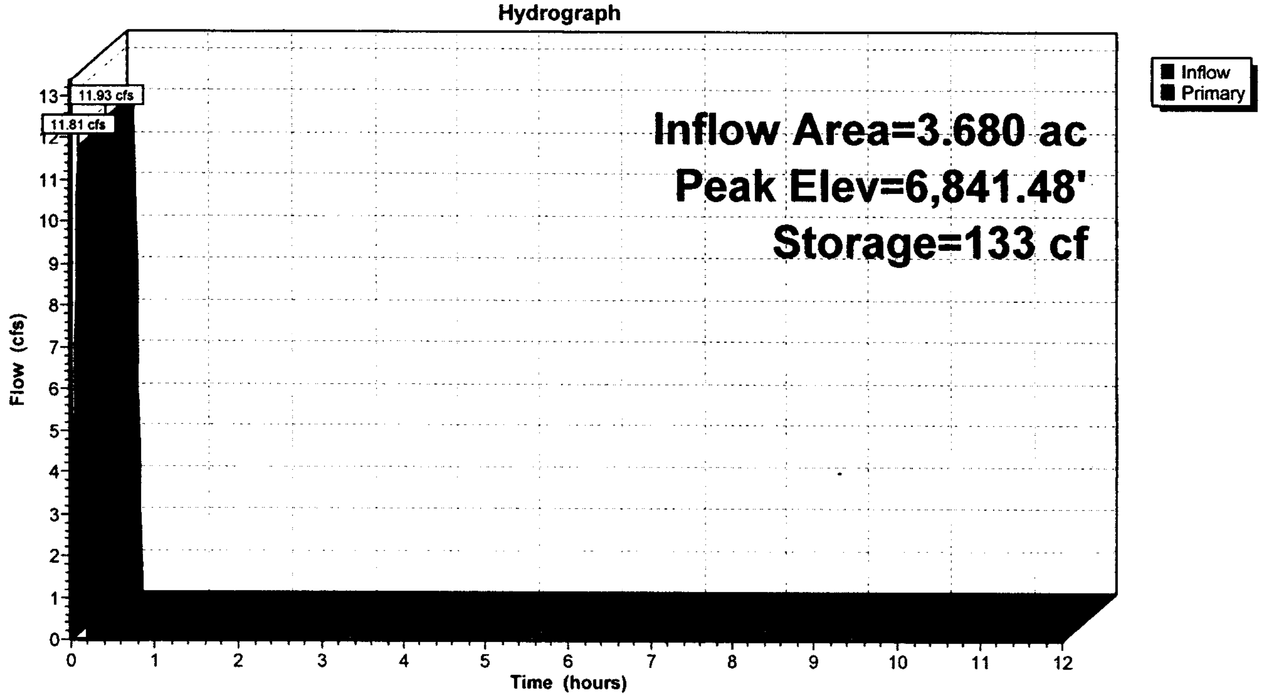
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6,840.00	20	0	0
6,841.00	100	60	60
6,842.00	200	150	210
6,843.00	1,500	850	1,060
6,844.50	5,200	5,025	6,085

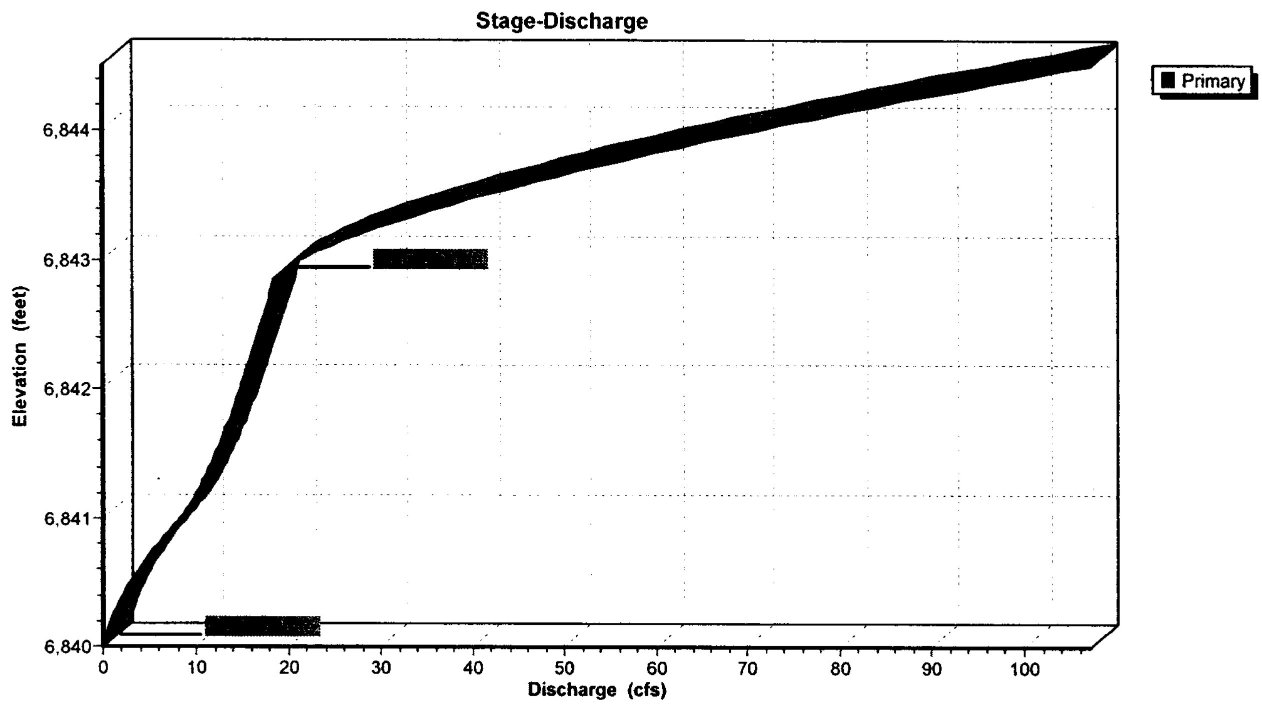
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=11.74 cfs @ 0.10 hrs HW=6,841.47' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)
└—**2=Orifice/Grate** (Orifice Controls 11.74 cfs @ 4.70 fps)

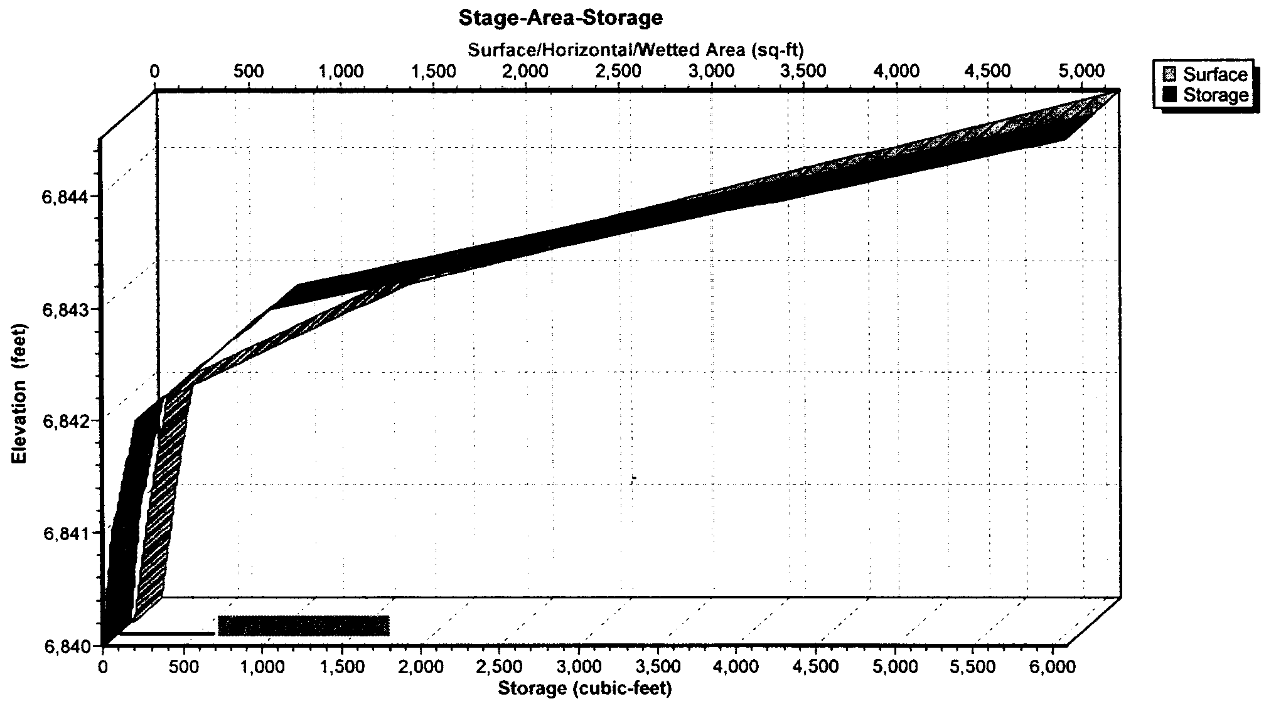
Pond Pond: West PLD



Pond Pond: West PLD



Pond Pond: West PLD



Pond Pond: West PLD

Inflow Area = 3.680 ac, Inflow Depth = 0.44" for 5-Year event
Inflow = 16.39 cfs @ 0.09 hrs, Volume= 0.135 af
Outflow = 15.20 cfs @ 0.11 hrs, Volume= 0.135 af, Atten= 7%, Lag= 0.6 min
Primary = 15.20 cfs @ 0.11 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,842.11' @ 0.11 hrs Surf.Area= 340 sf Storage= 302 cf

Plug-Flow detention time= 0.2 min calculated for 0.134 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (5.7 - 5.5)

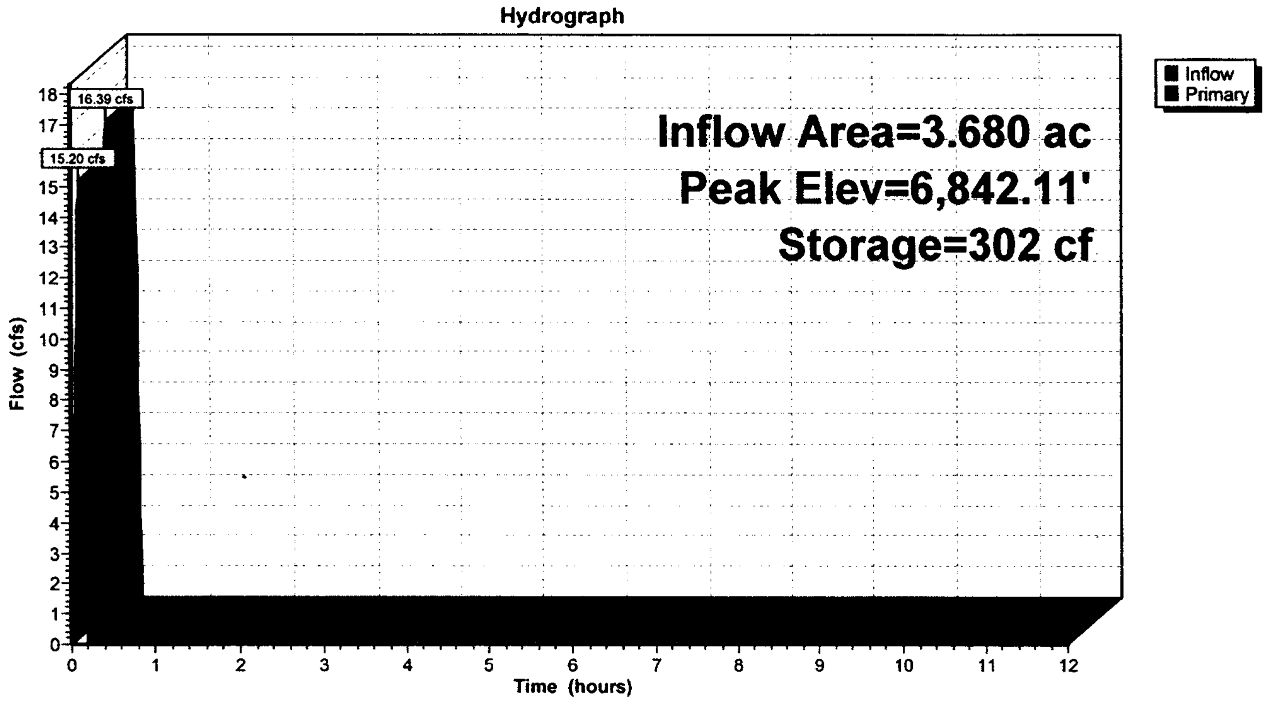
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6,840.00	20	0	0
6,841.00	100	60	60
6,842.00	200	150	210
6,843.00	1,500	850	1,060
6,844.50	5,200	5,025	6,085

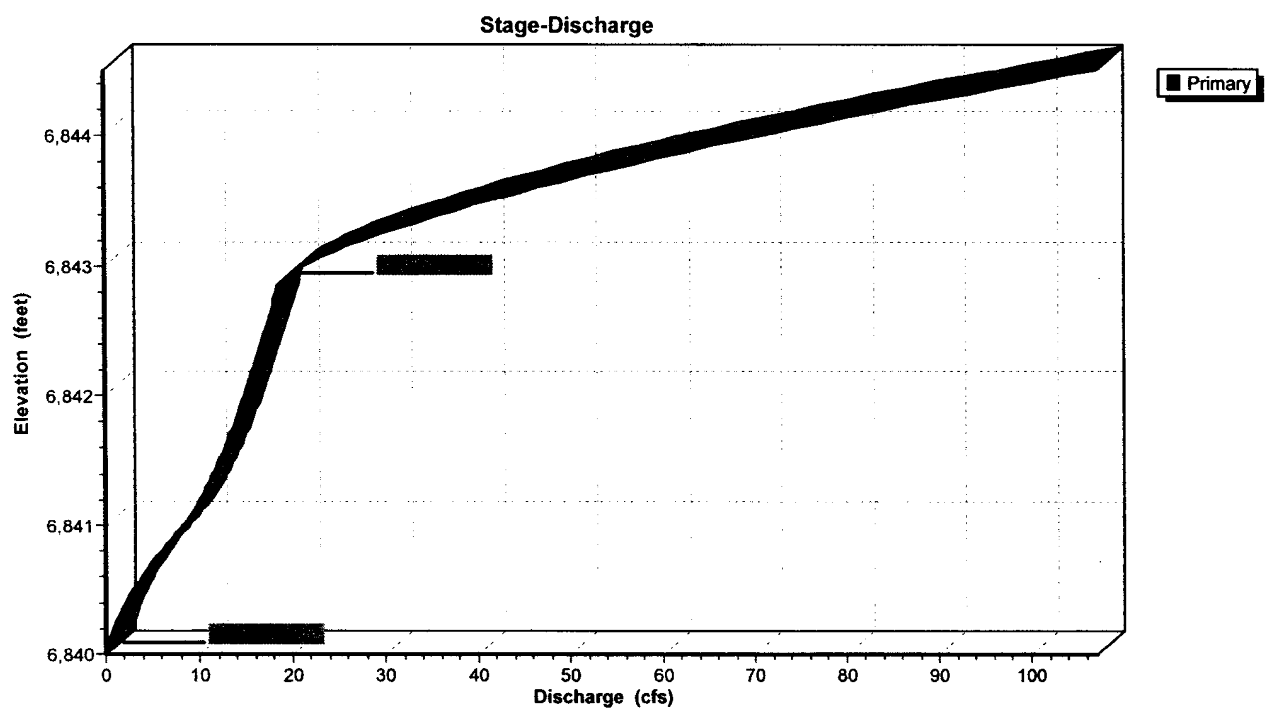
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=15.16 cfs @ 0.11 hrs HW=6,842.10' (Free Discharge)
├─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 15.16 cfs @ 6.06 fps)

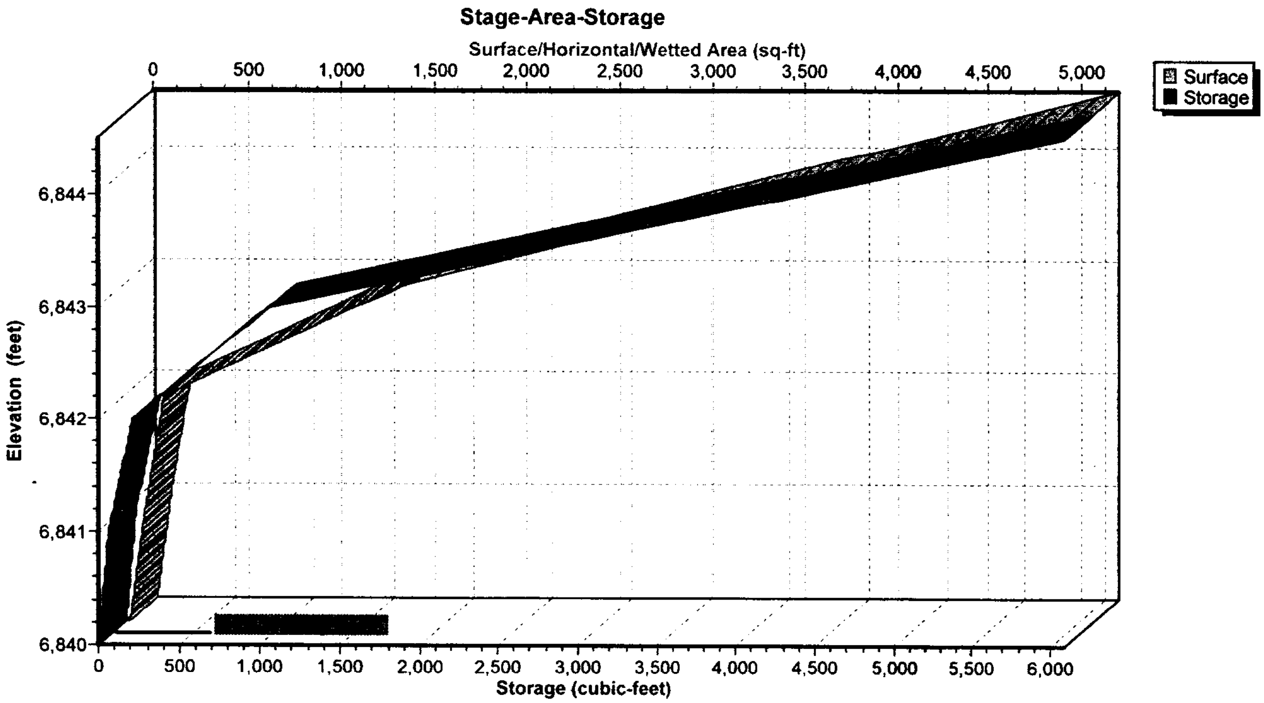
Pond Pond: West PLD



Pond Pond: West PLD



Pond Pond: West PLD



Pond Pond: West PLD

Inflow Area = 3.680 ac, Inflow Depth = 0.78" for 100-Year event
Inflow = 29.14 cfs @ 0.09 hrs, Volume= 0.240 af
Outflow = 25.15 cfs @ 0.11 hrs, Volume= 0.239 af, Atten= 14%, Lag= 1.0 min
Primary = 25.15 cfs @ 0.11 hrs, Volume= 0.239 af

Routing by Stor-Ind method, Time Span= 0.00-12.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 6,843.13' @ 0.11 hrs Surf.Area= 1,809 sf Storage= 1,479 cf

Plug-Flow detention time= 0.7 min calculated for 0.239 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (6.2 - 5.5)

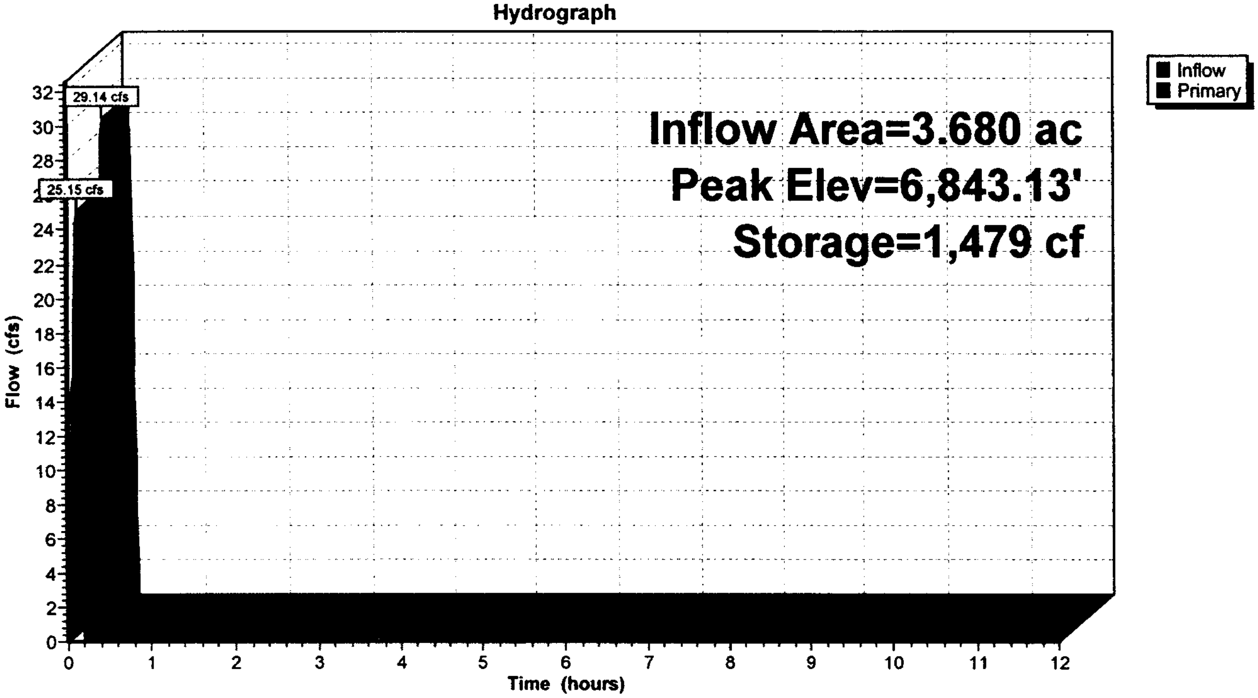
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6,840.00	20	0	0
6,841.00	100	60	60
6,842.00	200	150	210
6,843.00	1,500	850	1,060
6,844.50	5,200	5,025	6,085

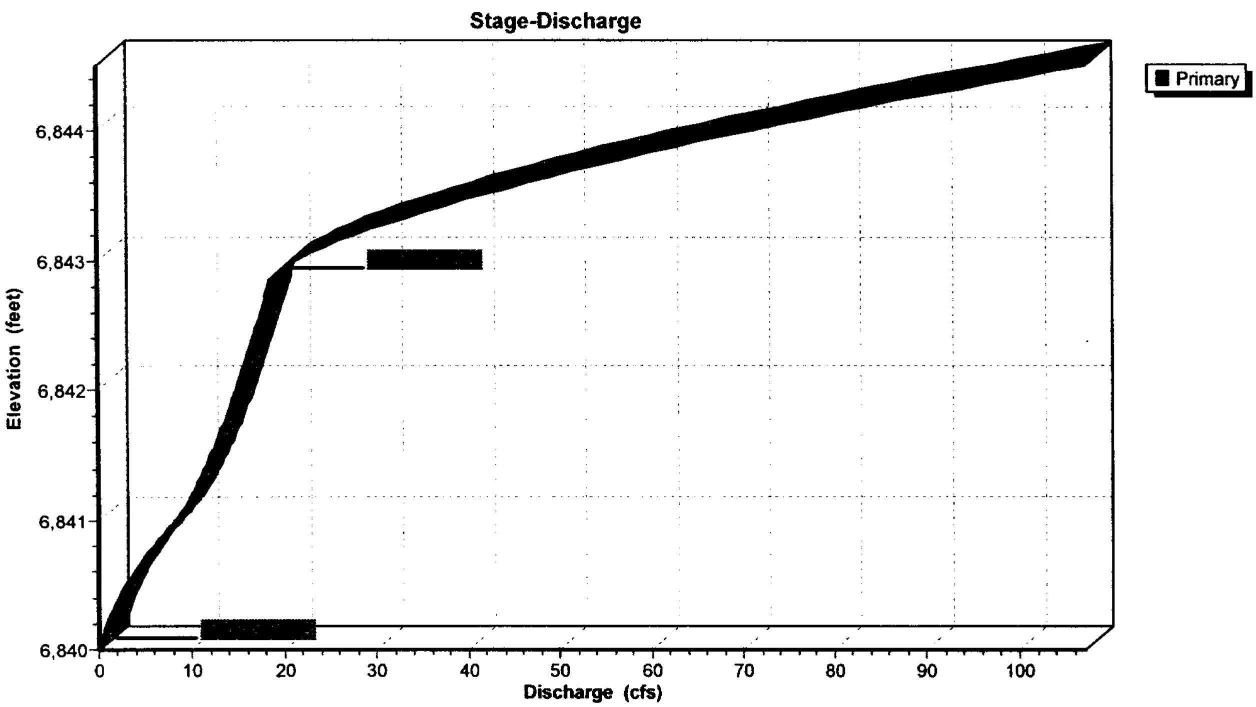
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=25.05 cfs @ 0.11 hrs HW=6,843.12' (Free Discharge)
├1=**Orifice/Grate** (Weir Controls 5.58 cfs @ 1.71 fps)
└2=**Orifice/Grate** (Orifice Controls 19.46 cfs @ 7.79 fps)

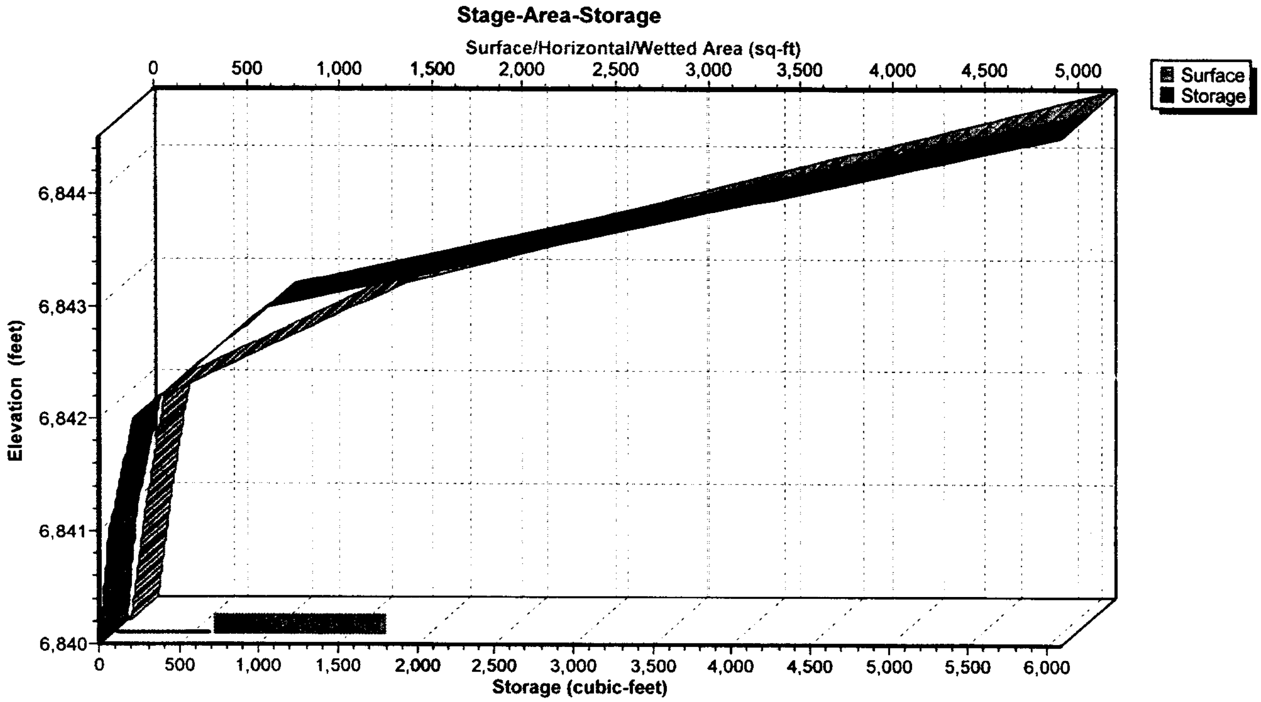
Pond Pond: West PLD



Pond Pond: West PLD



Pond Pond: West PLD



Appendix H: Operations and Maintenance Manual

OPERATION AND MAINTENANCE MANUAL
MERIDIAN CROSSING
PARK PLACE ENTERPRISES
EL PASO COUNTY, COLORADO

May 2008

PREPARED FOR:

Park Place Enterprises
15 Miranda Road
Colorado Springs, CO 80906

PREPARED BY:

Springs Engineering
31 N. Tejon Street
Suite 315
Colorado Springs, CO 80903

PROJECT NO. 07-057-0032

Table of Contents

Introduction

This Operation and Maintenance Plan is being submitted on behalf of Park Place Enterprises for a development known as Meridian Crossing in Falcon, Colorado. The purpose of this Operation and Maintenance Manual (O&M) is to identify facilities which are to be maintained by the Meridian Crossing Properties Owners Association (POA) and the frequency with which these items are to be maintained.

General Location and Description

Meridian Crossing is currently zoned CR and the proposed development includes 6 commercial lots, proposed water quality facilities, streets, and utilities.

Meridian Crossing is approximately 9.5 acres and is located north of the intersection of Meridian Road and Old Meridian Road in Falcon, Colorado, Section 12, Township 13 South, Range 65 West of the 6th Principal Meridian.

Description of Construction

Construction will consist of site grading, utility installation, and road paving. Approximately 9.5 acres of the site will be graded for construction of the proposed commercial units. Erosion control will be provided prior to construction.

Facilities

Water quality facilities will be owned and maintained by the POA. Water and sanitary sewer will be maintained by the Falcon Highlands Metropolitan District. All other utilities are to be maintained by their respective owners.

Inspection and Maintenance

A thorough inspection of the permanent structures shall be performed every 30 days as well as after any significant rain or snowmelt event. Inspectors are to look for any significant deterioration of the facilities including:

- Erosion of channels and side slopes.
- Accumulated trash or debris.

Repairs and removal of debris shall occur as soon as practical.

Porous Landscape Detention Facility

Lawn mowing and vegetative care shall be performed routinely, as aesthetic requirements demand. This shall limit unwanted vegetation. Irrigated turf grass shall be between 2 and 4 inches in height and non irrigated native turf grasses shall be 4 to 6 inches in height. Debris and litter removal shall be performed routinely, as aesthetic requirements demand. Removal of debris and litter from any detention area minimizes clogging of the sand media. Landscaping removal and replacement shall be done every 5 to 10 years depending on infiltration rates needed to drain the area in 12 hours or less. Over time the sandy loam sandy loam turf will clog. The layer will need to be replaced, along with all turf and other vegetation growing on the surface, to rehabilitate infiltration rates. Bin-annual inspections of the hydraulic performance of the area will need to be performed. This will determine if the sand media is allowing acceptable infiltration.

An Operation and Maintenance Log follows.

Operation & Maintenance Log

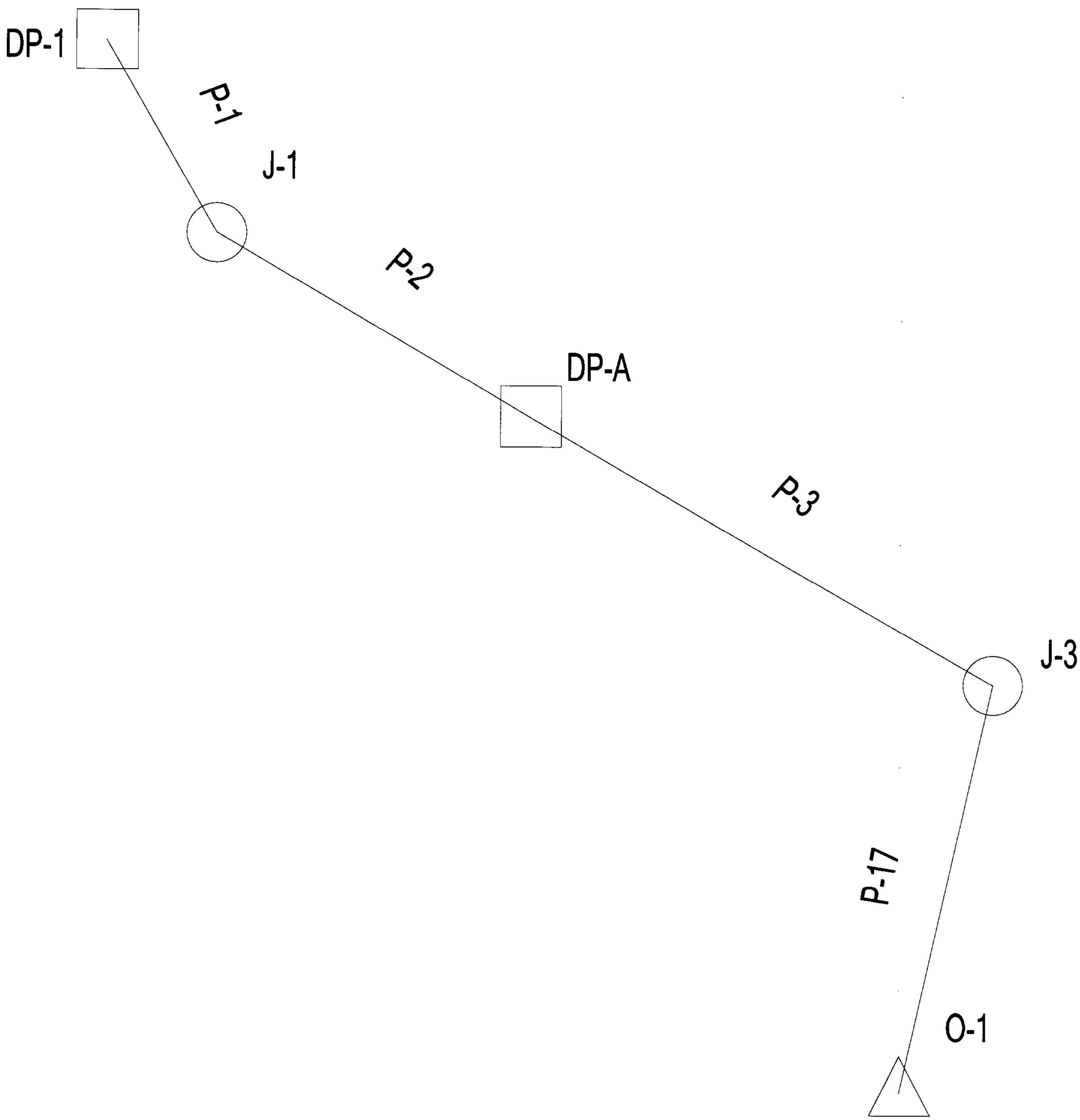
THE SHOPPES AT FALCON
OPERATION AND MAINTENANCE LOG

(Record inspections, items found maintenance and corrective actions taken. Also record any training received by Contractor personnel with regard to erosion control, materials handling and any inspections by outside agencies)

DATE	ITEM	SIGNATURE OF PERSON MAKING ENTRY

Appendix I: Ultimate Design StormCAD Calculations

Scenario: 100-year



Analysis Results
Scenario: 100-year

Note:
The input data may have been modified since the last calculation was performed.
The calculated results may be outdated.

Title:	Old Meridian Road
Project Engineer:	Charlene Sammons
Project Date:	11/14/07
Comments:	Storm in Old Meridian Road for Meridian Crossing Storm Sewer

Scenario Summary

Scenario	100-year
Physical Properties Alternat	Base-Physical Properties
Catchments Alternative	Catchments-100-year
System Flows Alternative	Base-System Flows
Structure Headlosses Alterr	Base-Structure Headlosses
Boundary Conditions Altern	Base-Boundary Conditions
Design Constraints Alternat	Base-Design Constraints
Capital Cost Alternative	Base-Cost
User Data Alternative	Base-User Data

Network Inventory

Number of Pipes	4	Number of Inlets	2
- Circular Pipes:	4	- Grate Inlets:	0
- Box Pipes:	0	- Curb Inlets:	2
- Arch Pipes:	0	- Combination Inlets:	0
- Vertical Elliptical Pipes:	0	- Slot Inlets:	0
- Horizontal Elliptical Pipes:	0	- Grate Inlets in Ditch:	0
Number of Junctions	2	- Generic Inlets:	0
Number of Outlets	1		

Circular Pipes Inventory

18 inch	274.57 ft	24 inch	55.00 ft
Total Length	329.57 ft		

Curb Inlet Inventory

Type R 10'	2

Inlet elements for network with outlet: O-1

Label	Inlet	Total System Flow (cfs)	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Bypass Target	Capture Efficiency (%)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method
DP-1	Curb Type R	7.61	7.61	10.28	DP-A	42.5	5,848.83	5,848.83	0.00	Absolut
DP-A	Curb Type R	9.39	2.10	14.37	<Automati	12.8	5,846.39	5,846.08	0.31	Standaı

Junction elements for network with outlet: O-1

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	Headloss Method	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
J-1	5,847.76	5,847.46	0.30	Standaı	0.00	0.00	7.55	8.50	6.59	0.88
J-3	5,844.91	5,844.91	0.00	Absolut	0.00	0.00	9.30	8.13	7.63	1.13

Analysis Results
Scenario: 100-year

Outlet: O-1

Label	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Gravity Element Headloss (ft)	System Additional Flow (cfs)	System Known Flow (cfs)	System Rational Flow (cfs)	System Intensity (in/hr)	System Flow Time (min)	System CA (acres)
O-1	6,843.10	6,843.10	0.00	0.00	0.00	9.22	8.06	7.83	1.13

Pipe elements for network with outlet: O-1

Label	Section Shape	Section Size	Length (ft)	Number of Sections	Constructed Slope (ft/ft)	Energy Slope (ft/ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-1	Circular	18 inch	71.21	1	0.012	0.011	7.61	6.31	6,847.76	6,846.90	6,848.83	6,847.79
P-2	Circular	18 inch	17.16	1	0.009	0.009	7.55	5.53	6,846.40	6,845.29	6,847.46	6,846.39
P-3	Circular	18 inch	86.20	1	0.009	0.009	9.39	6.33	6,844.90	6,844.13	6,846.08	6,845.29
P-17	Circular	24 inch	55.00	1	0.007	0.010	9.30	4.62	6,843.50	6,843.10	6,844.91	6,844.19

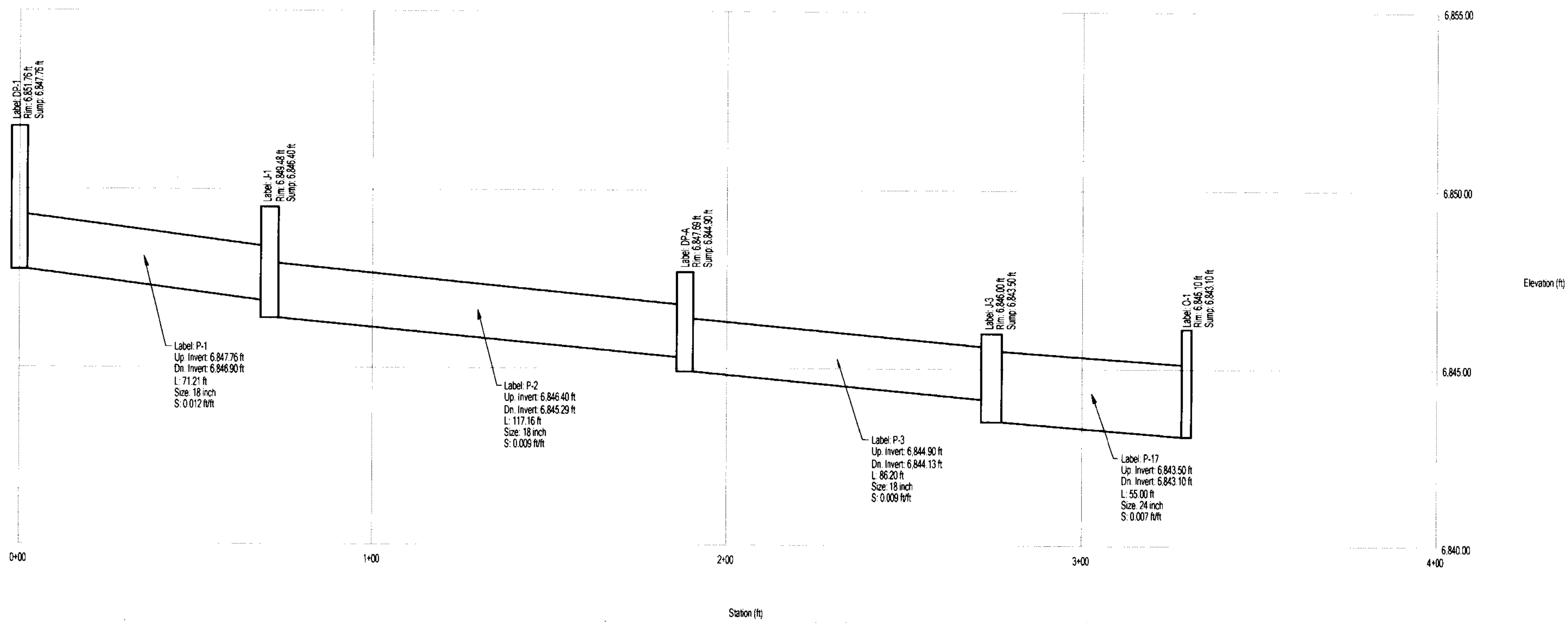
Scenario: 100-year

Combined Pipe\Node Report

Label	Up. Node	Dn. Node	L (ft)	Up. Inlet Area (acres)	Up. Inlet Rat. Coef.	Up. Inlet Area (acres)	Up. Calc. Sys. CA (acres)	Up.Inlet Rat. Q (cfs)	Size	Q Full (cfs)	Avg. v (ft/s)	Up. Gr Elev. (ft)	HGL In (ft)	Up. Invert (ft)	Dn. Gr. Elev. (ft)	HGL Out (ft)	Dn. Invert (ft)	S (ft/ft)
P-1	DP-1	J-1	71.21	2.07	1.00	2.07	0.88	17.89	18 inch	11.54	6.31	6,851.76	6,848.83	6,847.76	6,849.48	6,847.79	6,846.90	0.012
P-2	J-1	DP-A	117.16	N/A	N/A	N/A	0.88	N/A	18 inch	10.22	5.53	6,849.48	6,847.46	6,846.40	6,847.69	6,846.39	6,845.29	0.009
P-3	DP-A	J-3	86.20	0.80	1.00	0.80	1.13	6.63	18 inch	9.93	6.33	6,847.69	6,846.08	6,844.90	6,846.00	6,845.29	6,844.13	0.009
P-17	J-3	O-1	55.00	N/A	N/A	N/A	1.13	N/A	24 inch	10.45	4.62	6,846.00	6,844.91	6,843.50	6,846.10	6,844.19	6,843.10	0.007

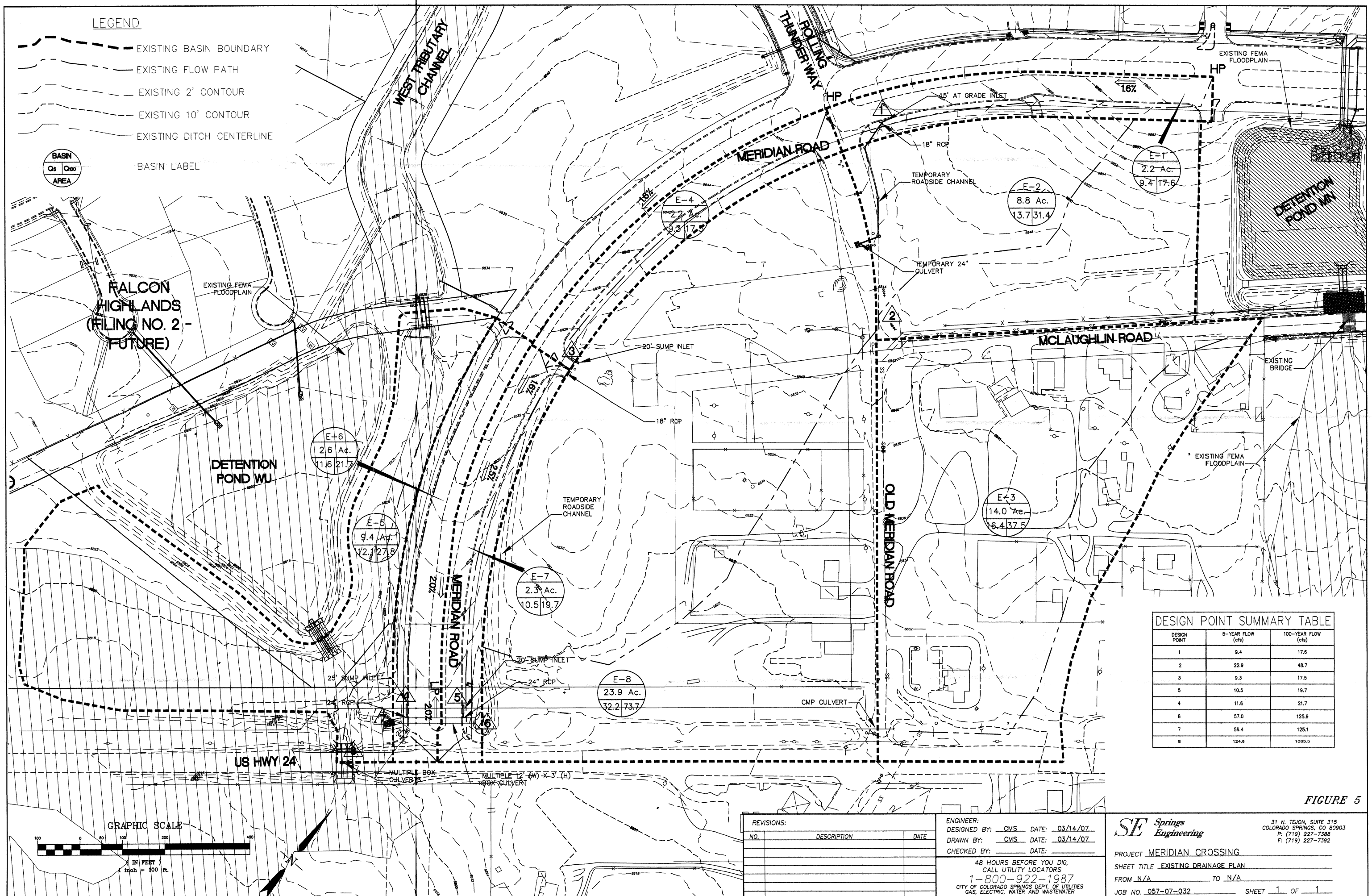
Profile
Scenario: 100-year

Profile: Ultimate
Scenario: 100-year



Title: Old Meridian Road
z:\...\reports\fdr\calcs\storm cad\ultimate.stm
07/24/08 03:05:24 PM

Project Engineer: Charlene Sammons
StormCAD v5.6 [05.06.012.00]



DESIGN POINT SUMMARY TABLE		
DESIGN POINT	5-YEAR FLOW (cfs)	100-YEAR FLOW (cfs)
1	9.4	17.6
2	22.9	48.7
3	9.3	17.5
5	10.5	19.7
4	11.6	21.7
6	57.0	125.9
7	56.4	125.1
8	124.6	1085.5

FIGURE 5

REVISIONS:

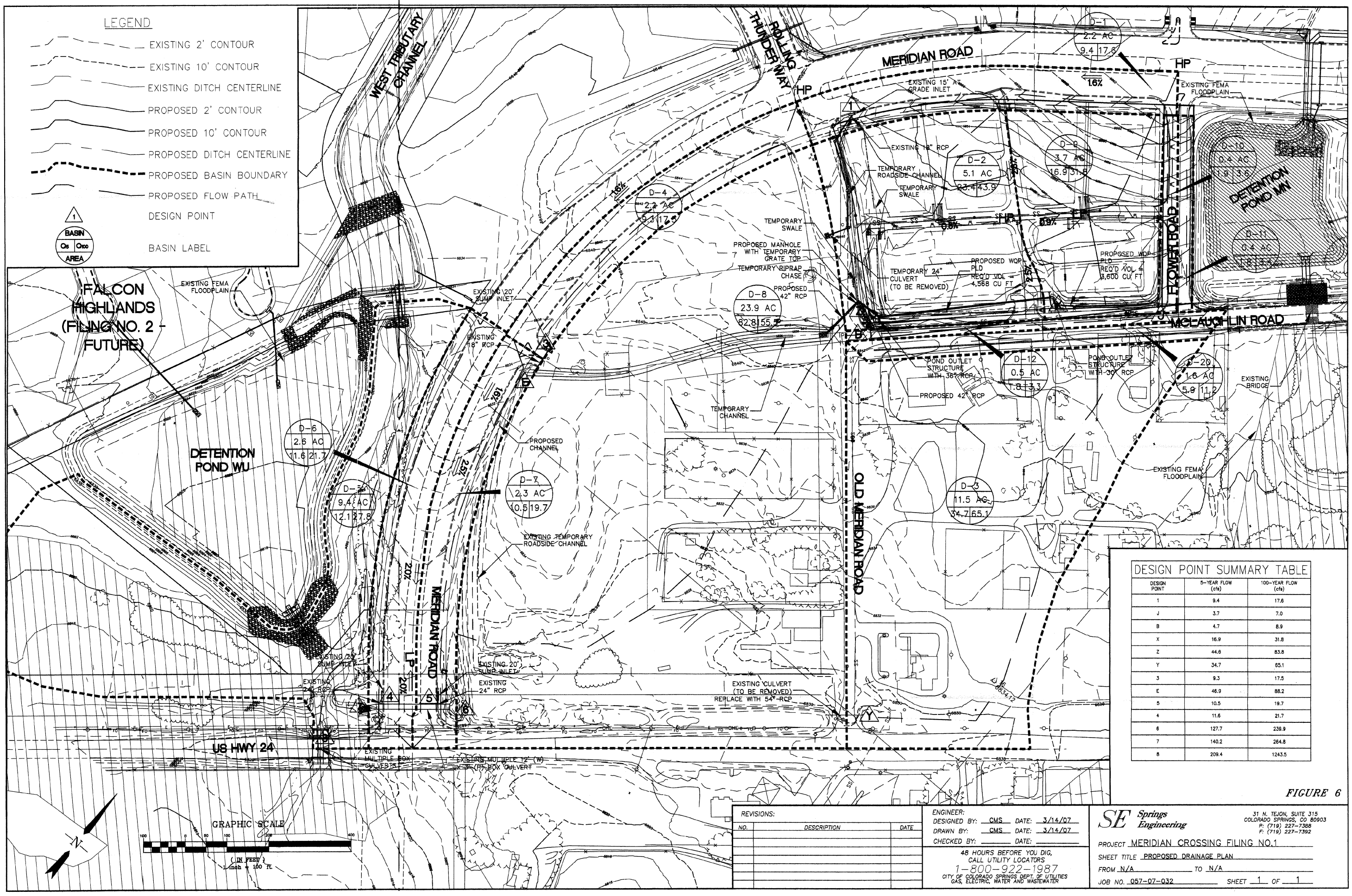
NO.	DESCRIPTION	DATE

ENGINEER:
DESIGNED BY: CMS DATE: 03/14/07
DRAWN BY: CMS DATE: 03/14/07
CHECKED BY: DATE:

48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS
1-800-922-1987
CITY OF COLORADO SPRINGS DEPT. OF UTILITIES GAS, ELECTRIC, WATER AND WASTEWATER

SE Springs Engineering
31 N. TEJON, SUITE 315
COLORADO SPRINGS, CO 80903
P: (719) 227-7388
F: (719) 227-7392

PROJECT MERIDIAN CROSSING
SHEET TITLE EXISTING DRAINAGE PLAN
FROM N/A TO N/A
JOB NO. 057-07-032 SHEET 1 OF 1



DESIGN POINT SUMMARY TABLE		
DESIGN POINT	5-YEAR FLOW (cfs)	100-YEAR FLOW (cfs)
1	9.4	17.6
J	3.7	7.0
B	4.7	8.9
X	16.9	31.8
Z	44.6	83.8
Y	34.7	65.1
3	9.3	17.5
E	46.9	88.2
5	10.5	19.7
4	11.6	21.7
6	127.7	239.9
7	140.2	264.8
8	209.4	1243.5

FIGURE 6

REVISIONS:

NO.	DESCRIPTION	DATE

ENGINEER:
DESIGNED BY: CMS DATE: 3/14/07
DRAWN BY: CMS DATE: 3/14/07
CHECKED BY: ____ DATE: ____

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PROJECT MERIDIAN CROSSING FILING NO.1
SHEET TITLE PROPOSED DRAINAGE PLAN
FROM N/A TO N/A
JOB NO. 057-07-032 SHEET 1 OF 1

APPENDIX F: PLD SITE PHOTOS


GUNS
LEWIS
STEVE LEWIS