AMERICAN STRUCTUREPOINT INC.

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Drainage Computations Summary

For

I-65 South Logistics Center

State Road 44 & Forest Road
Franklin, IN 46131

Prepared For:
GDI Construction
9775 Crosspoint Boulevard, Suite 105
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AMERICAN STRUCTUREPOINT, INC.

DRAINAGE COMPUTATIONS SUMMARY

For

I-65 South Logistics Center

State Road 44 & Forest Road
Franklin, IN 46131

PROJECT DESCRIPTION

The proposed project is located at the intersection of State Road 44 and Forest Road in Franklin, Johnson County, Indiana. The ±68.75 acre site currently consists of undeveloped farmland with no existing stormwater infrastructure onsite. The developed site will consist of a ±979,200 sf industrial warehouse facility, asphalt and concrete paving, installation of storm sewer piping and other associated utilities. In addition, a stormwater detention basin will be constructed to detain additional runoff from the proposed site improvements. Refer to Appendix A for an aerial map of the site's location.

The Natural Resources Conservation Service (NRCS) Web Soil Survey of Johnson County, Indiana, indicates an approximately 50.1% distribution of Brookston silty clay loam, a 19.6% distribution of Crosby silt loam, and a 30.3% distribution of Miami silt loam. Refer to Appendix A for the Soils Map.

The site is located within a special flood hazard zone, 'Flood Zone A', as indicated on the Flood Insurance Rate Maps (FIRM) 18081C0232D and 18081C0275D for Johnson County, Indiana, dated August 2, 2007. Compensatory storage for fill placed within the floodplain has been provided per City of Franklin requirements. Refer to Appendix A for the FIRM.

The adjacent land uses for this site have been included below:

North: Agriculture
South: Agriculture
East: Agriculture
West: Agriculture

EXISTING CONDITIONS

The existing property currently consists of undeveloped farmland. In the existing condition, stormwater runoff from the site is allowed to sheet flow un-detained across the site from west to east before eventually discharging to Amity Ditch east of the project site. No existing stormwater infrastructure exists on the project site.

The allowable release rates for the project site has been determined in accordance with the *City of Franklin Subdivision Control Ordinance* which requires runoff to be detained to 2-yr pre-existing rates in 10-year return storm events and to 10-yr pre-existing rates in 100-year storm events. The existing release rates have been summarized in the table below. Refer to Appendix B for Existing Drainage Conditions.

Storm Event	Existing Release Rates
2-Year	6.37 cfs
10-Year	13.51 cfs
100-Year	41.85 cfs

Table 1. Site Existing Release Rates

PROPOSED CONDITIONS

The proposed development includes the construction of a ±979,200 sf industrial warehouse facility, asphalt and concrete paving, installation of storm sewer piping and other associated utilities. The stormwater from the development will be collected in proposed storm infrastructure and conveyed to a new detention basin located on the east side of the property. The stormwater will eventually discharge to Amity Ditch.

Proposed conditions release rates have been modeled in ICPR and have been summarized in the table below. Due to the project's ultimate discharge into Amity Ditch, tailwater from upstream areas contributing to Amity Ditch were incorperated into the ICPR model to analyze the effects of the upstream stormwater on the detention basin as well as release rates into the ditch. As a result of this analysis, it was found that the peak discharge from the detention basin and the peak discharge through Amity Ditch from upstream areas did not occur at the same time and that tailwater effects on the proposed detention caused mnimal impact to the intended function of the basin. Refer to Appendix C for a Proposed Conditions Basin Map and runoff calculations.

Storm Event	Existing Release Rates	Allowable Release Rates	Proposed Release Rate
10-Year	13.51 cfs	6.37 cfs	6.36 cfs
100-Year	41.85 cfs	13.51 cfs	7.55 cfs

Table 2. Release Rate Summary

In addition to the modeling of tailwater in Amity Ditch, a second ICPR model was created to analyze the detention basin negating all storage volume below the floodplain base flood elevation. The purpose of this model is to ensure the detention basin has enough storage volume to accept the 10 and 100 year rainfall events without overtopping in the event of a fully flooded Amity Ditch. Refer to Appendix C for all proposed detention calculations.

COMPENSATORY STORAGE

Due to the project site's location within 'Flood Zone A', compensatory storage will be required for all fill placed within the floodplain. Amity Ditch has a base flood elevation of 717.80 for this segment of the ditch.

In the existing site conditions, it was determined that the site provided approximately 52,236 cy of floodplain storage within the property boundary limits. The proposed project will provide the compensatory storage within the detention basin to ensure no floodplain storage is lost as a result of the development. The table below summarizes pre and post floodplain volumes across the site.

	Volume
Existing	52,236 cy
Proposed	56,643 cy

Table 3. Floodplain Storage Volume

In addition to the detention modeling analysis described above, a third ICPR model was created to analyze the impact of stormwater runoff generated from the project site only. It was found that runoff from the site caused the basin to stage to an elevation of 713.36 in the 100-yr storm which was then used to generate the compensatory storage volume provided in Table 3. Refer to Appendix C for all compensatory storage calculations.

STORM SEWER DESIGN

The proposed storm sewer has been designed based on a 10-year storm event in accordance with the *City of Franklin Stormwater Management Ordinance.* All proposed storm has been sized to accept runoff from the fully developed project site. A storm basin map can be found in Appendix D of the report.

STORMWATER QUALITY

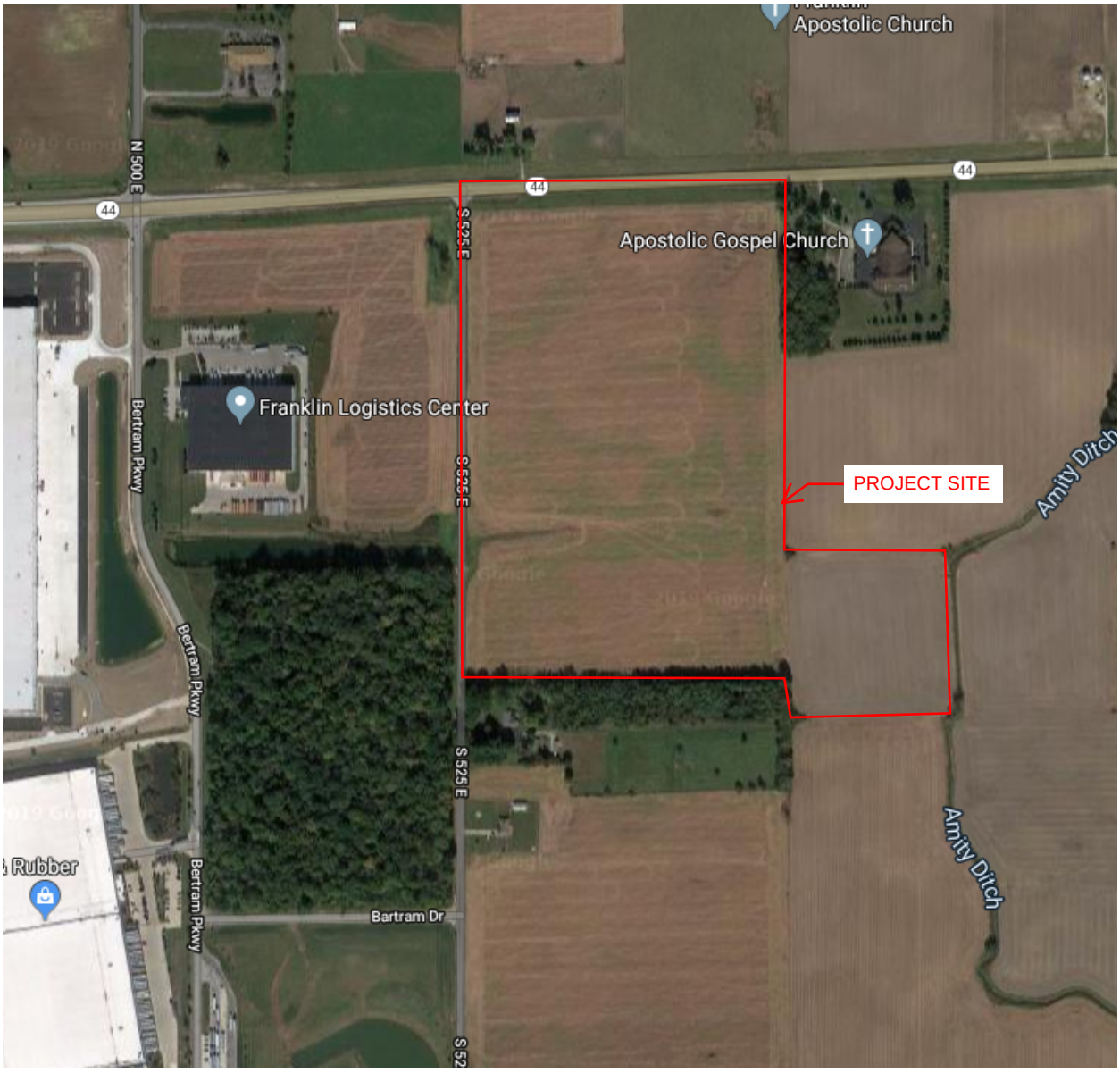
The proposed wet detention basin has been designed to act as water quality for the development in accordance with the *City of Franklin Stormwater Management Ordinance.* The required WQv for the basin based on full buildout of the site is 3.74 ac-ft. The water quality volume provided below normal pool is 57.58 ac-ft. Refer to Appendix E for water quality volume calculations.

SUMMARY AND CONCLUSIONS

The proposed storm sewer and site improvements have been designed in accordance with the *City of Franklin Subdivision Control Ordinance.* In addition, post developed peak discharge rates for the proposed development will be restricted to rates less than the pre-developed conditions. The detention basin will act as water quality to remove sediment and other solids from the stormwater prior to discharge from the site. We believe the proposed improvements will not adversely affect this site, adjacent developments, the City of Franklin, or Johnson County.

APPENDIX A

MAPS



PROJECT LOCATION MAP

Map Scale: 1:3,690 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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:
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 27, Sep 16, 2019

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

Date(s) aerial images were photographed: Sep 24, 2014—Mar 20, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Br	Brookston silty clay loam, 0 to 2 percent slopes	B/D	31.2	50.1%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	7.4	11.9%
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	C/D	4.8	7.7%
MnB2	Miami silt loam, 2 to 6 percent slopes, eroded	C	12.9	20.7%
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded	C	6.0	9.6%
Totals for Area of Interest			**62.3**	**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

National Flood Hazard Layer FIRMette

FEMA

Legend

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

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

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

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

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

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

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

N

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

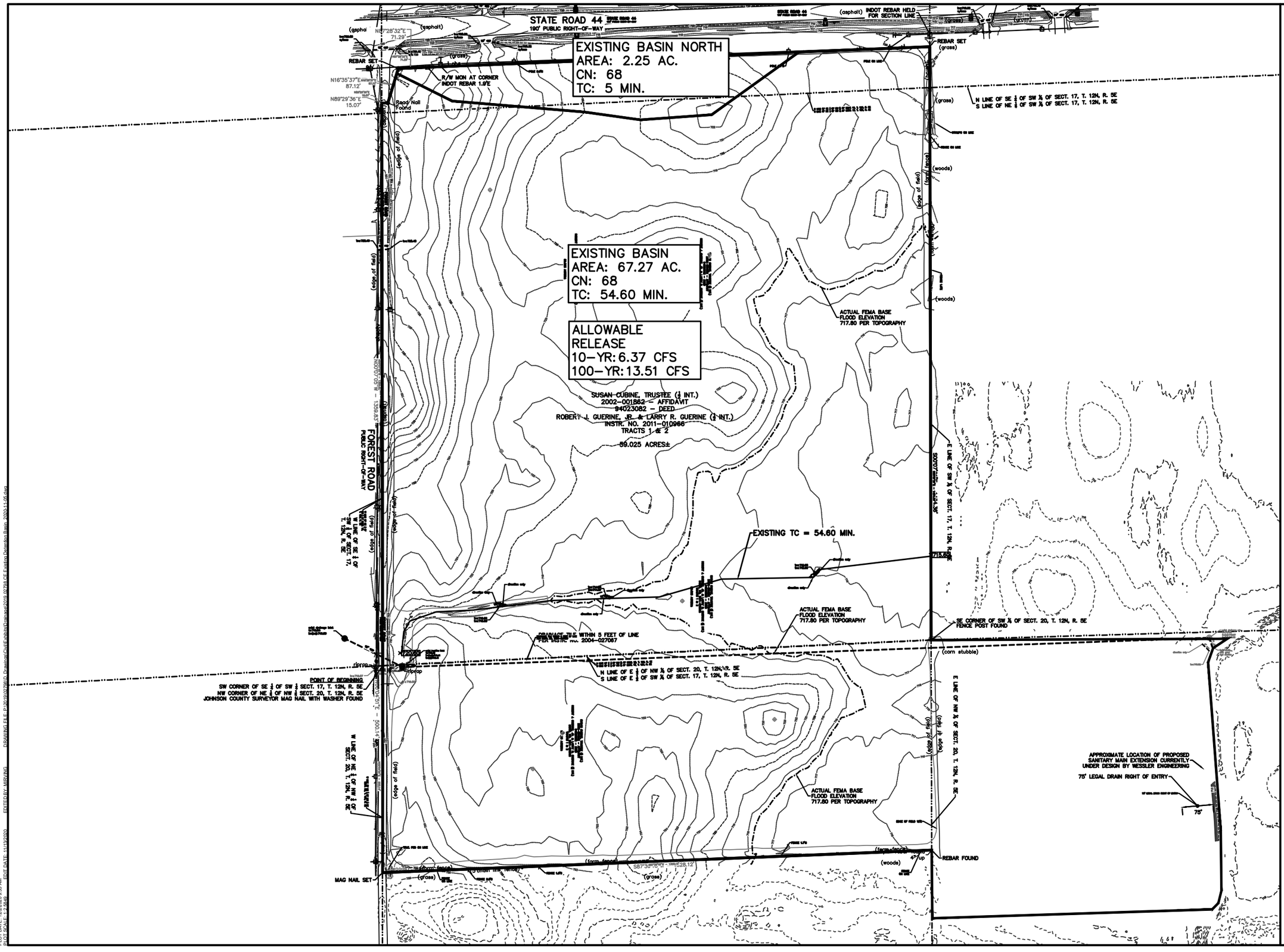
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/8/2020 at 7:13:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX B

EXISTING CONDITIONS



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I-65 SOUTH LOGISTICS CENTER LOT 1

81/89 Forest Road
Franklin, Indiana

CERTIFIED BY

ISSUANCE INDEX
DATE:
12/03/2020
PROJECT PHASE:
CONSTRUCTION DOCUMENTS

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

Project Number 2019.02798

EXISTING CONDITIONS BASINS MAP

EX-1

PLOT DATE: 12/2/2020 9:35 AM
PLOT SCALE: 1=4.3049
EDIT DATE: 11/19/2020
ENTERED BY: MRIVING
DRAWING FILE: I:\2019\02798\Engineering\Drawings\Sheets\Grading\2019.02798 EX Existing Basins.dwg

NOAA Atlas 14, Volume 2, Version 3
Location name: Franklin, Indiana, USA*
Latitude: 39.4813°, Longitude: -86.0012°
Elevation: 724.85 ft**
* source: ESRI Maps
** source: USGS

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** (0.333-0.421)	**0.444** (0.396-0.501)	**0.532** (0.473-0.599)	**0.600** (0.533-0.676)	**0.691** (0.609-0.779)	**0.761** (0.666-0.859)	**0.830** (0.719-0.939)	**0.902** (0.774-1.02)	**0.998** (0.842-1.14)	**1.07** (0.889-1.23)
10-min	**0.579** (0.518-0.654)	**0.693** (0.619-0.782)	**0.826** (0.735-0.931)	**0.927** (0.822-1.04)	**1.06** (0.931-1.19)	**1.15** (1.01-1.30)	**1.25** (1.08-1.41)	**1.35** (1.16-1.53)	**1.47** (1.24-1.68)	**1.56** (1.30-1.80)
15-min	**0.710** (0.634-0.802)	**0.848** (0.756-0.956)	**1.01** (0.903-1.14)	**1.14** (1.01-1.28)	**1.31** (1.15-1.47)	**1.43** (1.25-1.61)	**1.55** (1.34-1.76)	**1.68** (1.44-1.90)	**1.83** (1.55-2.10)	**1.95** (1.62-2.24)
30-min	**0.939** (0.839-1.06)	**1.13** (1.01-1.28)	**1.39** (1.24-1.57)	**1.58** (1.41-1.78)	**1.84** (1.62-2.08)	**2.04** (1.79-2.31)	**2.24** (1.94-2.54)	**2.44** (2.10-2.78)	**2.71** (2.29-3.11)	**2.92** (2.43-3.36)
60-min	**1.15** (1.02-1.30)	**1.39** (1.24-1.57)	**1.74** (1.55-1.97)	**2.02** (1.79-2.27)	**2.39** (2.11-2.70)	**2.69** (2.35-3.04)	**3.00** (2.60-3.39)	**3.32** (2.85-3.77)	**3.75** (3.17-4.29)	**4.10** (3.41-4.72)
2-hr	**1.34** (1.20-1.52)	**1.62** (1.45-1.84)	**2.04** (1.82-2.31)	**2.37** (2.10-2.68)	**2.84** (2.50-3.21)	**3.23** (2.81-3.64)	**3.64** (3.13-4.10)	**4.06** (3.45-4.59)	**4.66** (3.89-5.31)	**5.15** (4.22-5.91)
3-hr	**1.42** (1.27-1.61)	**1.72** (1.53-1.95)	**2.16** (1.93-2.45)	**2.53** (2.24-2.85)	**3.04** (2.67-3.43)	**3.47** (3.01-3.91)	**3.92** (3.36-4.43)	**4.40** (3.72-4.99)	**5.09** (4.20-5.82)	**5.65** (4.57-6.50)
6-hr	**1.70** (1.51-1.94)	**2.05** (1.83-2.34)	**2.59** (2.30-2.95)	**3.03** (2.68-3.44)	**3.66** (3.20-4.14)	**4.19** (3.63-4.74)	**4.75** (4.06-5.38)	**5.36** (4.50-6.09)	**6.24** (5.12-7.12)	**6.96** (5.59-7.99)
12-hr	**2.03** (1.82-2.30)	**2.44** (2.19-2.76)	**3.04** (2.72-3.43)	**3.52** (3.14-3.97)	**4.20** (3.71-4.72)	**4.76** (4.17-5.34)	**5.35** (4.63-6.00)	**5.97** (5.09-6.72)	**6.84** (5.72-7.76)	**7.54** (6.20-8.61)
24-hr	**2.43** (2.24-2.64)	**2.91** (2.69-3.17)	**3.57** (3.29-3.88)	**4.08** (3.75-4.43)	**4.77** (4.37-5.19)	**5.33** (4.86-5.79)	**5.88** (5.34-6.40)	**6.45** (5.83-7.03)	**7.22** (6.47-7.89)	**7.83** (6.96-8.69)
2-day	**2.84** (2.63-3.08)	**3.41** (3.15-3.69)	**4.15** (3.83-4.50)	**4.73** (4.36-5.12)	**5.51** (5.05-5.97)	**6.12** (5.59-6.64)	**6.73** (6.13-7.31)	**7.36** (6.66-8.01)	**8.20** (7.37-8.95)	**8.85** (7.90-9.69)
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)	**5.83** (5.39-6.26)	**6.46** (5.96-6.94)	**7.10** (6.52-7.63)	**7.74** (7.08-8.33)	**8.60** (7.82-9.28)	**9.27** (8.38-10.0)
4-day	**3.26** (3.05-3.48)	**3.89** (3.64-4.15)	**4.68** (4.39-5.00)	**5.31** (4.96-5.66)	**6.14** (5.73-6.55)	**6.80** (6.33-7.24)	**7.46** (6.92-7.95)	**8.12** (7.51-8.66)	**9.01** (8.28-9.61)	**9.69** (8.86-10.4)
7-day	**3.86** (3.61-4.14)	**4.59** (4.29-4.91)	**5.51** (5.14-5.89)	**6.24** (5.82-6.67)	**7.22** (6.72-7.72)	**8.00** (7.43-8.54)	**8.79** (8.14-9.39)	**9.59** (8.85-10.3)	**10.7** (9.80-11.4)	**11.5** (10.5-12.3)
10-day	**4.41** (4.13-4.71)	**5.24** (4.91-5.59)	**6.26** (5.87-6.69)	**7.07** (6.63-7.55)	**8.17** (7.64-8.71)	**9.04** (8.42-9.63)	**9.91** (9.21-10.6)	**10.8** (10.00-11.5)	**12.0** (11.0-12.8)	**12.9** (11.8-13.8)
20-day	**6.04** (5.70-6.43)	**7.15** (6.73-7.60)	**8.43** (7.94-8.96)	**9.43** (8.86-10.0)	**10.7** (10.1-11.4)	**11.8** (11.0-12.5)	**12.8** (11.9-13.6)	**13.8** (12.8-14.6)	**15.1** (14.0-16.0)	**16.1** (14.8-17.1)
30-day	**7.44** (7.03-7.88)	**8.76** (8.27-9.28)	**10.2** (9.62-10.8)	**11.3** (10.6-12.0)	**12.7** (12.0-13.5)	**13.8** (13.0-14.7)	**14.9** (14.0-15.8)	**16.0** (14.9-16.9)	**17.4** (16.1-18.4)	**18.4** (17.0-19.5)
45-day	**9.44** (8.90-9.98)	**11.1** (10.5-11.7)	**12.8** (12.0-13.5)	**14.1** (13.2-14.9)	**15.7** (14.8-16.6)	**17.0** (16.0-18.0)	**18.2** (17.0-19.2)	**19.3** (18.1-20.5)	**20.8** (19.4-22.0)	**21.9** (20.3-23.2)
60-day	**11.3** (10.6-11.9)	**13.2** (12.5-14.0)	**15.1** (14.3-16.0)	**16.6** (15.7-17.6)	**18.5** (17.4-19.6)	**20.0** (18.8-21.1)	**21.3** (20.0-22.6)	**22.6** (21.2-24.0)	**24.3** (22.7-25.7)	**25.5** (23.7-27.0)

[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.

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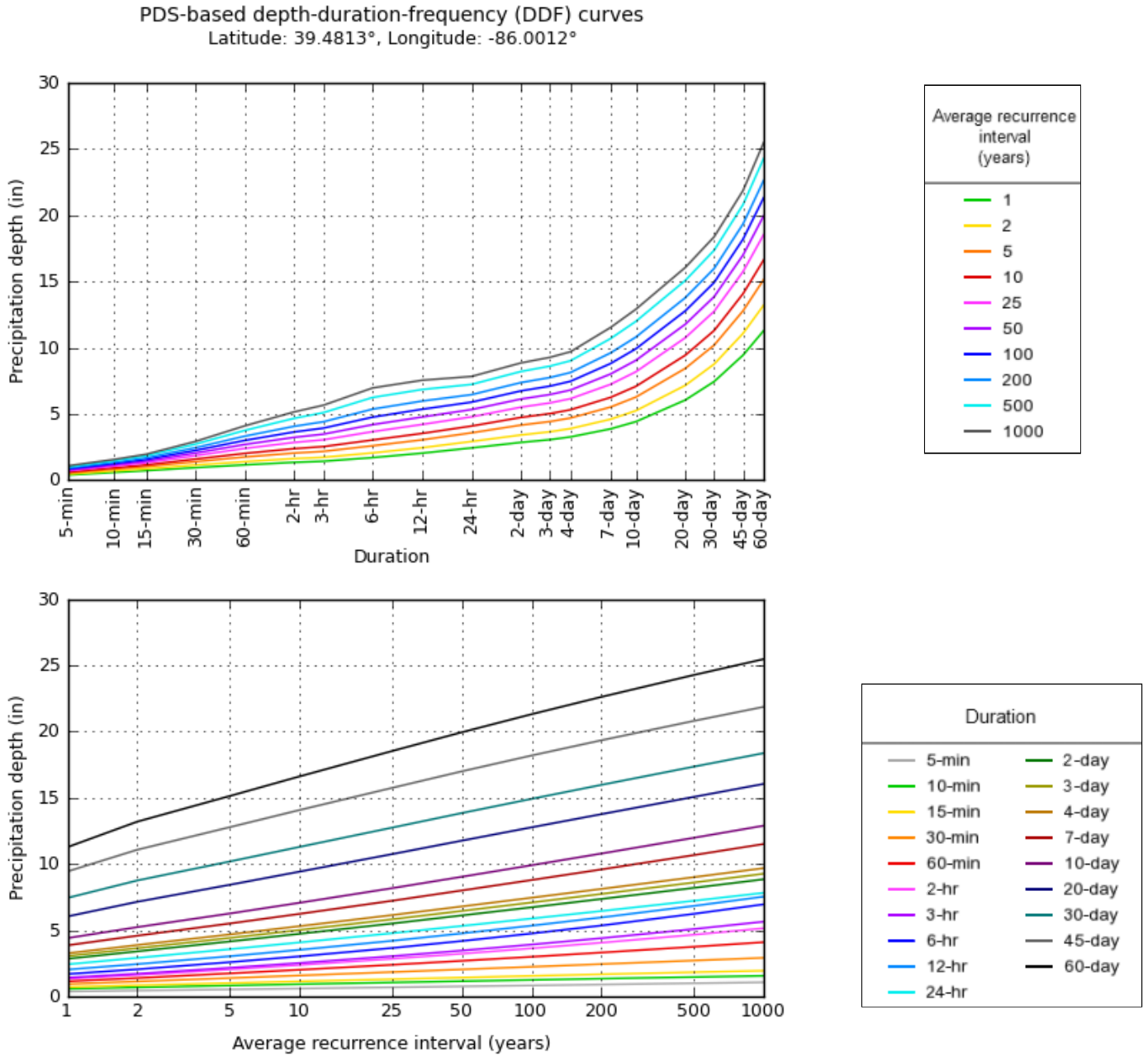
PF graphical



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Jan 6 21:52:51 2020

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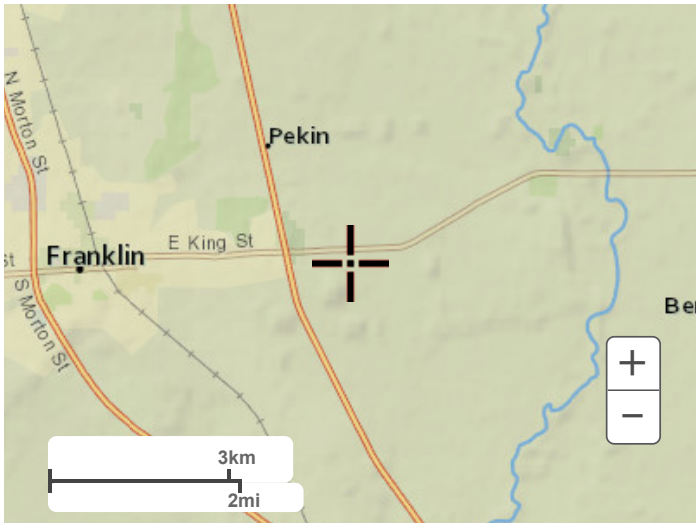
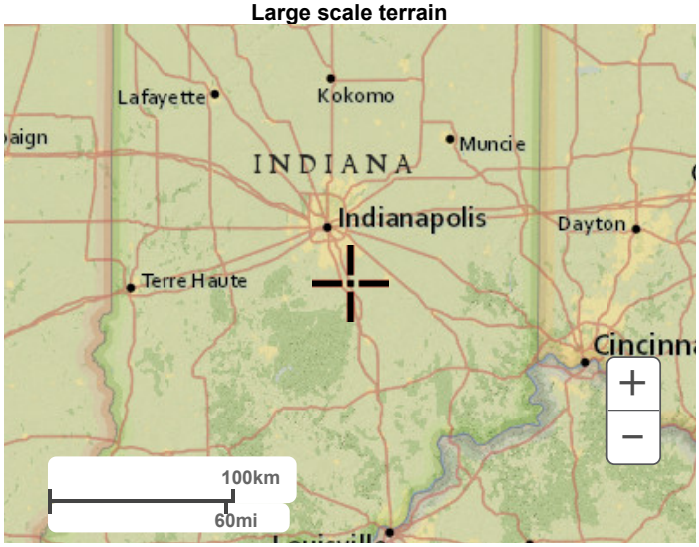
Maps & aerials

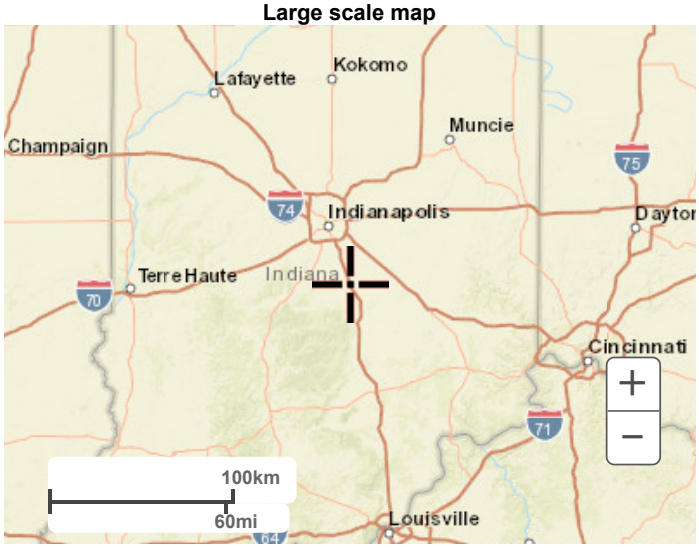
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Runoff Curve Number Calculation

49.8%B, 50.2% C

Job Information

Description: I-65 Logistics Center
Entity: City of Franklin
Job #: 2019.02798
Date: 11/5/2020

Basin:	Existing Conditions
CN Calculation Method:	Actual Soil Group
Site Condition:	Existing

Soil Name and Hydrologic Group		Area Description	Cover Description	Cover Condition	CN	Area	Product of CN x area
						(Acres)	
Br	B	Fully Developed	Open Space	Good Condition (grass cover >75%)	61	33.50	2043.392628
	B	Fully Developed	Impervious	Paved/Rooftop	98	0.00	0
CrA	C	Fully Developed	Open Space	Good Condition (grass cover >75%)	74	33.77	2498.780346
	C	Fully Developed	Impervious	Paved/Rooftop	98	0.00	0
					Totals =	67.27	4542.172974

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 67.5 Use CN = **68**

Time of Concentration (T_c) or Travel Time (T_t)

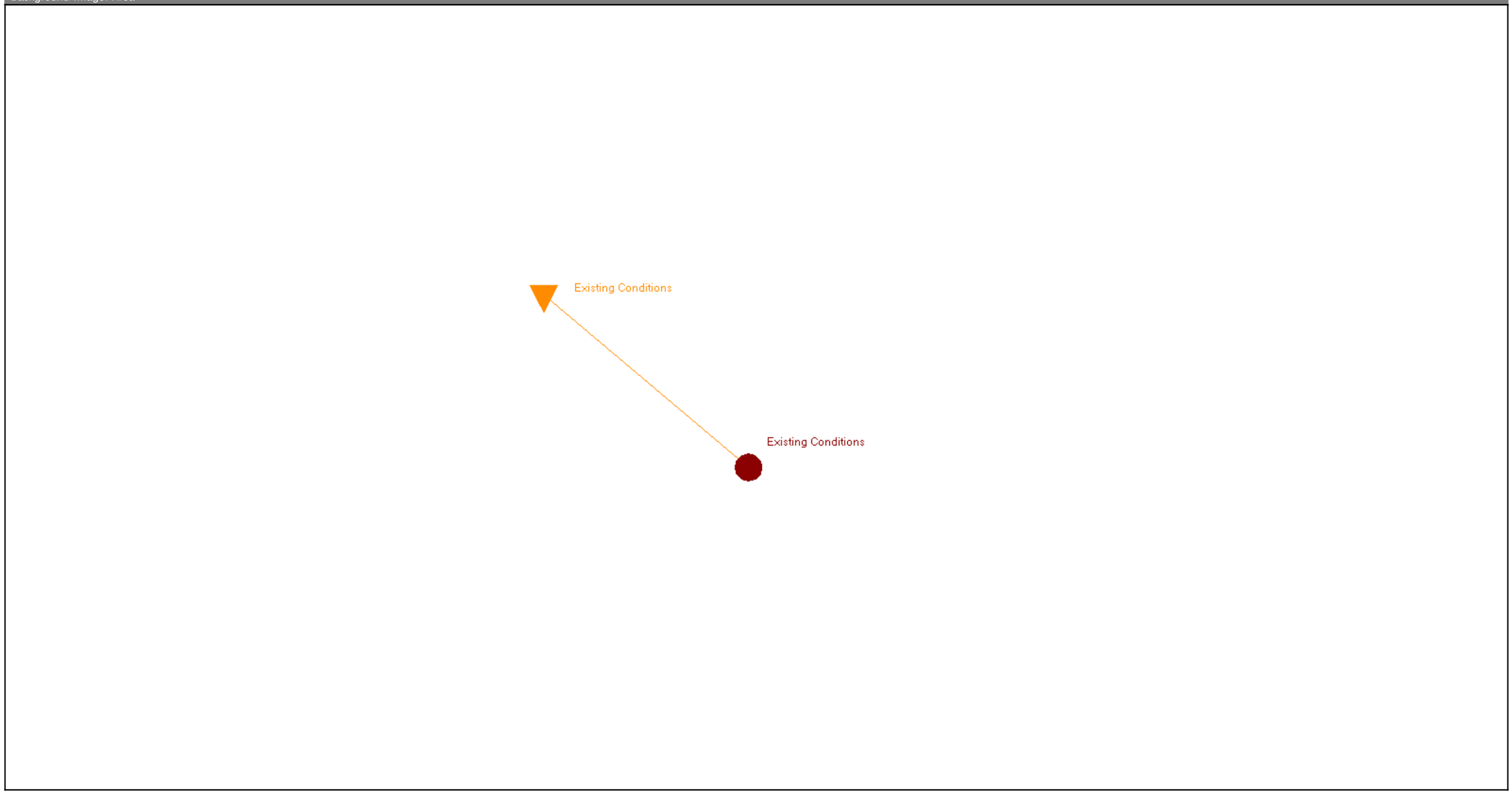
Project: Franklin Industrial | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: Existing Conditions

Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID								
Surface description		Unpaved							
Manning's roughness coeff., n		0.24							
Flow Length, L (L < 300 ft)	ft	100							
Rainfall Calculation Method		Entity Rainfall Data							
Two-year 24-hr rainfall, P2	in	3.12							
Land slope, s	ft/ft	0.00							
$T_t = \frac{.007\ (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$	hr	0.51	+		+		=	0.51	
Shallow Concentrated Flow	Segment ID								
Surface description, (paved or unpaved)		Unpaved		-		-			
Flow length, L	ft	1261		-		-			
Watercourse slope, s	ft/ft	0.003		-		-			
Average velocity, V	ft/s	0.88		-		-			
$T_t = \frac{L}{3600\ V}$	hr	0.40	+	-	+	-	=	0.40	
Channel Flow	Segment ID								
Channel Geometry		-		-		-			
Discharge (cfs)		-		-		-			
Diameter (ft)		-		-		-			
Bottom Width (ft)		-		-		-			
Side Slope (x:1) (ft)		-		-		-			
Slope of Channel (ft)		-		-		-			
Manning's Roughness Coefficient		-		-		-			
Depth (ft)		-		-		-			
Cross Sectional Area (ft^2)		-		-		-			
Wetted Perimeter (ft)		-		-		-			
Hydraulic Radius (ft)		-		-		-			
Velocity (ft/s)		-		-		-			
Flow length, L	ft	-		-		-			
$T_t = \frac{L}{3600\ V}$	hr	-	+	-	+	-	=	0.00	

Watershed or subarea T_c or T_t	hr	0.91
	min	54.6

Background Image: Area



Simple Basin: Existing Conditions

Scenario:	Scenario1
Node:	Existing Conditions
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	54.6000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	67.2700 ac
Curve Number:	68.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Indy HUFF 50 1Q

Comment:

Node: Existing Conditions

Scenario:	Scenario1
Type:	Time/Stage
Base Flow:	0.00 cfs
Initial Stage:	0.00 ft
Warning Stage:	0.00 ft
Boundary Stage:	

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	0.00
0	0	0	48.0000	0.00

Comment:

Simulation: 100yr-01hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:09:55 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 3.00 in
Storm Duration: 1.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-02hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:10:01 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.64 in
Edge Length Option:	Automatic	Storm Duration:	2.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-03hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:10:06 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources		Lookup Tables	
Rainfall Folder:	Huff 24hr Dist	Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options			
Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.92 in
Edge Length Option:	Automatic	Storm Duration:	3.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-06hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:10:12 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 4.75 in
Storm Duration: 6.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-12hr

Scenario: Scenario1

Run Date/Time: 11/5/2020 12:10:17 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global

Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 2Q
		Rainfall Amount:	5.35 in
Edge Length Option:	Automatic	Storm Duration:	12.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-24hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:10:24 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Lookup Tables

Boundary Stage Set:

		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 3Q
		Rainfall Amount:	5.88 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-01hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:10:29 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.02 in
Storm Duration: 1.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-02hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:10:34 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: Indy HUFF 50 1Q

Rainfall Amount: 2.37 in

Edge Length Option: Automatic

Storm Duration: 2.0000 hr

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 10yr-03hr

Scenario: Scenario1

Run Date/Time: 11/5/2020 12:10:39 PM

Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Folder:			
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	2.53 in
Edge Length Option:	Automatic	Storm Duration:	3.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-06hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:10:45 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 3.03 in
Storm Duration: 6.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-12hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:10:50 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 3.52 in
Storm Duration: 12.0000 hr

Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-24hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:10:55 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 3Q
		Rainfall Amount:	4.08 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 2yr-01hr

Scenario:	Scenario1
Run Date/Time:	11/5/2020 12:11:01 PM
Program Version:	ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 1.39 in
Storm Duration: 1.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 2yr-02hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:11:06 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 1.62 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 2yr-03hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:11:12 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set:
Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	1.72 in
Edge Length Option:	Automatic	Storm Duration:	3.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 2yr-06hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:11:17 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.05 in
Storm Duration: 6.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 2yr-12hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:11:22 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

Year	Month	Day	Hour [hr]

Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 2.44 in
Storm Duration: 12.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 2yr-24hr

Scenario: Scenario1
Run Date/Time: 11/5/2020 12:11:27 PM
Program Version: ICPR4 4.05.02

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 3Q
		Rainfall Amount:	2.91 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

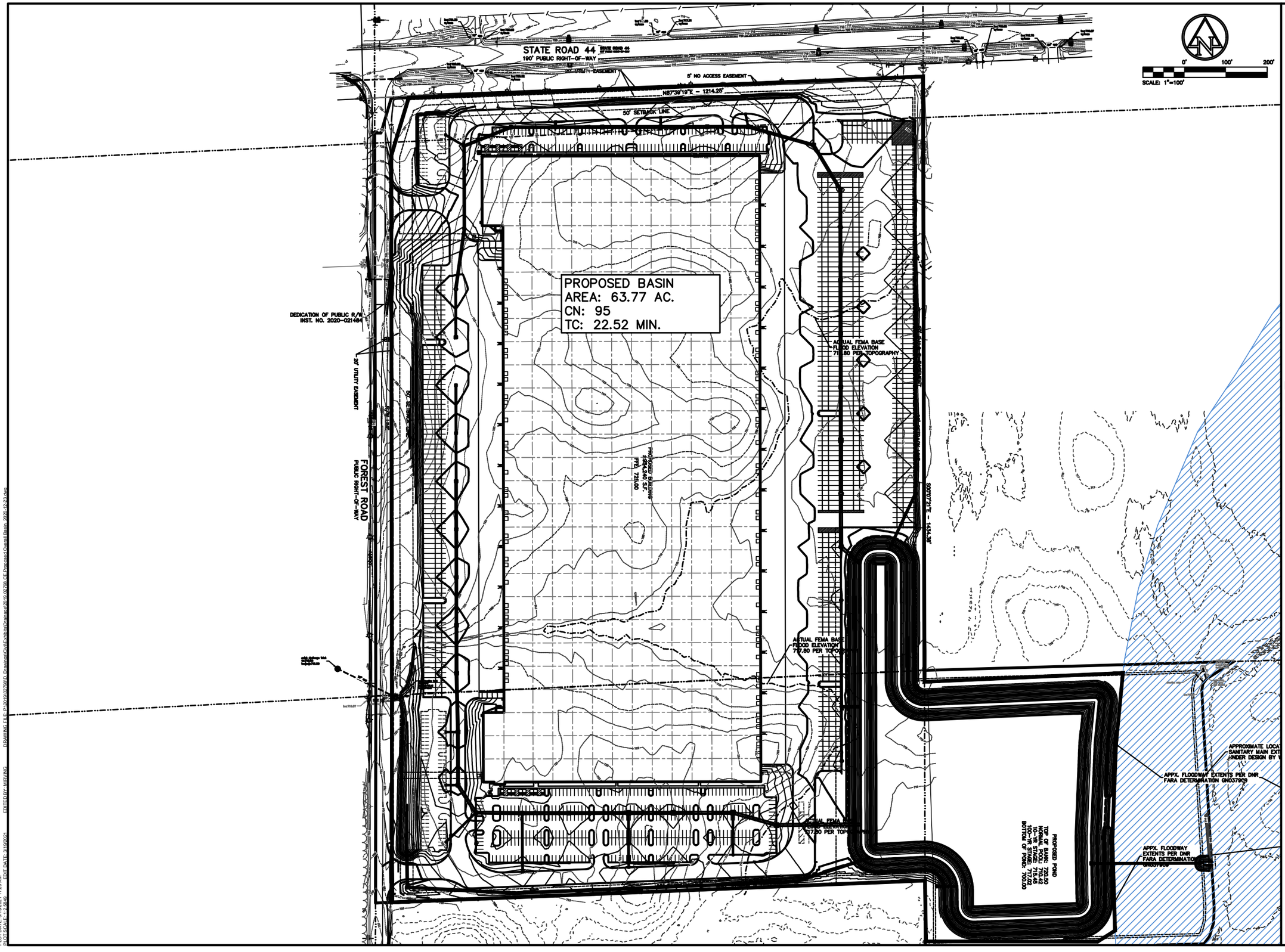
Comment:

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Existing Conditions	100yr-01hr	0.00	0.00	0.0000	38.85	0.00	0
Existing Conditions	100yr-02hr	0.00	0.00	0.0000	41.85	0.00	0
Existing Conditions	100yr-03hr	0.00	0.00	0.0000	38.23	0.00	0
Existing Conditions	100yr-06hr	0.00	0.00	0.0000	34.67	0.00	0
Existing Conditions	100yr-12hr	0.00	0.00	0.0000	32.31	0.00	0
Existing Conditions	100yr-24hr	0.00	0.00	0.0000	25.90	0.00	0
Existing Conditions	10yr-01hr	0.00	0.00	0.0000	12.92	0.00	0
Existing Conditions	10yr-02hr	0.00	0.00	0.0000	13.51	0.00	0
Existing Conditions	10yr-03hr	0.00	0.00	0.0000	12.68	0.00	0
Existing Conditions	10yr-06hr	0.00	0.00	0.0000	12.07	0.00	0
Existing Conditions	10yr-12hr	0.00	0.00	0.0000	13.35	0.00	0
Existing Conditions	10yr-24hr	0.00	0.00	0.0000	13.44	0.00	0
Existing Conditions	2yr-01hr	0.00	0.00	0.0000	2.78	0.00	0
Existing Conditions	2yr-02hr	0.00	0.00	0.0000	3.76	0.00	0
Existing Conditions	2yr-03hr	0.00	0.00	0.0000	3.30	0.00	0
Existing Conditions	2yr-06hr	0.00	0.00	0.0000	3.79	0.00	0
Existing Conditions	2yr-12hr	0.00	0.00	0.0000	4.97	0.00	0
Existing Conditions	2yr-24hr	0.00	0.00	0.0000	6.37	0.00	0

APPENDIX C

PROPOSED CONDITIONS – WET POND DESIGN



GDI CONSTRUCTION
9775 Crosspoint Blvd
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AMERICAN STRUCTUREPOINT INC.
9025 River Road, Suite 200 | Indianapolis, Indiana 46240
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www.structurepoint.com

I-65 SOUTH LOGISTICS CENTER LOT 1

81/89 Forest Road
Franklin, Indiana

STATE OF INDIANA
REGISTERED
No. PE11800804
PROFESSIONAL ENGINEER

CERTIFIED BY

ISSUANCE INDEX
DATE:
03/25/2021
PROJECT PHASE:
CONSTRUCTION DOCUMENTS

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

Project Number 2019.02798

PROPOSED CONDITIONS BASINS MAP

PR-1

PLOT DATE: 3/19/2021 11:23 AM
PLOT SCALE: 1:1.2581
PLOT DATE: 3/19/2021
DRAWING FILE: P:\2019\02798\D Planning\Civil\Engineering\Drawings\2019.02798 GE Concept Overall Basin #2021.03.23.dwg
PLOTTED BY: MIDWAY

Runoff Curve Number Calculation

49.8%B, 50.2% C

Job Information

Description: I-65 Logistics Center
Entity: City of Franklin
Job #: 2019.02798
Date: 12/23/2020

Basin:	Proposed Site
CN Calculation Method:	Less Pervious Soil Group Than Actual
Site Condition:	Developed

Soil Name and Hydrologic Group		Area Description	Cover Description	Cover Condition	CN	Area	Product of CN x area
						(Acres)	
Br	B	Fully Developed	Open Space	Good Condition (grass cover >75%)	74	4.58	339.1636088
	B	Water	Water	Water	100	4.44	443.6018457
	B	Fully Developed	Impervious	Paved/Rooftop	98	22.74	2228.496404
CrA	C	Fully Developed	Open Space	Good Condition (grass cover >75%)	80	4.62	369.6084481
	C	Water	Water	Water	100	4.47	447.1649128
	C	Fully Developed	Impervious	Paved/Rooftop	98	22.92	2246.395974
					Totals =	63.77	6074.431194

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 95.3 Use CN = **95**

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: 701

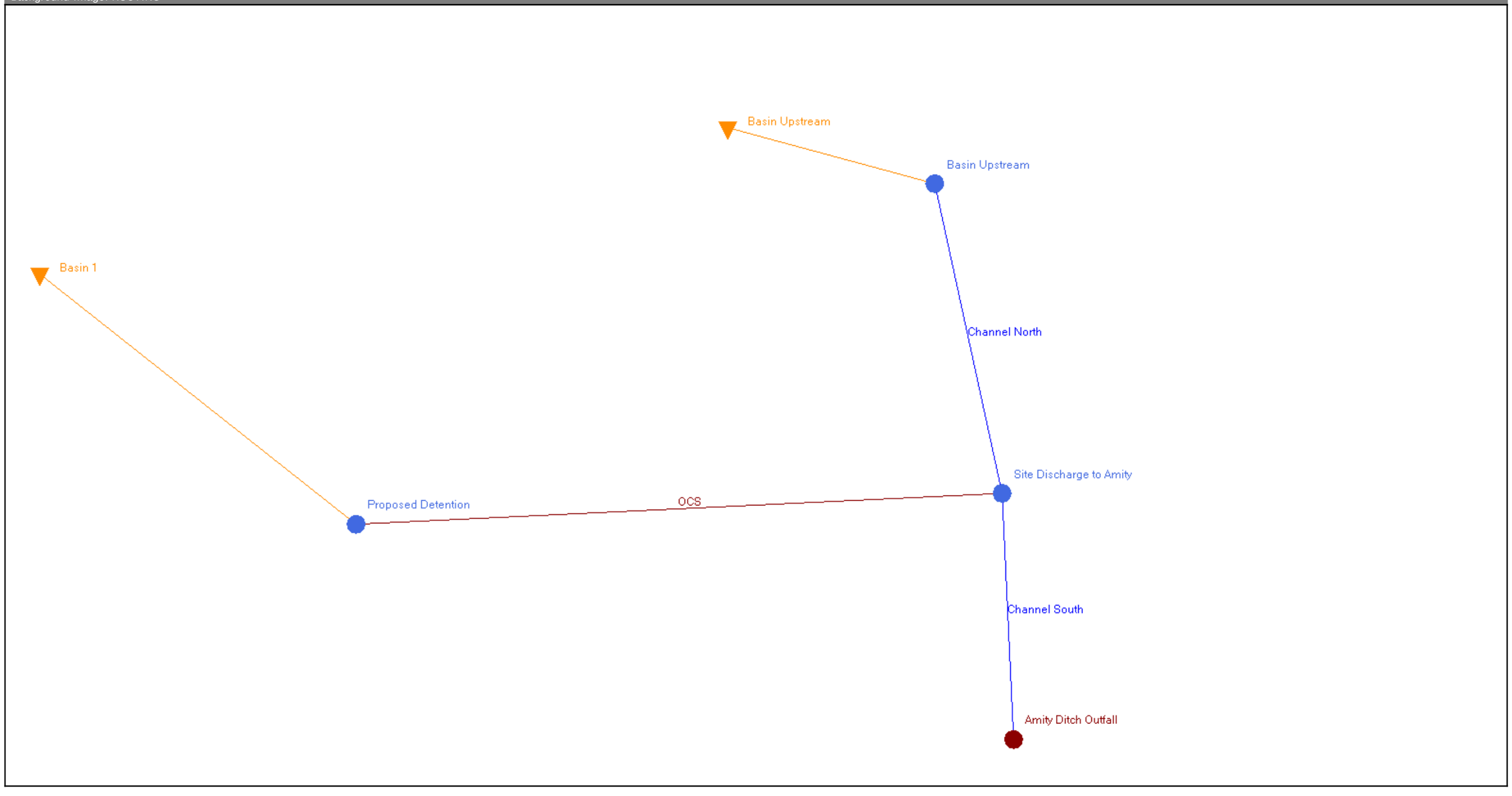
Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID								
Surface description		Unpaved							
Manning's roughness coeff., n		0.24							
Flow Length, L (L < 300 ft)	ft	100							
Rainfall Calculation Method		Entity Rainfall Data							
Two-year 24-hr rainfall, P2	in	2.90							
Land slope, s	ft/ft	0.01							
$T_t = \frac{.007\ (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$	hr	0.33	+		+		=	0.33	
Shallow Concentrated Flow	Segment ID								
Surface description, (paved or unpaved)		Unpaved		-		-			
Flow length, L	ft	267		-		-			
Watercourse slope, s	ft/ft	0.010		-		-			
Average velocity, V	ft/s	1.61		-		-			
$T_t = \frac{L}{3600\ V}$	hr	0.05	+	-	+	-	=	0.05	
Channel Flow	Segment ID								
Channel Geometry		-		-		-			
Discharge (cfs)		-		-		-			
Diameter (ft)		-		-		-			
Bottom Width (ft)		-		-		-			
Side Slope (x:1) (ft)		-		-		-			
Slope of Channel (ft)		-		-		-			
Manning's Roughness Coefficient		-		-		-			
Depth (ft)		-		-		-			
Cross Sectional Area (ft^2)		-		-		-			
Wetted Perimeter (ft)		-		-		-			
Hydraulic Radius (ft)		-		-		-			
Velocity (ft/s)		-		-		-			
Flow length, L	ft	-		-		-			
$T_t = \frac{L}{3600\ V}$	hr	-	+	-	+	-	=	0.00	

Watershed or subarea T_c or T_t	hr	0.38
	min	22.52

*A velocity of 5 ft/s was assumed for pipe travel time.

Background Image: ROUTING



Simple Basin: Basin 1

Scenario:	Scenario1
Node:	Proposed Detention
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	13.6000 min
Max Allowable Q:	999999999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	63.7700 ac
Curve Number:	95.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Indy HUFF 50 1Q

Comment:

Simple Basin: Basin Upstream

Scenario:	Scenario1
Node:	Basin Upstream
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	750.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	1369.3000 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSII-24

Comment:

Node: Amity Ditch Outfall

Scenario:	Scenario1
Type:	Time/Stage
Base Flow:	0.00 cfs
Initial Stage:	709.69 ft
Warning Stage:	709.69 ft
Boundary Stage:	

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	709.69
0	0	0	48.0000	709.69

Comment:

Node: Basin Upstream

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 709.73 ft
Warning Stage: 709.73 ft

Stage [ft]	Area [ac]	Area [ft2]
709.73	0.0000	0
717.80	0.0000	0

Comment:

Node: Proposed Detention

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 710.42 ft
Warning Stage: 719.50 ft

Stage [ft]	Area [ac]	Area [ft2]
710.42	6.8900	300128
717.80	8.3500	363726
719.50	8.7000	378972
720.50	8.9070	387989

Comment:

Node: Site Discharge to Amity

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 709.71 ft
Warning Stage: 717.80 ft

Stage [ft]	Area [ac]	Area [ft2]
709.71	0.0000	0
718.80	0.0000	0

Comment:

Channel Link: Channel North		Upstream		Downstream	
Scenario:	Scenario1	Invert:	711.71 ft	Invert:	709.71 ft
From Node:	Basin Upstream	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	Site Discharge to Amity	Geometry:	Irregular	Geometry:	Irregular
		Cross Section:	Amity Ditch Cross	Cross Section:	Amity Ditch Cross
Link Count:	1				
Flow Direction:	Positive				
Damping:	0.0000 ft				
Length:	1000.00 ft				
Contraction Coef:	0.00				
Expansion Coef:	0.00				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Comment:

Channel Link: Channel South		Upstream		Downstream	
Scenario:	Scenario1	Invert:	709.71 ft	Invert:	709.69 ft
From Node:	Site Discharge to Amity	Manning's N:	0.0000	Manning's N:	0.0000
		Geometry:	Irregular	Geometry:	Irregular
To Node:	Amity Ditch Outfall	Cross Section:	Amity Ditch Cross	Cross Section:	Amity Ditch Cross
Link Count:	1				
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	1000.00 ft				
Contraction Coef:	0.00				
Expansion Coef:	0.00				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Comment:

Drop Structure Link: OCS		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario1	Invert:	710.42 ft	Invert:	710.03 ft
From Node:	Proposed Detention	Manning's N:	0.0130	Manning's N:	0.0130
		Geometry: Circular		Geometry: Circular	
To Node:	Site Discharge to Amity	Max Depth:	2.00 ft	Max Depth:	2.00 ft
		Bottom Clip		Bottom Clip	
Link Count:	1	Default:	0.00 ft	Default:	0.00 ft
Flow Direction:	Both	Op Table:		Op Table:	
Solution:	Combine	Ref Node:		Ref Node:	
Increments:	0	Manning's N:	0.0000	Manning's N:	0.0000
Pipe Count:	1	Top Clip		Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	265.64 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	710.42 ft	Op Table:	
Control Elevation:	710.42 ft	Ref Node:	
Max Depth:	1.33 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	714.75 ft	Op Table:	
Control Elevation:	714.75 ft	Ref Node:	
Max Depth:	2.50 ft	Discharge Coefficients	
Max Width:	3.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600

Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 100yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:26:52 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.00 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-02hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:27:13 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 3.64 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-03hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:27:30 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

Year	Month	Day	Hour [hr]

Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 3.92 in
Storm Duration: 3.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 100yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:27:47 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	4.75 in
Edge Length Option:	Automatic	Storm Duration:	3.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-12hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:28:08 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 5.35 in
Storm Duration: 12.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-24hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:28:28 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 5.88 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:28:47 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	2.02 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-02hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:29:07 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.37 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-03hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:29:24 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.53 in
Storm Duration: 3.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:29:44 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.03 in
Edge Length Option:	Automatic	Storm Duration:	6.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-12hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:30:02 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources		Lookup Tables	
Rainfall Folder:	Huff 24hr Dist	Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options			
Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 2Q
		Rainfall Amount:	3.52 in
Edge Length Option:	Automatic	Storm Duration:	12.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-24hr

Scenario:	Scenario1
Run Date/Time:	12/27/2020 5:30:19 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 4.08 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Node Max Conditions [Scenario1]

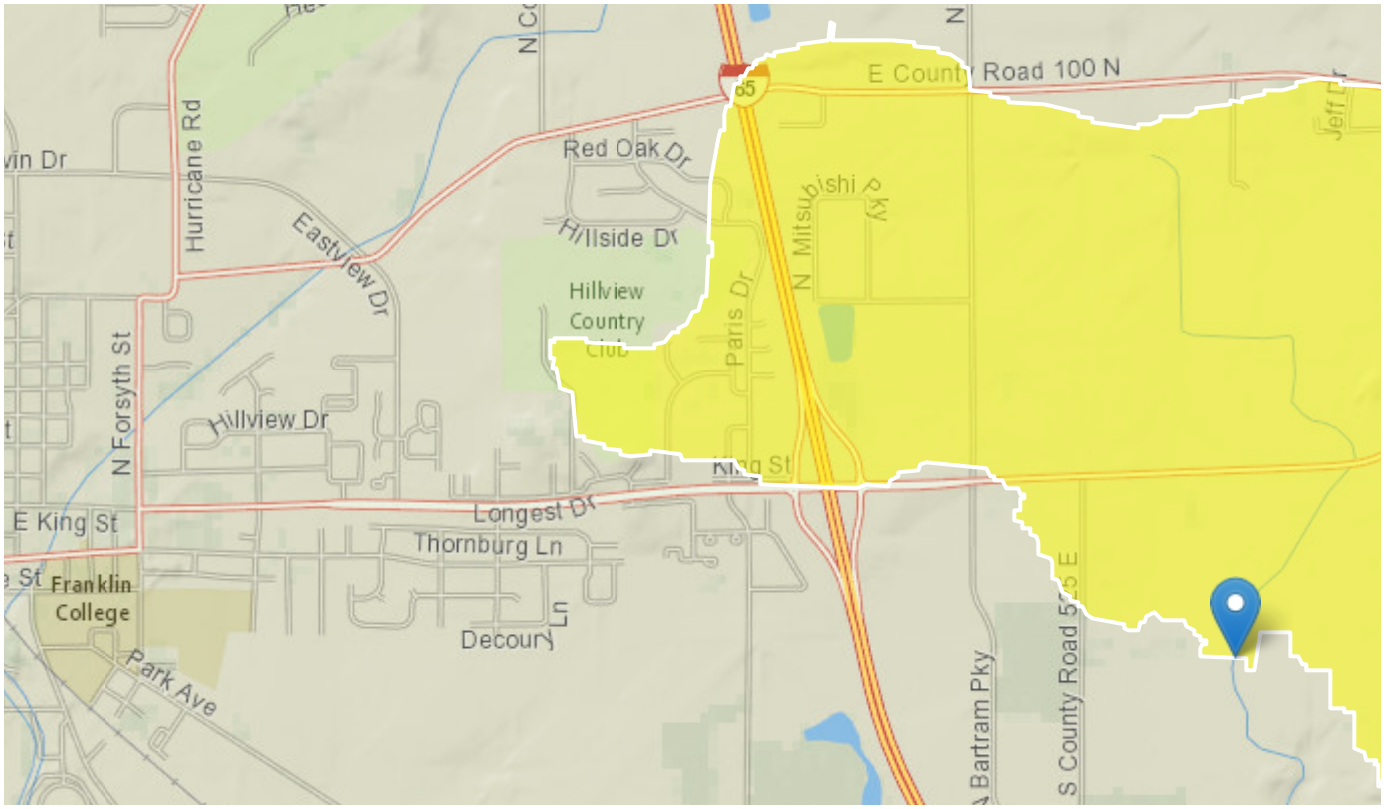
Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Amity Ditch Outfall	100yr-01hr	709.69	709.69	0.0000	165.17	0.00	0
Amity Ditch Outfall	100yr-02hr	709.69	709.69	0.0000	222.06	0.00	0
Amity Ditch Outfall	100yr-03hr	709.69	709.69	0.0000	243.21	0.00	0
Amity Ditch Outfall	100yr-06hr	709.69	709.69	0.0000	340.98	0.00	0
Amity Ditch Outfall	100yr-12hr	709.69	709.69	0.0000	356.49	0.00	0
Amity Ditch Outfall	100yr-24hr	709.69	709.69	0.0000	341.12	0.00	0
Amity Ditch Outfall	10yr-01hr	709.69	709.69	0.0000	75.21	0.00	0
Amity Ditch Outfall	10yr-02hr	709.69	709.69	0.0000	104.97	0.00	0
Amity Ditch Outfall	10yr-03hr	709.69	709.69	0.0000	119.45	0.00	0
Amity Ditch Outfall	10yr-06hr	709.69	709.69	0.0000	158.16	0.00	0
Amity Ditch Outfall	10yr-12hr	709.69	709.69	0.0000	189.54	0.00	0
Amity Ditch Outfall	10yr-24hr	709.69	709.69	0.0000	199.98	0.00	0
Basin Upstream	100yr-01hr	709.73	718.73	0.0010	187.95	193.65	521341
Basin Upstream	100yr-02hr	709.73	718.96	0.0010	254.03	258.42	542842
Basin Upstream	100yr-03hr	709.73	719.04	0.0010	282.04	284.55	550947
Basin Upstream	100yr-06hr	709.73	719.32	0.0010	372.98	373.95	577609
Basin Upstream	100yr-12hr	709.73	719.35	0.0010	386.15	384.93	581448
Basin Upstream	100yr-24hr	709.73	719.27	0.0010	360.82	359.33	575759
Basin Upstream	10yr-01hr	709.73	718.31	0.0010	93.97	95.88	483313
Basin Upstream	10yr-02hr	709.73	718.47	0.0010	125.50	128.16	497802
Basin Upstream	10yr-03hr	709.73	718.53	0.0010	139.68	142.88	503527
Basin Upstream	10yr-06hr	709.73	718.68	0.0010	179.17	183.69	517749
Basin Upstream	10yr-12hr	709.73	718.78	0.0010	210.98	213.68	528758

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Basin Upstream	10yr-24hr	709.73	718.79	0.0010	220.55	221.45	531822
Proposed Detention	100yr-01hr	719.50	715.40	0.0010	300.99	5.98	343071
Proposed Detention	100yr-02hr	719.50	715.60	0.0010	237.72	6.61	344778
Proposed Detention	100yr-03hr	719.50	715.72	0.0010	198.29	6.62	345794
Proposed Detention	100yr-06hr	719.50	716.07	0.0010	251.98	6.65	348809
Proposed Detention	100yr-12hr	719.50	716.48	0.0010	69.42	5.36	352345
Proposed Detention	100yr-24hr	719.50	717.02	0.0010	50.66	7.55	356968
Proposed Detention	10yr-01hr	719.50	714.46	0.0010	179.42	3.35	334952
Proposed Detention	10yr-02hr	719.50	714.87	0.0010	134.56	4.01	338472
Proposed Detention	10yr-03hr	719.50	715.05	0.0010	110.53	4.37	339997
Proposed Detention	10yr-06hr	719.50	715.45	0.0010	84.61	6.36	343516
Proposed Detention	10yr-12hr	719.50	715.63	0.0010	42.84	4.54	345032
Proposed Detention	10yr-24hr	719.50	716.05	0.0010	37.39	3.77	348676
Site Discharge to Amity	100yr-01hr	717.80	716.81	0.0010	193.65	179.65	824722
Site Discharge to Amity	100yr-02hr	717.80	717.15	0.0010	258.42	237.46	1262961
Site Discharge to Amity	100yr-03hr	717.80	717.30	0.0010	284.55	258.96	1541682
Site Discharge to Amity	100yr-06hr	717.80	717.64	0.0010	373.95	357.68	1612881
Site Discharge to Amity	100yr-12hr	717.80	717.69	0.0010	384.93	372.45	1621026
Site Discharge to Amity	100yr-24hr	717.80	717.64	0.0010	359.33	354.30	1612710
Site Discharge to Amity	10yr-01hr	717.80	716.19	0.0010	95.88	87.81	725772

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Site Discharge to Amity	10yr-02hr	717.80	716.42	0.0010	128.16	118.25	754034
Site Discharge to Amity	10yr-03hr	717.80	716.52	0.0010	142.88	133.01	765412
Site Discharge to Amity	10yr-06hr	717.80	716.77	0.0010	183.69	172.38	815198
Site Discharge to Amity	10yr-12hr	717.80	716.96	0.0010	213.68	204.18	871773
Site Discharge to Amity	10yr-24hr	717.80	717.02	0.0010	221.45	214.11	1113690

StreamStats Report

Region ID: IN
Workspace ID: IN20200106215613764000
Clicked Point (Latitude, Longitude): 39.47758, -85.99647
Time: 2020-01-06 16:56:28 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CONTDA	Area that contributes flow to a point on a stream	2.138	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	7.51	feet per mi
URBAN	Percentage of basin with urban development	2.8	percent
HIGHREG	HIGHREG	1008	dimensionless
DRNAREA	Area that drains to a point on a stream	2.138	square miles

Parameter Code	Parameter Description	Value	Unit
BFREGNO	BFREGNO	1566	dimensionless
K1INDNR	Average hydraulic conductivity (ft/d) for the top 70 ft of unconsolidated deposits from InDNR well database.	35	ft per day
BSLDEM10M	Mean basin slope computed from 10 m DEM	0.91	percent
QSSPERMTHK	Index of the permeability of surficial Quaternary sediments computed as in SIR 2014-5177	150	dimensionless
T2INDNR	Average transmissivity (ft2/d) for the full depth of unconsolidated deposits from InDNR well database.	3467	square feet per day
LOWREG	Low Flow Region Number	1729	dimensionless
K2INDNR	Average hydraulic conductivity (ft/d) for the full depth of unconsolidated deposits from InDNR well database.	46	ft per day
LC01FOREST	Percentage of forest from NLCD 2001 classes 41-43	1	percent
ST2INDNR	Average transmissivity (ft2/d) for the full depth of unconsolidated deposits within 1000 ft of stream channel from InDNR well database.	3760	square feet per day
LAT_OUT	Latitude of Basin Outlet	39.477562	degrees

Peak-Flow Statistics Parameters[Region 4 Peak Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONTDA	Contributing Drainage Area	2.138	square miles	0.31	2444
CSL10_85	Stream Slope 10 and 85 Method	7.51	feet per mi	2.7	48.7
URBAN	Percent Urban	2.8	percent	0	83.9
HIGHREG	HIGHREG	1008	dimensionless		

Peak-Flow Statistics Flow Report[Region 4 Peak Flow]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	SE	Equiv. Yrs.
10 Year Peak Flood	255	ft^3/s	135	480	23.1	7.7
25 Year Peak Flood	319	ft^3/s	213	478	22.5	10.6
50 Year Peak Flood	369	ft^3/s	246	553	22.4	12.9
100 Year Peak Flood	418	ft^3/s	277	630	22.4	15.1
200 Year Peak Flood	464	ft^3/s	305	704	22.7	16.6
500 Year Peak Flood	525	ft^3/s	341	808	23.5	18.2

Peak-Flow Statistics Citations

Knipe, David, and Rao, A.R.,2005, Estimation of peak discharges of Indiana streams by using log-Pearson III distribution: U.S. Federal Highway Administration Joint Transportation Research Program Interim Report FHWA/IN/JTRP-2005/1, 194 p. (http://in.water.usgs.gov/newreports/SPR_0518.pdf)

Bankfull Statistics Parameters[Bankfull Central Till Plain Region 2013 5078]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.138	square miles	0.04	812
BFREGNO	BFREGNO	1566	dimensionless		

Bankfull Statistics Flow Report[Bankfull Central Till Plain Region 2013 5078]

Statistic	Value	Unit
Bankfull Width	23.3	ft
Bankfull Depth	1.81	ft
Bankfull Area	41.7	ft^2

Bankfull Statistics Citations

Robinson, B.A.,2013, Regional bankfull-channel dimensions of non-urban wadeable streams in Indiana: U.S. Geological Survey, Scientific Investigations Report 2013–5078, 33 p. (http://pubs.usgs.gov/sir/2013/5078/)

Low-Flow Statistics Parameters[Statewide Lowflow 2016 5102]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.138	square miles	6.33	856
K1INDNR	Avg_Hydraulic_Conductivity_Upper_70ft	35	ft per day	5.78	76.9
BSLDEM10M	Mean Basin Slope from 10m DEM	0.91	percent	0.916	7.8
QSSPERMTHK	Permeability_Index	150	dimensionless	0	30000

Low-Flow Statistics Parameters[Statewide 30day Lowflow 2016 5102]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.138	square miles	6.33	856
K1INDNR	Avg_Hydraulic_Conductivity_Upper_70ft	35	ft per day	5.78	76.9
BSLDEM10M	Mean Basin Slope from 10m DEM	0.91	percent	0.916	7.8
QSSPERMTHK	Permeability_Index	150	dimensionless	0	30000

Low-Flow Statistics Disclaimers[Statewide Lowflow 2016 5102]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[Statewide Lowflow 2016 5102]

Statistic	Value	Unit
1 Day 10 Year Low Flow	0.0295	ft^3/s
7 Day 10 Year Low Flow	0.0425	ft^3/s

Low-Flow Statistics Disclaimers[Statewide 30day Lowflow 2016 5102]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[Statewide 30day Lowflow 2016 5102]

Statistic	Value	Unit
30 Day 10 Year Low Flow	0.0571	ft^3/s

Low-Flow Statistics Citations

Martin, G.R., Fowler, K.K., and Arihood, L.D.,2016, Estimating selected low-flow frequency statistics and harmonic-mean flows for ungaged, unregulated streams in Indiana (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5102, 45 p. (http://dx.doi.org/10.3133/sir20165102)

General Flow Statistics Parameters[Harmonic Mean Central Region 2016 5102]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.138	square miles	2.99	828
K2INDNR	Avg_Hydraulic_Conductivity_Full_Depth	46	ft per day	6.36	45.9
QSSPERMTHK	Permeability_Index	150	dimensionless	43.8	5400
LOWREG	Low Flow Region Number	1729	dimensionless		

General Flow Statistics Disclaimers[Harmonic Mean Central Region 2016 5102]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

General Flow Statistics Flow Report[Harmonic Mean Central Region 2016 5102]

Statistic	Value	Unit
Harmonic Mean Streamflow	0.557	ft^3/s

General Flow Statistics Citations

Martin, G.R., Fowler, K.K., and Arihood, L.D.,2016, Estimating selected low-flow frequency statistics and harmonic-mean flows for ungaged, unregulated streams in Indiana (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5102, 45 p. (http://dx.doi.org/10.3133/sir20165102)

Probability Statistics Parameters[Prob Zero Flow Statewide Low Flow 2016 5102]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.138	square miles	2.99	856
ST2INDNR	Avg_Transmissivity_Near_Channel	3760	square feet per day	409	7650
LAT_OUT	Latitude of Basin Outlet	39.477562	degrees	38.1	41.8

Probability Statistics Disclaimers[Prob Zero Flow Statewide Low Flow 2016 5102]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Probability Statistics Flow Report[Prob Zero Flow Statewide Low Flow 2016 5102]

Statistic	Value	Unit
Probability zero flow 1 day 10 year	0.922	dim
Probability zero flow 7 day 10 year	0.938	dim
Probability zero flow 30 day 10 year	0.654	dim

Probability Statistics Citations

Martin, G.R., Fowler, K.K., and Arihood, L.D.,2016, Estimating selected low-flow frequency statistics and harmonic-mean flows for ungaged, unregulated streams in Indiana (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5102, 45 p. (http://dx.doi.org/10.3133/sir20165102)

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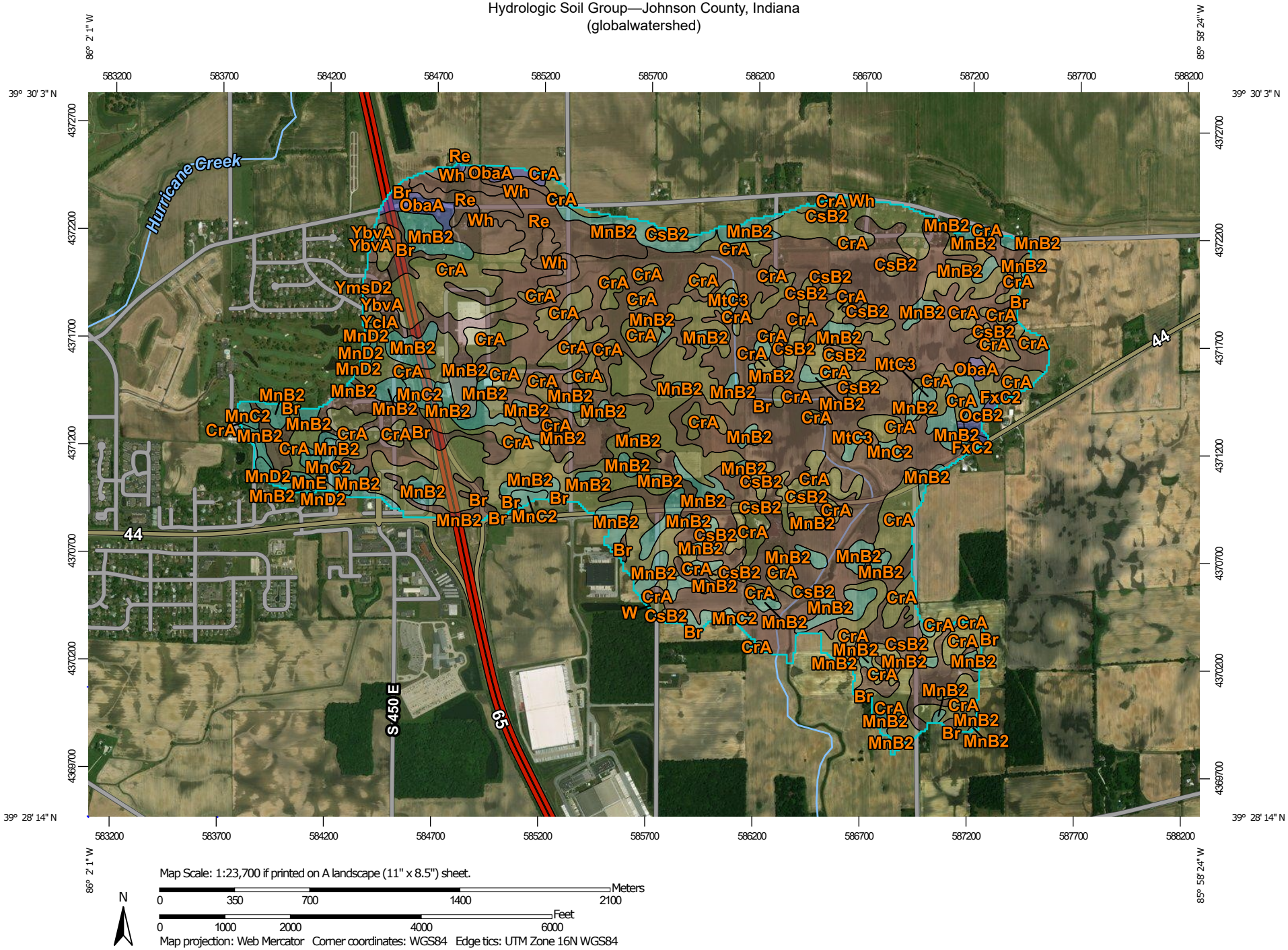
Application Version: 4.3.11

Hydrologic Soil Group—Johnson County, Indiana
(globalwatershed)



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.

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

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

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

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

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 27, Sep 16, 2019

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

Date(s) aerial images were photographed: Sep 24, 2014—Mar 20, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Br	Brookston silty clay loam, 0 to 2 percent slopes	B/D	542.7	39.6%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	475.7	34.7%
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	C/D	37.4	2.7%
FxC2	Fox complex, 6 to 12 percent slopes, eroded	B	2.1	0.2%
MnB2	Miami silt loam, 2 to 6 percent slopes, eroded	C	176.1	12.9%
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded	C	23.6	1.7%
MnD2	Miami silt loam, 12 to 18 percent slopes, eroded	C	3.8	0.3%
MnE	Miami silt loam, 18 to 25 percent slopes	C	1.8	0.1%
MtC3	Miami clay loam, 6 to 12 percent slopes, severely eroded	C	4.8	0.3%
ObaA	Ockley loam, 0 to 2 percent slopes	B	13.1	1.0%
OcB2	Ockley loam, 2 to 6 percent slopes, eroded	B	3.7	0.3%
Re	Rensselaer silty clay loam	B/D	36.8	2.7%
W	Water		5.5	0.4%
Wh	Whitaker silt loam, 0 to 2 percent slopes	B/D	32.2	2.4%
YbvA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	B/D	7.0	0.5%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	1.8	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
YmsB2	Miami silt loam-Urban land complex, 2 to 6 percent slopes, eroded	C	0.6	0.0%
YmsC2	Miami silt loam-Urban land complex, 6 to 12 percent slopes, eroded	C	0.4	0.0%
YmsD2	Miami silt loam-Urban land complex, 12 to 18 percent slopes, eroded	C	0.0	0.0%
Totals for Area of Interest			**1,369.3**	**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

Runoff Curve Number Calculation

47.2% B, 52.8% C

Job Information

Description: Franklin Industrial
Entity: City of Franklin
Job #: 2019.02798
Date: 1/9/2020

Basin:	Existing Upstream
CN Calculation Method:	Less Pervious Soil Group Than Actual
Site Condition:	Existing

Soil Name and Hydrologic Group		Area Description	Cover Description	Cover Condition	CN	Area	Product of CN x area
						(Acres)	
Br	B	Agricultural Land	Farmsteads	-	82	484.73	39748.0404
	B	Fully Developed	Residential	Residential - 1/3 Acre (30% Impervious)	81	161.58	13087.7694
CrA	C	Agricultural Land	Farmsteads	-	86	542.24	46632.8808
	C	Fully Developed	Residential	Residential - 1/3 Acre (30% Impervious)	86	180.75	15544.2936
					Totals =	1369.30	115012.9842

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 84.0 Use CN = **84**

PROPOSED STORMWATER SYSTEM
EMERGENCY SPILLWAY CALCULATIONS

Job Information

Description: I-65 Logistics Center
Reviewing Entity: City of Franklin
Job #: 2019.02798
Date: 12/28/20

****includes 155.99 from offsite west storm**
****includes 20.11 from offsite south**

***Emergency spillway must carry peak** **100** **yr flow rate of the pond**

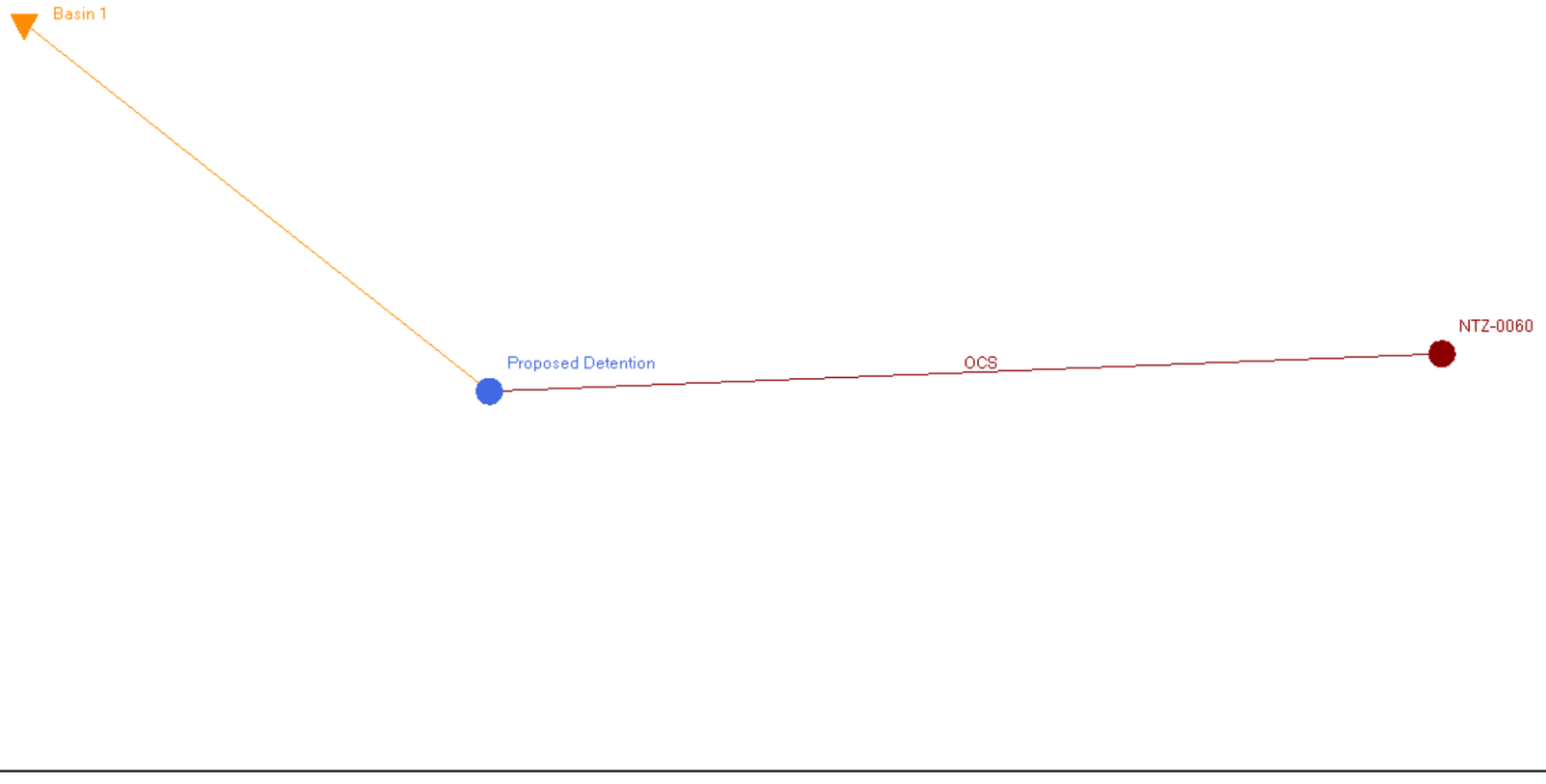
Peak inflow to Pond	**561.03**
125% of Peak inflow	701.29

Weir Formula→ $Q=C_{weir}*(L)*H^{3/2}$

C_{weir} =	3.00
Q =	701.29
L =	**70.00**
H =	2.23
100 yr Flood Elev. =	**717.80**
Spillway Elev. =	**718.25**
Overflow Elev. =	720.48
Berm Elevation =	**720.50**

***OVERFLOW SPILLWAY WIDTH OF 70 FEET HAS SUFFICIENT CAPACITY TO CARRY 125% OF THE 100 YR FLOW RATE**

Background Image: ICPR ROUTING



Simple Basin: Basin 1

Scenario:	Scenario1
Node:	Proposed Detention
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	13.6000 min
Max Allowable Q:	9999999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	63.7700 ac
Curve Number:	95.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Indy HUFF 50 1Q

Comment:

Node: NTZ-0060

Scenario:	Scenario1
Type:	Time/Stage
Base Flow:	0.00 cfs
Initial Stage:	717.80 ft
Warning Stage:	717.80 ft
Boundary Stage:	

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	717.80
0	0	0	48.0000	717.80

Comment:

Node: Proposed Detention

Scenario:	Scenario1
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	710.42 ft
Warning Stage:	719.50 ft

Stage [ft]	Area [ac]	Area [ft2]
717.80	8.3500	363726
719.50	8.7000	378972
720.50	8.9070	387989

Comment:

Drop Structure Link: OCS		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario1	Invert:	710.42 ft	Invert:	710.03 ft
From Node:	Proposed Detention	Manning's N:	0.0130	Manning's N:	0.0130
		Geometry: Circular		Geometry: Circular	
To Node:	NTZ-0060	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	265.64 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	1.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	710.42 ft	Ref Node:	
Control Elevation:	710.42 ft	Discharge Coefficients	
Max Depth:	1.33 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	714.75 ft	Ref Node:	
Control Elevation:	714.75 ft		

Max Depth: 2.50 ft
Max Width: 3.00 ft
Fillet: 0.00 ft

Discharge Coefficients

Weir Default: 3.200
Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 100yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:41:42 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:

Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.00 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-02hr

Scenario:	Scenario1
Run Date/Time:	12/27/2020 5:42:02 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: Indy HUFF 50 1Q

Rainfall Amount: 3.64 in

Storm Duration: 2.0000 hr

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 100yr-03hr

Scenario: Scenario1

Run Date/Time: 12/27/2020 5:42:24 PM

Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: Indy HUFF 50 1Q

Rainfall Amount: 3.92 in

Storm Duration: 3.0000 hr

Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:42:54 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	4.75 in
Edge Length Option:	Automatic	Storm Duration:	6.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-12hr

Scenario:	Scenario1
Run Date/Time:	12/27/2020 5:43:12 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 5.35 in
Storm Duration: 12.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-24hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:43:27 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 5.88 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:43:43 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	2.02 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-02hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:43:59 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.37 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-03hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:44:18 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

Year	Month	Day	Hour [hr]

Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.53 in
Storm Duration: 3.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 10yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:44:35 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.03 in
Edge Length Option:	Automatic	Storm Duration:	6.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-12hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:44:48 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 3.52 in
Storm Duration: 6.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-24hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:45:12 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

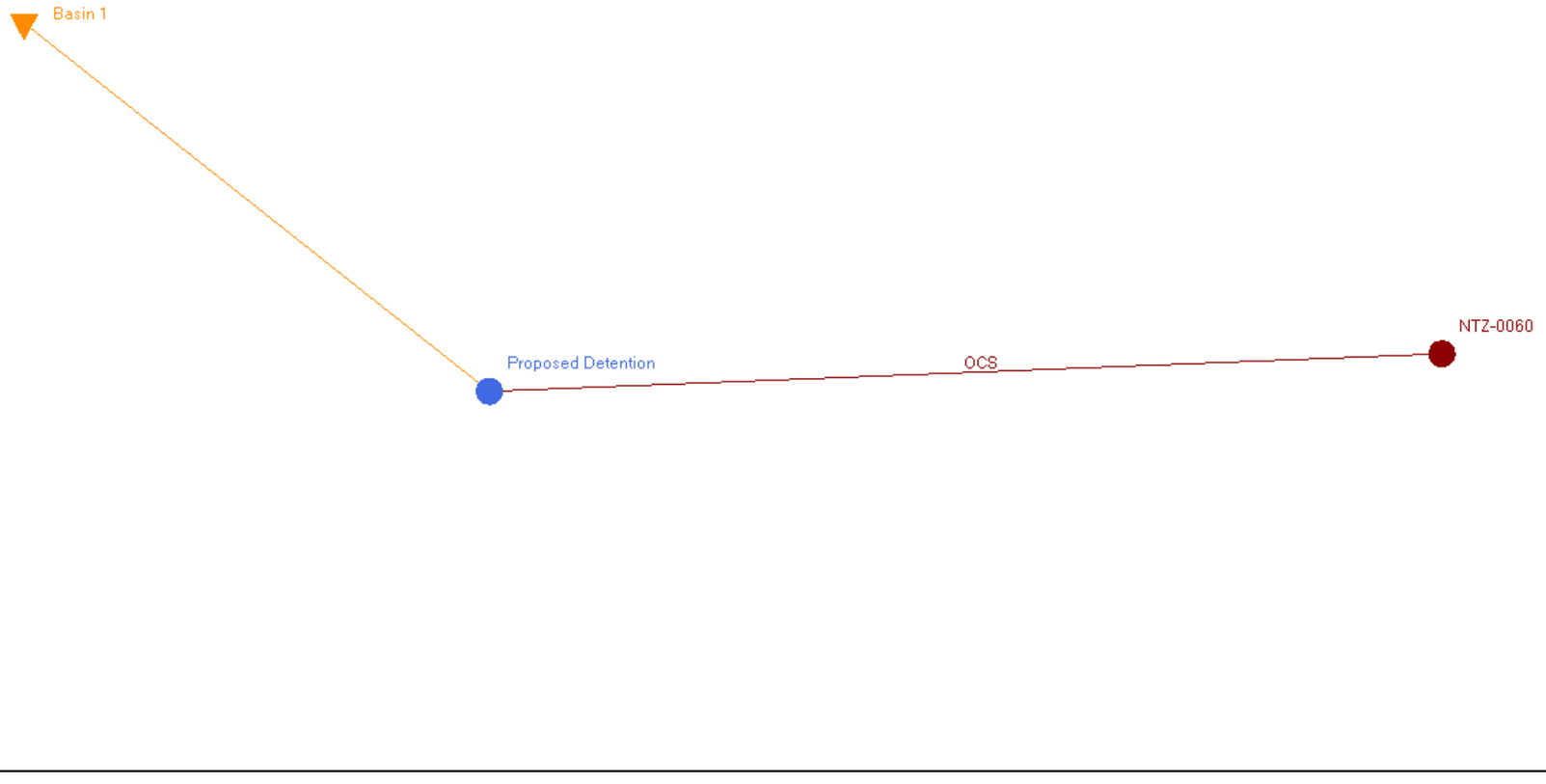
IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 4.08 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NTZ-0060	100yr-01hr	717.80	717.80	0.0000	13.85	18.87	0
NTZ-0060	100yr-02hr	717.80	717.80	0.0000	15.08	18.87	0
NTZ-0060	100yr-03hr	717.80	717.80	0.0000	15.28	18.87	0
NTZ-0060	100yr-06hr	717.80	717.80	0.0000	15.77	18.87	0
NTZ-0060	100yr-12hr	717.80	717.80	0.0000	15.71	18.87	0
NTZ-0060	100yr-24hr	717.80	717.80	0.0000	14.47	18.87	0
NTZ-0060	10yr-01hr	717.80	717.80	0.0000	10.76	18.87	0
NTZ-0060	10yr-02hr	717.80	717.80	0.0000	11.48	18.87	0
NTZ-0060	10yr-03hr	717.80	717.80	0.0000	11.49	18.87	0
NTZ-0060	10yr-06hr	717.80	717.80	0.0000	11.64	18.87	0
NTZ-0060	10yr-12hr	717.80	717.80	0.0000	13.44	18.87	0
NTZ-0060	10yr-24hr	717.80	717.80	0.0000	11.20	18.87	0
Proposed Detention	100yr-01hr	719.50	719.20	0.0189	300.99	13.85	376309
Proposed Detention	100yr-02hr	719.50	719.46	0.0189	237.72	15.08	378647
Proposed Detention	100yr-03hr	719.50	719.51	0.0189	198.29	15.28	379043
Proposed Detention	100yr-06hr	719.50	719.62	0.0189	148.80	15.77	380049
Proposed Detention	100yr-12hr	719.50	719.60	0.0189	66.63	15.71	379913
Proposed Detention	100yr-24hr	719.50	719.33	0.0189	40.46	14.47	377452
Proposed Detention	10yr-01hr	719.50	718.65	0.0189	179.41	10.76	371323
Proposed Detention	10yr-02hr	719.50	718.76	0.0189	134.56	11.48	372363
Proposed Detention	10yr-03hr	719.50	718.77	0.0189	110.53	11.49	372388
Proposed Detention	10yr-06hr	719.50	718.79	0.0189	84.60	11.64	372613
Proposed Detention	10yr-12hr	719.50	719.12	0.0189	83.10	13.44	375565
Proposed Detention	10yr-24hr	719.50	718.72	0.0189	27.70	11.20	371950

Background Image: ICPR ROUTING



Simple Basin: Basin 1

Scenario:	Scenario1
Node:	Proposed Detention
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	13.6000 min
Max Allowable Q:	999999999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	63.7700 ac
Curve Number:	95.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	Indy HUFF 50 1Q

Comment:

Node: NTZ-0060

Scenario:	Scenario1
Type:	Time/Stage
Base Flow:	0.00 cfs
Initial Stage:	710.03 ft
Warning Stage:	717.80 ft
Boundary Stage:	

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	710.03
0	0	0	48.0000	710.03

Comment:

Node: Proposed Detention

Scenario:	Scenario1
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	710.42 ft
Warning Stage:	719.50 ft

Stage [ft]	Area [ac]	Area [ft2]
710.42	6.8900	300128
717.80	8.3500	363726
719.50	8.7000	378972
720.50	8.9070	387989

Comment:

Drop Structure Link: OCS		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario1	Invert:	710.42 ft	Invert:	710.03 ft
From Node:	Proposed Detention	Manning's N:	0.0130	Manning's N:	0.0130
		Geometry: Circular		Geometry: Circular	
To Node:	NTZ-0060	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	265.64 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	1.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	710.42 ft	Ref Node:	
Control Elevation:	710.42 ft	Discharge Coefficients	
Max Depth:	1.33 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	714.75 ft		

Control Elevation: 714.75 ft
Max Depth: 2.50 ft
Max Width: 3.00 ft
Fillet: 0.00 ft

Ref Node:

Discharge Coefficients

Weir Default: 3.200
Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 100yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:34:32 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Lookup Tables

Boundary Stage Set:

		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.00 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-02hr

Scenario:	Scenario1
Run Date/Time:	12/27/2020 5:35:01 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 3.64 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100yr-03hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:35:21 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: Indy HUFF 50 1Q

Rainfall Amount: 3.92 in

Edge Length Option:	Automatic	Storm Duration:	3.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:35:37 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Folder:

Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	4.75 in
Edge Length Option:	Automatic	Storm Duration:	6.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 100yr-12hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:35:58 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching: SAOR

Max Iterations: 6

Over-Relax Weight Fact: 0.5 dec

dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft

Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: Indy HUFF 50 2Q

Rainfall Amount: 5.35 in

Storm Duration: 12.0000 hr

Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Simulation: 100yr-24hr

Scenario: Scenario1

Run Date/Time: 12/27/2020 5:36:14 PM

Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 5.88 in
Storm Duration: 24.0000 hr

Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-01hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:36:33 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:

Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	2.02 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-02hr

Scenario:	Scenario1
Run Date/Time:	12/27/2020 5:36:53 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.37 in
Storm Duration: 2.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-03hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:37:12 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 1Q
Rainfall Amount: 2.53 in
Storm Duration: 3.0000 hr
Dflt Damping (1D): 0.0050 ft

Min Node Srf Area (1D):	100 ft2
Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-06hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:37:28 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:

Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	Indy HUFF 50 1Q
		Rainfall Amount:	3.03 in
Edge Length Option:	Automatic	Storm Duration:	6.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-12hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:37:43 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 2Q
Rainfall Amount: 3.52 in
Storm Duration: 6.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 10yr-24hr

Scenario: Scenario1
Run Date/Time: 12/27/2020 5:38:01 PM
Program Version: ICPR4 4.05.01

General

Run Mode: Normal

Year	Month	Day	Hour [hr]

Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		48.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder: Huff 24hr Dist

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

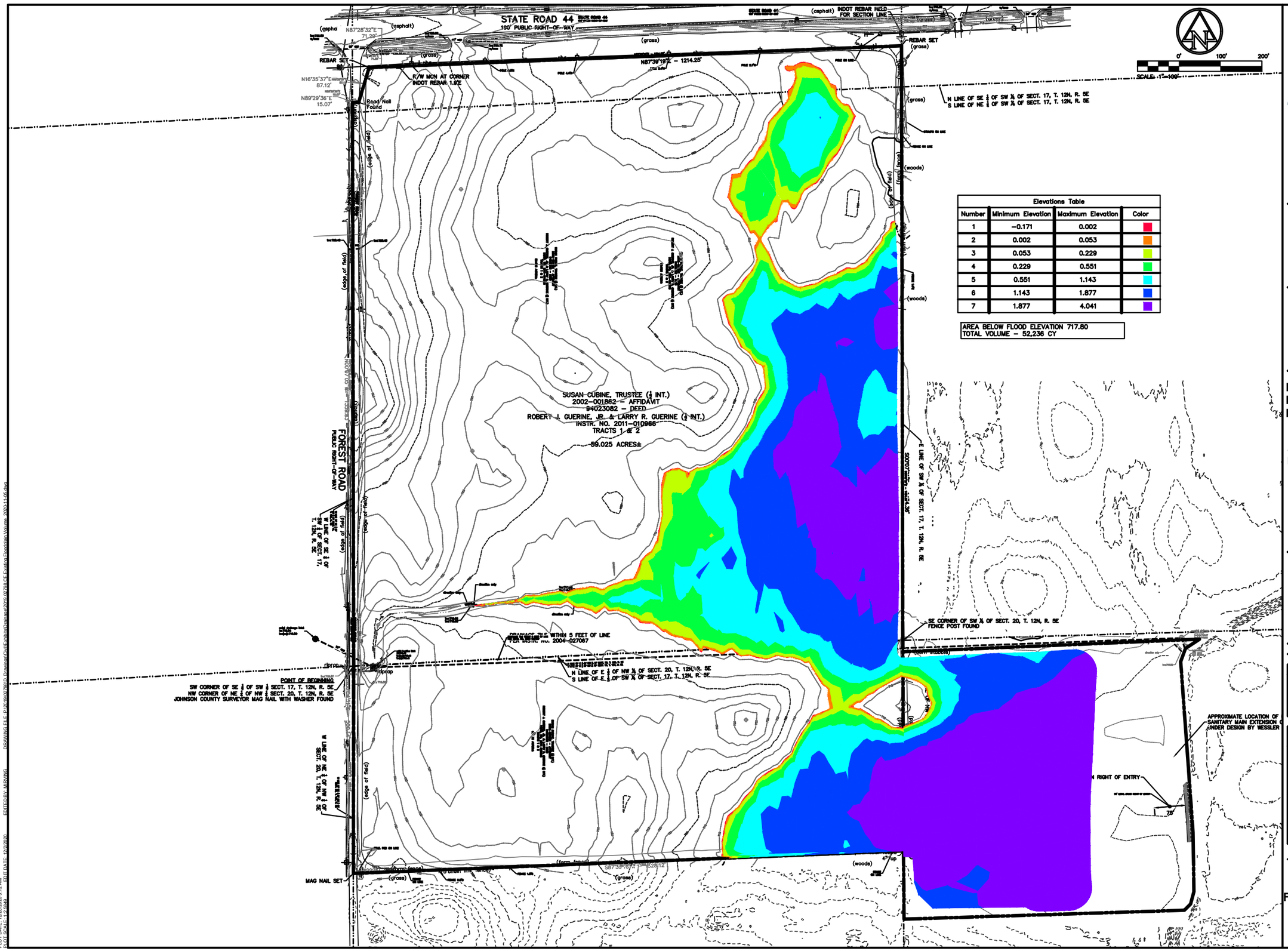
IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: Indy HUFF 50 3Q
Rainfall Amount: 4.08 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2

Energy Switch (1D): Energy

Comment:

Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NTZ-0060	100yr-01hr	717.80	710.03	0.0000	4.87	0.00	0
NTZ-0060	100yr-02hr	717.80	710.03	0.0000	5.89	0.00	0
NTZ-0060	100yr-03hr	717.80	710.03	0.0000	6.22	0.00	0
NTZ-0060	100yr-06hr	717.80	710.03	0.0000	7.07	0.00	0
NTZ-0060	100yr-12hr	717.80	710.03	0.0000	7.47	0.00	0
NTZ-0060	100yr-24hr	717.80	710.03	0.0000	7.51	0.00	0
NTZ-0060	10yr-01hr	717.80	710.03	0.0000	2.55	0.00	0
NTZ-0060	10yr-02hr	717.80	710.03	0.0000	3.18	0.00	0
NTZ-0060	10yr-03hr	717.80	710.03	0.0000	3.55	0.00	0
NTZ-0060	10yr-06hr	717.80	710.03	0.0000	4.50	0.00	0
NTZ-0060	10yr-12hr	717.80	710.03	0.0000	5.43	0.00	0
NTZ-0060	10yr-24hr	717.80	710.03	0.0000	5.36	0.00	0
Proposed Detention	100yr-01hr	719.50	712.22	0.0010	300.99	4.87	315606
Proposed Detention	100yr-02hr	719.50	712.62	0.0010	237.72	5.89	319078
Proposed Detention	100yr-03hr	719.50	712.76	0.0010	198.29	6.22	320321
Proposed Detention	100yr-06hr	719.50	713.15	0.0010	148.80	7.07	323653
Proposed Detention	100yr-12hr	719.50	713.34	0.0010	66.63	7.47	325277
Proposed Detention	100yr-24hr	719.50	713.36	0.0010	40.46	7.51	325454
Proposed Detention	10yr-01hr	719.50	711.54	0.0010	179.42	2.55	309760
Proposed Detention	10yr-02hr	719.50	711.76	0.0010	134.56	3.18	311670
Proposed Detention	10yr-03hr	719.50	711.84	0.0010	110.53	3.55	312401
Proposed Detention	10yr-06hr	719.50	712.08	0.0010	84.61	4.50	314412
Proposed Detention	10yr-12hr	719.50	712.43	0.0010	83.10	5.43	317485
Proposed Detention	10yr-24hr	719.50	712.40	0.0010	27.70	5.36	317212



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	–0.171	0.002	
2	0.002	0.053	
3	0.053	0.229	
4	0.229	0.551	
5	0.551	1.143	
6	1.143	1.877	
7	1.877	4.041	

AREA BELOW FLOOD ELEVATION 717.80
TOTAL VOLUME – 52,236 CY

GDI CONSTRUCTION
9775 Crosspoint Blvd
Suite 105
Indianapolis, IN 46256
317.567.6100

AMERICAN STRUCTUREPOINT INC.
9025 River Road, Suite 200 | Indianapolis, Indiana 46240
TEL 317.547.5580 | FAX 317.543.0270
www.structurepoint.com

I-65 SOUTH LOGISTICS CENTER LOT 1

81/89 Forest Road
Franklin, Indiana

CERTIFIED BY

ISSUANCE INDEX
DATE:
12/30/2020
PROJECT PHASE:
CONSTRUCTION DOCUMENTS

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

Project Number 2019.02798

EXISTING CONDITIONS FLOODPLAIN VOLUME

STATE ROAD 44
190' PUBLIC RIGHT-OF-WAY

20' UTILITY EASEMENT

5' NO ACCESS EASEMENT

N87°39'19"E - 1214.25'

INDOT REBAR HELD FOR SECTION LINE

MM 51

REBAR SET

REBAR SET
TBM 50

R/W MON AT CORNER
INDOT REBAR LYE

50' SETBACK LINE

N LINE OF SE ¼ OF SW ¼ OF SECT. 17, T. 12N, R. 5E
S LINE OF NE ¼ OF SW ¼ OF SECT. 17, T. 12N, R. 5E

DEDICATION OF PUBLIC R/W
INST. NO. 2020-021484

20' UTILITY EASEMENT

R/W LINE

50' SETBACK LINE

TBM 5

FOREST ROAD
PUBLIC RIGHT-OF-WAY

W LINE OF SE ¼ OF SW ¼ OF SECT. 17, T. 12N R. 5E

SUSAN CUBINE, TRUSTEE (1 INT.)
2002-001862 - AFFIDAVIT
94023082 - DEED
ROBERT J. GUERINE, JR. & LARRY R. GUERINE (2 INT.)
INSTR. NO. 2011-010966
TRACTS 1 & 2
59.025 ACRES±

ACTUAL FEMA BASE FLOOD ELEVATION 717.80 PER TOPOGRAPHY

20' D.U.& E. EASEMENT

25' SETBACK LINE

S00°07'21"E - 1434.36'

E LINE OF SW ¼ OF SECT. 17, T. 12N, R. 5E

ACTUAL FEMA BASE FLOOD ELEVATION 717.80 PER TOPOGRAPHY

DRAINAGE TILE WITHIN 5 FEET OF LINE PER INSTR. NO. 2004-027067

N LINE OF E ½ OF NW ¼ OF SECT. 20, T. 12N, R. 5E
S LINE OF E ½ OF SW ¼ OF SECT. 17, T. 12N, R. 5E

POINT OF BEGINNING
NE ¼ OF SW ¼ SECT. 17, T. 12N, R. 5E
NW ¼ OF NW ¼ SECT. 20, T. 12N, R. 5E
SURVEYOR MAG NAIL WITH WASHER FOUND

W LINE OF NW ¼ OF NW ¼ SECT. 20, T. 12N, R. 5E

TBM 5

MAG NAIL SET

25' SETBACK LINE

20' D.U.& E. EASEMENT

SE CORNER OF SW ¼ OF SECT. 20, T. 12N, R. 5E
FENCE POST FOUND

APPROXIMATE LOCATION OF PROPOSED SANITARY MAIN EXTENSION CURRENTLY UNDER DESIGN BY WESSLER ENGINEERING

APPX. FLOODWAY EXTENTS PER DNR FARA DETERMINATION GN037909

DRAIN RIGHT OF ENTRY

75'

APPX. FLOODWAY EXTENTS PER DNR FARA DETERMINATION GN037909

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-5.000	-3.993	
2	-3.993	-2.636	
3	-2.636	-1.202	
4	-1.202	-0.467	
5	-0.467	-0.158	
6	-0.158	-0.040	
7	-0.040	0.000	

AREA BELOW FLOOD ELEVATION 717.80
TOTAL VOLUME ABOVE POND 100-YR STAGE (SITE ONLY)
ELEVATION 713.36 - 56,643 CY

0' 100' 200'
SCALE: 1"=100'

GDI CONSTRUCTION
9775 Crosspoint Blvd
Suite 105
Indianapolis, IN 46256

317.567.6100

AMERICAN STRUCTUREPOINT INC.
9025 River Road, Suite 200 | Indianapolis, Indiana 46240
TEL 317.547.5580 | FAX 317.543.0270
www.structurepoint.com

I-65 SOUTH LOGISTICS CENTER LOT 1

81/89 Forest Road
Franklin, Indiana

JUSTIN ERIC OLASCHIN
REGISTERED
No. PE11800804
STATE OF INDIANA
PROFESSIONAL ENGINEER

CERTIFIED BY

ISSUANCE INDEX
DATE:
03/25/2021
PROJECT PHASE:
CONSTRUCTION DOCUMENTS

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

Project Number 2019.02798

PROPOSED FLOODPLAIN VOLUME

PLOT DATE: 3/19/2021 11:26 AM
PLOT SCALE: 1.0000
EDIT DATE: 12/29/2020
EDITED BY: MRVING
DRAWING FILE: P:\2019\02798\D. Drawings\Civil\Exhibits\Ordinance\2019.02798.CE.Proposed Floodplain Volume 2020-12-23.dwg

APPENDIX D

PROPOSED CONDITIONS – STORM SEWER

East Inlet Basins Exhibit

I-65 South Logistics Center
State Road 44 & Forest Road
Franklin, Indiana

0' 75' 150'

SCALE: 1" = 150'

March 19, 2021

AMERICAN STRUCTUREPOINT INC.

2019.02798

PLOT DATE (17"x11"): 3/19/2021 12:32 PM
DRAWING FILE: P:\2019\02798\D. Drawings\Civil\Exhibits\Drainage\2019.02798.CE.Proposed Inlet Basins_2021-03-17.dwg

BASIN 113
AREA: 0.19 ±AC.
C: 0.74
TC: 5.00 MIN.

BASIN RD119
AREA: 2.79 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN RD123
AREA: 3.99 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN RD302
AREA: 3.99 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN 111
AREA: 0.28 ±AC.
C: 0.71
TC: 5.00 MIN.

BASIN 112
AREA: 0.19 ±AC.
C: 0.79
TC: 5.00 MIN.

BASIN 110
AREA: 0.19 ±AC.
C: 0.80
TC: 5.00 MIN.

BASIN 109
AREA: 0.19 ±AC.
C: 0.82
TC: 5.00 MIN.

BASIN 108
AREA: 0.38 ±AC.
C: 0.72
TC: 5.00 MIN.

BASIN RD103
AREA: 1.39 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN RD102
AREA: 2.39 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN RD203
AREA: 3.19 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN RD207
AREA: 2.79 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN 107
AREA: 0.19 ±AC.
C: 0.82
TC: 5.00 MIN.

BASIN 105
AREA: 0.73 ±AC.
C: 0.59
TC: 5.00 MIN.

BASIN 104
AREA: 0.33 ±AC.
C: 0.57
TC: 5.00 MIN.

BASIN 101
AREA: 0.81 ±AC.
C: 0.68
TC: 5.00 MIN.

BASIN 201
AREA: 0.84 ±AC.
C: 0.67
TC: 8.68 MIN.

BASIN 202
AREA: 0.79 ±AC.
C: 0.69
TC: 7.39 MIN.

BASIN 203
AREA: 0.69 ±AC.
C: 0.72
TC: 5.00 MIN.

BASIN 204
AREA: 0.56 ±AC.
C: 0.81
TC: 5.00 MIN.

BASIN 205
AREA: 0.56 ±AC.
C: 0.81
TC: 5.00 MIN.

BASIN 206
AREA: 0.55 ±AC.
C: 0.82
TC: 5.00 MIN.

BASIN 207
AREA: 0.53 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN 102
AREA: 2.94 ±AC.
C: 0.49
TC: 18.68 MIN.

BASIN 103
AREA: 0.37 ±AC.
C: 0.74
TC: 5.00 MIN.

BASIN 701
AREA: 5.51 ±AC.
C: 0.37
TC: 22.52 MIN.

BASIN 208A
AREA: 0.15 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN 208
AREA: 0.36 ±AC.
C: 0.51
TC: 5.00 MIN.

BASIN 210
AREA: 0.41 ±AC.
C: 0.65
TC: 5.00 MIN.

BASIN 209
AREA: 0.22 ±AC.
C: 0.79
TC: 5.00 MIN.

BASIN 211
AREA: 0.18 ±AC.
C: 0.68
TC: 5.00 MIN.

BASIN 213
AREA: 0.08 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN RD208
AREA: 1.39 ±AC.
C: 0.90
TC: 5.00 MIN.

BASIN 217
AREA: 0.35 ±AC.
C: 0.82
TC: 5.00 MIN.

BASIN 218
AREA: 0.43 ±AC.
C: 0.81
TC: 5.00 MIN.

BASIN 221
AREA: 0.15 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN 222
AREA: 0.36 ±AC.
C: 0.81
TC: 5.00 MIN.

BASIN 223
AREA: 0.41 ±AC.
C: 0.81
TC: 5.00 MIN.

BASIN 219
AREA: 0.46 ±AC.
C: 0.78
TC: 5.00 MIN.

BASIN 704
AREA: 0.22 ±AC.
C: 0.30
TC: 5.00 MIN.

BASIN 215
AREA: 0.17 ±AC.
C: 0.79
TC: 5.00 MIN.

BASIN 216
AREA: 0.19 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN 214
AREA: 0.53 ±AC.
C: 0.73
TC: 5.00 MIN.

BASIN 212
AREA: 0.05 ±AC.
C: 0.85
TC: 5.00 MIN.

BASIN 703
AREA: 0.46 ±AC.
C: 0.30
TC: 5.00 MIN.

BASIN 702
AREA: 0.51 ±AC.
C: 0.30
TC: 5.00 MIN.

STORM STR 900
STORM STR 101
STORM STR 102
STORM STR 103
STORM STR 104
STORM STR 105
STORM STR 107
STORM STR 108
STORM STR 109
STORM STR 110
STORM STR 111
STORM STR 112
STORM STR 201
STORM STR 202
STORM STR 203
STORM STR 204
STORM STR 205
STORM STR 206
STORM STR 207
STORM STR 208
STORM STR 208A
STORM STR 209
STORM STR 210
STORM STR 211
STORM STR 212
STORM STR 213
STORM STR 214
STORM STR 215
STORM STR 216
STORM STR 217
STORM STR 218
STORM STR 219
STORM STR 220
STORM STR 221
STORM STR 222
STORM STR 223
STORM STR 701
STORM STR 702
STORM STR 703
STORM STR 704

TC BASIN 201 = 8.68 MIN.
TC BASIN 202 = 7.39 MIN.
TC BASIN 203 = 8.80 MIN.
TC BASIN 701 = 22.52 MIN.
TC BASIN 102 = 18.68 MIN.

STATE ROAD 44
FOREST ROAD
DEDICATION OF PUBLIC R/W; INST. NO. 2020021454

0' 75' 150'
SCALE: 1" = 150'

March 19, 2021

PLOT DATE (17"x11"): 3/19/2021 12:32 PM
DRAWING FILE: P:\2019\02798\D. Drawings\Civil\Exhibits\Drainage\2019.02798.CE.Proposed Inlet Basins_2021-03-17.dwg

West Inlet Basins Exhibit

I-65 South Logistics Center
State Road 44 & Forest Road
Franklin, Indiana

AMERICAN STRUCTUREPOINT INC.
2019.02798

PROPOSED STORM SEWER SYSTEM
STORM SEWER DESIGN TABLE - RATIONAL METHOD

Job Information

Description: I-65 Logistics Center
Reviewing Entity: City of Franklin
Job #: 2019.02798
Date: 03/19/21

Design Parameters	
Design Storm:	10-yr
Intensity Calculation Method:	Entity Data
Invert Calculation Method:	Match Invert
Drop Amount:	-

STR.	TO STR.	LENGTH	PIPE MATERIAL	FLOW									ENTITY DATA											RIM		INVERT		COVER	
				DIRECT TO CASTING		DIRECT TO INLET		cA		INLET	CASTING	TO INLET	i		CASTING	INLET	PIPE DIAMETER	PIPE SLOPE	MANNING'S N	FULL PIPE CAPACITY	CAPACITY UTILIZATION	FULL FLOW VELOCITY	FLOW DEPTH	FLOW VELOCITY	TRAVEL TIME	ELEV.		ELEV.			
				c	AREA	c	AREA	INLET	CASTING	CUM. cA	Tc	Tcum	CASTING	INLET	Q	CUM. Q									U.S.	D.S.	U.S.	D.S.	U.S.	D.S
		(ft)			(acres)		(acres)				(min)	(min)	(in/hr)		(CFS)	(CFS)	(inches)	(%)		(cfs)	(%)	(ft/sec)	(ft)	(ft/sec)	(min)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
101	**102**	116.0	RCP	0.68	0.81	-	-	0.55	0.55	0.55	5.00	5.00	7.20	7.20	3.99	3.99	18	0.20	0.013	4.70	85%	2.66	1.06	2.98	0.73	719.53	719.53	715.29	715.05	2.53	2.76
102	**103**	147.0	RCP	0.49	2.94	0.90	2.39	3.59	1.43	4.14	**18.38**	18.38	4.56	4.56	6.54	18.87	36	0.10	0.013	21.09	89%	2.98	2.21	3.37	0.82	719.53	722.79	713.85	713.71	2.34	5.75
103	**105**	200.4	RCP	0.74	0.37	0.90	1.39	1.52	0.27	5.66	5.00	19.20	7.20	4.46	1.94	25.24	36	0.15	0.013	25.83	98%	3.65	2.40	4.17	0.91	722.79	721.82	713.71	713.41	5.75	5.08
104	**105**	52.5	RCP	0.57	0.33	-	-	0.19	0.19	0.19	5.00	5.00	7.20	7.20	1.35	1.35	12	0.40	0.013	2.25	60%	2.87	0.56	3.00	0.31	722.04	721.82	717.92	717.71	2.95	2.95
105	**107**	121.7	RCP	0.59	0.73	-	-	0.43	0.43	6.27	5.00	20.12	7.20	4.35	3.07	27.29	36	0.18	0.013	27.90	98%	3.95	2.40	4.50	0.51	721.82	723.16	713.41	713.19	5.08	6.64
107	**109**	108.0	RCP	0.82	0.19	-	-	0.15	0.15	6.43	5.00	20.63	7.20	4.29	1.10	27.57	36	0.19	0.013	28.69	96%	4.06	2.36	4.62	0.44	723.16	722.69	713.19	712.99	6.64	6.36
108	**109**	12.7	RCP	0.72	0.38	-	-	0.27	0.27	0.27	5.00	5.00	7.20	7.20	1.98	1.98	12	0.35	0.013	2.11	94%	2.68	0.77	3.05	0.08	720.70	722.69	717.04	716.99	2.50	4.52
109	**110**	112.5	RCP	0.82	0.19	-	-	0.15	0.15	6.85	5.00	21.07	7.20	4.24	1.11	29.04	36	0.20	0.013	29.83	97%	4.22	2.39	4.81	0.44	722.69	722.68	712.99	712.77	6.36	6.58
110	**112**	141.0	RCP	0.80	0.19	-	-	0.15	0.15	7.00	5.00	21.52	7.20	4.18	1.07	29.30	42	0.10	0.013	31.82	92%	3.31	2.65	3.75	0.71	722.68	722.53	712.77	712.63	6.04	6.03
111	**112**	22.6	RCP	0.71	0.28	-	-	0.20	0.20	0.20	5.00	5.00	7.20	7.20	1.43	1.43	12	0.35	0.013	2.11	68%	2.68	0.60	2.89	0.14	721.37	722.53	717.71	717.63	2.50	3.74
112	**113**	112.5	RCP	0.79	0.19	-	-	0.15	0.15	7.35	5.00	22.23	7.20	4.10	1.08	30.14	42	0.10	0.013	31.82	95%	3.31	2.72	3.76	0.57	722.53	722.66	712.63	712.52	6.03	6.27
113	**115**	99.0	RCP	0.74	0.19	-	-	0.14	0.14	7.49	5.00	22.79	7.20	4.03	1.00	30.20	42	0.10	0.013	31.82	95%	3.31	2.72	3.76	0.50	722.66	722.57	712.52	712.42	6.27	6.28
114	**115**	31.2	RCP	0.69	0.23	-	-	0.16	0.16	0.16	5.00	5.00	7.20	7.20	1.15	1.15	12	0.35	0.013	2.11	54%	2.68	0.53	2.74	0.19	721.24	722.57	717.53	717.42	2.55	3.99
115	**117**	164.3	RCP	0.81	0.14	-	-	0.11	0.11	7.76	5.00	23.29	7.20	3.97	0.81	30.83	42	0.10	0.013	31.82	97%	3.31	2.78	3.77	0.83	722.57	718.75	712.42	712.25	6.28	2.62
117	**118**	125.4	RCP	0.62	0.55	-	-	0.34	0.34	8.10	5.00	24.12	7.20	3.87	2.46	31.39	42	0.11	0.013	32.60	96%	3.39	2.76	3.86	0.62	718.75	718.90	712.25	712.12	2.62	2.91
118	**119**	90.1	RCP	0.85	0.81	-	-	0.69	0.69	8.79	5.00	24.74	7.20	3.80	4.94	33.40	42	0.12	0.013	34.85	96%	3.62	2.75	4.12	0.41	718.90	718.96	712.12	712.01	2.91	3.07
119	**120**	128.8	RCP	0.85	0.61	0.90	2.79	3.03	0.52	11.82	5.00	25.15	7.20	3.75	3.73	44.32	42	0.21	0.013	45.55	97%	4.73	2.79	5.40	0.45	718.96	718.96	712.01	711.75	3.07	3.34
120	**121**	128.8	RCP	0.85	0.74	-	-	0.63	0.63	12.45	5.00	25.61	7.20	3.70	4.51	46.00	48	0.11	0.013	47.64	97%	3.79	3.16	4.32	0.57	718.96	718.96	711.75	711.61	2.80	2.94
121	**122**	128.8	RCP	0.85	0.74	-	-	0.63	0.63	13.07	5.00	26.17	7.20	3.63	4.51	47.43	48	0.12	0.013	49.76	95%	3.96	3.12	4.51	0.54	718.96	718.96	711.61	711.45	2.94	3.09
122	**123**	128.8	RCP	0.85	0.74	-	-	0.63	0.63	13.70	5.00	26.71	7.20	3.56	4.51	48.81	48	0.13	0.013	51.79	94%	4.12	3.09	4.69	0.52	718.96	718.96	711.45	711.28	3.09	3.26
123	**124**	128.8	RCP	0.85	0.74	0.90	3.99	4.21	0.63	17.92	5.00	27.23	7.20	3.50	4.51	62.71	54	0.12	0.013	66.69	94%	4.19	3.47	4.77	0.51	718.96	718.96	711.28	711.14	2.72	2.87
124	**125**	128.8	RCP	0.82	0.95	-	-	0.78	0.78	18.69	5.00	27.75	7.20	3.44	5.58	64.28	54	0.12	0.013	66.69	96%	4.19	3.55	4.78	0.51	718.96	718.71	711.14	710.99	2.87	2.77
125	**126**	59.7	RCP	0.83	0.54	-	-	0.45	0.45	19.14	5.00	28.26	7.20	3.38	3.24	64.66	54	0.12	0.013	66.69	97%	4.19	3.57	4.78	0.24	718.71	-	710.99	**710.92**	2.77	-
201	**202**	116.0	RCP	0.67	0.84	-	-	0.56	0.56	0.56	**8.68**	8.68	5.99	5.99	3.37	3.37	18	0.18	0.013	4.46	76%	2.52	0.97	2.77	0.77	719.53	719.53	715.31	715.10	2.51	2.72
202	**203**	116.0	RCP	0.69	0.79	-	-	0.54	0.54	1.10	**7.39**	9.45	6.42	5.74	3.48	6.34	18	0.40	0.013	6.64	95%	3.76	1.17	4.28	0.51	719.53	719.53	715.10	714.63	2.72	3.18
203	**204**	116.0	RCP	0.72	0.69	0.90	3.19	3.36	0.49	4.46	5.00	9.96	7.20	5.57	3.54	24.88	36	0.15	0.013	25.40	98%	3.59	2.41	4.10	0.54	719.53	719.53	713.88	713.72	2.31	2.48
204	**205**	116.0	RCP	0.81	0.56	-	-	0.45	0.45	4.92	5.00	10.50	7.20	5.50	3.27	27.05	36	0.17	0.013	27.50	98%	3.89	2.42	4.43	0.50	719.53	719.53	713.72	713.52	2.48	2.67
205	**206**	116.0	RCP	0.81	0.56	-	-	0.45	0.45	5.37	5.00	11.00	7.20	5.44	3.26	29.22	36	0.21	0.013	30.20	97%	4.27	2.38	4.87	0.45	719.53	719.53	713.52	713.28	2.67	2.91
206	**207**	116.0	RCP	0.82	0.55	-	-	0.45	0.45	5.82	5.00	11.45	7.20	5.39	3.25	31.37	42	0.11	0.013	32.60	96%	3.39	2.76	3.86	0.57	719.53	719.53	713.28	713.16	2.37	2.49
207	**208**	141.8	RCP	0.85	0.53	0.90	2.79	2.96	0.45	8.78	5.00	12.02	7.20	5.32	3.24	46.72	42	0.23	0.013	48.25	97%	5.02	2.77	5.71	0.47	719.53	719.20	713.16	712.83	2.49	2.49
208A	**208**	29.0	RCP	0.85	0.15	-	-	0.13	0.13	0.13	5.00	5.00	7.20	7.20	0.92	0.92	12	0.35	0.013	2.11	43%	2.68	0.46	2.59	0.18	719.82	719.20	715.64	715.53	3.01	2.50
208	**210**	128.2	RCP	0.51	0.36	0.90	1.39	1.44	0.18	10.35	5.00	12.49	7.20	5.26	1.32	54.44	42	0.31	0.013	56.02	97%	5.82	2.78	6.63	0.37	719.20	719.54	712.83	712.44	2.49	3.23
209	**210**	29.0	RCP	0.79	0.22	-	-	0.18	0.18	0.18	5.00	5.00	7.20	7.20	1.27	1.27	12	0.35	0.013	2.11	60%	2.68	0.56	2.81	0.18	719.61	719.54	715.94	715.84	2.51	2.53
210	**213**	78.9	RCP	0.65	0.41	-	-	0.27	0.27	10.79	5.00	12.86	7.20	5.22	1.92	56.30	48	0.17	0.013	58.35	96%	4.64	3.16	5.29	0.28	719.54	722.54	712.44	712.31	2.68	5.82
211	**213**	100.6	RCP	0.68	0.18	-	-	0.12	0.12	0.12	5.00	5.00	7.20	7.20	0.87	0.87	12	0.35	0.013	2.11	41%	2.68	0.45	2.55	0.62	720.31	722.54	716.56	716.21	2.58	5.17
212	**213**	75.0	RCP	0.85	0.05	-	-	0.04	0.04	0.04	5.00	5.00	7.20	7.20	0.29	0.29	12	0.35	0.013	2.11	14%	2.68	0.25	1.88	0.47	722.87	722.54	719.07	718.81	2.63	2.57
213	**217**	112.5	RCP	0.85	0.08	-	-	0.07	0.07	11.01	5.00	13.14	7.20	5.18	0.47	57.11	48	0.17	0.013	58.35	98%	4.64	3.20	5.29	0.40	722.54	723.09	712.31	712.12	5.82	6.56
214	**216**	21.2	RCP	0.73	0.53	-	-	0.39	0.39	0.39	5.00	5.00	7.20	7.20	2.79	2.79	15	0.25	0.013	3.23	87%	2.63	0.90	2.96	0.13	720.44	722.74	716.39	716.34	2.61	4.96
215	**216**	112.5	RCP	0.79	0.17	-	-	0.14	0.14	0.14	5.00	5.00	7.20	7.20	0.97	0.97	12	0.35	0.013	2.11	46%	2.68	0.48	2.63	0.70	722.42	722.74	718.73	718.34	2.52	3.23
216	**217**	120.0	RCP	0.85	0.19	-	-	0.16	0.16	0.68	5.00	5.70	7.20	6.97	1.14	4.76	15	0.60	0.013	5.00	95%	4.08	0.97	4.64	0.49	722.74	723.09	716.34	715.62	4.96	6.04
217	**218**	112.5	RCP	0.82	0.35	-	-	0.29	0.29	11.98	5.00	13.54	7.20	5.14	2.07	61.56	48	0.19	0.013	62.61	98%	4.98	3.22	5.68	0.38	723.09	722.42	712.12	711.91	6.56	6.10
218	**222**	144.0	RCP	0.81	0.43	-	-	0.35	0.35	12.34	5.00	13.92	7.20	5.09	2.53	62.81	48	0.20	0.013	64.24	98%	5.11	3.20	5.83	0.47	722.42	722.57	711.91	711.62	6.10	6.53
219	**221**	11.2	RCP	0.78	0.46	-	-	0.36	0.36	0.36	5.00	5.00	7.20	7.20	2.57	2.57	15	0.25	0.013	3.23	80%	2.63	0.84	2.92	0.07	720.73	722.26	716.75	716.72	2.54	4.10
220	**221**	108.0	RCP	0.85	0.14	-	-	0.12	0.12	0.12	5.00	5.00	7.20	7.20	0.87	0.87	12	0.35	0.013	2.11	41%	2.68	0.45	2.56	0.67	722.63	722.26	718.85	718.47	2.61	2.63
221	**222**	120.0	RCP	0.85	0.15	-	-	0.13	0.13	0.61	5.00	5.67	7.20	6.98	0.93	4.25	15	0.50	0.013	4.57	93%	3.72	0.95	4.23	0.54	722.26	722.57	716.72	716.12	4.10	5.01
222	**223**	108.0	RCP	0.81	0.36	-	-	0.29	0.29	13.24	5.00	14.39	7.20	5.04	2.12	66.66	54	0.12	0.013	68.12	98%	4.28	3.60	4.88	0.42	722.57	722.63	711.62	711.49	5.99	6.18
223	**225**	144.0	RCP	0.81	0.41	-	-	0.34	0.34	13.58	5.00	14.81	7.20	4.99	2.43	67.68	54	0.12	0.013	68.12	99%	4.28	3.66	4.88	0.56	722.63	722.55	711.49	711.32	6.18	6.28
224	**225**	102.0	RCP	0.85	0.12	-	-	0.10	0.10	0.10	5.00	5.00	7.20	7.20	0.73	0.73	12	0.35	0.013	2.11	35%	2.68	0.41	2.44	0.63	722.54	722.55	718.67	718.32	2.70	3.07
225	**226**	109.7	RCP	0.80	0.40	-	-	0.32	0.32	14.00	5.00	15.37	7.20	4.92	2.31	68.85	54	0.13	0.013	69.53	99%	4.37	3.65	4.98	0.42	722.55	722.45	711.32	711.18	6.28	6.31
226	**227**	93.0	RCP	0.85	0.14	-	-	0.12	0.12	14.11	5.00	15.79	7.20	4.87	0.83	68.71	54	0.13	0.013	69.53	99%	4.37	3.64	4.98	0.35	722.45	719.50	711.18	711.06	6.31	3.48
227	**228**	109.9	RCP	0.70	0.54	-	-	0.38	0.38	14.49	5.00	16.14	7.20	4.83	2.74	69.95	54	0.13	0.013	70.90	99%	4.46	3.63	5.08	0.41	719.50	-	711.06	**710.92**	3.48	-
301	**302**	128.8	RCP	0.83	0.60	-	-	0.50	0.50	0.50	5.00	5.00	7.20	7.20	3.57	3.57	15	0.40	0.013	4.09	88%	3.33	0.91	3.75	0.64	718.99	718.99	715.05	714.53	2.51	3.02
302	**305**	128.8	RCP	0.83	0.60	0.90	3.99	4.08	0.50	4.58	5.00	5.64	7.20	6.99	3.58	32.01	30	0.65	0.013	33.07	97%	6.74	1.98	7.68	0.32	718.99	718.99	712.43	711.60	3.77	4.61
304	**305**	131.1	RCP	0.75	0.65	-	-	0.49	0.49	0.49	5.00	5.00	7.20	7.20	3.54	3.54	15	0.40	0.013	4.09	87%	3.33	0.90	3.75	0.66	718.98	718.99	715.02	714.50	2.52	3.06
305	**306**	44.2	RCP	0.83	0.60	-	-	0.50	0.50	5.57	5.00	5.96	7.20	6.88	3.58	38.34	36	0.40	0.013	42.18	91%	5.97	2.24	6.76	0.12	718.99	-	711.10	**710.92**	4.56	-
401	**402**	90.1	RCP	0.85	0.63	-	-	0.53	0.53	0.53	5.00	5.00	7.20	7.20	3.83	3.83	15	0.38	0.013	3.98	96%	3.24	0.99	3.70	0.46	718.16	718.25	714.27	713.93	2.46	2.89
402	**403**	128.8	RCP	0.85	0.31	-	-	0.26	0.26	0.80	5.00	5.46	7.20	7.05	1.90	5.61	18	0.31	0.013	5.85	96%	3.31	1.18	3.77	0.65	718.25	718.25	713.93	713.53	2.62	3.02
403	**404**	128.8	RCP	0.85	0.38	-	-	0.32	0.32	1.12	5.00	6.11	7.20	6.84	2.30	7.62	18	0.58	0.013	8.00	95%	4.53	1.17	5.15	0.47	718.25	718.25	713.53	712.78	3.02	3.77
404	**405**	128.8	RCP	0.85	0.38	-	-	0.32	0.32	1.43	5.00	6.59	7.20	6.68	2.30	9.58	24	0.20	0.013	10.12	95%	3.22	1.55	3.66	0.67	718.25	718.25	712.78	712.52	3.22	3.48
405	**406**	128.8	RCP	0.85	0.38	-	-	0.32	0.32	1.75	5.00	7.25	7.20	6.46	2.30	11.33	24	0.28	0.013	11.97	95%	3.81	1.55	4.33	0.56	718.25	718.25	712.52	712.16	3.48	3.84
406	**407**	128.8	RCP	0.85	0.38	-	-	0.32	0.32	2.07	5.00	7.81	7.20	6.28	2.30	13.01	24	0.37	0.013	13.76	95%	4.38	1.55	4.98	0.49	718.25	718.25	712.16	711.69	3.84	4.32
407	**408**	148.9	RCP	0.75	0.52	-	-	0.39	0.39	2.47	5.00	8.30	7.20	6.12	2.84	15.08	24	0.51	0.013	16.23	93%	5.17	1.53	5.87	0.48	718.25	-	711.69	**710.92**	4.32	-
701	**702**	92.1	RCP	0.37	5.51	-	-	2.04	2.04	2.04	**22.52**	22.52	4.06	4.06	8.28	8.28	36	0.29	0.013	35.92	23%	5.08	0.98	4.13	0.30	-	722.28	714.45	714.18	-	4.76
702	**703**	256.9	RCP	0.30	0.51	-	-	0.15	0.15	2.19	5.00	22.82	7.20	4.03	1.11	8.83	36	0.29	0.013	35.92	25%	5.08	1.01	4.20	0.84	722.28	721.62	714.18	713.44	4.76	4.85
703	**704**	288.7	RCP	0.30	0.46	-	-	0.14	0.14	2.33	5.00	23.66	7.20	3.93	1.00	9.16	36	0.29	0.013	35.92	25%	5.08	1.03	4.25	0.95	721.62	724.22	713.44	712.60	4.85	8.28
704	**705**	394.7	RCP	0.30	0.22	-	-	0.06	0.06	2.40	5.00	24.61	7.20	3.81	0.47	9.14	36	0.29	0.013	35.92	25%	5.08	1.03	4.24	1.29	724.22	717.59	712.60	711.45	8.28	2.80
705	**706**	184.3	RCP	-	-	-	-	-	-	2.40	5.00	25.91	7.20	3.66	-	8.77	36	0.29	0.013	35.92	24%	5.08	1.01	4.20	0.60	717.59	-	711.45	**710.92**	2.80	-
710	**711**	50.1	RCP	0.30	3.33	-	-	1.00	1.00	1.00	**16.89**	16.89	4.74	4.74	4.73	4.73	15	0.90	0.013	6.13	77%	4.99	0.82	5.51	0.17	715.31	-	711.37	**710.92**	2.50	-

PROPOSED STORM SEWER SYSTEM
HYDRAULIC GRADE LINE (HGL) CALCULATIONS

Job Information

Description: I-65 Logistics Center
Entity: City of Franklin
Job #: 2019.02798
Date: 03/19/21

Design Parameters	
Design Storm:	10-yr
Intensity Calculation Method:	Entity Data
Starting Elevation:	(dc+D)/2
Calculation Method:	Structure Coefficient

D.S. STR.	U.S. STR.	D.S. INV. ELEV.	D.S. CROWN ELEV.	(dc+D)/2 ELEV.	STARTING ELEV.	Tc	INTENSITY ENTITY DATA	FLOW	DIAMETER	SLOPE	AREA	WETTED PERIMETE	HYDRAULIC RADIUS	FLOW DEPTH	CRITICAL DEPTH	VELOCITY	LENGTH	MANNING'S N	FRICTION LOSS	UPSTREAM MAXIMUM INFLUENT VELOCITY	OUTLET STRUCTURE COEFFICIENT	UPSTREAM STRUCTURE COEFFICIENT	EFFLUENT PIPE VELOCITY	OUTLET STRUCTURE LOSS	UPSTREAM STRUCTURE LOSS	TOTAL LOSS	U.S. HGL ELEV.	U.S. STR. T.R.	U.S. STR. CROWN
		(ft)	(ft)	(ft)	(ft)	(min)	(in/hr)	(cfs)	(in.)	%	(sq. ft)	(ft.)	(ft.)	(ft.)	(ft)	(ft/s)	(ft)		(ft)	(ft/s)			(ft/s)	(ft)	(ft)	(ft)	(ft.)	(ft.)	(ft.)
102	101	715.05	716.55	716.19	718.02	5.00	7.20	3.99	18	0.20	1.336	2.998	0.446	1.061	0.764	2.98	116	0.013	0.231	-	-	1.25	3.37	-	0.173	0.403	718.43	719.53	716.79
103	102	713.71	716.71	715.90	717.86	18.38	4.56	18.87	36	0.10	5.592	6.201	0.902	2.214	1.392	3.37	147	0.013	0.146	2.98	-	0.50	4.17	-	0.019	0.166	718.02	719.53	716.85
105	103	713.41	716.41	715.72	717.51	19.20	4.46	25.24	36	0.15	6.059	6.640	0.913	2.399	1.621	4.17	200	0.013	0.299	3.37	-	0.50	4.50	-	0.046	0.345	717.86	722.79	716.71
105	104	717.71	718.71	718.45	718.45	5.00	7.20	1.35	12	0.40	0.451	1.688	0.267	0.559	0.492	3.00	53	0.013	0.209	-	-	1.25	4.50	-	0.175	0.384	718.84	722.04	718.92
107	105	713.19	716.19	715.54	717.28	20.12	4.35	27.29	36	0.18	6.067	6.648	0.913	2.402	1.689	4.50	122	0.013	0.212	4.17	-	0.50	4.62	-	0.022	0.234	717.51	721.82	716.41
109	107	712.99	715.99	715.34	717.07	20.63	4.29	27.57	36	0.19	5.965	6.544	0.912	2.360	1.697	4.62	108	0.013	0.199	4.50	-	0.50	4.81	-	0.009	0.207	717.28	723.16	716.19
109	108	716.99	717.99	717.79	717.79	5.00	7.20	1.98	12	0.35	0.648	2.137	0.303	0.768	0.600	3.05	13	0.013	0.044	-	-	1.25	4.81	-	0.181	0.225	718.02	720.70	718.04
110	109	712.77	715.77	715.14	716.83	21.07	4.24	29.04	36	0.20	6.040	6.619	0.912	2.391	1.744	4.81	112	0.013	0.224	4.62	-	0.50	3.75	-	0.014	0.237	717.07	722.69	715.99
112	110	712.63	716.13	715.21	716.62	21.52	4.18	29.30	42	0.10	7.809	7.384	1.058	2.648	1.671	3.75	141	0.013	0.140	4.81	-	0.50	3.76	-	0.070	0.211	716.83	722.68	716.27
112	111	717.63	718.63	718.38	718.38	5.00	7.20	1.43	12	0.35	0.497	1.782	0.279	0.605	0.507	2.89	23	0.013	0.079	-	-	1.25	3.76	-	0.162	0.240	718.62	721.37	718.71
113	112	712.52	716.02	715.11	716.51	22.23	4.10	30.14	42	0.10	8.010	7.544	1.062	2.716	1.696	3.76	112	0.013	0.112	3.75	-	0.50	3.76	-	0.001	0.112	716.62	722.53	716.13
115	113	712.42	715.92	715.02	716.41	22.79	4.03	30.20	42	0.10	8.025	7.556	1.062	2.721	1.698	3.76	99	0.013	0.098	3.76	-	0.50	3.77	-	0.000	0.099	716.51	722.66	716.02
115	114	717.42	718.42	718.14	718.14	5.00	7.20	1.15	12	0.35	0.419	1.623	0.258	0.526	0.451	2.74	31	0.013	0.108	-	-	1.25	3.77	-	0.146	0.254	718.40	721.24	718.53
117	115	712.25	715.75	714.86	716.25	23.29	3.97	30.83	42	0.10	8.183	7.690	1.064	2.776	1.716	3.77	164	0.013	0.163	3.76	-	0.50	3.86	-	0.000	0.164	716.41	722.57	715.92
118	117	712.12	715.62	714.74	716.11	24.12	3.87	31.39	42	0.11	8.132	7.646	1.064	2.758	1.732	3.86	125	0.013	0.131	3.77	-	0.50	4.12	-	0.005	0.136	716.25	718.75	715.75
119	118	712.01	715.51	714.66	715.99	24.74	3.80	33.40	42	0.12	8.097	7.616	1.063	2.746	1.790	4.12	90	0.013	0.108	3.86	-	0.50	5.40	-	0.016	0.124	716.11	718.90	715.62
120	119	711.75	715.25	714.54	715.63	25.15	3.75	44.32	42	0.21	8.214	7.717	1.064	2.787	2.075	5.40	129	0.013	0.263	4.12	-	0.50	4.32	-	0.094	0.356	715.99	718.96	715.51
121	120	711.61	715.61	714.62	715.41	25.61	3.70	46.00	48	0.11	10.651	8.760	1.216	3.161	2.030	4.32	129	0.013	0.141	5.40	-	0.50	4.51	-	0.081	0.222	715.63	718.96	715.75
122	121	711.45	715.45	714.48	715.24	26.17	3.63	47.43	48	0.12	10.523	8.665	1.214	3.122	2.063	4.51	129	0.013	0.154	4.32	-	0.50	4.69	-	0.013	0.167	715.41	718.96	715.61
123	122	711.28	715.28	714.33	715.06	26.71	3.56	48.81	48	0.13	10.415	8.588	1.213	3.090	2.095	4.69	129	0.013	0.166	4.51	-	0.50	4.77	-	0.013	0.179	715.24	718.96	715.45
124	123	711.14	715.64	714.54	714.91	27.23	3.50	62.71	54	0.12	13.154	9.644	1.364	3.469	2.303	4.77	129	0.013	0.147	4.69	-	0.50	4.78	-	0.006	0.153	715.06	718.96	715.78
125	124	710.99	715.49	714.41	714.76	27.75	3.44	64.28	54	0.12	13.460	9.842	1.368	3.550	2.333	4.78	129	0.013	0.147	4.77	-	0.50	4.78	-	0.001	0.148	714.91	718.96	715.64
126	125	710.92	715.42	714.34	714.34	28.26	3.38	64.66	54	0.12	13.534	9.892	1.368	3.571	2.340	4.78	60	0.013	0.068	4.78	1.00	0.50	-	0.354	0.000	0.423	714.76	718.71	715.49
202	201	715.10	716.60	716.20	718.91	8.68	5.99	3.37	18	0.18	1.215	2.812	0.432	0.974	0.699	2.77	116	0.013	0.208	-	-	1.25	4.28	-	0.149	0.357	719.27	719.53	716.81
203	202	714.63	716.13	715.87	718.36	9.45	5.74	6.34	18	0.40	1.481	3.252	0.455	1.172	0.973	4.28	116	0.013	0.462	2.77	-	0.50	4.10	-	0.083	0.544	718.91	719.53	716.60
204	203	713.72	716.72	716.02	718.19	9.96	5.57	24.88	36	0.15	6.075	6.657	0.913	2.406	1.609	4.10	116	0.013	0.167	4.28	-	0.50	4.43	-	0.012	0.179	718.36	719.53	716.88
205	204	713.52	716.52	715.86	717.97	10.50	5.50	27.05	36	0.17	6.100	6.683	0.913	2.416	1.681	4.43	116	0.013	0.196	4.10	-	0.50	4.87	-	0.022	0.219	718.19	719.53	716.72
206	205	713.28	716.28	715.66	717.70	11.00	5.44	29.22	36	0.21	6.004	6.583	0.912	2.376	1.750	4.87	116	0.013	0.237	4.43	-	0.50	3.86	-	0.031	0.268	717.97	719.53	716.52
207	206	713.16	716.66	715.78	717.51	11.45	5.39	31.37	42	0.11	8.128	7.643	1.064	2.757	1.732	3.86	116	0.013	0.121	4.87	-	0.50	5.71	-	0.068	0.189	717.70	719.53	716.78
208	207	712.83	716.33	715.65	717.05	12.02	5.32	46.72	42	0.23	8.176	7.684	1.064	2.773	2.133	5.71	142	0.013	0.324	3.86	-	0.50	6.63	-	0.138	0.462	717.51	719.53	716.66
208	208A	715.53	716.53	716.23	717.05	5.00	7.20	0.92	12	0.35	0.354	1.493	0.237	0.461	0.401	2.59	29	0.013	0.101	-	-	1.25	6.63	-	0.130	0.231	717.28	719.82	716.64
210	208	712.44	715.94	715.34	716.56	12.49	5.26	54.44	42	0.31	8.206	7.710	1.064	2.784	2.309	6.63	128	0.013	0.395	5.71	-	0.50	5.29	-	0.088	0.484	717.05	719.20	716.33
210	209	715.84	716.84	716.57	716.57	5.00	7.20	1.27	12	0.35	0.453	1.692	0.268	0.560	0.476	2.81	29	0.013	0.101	-	-	1.25	5.29	-	0.153	0.254	716.83	719.61	716.94
213	210	712.31	716.31	715.43	716.31	12.86	5.22	56.30	48	0.17	10.645	8.756	1.216	3.159	2.257	5.29	79	0.013	0.130	6.63	-	0.50	5.29	-	0.125	0.254	716.56	719.54	716.44
213	211	716.21	717.21	716.90	716.90	5.00	7.20	0.87	12	0.35	0.340	1.466	0.232	0.448	0.390	2.55	101	0.013	0.350	-	-	1.25	5.29	-	0.127	0.477	717.38	720.31	717.56
213	212	718.81	719.81	719.42	719.42	5.00	7.20	0.29	12	0.35	0.153	1.047	0.147	0.250	0.221	1.88	75	0.013	0.261	-	-	1.25	5.29	-	0.069	0.329	719.75	722.87	720.07
217	213	712.12	716.12	715.26	716.12	13.14	5.18	57.11	48	0.17	10.791	8.868	1.217	3.204	2.274	5.29	113	0.013	0.185	5.29	-	0.50	5.68	-	0.000	0.185	716.31	722.54	716.31
216	214	716.34	717.59	717.30	717.50	5.00	7.20	2.79	15	0.25	0.943	2.528	0.373	0.898	0.671	2.96	21	0.013	0.053	-	-	1.25	4.64	-	0.170	0.223	717.73	720.44	717.64
216	215	718.34	719.34	719.05	719.05	5.00	7.20	0.97	12	0.35	0.370	1.526	0.243	0.478	0.414	2.63	113	0.013	0.392	-	-	1.25	4.64	-	0.134	0.526	719.57	722.42	719.73
217	216	715.62	716.87	716.69	716.69	5.70	6.97	4.76	15	0.60	1.025	2.702	0.379	0.973	0.884	4.64	120	0.013	0.716	2.96	-	0.50	5.68	-	0.099	0.815	717.50	722.74	717.59
218	217	711.91	715.91	715.09	715.88	13.54	5.14	61.56	48	0.19	10.839	8.906	1.217	3.219	2.365	5.68	113	0.013	0.213	5.29	-	0.50	5.83	-	0.033	0.246	716.12	723.09	716.12
222	218	711.62	715.62	714.81	715.58	13.92	5.09	62.81	48	0.20	10.780	8.859	1.217	3.201	2.390	5.83	144	0.013	0.286	5.68	-	0.50	4.88	-	0.013	0.300	715.88	722.42	715.91
221	219	716.72	717.97	717.67	717.83	5.00	7.20	2.57	15	0.25	0.881	2.409	0.366	0.843	0.643	2.92	11	0.013	0.028	-	-	1.25	4.23	-	0.166	0.194	718.02	720.73	718.00
221	220	718.47	719.47	719.16	719.16	5.00	7.20	0.87	12	0.35	0.342	1.469	0.233	0.449	0.392	2.56	108	0.013	0.376	-	-	1.25	4.23	-	0.127	0.503	719.67	722.63	719.85
222	221	716.12	717.37	717.16	717.16	5.67	6.98	4.25	15	0.50	1.005	2.656	0.378	0.954	0.835	4.23	120	0.013	0.597	2.92	-	0.50	4.88	-	0.072	0.669	717.83	722.26	717.97
223	222	711.49	715.99	714.93	715.37	14.39	5.04	66.66	54	0.12	13.655	9.975	1.369	3.604	2.378	4.88	108	0.013	0.129	5.83	-	0.50	4.88	-	0.079	0.207	715.58	722.57	716.12
225	223	711.32	715.82	714.76	715.20	14.81	4.99	67.68	54	0.12	13.860	10.121	1.369	3.662	2.397	4.88	144	0.013	0.172	4.88	-	0.50	4.98	-	0.000	0.172	715.37	722.63	715.99
225	224	718.32	719.32	718.99	718.99	5.00	7.20	0.73	12	0.35	0.299	1.382	0.217	0.406	0.357	2.44	102	0.013	0.355	-	-	1.25	4.98	-	0.115	0.471	719.47	722.54	719.67
226	225	711.18	715.68	714.64	715.06	15.37	4.92	68.85	54	0.13	13.815	10.088	1.369	3.649	2.418	4.98	110	0.013	0.136	4.88	-	0.50	4.98	-	0.008	0.144	715.20	722.55	715.82
227	226	711.06	715.56	714.52	714.94	15.79	4.87	68.71	54	0.13	13.788	10.069	1.369	3.641	2.416	4.98	93	0.013	0.116	4.98	-	0.50	5.08	-	0.000	0.116	715.06	722.45	715.68
228	227	710.92	715.42	714.39	714.39	16.14	4.83	69.95	54	0.13	13.764	10.052	1.369	3.635	2.439	5.08	110	0.013	0.142	4.98	1.00	0.50	-	0.401	0.008	0.551	714.94	719.50	715.56
302	301	714.53	715.78	715.54	715.60	5.00	7.20	3.57	15	0.40	0.953	2.546	0.374	0.906	0.763	3.75	129	0.013	0.512	-	-	1.25	7.68	-	0.273	0.786	716.38	718.99	716.30
305	302	711.60	714.10	713.81	714.42	5.64	6.99	32.01	30	0.65	4.171	5.488	0.760	1.981	1.927	7.68	129	0.013	0.832	3.75	-	0.50	6.76	-	0.348	1.180	715.60	718.99	714.93
305	304	714.50	715.75	715.50	715.50	5.00	7.20	3.54	15	0.40	0.945	2.531	0.373	0.899	0.760	3.75	131	0.013	0.521	-	-	1.25	6.76	-	0.273	0.794	716.30	718.98	716.27
306	305	710.92	713.92	713.43	713.43	5.96	6.88	38.34	36	0.40	5.671	6.269	0.905	2.244	2.015	6.76	44	0.013	0.176	7.68	1.00	0.50	-	0.710	0.102	0.988	714.42	718.99	714.10
402	401	713.93	715.18	714.95	716.51	5.00	7.20	3.83	15	0.38	1.037	2.731	0.380	0.985	0.792	3.70	90	0.013	0.341	-	-	1.25	3.77	-	0.265	0.606	717.11	718.16	715.52
403	402	713.53	715.03	714.73	716.11	5.46	7.05	5.61	18	0.31	1.489	3.268	0.456	1.178	0.914	3.77	129	0.013	0.397	3.70	-	0.50	5.15	-	0.004	0.401	716.51	718.25	715.43
404	403	712.78	714.28	714.07	715.27	6.11	6.84	7.62	18	0.58	1.480	3.249	0.455	1.171	1.070	5.15	129	0.013	0.743	3.77	-	0.50	3.66	-	0.096	0.838	716.11	718.25	715.03
405	404	712.52	714.52	714.08	714.91	6.59	6.68	9.58	24	0.20	2.615	4.310	0.607	1.552	1.106	3.66	129	0.013	0.256	5.15	-	0.50	4.33	-	0.102	0.358	715.27	718.25	714.78
406	405	712.16	714.16	713.77	714.51	7.25	6.46	11.33	24	0.28	2.614	4.308	0.607	1.551	1.208	4.33	129	0.013	0.359	3.66	-	0.50	4.98	-	0.042	0.400	714.91	718.25	714.52
407	406	711.69	713.69	713.33	713.99	7.81	6.28	13.01	24	0.37	2.611	4.304	0.607	1.549	1.298	4.98	129	0.013	0.474	4.33	-	0.50	5.87	-	0.047	0.521	714.51	718.25	714.16
408	407	710.92	712.92	712.62	712.62	8.30	6.12	15.08	24	0.51	2.571	4.248	0.605	1.526	1.400	5.87	149	0.013	0.762	4.98	1.00	0.50	-	0.534	0.074	1.371	713.99	718.25	713.69
702	701	714.18	717.18	716.13	716.42	22.52	4.06	8.28	36	0.29	2.006	3.650	0.549	0.980	0.907	4.13	92	0.013	0.266	-	-	1.25	4.20	-	0.331	0.597	717.01	-	717.45
703	702	713.44	716.44	715.41	715.67	22.82	4.03	8.83	36	0.29	2.100	3.721	0.564	1.013	0.938	4.20	257	0.013	0.741	4.13	-	0.50	4.25	-	0.005	0.746	716.42	722.28	717.18
704	703	712.60	715.60	714.58	714.83	23.66	3.93	9.16	36	0.29	2.156	3.762	0.573	1.033	0.956	4.25	289	0.013	0.832	4.20	-	0.50	4.24	-	0.003	0.835	715.67	721.62	716.44
705	704	711.45	714.45	713.43	713.70	24.61	3.81	9.14	36	0.29	2.153	3.760	0.573	1.032	0.955	4.24	395	0.013	1.138	4.25	-	0.50	4.20	-	0.000	1.139	714.83	724.22	715.60
706	705	710.92	713.92	712.89	712.89	25.91	3.66	8.77	36	0.29	2.090	3.713	0.563	1.010	0.935	4.20	184	0.013	0.531	4.24	1.00	0.50	-	0.273	0.003	0.808	713.70	717.59	714.45
711	710	710.92	712.17	711.99	711.99	16.89	4.74	4.73	15	0.90	0.858	2.369	0.362	0.824	0.882	5.51	50	0.013	0.449	-	1.00	1.25	-	0.472	0.589	1.510	713.50	715.31	712.62

Runoff Coefficient and Runoff Curve Number Calculation

Job Information

Description: I-65 Logistics Center
Entity: City of Franklin
Job #: 2019.02798
Date: 3/19/2021

	Runoff Coefficient	Runoff Curve Number
Roof	**0.90**	**98**
Grass	**0.30**	**77**
Pavement	**0.85**	**98**
Water	**1.00**	**100**

Basin	Structure	Roof Area	Pervious Area	Pavement Area	Water Area	Total Area	Weighted Runoff Coefficient	Weighted Curve Number
		(acres)	(acres)	(acres)	(acres)	(acres)	C	CN
101	101	-	0.24	0.57	-	0.81	0.68	92
102	102	-	1.94	1.00	-	2.94	0.49	84
103	103	-	0.08	0.29	-	0.37	0.74	94
104	104	-	0.16	0.16	-	0.33	0.57	87
105	105	-	0.35	0.38	-	0.73	0.59	88
107	107	-	0.01	0.18	-	0.19	0.82	97
108	108	-	0.09	0.29	-	0.38	0.72	93
109	109	-	0.01	0.18	-	0.19	0.82	97
110	110	-	0.02	0.17	-	0.19	0.80	96
111	111	-	0.07	0.21	-	0.28	0.71	93
112	112	-	0.02	0.17	-	0.19	0.79	96
113	113	-	0.04	0.15	-	0.19	0.74	94
114	114	-	0.07	0.16	-	0.23	0.69	92
115	115	-	0.01	0.13	-	0.14	0.81	96
117	117	-	0.23	0.32	-	0.55	0.62	89
118	118	-	0.00	0.81	-	0.81	0.85	98
119	119	-	-	0.61	-	0.61	0.85	98
120	120	-	-	0.74	-	0.74	0.85	98
121	121	-	-	0.74	-	0.74	0.85	98
122	122	-	-	0.74	-	0.74	0.85	98
123	123	-	-	0.74	-	0.74	0.85	98
124	124	-	0.05	0.89	-	0.95	0.82	97
125	125	-	0.02	0.52	-	0.54	0.83	97
201	201	-	0.27	0.56	-	0.84	0.67	91
202	202	-	0.23	0.56	-	0.79	0.69	92
203	203	-	0.17	0.52	-	0.69	0.72	93
204	204	-	0.04	0.52	-	0.56	0.81	97
205	205	-	0.04	0.52	-	0.56	0.81	96
206	206	-	0.03	0.52	-	0.55	0.82	97
207	207	-	-	0.53	-	0.53	0.85	98
208A	208A	-	-	0.15	-	0.15	0.85	98
208	208	-	0.22	0.14	-	0.36	0.51	85
209	209	-	0.02	0.20	-	0.22	0.79	96
210	210	-	0.15	0.26	-	0.41	0.65	90
211	211	-	0.06	0.12	-	0.18	0.68	91
212	212	-	-	0.05	-	0.05	0.85	98
213	213	-	0.00	0.08	-	0.08	0.85	98
214	214	-	0.12	0.42	-	0.53	0.73	93
215	215	-	0.02	0.15	-	0.17	0.79	96
216	216	-	0.00	0.19	-	0.19	0.85	98
217	217	-	0.02	0.33	-	0.35	0.82	97
218	218	-	0.03	0.40	-	0.43	0.81	96
219	219	-	0.06	0.40	-	0.46	0.78	95
220	220	-	0.00	0.14	-	0.14	0.85	98
221	221	-	0.00	0.15	-	0.15	0.85	98
222	222	-	0.03	0.34	-	0.36	0.81	96
223	223	-	0.03	0.39	-	0.41	0.81	97
224	224	-	-	0.12	-	0.12	0.85	98
225	225	-	0.03	0.37	-	0.40	0.80	96
226	226	-	-	0.14	-	0.14	0.85	98
227	227	-	0.15	0.40	-	0.54	0.70	92
301	301	-	0.02	0.58	-	0.60	0.83	97
302	302	-	0.02	0.58	-	0.60	0.83	97
304	304	-	0.12	0.54	-	0.65	0.75	94
305	305	-	0.02	0.58	-	0.60	0.83	97
401	401	-	-	0.63	-	0.63	0.85	98
402	402	-	-	0.31	-	0.31	0.85	98
403	403	-	-	0.38	-	0.38	0.85	98
404	404	-	-	0.38	-	0.38	0.85	98
405	405	-	-	0.38	-	0.38	0.85	98
406	406	-	-	0.38	-	0.38	0.85	98
407	407	-	0.09	0.43	-	0.52	0.75	94
701	701	-	4.81	0.70	-	5.51	0.37	80
702	702	-	0.51	-	-	0.51	0.30	77
703	703	-	0.46	-	-	0.46	0.30	77
704	704	-	0.22	-	-	0.22	0.30	77
705	705	-	-	-	-	-	-	-
710	710	-	3.33	-	-	3.33	0.30	77
RD102	RD102	2.39	-	-	-	2.39	0.90	98
RD203	RD203	3.19	-	-	-	3.19	0.90	98
RD103	RD103	1.39	-	-	-	1.39	0.90	98
RD207	RD207	2.79	-	-	-	2.79	0.90	98
RD208	RD208	1.39	-	-	-	1.39	0.90	98
RD302	RD302	3.99	-	-	-	3.99	0.90	98
RD123	RD123	3.99	-	-	-	3.99	0.90	98
RD119	RD119	2.79	-	-	-	2.79	0.90	98
TOTAL	TOTAL	21.91	14.75	24.62	-	61.27	0.74	93

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: TC 201

Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID									
Surface description		Unpaved								
Manning's roughness coeff., n		0.24								
Flow Length, L (L < 300 ft)	ft	100								
Rainfall Calculation Method		Entity Rainfall Data								
Two-year 24-hr rainfall, P2	in	2.90								
Land slope, s	ft/ft	0.10								
$T_t = \frac{.007\,(nL)^{0.8}}{(P_2)^{0.5}s^{0.4}}$	hr	0.13	+		+		=	0.13		
Shallow Concentrated Flow	Segment ID									
Surface description, (paved or unpaved)		Unpaved		Paved		-				
Flow length, L	ft	11		74		-				
Watercourse slope, s	ft/ft	0.096		0.014		-				
Average velocity, V	ft/s	5.00		1.91		-				
$T_t = \frac{L}{3600\,V}$	hr	0.00	+	0.01	+	-	=	0.01		
Channel Flow	Segment ID									
Channel Geometry		-		-		-				
Discharge (cfs)		-		-		-				
Diameter (ft)		-		-		-				
Bottom Width (ft)		-		-		-				
Side Slope (x:1) (ft)		-		-		-				
Slope of Channel (ft)		-		-		-				
Manning's Roughness Coefficient		-		-		-				
Depth (ft)		-		-		-				
Cross Sectional Area (ft^2)		-		-		-				
Wetted Perimeter (ft)		-		-		-				
Hydraulic Radius (ft)		-		-		-				
Velocity (ft/s)		-		-		-				
Flow length, L	ft	-		-		-				
$T_t = \frac{L}{3600\,V}$	hr	-	+	-	+	-	=	0.00		

Watershed or subarea T_c or T_t	hr	0.14
	min	8.68

*A velocity of 5 ft/s was assumed for pipe travel time.

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: TC 202

Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID								
Surface description		Unpaved							
Manning's roughness coeff., n		0.24							
Flow Length, L (L < 300 ft)	ft	94							
Rainfall Calculation Method		Entity Rainfall Data							
Two-year 24-hr rainfall, P2	in	2.90							
Land slope, s	ft/ft	0.12							
$T_t = \frac{.007\ (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$	hr	0.12	+		+		=	0.12	
Shallow Concentrated Flow	Segment ID								
Surface description, (paved or unpaved)		Paved		-		-			
Flow length, L	ft	70		-		-			
Watercourse slope, s	ft/ft	0.015		-		-			
Average velocity, V	ft/s	2.49		-		-			
$T_t = \frac{L}{3600\ V}$	hr	0.01	+	-	+	-	=	0.01	
Channel Flow	Segment ID								
Channel Geometry		-		-		-			
Discharge (cfs)		-		-		-			
Diameter (ft)		-		-		-			
Bottom Width (ft)		-		-		-			
Side Slope (x:1) (ft)		-		-		-			
Slope of Channel (ft)		-		-		-			
Manning's Roughness Coefficient		-		-		-			
Depth (ft)		-		-		-			
Cross Sectional Area (ft^2)		-		-		-			
Wetted Perimeter (ft)		-		-		-			
Hydraulic Radius (ft)		-		-		-			
Velocity (ft/s)		-		-		-			
Flow length, L	ft	-		-		-			
$T_t = \frac{L}{3600\ V}$	hr	-	+	-	+	-	=	0.00	

Watershed or subarea T_c or T_t	hr	0.12
	min	7.39

*A velocity of 5 ft/s was assumed for pipe travel time.

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: Offsite 12" to 102

Present - Developed X
Tc X T_t - through subarea

Sheet Flow		Segment ID						
Surface description			Unpaved					
Manning's roughness coeff., n			0.24					
Flow Length, L (L < 300 ft)		ft	100					
Rainfall Calculation Method			Entity Rainfall Data					
Two-year 24-hr rainfall, P2		in	2.90					
Land slope, s		ft/ft	0.02					
$T_t = \frac{.007\ (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$		hr	0.27	+		+		= 0.27

Shallow Concentrated Flow		Segment ID						
Surface description, (paved or unpaved)			Unpaved		-		-	
Flow length, L		ft	296		-		-	
Watercourse slope, s		ft/ft	0.017		-		-	
Average velocity, V		ft/s	2.10		-		-	
$T_t = \frac{L}{3600\ V}$		hr	0.04	+	-	+	-	= 0.04

Channel Flow		Segment ID						
Channel Geometry			-		-		-	
Discharge (cfs)			-		-		-	
Diameter (ft)			-		-		-	
Bottom Width (ft)			-		-		-	
Side Slope (x:1) (ft)			-		-		-	
Slope of Channel (ft)			-		-		-	
Manning's Roughness Coefficient			-		-		-	
Depth (ft)			-		-		-	
Cross Sectional Area (ft^2)			-		-		-	
Wetted Perimeter (ft)			-		-		-	
Hydraulic Radius (ft)			-		-		-	
Velocity (ft/s)			-		-		-	
Flow length, L		ft	-		-		-	
$T_t = \frac{L}{3600\ V}$		hr	-	+	-	+	-	= 0.00

Watershed or subarea T_c or T_t	hr	0.31
	min	18.38

*A velocity of 5 ft/s was assumed for pipe travel time.

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: 701

Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID								
Surface description		Unpaved							
Manning's roughness coeff., n		0.24							
Flow Length, L (L < 300 ft)	ft	100							
Rainfall Calculation Method		Entity Rainfall Data							
Two-year 24-hr rainfall, P2	in	2.90							
Land slope, s	ft/ft	0.01							
$T_t = \frac{.007\ (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$	hr	0.33	+		+		=	0.33	
Shallow Concentrated Flow	Segment ID								
Surface description, (paved or unpaved)		Unpaved		-		-			
Flow length, L	ft	267		-		-			
Watercourse slope, s	ft/ft	0.010		-		-			
Average velocity, V	ft/s	1.61		-		-			
$T_t = \frac{L}{3600\ V}$	hr	0.05	+	-	+	-	=	0.05	
Channel Flow	Segment ID								
Channel Geometry		-		-		-			
Discharge (cfs)		-		-		-			
Diameter (ft)		-		-		-			
Bottom Width (ft)		-		-		-			
Side Slope (x:1) (ft)		-		-		-			
Slope of Channel (ft)		-		-		-			
Manning's Roughness Coefficient		-		-		-			
Depth (ft)		-		-		-			
Cross Sectional Area (ft^2)		-		-		-			
Wetted Perimeter (ft)		-		-		-			
Hydraulic Radius (ft)		-		-		-			
Velocity (ft/s)		-		-		-			
Flow length, L	ft	-		-		-			
$T_t = \frac{L}{3600\ V}$	hr	-	+	-	+	-	=	0.00	

Watershed or subarea T_c or T_t	hr	0.38
	min	22.52

*A velocity of 5 ft/s was assumed for pipe travel time.

Time of Concentration (T_c) or Travel Time (T_t)

Project: I-65 Logistics Center | By: - | Date: -
Location: City of Franklin | Checked: | Date:
Basin: 710

Present - Developed X
Tc X T_t - through subarea

Sheet Flow	Segment ID								
Surface description		Unpaved							
Manning's roughness coeff., n		0.24							
Flow Length, L (L < 300 ft)	ft	100							
Rainfall Calculation Method		Entity Rainfall Data							
Two-year 24-hr rainfall, P2	in	2.90							
Land slope, s	ft/ft	0.02							
$T_t = \frac{.007\,(nL)^{0.8}}{(P_2)^{0.5}s^{0.4}}$	hr	0.26	+		+		=	0.26	
Shallow Concentrated Flow	Segment ID								
Surface description, (paved or unpaved)		Unpaved		-		-			
Flow length, L	ft	155		-		-			
Watercourse slope, s	ft/ft	0.018		-		-			
Average velocity, V	ft/s	2.15		-		-			
$T_t = \frac{L}{3600\,V}$	hr	0.02	+	-	+	-	=	0.02	
Channel Flow	Segment ID								
Channel Geometry		-		-		-			
Discharge (cfs)		-		-		-			
Diameter (ft)		-		-		-			
Bottom Width (ft)		-		-		-			
Side Slope (x:1) (ft)		-		-		-			
Slope of Channel (ft)		-		-		-			
Manning's Roughness Coefficient		-		-		-			
Depth (ft)		-		-		-			
Cross Sectional Area (ft^2)		-		-		-			
Wetted Perimeter (ft)		-		-		-			
Hydraulic Radius (ft)		-		-		-			
Velocity (ft/s)		-		-		-			
Flow length, L	ft	-		-		-			
$T_t = \frac{L}{3600\,V}$	hr	-	+	-	+	-	=	0.00	

Watershed or subarea T_c or T_t	hr	0.28
	min	16.89

*A velocity of 5 ft/s was assumed for pipe travel time.

PROPOSED STORM SEWER SYSTEM
ORIFICE FLOW CASTING CAPACITY CALCULATIONS

Job Information

Description: I-65 Logistics Center
Reviewing Entity: City of Franklin
Job #: 2019.02798
Date: 03/19/21

Design Parameters	
Design Storm:	10-yr
Clogging (%):	50%
Intensity Calculation Method:	Entity Data

STR. NO.	SPECIFIED STRUCTURE TYPE	SPECIFIED CASTING TYPE	PIPE COVER (ft)	STRUCTURE DEPTH (ft)	CASTING c	CASTING A (acres)	CASTING Tc (min)	ENTITY DATA i (in/hr)	CASTING FLOW (cfs)	ORIFICE FLOW DEPTH (ft)	WEIR FLOW DEPTH (ft)	PONDING DEPTH (ft)
101	TYPE "J" MANHOLE	R-3455-C	2.53	4.24	0.68	0.81	5.00	7.20	3.99	0.41	0.41	0.41
102	TYPE "K" MANHOLE	R-3457-C2	2.34	5.67	0.49	2.94	18.38	4.56	6.54	0.20	0.45	0.45
103	TYPE "J" MANHOLE	R-3287-10V	5.75	9.08	0.74	0.37	5.00	7.20	1.94	0.15	0.38	0.38
104	TYPE "A" INLET	R-4342	2.95	4.12	0.57	0.33	5.00	7.20	1.35	0.08	0.29	0.29
105	TYPE "J" MANHOLE	R-3287-15	5.08	8.42	0.59	0.73	5.00	7.20	3.07	0.16	0.42	0.42
107	TYPE "J" MANHOLE	R-3010	6.64	9.97	0.82	0.19	5.00	7.20	1.10	0.21	0.30	0.30
108	TYPE "J" INLET	R-3287-SB10	2.50	3.66	0.72	0.38	5.00	7.20	1.98	0.30	0.39	0.39
109	TYPE "J" MANHOLE	R-3010	6.36	9.69	0.82	0.19	5.00	7.20	1.11	0.21	0.30	0.30
110	TYPE "K" MANHOLE	R-3010	6.04	9.92	0.80	0.19	5.00	7.20	1.07	0.20	0.29	0.29
111	TYPE "A" INLET	R-3010	2.50	3.67	0.71	0.28	5.00	7.20	1.43	0.35	0.35	0.35
112	TYPE "K" MANHOLE	R-3010	6.03	9.90	0.79	0.19	5.00	7.20	1.08	0.20	0.29	0.29
113	TYPE "K" MANHOLE	R-3010	6.27	10.14	0.74	0.19	5.00	7.20	1.00	0.17	0.28	0.28
114	TYPE "A" INLET	R-3010	2.55	3.72	0.69	0.23	5.00	7.20	1.15	0.23	0.31	0.31
115	TYPE "K" MANHOLE	R-3010	6.28	10.16	0.81	0.14	5.00	7.20	0.81	0.11	0.25	0.25
117	TYPE "K" MANHOLE	R-3287-SB10	2.62	6.49	0.62	0.55	5.00	7.20	2.46	0.46	0.44	0.46
118	TYPE "K" MANHOLE	R-3457-C2	2.91	6.78	0.85	0.81	5.00	7.20	4.94	0.12	0.38	0.38
119	TYPE "K" MANHOLE	R-3455-C	3.07	6.95	0.85	0.61	5.00	7.20	3.73	0.36	0.40	0.40
120	TYPE "K" MANHOLE	R-3455-C	2.80	7.21	0.85	0.74	5.00	7.20	4.51	0.52	0.44	0.52
121	TYPE "K" MANHOLE	R-3455-C	2.94	7.35	0.85	0.74	5.00	7.20	4.51	0.52	0.44	0.52
122	TYPE "K" MANHOLE	R-3455-C	3.09	7.51	0.85	0.74	5.00	7.20	4.51	0.52	0.44	0.52
123	TYPE "L" MANHOLE	R-3455-C	2.72	7.68	0.85	0.74	5.00	7.20	4.51	0.52	0.44	0.52
124	TYPE "L" MANHOLE	R-3457-C2	2.87	7.82	0.82	0.95	5.00	7.20	5.58	0.15	0.41	0.41
125	TYPE "L" MANHOLE	R-3287-15	2.77	7.73	0.83	0.54	5.00	7.20	3.24	0.18	0.43	0.43
201	TYPE "C" MANHOLE	R-3455-C	2.51	4.22	0.67	0.84	8.68	5.99	3.37	0.29	0.37	0.37
202	TYPE "C" MANHOLE	R-3455-C	2.72	4.43	0.69	0.79	7.39	6.42	3.48	0.31	0.38	0.38
203	TYPE "J" MANHOLE	R-3455-C	2.31	5.64	0.72	0.69	5.00	7.20	3.54	0.32	0.38	0.38
204	TYPE "J" MANHOLE	R-3455-C	2.48	5.81	0.81	0.56	5.00	7.20	3.27	0.27	0.36	0.36
205	TYPE "J" MANHOLE	R-3455-C	2.67	6.01	0.81	0.56	5.00	7.20	3.26	0.27	0.36	0.36
206	TYPE "K" MANHOLE	R-3455-C	2.37	6.25	0.82	0.55	5.00	7.20	3.25	0.27	0.36	0.36
207	TYPE "K" MANHOLE	R-3455-C	2.49	6.37	0.85	0.53	5.00	7.20	3.24	0.27	0.36	0.36
208A	TYPE "A" INLET	R-4342	3.01	4.18	0.85	0.15	5.00	7.20	0.92	0.04	0.23	0.23
208	TYPE "K" MANHOLE	R-3472	2.49	6.37	0.51	0.36	5.00	7.20	1.32	0.18	0.25	0.25
209	TYPE "A" INLET	R-4342	2.51	3.68	0.79	0.22	5.00	7.20	1.27	0.07	0.28	0.28
210	TYPE "K" MANHOLE	R-3472	2.68	7.10	0.65	0.41	5.00	7.20	1.92	0.37	0.32	0.37
211	TYPE "A" INLET	R-4342	2.58	3.75	0.68	0.18	5.00	7.20	0.87	0.03	0.22	0.22
212	TYPE "A" INLET	R-3010	2.63	3.80	0.85	0.05	5.00	7.20	0.29	0.01	0.13	0.13
213	TYPE "K" MANHOLE	R-3010	5.82	10.23	0.85	0.08	5.00	7.20	0.47	0.04	0.18	0.18
214	TYPE "B" INLET	R-3287-15	2.61	4.05	0.73	0.53	5.00	7.20	2.79	0.13	0.39	0.39
215	TYPE "A" INLET	R-3010	2.52	3.69	0.79	0.17	5.00	7.20	0.97	0.16	0.28	0.28
216	TYPE "C" MANHOLE	R-3010	4.96	6.40	0.85	0.19	5.00	7.20	1.14	0.23	0.31	0.31
217	TYPE "K" MANHOLE	R-3472	6.56	10.97	0.82	0.35	5.00	7.20	2.07	0.44	0.33	0.44
218	TYPE "K" MANHOLE	R-3455-C	6.10	10.51	0.81	0.43	5.00	7.20	2.53	0.16	0.31	0.31
219	TYPE "J" INLET	R-3287-SB10	2.54	3.98	0.78	0.46	5.00	7.20	2.57	0.51	0.45	0.51
220	TYPE "A" INLET	R-3010	2.61	3.78	0.85	0.14	5.00	7.20	0.87	0.13	0.26	0.26
221	TYPE "C" MANHOLE	R-3010	4.10	5.54	0.85	0.15	5.00	7.20	0.93	0.15	0.27	0.27
222	TYPE "L" MANHOLE	R-3472	5.99	10.95	0.81	0.36	5.00	7.20	2.12	0.46	0.34	0.46
223	TYPE "L" MANHOLE	R-3455-C	6.18	11.14	0.81	0.41	5.00	7.20	2.43	0.15	0.30	0.30
224	TYPE "A" INLET	R-3010	2.70	3.86	0.85	0.12	5.00	7.20	0.73	0.09	0.23	0.23
225	TYPE "L" MANHOLE	R-3472	6.28	11.24	0.80	0.40	5.00	7.20	2.31	0.55	0.36	0.55
226	TYPE "L" MANHOLE	R-3010	6.31	11.27	0.85	0.14	5.00	7.20	0.83	0.12	0.25	0.25
227	TYPE "L" MANHOLE	R-3287-SB10	3.48	8.44	0.70	0.54	5.00	7.20	2.74	0.58	0.47	0.58
301	TYPE "J" MANHOLE	R-3287-15	2.51	3.95	0.83	0.60	5.00	7.20	3.57	0.22	0.46	0.46
302	TYPE "J" MANHOLE	R-3287-15	3.77	6.56	0.83	0.60	5.00	7.20	3.58	0.22	0.46	0.46
304	TYPE "J" MANHOLE	R-3287-15	2.52	3.96	0.75	0.65	5.00	7.20	3.54	0.21	0.46	0.46
305	TYPE "J" MANHOLE	R-3287-15	4.56	7.90	0.83	0.60	5.00	7.20	3.58	0.22	0.46	0.46
401	TYPE "B" INLET	R-3287-15	2.46	3.89	0.85	0.63	5.00	7.20	3.83	0.25	0.48	0.48
402	TYPE "C" MANHOLE	R-3287-SB10	2.62	4.33	0.85	0.31	5.00	7.20	1.90	0.28	0.38	0.38
403	TYPE "C" MANHOLE	R-3287-SB10	3.02	4.73	0.85	0.38	5.00	7.20	2.30	0.40	0.42	0.42
404	TYPE "C" MANHOLE	R-3287-SB10	3.22	5.47	0.85	0.38	5.00	7.20	2.30	0.40	0.42	0.42
405	TYPE "C" MANHOLE	R-3287-SB10	3.48	5.73	0.85	0.38	5.00	7.20	2.30	0.40	0.42	0.42
406	TYPE "C" MANHOLE	R-3287-SB10	3.84	6.09	0.85	0.38	5.00	7.20	2.30	0.40	0.42	0.42
407	TYPE "C" MANHOLE	R-3287-SB10	4.32	6.57	0.75	0.52	5.00	7.20	2.84	0.62	0.48	0.62
702	TYPE "J" MANHOLE	R-4342	4.76	8.10	0.30	0.51	5.00	7.20	1.11	0.05	0.25	0.25
703	TYPE "J" MANHOLE	R-4342	4.85	8.19	0.30	0.46	5.00	7.20	1.00	0.04	0.24	0.24
704	TYPE "J" MANHOLE	R-4342	8.28	11.62	0.30	0.22	5.00	7.20	0.47	0.01	0.15	0.15
705	TYPE "J" MANHOLE	R-1772	2.80	6.14	-	-	-	-	-	-	-	0.00
710	TYPE "E" INLET	R-4215-C	2.50	3.94	0.30	3.33	16.89	4.74	4.73	0.35	0.42	0.42

APPENDIX E

PROPOSED CONDITIONS – WATER QUALITY

PROPOSED STORMWATER SYSTEM
WATER QUALITY VOLUME CALCULATIONS

Job Information

Description: I-65 Logistics Center
Reviewing Entity: City of Franklin
Job Number: 2019.02798
Date: 03/19/21

Detention Pond

$$WQv = \frac{(P) * (Rv) * (A)}{12}$$

P = **1" rainfall**
Rv = **0.05 + 0.009(I) where I is the percent impervious cover**
A = **area in acres**

PARAMETERS

P =	1.00	(in)
Pervious Area	14.75	
Impervious Area	46.53	
I =	75.9%	(%)
Rv =	0.73	
A =	61.27	(acres)

CALCULATED WQv

WQv = **3.74 (ac-ft)**

163119.99 (ft^3)

	Pool				
	Stage	**Area**	**Incremental Volume**	**Volume**	
	(ft)	**(acre)**	**(acre-ft)**	**(acre-ft)**	
Below Normal Pool	700.00	4.53	0.00	0.00	
	708.92	6.16	47.68	47.68	
	709.92	6.79	6.48	54.16	
	710.42	6.89	3.42	57.58	
	Total Volume			57.58	> 11.23