TECHNICAL INFORMATION REPORT

PATCH LINVILLE WAY, LLC

FORMER-FRANKLIN SHELL BUILDING

March 8, 2021

Client/Owner:

Linville Way, LLC

Alex Chittenden

40 Linville Way

Franklin, IN 46131

Engineer:

Veridus Group, Inc.

Timothy M. Jensen, PE

6280 N. Shadeland Avenue, Suite A

Indianapolis, IN 46220

VERIDUS ENGINEERING

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Apendices

1. SITE LOCATION AND BACKGROUND

The project site is located on an approximately 13.112-acre parcel located at the northeast corner of Linville Way. and Graham Rd., Franklin, Indiana. The proposed project will be a parking lot addition of an overall industrial development that is planned for this property. Phase I included the construction of an approximately 50,400 square foot spec industrial building shell. This new phase includes the parking lot addition, and utility connections.

The project site is zoned IL, Industrial Light, by the City of Franklin. The proposed use is in compliance with the zoning. Figure 1 below is a location map and Figure 2 is a zoomed in aerial photograph showing the existing conditions of the site.

Figure 1

Figure 2


SITE
County Rd 250 E
Under One Woof
County Rd 250 E
Johnson County
Animal Shelter
Linville Way
Graham Rd
Airtomic Div. RBC
Premium Composite
Tech North
County Rd 250 E
Jays Fireworks
Shopping mall
Commerce Dr
Commerce Dr

2. EXISITNG CONDITIONS

Watershed/Flood Mapping

The site is located within the Young Creek-Ray Creek watershed and is located in Zone 'X' as indicated on the FEMA flood map in Appendix A.

Site Soils

The existing soils on the site are Brookston silty clay, Crosby silt loam, Fox complex, and Miami silt loam. Soils data is included in Appendix B.

Site Wetlands

There are no known wetlands or suspected areas within the project boundaries.

Existing Stormwater Runoff

In the existing condition, the site is partially developed. The site site has 3 drainage areas. The stormwater detention pond is designed to take 9.35-acres of the 13.2-acre site in a fully developed condition. Out of the 9.35-acres, the pond was designed to detain up to 6.744-acres of impervious surface. In the current conditions, there are 2.05 acres of impervious area out of the 9.35-acres total pond drainage area. The existing drainage areas are shown in Appendix C. The site includes a bypass as described in the previous drainage report. The previous drainage report can be found in Appendix D.

3. DEVELOPED CONDITIONS

In the developed condition, the existing drainage areas 1B and 1A will be slightly modified due to how the proposed drainage systems functions. Under proposed conditions the site the proposed parking additions will sheet flow West towards the detention basin, along with the rest of area 1A. Area 1B will still flow through an existing swale and pipe network, and into th existing ditch southeast of the Site. The new drainage areas are clearly shown in Appendix C.

Under the proposed conditions, the total impervious surface of the site flowing towards the pond will be 3.38 acres. The 3.38-acres of impervious is still under the detention basin design of 6.744-acres, so the proposed additions will be properly detained. Under the proposed conditions, Area 1B will have an additional 0.18 Acres of impervious, but it is still accounted for on the bypass design, per the 2017 drainage report. Additionally, there will be pond capacity for additional 3.184-acres of impervious surface for future additions left. The detention basin calculations are included with the previous drainage report in Appendix D.

4. WATER QUALITY TREATMENT

The wet detention basin will continue to provide water quality measures, as originally intended.

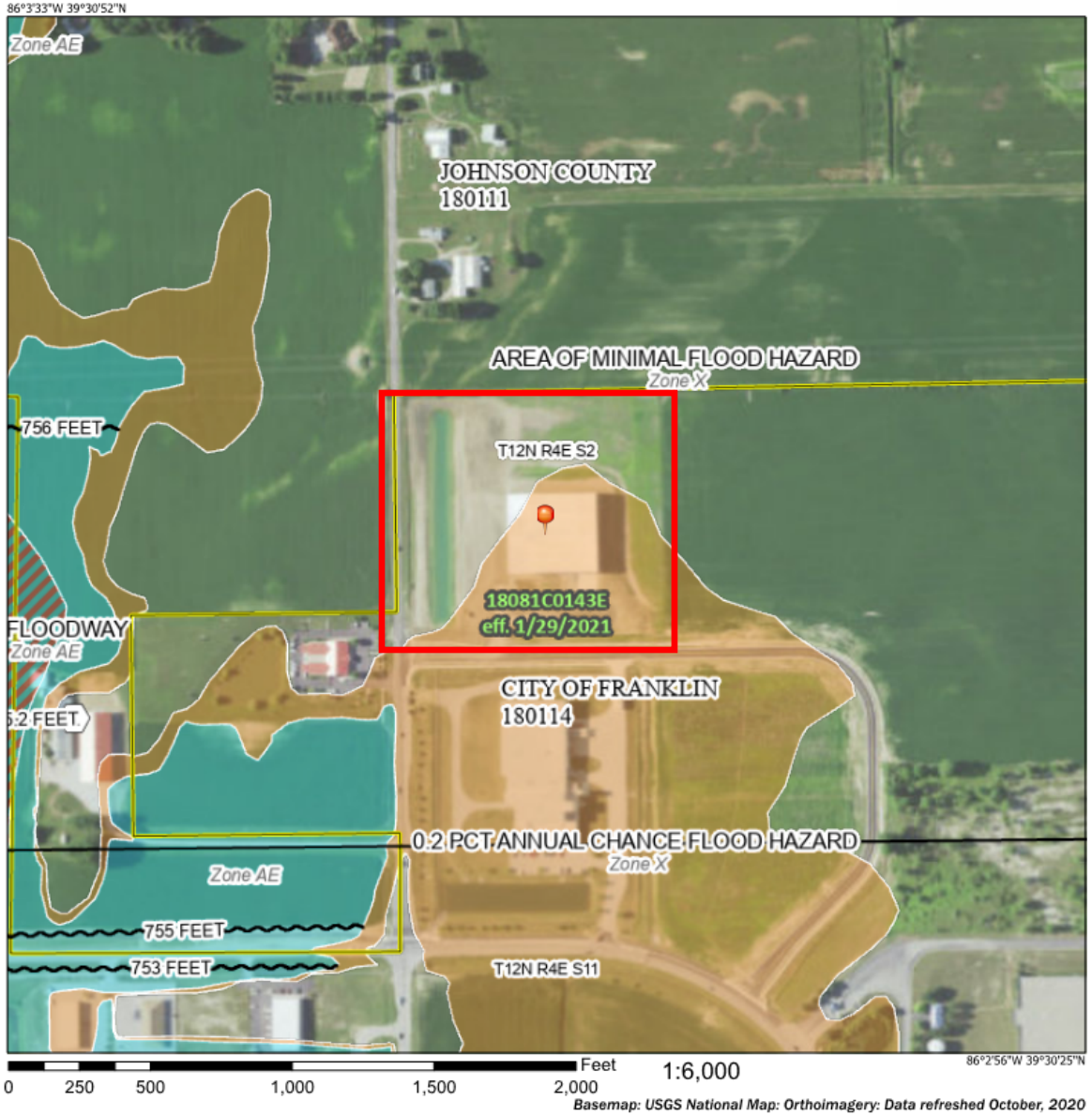
5. CONCLUSION

The existing detention basin was design to account for the proposed parking improvements, and other future additions. The design and analysis methods used in this study conform to the requirements of The City of Franklin Indiana Subdivision Control Ordinance and commonly accepted civil engineering practices. As proven, the allowable discharge rates have been satisfied. Therefore, no adverse effects are anticipated for adjacent or downstream land use.

Appendix A

FEMA Flood Zone Map

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
  - 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 3/1/2021 at 12:47 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.

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Appendix B

NRCS Soils Information


Hydrologic Soil Group—Johnson County, Indiana
3/1/2021
Page 1 of 4
CrA
GrA
Br
YbvA
YclA
MnC2
FrC2
Graham Rd
Soil Map may not be valid at this scale.
Web Soil Survey
National Cooperative Soil Survey
Natural Resources
Conservation Service
Map Scale: 1:2,270 if printed on A landscape (11" x 8.5") sheet.
Meters
Feet
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 28, Jun 4, 2020

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

Date(s) aerial images were photographed: Jul 27, 2019—Sep 26, 2019

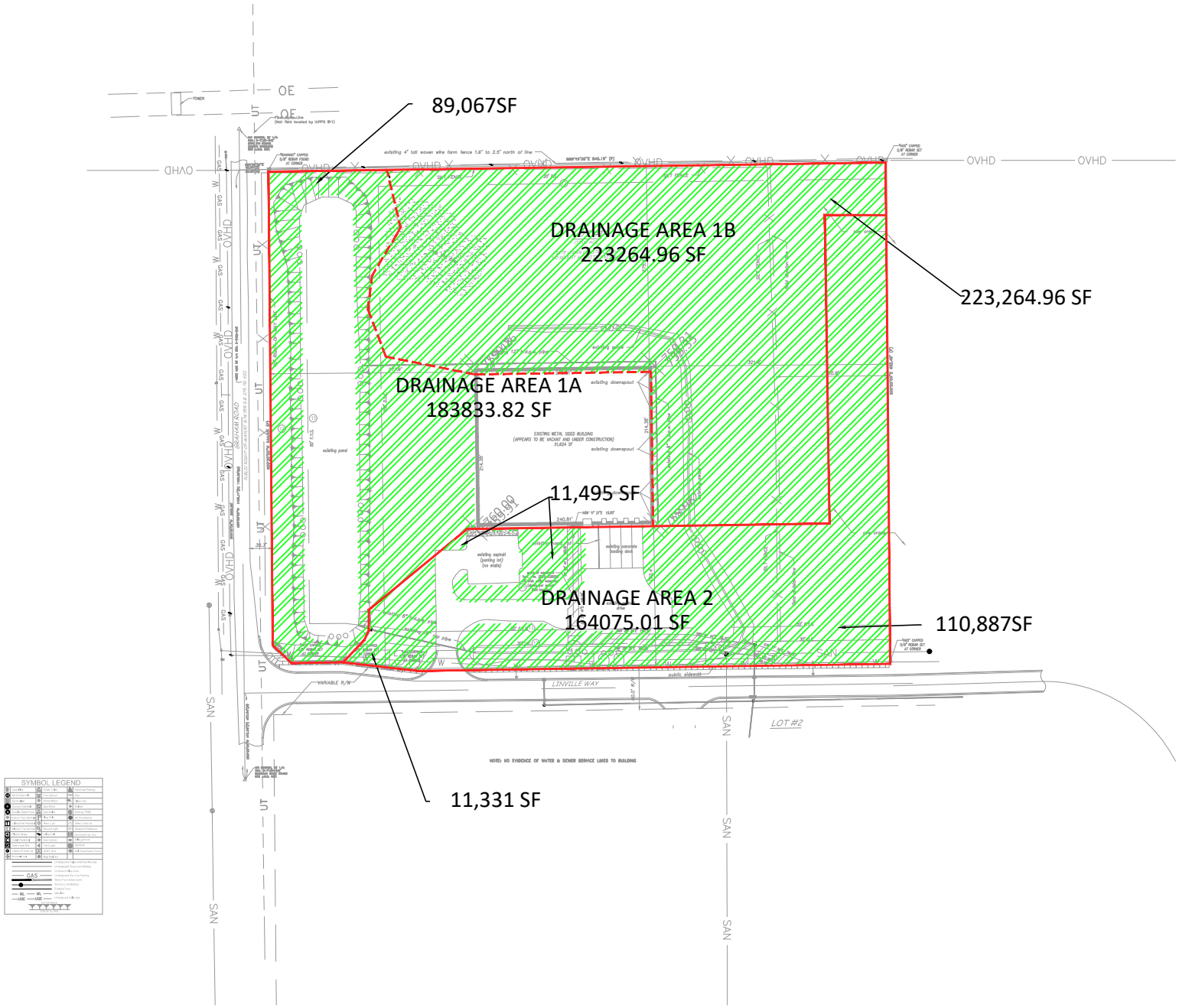
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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	10.9	54.8%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	5.9	29.6%
FxC2	Fox complex, 6 to 12 percent slopes, eroded	B	1.1	5.4%
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded	C	0.4	2.1%
YbvA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	B/D	1.5	7.7%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	0.1	0.5%
Totals for Area of Interest			**20.0**	**100.0%**

Appendix C

Areas Exhibits



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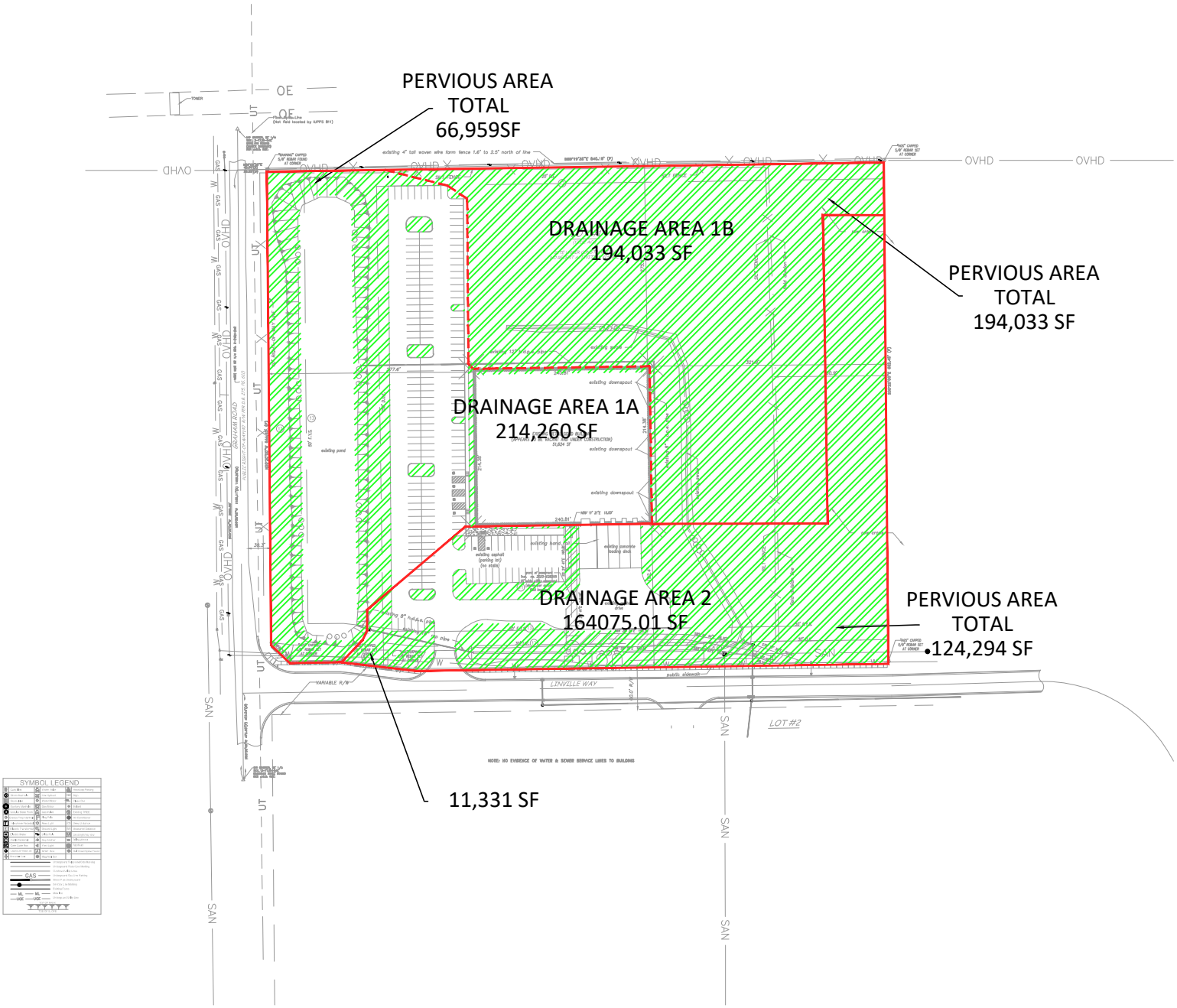
Phone: (317) 598-6647 | www.theveridusgroup.com

NORTH

EXISTING DRAINAGE AREAS
Scale: 1" = 200'



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NORTH

PROPOSED DRAINAGE AREAS
Scale: 1" = 200'

Appendix D

2017 Drainage Report

STORMWATER DRAINAGE TECHNICAL REPORT

For

Franklin Shell Building

40 Linville Way

Franklin, IN

By

Kristopher Holeyfield, PE

Veridus Group, Inc.

6280 N. Shadeland Avenue, Suite A

Indianapolis, IN 46220

September 18, 2017 – Revision 01

Original: July 13, 2017

Table of Contents

Project Narrative

The project site is located on an approximately 13.2-acre parcel located at the northeast corner of Musicland Dr. and Graham Rd., Franklin, Indiana. The proposed project will be the first phase of an overall industrial development that is planned for this property. Phase I includes the construction of an approximately 50,400 square foot spec industrial building. The proposed truck docks with face south towards Musicland Dr. and proposed employee parking is also located on the south side of the building.

The project site is zoned IL, Industrial Light, by the City of Franklin. The proposed use is in compliance with the zoning. Figure 1 below is a location map and Figure 2 is a zoomed in aerial photograph showing the existing conditions of the site.

Figure 1: Location Map

Figure 2: Existing Conditions

Existing Conditions

The property is currently vacant farmland. There is no floodplain on the property. Existing soils on the property are a mixture of Brookstone Silty Clay Loam (Br) and Crosby Silt Loam (CrA). Each of these soils are classified under the hydrologic soil group B and C respectively. Refer to the Appendix for FEMA floodplain information, soil map, and soil information.

Proposed Conditions

The runoff rate for the development was determined using the HydroCAD computer software modeling hydrographs based on the NRCS TR-55 time of concentration and curve number calculation methodologies. Curve numbers for pre-development conditions were determined using the hydrologic soil group B. Curve numbers for post-development conditions were determined using the hydrologic soil group D. The 24-hour NRCS Type 2 Rainfall Distribution was utilized for runoff calculations. Rainfall data was pulled from NOAA to determine the rainfall depths. Please refer to the appendix for the NOAA rainfall information.

Storm Sewers

A majority of the current site surface flows into the stormwater detention basin or vegetative swales. The underground storm sewers provided convey roof drainage and detention outfall flows. These systems were designed to handle the peak runoff from a 24-hour, 10-year frequency storm. Reinforced concrete pipe (RCP) and High-Density Polyethylene (HDPE) are proposed on site and maintain 2.0-ft of cover.

Drainage Overflow Design

The stormwater detention basin will overflow into the outlet structure and southeast towards the proposed road. This path will be updated once the road design is complete and the vertical curves and sags are identified.

Stormwater Quantity

The stormwater detention pond is designed to take 9.35-acres of the 13.2-acre site in a fully developed condition. Using a hydrologic soil group B and under the pasture properties, the CN for the pre-developed property is 61. Based on a hydrologic soil group D, pervious, and impervious areas, the weighted CN for the fully developed property is 93. The building, pavement, future pavement, and future building were considered impervious and have a CN of 98. The remaining pervious area had a CN value of 80. Refer to the hydrocad report in the appendix for a breakdown of these areas.

Given this information, the total watershed for the proposed ponds is 9.35-acres. The pond is designed to release the post 10-yr event at the pre 2-yr rates and the post 100-yr event at the pre 10-yr rates. The allowable and proposed discharges are as follows:

	Allowable Discharge	Proposed Discharge	Water Surface Elevation	Storage (cu. Ft.)
10-year	3.36-cfs	2.37-cfs	755.46	69,438
100-year	12.44-cfs	3.91-cfs	756.12	105,149
Normal Pool			754.00	

Two 8" storm pipes will control the release of the 10-yr and 100-yr storm events. Refer to the construction details and hydrocad report for additional weir information.

Bypass: Since a portion of the site does not drain directly to the pond, it has been oversized to account for the bypass. 3.85-acres bypass the site in the future condition. The bypass is designed to the current phased condition since it is the most stringent phase. When the complete project is built out, a majority of the bypass watershed will be picked up with roof drainage and piped to the proposed pond. The proposed pond is designed to account for this flow.

Since the pond is discharging at the 100-yr condition 3.91-cfs, a total peak flow of 8.53-cfs is allowed from the bypass watershed. Using an 12" pipe to control the peak flow into the Linville Way stormwater system, the 100-yr release peak flow for the bypass area is 5.93-cfs, less than what is allowed. Please refer to the hydrocad report and drainage area exhibit for details.

Stormwater Quality

The wet detention pond provides the stormwater quality measures.

Conclusion

The design and analysis methods used in this study conform to the requirements of The City of Franklin Indiana Subdivision Control Ordinance and commonly accepted civil engineering practices. As proven, the allowable discharge rates have been satisfied. Therefore, no adverse effects are anticipated for adjacent or downstream land use.

Appendix A: FEMA floodplain map

MAP SCALE 1 " = 500 '

250 0 500 1000 FEET

0 150 300 METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0143D

FIRM

FLOOD INSURANCE RATE MAP

JOHNSON COUNTY, INDIANA

AND INCORPORATED AREAS

PANEL 143 OF 352

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

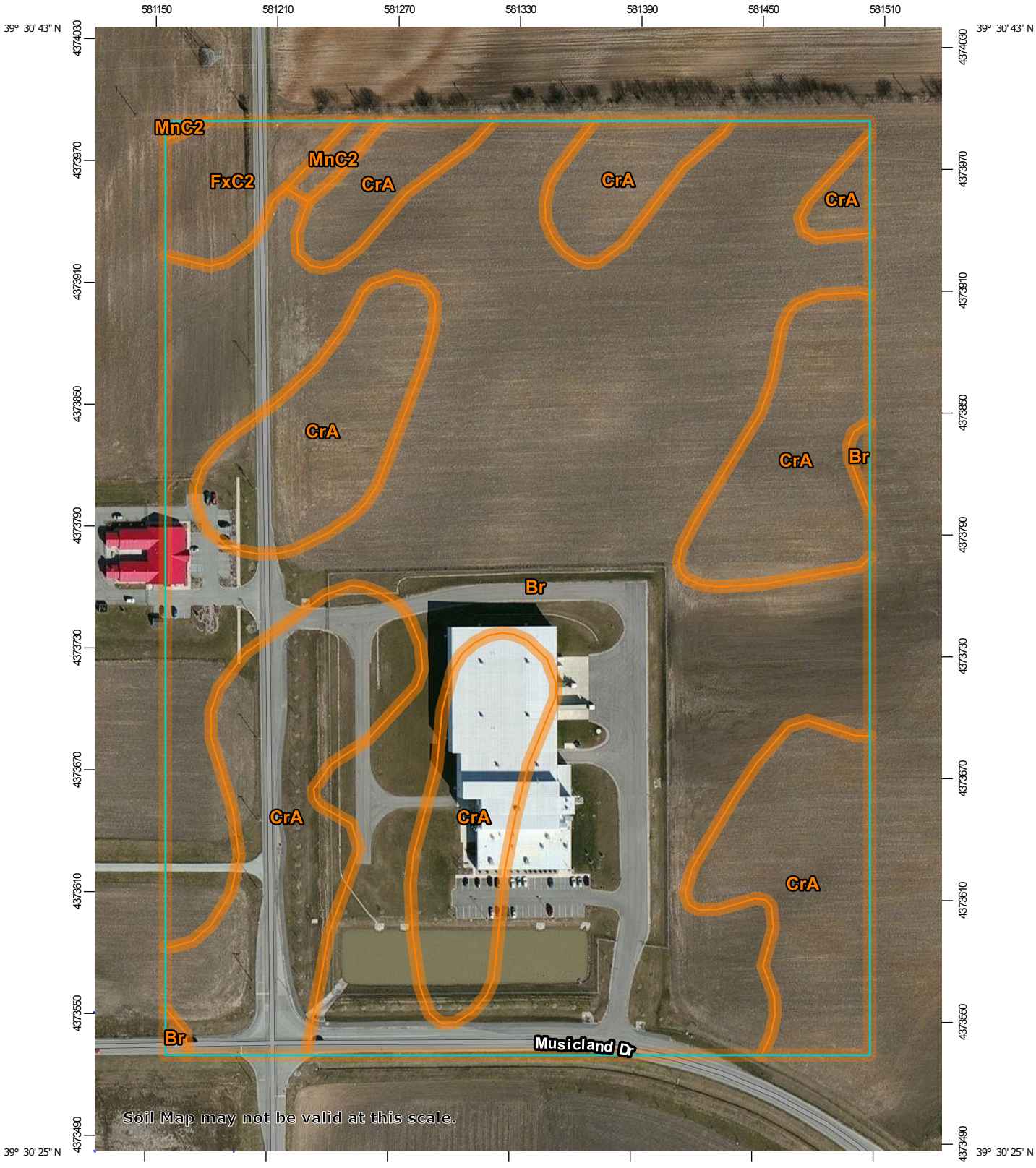
COMMUNITY	NUMBER	PANEL	SUFFIX
FRANKLIN, CITY OF	180114	0143	D
JOHNSON COUNTY	180111	0143	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18081C0143D
EFFECTIVE DATE
AUGUST 2, 2007

Federal Emergency Management Agency

Appendix B: NRCS Soil Map and Soil Information



Map Scale: 1:2,700 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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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)

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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 24, Sep 15, 2016

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

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

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

Map Unit Legend

Johnson County, Indiana (IN081)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Br	Brookston silty clay loam, 0 to 2 percent slopes	24.1	60.6%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	14.4	36.3%
FxC2	Fox complex, 6 to 12 percent slopes, eroded	1.0	2.6%
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded	0.2	0.5%
Totals for Area of Interest		**39.7**	**100.0%**

Johnson County, Indiana

Br—Brookston silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t98n
Elevation: 600 to 1,260 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Brookston and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brookston

Setting

Landform: Depressions, till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 16 inches: silty clay loam
Btg1 - 16 to 32 inches: silty clay loam
Btg2 - 32 to 44 inches: loam
C - 44 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Crosby
Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 24, Sep 15, 2016

Johnson County, Indiana

CrA—Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy4
Elevation: 600 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 49 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Crosby and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Crosby

Setting

Landform: Ground moraines, recessionial moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 10 inches: silt loam
Btg - 10 to 17 inches: silty clay loam
2Bt - 17 to 29 inches: clay loam
2BCt - 29 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 55 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Williamstown, eroded

Percent of map unit: 5 percent
Landform: Ground moraines, recessional moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Treaty, drained

Percent of map unit: 2 percent
Landform: Depressions, swales, water-lain moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 24, Sep 15, 2016

Appendix E: Detention Calculations (HydroCAD Report)

NOAA Atlas 14, Volume 2, Version 3
Location name: Franklin, Indiana, USA*
Latitude: 39.5107°, Longitude: -86.0542°
Elevation: 755.79 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** (0.333-0.422)	**0.444** (0.396-0.501)	**0.532** (0.472-0.601)	**0.601** (0.532-0.678)	**0.692** (0.608-0.781)	**0.763** (0.666-0.863)	**0.832** (0.719-0.944)	**0.905** (0.775-1.03)	**1.00** (0.844-1.15)	**1.07** (0.891-1.24)
10-min	**0.580** (0.517-0.655)	**0.693** (0.618-0.783)	**0.827** (0.734-0.933)	**0.928** (0.822-1.05)	**1.06** (0.930-1.20)	**1.16** (1.01-1.31)	**1.25** (1.08-1.42)	**1.35** (1.16-1.54)	**1.47** (1.24-1.69)	**1.56** (1.30-1.81)
15-min	**0.711** (0.634-0.803)	**0.848** (0.755-0.957)	**1.01** (0.902-1.15)	**1.14** (1.01-1.29)	**1.31** (1.15-1.48)	**1.43** (1.25-1.62)	**1.56** (1.35-1.77)	**1.68** (1.44-1.91)	**1.84** (1.55-2.11)	**1.96** (1.62-2.26)
30-min	**0.940** (0.839-1.06)	**1.13** (1.01-1.28)	**1.39** (1.24-1.57)	**1.59** (1.40-1.79)	**1.85** (1.62-2.09)	**2.05** (1.79-2.31)	**2.25** (1.94-2.55)	**2.45** (2.10-2.79)	**2.73** (2.29-3.12)	**2.93** (2.43-3.38)
60-min	**1.15** (1.02-1.30)	**1.39** (1.24-1.57)	**1.74** (1.55-1.97)	**2.02** (1.79-2.28)	**2.40** (2.11-2.70)	**2.70** (2.35-3.05)	**3.01** (2.60-3.41)	**3.33** (2.85-3.79)	**3.77** (3.17-4.32)	**4.12** (3.42-4.75)
2-hr	**1.34** (1.20-1.52)	**1.62** (1.45-1.84)	**2.04** (1.82-2.31)	**2.38** (2.10-2.69)	**2.85** (2.50-3.21)	**3.23** (2.81-3.65)	**3.64** (3.13-4.11)	**4.07** (3.45-4.61)	**4.68** (3.89-5.33)	**5.17** (4.22-5.93)
3-hr	**1.42** (1.27-1.62)	**1.72** (1.53-1.95)	**2.17** (1.93-2.46)	**2.53** (2.24-2.86)	**3.05** (2.67-3.44)	**3.47** (3.01-3.92)	**3.93** (3.36-4.45)	**4.41** (3.72-5.01)	**5.11** (4.21-5.84)	**5.67** (4.58-6.53)
6-hr	**1.70** (1.51-1.94)	**2.05** (1.82-2.35)	**2.59** (2.29-2.95)	**3.03** (2.67-3.45)	**3.66** (3.19-4.16)	**4.19** (3.62-4.75)	**4.76** (4.05-5.40)	**5.37** (4.50-6.11)	**6.25** (5.11-7.14)	**6.97** (5.59-8.02)
12-hr	**2.03** (1.82-2.30)	**2.44** (2.19-2.76)	**3.04** (2.72-3.43)	**3.52** (3.14-3.98)	**4.20** (3.71-4.72)	**4.77** (4.17-5.35)	**5.36** (4.63-6.02)	**5.98** (5.09-6.74)	**6.85** (5.72-7.78)	**7.56** (6.20-8.63)
24-hr	**2.43** (2.24-2.65)	**2.91** (2.68-3.18)	**3.57** (3.28-3.89)	**4.08** (3.75-4.44)	**4.77** (4.36-5.20)	**5.32** (4.85-5.80)	**5.88** (5.33-6.41)	**6.44** (5.81-7.04)	**7.21** (6.44-7.90)	**7.80** (6.93-8.72)
2-day	**2.85** (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)	**6.74** (6.12-7.32)	**7.36** (6.66-8.02)	**8.20** (7.36-8.95)	**8.85** (7.88-9.70)
3-day	**3.05** (2.84-3.28)	**3.64** (3.39-3.92)	**4.42** (4.11-4.75)	**5.02** (4.66-5.39)	**5.82** (5.39-6.26)	**6.45** (5.95-6.94)	**7.09** (6.51-7.63)	**7.73** (7.07-8.33)	**8.59** (7.81-9.27)	**9.25** (8.36-10.0)
4-day	**3.26** (3.05-3.48)	**3.88** (3.64-4.15)	**4.68** (4.38-5.00)	**5.30** (4.96-5.66)	**6.14** (5.72-6.55)	**6.79** (6.32-7.23)	**7.44** (6.91-7.94)	**8.11** (7.49-8.64)	**8.99** (8.26-9.59)	**9.66** (8.84-10.3)
7-day	**3.86** (3.60-4.14)	**4.59** (4.28-4.92)	**5.50** (5.13-5.90)	**6.23** (5.80-6.67)	**7.22** (6.70-7.72)	**7.99** (7.40-8.54)	**8.78** (8.11-9.39)	**9.58** (8.82-10.2)	**10.7** (9.77-11.4)	**11.5** (10.5-12.3)
10-day	**4.40** (4.12-4.71)	**5.23** (4.90-5.59)	**6.25** (5.86-6.68)	**7.06** (6.61-7.54)	**8.16** (7.61-8.70)	**9.02** (8.40-9.62)	**9.89** (9.19-10.5)	**10.8** (9.97-11.5)	**12.0** (11.0-12.8)	**12.9** (11.8-13.8)
20-day	**6.04** (5.69-6.42)	**7.14** (6.72-7.60)	**8.42** (7.92-8.96)	**9.42** (8.84-10.0)	**10.7** (10.1-11.4)	**11.8** (11.0-12.5)	**12.8** (11.9-13.5)	**13.8** (12.8-14.6)	**15.1** (13.9-16.0)	**16.0** (14.8-17.1)
30-day	**7.43** (7.01-7.87)	**8.75** (8.25-9.27)	**10.2** (9.59-10.8)	**11.3** (10.6-12.0)	**12.7** (12.0-13.5)	**13.8** (13.0-14.6)	**14.9** (13.9-15.8)	**16.0** (14.9-16.9)	**17.3** (16.1-18.4)	**18.3** (17.0-19.5)
45-day	**9.43** (8.88-9.98)	**11.1** (10.4-11.7)	**12.8** (12.0-13.5)	**14.1** (13.2-14.9)	**15.7** (14.8-16.6)	**17.0** (15.9-18.0)	**18.2** (17.0-19.2)	**19.3** (18.0-20.5)	**20.8** (19.3-22.0)	**21.8** (20.2-23.2)
60-day	**11.3** (10.6-11.9)	**13.2** (12.4-14.0)	**15.1** (14.2-16.0)	**16.6** (15.6-17.6)	**18.5** (17.4-19.6)	**19.9** (18.7-21.1)	**21.3** (19.9-22.6)	**22.6** (21.1-24.0)	**24.3** (22.6-25.7)	**25.5** (23.7-27.1)

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

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

Please refer to NOAA Atlas 14 document for more information.

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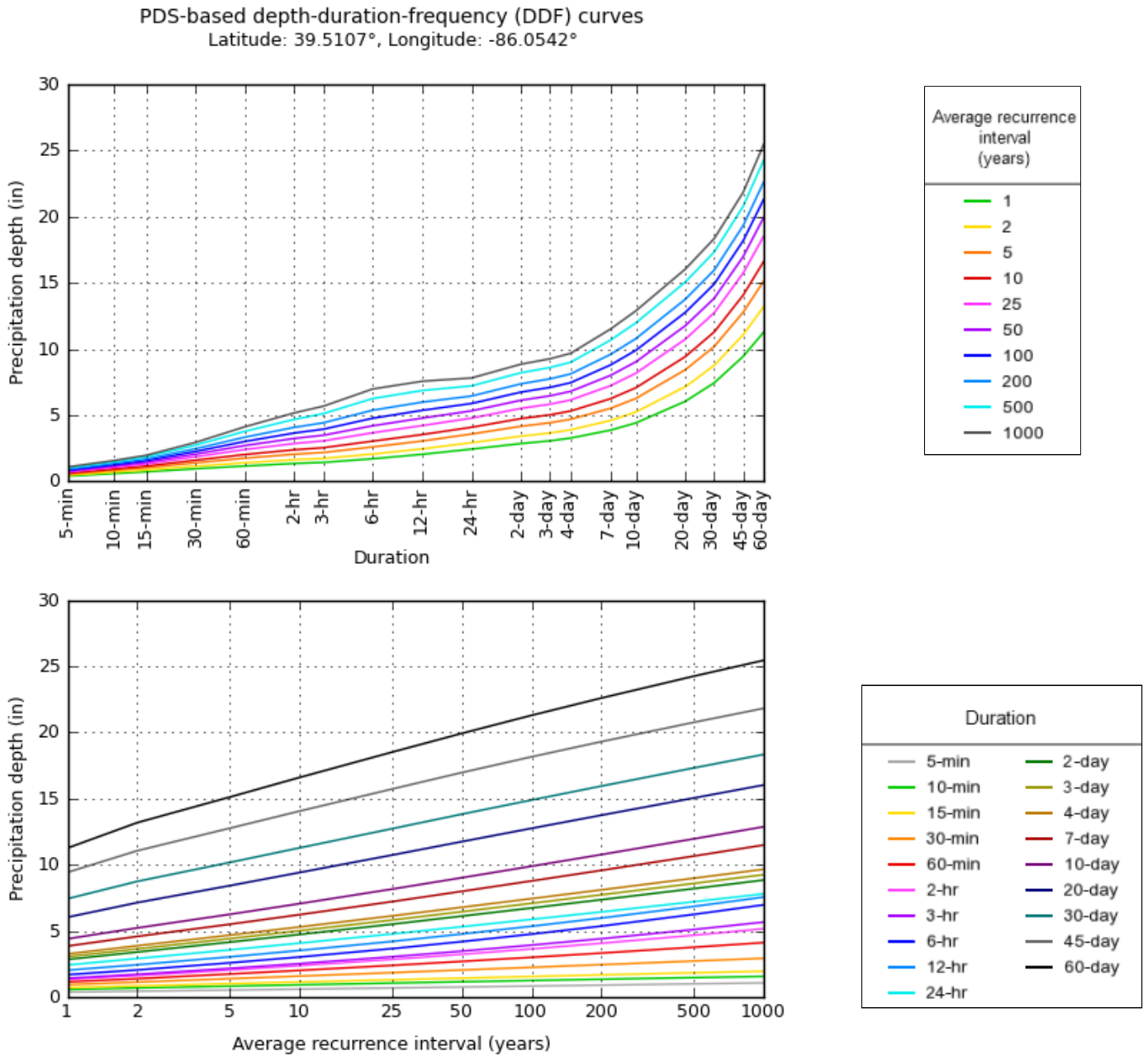
PF graphical



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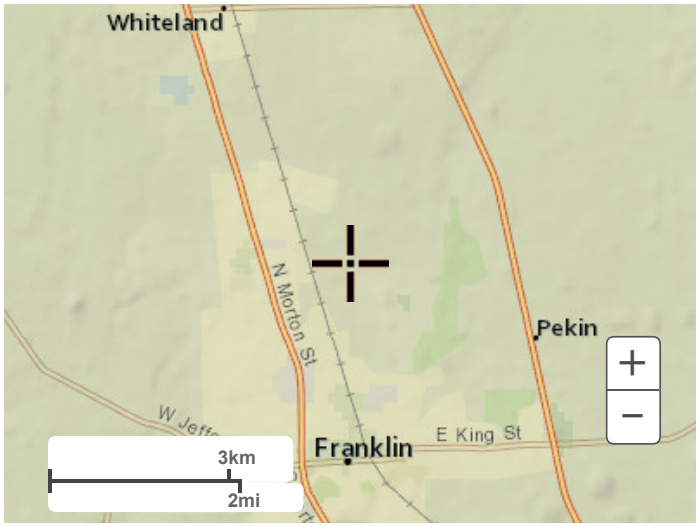
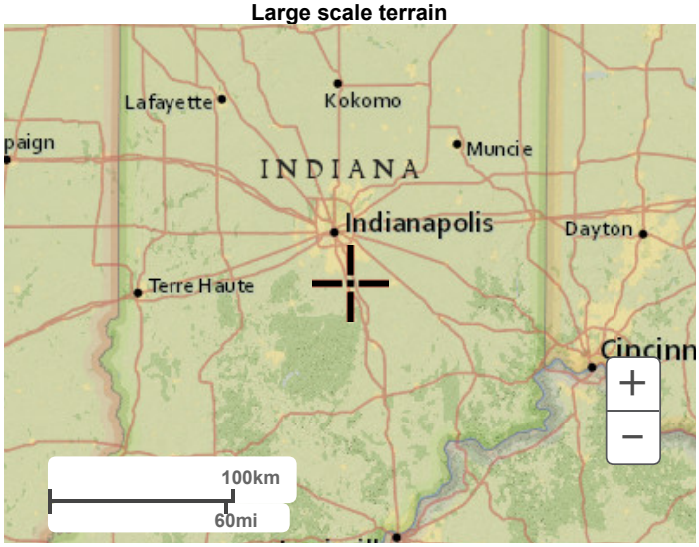
Maps & aerials

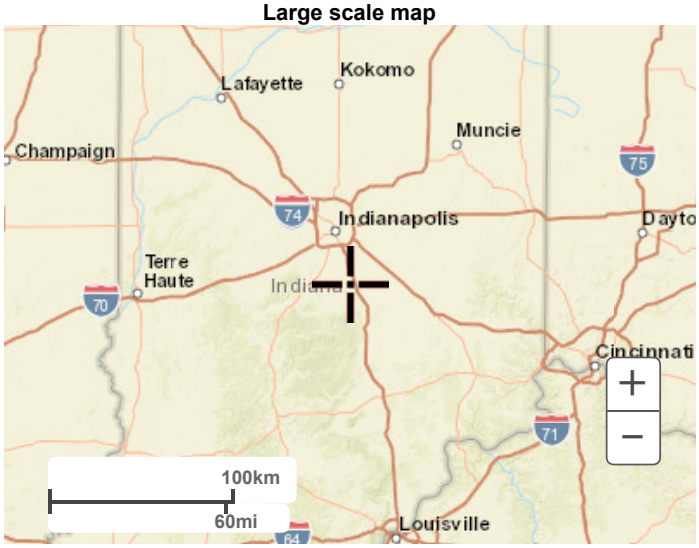
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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National Water Center
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Disclaimer

Summary for Subcatchment EX: Existing

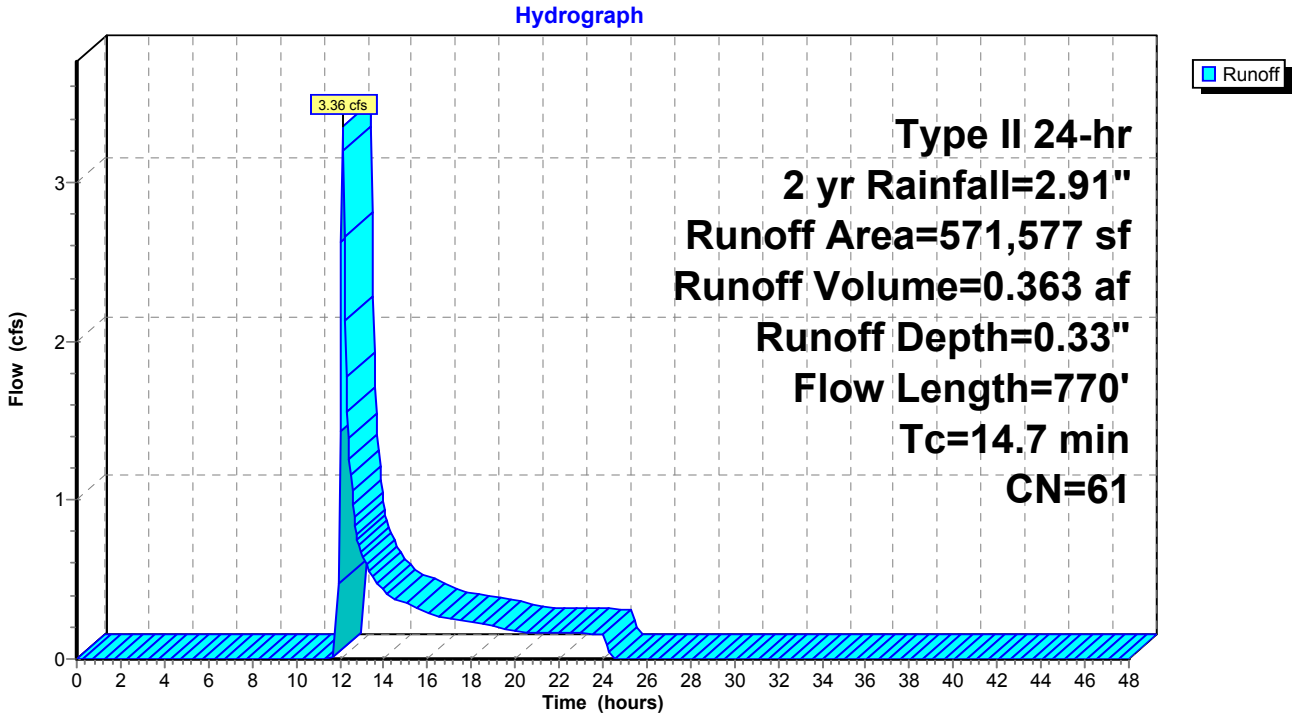
Runoff = 3.36 cfs @ 12.12 hrs, Volume= 0.363 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 yr Rainfall=2.91"

Area (sf)	CN	Description
571,577	61	Pasture/grassland/range, Good, HSG B
571,577		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	20	0.0500	0.19		**Sheet Flow,** Range n= 0.130 P2= 2.91"
12.9	750	0.0036	0.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.7	770	Total			

Subcatchment EX: Existing



Summary for Subcatchment EX: Existing

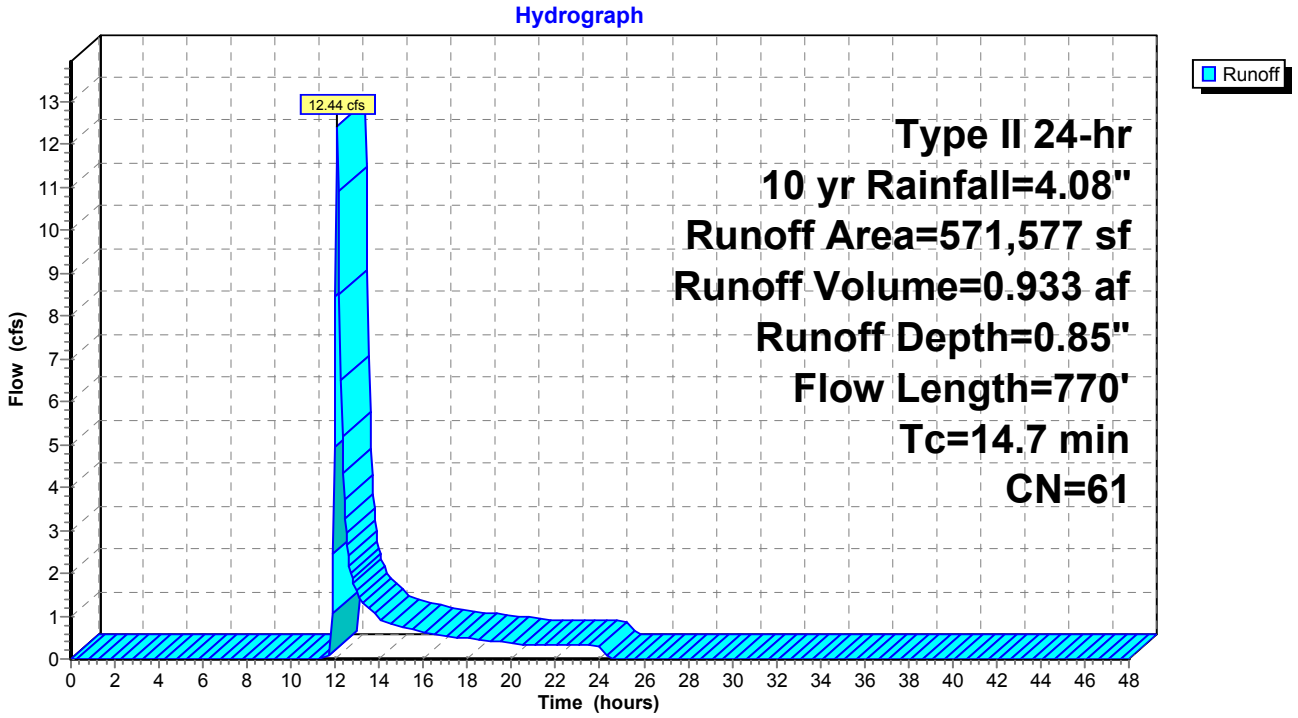
Runoff = 12.44 cfs @ 12.09 hrs, Volume= 0.933 af, Depth= 0.85"

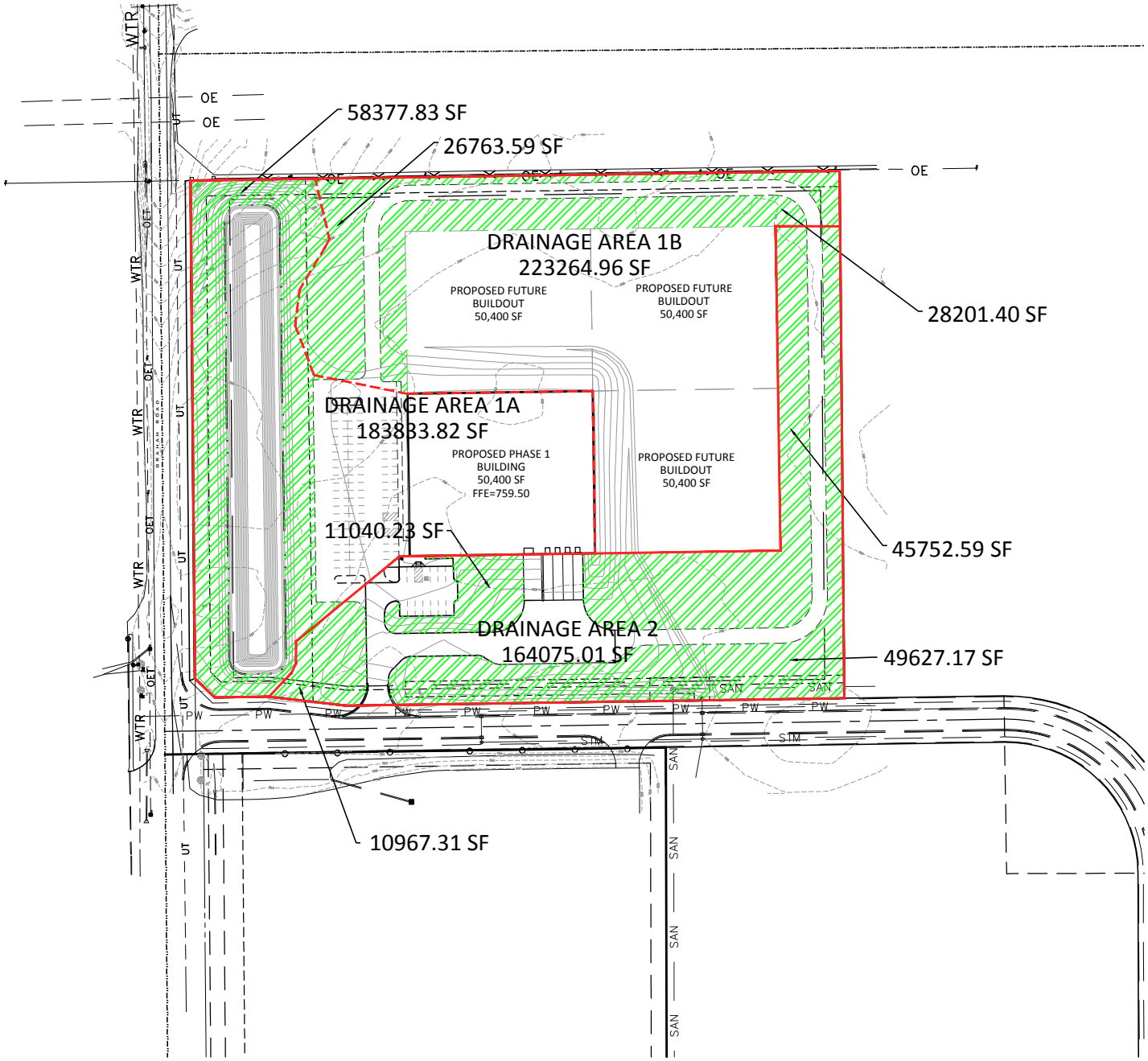
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Rainfall=4.08"

Area (sf)	CN	Description
571,577	61	Pasture/grassland/range, Good, HSG B
571,577		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	20	0.0500	0.19		**Sheet Flow,** Range n= 0.130 P2= 2.91"
12.9	750	0.0036	0.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
14.7	770	Total			

Subcatchment EX: Existing





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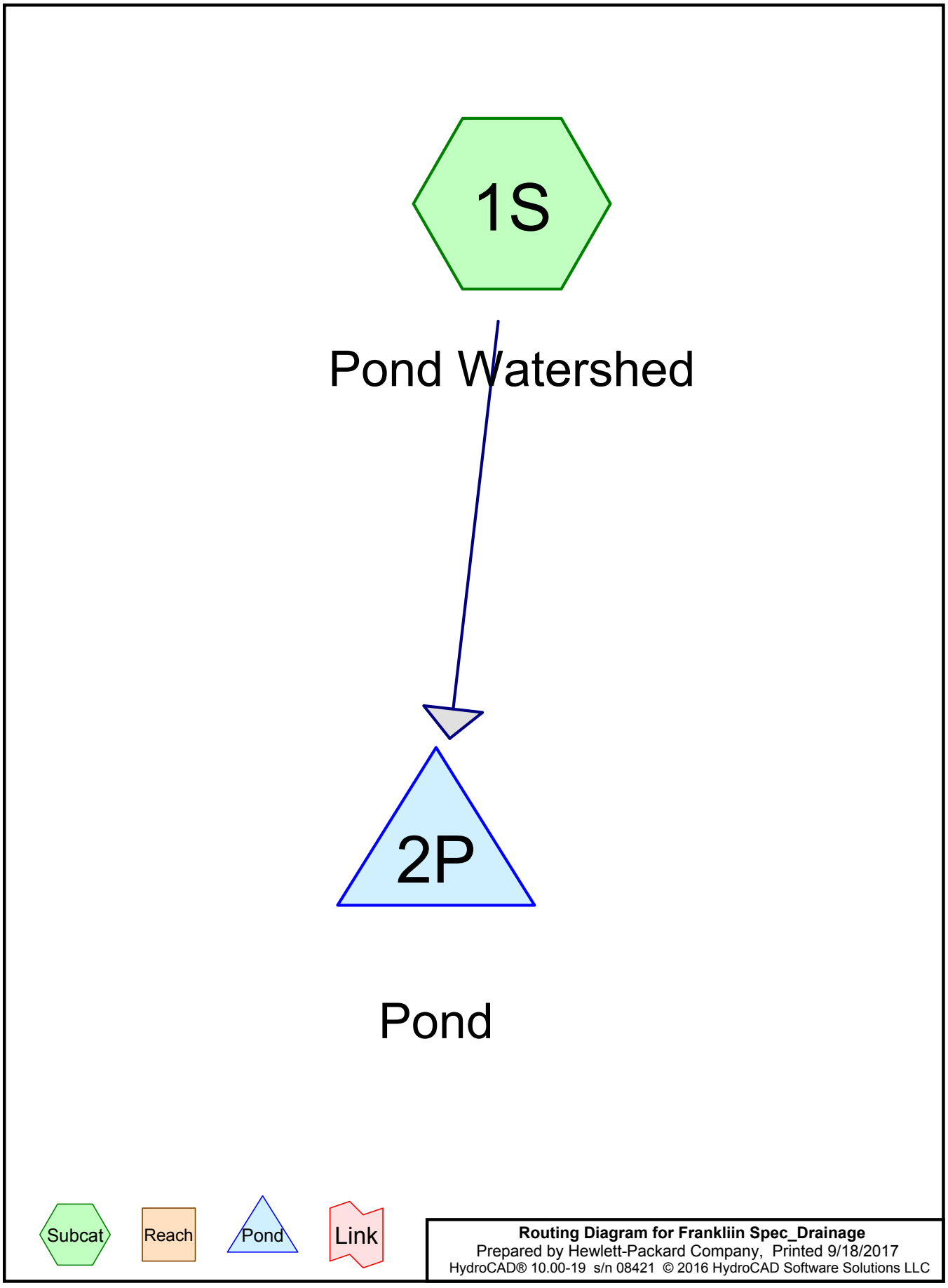
NORTH

PROPOSED DRAINAGE AREAS
Scale: 1" = 200'



Routing Diagram for Frankliin Spec_Drainage
Prepared by Hewlett-Packard Company, Printed 9/18/2017

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.602	80	>75% Grass cover, Good, HSG D (1S)
6.744	98	Paved parking, HSG D (1S)
9.346	**93**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
9.346	HSG D	1S
0.000	Other	
9.346		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	2.602	0.000	2.602	>75% Grass cover, Good	1S
0.000	0.000	0.000	6.744	0.000	6.744	Paved parking	1S
0.000	**0.000**	**0.000**	**9.346**	**0.000**	**9.346**	**TOTAL AREA**	

Summary for Subcatchment 1S: Pond Watershed

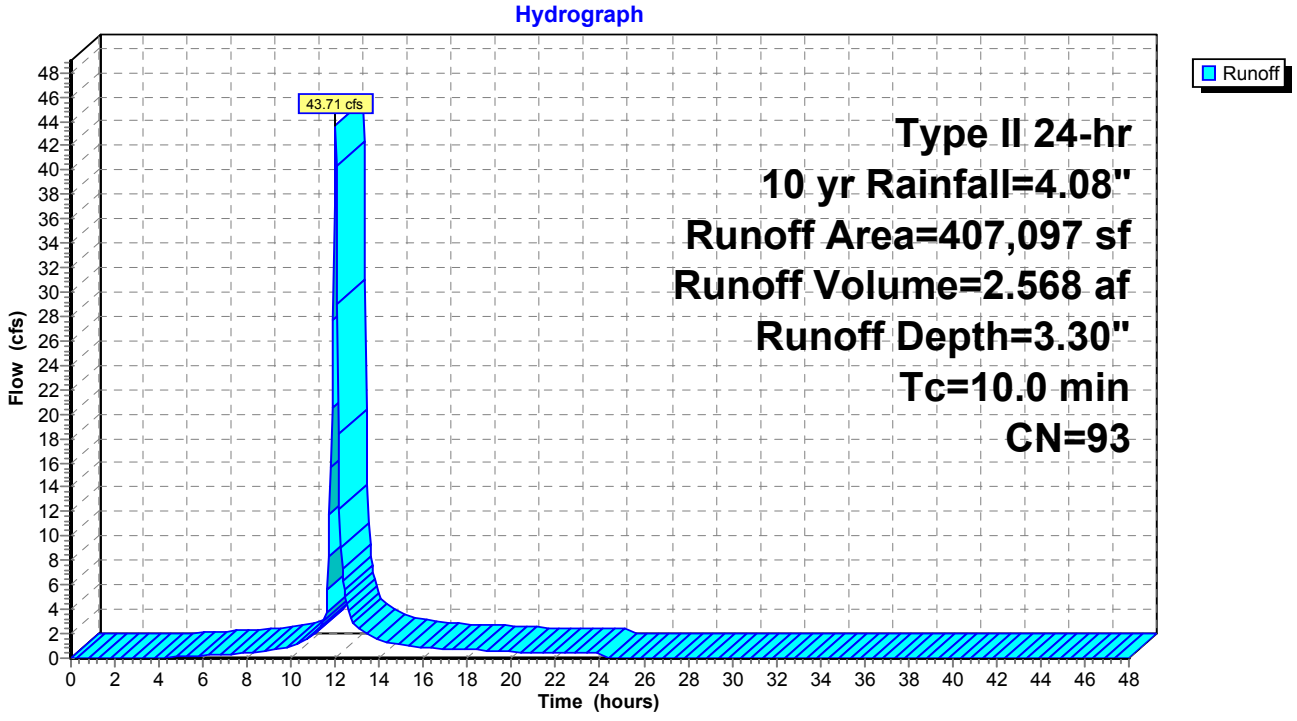
Runoff = 43.71 cfs @ 12.01 hrs, Volume= 2.568 af, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Rainfall=4.08"

Area (sf)	CN	Description
293,756	98	Paved parking, HSG D
113,341	80	>75% Grass cover, Good, HSG D
407,097	93	Weighted Average
113,341		27.84% Pervious Area
293,756		72.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Pond Watershed



Summary for Pond 2P: Pond

Inflow Area = 9.346 ac, 72.16% Impervious, Inflow Depth = 3.30" for 10 yr event
Inflow = 43.71 cfs @ 12.01 hrs, Volume= 2.568 af
Outflow = 2.37 cfs @ 13.10 hrs, Volume= 2.427 af, Atten= 95%, Lag= 65.4 min
Primary = 2.37 cfs @ 13.10 hrs, Volume= 2.427 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 755.46' @ 13.10 hrs Surf.Area= 51,683 sf Storage= 69,438 cf

Plug-Flow detention time= 495.8 min calculated for 2.424 af (94% of inflow)
Center-of-Mass det. time= 465.2 min (1,250.2 - 785.0)

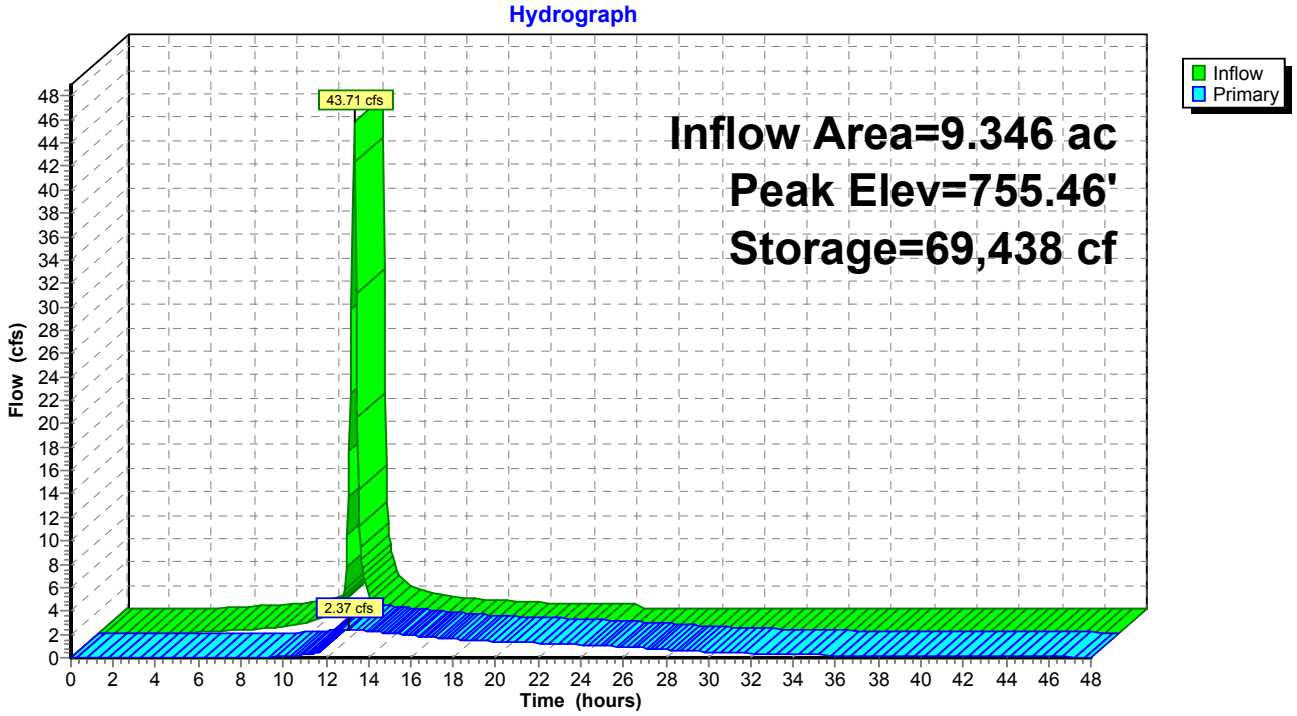
Volume	Invert	Avail.Storage	Storage Description
#1	754.00'	186,531 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.00	43,711	0	0
757.50	62,878	186,531	186,531

Device	Routing	Invert	Outlet Devices
#1	Primary	753.96'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	754.00'	**8.0" Vert. Orifice/Grate** X 2 rows with 12.0" cc spacing C= 0.600
#3	Device 1	755.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.37 cfs @ 13.10 hrs HW=755.46' (Free Discharge)
↑└─**1=Orifice/Grate** (Passes 2.37 cfs of 7.36 cfs potential flow)
↑ ├─**2=Orifice/Grate** (Orifice Controls 2.37 cfs @ 3.92 fps)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: Pond


Hydrograph
Inflow
Primary
43.71 cfs
2.37 cfs
Inflow Area=9.346 ac
Peak Elev=755.46'
Storage=69,438 cf
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Stage-Discharge for Pond 2P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
754.00	0.00	755.02	1.39	756.04	3.68	757.06	6.51
754.02	0.00	755.04	1.42	756.06	3.73	757.08	6.55
754.04	0.01	755.06	1.45	756.08	3.78	757.10	6.59
754.06	0.01	755.08	1.48	756.10	3.84	757.12	6.63
754.08	0.02	755.10	1.51	756.12	3.90	757.14	6.68
754.10	0.04	755.12	1.54	756.14	3.96	757.16	6.72
754.12	0.05	755.14	1.58	756.16	4.02	757.18	6.76
754.14	0.07	755.16	1.62	756.18	4.08	757.20	6.79
754.16	0.09	755.18	1.66	756.20	4.15	757.22	6.83
754.18	0.11	755.20	1.70	756.22	4.21	757.24	6.87
754.20	0.13	755.22	1.74	756.24	4.28	757.26	6.91
754.22	0.16	755.24	1.79	756.26	4.34	757.28	6.95
754.24	0.19	755.26	1.84	756.28	4.41	757.30	6.99
754.26	0.22	755.28	1.89	756.30	4.48	757.32	7.03
754.28	0.25	755.30	1.94	756.32	4.55	757.34	7.06
754.30	0.28	755.32	1.99	756.34	4.62	757.36	7.10
754.32	0.32	755.34	2.04	756.36	4.69	757.38	7.14
754.34	0.36	755.36	2.10	756.38	4.76	757.40	7.17
754.36	0.39	755.38	2.15	756.40	4.83	757.42	7.21
754.38	0.43	755.40	2.21	756.42	4.90	757.44	7.25
754.40	0.47	755.42	2.26	756.44	4.97	757.46	7.28
754.42	0.51	755.44	2.32	756.46	5.03	757.48	7.32
754.44	0.55	755.46	2.38	756.48	5.10	757.50	**7.36**
754.46	0.59	755.48	2.43	756.50	5.16		
754.48	0.63	755.50	2.49	756.52	5.22		
754.50	0.68	755.52	2.55	756.54	5.28		
754.52	0.72	755.54	2.60	756.56	5.33		
754.54	0.76	755.56	2.66	756.58	5.39		
754.56	0.80	755.58	2.71	756.60	5.44		
754.58	0.84	755.60	2.76	756.62	5.49		
754.60	0.87	755.62	2.81	756.64	5.55		
754.62	0.91	755.64	2.86	756.66	5.60		
754.64	0.94	755.66	2.90	756.68	5.65		
754.66	0.96	755.68	2.94	756.70	5.70		
754.68	0.99	755.70	2.98	756.72	5.75		
754.70	1.02	755.72	3.02	756.74	5.80		
754.72	1.05	755.74	3.07	756.76	5.85		
754.74	1.07	755.76	3.11	756.78	5.89		
754.76	1.10	755.78	3.14	756.80	5.94		
754.78	1.12	755.80	3.18	756.82	5.99		
754.80	1.15	755.82	3.22	756.84	6.03		
754.82	1.17	755.84	3.26	756.86	6.08		
754.84	1.20	755.86	3.30	756.88	6.12		
754.86	1.22	755.88	3.33	756.90	6.17		
754.88	1.24	755.90	3.37	756.92	6.21		
754.90	1.27	755.92	3.41	756.94	6.26		
754.92	1.29	755.94	3.45	756.96	6.30		
754.94	1.31	755.96	3.49	756.98	6.34		
754.96	1.33	755.98	3.53	757.00	6.39		
754.98	1.35	756.00	3.58	757.02	6.43		
755.00	1.37	756.02	3.63	757.04	6.47		

Stage-Area-Storage for Pond 2P: Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
754.00	43,711	0
754.05	43,985	2,192
754.10	44,259	4,398
754.15	44,532	6,618
754.20	44,806	8,852
754.25	45,080	11,099
754.30	45,354	13,360
754.35	45,628	15,634
754.40	45,902	17,923
754.45	46,175	20,224
754.50	46,449	22,540
754.55	46,723	24,869
754.60	46,997	27,212
754.65	47,271	29,569
754.70	47,544	31,939
754.75	47,818	34,323
754.80	48,092	36,721
754.85	48,366	39,133
754.90	48,640	41,558
754.95	48,913	43,997
755.00	49,187	46,449
755.05	49,461	48,915
755.10	49,735	51,395
755.15	50,009	53,889
755.20	50,283	56,396
755.25	50,556	58,917
755.30	50,830	61,452
755.35	51,104	64,000
755.40	51,378	66,562
755.45	51,652	69,138
755.50	51,925	71,727
755.55	52,199	74,330
755.60	52,473	76,947
755.65	52,747	79,578
755.70	53,021	82,222
755.75	53,295	84,880
755.80	53,568	87,551
755.85	53,842	90,237
755.90	54,116	92,936
755.95	54,390	95,648
756.00	54,664	98,375
756.05	54,937	101,115
756.10	55,211	103,868
756.15	55,485	106,636
756.20	55,759	109,417
756.25	56,033	112,212
756.30	56,306	115,020
756.35	56,580	117,842
756.40	56,854	120,678
756.45	57,128	123,528
756.50	57,402	126,391
756.55	57,676	129,268
756.60	57,949	132,158
756.65	58,223	135,063
756.70	58,497	137,981
756.75	58,771	140,912
756.80	59,045	143,858
756.85	59,318	146,817
756.90	59,592	149,790
756.95	59,866	152,776
757.00	60,140	155,776
757.05	60,414	158,790
757.10	60,687	161,818
757.15	60,961	164,859
757.20	61,235	167,914
757.25	61,509	170,982
757.30	61,783	174,065
757.35	62,057	177,161
757.40	62,330	180,270
757.45	62,604	183,394
757.50	**62,878**	**186,531**

Summary for Subcatchment 1S: Pond Watershed

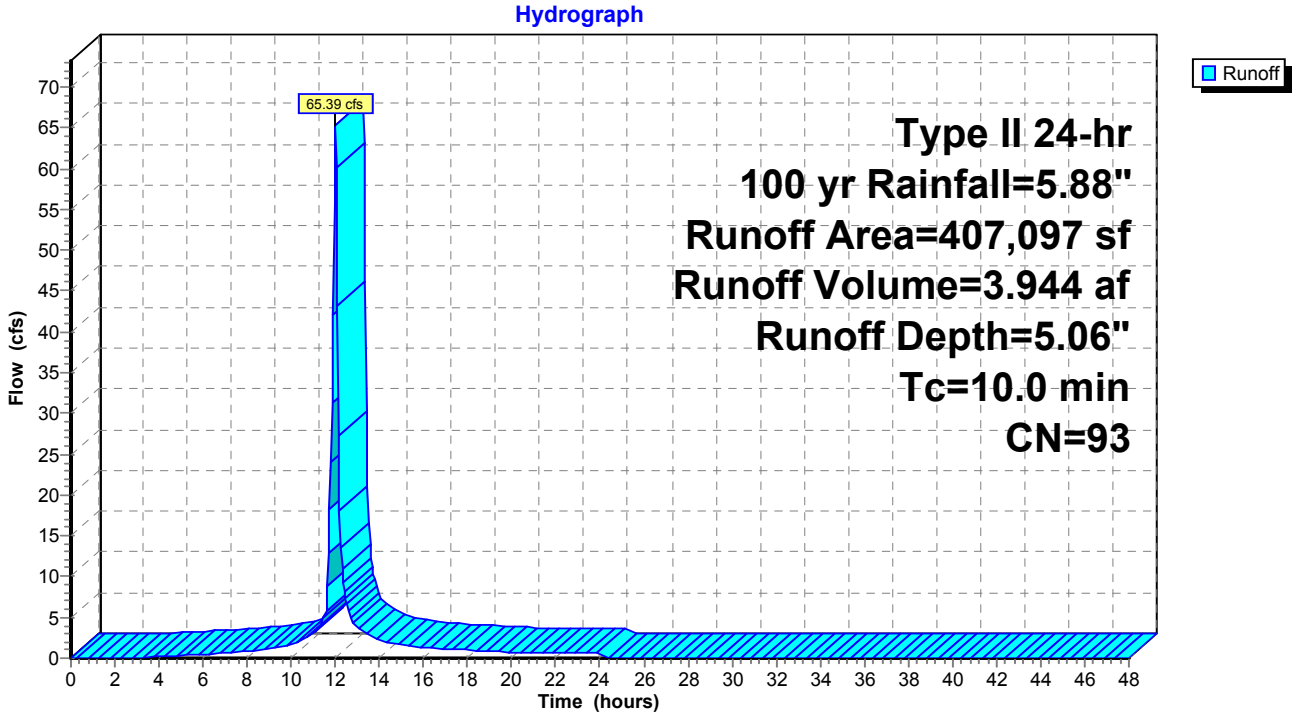
Runoff = 65.39 cfs @ 12.01 hrs, Volume= 3.944 af, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 yr Rainfall=5.88"

Area (sf)	CN	Description
293,756	98	Paved parking, HSG D
113,341	80	>75% Grass cover, Good, HSG D
407,097	93	Weighted Average
113,341		27.84% Pervious Area
293,756		72.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: Pond Watershed



Summary for Pond 2P: Pond

Inflow Area = 9.346 ac, 72.16% Impervious, Inflow Depth = 5.06" for 100 yr event
Inflow = 65.39 cfs @ 12.01 hrs, Volume= 3.944 af
Outflow = 3.91 cfs @ 12.94 hrs, Volume= 3.784 af, Atten= 94%, Lag= 56.0 min
Primary = 3.91 cfs @ 12.94 hrs, Volume= 3.784 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 756.12' @ 12.94 hrs Surf.Area= 55,338 sf Storage= 105,148 cf

Plug-Flow detention time= 464.5 min calculated for 3.780 af (96% of inflow)
Center-of-Mass det. time= 441.1 min (1,214.8 - 773.8)

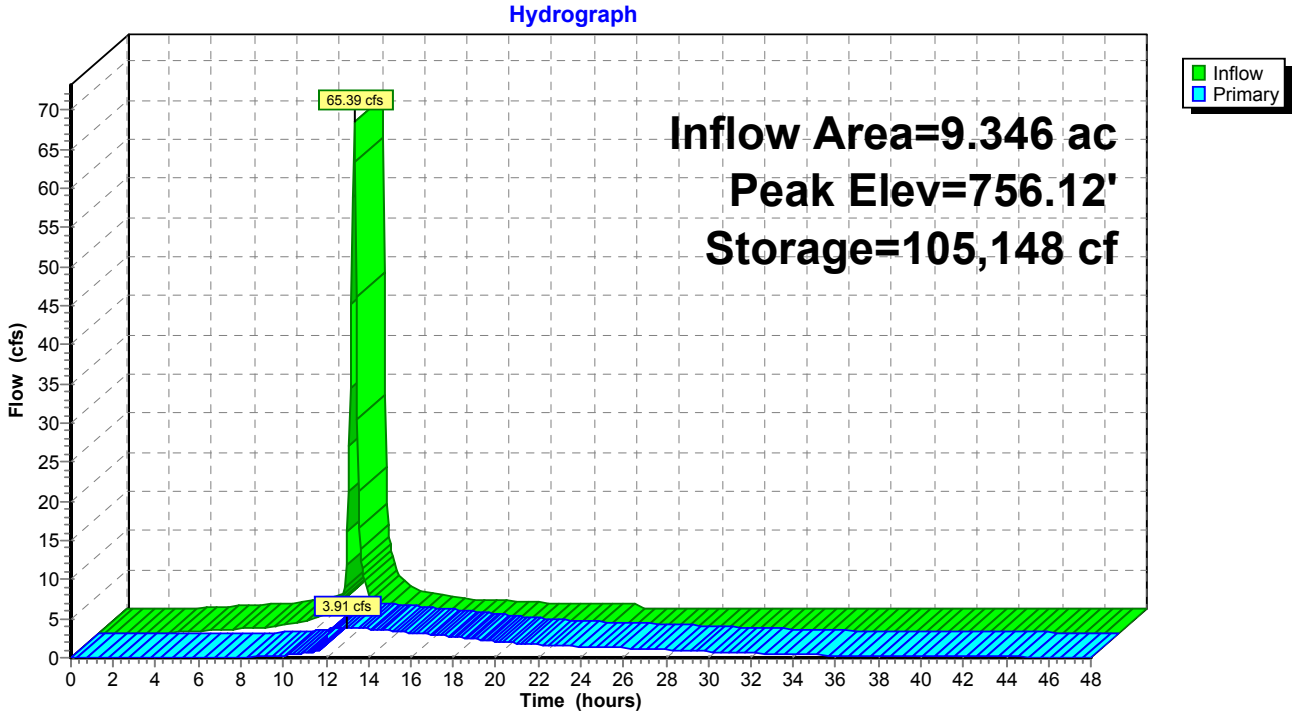
Volume	Invert	Avail.Storage	Storage Description
#1	754.00'	186,531 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.00	43,711	0	0
757.50	62,878	186,531	186,531

Device	Routing	Invert	Outlet Devices
#1	Primary	753.96'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	754.00'	**8.0" Vert. Orifice/Grate** X 2 rows with 12.0" cc spacing C= 0.600
#3	Device 1	755.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.91 cfs @ 12.94 hrs HW=756.12' (Free Discharge)
└**1=Orifice/Grate** (Passes 3.91 cfs of 10.11 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 3.74 cfs @ 5.36 fps)
  └**3=Orifice/Grate** (Orifice Controls 0.16 cfs @ 1.61 fps)

Pond 2P: Pond


Hydrograph
Inflow
Primary
65.39 cfs
3.91 cfs
Inflow Area=9.346 ac
Peak Elev=756.12'
Storage=105,148 cf
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Stage-Discharge for Pond 2P: Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
754.00	0.00	755.02	1.39	756.04	3.68	757.06	6.51
754.02	0.00	755.04	1.42	756.06	3.73	757.08	6.55
754.04	0.01	755.06	1.45	756.08	3.78	757.10	6.59
754.06	0.01	755.08	1.48	756.10	3.84	757.12	6.63
754.08	0.02	755.10	1.51	756.12	3.90	757.14	6.68
754.10	0.04	755.12	1.54	756.14	3.96	757.16	6.72
754.12	0.05	755.14	1.58	756.16	4.02	757.18	6.76
754.14	0.07	755.16	1.62	756.18	4.08	757.20	6.79
754.16	0.09	755.18	1.66	756.20	4.15	757.22	6.83
754.18	0.11	755.20	1.70	756.22	4.21	757.24	6.87
754.20	0.13	755.22	1.74	756.24	4.28	757.26	6.91
754.22	0.16	755.24	1.79	756.26	4.34	757.28	6.95
754.24	0.19	755.26	1.84	756.28	4.41	757.30	6.99
754.26	0.22	755.28	1.89	756.30	4.48	757.32	7.03
754.28	0.25	755.30	1.94	756.32	4.55	757.34	7.06
754.30	0.28	755.32	1.99	756.34	4.62	757.36	7.10
754.32	0.32	755.34	2.04	756.36	4.69	757.38	7.14
754.34	0.36	755.36	2.10	756.38	4.76	757.40	7.17
754.36	0.39	755.38	2.15	756.40	4.83	757.42	7.21
754.38	0.43	755.40	2.21	756.42	4.90	757.44	7.25
754.40	0.47	755.42	2.26	756.44	4.97	757.46	7.28
754.42	0.51	755.44	2.32	756.46	5.03	757.48	7.32
754.44	0.55	755.46	2.38	756.48	5.10	757.50	**7.36**
754.46	0.59	755.48	2.43	756.50	5.16		
754.48	0.63	755.50	2.49	756.52	5.22		
754.50	0.68	755.52	2.55	756.54	5.28		
754.52	0.72	755.54	2.60	756.56	5.33		
754.54	0.76	755.56	2.66	756.58	5.39		
754.56	0.80	755.58	2.71	756.60	5.44		
754.58	0.84	755.60	2.76	756.62	5.49		
754.60	0.87	755.62	2.81	756.64	5.55		
754.62	0.91	755.64	2.86	756.66	5.60		
754.64	0.94	755.66	2.90	756.68	5.65		
754.66	0.96	755.68	2.94	756.70	5.70		
754.68	0.99	755.70	2.98	756.72	5.75		
754.70	1.02	755.72	3.02	756.74	5.80		
754.72	1.05	755.74	3.07	756.76	5.85		
754.74	1.07	755.76	3.11	756.78	5.89		
754.76	1.10	755.78	3.14	756.80	5.94		
754.78	1.12	755.80	3.18	756.82	5.99		
754.80	1.15	755.82	3.22	756.84	6.03		
754.82	1.17	755.84	3.26	756.86	6.08		
754.84	1.20	755.86	3.30	756.88	6.12		
754.86	1.22	755.88	3.33	756.90	6.17		
754.88	1.24	755.90	3.37	756.92	6.21		
754.90	1.27	755.92	3.41	756.94	6.26		
754.92	1.29	755.94	3.45	756.96	6.30		
754.94	1.31	755.96	3.49	756.98	6.34		
754.96	1.33	755.98	3.53	757.00	6.39		
754.98	1.35	756.00	3.58	757.02	6.43		
755.00	1.37	756.02	3.63	757.04	6.47		

Stage-Area-Storage for Pond 2P: Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
754.00	43,711	0
754.05	43,985	2,192
754.10	44,259	4,398
754.15	44,532	6,618
754.20	44,806	8,852
754.25	45,080	11,099
754.30	45,354	13,360
754.35	45,628	15,634
754.40	45,902	17,923
754.45	46,175	20,224
754.50	46,449	22,540
754.55	46,723	24,869
754.60	46,997	27,212
754.65	47,271	29,569
754.70	47,544	31,939
754.75	47,818	34,323
754.80	48,092	36,721
754.85	48,366	39,133
754.90	48,640	41,558
754.95	48,913	43,997
755.00	49,187	46,449
755.05	49,461	48,915
755.10	49,735	51,395
755.15	50,009	53,889
755.20	50,283	56,396
755.25	50,556	58,917
755.30	50,830	61,452
755.35	51,104	64,000
755.40	51,378	66,562
755.45	51,652	69,138
755.50	51,925	71,727
755.55	52,199	74,330
755.60	52,473	76,947
755.65	52,747	79,578
755.70	53,021	82,222
755.75	53,295	84,880
755.80	53,568	87,551
755.85	53,842	90,237
755.90	54,116	92,936
755.95	54,390	95,648
756.00	54,664	98,375
756.05	54,937	101,115
756.10	55,211	103,868
756.15	55,485	106,636
756.20	55,759	109,417
756.25	56,033	112,212
756.30	56,306	115,020
756.35	56,580	117,842
756.40	56,854	120,678
756.45	57,128	123,528
756.50	57,402	126,391
756.55	57,676	129,268
756.60	57,949	132,158
756.65	58,223	135,063
756.70	58,497	137,981
756.75	58,771	140,912
756.80	59,045	143,858
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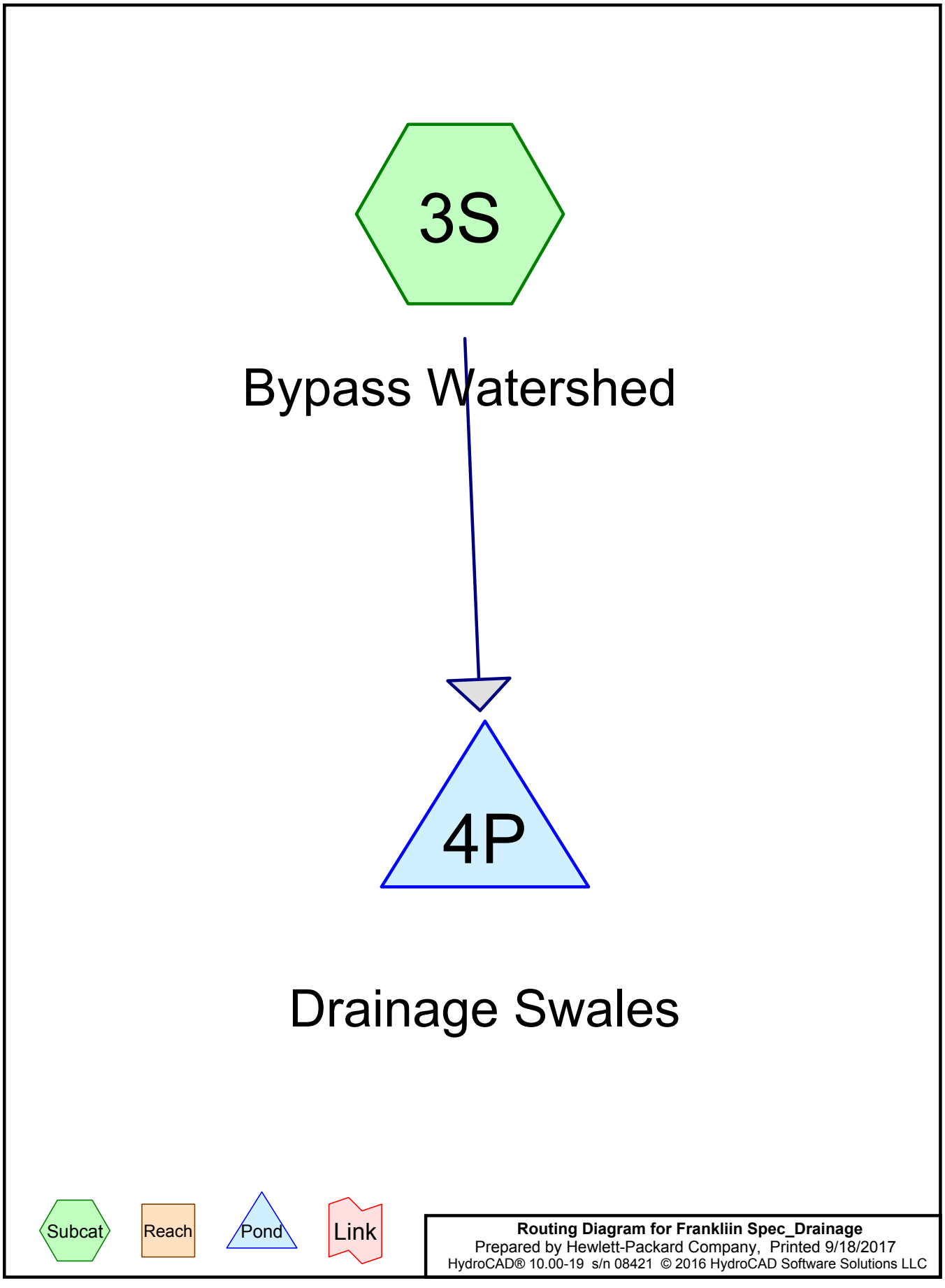
756.90	59,592	149,790
756.95	59,866	152,776
757.00	60,140	155,776
757.05	60,414	158,790
757.10	60,687	161,818
757.15	60,961	164,859
757.20	61,235	167,914
757.25	61,509	170,982
757.30	61,783	174,065
757.35	62,057	177,161
757.40	62,330	180,270
757.45	62,604	183,394
757.50	**62,878**	**186,531**



Routing Diagram for Frankliin Spec_Drainage
Prepared by Hewlett-Packard Company, Printed 9/18/2017

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.125	61	DRAINAGE AREA 1B: PERVIOUS (3S)
1.072	98	DRAINAGE AREA 2: IMPERVIOUS (3S)
2.695	80	DRAINAGE AREA 2: PERVIOUS (3S)
8.892	**71**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
8.892	Other	3S
8.892		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchm Numbers
0.000	0.000	0.000	0.000	5.125	5.125	DRAINAGE AREA 1B: PERVIOUS	
0.000	0.000	0.000	0.000	1.072	1.072	DRAINAGE AREA 2: IMPERVIOUS	
0.000	0.000	0.000	0.000	2.695	2.695	DRAINAGE AREA 2: PERVIOUS	
0.000	**0.000**	**0.000**	**0.000**	**8.892**	**8.892**	**TOTAL AREA**	

Summary for Subcatchment 3S: Bypass Watershed

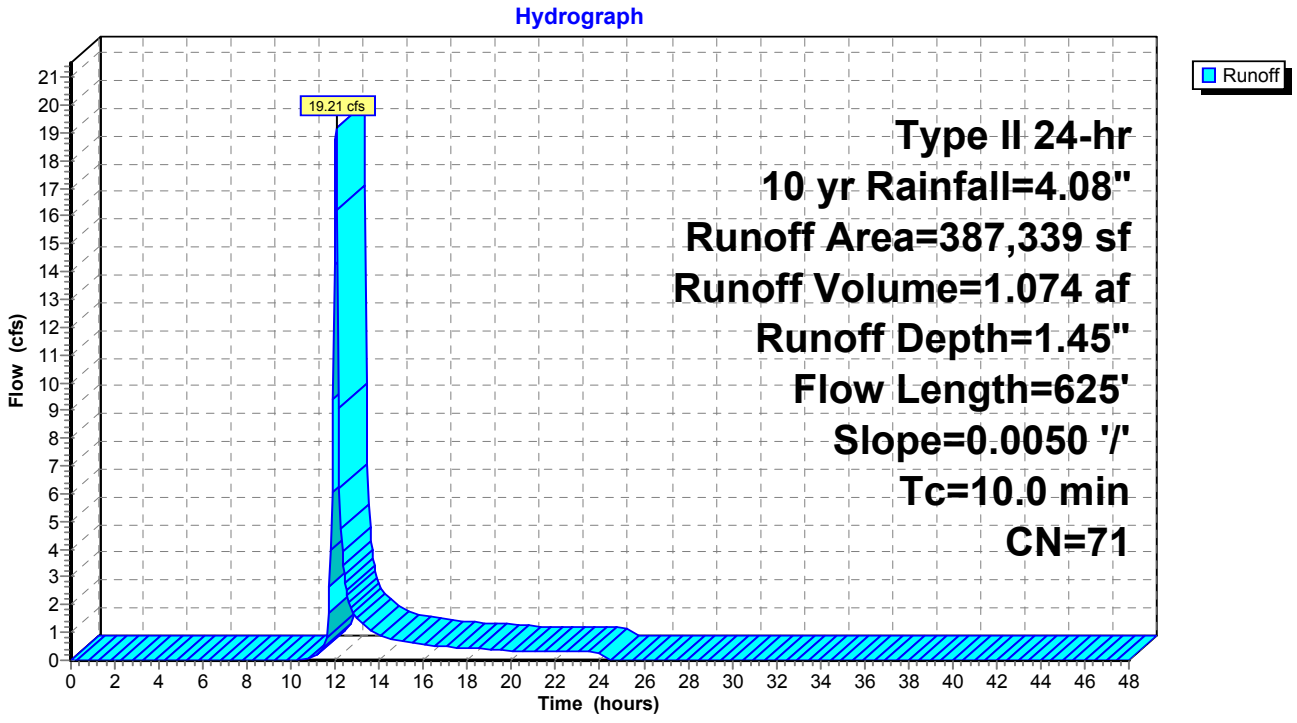
Runoff = 19.21 cfs @ 12.02 hrs, Volume= 1.074 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 yr Rainfall=4.08"

	Area (sf)	CN	Description
*	117,386	80	DRAINAGE AREA 2: PERVIOUS
*	46,689	98	DRAINAGE AREA 2: IMPERVIOUS
*	223,264	61	DRAINAGE AREA 1B: PERVIOUS
	387,339	71	Weighted Average
	340,650		87.95% Pervious Area
	46,689		12.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	625	0.0050	3.78	25.35	**Channel Flow,** Area= 6.7 sf Perim= 9.5' r= 0.71' n= 0.022 Earth, clean & straight
2.8	625	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3S: Bypass Watershed



Summary for Pond 4P: Drainage Swales

Inflow Area = 8.892 ac, 12.05% Impervious, Inflow Depth = 1.45" for 10 yr event
Inflow = 19.21 cfs @ 12.02 hrs, Volume= 1.074 af
Outflow = 4.89 cfs @ 12.25 hrs, Volume= 1.074 af, Atten= 75%, Lag= 13.6 min
Primary = 4.89 cfs @ 12.25 hrs, Volume= 1.074 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 753.38' @ 12.25 hrs Surf.Area= 17,043 sf Storage= 12,237 cf

Plug-Flow detention time= 16.8 min calculated for 1.073 af (100% of inflow)
Center-of-Mass det. time= 16.7 min (873.5 - 856.8)

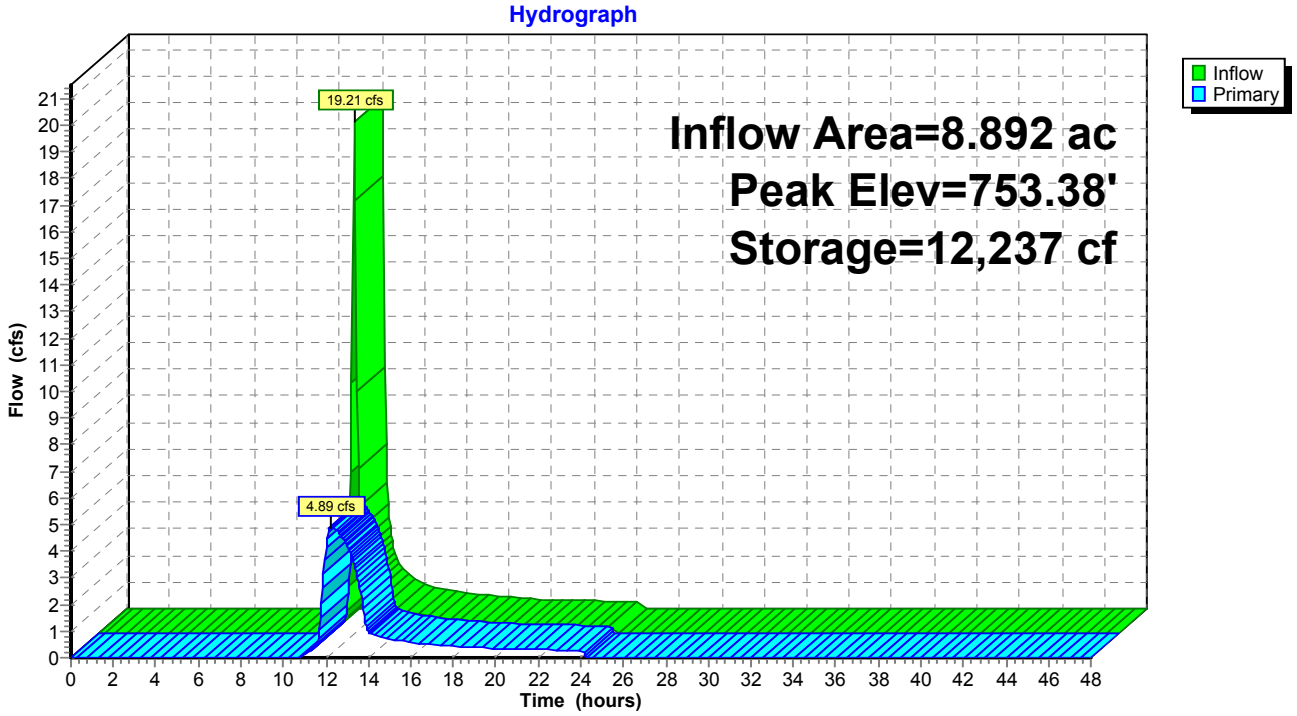
Volume	Invert	Avail.Storage	Storage Description
#1	751.20'	68,534 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
751.20	0	0.0	0	0	0
752.00	2,261	560.0	603	603	24,957
753.00	11,539	1,262.0	6,303	6,906	126,744
754.00	28,569	1,733.0	19,421	26,327	239,009
755.00	57,516	2,166.0	42,207	68,534	373,371

Device	Routing	Invert	Outlet Devices
#1	Primary	751.20'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	751.20'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.89 cfs @ 12.25 hrs HW=753.38' (Free Discharge)
↑**1=Orifice/Grate** (Passes 4.89 cfs of 10.16 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 4.89 cfs @ 6.23 fps)

Pond 4P: Drainage Swales



Stage-Discharge for Pond 4P: Drainage Swales

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
751.20	0.00	752.22	2.73	753.24	4.69	754.26	6.05
751.22	0.00	752.24	2.78	753.26	4.72	754.28	6.07
751.24	0.01	752.26	2.83	753.28	4.75	754.30	6.10
751.26	0.02	752.28	2.88	753.30	4.78	754.32	6.12
751.28	0.03	752.30	2.93	753.32	4.81	754.34	6.14
751.30	0.04	752.32	2.98	753.34	4.84	754.36	6.17
751.32	0.06	752.34	3.03	753.36	4.87	754.38	6.19
751.34	0.09	752.36	3.07	753.38	4.90	754.40	6.21
751.36	0.11	752.38	3.12	753.40	4.93	754.42	6.24
751.38	0.14	752.40	3.16	753.42	4.96	754.44	6.26
751.40	0.17	752.42	3.21	753.44	4.99	754.46	6.28
751.42	0.20	752.44	3.25	753.46	5.02	754.48	6.31
751.44	0.24	752.46	3.30	753.48	5.05	754.50	6.33
751.46	0.28	752.48	3.34	753.50	5.07	754.52	6.35
751.48	0.32	752.50	3.38	753.52	5.10	754.54	6.37
751.50	0.37	752.52	3.42	753.54	5.13	754.56	6.40
751.52	0.42	752.54	3.47	753.56	5.16	754.58	6.42
751.54	0.47	752.56	3.51	753.58	5.19	754.60	6.44
751.56	0.52	752.58	3.55	753.60	5.21	754.62	6.46
751.58	0.57	752.60	3.59	753.62	5.24	754.64	6.48
751.60	0.63	752.62	3.63	753.64	5.27	754.66	6.51
751.62	0.69	752.64	3.67	753.66	5.29	754.68	6.53
751.64	0.75	752.66	3.71	753.68	5.32	754.70	6.55
751.66	0.81	752.68	3.74	753.70	5.35	754.72	6.57
751.68	0.88	752.70	3.78	753.72	5.37	754.74	6.59
751.70	0.95	752.72	3.82	753.74	5.40	754.76	6.62
751.72	1.01	752.74	3.86	753.76	5.43	754.78	6.64
751.74	1.08	752.76	3.89	753.78	5.45	754.80	6.66
751.76	1.15	752.78	3.93	753.80	5.48	754.82	6.68
751.78	1.22	752.80	3.97	753.82	5.51	754.84	6.70
751.80	1.30	752.82	4.00	753.84	5.53	754.86	6.72
751.82	1.37	752.84	4.04	753.86	5.56	754.88	6.74
751.84	1.45	752.86	4.07	753.88	5.58	754.90	6.76
751.86	1.52	752.88	4.11	753.90	5.61	754.92	6.79
751.88	1.60	752.90	4.14	753.92	5.63	754.94	6.81
751.90	1.67	752.92	4.18	753.94	5.66	754.96	6.83
751.92	1.75	752.94	4.21	753.96	5.69	754.98	6.85
751.94	1.83	752.96	4.24	753.98	5.71	755.00	**6.87**
751.96	1.90	752.98	4.28	754.00	5.74		
751.98	1.98	753.00	4.31	754.02	5.76		
752.00	2.05	753.02	4.34	754.04	5.78		
752.02	2.13	753.04	4.38	754.06	5.81		
752.04	2.20	753.06	4.41	754.08	5.83		
752.06	2.27	753.08	4.44	754.10	5.86		
752.08	2.34	753.10	4.47	754.12	5.88		
752.10	2.40	753.12	4.51	754.14	5.91		
752.12	2.47	753.14	4.54	754.16	5.93		
752.14	2.53	753.16	4.57	754.18	5.96		
752.16	2.58	753.18	4.60	754.20	5.98		
752.18	2.63	753.20	4.63	754.22	6.00		
752.20	2.67	753.22	4.66	754.24	6.03		

Stage-Area-Storage for Pond 4P: Drainage Swales

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
751.20	0	0
751.25	9	0
751.30	35	1
751.35	79	4
751.40	141	9
751.45	221	18
751.50	318	32
751.55	433	50
751.60	565	75
751.65	715	107
751.70	883	147
751.75	1,069	196
751.80	1,272	254
751.85	1,493	323
751.90	1,731	404
751.95	1,987	497
752.00	2,261	603
752.05	2,555	723
752.10	2,866	859
752.15	3,196	1,010
752.20	3,543	1,179
752.25	3,908	1,365
752.30	4,292	1,570
752.35	4,693	1,794
752.40	5,112	2,039
752.45	5,549	2,306
752.50	6,004	2,594
752.55	6,477	2,906
752.60	6,968	3,242
752.65	7,476	3,603
752.70	8,003	3,990
752.75	8,547	4,404
752.80	9,110	4,845
752.85	9,690	5,315
752.90	10,289	5,815
752.95	10,905	6,345
753.00	11,539	6,906
753.05	12,210	7,499
753.10	12,900	8,127
753.15	13,610	8,790
753.20	14,338	9,488
753.25	15,085	10,224
753.30	15,851	10,997
753.35	16,636	11,809
753.40	17,440	12,661
753.45	18,263	13,553
753.50	19,105	14,488
753.55	19,966	15,464
753.60	20,846	16,484
753.65	21,745	17,549
753.70	22,663	18,659
753.75	23,600	19,816
753.80	24,556	21,020
753.85	25,531	22,272
753.90	26,524	23,573
753.95	27,537	24,924
754.00	28,569	26,327
754.05	29,778	27,786
754.10	31,013	29,305
754.15	32,272	30,887
754.20	33,556	32,533
754.25	34,866	34,243
754.30	36,200	36,020
754.35	37,560	37,864
754.40	38,945	39,776
754.45	40,354	41,759
754.50	41,789	43,812
754.55	43,249	45,938
754.60	44,734	48,138
754.65	46,244	50,412
754.70	47,779	52,762
754.75	49,339	55,190
754.80	50,925	57,697
754.85	52,535	60,283
754.90	54,170	62,951
754.95	55,831	65,700
755.00	**57,516**	**68,534**

Summary for Subcatchment 3S: Bypass Watershed

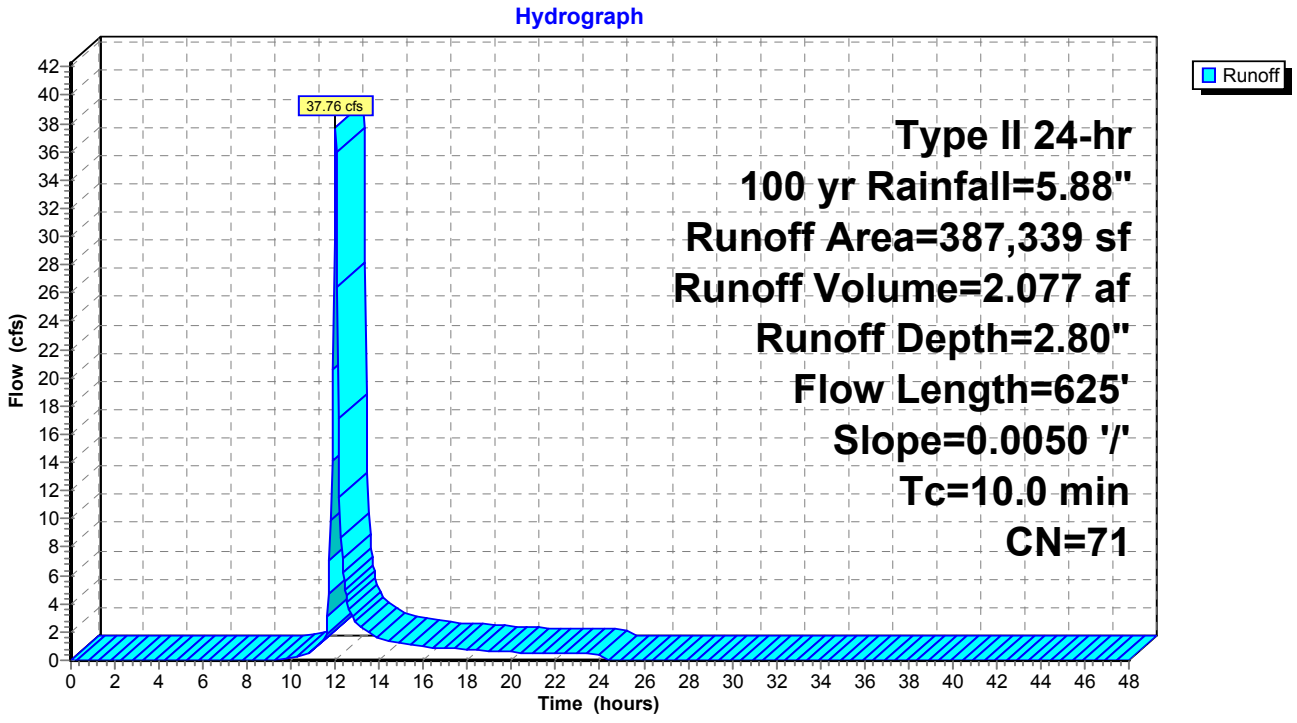
Runoff = 37.76 cfs @ 12.02 hrs, Volume= 2.077 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 yr Rainfall=5.88"

	Area (sf)	CN	Description
*	117,386	80	DRAINAGE AREA 2: PERVIOUS
*	46,689	98	DRAINAGE AREA 2: IMPERVIOUS
*	223,264	61	DRAINAGE AREA 1B: PERVIOUS
	387,339	71	Weighted Average
	340,650		87.95% Pervious Area
	46,689		12.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	625	0.0050	3.78	25.35	**Channel Flow,** Area= 6.7 sf Perim= 9.5' r= 0.71' n= 0.022 Earth, clean & straight
2.8	625	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3S: Bypass Watershed



Summary for Pond 4P: Drainage Swales

Inflow Area = 8.892 ac, 12.05% Impervious, Inflow Depth = 2.80" for 100 yr event
Inflow = 37.76 cfs @ 12.02 hrs, Volume= 2.077 af
Outflow = 5.93 cfs @ 12.37 hrs, Volume= 2.077 af, Atten= 84%, Lag= 21.3 min
Primary = 5.93 cfs @ 12.37 hrs, Volume= 2.077 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 754.16' @ 12.37 hrs Surf.Area= 32,460 sf Storage= 31,126 cf

Plug-Flow detention time= 39.9 min calculated for 2.074 af (100% of inflow)
Center-of-Mass det. time= 39.8 min (877.2 - 837.4)

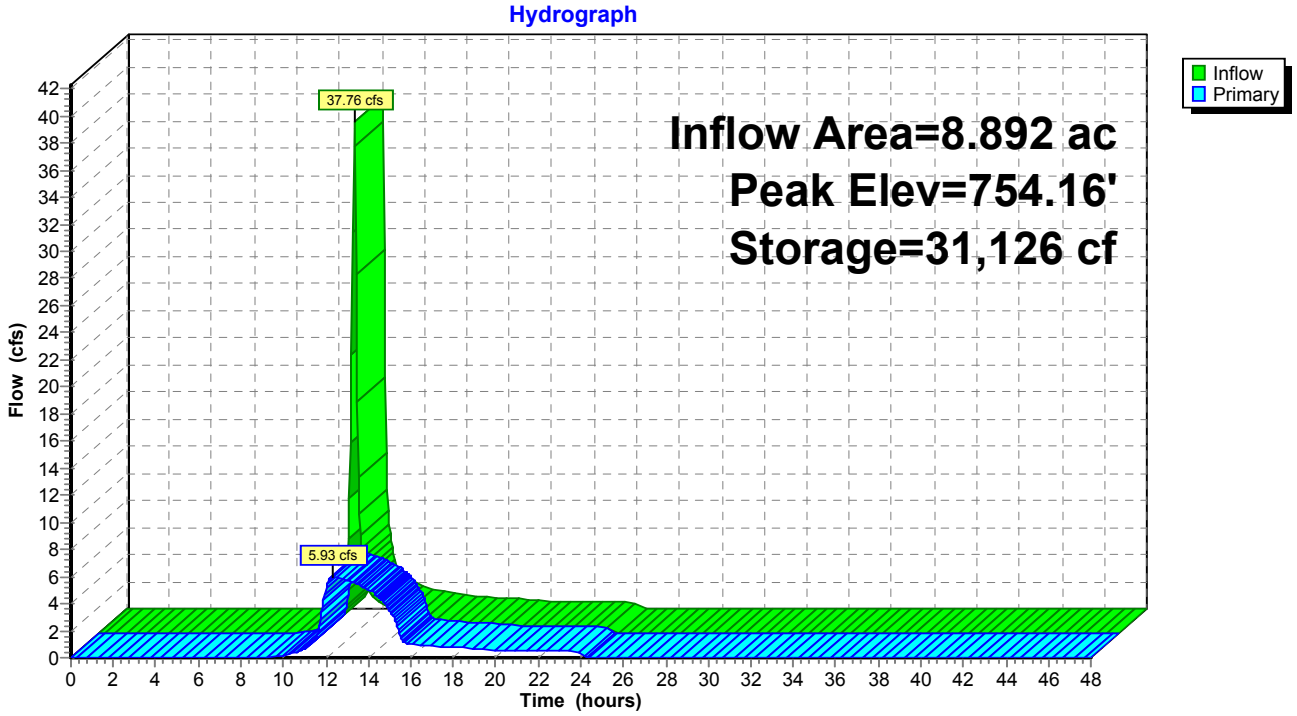
Volume	Invert	Avail.Storage	Storage Description
#1	751.20'	68,534 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
751.20	0	0.0	0	0	0
752.00	2,261	560.0	603	603	24,957
753.00	11,539	1,262.0	6,303	6,906	126,744
754.00	28,569	1,733.0	19,421	26,327	239,009
755.00	57,516	2,166.0	42,207	68,534	373,371

Device	Routing	Invert	Outlet Devices
#1	Primary	751.20'	**18.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	751.20'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.93 cfs @ 12.37 hrs HW=754.16' (Free Discharge)
↑**1=Orifice/Grate** (Passes 5.93 cfs of 12.64 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 5.93 cfs @ 7.55 fps)

Pond 4P: Drainage Swales



Stage-Discharge for Pond 4P: Drainage Swales

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
751.20	0.00	752.22	2.73	753.24	4.69	754.26	6.05
751.22	0.00	752.24	2.78	753.26	4.72	754.28	6.07
751.24	0.01	752.26	2.83	753.28	4.75	754.30	6.10
751.26	0.02	752.28	2.88	753.30	4.78	754.32	6.12
751.28	0.03	752.30	2.93	753.32	4.81	754.34	6.14
751.30	0.04	752.32	2.98	753.34	4.84	754.36	6.17
751.32	0.06	752.34	3.03	753.36	4.87	754.38	6.19
751.34	0.09	752.36	3.07	753.38	4.90	754.40	6.21
751.36	0.11	752.38	3.12	753.40	4.93	754.42	6.24
751.38	0.14	752.40	3.16	753.42	4.96	754.44	6.26
751.40	0.17	752.42	3.21	753.44	4.99	754.46	6.28
751.42	0.20	752.44	3.25	753.46	5.02	754.48	6.31
751.44	0.24	752.46	3.30	753.48	5.05	754.50	6.33
751.46	0.28	752.48	3.34	753.50	5.07	754.52	6.35
751.48	0.32	752.50	3.38	753.52	5.10	754.54	6.37
751.50	0.37	752.52	3.42	753.54	5.13	754.56	6.40
751.52	0.42	752.54	3.47	753.56	5.16	754.58	6.42
751.54	0.47	752.56	3.51	753.58	5.19	754.60	6.44
751.56	0.52	752.58	3.55	753.60	5.21	754.62	6.46
751.58	0.57	752.60	3.59	753.62	5.24	754.64	6.48
751.60	0.63	752.62	3.63	753.64	5.27	754.66	6.51
751.62	0.69	752.64	3.67	753.66	5.29	754.68	6.53
751.64	0.75	752.66	3.71	753.68	5.32	754.70	6.55
751.66	0.81	752.68	3.74	753.70	5.35	754.72	6.57
751.68	0.88	752.70	3.78	753.72	5.37	754.74	6.59
751.70	0.95	752.72	3.82	753.74	5.40	754.76	6.62
751.72	1.01	752.74	3.86	753.76	5.43	754.78	6.64
751.74	1.08	752.76	3.89	753.78	5.45	754.80	6.66
751.76	1.15	752.78	3.93	753.80	5.48	754.82	6.68
751.78	1.22	752.80	3.97	753.82	5.51	754.84	6.70
751.80	1.30	752.82	4.00	753.84	5.53	754.86	6.72
751.82	1.37	752.84	4.04	753.86	5.56	754.88	6.74
751.84	1.45	752.86	4.07	753.88	5.58	754.90	6.76
751.86	1.52	752.88	4.11	753.90	5.61	754.92	6.79
751.88	1.60	752.90	4.14	753.92	5.63	754.94	6.81
751.90	1.67	752.92	4.18	753.94	5.66	754.96	6.83
751.92	1.75	752.94	4.21	753.96	5.69	754.98	6.85
751.94	1.83	752.96	4.24	753.98	5.71	755.00	**6.87**
751.96	1.90	752.98	4.28	754.00	5.74		
751.98	1.98	753.00	4.31	754.02	5.76		
752.00	2.05	753.02	4.34	754.04	5.78		
752.02	2.13	753.04	4.38	754.06	5.81		
752.04	2.20	753.06	4.41	754.08	5.83		
752.06	2.27	753.08	4.44	754.10	5.86		
752.08	2.34	753.10	4.47	754.12	5.88		
752.10	2.40	753.12	4.51	754.14	5.91		
752.12	2.47	753.14	4.54	754.16	5.93		
752.14	2.53	753.16	4.57	754.18	5.96		
752.16	2.58	753.18	4.60	754.20	5.98		
752.18	2.63	753.20	4.63	754.22	6.00		
752.20	2.67	753.22	4.66	754.24	6.03		

Stage-Area-Storage for Pond 4P: Drainage Swales

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
751.20	0	0
751.25	9	0
751.30	35	1
751.35	79	4
751.40	141	9
751.45	221	18
751.50	318	32
751.55	433	50
751.60	565	75
751.65	715	107
751.70	883	147
751.75	1,069	196
751.80	1,272	254
751.85	1,493	323
751.90	1,731	404
751.95	1,987	497
752.00	2,261	603
752.05	2,555	723
752.10	2,866	859
752.15	3,196	1,010
752.20	3,543	1,179
752.25	3,908	1,365
752.30	4,292	1,570
752.35	4,693	1,794
752.40	5,112	2,039
752.45	5,549	2,306
752.50	6,004	2,594
752.55	6,477	2,906
752.60	6,968	3,242
752.65	7,476	3,603
752.70	8,003	3,990
752.75	8,547	4,404
752.80	9,110	4,845
752.85	9,690	5,315
752.90	10,289	5,815
752.95	10,905	6,345
753.00	11,539	6,906
753.05	12,210	7,499
753.10	12,900	8,127
753.15	13,610	8,790
753.20	14,338	9,488
753.25	15,085	10,224
753.30	15,851	10,997
753.35	16,636	11,809
753.40	17,440	12,661
753.45	18,263	13,553
753.50	19,105	14,488
753.55	19,966	15,464
753.60	20,846	16,484
753.65	21,745	17,549
753.70	22,663	18,659
753.75	23,600	19,816
753.80	24,556	21,020
753.85	25,531	22,272
753.90	26,524	23,573
753.95	27,537	24,924
754.00	28,569	26,327
754.05	29,778	27,786
754.10	31,013	29,305
754.15	32,272	30,887
754.20	33,556	32,533
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754.30	36,200	36,020
754.35	37,560	37,864
754.40	38,945	39,776
754.45	40,354	41,759
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754.80	50,925	57,697
754.85	52,535	60,283
754.90	54,170	62,951
754.95	55,831	65,700
755.00	**57,516**	**68,534**