Les Schwab Tire Center
Storm Report

7105 Old Meridian RD.
Falcon Colorado

Prepared For:

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Cushing Terrell Project No. LSCO_21WIN
PCD FILLING NO. : PPR-21-023
JULY, 21, 2021

COLORADO LICENSED PROFESSIONAL ENGINEER ZACHARY W. GRAHAM 39039

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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 88% 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.

Unresolved. In a conclusion narrative placed after section 6.4 determine whether design will be compliant with originally proposed conditions. If there is an increase in runoff determine whether it is a negligible amount.

Cushing Terrell

APPENDIX A: HYDROLOGIC AND HYDRAULIC CALCULATIONS

Channel Report

5 YEAR CONC CHANNEL

Rectangular

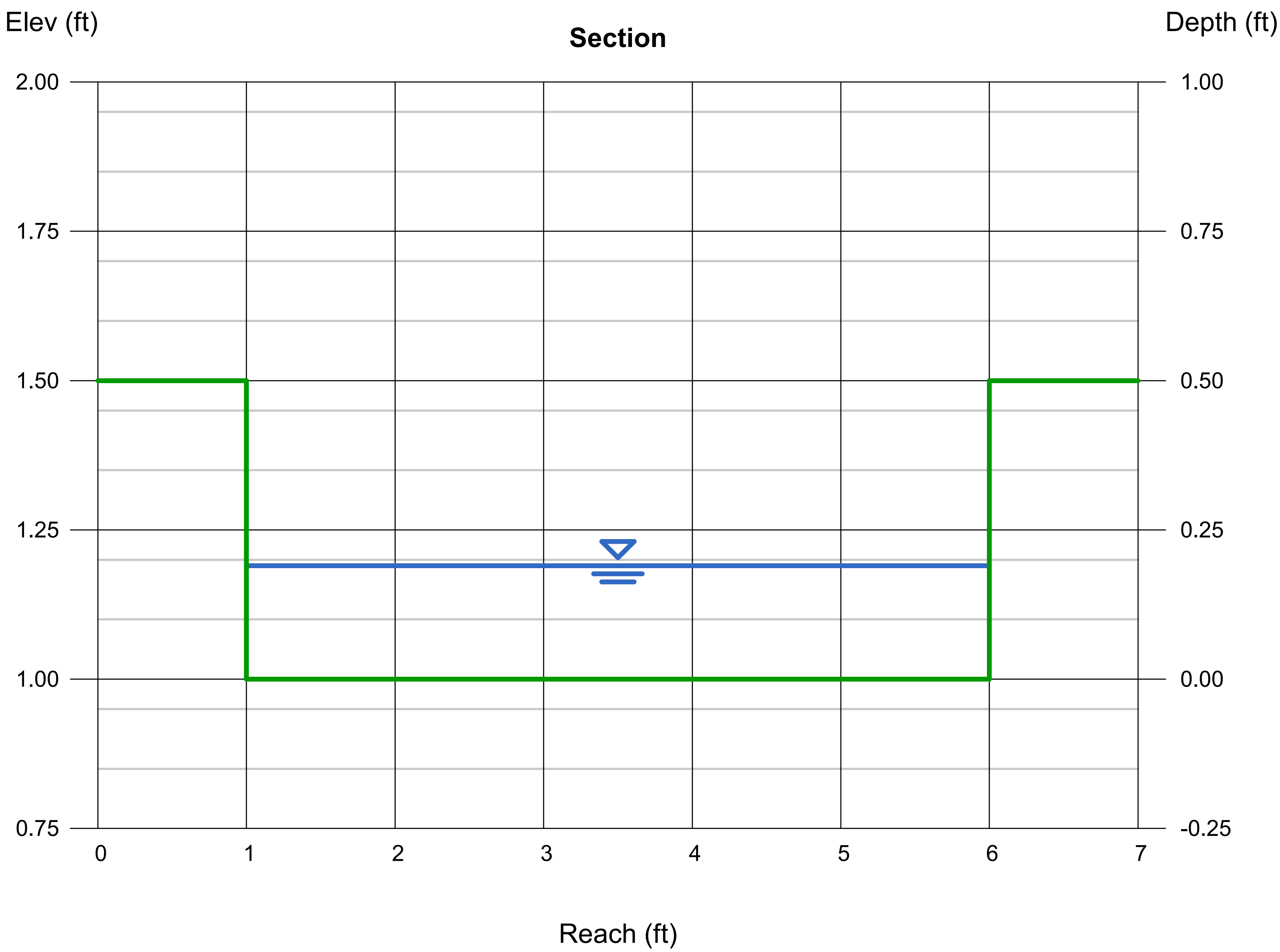
Bottom Width (ft)	=	5.00
Total Depth (ft)	=	0.50
Invert Elev (ft)	=	1.00
Slope (%)	=	0.50
N-Value	=	0.016

Calculations

Compute by:		Known Q
Known Q (cfs)	=	1.94

Highlighted

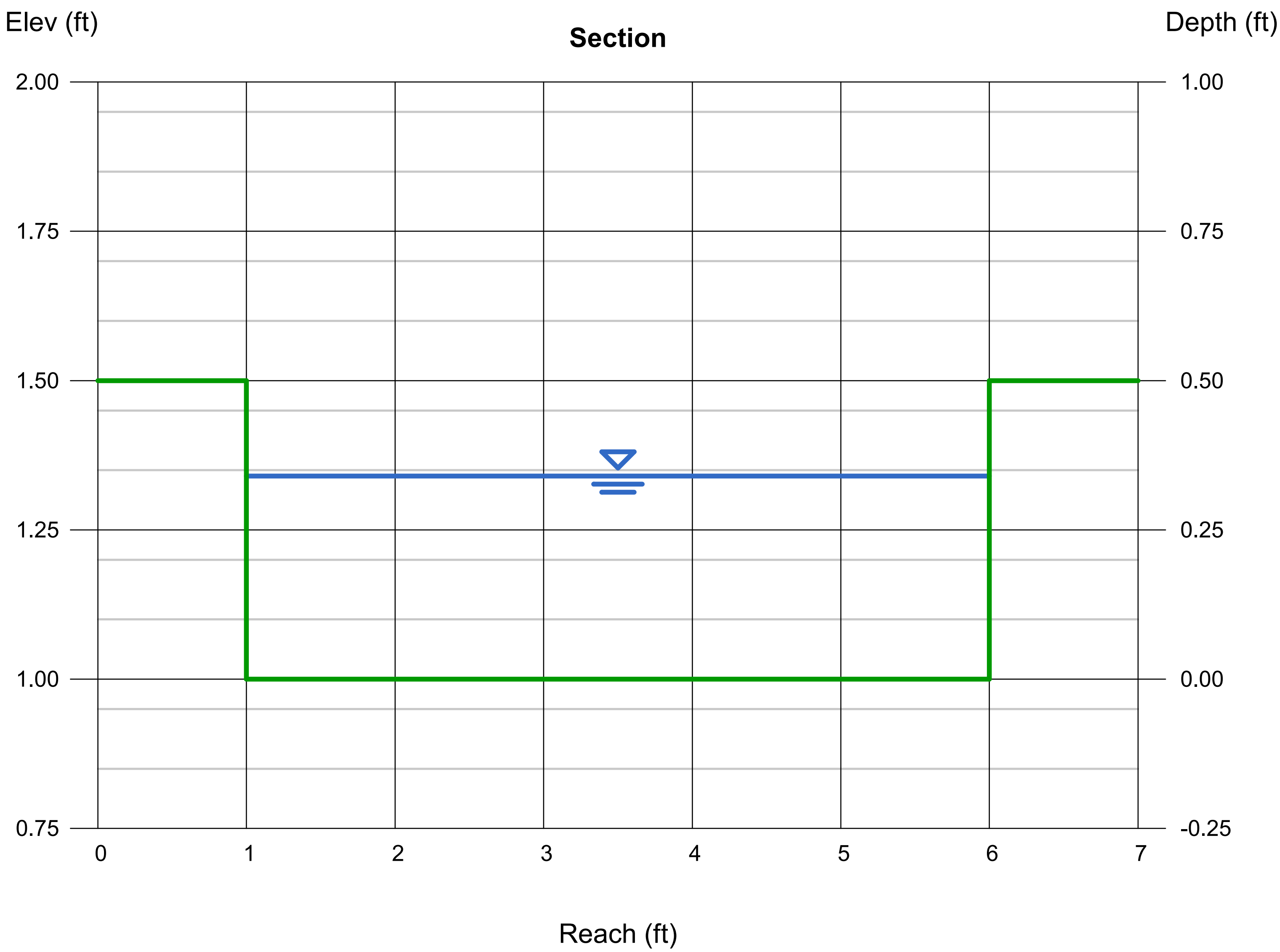
Depth (ft)	=	0.19
Q (cfs)	=	1.940
Area (sqft)	=	0.95
Velocity (ft/s)	=	2.04
Wetted Perim (ft)	=	5.38
Crit Depth, Yc (ft)	=	0.17
Top Width (ft)	=	5.00
EGL (ft)	=	0.25



Channel Report

100 YEAR CONC CHANNEL

Rectangular		**Highlighted**	
Bottom Width (ft)	= 5.00	Depth (ft)	= 0.34
Total Depth (ft)	= 0.50	Q (cfs)	= 4.810
		Area (sqft)	= 1.70
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.83
Slope (%)	= 0.50	Wetted Perim (ft)	= 5.68
N-Value	= 0.016	Crit Depth, Yc (ft)	= 0.31
		Top Width (ft)	= 5.00
Calculations		EGL (ft)	= 0.46
Compute by:	Known Q		
Known Q (cfs)	= 4.81		



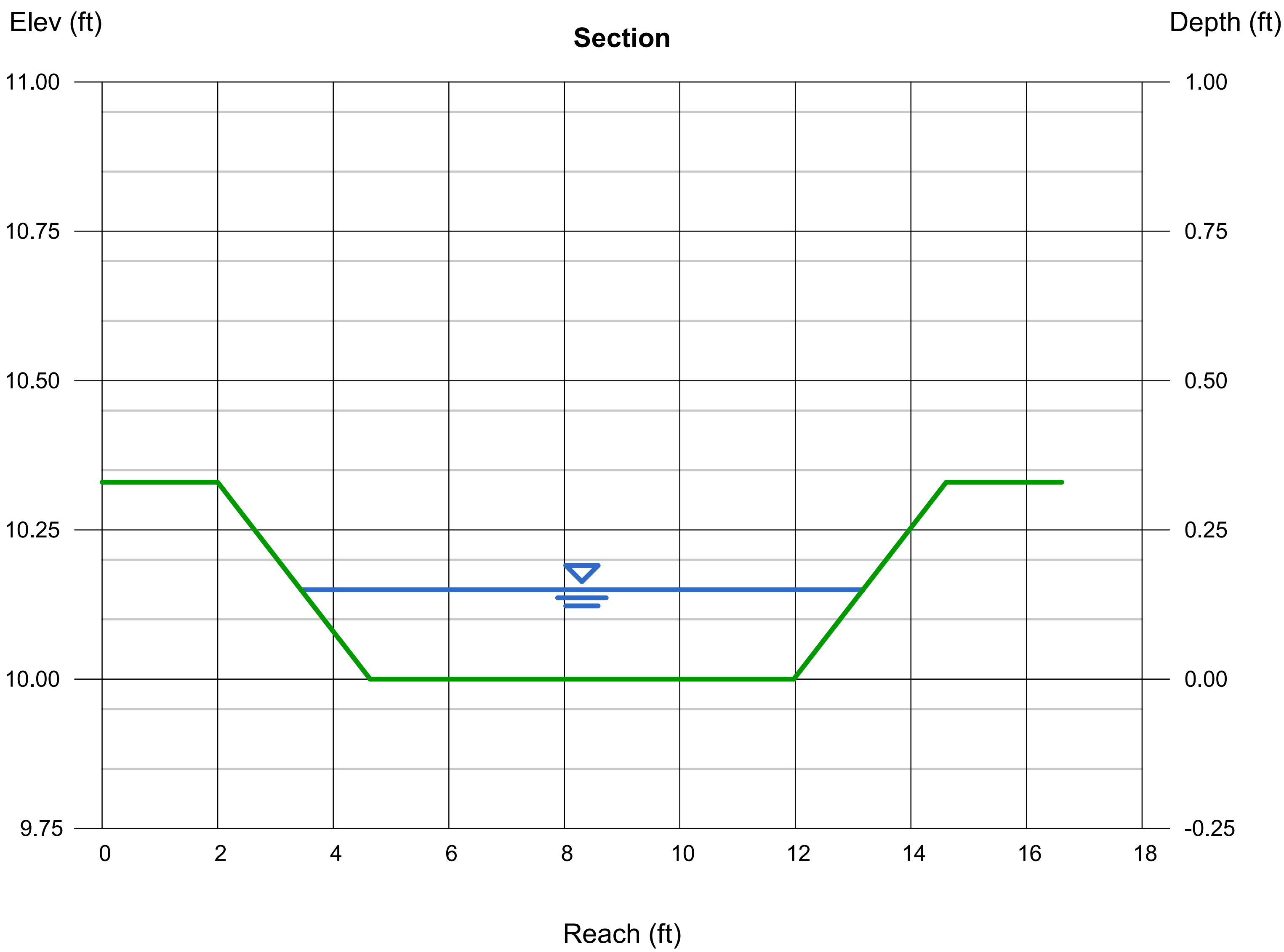
Channel Report

CROSS PAN 5 YEAR

Trapezoidal
Bottom Width (ft) = 7.33
Side Slopes (z:1) = 8.00, 8.00
Total Depth (ft) = 0.33
Invert Elev (ft) = 10.00
Slope (%) = 0.50
N-Value = 0.016

Calculations
Compute by: Known Q
Known Q (cfs) = 1.94

Highlighted
Depth (ft) = 0.15
Q (cfs) = 1.940
Area (sqft) = 1.28
Velocity (ft/s) = 1.52
Wetted Perim (ft) = 9.75
Crit Depth, Yc (ft) = 0.13
Top Width (ft) = 9.73
EGL (ft) = 0.19



Channel Report

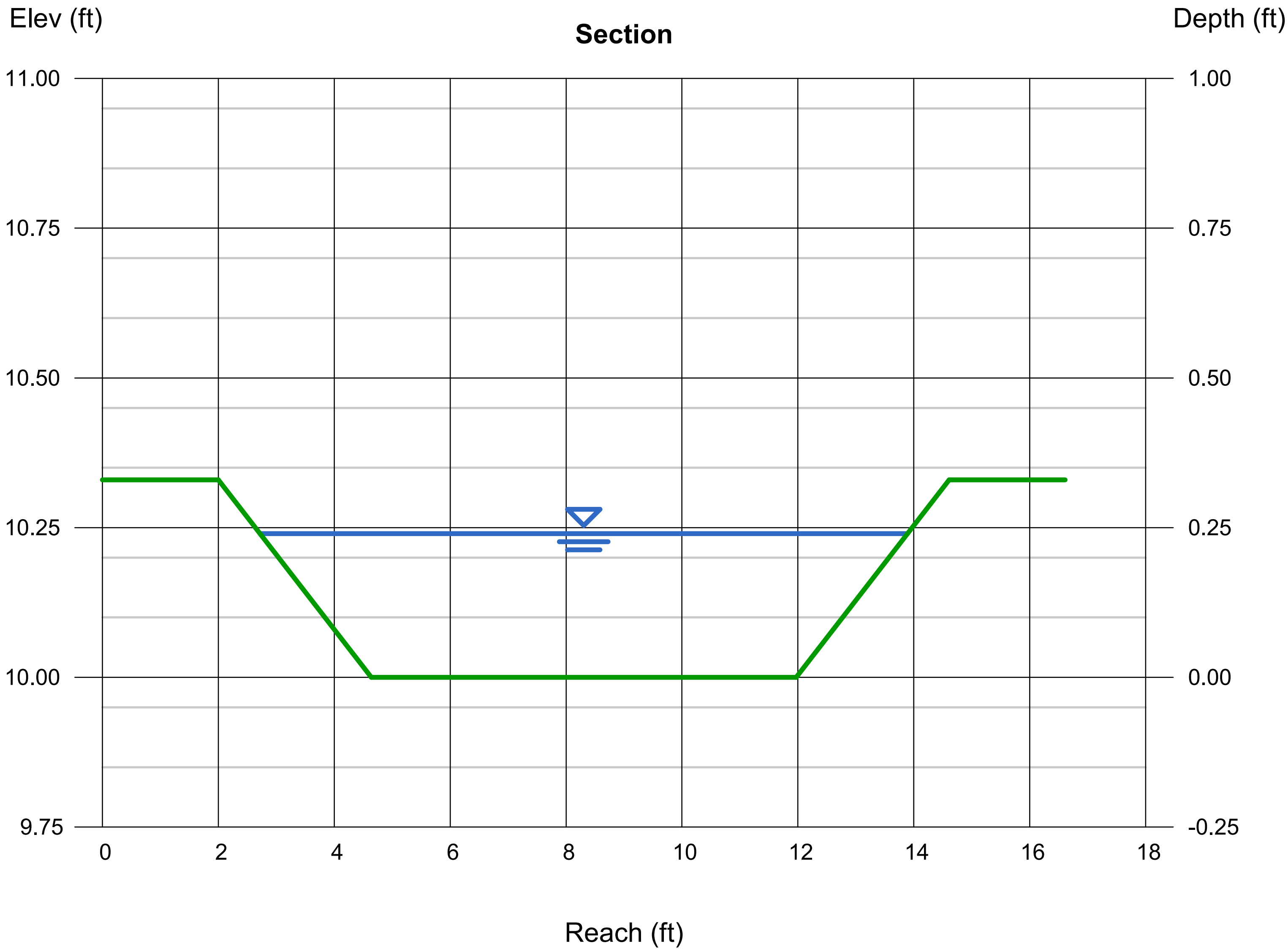
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Tuesday, Jul 20 2021

CROSS PAN 100 YEAR

Trapezoidal
Bottom Width (ft) = 7.33
Side Slopes (z:1) = 8.00, 8.00
Total Depth (ft) = 0.33
Invert Elev (ft) = 10.00
Slope (%) = 0.50
N-Value = 0.016

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

Highlighted
Depth (ft) = 0.24
Q (cfs) = 4.810
Area (sqft) = 2.22
Velocity (ft/s) = 2.17
Wetted Perim (ft) = 11.20
Crit Depth, Yc (ft) = 0.22
Top Width (ft) = 11.17
EGL (ft) = 0.31



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jul 20 2021

SINGLE SIDEWALK CHASE CAPACITY

Rectangular

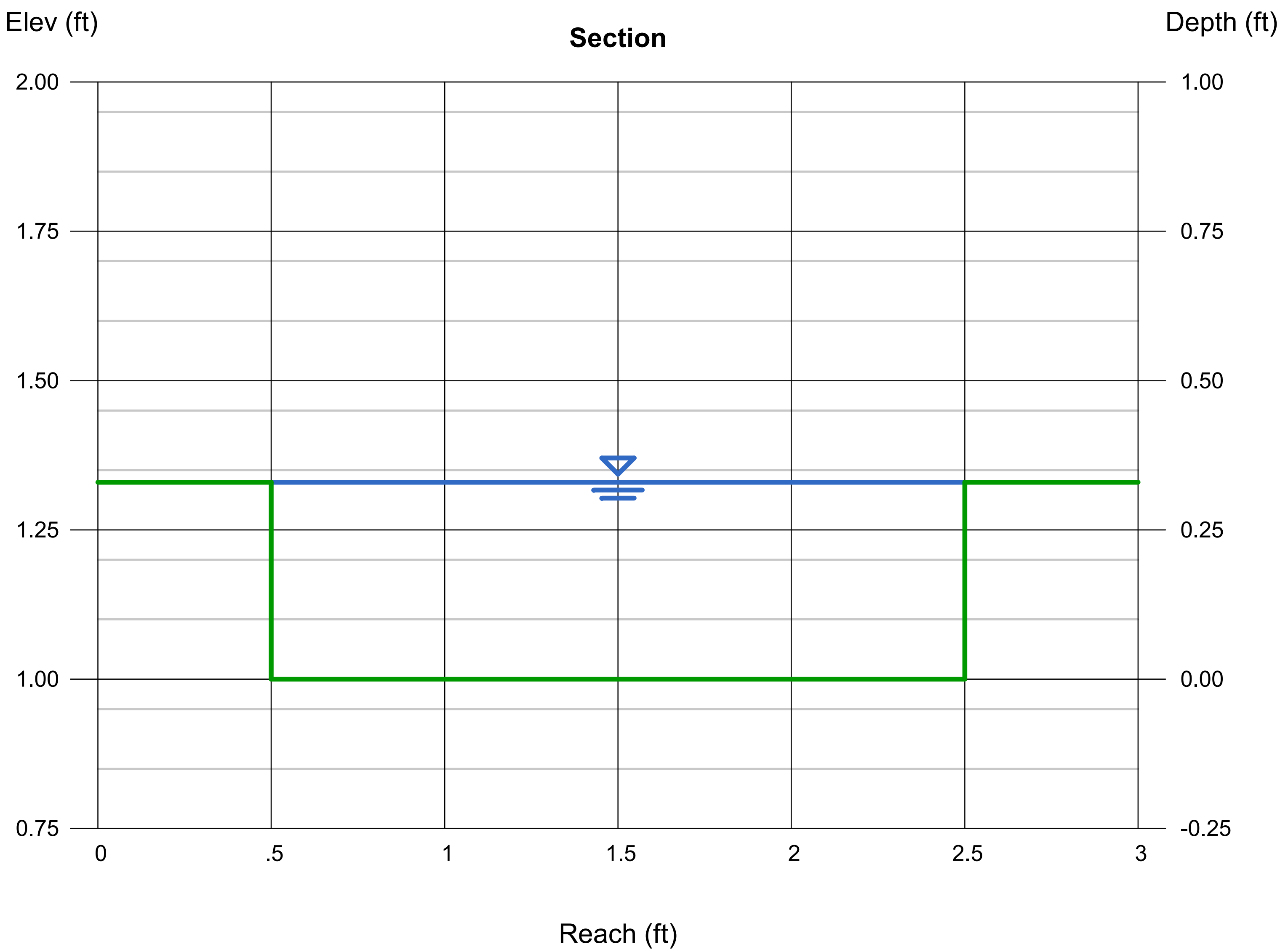
Bottom Width (ft)	= 2.00
Total Depth (ft)	= 0.33
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.016

Calculations

Compute by:	Q vs Depth
No. Increments	= 1

Highlighted

Depth (ft)	= 0.33
Q (cfs)	= 1.711
Area (sqft)	= 0.66
Velocity (ft/s)	= 2.59
Wetted Perim (ft)	= 2.66
Crit Depth, Yc (ft)	= 0.29
Top Width (ft)	= 2.00
EGL (ft)	= 0.43



Overland Velocity Calc	
SLOPE	VELOCITY
0.015	1.98

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

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

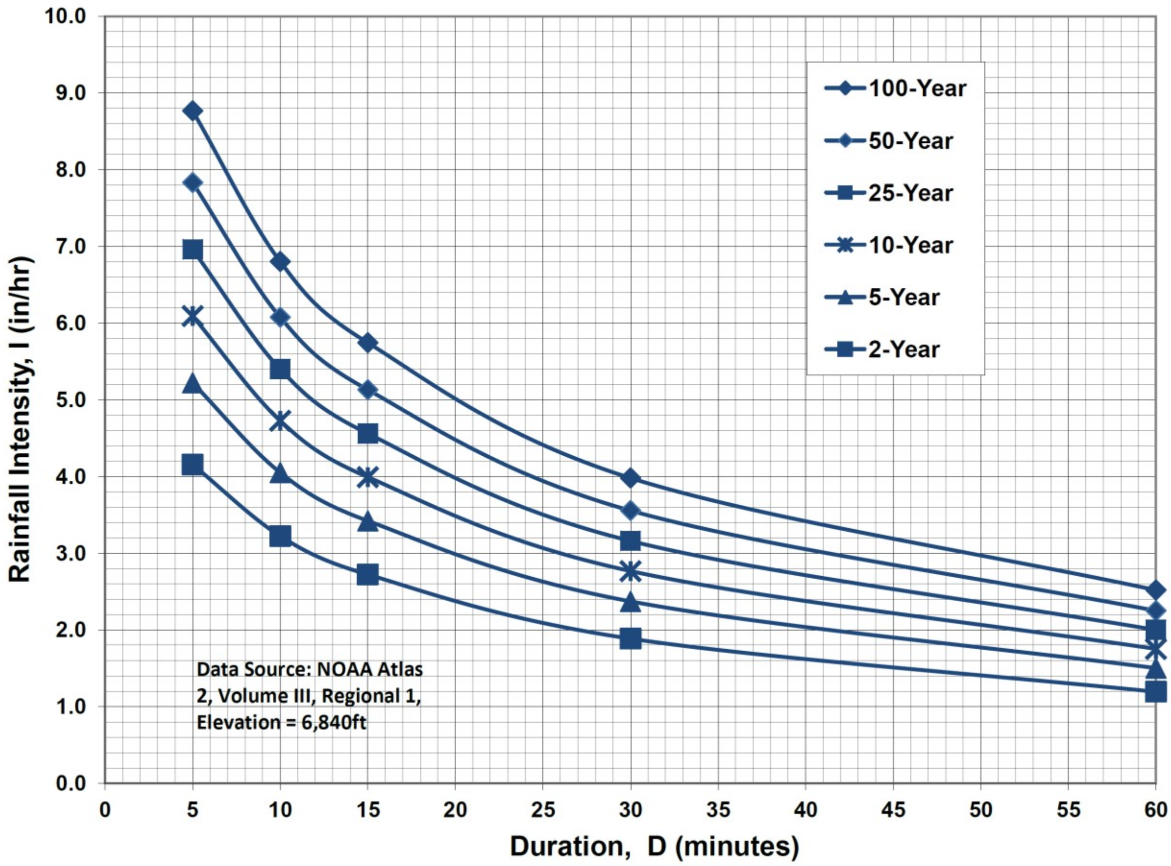
Paved $V = 20.3282\ (s)^{0.5}$

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.

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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

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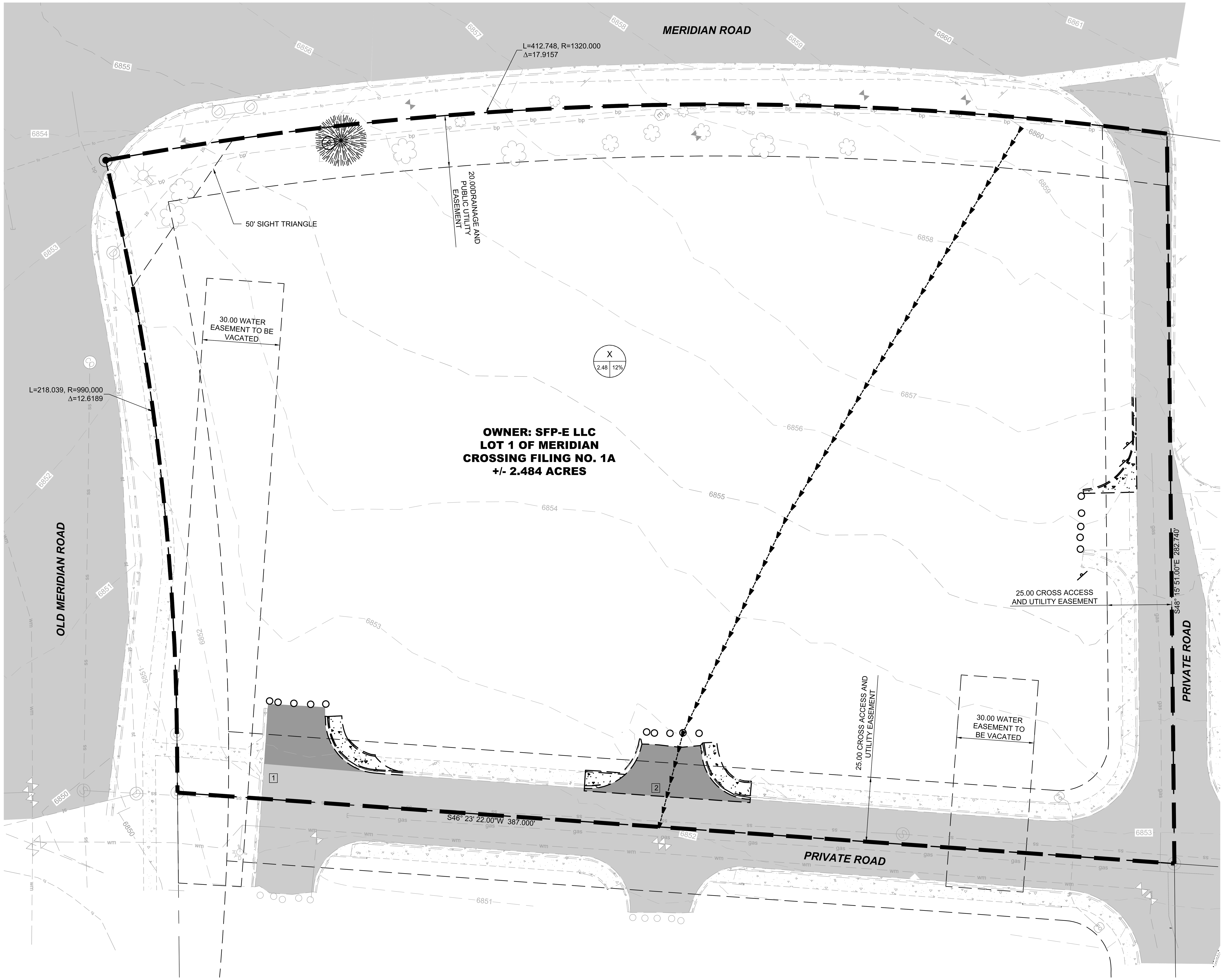
APPENDIX B: BASIN MAPS



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

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Tires LES SCHWAB

LES SCHWAB TIRE CENTER

7105 N MERIDIAN RD.
FALCON, CO

NOT FOR CONSTRUCTION - PRELIMINARY DESIGN

SITE DEVELOPMENT PLANS

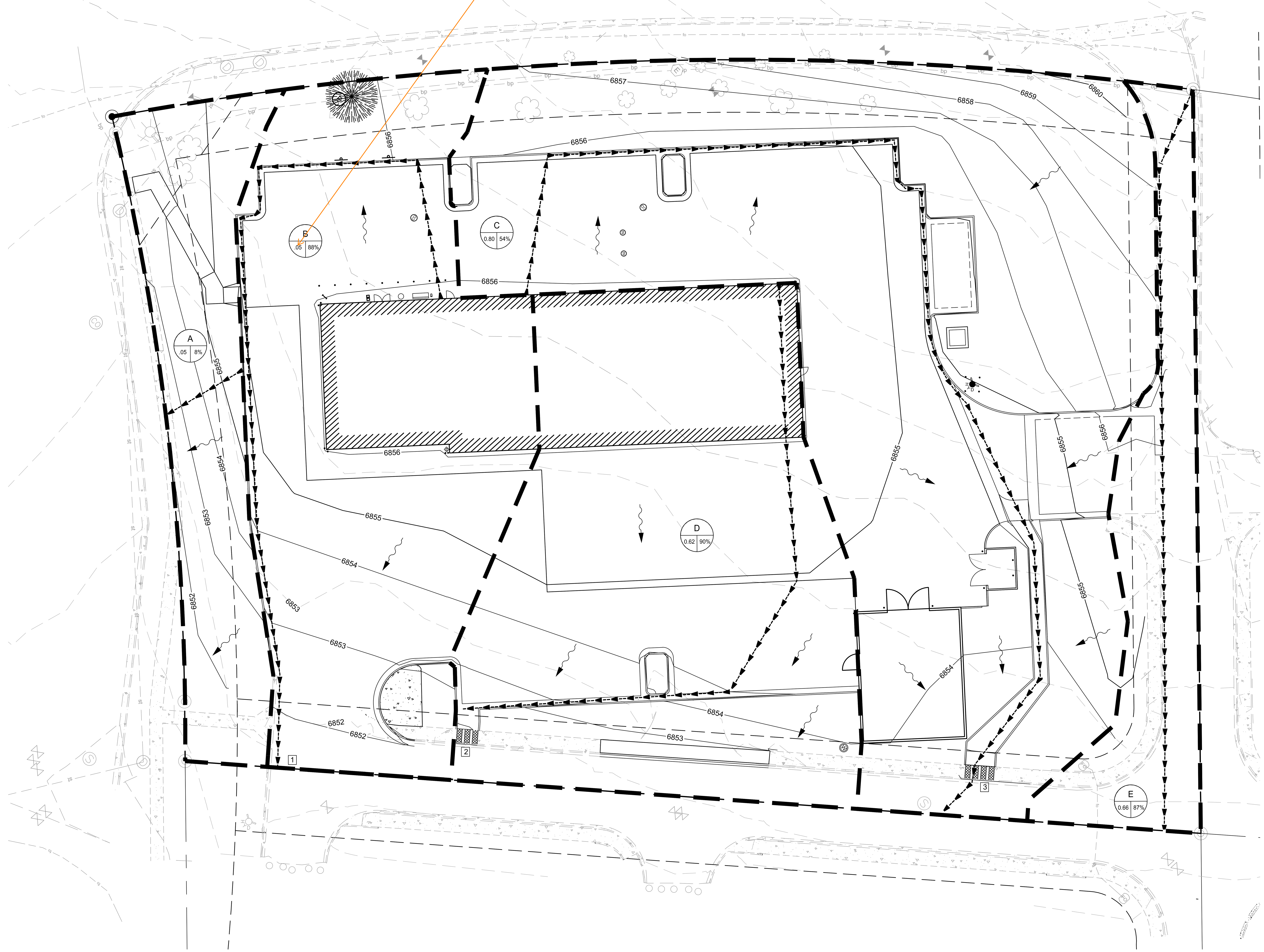
07.21.2021
DRAWN BY | WALKER
CHECKED BY | GRAHAM
REVISIONS
-

EXISTING BASIN MAP

PCD FILE NO. PPR-21-023

D.1

Basin areas shown on this map only add up to 2.18ac whereas the report text above (and Basin X on previous page) states that the area is 2.48ac. Areas shown for each basin on Table 3.2 in report above appears to be more accurate than this map. Please revise report/map as needed to remove discrepancies.



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

DESIGN POINT

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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.2

7/20/2021 2:07 PM | L:\LesSchwab\New\LSCO_20FAL\BIMCAD\Civil\LSCO_20FAL_D.2.dwg

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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.

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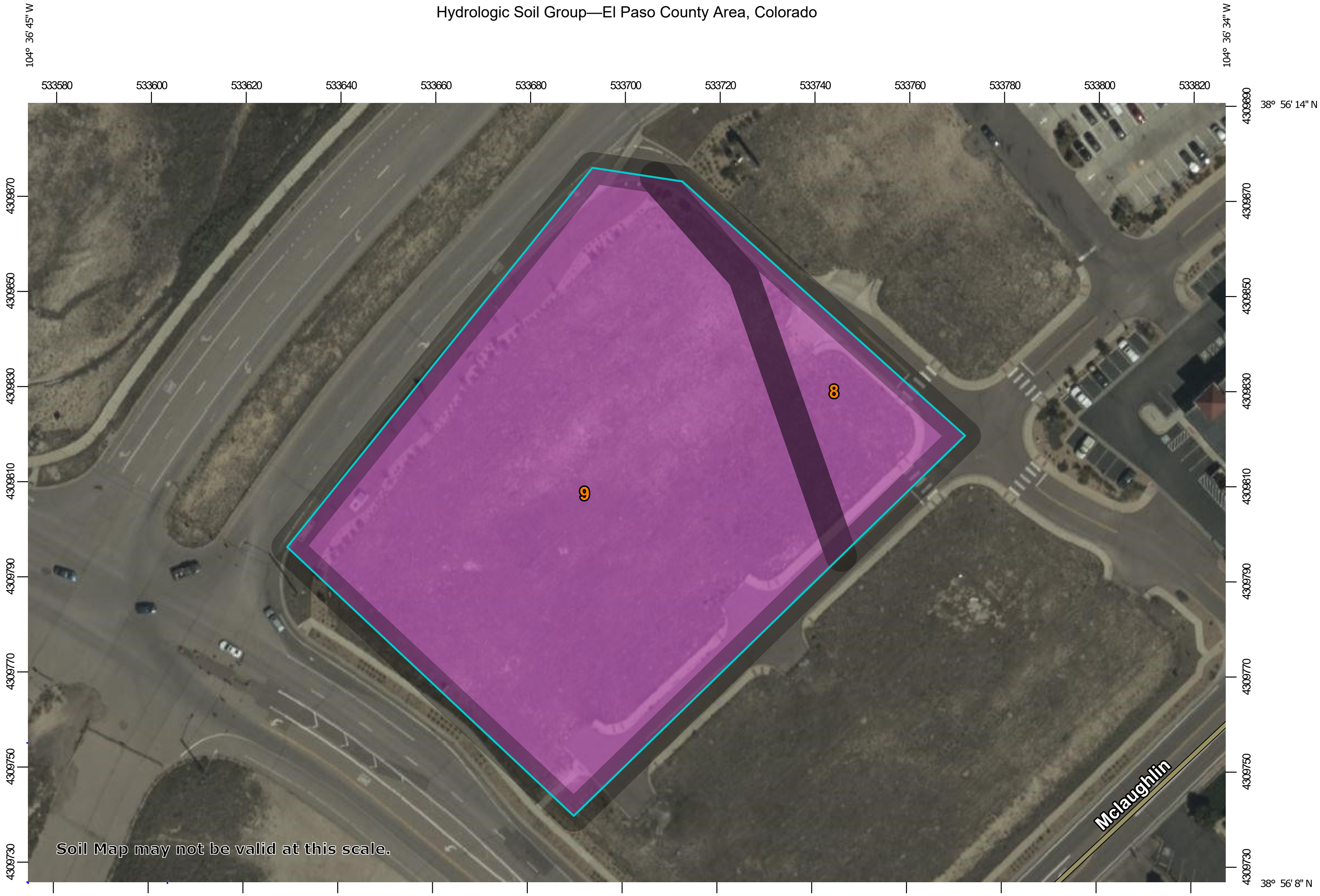
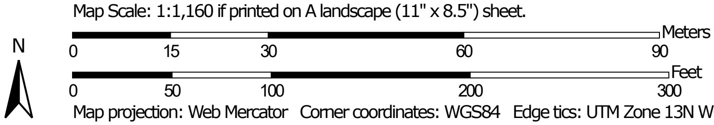
APPENDIX D: WEB SOIL SURVEY



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



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 PROFESSIONAL ENGINEER CHARLENE M. SAMMONS Seal 36727

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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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

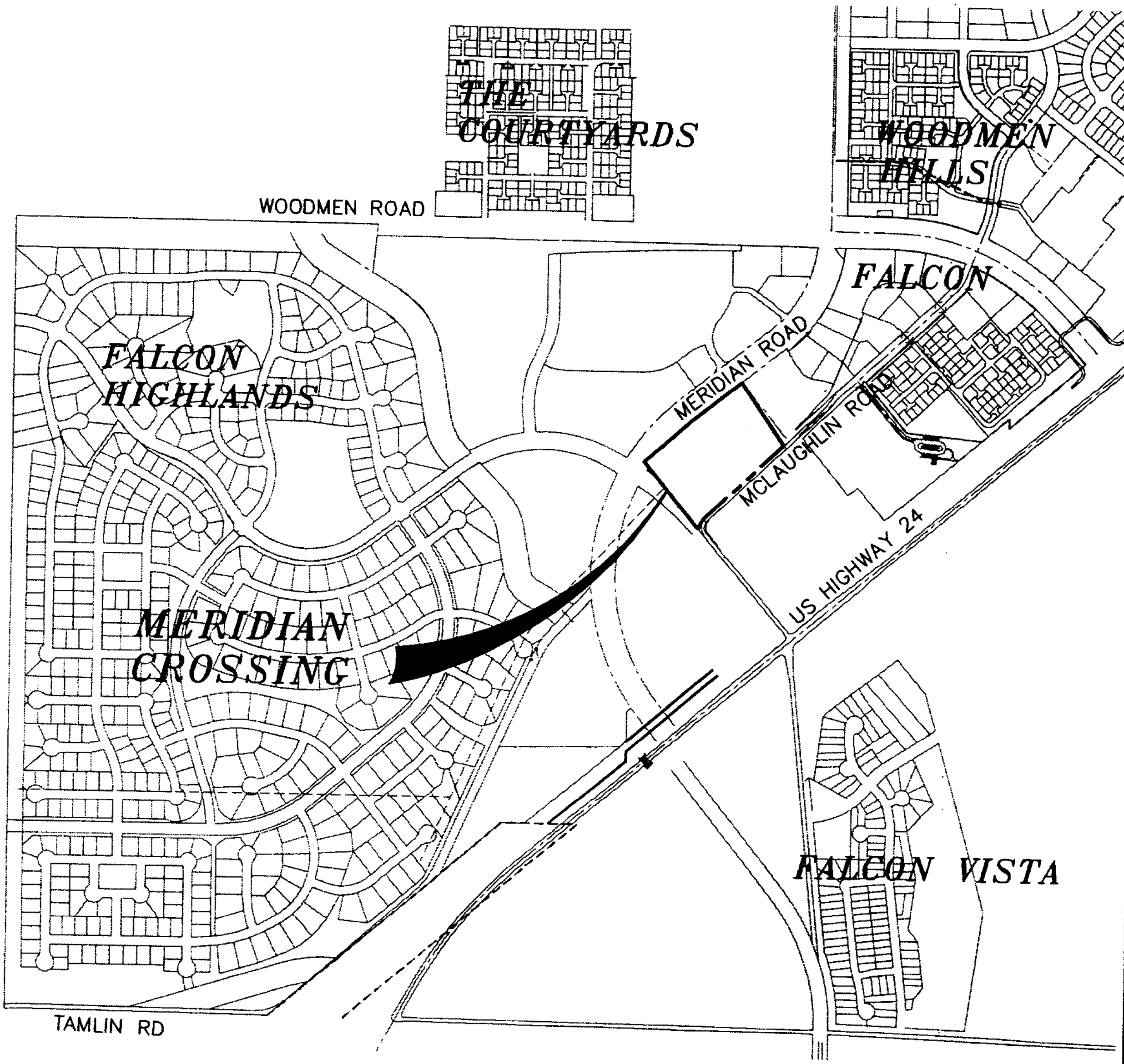
Mild summers and winters, light precipitation; high evaporation and moderately high wind velocities characterize the climate of the study area.

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.

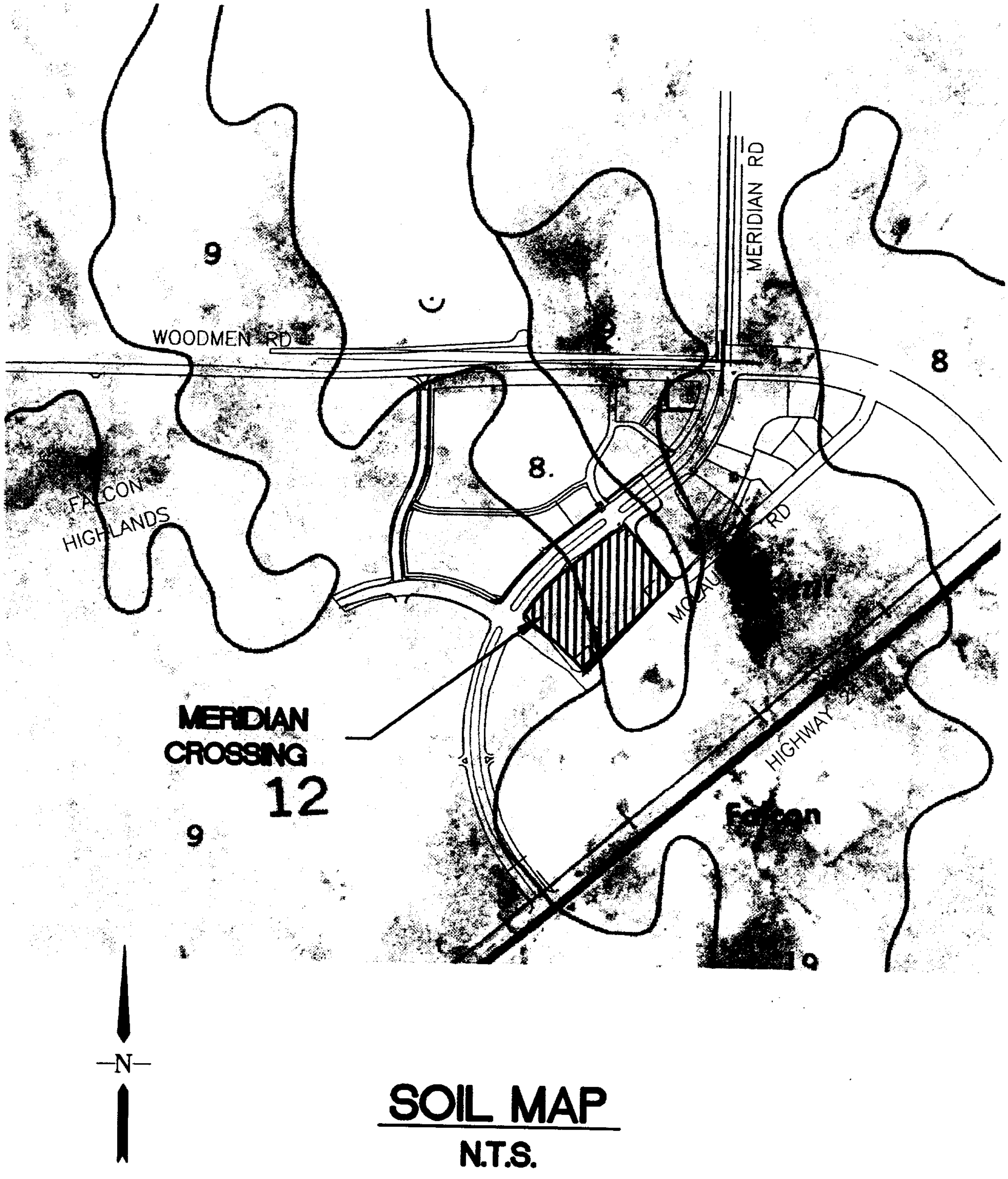


VICINITY MAP

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.

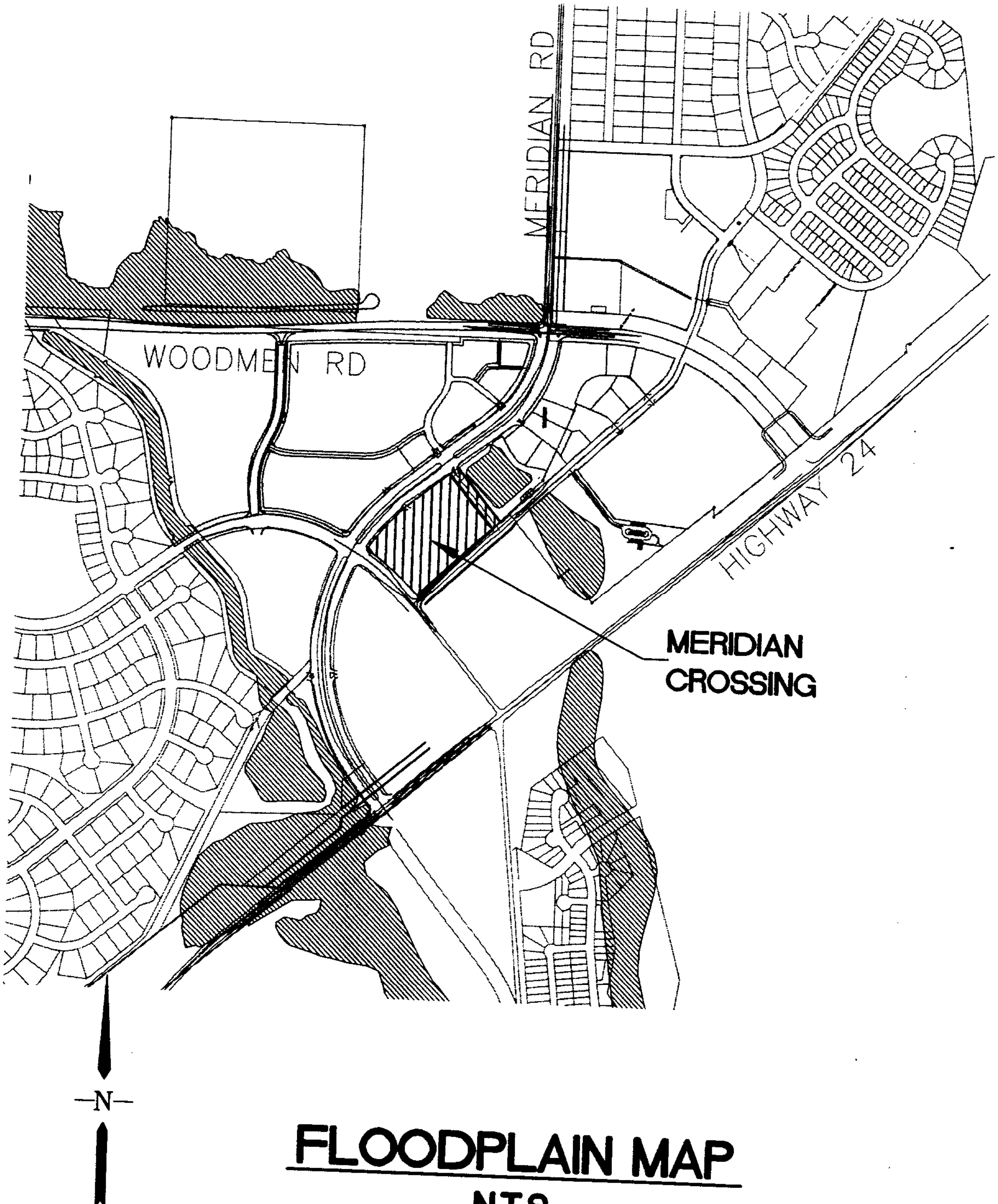
6. Master Development Drainage Plan, and Preliminary Drainage Report and Final Drainage Report for Falcon Highland Filing No. 1, October 2004. Prepared by URS Corp.

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.

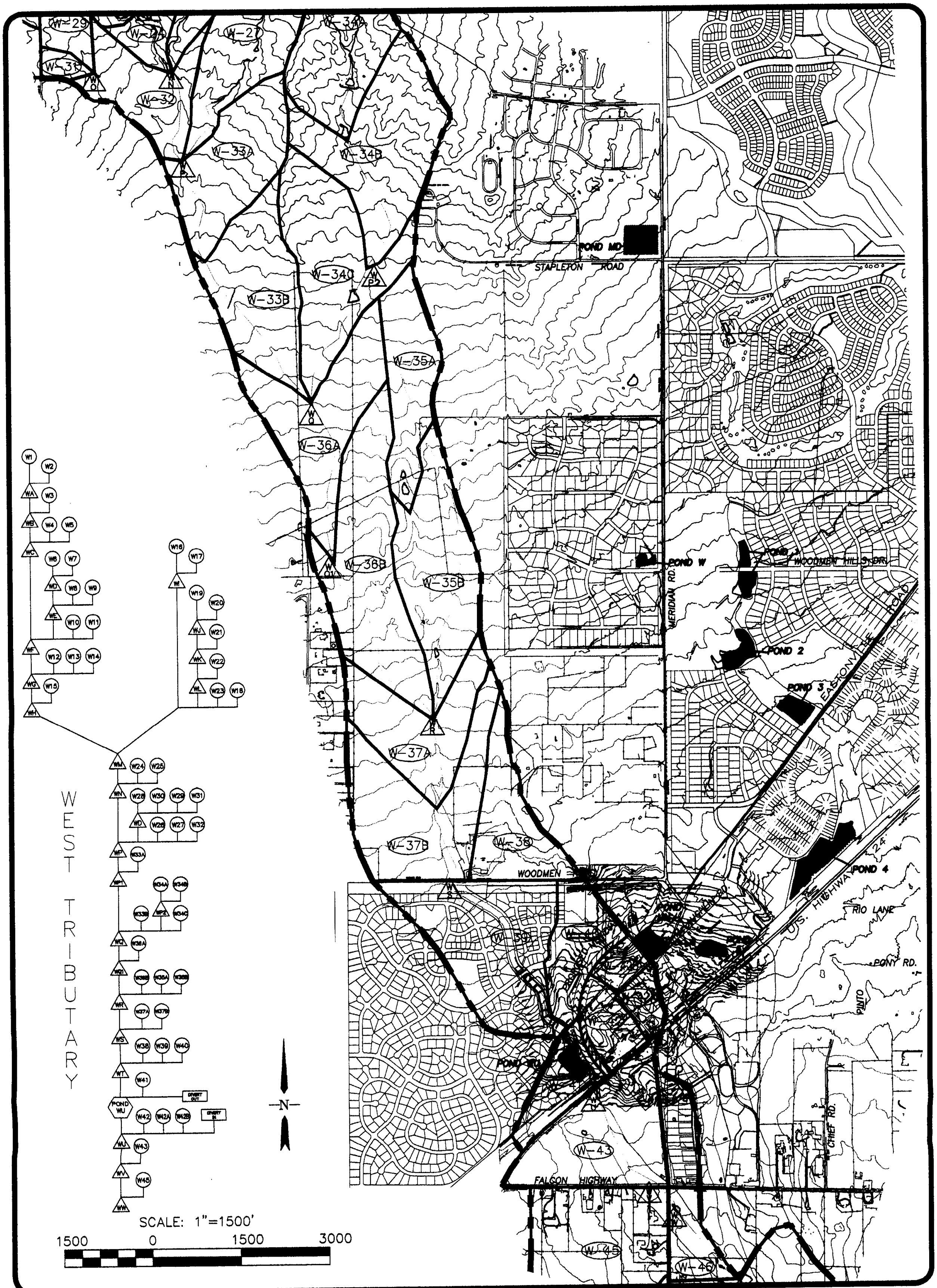
MERIDIAN CROSSING

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
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```
 76        KK
 77        KM
 78        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

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
```

KK							
KM							
RK	4662	.0225	.035		TRAP	5	4
KK	W27						
KM							
BA	.1633						
LS		60					
UD	.253						
KK	W32						
KM							
BA	.0890						
LS		60					
UD	.170						
KK	WP						
KM							
HC	5						
KK	P-Q						
KM							
RK	1925	.0182	.035		TRAP	25	4
KK	W33A						
KM							
BA	.1261						
LS		60					
UD	.186						
KK	WP1						
KM							
HC	2						
KK	P1-Q						
KM							
RK	3000	.020	.035		TRAP	25	4
KK	W33B						
KM							
BA	.1360						
LS		60					
UD	.225						
KK	W34A						
KM							
BA	.1261						
LS		60					
UD	.173						
KK	34A-P2						
KM							
RK	2550	.0176	.035		TRAP	25	4
KK	W34B						
KM							
BA	.1766						
LS		60					
UD	.224						
KK	WP2						
KM							
HC	2						
KK	P2-Q						
KM							
RK	2640	.021	.035		TRAP	25	4
KK	W34C						
KM							
BA	.1625						
LS		60					
UD	.244						
KK	WQ						
KM							
HC	4						
KK	Q-Q1						
KM							
RK	2940	.022	.035		TRAP	25	4
KK	W36A						
KM							
BA	.1429						
LS		60					
UD	.234						
KK	WQ1						
KM							
HC	2						
KK	Q1-R						
KM							
RK	3400	.022	.035		TRAP	25	4

```
KK     W36B
KM
BA    .1918
LS              60
UD     .306

KK     W35A
KM
BA    .0958
LS              60
UD     .187

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

KK     W35B
KM
BA    .1507
LS        0     60
UD     .259

KK       WR
KM
HC        4

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

KK     W37A
KM
BA    .1138
LS              60
UD     .185

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

KK     W37B
KM
BA    .1636
LS              61
UD     .218

KK       WS
KM
HC        3

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

KK      W38
KM
BA    .0907
LS              62
UD     .190

KK
KM
RK     2922  .0171    .035         TRAP      5      4

KK      W39
KM
BA    .1833
LS              60
UD     .251

KK      W40
KM
BA    .0964
LS              60
UD     .165

KK       WT
KM
HC        4

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

KK      W41
KM
BA    .0601
LS              60
UD     .117

KK      W42
KM
BA    .0581
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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```
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
605    SQ       0       8    15.5      41    84.4     110     138     152     205
606    RS       1    ELEV     968

607    KK      MH
608    KM
609    HC       2

610    KK
611    KM
612    RK    1276   .0212    .035            TRAP      15       4

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

618    KK     M15
619    KM
620    BA   .1242
621    LS              64
622    UD    .203

623    KK      MI
624    KM
625    HC       2

626    KK
627    KM
628    RK    1995   .0165    .035            TRAP      15       4

629    KK     M19
630    KM
631    BA   .0499
632    LS              61
633    UD    .159

634    KK      MJ
635    KM
636    HC       2

637    KK
638    KM
639    RK    2215   .0158    .035            TRAP      15       4

640    KK     M10
641    KM
642    BA   .0581
643    LS              62
644    UD    .102

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

648    KK    M11A
649    KM
650    BA   .1067
651    LS              61
652    UD    .231

653    KK      MK
654    KM
655    HC       2

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

659    KK    M11B
660    KM
661    BA   .0879
662    LS              60
663    UD    .150

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

667    KK    M11C
668    KM
669    BA   .0933
670    LS              60
671    UD    .160

672    KK     MK1
673    KM
674    HC       3

675    KK   K1-ML
676    KM
677    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						

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

KK     W51
KM
BA   .0546
LS             63
UD    .172

KK     WAC
KM
HC       2

KK
KM
RK     638   .0345   .035          TRAP    40    4

KK     W52
KM
BA   .0499
LS             63
UD    .109

KK
KM
RK    1171   .0205   .035          TRAP     5    4

KK     W53
KM
BA   .0531
LS             63
UD    .156

KK     WAD
KM
HC       2

KK
KM
RK     290   .0310   .035          TRAP    10    4

KK     W54
KM
BA   .0078
LS             60
UD    .050

KK     WAE
KM
HC       3

KK
KM
RK    1925   .0052   .035          TRAP    40    4

KK     W56
KM
BA   .1831
LS             60
UD    .191

KK     WAF
KM
HC       2

KK
KM
RK    1032   .0155   .035          TRAP    40    4

KK     W62
KM
BA   .0750
LS             60
UD    .090

KK
KM
RK    2169   .0203   .035          TRAP     5    4

KK     W63
KM
BA    .047
LS             60
UD    .109

KK
KM
RK    1450   .0131   .035          TRAP     5    4

KK     W61
KM
BA    .192
LS             60
UD    .251

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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RS      1   ELEV    920

KK
KM
RK   1700  .0141   .035          TRAP      5      4

KK    E1C
KM
BA  .0845
LS           60
UD   .200

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

KK     E4
KM
BA   .127
LS           60
UD   .200

KK    ED1
KM
HC      2

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

KK     E5
KM
BA   .094
LS           60
UD   .160

KK     ED
KM
HC      3

KK
KM
RK    950  .0211   .035          TRAP     10      4

KK     E8
KM
BA  .0446
LS           60
UD   .139

KK     EE
KM
HC      2

KK
KM
RK   1500  .0127   .035          TRAP     10      4

KK    E10
KM
BA   .029
LS           60
UD   .158

KK     EF
KM
HC      2

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

KK     E6
KM
BA   .119
LS           60
UD   .228

KK     E7
KM
BA   .031
LS           60
UD   .082

KK
KM
RK   1100  .0100   .035          TRAP      5      4

KK    EG1
KM
HC      2

KK   G1-G
KM
RK   1650  .0176   .035          TRAP      5      4
```

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					

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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KK
KM
RK     1832   .0126    .035          TRAP     40      4

KK      E27
KM
BA    .1236
LS              63
UD     .172

KK       EO
KM
HC        2

KK
KM
RK     1625   .0133    .035          TRAP      5      3

KK      W55
KM
BA    .0452
LS              60
UD     .093

KK      WAG
KM
HC        2

KK
KM
RK     2025   .0109    .035          TRAP      5      4

KK      W59
KM
BA    .0705
LS              60
UD     .200

KK      WAJ
KM
HC        4

KK
KM
RK     1450   .0124    .035          TRAP     40      4

KK      E28
KM
BA    .0718
LS              61
UD     .223

KK
KM
RK     2064   .0165    .035          TRAP     40      4

KK      E29
KM
BA    .0465
LS              61
UD     .166

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

KK      W60
KM
BA    .0711
LS              60
UD     .182

KK       ZZ
KM         COMBINE ALL AT DP ZZ
HC        3
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             .           .
                .           .           .
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221             .           .           .         W22
                .           .           .           .
                .           .           .           .
226             .           .         WL ............
                .           .           V
                .           .           V
229             .           .
                .           .           .
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232             .           .           .         W23
                .           .           .           .
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237             .           .           .           .         W18
                .           .           .           .           .
                .           .           .           .           .
242           WM ................................................
                V
                V
245           M-N
                .
                .
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
                .
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 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
                .            .            .
                .            .            .
 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         .           .
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              .           .           .
  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         .              .              .            .
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             .              .              .            .              .
1049         .              .              .          EG1............
             .              .              .            V
             .              .              .            V
1052         .              .              .         G1-G
             .              .              .            .
             .              .              .            .
1055         .              .              .            .             E9
             .              .              .            .              V
             .              .              .            .              V
1060         .              .              .            .
             .              .              .            .              .
             .              .              .            .              .
1063         .              .              .            .              .            E11
             .              .              .            .              .              .
             .              .              .            .              .              .
1068         .              .              .            .              .              .            E12
             .              .              .            .              .              .              .
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1073         .              .             EG ................................................
             .              .              .
             .              .              .
1076         .              .              .          E13
             .              .              .            .
             .              .              .            .
1081         .              .              .            .            E14
             .              .              .            .              V
             .              .              .            .              V
1086         .              .              .            .
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             .              .              .            .              .
1089         .              .             EH ........................
             .              .              V
             .              .              V
1092         .              .
             .              .              .
             .              .              .
1095         .              .              .          E19
             .              .              .            .
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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            .           .           .
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                .           .           .           .
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.............................
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(***) 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              *
*                                    *                          *                                    *
**************************************                          **************************************
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                         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
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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 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	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									

+			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						

```
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
```

```
KM
BA   .1633
LS                60
UD    .253

KK     W32
KM
BA   .0890
LS                60
UD    .170

KK      WP
KM
HC       5

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

KK    W33A
KM
BA   .1261
LS                60
UD    .186

KK     WP1
KM
HC       2

KK    P1-Q
KM
RK    3000    .020    .035             TRAP        25        4

KK    W33B
KM
BA   .1360
LS                60
UD    .225

KK    W34A
KM
BA   .1261
LS                60
UD    .173

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

KK    W34B
KM
BA   .1766
LS                60
UD    .224

KK     WP2
KM
HC       2

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

KK    W34C
KM
BA   .1625
LS                60
UD    .244

KK      WQ
KM
HC       4

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

KK    W36A
KM
BA   .1429
LS                60
UD    .234

KK     WQ1
KM
HC       2

KK    Q1-R
KM
RK    3400    .022    .035             TRAP        25        4

KK    W36B
KM
BA   .1918
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						

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

```
KK    W51
KM
BA  .0546
LS              63
UD   .172

KK    WAC
KM
HC      2

KK
KM
RK    638   .0345    .035            TRAP      40       4

KK    W52
KM
BA  .0499
LS              63
UD   .109

KK
KM
RK   1171   .0205    .035            TRAP       5       4

KK    W53
KM
BA  .0531
LS              63
UD   .156

KK    WAD
KM
HC      2

KK
KM
RK    290   .0310    .035            TRAP      10       4

KK    W54
KM
BA  .0078
LS              60
UD   .050

KK    WAE
KM
HC      3

KK
KM
RK   1925   .0052    .035            TRAP      40       4

KK    W56
KM
BA  .1831
LS              60
UD   .191

KK    WAF
KM
HC      2

KK
KM
RK   1032   .0155    .035            TRAP      40       4

KK    W62
KM
BA  .0750
LS              60
UD   .090

KK
KM
RK   2169   .0203    .035            TRAP       5       4

KK    W63
KM
BA   .047
LS              60
UD   .109

KK
KM
RK   1450   .0131    .035            TRAP       5       4

KK    W61
KM
BA   .192
LS              60
UD   .251

KK    WAH
KM
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
```



```
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
```

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									

```
KM
HC       2

KK
KM
RK    1832   .0126    .035          TRAP       40        4

KK     E27
KM
BA   .1236
LS              63
UD    .172

KK      EO
KM
HC       2

KK
KM
RK    1625   .0133    .035          TRAP        5        3

KK     W55
KM
BA   .0452
LS              60
UD    .093

KK     WAG
KM
HC       2

KK
KM
RK    2025   .0109    .035          TRAP        5        4

KK     W59
KM
BA   .0705
LS              60
UD    .200

KK     WAJ
KM
HC       4

KK
KM
RK    1450   .0124    .035          TRAP       40        4

KK     E28
KM
BA   .0718
LS              61
UD    .223

KK
KM
RK    2064   .0165    .035          TRAP       40        4

KK     E29
KM
BA   .0465
LS              61
UD    .166

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

KK     W60
KM
BA   .0711
LS              60
UD    .182

KK      ZZ
KM        COMBINE ALL AT DP ZZ
HC       3
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
```

```
            .         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             .          .
```

```
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 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	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
1                                      HEC-1 INPUT                                          PAGE  3

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


 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
1                                           HEC-1 INPUT                                              PAGE 11

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
1                                           HEC-1 INPUT                                              PAGE 12

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
```

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              .
              .
 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           .
              .            .
              .            .
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```
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
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            .         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 ......................
```

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            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     *
*                                        *
******************************************
```

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

HYDROGRAPH AT							
+	W33B	.14	1	FLOW	1.	9.	78.
				TIME	6.33	5.92	5.92
HYDROGRAPH AT							
+	W34A	.14	1	FLOW	1.	10.	96.
				TIME	6.33	5.92	5.83
ROUTED TO							
+	34A-P2	.14	1	FLOW	1.	10.	93.
				TIME	6.33	6.08	5.92
HYDROGRAPH AT							
+	W34B	.18	1	FLOW	1.	11.	101.
				TIME	6.33	5.92	5.92
2 COMBINED AT							
+	WP2	.32	1	FLOW	2.	20.	195.
				TIME	6.33	6.00	5.92
ROUTED TO							
+	P2-Q	.32	1	FLOW	2.	19.	186.
				TIME	6.75	6.17	6.00
HYDROGRAPH AT							
+	W34C	.16	1	FLOW	1.	10.	90.
				TIME	6.33	6.00	5.92
4 COMBINED AT							
+	WQ	2.37	1	FLOW	19.	115.	1336.
				TIME	6.92	6.25	6.00
ROUTED TO							
+	Q-Q1	2.37	1	FLOW	19.	114.	1294.
				TIME	7.08	6.33	6.00
HYDROGRAPH AT							
+	W36A	.14	1	FLOW	1.	9.	81.
				TIME	6.33	5.92	5.92
2 COMBINED AT							
+	WQ1	2.51	1	FLOW	20.	118.	1363.
				TIME	7.08	6.33	6.00
ROUTED TO							
+	Q1-R	2.51	1	FLOW	20.	117.	1320.
				TIME	7.25	6.42	6.08
HYDROGRAPH AT							
+	W36B	.19	1	FLOW	1.	10.	91.
				TIME	6.42	6.00	6.00
HYDROGRAPH AT							
+	W35A	.10	1	FLOW	1.	7.	62.
				TIME	6.33	5.92	5.83
ROUTED TO							
+	35A-WR	.10	1	FLOW	1.	6.	58.
				TIME	6.92	6.25	6.00
HYDROGRAPH AT							
+	W35B	.15	1	FLOW	1.	9.	81.
				TIME	6.42	6.00	5.92
4 COMBINED AT							
+	WR	2.95	1	FLOW	22.	132.	1506.
				TIME	7.17	6.42	6.08
ROUTED TO							
+	WR-S	2.95	1	FLOW	22.	131.	1485.
				TIME	7.33	6.50	6.08
HYDROGRAPH AT							
+	W37A	.11	1	FLOW	1.	8.	74.
				TIME	6.33	5.92	5.83
ROUTED TO							
+	37A-S	.11	1	FLOW	1.	8.	71.
				TIME	6.58	6.00	5.92
HYDROGRAPH AT							
+	W37B	.16	1	FLOW	145.	201.	410.
				TIME	5.83	5.83	5.83
3 COMBINED AT							
+	WS	3.23	1	FLOW	145.	201.	1705.
				TIME	5.83	5.83	6.08
ROUTED TO							
+	S-T	3.23	1	FLOW	140.	197.	1632.
				TIME	5.92	5.92	6.17
HYDROGRAPH AT							
+	W38	.09	1	FLOW	2.	10.	67.
				TIME	5.92	5.92	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)		Tc	INTENSITY		TOTAL FLOWS	
		CA(5)	CA(100)	(min.)	I(5) (in/hr)	I(100) (in/hr)	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(equivalent) CA(100)	Tc (min.)	INTENSITY I(5) (in/hr)	INTENSITY I(100) (in/hr)	TOTAL FLOWS Q(5) (cfs)	TOTAL FLOWS 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)		Tc	INTENSITY		TOTAL FLOWS	
		CA(5)	CA(100)	(min.)	I(5) (in/hr)	I(100) (in/hr)	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

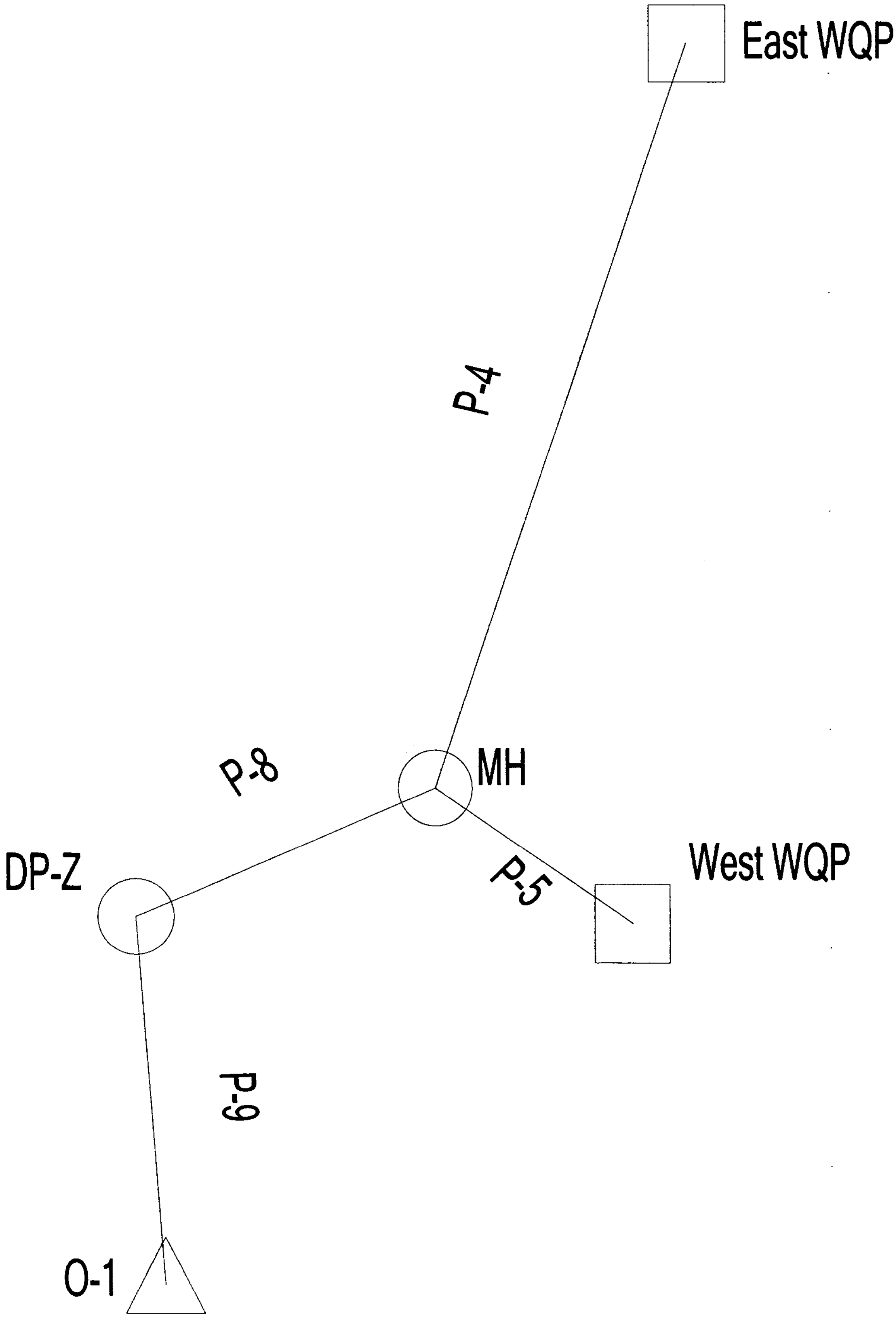
	Formula	Slope	Slope	n	Type	flow	Q_{max}	Q	Comments
Residential	$Q=171.7\ S^{1/2}$	0.5%	0.02	0.016	V	0.5	34	12.0	
		1.0%					34	17.0	
		1.5%					34	20.8	
		2.0%					34	24.1	
		2.5%					34	26.9	
		3.0%					34	29.5	
		3.5%					34	31.8	
		4.0%					34	34.0	
Collector/Arterial	$Q=171.7\ S^{1/2}$	0.5%	0.02	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	;,841.13	;,840.07	1.06	Standaı	0.00	0.00	72.94	8.64	6.22	8.38
MH	;,842.25	;,841.42	0.83	Standaı	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	;,844.85	;,844.85	0.00	Absolut
West WQP	Generic Default 1	44.27	44.27	0.00	N/A	100.0	;,842.28	;,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	3,836.40	3,836.40	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	26.11	1	0.008	0.006	32.00	6.52	3,842.25	6,839.05	3,844.85	3,842.25
P-5	Circular	36 inch	5.58	1	0.047	0.004	44.27	6.26	3,839.11	6,838.85	3,842.28	3,842.25
P-8	Circular	42 inch	60.40	1	0.011	0.005	73.34	7.67	3,838.05	6,837.39	3,841.42	3,841.13
P-9	Circular	42 inch	07.18	1	0.009	0.008	72.94	10.03	3,837.39	6,836.40	3,840.07	3,838.71

Scenario: 100-year

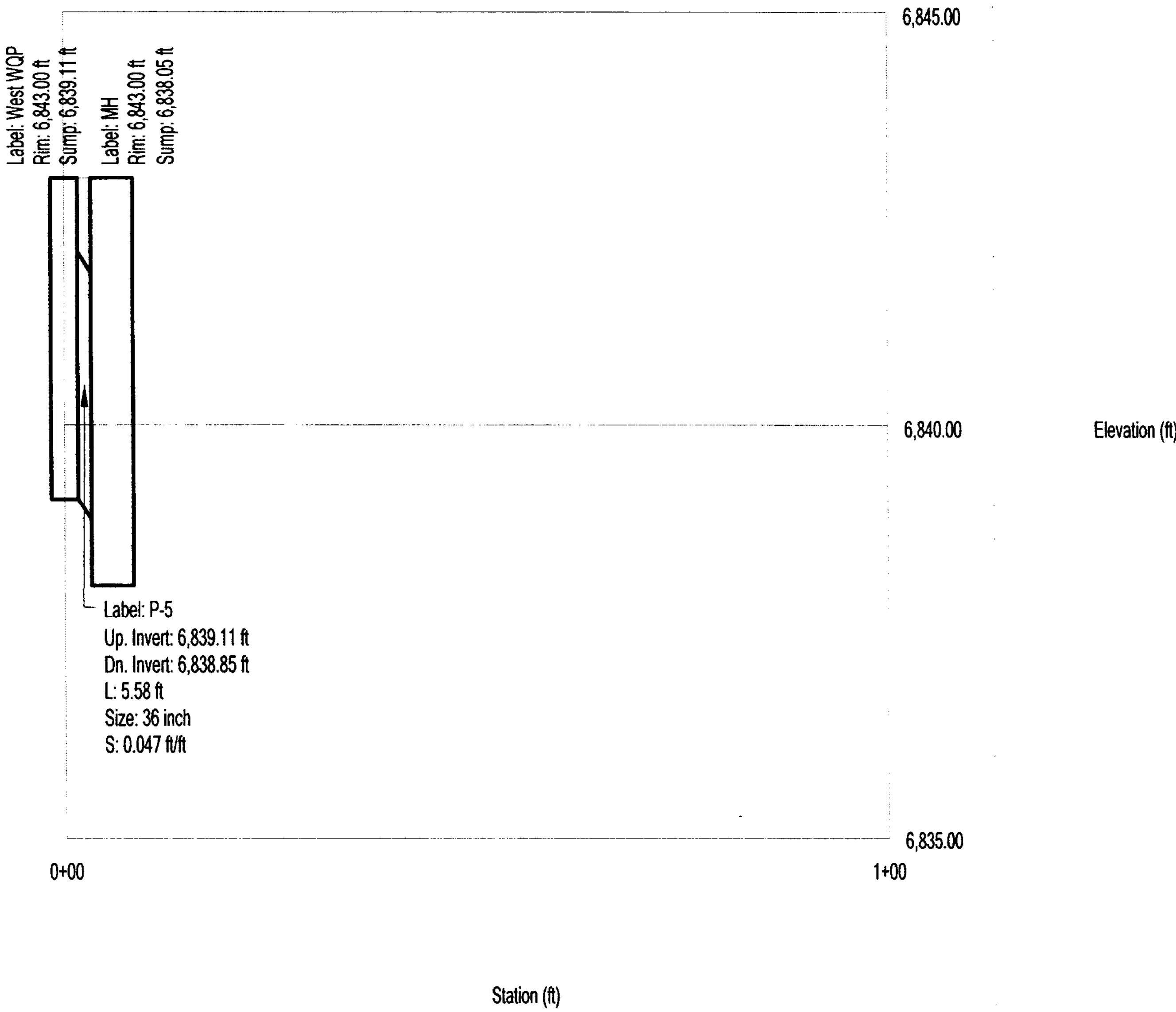
Combined Pipe\Node Report

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

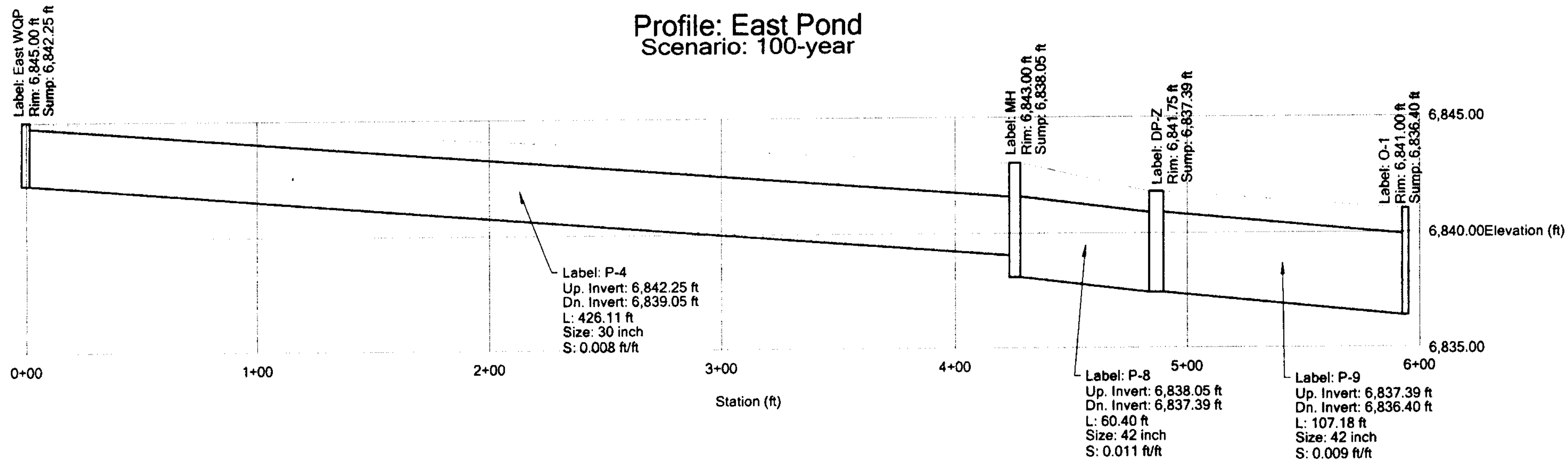
Profile
Scenario: 100-year

Profile: West Pond

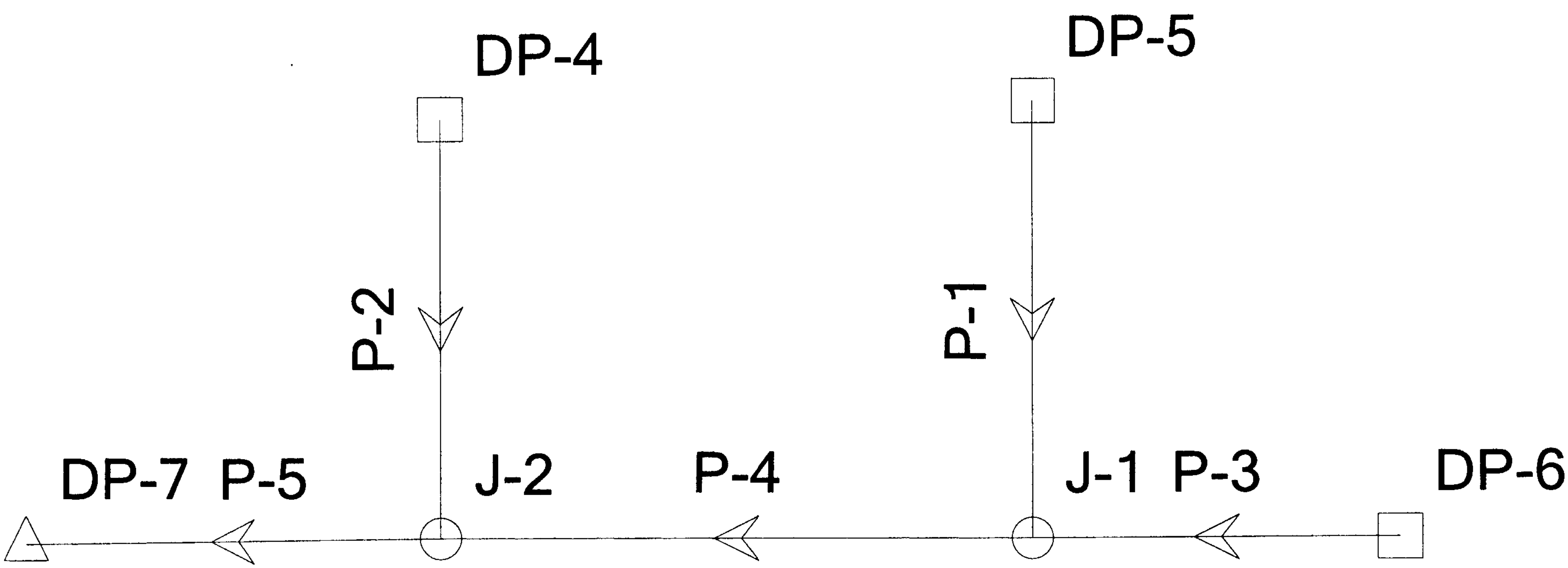
Scenario: 100-year



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	250.69	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	3,814.44	3,814.44	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	3,817.71	3,817.71	0.00	Absolut	0.00	0.00	262.00	5.25	22.36	49.53
J-2	3,817.08	3,817.08	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	3,817.10	6,816.25	3,818.70	3,817.76
P-2	Circular	24 inch	91.50	1	0.016940	014085	22.05	8.96	3,817.10	6,815.55	3,818.78	3,816.86
P-3	Box	6 x 3 ft	28.85	2	0.005199	005093	:50.69	8.63	3,815.40	6,815.25	3,817.78	3,817.71
P-4	Box	6 x 3 ft	33.50	2	0.005243	005221	:62.00	8.76	3,815.25	6,814.55	3,817.71	3,817.08
P-5	Box	6 x 3 ft	20.66	2	0.005324	004607	:73.54	9.31	3,814.55	6,814.44	3,817.08	3,816.82

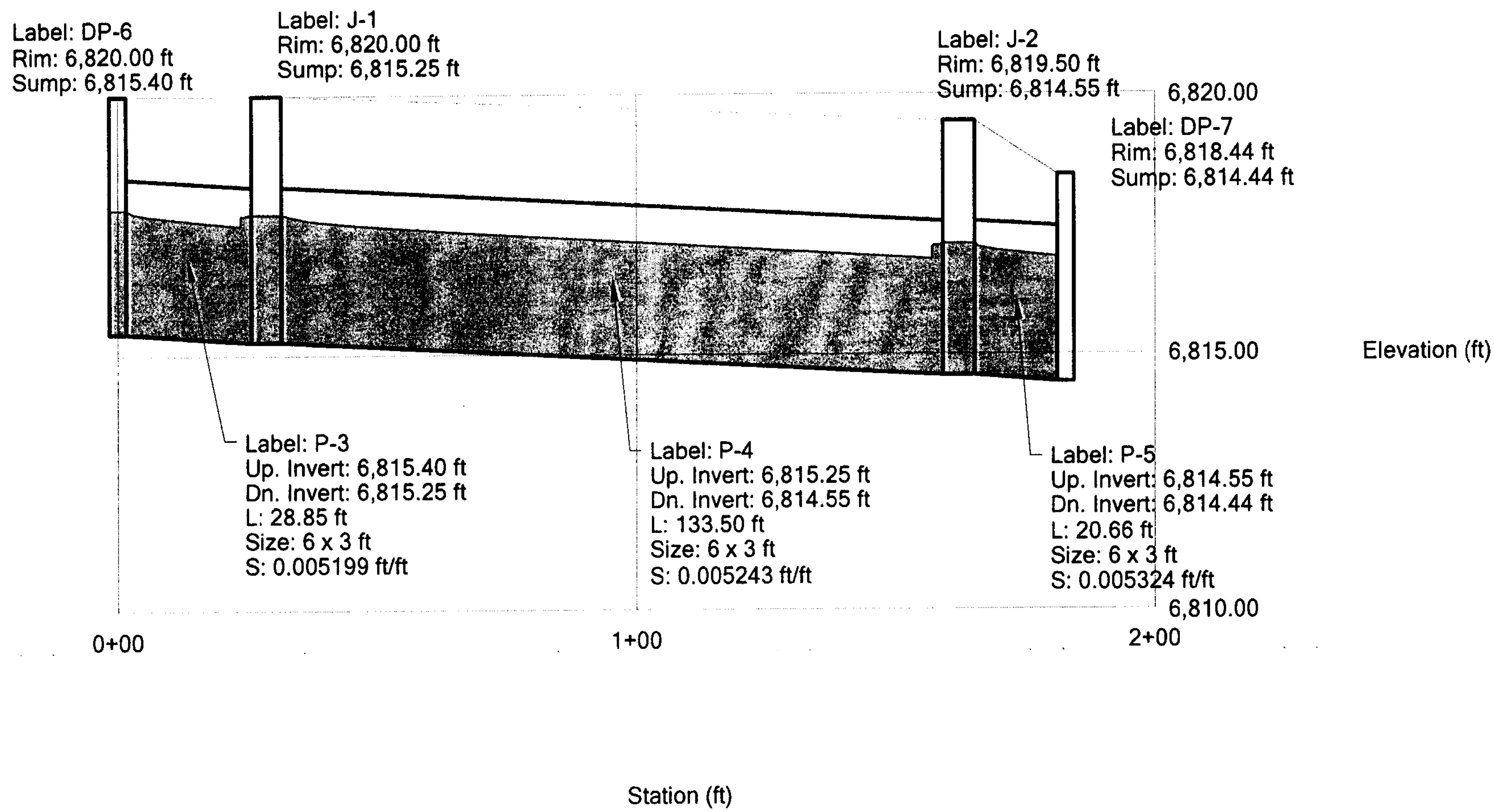
Scenario: 100-year

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

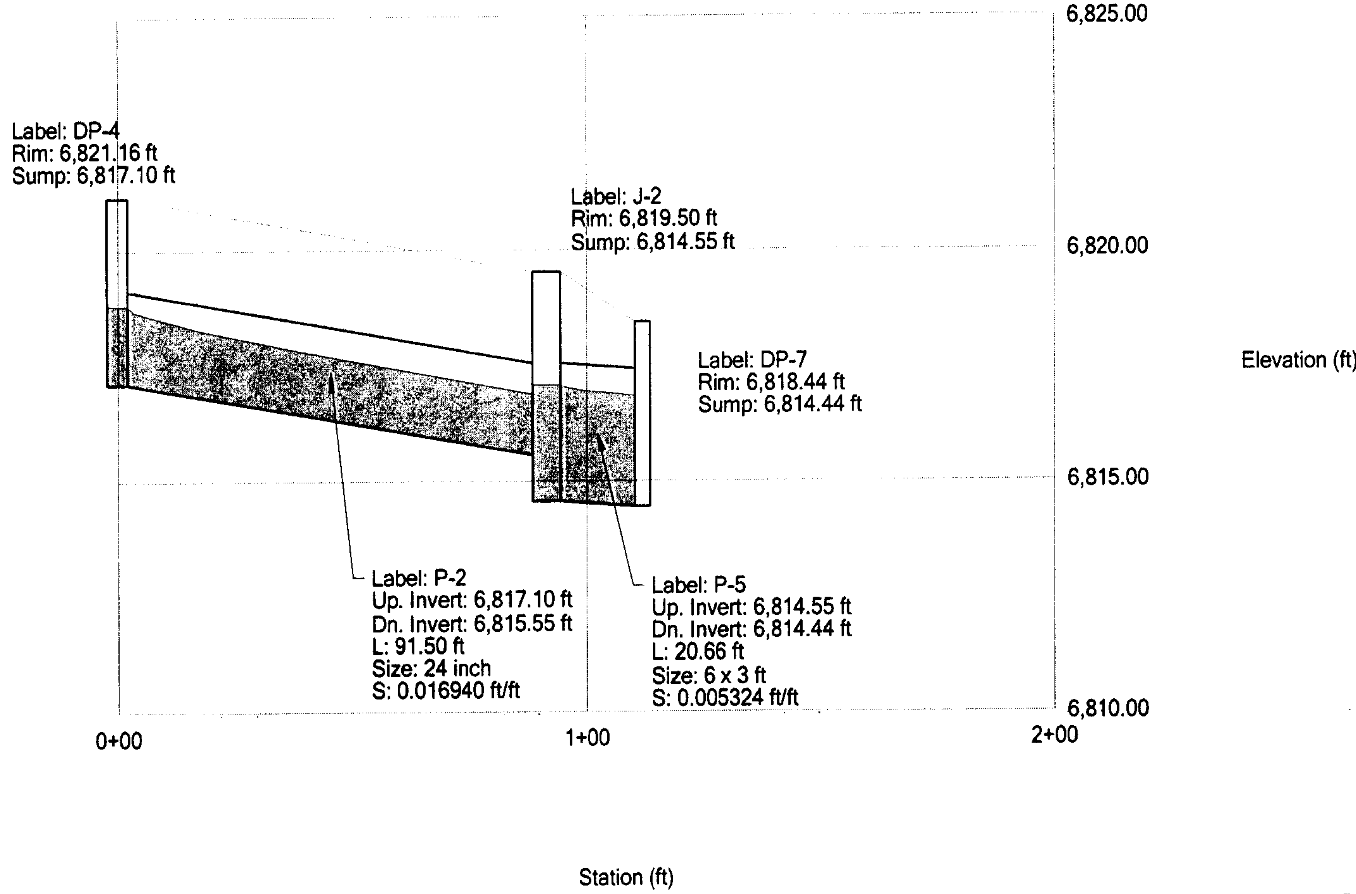
Profile: RCB @ Highway 24

Scenario: 100-year



Profile: Sump Inlet Left

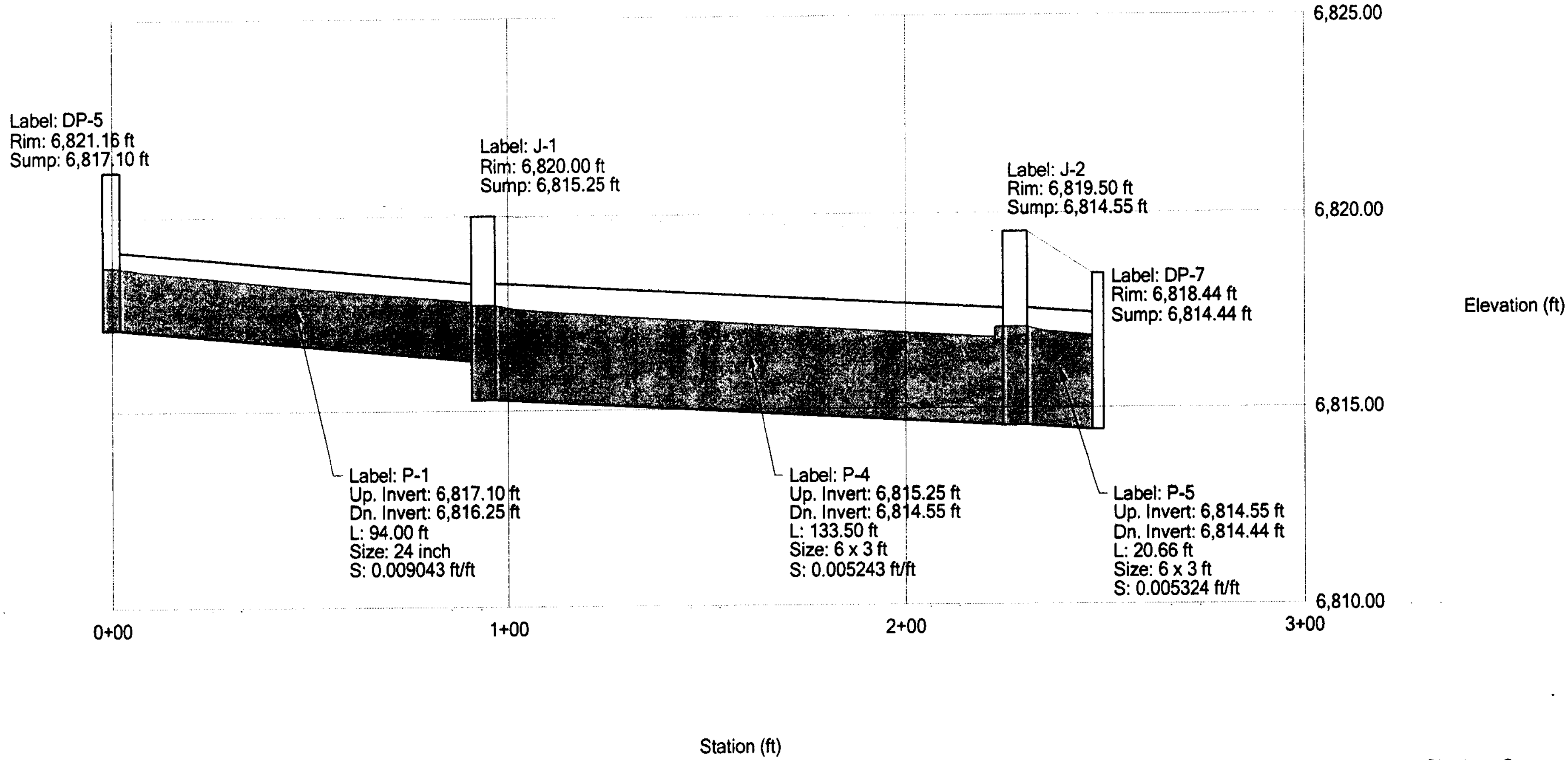
Scenario: 100-year



Profile
Scenario: 100-year

Profile: Sump Inlet Right

Scenario: 100-year



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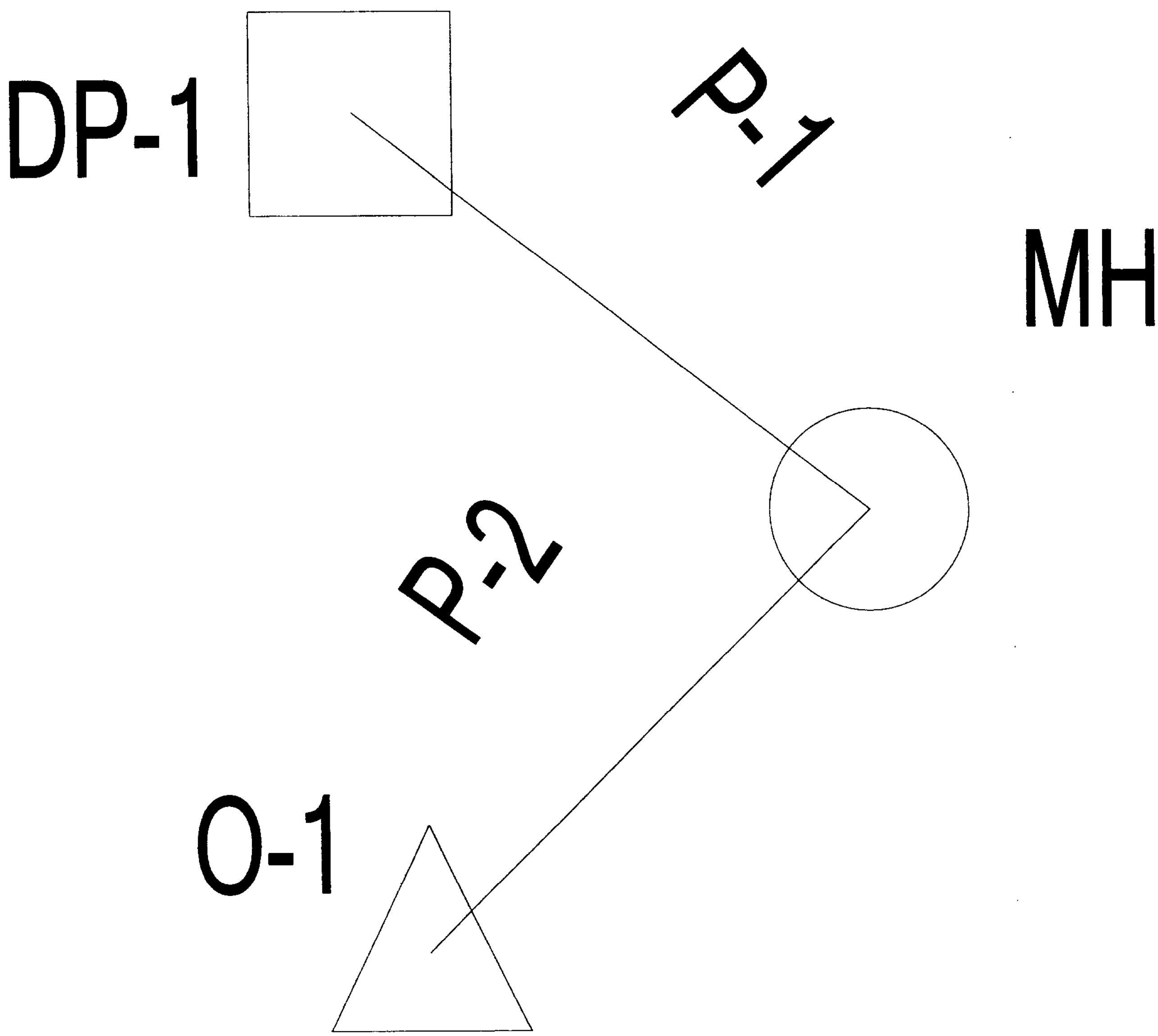
Project Engineer: Charlene Sammons
StormCAD v5.6 [05.06.012.00]

Scenario: 100-year



Analysis Results
Scenario: 100-year

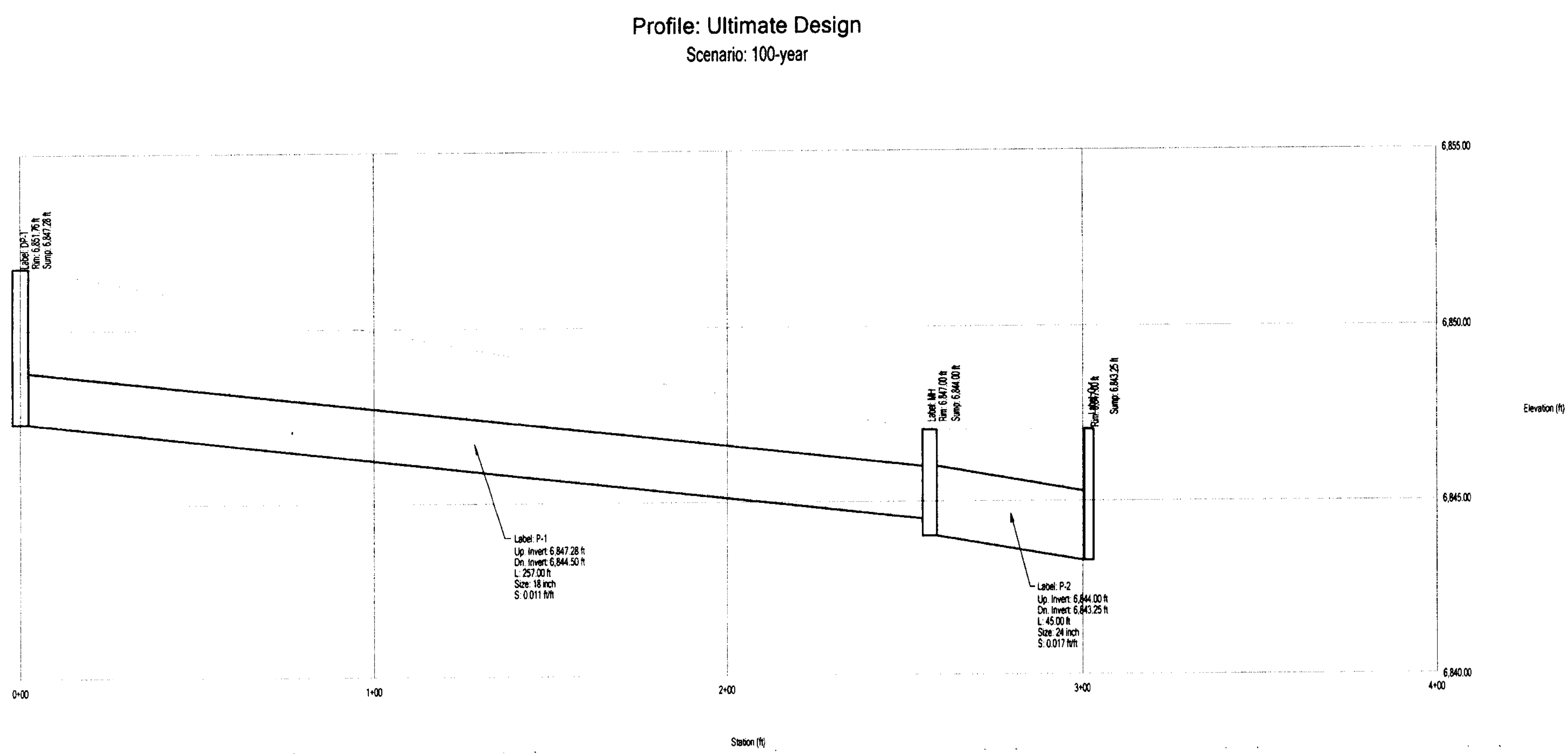
Outlet: O-1

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	3,843.25	3,843.25	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	157.00	1	0.011	0.011	7.61	6.16	3,847.28	6,844.50	3,848.35	3,845.42
P-2	Circular	24 inch	45.00	1	0.017	0.012	7.39	6.17	3,844.00	6,843.25	3,844.97	3,843.96

Profile
Scenario: 100-year



Title: Old Meridian Road
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Project Engineer: Charlene Sammons
StormCAD v5.6 [05.06.012.00]

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 Elev:	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

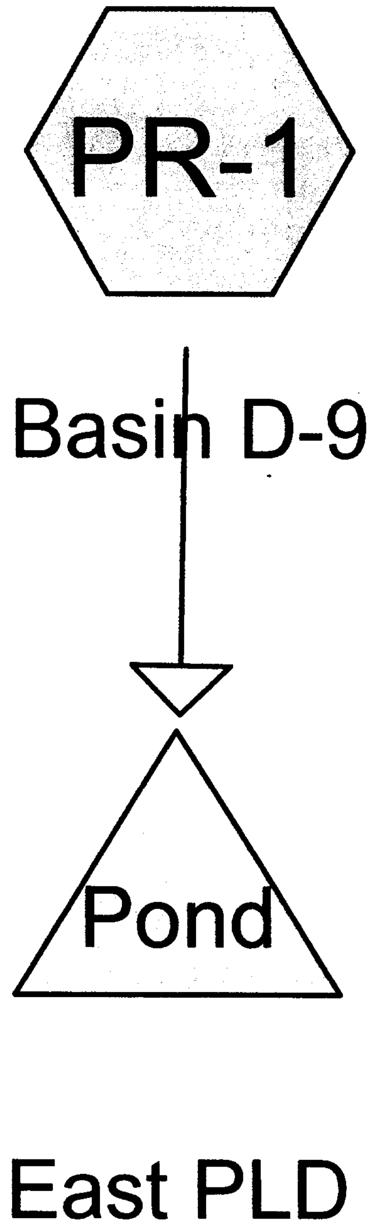
Appendix G: Water Quality Pond Calculations

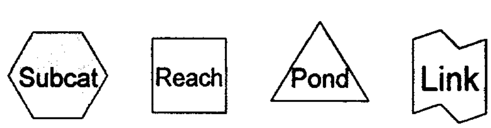
Design Procedure Form: Porous Landscape Detention (PLD)

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
HydroCAD® 8.00 s/n 004515 © 2006 HydroCAD Software Solutions LLC

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

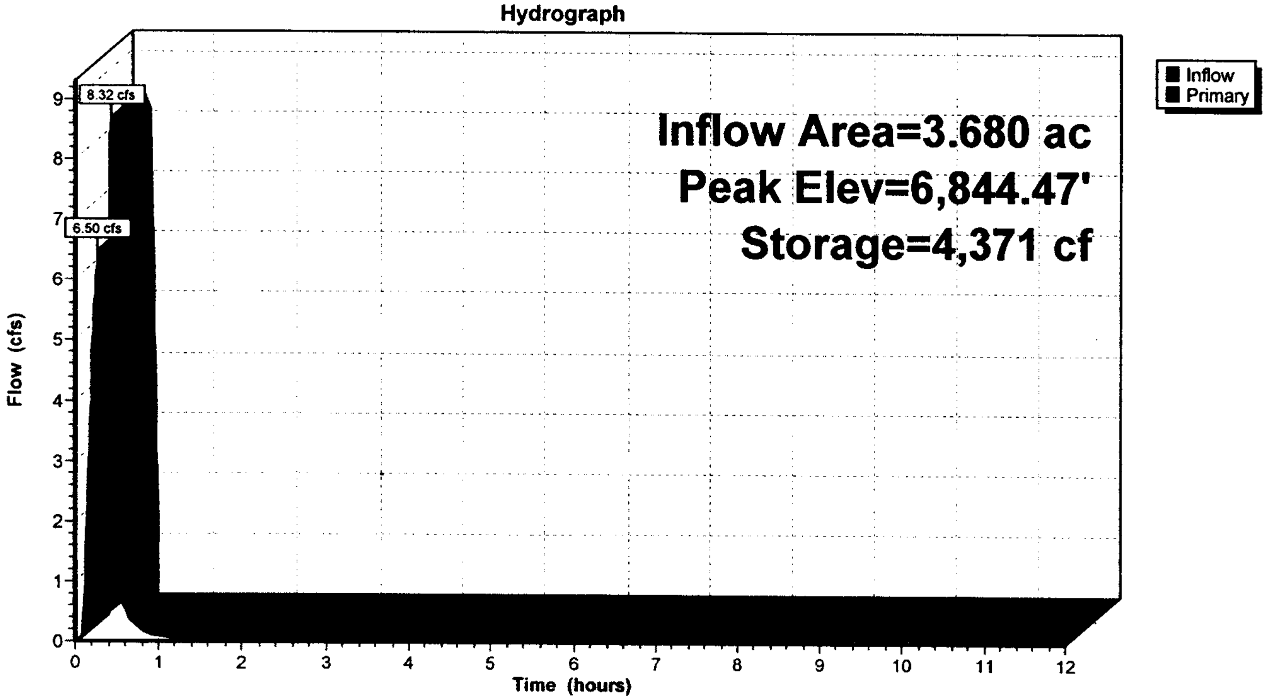
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
6,843.00	2,200	0	0	2,200
6,844.00	3,300	2,731	2,731	3,320
6,846.00	3,700	6,996	9,728	3,939

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)

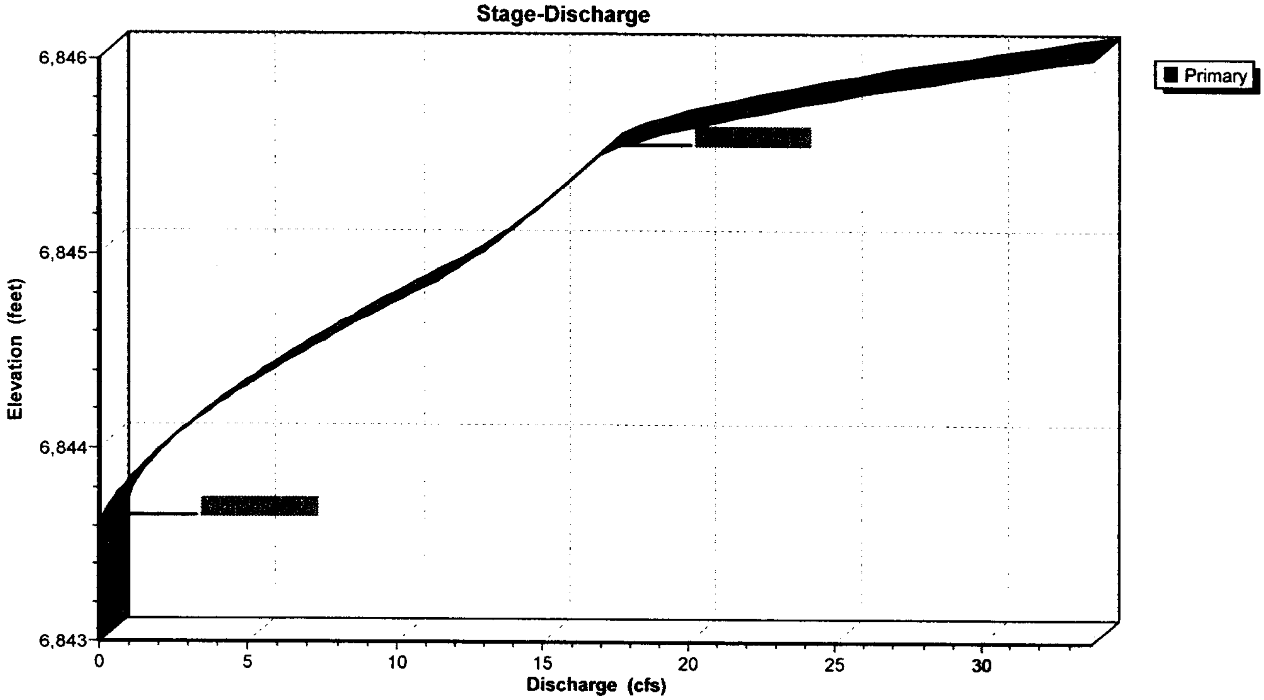
Pond Pond: East PLD

Hydrograph



Pond Pond: East PLD

Stage-Discharge



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)

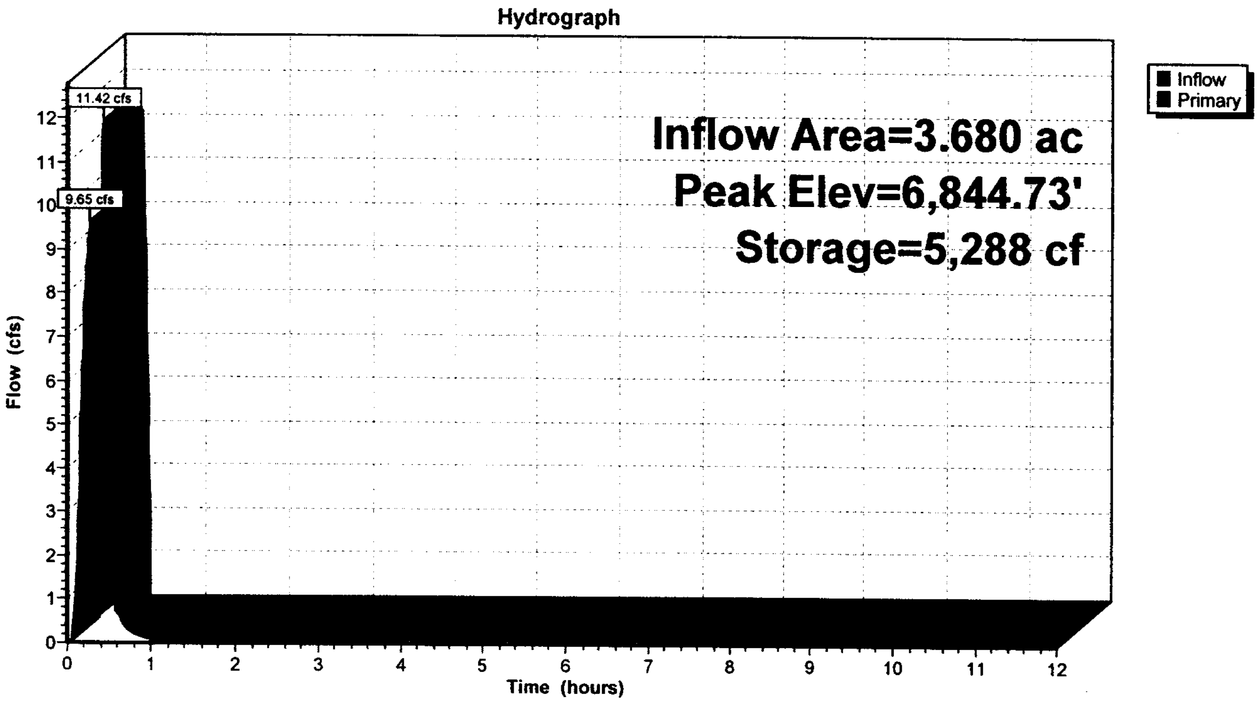
Volume	Invert	Avail.Storage	Storage Description
#1	6,843.00'	9,728 cf	**Custom Stage Data (Pyramidal)** Listed below

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

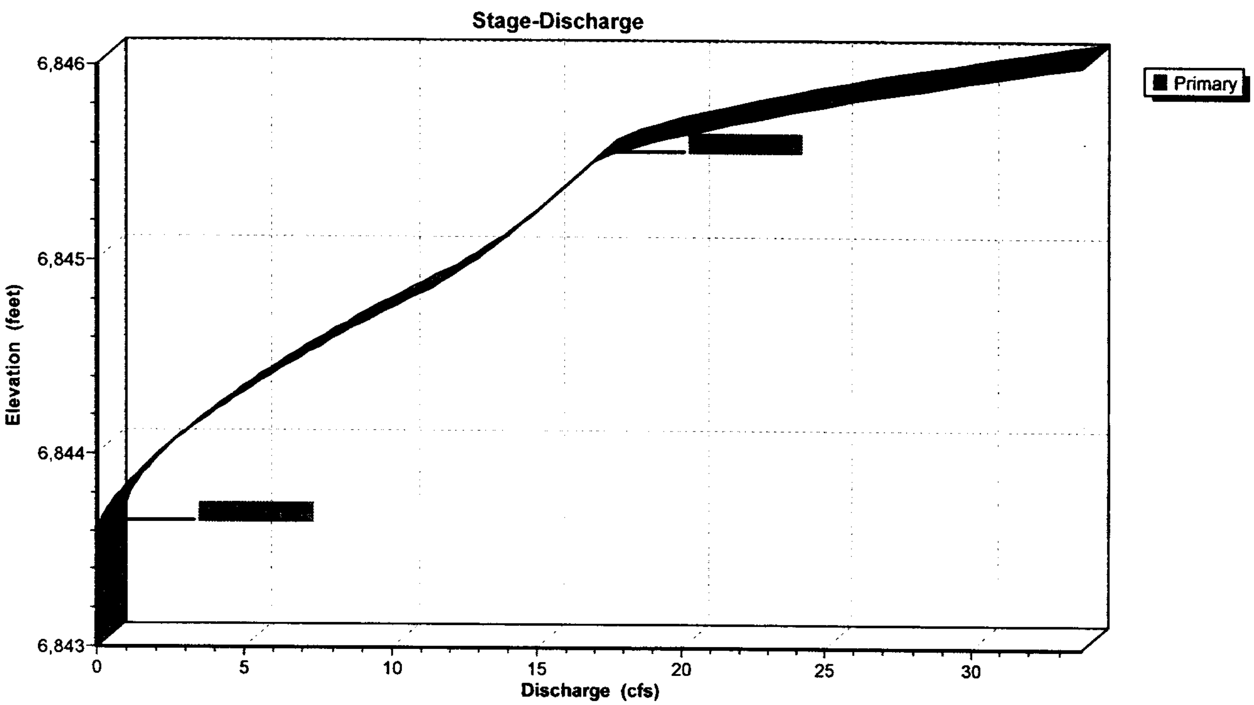
Device	Routing	Invert	Outlet Devices
#1	Primary	6,845.50'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,843.60'	**2.50' W x 1.25' H Vert. Orifice/Grate** C= 0.600

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)

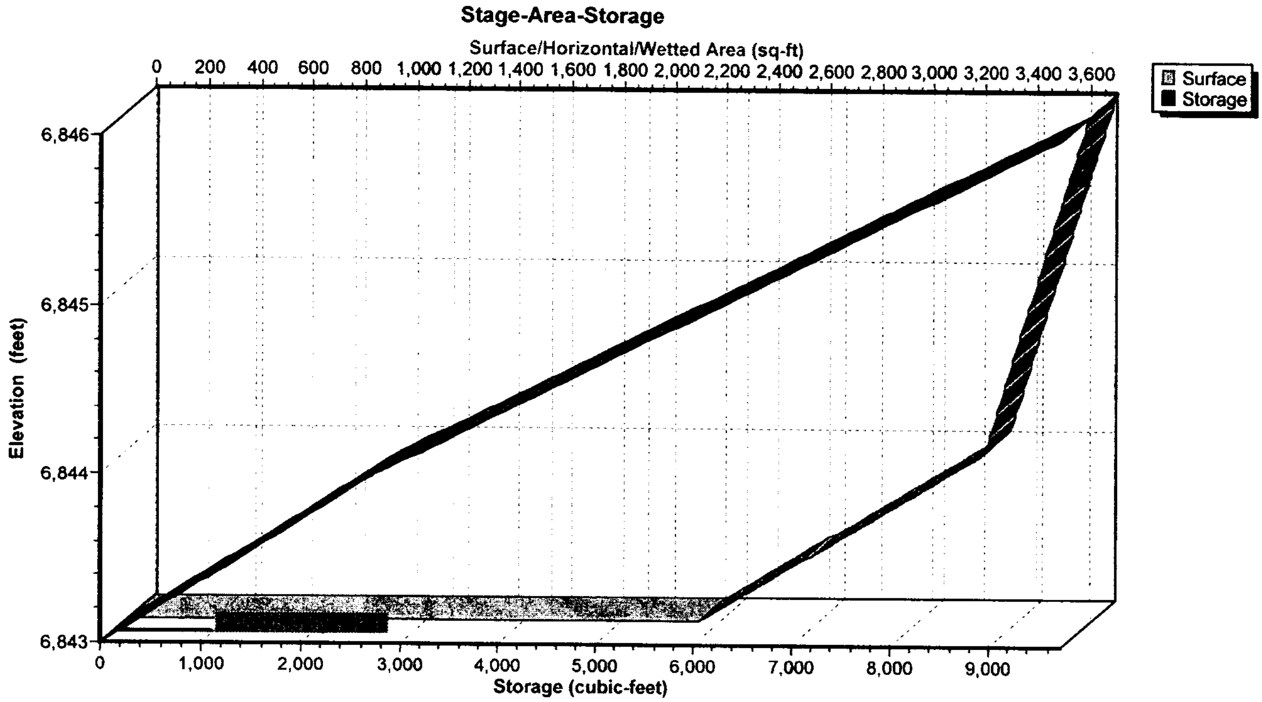
Pond Pond: East PLD



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)

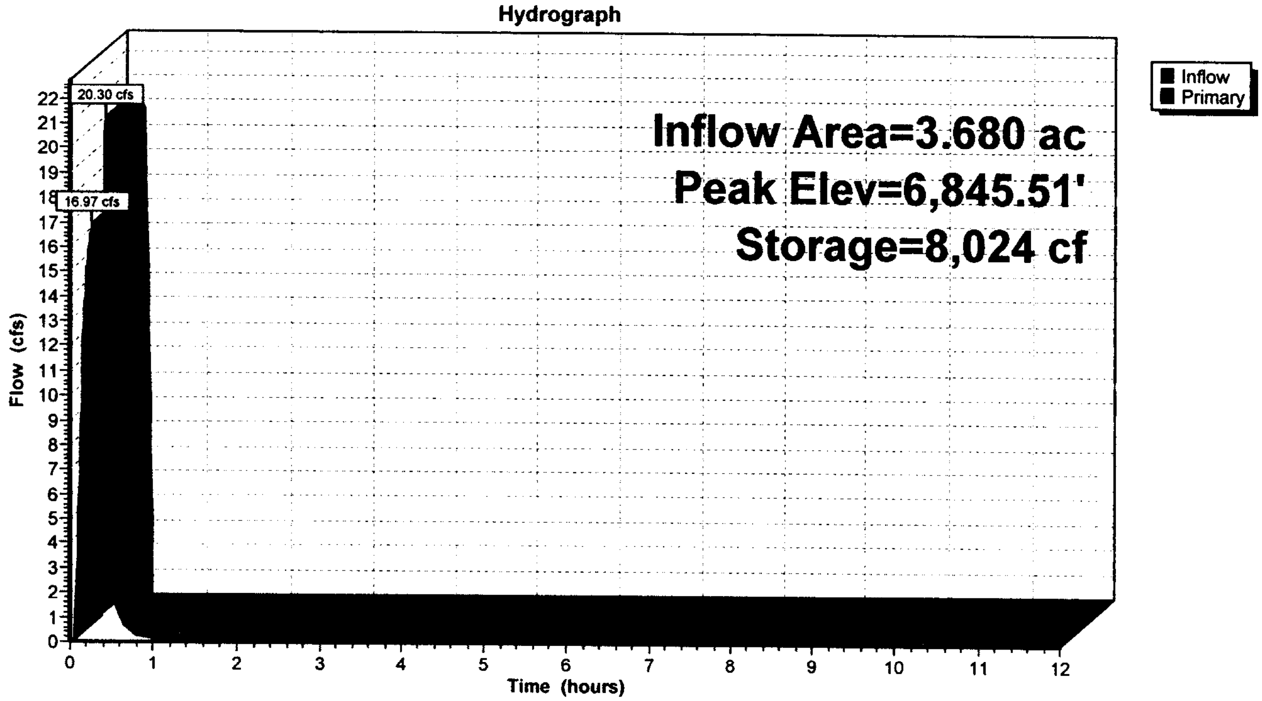
Volume	Invert	Avail.Storage	Storage Description
#1	6,843.00'	9,728 cf	**Custom Stage Data (Pyramidal)** Listed below

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

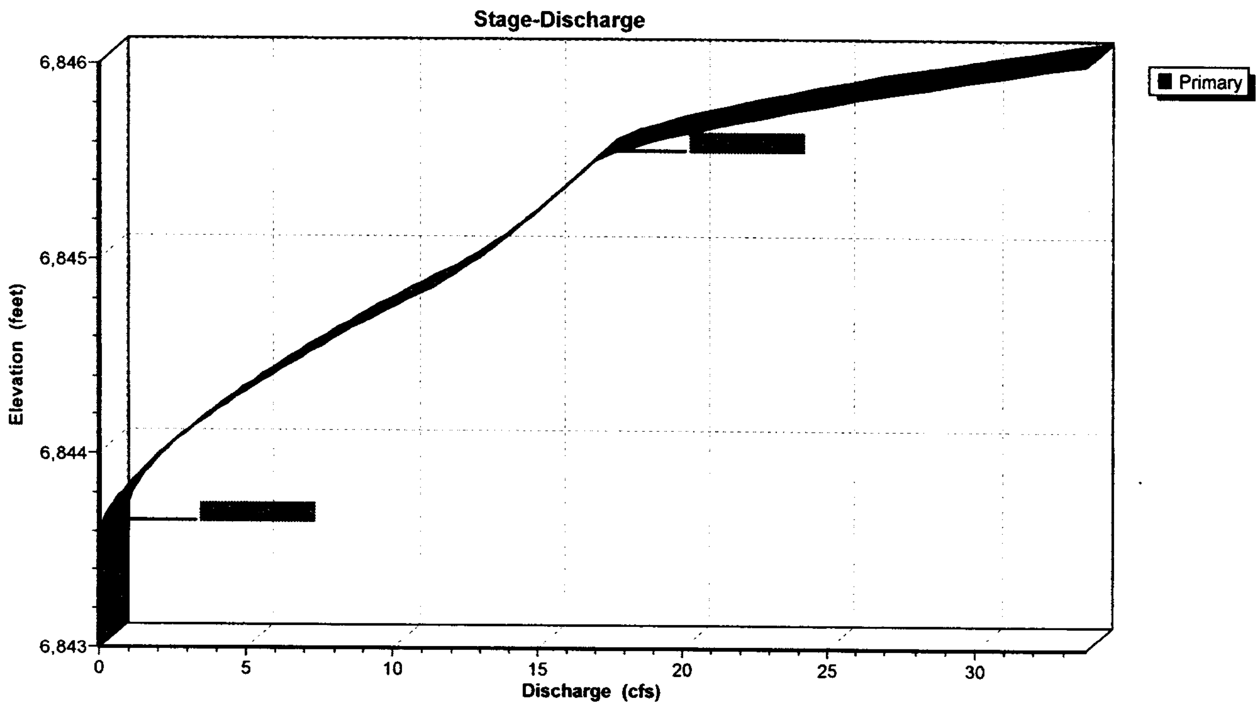
Device	Routing	Invert	Outlet Devices
#1	Primary	6,845.50'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,843.60'	**2.50' W x 1.25' H Vert. Orifice/Grate** C= 0.600

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)

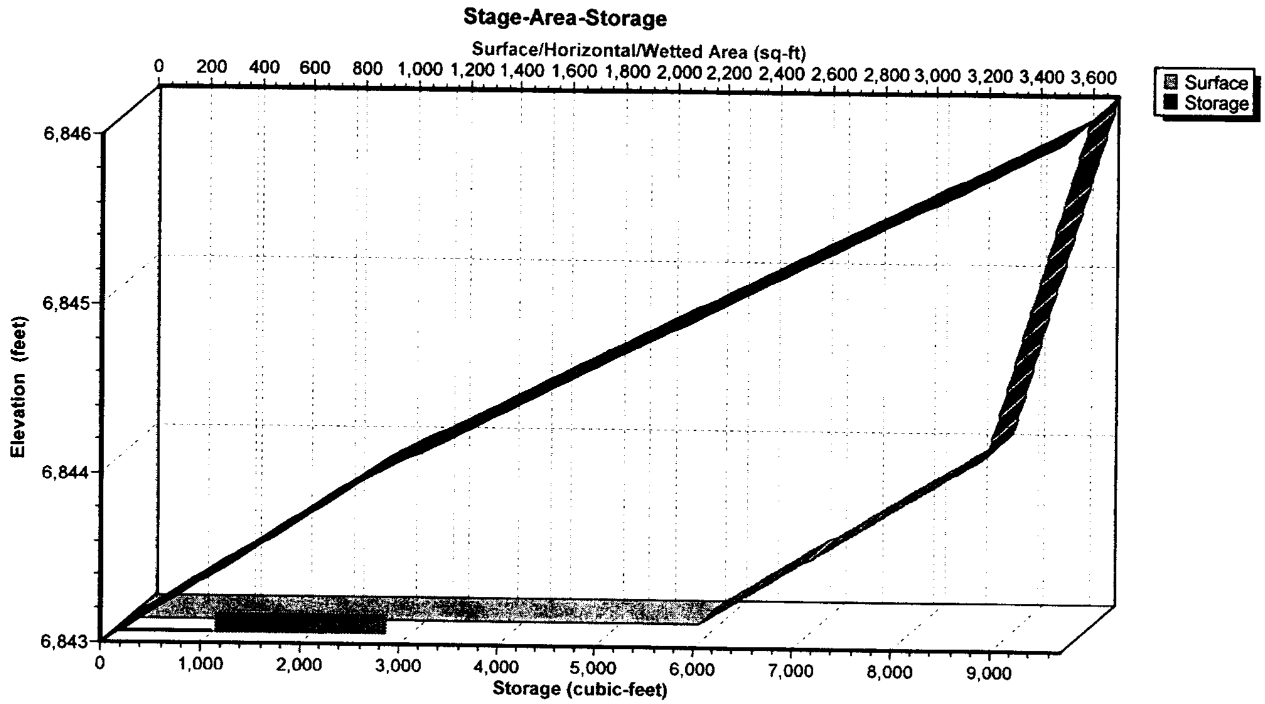
Pond Pond: East PLD



Pond Pond: East PLD



Pond Pond: East PLD

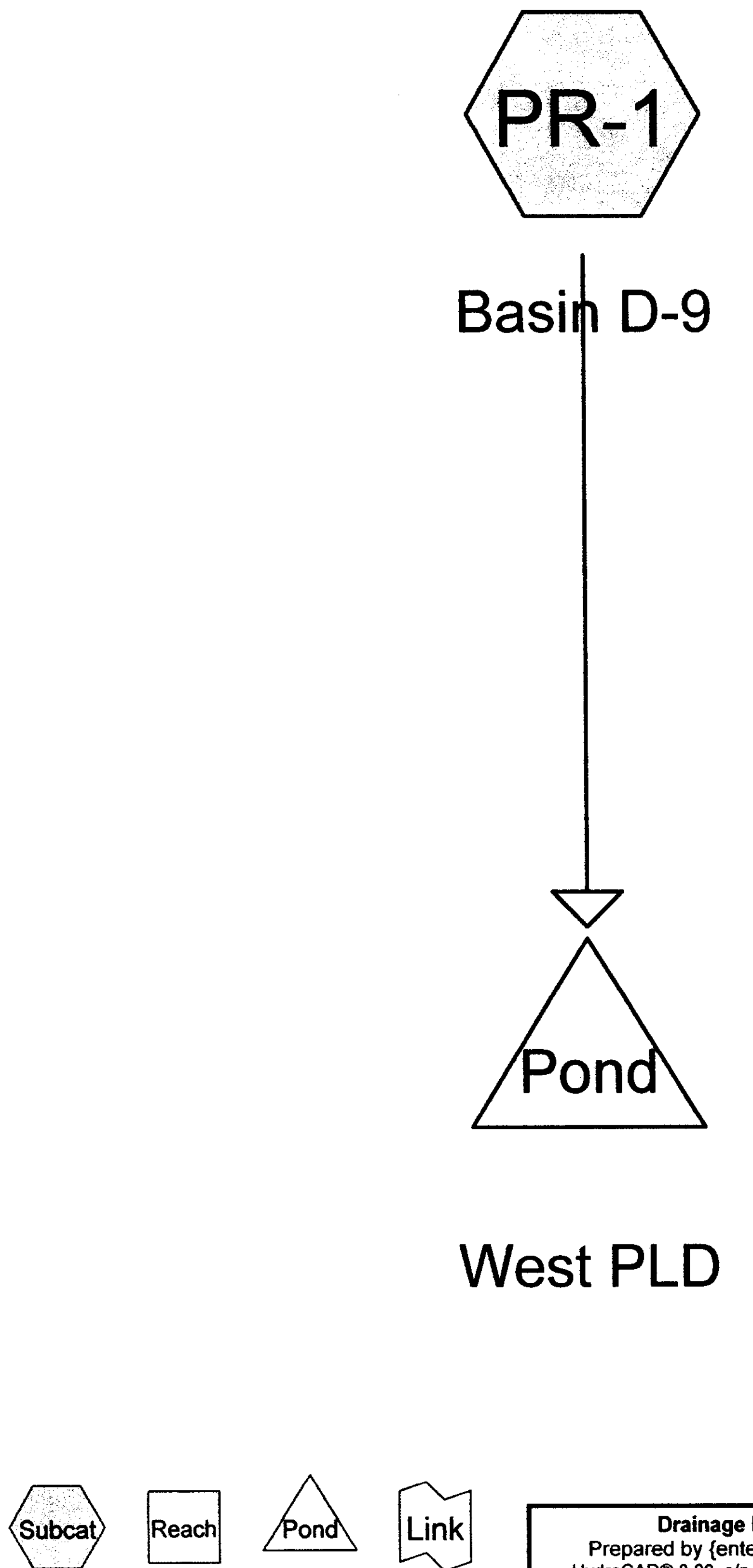


Design Procedure Form: Porous Landscape Detention (PLD)

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

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)

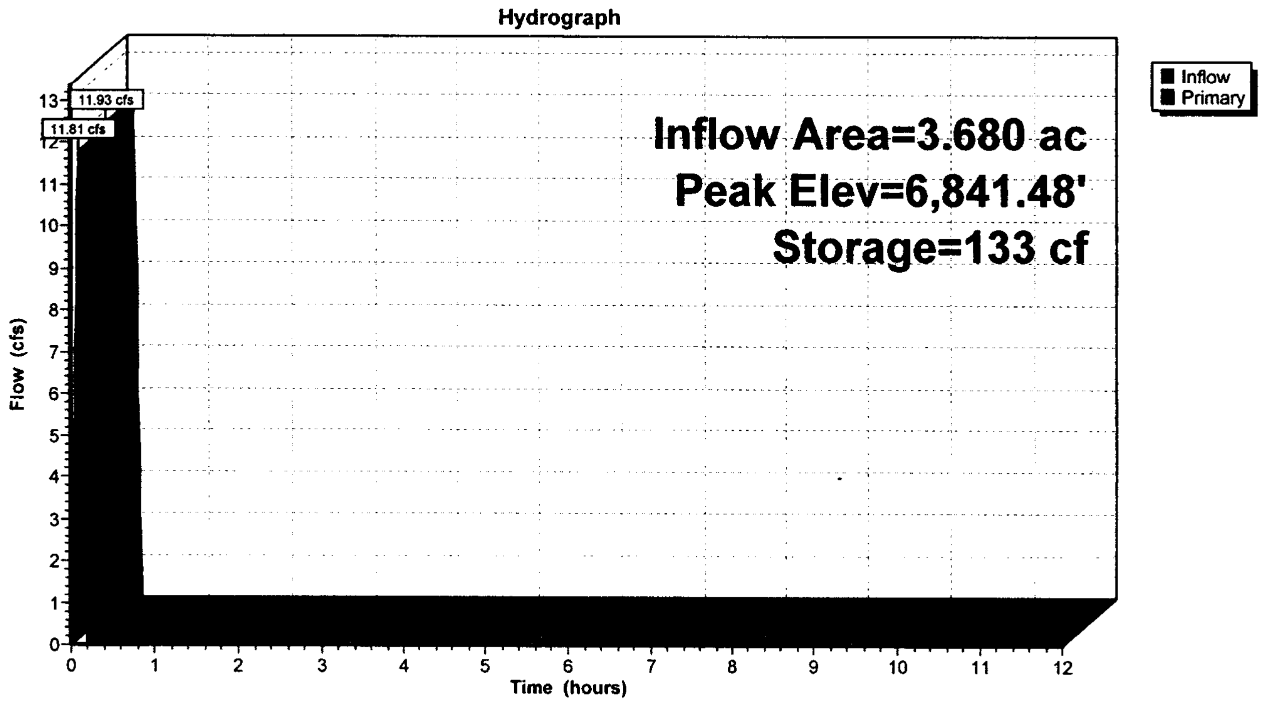
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

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

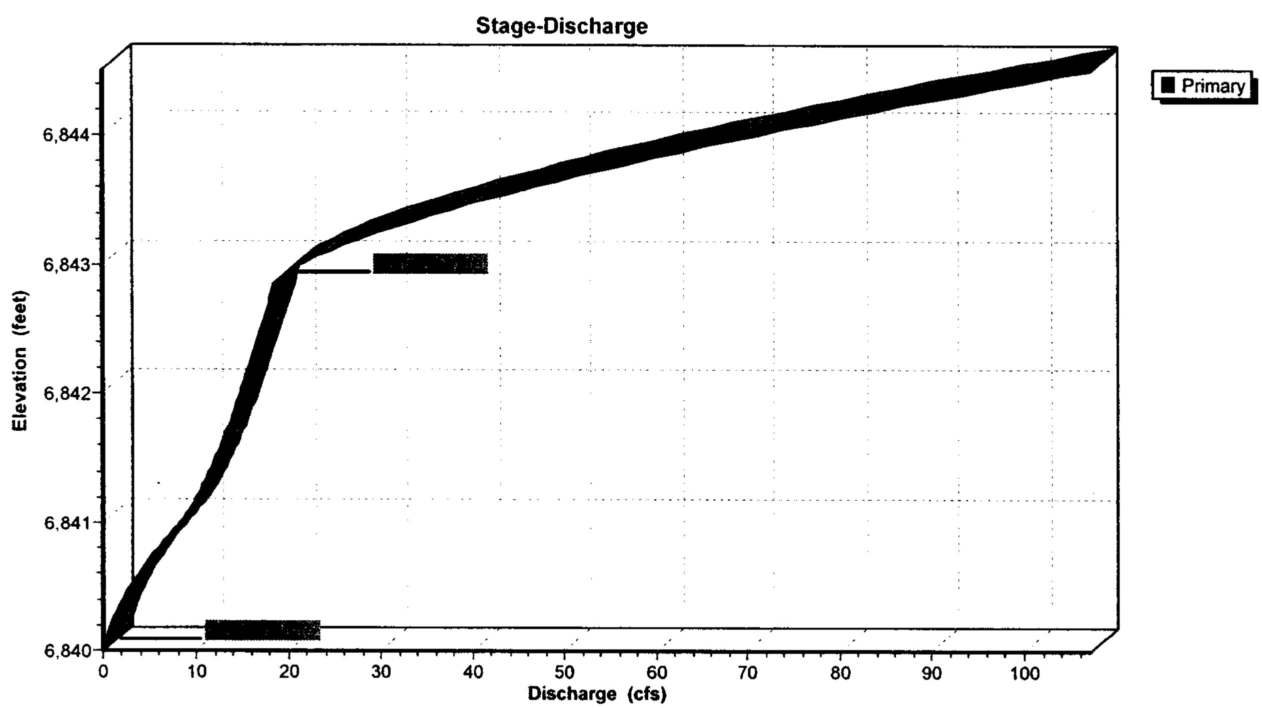
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

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)

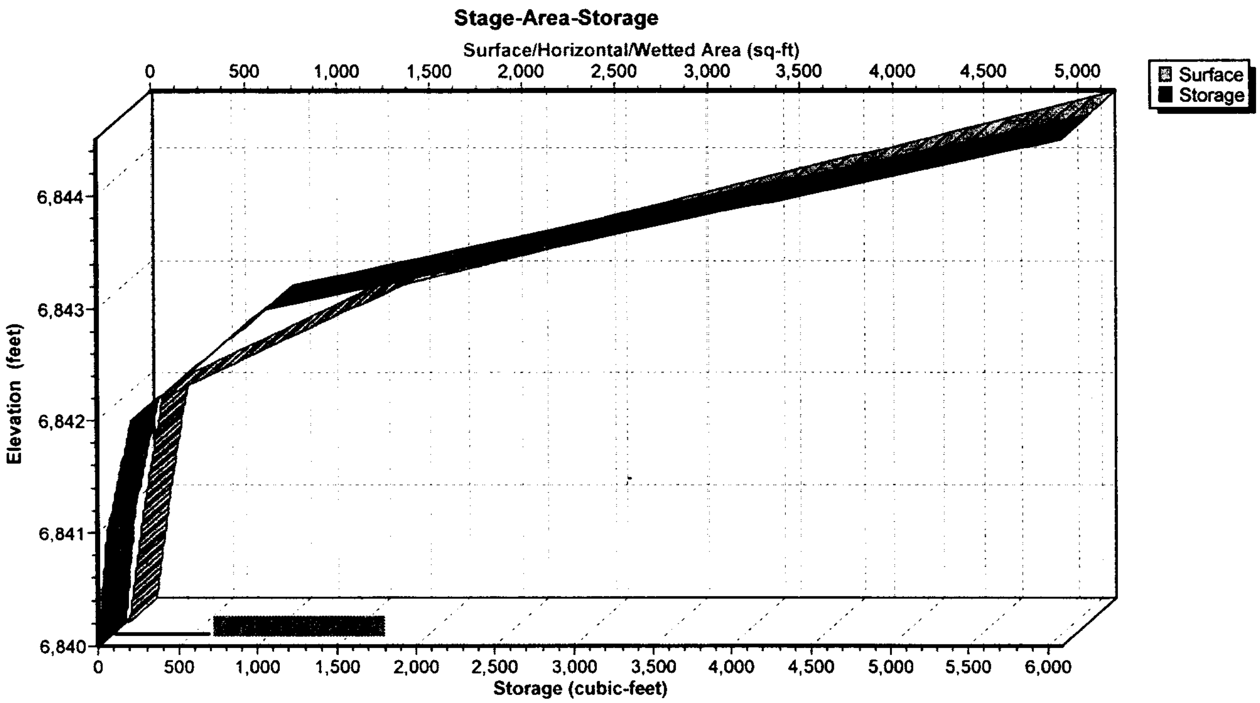
Pond Pond: West PLD



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)

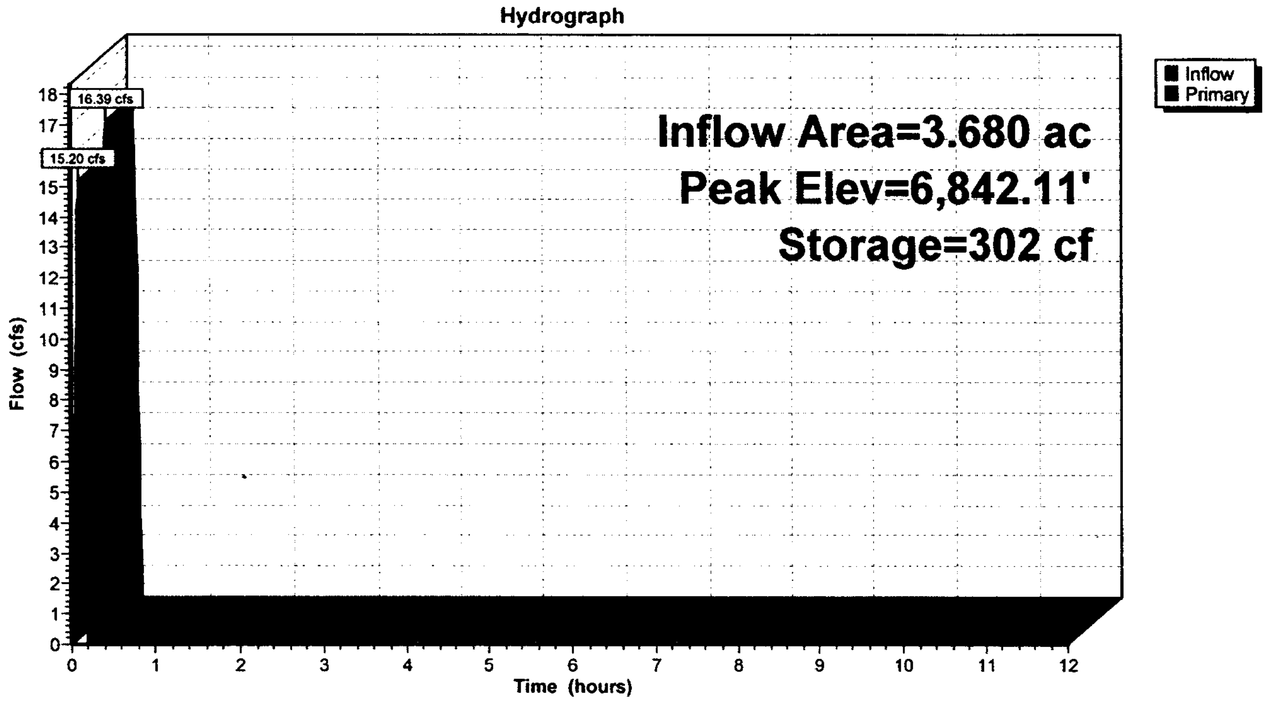
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

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

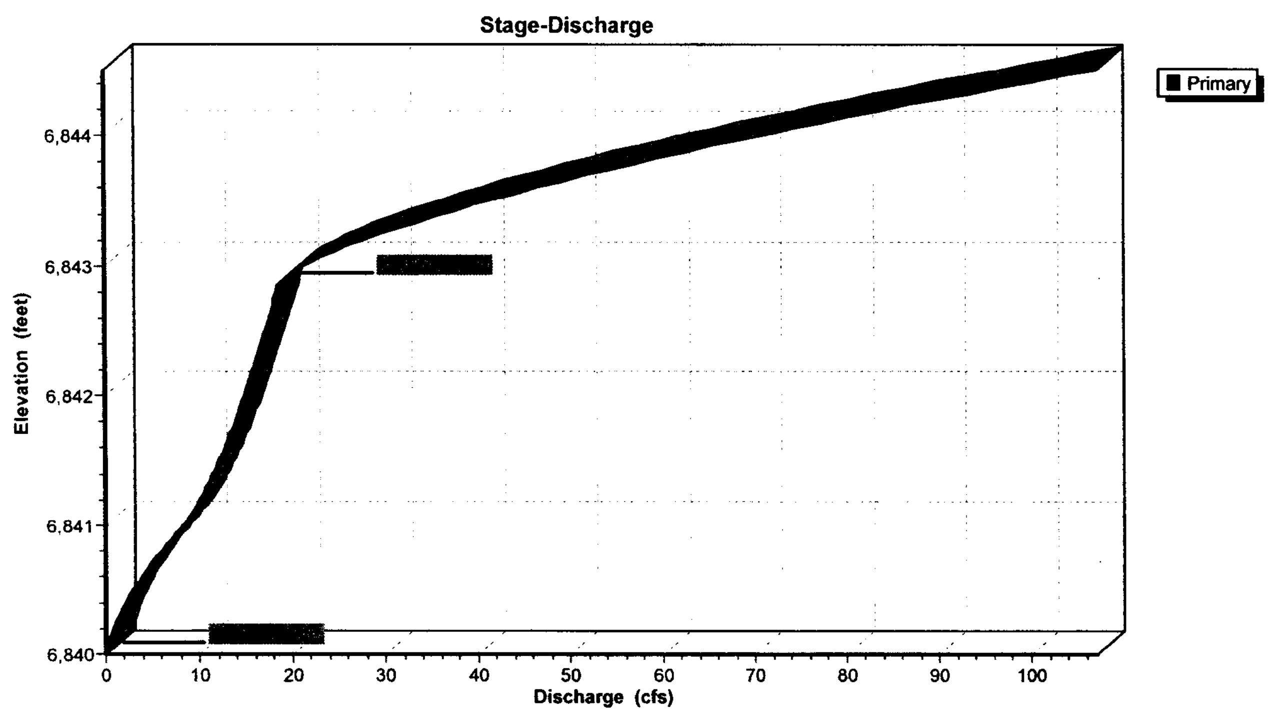
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

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)

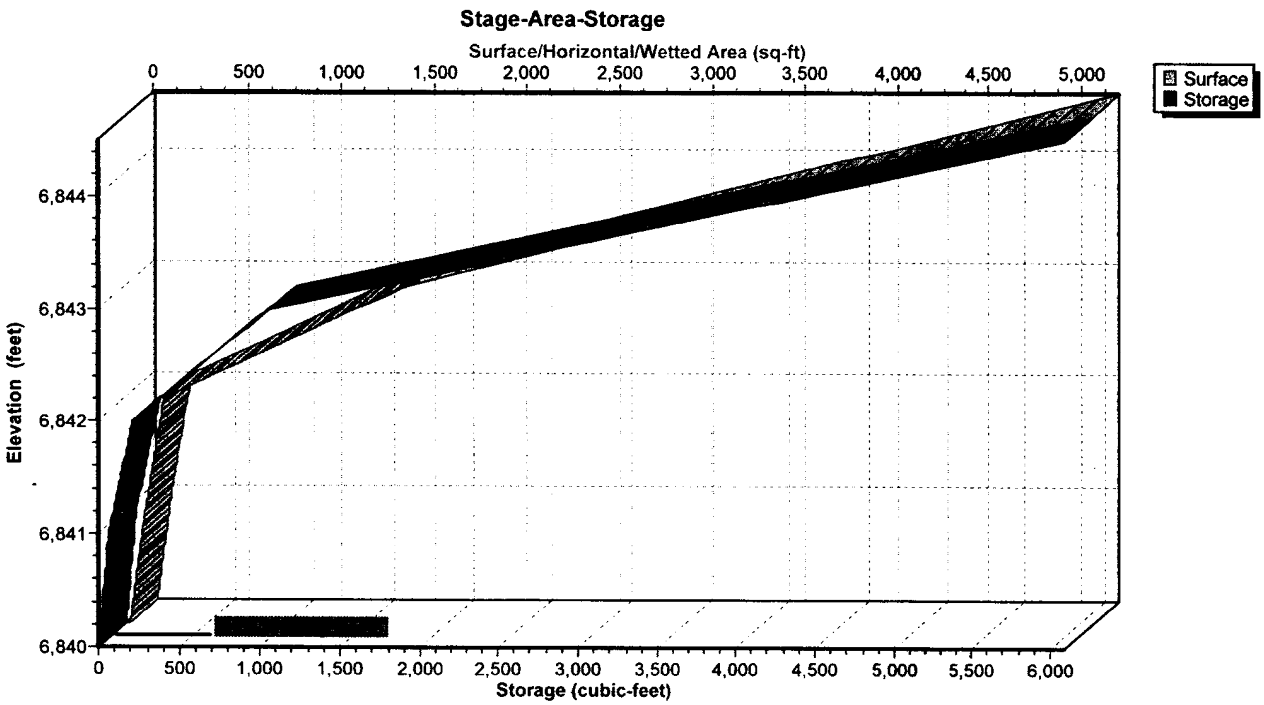
Pond Pond: West PLD



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)

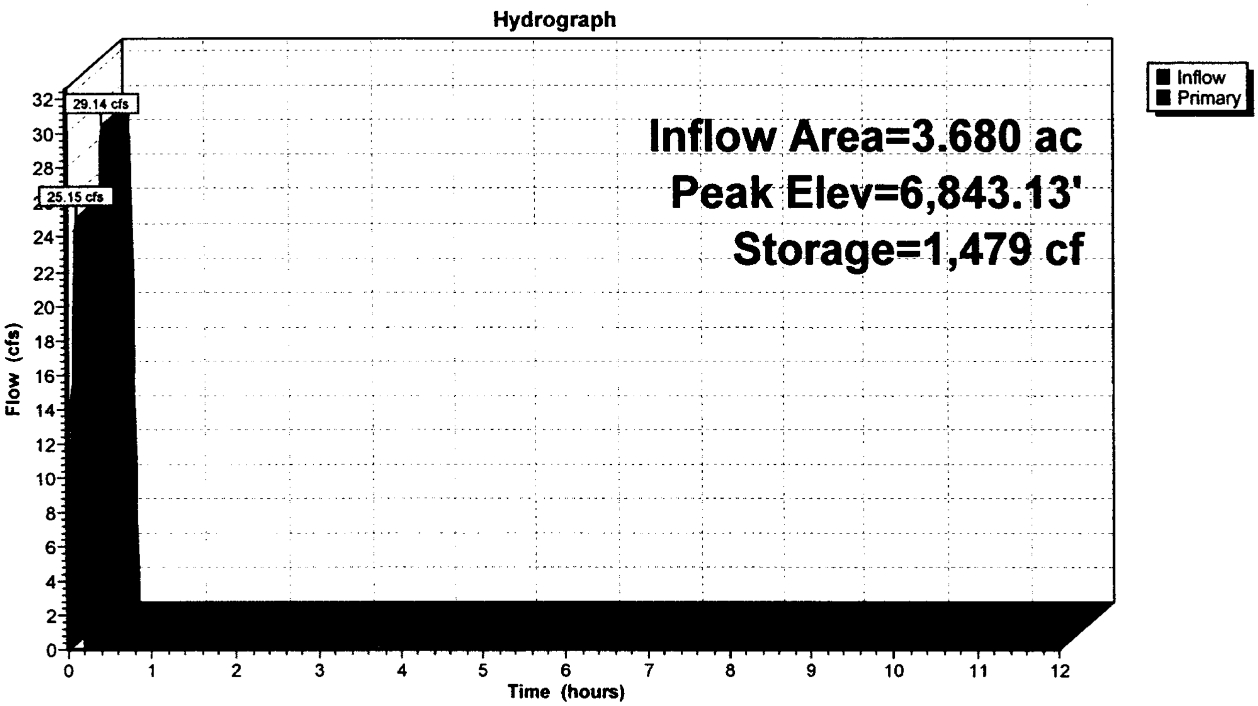
Volume	Invert	Avail.Storage	Storage Description
#1	6,840.00'	6,085 cf	**Custom Stage Data (Prismatic)** Listed below

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

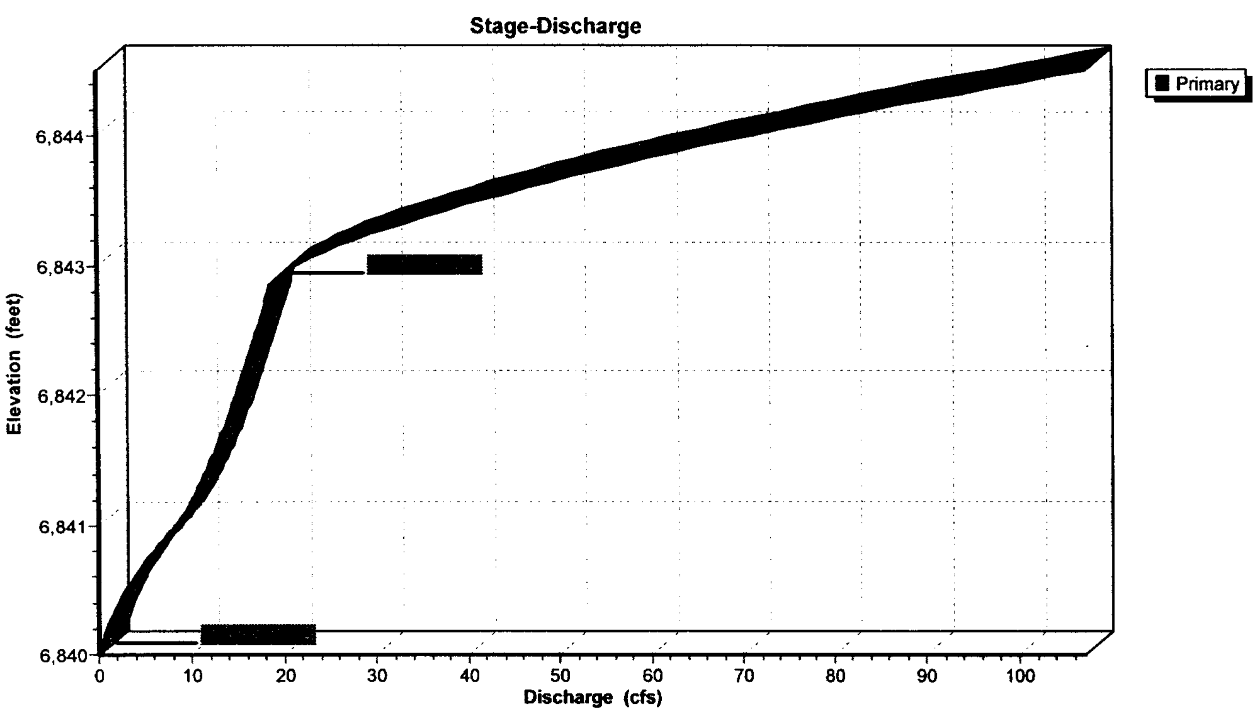
Device	Routing	Invert	Outlet Devices
#1	Primary	6,842.85'	**3.00' x 3.00' Horiz. Orifice/Grate** Limited to weir flow C= 1.000
#2	Primary	6,840.00'	**2.50' W x 1.00' H Vert. Orifice/Grate** C= 0.600

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)

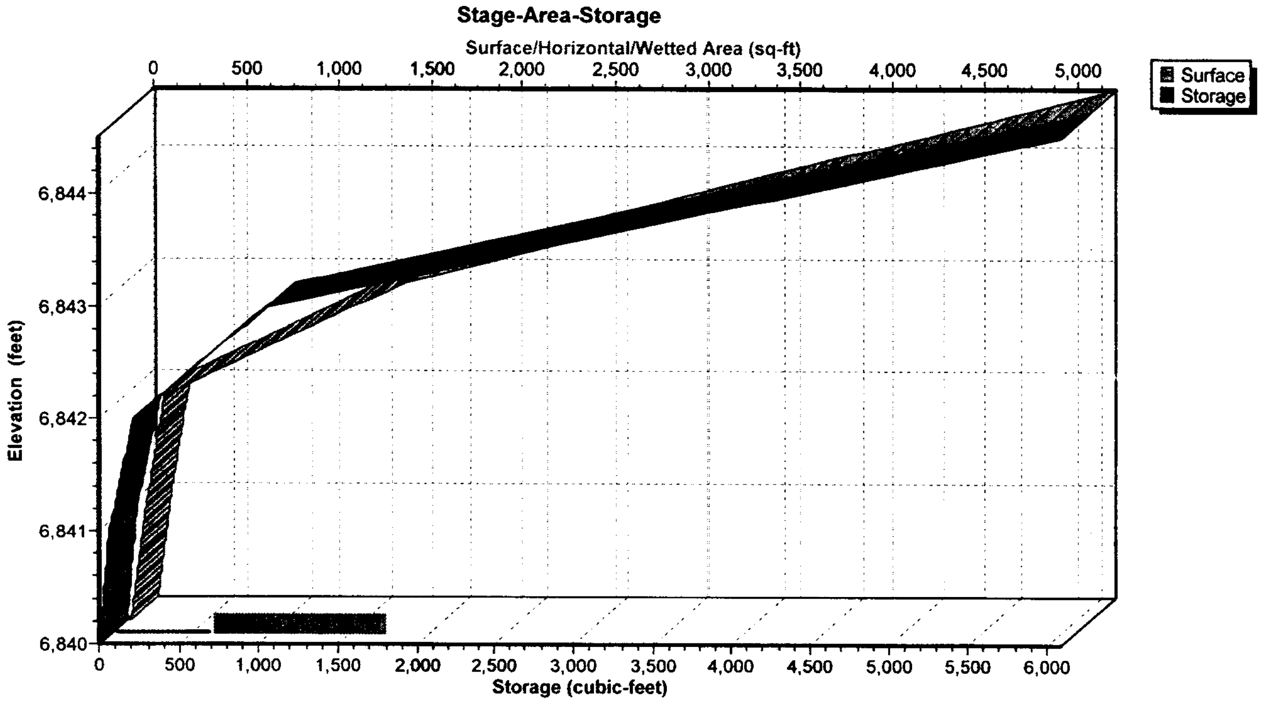
Pond Pond: West PLD



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

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INSPECTION AND MAINTENANCE 2

POROUS LANDSCAPE DETENTION FACILITY 2

OPERATION & MAINTENANCE LOG 4

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

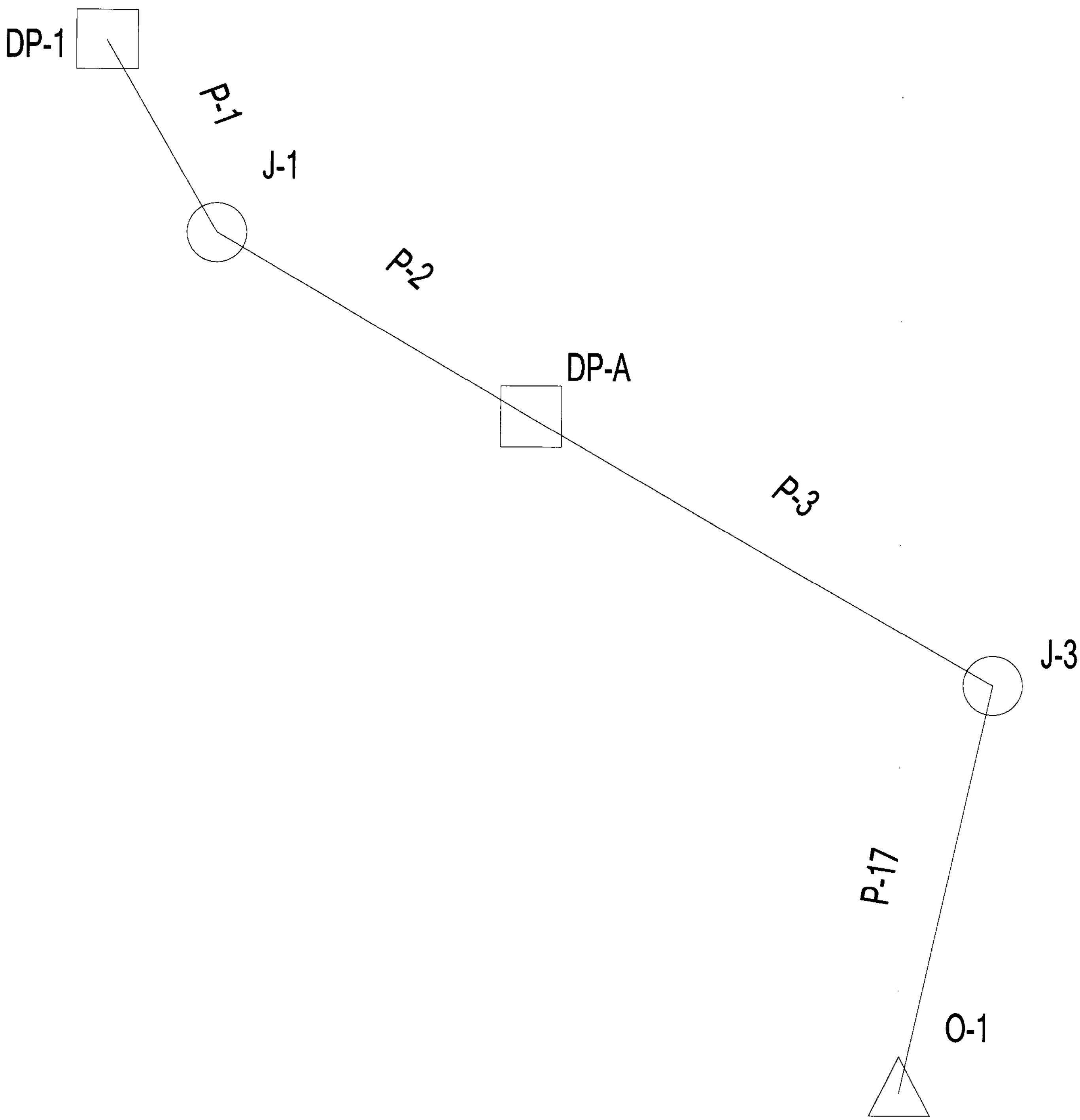
THE SHOPPES AT FALCON
OPERATION AND MAINTENANCE LOG

(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	Standai

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	Standai	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

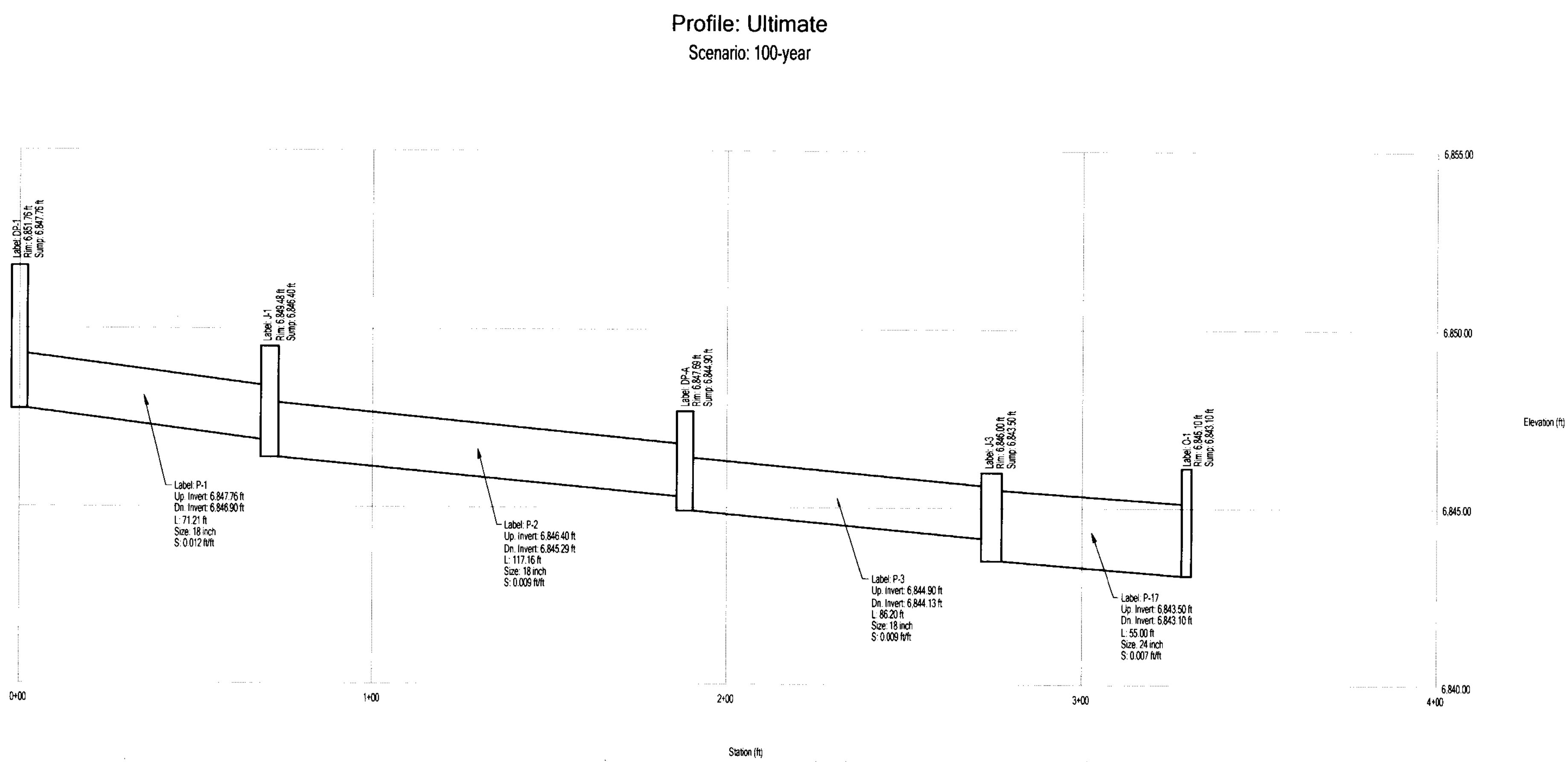
Label	Section Shape	Section Size	Length (ft)	Number of Sections	Constructed Slope (ft/ft)	Energy Slope (ft/ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
P-1	Circular	18 inch	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

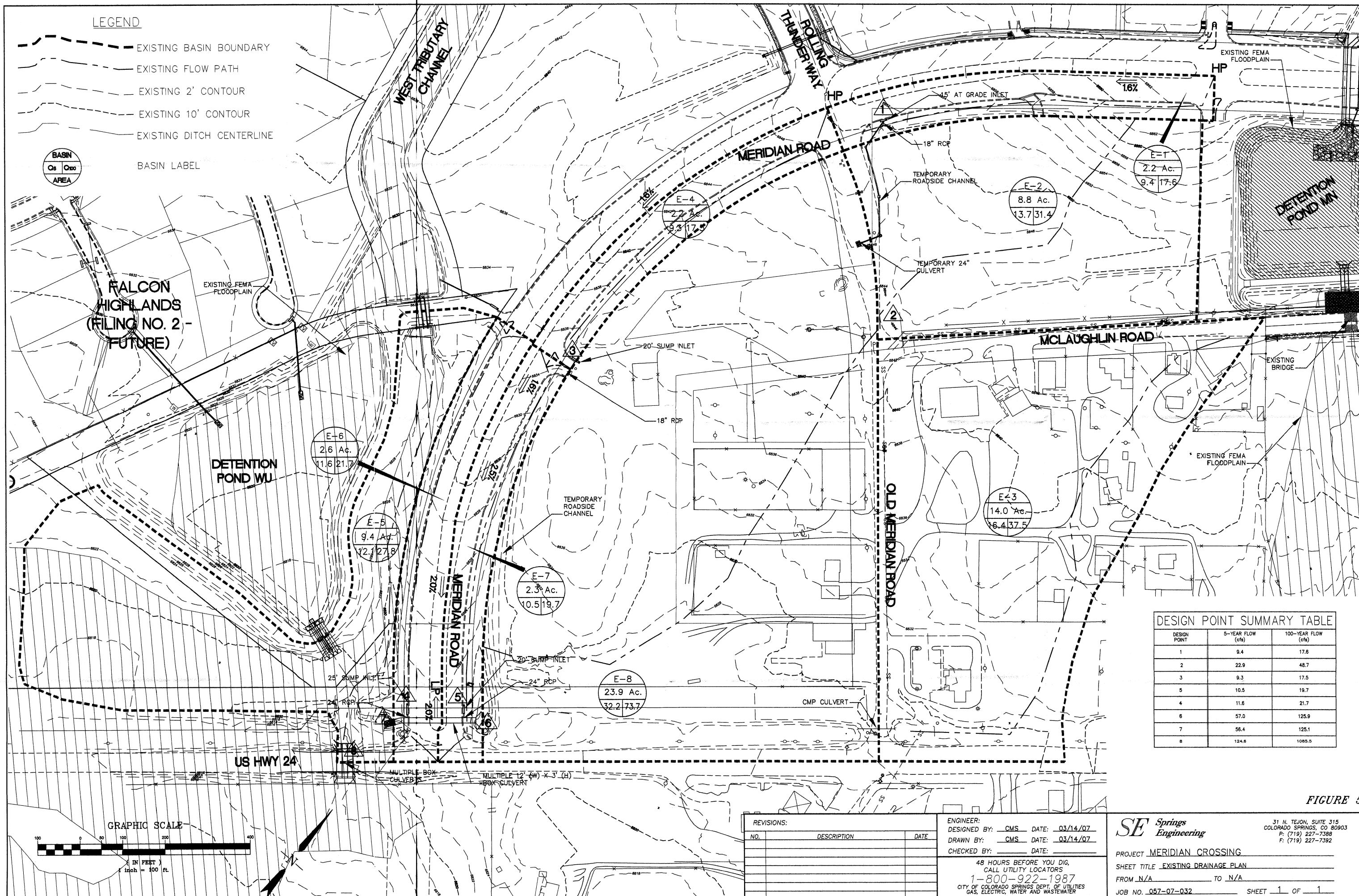
Scenario: 100-year

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





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:

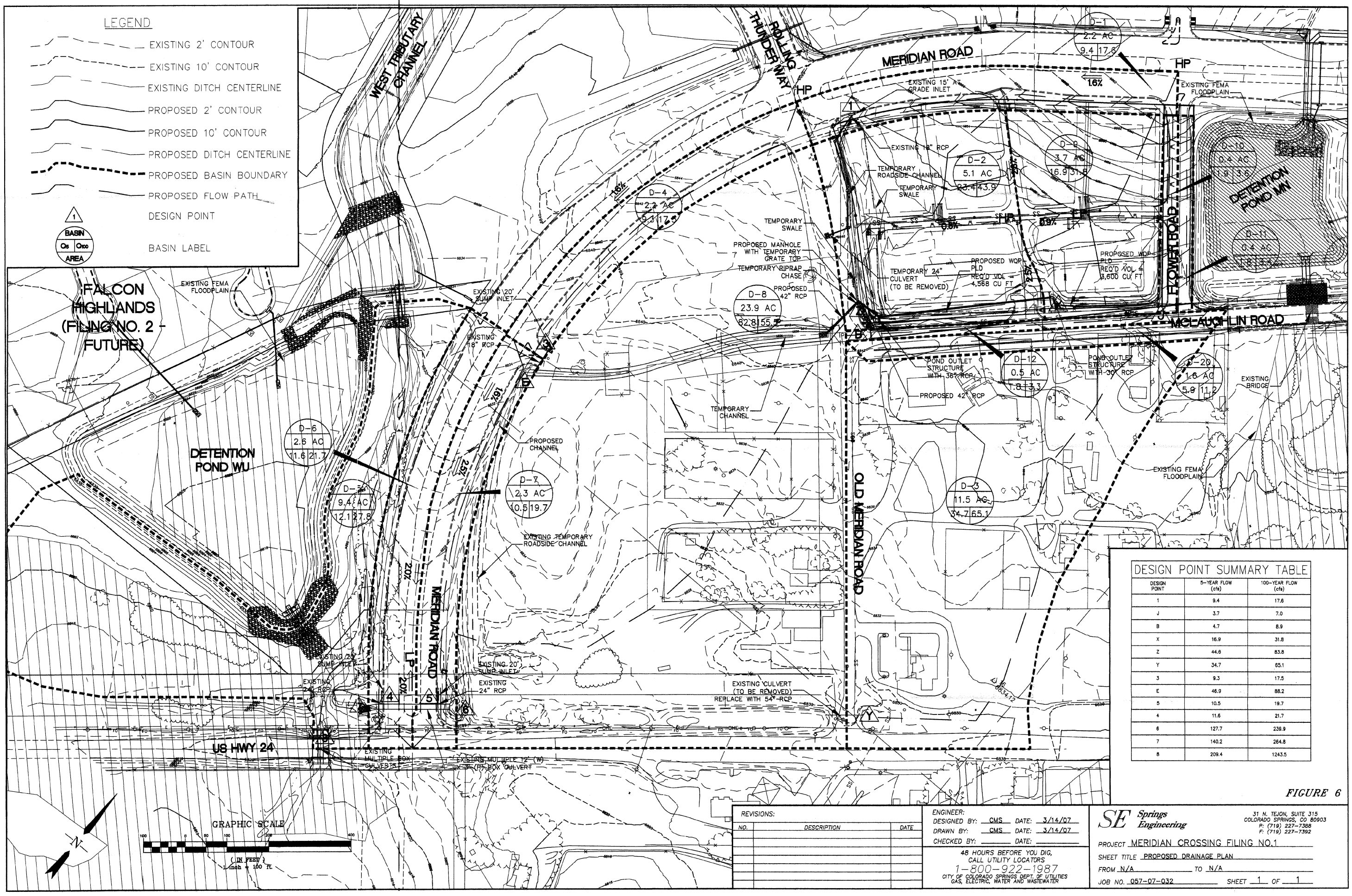
NO.	DESCRIPTION	DATE

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: ______

48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS
1-800-922-1987
CITY OF COLORADO SPRINGS DEPT. OF UTILITIES GAS, ELECTRIC, WATER AND WASTEWATER

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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

Cushing Terrell

APPENDIX F: PLD SITE PHOTOS


GUNS
LEWIS
STEVE LEWIS