Farnsworth GROUP

STORM WATER DETENTION REPORT

Casey's General Store
Town of Franklin, IN

Owner: Casey's Retail Company
One Convenience Boulevard
Ankeny, IA 60181
(515) 965-6100

Engineer: Farnsworth Group, Inc.
2211 West Bradley Avenue
Champaign, Illinois 61821
(217) 352-7408

October 2015

TABLE OF CONTENTS

ABSTRACT	5
PRE-DEVELOPMENT CONDITIONS	6
POST-DEVELOPMENT CONDITIONS	7
ALLOWABLE PEAK DISCHARGE	8
STORM ROUTING	9
CONCLUSION	10
APPENDIX	11

DETENTION ANALYSIS

Casey's – Franklin, IN Storm Detention October 2015

ABSTRACT

Casey's General Stores is proposing to construct a new convenience store with fuel sales in the Town of Franklin, IN. The new store will be located on the north side of Earlywood Drive, East of Professional Drive and west of US 31 (Morton Street). The proposed development will include the construction of an approximate 4,350 SF convenience store with fuel islands, access drives onto Professional Drive and Earlywood Drive Street, associated parking areas and drive lanes, and utility services.

The report will analyze the pre-development and the post-development conditions, determine the estimated required storage volume to control the 2-year, 10-year and 100-year storm events, and design the required outlet structure to control the peak runoff rates for the post-development 10-year and 100-year storm events.

Per the City of Franklin stormwater detention standards, the drainage facility shall provide storm water control for the critical peak storm from the analysis of the 1-hr, 2-hr, 3-hr, 6-hr, 12-hr and 24-hr storm durations.

The report will follow the SCS TR-55 methodology and will use the Bentley Pondpack software program.

PRE-DEVELOPMENT CONDITIONS

The existing site is approximately 1.64 acres in size. The existing ground cover conditions consists of asphalt paving, concrete paving, and limited lawn areas with >75% coverage.

The following land use classification and corresponding curve numbers are based upon the existing site conditions and the existing soil classification as determined by the National Resource Conservation Service soils map for the area.

Existing Area 1

Soil Group D	Open Space/Lawn	0.437 ac	CN = 80
		Weighted CN = 80	

Existing Area 2

Soil Group D	Open Space/Lawn	0.856 ac	CN = 80
		Weighted CN = 80	

Existing Area 3

Soil Group D	Open Space/Lawn	0.346 ac	CN = 80
		Weighted CN = 80	

POST-DEVELOPMENT CONDITIONS

The post-developed conditions will result in the development of a commercial/retail business (Casey's General Store) with fuel sales. The proposed ground cover conditions will consist of an approximate 4,350 SF retail building, parking and drive aisles and perimeter green space areas.

The following land use classification and corresponding curve numbers are based upon the proposed site conditions and the existing soil classification as determined by the National Resource Conservation Service soils map for the area.

Developed Area 1			
Soil Group D	Open Space/Lawn	0.152 ac	CN = 80
		Weighted CN = 80	
Developed Area 2			
Soil Group D	Open Space/Lawn	0.663 ac	CN = 80
	Pavement/Building	0.719 ac	CN = 98
		Weighted CN = 77	
Developed Area 3			
Soil Group D	Open Space/Lawn	0.102 ac	CN = 80
	Pavement/Building	0.003 ac	CN = 98
		Weighted CN = 80	

ALLOWABLE PEAK DISCHARGE

Per the City of Franklin, IN, Stormwater Detention Design Criteria, the runoff rates shall meet the following:

- 2-yr pre-development storm runoff for the 10-yr post-development storm event
- 10-yr pre-development storm runoff rate for the 100-year post-development storm event

The Indiana Department of Transportation Drainage Manual requires that the peak rate of discharge from the property cannot exceed the 10-year, pre-development 24-hour discharge rate for post developed 50-year storm event

For this project, the Town of Ferdinand's requirements shall govern as they are more restrictive.

For the proposed Casey's General Store site, the existing condition discharge rates are as follows:

	Area 1	Area 2	Area 3
Storm Event	(cfs)	(cfs)	(cfs)
1-hr 2-year	0.45	0.55	0.26
1-hr 10-year	1.23	1.47	0.71
1-hr 100-year	2.83	3.40	1.63
2-hr 2-year	0.59	0.70	0.34
2-hr 10-year	1.54	1.80	0.86
2-hr 100-year	3.62	4.15	2.02
3-hr 2-year	0.52	0.68	0.31
3-hr 10-year	1.33	1.71	0.80
3-hr 100-year	3.11	3.99	1.85
6-hr 2-year	0.54	0.87	0.39
6-hr 10-year	1.20	1.93	0.85
6-hr 100-year	2.50	4.05	1.77
12-hr 2-year	0.65	1.05	0.46
12-hr 10-year	1.30	2.10	0.92
12-hr 100-year	2.49	4.04	1.77
24-hr 2-year	0.77	1.25	0.55
24-hr 10-year	1.38	2.25	0.98
24-hr 100-year	2.40	3.89	1.70

Under post-development conditions, the 2-hr storm event has been determined to be the critical design storm. This storm event produces the greatest storm runoff rates for the post-development 10-year and 100-year events.

The rainfall intensities for the 2-year, 10-year and 100-year 24-hour storms have been taken from the NOAA Atlas 14, Volume 2 Version 3. See the Precipitation Table in Appendix Section 1.

STORM ROUTING

For this project an at grade detention basin will be required to control the stormwater runoff from the site for Area 2. No detention basin will be required for Area 1, and Area 3 as the peak flows are less than the allowable rates during post development.

The control outlet structure for the detention basin will be located within modified catch basin 2.1 located on the northwest corner of the site. Incremental storage of the 21" drainage pipe leading from the detention basin to modified catch basin 2.0 (control point) is ignored to simplify the design calculations.

The control for the detention basin will consist of two orifices; a 3.4" (0.285') diameter hole at 769.40 and a 7.20" (0.60') diameter hole at 774.35. Both orifices are located within modified catch basin 2.0.

The developed condition hydrographs for the 2-year, 10-year and 100-year storms were calculated and routed through the proposed outlet structure using the 2005 version of Bentley Pondpack software. The results of the storm routings are located in Section 3 Appendix of this report.

The results of the storm routings are as follows:

	Storm Event (2-hr)	Pre-Developed Discharge (cfs)	Post-Developed Discharge (cfs)	Peak Elevation (ft)
CP 1	2-year	0.59	0.28	N/A
	10-year	1.55	0.59	N/A
	100-year	3.63	1.21	N/A
CP 2	2-year	0.70	0.56	772.84
	10-year	1.80	0.65	774.04
	100-year	4.15	1.79	775.17
CP 3	2-year	0.34	0.06	N/A
	10-year	0.86	0.16	N/A
	100-year	2.02	0.36	N/A

CONCLUSION

The results of the analysis demonstrate that adequate detention storage volume is provided for the proposed Casey's General Store site. The results of the storm routings indicates that the allowable peak discharges will not be exceeded once the store and associated infrastructure has been constructed as proposed.

All pertinent worksheets, storm routing information are located within the Appendix of this report.

APPENDIX

Section 1

Project Location Map

NCRS Soils Map

Rainfall Table 1

Pre-Development Drainage and Flow Map

Post-Development Drainage and Flow Map

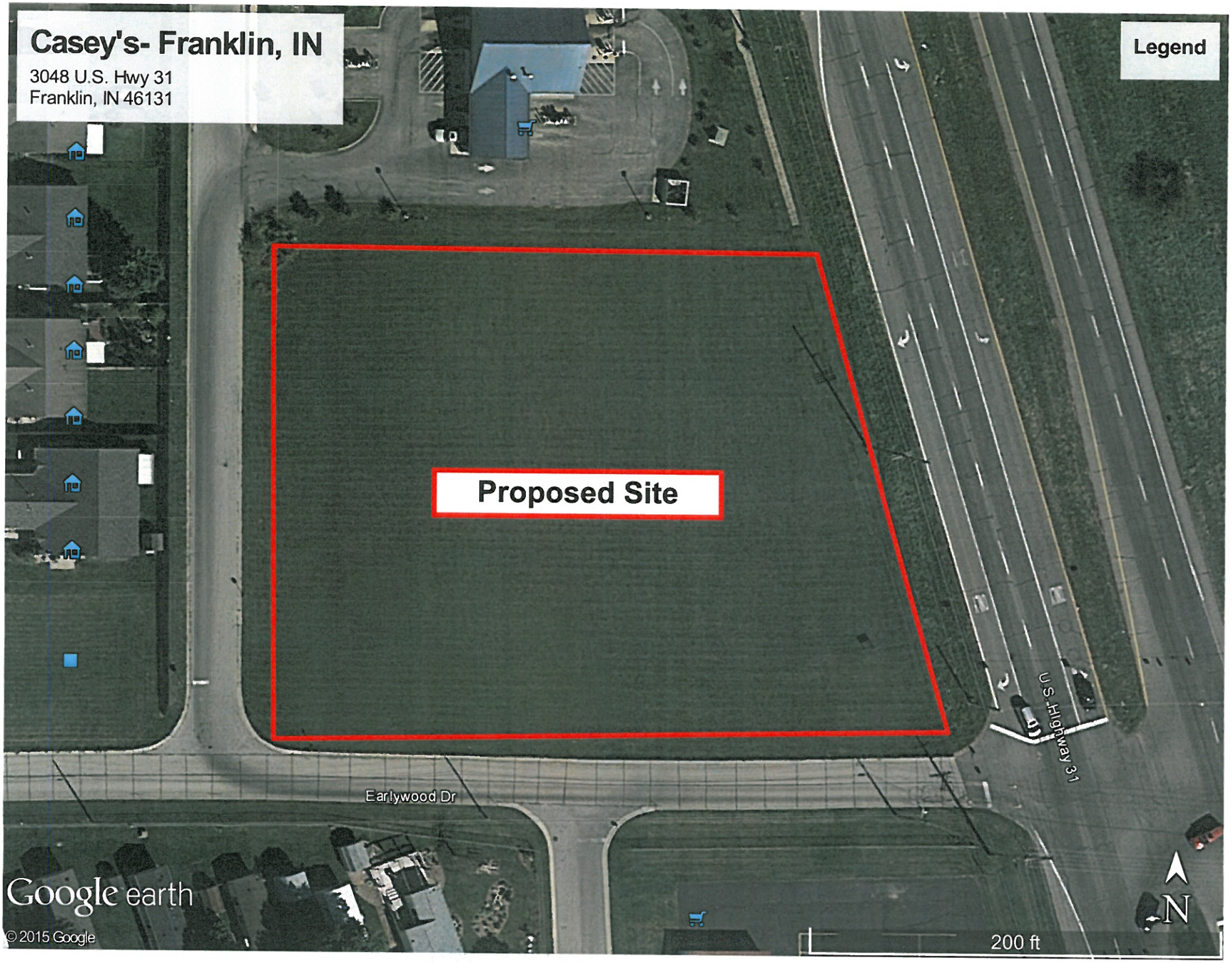
Section 2

Pre-Development Runoff Models

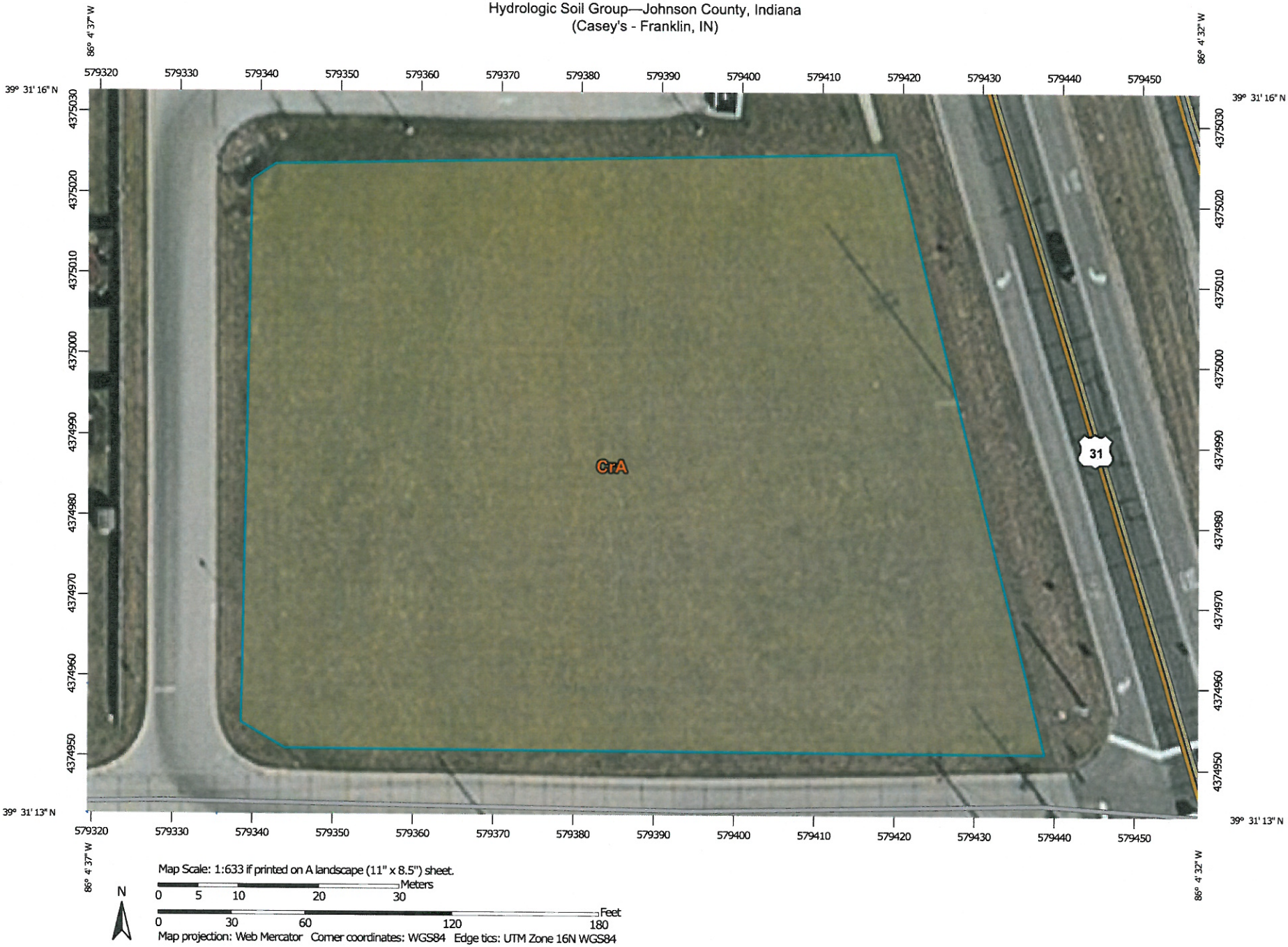
Section 3

Post-Development Runoff Models

Section 1


Casey's- Franklin, IN
3048 U.S. Hwy 31
Franklin, IN 46131
Legend
Proposed Site
Earlywood Dr
U.S. Highway 31
Google earth
© 2015 Google
200 ft
N

Hydrologic Soil Group—Johnson County, Indiana
(Casey's - Franklin, IN)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 22, Sep 16, 2014

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

Date(s) aerial images were photographed: Sep 17, 2011—Mar 10, 2012

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Johnson County, Indiana (IN081)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	1.6	100.0%
Totals for Area of Interest			**1.6**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOAA Atlas 14, Volume 2, Version 3
Location name: Franklin, Indiana, US*
Latitude: 39.5213°, Longitude: -86.0775°
Elevation: 773 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.373 (0.333-0.423)	0.444 (0.396-0.502)	0.533 (0.473-0.601)	0.602 (0.533-0.679)	0.693 (0.609-0.783)	0.764 (0.666-0.865)	0.834 (0.720-0.946)	0.907 (0.776-1.03)	1.01 (0.845-1.15)	1.08 (0.893-1.24)
10-min	0.580 (0.517-0.657)	0.694 (0.618-0.784)	0.828 (0.735-0.934)	0.930 (0.822-1.05)	1.06 (0.931-1.20)	1.16 (1.01-1.31)	1.26 (1.08-1.42)	1.35 (1.16-1.54)	1.48 (1.24-1.69)	1.57 (1.30-1.81)
15-min	0.711 (0.634-0.805)	0.848 (0.755-0.959)	1.02 (0.902-1.15)	1.14 (1.01-1.29)	1.31 (1.15-1.48)	1.43 (1.25-1.62)	1.56 (1.35-1.77)	1.68 (1.44-1.92)	1.84 (1.55-2.11)	1.96 (1.63-2.26)
30-min	0.940 (0.839-1.07)	1.14 (1.01-1.28)	1.39 (1.24-1.57)	1.59 (1.41-1.79)	1.85 (1.62-2.09)	2.05 (1.79-2.32)	2.25 (1.94-2.55)	2.46 (2.10-2.80)	2.73 (2.30-3.13)	2.94 (2.44-3.39)
60-min	1.15 (1.02-1.30)	1.39 (1.24-1.57)	1.75 (1.55-1.97)	2.02 (1.79-2.28)	2.40 (2.11-2.71)	2.70 (2.36-3.06)	3.01 (2.60-3.41)	3.33 (2.85-3.80)	3.78 (3.18-4.33)	4.13 (3.42-4.77)
2-hr	1.34 (1.20-1.52)	1.63 (1.45-1.85)	2.04 (1.82-2.32)	2.38 (2.10-2.69)	2.85 (2.50-3.22)	3.24 (2.82-3.65)	3.65 (3.14-4.12)	4.08 (3.46-4.61)	4.68 (3.90-5.34)	5.18 (4.23-5.94)
3-hr	1.42 (1.27-1.62)	1.72 (1.53-1.95)	2.17 (1.93-2.46)	2.53 (2.24-2.87)	3.05 (2.67-3.44)	3.48 (3.01-3.93)	3.94 (3.37-4.46)	4.42 (3.73-5.02)	5.12 (4.22-5.85)	5.68 (4.59-6.54)
6-hr	1.70 (1.51-1.94)	2.05 (1.82-2.35)	2.59 (2.29-2.96)	3.03 (2.67-3.45)	3.66 (3.19-4.16)	4.19 (3.62-4.75)	4.76 (4.05-5.40)	5.37 (4.50-6.12)	6.26 (5.12-7.15)	6.98 (5.59-8.03)
12-hr	2.03 (1.82-2.30)	2.44 (2.19-2.77)	3.04 (2.72-3.44)	3.53 (3.14-3.98)	4.21 (3.71-4.73)	4.77 (4.17-5.36)	5.36 (4.63-6.02)	5.98 (5.09-6.75)	6.86 (5.72-7.79)	7.57 (6.21-8.65)
24-hr	2.43 (2.24-2.65)	2.91 (2.68-3.18)	3.57 (3.28-3.89)	4.08 (3.75-4.45)	4.77 (4.36-5.21)	5.32 (4.85-5.82)	5.88 (5.33-6.43)	6.44 (5.81-7.06)	7.22 (6.44-7.93)	7.81 (6.92-8.73)
2-day	2.85 (2.63-3.08)	3.41 (3.15-3.69)	4.16 (3.84-4.50)	4.74 (4.36-5.13)	5.51 (5.06-5.98)	6.13 (5.59-6.65)	6.74 (6.13-7.33)	7.38 (6.66-8.03)	8.22 (7.36-8.98)	8.87 (7.89-9.73)
3-day	3.05 (2.84-3.28)	3.65 (3.39-3.92)	4.42 (4.11-4.75)	5.02 (4.66-5.39)	5.82 (5.39-6.26)	6.46 (5.96-6.94)	7.09 (6.52-7.63)	7.74 (7.07-8.34)	8.60 (7.81-9.29)	9.26 (8.37-10.0)
4-day	3.26 (3.05-3.48)	3.88 (3.64-4.15)	4.68 (4.38-5.01)	5.30 (4.96-5.66)	6.14 (5.72-6.55)	6.79 (6.32-7.24)	7.44 (6.91-7.94)	8.11 (7.49-8.65)	8.99 (8.26-9.59)	9.66 (8.84-10.3)
7-day	3.86 (3.60-4.14)	4.59 (4.28-4.92)	5.50 (5.13-5.90)	6.23 (5.80-6.67)	7.22 (6.70-7.72)	7.99 (7.40-8.54)	8.78 (8.11-9.39)	9.58 (8.82-10.3)	10.7 (9.77-11.4)	11.5 (10.5-12.3)
10-day	4.40 (4.12-4.71)	5.23 (4.90-5.59)	6.25 (5.86-6.68)	7.06 (6.60-7.54)	8.16 (7.61-8.70)	9.02 (8.40-9.61)	9.89 (9.19-10.5)	10.8 (9.97-11.5)	12.0 (11.0-12.8)	12.9 (11.8-13.8)
20-day	6.04 (5.68-6.42)	7.14 (6.72-7.60)	8.42 (7.92-8.96)	9.42 (8.84-10.0)	10.7 (10.1-11.4)	11.7 (11.0-12.5)	12.8 (11.9-13.5)	13.8 (12.8-14.6)	15.0 (13.9-16.0)	16.0 (14.8-17.1)
30-day	7.43 (7.01-7.87)	8.75 (8.25-9.27)	10.2 (9.59-10.8)	11.3 (10.6-12.0)	12.7 (12.0-13.5)	13.8 (13.0-14.6)	14.9 (13.9-15.8)	15.9 (14.9-16.9)	17.3 (16.1-18.4)	18.3 (17.0-19.5)
45-day	9.42 (8.87-9.98)	11.1 (10.4-11.7)	12.8 (12.0-13.5)	14.1 (13.2-14.9)	15.7 (14.8-16.6)	17.0 (15.9-18.0)	18.2 (17.0-19.2)	19.3 (18.0-20.4)	20.8 (19.3-22.0)	21.8 (20.2-23.2)
60-day	11.3 (10.6-11.9)	13.2 (12.4-14.0)	15.1 (14.2-16.0)	16.6 (15.6-17.6)	18.5 (17.4-19.6)	19.9 (18.7-21.1)	21.3 (19.9-22.6)	22.6 (21.1-24.0)	24.3 (22.6-25.7)	25.5 (23.7-27.1)

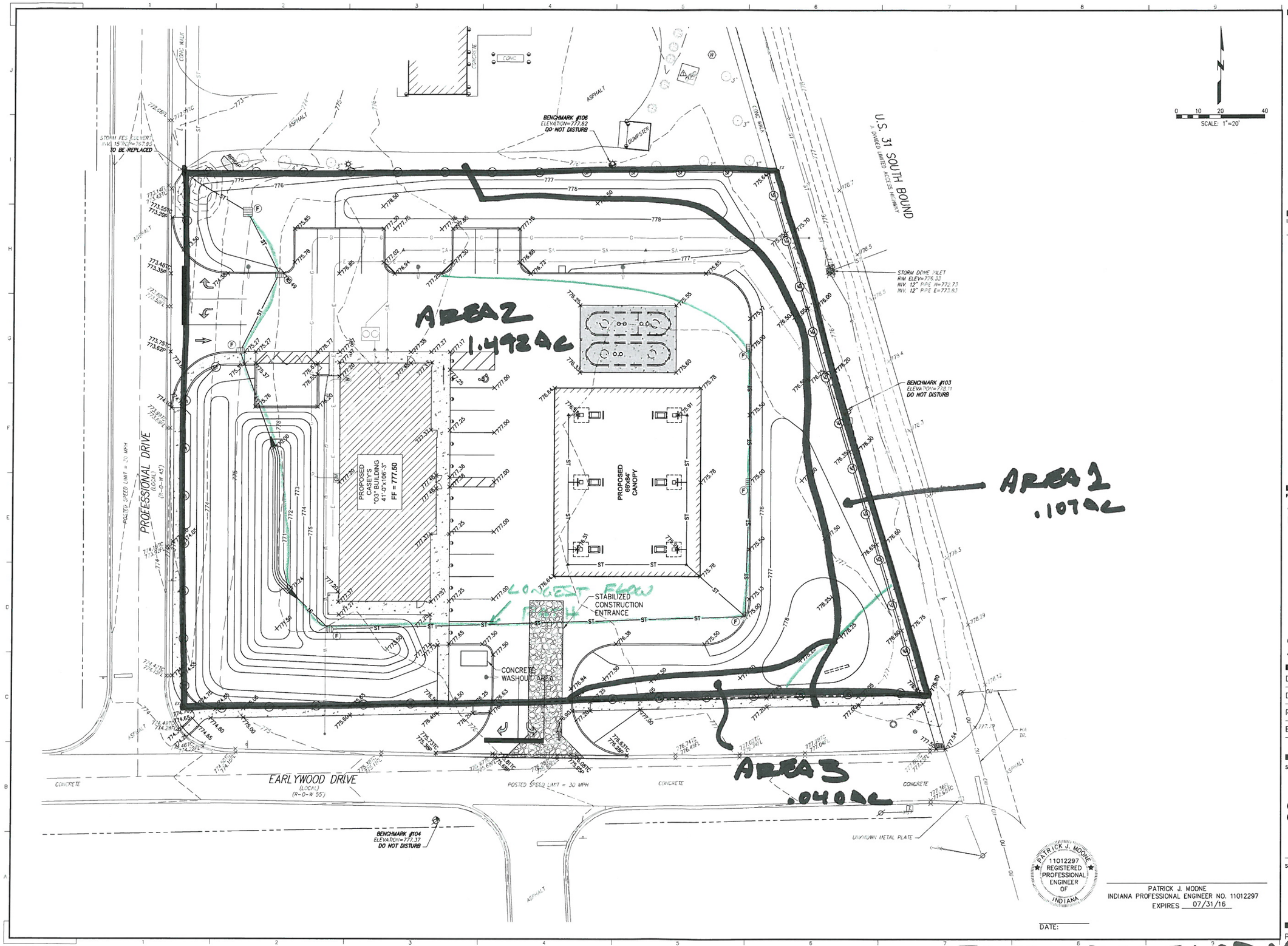
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



PATRICK J. MOONE
11012297
REGISTERED PROFESSIONAL ENGINEER OF INDIANA

PATRICK J. MOONE
INDIANA PROFESSIONAL ENGINEER NO. 11012297
EXPIRES 07/31/16

DATE:

Farnsworth GROUP
2211 WEST BRADLEY AVENUE
CHAMPAIGN, ILLINOIS 61821
(217) 352-7408 / info@f-w.com
D/B/A FARNSWORTH ENGINEERING GROUP, INCORPORATED
www.f-w.com
Engineers | Architects | Surveyors | Scientists

ISSUE:

#	Date:	Description:

PROJECT:

CASEY'S
MARKETING COMPANY

CITY OF FRANKLIN
JOHNSON CO., INDIANA

Date:	xx-xx-15
Design/Drawn:	
Reviewed:	PJM
Book No.: -	Field: -

SHEET TITLE:

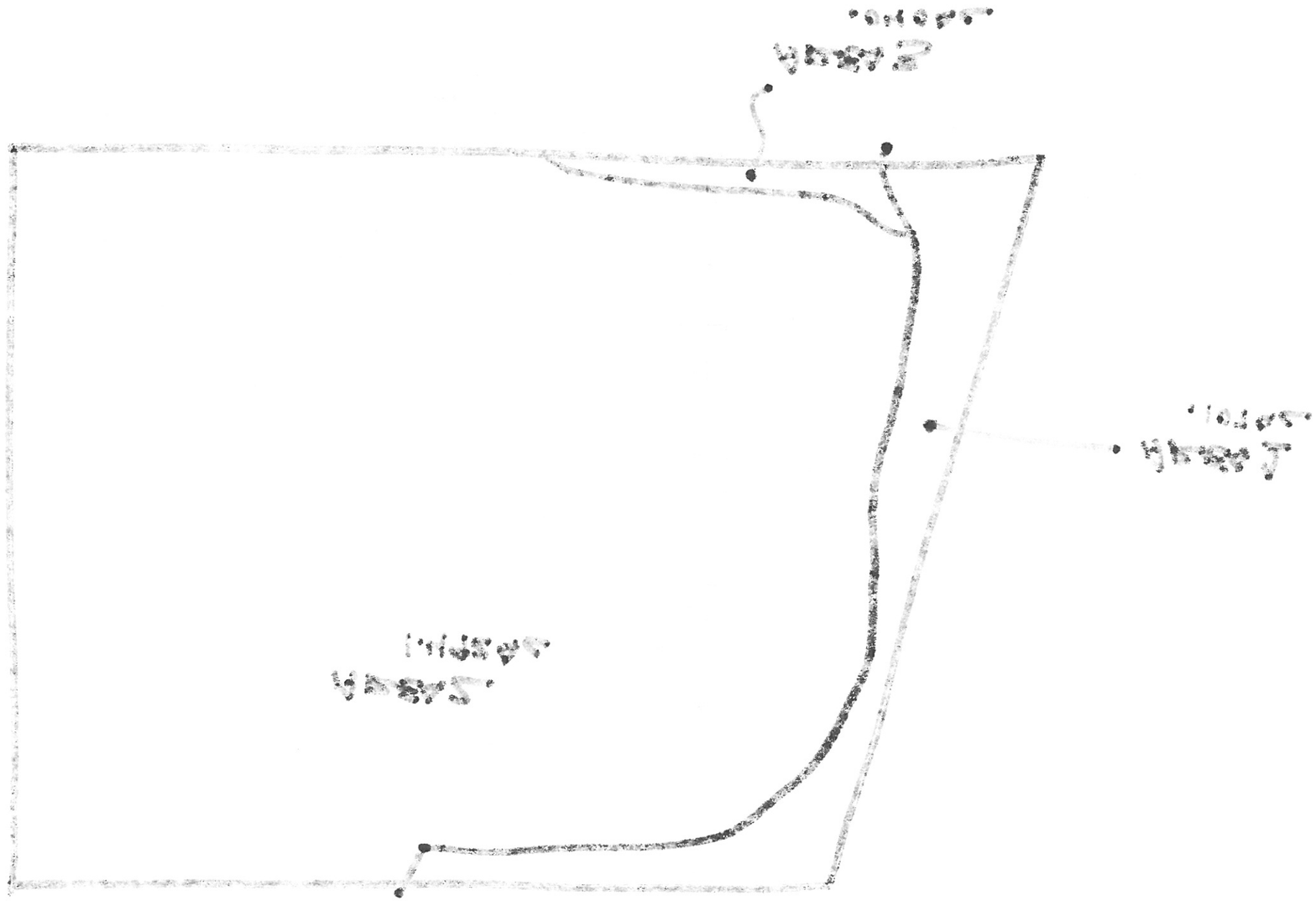
GRADING & EROSION CONTROL PLAN

SHEET NUMBER:

5
of __

Project No.: 151019.02

POST-DEVELOPMENT



PATRICK J. MOONE
11012297
REGISTERED PROFESSIONAL ENGINEER OF INDIANA

PATRICK J. MOONE
INDIANA PROFESSIONAL ENGINEER NO. 11012297
EXPIRES 07/31/16

DATE:

Farnsworth GROUP
2211 WEST BRADLEY AVENUE
CHAMPAIGN, ILLINOIS 61821
(217) 352-7408 / info@f-w.com
D/B/A FARNSWORTH ENGINEERING GROUP, INCORPORATED
www.f-w.com
Engineers | Architects | Surveyors | Scientists

ISSUE:

#	Date:	Description:

PROJECT:

CASEY'S MARKETING COMPANY

CITY OF FRANKLIN
JOHNSON CO., INDIANA

Date:	xx-xx-15
Design/Drawn:	
Reviewed:	PJM
Book No.: -	Field: -

SHEET TITLE:

EXISTING TOPOGRAPHY & DEMOLITION PLAN

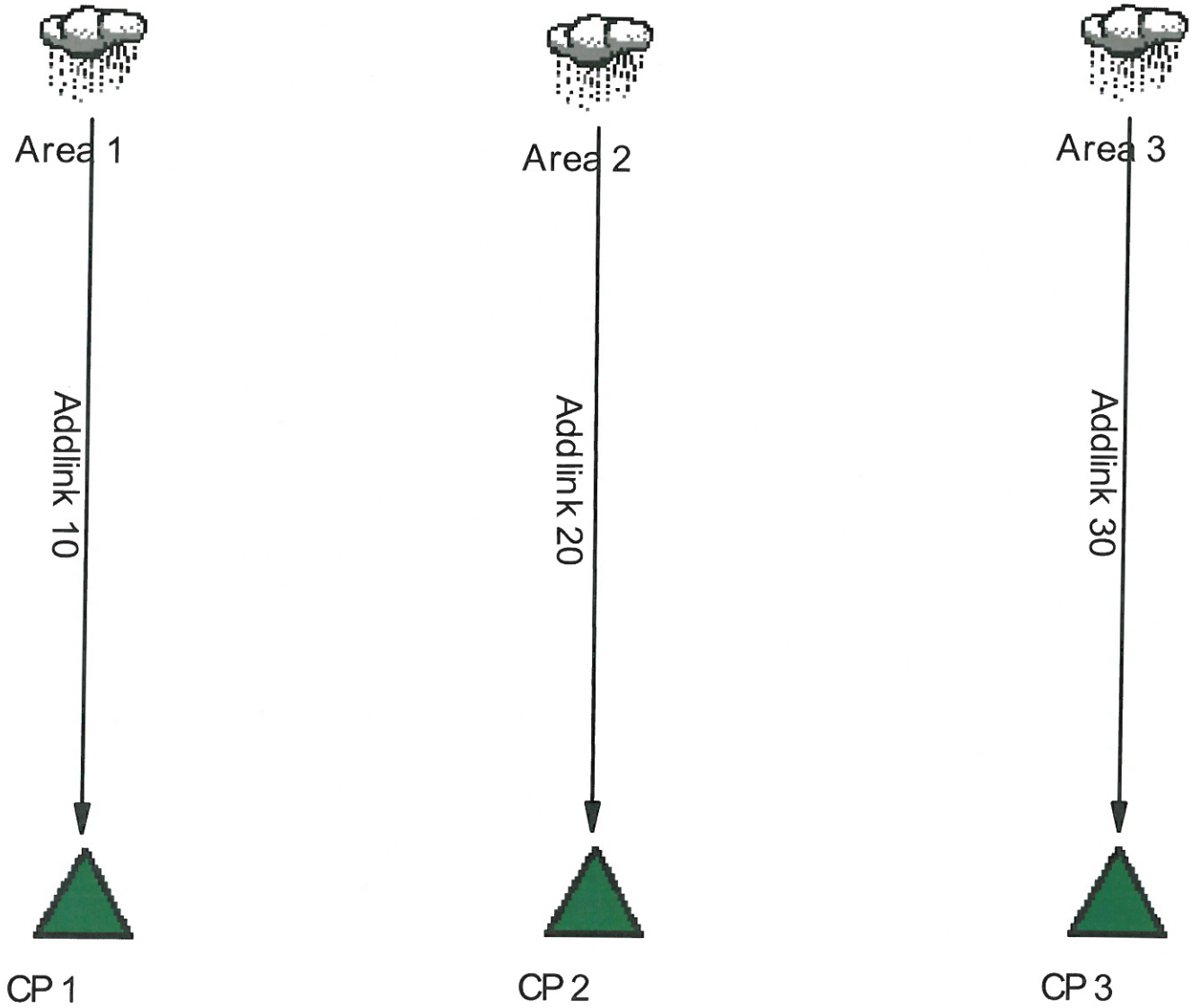
SHEET NUMBER:

3
of __

Project No.: 151019.02

PRE-DEVELOPMENT

Section 2


Area 1
Area 2
Area 3
Addlink 10
Addlink 20
Addlink 30
CP 1
CP 2
CP 3

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

Project Date: 10/2/2015
Project Engineer: pmoone
Project Title: Casey's - Franklin, IN
Project Comments:
Existing Conditions Model

Table of Contents

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

Watershed..... Master Network Summary 1.01

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

Franklin, IN.... Design Storms 2.01

********** TC CALCULATIONS **********

AREA 1..... Tc Calcs 3.01

AREA 2..... Tc Calcs 3.03

AREA 3..... Tc Calcs 3.05

********** CN CALCULATIONS **********

AREA 1..... Runoff CN-Area 4.01

AREA 2..... Runoff CN-Area 4.02

AREA 3..... Runoff CN-Area 4.03

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Franklin, IN

Return Event	Total Depth in	Rainfall Type	RNF ID
2	1.3900	Synthetic Curve	1 HR Type II
10	2.0200	Synthetic Curve	1 HR Type II
100	3.0100	Synthetic Curve	1 HR Type II
3	1.6300	Synthetic Curve	2 HR Type II
13	2.3800	Synthetic Curve	2 HR Type II
103	3.6500	Synthetic Curve	2 HR Type II
4	1.7200	Synthetic Curve	3 HR Type II
14	2.5300	Synthetic Curve	3 HR Type II
104	3.9400	Synthetic Curve	3 HR Type II
5	2.0500	Synthetic Curve	6 HR Type II
15	3.0300	Synthetic Curve	6 HR Type II
105	4.7600	Synthetic Curve	6 HR Type II
6	2.4400	Synthetic Curve	12 HR Type II
16	3.5300	Synthetic Curve	12 HR Type II
106	5.3600	Synthetic Curve	12 HR Type II
7	2.9100	Synthetic Curve	TypeII 24hr
17	4.0800	Synthetic Curve	TypeII 24hr
107	5.8800	Synthetic Curve	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)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 1	AREA	2	.009		.5750	.45		
AREA 1	AREA	10	.021		.5750	1.23		
AREA 1	AREA	100	.046		.5500	2.84		
AREA 1	AREA	3	.013		1.0750	.59		
AREA 1	AREA	13	.029		1.0500	1.55		
AREA 1	AREA	103	.064		1.0500	3.63		
AREA 1	AREA	4	.015		1.5500	.52		
AREA 1	AREA	14	.033		1.5500	1.33		
AREA 1	AREA	104	.073		1.5250	3.09		
AREA 1	AREA	5	.022		3.0750	.54		
AREA 1	AREA	15	.046		3.0500	1.20		
AREA 1	AREA	105	.098		3.0500	2.51		
AREA 1	AREA	6	.031		5.9500	.65		
AREA 1	AREA	16	.060		5.9500	1.30		
AREA 1	AREA	106	.117		5.9250	2.50		
AREA 1	AREA	7	.043		11.9500	.77		
AREA 1	AREA	17	.077		11.9250	1.38		
AREA 1	AREA	107	.134		11.9250	2.40		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 2	AREA	2	.017		.6750	.55		
AREA 2	AREA	10	.041		.6750	1.47		
AREA 2	AREA	100	.090		.6500	3.40		
AREA 2	AREA	3	.025		1.1750	.70		
AREA 2	AREA	13	.058		1.1500	1.80		
AREA 2	AREA	103	.125		1.1500	4.15		
AREA 2	AREA	4	.029		1.6500	.68		
AREA 2	AREA	14	.065		1.6250	1.71		
AREA 2	AREA	104	.142		1.6250	3.99		
AREA 2	AREA	5	.042		3.1500	.87		
AREA 2	AREA	15	.091		3.1500	1.93		
AREA 2	AREA	105	.191		3.1250	4.05		
AREA 2	AREA	6	.060		6.0500	1.05		
AREA 2	AREA	16	.118		6.0500	2.10		
AREA 2	AREA	106	.229		6.0250	4.04		
AREA 2	AREA	7	.084		12.0500	1.25		
AREA 2	AREA	17	.150		12.0250	2.25		
AREA 2	AREA	107	.262		12.0250	3.89		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 3	AREA	2	.007		.6250	.26		
AREA 3	AREA	10	.017		.6250	.71		
AREA 3	AREA	100	.036		.6250	1.63		
AREA 3	AREA	3	.010		1.1250	.34		
AREA 3	AREA	13	.023		1.1000	.86		
AREA 3	AREA	103	.051		1.1000	2.02		
AREA 3	AREA	4	.012		1.6000	.31		
AREA 3	AREA	14	.026		1.6000	.80		
AREA 3	AREA	104	.057		1.5750	1.85		
AREA 3	AREA	5	.017		3.1250	.39		
AREA 3	AREA	15	.037		3.1250	.85		
AREA 3	AREA	105	.077		3.1000	1.77		
AREA 3	AREA	6	.024		6.0250	.46		
AREA 3	AREA	16	.048		6.0000	.92		
AREA 3	AREA	106	.093		6.0000	1.77		
AREA 3	AREA	7	.034		12.0000	.55		
AREA 3	AREA	17	.061		12.0000	.98		
AREA 3	AREA	107	.106		12.0000	1.70		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 1	JCT	2	.009		.5750	.45		
*CP 1	JCT	10	.021		.5750	1.23		
*CP 1	JCT	100	.046		.5500	2.84		
*CP 1	JCT	3	.013		1.0750	.59		
*CP 1	JCT	13	.029		1.0500	1.55		
*CP 1	JCT	103	.064		1.0500	3.63		
*CP 1	JCT	4	.015		1.5500	.52		
*CP 1	JCT	14	.033		1.5500	1.33		
*CP 1	JCT	104	.073		1.5250	3.09		
*CP 1	JCT	5	.022		3.0750	.54		
*CP 1	JCT	15	.046		3.0500	1.20		
*CP 1	JCT	105	.098		3.0500	2.51		
*CP 1	JCT	6	.031		5.9500	.65		
*CP 1	JCT	16	.060		5.9500	1.30		
*CP 1	JCT	106	.117		5.9250	2.50		
*CP 1	JCT	7	.043		11.9500	.77		
*CP 1	JCT	17	.077		11.9250	1.38		
*CP 1	JCT	107	.134		11.9250	2.40		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 2	JCT	2	.017		.6750	.55		
*CP 2	JCT	10	.041		.6750	1.47		
*CP 2	JCT	100	.090		.6500	3.40		
*CP 2	JCT	3	.025		1.1750	.70		
*CP 2	JCT	13	.058		1.1500	1.80		
*CP 2	JCT	103	.125		1.1500	4.15		
*CP 2	JCT	4	.029		1.6500	.68		
*CP 2	JCT	14	.065		1.6250	1.71		
*CP 2	JCT	104	.142		1.6250	3.99		
*CP 2	JCT	5	.042		3.1500	.87		
*CP 2	JCT	15	.091		3.1500	1.93		
*CP 2	JCT	105	.191		3.1250	4.05		
*CP 2	JCT	6	.060		6.0500	1.05		
*CP 2	JCT	16	.118		6.0500	2.10		
*CP 2	JCT	106	.229		6.0250	4.04		
*CP 2	JCT	7	.084		12.0500	1.25		
*CP 2	JCT	17	.150		12.0250	2.25		
*CP 2	JCT	107	.262		12.0250	3.89		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 3	JCT	2	.007		.6250	.26		
*CP 3	JCT	10	.017		.6250	.71		
*CP 3	JCT	100	.036		.6250	1.63		
*CP 3	JCT	3	.010		1.1250	.34		
*CP 3	JCT	13	.023		1.1000	.86		
*CP 3	JCT	103	.051		1.1000	2.02		
*CP 3	JCT	4	.012		1.6000	.31		
*CP 3	JCT	14	.026		1.6000	.80		
*CP 3	JCT	104	.057		1.5750	1.85		
*CP 3	JCT	5	.017		3.1250	.39		
*CP 3	JCT	15	.037		3.1250	.85		
*CP 3	JCT	105	.077		3.1000	1.77		
*CP 3	JCT	6	.024		6.0250	.46		
*CP 3	JCT	16	.048		6.0000	.92		
*CP 3	JCT	106	.093		6.0000	1.77		
*CP 3	JCT	7	.034		12.0000	.55		
*CP 3	JCT	17	.061		12.0000	.98		
*CP 3	JCT	107	.106		12.0000	1.70		

Title... Project Date: 10/2/2015
Project Engineer: pmoone
Project Title: Casey's - Franklin, IN
Project Comments:
Existing Conditions Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 2

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 2 yr
Total Rainfall Depth= 1.3900 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 10 yr
Total Rainfall Depth= 2.0200 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 100 yr
Total Rainfall Depth= 3.0100 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 3

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 3 yr
Total Rainfall Depth= 1.6300 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Storm Tag Name = 13

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 13 yr
Total Rainfall Depth= 2.3800 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Title... Project Date: 10/2/2015
Project Engineer: pmoone
Project Title: Casey's - Franklin, IN
Project Comments:
Existing Conditions Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 103

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 103 yr
Total Rainfall Depth= 3.6500 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Storm Tag Name = 4

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 4 yr
Total Rainfall Depth= 1.7200 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 14

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 14 yr
Total Rainfall Depth= 2.5300 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 104

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 104 yr
Total Rainfall Depth= 3.9400 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 5

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 5 yr
Total Rainfall Depth= 2.0500 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Title... Project Date: 10/2/2015
Project Engineer: pmoone
Project Title: Casey's - Franklin, IN
Project Comments:
Existing Conditions Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 15

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 15 yr
Total Rainfall Depth= 3.0300 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Storm Tag Name = 105

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 105 yr
Total Rainfall Depth= 4.7600 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Storm Tag Name = 6

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 6 yr
Total Rainfall Depth= 2.4400 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Storm Tag Name = 16

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 16 yr
Total Rainfall Depth= 3.5300 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Storm Tag Name = 106

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 106 yr
Total Rainfall Depth= 5.3600 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Title... Project Date: 10/2/2015
Project Engineer: pmoone
Project Title: Casey's - Franklin, IN
Project Comments:
Existing Conditions Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 7

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 7 yr
Total Rainfall Depth= 2.9100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 17

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 17 yr
Total Rainfall Depth= 4.0800 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 107

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 107 yr
Total Rainfall Depth= 5.8800 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

```
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
TIME OF CONCENTRATION CALCULATOR
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::


----------------------------------------------------------------------


Segment #1:  Tc: TR-55 Sheet

Mannings n          .1300
Hydraulic Length    50.00 ft
2yr, 24hr P        3.1000 in
Slope             .015000 ft/ft

Avg.Velocity          .15 ft/sec

                                        Segment #1 Time:     .0953 hrs
----------------------------------------------------------------------

Segment #2:  Tc: TR-55 Shallow

Hydraulic Length    50.00 ft
Slope             .014500 ft/ft
Unpaved

Avg.Velocity         1.94 ft/sec

                                        Segment #2 Time:     .0071 hrs
----------------------------------------------------------------------

                                              ==========================
                                               Total Tc:     .1025 hrs
                                              ==========================
```

```
-----------------------------------------------------------------------
Tc Equations used...
-----------------------------------------------------------------------


==== SCS TR-55 Sheet Flow ==============================================

     Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

     Where:  Tc = Time of concentration, hrs
             n  = Mannings n
             Lf = Flow length, ft
             P  = 2yr, 24hr Rain depth, inches
             Sf = Slope, %


==== SCS TR-55 Shallow Concentrated Flow ===============================

     Unpaved surface:
     V  = 16.1345 * (Sf**0.5)

     Paved surface:
     V  = 20.3282 * (Sf**0.5)

     Tc = (Lf / V) / (3600sec/hr)

     Where:  V  = Velocity, ft/sec
             Sf = Slope, ft/ft
             Tc = Time of concentration, hrs
             Lf = Flow length, ft
```

```
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
TIME OF CONCENTRATION CALCULATOR
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::


----------------------------------------------------------------------


Segment #1:  Tc: TR-55 Sheet

Mannings n          .1300
Hydraulic Length    70.00 ft
2yr, 24hr P        3.1000 in
Slope             .005000 ft/ft

Avg.Velocity          .10 ft/sec

                                        Segment #1 Time:     .1937 hrs
----------------------------------------------------------------------

Segment #2:  Tc: TR-55 Shallow

Hydraulic Length   190.00 ft
Slope             .008000 ft/ft
Unpaved

Avg.Velocity         1.44 ft/sec

                                        Segment #2 Time:     .0366 hrs
----------------------------------------------------------------------

                                          ==========================
                                           Total Tc:     .2302 hrs
                                          ==========================
```

```
-----------------------------------------------------------------------
Tc Equations used...
-----------------------------------------------------------------------


==== SCS TR-55 Sheet Flow ==============================================

     Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

     Where:  Tc = Time of concentration, hrs
             n  = Mannings n
             Lf = Flow length, ft
             P  = 2yr, 24hr Rain depth, inches
             Sf = Slope, %


==== SCS TR-55 Shallow Concentrated Flow ===============================

     Unpaved surface:
     V  = 16.1345 * (Sf**0.5)

     Paved surface:
     V  = 20.3282 * (Sf**0.5)

     Tc = (Lf / V) / (3600sec/hr)

     Where:  V  = Velocity, ft/sec
             Sf = Slope, ft/ft
             Tc = Time of concentration, hrs
             Lf = Flow length, ft
```

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: TR-55 Sheet

Mannings n	.1300	
Hydraulic Length	70.00	ft
2yr, 24hr P	3.1000	in
Slope	.007500	ft/ft

Avg.Velocity .12 ft/sec

Segment #1 Time: .1647 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length	80.00	ft
Slope	.012500	ft/ft
Unpaved		

Avg.Velocity 1.80 ft/sec

Segment #2 Time: .0123 hrs

==========
Total Tc: .1770 hrs
==========

```
-----------------------------------------------------------------------
Tc Equations used...
-----------------------------------------------------------------------


==== SCS TR-55 Sheet Flow ==============================================

     Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

     Where:  Tc = Time of concentration, hrs
             n  = Mannings n
             Lf = Flow length, ft
             P  = 2yr, 24hr Rain depth, inches
             Sf = Slope, %


==== SCS TR-55 Shallow Concentrated Flow ===============================

     Unpaved surface:
     V  = 16.1345 * (Sf**0.5)

     Paved surface:
     V  = 20.3282 * (Sf**0.5)

     Tc = (Lf / V) / (3600sec/hr)

     Where:  V  = Velocity, ft/sec
             Sf = Slope, ft/ft
             Tc = Time of concentration, hrs
             Lf = Flow length, ft
```

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
Open space (Lawns,parks etc.) - Goo	80	.437			80.00
COMPOSITE AREA & WEIGHTED CN --->		.437			80.00 (80)

File.... P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\Existing.ppw

RUNOFF CURVE NUMBER DATA

:::

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
Open space (Lawns,parks etc.) - Goo	80	.856			80.00
COMPOSITE AREA & WEIGHTED CN --->		.856			80.00 (80)

:::

RUNOFF CURVE NUMBER DATA
::

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Open space (Lawns,parks etc.) - Goo	80	.346			80.00
COMPOSITE AREA & WEIGHTED CN --->		.346			80.00 (80)

::

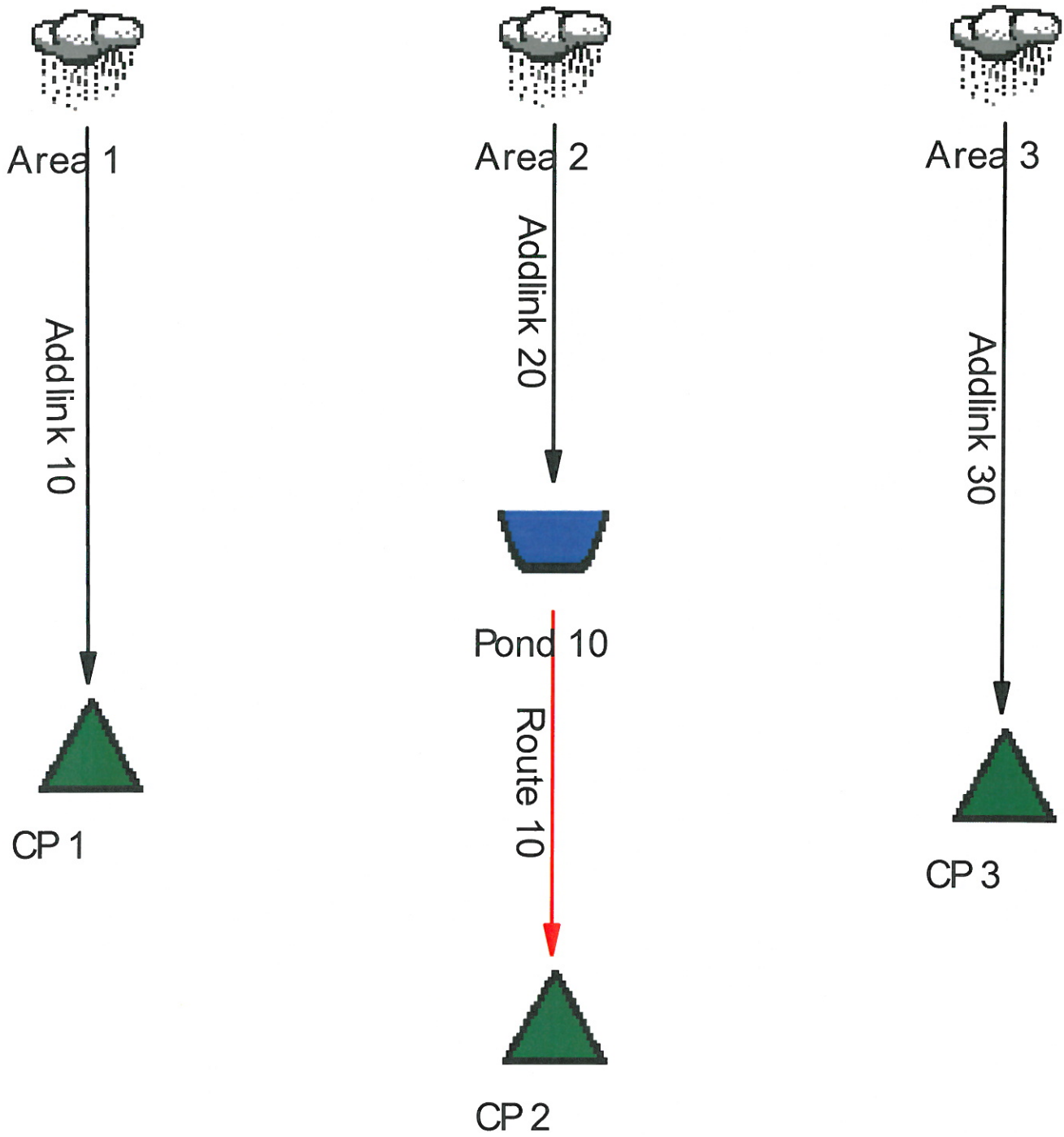
Index of Starting Page Numbers for ID Names

----- A -----
AREA 1... 3.01, 4.01
AREA 2... 3.03, 4.02
AREA 3... 3.05, 4.03

----- F -----
Franklin, IN... 2.01

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

Section 3


Area 1
Addlink 10
CP 1
Area 2
Addlink 20
Pond 10
Route 10
CP 2
Area 3
Addlink 30
CP 3

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

Project Date: 6/3/2013
Project Engineer:
Project Title: Watershed
Project Comments:
Proposed Model

Table of Contents

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

Watershed..... Master Network Summary 1.01

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

Franklin, IN.... Design Storms 2.01

********** TC CALCULATIONS **********

AREA 1..... Tc Calcs 3.01

AREA 2..... Tc Calcs 3.03

AREA 3..... Tc Calcs 3.05

********** CN CALCULATIONS **********

AREA 1..... Runoff CN-Area 4.01

AREA 2..... Runoff CN-Area 4.02

AREA 3..... Runoff CN-Area 4.03

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

AREA 1..... 2
Unit Hyd. Summary 5.01

Table of Contents (continued)

AREA 1..... 3
Unit Hyd. Summary 5.02

AREA 1..... 4
Unit Hyd. Summary 5.03

AREA 1..... 5
Unit Hyd. Summary 5.04

AREA 1..... 6
Unit Hyd. Summary 5.05

AREA 1..... 7
Unit Hyd. Summary 5.06

AREA 1..... 10
Unit Hyd. Summary 5.07

AREA 1..... 13
Unit Hyd. Summary 5.08

AREA 1..... 14
Unit Hyd. Summary 5.09

AREA 1..... 15
Unit Hyd. Summary 5.10

AREA 1..... 16
Unit Hyd. Summary 5.11

AREA 1..... 17
Unit Hyd. Summary 5.12

AREA 1..... 100
Unit Hyd. Summary 5.13

AREA 1..... 103
Unit Hyd. Summary 5.14

AREA 1..... 104
Unit Hyd. Summary 5.15

AREA 1..... 105
Unit Hyd. Summary 5.16

AREA 1..... 106
Unit Hyd. Summary 5.17

Table of Contents (continued)

AREA 1..... 107
Unit Hyd. Summary 5.18

AREA 2..... 2
Unit Hyd. Summary 5.19

AREA 2..... 3
Unit Hyd. Summary 5.20

AREA 2..... 4
Unit Hyd. Summary 5.21

AREA 2..... 5
Unit Hyd. Summary 5.22

AREA 2..... 6
Unit Hyd. Summary 5.23

AREA 2..... 7
Unit Hyd. Summary 5.24

AREA 2..... 10
Unit Hyd. Summary 5.25

AREA 2..... 13
Unit Hyd. Summary 5.26

AREA 2..... 14
Unit Hyd. Summary 5.27

AREA 2..... 15
Unit Hyd. Summary 5.28

AREA 2..... 16
Unit Hyd. Summary 5.29

AREA 2..... 17
Unit Hyd. Summary 5.30

AREA 2..... 100
Unit Hyd. Summary 5.31

AREA 2..... 103
Unit Hyd. Summary 5.32

AREA 2..... 104
Unit Hyd. Summary 5.33

Table of Contents (continued)

AREA 2..... 105
Unit Hyd. Summary 5.34

AREA 2..... 106
Unit Hyd. Summary 5.35

AREA 2..... 107
Unit Hyd. Summary 5.36

AREA 3..... 2
Unit Hyd. Summary 5.37

AREA 3..... 3
Unit Hyd. Summary 5.38

AREA 3..... 4
Unit Hyd. Summary 5.39

AREA 3..... 5
Unit Hyd. Summary 5.40

AREA 3..... 6
Unit Hyd. Summary 5.41

AREA 3..... 7
Unit Hyd. Summary 5.42

AREA 3..... 10
Unit Hyd. Summary 5.43

AREA 3..... 13
Unit Hyd. Summary 5.44

AREA 3..... 14
Unit Hyd. Summary 5.45

AREA 3..... 15
Unit Hyd. Summary 5.46

AREA 3..... 16
Unit Hyd. Summary 5.47

AREA 3..... 17
Unit Hyd. Summary 5.48

AREA 3..... 100
Unit Hyd. Summary 5.49

Table of Contents (continued)

AREA 3..... 103
Unit Hyd. Summary 5.50

AREA 3..... 104
Unit Hyd. Summary 5.51

AREA 3..... 105
Unit Hyd. Summary 5.52

AREA 3..... 106
Unit Hyd. Summary 5.53

AREA 3..... 107
Unit Hyd. Summary 5.54

********** POND VOLUMES **********

POND 10..... Vol: Elev-Area 6.01

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

Outlet 1..... Outlet Input Data 7.01

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

POND 10..... Pond E-V-Q Table 8.01

MASTER DESIGN STORM SUMMARY

Network Storm Collection: Franklin, IN

Return Event	Total Depth in	Rainfall Type	RNF ID
2	1.3900	Synthetic Curve	1 HR Type II
10	2.0200	Synthetic Curve	1 HR Type II
100	3.0100	Synthetic Curve	1 HR Type II
3	1.6300	Synthetic Curve	2 HR Type II
13	2.3800	Synthetic Curve	2 HR Type II
103	3.6500	Synthetic Curve	2 HR Type II
4	1.7200	Synthetic Curve	3 HR Type II
14	2.5300	Synthetic Curve	3 HR Type II
104	3.9400	Synthetic Curve	3 HR Type II
5	2.0500	Synthetic Curve	6 HR Type II
15	3.0300	Synthetic Curve	6 HR Type II
105	4.7600	Synthetic Curve	6 HR Type II
6	2.4400	Synthetic Curve	12 HR Type II
16	3.5300	Synthetic Curve	12 HR Type II
106	5.3600	Synthetic Curve	12 HR Type II
7	2.9100	Synthetic Curve	TypeII 24hr
17	4.0800	Synthetic Curve	TypeII 24hr
107	5.8800	Synthetic Curve	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)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 1	AREA	2	.003		.5500	.22		
AREA 1	AREA	10	.007		.5500	.50		
AREA 1	AREA	100	.014		.5500	1.02		
AREA 1	AREA	3	.005		1.0500	.28		
AREA 1	AREA	13	.010		1.0500	.59		
AREA 1	AREA	103	.019		1.0250	1.21		
AREA 1	AREA	4	.005		1.5250	.24		
AREA 1	AREA	14	.011		1.5250	.51		
AREA 1	AREA	104	.021		1.5250	1.03		
AREA 1	AREA	5	.007		3.0250	.20		
AREA 1	AREA	15	.014		3.0250	.39		
AREA 1	AREA	105	.028		3.0250	.74		
AREA 1	AREA	6	.010		5.9250	.23		
AREA 1	AREA	16	.018		5.9250	.41		
AREA 1	AREA	106	.033		5.9250	.73		
AREA 1	AREA	7	.013		11.9250	.25		
AREA 1	AREA	17	.023		11.9250	.42		
AREA 1	AREA	107	.037		11.9250	.69		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 2	AREA	2	.068		.5500	4.74		
AREA 2	AREA	10	.130		.5500	9.29		
AREA 2	AREA	100	.237		.5500	17.05		
AREA 2	AREA	3	.091		1.0500	5.52		
AREA 2	AREA	13	.168		1.0250	10.53		
AREA 2	AREA	103	.310		1.0250	19.84		
AREA 2	AREA	4	.100		1.5250	4.70		
AREA 2	AREA	14	.184		1.5250	8.82		
AREA 2	AREA	104	.344		1.5250	16.35		
AREA 2	AREA	5	.133		3.0250	3.59		
AREA 2	AREA	15	.240		3.0250	6.38		
AREA 2	AREA	105	.440		3.0250	11.39		
AREA 2	AREA	6	.174		5.9250	3.91		
AREA 2	AREA	16	.297		5.9250	6.55		
AREA 2	AREA	106	.512		5.9250	11.00		
AREA 2	AREA	7	.226		11.9250	4.24		
AREA 2	AREA	17	.360		11.9250	6.63		
AREA 2	AREA	107	.574		11.9250	10.31		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
AREA 3	AREA	2	.001		.5750	.05		
AREA 3	AREA	10	.002		.5500	.13		
AREA 3	AREA	100	.004		.5500	.29		
AREA 3	AREA	3	.001		1.0500	.06		
AREA 3	AREA	13	.003		1.0500	.16		
AREA 3	AREA	103	.006		1.0500	.36		
AREA 3	AREA	4	.001		1.5250	.05		
AREA 3	AREA	14	.003		1.5250	.14		
AREA 3	AREA	104	.007		1.5250	.31		
AREA 3	AREA	5	.002		3.0250	.05		
AREA 3	AREA	15	.004		3.0250	.12		
AREA 3	AREA	105	.009		3.0250	.24		
AREA 3	AREA	6	.003		5.9250	.06		
AREA 3	AREA	16	.006		5.9250	.13		
AREA 3	AREA	106	.011		5.9250	.24		
AREA 3	AREA	7	.004		11.9250	.08		
AREA 3	AREA	17	.007		11.9250	.13		
AREA 3	AREA	107	.013		11.9250	.23		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 1	JCT	2	.003		.5500	.22		
*CP 1	JCT	10	.007		.5500	.50		
*CP 1	JCT	100	.014		.5500	1.02		
*CP 1	JCT	3	.005		1.0500	.28		
*CP 1	JCT	13	.010		1.0500	.59		
*CP 1	JCT	103	.019		1.0250	1.21		
*CP 1	JCT	4	.005		1.5250	.24		
*CP 1	JCT	14	.011		1.5250	.51		
*CP 1	JCT	104	.021		1.5250	1.03		
*CP 1	JCT	5	.007		3.0250	.20		
*CP 1	JCT	15	.014		3.0250	.39		
*CP 1	JCT	105	.028		3.0250	.74		
*CP 1	JCT	6	.010		5.9250	.23		
*CP 1	JCT	16	.018		5.9250	.41		
*CP 1	JCT	106	.033		5.9250	.73		
*CP 1	JCT	7	.013		11.9250	.25		
*CP 1	JCT	17	.023		11.9250	.42		
*CP 1	JCT	107	.037		11.9250	.69		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 2	JCT	2	.068		.9000	.54		
*CP 2	JCT	10	.130		.9500	.64		
*CP 2	JCT	100	.237		.9250	1.50		
*CP 2	JCT	3	.091		1.2500	.56		
*CP 2	JCT	13	.168		1.4750	.66		
*CP 2	JCT	103	.310		1.2750	1.79		
*CP 2	JCT	4	.100		1.7750	.56		
*CP 2	JCT	14	.184		1.7750	.65		
*CP 2	JCT	104	.344		1.7750	1.86		
*CP 2	JCT	5	.133		3.2250	.58		
*CP 2	JCT	15	.240		3.3250	.67		
*CP 2	JCT	105	.440		3.2250	2.06		
*CP 2	JCT	6	.174		6.1250	.60		
*CP 2	JCT	16	.297		6.3750	.72		
*CP 2	JCT	106	.512		6.1250	2.06		
*CP 2	JCT	7	.226		12.1250	.61		
*CP 2	JCT	17	.360		12.3000	.76		
*CP 2	JCT	107	.574		12.1250	1.98		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*CP 3	JCT	2	.001		.5750	.05		
*CP 3	JCT	10	.002		.5500	.13		
*CP 3	JCT	100	.004		.5500	.29		
*CP 3	JCT	3	.001		1.0500	.06		
*CP 3	JCT	13	.003		1.0500	.16		
*CP 3	JCT	103	.006		1.0500	.36		
*CP 3	JCT	4	.001		1.5250	.05		
*CP 3	JCT	14	.003		1.5250	.14		
*CP 3	JCT	104	.007		1.5250	.31		
*CP 3	JCT	5	.002		3.0250	.05		
*CP 3	JCT	15	.004		3.0250	.12		
*CP 3	JCT	105	.009		3.0250	.24		
*CP 3	JCT	6	.003		5.9250	.06		
*CP 3	JCT	16	.006		5.9250	.13		
*CP 3	JCT	106	.011		5.9250	.24		
*CP 3	JCT	7	.004		11.9250	.08		
*CP 3	JCT	17	.007		11.9250	.13		
*CP 3	JCT	107	.013		11.9250	.23		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID		Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
POND 10	IN	POND	2	.068		.5500	4.74		
POND 10	IN	POND	10	.130		.5500	9.29		
POND 10	IN	POND	100	.237		.5500	17.05		
POND 10	IN	POND	3	.091		1.0500	5.52		
POND 10	IN	POND	13	.168		1.0250	10.53		
POND 10	IN	POND	103	.310		1.0250	19.84		
POND 10	IN	POND	4	.100		1.5250	4.70		
POND 10	IN	POND	14	.184		1.5250	8.82		
POND 10	IN	POND	104	.344		1.5250	16.35		
POND 10	IN	POND	5	.133		3.0250	3.59		
POND 10	IN	POND	15	.240		3.0250	6.38		
POND 10	IN	POND	105	.440		3.0250	11.39		
POND 10	IN	POND	6	.174		5.9250	3.91		
POND 10	IN	POND	16	.297		5.9250	6.55		
POND 10	IN	POND	106	.512		5.9250	11.00		
POND 10	IN	POND	7	.226		11.9250	4.24		
POND 10	IN	POND	17	.360		11.9250	6.63		
POND 10	IN	POND	107	.574		11.9250	10.31		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

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

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
POND 10	OUT POND	2	.068		.9000	.54	772.67	.044
POND 10	OUT POND	10	.130		.9500	.64	773.89	.100
POND 10	OUT POND	100	.237		.9250	1.50	774.99	.179
POND 10	OUT POND	3	.091		1.2500	.56	772.89	.052
POND 10	OUT POND	13	.168		1.4750	.66	774.11	.113
POND 10	OUT POND	103	.310		1.2750	1.79	775.25	.203
POND 10	OUT POND	4	.100		1.7750	.56	772.91	.053
POND 10	OUT POND	14	.184		1.7750	.65	774.08	.112
POND 10	OUT POND	104	.344		1.7750	1.86	775.33	.210
POND 10	OUT POND	5	.133		3.2250	.58	773.11	.061
POND 10	OUT POND	15	.240		3.3250	.67	774.34	.129
POND 10	OUT POND	105	.440		3.2250	2.06	775.57	.233
POND 10	OUT POND	6	.174		6.1250	.60	773.33	.071
POND 10	OUT POND	16	.297		6.3750	.72	774.46	.137
POND 10	OUT POND	106	.512		6.1250	2.06	775.57	.233
POND 10	OUT POND	7	.226		12.1250	.61	773.54	.080
POND 10	OUT POND	17	.360		12.3000	.76	774.52	.142
POND 10	OUT POND	107	.574		12.1250	1.98	775.47	.223

Title... Project Date: 6/3/2013
Project Engineer:
Project Title: Watershed
Project Comments:
Proposed Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 2

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 2 yr
Total Rainfall Depth= 1.3900 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 10 yr
Total Rainfall Depth= 2.0200 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm 1 HR Type II
Storm Frequency = 100 yr
Total Rainfall Depth= 3.0100 in
Duration Multiplier = 1
Resulting Duration = 1.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 1.0000 hrs

Storm Tag Name = 3

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 3 yr
Total Rainfall Depth= 1.6300 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Storm Tag Name = 13

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 13 yr
Total Rainfall Depth= 2.3800 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Title... Project Date: 6/3/2013
Project Engineer:
Project Title: Watershed
Project Comments:
Proposed Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 103

Data Type, File, ID = Synthetic Storm 2 HR Type II
Storm Frequency = 103 yr
Total Rainfall Depth= 3.6500 in
Duration Multiplier = 1
Resulting Duration = 2.0000 hrs
Resulting Start Time= .0000 hrs Step= .0500 hrs End= 2.0000 hrs

Storm Tag Name = 4

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 4 yr
Total Rainfall Depth= 1.7200 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 14

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 14 yr
Total Rainfall Depth= 2.5300 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 104

Data Type, File, ID = Synthetic Storm 3 HR Type II
Storm Frequency = 104 yr
Total Rainfall Depth= 3.9400 in
Duration Multiplier = 1
Resulting Duration = 3.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 3.0000 hrs

Storm Tag Name = 5

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 5 yr
Total Rainfall Depth= 2.0500 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Title... Project Date: 6/3/2013
Project Engineer:
Project Title: Watershed
Project Comments:
Proposed Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 15

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 15 yr
Total Rainfall Depth= 3.0300 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Storm Tag Name = 105

Data Type, File, ID = Synthetic Storm 6 HR Type II
Storm Frequency = 105 yr
Total Rainfall Depth= 4.7600 in
Duration Multiplier = 1
Resulting Duration = 6.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 6.0000 hrs

Storm Tag Name = 6

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 6 yr
Total Rainfall Depth= 2.4400 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Storm Tag Name = 16

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 16 yr
Total Rainfall Depth= 3.5300 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Storm Tag Name = 106

Data Type, File, ID = Synthetic Storm 12 HR Type II
Storm Frequency = 106 yr
Total Rainfall Depth= 5.3600 in
Duration Multiplier = 1
Resulting Duration = 12.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 12.0000 hrs

Title... Project Date: 6/3/2013
Project Engineer:
Project Title: Watershed
Project Comments:
Proposed Model

DESIGN STORMS SUMMARY

Design Storm File,ID = Franklin, IN

Storm Tag Name = 7

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 7 yr
Total Rainfall Depth= 2.9100 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 17

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 17 yr
Total Rainfall Depth= 4.0800 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 107

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 107 yr
Total Rainfall Depth= 5.8800 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

```
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
TIME OF CONCENTRATION CALCULATOR
::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::


----------------------------------------------------------------------


Segment #1:  Tc: TR-55 Sheet

Mannings n          .1300
Hydraulic Length    30.00 ft
2yr, 24hr P        3.5000 in
Slope             .034000 ft/ft

Avg.Velocity          .19 ft/sec

                                          Segment #1 Time:     .0430 hrs
----------------------------------------------------------------------

                                                 ==========================
                                                  Total Tc:     .0430 hrs

                                                  Calculated Tc < Min.Tc:
                                                  Use Minimum Tc...
                                                  Use Tc =      .0833 hrs
                                                 ==========================
```

```
--------------------------------------------------------------------------
Tc Equations used...
--------------------------------------------------------------------------


==== SCS TR-55 Sheet Flow ==============================================

     Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

     Where:  Tc = Time of concentration, hrs
             n  = Mannings n
             Lf = Flow length, ft
             P  = 2yr, 24hr Rain depth, inches
             Sf = Slope, %
```

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: TR-55 Sheet

Mannings n	.0110	
Hydraulic Length	165.00	ft
2yr, 24hr P	3.1000	in
Slope	.017000	ft/ft
Avg.Velocity	1.40	ft/sec

Segment #1 Time: .0327 hrs

Segment #2: Tc: TR-55 Channel

Flow Area	.7810	sq.ft
Wetted Perimeter	3.14	ft
Hydraulic Radius	.25	ft
Slope	.005000	ft/ft
Mannings n	.0130	
Hydraulic Length	500.00	ft
Avg.Velocity	3.20	ft/sec

Segment #2 Time: .0433 hrs

==========
Total Tc: .0760 hrs

Calculated Tc < Min.Tc:
Use Minimum Tc...
Use Tc = .0833 hrs
==========

Tc Equations used...

==== SCS TR-55 Sheet Flow ==========

```
Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

Where:  Tc = Time of concentration, hrs
        n  = Mannings n
        Lf = Flow length, ft
        P  = 2yr, 24hr Rain depth, inches
        Sf = Slope, %
```

==== SCS Channel Flow ==========

```
R  = Aq / Wp
V  = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

Tc = (Lf / V) / (3600sec/hr)

Where:  R  = Hydraulic radius
        Aq = Flow area, sq.ft.
        Wp = Wetted perimeter, ft
        V  = Velocity, ft/sec
        Sf = Slope, ft/ft
        n  = Mannings n
        Tc = Time of concentration, hrs
        Lf = Flow length, ft
```

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: TR-55 Sheet

Mannings n	.1300	
Hydraulic Length	50.00	ft
2yr, 24hr P	3.5000	in
Slope	.013300	ft/ft

Avg.Velocity .15 ft/sec

Segment #1 Time: .0942 hrs

Total Tc: .0942 hrs

Tc Equations used...

==== SCS TR-55 Sheet Flow ==========

```
Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

Where:  Tc = Time of concentration, hrs
        n  = Mannings n
        Lf = Flow length, ft
        P  = 2yr, 24hr Rain depth, inches
        Sf = Slope, %
```

File.... P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\proposed.ppw

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
Impervious Areas - Paved parking lo	98	.027			98.00
Open space (Lawns,parks etc.) - Goo	80	.080			80.00
COMPOSITE AREA & WEIGHTED CN --->		.107			84.54 (85)

RUNOFF CURVE NUMBER DATA

::

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
Impervious Areas - Paved parking lo	98	.719			98.00
Open space (Lawns,parks etc.) - Goo	80	.773			80.00

COMPOSITE AREA & WEIGHTED CN ---> 1.492 88.67 (89)

::

File.... P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\proposed.ppw

RUNOFF CURVE NUMBER DATA

::

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	Impervious Adjustment %UC	Adjusted CN
Open space (Lawns,parks etc.) - Goo	80	.037			80.00
Impervious Areas - Paved parking lo	98	.003			98.00
COMPOSITE AREA & WEIGHTED CN --->		.040			81.35 (81)

::

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration      = 1.0000 hrs      Rain Depth = 1.3900 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 2
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5555 hrs
Computed Peak Flow             =      .22 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =      .22 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 1
             CN   =   85
             Area =        .107 acres
             S    =   1.7647 in
             0.2S =    .3529 in

              Cumulative Runoff
             -------------------
                      .3839 in
                       .003 ac-ft

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

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 3 year storm
Duration      = 2.0000 hrs      Rain Depth = 1.6300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 3
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0444 hrs
Computed Peak Flow             =      .29 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =      .28 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                       .5362 in
                        .005 ac-ft

HYG Volume...           .005 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 4 year storm
Duration      = 3.0000 hrs      Rain Depth = 1.7200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 4
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5333 hrs
Computed Peak Flow             =      .24 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =      .24 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 1
             CN   =   85
             Area =        .107 acres
             S    =   1.7647 in
             0.2S =    .3529 in

              Cumulative Runoff
             -------------------
                      .5967 in
                       .005 ac-ft

HYG Volume...           .005 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration      = 6.0000 hrs      Rain Depth = 2.0500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 5
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0332 hrs
Computed Peak Flow             =      .20 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =      .20 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                       .8319 in
                        .007 ac-ft

HYG Volume...           .007 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 6 year storm
Duration      = 12.0000 hrs     Rain Depth = 2.4400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 6
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =      .23 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =      .23 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 1
               CN   =   85
               Area =        .107 acres
               S    =   1.7647 in
               0.2S =    .3529 in

                Cumulative Runoff
               -------------------
                       1.1309 in
                         .010 ac-ft

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

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 7 year storm
Duration      = 24.0000 hrs     Rain Depth = 2.9100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 7
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =      .26 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .25 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 1
               CN   =   85
               Area =        .107 acres
               S    =   1.7647 in
               0.2S =    .3529 in

                Cumulative Runoff
               -------------------
                       1.5129 in
                         .013 ac-ft

HYG Volume...            .013 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration      = 1.0000 hrs      Rain Depth = 2.0200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 10
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5444 hrs
Computed Peak Flow             =      .51 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =      .50 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 1
             CN   =   85
             Area =        .107 acres
             S    =   1.7647 in
             0.2S =    .3529 in

              Cumulative Runoff
             -------------------
                      .8098 in
                       .007 ac-ft

HYG Volume...           .007 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 13 year storm
Duration      = 2.0000 hrs      Rain Depth = 2.3800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 13
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0333 hrs
Computed Peak Flow             =      .62 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =      .59 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      1.0837 in
                        .010 ac-ft

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

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 14 year storm
Duration      = 3.0000 hrs      Rain Depth = 2.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 14
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5222 hrs
Computed Peak Flow             =      .51 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =      .51 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      1.2024 in
                        .011 ac-ft

HYG Volume...           .011 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 15 year storm
Duration      = 6.0000 hrs      Rain Depth = 3.0300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 15
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0221 hrs
Computed Peak Flow             =      .39 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =      .39 cfs
=============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      1.6135 in
                        .014 ac-ft

HYG Volume...           .014 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 16 year storm
Duration      = 12.0000 hrs     Rain Depth = 3.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 16
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =      .41 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =      .41 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      2.0425 in
                        .018 ac-ft

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

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 17 year storm
Duration      = 24.0000 hrs     Rain Depth = 4.0800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 17
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =      .42 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .42 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      2.5294 in
                        .023 ac-ft

HYG Volume...           .023 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration      = 1.0000 hrs      Rain Depth = 3.0100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 100
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5444 hrs
Computed Peak Flow             =     1.04 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =     1.02 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      1.5966 in
                        .014 ac-ft

HYG Volume...           .014 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 103 year storm
Duration      = 2.0000 hrs      Rain Depth = 3.6500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 103
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0333 hrs
Computed Peak Flow             =     1.26 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0250 hrs
Peak Flow, Interpolated Output =     1.21 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      2.1476 in
                        .019 ac-ft

HYG Volume...           .019 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 104 year storm
Duration      = 3.0000 hrs      Rain Depth = 3.9400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 104
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5222 hrs
Computed Peak Flow             =     1.04 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =     1.03 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 1
               CN   =   85
               Area =        .107 acres
               S    =   1.7647 in
               0.2S =    .3529 in

                Cumulative Runoff
               -------------------
                       2.4043 in
                         .021 ac-ft

HYG Volume...           .021 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 105 year storm
Duration      = 6.0000 hrs      Rain Depth = 4.7600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 105
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0221 hrs
Computed Peak Flow             =      .74 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =      .74 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 1
               CN   =   85
               Area =        .107 acres
               S    =   1.7647 in
               0.2S =    .3529 in

                Cumulative Runoff
               -------------------
                       3.1469 in
                         .028 ac-ft

HYG Volume...            .028 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 106 year storm
Duration      = 12.0000 hrs     Rain Depth = 5.3600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 106
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =      .73 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =      .73 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 1
             CN   =   85
             Area =        .107 acres
             S    =   1.7647 in
             0.2S =    .3529 in

              Cumulative Runoff
             -------------------
                     3.7022 in
                       .033 ac-ft

HYG Volume...           .033 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 107 year storm
Duration      = 24.0000 hrs     Rain Depth = 5.8800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 1 107
Tc (Min. Tc)  = .0833 hrs
Drainage Area = .107 acres  Runoff CN= 85

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =      .69 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .69 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 1
              CN   =   85
              Area =        .107 acres
              S    =   1.7647 in
              0.2S =    .3529 in

               Cumulative Runoff
              -------------------
                      4.1894 in
                        .037 ac-ft

HYG Volume...           .037 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 1)
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 =     1.45 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration      = 1.0000 hrs      Rain Depth = 1.3900 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 2
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5444 hrs
Computed Peak Flow             =     4.79 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =     4.74 cfs
============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                       .5490 in
                        .068 ac-ft

HYG Volume...            .068 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 3 year storm
Duration      = 2.0000 hrs      Rain Depth = 1.6300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 3
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0333 hrs
Computed Peak Flow             =     5.77 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =     5.52 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 2
             CN   =   89
             Area =       1.492 acres
             S    =   1.2360 in
             0.2S =    .2472 in

              Cumulative Runoff
             -------------------
                      .7302 in
                       .091 ac-ft

HYG Volume...           .091 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 4 year storm
Duration      = 3.0000 hrs      Rain Depth = 1.7200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 4
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5222 hrs
Computed Peak Flow             =     4.72 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =     4.70 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                       .8008 in
                        .100 ac-ft

HYG Volume...           .100 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration      = 6.0000 hrs      Rain Depth = 2.0500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 5
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0221 hrs
Computed Peak Flow             =     3.59 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =     3.59 cfs
=============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.0696 in
                        .133 ac-ft

HYG Volume...           .133 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 6 year storm
Duration      = 12.0000 hrs     Rain Depth = 2.4400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 6
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =     3.92 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =     3.91 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.4024 in
                        .174 ac-ft

HYG Volume...           .174 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 7 year storm
Duration      = 24.0000 hrs     Rain Depth = 2.9100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 7
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =     4.25 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =     4.24 cfs
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.8187 in
                        .226 ac-ft

HYG Volume...           .226 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration      = 1.0000 hrs      Rain Depth = 2.0200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 10
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5444 hrs
Computed Peak Flow             =     9.50 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =     9.29 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.0446 in
                        .130 ac-ft

HYG Volume...           .130 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 13 year storm
Duration      = 2.0000 hrs      Rain Depth = 2.3800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 13
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0333 hrs
Computed Peak Flow             =    11.04 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0250 hrs
Peak Flow, Interpolated Output =    10.53 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.3503 in
                        .168 ac-ft

HYG Volume...           .168 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 14 year storm
Duration      = 3.0000 hrs      Rain Depth = 2.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 14
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5222 hrs
Computed Peak Flow             =     8.89 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =     8.82 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.4810 in
                        .184 ac-ft

HYG Volume...           .184 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 15 year storm
Duration      = 6.0000 hrs      Rain Depth = 3.0300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 15
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0221 hrs
Computed Peak Flow             =     6.39 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =     6.38 cfs
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.9270 in
                        .240 ac-ft

HYG Volume...           .240 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 16 year storm
Duration      = 12.0000 hrs     Rain Depth = 3.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 16
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =     6.57 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =     6.55 cfs
=============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 2
               CN   =   89
               Area =       1.492 acres
               S    =   1.2360 in
               0.2S =    .2472 in

                Cumulative Runoff
               -------------------
                       2.3849 in
                         .297 ac-ft

HYG Volume...            .297 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 17 year storm
Duration      = 24.0000 hrs     Rain Depth = 4.0800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 17
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =     6.66 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =     6.63 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 2
               CN   =   89
               Area =       1.492 acres
               S    =   1.2360 in
               0.2S =    .2472 in

                Cumulative Runoff
               -------------------
                       2.8982 in
                         .360 ac-ft

HYG Volume...           .360 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration      = 1.0000 hrs      Rain Depth = 3.0100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 100
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =    .5333 hrs
Computed Peak Flow             =    17.76 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =    17.05 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      1.9089 in
                        .237 ac-ft

HYG Volume...           .237 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 103 year storm
Duration      = 2.0000 hrs      Rain Depth = 3.6500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 103
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.0333 hrs
Computed Peak Flow             =    20.56 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0250 hrs
Peak Flow, Interpolated Output =    19.84 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      2.4962 in
                        .310 ac-ft

HYG Volume...           .310 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 104 year storm
Duration      = 3.0000 hrs      Rain Depth = 3.9400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 104
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   1.5222 hrs
Computed Peak Flow             =    16.53 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =    16.35 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 2
             CN   =   89
             Area =       1.492 acres
             S    =   1.2360 in
             0.2S =    .2472 in

              Cumulative Runoff
             -------------------
                     2.7668 in
                       .344 ac-ft

HYG Volume...           .344 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 105 year storm
Duration      = 6.0000 hrs      Rain Depth = 4.7600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 105
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

=============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   3.0221 hrs
Computed Peak Flow             =    11.43 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =    11.39 cfs
=============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      3.5426 in
                        .440 ac-ft

HYG Volume...           .440 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 106 year storm
Duration      = 12.0000 hrs     Rain Depth = 5.3600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 106
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =   5.9220 hrs
Computed Peak Flow             =    11.05 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =    11.00 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      4.1175 in
                        .512 ac-ft

HYG Volume...           .512 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 107 year storm
Duration      = 24.0000 hrs     Rain Depth = 5.8800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 2 107
Tc (Min. Tc)  = .0833 hrs
Drainage Area = 1.492 acres  Runoff CN= 89

============================================
Computational Time Increment   =   .01111 hrs
Computed Peak Time             =  11.9218 hrs
Computed Peak Flow             =    10.36 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =    10.31 cfs
============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 2
              CN   =   89
              Area =       1.492 acres
              S    =   1.2360 in
              0.2S =    .2472 in

               Cumulative Runoff
              -------------------
                      4.6192 in
                        .574 ac-ft

HYG Volume...           .574 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .08333 hrs (ID: AREA 2)
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 =    20.29 cfs
Unit peak time      Tp =   .05555 hrs
Unit receding limb, Tr =   .22221 hrs
Total unit time,    Tb =   .27777 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration      = 1.0000 hrs      Rain Depth = 1.3900 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 2
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =    .5775 hrs
Computed Peak Flow             =      .05 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5750 hrs
Peak Flow, Interpolated Output =      .05 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .2596 in
                        .001 ac-ft

HYG Volume...           .001 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 3 year storm
Duration      = 2.0000 hrs      Rain Depth = 1.6300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 3
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.0546 hrs
Computed Peak Flow             =      .06 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =      .06 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 3
             CN   =   81
             Area =        .040 acres
             S    =   2.3457 in
             0.2S =    .4691 in

              Cumulative Runoff
             -------------------
                      .3843 in
                       .001 ac-ft

HYG Volume...           .001 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 4 year storm
Duration      = 3.0000 hrs      Rain Depth = 1.7200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 4
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.5442 hrs
Computed Peak Flow             =      .06 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5500 hrs
Peak Flow, Interpolated Output =      .05 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 3
             CN   =   81
             Area =        .040 acres
             S    =   2.3457 in
             0.2S =    .4691 in

              Cumulative Runoff
             -------------------
                      .4350 in
                       .001 ac-ft

HYG Volume...           .001 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration      = 6.0000 hrs      Rain Depth = 2.0500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 5
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   3.0507 hrs
Computed Peak Flow             =      .05 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0500 hrs
Peak Flow, Interpolated Output =      .05 cfs
============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .6365 in
                        .002 ac-ft

HYG Volume...           .002 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 6 year storm
Duration      = 12.0000 hrs     Rain Depth = 2.4400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 6
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   5.9382 hrs
Computed Peak Flow             =      .06 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9500 hrs
Peak Flow, Interpolated Output =      .06 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .8999 in
                        .003 ac-ft

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

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 7 year storm
Duration      = 24.0000 hrs     Rain Depth = 2.9100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 7
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =  11.9392 hrs
Computed Peak Flow             =      .08 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .08 cfs
============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 3
               CN   =   81
               Area =        .040 acres
               S    =   2.3457 in
               0.2S =    .4691 in

                Cumulative Runoff
               -------------------
                       1.2447 in
                         .004 ac-ft

HYG Volume...           .004 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration      = 1.0000 hrs      Rain Depth = 2.0200 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 10
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =    .5649 hrs
Computed Peak Flow             =      .13 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =      .13 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .6173 in
                        .002 ac-ft

HYG Volume...           .002 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 13 year storm
Duration      = 2.0000 hrs      Rain Depth = 2.3800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 13
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.0546 hrs
Computed Peak Flow             =      .16 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =      .16 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .8578 in
                        .003 ac-ft

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

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 14 year storm
Duration      = 3.0000 hrs      Rain Depth = 2.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 14
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

=============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.5316 hrs
Computed Peak Flow             =      .14 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =      .14 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
=============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                       .9638 in
                        .003 ac-ft

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

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

Time Concentration, Tc =    .09416 hrs (ID: AREA 3)
Computational Incr, Tm =    .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 15 year storm
Duration      = 6.0000 hrs      Rain Depth = 3.0300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 15
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   3.0381 hrs
Computed Peak Flow             =      .12 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0500 hrs
Peak Flow, Interpolated Output =      .12 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      1.3366 in
                        .004 ac-ft

HYG Volume...           .004 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 16 year storm
Duration      = 12.0000 hrs     Rain Depth = 3.5300 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 16
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   5.9382 hrs
Computed Peak Flow             =      .13 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =      .13 cfs
============================================

                 DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      1.7329 in
                        .006 ac-ft

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

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 17 year storm
Duration      = 24.0000 hrs     Rain Depth = 4.0800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 17
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =  11.9266 hrs
Computed Peak Flow             =      .14 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .13 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      2.1889 in
                        .007 ac-ft

HYG Volume...           .007 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration      = 1.0000 hrs      Rain Depth = 3.0100 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 1 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 100
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =    .5524 hrs
Computed Peak Flow             =      .30 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =    .5500 hrs
Peak Flow, Interpolated Output =      .29 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      1.3212 in
                        .004 ac-ft

HYG Volume...           .004 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 103 year storm
Duration      = 2.0000 hrs      Rain Depth = 3.6500 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 2 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 103
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.0420 hrs
Computed Peak Flow             =      .37 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.0500 hrs
Peak Flow, Interpolated Output =      .36 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      1.8308 in
                        .006 ac-ft

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

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 104 year storm
Duration      = 3.0000 hrs      Rain Depth = 3.9400 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 3 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 104
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   1.5316 hrs
Computed Peak Flow             =      .31 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   1.5250 hrs
Peak Flow, Interpolated Output =      .31 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 3
             CN   =   81
             Area =        .040 acres
             S    =   2.3457 in
             0.2S =    .4691 in

              Cumulative Runoff
             -------------------
                     2.0711 in
                       .007 ac-ft

HYG Volume...           .007 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 105 year storm
Duration      = 6.0000 hrs      Rain Depth = 4.7600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 6 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 105
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   3.0256 hrs
Computed Peak Flow             =      .24 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   3.0250 hrs
Peak Flow, Interpolated Output =      .24 cfs
============================================

                DRAINAGE AREA
              -------------------
              ID:AREA 3
              CN   =   81
              Area =        .040 acres
              S    =   2.3457 in
              0.2S =    .4691 in

               Cumulative Runoff
              -------------------
                      2.7743 in
                        .009 ac-ft

HYG Volume...           .009 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 106 year storm
Duration      = 12.0000 hrs     Rain Depth = 5.3600 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - 12 HR Type II
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 106
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =   5.9256 hrs
Computed Peak Flow             =      .24 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =   5.9250 hrs
Peak Flow, Interpolated Output =      .24 cfs
============================================

                DRAINAGE AREA
             -------------------
             ID:AREA 3
             CN   =   81
             Area =        .040 acres
             S    =   2.3457 in
             0.2S =    .4691 in

              Cumulative Runoff
             -------------------
                     3.3055 in
                       .011 ac-ft

HYG Volume...           .011 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

```
SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 107 year storm
Duration      = 24.0000 hrs     Rain Depth = 5.8800 in
Rain Dir      = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
Rain File -ID =  - TypeII  24hr
Unit Hyd Type = Default Curvilinear
HYG Dir       = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Mo
HYG File - ID = work_pad.hyg - AREA 3 107
Tc            = .0942 hrs
Drainage Area = .040 acres  Runoff CN= 81

=============================================
Computational Time Increment   =   .01255 hrs
Computed Peak Time             =  11.9266 hrs
Computed Peak Flow             =      .23 cfs

Time Increment for HYG File    =    .0250 hrs
Peak Time, Interpolated Output =  11.9250 hrs
Peak Flow, Interpolated Output =      .23 cfs
=============================================

                 DRAINAGE AREA
               -------------------
               ID:AREA 3
               CN   =   81
               Area =        .040 acres
               S    =   2.3457 in
               0.2S =    .4691 in

                Cumulative Runoff
               -------------------
                       3.7745 in
                         .013 ac-ft

HYG Volume...           .013 ac-ft (area under HYG curve)

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

Time Concentration, Tc =   .09416 hrs (ID: AREA 3)
Computational Incr, Tm =   .01255 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 =      .48 cfs
Unit peak time      Tp =   .06277 hrs
Unit receding limb, Tr =   .25109 hrs
Total unit time,    Tb =   .31386 hrs
```

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
769.40	-----	.0000	.0000	.000	.000
771.00	-----	.0128	.0128	.007	.007
772.00	-----	.0244	.0549	.018	.025
773.00	-----	.0390	.0942	.031	.057
774.00	-----	.0623	.1506	.050	.107
775.00	-----	.0855	.2208	.074	.180
776.00	-----	.1103	.2929	.098	.278
777.00	-----	.1368	.3699	.123	.401

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
770.00	-----	.0018	.0018	.000	.000

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Interpolated area from closest two given contour areas
is computed using the relationship:

IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))**2

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 769.40 ft
Increment = .10 ft
Max. Elev.= 777.00 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
Orifice-Circular	O0	--->	TW	769.400	777.000
Orifice-Circular	O1	--->	TW	774.350	777.000

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

```
Structure ID      = O0
Structure Type    = Orifice-Circular
-----------------------------------
# of Openings     =         1
Invert Elev.      =    769.40 ft
Diameter          =     .2850 ft
Orifice Coeff.    =      .600


Structure ID      = O1
Structure Type    = Orifice-Circular
-----------------------------------
# of Openings     =         1
Invert Elev.      =    774.35 ft
Diameter          =     .6000 ft
Orifice Coeff.    =      .600


Structure ID      = TW
Structure Type    = TW SETUP, DS Channel
-----------------------------------
FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations=    40
Min. TW tolerance =    .01 ft
Max. TW tolerance =    .01 ft
Min. HW tolerance =    .01 ft
Max. HW tolerance =    .01 ft
Min.  Q tolerance =    .00 cfs
Max.  Q tolerance =    .00 cfs
```

LEVEL POOL ROUTING DATA

HYG Dir = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\
Inflow HYG file = work_pad.hyg - POND 10 IN 2
Outflow HYG file = work_pad.hyg - POND 10 OUT 2

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Outlet 1

No Infiltration

INITIAL CONDITIONS

Starting WS Elev = 769.40 ft
Starting Volume = .000 ac-ft
Starting Outflow = .00 cfs
Starting Infiltr. = .00 cfs
Starting Total Qout= .00 cfs
Time Increment = .0250 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
769.40	.00	.000	.0000	.00	.00	.00
769.50	.02	.000	.0000	.00	.02	.02
769.60	.06	.000	.0002	.00	.06	.07
769.70	.12	.000	.0004	.00	.12	.17
769.80	.16	.000	.0008	.00	.16	.26
769.90	.18	.000	.0013	.00	.18	.39
770.00	.21	.000	.0018	.00	.21	.56
770.10	.23	.001	.0025	.00	.23	.78
770.20	.25	.001	.0032	.00	.25	1.07
770.30	.27	.001	.0041	.00	.27	1.44
770.40	.28	.002	.0050	.00	.28	1.90
770.50	.30	.002	.0060	.00	.30	2.45
770.60	.32	.003	.0072	.00	.32	3.10
770.70	.33	.004	.0085	.00	.33	3.87
770.80	.34	.005	.0098	.00	.34	4.77
770.90	.36	.006	.0113	.00	.36	5.80
771.00	.37	.007	.0128	.00	.37	6.98
771.10	.38	.008	.0138	.00	.38	8.28
771.20	.40	.010	.0148	.00	.40	9.68
771.30	.41	.011	.0159	.00	.41	11.17

LEVEL POOL ROUTING DATA

HYG Dir = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\
Inflow HYG file = work_pad.hyg - POND 10 IN 2
Outflow HYG file = work_pad.hyg - POND 10 OUT 2

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Outlet 1

No Infiltration

INITIAL CONDITIONS

Starting WS Elev = 769.40 ft
Starting Volume = .000 ac-ft
Starting Outflow = .00 cfs
Starting Infiltr. = .00 cfs
Starting Total Qout= .00 cfs
Time Increment = .0250 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
771.40	.42	.013	.0170	.00	.42	12.78
771.50	.43	.015	.0181	.00	.43	14.49
771.60	.44	.016	.0193	.00	.44	16.31
771.70	.45	.018	.0205	.00	.45	18.25
771.80	.46	.021	.0218	.00	.46	20.31
771.90	.47	.023	.0231	.00	.47	22.49
772.00	.48	.025	.0244	.00	.48	24.79
772.10	.49	.028	.0257	.00	.49	27.23
772.20	.50	.030	.0270	.00	.50	29.79
772.30	.51	.033	.0284	.00	.51	32.49
772.40	.52	.036	.0298	.00	.52	35.31
772.50	.53	.039	.0313	.00	.53	38.28
772.60	.54	.042	.0328	.00	.54	41.39
772.70	.55	.046	.0343	.00	.55	44.64
772.80	.55	.049	.0358	.00	.55	48.04
772.90	.56	.053	.0374	.00	.56	51.59
773.00	.57	.057	.0390	.00	.57	55.30
773.10	.58	.061	.0411	.00	.58	59.18
773.20	.59	.065	.0432	.00	.59	63.27
773.30	.60	.069	.0454	.00	.60	67.57

LEVEL POOL ROUTING DATA

HYG Dir = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\
Inflow HYG file = work_pad.hyg - POND 10 IN 2
Outflow HYG file = work_pad.hyg - POND 10 OUT 2

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Outlet 1

No Infiltration

INITIAL CONDITIONS

Starting WS Elev = 769.40 ft
Starting Volume = .000 ac-ft
Starting Outflow = .00 cfs
Starting Infiltr. = .00 cfs
Starting Total Qout= .00 cfs
Time Increment = .0250 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
773.40	.60	.074	.0477	.00	.60	72.08
773.50	.61	.079	.0500	.00	.61	76.81
773.60	.62	.084	.0523	.00	.62	81.77
773.70	.63	.089	.0547	.00	.63	86.96
773.80	.63	.095	.0572	.00	.63	92.39
773.90	.64	.101	.0597	.00	.64	98.05
774.00	.65	.107	.0623	.00	.65	103.96
774.10	.66	.113	.0645	.00	.66	110.11
774.20	.66	.120	.0666	.00	.66	116.46
774.30	.67	.126	.0689	.00	.67	123.03
774.35	.67	.130	.0700	.00	.67	126.39
774.40	.68	.133	.0711	.00	.68	129.82
774.50	.74	.141	.0734	.00	.74	136.87
774.60	.84	.148	.0758	.00	.84	144.19
774.70	.98	.156	.0782	.00	.98	151.78
774.80	1.15	.164	.0806	.00	1.15	159.63
774.90	1.33	.172	.0830	.00	1.33	167.73
775.00	1.52	.180	.0855	.00	1.52	176.08
775.10	1.64	.189	.0878	.00	1.64	184.58
775.20	1.74	.198	.0902	.00	1.74	193.30

LEVEL POOL ROUTING DATA

HYG Dir = P:\2015\0151019.00 - Caseys Franklin - US 31, IN\Drainage\Models\
Inflow HYG file = work_pad.hyg - POND 10 IN 2
Outflow HYG file = work_pad.hyg - POND 10 OUT 2

Pond Node Data = POND 10
Pond Volume Data = POND 10
Pond Outlet Data = Outlet 1

No Infiltration

INITIAL CONDITIONS

Starting WS Elev = 769.40 ft
Starting Volume = .000 ac-ft
Starting Outflow = .00 cfs
Starting Infiltr. = .00 cfs
Starting Total Qout= .00 cfs
Time Increment = .0250 hrs

Elevation ft	Outflow cfs	Storage ac-ft	Area acres	Infilt. cfs	Q Total cfs	2S/t + O cfs
775.30	1.83	.207	.0926	.00	1.83	202.25
775.40	1.92	.216	.0950	.00	1.92	211.42
775.50	2.00	.226	.0975	.00	2.00	220.81
775.60	2.08	.236	.1000	.00	2.08	230.46
775.70	2.16	.246	.1025	.00	2.16	240.33
775.80	2.23	.256	.1051	.00	2.23	250.45
775.90	2.30	.267	.1077	.00	2.30	260.82
776.00	2.36	.278	.1103	.00	2.36	271.43
776.10	2.42	.289	.1128	.00	2.42	282.30
776.20	2.49	.301	.1154	.00	2.49	293.40
776.30	2.55	.312	.1180	.00	2.55	304.76
776.40	2.60	.324	.1206	.00	2.60	316.35
776.50	2.66	.336	.1232	.00	2.66	328.21
776.60	2.72	.349	.1259	.00	2.72	340.32
776.70	2.77	.361	.1286	.00	2.77	352.68
776.80	2.82	.374	.1313	.00	2.82	365.32
776.90	2.87	.388	.1340	.00	2.87	378.20
777.00	2.92	.401	.1368	.00	2.92	391.36