VISTA ENGINEERING CORP.
CONSULTING ENGINEERS & LAND SURVEYORS

605 28¼ ROAD, SUITE B
GRAND JUNCTION, COLORADO 81506
TELEPHONE: (970) 243-2242
FAX: (970) 243-3810

FINAL DRAINAGE STUDY

HOLLOW CREEK SUBDIVSION

Prepared for:

Ruckman, Inc.
P.O. Box 2204
Grand Junction, CO 81502

NOVEMBER 1, 2006

4260.01-01

CERTIFICATION

I hereby certify that this Final Drainage Study the Hollow Creek Subdivision was prepared under my direct supervision.

Fredrick L. Larsen, P.E.
Registered Professional Engineer
State of Colorado, # 34866

TABLE OF CONTENTS

I. GENERAL LOCATION AND DESCRIPTION 1

A. SITE AND MAJOR BASIN LOCATION 1
1. Streets in the vicinity 1
2. Development in the vicinity 1
B. SITE AND MAJOR BASIN DESCRIPTION 1
1. Acreage 1
2. Ground Cover 1
3. Hydrologic Soil Types 1

II. EXISTING DRAINAGE CONDITIONS 2

A. MAJOR BASINS 2
1. General topography, drainage patterns and features, canals, ditches, wetlands 2
2. Previously determined 100 year flood plains 2
B. SITE 2
1. Historic Drainage Patterns 2
2. Inflow characteristics from up stream 2
3. Discharge characteristics to downstream sub-basins 3

III. PROPOSED DRAINAGE CONDITIONS 4

A. CHANGES IN DRAINAGE PATTERNS 4
1. Major basin 4
2. Site 4
B. MAINTENANCE ISSUES 5
3. Access 5
4. Ownership and responsibility 5

IV. DESIGN CRITERA AND APPROACH 6

A. GENERAL CONSIDERATIONS 6
1. Previous drainage studies performed in the area 6
B. HYDROLOGY 7
1. Design storms and precipitation 7
2. Runoff calculation method 7
3. Detention/retention basin design method 7
4. Parameter selection procedures 7
5. Analysis and design procedures 7
C. HYDRAULICS 7
1. Hydraulic calculation methods 7
2. Parameter selection procedures 8
3. Analysis and design procedures 8
4. Justification of proposed methods not presented or referenced in SWMM 8

V. ATTACHMENTS 9

A. HYDROLOGY 9
1. Existing Conditions 9
2. Post-Developed Conditions 9
B. FEMA FLOOD INSURANCE RATE MAP 9
1. Community Panel No. 080115 0265B 9
C. SOILS INFORMATION 9
D. HYDRUALIC CALCULATIONS 9

I. GENERAL LOCATION AND DESCRIPTION

A. SITE AND MAJOR BASIN LOCATION

1. Streets in the vicinity

The Hollow Creek Subdivision is located at 1662 K Road in Fruita Colorado. The site is bounded on the on north by the Potter property, on the east by the Queens Subdivision, on the west by Juniper Street, and on the south by K Road (aka Ottley Ave). The Evening Breeze and Santa Fe Ranch Subdivisions are to the west across Juniper Street.

The subdivision is located in the lower part of the Big Salt Wash drainage basin. Runoff from the proposed subdivision will be detained on site and released at a metered rate.

2. Development in the vicinity

The site is bounded on the on north by the Potter property, on the east by the Queens Subdivision, on the west by Juniper Street, and on the south by K Road (aka Ottley Ave). The Evening Breeze and Santa Fe Ranch Subdivisions are to the west across Juniper Street.

B. SITE AND MAJOR BASIN DESCRIPTION

1. Acreage

The site is approximately 9.9 Acres

2. Ground Cover

The ground cover is in generally poor condition. The property was previously used for agricultural purposes.

3. Hydrologic Soil Types

The site consists of primarily Sagrlite Loam and Turley Clay Loam both of which are considered to be a Type C soils. Type C soils have low infiltration rates when thoroughly wetted and consist of soils with a layer that impedes downward movement of water. These soils are moderately fine to fine in texture.

II. EXISTING DRAINAGE CONDITIONS

A. MAJOR BASINS

1. *General topography, drainage patterns and features, canals, ditches, wetlands*

   The subdivision is located in the lower part of the Big Salt Wash drainage basin. Runoff from the proposed subdivision will be detained on site and released at a metered rate.

   The Big Salt Wash is northwest of the site.

2. *Previously determined 100 year flood plains*

   The site is located in the 500-year floodplain (Zone X) as described on the FEMA Flood Insurance Rate Map Community Panel Number 080115 0265B (see attached). The Flood Insurance Rate Map does not indicate a base flood elevation from which to design top of footing elevations. The top of footing elevations for the homes are designed to be a minimum of 1.5 feet above the curb and gutter flow line elevation at the low corner of the individual building lots.

   Review of the Final Drainage Study for the Evening Breeze Subdivision reveals that a request for a letter of map revision was made on February 12, 1999. The Federal Emergency Management Agency responded with a Letter of Map Revision dated effective May 4, 2000. The revised 100-year floodway elevation correction does not affect this site.

B. SITE

1. *Historic Drainage Patterns*

   The site historically drains southeast toward K Road. Drainage was collected by a tailwater ditch. The tailwater ditch historically conveyed the flows west across Highway 50 and on to the Big Salt Wash.

2. *Inflow characteristics from up stream*

   There are no apparent inflows for up stream of the existing site. The site is bounded to the north by the Potter property, on the east by the Queens Subdivision, on the west by Juniper Street, and on the south by K Road (aka Ottley Ave). The Evening Breeze and Santa Fe Ranch Subdivisions are to the west across Juniper Street.

   The Potter property generally drains to the Big Salt wash. The Evening Breeze Subdivision and the Santa Fe Ranch Subdivision to the west and the Evening Breeze Subdivision to the east convey drainage away from this site.

3. *Discharge characteristics to downstream sub-basins*

The site historically drains southeast toward K Road. Drainage was collected by a tailwater ditch. The tailwater ditch historically conveyed the flows west across Highway 50 and on to the Big Salt Wash.

III. PROPOSED DRAINAGE CONDITIONS

A. CHANGES IN DRAINAGE PATTERNS

1. *Major basin*

The proposed subdivision will not significantly alter the Big Salt Wash drainage patterns.

2. *Site*

The onsite drainage patterns will be altered by directing flows from finished residential subdivision lots to the subdivision roadways. The roadways will convey storm flows to the proposed detention facility located near the intersection of Juniper Street and K Road.

Several lots along Juniper Street will drain across Juniper Street to the Santa Fe Ranch Subdivision. An existing V-pan crossing Juniper Street at near the intersection with Santa Fe Circle shall be extended to join with the proposed curb and gutter to be constructed along the east side of Juniper Street. Lots 3 through 6 of Block 3 will drain to Juniper Street flowing south to the V-pan and the west to the Santa Fe Ranch Subdivision. It is assumed that this was the intent of the original Santa Fe Ranch Subdivision design.

The remainder of the lots fronting Juniper Street will drain to the proposed curb and gutter flowing south to the intersection of Birchwood Avenue and Juniper Street. A combination curb inlet at the north east curb return will collect the flows from Juniper Street and the north curb line of Birchwood Avenue and direct them into the detention pond via a second combination curb inlet on the south curb line of Birchwood Avenue (see the Grading and Drainage Plan included).

The combination curb inlet on the south curb line of Birchwood Avenue will collect flows from Birchwood Avenue/Street. The combination curb inlets are of adequate size to capture greater than the 10-year event flows (see curb inlet calculations in the appendix). Each inlet will capture approximately 4 cfs at a depth of 0.5 feet in a sump condition. The excess flows generated by the major storm event will overtop the side walk and flow into the detention pond.

B. MAINTENANCE ISSUES

3. *Access*

Access to the detention pond will be via the intersection of Juniper Street and Birchwood Avenue. The pond is graded to slope at 6:1 near the intersection to allow for access by equipment for maintenance of the detention pond.

4. *Ownership and responsibility*

The home owners association will maintain the detention pond landscaping and the City of Fruita will maintain the inlets, piping, outfall structure, and the connection to the 24" storm drain in K Road.

IV. DESIGN CRITERA AND APPROACH

A. GENERAL CONSIDERATIONS

1. Previous drainage studies performed in the area

There have been three drainage studies performed in the area surrounding the proposed subdivision. These are the final drainage studies for the Queens Subdivision, the Santa Fe Ranch Subdivision, and the Evening Breeze Subdivision.

The Final Drainage Study for the Evening Breeze Subdivision revised February 15, 1999 by Atkins and Associates, Inc. indicates that the subdivision drains directly to the Big Salt Wash.

The Final Drainage Study for the Santa Fe Ranch Subdivision dated September 24, 2003 by this office also indicates that the subdivision drains directly to the Big Salt Wash.

The Drainage Report for the Queens Subdivision dated June 2003 by Crane Associates indicates that the subdivision drains to the Big Salt Wash via a 24" HDPE storm drain installed in K Road. Based upon the analysis performed by Crane Associates the Queens Subdivision generates a peak flow of approximately 15 cfs during the 100-year storm event. The as-built record drawings obtained from the City of Fruita indicate that the 24" storm drain was laid on a slope of approximately 0.004 ft/ft with manholes every 300 ft.

This results in a flow capacity, as defined by the City of Fruita, of approximately 17 cfs (see attached calculations). The City of Fruita defines the storm drain capacity as the depth of flow equal to the diameter of the pipeline ($d_w/\phi = 1$) allowing for no surcharging of the sewerline during the 100-year storm event.

The Preliminary Drainage Study for this site indicates that the existing Haller property generates a peak flow of approximately 7 cfs and the developed subdivision will generate peak flows of approximately 13 cfs during the 100-year storm.

The hydrologic model for the post developed drainage conditions indicates that the subdivision will generate approximately 15 cfs during the 100-year storm event and discharge flows through the proposed detention basin at a rate of approximately 5 cfs.

At the proposed detention basin outlet manhole the existing 24" stormdrain will surcharge approximately 1.7 feet above the pipeline crown under the combined 100-year storm event peak flows from the Queens Subdivision and the post-developed peak flows from the proposed Hollow Creek Subdivision.

V. ATTACHMENTS

A. PRELIMINARY HYDROLOGY

1. *Existing Conditions*

2. *Proposed Conditions*

B. FEMA FLOOD INSURANCE RATE MAP

1. *Community Panel No. 080115 0265B*

C. SOILS INFORMATION

D. HYDRUALIC CALCULATIONS

HYDROLOGY MODEL

Existing Conditions

Proposed Conditions

Fee Calc

Type C soils

~~Curve # undeveloped = 74 -~~
~~=> Equivelent to C factor of~~

~~Curve # developed = 84~~
~~=> Equivelent to C factor of~~

From Table 702 summm Type C soil

$C_{undeveloped} = .53$ (.1 Imperv.)

$C_{developed} = .58$ (.42 Imp.) →

$Fee = 14{,}828(.58 - .53)A^{.7}$ $A = 9.9$ acres

$= 3689.75$ for Q at $Q_{developed}$

However, detention reduces Q_d

$Q_h = 5.78$ cfs (In this report)

$Q_d = 15.10$ cfs (w/o detention) - this report

$Q_d = 8.24$ cfs (w/ detention) 4/26/07 Report

$Q_d - Q_h$ reqd $= 15.10 - 5.78 = 9.32$ cfs

$Q_d - Q_h$ ~~resulting~~ design $= 8.24 - 5.78 = 2.46$ cfs

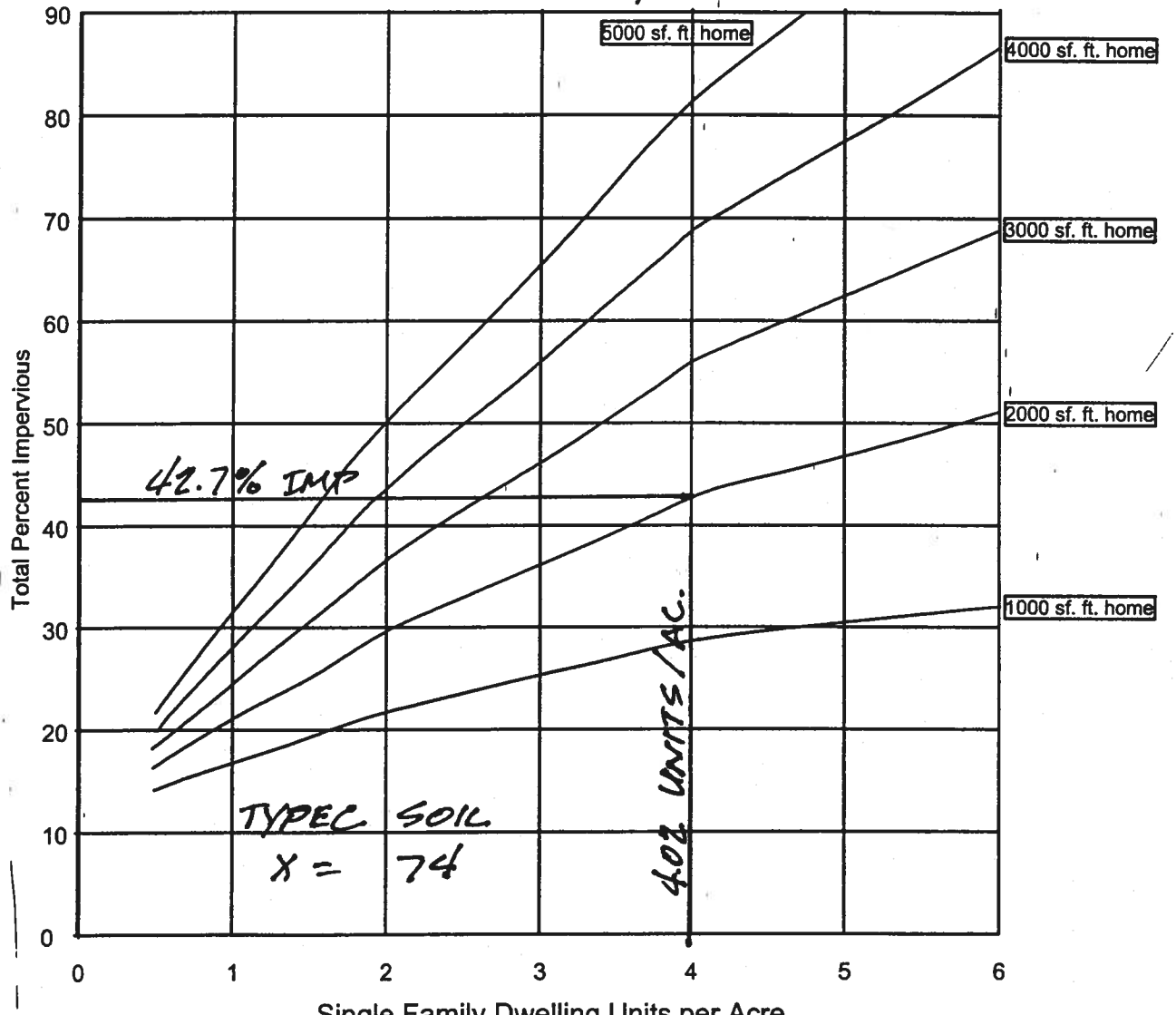
$Fee = 3689.75 \times \frac{2.46}{9.32} = \$973.90$

EWM 5-25-07

STORMWATER MANAGEMENT MANUAL

Watershed Imperviousness, Single-Family Residential Ranch Style House

HOLLOW CREEK SUBDIVISION
1662 OTTLEY AVE.



$CN = 98(IMP) + X(1-IMP)$ Eq 708

$98(0.427) + 74(1-0.427)$

$= 84.25$

84

USE CN = 90

Revision	Date
ORIGINAL ISSUE	3/27/06

WRC ENGINEERING, INC.

REFERENCE: UDFCD 2001. Urban Storm Drainage Criteria Manual, Volume 1

FIGURE 703

RUNOFF CURVE NUMBERS

Land Use or Surface Characteristic	Average Imperv. (%)	Runoff Curve Number Soil Complex A	B	C	D
Business					
Commercial Areas	85	89	92	94	95
Neighborhood Areas	70	80	87	91	93
Residential					
Single Family (note 1)	(note 1)				
Multi-unit (detached)	60	74	83	88	91
Multi-unit (attached)	75	83	89	92	94
Apartments	80	86	91	93	94
Industrial					
Light	80	86	91	93	94
Heavy	90	92	94	96	96
Parks, cemeteries	5	42	63	75	81
Playgrounds	10	45	65	76	82
Schools	50	69	80	86	89
Railroad yards	15	48	67	78	83
Irrigated Areas					
Lawns, parks, golf course	0	39	61	74	80
Agriculture	0	39	61	74	80
Undeveloped Areas					
Pre-development conditions	2	40	62	74	80
Greenbelts, agriculture	2	40	62	74	80
Off-site analysis when land use Unknown	45	66	78	85	88
Outcrops	70	80	87		94
Streets/Roads					
Paved	100	98	98	98	98
Gravel	40	63	76	84	87
Drives/Walks	90	92	94	96	96
Roofs	90	92	94	96	96

Note 1: Estimate imperviousness from Figures 703, 704, and 705. Then compute Curve Number, CN, from equation 708, based on NRCS Soils type.

NOTE: ESTIMATE IMPERVIOUS FROM FIGURES 703, 704, 705. THEN COMPUTE CURVE NUMBER, CN, FROM EQUATION 708, BASED ON NRCS SOILS TYPE. USE OF THIS TABLE IS LIMITED TO EVALUATION OF IMPERVIOUSNESS FOR FUTURE DEVELOPMENT PROJECTIONS WITHIN REGIONAL WATERSHED MASTER PLANS, OR IN CONCEPTUAL DRAINAGE PLANS.

Revision	Date
ORIGINAL ISSUE	3/27/06

WRC ENGINEERING INC

REFERENCE: SCS TECHNICAL RELEASE NO. 55 (1986)

TABLE 704

The soil group is determined from published soil maps for the area, which correlates each soil name with the soil group. Land use and treatment class are determined during field visits or from aerial photographs. Procedures for determining land use and treatment class are found in Chapter 8 of National Engineering Handbook, Section 4 (SCS, 1985). Antecedent moisture condition of the watershed is explained as follows:

The amount of rainfall in a period of 5 to 30 days preceding a particular storm is referred to as antecedent rainfall, and the resulting condition of the watershed in regard to potential runoff is referred to as an antecedent moisture condition. In general, higher amounts of antecedent rainfall result in greater amounts of runoff from a given storm. The effects of infiltration and evapo-transpiration during the antecedent period are also important, as they may increase or lessen the effect of antecedent rainfall. Because of the difficulties of determining antecedent storm conditions from data normally available, the conditions are reduced to three cases, AMC-I, AMC-II and AMC-III. For the Mesa County area, an AMC-II condition is recommended for determining storm runoff.

Having determined the soil group, land use and treatment class and the antecedent moisture condition, CN values can be determined from **Table 704**, which is reproduced from **Table 2-2** in TR-55 (SCS, 1986).

When land uses shown in **Table 704** are not applicable or when more detailed land use information is available, CN values can be calculated directly from imperviousness estimates using the following equation.

$$CN = 98*Imp + X*(1-Imp) \qquad (708)$$

Where:

Imp. = Imperviousness as a decimal
X = Adjustment factor based on NRCS Soil Type

NRCS Soil Type	Adjustment Factor
A	39
B	61
C	74
D	80

Note that Equation 708 was derived from the data plotted on **Figure 2-3** in TR-55 (SCS 1986) and applies when impervious surfaces are connected. Adjustment for disconnected impervious surfaces can be made using **Figure 2-4** in TR-55. This adjustment is not required as the connected impervious surface assumption will result in conservatively high CN values.

704.3 Green and Ampt Method

The Green-Ampt method models infiltration by combining an unsaturated flow form of Darcy's law with requirements of mass conservation. The Green-Ampt method involves the simulation of rainfall loss as a two phase process. The first phase of rainfall loss is called initial abstraction (IA) or surface retention loss, which involves vegetation interception, evaporation, and surface depression storage. Typical surface retention loss values are shown in **Table 705.**

Job File: C:\MY DOCUMENTS\PROJECT1.PPW
Rain Dir: C:\HAESTAD\PPKW\RAINFALL\

==========
JOB TITLE
==========

Hollow Creek Subdivision
Preliminary Hydrology
Existing Conditions

G D Haller Property
1662 K Road
Fruita, CO

Vista Engineering Corp
605 28 1/4 Road
Grand Junction, CO 81506

Table of Contents

********** MASTER SUMMARY **********

Watershed..... Master Network Summary 1.01

********** DESIGN STORMS SUMMARY **********

gjcity..... Design Storms 2.01

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID GRANDJCT.RNQ gjcity

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
Pre.10	1.5000	Synthetic Curve	SCSTYPES	TypeII 24hr
Pre100	2.0100	Synthetic Curve	SCSTYPES	TypeII 24hr
Pre..2	.7000	Synthetic Curve	SCSTYPES	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
HALLER PROPERTY	AREA	10	.376		12.2411	3.33		
HALLER PROPERTY	AREA	100	.668		12.2411	6.25		
HALLER PROPERTY	AREA	2	.047		12.3747	.19		
*OUT 10	JCT	10	.376		12.2411	3.33		
*OUT 10	JCT	100	.668		12.2411	6.25		
*OUT 10	JCT	2	.047		12.3747	.19		

Type.... Design Storms
Name.... gjcity

File.... C:\HAESTAD\PPKW\RAINFALL\GRANDJCT.RNQ
Title... Hollow Creek Subdivision
Preliminary Hydrology
Existing Conditions

G D Haller Property
1662 K Road
Fruita, CO

Vista Engineering Corp
605 28 1/4 Road
Grand Junction, CO 81506

DESIGN STORMS SUMMARY

Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Pre.10
Description: SCS Type II 24 Hour 10-year storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 1.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = Pre100
Description: SCS 100 year 24 hour storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 2.0100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = Pre..2
Description: SCS 2 year 24 hour Storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= .7000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Index of Starting Page Numbers for ID Names

----- G -----
gjcity... 2.01

----- W -----
Watershed... 1.01

==========
JOB TITLE
==========

Hollow Creek Subdivision
Final Drainage Report

G D Haller Property
1662 K Road
Fruita, CO

Post-Developed Conditions

for

Ruckman, Inc.
P.O. Box 2204
Grand Junction, CO 81502

by

Vista Engineering Corp
605 28 1/4 Road
Grand Junction, CO 81506

REVISED
4/26/07

Table of Contents

********** MASTER SUMMARY **********

Watershed..... Master Network Summary 1.01

********** NETWORK SUMMARIES (DETAILED) **********

Watershed..... Dev..2
Executive Summary (Nodes) 2.01
Executive Summary (Links) 2.02
Network Calcs Sequence 2.05

Watershed..... Dev.10
Executive Summary (Nodes) 2.07
Executive Summary (Links) 2.08

Watershed..... Dev100
Executive Summary (Nodes) 2.11
Executive Summary (Links) 2.12

********** DESIGN STORMS SUMMARY **********

gjcity..... Design Storms 3.01

gjcity..... Dev100
Design Storms 3.03

********** RAINFALL DATA **********

TypeII 24hr.... Dev..2
Synthetic Curve 4.01
Synthetic Cumulative Depth 4.03

TypeII 24hr.... Dev.10
Synthetic Curve 4.05

Table of Contents (continued)

Synthetic Cumulative Depth 4.07

TypeII 24hr.... Dev100
Synthetic Curve 4.09
Synthetic Cumulative Depth 4.11

********** RUNOFF HYDROGRAPHS **********

A..... Dev..2
SCS Unit Hyd. Summary 5.01

A..... Dev.10
SCS Unit Hyd. Summary 5.02

A..... Dev100
SCS Unit Hyd. Summary 5.03

B..... Dev..2
SCS Unit Hyd. Summary 5.04

B..... Dev.10
SCS Unit Hyd. Summary 5.05

B..... Dev100
SCS Unit Hyd. Summary 5.06

C..... Dev..2
SCS Unit Hyd. Summary 5.07

C..... Dev.10
SCS Unit Hyd. Summary 5.08

C..... Dev100
SCS Unit Hyd. Summary 5.09

D..... Dev..2
SCS Unit Hyd. Summary 5.10

D..... Dev.10
SCS Unit Hyd. Summary 5.11

D..... Dev100
SCS Unit Hyd. Summary 5.12

E..... Dev..2
SCS Unit Hyd. Summary 5.13

Table of Contents (continued)

E..... Dev.10
SCS Unit Hyd. Summary 5.14

E..... Dev100
SCS Unit Hyd. Summary 5.15

F..... Dev..2
SCS Unit Hyd. Summary 5.16

F..... Dev.10
SCS Unit Hyd. Summary 5.17

F..... Dev100
SCS Unit Hyd. Summary 5.18

G..... Dev..2
SCS Unit Hyd. Summary 5.19

G..... Dev.10
SCS Unit Hyd. Summary 5.20

G..... Dev100
SCS Unit Hyd. Summary 5.21

H..... Dev..2
SCS Unit Hyd. Summary 5.22

H..... Dev.10
SCS Unit Hyd. Summary 5.23

H..... Dev100
SCS Unit Hyd. Summary 5.24

I..... Dev..2
SCS Unit Hyd. Summary 5.25

I..... Dev.10
SCS Unit Hyd. Summary 5.26

I..... Dev100
SCS Unit Hyd. Summary 5.27

********** OUTLET STRUCTURES **********

PR 10..... Outlet Input Data 6.01

Table of Contents (continued)

Composite Rating Curve 6.04

********** POND ROUTING **********

DETPOND..... Pond E-V-Q Table 7.01

DETPOND OUT Dev..2
Pond Routing Summary 7.03

DETPOND OUT Dev.10
Pond Routing Summary 7.04

DETPOND OUT Dev100
Pond Routing Summary 7.05

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID GRANDJCT.RNQ gjcity

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
Dev100	2.0100	Synthetic Curve	SCSTYPES	TypeII 24hr
Dev.10	1.1200	Synthetic Curve	SCSTYPES	TypeII 24hr
Dev..2	.7000	Synthetic Curve	SCSTYPES	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
1	JCT	100	.044		11.9906	.72		
1	JCT	10	.016		12.0073	.26		
1	JCT	2	.006		12.0073	.08		
2	JCT	100	.076		11.9572	1.29		
2	JCT	10	.027		11.9739	.46		
2	JCT	2	.010		11.9906	.15		
3	JCT	100	.181		11.9906	2.97		
3	JCT	10	.066		12.0073	1.06		
3	JCT	2	.024		12.0240	.35		
4	JCT	100	.207		11.9739	3.43		
4	JCT	10	.075		11.9906	1.23		
4	JCT	2	.027		12.0240	.40		
5	JCT	100	.191		12.0240	2.98		
5	JCT	10	.070		12.0240	1.07		
5	JCT	2	.025		12.0407	.34		
6	JCT	100	.276		11.9906	4.55		
6	JCT	10	.100		12.0073	1.64		
6	JCT	2	.036		12.0240	.53		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
7	JCT	100	.919		11.9906	14.90		
7	JCT	10	.334		12.0073	5.35		
7	JCT	2	.120		12.0240	1.73		
8	JCT	100	.572		11.9739	9.45		
8	JCT	10	.208		12.0073	3.39		
8	JCT	2	.074		12.0240	1.11		
A	AREA	100	.044		11.9906	.72		
A	AREA	10	.016		12.0073	.26		
A	AREA	2	.006		12.0073	.08		
B	AREA	100	.076		11.9572	1.29		
B	AREA	10	.027		11.9739	.46		
B	AREA	2	.010		11.9906	.15		
C	AREA	100	.137		11.9906	2.25		
C	AREA	10	.050		12.0073	.81		
C	AREA	2	.018		12.0240	.26		
D	AREA	100	.131		11.9906	2.16		
D	AREA	10	.048		12.0073	.77		
D	AREA	2	.017		12.0240	.25		
DETPOND	IN POND	100	.931		11.9906	15.10		
DETPOND	IN POND	10	.338		12.0073	5.40		
DETPOND	IN POND	2	.120		12.0240	1.74		
DETPOND	OUT POND	100	.930		12.1743	5.78	4491.44	.342
DETPOND	OUT POND	10	.337		12.3246	1.08	4489.45	.119
DETPOND	OUT POND	2	.119		12.3079	.42	4488.27	.032
E	AREA	100	.191		12.0240	2.98		
E	AREA	10	.070		12.0240	1.07		
E	AREA	2	.025		12.0407	.34		

Q_d w/o detention

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

*(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
F	AREA	100	.095		11.9739	1.60		
F	AREA	10	.034		11.9906	.57		
F	AREA	2	.012		12.0073	.19		
G	AREA	100	.089		11.9906	1.47		
G	AREA	10	.032		11.9906	.53		
G	AREA	2	.012		12.0073	.17		
H	AREA	100	.156		11.9906	2.54		
H	AREA	10	.057		12.0073	.91		
H	AREA	2	.020		12.0240	.29		
I	AREA	100	.012		11.9238	.22		
I	AREA	10	.003		11.9906	.05		
I	AREA	2	.000		11.9906	.00		
*SDMH	JCT	100	.930		12.1743	5.78		
*SDMH	JCT	10	.337		12.3246	1.08		
*SDMH	JCT	2	.119		12.3079	.42		

Revised 5/10/07

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev..2
Description: SCS 2 year 24 hour Storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= .7000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
1		JCT	.006		12.0073	.08	
2		JCT	.010		11.9906	.15	
3		JCT	.024		12.0240	.35	
4		JCT	.027		12.0240	.40	
5		JCT	.025		12.0407	.34	
6		JCT	.036		12.0240	.53	
7		JCT	.120		12.0240	1.73	
8		JCT	.074		12.0240	1.11	
A		AREA	.006		12.0073	.08	
B		AREA	.010		11.9906	.15	
C		AREA	.018		12.0240	.26	
D		AREA	.017		12.0240	.25	
DETPOND	IN	POND	.120		12.0240	1.74	
DETPOND	OUT	POND	.119		12.3079	.42	4488.27
E		AREA	.025		12.0407	.34	
F		AREA	.012		12.0073	.19	
G		AREA	.012		12.0073	.17	
H		AREA	.020		12.0240	.29	
I		AREA	.000		11.9906	.00	
Outfall SDMH		JCT	.119		12.3079	.42	

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev..2
Description: SCS 2 year 24 hour Storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= .7000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
1-3	ADD	UN	.006		12.0073	.08	1	
		DL	.006		12.0073	.08		
		DN	.024		12.0240	.35	3	
3-6	ADD	UN	.024		12.0240	.35	3	
		DL	.024		12.0240	.35		
		DN	.036		12.0240	.53	6	
4-8	ADD	UN	.027		12.0240	.40	4	
		DL	.027		12.0240	.40		
		DN	.074		12.0240	1.11	8	
5-7	ADD	UN	.025		12.0407	.34	5	
		DL	.025		12.0407	.34		
		DN	.120		12.0240	1.73	7	
6-8	ADD	UN	.036		12.0240	.53	6	
		DL	.036		12.0240	.53		
		DN	.074		12.0240	1.11	8	
7-DP	ADD	UN	.120		12.0240	1.73	7	
		DL	.120		12.0240	1.73		
		DN	.120		12.0240	1.74	DETPOND	IN
A 10	ADD	UN	.010		11.9906	.15	2	
		DL	.010		11.9906	.15		
		DN	.027		12.0240	.40	4	

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
A 20	ADD	UN	.074		12.0240	1.11	8	
		DL	.074		12.0240	1.11		
		DN	.120		12.0240	1.73	7	
A-1	ADD	UN	.006		12.0073	.08	A	
		DL	.006		12.0073	.08		
		DN	.006		12.0073	.08	1	
B-2	ADD	UN	.010		11.9906	.15	B	
		DL	.010		11.9906	.15		
		DN	.010		11.9906	.15	2	
C-3	ADD	UN	.018		12.0240	.26	C	
		DL	.018		12.0240	.26		
		DN	.024		12.0240	.35	3	
D-4	ADD	UN	.017		12.0240	.25	D	
		DL	.017		12.0240	.25		
		DN	.027		12.0240	.40	4	
E-5	ADD	UN	.025		12.0407	.34	E	
		DL	.025		12.0407	.34		
		DN	.025		12.0407	.34	5	
F-6	ADD	UN	.012		12.0073	.19	F	
		DL	.012		12.0073	.19		
		DN	.036		12.0240	.53	6	
G-8	ADD	UN	.012		12.0073	.17	G	
		DL	.012		12.0073	.17		
		DN	.074		12.0240	1.11	8	
H-7	ADD	UN	.020		12.0240	.29	H	
		DL	.020		12.0240	.29		
		DN	.120		12.0240	1.73	7	
I-DP	ADD	UN	.000		11.9906	.00	I	
		DL	.000		11.9906	.00		
		DN	.120		12.0240	1.74	DETPOND	IN

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
PR 10	PONDrt	UN	.120		12.0240	1.74	DETPOND	IN
PR 10			.119		12.3079	.42	DETPOND	OUT
		DL	.119		12.3079	.42		
		DN	.119		12.3079	.42	SDMH	

NETWORK RUNOFF NODE SEQUENCE

Runoff Data	Apply to Node	Receiving Link
SCS UH A	Subarea A	Add Hyd A
SCS UH B	Subarea B	Add Hyd B
SCS UH C	Subarea C	Add Hyd C
SCS UH D	Subarea D	Add Hyd D
SCS UH E	Subarea E	Add Hyd E
SCS UH F	Subarea F	Add Hyd F
SCS UH G	Subarea G	Add Hyd G
SCS UH H	Subarea H	Add Hyd H
SCS UH I	Subarea I	Add Hyd I

NETWORK ROUTING SEQUENCE

Link Operation	UPstream Node			DNstream Node		
Add Hyd A-1	Subarea	A		Jct	1	
Add Hyd C-3	Subarea	C		Jct	3	
Add Hyd 1-3	Jct	1		Jct	3	
Add Hyd B-2	Subarea	B		Jct	2	
Add Hyd 3-6	Jct	3		Jct	6	
Add Hyd F-6	Subarea	F		Jct	6	
Add Hyd D-4	Subarea	D		Jct	4	
Add Hyd A 10	Jct	2		Jct	4	
Add Hyd E-5	Subarea	E		Jct	5	
Add Hyd G-8	Subarea	G		Jct	8	
Add Hyd 4-8	Jct	4		Jct	8	
Add Hyd 6-8	Jct	6		Jct	8	
Add Hyd A 20	Jct	8		Jct	7	
Add Hyd H-7	Subarea	H		Jct	7	
Add Hyd 5-7	Jct	5		Jct	7	
Add Hyd 7-DP	Jct	7		Pond	DETPOND	IN
Add Hyd I-DP	Subarea	I		Pond	DETPOND	IN
POND ROUTE TOTAL OUTFLOW...						
Total Pond Outflow	Pond	DETPOND	IN	Outflow	DETPOND	OUT
SET POND ROUTING LINK TO TOTAL POND OUTFLOW...						
Outlet PR 10	Outflow	DETPOND	OUT	Jct	SDMH	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev.10
Description: SCS Type II 24 Hour 10-year storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 1.1200 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
1		JCT	.016		12.0073	.26	
2		JCT	.027		11.9739	.46	
3		JCT	.066		12.0073	1.06	
4		JCT	.075		11.9906	1.23	
5		JCT	.070		12.0240	1.07	
6		JCT	.100		12.0073	1.64	
7		JCT	.334		12.0073	5.35	
8		JCT	.208		12.0073	3.39	
A		AREA	.016		12.0073	.26	
B		AREA	.027		11.9739	.46	
C		AREA	.050		12.0073	.81	
D		AREA	.048		12.0073	.77	
DETPOND	IN	POND	.338		12.0073	5.40	
DETPOND	OUT	POND	.337		12.3246	1.08	4489.45
E		AREA	.070		12.0240	1.07	
F		AREA	.034		11.9906	.57	
G		AREA	.032		11.9906	.53	
H		AREA	.057		12.0073	.91	
I		AREA	.003		11.9906	.05	
Outfall SDMH		JCT	.337		12.3246	1.08	

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev.10
Description: SCS Type II 24 Hour 10-year storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 1.1200 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
1-3	ADD	UN	.016		12.0073	.26	1	
		DL	.016		12.0073	.26		
		DN	.066		12.0073	1.06	3	
3-6	ADD	UN	.066		12.0073	1.06	3	
		DL	.066		12.0073	1.06		
		DN	.100		12.0073	1.64	6	
4-8	ADD	UN	.075		11.9906	1.23	4	
		DL	.075		11.9906	1.23		
		DN	.208		12.0073	3.39	8	
5-7	ADD	UN	.070		12.0240	1.07	5	
		DL	.070		12.0240	1.07		
		DN	.334		12.0073	5.35	7	
6-8	ADD	UN	.100		12.0073	1.64	6	
		DL	.100		12.0073	1.64		
		DN	.208		12.0073	3.39	8	
7-DP	ADD	UN	.334		12.0073	5.35	7	
		DL	.334		12.0073	5.35		
		DN	.338		12.0073	5.40	DETPOND	IN
A 10	ADD	UN	.027		11.9739	.46	2	
		DL	.027		11.9739	.46		
		DN	.075		11.9906	1.23	4	

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
A 20	ADD	UN	.208		12.0073	3.39	8	
		DL	.208		12.0073	3.39		
		DN	.334		12.0073	5.35	7	
A-1	ADD	UN	.016		12.0073	.26	A	
		DL	.016		12.0073	.26		
		DN	.016		12.0073	.26	1	
B-2	ADD	UN	.027		11.9739	.46	B	
		DL	.027		11.9739	.46		
		DN	.027		11.9739	.46	2	
C-3	ADD	UN	.050		12.0073	.81	C	
		DL	.050		12.0073	.81		
		DN	.066		12.0073	1.06	3	
D-4	ADD	UN	.048		12.0073	.77	D	
		DL	.048		12.0073	.77		
		DN	.075		11.9906	1.23	4	
E-5	ADD	UN	.070		12.0240	1.07	E	
		DL	.070		12.0240	1.07		
		DN	.070		12.0240	1.07	5	
F-6	ADD	UN	.034		11.9906	.57	F	
		DL	.034		11.9906	.57		
		DN	.100		12.0073	1.64	6	
G-8	ADD	UN	.032		11.9906	.53	G	
		DL	.032		11.9906	.53		
		DN	.208		12.0073	3.39	8	
H-7	ADD	UN	.057		12.0073	.91	H	
		DL	.057		12.0073	.91		
		DN	.334		12.0073	5.35	7	
I-DP	ADD	UN	.003		11.9906	.05	I	
		DL	.003		11.9906	.05		
		DN	.338		12.0073	5.40	DETPOND	IN

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
PR 10	PONDrt	UN	.338		12.0073	5.40	DETPOND	IN
PR 10			.337		12.3246	1.08	DETPOND	OUT
		DL	.337		12.3246	1.08		
		DN	.337		12.3246	1.08	SDMH	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev100

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 2.0100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
1		JCT	.044		11.9906	.72	
2		JCT	.076		11.9572	1.29	
3		JCT	.181		11.9906	2.97	
4		JCT	.207		11.9739	3.43	
5		JCT	.191		12.0240	2.98	
6		JCT	.276		11.9906	4.55	
7		JCT	.919		11.9906	14.90	
8		JCT	.572		11.9739	9.45	
A		AREA	.044		11.9906	.72	
B		AREA	.076		11.9572	1.29	
C		AREA	.137		11.9906	2.25	
D		AREA	.131		11.9906	2.16	
DETPOND	IN	POND	.931		11.9906	15.10	
DETPOND	OUT	POND	.930		12.1743	5.78	4491.44
E		AREA	.191		12.0240	2.98	
F		AREA	.095		11.9739	1.60	
G		AREA	.089		11.9906	1.47	
H		AREA	.156		11.9906	2.54	
I		AREA	.012		11.9238	.22	
Outfall SDMH		JCT	.930		12.1743	5.78	

0.72+1.31 = 2.03 13%

1.31

Revised 5/10/07

Area: A + 0.58C = 0.48 + 0.58(1.49) = 0.48 + 0.86 = 1.34 Acres flows thru Santa Fe Sub.

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev100

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 2.0100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
1-3	ADD	UN	.044		11.9906	.72	1	
		DL	.044		11.9906	.72		
		DN	.181		11.9906	2.97	3	
3-6	ADD	UN	.181		11.9906	2.97	3	
		DL	.181		11.9906	2.97		
		DN	.276		11.9906	4.55	6	
4-8	ADD	UN	.207		11.9739	3.43	4	
		DL	.207		11.9739	3.43		
		DN	.572		11.9739	9.45	8	
5-7	ADD	UN	.191		12.0240	2.98	5	
		DL	.191		12.0240	2.98		
		DN	.919		11.9906	14.90	7	
6-8	ADD	UN	.276		11.9906	4.55	6	
		DL	.276		11.9906	4.55		
		DN	.572		11.9739	9.45	8	
7-DP	ADD	UN	.919		11.9906	14.90	7	
		DL	.919		11.9906	14.90		
		DN	.931		11.9906	15.10	DETPOND	IN
A 10	ADD	UN	.076		11.9572	1.29	2	
		DL	.076		11.9572	1.29		
		DN	.207		11.9739	3.43	4	

NETWORK SUMMARY -- LINKS

(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
A 20	ADD	UN	.572		11.9739	9.45	8	
		DL	.572		11.9739	9.45		
		DN	.919		11.9906	14.90	7	
A-1	ADD	UN	.044		11.9906	.72	A	
		DL	.044		11.9906	.72		
		DN	.044		11.9906	.72	1	
B-2	ADD	UN	.076		11.9572	1.29	B	
		DL	.076		11.9572	1.29		
		DN	.076		11.9572	1.29	2	
C-3	ADD	UN	.137		11.9906	2.25	C	
		DL	.137		11.9906	2.25		
		DN	.181		11.9906	2.97	3	
D-4	ADD	UN	.131		11.9906	2.16	D	
		DL	.131		11.9906	2.16		
		DN	.207		11.9739	3.43	4	
E-5	ADD	UN	.191		12.0240	2.98	E	
		DL	.191		12.0240	2.98		
		DN	.191		12.0240	2.98	5	
F-6	ADD	UN	.095		11.9739	1.60	F	
		DL	.095		11.9739	1.60		
		DN	.276		11.9906	4.55	6	
G-8	ADD	UN	.089		11.9906	1.47	G	
		DL	.089		11.9906	1.47		
		DN	.572		11.9739	9.45	8	
H-7	ADD	UN	.156		11.9906	2.54	H	
		DL	.156		11.9906	2.54		
		DN	.919		11.9906	14.90	7	
I-DP	ADD	UN	.012		11.9238	22	I	
		DL	.012		11.9238	.22		
		DN	.931		11.9906	15.10	DETPOND	IN

NETWORK SUMMARY -- LINKS
(UN=Upstream Node; DL=DNstream End of Link; DN=DNstream Node)
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

Link ID	Type		HYG Vol ac-ft	Trun.	Peak Time hrs	Peak Q cfs	End Points	
PR 10	PONDrt	UN	.931		11.9906	15.10	DETPOND	IN
PR 10			.930		12.1743	5.78	DETPOND	OUT
		DL	.930		12.1743	5.78		
		DN	.930		12.1743	5.78	SDMH	

File.... C:\HAESTAD\PPKW\RAINFALL\GRANDJCT.RNQ
Title... Hollow Creek Subdivision
Final Drainage Report

G D Haller Property
1662 K Road
Fruita, CO

Post-Developed Conditions

for

Ruckman, Inc.
P.O. Box 2204
Grand Junction, CO 81502

by

Vista Engineering Corp
605 28 1/4 Road
Grand Junction, CO 81506

DESIGN STORMS SUMMARY

Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev100

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 2.0100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = Dev.10
Description: SCS Type II 24 Hour 10-year storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 1.1200 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

File.... C:\HAESTAD\PPKW\RAINFALL\GRANDJCT.RNQ
Title... Hollow Creek Subdivision
Final Drainage Report

G D Haller Property
1662 K Road
Fruita, CO

Post-Developed Conditions

for

Ruckman, Inc.
P.O. Box 2204
Grand Junction, CO 81502

by

Vista Engineering Corp
605 28 1/4 Road
Grand Junction, CO 81506

DESIGN STORMS SUMMARY

Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev..2
Description: SCS 2 year 24 hour Storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= .7000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

DESIGN STORMS SUMMARY

Design Storm File,ID = GRANDJCT.RNQ gjcity

Storm Tag Name = Dev100

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 2.0100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = Dev.10
Description: SCS Type II 24 Hour 10-year storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 1.1200 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = Dev..2
Description: SCS 2 year 24 hour Storm

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= .7000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev..2
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS 2 year 24 hour Storm

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.000	.001	.002	.003	.004
.5000	.005	.006	.007	.008	.009
1.0000	.011	.012	.013	.014	.015
1.5000	.016	.017	.018	.020	.021
2.0000	.022	.023	.024	.026	.027
2.5000	.028	.029	.031	.032	.033
3.0000	.035	.036	.037	.038	.040
3.5000	.041	.042	.044	.045	.047
4.0000	.048	.049	.051	.052	.054
4.5000	.055	.057	.058	.060	.061
5.0000	.063	.065	.066	.068	.070
5.5000	.071	.073	.075	.076	.078
6.0000	.080	.082	.084	.085	.087
6.5000	.089	.091	.093	.095	.097
7.0000	.099	.101	.103	.105	.107
7.5000	.109	.111	.113	.116	.118
8.0000	.120	.122	.125	.127	.130
8.5000	.132	.135	.138	.141	.144
9.0000	.147	.150	.153	.157	.160
9.5000	.163	.166	.170	.173	.177
10.0000	.181	.185	.189	.194	.199
10.5000	.204	.209	.215	.221	.228
11.0000	.235	.243	.251	.261	.271
11.5000	.283	.307	.354	.431	.568
12.0000	.663	.682	.699	.713	.725
12.5000	.735	.743	.751	.759	.766
13.0000	.772	.778	.784	.789	.794
13.5000	.799	.804	.808	.812	.816
14.0000	.820	.824	.827	.831	.834
14.5000	.838	.841	.844	.847	.850
15.0000	.854	.856	.859	.862	.865
15.5000	.868	.870	.873	.875	.878
16.0000	.880	.882	.885	.887	.889
16.5000	.891	.893	.895	.898	.900
17.0000	.902	.904	.906	.908	.910
17.5000	.912	.914	.915	.917	.919
18.0000	.921	.923	.925	.926	.928
18.5000	.930	.931	.933	.935	.936
19.0000	.938	.939	.941	.942	.944
19.5000	.945	.947	.948	.949	.951
20.0000	.952	.953	.955	.956	.957
20.5000	.958	.960	.961	.962	.964
21.0000	.965	.966	.967	.968	.970
21.5000	.971	.972	.973	.975	.976
22.0000	.977	.978	.979	.981	.982

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev..2
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS 2 year 24 hour Storm

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time hrs | Time on left represents time for first value in each row.

Time hrs					
22.5000	.983	.984	.985	.986	.988
23.0000	.989	.990	.991	.992	.993
23.5000	.994	.996	.997	.998	.999
24.0000	1.000				

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0007	.0014	.0021	.0029
.5000	.0036	.0043	.0051	.0058	.0066
1.0000	.0074	.0081	.0089	.0097	.0105
1.5000	.0113	.0121	.0129	.0137	.0146
2.0000	.0154	.0162	.0171	.0180	.0188
2.5000	.0197	.0206	.0215	.0223	.0232
3.0000	.0242	.0251	.0260	.0269	.0278
3.5000	.0288	.0297	.0307	.0317	.0326
4.0000	.0336	.0346	.0356	.0366	.0376
4.5000	.0387	.0397	.0408	.0419	.0430
5.0000	.0441	.0452	.0464	.0475	.0487
5.5000	.0499	.0511	.0523	.0535	.0547
6.0000	.0560	.0573	.0585	.0598	.0612
6.5000	.0625	.0638	.0652	.0665	.0679
7.0000	.0693	.0707	.0721	.0736	.0750
7.5000	.0765	.0780	.0794	.0809	.0825
8.0000	.0840	.0856	.0872	.0889	.0907
8.5000	.0926	.0945	.0965	.0986	.1007
9.0000	.1029	.1051	.1074	.1096	.1119
9.5000	.1141	.1164	.1188	.1213	.1240
10.0000	.1267	.1296	.1326	.1359	.1392
10.5000	.1428	.1466	.1506	.1550	.1596
11.0000	.1645	.1699	.1759	.1826	.1900
11.5000	.1981	.2148	.2481	.3016	.3975
12.0000	.4641	.4774	.4890	.4991	.5076
12.5000	.5145	.5204	.5260	.5311	.5359
13.0000	.5404	.5446	.5485	.5523	.5559
13.5000	.5593	.5625	.5656	.5685	.5713
14.0000	.5740	.5766	.5791	.5816	.5840
14.5000	.5863	.5887	.5909	.5932	.5953
15.0000	.5975	.5995	.6016	.6035	.6055
15.5000	.6073	.6092	.6110	.6127	.6144
16.0000	.6160	.6176	.6192	.6208	.6223
16.5000	.6238	.6253	.6268	.6283	.6298
17.0000	.6312	.6327	.6341	.6355	.6368
17.5000	.6382	.6395	.6408	.6421	.6434
18.0000	.6447	.6460	.6472	.6484	.6496
18.5000	.6508	.6519	.6531	.6542	.6553
19.0000	.6564	.6575	.6586	.6596	.6606
19.5000	.6616	.6626	.6636	.6645	.6655
20.0000	.6664	.6673	.6682	.6691	.6700
20.5000	.6709	.6718	.6727	.6736	.6745
21.0000	.6753	.6762	.6771	.6779	.6788
21.5000	.6797	.6805	.6814	.6822	.6831
22.0000	.6839	.6847	.6856	.6864	.6872

Type.... Synthetic Cumulative Depth
Name.... TypeII 24hr Tag: Dev..2
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS 2 year 24 hour Storm
Storm... TypeII 24hr Tag: Dev..2

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
22.5000	.6881	.6889	.6897	.6905	.6913
23.0000	.6921	.6929	.6937	.6945	.6953
23.5000	.6961	.6969	.6977	.6985	.6992
24.0000	.7000				

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev.10
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS Type II 24 Hour 10-year storm

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.000	.001	.002	.003	.004
.5000	.005	.006	.007	.008	.009
1.0000	.011	.012	.013	.014	.015
1.5000	.016	.017	.018	.020	.021
2.0000	.022	.023	.024	.026	.027
2.5000	.028	.029	.031	.032	.033
3.0000	.035	.036	.037	.038	.040
3.5000	.041	.042	.044	.045	.047
4.0000	.048	.049	.051	.052	.054
4.5000	.055	.057	.058	.060	.061
5.0000	.063	.065	.066	.068	.070
5.5000	.071	.073	.075	.076	.078
6.0000	.080	.082	.084	.085	.087
6.5000	.089	.091	.093	.095	.097
7.0000	.099	.101	.103	.105	.107
7.5000	.109	.111	.113	.116	.118
8.0000	.120	.122	.125	.127	.130
8.5000	.132	.135	.138	.141	.144
9.0000	.147	.150	.153	.157	.160
9.5000	.163	.166	.170	.173	.177
10.0000	.181	.185	.189	.194	.199
10.5000	.204	.209	.215	.221	.228
11.0000	.235	.243	.251	.261	.271
11.5000	.283	.307	.354	.431	.568
12.0000	.663	.682	.699	.713	.725
12.5000	.735	.743	.751	.759	.766
13.0000	.772	.778	.784	.789	.794
13.5000	.799	.804	.808	.812	.816
14.0000	.820	.824	.827	.831	.834
14.5000	.838	.841	.844	.847	.850
15.0000	.854	.856	.859	.862	.865
15.5000	.868	.870	.873	.875	.878
16.0000	.880	.882	.885	.887	.889
16.5000	.891	.893	.895	.898	.900
17.0000	.902	.904	.906	.908	.910
17.5000	.912	.914	.915	.917	.919
18.0000	.921	.923	.925	.926	.928
18.5000	.930	.931	.933	.935	.936
19.0000	.938	.939	.941	.942	.944
19.5000	.945	.947	.948	.949	.951
20.0000	.952	.953	.955	.956	.957
20.5000	.958	.960	.961	.962	.964
21.0000	.965	.966	.967	.968	.970
21.5000	.971	.972	.973	.975	.976
22.0000	.977	.978	.979	.981	.982

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev.10
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS Type II 24 Hour 10-year storm

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time hrs | Time on left represents time for first value in each row.

Time hrs					
22.5000	.983	.984	.985	.986	.988
23.0000	.989	.990	.991	.992	.993
23.5000	.994	.996	.997	.998	.999
24.0000	1.000				

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0011	.0023	.0034	.0046
.5000	.0057	.0069	.0081	.0093	.0105
1.0000	.0118	.0130	.0142	.0155	.0168
1.5000	.0181	.0194	.0207	.0220	.0233
2.0000	.0246	.0260	.0274	.0287	.0301
2.5000	.0315	.0329	.0343	.0358	.0372
3.0000	.0386	.0401	.0416	.0431	.0446
3.5000	.0461	.0476	.0491	.0506	.0522
4.0000	.0538	.0553	.0569	.0586	.0602
4.5000	.0619	.0636	.0653	.0670	.0688
5.0000	.0706	.0724	.0742	.0760	.0779
5.5000	.0798	.0817	.0837	.0856	.0876
6.0000	.0896	.0916	.0937	.0957	.0978
6.5000	.1000	.1021	.1043	.1064	.1087
7.0000	.1109	.1131	.1154	.1177	.1200
7.5000	.1224	.1247	.1271	.1295	.1319
8.0000	.1344	.1369	.1396	.1423	.1452
8.5000	.1481	.1512	.1544	.1577	.1611
9.0000	.1646	.1682	.1718	.1754	.1790
9.5000	.1826	.1862	.1901	.1941	.1983
10.0000	.2027	.2073	.2122	.2174	.2228
10.5000	.2285	.2345	.2410	.2480	.2554
11.0000	.2632	.2718	.2815	.2922	.3041
11.5000	.3170	.3437	.3969	.4825	.6360
12.0000	.7426	.7638	.7825	.7986	.8122
12.5000	.8232	.8327	.8415	.8498	.8575
13.0000	.8646	.8713	.8777	.8837	.8895
13.5000	.8949	.9000	.9050	.9097	.9141
14.0000	.9184	.9225	.9265	.9305	.9343
14.5000	.9381	.9419	.9455	.9490	.9525
15.0000	.9559	.9592	.9625	.9657	.9687
15.5000	.9717	.9747	.9775	.9803	.9830
16.0000	.9856	.9882	.9907	.9932	.9957
16.5000	.9981	1.0006	1.0029	1.0053	1.0077
17.0000	1.0100	1.0122	1.0145	1.0167	1.0189
17.5000	1.0211	1.0232	1.0253	1.0274	1.0295
18.0000	1.0315	1.0335	1.0355	1.0374	1.0394
18.5000	1.0413	1.0431	1.0449	1.0468	1.0485
19.0000	1.0503	1.0520	1.0537	1.0554	1.0570
19.5000	1.0586	1.0602	1.0617	1.0633	1.0648
20.0000	1.0662	1.0677	1.0691	1.0706	1.0720
20.5000	1.0735	1.0749	1.0763	1.0777	1.0791
21.0000	1.0805	1.0819	1.0833	1.0847	1.0861
21.5000	1.0875	1.0888	1.0902	1.0915	1.0929
22.0000	1.0942	1.0956	1.0969	1.0983	1.0996

Type.... Synthetic Cumulative Depth
Name.... TypeII 24hr Tag: Dev.10
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF
Title... SCS Type II 24 Hour 10-year storm
Storm... TypeII 24hr Tag: Dev.10

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
22.5000	1.1009	1.1022	1.1035	1.1048	1.1061
23.0000	1.1074	1.1087	1.1100	1.1112	1.1125
23.5000	1.1138	1.1150	1.1163	1.1175	1.1188
24.0000	1.1200				

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev100
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.000	.001	.002	.003	.004
.5000	.005	.006	.007	.008	.009
1.0000	.011	.012	.013	.014	.015
1.5000	.016	.017	.018	.020	.021
2.0000	.022	.023	.024	.026	.027
2.5000	.028	.029	.031	.032	.033
3.0000	.035	.036	.037	.038	.040
3.5000	.041	.042	.044	.045	.047
4.0000	.048	.049	.051	.052	.054
4.5000	.055	.057	.058	.060	.061
5.0000	.063	.065	.066	.068	.070
5.5000	.071	.073	.075	.076	.078
6.0000	.080	.082	.084	.085	.087
6.5000	.089	.091	.093	.095	.097
7.0000	.099	.101	.103	.105	.107
7.5000	.109	.111	.113	.116	.118
8.0000	.120	.122	.125	.127	.130
8.5000	.132	.135	.138	.141	.144
9.0000	.147	.150	.153	.157	.160
9.5000	.163	.166	.170	.173	.177
10.0000	.181	.185	.189	.194	.199
10.5000	.204	.209	.215	.221	.228
11.0000	.235	.243	.251	.261	.271
11.5000	.283	.307	.354	.431	.568
12.0000	.663	.682	.699	.713	.725
12.5000	.735	.743	.751	.759	.766
13.0000	.772	.778	.784	.789	.794
13.5000	.799	.804	.808	.812	.816
14.0000	.820	.824	.827	.831	.834
14.5000	.838	.841	.844	.847	.850
15.0000	.854	.856	.859	.862	.865
15.5000	.868	.870	.873	.875	.878
16.0000	.880	.882	.885	.887	.889
16.5000	.891	.893	.895	.898	.900
17.0000	.902	.904	.906	.908	.910
17.5000	.912	.914	.915	.917	.919
18.0000	.921	.923	.925	.926	.928
18.5000	.930	.931	.933	.935	.936
19.0000	.938	.939	.941	.942	.944
19.5000	.945	.947	.948	.949	.951
20.0000	.952	.953	.955	.956	.957
20.5000	.958	.960	.961	.962	.964
21.0000	.965	.966	.967	.968	.970
21.5000	.971	.972	.973	.975	.976
22.0000	.977	.978	.979	.981	.982
22.5000	.983	.984	.985	.986	.988

Type.... Synthetic Curve
Name.... TypeII 24hr Tag: Dev100
File.... C:\HAESTAD\PPKW\RAINFALL\SCSTYPES.RNF

CUMULATIVE RAINFALL FRACTIONS
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
23.0000	.989	.990	.991	.992	.993
23.5000	.994	.996	.997	.998	.999
24.0000	1.000				

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
.0000	.0000	.0020	.0041	.0061	.0082
.5000	.0103	.0124	.0146	.0167	.0189
1.0000	.0211	.0233	.0256	.0278	.0301
1.5000	.0324	.0347	.0371	.0394	.0418
2.0000	.0442	.0467	.0491	.0516	.0540
2.5000	.0565	.0591	.0616	.0642	.0668
3.0000	.0693	.0720	.0746	.0773	.0800
3.5000	.0827	.0854	.0881	.0909	.0937
4.0000	.0965	.0993	.1022	.1051	.1081
4.5000	.1111	.1141	.1172	.1203	.1234
5.0000	.1266	.1299	.1331	.1365	.1398
5.5000	.1432	.1466	.1501	.1536	.1572
6.0000	.1608	.1644	.1681	.1718	.1756
6.5000	.1794	.1832	.1871	.1910	.1950
7.0000	.1990	.2030	.2071	.2112	.2154
7.5000	.2196	.2238	.2281	.2324	.2368
8.0000	.2412	.2457	.2504	.2554	.2605
8.5000	.2658	.2714	.2771	.2830	.2891
9.0000	.2955	.3019	.3083	.3148	.3212
9.5000	.3276	.3342	.3411	.3484	.3559
10.0000	.3638	.3721	.3809	.3901	.3998
10.5000	.4100	.4209	.4326	.4450	.4583
11.0000	.4724	.4878	.5052	.5244	.5457
11.5000	.5688	.6167	.7123	.8659	1.1414
12.0000	1.3326	1.3707	1.4043	1.4332	1.4576
12.5000	1.4774	1.4943	1.5102	1.5251	1.5389
13.0000	1.5517	1.5637	1.5751	1.5860	1.5963
13.5000	1.6060	1.6152	1.6241	1.6325	1.6406
14.0000	1.6482	1.6556	1.6628	1.6699	1.6768
14.5000	1.6836	1.6903	1.6968	1.7032	1.7094
15.0000	1.7155	1.7215	1.7273	1.7330	1.7385
15.5000	1.7439	1.7492	1.7543	1.7593	1.7641
16.0000	1.7688	1.7734	1.7779	1.7824	1.7869
16.5000	1.7913	1.7956	1.7999	1.8042	1.8084
17.0000	1.8125	1.8166	1.8207	1.8247	1.8286
17.5000	1.8325	1.8363	1.8401	1.8439	1.8476
18.0000	1.8512	1.8548	1.8583	1.8618	1.8653
18.5000	1.8687	1.8720	1.8753	1.8785	1.8817
19.0000	1.8849	1.8880	1.8910	1.8940	1.8969
19.5000	1.8998	1.9027	1.9055	1.9082	1.9109
20.0000	1.9135	1.9161	1.9187	1.9213	1.9239
20.5000	1.9265	1.9290	1.9316	1.9341	1.9366
21.0000	1.9391	1.9417	1.9442	1.9466	1.9491
21.5000	1.9516	1.9540	1.9565	1.9589	1.9614
22.0000	1.9638	1.9662	1.9686	1.9710	1.9733
22.5000	1.9757	1.9781	1.9804	1.9827	1.9851

CUMULATIVE RAINFALL DEPTHS (in)
Output Time increment = .1000 hrs
Time on left represents time for first value in each row.

Time hrs					
23.0000	1.9874	1.9897	1.9920	1.9943	1.9966
23.5000	1.9988	2.0011	2.0033	2.0056	2.0078
24.0000	2.0100				

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - A Dev..2
Tc = .1734 hrs
Drainage Area = .483 acres Runoff CN= 90

==========
Computational Time Increment = .02312 hrs
Computed Peak Time = 12.0448 hrs
Computed Peak Flow = .08 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0406 hrs
Peak Flow, Interpolated Output = .08 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .483 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.006 ac-ft

HYG Volume... .006 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17339 hrs (ID: A)
Computational Incr, Tm = .02312 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 3.16 cfs
Unit peak time Tp = .11559 hrs
Unit receding limb, Tr = .46237 hrs
Total unit time, Tb = .57797 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - A Dev.10
Tc = .1734 hrs
Drainage Area = .483 acres Runoff CN= 90

==========
Computational Time Increment = .02312 hrs
Computed Peak Time = 12.0217 hrs
Computed Peak Flow = .26 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .26 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .483 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.016 ac-ft

HYG Volume... .016 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17339 hrs (ID: A)
Computational Incr, Tm = .02312 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 3.16 cfs
Unit peak time Tp = .11559 hrs
Unit receding limb, Tr = .46237 hrs
Total unit time, Tb = .57797 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - A Dev100
Tc = .1734 hrs
Drainage Area = .483 acres Runoff CN= 90

==========
Computational Time Increment = .02312 hrs
Computed Peak Time = 11.9986 hrs
Computed Peak Flow = .72 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = .72 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .483 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.044 ac-ft

HYG Volume... .044 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17339 hrs (ID: A)
Computational Incr, Tm = .02312 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 3.16 cfs
Unit peak time Tp = .11559 hrs
Unit receding limb, Tr = .46237 hrs
Total unit time, Tb = .57797 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - B Dev..2
Tc = .1365 hrs
Drainage Area = .822 acres Runoff CN= 90

==========
Computational Time Increment = .01820 hrs
Computed Peak Time = 12.0140 hrs
Computed Peak Flow = .15 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .15 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .822 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.010 ac-ft

HYG Volume... .010 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .13652 hrs (ID: B)
Computational Incr, Tm = .01820 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.82 cfs
Unit peak time Tp = .09102 hrs
Unit receding limb, Tr = .36406 hrs
Total unit time, Tb = .45508 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - B Dev.10
Tc = .1365 hrs
Drainage Area = .822 acres Runoff CN= 90

==========
Computational Time Increment = .01820 hrs
Computed Peak Time = 11.9776 hrs
Computed Peak Flow = .46 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = .46 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .822 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.027 ac-ft

HYG Volume... .027 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .13652 hrs (ID: B)
Computational Incr, Tm = .01820 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.82 cfs
Unit peak time Tp = .09102 hrs
Unit receding limb, Tr = .36406 hrs
Total unit time, Tb = .45508 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - B Dev100
Tc = .1365 hrs
Drainage Area = .822 acres Runoff CN= 90

==========
Computational Time Increment = .01820 hrs
Computed Peak Time = 11.9594 hrs
Computed Peak Flow = 1.29 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9571 hrs
Peak Flow, Interpolated Output = 1.29 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .822 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.076 ac-ft

HYG Volume... .076 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .13652 hrs (ID: B)
Computational Incr, Tm = .01820 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.82 cfs
Unit peak time Tp = .09102 hrs
Unit receding limb, Tr = .36406 hrs
Total unit time, Tb = .45508 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - C Dev..2
Tc = .1663 hrs
Drainage Area = 1.490 acres Runoff CN= 90

==========
Computational Time Increment = .02218 hrs
Computed Peak Time = 12.0202 hrs
Computed Peak Flow = .26 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = .26 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.490 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.018 ac-ft

HYG Volume... .018 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: C)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 10.15 cfs
Unit peak time Tp = .11089 hrs
Unit receding limb, Tr = .44355 hrs
Total unit time, Tb = .55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - C Dev.10
Tc = .1663 hrs
Drainage Area = 1.490 acres Runoff CN= 90

==========
Computational Time Increment = .02218 hrs
Computed Peak Time = 11.9980 hrs
Computed Peak Flow = .81 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .81 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.490 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.050 ac-ft

HYG Volume... .050 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: C)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 10.15 cfs
Unit peak time Tp = .11089 hrs
Unit receding limb, Tr = .44355 hrs
Total unit time, Tb = .55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - C Dev100
Tc = .1663 hrs
Drainage Area = 1.490 acres Runoff CN= 90

==========

Computational Time Increment	=	.02218 hrs
Computed Peak Time	=	11.9980 hrs
Computed Peak Flow	=	2.25 cfs
Time Increment for HYG File	=	.0167 hrs
Peak Time, Interpolated Output	=	11.9905 hrs
Peak Flow, Interpolated Output	=	2.25 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.490 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.137 ac-ft

HYG Volume... .137 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: C)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak,	qp =	10.15 cfs
Unit peak time	Tp =	.11089 hrs
Unit receding limb,	Tr =	.44355 hrs
Total unit time,	Tb =	.55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - D Dev..2
Tc = .1663 hrs
Drainage Area = 1.430 acres Runoff CN= 90

==========
Computational Time Increment = .02218 hrs
Computed Peak Time = 12.0202 hrs
Computed Peak Flow = .25 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = .25 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.430 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.017 ac-ft

HYG Volume... .017 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: D)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 9.74 cfs
Unit peak time Tp = .11089 hrs
Unit receding limb, Tr = .44355 hrs
Total unit time, Tb = .55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - D Dev.10
Tc = .1663 hrs
Drainage Area = 1.430 acres Runoff CN= 90

==========
Computational Time Increment = .02218 hrs
Computed Peak Time = 11.9980 hrs
Computed Peak Flow = .77 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .77 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.430 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.048 ac-ft

HYG Volume... .048 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: D)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 9.74 cfs
Unit peak time Tp = .11089 hrs
Unit receding limb, Tr = .44355 hrs
Total unit time, Tb = .55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - D Dev100
Tc = .1663 hrs
Drainage Area = 1.430 acres Runoff CN= 90

==========
Computational Time Increment = .02218 hrs
Computed Peak Time = 11.9980 hrs
Computed Peak Flow = 2.16 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = 2.16 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.430 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.131 ac-ft

HYG Volume... .131 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16633 hrs (ID: D)
Computational Incr, Tm = .02218 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 9.74 cfs
Unit peak time Tp = .11089 hrs
Unit receding limb, Tr = .44355 hrs
Total unit time, Tb = .55444 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - E Dev..2
Tc = .2045 hrs
Drainage Area = 2.080 acres Runoff CN= 90

==========

Computational Time Increment = .02727 hrs
Computed Peak Time = 12.0533 hrs
Computed Peak Flow = .34 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0573 hrs
Peak Flow, Interpolated Output = .34 cfs

==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 2.080 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.025 ac-ft

HYG Volume... .025 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .20452 hrs (ID: E)
Computational Incr, Tm = .02727 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.52 cfs
Unit peak time Tp = .13635 hrs
Unit receding limb, Tr = .54540 hrs
Total unit time, Tb = .68175 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - E Dev.10
Tc = .2045 hrs
Drainage Area = 2.080 acres Runoff CN= 90

==========
Computational Time Increment = .02727 hrs
Computed Peak Time = 12.0261 hrs
Computed Peak Flow = 1.07 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = 1.07 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 2.080 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.070 ac-ft

HYG Volume... .070 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .20452 hrs (ID: E)
Computational Incr, Tm = .02727 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.52 cfs
Unit peak time Tp = .13635 hrs
Unit receding limb, Tr = .54540 hrs
Total unit time, Tb = .68175 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - E Dev100
Tc = .2045 hrs
Drainage Area = 2.080 acres Runoff CN= 90

==========
Computational Time Increment = .02727 hrs
Computed Peak Time = 12.0261 hrs
Computed Peak Flow = 2.98 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = 2.98 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 2.080 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.191 ac-ft

HYG Volume... .191 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .20452 hrs (ID: E)
Computational Incr, Tm = .02727 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.52 cfs
Unit peak time Tp = .13635 hrs
Unit receding limb, Tr = .54540 hrs
Total unit time, Tb = .68175 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - F Dev..2
Tc = .1432 hrs
Drainage Area = 1.030 acres Runoff CN= 90

==========
Computational Time Increment = .01909 hrs
Computed Peak Time = 12.0101 hrs
Computed Peak Flow = .19 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = .19 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.030 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.012 ac-ft

HYG Volume... .012 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .14320 hrs (ID: F)
Computational Incr, Tm = .01909 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 8.15 cfs
Unit peak time Tp = .09547 hrs
Unit receding limb, Tr = .38188 hrs
Total unit time, Tb = .47735 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - F Dev.10
Tc = .1432 hrs
Drainage Area = 1.030 acres Runoff CN= 90

==========
Computational Time Increment = .01909 hrs
Computed Peak Time = 11.9910 hrs
Computed Peak Flow = .57 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = .57 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.030 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.034 ac-ft

HYG Volume... .034 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .14320 hrs (ID: F)
Computational Incr, Tm = .01909 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 8.15 cfs
Unit peak time Tp = .09547 hrs
Unit receding limb, Tr = .38188 hrs
Total unit time, Tb = .47735 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - F Dev100
Tc = .1432 hrs
Drainage Area = 1.030 acres Runoff CN= 90

==========
Computational Time Increment = .01909 hrs
Computed Peak Time = 11.9719 hrs
Computed Peak Flow = 1.61 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9738 hrs
Peak Flow, Interpolated Output = 1.60 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.030 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.095 ac-ft

HYG Volume... .095 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .14320 hrs (ID: F)
Computational Incr, Tm = .01909 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 8.15 cfs
Unit peak time Tp = .09547 hrs
Unit receding limb, Tr = .38188 hrs
Total unit time, Tb = .47735 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - G Dev..2
Tc = .1624 hrs
Drainage Area = .970 acres Runoff CN= 90

==========
Computational Time Increment = .02165 hrs
Computed Peak Time = 12.0371 hrs
Computed Peak Flow = .17 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = .17 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .970 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.012 ac-ft

HYG Volume... .012 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16237 hrs (ID: G)
Computational Incr, Tm = .02165 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.77 cfs
Unit peak time Tp = .10825 hrs
Unit receding limb, Tr = .43299 hrs
Total unit time, Tb = .54124 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - G Dev.10
Tc = .1624 hrs
Drainage Area = .970 acres Runoff CN= 90

==========
Computational Time Increment = .02165 hrs
Computed Peak Time = 12.0155 hrs
Computed Peak Flow = .53 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .53 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .970 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.032 ac-ft

HYG Volume... .032 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16237 hrs (ID: G)
Computational Incr, Tm = .02165 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.77 cfs
Unit peak time Tp = .10825 hrs
Unit receding limb, Tr = .43299 hrs
Total unit time, Tb = .54124 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - G Dev100
Tc = .1624 hrs
Drainage Area = .970 acres Runoff CN= 90

==========
Computational Time Increment = .02165 hrs
Computed Peak Time = 11.9938 hrs
Computed Peak Flow = 1.47 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = 1.47 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = .970 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.089 ac-ft

HYG Volume... .089 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16237 hrs (ID: G)
Computational Incr, Tm = .02165 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 6.77 cfs
Unit peak time Tp = .10825 hrs
Unit receding limb, Tr = .43299 hrs
Total unit time, Tb = .54124 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - H Dev..2
Tc = .1724 hrs
Drainage Area = 1.700 acres Runoff CN= 90

==========
Computational Time Increment = .02298 hrs
Computed Peak Time = 12.0426 hrs
Computed Peak Flow = .30 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0406 hrs
Peak Flow, Interpolated Output = .30 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.700 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.1437 in
.020 ac-ft

HYG Volume... .020 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17237 hrs (ID: H)
Computational Incr, Tm = .02298 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.17 cfs
Unit peak time Tp = .11491 hrs
Unit receding limb, Tr = .45964 hrs
Total unit time, Tb = .57455 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - H Dev.10
Tc = .1724 hrs
Drainage Area = 1.700 acres Runoff CN= 90

==========
Computational Time Increment = .02298 hrs
Computed Peak Time = 12.0196 hrs
Computed Peak Flow = .91 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .91 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.700 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

.4012 in
.057 ac-ft

HYG Volume... .057 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17237 hrs (ID: H)
Computational Incr, Tm = .02298 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.17 cfs
Unit peak time Tp = .11491 hrs
Unit receding limb, Tr = .45964 hrs
Total unit time, Tb = .57455 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - H Dev100
Tc = .1724 hrs
Drainage Area = 1.700 acres Runoff CN= 90

==========
Computational Time Increment = .02298 hrs
Computed Peak Time = 11.9967 hrs
Computed Peak Flow = 2.55 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9905 hrs
Peak Flow, Interpolated Output = 2.54 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 90
Area = 1.700 acres
S = 1.1111 in
0.2S = .2222 in

Cumulative Runoff

1.1025 in
.156 ac-ft

HYG Volume... .156 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .17237 hrs (ID: H)
Computational Incr, Tm = .02298 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 11.17 cfs
Unit peak time Tp = .11491 hrs
Unit receding limb, Tr = .45964 hrs
Total unit time, Tb = .57455 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = .7000 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - I Dev..2
Tc (Min. Tc) = .0833 hrs
Drainage Area = .190 acres Runoff CN= 84

==========
Computational Time Increment = .01111 hrs
Computed Peak Time = 12.0285 hrs
Computed Peak Flow = .01 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0239 hrs
Peak Flow, Interpolated Output = .01 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 84
Area = .190 acres
S = 1.9048 in
0.2S = .3810 in

Cumulative Runoff

.0458 in
.001 ac-ft

HYG Volume... .000 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .08330 hrs (ID: I)
Computational Incr, Tm = .01111 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 2.58 cfs
Unit peak time Tp = .05553 hrs
Unit receding limb, Tr = .22213 hrs
Total unit time, Tb = .27767 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 1.1200 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - I Dev.10
Tc (Min. Tc) = .0833 hrs
Drainage Area = .190 acres Runoff CN= 84

Computational Time Increment = .01111 hrs
Computed Peak Time = 12.0063 hrs
Computed Peak Flow = .05 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 12.0072 hrs
Peak Flow, Interpolated Output = .05 cfs

DRAINAGE AREA
ID:None Selected
CN = 84
Area = .190 acres
S = 1.9048 in
0.2S = .3810 in

Cumulative Runoff
.2066 in
.003 ac-ft

HYG Volume... .003 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .08330 hrs (ID: I)
Computational Incr, Tm = .01111 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 2.58 cfs
Unit peak time Tp = .05553 hrs
Unit receding limb, Tr = .22213 hrs
Total unit time, Tb = .27767 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 2.0100 in
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\
Rain File -ID = SCSTYPES.RNF - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
HYG File - ID = 4260.HYG - I Dev100
Tc (Min. Tc) = .0833 hrs
Drainage Area = .190 acres Runoff CN= 84

==========
Computational Time Increment = .01111 hrs
Computed Peak Time = 11.9286 hrs
Computed Peak Flow = .22 cfs

Time Increment for HYG File = .0167 hrs
Peak Time, Interpolated Output = 11.9237 hrs
Peak Flow, Interpolated Output = .22 cfs
==========

DRAINAGE AREA

ID:None Selected
CN = 84
Area = .190 acres
S = 1.9048 in
0.2S = .3810 in

Cumulative Runoff

.7510 in
.012 ac-ft

HYG Volume... .012 ac-ft (area under HYG curve)

***** UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .08330 hrs (ID: I)
Computational Incr, Tm = .01111 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 2.58 cfs
Unit peak time Tp = .05553 hrs
Unit receding limb, Tr = .22213 hrs
Total unit time, Tb = .27767 hrs

File.... C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\4260 DEVELOPED.PPW

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 4487.70 ft
Increment = .10 ft
Max. Elev.= 4492.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Inlet Box	IB	--->	CP	4491.000	4492.000
Orifice-Circular	CO	--->	CP	4487.700	4492.000
Culvert-Circular	CP	--->	TW	4487.700	4492.000

TW SETUP, DS Channel

File.... C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\4260 DEVELOPED.PPW

OUTLET STRUCTURE INPUT DATA

Structure ID	= IB	
Structure Type	= Inlet Box	
# of Openings	= 1	
Invert Elev.	= 4491.00	ft
Orifice Area	= 1.2600	sq.ft
Orifice Coeff.	= .650	
Weir Length	= 7.75	ft
Weir Coeff.	= 3.400	
K, Submerged	= .000	
K, Reverse	= 1.000	
Kb,Barrel	= .000000	(per ft of full flow)
Barrel Length	= .00	ft
Mannings n	= .0000	

Structure ID	= CO	
Structure Type	= Orifice-Circular	
# of Openings	= 1	
Invert Elev.	= 4487.70	ft
Diameter	= .5000	ft
Orifice Coeff.	= .650	

OUTLET STRUCTURE INPUT DATA

Structure ID	=	CP	
Structure Type	=	Culvert-Circular	
No. Barrels	=	1	
Barrel Diameter	=	1.2500	ft
Upstream Invert	=	4487.70	ft
Dnstream Invert	=	4485.50	ft
Horiz. Length	=	20.00	ft
Barrel Length	=	20.12	ft
Barrel Slope	=	.11001	ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0140	
Ke	=	.6000	(forward entrance loss)
Kb	=	.026936	(per ft of full flow)
Kr	=	.5000	(reverse entrance loss)
HW Convergence	=	.100	+/- ft

INLET CONTROL DATA...

Equation form	=	1
Inlet Control K	=	.0098
Inlet Control M	=	2.0000
Inlet Control c	=	.03980
Inlet Control Y	=	.6700
T1 ratio (HW/D)	=	1.106
T2 ratio (HW/D)	=	1.252
Slope Factor	=	-.500

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

At T1 Elev =	4489.08 ft	--->	Flow =	4.80	cfs
At T2 Elev =	4489.27 ft	--->	Flow =	5.49	cfs

Structure ID	=	TW
Structure Type	=	TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations	=	30
Min. TW tolerance	=	.01 ft
Max. TW tolerance	=	.01 ft
Min. HW tolerance	=	.01 ft
Max. HW tolerance	=	.01 ft
Min. Q tolerance	=	.10 cfs
Max. Q tolerance	=	.10 cfs

File.... C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\4260 DEVELOPED.PPW

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Converge		Notes
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
4487.70	.00	Free Outfall		(no Q: IB,CO,CP)
4487.80	.02	Free Outfall		CO,CP (no Q: IB)
4487.90	.08	Free Outfall		CO,CP (no Q: IB)
4488.00	.18	Free Outfall		CO,CP (no Q: IB)
4488.10	.29	Free Outfall		CO,CP (no Q: IB)
4488.20	.37	Free Outfall		CO,CP (no Q: IB)
4488.30	.44	Free Outfall		CO,CP (no Q: IB)
4488.40	.52	Free Outfall		CO,CP (no Q: IB)
4488.50	.59	Free Outfall		CO,CP (no Q: IB)
4488.60	.65	Free Outfall		CO,CP (no Q: IB)
4488.70	.71	Free Outfall		CO,CP (no Q: IB)
4488.80	.76	Free Outfall		CO,CP (no Q: IB)
4488.90	.82	Free Outfall		CO,CP (no Q: IB)
4489.00	.87	Free Outfall		CO,CP (no Q: IB)
4489.10	.92	Free Outfall		CO,CP (no Q: IB)
4489.20	.97	Free Outfall		CO,CP (no Q: IB)
4489.30	1.01	Free Outfall		CO,CP (no Q: IB)
4489.40	1.05	Free Outfall		CO,CP (no Q: IB)
4489.50	1.10	Free Outfall		CO,CP (no Q: IB)
4489.60	1.14	Free Outfall		CO,CP (no Q: IB)
4489.70	1.18	Free Outfall		CO,CP (no Q: IB)
4489.80	1.22	Free Outfall		CO,CP (no Q: IB)
4489.90	1.26	Free Outfall		CO,CP (no Q: IB)
4490.00	1.29	Free Outfall		CO,CP (no Q: IB)
4490.10	1.33	Free Outfall		CO,CP (no Q: IB)
4490.20	1.36	Free Outfall		CO,CP (no Q: IB)
4490.30	1.40	Free Outfall		CO,CP (no Q: IB)
4490.40	1.43	Free Outfall		CO,CP (no Q: IB)
4490.50	1.46	Free Outfall		CO,CP (no Q: IB)
4490.60	1.50	Free Outfall		CO,CP (no Q: IB)
4490.70	1.53	Free Outfall		CO,CP (no Q: IB)
4490.80	1.56	Free Outfall		CO,CP (no Q: IB)
4490.90	1.59	Free Outfall		CO,CP (no Q: IB)
4491.00	1.62	Free Outfall		CO,CP (no Q: IB)
4491.10	2.42	Free Outfall		IB,CO,CP
4491.20	3.87	Free Outfall		IB,CO,CP
4491.30	5.05	Free Outfall		IB,CO,CP
4491.40	5.60	Free Outfall		IB,CO,CP

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Converge		Notes
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
4491.50	6.09	Free Outfall		IB,CO,CP
4491.60	6.52	Free Outfall		IB,CO,CP
4491.70	6.93	Free Outfall		IB,CO,CP
4491.80	7.30	Free Outfall		IB,CO,CP
4491.90	7.64	Free Outfall		IB,CO,CP
4492.00	7.96	Free Outfall		IB,CO,CP

Type.... Pond E-V-Q Table
Name.... DETPOND
File.... C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\4260 DEVELOPED.PPW

LEVEL POOL ROUTING DATA

HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
Inflow HYG file = 4260.HYG - DETPOND IN Dev100
Outflow HYG file = 4260.HYG - DETPOND OUT Dev100

Pond Node Data = DETPOND
Pond Volume Data = DETPOND
Pond Outlet Data = PR 10

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	4487.70 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0167 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
4487.70	.00	.000	.0500	.00	.00	.00
4487.80	.02	.005	.0523	.00	.02	7.44
4487.90	.08	.010	.0546	.00	.08	15.25
4488.00	.18	.016	.0570	.00	.18	23.41
4488.10	.29	.022	.0589	.00	.29	31.92
4488.20	.37	.028	.0608	.00	.37	40.67
4488.30	.44	.034	.0627	.00	.44	49.70
4488.40	.52	.040	.0646	.00	.52	59.01
4488.50	.59	.047	.0666	.00	.59	68.56
4488.60	.65	.054	.0686	.00	.65	78.43
4488.70	.71	.061	.0707	.00	.71	88.59
4488.80	.76	.068	.0728	.00	.76	99.05
4488.90	.82	.075	.0749	.00	.82	109.81
4489.00	.87	.083	.0770	.00	.87	120.82
4489.10	.92	.091	.0792	.00	.92	132.20
4489.20	.97	.099	.0814	.00	.97	143.89
4489.30	1.01	.107	.0836	.00	1.01	155.90
4489.40	1.05	.115	.0858	.00	1.05	168.23
4489.50	1.10	.124	.0881	.00	1.10	180.83
4489.60	1.14	.133	.0904	.00	1.14	193.82
4489.70	1.18	.142	.0928	.00	1.18	207.15
4489.80	1.22	.152	.0952	.00	1.22	220.82
4489.90	1.26	.161	.0976	.00	1.26	234.83

LEVEL POOL ROUTING DATA

HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
Inflow HYG file = 4260.HYG - DETPOND IN Dev100
Outflow HYG file = 4260.HYG - DETPOND OUT Dev100

Pond Node Data = DETPOND
Pond Volume Data = DETPOND
Pond Outlet Data = PR 10

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	4487.70 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0167 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
4490.00	1.29	.171	.1000	.00	1.29	249.13
4490.10	1.33	.181	.1025	.00	1.33	263.85
4490.20	1.36	.192	.1050	.00	1.36	278.93
4490.30	1.40	.202	.1075	.00	1.40	294.37
4490.40	1.43	.213	.1100	.00	1.43	310.18
4490.50	1.46	.224	.1126	.00	1.46	326.28
4490.60	1.50	.236	.1152	.00	1.50	342.84
4490.70	1.53	.247	.1179	.00	1.53	359.78
4490.80	1.56	.259	.1206	.00	1.56	377.11
4490.90	1.59	.271	.1233	.00	1.59	394.82
4491.00	1.62	.284	.1260	.00	1.62	412.84
4491.10	2.42	.297	.1287	.00	2.42	432.11
4491.20	3.87	.310	.1314	.00	3.87	452.42
4491.30	5.05	.323	.1341	.00	5.05	472.86
4491.40	5.60	.336	.1369	.00	5.60	493.06
4491.50	6.09	.350	.1396	.00	6.09	513.50
4491.60	6.52	.364	.1425	.00	6.52	534.40
4491.70	6.93	.379	.1453	.00	6.93	555.68
4491.80	7.30	.393	.1482	.00	7.30	577.33
4491.90	7.64	.408	.1511	.00	7.64	599.38
4492.00	7.96	.424	.1540	.00	7.96	621.72

LEVEL POOL ROUTING SUMMARY

HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
Inflow HYG file = 4260.HYG - DETPOND IN Dev..2
Outflow HYG file = 4260.HYG - DETPOND OUT Dev..2

Pond Node Data = DETPOND
Pond Volume Data = DETPOND
Pond Outlet Data = PR 10

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	4487.70 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0167 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	1.74 cfs	at	12.0240 hrs
Peak Outflow	=	.42 cfs	at	12.3079 hrs
Peak Elevation	=	4488.27 ft		
Peak Storage	=	.032 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.120
- Infiltration	=	.000
- HYG Vol OUT	=	.119
- Retained Vol	=	.001
Unrouted Vol	=	-.000 ac-ft (.005% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
Inflow HYG file = 4260.HYG - DETPOND IN Dev.10
Outflow HYG file = 4260.HYG - DETPOND OUT Dev.10

Pond Node Data = DETPOND
Pond Volume Data = DETPOND
Pond Outlet Data = PR 10

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	4487.70 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0167 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	5.40 cfs	at	12.0073 hrs
Peak Outflow	=	1.08 cfs	at	12.3246 hrs
Peak Elevation	=	4489.45 ft		
Peak Storage	=	.119 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.338
- Infiltration	=	.000
- HYG Vol OUT	=	.337
- Retained Vol	=	.001
Unrouted Vol	=	-.000 ac-ft (.001% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = C:\MY DOCUMENTS\HOLLOW CREEK SUBDIVISION\
Inflow HYG file = 4260.HYG - DETPOND IN Dev100
Outflow HYG file = 4260.HYG - DETPOND OUT Dev100

Pond Node Data = DETPOND
Pond Volume Data = DETPOND
Pond Outlet Data = PR 10

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	4487.70 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0167 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	15.10 cfs	at	11.9906 hrs
Peak Outflow	=	5.78 cfs	at	12.1743 hrs
Peak Elevation	=	4491.44 ft		
Peak Storage	=	.342 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.931
- Infiltration	=	.000
- HYG Vol OUT	=	.930
- Retained Vol	=	.001
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

Index of Starting Page Numbers for ID Names

----- A -----
A Dev..2... 5.01, 5.02, 5.03

----- B -----
B Dev..2... 5.04, 5.05, 5.06

----- C -----
C Dev..2... 5.07, 5.08, 5.09

----- D -----
D Dev..2... 5.10, 5.11, 5.12
DETPOND... 7.01
DETPOND OUT Dev..2... 7.03, 7.04, 7.05

----- E -----
E Dev..2... 5.13, 5.14, 5.15

----- F -----
F Dev..2... 5.16, 5.17, 5.18

----- G -----
G Dev..2... 5.19, 5.20, 5.21
gjcity... 3.01, 3.03

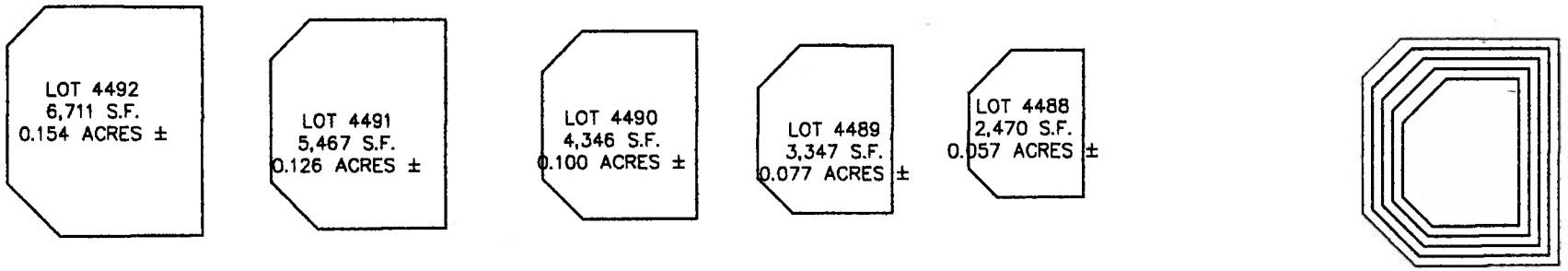
----- H -----
H Dev..2... 5.22, 5.23, 5.24

----- I -----
I Dev..2... 5.25, 5.26, 5.27

----- P -----
PR 10... 6.01, 6.04

----- T -----
TypeII 24hr Dev..2... 4.01, 4.03, 4.05, 4.07, 4.09, 4.11

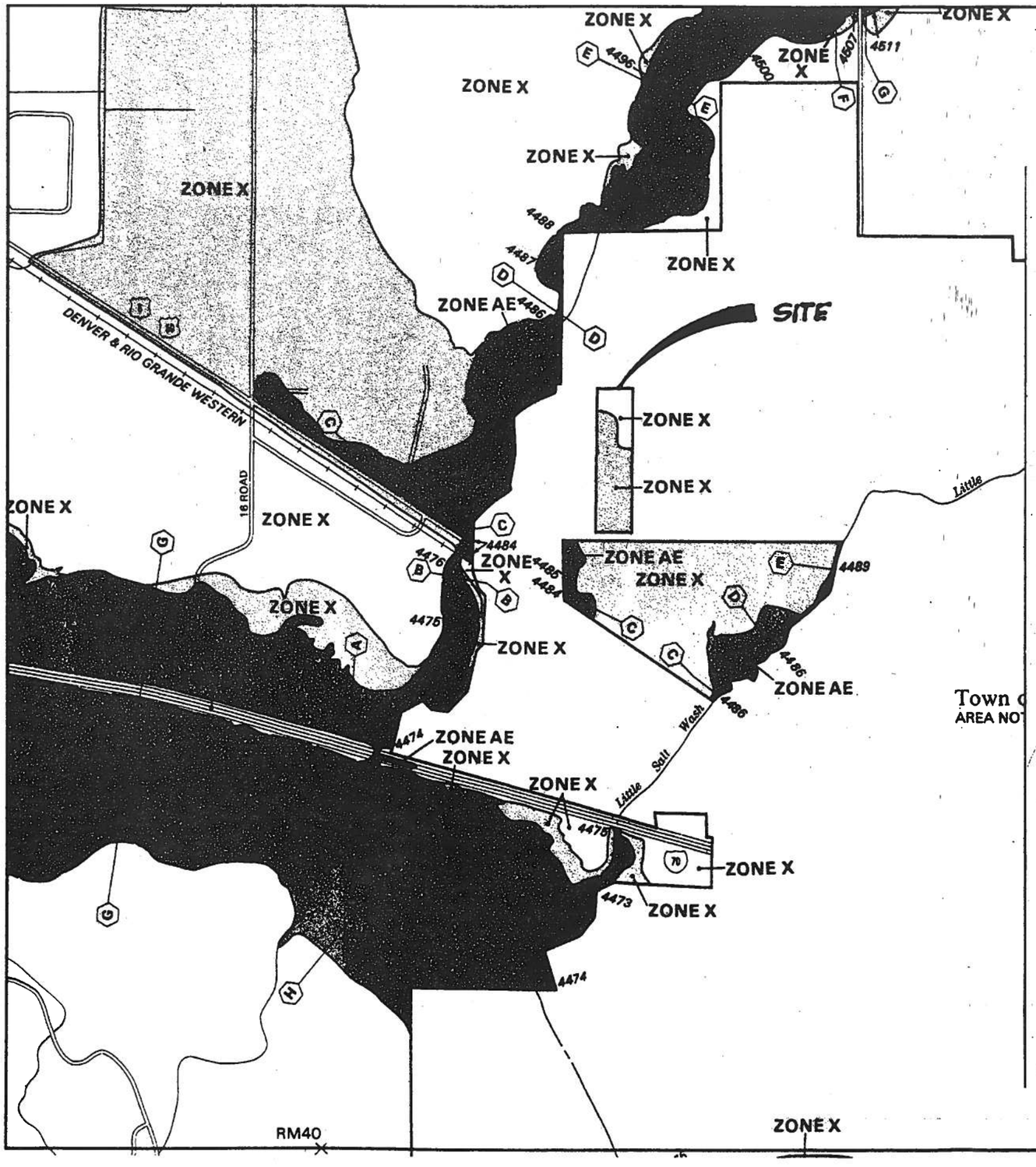
----- W -----
Watershed... 1.01, 2.01, 2.02, 2.05, 2.07, 2.08, 2.11, 2.12



Top 4491.00
4487.70
Ent.

FEMA FLOOD INSURANCE RATE MAP

Community Panel No. 080115 0265B


ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE AE
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X

SOILS INFORMATION

Tr-Turley clay loam, 0 to 2 percent slopes

Map Unit Setting

MLRA:

Elevation: 4,500 to 4,800 feet (1,372 to 1,463 meters)

Mean annual precipitation: 7 to 10 inches (178 to 254 millimeters)

Average annual air temperature: 50 to 54 degrees F. (10 to 12 degrees C.)

Frost-free period: 150 to 190 days

Map Unit Composition

Turley and similar soils: 90 percent

Minor components: 10 percent

Component Descriptions

Turley soils

Landform: Fan terrace

Geomorphic position: Unspecified

Parent material: Alluvium derived from sandstone and shale

Slope: 0 to 2 percent

Surface fragments: Unspecified

Depth to restrictive feature: Unspecified

Drainage class: Well drained

Slowest permeability: About 0.20 in/hr (moderately slow)

Available water capacity: About 10.4 inches (high)

Shrink-swell potential: About 1.5 LEP (low)

Flooding hazard: None

Ponding hazard: Unspecified

Seasonal water table minimum depth: Greater than 6 feet

Runoff class: Medium

Calcium carbonate maximum: About 10 percent

Gypsum maximum: None

Salinity maximum: About 2 mmhos/cm (nonsaline)

Sodicity maximum: About 0 SAR (nonsodic)

Ecological site: Unspecified

Potential native vegetation: Unspecified

Land capability (irrigated): 2e

Land capability (non irrigated): 7c

##

Typical Profile:

Ap-0 to 10 inches; clay loam

C1-10 to 20 inches; fine sandy loam

C2-20 to 30 inches; clay loam

C3-30 to 60 inches; stratified loam to silty clay loam

##

Minor Components

Other Soils and similar soils

Composition: About 10 percent

Landform: Unspecified

Geomorphic Position: Unspecified

Slope: Unspecified

Depth to restrictive feature: Unspecified

Drainage class: Unspecified

Ecological site: Unspecified

##

Re-Sagrlite loam, 0 to 2 percent slopes

Map Unit Setting

MLRA:

Elevation: 4,500 to 4,900 feet (1,372 to 1,494 meters)

Mean annual precipitation: 7 to 10 inches (178 to 254 millimeters)

Average annual air temperature: 50 to 54 degrees F. (10 to 12 degrees C.)

Frost-free period: 150 to 190 days

Map Unit Composition

Sagrlite and similar soils: 90 percent

Minor components: 10 percent

Component Descriptions

Sagrlite soils

Landform: Terrace, alluvial fan

Geomorphic position: Unspecified

Parent material: Silty alluvium derived from sandstone and shale

Slope: 0 to 2 percent

Surface fragments: Unspecified

Depth to restrictive feature: Unspecified

Drainage class: Well drained

Slowest permeability: About 0.60 in/hr (moderate)

Available water capacity: About 9.3 inches (high)

Shrink-swell potential: About 1.5 LEP (low)

Flooding hazard: None

Ponding hazard: Unspecified

Seasonal water table minimum depth: Greater than 6 feet

Runoff class: Low

Calcium carbonate maximum: About 20 percent

Gypsum maximum: About 1 percent

Salinity maximum: About 8 mmhos/cm (slightly saline)

Sodicity maximum: About 10 SAR (slightly sodic)

Ecological site: Unspecified

Potential native vegetation: Unspecified

Land capability (irrigated): 2s

Land capability (non irrigated): 7c

##

Typical Profile:

Ap-0 to 13 inches; loam

C-13 to 60 inches; silt loam

##

Minor Components

Other Soils and similar soils

Composition: About 10 percent

Landform: Unspecified

Geomorphic Position: Unspecified

Slope: Unspecified

Depth to restrictive feature: Unspecified

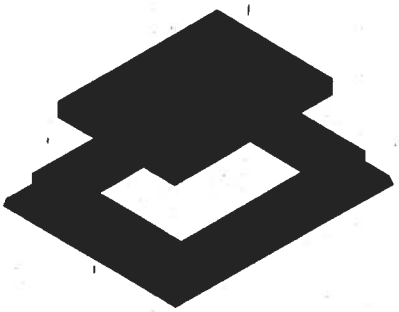
Drainage class: Unspecified

Ecological site: Unspecified

HYDRUALIC CALCULATIONS

CAST IRON **INLET FRAME & GRATE** **IFG-1927 C.I.**

IFG1927CI

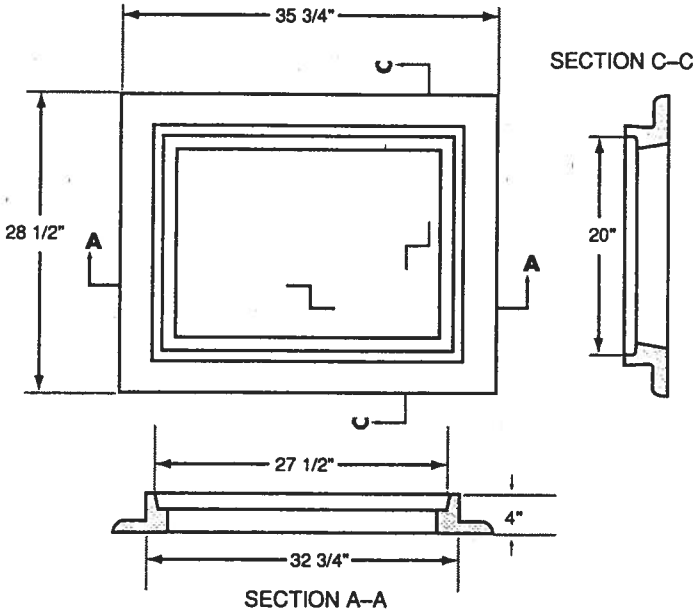


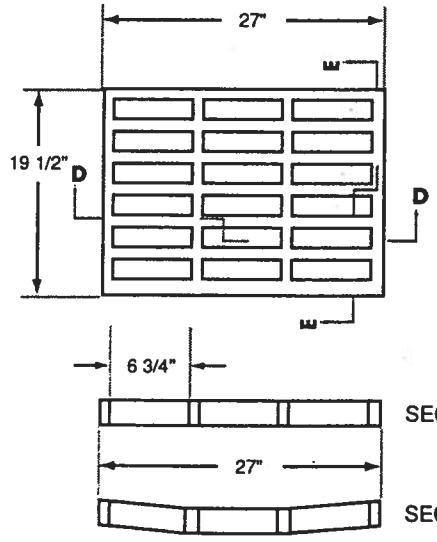
APPROXIMATE WEIGHT

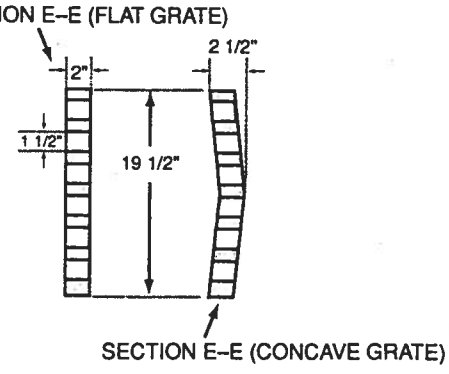
FRAME	**201 lb**
GRATE FLAT	**171 lb**
GRATE CONCAVE	**182 lb**

NOTE:
FINISH—BLACK BITUMINOUS PAINT

Weir Length: 7.750 feet
Orifice Area: 1.2656 Square feet







860 4TH AVE. • P.O. BOX 669 • GRAND JCT, CO 81502 • 970.243.2032 • FAX 970.242.4962

FHWA Urban Drainage Design Program, HY-22
Drainage of Highway Pavements

Inlets on Sag
Date: 11/01/2006

Project No. :4260.01-01
Project Name.:Hollow Creek Subdivision
Computed by :FLL

Project Description
Combination Inlet Capacity Calculation
9.9 Acre Residential Subdivision
1662 K Road, Fruita, CO

Inlets on Sag: Equal-Length Combination Inlet

Roadway and Discharge Data

		Composite/Dep
	Cross Slope	
Sx	Pavement Cross Slope (ft/ft)	0.0200
Sw	Gutter Cross Slope (ft/ft)	0.0833
n	Manning's Coefficient	0.016
W	Gutter Width (ft)	1.50
a	Gutter Depression (inch)	1.50

Inlet Interception

	Inlet Type *Sag*	Curb-Opening
L	Curb-Opening Length (ft)	3.00
H	Curb-Opening Height (in)	5.00
	Inlet Type *Sag*	Parallel Bar P-1-7/8
T	Width of Spread (ft)	14.00
WGR	Grate Width (ft)	1.50
L	Grate Length (ft)	3.00
	Inlet Type *Sag*	Equal Length Combination
d_ave	Depth of Flow (ft)	0.375
d_curb	Depth at Curb (ft)	0.500
Qi	Intercepted Flow (cfs)	4.130

Project Name: Hollow Creek Subdivision
Project No.: 4260.01-01
Description: Storm Drain System Backwater Calculation - Final Drainage Study

Location			Inlet Flow		Geometric Design						Design Flow Head Losses																	
Line No.	MH/Inlet	Station	Q_i (cfs)	ΣQ_i (cfs)	Pipe Type	n 0.013	Length (ft)	Slope (ft/ft)	ϕ_o (ft)	Flowline Out (ft)	d_n/ϕ (ft)	S_f (ft/ft)	H_f (ft)	V (ft/sec)	H_e & H_c (ft)	θ (deg)	ϕ_{MH} (ft)	D_i (ft)	K_o	C_d	C_Q	C_p	C_B	K	H_M (ft)	EL_{HGL} @ Pipe Outlet (ft)	Surcharge Depth (ft)	Elevation Rim/inlet (ft)	Free Board (ft)	Notes
K Road (24" HDPE) Storm Sewer - Queens Subdivision flows																												
	Det Pond	10+32.00	15							4485.47															4486.91	-0.56	4492.2	5.29	SDMH Juniper and Ottley
				15	HDPE	0.012	126	0.003	2		1	0.00374488	0.47	4.7746		180	4	2	0.2	1	2	1	1	0.4	0.1416	0.61				
	SD-4	9+06.00								4484.83																4486.29	-0.54	4492.4	6.11	
				15	HDPE	0.012	300	0.004	2		1	0.00374488	1.12	4.7746		180	4	2	0.2	1	2	1	1	0.4	0.1416	1.27				
	SD-3	6+06.00								4483.38																4485.03	-0.35	4490.83	5.80	
				15	HDPE	0.012	239	0.005	2		1	0.00374488	0.9	4.7746		180	4	2	0.2	1	2	1	1	0.4	0.1416	1.04				
	SD-2	3+71.00								4481.99																4483.99		4490.24		Inlet to Drop MH (full pipe)
	SD-2'	3+67.00								4475.99																4478.38	0.39	4490.24	11.86	Drop Manhole
				15	HDPE	0.012	270	0.003	2		1	0.00374488	1.01	4.7746		180	4	2	0.2	1	2	1	1	0.4	0.1416	1.15				
	Outlet	0+97.00								4475.23																4477.23				Outlet at Big Salt Wash
K Road (24" HDPE) Storm Sewer - Queens Subdivision and proposed Hollow Creek Subdivision (100-year peak flows)																												
	Det Pond	10+32.00	20							4485.47															4489.17	1.70	4492.2	3.03	SDMH Juniper and Ottley
				20	HDPE	0.012	126	0.003	2		1	0.00665756	0.84	6.3662		180	4	2	0.2	1	2	1	1	0.4	0.2517	1.09				
	SD-4	9+06.00								4484.83																4488.08	1.25	4492.4	4.32	
				20	HDPE	0.012	300	0.004	2		1	0.00665756	2	6.3662		180	4	2	0.2	1	2	1	1	0.4	0.2517	2.25				
	SD-3	6+06.00								4483.38																4485.83	0.45	4490.83	5.00	
				20	HDPE	0.012	239	0.005	2		1	0.00665756	1.59	6.3662		180	4	2	0.2	1	2	1	1	0.4	0.2517	1.84				
	SD-2	3+71.00								4481.99																4483.99		4490.24		Inlet to Drop MH (full pipe)
	SD-2'	3+67.00								4475.99																4479.28	1.29	4490.24	10.96	Drop Manhole
				20	HDPE	0.012	270	0.003	2		1	0.00665756	1.8	6.3662		180	4	2	0.2	1	2	1	1	0.4	0.2517	2.05				
	Outlet	0+97.00								4475.23																4477.23				Outlet at Big Salt Wash
K Road (24" HDPE) Storm Sewer - Defined Capacity																												
	Det Pond	10+32.00	17							4485.47															4487.73	0.26	4492.2	4.47	SDMH Juniper and Ottley
				17	HDPE	0.012	126	0.003	2		1	0.00481009	0.61	5.4113		180	4	2	0.2	1	2	1	1	0.4	0.1819	0.79				
	SD-4	9+06.00								4484.83																4486.95	0.12	4492.4	5.45	
				17	HDPE	0.012	300	0.004	2		1	0.00481009	1.44	5.4113		180	4	2	0.2	1	2	1	1	0.4	0.1819	1.62				
	SD-3	6+06.00								4483.38																4485.32	-0.06	4490.83	5.51	
				17	HDPE	0.012	239	0.005	2		1	0.00481009	1.15	5.4113		180	4	2	0.2	1	2	1	1	0.4	0.1819	1.33				
	SD-2	3+71.00								4481.99																4483.99		4490.24		Inlet to Drop MH (full pipe)
	SD-2'	3+67.00								4475.99																4478.71	0.72	4490.24	11.53	Drop Manhole
				17	HDPE	0.012	270	0.003	2		1	0.00481009	1.3	5.4113		180	4	2	0.2	1	2	1	1	0.4	0.1819	1.48				
	Outlet	0+97.00								4475.23																4477.23		4479.23		Outlet at Big Salt Wash

Variable Description

Q_i = Inlet design flow
ΣQ_i = Sum of the inlet design flows
n = Mannings friction factor
ϕ_o = Diameter of pipe outlet
d_n/ϕ = Depth of flow/Diameter of pipe

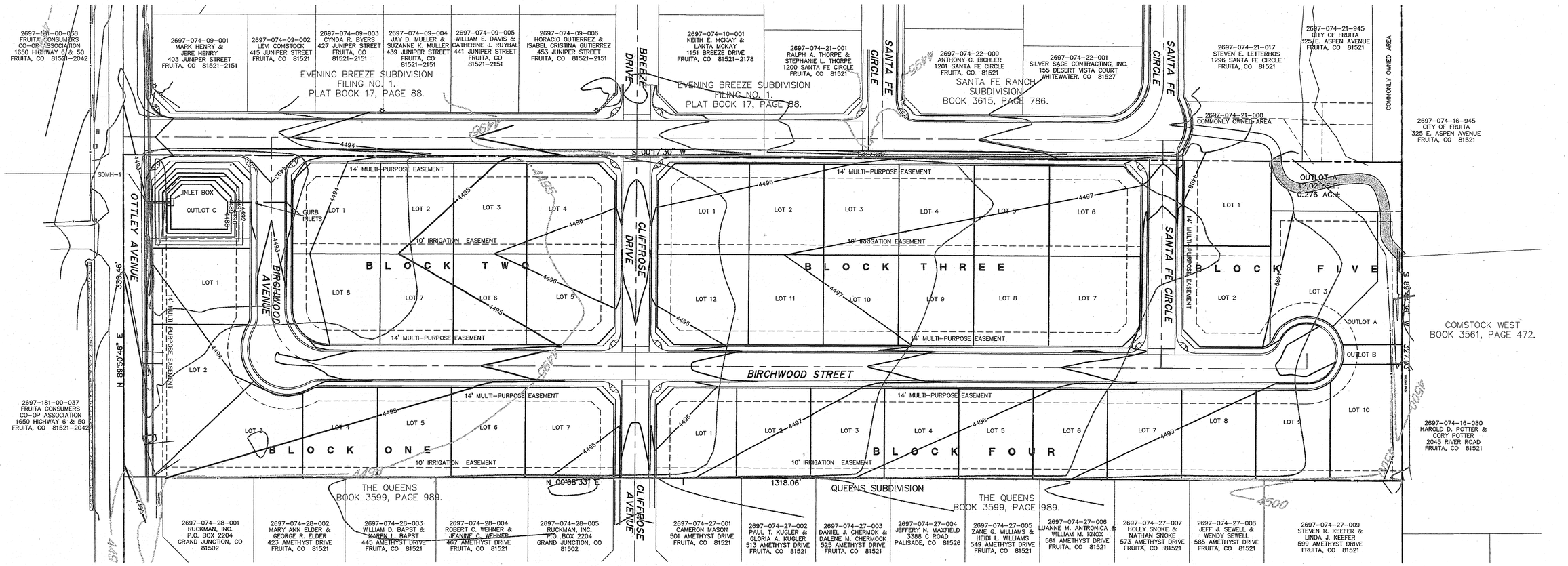
S_f = Frictional Slope
H_f = Headloss due to friction in the pipeline
V = Velocity
H_e & H_c = Headloss due to expansion and/or contraction
θ = Interior angle of sewer line bend

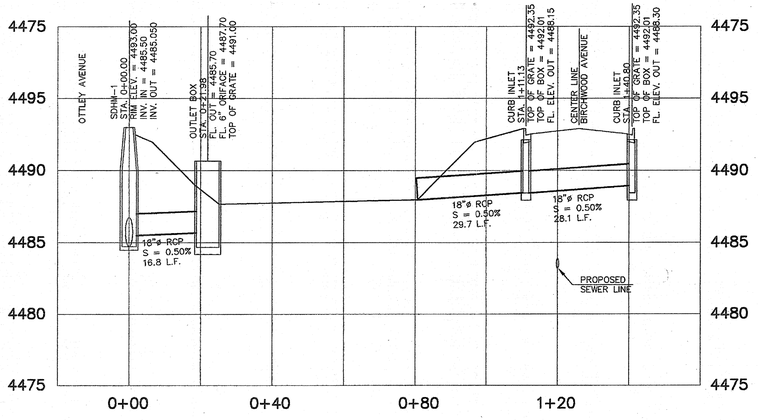
ϕ_{MH} = Inside diameter of manhole
ϕ_i = Diameter of pipe inlet
K_o = Initial headloss coefficient based upon relative manhole size
C_d = Flowdepth correction
C_Q = Relative flow correction

C_p = Plunging flow correction
C_B = Benching correction
K = Adjusted head loss coeficient
H_M = Junction/Manhole head loss

Note:
1.) Stormdrain stationing and elevations based upon Crane Associates As-built information.

Vista Engineering Corporation
605 28 1/4 Road
Grand Junction, CO 81505

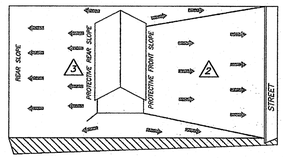




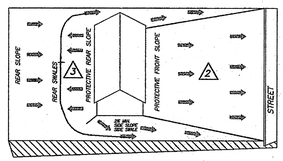
DETENTION BASIN OUTFALL PROFILE
VERTICAL SCALE: 1"=5'
HORIZONTAL SCALE: 1"=20'

HOLLOW CREEK SUBDIVISION
TOP-OF-CONCRETE ELEVATION TABULATION
11-01-06

LOT	BLOCK	ADDRESS	T.C. ELEV. (MIN.)	T.C. ELEV. (MAX.)
1	1	BIRCHWOOD AVENUE	4494.5	4496.0
2	1	BIRCHWOOD AVENUE	4495.0	4496.5
3	1	BIRCHWOOD STREET	4495.5	4497.0
4	1	BIRCHWOOD STREET	4495.7	4497.2
5	1	BIRCHWOOD STREET	4495.9	4497.4
6	1	BIRCHWOOD STREET	4496.5	4498.0
7A	1	BIRCHWOOD STREET	4496.9	4498.4
7B	1	CLIFFROSE AVENUE	4496.9	4498.4
1A	2	BIRCHWOOD AVENUE	4495.5	4494.4
1B	2	JUNIPER STREET	4495.5	4494.4
2	2	JUNIPER STREET	4495.8	4497.3
3	2	JUNIPER STREET	4496.2	4497.7
4A	2	JUNIPER STREET	4496.8	4498.3
4B	2	CLIFFROSE AVENUE	4496.8	4498.3
5A	2	CLIFFROSE AVENUE	4496.9	4498.4
5B	2	BIRCHWOOD STREET	4496.9	4498.4
6	2	BIRCHWOOD STREET	4496.5	4498.0
7	2	BIRCHWOOD STREET	4495.9	4497.4
8A	2	BIRCHWOOD AVENUE	4494.8	4496.3
8B	2	BIRCHWOOD STREET	4494.8	4496.3
1A	3	CLIFFROSE AVENUE	4496.9	4498.4
1B	3	JUNIPER STREET	4496.9	4498.4
2	3	JUNIPER STREET	4497.1	4498.6
3	3	JUNIPER STREET	4497.3	4498.8
4	3	JUNIPER STREET	4497.7	4499.2
5	3	JUNIPER STREET	4497.9	4499.4
6A	3	SANTA FE DRIVE	4498.1	4499.6
6B	3	JUNIPER STREET	4498.1	4499.6
7A	3	SANTA FE DRIVE	4499.3	4500.8
7B	3	BIRCHWOOD STREET	4498.3	4500.8
8	3	BIRCHWOOD STREET	4498.9	4500.4
9	3	BIRCHWOOD STREET	4498.5	4500.0
10	3	BIRCHWOOD STREET	4498.1	4499.6
11	3	BIRCHWOOD STREET	4497.8	4499.3
12A	3	BIRCHWOOD STREET	4497.1	4498.6
12B	3	CLIFFROSE AVENUE	4497.1	4498.6
1A	4	BIRCHWOOD STREET	4497.1	4498.6
1B	4	CLIFFROSE AVENUE	4497.1	4498.6
2	4	BIRCHWOOD STREET	4497.8	4499.3
3	4	BIRCHWOOD STREET	4498.1	4499.6
4	4	BIRCHWOOD STREET	4498.5	4500.0
5	4	BIRCHWOOD STREET	4498.9	4500.4
6	4	BIRCHWOOD STREET	4499.3	4500.8
7	4	BIRCHWOOD STREET	4499.5	4501.0
8	4	BIRCHWOOD STREET	4499.9	4501.4
9	4	BIRCHWOOD STREET	4500.3	4501.8
10	4	BIRCHWOOD STREET	4500.5	4502.0
1	5	SANTA FE DRIVE	4498.5	4500.0
2A	5	SANTA FE DRIVE	4499.7	4501.2
2B	5	BIRCHWOOD STREET	4499.7	4501.2
3	5	BIRCHWOOD STREET	4500.5	4502.0

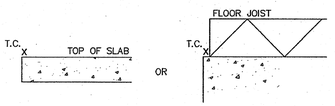


⚠1 TYPE 'B' TYPICAL LOT GRADING



⚠1 TYPE 'A' TYPICAL LOT GRADING

NOTES:
⚠1 ALL LOTS ARE TYPE 'A' UNLESS MARKED OTHERWISE ON PLAN.
⚠2 MINIMUM ELEVATION OF TC (TOP OF SLAB OR FOUNDATION) SHALL BE 0.67 FT. + 2% OF SETBACK (25') = 1.17' ABOVE (MEASURED FROM FLOWLINE OF GUTTER).
⚠3 MINIMUM SIDE AND REAR SLOPES SHALL BE 6" DROP FROM FOUNDATION IN FIRST 10'.



T.C. = TOP OF CONCRETE (MINIMUM ELEVATION)
NOT TO SCALE

N

FEET 50 0 50 FEET
GRAPHIC SCALE
SCALE: 1 INCH = 50 FEET

LEGEND
4670 EXISTING CONTOURS
4670 PROPOSED CONTOURS

SEE SHEET 4 OF 32 FOR LEGEND AND DETAILS

CALL 1-800-922-1987 UTILITY NOTIFICATION CENTER OF COLORADO

BENCHMARK/CONTROL
S 1/4 CORNER
SECTION 7, T.1N, R.2W, U.M.
FLETCHER, LS 24953
NORTHING 71188.7940
EASTING 39329.2830
ELEVATION 4491.67 (NAVD '88)

COLORADO REGISTERED
FREDERICK L. LIBERSAT
34866
PROFESSIONAL ENGINEER
11/1/06

APPROVED FOR CONSTRUCTION:
City of Fruita Date

ACCEPTED AS CONSTRUCTION:
City of Fruita Date

DRAWN BY: F.J.B.	REVIEWED ____ DATE: ____ FOR ____	VISTA ENGINEERING CORP.	REVISION	DATE	DESCRIPTION	BY	CH'D
DESIGNED BY: F.L.L.	REVIEWED ____ DATE: ____ FOR VISTA ENGINEERING CORP.	CONSULTING ENGINEERS AND LAND SURVEYORS					
CHECKED BY: F.L.L.		805 28 1/4 ROAD, SUITE B • GRAND JUNCTION, CO 81506 • (970) 243-2242					

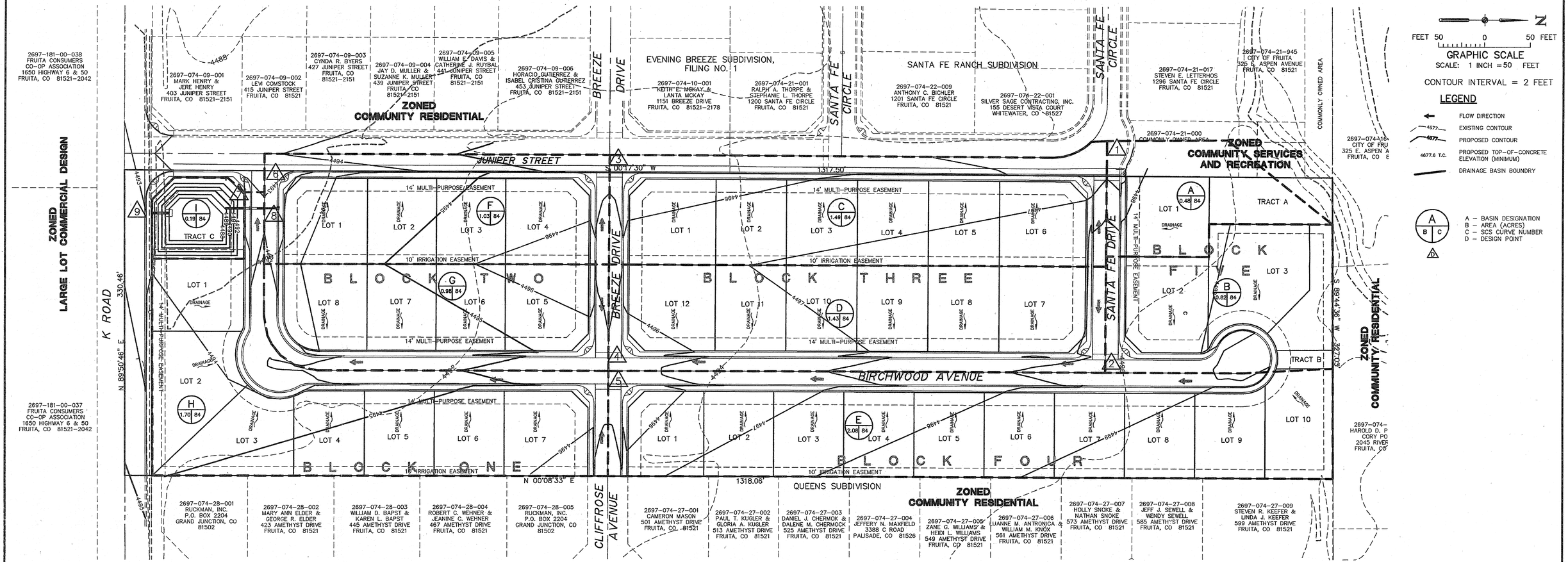
RUCKMAN, INC. GRAND JUNCTION, COLORADO

GRADING AND DRAINAGE PLAN
HOLLOW CREEK SUBDIVISION

SCALE: 1" = 50' | JOB NO: 4260.01-01 | DATE: 11-01-06

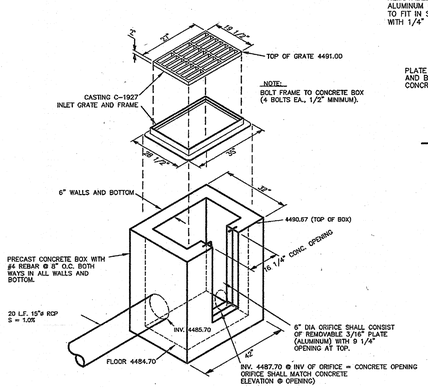
SHEET NO: 18 of 32

N:\SDSKPRO\14260.01-01\dwg\GRADING.dwg, 11/2/2006 9:26:56 AM

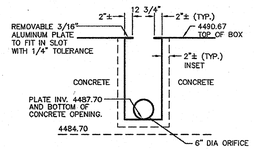


BASIN/ DESIGN POINT	AREA (AC)	RUNOFF FLOW 2-YEAR (CFS)	RUNOFF FLOW 100-YEAR (CFS)	NOTE
FUTURE GRAVITY OUTFALL				
A	0.483	0.08	0.72	
B	0.822	0.15	1.29	
C	1.487	0.26	2.25	
D	1.431	0.25	2.16	
E	2.078	0.34	2.98	
F	1.030	0.19	1.60	
G	0.976	0.17	1.47	
H	1.696	0.29	2.54	
I	0.193	0.01	0.22	
1		0.08	0.72	
2		0.15	1.29	
3		0.35	2.97	
4		0.40	3.43	
5		0.34	2.98	
6		0.53	4.55	
7		1.73	14.90	SOUTH INLET
8		1.11	9.45	NORTH INLET
9		0.42	5.78	OUTFALL

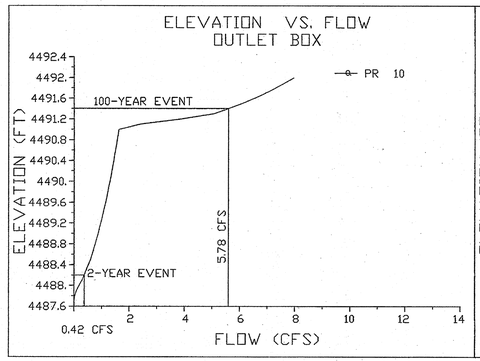
STORM EVENT	MAX. W.S. ELEV.	PEAK VOLUME (AC-FT)	PEAK INFLOW (CFS)	PEAK DISCHARGE (CFS)
DETENTION BASIN OUTFALL				
2-YEAR	4488.27	0.032	1.74	0.42
100-YEAR	4491.44	0.342	15.10	5.78

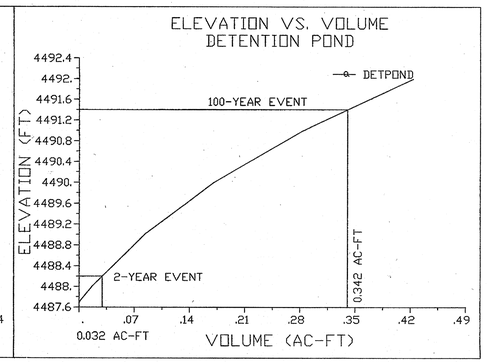


CONCRETE OUTLET STRUCTURE
N.T.S.



WEIR PLATE DETAIL
N.T.S.





11/1/06

DRAWN BY: F.J.B.	REVIEWED ____ DATE: ____ FOR ____	VISTA ENGINEERING CORP. CONSULTING ENGINEERS AND LAND SURVEYORS 605 28 1/4 ROAD, SUITE B • GRAND JUNCTION, CO 81506 • (970) 243-2242	REVISION	DATE	DESCRIPTION	BY	CH'D
DESIGNED BY: F.L.L.	REVIEWED ____ DATE: ____ FOR VISTA ENGINEERING CORP.						
CHECKED BY: F.L.L.							

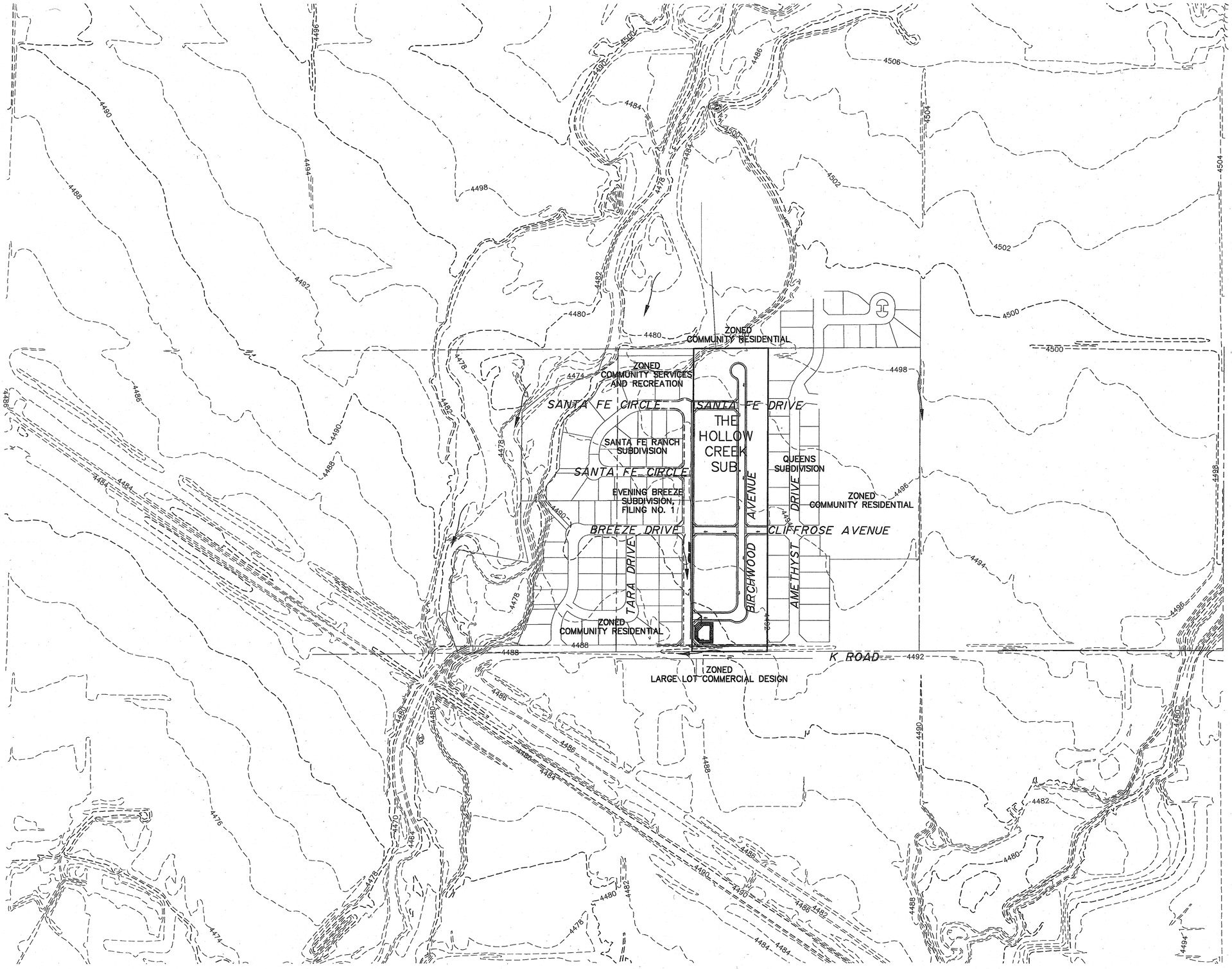
RUCKMAN, INC. GRAND JUNCTION, COLORADO

POST-DEVELOPMENT DRAINAGE MAP
HOLLOW CREEK SUBDIVISION

SCALE:	JOB NO:	DATE:
1" = 50'	4260.01-01	11/3/06

SHEET NO: 1 OF 1

C:\Land Projects R2\4260.01-01\dwg\Post-development drainage map.dwg, 10/31/2006 2:28:02 PM



N

FEET 200 0 200 FEET

GRAPHIC SCALE

SCALE: 1 INCH = 200 FEET

CONTOUR INTERVAL = 2 FEET

SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 EAST

VERTICAL DATUM: 1988 NAVD

LEGEND

4678 EXISTING 2 FOOT CONTOURS

4680 EXISTING 10 FOOT CONTOURS

FLOW DIRECTION

NOTE:

1. CONTOURS BASED ON 2001 MESA COUNTY AERIAL SURVEY. 2 FOOT CONTOUR INTERVAL.

COLORADO REGISTERED PROFESSIONAL ENGINEER FREDRICK L. LARSEN 34866

11/1/06

DRAWN BY: SGS	REVIEWED DATE: FOR	VISTA ENGINEERING CORP. CONSULTING ENGINEERS AND LAND SURVEYORS 605 28 1/4 ROAD, SUITE B • GRAND JUNCTION, CO 81506 • (970) 243-2242	REVISION	DATE	DESCRIPTION	BY	CH'D
DESIGNED BY: FLL	REVIEWED DATE: FOR VISTA ENGINEERING CORP.						
CHECKED BY: FLL							

RUCKMAN. INC. GRAND JUNCTION, COLORA

OFF SITE DRAINAGE BASIN MAP
HOLLOW CREEK SUBDIVISION

C:\Land Projects R2\4260.01-01\dwg\OFF SITE BASIN MAP.dwg, 11/2/2006 9:52:54 AM