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MASTER
STORMWATER TECHNICAL REPORT

For:
DEERFIELD

Runyon Road
White River Township, Johnson County
Indiana

Project #W21-0353

Prepared for:
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Master Stormwater Technical Report
Prepared For:
Deerfield
Johnson County, IN
Project #W21-0353

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PROJECT NARRATIVE

Project Overview:

Lennar Homes of Indiana, LLC is proposing to develop a 96 lot single family residential subdivision to be known as "Deerfield" on a 51.6+/- acre tract of undeveloped land in Johnson County, Indiana. Section 1 of Deerfield consists of 49 lots on 26.71 acres. Said development is located east of Runyon Road, between Smith Valley Road and Olive Branch Road. Refer to **Figure 1.1.**

The proposed development is on a site at a Latitude of N 39° 35' 52" and Longitude W 86° 11' 05", falling within White River Township. The site is located in part of the Northwest Quarter of the Southeast Quarter of Section 3, Township 13 North, and Range 3 East, in Johnson County, Indiana.

Floodzone:
Based upon a scaled interpretation of the Flood Insurance Map Nos.18081C0106E for Johnson County, Indiana, dated January 29, 2021, a portion of the subject tract ***IS NOT*** located within Zone AE (Special Flood Hazard Area inundated by 100-year flood-Base Flood Elevations determined). Turkey Pen Creek lies south of the proposed development and is the receiving water for the site. Refer to **Figure 1.2.**

Pre-Developed Conditions:

Currently the tract is primarily covered with agricultural land with tree lines along several boundary lines. There is wooded land in the northeast corner and along the southern portion. There is also an existing overhead power line at the southeast corner. There is an existing open channel located in the southern wooded area that drains offsite land from the east to the south. Said open channel is a tributary to Turkey Pen Creek. Existing single family residential homes are located in the southwest and northeast corners. The site is adjoined by large single family estate lots to the north, east, and west, single family residential subdivisions to the north, northwest, and southeast, and agricultural land and woods to the east and northeast. Refer to **Figure 1.3**.

The tract consists of the following soil types: Eel Silt Loam, Fox Loam, Fox Complex, Ockley Loam, Rensselaer Silty Clay Loam, Sleeth Loam, Eel Silt Loam-Urban Land Complex, Fox-Urban Land Complex,, Ockley loam-Urban Land Complex, and Rensselaer Silty Clay Loam-Urban Land Complex. A soil map has been included with this report. An abbreviated NRCS Soils Report can be found in **Section 1** of this report.

Detailed topography from survey work by Weihe Engineers, Inc. was used to determine the Pre-Developed Basin Map, **Figure 2.1**. The entire tract is a part of the Honey Creek-Turkey Pen Creek watershed, which is located offsite southwest of the site. The site consists of three existing onsite watersheds, which are explained below.

EX-S

The overall onsite acreage of this basin is 30.47 acres and drains into the open channel that is a tributary to Turkey Pen Creek. However, only 22.29 acres of it will be impacted by the development and the remaining 8.18 acres will remain as existing. Therefore, only the impacted 22.29 acres of the overall was utilized to calculate the allowable release rate to the open channel to the south. The 8.18 acre basin was included in the calculation including offsite runoff to see the total existing flow leaving the site through the existing open channel to the south.

EX-NE

This 18.37 acre onsite basin drains to a natural depression in the farm field near the middle of the site that stores water. This storage area was modeled under existing conditions, which determines that it overtops the natural overland weir at an elevation of 706.3. The overtopping runoff then combines with runoff from EX-S to contribute to the allowable release rate to the south.

EX-NW

This 2.73 acre onsite basin drains to a natural depression in the farm field in the northwest corner that stores water. This storage area was also modeled under existing conditions, but was not included in any allowable release rate calculations. This area overtops to the north, and the proposed site is not planning to release any runoff to the north.

The development will be designed to not obstruct offsite floodwaters so there is not a negative drainage impact to adjacent landowners. There are six existing offsite basins that drain onsite that will impact the proposed detention basin, and one that will drain onto the site, but will not enter the detention basin. The offsite basins were delineated using LIDAR data and Johnson County GIS information. They were not used to calculate allowable or proposed release rates, but were included in the final staging calculations for the proposed detention system and in finding the total existing flow in the existing open channel to the south. The offsite basins are explained below.

OFF-NE1
The 13.95 acre basin is located east of the site, between the eastern boundary and Berry Road. It is covered with farmland, grass and existing homes. Runoff from this basin crosses onsite at the northeast corner and combines with runoff from EX-NE.

OFF-NE2
The 5.65 acre basin is located east of Berry Road. It drains to an existing culvert under Berry Road and combines with runoff from basin OFF-NE2.

OFF-NW
The 0.35 acre basin is located along Runyon Road and drains into the depressional area with EX-NW. It is covered with a house, drive, grass and trees.

OFF-S
The 0.65 acre basin is located along Runyon Road and drains into the open channel with runoff from EX-S. It is covered with a house, drive, grass and trees.

OFF-N1
The 0.80 acre basin is located along the northern property line. It is a long narrow basin that consists of the tree line on the adjacent property.

OFF-N2
The 0.40 acre basin is located along the northern property line. It consists of the tree line on the adjacent property and the southern half of the barn just north of the property line.

OFF-E
The 6.23 acre basin is located east of the site, between the eastern boundary and Berry Road. It is covered with farmland, woods, grass, and existing homes. Runoff from this basin crosses onsite at the southeast corner and combines with runoff from the undeveloped portion of EX-S. This basin flows across the site and into the existing open channel south of the site.

Post-Developed Conditions:

The development will be a single family residential subdivision that consists of 96 lots with associated roads, sidewalks, driveways, and multi-use asphalt paths servicing the lots in the subdivision. There is one (1) proposed wet pond, located in the southern portion of the site. The pond will have an outlet control structure and 15" RCP to regulate the release of runoff from the pond. The outlet pipe will discharge into the existing open channel that drains to the south of the site. The pond has a normal pool area of 1.99 acres and will detain runoff from all of the proposed development.

The pond outlet, detention pond, storm sewers and water quality features will be designed per Johnson County Surveyor's Office standards. Stormwater from the site will be detained to meet the allowable release rates based on the Subdivision Control Ordinance of Johnson County, Indiana dated February 26, 2018. Allowable release rates are calculated by analyzing the existing watersheds and depressional storage areas. Per the ordinance, all farmland shall use a pasture curve number. To meet the detention requirements, the peak runoff from a 10-year storm in developed conditions shall be less than the peak runoff from a 2-year storm in existing conditions and the peak runoff from a 100-year storm in developed conditions shall be less than the peak runoff from a 10-year storm in existing conditions.

In this report, the release rate was only analyzed at the southern boundary of the site. As previously described the 8.18 acre basin along the southern boundary will not be disturbed by the development, therefore it was not included in the allowable or proposed release rate calculations.

Onsite basins were analyzed under existing and proposed conditions to show that the onsite runoff from the development is being detained per the standards. Offsite basins are analyzed along with onsite basins to determine the final staging elevations of the pond and to compare the proposed discharge that travels through the site and into the existing open channel to that of the existing combined onsite and offsite discharge. The offsite basins are not detained, but are routed through the pond and storm infrastructure to the locations where runoff leaves the site.

<u>Release Rate Comparison (Onsite Basins Only)</u>

BNDY-S

Q_{2e}=	1.37
Q_{10p}=	1.24

Q_{10p}<=Q_{2e} YES

Q_{10e}=	5.16
Q_{100p}=	4.14

Q_{100p}<=Q_{10e} YES

Detention Basin Summary

Normal Pool	2-Year Stage	10-Year Stage	100-Year Stage	Spillway Elev.
699.50	701.24	702.67	704.32	704.30

Downstream Channel Capacity

The existing channel downstream of the site has been surveyed and has an average bottom width of 7.7', an average side slope of 0.3':1' (H:V), an average longitudinal slope of 0.94%, and an average height of 1.9' measured from top of bank to flowline of channel. These average measurements result in a channel capacity of 92.5 cfs when flowing to the top of bank.

The proposed flow leaving the developed site was combined with offsite flow in the channel resulting in a peak 100-year flow of 117.83 cfs. This flowrate was generated by combining 12.80 cfs of developed flow leaving the site (including offsite basins), 100.17 cfs of flow that can pass through the upstream 48" culvert under Dartmoor Drive, and 4.86 cfs of flow that enters the channel from the adjacent pond in the Auburn Trace development. Below is a table comparing existing to proposed release rates from the developed site showing the reduction of runoff in the channel.

BNDY-S Release Rate Comparison (Onsite and Offsite Basins)

	2-yr (cfs)	10-yr (cfs)	100-yr (cfs)
Pre-Developed	4.97	13.75	49.47
Post-Developed	1.33	3.33	12.80
Difference	-3.64	-10.42	-36.67

Results show that the 100-year storm will flow above the average top of bank. The flow depth above the top of bank would be less than 0.5' during the 100-year storm event. More frequent storm events will be contained within the top of bank of the channel.

Storm Sewers

The storm sewer system will be designed to convey stormwater at a minimum velocity of 2.5 feet/second and a maximum velocity of 10 ft/second through reinforced concrete pipes while maintaining a hydraulic grade line (HGL) elevation below the top of castings during a 10-year storm event. Inlets have been spaced at 500' or less. Curb inlets have been sized to stage less than 0.5' during the 10-year storm when 50% clogged and beehive inlets have been sized to stage less than 0.8' under the same conditions. There is one curb inlet that is sized as a double inlet to be less than 0.5' of ponding. Pipe sizing calculations for the entire site is included in this submittal, but inlet capacity calculations for future inlets will be submitted for review when those are proposed for construction.

Water Quality:

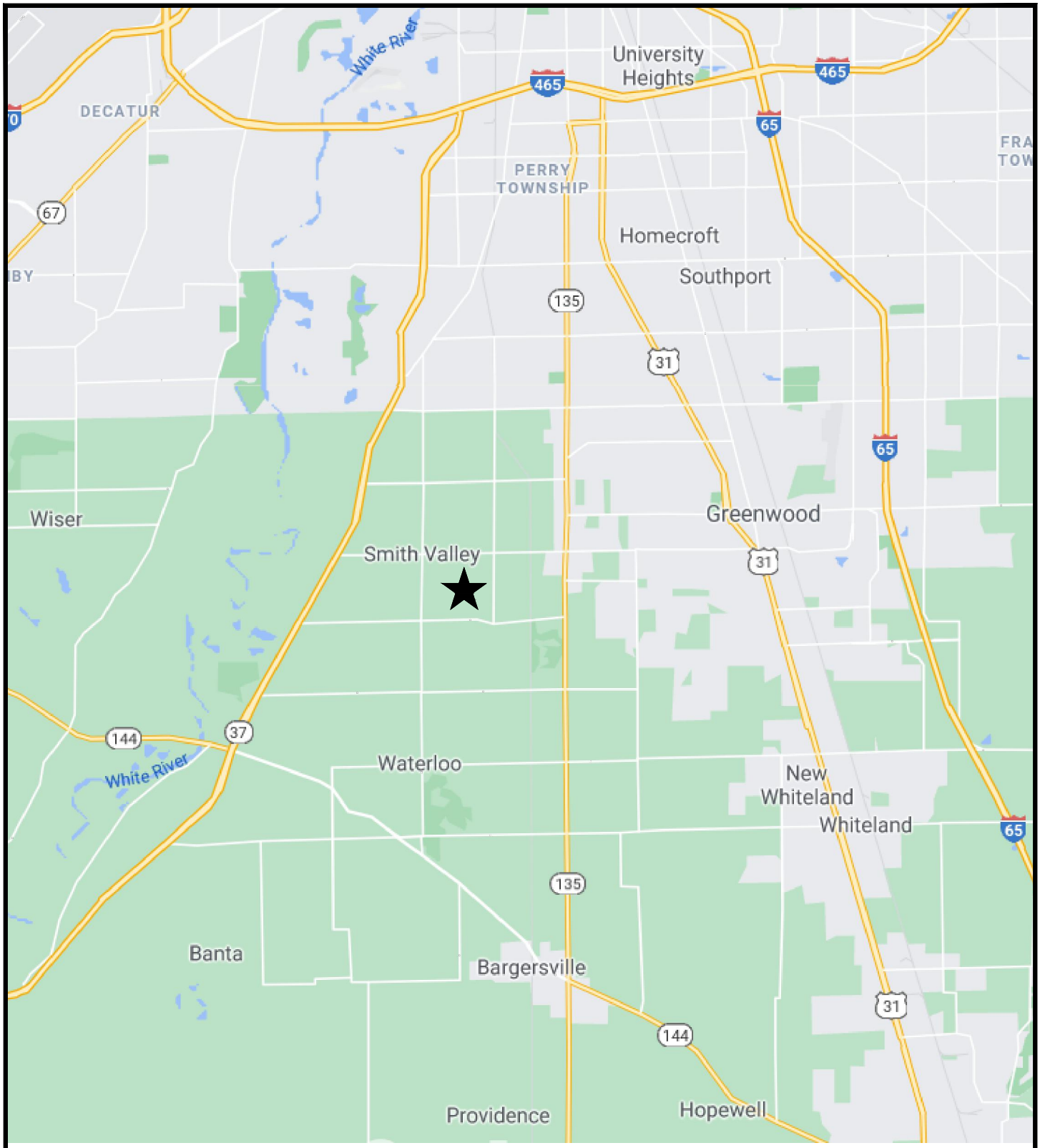
Deerfield will utilize a Wet Detention Basin to meet the standards for Water Quality as defined in Subdivision Control Ordinance of Johnson County, Indiana. The Wet Detention Basin will be designed to have 3 times the Water Quality Volume (WQV) available below the normal pool. The water quality volume is calculated with the following equation:

$$WQv = (P)*(Rv)*(A) /12$$

WQv = Water Quality Volume
P = 1.25 inch of rainfall
Rv = Volumetric runoff coefficient (0.05 + 0.009 (I))
A = Area

A value of 42% will be used for the impervious percent in the Volumetric Runoff coefficient calculations. See **Section 5** of this report for calculations.

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:00pm
PLOTTED BY: Gaithert



★ PROJECT LOCATION

DEERFIELD
JOHNSON COUNTY, IN

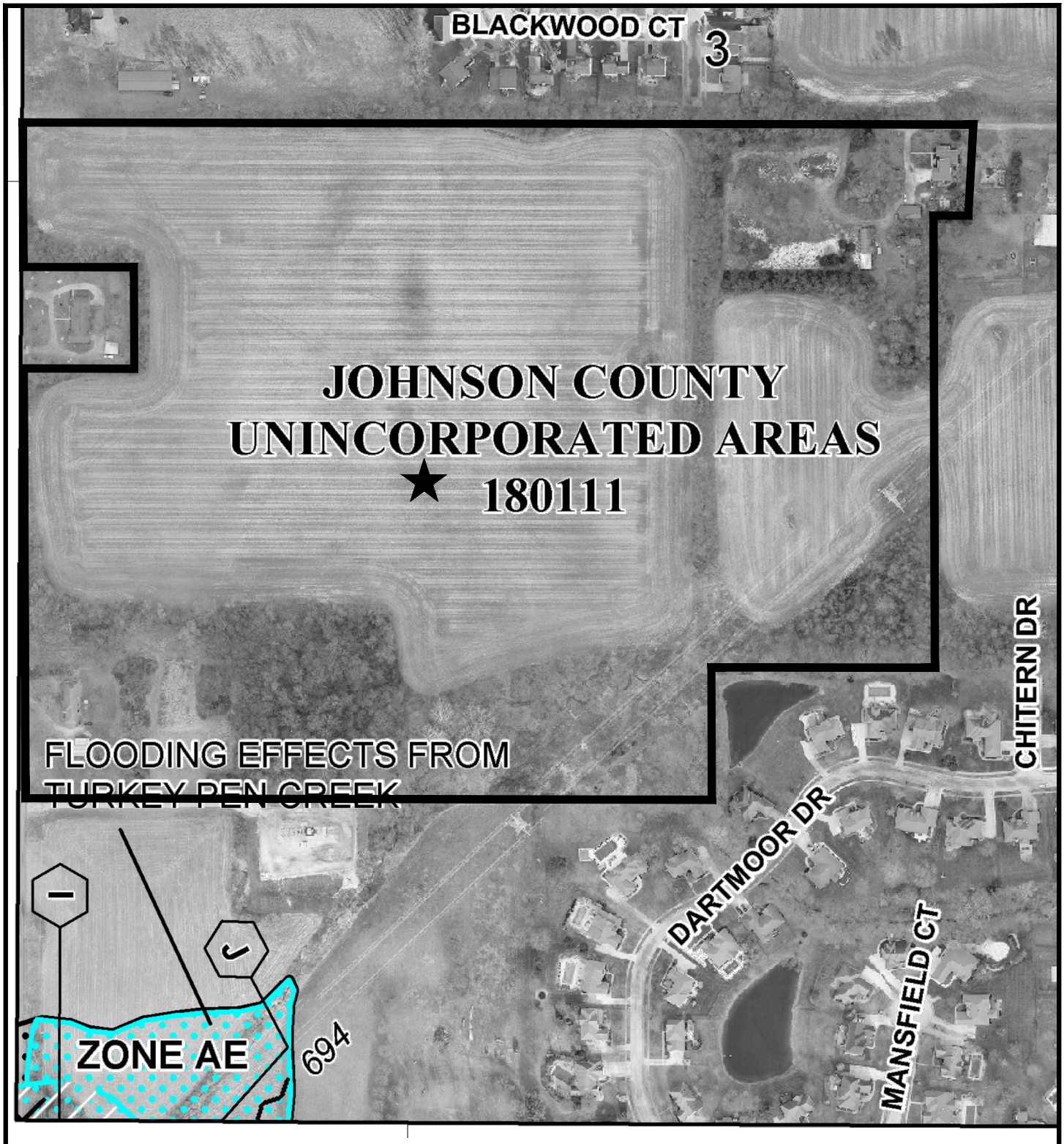
LOCATION MAP

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611

FIGURE 1.1

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:01pm
PLOTTED BY: Gaithert



★ PROJECT LOCATION

DEERFIELD
JOHNSON COUNTY, IN

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611

FIGURE 1.2

FEMA MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:02pm
PLOTTED BY: Gaithert

★ PROJECT LOCATION

DEERFIELD
JOHNSON COUNTY, IN

AERIAL MAP

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611

FIGURE 1.3

Date: August 17, 2022

Soil Map—Johnson County, Indiana

Map Scale: 1:3,530 if printed on A landscape (11" x 8.5") 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 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

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 29, Sep 8, 2021

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

Date(s) aerial images were photographed: Oct 22, 2020—Nov 12, 2020

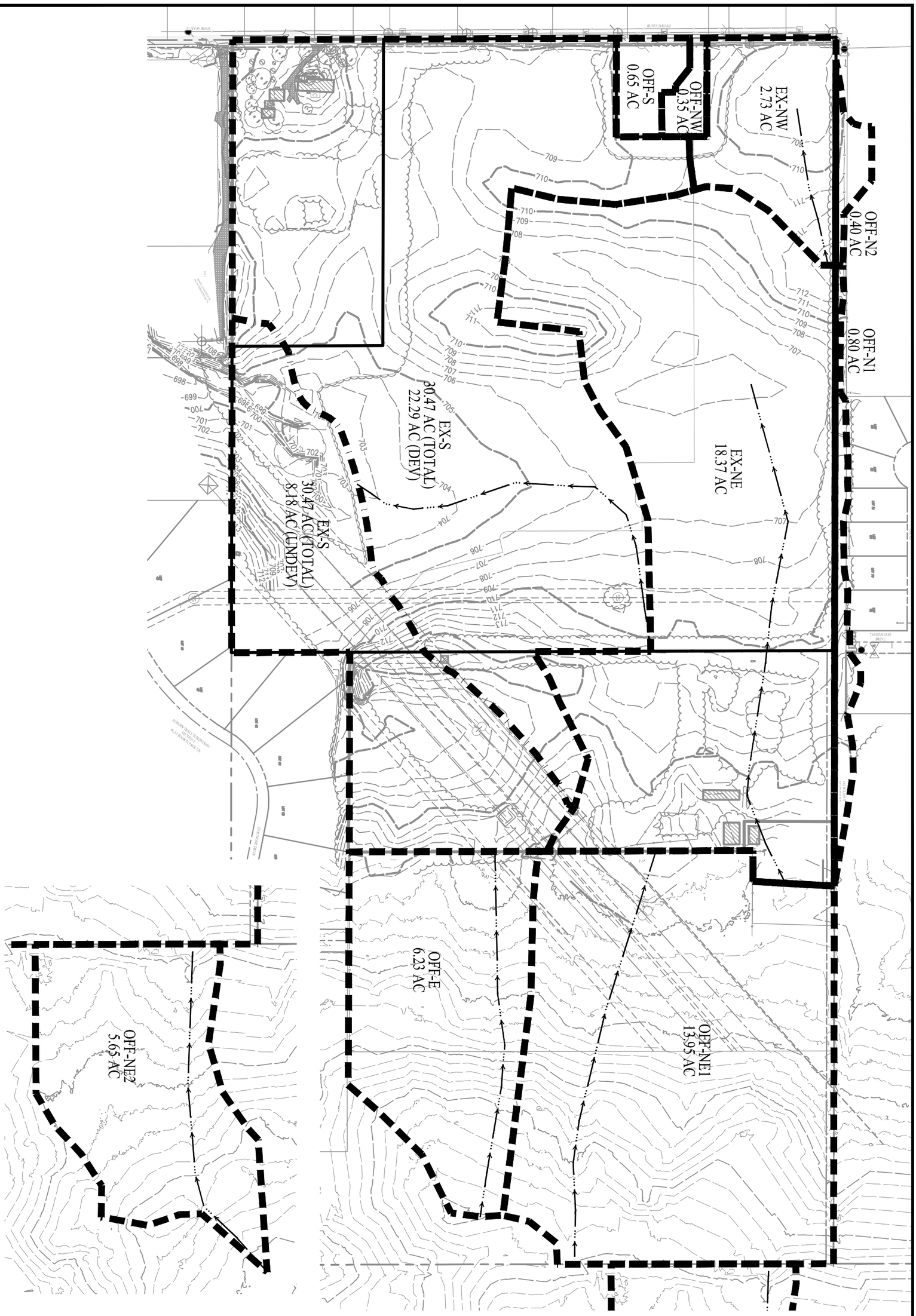
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ee	Eel silt loam, 0 to 2 percent slopes, frequently flooded	3.9	7.4%
FoB2	Fox loam, 2 to 6 percent slopes, eroded	17.3	33.1%
FxC2	Fox complex, 6 to 12 percent slopes, eroded	0.8	1.5%
ObaA	Ockley loam, 0 to 2 percent slopes	19.1	36.4%
Re	Rensselaer silty clay loam	9.3	17.8%
Sk	Sleeth loam	1.8	3.4%
YelAH	Eel silt loam-Urban land complex, 0 to 2 percent slopes, frequently flooded, brief duration	0.0	0.0%
YflB2	Fox loam-Urban land complex, 2 to 6 percent slopes, eroded	0.0	0.1%
YobA	Ockley loam-Urban land complex, 0 to 2 percent slopes	0.0	0.1%
YreA	Rensselaer silty clay loam-Urban land complex, 0 to 2 percent slopes	0.1	0.2%
Totals for Area of Interest		**52.4**	**100.0%**

PRE-DEVELOPED
DRAINAGE CALCULATIONS

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:07pm
PLOTTED BY: Gaithert



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JOHNSON COUNTY, IN

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SCALE: 1" = 200'
0 50 100 200

FIGURE 2.1

PRE-DEVELOPED BASIN MAP

Date: August 17, 2022

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

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Weighted Curve Number Calculations

Existing Conditions

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Basin Name	Soil Group %				Type of Cover/ Condition of Cover	Percent of Basin	Curve Number (CN)				Weighted CN
	A	B	C	D			A	B	C	D	
EX-S (DEV)	1%	99%	0%	0%	Impervious	1%	98	98	98	98	98.0
	1%	99%	0%	0%	Pasture (Good Cond.)	78%	39	61	74	80	60.8
	1%	99%	0%	0%	Farmstead	4%	59	74	82	86	73.9
	1%	99%	0%	0%	Woods (Good Cond.)	17%	30	55	70	77	54.8
EX-S (DEV)						100%					**60.6**
EX-NE	0%	100%	0%	0%	Impervious	0%	98	98	98	98	98.0
	0%	100%	0%	0%	Pasture (Good Cond.)	82%	39	61	74	80	61.0
	0%	100%	0%	0%	Farmstead	4%	59	74	82	86	74.0
	0%	100%	0%	0%	Woods (Good Cond.)	14%	30	55	70	77	55.0
EX-NE						100%					**60.7**
EX-NW	0%	100%	0%	0%	Impervious	3%	98	98	98	98	98.0
	0%	100%	0%	0%	Pasture (Good Cond.)	82%	39	61	74	80	61.0
	0%	100%	0%	0%	Woods-Grass (Good Cond.)	15%	32	58	72	79	58.0
EX-NW						100%					**61.7**
OFF-NE1	0%	66%	34%	0%	Impervious	14%	98	98	98	98	98.0
	0%	66%	34%	0%	Pasture (Good Cond.)	81%	39	61	74	80	65.4
	0%	66%	34%	0%	Woods (Good Cond.)	5%	30	55	70	77	60.1
OFF-NE1						100%					**69.7**
OFF-NE2	0%	24%	76%	0%	Impervious	15%	98	98	98	98	98.0
	0%	24%	76%	0%	Pasture (Good Cond.)	85%	39	61	74	80	70.9
	0%	24%	76%	0%	Woods (Good Cond.)	0%	30	55	70	77	66.4
OFF-NE2						100%					**74.9**
OFF-NW	0%	100%	0%	0%	Impervious	18%	98	98	98	98	98.0
	0%	100%	0%	0%	Pasture (Good Cond.)	22%	39	61	74	80	61.0
	0%	100%	0%	0%	Woods (Good Cond.)	60%	30	55	70	77	55.0
OFF-NW						100%					**64.1**
OFF-S	0%	100%	0%	0%	Impervious	33%	98	98	98	98	98.0
	0%	100%	0%	0%	Pasture (Good Cond.)	38%	39	61	74	80	61.0
	0%	100%	0%	0%	Woods (Good Cond.)	29%	30	55	70	77	55.0
OFF-S						100%					**71.5**
OFF-E	6%	77%	17%	0%	Impervious	2%	98	98	98	98	98.0
	6%	77%	17%	0%	Pasture (Good Cond.)	65%	39	61	74	80	61.9
	6%	77%	17%	0%	Woods (Good Cond.)	33%	30	55	70	77	56.1
OFF-E						100%					**60.7**
EX-S (UNDEV)	48%	52%	0%	0%	Impervious	1%	98	98	98	98	98.0
	48%	52%	0%	0%	Woods, Good Cond.	55%	30	55	70	77	43.0
	48%	52%	0%	0%	Pasture (Good Cond.)	44%	39	61	74	80	50.4
EX-S (UNDEV)						100%					**46.8**

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Weighted Curve Number Calculations** **Existing Conditions**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

Basin Name	Soil Group %				Type of Cover/ Condition of Cover	Percent of Basin	Curve Number (CN)				Weighted CN
	A	B	C	D			A	B	C	D	
OFF-N1	0%	100%	0%	0%	Woods, Good Cond.	100%	30	55	70	77	**55.0**
OFF-N2	0%	100%	0%	0%	Impervious	12%	98	98	98	98	98.0
	0%	100%	0%	0%	Woods, Good Cond.	88%	30	55	70	77	55.0
OFF-N2						100%					**60.2**

WEIHE ENGINEERS
Land Surveying | Civil Engineering
Landscape Architecture
Build with confidence.

Time of Concentration Calculations
Existing Conditions

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Mannings Values (n)			
Overland Flow		Channel Flow	
Farm Field	0.17	Grass	0.03
Dense Grass	0.24	Concrete	0.015
Pavement	0.011	Rip-Rap	0.035

2 Yr, 24 Hr Rainfall= 2.92
Tc minimum= 5

Overland Flow Travel Time: $T_t = \frac{0.0043\,(nL)^{0.8}}{S^{0.4}}$

Shallow Conc Flow Travel Time:
Channel Flow Travel Time: $T_t = \frac{L}{60\,V}$

Shallow Conc Flow (Unpaved): $V = 16.1345\,(S)^{0.5}$

Shallow Conc Flow (Paved): $V = 20.3282\,(S)^{0.5}$

Paved Gutter & Channel Flow $V = \frac{1.486}{n} R^{2/3} S^{1/2}$; $R = \frac{A}{P_w}$

Basin	Overland Flow				Overland Flow				Shallow Conc. Flow					Channel Flow								Tc
	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	Pave/Un P or U	Vel (ft/s)	T_t (min)	Len (ft)	A (sf)	Pw (ft)	r (ft)	S %	n	Vel (ft/s)	T_t (min)	(min)
EX-S (DEV)	100	1.30	0.24	18				0	848	0.80	U	1.44	10								0	**28**
EX-NE	100	1.50	0.24	17				0	1037	1.31	U	1.85	9								0	**26**
EX-NW	100	1.40	0.24	17				0	252	1.30	U	1.84	2								0	**20**
OFF-NE1	100	1.50	0.24	17				0	821	2.50	U	2.55	5								0	**22**
OFF-NE2	100	1.40	0.24	17				0	667	2.40	U	2.50	4								0	**22**
OFF-NW	100	1.20	0.24	18				0	20	1.20	U	1.77	0								0	**19**
OFF-S	93	1.40	0.24	16				0	0	0.00	U	0.00	0								0	**16**
OFF-E	100	1.70	0.24	16				0	712	2.90	U	2.75	4								0	**20**
EX-S (UNDEV)	100	1.00	0.24	20				0	205	0.90	U	1.53	2								0	**22**
OFF-N1				0				0	182	0.77	U	1.42	2								0	**5**
OFF-N2				0				0			U		0								0	**5**

NOAA Atlas 14, Volume 2, Version 3
Location name: Greenwood, Indiana, USA*
Latitude: 39.5977°, Longitude: -86.1848°
Elevation: 706.22 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	0.378 (0.338-0.425)	0.449 (0.402-0.506)	0.539 (0.480-0.606)	0.609 (0.541-0.684)	0.701 (0.617-0.788)	0.773 (0.676-0.872)	0.843 (0.730-0.953)	0.917 (0.787-1.04)	1.02 (0.857-1.16)	1.09 (0.907-1.25)
10-min	0.587 (0.525-0.661)	0.702 (0.627-0.789)	0.837 (0.746-0.941)	0.940 (0.834-1.06)	1.07 (0.944-1.21)	1.17 (1.02-1.32)	1.27 (1.10-1.43)	1.37 (1.17-1.55)	1.49 (1.26-1.71)	1.59 (1.32-1.83)
15-min	0.719 (0.643-0.810)	0.858 (0.767-0.965)	1.03 (0.916-1.16)	1.16 (1.03-1.30)	1.32 (1.17-1.49)	1.45 (1.27-1.64)	1.58 (1.37-1.78)	1.70 (1.46-1.93)	1.87 (1.57-2.13)	1.98 (1.65-2.28)
30-min	0.952 (0.851-1.07)	1.15 (1.03-1.29)	1.41 (1.25-1.58)	1.61 (1.43-1.80)	1.87 (1.65-2.10)	2.07 (1.81-2.34)	2.28 (1.97-2.57)	2.49 (2.13-2.82)	2.76 (2.33-3.16)	2.97 (2.47-3.42)
60-min	1.16 (1.04-1.31)	1.41 (1.26-1.59)	1.77 (1.57-1.99)	2.04 (1.81-2.30)	2.42 (2.14-2.73)	2.73 (2.39-3.08)	3.04 (2.64-3.44)	3.37 (2.89-3.83)	3.82 (3.22-4.37)	4.18 (3.47-4.81)
2-hr	1.36 (1.22-1.54)	1.65 (1.47-1.86)	2.07 (1.85-2.33)	2.41 (2.14-2.71)	2.89 (2.54-3.24)	3.28 (2.87-3.68)	3.70 (3.19-4.15)	4.13 (3.52-4.65)	4.75 (3.96-5.38)	5.25 (4.30-5.99)
3-hr	1.44 (1.29-1.63)	1.75 (1.56-1.97)	2.20 (1.97-2.48)	2.57 (2.28-2.88)	3.09 (2.72-3.47)	3.53 (3.07-3.95)	3.99 (3.43-4.48)	4.48 (3.80-5.06)	5.18 (4.30-5.90)	5.76 (4.68-6.60)
6-hr	1.71 (1.53-1.94)	2.07 (1.85-2.34)	2.61 (2.34-2.95)	3.06 (2.72-3.44)	3.70 (3.25-4.15)	4.23 (3.68-4.74)	4.81 (4.12-5.39)	5.42 (4.57-6.11)	6.31 (5.20-7.14)	7.04 (5.68-8.03)
12-hr	2.05 (1.84-2.30)	2.46 (2.22-2.77)	3.06 (2.76-3.44)	3.56 (3.18-3.98)	4.24 (3.76-4.74)	4.81 (4.22-5.37)	5.40 (4.69-6.04)	6.03 (5.16-6.76)	6.92 (5.79-7.82)	7.63 (6.28-8.68)
24-hr	2.43 (2.25-2.65)	2.92 (2.70-3.18)	3.57 (3.30-3.89)	4.08 (3.77-4.44)	4.77 (4.38-5.19)	5.32 (4.87-5.79)	5.87 (5.34-6.39)	6.43 (5.82-7.01)	7.19 (6.45-7.86)	7.77 (6.92-8.76)
2-day	2.85 (2.65-3.07)	3.41 (3.17-3.67)	4.16 (3.86-4.48)	4.74 (4.38-5.10)	5.51 (5.08-5.94)	6.12 (5.62-6.60)	6.73 (6.15-7.27)	7.36 (6.69-7.96)	8.19 (7.38-8.88)	8.83 (7.90-9.61)
3-day	3.05 (2.85-3.27)	3.65 (3.41-3.90)	4.42 (4.13-4.73)	5.01 (4.67-5.37)	5.82 (5.41-6.23)	6.45 (5.97-6.90)	7.08 (6.54-7.59)	7.72 (7.09-8.28)	8.58 (7.83-9.21)	9.23 (8.38-9.94)
4-day	3.25 (3.06-3.47)	3.88 (3.65-4.14)	4.68 (4.39-4.99)	5.29 (4.97-5.64)	6.13 (5.73-6.52)	6.78 (6.33-7.21)	7.43 (6.92-7.90)	8.09 (7.50-8.61)	8.96 (8.27-9.54)	9.64 (8.85-10.3)
7-day	3.85 (3.61-4.11)	4.58 (4.29-4.89)	5.49 (5.14-5.86)	6.22 (5.81-6.63)	7.20 (6.71-7.67)	7.98 (7.42-8.49)	8.76 (8.13-9.32)	9.56 (8.84-10.2)	10.6 (9.78-11.3)	11.5 (10.5-12.2)
10-day	4.39 (4.13-4.69)	5.21 (4.90-5.56)	6.23 (5.86-6.65)	7.04 (6.61-7.51)	8.13 (7.62-8.66)	8.99 (8.40-9.57)	9.85 (9.18-10.5)	10.7 (9.97-11.4)	11.9 (11.0-12.7)	12.8 (11.8-13.7)
20-day	6.01 (5.67-6.39)	7.10 (6.70-7.55)	8.38 (7.89-8.90)	9.37 (8.81-9.95)	10.7 (10.0-11.3)	11.7 (10.9-12.4)	12.7 (11.9-13.5)	13.7 (12.8-14.5)	15.0 (13.9-15.9)	16.0 (14.7-17.0)
30-day	7.40 (6.98-7.83)	8.71 (8.22-9.22)	10.1 (9.56-10.7)	11.2 (10.6-11.9)	12.7 (11.9-13.4)	13.8 (12.9-14.6)	14.8 (13.9-15.7)	15.9 (14.8-16.8)	17.2 (16.0-18.3)	18.2 (16.9-19.4)
45-day	9.36 (8.85-9.90)	11.0 (10.4-11.6)	12.7 (12.0-13.4)	14.0 (13.2-14.7)	15.6 (14.7-16.5)	16.9 (15.8-17.8)	18.0 (16.9-19.0)	19.2 (18.0-20.2)	20.6 (19.3-21.8)	21.7 (20.2-22.9)
60-day	11.2 (10.6-11.8)	13.1 (12.4-13.9)	15.0 (14.2-15.9)	16.5 (15.6-17.4)	18.4 (17.3-19.4)	19.8 (18.6-20.9)	21.1 (19.9-22.3)	22.4 (21.1-23.7)	24.1 (22.5-25.5)	25.2 (23.6-26.7)

[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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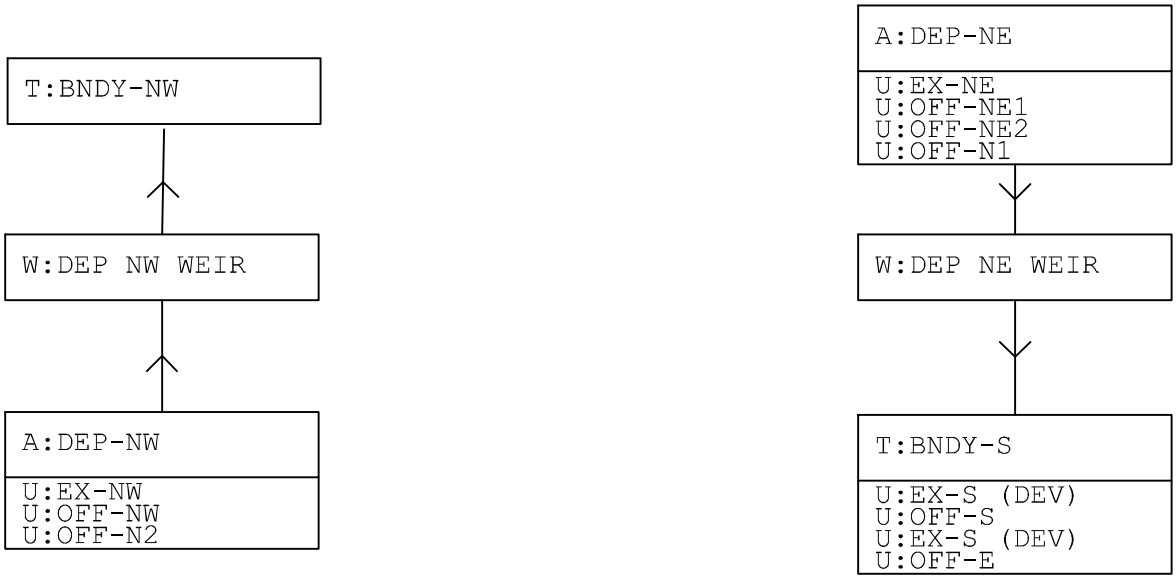
PF graphical

DEERFIELD - W21-0353
EXISTING CONDITIONS
ICPR ROUTING SCHEMATIC



DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS
ICPR INPUT REPORT

==========
==== Basins ==========
==========

```
         Name: EX-NE                    Node: DEP-NE                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 26.00
                Area(ac): 18.370                 Time Shift(hrs): 0.00
            Curve Number: 60.70              Max Allowable Q(cfs): 999999.000
                 DCIA(%): 0.00
```

```
         Name: EX-NW                    Node: DEP-NW                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 20.00
                Area(ac): 2.730                  Time Shift(hrs): 0.00
            Curve Number: 61.70              Max Allowable Q(cfs): 999999.000
                 DCIA(%): 0.00
```

```
         Name: EX-S (DEV)               Node: BNDY-S                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 28.00
                Area(ac): 22.290                 Time Shift(hrs): 0.00
            Curve Number: 60.60              Max Allowable Q(cfs): 999999.000
                 DCIA(%): 0.00
```

```
         Name: EX-S (UNDEV)             Node: BNDY-S                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
                Area(ac): 8.180                  Time Shift(hrs): 0.00
```

```
          Curve Number: 46.80              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-E                    Node: BNDY-S                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 20.00
               Area(ac): 6.230                   Time Shift(hrs): 0.07
          Curve Number: 60.70              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-N1                   Node: DEP-NE                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 5.00
               Area(ac): 0.800                   Time Shift(hrs): 0.03
          Curve Number: 55.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-N2                   Node: DEP-NW                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 5.00
               Area(ac): 0.400                   Time Shift(hrs): 0.03
          Curve Number: 60.20              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-NE1                  Node: DEP-NE                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
               Area(ac): 13.950                  Time Shift(hrs): 0.05
          Curve Number: 69.70              Max Allowable Q(cfs): 999999.000
```

```
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
------
         Name: OFF-NE2                  Node: DEP-NE                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
               Area(ac): 5.650                   Time Shift(hrs): 0.25
           Curve Number: 74.90             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



-----------------------------------------------------------------------------------------------
------
         Name: OFF-NW                   Node: DEP-NW                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 19.00
               Area(ac): 0.350                   Time Shift(hrs): 0.17
           Curve Number: 64.10             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



-----------------------------------------------------------------------------------------------
------
         Name: OFF-S                    Node: BNDY-S                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 16.00
               Area(ac): 0.650                   Time Shift(hrs): 0.10
           Curve Number: 71.50             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



=================================================================================
==== Nodes ======================================================================
=================================================================================

      Name: BNDY-NW             Base Flow(cfs): 0.000          Init Stage(ft): 709.100
     Group: BASE                                               Warn Stage(ft): 709.100
      Type: Time/Stage



      Time(hrs)       Stage(ft)
```

```
--------------- ---------------
          0.00         709.100
         99.00         709.100

-------------------------------------------------------------------------------------------
      Name: BNDY-S              Base Flow(cfs): 0.000          Init Stage(ft): 699.300
     Group: BASE                                               Warn Stage(ft): 699.300
      Type: Time/Stage



      Time(hrs)       Stage(ft)
--------------- ---------------
          0.00         699.300
         99.00         699.300

-------------------------------------------------------------------------------------------
      Name: DEP-NE              Base Flow(cfs): 0.000          Init Stage(ft): 705.600
     Group: BASE                                               Warn Stage(ft): 706.300
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
        705.600          0.0100
        706.000          0.7540
        707.000          4.9030

-------------------------------------------------------------------------------------------
      Name: DEP-NW              Base Flow(cfs): 0.000          Init Stage(ft): 708.300
     Group: BASE                                               Warn Stage(ft): 709.200
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
        708.300          0.0100
        709.000          0.7860
        710.000          1.4070

===========================================================================================
==== Weirs ================================================================================
===========================================================================================

         Name: DEP NE WEIR         From Node: DEP-NE
        Group: BASE                  To Node: BNDY-S
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Trapezoidal

            Bottom Width(ft): 154.00
        Left Side Slope(h/v): 164.00
       Right Side Slope(h/v): 180.00
                   Invert(ft): 706.300
       Control Elevation(ft): 706.300
      Struct Opening Dim(ft): 9999.00
```

```
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------
------
         Name: DEP NW WEIR         From Node: DEP-NW
        Group: BASE                  To Node: BNDY-NW
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Trapezoidal

           Bottom Width(ft): 2.00
        Left Side Slope(h/v): 16.00
       Right Side Slope(h/v): 255.00
                  Invert(ft): 709.200
       Control Elevation(ft): 709.200
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



=========================================================================================
==== Hydrology Simulations ==============================================================
=========================================================================================

         Name: 002YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-01HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 1.41

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-------------------------------------------------------------------------------------------
------
         Name: 002YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
```

```
    Rainfall Amount(in): 1.65

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 1.75

Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.07

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 2.46

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-24HR
```

```
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-24HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 2.92

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-01HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.04

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.41

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.57
```

```
Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.06

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 3.56

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-24HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 4.08

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-01HR.R32
```

```
      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.04

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.70

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.99

Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 4.81

Time(hrs)       Print Inc(min)
--------------- ---------------
```

```
6.000          1.00

-------------------------------------------------------------------------------------------
------
         Name: 100YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 5.40

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-------------------------------------------------------------------------------------------
------
         Name: 100YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-24HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 5.87

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

=============================================================================================
==== Routing Simulations ====================================================================
=============================================================================================

         Name: 002YR-01HR          Hydrology Sim: 002YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000
```

```
Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 002YR-02HR          Hydrology Sim: 002YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-02HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 002YR-03HR          Hydrology Sim: 002YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
```

```
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 002YR-06HR          Hydrology Sim: 002YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-06HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 002YR-12HR          Hydrology Sim: 002YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes
```

```
-----------------------------------------------------------------------------------------------
------
         Name: 002YR-24HR          Hydrology Sim: 002YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 010YR-01HR          Hydrology Sim: 010YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 010YR-02HR          Hydrology Sim: 010YR-02HR
```

```
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-02HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-03HR          Hydrology Sim: 010YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-06HR          Hydrology Sim: 010YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-06HR.I32
```

```
      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-12HR          Hydrology Sim: 010YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-24HR          Hydrology Sim: 010YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No
```

```
        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-01HR          Hydrology Sim: 100YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-02HR          Hydrology Sim: 100YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-02HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
```

```
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 100YR-03HR          Hydrology Sim: 100YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 100YR-06HR          Hydrology Sim: 100YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-06HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:
```

```
Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-12HR          Hydrology Sim: 100YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-24HR          Hydrology Sim: 100YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:
```

Time(hrs)	Print Inc(min)
30.000	1.000

Group	Run
BASE	Yes

DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS
ICPR BASIN REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-01HR	EX-NE	BASE	1.16	0.08	0.002	127
002YR-02HR	EX-NE	BASE	1.91	0.33	0.018	1206
002YR-03HR	EX-NE	BASE	2.66	0.31	0.029	1959
002YR-06HR	EX-NE	BASE	2.77	0.45	0.082	5492
002YR-12HR	EX-NE	BASE	6.70	0.98	0.177	11811
002YR-24HR	EX-NE	BASE	15.72	1.16	0.326	21707
010YR-01HR	EX-NE	BASE	0.87	1.89	0.076	5064
010YR-02HR	EX-NE	BASE	1.04	2.49	0.162	10818
010YR-03HR	EX-NE	BASE	1.27	2.46	0.208	13862
010YR-06HR	EX-NE	BASE	1.96	2.90	0.376	25105
010YR-12HR	EX-NE	BASE	6.64	2.91	0.586	39045
010YR-24HR	EX-NE	BASE	15.66	3.09	0.836	55774
100YR-01HR	EX-NE	BASE	0.64	9.50	0.368	24510
100YR-02HR	EX-NE	BASE	0.87	11.81	0.647	43136
100YR-03HR	EX-NE	BASE	1.10	11.32	0.787	52468
100YR-06HR	EX-NE	BASE	1.68	10.78	1.233	82188
100YR-12HR	EX-NE	BASE	6.12	7.39	1.589	105971
100YR-24HR	EX-NE	BASE	15.66	6.75	1.891	126128
002YR-01HR	EX-NW	BASE	1.07	0.03	0.004	42
002YR-02HR	EX-NW	BASE	1.82	0.06	0.025	250
002YR-03HR	EX-NW	BASE	1.78	0.06	0.038	379
002YR-06HR	EX-NW	BASE	2.22	0.09	0.097	966
002YR-12HR	EX-NW	BASE	6.67	0.17	0.200	1979
002YR-24HR	EX-NW	BASE	15.69	0.20	0.357	3536
010YR-01HR	EX-NW	BASE	0.71	0.36	0.090	889
010YR-02HR	EX-NW	BASE	0.89	0.46	0.185	1832
010YR-03HR	EX-NW	BASE	1.16	0.45	0.233	2311
010YR-06HR	EX-NW	BASE	1.87	0.50	0.411	4078
010YR-12HR	EX-NW	BASE	6.09	0.47	0.630	6240
010YR-24HR	EX-NW	BASE	15.64	0.50	0.889	8815
100YR-01HR	EX-NW	BASE	0.53	1.74	0.400	3967
100YR-02HR	EX-NW	BASE	0.76	2.10	0.697	6903
100YR-03HR	EX-NW	BASE	0.98	1.95	0.841	8330
100YR-06HR	EX-NW	BASE	1.60	1.77	1.301	12891
100YR-12HR	EX-NW	BASE	6.09	1.15	1.666	16510
100YR-24HR	EX-NW	BASE	15.64	1.05	1.974	19566
002YR-01HR	EX-S (DEV)	BASE	1.18	0.09	0.002	145
002YR-02HR	EX-S (DEV)	BASE	1.93	0.38	0.018	1435
002YR-03HR	EX-S (DEV)	BASE	2.68	0.37	0.029	2341
002YR-06HR	EX-S (DEV)	BASE	2.80	0.53	0.081	6565
002YR-12HR	EX-S (DEV)	BASE	6.72	1.17	0.175	14149
002YR-24HR	EX-S (DEV)	BASE	15.74	1.37	0.322	26086
010YR-01HR	EX-S (DEV)	BASE	0.87	2.21	0.075	6088
010YR-02HR	EX-S (DEV)	BASE	1.06	2.92	0.161	13045
010YR-03HR	EX-S (DEV)	BASE	1.31	2.89	0.207	16729
010YR-06HR	EX-S (DEV)	BASE	1.99	3.43	0.374	30236
010YR-12HR	EX-S (DEV)	BASE	6.66	3.50	0.581	47013
010YR-24HR	EX-S (DEV)	BASE	15.68	3.70	0.831	67238

100YR-01HR	EX-S (DEV)	BASE	0.68	11.05	0.366	29624
100YR-02HR	EX-S (DEV)	BASE	0.87	13.81	0.645	52199
100YR-03HR	EX-S (DEV)	BASE	1.12	13.32	0.785	63514
100YR-06HR	EX-S (DEV)	BASE	1.74	12.85	1.227	99301
100YR-12HR	EX-S (DEV)	BASE	6.10	8.90	1.581	127938
100YR-24HR	EX-S (DEV)	BASE	15.68	8.11	1.883	152350
002YR-01HR	EX-S (UNDEV)	BASE	0.00	0.00	0.000	0
002YR-02HR	EX-S (UNDEV)	BASE	0.00	0.00	0.000	0
002YR-03HR	EX-S (UNDEV)	BASE	0.00	0.00	0.000	0
002YR-06HR	EX-S (UNDEV)	BASE	0.00	0.00	0.000	0
002YR-12HR	EX-S (UNDEV)	BASE	10.85	0.01	0.003	89
002YR-24HR	EX-S (UNDEV)	BASE	19.26	0.08	0.035	1030
010YR-01HR	EX-S (UNDEV)	BASE	0.00	0.00	0.000	0
010YR-02HR	EX-S (UNDEV)	BASE	2.05	0.03	0.001	44
010YR-03HR	EX-S (UNDEV)	BASE	2.93	0.07	0.007	221
010YR-06HR	EX-S (UNDEV)	BASE	3.42	0.13	0.051	1501
010YR-12HR	EX-S (UNDEV)	BASE	6.75	0.32	0.130	3873
010YR-24HR	EX-S (UNDEV)	BASE	18.04	0.44	0.247	7340
100YR-01HR	EX-S (UNDEV)	BASE	0.98	0.64	0.047	1407
100YR-02HR	EX-S (UNDEV)	BASE	1.17	1.06	0.157	4655
100YR-03HR	EX-S (UNDEV)	BASE	1.32	1.11	0.224	6657
100YR-06HR	EX-S (UNDEV)	BASE	1.96	1.53	0.461	13688
100YR-12HR	EX-S (UNDEV)	BASE	6.65	1.58	0.673	19983
100YR-24HR	EX-S (UNDEV)	BASE	15.69	1.43	0.863	25619
002YR-01HR	OFF-E	BASE	1.14	0.03	0.002	43
002YR-02HR	OFF-E	BASE	1.94	0.11	0.018	417
002YR-03HR	OFF-E	BASE	1.89	0.11	0.030	671
002YR-06HR	OFF-E	BASE	2.60	0.15	0.083	1872
002YR-12HR	OFF-E	BASE	6.74	0.34	0.177	4013
002YR-24HR	OFF-E	BASE	15.76	0.40	0.326	7364
010YR-01HR	OFF-E	BASE	0.83	0.68	0.076	1713
010YR-02HR	OFF-E	BASE	1.00	0.90	0.164	3700
010YR-03HR	OFF-E	BASE	1.23	0.89	0.209	4723
010YR-06HR	OFF-E	BASE	1.98	1.02	0.378	8540
010YR-12HR	OFF-E	BASE	6.16	1.00	0.586	13259
010YR-24HR	OFF-E	BASE	15.71	1.07	0.837	18919
100YR-01HR	OFF-E	BASE	0.65	3.59	0.367	8298
100YR-02HR	OFF-E	BASE	0.83	4.41	0.651	14713
100YR-03HR	OFF-E	BASE	1.09	4.13	0.789	17850
100YR-06HR	OFF-E	BASE	1.67	3.80	1.235	27935
100YR-12HR	OFF-E	BASE	6.16	2.53	1.591	35975
100YR-24HR	OFF-E	BASE	15.71	2.32	1.892	42783
002YR-01HR	OFF-N1	BASE	0.03	0.00	0.000	0
002YR-02HR	OFF-N1	BASE	2.05	0.00	0.000	0
002YR-03HR	OFF-N1	BASE	2.89	0.00	0.002	5
002YR-06HR	OFF-N1	BASE	4.84	0.01	0.022	63
002YR-12HR	OFF-N1	BASE	6.64	0.02	0.075	218
002YR-24HR	OFF-N1	BASE	18.03	0.03	0.174	505
010YR-01HR	OFF-N1	BASE	0.93	0.03	0.019	55
010YR-02HR	OFF-N1	BASE	1.14	0.05	0.067	194
010YR-03HR	OFF-N1	BASE	1.11	0.05	0.095	277
010YR-06HR	OFF-N1	BASE	1.85	0.07	0.211	612
010YR-12HR	OFF-N1	BASE	6.63	0.09	0.366	1062
010YR-24HR	OFF-N1	BASE	15.63	0.10	0.561	1630

100YR-01HR	OFF-N1	BASE	0.41	0.34	0.205	596
100YR-02HR	OFF-N1	BASE	0.65	0.44	0.415	1205
100YR-03HR	OFF-N1	BASE	0.94	0.39	0.525	1525
100YR-06HR	OFF-N1	BASE	1.54	0.38	0.886	2572
100YR-12HR	OFF-N1	BASE	6.04	0.26	1.184	3439
100YR-24HR	OFF-N1	BASE	15.63	0.24	1.442	4187
002YR-01HR	OFF-N2	BASE	1.01	0.00	0.001	2
002YR-02HR	OFF-N2	BASE	1.75	0.01	0.015	22
002YR-03HR	OFF-N2	BASE	1.70	0.01	0.026	38
002YR-06HR	OFF-N2	BASE	2.15	0.01	0.076	110
002YR-12HR	OFF-N2	BASE	6.64	0.02	0.167	242
002YR-24HR	OFF-N2	BASE	15.64	0.03	0.311	451
010YR-01HR	OFF-N2	BASE	0.51	0.05	0.070	102
010YR-02HR	OFF-N2	BASE	0.66	0.07	0.153	223
010YR-03HR	OFF-N2	BASE	0.95	0.07	0.198	287
010YR-06HR	OFF-N2	BASE	1.84	0.07	0.361	524
010YR-12HR	OFF-N2	BASE	6.04	0.07	0.565	821
010YR-24HR	OFF-N2	BASE	15.63	0.07	0.811	1177
100YR-01HR	OFF-N2	BASE	0.36	0.34	0.354	514
100YR-02HR	OFF-N2	BASE	0.56	0.35	0.628	912
100YR-03HR	OFF-N2	BASE	0.81	0.31	0.766	1112
100YR-06HR	OFF-N2	BASE	1.54	0.27	1.203	1747
100YR-12HR	OFF-N2	BASE	6.03	0.16	1.554	2256
100YR-24HR	OFF-N2	BASE	15.63	0.15	1.851	2688
002YR-01HR	OFF-NE1	BASE	0.78	1.16	0.059	2984
002YR-02HR	OFF-NE1	BASE	0.98	1.45	0.117	5946
002YR-03HR	OFF-NE1	BASE	1.22	1.40	0.148	7481
002YR-06HR	OFF-NE1	BASE	1.96	1.56	0.259	13110
002YR-12HR	OFF-NE1	BASE	6.16	1.61	0.425	21532
002YR-24HR	OFF-NE1	BASE	15.69	1.85	0.656	33222
010YR-01HR	OFF-NE1	BASE	0.64	5.20	0.246	12454
010YR-02HR	OFF-NE1	BASE	0.83	5.85	0.400	20237
010YR-03HR	OFF-NE1	BASE	1.08	5.39	0.477	24137
010YR-06HR	OFF-NE1	BASE	1.71	4.93	0.732	37056
010YR-12HR	OFF-NE1	BASE	6.11	3.65	1.027	51989
010YR-24HR	OFF-NE1	BASE	15.69	3.70	1.362	68946
100YR-01HR	OFF-NE1	BASE	0.59	16.39	0.717	36328
100YR-02HR	OFF-NE1	BASE	0.78	18.01	1.109	56133
100YR-03HR	OFF-NE1	BASE	0.98	16.12	1.300	65849
100YR-06HR	OFF-NE1	BASE	1.61	13.51	1.869	94625
100YR-12HR	OFF-NE1	BASE	5.57	7.63	2.308	116869
100YR-24HR	OFF-NE1	BASE	15.69	6.88	2.671	135236
002YR-01HR	OFF-NE2	BASE	0.89	1.10	0.132	2715
002YR-02HR	OFF-NE2	BASE	1.08	1.25	0.220	4504
002YR-03HR	OFF-NE2	BASE	1.33	1.15	0.262	5379
002YR-06HR	OFF-NE2	BASE	1.96	1.08	0.411	8432
002YR-12HR	OFF-NE2	BASE	6.36	0.91	0.622	12755
002YR-24HR	OFF-NE2	BASE	15.89	1.00	0.902	18502
010YR-01HR	OFF-NE2	BASE	0.79	3.56	0.394	8085
010YR-02HR	OFF-NE2	BASE	0.98	3.74	0.590	12103
010YR-03HR	OFF-NE2	BASE	1.23	3.34	0.685	14056
010YR-06HR	OFF-NE2	BASE	1.86	2.84	0.992	20346
010YR-12HR	OFF-NE2	BASE	6.31	1.84	1.336	27393
010YR-24HR	OFF-NE2	BASE	15.89	1.82	1.717	35211

100YR-01HR	OFF-NE2	BASE	0.74	9.34	0.975	19997
100YR-02HR	OFF-NE2	BASE	0.93	9.73	1.430	29319
100YR-03HR	OFF-NE2	BASE	1.18	8.57	1.648	33795
100YR-06HR	OFF-NE2	BASE	1.67	6.91	2.282	46803
100YR-12HR	OFF-NE2	BASE	5.77	3.61	2.763	56678
100YR-24HR	OFF-NE2	BASE	15.85	3.17	3.157	64745
002YR-01HR	OFF-NW	BASE	1.18	0.01	0.014	18
002YR-02HR	OFF-NW	BASE	1.39	0.01	0.045	58
002YR-03HR	OFF-NW	BASE	1.65	0.01	0.064	81
002YR-06HR	OFF-NW	BASE	2.32	0.02	0.138	175
002YR-12HR	OFF-NW	BASE	6.84	0.03	0.258	328
002YR-24HR	OFF-NW	BASE	15.83	0.03	0.437	555
010YR-01HR	OFF-NW	BASE	0.80	0.07	0.128	162
010YR-02HR	OFF-NW	BASE	1.01	0.08	0.240	305
010YR-03HR	OFF-NW	BASE	1.23	0.08	0.298	378
010YR-06HR	OFF-NW	BASE	2.03	0.08	0.498	633
010YR-12HR	OFF-NW	BASE	6.25	0.07	0.739	939
010YR-24HR	OFF-NW	BASE	15.79	0.07	1.022	1298
100YR-01HR	OFF-NW	BASE	0.68	0.28	0.485	616
100YR-02HR	OFF-NW	BASE	0.89	0.33	0.811	1030
100YR-03HR	OFF-NW	BASE	1.14	0.30	0.971	1233
100YR-06HR	OFF-NW	BASE	1.77	0.26	1.463	1859
100YR-12HR	OFF-NW	BASE	6.21	0.16	1.851	2352
100YR-24HR	OFF-NW	BASE	15.79	0.15	2.177	2765
002YR-01HR	OFF-S	BASE	0.70	0.08	0.081	192
002YR-02HR	OFF-S	BASE	0.88	0.10	0.150	353
002YR-03HR	OFF-S	BASE	1.13	0.09	0.183	432
002YR-06HR	OFF-S	BASE	1.95	0.09	0.307	725
002YR-12HR	OFF-S	BASE	6.18	0.09	0.489	1153
002YR-24HR	OFF-S	BASE	15.71	0.10	0.737	1738
010YR-01HR	OFF-S	BASE	0.60	0.34	0.295	695
010YR-02HR	OFF-S	BASE	0.81	0.36	0.463	1093
010YR-03HR	OFF-S	BASE	1.06	0.32	0.544	1284
010YR-06HR	OFF-S	BASE	1.66	0.27	0.817	1929
010YR-12HR	OFF-S	BASE	6.14	0.19	1.129	2664
010YR-24HR	OFF-S	BASE	15.71	0.19	1.481	3494
100YR-01HR	OFF-S	BASE	0.53	1.01	0.806	1901
100YR-02HR	OFF-S	BASE	0.74	1.04	1.220	2879
100YR-03HR	OFF-S	BASE	0.95	0.89	1.417	3343
100YR-06HR	OFF-S	BASE	1.42	0.71	2.009	4739
100YR-12HR	OFF-S	BASE	5.58	0.38	2.462	5810
100YR-24HR	OFF-S	BASE	15.71	0.34	2.837	6694

DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS (ONSITE BASINS ONLY)
ICPR NODE REPORT (ALLOWABLE RELEASE RATE CALCULATION)

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
BNDY-NW	002YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-12HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-24HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-12HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-24HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-12HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-24HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-S	002YR-01HR	699.30	699.30	0.0000	0	0.05	0.00
BNDY-S	002YR-02HR	699.30	699.30	0.0000	0	0.38	0.00
BNDY-S	002YR-03HR	699.30	699.30	0.0000	0	0.37	0.00
BNDY-S	002YR-06HR	699.30	699.30	0.0000	0	0.53	0.00
BNDY-S	002YR-12HR	699.30	699.30	0.0000	0	1.17	0.00
BNDY-S	002YR-24HR	699.30	699.30	0.0000	0	1.37	0.00
BNDY-S	010YR-01HR	699.30	699.30	0.0000	0	2.21	0.00
BNDY-S	010YR-02HR	699.30	699.30	0.0000	0	2.91	0.00
BNDY-S	010YR-03HR	699.30	699.30	0.0000	0	2.88	0.00
BNDY-S	010YR-06HR	699.30	699.30	0.0000	0	3.43	0.00
BNDY-S	010YR-12HR	699.30	699.30	0.0000	0	3.52	0.00
BNDY-S	010YR-24HR	699.30	699.30	0.0000	0	5.16	0.00
BNDY-S	100YR-01HR	699.30	699.30	0.0000	0	11.04	0.00
BNDY-S	100YR-02HR	699.30	699.30	0.0000	0	13.77	0.00
BNDY-S	100YR-03HR	699.30	699.30	0.0000	0	13.31	0.00
BNDY-S	100YR-06HR	699.30	699.30	0.0000	0	17.61	0.00
BNDY-S	100YR-12HR	699.30	699.30	0.0000	0	16.15	0.00
BNDY-S	100YR-24HR	699.30	699.30	0.0000	0	14.71	0.00
DEP-NE	002YR-01HR	705.62	706.30	0.0018	1875	0.05	0.00
DEP-NE	002YR-02HR	705.74	706.30	0.0027	12021	0.33	0.00
DEP-NE	002YR-03HR	705.80	706.30	0.0026	16644	0.31	0.00
DEP-NE	002YR-06HR	705.96	706.30	0.0033	29325	0.45	0.00
DEP-NE	002YR-12HR	706.12	706.30	0.0032	53791	0.98	0.00
DEP-NE	002YR-24HR	706.26	706.30	0.0029	80611	1.16	0.00
DEP-NE	010YR-01HR	705.87	706.30	0.0049	22437	1.89	0.00
DEP-NE	010YR-02HR	706.07	706.30	0.0049	45574	2.49	0.00
DEP-NE	010YR-03HR	706.14	706.30	0.0050	57889	2.46	0.00
DEP-NE	010YR-06HR	706.30	706.30	0.0050	86965	2.89	0.00
DEP-NE	010YR-12HR	706.32	706.30	0.0047	90863	2.91	1.53

DEP-NE	010YR-24HR	706.33	706.30	0.0037	92070	3.09	2.33
DEP-NE	100YR-01HR	706.22	706.30	0.0050	71853	9.48	0.00
DEP-NE	100YR-02HR	706.35	706.30	0.0050	95327	11.81	5.01
DEP-NE	100YR-03HR	706.35	706.30	0.0050	95810	11.31	5.47
DEP-NE	100YR-06HR	706.36	706.30	0.0050	97904	10.78	7.62
DEP-NE	100YR-12HR	706.36	706.30	0.0050	97592	7.38	7.29
DEP-NE	100YR-24HR	706.35	706.30	0.0042	96974	6.74	6.64
DEP-NW	002YR-01HR	708.32	709.20	0.0013	1322	0.03	0.00
DEP-NW	002YR-02HR	708.38	709.20	0.0016	4481	0.06	0.00
DEP-NW	002YR-03HR	708.41	709.20	0.0016	5807	0.06	0.00
DEP-NW	002YR-06HR	708.49	709.20	0.0020	9547	0.08	0.00
DEP-NW	002YR-12HR	708.58	709.20	0.0017	13767	0.17	0.00
DEP-NW	002YR-24HR	708.67	709.20	0.0015	18465	0.20	0.00
DEP-NW	010YR-01HR	708.46	709.20	0.0038	7964	0.35	0.00
DEP-NW	010YR-02HR	708.55	709.20	0.0037	12676	0.46	0.00
DEP-NW	010YR-03HR	708.59	709.20	0.0036	14596	0.45	0.00
DEP-NW	010YR-06HR	708.70	709.20	0.0037	19697	0.50	0.00
DEP-NW	010YR-12HR	708.80	709.20	0.0025	24476	0.47	0.00
DEP-NW	010YR-24HR	708.89	709.20	0.0019	29159	0.50	0.00
DEP-NW	100YR-01HR	708.66	709.20	0.0036	17745	1.74	0.00
DEP-NW	100YR-02HR	708.81	709.20	0.0037	25024	2.09	0.00
DEP-NW	100YR-03HR	708.87	709.20	0.0037	27878	1.95	0.00
DEP-NW	100YR-06HR	709.02	709.20	0.0037	34713	1.77	0.00
DEP-NW	100YR-12HR	709.12	709.20	0.0031	37473	1.15	0.00
DEP-NW	100YR-24HR	709.20	709.20	0.0024	39661	1.05	0.00

DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS (ONSITE BASINS ONLY)
ICPR LINK REPORT (ALLOWABLE RELEASE RATE CALCULATION)

Name	Simulation	Max Flow cfs	Max Delta Q cfs	Max US Stage ft	Max DS Stage ft
DEP NE WEIR	002YR-01HR	0.00	0.000	705.62	699.30
DEP NE WEIR	002YR-02HR	0.00	0.000	705.74	699.30
DEP NE WEIR	002YR-03HR	0.00	0.000	705.80	699.30
DEP NE WEIR	002YR-06HR	0.00	0.000	705.96	699.30
DEP NE WEIR	002YR-12HR	0.00	0.000	706.12	699.30
DEP NE WEIR	002YR-24HR	0.00	0.000	706.26	699.30
DEP NE WEIR	010YR-01HR	0.00	0.000	705.87	699.30
DEP NE WEIR	010YR-02HR	0.00	0.000	706.07	699.30
DEP NE WEIR	010YR-03HR	0.00	0.000	706.14	699.30
DEP NE WEIR	010YR-06HR	0.00	0.000	706.30	699.30
DEP NE WEIR	010YR-12HR	1.53	0.071	706.32	699.30
DEP NE WEIR	010YR-24HR	2.33	0.100	706.33	699.30
DEP NE WEIR	100YR-01HR	0.00	0.000	706.22	699.30
DEP NE WEIR	100YR-02HR	5.01	-0.392	706.35	699.30
DEP NE WEIR	100YR-03HR	5.47	-0.251	706.35	699.30
DEP NE WEIR	100YR-06HR	7.62	0.293	706.36	699.30
DEP NE WEIR	100YR-12HR	7.29	0.255	706.36	699.30
DEP NE WEIR	100YR-24HR	6.64	0.273	706.35	699.30
DEP NW WEIR	002YR-01HR	0.00	0.000	708.32	709.10
DEP NW WEIR	002YR-02HR	0.00	0.000	708.38	709.10
DEP NW WEIR	002YR-03HR	0.00	0.000	708.41	709.10
DEP NW WEIR	002YR-06HR	0.00	0.000	708.49	709.10
DEP NW WEIR	002YR-12HR	0.00	0.000	708.58	709.10
DEP NW WEIR	002YR-24HR	0.00	0.000	708.67	709.10
DEP NW WEIR	010YR-01HR	0.00	0.000	708.46	709.10
DEP NW WEIR	010YR-02HR	0.00	0.000	708.55	709.10
DEP NW WEIR	010YR-03HR	0.00	0.000	708.59	709.10
DEP NW WEIR	010YR-06HR	0.00	0.000	708.70	709.10
DEP NW WEIR	010YR-12HR	0.00	0.000	708.80	709.10
DEP NW WEIR	010YR-24HR	0.00	0.000	708.89	709.10
DEP NW WEIR	100YR-01HR	0.00	0.000	708.66	709.10
DEP NW WEIR	100YR-02HR	0.00	0.000	708.81	709.10
DEP NW WEIR	100YR-03HR	0.00	0.000	708.87	709.10
DEP NW WEIR	100YR-06HR	0.00	0.000	709.02	709.10
DEP NW WEIR	100YR-12HR	0.00	0.000	709.12	709.10
DEP NW WEIR	100YR-24HR	0.00	0.000	709.20	709.10

DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS (ONSITE AND OFFSITE BASINS)
ICPR NODE REPORT (DOWNSTREAM CHANNEL FLOW CALCULATION)

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
BNDY-NW	002YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-12HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	002YR-24HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-12HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	010YR-24HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-01HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-02HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-03HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-06HR	709.10	709.10	0.0000	0	0.00	0.00
BNDY-NW	100YR-12HR	709.10	709.10	0.0000	0	0.08	0.00
BNDY-NW	100YR-24HR	709.10	709.10	0.0000	0	0.31	0.00
BNDY-S	002YR-01HR	699.30	699.30	0.0000	0	0.13	0.00
BNDY-S	002YR-02HR	699.30	699.30	0.0000	0	0.54	0.00
BNDY-S	002YR-03HR	699.30	699.30	0.0000	0	0.51	0.00
BNDY-S	002YR-06HR	699.30	699.30	0.0000	0	1.01	0.00
BNDY-S	002YR-12HR	699.30	699.30	0.0000	0	3.36	0.00
BNDY-S	002YR-24HR	699.30	699.30	0.0000	0	4.97	0.00
BNDY-S	010YR-01HR	699.30	699.30	0.0000	0	3.10	0.00
BNDY-S	010YR-02HR	699.30	699.30	0.0000	0	7.87	0.00
BNDY-S	010YR-03HR	699.30	699.30	0.0000	0	8.15	0.00
BNDY-S	010YR-06HR	699.30	699.30	0.0000	0	11.09	0.00
BNDY-S	010YR-12HR	699.30	699.30	0.0000	0	13.18	0.00
BNDY-S	010YR-24HR	699.30	699.30	0.0000	0	13.75	0.00
BNDY-S	100YR-01HR	699.30	699.30	0.0000	0	37.82	0.00
BNDY-S	100YR-02HR	699.30	699.30	0.0000	0	49.47	0.00
BNDY-S	100YR-03HR	699.30	699.30	0.0000	0	48.93	0.00
BNDY-S	100YR-06HR	699.30	699.30	0.0000	0	48.52	0.00
BNDY-S	100YR-12HR	699.30	699.30	0.0000	0	31.98	0.00
BNDY-S	100YR-24HR	699.30	699.30	0.0000	0	28.98	0.00
DEP-NE	002YR-01HR	705.88	706.30	0.0050	22806	2.26	0.00
DEP-NE	002YR-02HR	706.08	706.30	0.0050	47437	2.74	0.00
DEP-NE	002YR-03HR	706.15	706.30	0.0049	59690	2.58	0.00
DEP-NE	002YR-06HR	706.31	706.30	0.0050	89211	2.89	0.65
DEP-NE	002YR-12HR	706.33	706.30	0.0047	91929	3.46	2.23
DEP-NE	002YR-24HR	706.33	706.30	0.0037	93256	4.00	3.22
DEP-NE	010YR-01HR	706.20	706.30	0.0050	69665	10.04	0.00
DEP-NE	010YR-02HR	706.35	706.30	0.0050	95521	11.60	5.20
DEP-NE	010YR-03HR	706.35	706.30	0.0050	95695	10.90	5.36
DEP-NE	010YR-06HR	706.36	706.30	0.0050	97585	10.51	7.28
DEP-NE	010YR-12HR	706.36	706.30	0.0050	98547	8.44	8.34

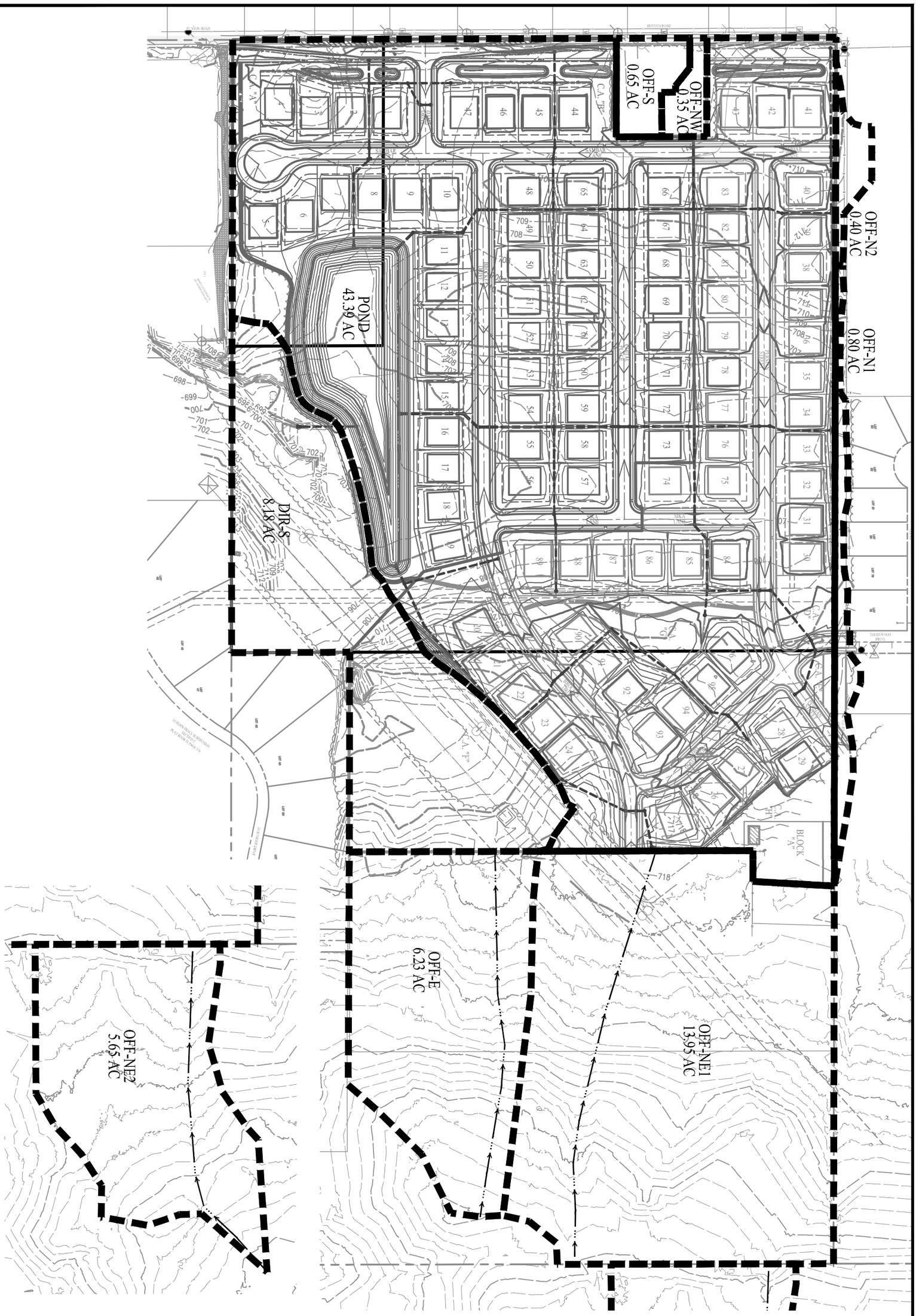
DEP-NE	010YR-24HR	706.36	706.30	0.0043	98709	8.64	8.52
DEP-NE	100YR-01HR	706.43	706.30	0.0050	110039	32.67	24.85
DEP-NE	100YR-02HR	706.45	706.30	0.0050	113847	37.97	31.81
DEP-NE	100YR-03HR	706.45	706.30	0.0050	113468	35.53	31.08
DEP-NE	100YR-06HR	706.44	706.30	0.0050	112932	31.39	30.07
DEP-NE	100YR-12HR	706.41	706.30	0.0050	106264	18.73	18.67
DEP-NE	100YR-24HR	706.40	706.30	0.0046	105044	16.97	16.83
DEP-NW	002YR-01HR	708.32	709.20	0.0008	1474	0.04	0.00
DEP-NW	002YR-02HR	708.40	709.20	0.0011	5131	0.08	0.00
DEP-NW	002YR-03HR	708.43	709.20	0.0010	6625	0.08	0.00
DEP-NW	002YR-06HR	708.52	709.20	0.0012	10852	0.11	0.00
DEP-NW	002YR-12HR	708.61	709.20	0.0019	15625	0.21	0.00
DEP-NW	002YR-24HR	708.72	709.20	0.0017	20928	0.25	0.00
DEP-NW	010YR-01HR	708.48	709.20	0.0017	9012	0.46	0.00
DEP-NW	010YR-02HR	708.59	709.20	0.0017	14379	0.59	0.00
DEP-NW	010YR-03HR	708.63	709.20	0.0017	16528	0.57	0.00
DEP-NW	010YR-06HR	708.75	709.20	0.0017	22299	0.64	0.00
DEP-NW	010YR-12HR	708.86	709.20	0.0024	27702	0.60	0.00
DEP-NW	010YR-24HR	708.97	709.20	0.0022	33000	0.63	0.00
DEP-NW	100YR-01HR	708.71	709.20	0.0029	20091	2.13	0.00
DEP-NW	100YR-02HR	708.88	709.20	0.0027	28281	2.60	0.00
DEP-NW	100YR-03HR	708.94	709.20	0.0027	31553	2.46	0.00
DEP-NW	100YR-06HR	709.12	709.20	0.0029	37385	2.25	0.00
DEP-NW	100YR-12HR	709.23	709.20	0.0031	40447	1.47	0.08
DEP-NW	100YR-24HR	709.25	709.20	0.0028	41110	1.35	0.31

DEERFIELD - W21-0353
PRE-DEVELOPED CONDITIONS (ONSITE AND OFFSITE BASINS)
ICPR LINK REPORT (DOWNSTREAM CHANNEL FLOW CALCULATION)

Name	Simulation	Max Flow cfs	Max Delta Q cfs	Max US Stage ft	Max DS Stage ft
DEP NE WEIR	002YR-01HR	0.00	0.000	705.88	699.30
DEP NE WEIR	002YR-02HR	0.00	0.000	706.08	699.30
DEP NE WEIR	002YR-03HR	0.00	0.000	706.15	699.30
DEP NE WEIR	002YR-06HR	0.65	-0.034	706.31	699.30
DEP NE WEIR	002YR-12HR	2.23	0.119	706.33	699.30
DEP NE WEIR	002YR-24HR	3.22	0.147	706.33	699.30
DEP NE WEIR	010YR-01HR	0.00	0.000	706.20	699.30
DEP NE WEIR	010YR-02HR	5.20	-0.450	706.35	699.30
DEP NE WEIR	010YR-03HR	5.36	-0.288	706.35	699.30
DEP NE WEIR	010YR-06HR	7.28	0.279	706.36	699.30
DEP NE WEIR	010YR-12HR	8.34	0.285	706.36	699.30
DEP NE WEIR	010YR-24HR	8.52	0.315	706.36	699.30
DEP NE WEIR	100YR-01HR	24.85	-1.442	706.43	699.30
DEP NE WEIR	100YR-02HR	31.81	-1.071	706.45	699.30
DEP NE WEIR	100YR-03HR	31.08	-0.809	706.45	699.30
DEP NE WEIR	100YR-06HR	30.07	0.582	706.44	699.30
DEP NE WEIR	100YR-12HR	18.67	0.442	706.41	699.30
DEP NE WEIR	100YR-24HR	16.83	0.392	706.40	699.30
DEP NW WEIR	002YR-01HR	0.00	0.000	708.32	709.10
DEP NW WEIR	002YR-02HR	0.00	0.000	708.40	709.10
DEP NW WEIR	002YR-03HR	0.00	0.000	708.43	709.10
DEP NW WEIR	002YR-06HR	0.00	0.000	708.52	709.10
DEP NW WEIR	002YR-12HR	0.00	0.000	708.61	709.10
DEP NW WEIR	002YR-24HR	0.00	0.000	708.72	709.10
DEP NW WEIR	010YR-01HR	0.00	0.000	708.48	709.10
DEP NW WEIR	010YR-02HR	0.00	0.000	708.59	709.10
DEP NW WEIR	010YR-03HR	0.00	0.000	708.63	709.10
DEP NW WEIR	010YR-06HR	0.00	0.000	708.75	709.10
DEP NW WEIR	010YR-12HR	0.00	0.000	708.86	709.10
DEP NW WEIR	010YR-24HR	0.00	0.000	708.97	709.10
DEP NW WEIR	100YR-01HR	0.00	0.000	708.71	709.10
DEP NW WEIR	100YR-02HR	0.00	0.000	708.88	709.10
DEP NW WEIR	100YR-03HR	0.00	0.000	708.94	709.10
DEP NW WEIR	100YR-06HR	0.00	0.000	709.12	709.10
DEP NW WEIR	100YR-12HR	0.08	0.001	709.23	709.10
DEP NW WEIR	100YR-24HR	0.31	0.007	709.25	709.10

POST-DEVELOPED
DETENTION CALCULATIONS

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:17pm
PLOTTED BY: Gaithert



DEERFIELD
JOHNSON COUNTY, IN

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611

SCALE: 1" = 200'
0 50 100 200

FIGURE 3.1

POST-DEVELOPED BASIN MAP

Date: August 17, 2022

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Allowable Release Rate Calculations**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

BNDY-S

Q_{2e}=	1.37
Q_{10p}=	1.24
Q_{10p}<=Q_{2e}	YES

Q_{10e}=	5.16
Q_{100p}=	4.14
Q_{100p}<=Q_{10e}	YES

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.℠*	**Weighted Curve Number Calculations** **Proposed Conditions**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

Basin Name	Soil Group %				Type of Cover/ Condition of Cover	Percent of Basin	Curve Number (CN)				Weighted CN
	A	B	C	D			A	B	C	D	
POND	1%	99%	0%	0%	Impervious	7%	98	98	98	98	98.0
	1%	99%	0%	0%	Residential, 1/4 ac.	74%	61	75	83	87	74.9
	1%	99%	0%	0%	Open Space, Good Cond.	19%	39	61	74	80	60.8
POND						100%					**73.8**
DIR S	48%	52%	0%	0%	Impervious	1%	98	98	98	98	98.0
	48%	52%	0%	0%	Woods, Good Cond.	55%	30	55	70	77	43.0
	48%	52%	0%	0%	Open Space, Good Cond.	44%	39	61	74	80	50.4
DIR S						100%					**46.8**

WEIHE ENGINEERS
Land Surveying | Civil Engineering
Landscape Architecture
Build with confidence.

Time of Concentration Calculations
Proposed Conditions

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Mannings Values (n)			
Overland Flow		Channel Flow	
Farm Field	0.17	Grass	0.03
Dense Grass	0.24	Concrete	0.015
Pavement	0.011	Rip-Rap	0.035

2 Yr, 24 Hr Rainfall= 2.92
Tc minimum= 5

Overland Flow Travel Time: $T_t = \frac{0.0043\,(nL)^{0.8}}{S^{0.4}}$

Shallow Conc Flow Travel Time:
Channel Flow Travel Time: $T_t = \frac{L}{60\,V}$

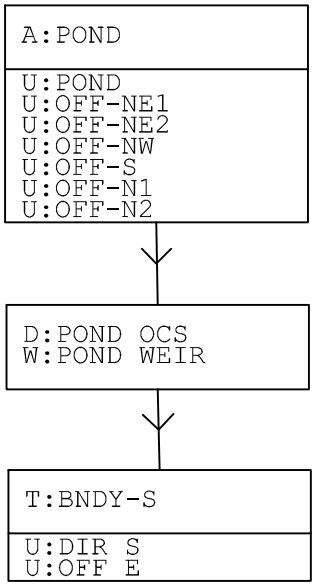
Shallow Conc Flow (Unpaved): $V = 16.1345\,(S)^{0.5}$

Shallow Conc Flow (Paved): $V = 20.3282\,(S)^{0.5}$

Paved Gutter & Channel Flow $V = \frac{1.486}{n} R^{2/3} S^{1/2}$; $R = \frac{A}{P_w}$

Basin	Overland Flow				Overland Flow				Shallow Conc. Flow					Channel Flow								Tc
	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	Pave/Un P or U	Vel (ft/s)	T_t (min)	Len (ft)	A (sf)	Pw (ft)	r (ft)	S %	n	Vel (ft/s)	T_t (min)	(min)
POND	100	1.00	0.24	20				0	252	1.00	U	1.61	3	1303						3.00	7	**30**
DIR S	100	1.00	0.24	20				0	205	0.90	U	1.53	2	0						3.00	0	**22**

DEERFIELD - W21-0353
POST-DEVELOPED CONDITIONS
ICPR ROUTING SCHEMATIC



DEERFIELD - W210353
POST-DEVELOPED CONDITIONS
ICPR INPUT REPORT

==========
==== Basins ==========
==========

```
         Name: DIR S                    Node: BNDY-S                 Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
            Area(ac): 8.180                      Time Shift(hrs): 0.00
          Curve Number: 46.80              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00
```


```
         Name: OFF E                    Node: BNDY-S                 Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 20.00
            Area(ac): 6.230                      Time Shift(hrs): 0.07
          Curve Number: 60.70              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00
```


```
         Name: OFF-N1                   Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 5.00
            Area(ac): 0.800                      Time Shift(hrs): 0.08
          Curve Number: 55.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00
```


```
         Name: OFF-N2                   Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 5.00
            Area(ac): 0.400                      Time Shift(hrs): 0.08
```

```
          Curve Number: 60.20              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-NE1                  Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
               Area(ac): 13.950                  Time Shift(hrs): 0.08
          Curve Number: 69.70              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-NE2                  Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 22.00
               Area(ac): 5.650                   Time Shift(hrs): 0.25
          Curve Number: 74.90              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-NW                   Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 19.00
               Area(ac): 0.350                   Time Shift(hrs): 0.12
          Curve Number: 64.10              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



--------------------------------------------------------------------------------------------------
------
         Name: OFF-S                    Node: POND                   Status: Offsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                   Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 16.00
               Area(ac): 0.650                   Time Shift(hrs): 0.10
          Curve Number: 71.50              Max Allowable Q(cfs): 999999.000
```

```
                DCIA(%): 0.00


-----------------------------------------------------------------------------------------------
------
         Name: POND                      Node: POND                    Status: Onsite
        Group: BASE                      Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh484                    Peaking Factor: 484.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 30.00
               Area(ac): 43.390                  Time Shift(hrs): 0.00
          Curve Number: 73.80              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00



=============================================================================================
==== Nodes ==================================================================================
=============================================================================================

      Name: BNDY-S              Base Flow(cfs): 0.000          Init Stage(ft): 699.300
     Group: BASE                                               Warn Stage(ft): 699.300
      Type: Time/Stage



      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00         699.300
          99.00         699.300

-----------------------------------------------------------------------------------------------
      Name: POND                Base Flow(cfs): 0.000          Init Stage(ft): 699.500
     Group: BASE                                               Warn Stage(ft): 704.300
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
        699.500          1.9920
        700.000          2.0670
        701.000          2.2200
        702.000          2.3740
        703.000          2.5310
        704.000          2.6910
        705.000          2.8530
        706.000          3.0170

=============================================================================================
==== Drop Structures ========================================================================
=============================================================================================

         Name: POND OCS            From Node: POND               Length(ft): 120.00
        Group: BASE                  To Node: BNDY-S                  Count: 1
```

```
               UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Most Restrictive
     Span(in): 15.00          15.00                                 Flow: Both
     Rise(in): 15.00          15.00                     Entrance Loss Coef: 0.500
   Invert(ft): 699.500        699.300                       Exit Loss Coef: 0.000
  Manning's N: 0.013000       0.013000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 3 for Drop Structure POND OCS ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000

                   Type: Vertical: Mavis            Top Clip(in): 0.000

                   Flow: Both                     Weir Disc Coef: 3.200

               Geometry: Circular              Orifice Disc Coef: 0.600


               Span(in): 6.00                        Invert(ft): 699.500
               Rise(in): 6.00                   Control Elev(ft): 699.500

*** Weir 2 of 3 for Drop Structure POND OCS ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000

                   Type: Vertical: Mavis            Top Clip(in): 0.000

                   Flow: Both                     Weir Disc Coef: 3.200

               Geometry: Circular              Orifice Disc Coef: 0.600


               Span(in): 10.00                       Invert(ft): 701.900
               Rise(in): 10.00                  Control Elev(ft): 701.900

*** Weir 3 of 3 for Drop Structure POND OCS ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000

                   Type: Horizontal                 Top Clip(in): 0.000

                   Flow: Both                     Weir Disc Coef: 3.200

               Geometry: Rectangular           Orifice Disc Coef: 0.600
```

```
               Span(in): 24.00                        Invert(ft): 703.400
               Rise(in): 24.00                  Control Elev(ft): 703.400


==========================================================================================
==== Weirs ===============================================================================
==========================================================================================

         Name: POND WEIR           From Node: POND
        Group: BASE                  To Node: BNDY-S
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Trapezoidal

            Bottom Width(ft): 60.00
        Left Side Slope(h/v): 4.00
       Right Side Slope(h/v): 4.00
                   Invert(ft): 704.300
       Control Elevation(ft): 704.300
      Struct Opening Dim(ft): 9999.00
                                              TABLE
             Bottom Clip(ft): 0.000
                Top Clip(ft): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 002YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-01HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 1.41

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 1.65
```

```
Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 1.75

Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.07

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 2.46

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 002YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-24HR.R32
```

```
      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 2.92

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-01HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.04

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.41

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 2.57

Time(hrs)       Print Inc(min)
--------------- ---------------
```

```
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.06

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 3.56

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 010YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-24HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 4.08

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-01HR.R32
```

```
      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.04

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-02HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.70

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-03HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 3.99

Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-06HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: HUFF-1Q
    Rainfall Amount(in): 4.81

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.00
```

```
-----------------------------------------------------------------------------------------------
------
         Name: 100YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-12HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: HUFF-2Q
    Rainfall Amount(in): 5.40

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00

-----------------------------------------------------------------------------------------------
------
         Name: 100YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-24HR.R32



      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: HUFF-3Q
    Rainfall Amount(in): 5.87

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          1.00

=================================================================================================
==== Routing Simulations ========================================================================
=================================================================================================

         Name: 002YR-01HR          Hydrology Sim: 002YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000

Group           Run
```

```
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 002YR-02HR          Hydrology Sim: 002YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-02HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 002YR-03HR          Hydrology Sim: 002YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
BASE            Yes
```

```
-----------------------------------------------------------------------------------------------
------
         Name: 002YR-06HR          Hydrology Sim: 002YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-06HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 002YR-12HR          Hydrology Sim: 002YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
```

```
         Name: 002YR-24HR          Hydrology Sim: 002YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\002YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-01HR          Hydrology Sim: 010YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-02HR          Hydrology Sim: 010YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-02HR.I32
```

```
      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-03HR          Hydrology Sim: 010YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-06HR          Hydrology Sim: 010YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-06HR.I32



      Execute: Yes         Restart: No            Patch: No
```

```
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-12HR          Hydrology Sim: 010YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 010YR-24HR          Hydrology Sim: 010YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\010YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
```

```
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-01HR          Hydrology Sim: 100YR-01HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-01HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 3.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-02HR          Hydrology Sim: 100YR-02HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-02HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
```

```
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-03HR          Hydrology Sim: 100YR-03HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-03HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           1.000

Group           Run
--------------- -----
BASE            Yes


-----------------------------------------------------------------------------------------------
------
         Name: 100YR-06HR          Hydrology Sim: 100YR-06HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-06HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 9.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:
```

```
Time(hrs)       Print Inc(min)
--------------- ---------------
9.000           1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 100YR-12HR          Hydrology Sim: 100YR-12HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-12HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 18.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
18.000          1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------
------
         Name: 100YR-24HR          Hydrology Sim: 100YR-24HR
     Filename: C:\Users\gaithert\Desktop\Work\Deerfield\EXISTING\100YR-24HR.I32



      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
```

```
30.000          1.000

Group           Run
--------------- -----
BASE            Yes
```

DEERFIELD - W210353
POST-DEVELOPED CONDITIONS
ICPR BASIN REPORT

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-01HR	DIR S	BASE	0.00	0.00	0.000	0
002YR-02HR	DIR S	BASE	0.00	0.00	0.000	0
002YR-03HR	DIR S	BASE	0.00	0.00	0.000	0
002YR-06HR	DIR S	BASE	0.00	0.00	0.000	0
002YR-12HR	DIR S	BASE	10.85	0.01	0.003	89
002YR-24HR	DIR S	BASE	19.26	0.08	0.035	1030
010YR-01HR	DIR S	BASE	0.00	0.00	0.000	0
010YR-02HR	DIR S	BASE	2.05	0.03	0.001	44
010YR-03HR	DIR S	BASE	2.93	0.07	0.007	221
010YR-06HR	DIR S	BASE	3.42	0.13	0.051	1501
010YR-12HR	DIR S	BASE	6.75	0.32	0.130	3873
010YR-24HR	DIR S	BASE	18.04	0.44	0.247	7340
100YR-01HR	DIR S	BASE	0.98	0.64	0.047	1407
100YR-02HR	DIR S	BASE	1.17	1.06	0.157	4655
100YR-03HR	DIR S	BASE	1.32	1.11	0.224	6657
100YR-06HR	DIR S	BASE	1.96	1.53	0.461	13688
100YR-12HR	DIR S	BASE	6.65	1.58	0.673	19983
100YR-24HR	DIR S	BASE	15.69	1.43	0.863	25619
002YR-01HR	OFF E	BASE	1.14	0.03	0.002	43
002YR-02HR	OFF E	BASE	1.94	0.11	0.018	417
002YR-03HR	OFF E	BASE	1.89	0.11	0.030	671
002YR-06HR	OFF E	BASE	2.60	0.15	0.083	1872
002YR-12HR	OFF E	BASE	6.74	0.34	0.177	4013
002YR-24HR	OFF E	BASE	15.76	0.40	0.326	7364
010YR-01HR	OFF E	BASE	0.83	0.68	0.076	1713
010YR-02HR	OFF E	BASE	1.00	0.90	0.164	3700
010YR-03HR	OFF E	BASE	1.23	0.89	0.209	4723
010YR-06HR	OFF E	BASE	1.98	1.02	0.378	8540
010YR-12HR	OFF E	BASE	6.16	1.00	0.586	13259
010YR-24HR	OFF E	BASE	15.71	1.07	0.837	18919
100YR-01HR	OFF E	BASE	0.65	3.59	0.367	8298
100YR-02HR	OFF E	BASE	0.83	4.41	0.651	14713
100YR-03HR	OFF E	BASE	1.09	4.13	0.789	17850
100YR-06HR	OFF E	BASE	1.67	3.80	1.235	27935
100YR-12HR	OFF E	BASE	6.16	2.53	1.591	35975
100YR-24HR	OFF E	BASE	15.71	2.32	1.892	42783
002YR-01HR	OFF-N1	BASE	0.08	0.00	0.000	0
002YR-02HR	OFF-N1	BASE	2.10	0.00	0.000	0
002YR-03HR	OFF-N1	BASE	2.94	0.00	0.002	5
002YR-06HR	OFF-N1	BASE	4.89	0.01	0.022	63
002YR-12HR	OFF-N1	BASE	6.69	0.02	0.075	218
002YR-24HR	OFF-N1	BASE	18.08	0.03	0.174	505
010YR-01HR	OFF-N1	BASE	0.98	0.03	0.019	55
010YR-02HR	OFF-N1	BASE	1.19	0.05	0.067	194
010YR-03HR	OFF-N1	BASE	1.16	0.05	0.095	277
010YR-06HR	OFF-N1	BASE	1.90	0.07	0.211	612
010YR-12HR	OFF-N1	BASE	6.68	0.09	0.366	1062
010YR-24HR	OFF-N1	BASE	15.68	0.10	0.561	1630

100YR-01HR	OFF-N1	BASE	0.46	0.34	0.205	596
100YR-02HR	OFF-N1	BASE	0.70	0.44	0.415	1205
100YR-03HR	OFF-N1	BASE	0.99	0.39	0.525	1525
100YR-06HR	OFF-N1	BASE	1.59	0.38	0.886	2572
100YR-12HR	OFF-N1	BASE	6.09	0.26	1.184	3439
100YR-24HR	OFF-N1	BASE	15.68	0.24	1.442	4187
002YR-01HR	OFF-N2	BASE	1.06	0.00	0.001	2
002YR-02HR	OFF-N2	BASE	1.80	0.01	0.015	22
002YR-03HR	OFF-N2	BASE	1.75	0.01	0.026	38
002YR-06HR	OFF-N2	BASE	2.20	0.01	0.076	110
002YR-12HR	OFF-N2	BASE	6.69	0.02	0.167	242
002YR-24HR	OFF-N2	BASE	15.69	0.03	0.311	451
010YR-01HR	OFF-N2	BASE	0.56	0.05	0.070	102
010YR-02HR	OFF-N2	BASE	0.71	0.07	0.153	223
010YR-03HR	OFF-N2	BASE	1.00	0.07	0.198	287
010YR-06HR	OFF-N2	BASE	1.89	0.07	0.361	524
010YR-12HR	OFF-N2	BASE	6.09	0.07	0.565	821
010YR-24HR	OFF-N2	BASE	15.68	0.07	0.811	1177
100YR-01HR	OFF-N2	BASE	0.41	0.34	0.354	514
100YR-02HR	OFF-N2	BASE	0.61	0.35	0.628	912
100YR-03HR	OFF-N2	BASE	0.86	0.31	0.766	1112
100YR-06HR	OFF-N2	BASE	1.59	0.27	1.203	1747
100YR-12HR	OFF-N2	BASE	6.08	0.16	1.554	2256
100YR-24HR	OFF-N2	BASE	15.68	0.15	1.851	2688
002YR-01HR	OFF-NE1	BASE	0.81	1.16	0.059	2984
002YR-02HR	OFF-NE1	BASE	1.01	1.45	0.117	5946
002YR-03HR	OFF-NE1	BASE	1.25	1.40	0.148	7481
002YR-06HR	OFF-NE1	BASE	1.99	1.56	0.259	13110
002YR-12HR	OFF-NE1	BASE	6.19	1.61	0.425	21532
002YR-24HR	OFF-NE1	BASE	15.72	1.85	0.656	33222
010YR-01HR	OFF-NE1	BASE	0.67	5.20	0.246	12454
010YR-02HR	OFF-NE1	BASE	0.86	5.85	0.400	20237
010YR-03HR	OFF-NE1	BASE	1.11	5.39	0.477	24137
010YR-06HR	OFF-NE1	BASE	1.74	4.93	0.732	37056
010YR-12HR	OFF-NE1	BASE	6.14	3.65	1.027	51989
010YR-24HR	OFF-NE1	BASE	15.72	3.70	1.362	68946
100YR-01HR	OFF-NE1	BASE	0.62	16.39	0.717	36328
100YR-02HR	OFF-NE1	BASE	0.81	18.01	1.109	56133
100YR-03HR	OFF-NE1	BASE	1.01	16.12	1.300	65849
100YR-06HR	OFF-NE1	BASE	1.64	13.51	1.869	94625
100YR-12HR	OFF-NE1	BASE	5.60	7.63	2.308	116869
100YR-24HR	OFF-NE1	BASE	15.72	6.88	2.671	135236
002YR-01HR	OFF-NE2	BASE	0.89	1.10	0.132	2715
002YR-02HR	OFF-NE2	BASE	1.08	1.25	0.220	4504
002YR-03HR	OFF-NE2	BASE	1.33	1.15	0.262	5379
002YR-06HR	OFF-NE2	BASE	1.96	1.08	0.411	8432
002YR-12HR	OFF-NE2	BASE	6.36	0.91	0.622	12755
002YR-24HR	OFF-NE2	BASE	15.89	1.00	0.902	18502
010YR-01HR	OFF-NE2	BASE	0.79	3.56	0.394	8085
010YR-02HR	OFF-NE2	BASE	0.98	3.74	0.590	12103
010YR-03HR	OFF-NE2	BASE	1.23	3.34	0.685	14056
010YR-06HR	OFF-NE2	BASE	1.86	2.84	0.992	20346
010YR-12HR	OFF-NE2	BASE	6.31	1.84	1.336	27393
010YR-24HR	OFF-NE2	BASE	15.89	1.82	1.717	35211

100YR-01HR	OFF-NE2	BASE	0.74	9.34	0.975	19997
100YR-02HR	OFF-NE2	BASE	0.93	9.73	1.430	29319
100YR-03HR	OFF-NE2	BASE	1.18	8.57	1.648	33795
100YR-06HR	OFF-NE2	BASE	1.67	6.91	2.282	46803
100YR-12HR	OFF-NE2	BASE	5.77	3.61	2.763	56678
100YR-24HR	OFF-NE2	BASE	15.85	3.17	3.157	64745
002YR-01HR	OFF-NW	BASE	1.13	0.01	0.014	18
002YR-02HR	OFF-NW	BASE	1.34	0.01	0.045	58
002YR-03HR	OFF-NW	BASE	1.60	0.01	0.064	81
002YR-06HR	OFF-NW	BASE	2.27	0.02	0.138	175
002YR-12HR	OFF-NW	BASE	6.79	0.03	0.258	328
002YR-24HR	OFF-NW	BASE	15.78	0.03	0.437	555
010YR-01HR	OFF-NW	BASE	0.75	0.07	0.128	162
010YR-02HR	OFF-NW	BASE	0.96	0.08	0.240	305
010YR-03HR	OFF-NW	BASE	1.18	0.08	0.298	378
010YR-06HR	OFF-NW	BASE	1.98	0.08	0.498	633
010YR-12HR	OFF-NW	BASE	6.20	0.07	0.739	939
010YR-24HR	OFF-NW	BASE	15.74	0.07	1.022	1298
100YR-01HR	OFF-NW	BASE	0.63	0.28	0.485	616
100YR-02HR	OFF-NW	BASE	0.84	0.33	0.811	1030
100YR-03HR	OFF-NW	BASE	1.09	0.30	0.971	1233
100YR-06HR	OFF-NW	BASE	1.72	0.26	1.463	1859
100YR-12HR	OFF-NW	BASE	6.16	0.16	1.851	2352
100YR-24HR	OFF-NW	BASE	15.74	0.15	2.177	2765
002YR-01HR	OFF-S	BASE	0.70	0.08	0.081	192
002YR-02HR	OFF-S	BASE	0.88	0.10	0.150	353
002YR-03HR	OFF-S	BASE	1.13	0.09	0.183	432
002YR-06HR	OFF-S	BASE	1.95	0.09	0.307	725
002YR-12HR	OFF-S	BASE	6.18	0.09	0.489	1153
002YR-24HR	OFF-S	BASE	15.71	0.10	0.737	1738
010YR-01HR	OFF-S	BASE	0.60	0.34	0.295	695
010YR-02HR	OFF-S	BASE	0.81	0.36	0.463	1093
010YR-03HR	OFF-S	BASE	1.06	0.32	0.544	1284
010YR-06HR	OFF-S	BASE	1.66	0.27	0.817	1929
010YR-12HR	OFF-S	BASE	6.14	0.19	1.129	2664
010YR-24HR	OFF-S	BASE	15.71	0.19	1.481	3494
100YR-01HR	OFF-S	BASE	0.53	1.01	0.806	1901
100YR-02HR	OFF-S	BASE	0.74	1.04	1.220	2879
100YR-03HR	OFF-S	BASE	0.95	0.89	1.417	3343
100YR-06HR	OFF-S	BASE	1.42	0.71	2.009	4739
100YR-12HR	OFF-S	BASE	5.58	0.38	2.462	5810
100YR-24HR	OFF-S	BASE	15.71	0.34	2.837	6694
002YR-01HR	POND	BASE	0.73	6.38	0.115	18133
002YR-02HR	POND	BASE	1.00	7.40	0.197	30952
002YR-03HR	POND	BASE	1.20	7.04	0.235	37063
002YR-06HR	POND	BASE	1.93	7.18	0.376	59250
002YR-12HR	POND	BASE	6.13	6.49	0.577	90885
002YR-24HR	POND	BASE	15.67	7.15	0.847	133371
010YR-01HR	POND	BASE	0.67	21.17	0.362	57013
010YR-02HR	POND	BASE	0.87	23.21	0.550	86583
010YR-03HR	POND	BASE	1.07	21.35	0.639	100583
010YR-06HR	POND	BASE	1.73	19.34	0.935	147225
010YR-12HR	POND	BASE	6.13	13.40	1.267	199623
010YR-24HR	POND	BASE	15.67	13.28	1.639	258141

100YR-01HR	POND	BASE	0.60	56.46	0.922	145222
100YR-02HR	POND	BASE	0.80	62.06	1.365	215014
100YR-03HR	POND	BASE	1.00	56.69	1.573	247759
100YR-06HR	POND	BASE	1.60	48.44	2.194	345630
100YR-12HR	POND	BASE	5.60	26.62	2.666	419879
100YR-24HR	POND	BASE	15.67	23.51	3.053	480827

DEERFIELD - W210353
POST-DEVELOPED CONDITIONS (ONSITE BASINS ONLY)
ICPR NODE REPORT (PROPOSED RELEASE RATE CALCULATION)

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
BNDY-S	002YR-01HR	699.30	699.30	0.0000	0	0.03	0.00
BNDY-S	002YR-02HR	699.30	699.30	0.0000	0	0.14	0.00
BNDY-S	002YR-03HR	699.30	699.30	0.0000	0	0.22	0.00
BNDY-S	002YR-06HR	699.30	699.30	0.0000	0	0.45	0.00
BNDY-S	002YR-12HR	699.30	699.30	0.0000	0	0.62	0.00
BNDY-S	002YR-24HR	699.30	699.30	0.0000	0	0.81	0.00
BNDY-S	010YR-01HR	699.30	699.30	0.0000	0	0.28	0.00
BNDY-S	010YR-02HR	699.30	699.30	0.0000	0	0.61	0.00
BNDY-S	010YR-03HR	699.30	699.30	0.0000	0	0.70	0.00
BNDY-S	010YR-06HR	699.30	699.30	0.0000	0	0.90	0.00
BNDY-S	010YR-12HR	699.30	699.30	0.0000	0	1.07	0.00
BNDY-S	010YR-24HR	699.30	699.30	0.0000	0	1.24	0.00
BNDY-S	100YR-01HR	699.30	699.30	0.0000	0	0.79	0.00
BNDY-S	100YR-02HR	699.30	699.30	0.0000	0	1.14	0.00
BNDY-S	100YR-03HR	699.30	699.30	0.0000	0	1.26	0.00
BNDY-S	100YR-06HR	699.30	699.30	0.0000	0	2.81	0.00
BNDY-S	100YR-12HR	699.30	699.30	0.0000	0	3.63	0.00
BNDY-S	100YR-24HR	699.30	699.30	0.0000	0	4.14	0.00
POND	002YR-01HR	699.63	704.30	0.0043	87628	6.37	0.03
POND	002YR-02HR	699.80	704.30	0.0050	88748	7.40	0.14
POND	002YR-03HR	699.88	704.30	0.0048	89262	7.04	0.22
POND	002YR-06HR	700.10	704.30	0.0049	90723	7.18	0.45
POND	002YR-12HR	700.37	704.30	0.0042	92522	6.49	0.62
POND	002YR-24HR	700.74	704.30	0.0045	94950	7.15	0.81
POND	010YR-01HR	699.95	704.30	0.0050	89730	21.16	0.28
POND	010YR-02HR	700.35	704.30	0.0050	92360	23.20	0.61
POND	010YR-03HR	700.51	704.30	0.0050	93451	21.35	0.70
POND	010YR-06HR	700.95	704.30	0.0050	96355	19.33	0.90
POND	010YR-12HR	701.38	704.30	0.0050	99246	13.40	1.07
POND	010YR-24HR	701.85	704.30	0.0050	102387	13.28	1.24
POND	100YR-01HR	700.69	704.30	0.0050	94651	56.45	0.79
POND	100YR-02HR	701.56	704.30	0.0050	100483	62.05	1.14
POND	100YR-03HR	701.91	704.30	0.0050	102805	56.68	1.26
POND	100YR-06HR	702.69	704.30	0.0050	108107	48.44	2.81
POND	100YR-12HR	703.04	704.30	0.0050	110525	26.62	3.63
POND	100YR-24HR	703.37	704.30	0.0050	112829	23.51	4.14

DEERFIELD - W210353
POST-DEVELOPED CONDITIONS (ONSITE BASINS ONLY)
ICPR LINK REPORT (PROPOSED RELEASE RATE CALCULATION)

Name	Simulation	Max Flow cfs	Max Delta Q cfs	Max US Stage ft	Max DS Stage ft
POND OCS	002YR-01HR	0.03	0.002	699.63	699.30
POND OCS	002YR-02HR	0.14	0.002	699.80	699.30
POND OCS	002YR-03HR	0.22	0.002	699.88	699.30
POND OCS	002YR-06HR	0.45	0.003	700.10	699.30
POND OCS	002YR-12HR	0.62	0.005	700.37	699.30
POND OCS	002YR-24HR	0.81	0.006	700.74	699.30
POND OCS	010YR-01HR	0.28	0.004	699.95	699.30
POND OCS	010YR-02HR	0.61	0.004	700.35	699.30
POND OCS	010YR-03HR	0.70	0.005	700.51	699.30
POND OCS	010YR-06HR	0.90	0.006	700.95	699.30
POND OCS	010YR-12HR	1.07	0.007	701.38	699.30
POND OCS	010YR-24HR	1.24	0.007	701.85	699.30
POND OCS	100YR-01HR	0.79	0.007	700.69	699.30
POND OCS	100YR-02HR	1.14	0.006	701.56	699.30
POND OCS	100YR-03HR	1.26	0.007	701.91	699.30
POND OCS	100YR-06HR	2.81	0.008	702.69	699.30
POND OCS	100YR-12HR	3.63	0.009	703.04	699.30
POND OCS	100YR-24HR	4.14	0.009	703.37	699.30
POND WEIR	002YR-01HR	0.00	0.000	699.63	699.30
POND WEIR	002YR-02HR	0.00	0.000	699.80	699.30
POND WEIR	002YR-03HR	0.00	0.000	699.88	699.30
POND WEIR	002YR-06HR	0.00	0.000	700.10	699.30
POND WEIR	002YR-12HR	0.00	0.000	700.37	699.30
POND WEIR	002YR-24HR	0.00	0.000	700.74	699.30
POND WEIR	010YR-01HR	0.00	0.000	699.95	699.30
POND WEIR	010YR-02HR	0.00	0.000	700.35	699.30
POND WEIR	010YR-03HR	0.00	0.000	700.51	699.30
POND WEIR	010YR-06HR	0.00	0.000	700.95	699.30
POND WEIR	010YR-12HR	0.00	0.000	701.38	699.30
POND WEIR	010YR-24HR	0.00	0.000	701.85	699.30
POND WEIR	100YR-01HR	0.00	0.000	700.69	699.30
POND WEIR	100YR-02HR	0.00	0.000	701.56	699.30
POND WEIR	100YR-03HR	0.00	0.000	701.91	699.30
POND WEIR	100YR-06HR	0.00	0.000	702.69	699.30
POND WEIR	100YR-12HR	0.00	0.000	703.04	699.30
POND WEIR	100YR-24HR	0.00	0.000	703.37	699.30

DEERFIELD - W210353
POST-DEVELOPED CONDITIONS (ONSITE AND OFFSITE BASINS)
ICPR NODE REPORT (DOWNSTREAM CHANNEL FLOW AND POND STAGING CALCULATION)

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
BNDY-S	002YR-01HR	699.30	699.30	0.0000	0	0.06	0.00
BNDY-S	002YR-02HR	699.30	699.30	0.0000	0	0.35	0.00
BNDY-S	002YR-03HR	699.30	699.30	0.0000	0	0.43	0.00
BNDY-S	002YR-06HR	699.30	699.30	0.0000	0	0.68	0.00
BNDY-S	002YR-12HR	699.30	699.30	0.0000	0	0.91	0.00
BNDY-S	002YR-24HR	699.30	699.30	0.0000	0	1.33	0.00
BNDY-S	010YR-01HR	699.30	699.30	0.0000	0	1.09	0.00
BNDY-S	010YR-02HR	699.30	699.30	0.0000	0	1.34	0.00
BNDY-S	010YR-03HR	699.30	699.30	0.0000	0	1.33	0.00
BNDY-S	010YR-06HR	699.30	699.30	0.0000	0	1.60	0.00
BNDY-S	010YR-12HR	699.30	699.30	0.0000	0	2.32	0.00
BNDY-S	010YR-24HR	699.30	699.30	0.0000	0	3.33	0.00
BNDY-S	100YR-01HR	699.30	699.30	0.0000	0	4.52	0.00
BNDY-S	100YR-02HR	699.30	699.30	0.0000	0	5.93	0.00
BNDY-S	100YR-03HR	699.30	699.30	0.0000	0	5.86	0.00
BNDY-S	100YR-06HR	699.30	699.30	0.0000	0	8.73	0.00
BNDY-S	100YR-12HR	699.30	699.30	0.0000	0	11.90	0.00
BNDY-S	100YR-24HR	699.30	699.30	0.0000	0	12.80	0.00
POND	002YR-01HR	699.67	704.30	0.0048	87857	8.60	0.05
POND	002YR-02HR	699.90	704.30	0.0050	89410	10.10	0.24
POND	002YR-03HR	700.01	704.30	0.0050	90117	9.57	0.33
POND	002YR-06HR	700.32	704.30	0.0049	92169	9.91	0.59
POND	002YR-12HR	700.71	704.30	0.0050	94804	9.13	0.80
POND	002YR-24HR	701.24	704.30	0.0050	98290	10.13	1.02
POND	010YR-01HR	700.11	704.30	0.0050	90780	29.45	0.46
POND	010YR-02HR	700.67	704.30	0.0050	94495	32.58	0.78
POND	010YR-03HR	700.90	704.30	0.0050	96030	30.30	0.88
POND	010YR-06HR	701.52	704.30	0.0050	100218	27.47	1.13
POND	010YR-12HR	702.14	704.30	0.0050	104351	19.26	1.49
POND	010YR-24HR	702.67	704.30	0.0050	108024	19.15	2.79
POND	100YR-01HR	701.14	704.30	0.0050	97676	80.67	0.98
POND	100YR-02HR	702.36	704.30	0.0050	105882	89.32	1.96
POND	100YR-03HR	702.81	704.30	0.0050	108977	82.10	3.13
POND	100YR-06HR	703.67	704.30	0.0050	114954	70.33	7.69
POND	100YR-12HR	704.01	704.30	0.0050	117276	38.72	9.95
POND	100YR-24HR	704.32	704.30	0.0050	119480	34.37	10.99

DEERFIELD - W210353
POST-DEVELOPED CONDITIONS (ONSITE AND OFFSITE BASINS)
ICPR LINK REPORT (DOWNSTREAM CHANNEL FLOW AND POND STAGING CALCULATION)

Name	Simulation	Max Flow cfs	Max Delta Q cfs	Max US Stage ft	Max DS Stage ft
POND OCS	002YR-01HR	0.05	0.002	699.67	699.30
POND OCS	002YR-02HR	0.24	0.003	699.90	699.30
POND OCS	002YR-03HR	0.33	0.003	700.01	699.30
POND OCS	002YR-06HR	0.59	0.004	700.32	699.30
POND OCS	002YR-12HR	0.80	0.006	700.71	699.30
POND OCS	002YR-24HR	1.02	0.007	701.24	699.30
POND OCS	010YR-01HR	0.46	0.005	700.11	699.30
POND OCS	010YR-02HR	0.78	0.006	700.67	699.30
POND OCS	010YR-03HR	0.88	0.006	700.90	699.30
POND OCS	010YR-06HR	1.13	0.006	701.52	699.30
POND OCS	010YR-12HR	1.49	0.007	702.14	699.30
POND OCS	010YR-24HR	2.79	0.008	702.67	699.30
POND OCS	100YR-01HR	0.98	0.006	701.14	699.30
POND OCS	100YR-02HR	1.96	0.007	702.36	699.30
POND OCS	100YR-03HR	3.13	0.009	702.81	699.30
POND OCS	100YR-06HR	7.69	-0.064	703.67	699.30
POND OCS	100YR-12HR	9.95	-0.062	704.01	699.30
POND OCS	100YR-24HR	10.43	-0.058	704.32	699.30
POND WEIR	002YR-01HR	0.00	0.000	699.67	699.30
POND WEIR	002YR-02HR	0.00	0.000	699.90	699.30
POND WEIR	002YR-03HR	0.00	0.000	700.01	699.30
POND WEIR	002YR-06HR	0.00	0.000	700.32	699.30
POND WEIR	002YR-12HR	0.00	0.000	700.71	699.30
POND WEIR	002YR-24HR	0.00	0.000	701.24	699.30
POND WEIR	010YR-01HR	0.00	0.000	700.11	699.30
POND WEIR	010YR-02HR	0.00	0.000	700.67	699.30
POND WEIR	010YR-03HR	0.00	0.000	700.90	699.30
POND WEIR	010YR-06HR	0.00	0.000	701.52	699.30
POND WEIR	010YR-12HR	0.00	0.000	702.14	699.30
POND WEIR	010YR-24HR	0.00	0.000	702.67	699.30
POND WEIR	100YR-01HR	0.00	0.000	701.14	699.30
POND WEIR	100YR-02HR	0.00	0.000	702.36	699.30
POND WEIR	100YR-03HR	0.00	0.000	702.81	699.30
POND WEIR	100YR-06HR	0.00	0.000	703.67	699.30
POND WEIR	100YR-12HR	0.00	0.000	704.01	699.30
POND WEIR	100YR-24HR	0.56	0.052	704.32	699.30

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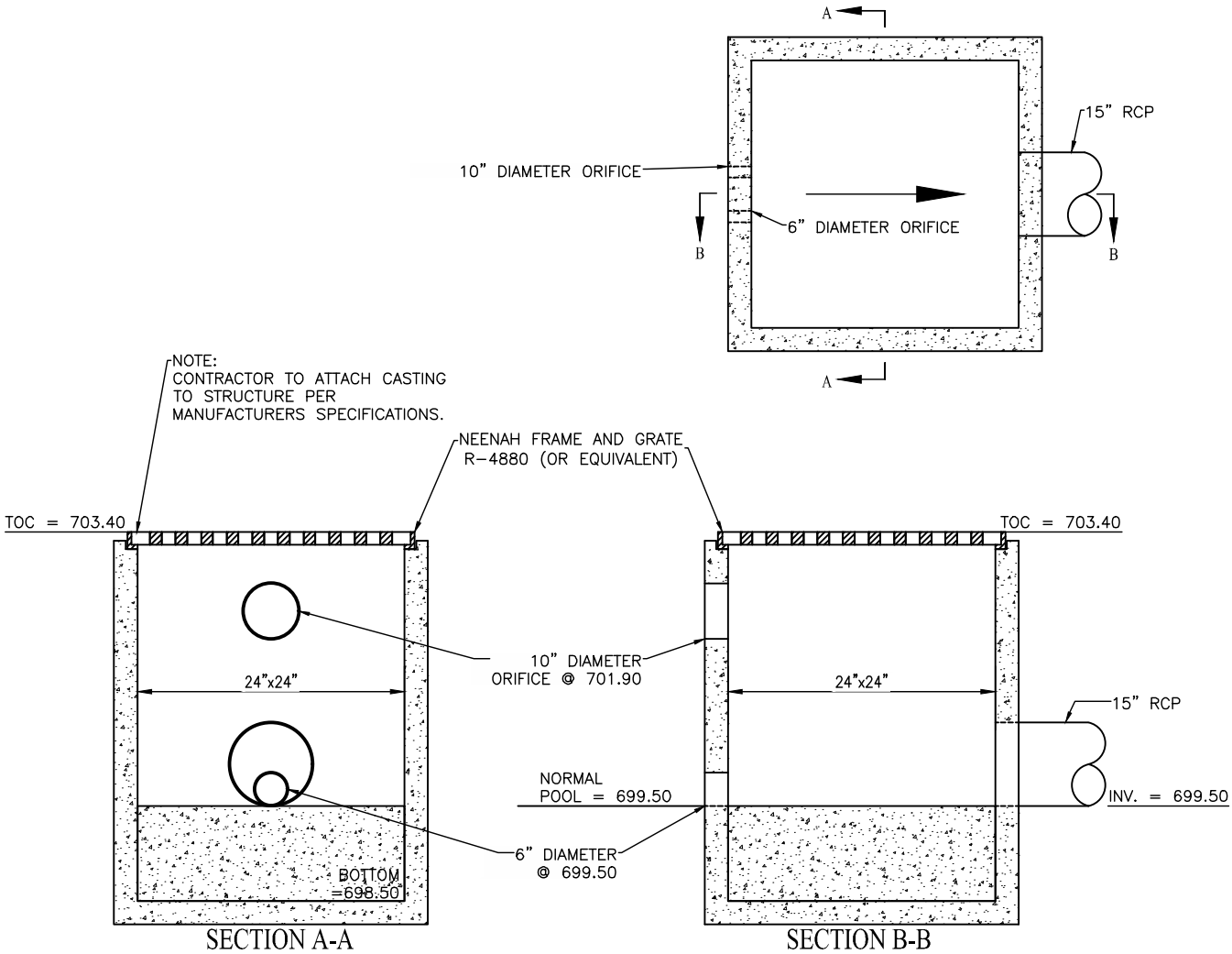
PLOTTED BY: Gaithert



POND OUTLET STRUCTURE #401
NOT TO SCALE

DETAIL EXHIBIT

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10505 N. College Avenue
Indianapolis, Indiana 46280
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WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Emergency Overflow Weir Calculations**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

$$A = (b + dy)d \qquad P_w = 2d\sqrt{1 + y^2} + b \qquad R = \frac{A}{P_w} \qquad V = \frac{1.49}{n} R^{2/3} S^{1/2} \qquad Q = 3.367bd^{3/2}$$

Weir Location	Depth, d (ft)	Bottom Width, b (ft)	n	Slope, S (ft/ft)	Side Slope, y (H:V)	Area, A (ft^2)	Wetted Perimeter, P_w (ft)	Hydraulic Radius, R (ft)	Velocity, V (ft/s)	Max. Discharge, Q (cfs)	100-yr Pond Inflow (cfs)	1.25*100-yr Pond Inflow (cfs)	Capacity Check
POND	0.70	60.0	0.030	0.0200	4	43.96	65.77	0.67	5.37	118.32	89.32	111.65	OK

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\DETAILS FOR PLANS\W210353-SPILLWAY DETAIL.dwg
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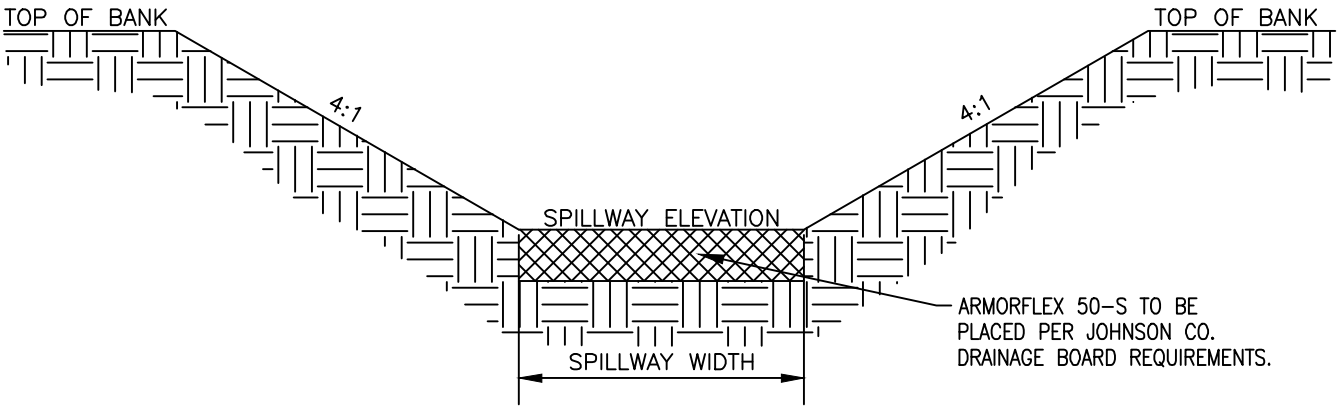
PLOTTED BY: Gaithert



LOCATION:	TOP OF BANK ELEV.:	100YR ELEV.:	SPILLWAY ELEV.:	SPILLWAY WIDTH:
POND	706.0	704.32	704.3	60'

DETAIL EXHIBIT

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PIPE SIZING CALCULATIONS

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
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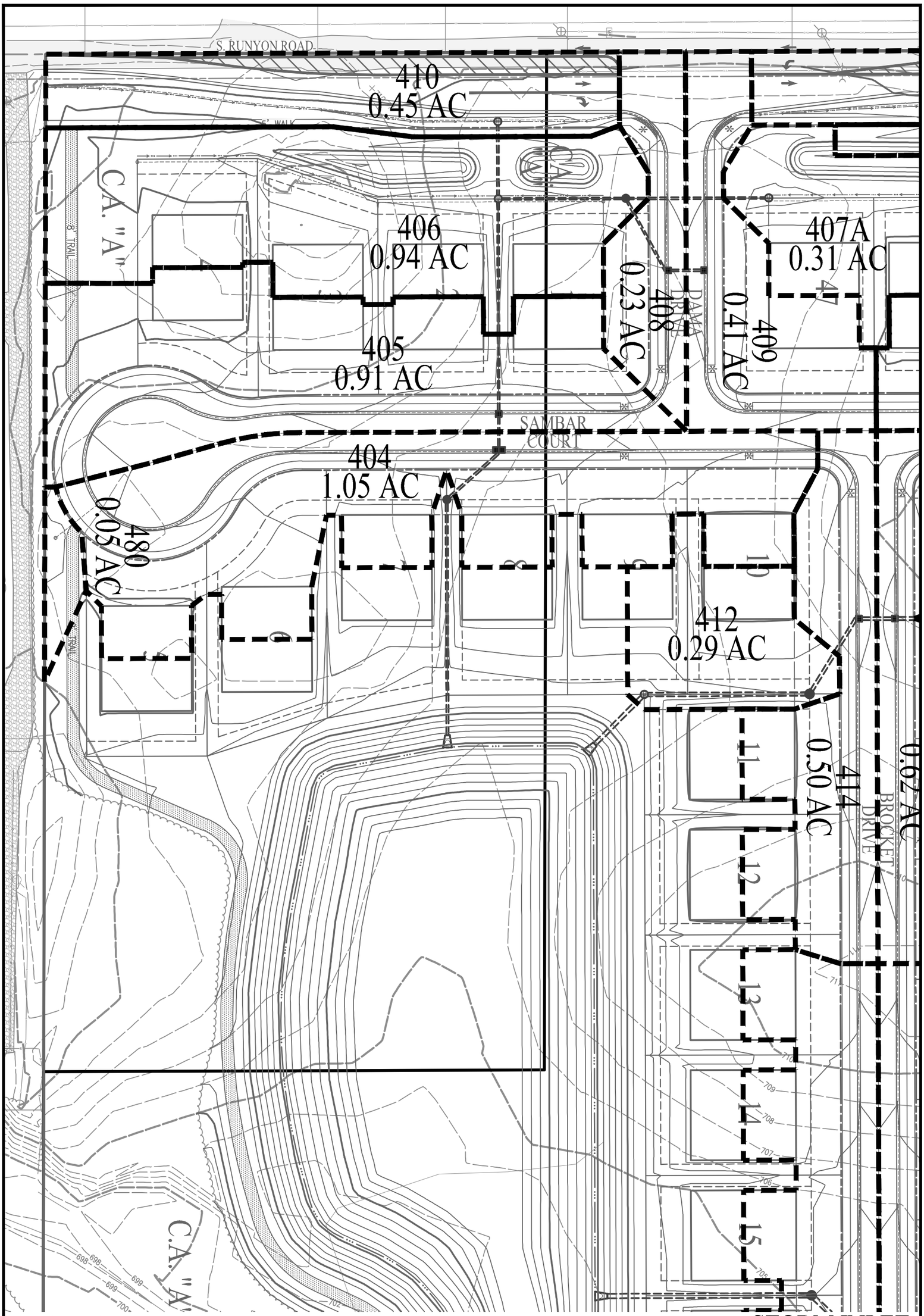

DEERFIELD
JOHNSON COUNTY, IN

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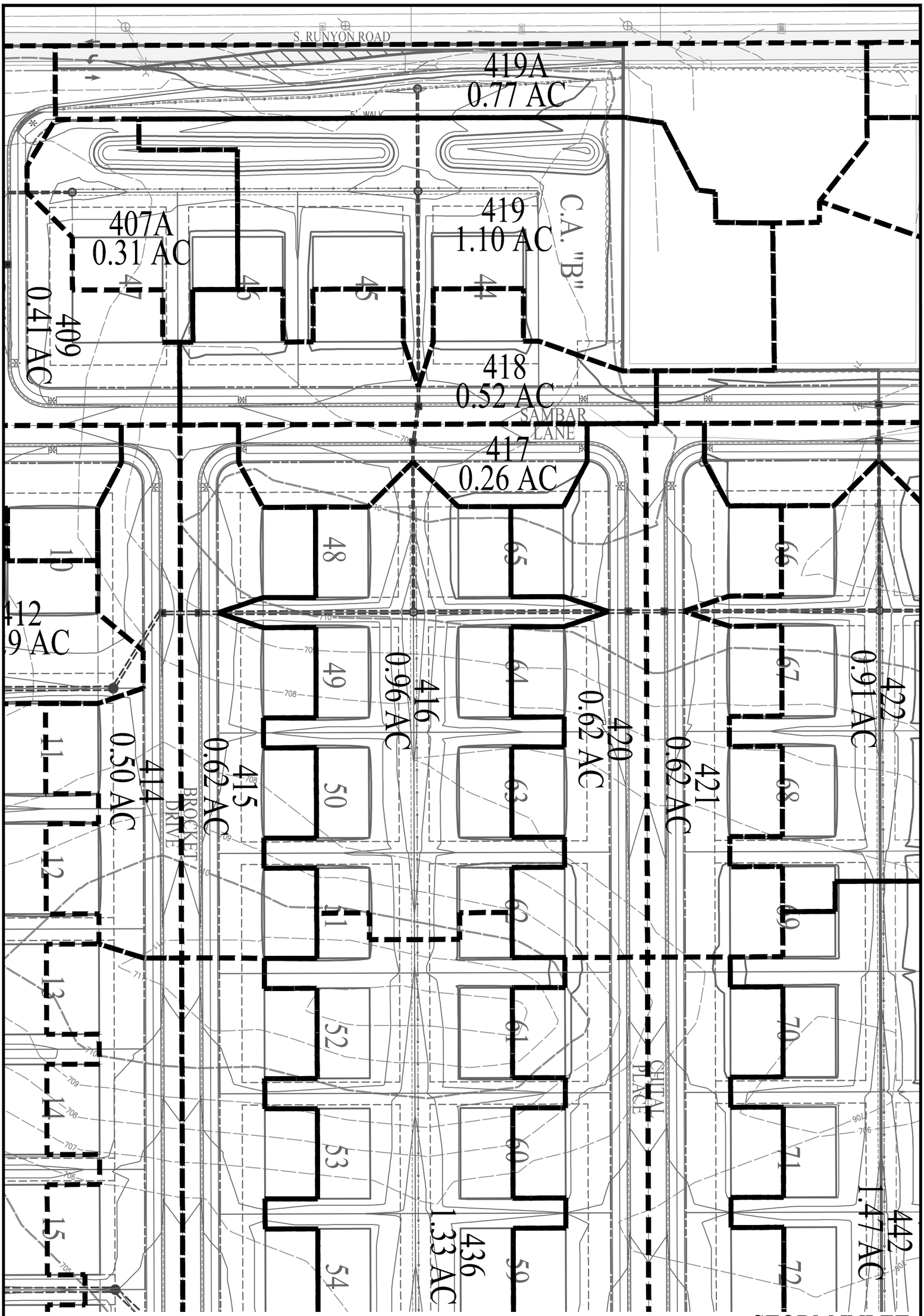
SCALE: 1" = 60'
0 15 30 60

FIGURE 4.1

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:23pm
PLOTTED BY: Gaithert



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SCALE: 1" = 60'
0 15 30 60

FIGURE 4.2

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
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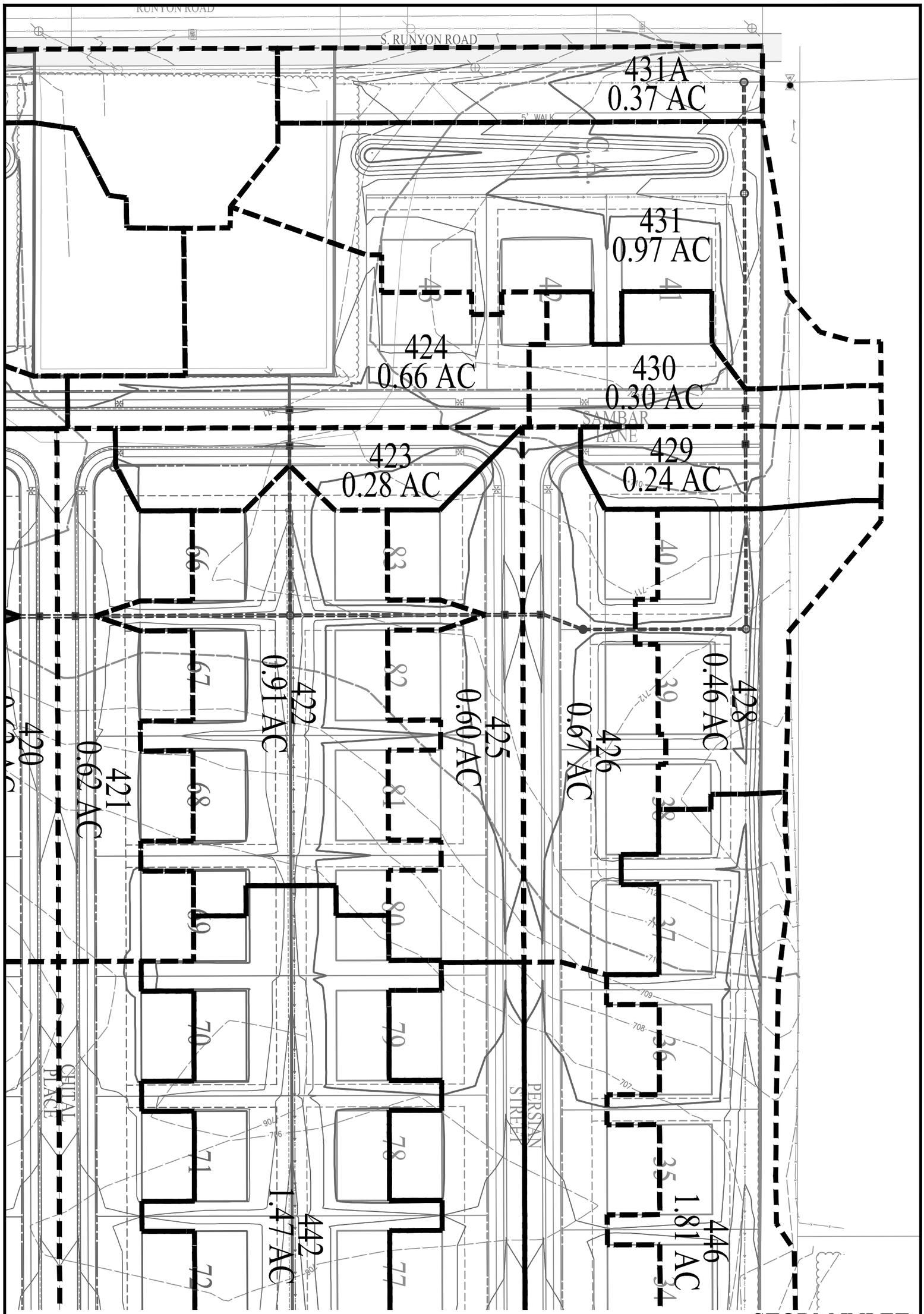

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JOHNSON COUNTY, IN

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Indianapolis, Indiana 46280
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317 | 846 - 6611

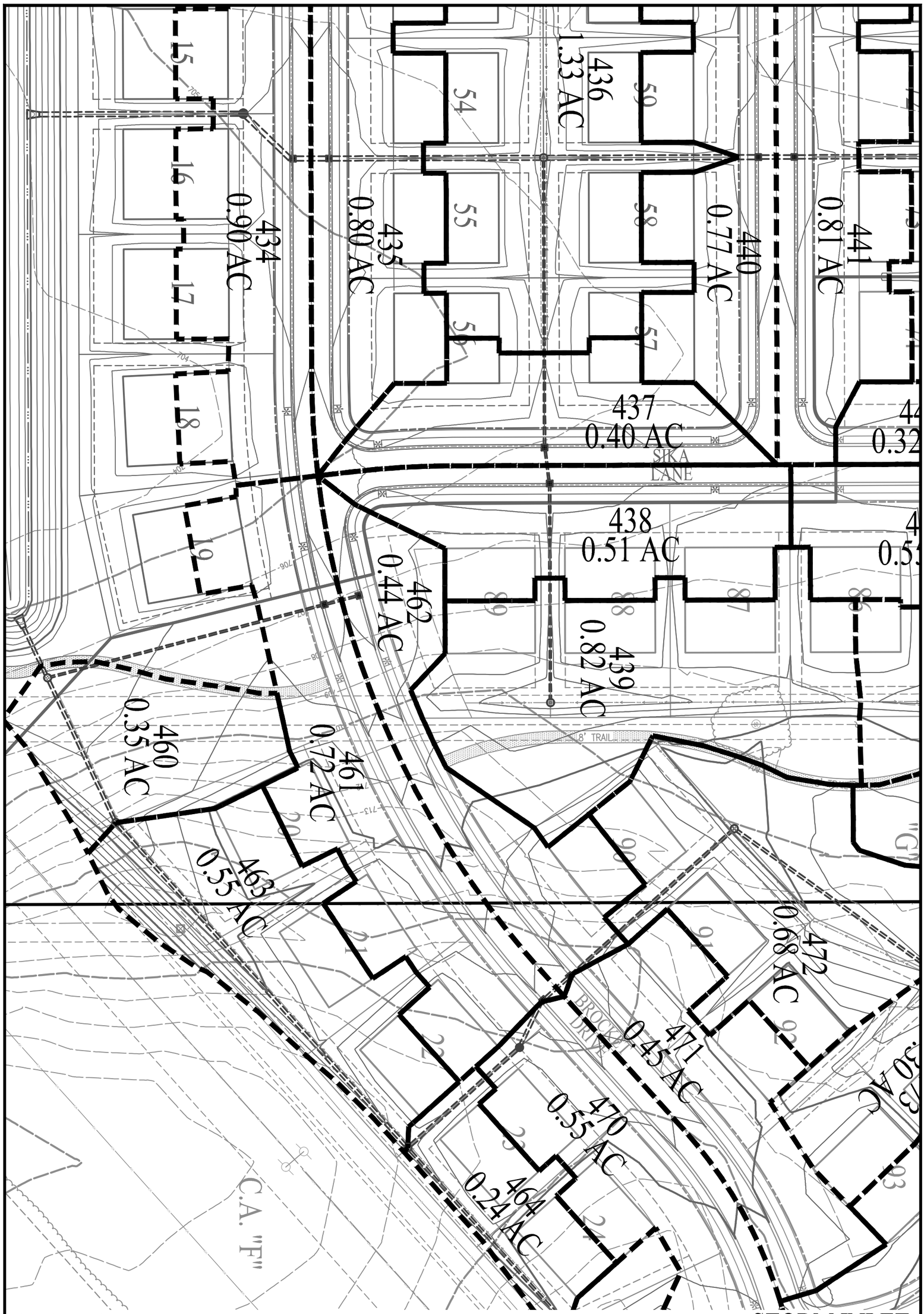
SCALE: 1" = 60'
0 15 30 60

FIGURE 4.3

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:25pm
PLOTTED BY: Gaithert



DEERFIELD
JOHNSON COUNTY, IN

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
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317 | 846 - 6611

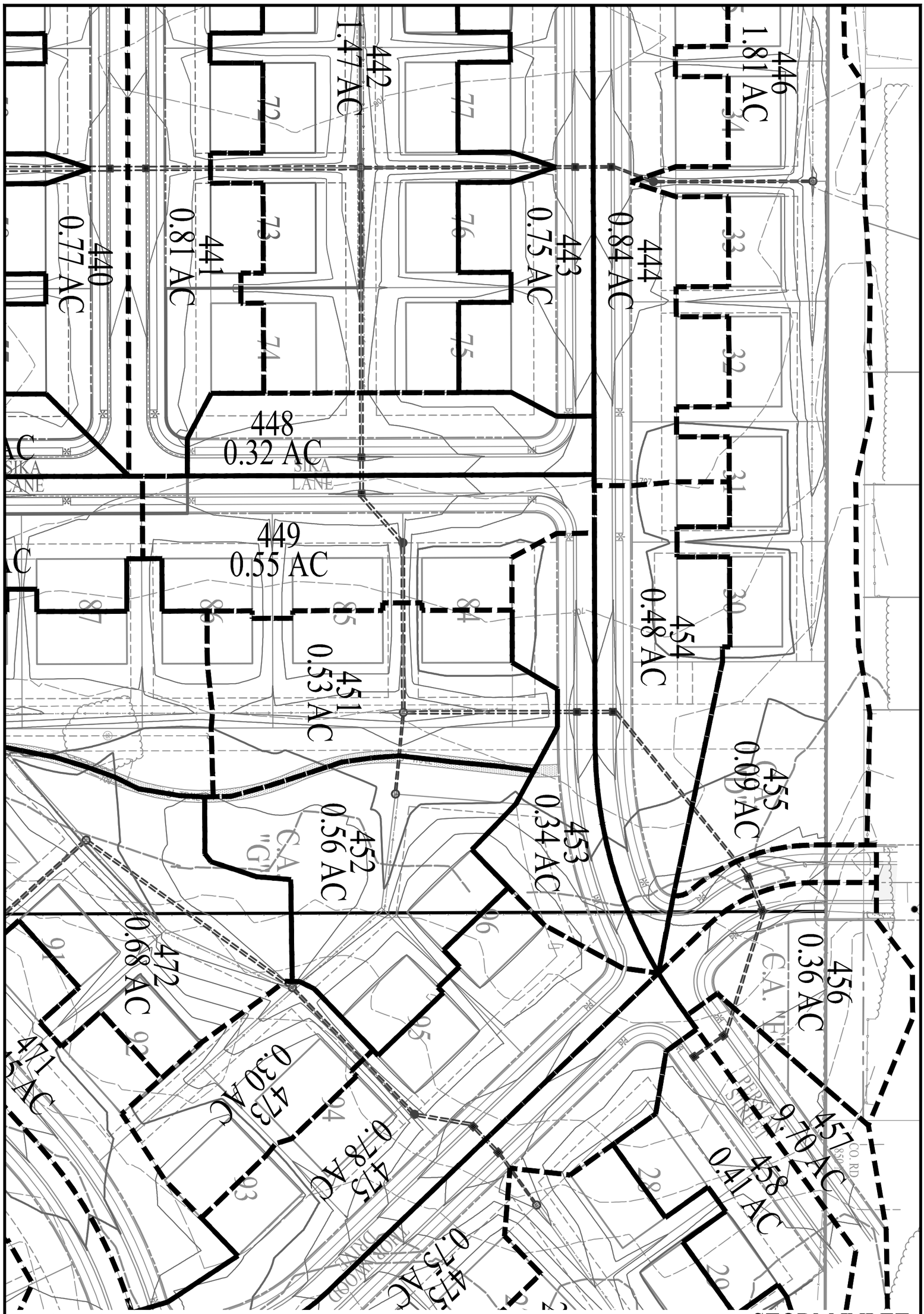
SCALE: 1" = 60'
0 15 30 60

FIGURE 4.4

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:26pm
PLOTTED BY: Gaithert



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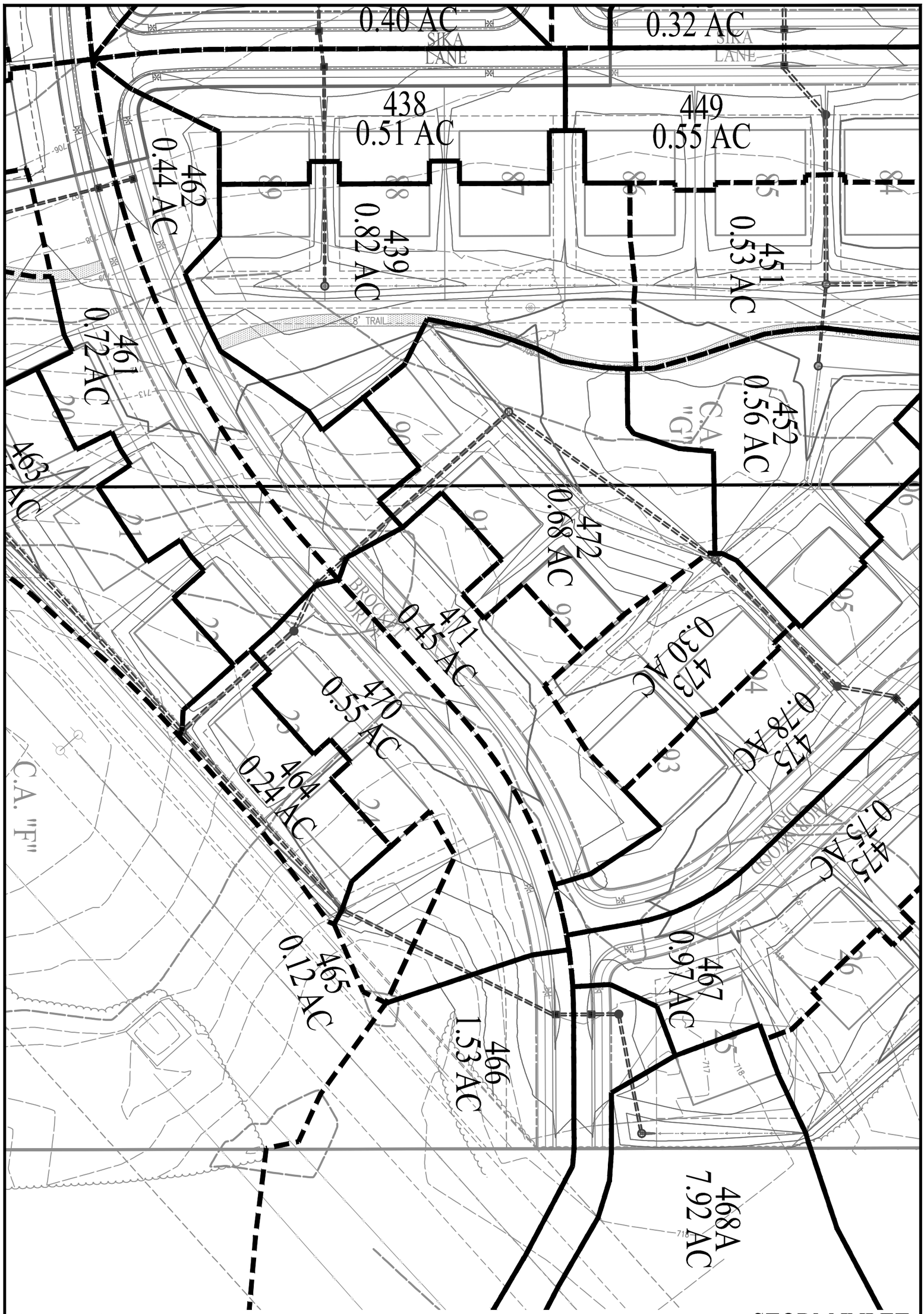
SCALE: 1" = 60'
0 15 30 60

FIGURE 4.5

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:27pm
PLOTTED BY: Gaithert



DEERFIELD
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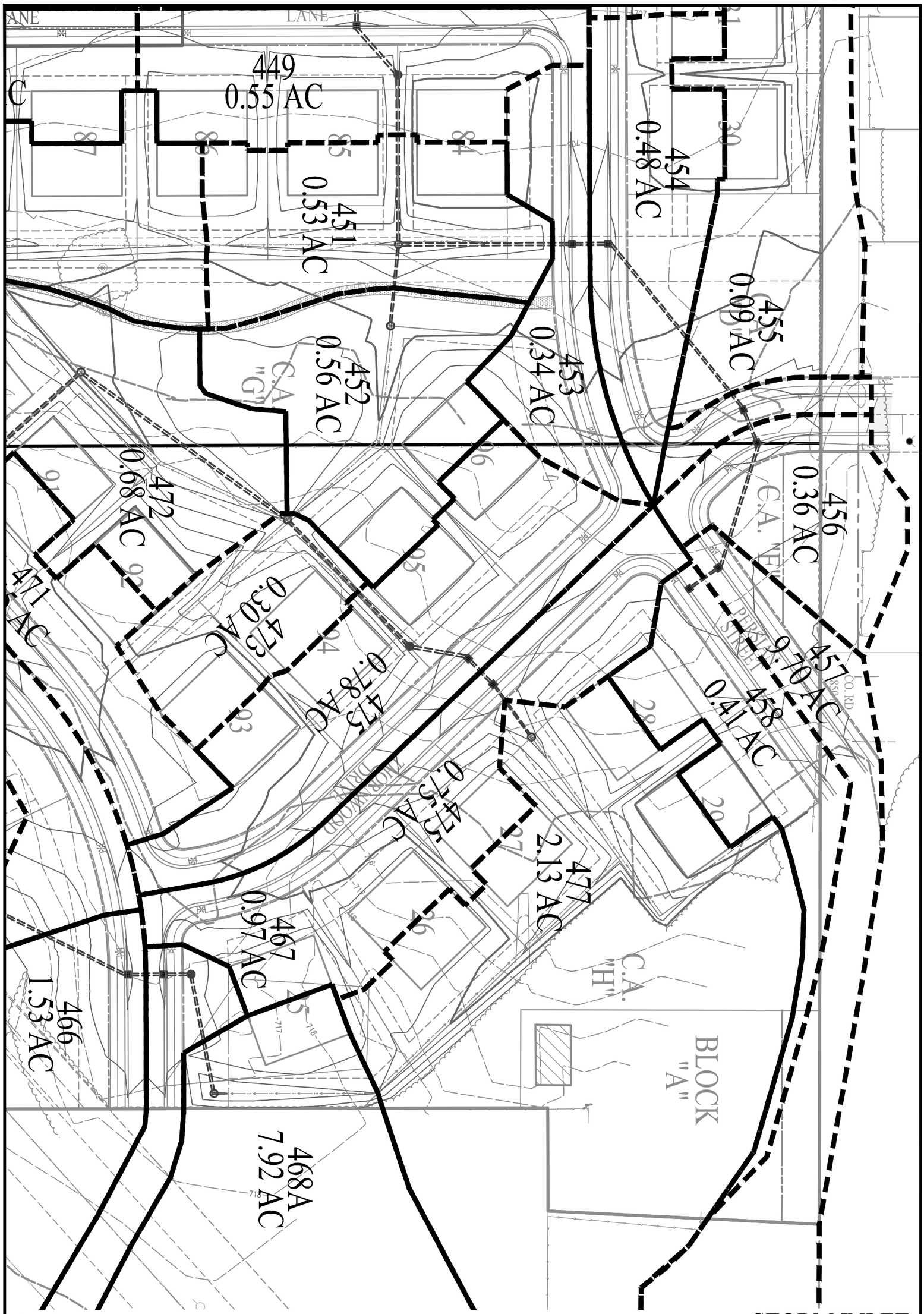
SCALE: 1" = 60'
0 15 30 60

FIGURE 4.6

STORM INLET
BASIN MAP

Date: August 17, 2022

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:29pm
PLOTTED BY: Gaithert



DEERFIELD
JOHNSON COUNTY, IN

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Indianapolis, Indiana 46280
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317 | 846 - 6611

SCALE: 1" = 60'
0 15 30 60

FIGURE 4.7

STORM INLET
BASIN MAP

Date: August 17, 2022

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture Build with confidence.	**Composite "c" Value Calculations**	**Project:** Deerfield **Date:** 8/17/2022 **Job No.:** W21-0353 **Checked By:** JEP **Prepared By:** TPG

Typical Full Pad (L_p, W_p)	70	60
Typical Driveway (L_d, W_d)	36	16
Street Width, B-B (W_{st})	28	
Sidewalk Width (W_{sw})	5	
Walking Path Width (W_{wp})	8	

$$A_{imp} = \frac{(\#Pads)(L_p)(W_p) + (\#Drives)(L_d)(W_d) + (L_{st})\left({W_{st}}/{2}\right) + (L_{sw})(W_{sw}) + (L_{wp})(W_{wp})}{43{,}560}$$

$$A_{per} = A_t - A_{imp}$$

$$C_w = \frac{(0.85A_{imp} + 0.2A_{per})}{A_t}$$

Str. #	Total Drainage Area, A_t (acre)	Number of Pads	Number of Driveways	Street Length L_{st} (ft)	Sidewalk Length L_{sw} (ft)	Walking Path Length L_{wp} (ft)	Total Impervious Area A_{imp} (acre)	Total Pervious Area A_{per} (acre)	Composite "c" Value C_w
404	1.05	3	6		548	0	0.64	0.41	0.59
405	0.91	2	4		448	78	0.49	0.42	0.55
406	0.94	2	0	0	0	103	0.21	0.73	0.35
407A	0.31	0.75	0	0	0	0	0.07	0.24	0.35
408	0.23	0	0		198	0	0.13	0.10	0.57
409	0.41	0.5	1		299	0	0.25	0.16	0.59
410	0.45	0	0		383	0	0.29	0.16	0.62
412	0.29	0.75	0	0	0	0	0.07	0.21	0.36
414	0.50	1	2	380	343	0	0.28	0.21	0.57
415	0.62	2	4	380	343	0	0.41	0.21	0.63
416	0.96	3.5	0	0	0	0	0.34	0.62	0.43
417	0.26	0	0	232	232	0	0.10	0.16	0.45
418	0.52	1.5	3	317	317	0	0.32	0.19	0.61
419	1.10	1.25	0	0	0	0	0.22	0.89	0.33
419A	0.77	0	0		378	0	0.30	0.47	0.46
420	0.62	2	4	380	343	0	0.41	0.21	0.63
421	0.62	2	4	380	343	0	0.41	0.21	0.63
422	0.91	3.5	0	0	0	0	0.34	0.57	0.44
423	0.28	0	0	264	246	0	0.11	0.17	0.46
424	0.66	0.75	1	308	308	0	0.28	0.39	0.47
425	0.60	2	4	350	330	0	0.40	0.21	0.63
426	0.67	2	4	382	345	0	0.41	0.26	0.60
428	0.46	1.25	0	0	0	0	0.13	0.34	0.38
429	0.24	0	0	121	121	0	0.07	0.17	0.40
430	0.30	0.75	2	155	155	0	0.18	0.12	0.58
431	0.97	1.5	0	0	0	0	0.17	0.80	0.31
431A	0.37	0	0		285	0	0.10	0.27	0.38
434	0.90	3	6	462	464	0	0.57	0.33	0.61
435	0.80	2.5	5	455	432	0	0.50	0.30	0.61
436	1.33	5	0	0	0	0	0.48	0.85	0.44
437	0.40	0.5	0	291	256	0	0.17	0.23	0.48
438	0.51	1.5	3	308	284	0	0.32	0.20	0.60
439	0.82	1.75	0	0	0	214	0.21	0.61	0.36
440	0.77	2.5	5	448	428	0	0.50	0.27	0.62
441	0.81	2.5	5	480	443	0	0.51	0.30	0.61
442	1.47	5.5	0	0	0	0	0.53	0.94	0.43
443	0.75	2.5	5	415	415	0	0.49	0.26	0.62

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Composite "c" Value Calculations**	**Project:** Deerfield **Date:** 8/17/2022 **Job No.:** W21-0353 **Checked By:** JEP **Prepared By:** TPG

Typical Full Pad (L_p, W_p)	70	60
Typical Driveway (L_d, W_d)	36	16
Street Width, B-B (W_{st})	28	
Sidewalk Width (W_{sw})	5	
Walking Path Width (W_{wp})	8	

$$A_{imp} = \frac{(\#Pads)(L_p)(W_p) + (\#Drives)(L_d)(W_d) + (L_{st})\left({W_{st}}/{2}\right) + (L_{sw})(W_{sw}) + (L_{wp})(W_{wp})}{43{,}560}$$

$$A_{per} = A_t - A_{imp}$$

$$C_w = \frac{(0.85A_{imp} + 0.2A_{per})}{A_t}$$

Str. #	Total Drainage Area, A_t (acre)	Number of Pads	Number of Driveways	Street Length L_{st} (ft)	Sidewalk Length L_{sw} (ft)	Walking Path Length L_{wp} (ft)	Total Impervious Area A_{imp} (acre)	Total Pervious Area A_{per} (acre)	Composite "c" Value C_w
444	0.84	2.75	5	461	461	0	0.53	0.30	0.61
446	1.81	4.25	0	0	0	0	0.41	1.40	0.35
448	0.32	0	0	296	260	0	0.12	0.20	0.45
449	0.55	1.5	3	326	290	0	0.32	0.23	0.58
451	0.53	1.25	0	0	0	109	0.14	0.39	0.37
452	0.56	1	0	0	0	112	0.12	0.45	0.33
453	0.34	0	0	294	290	17	0.13	0.21	0.45
454	0.48	0.75	2	325	287	0	0.24	0.24	0.52
455	0.09	0	0	153	145	0	0.07	0.03	0.67
456	0.36	0	0	192	141	0	0.08	0.28	0.34
457	9.70	0	0	193	193	0	1.64	8.07	0.31
458	0.41	1	2	182	182	0	0.20	0.21	0.52
460	0.35	0	0	0	0	80	0.01	0.34	0.23
461	0.72	2	4	390	397	36	0.42	0.30	0.58
462	0.44	0.5	1	383	345	0	0.22	0.22	0.53
463	0.55	1.5	0	0	0	0	0.14	0.40	0.37
464	0.24	1	0	0	0	0	0.10	0.14	0.47
465	0.12	0	0	0	0	0	0.00	0.12	0.20
466	1.53	0	0	133	130	0	0.06	1.47	0.22
467	0.96	0	0	108	109	0	0.06	0.91	0.24
468A	7.92	0.5	0	0	0	0	1.18	6.74	0.30
470	0.55	1	2	296	290	0	0.25	0.30	0.50
471	0.45	1	0.5	252	267	0	0.21	0.23	0.51
472	0.68	1.5	0	0	0	72	0.16	0.52	0.35
473	0.30	1	0	0	0	0	0.10	0.20	0.41
475	0.78	2	4	458	400	0	0.44	0.34	0.57
476	0.75	1.5	3	490	425	0	0.39	0.36	0.54
477	2.13	2	0	0	0	0	0.37	1.76	0.31
480	0.05	0	0	0	0	63	0.01	0.04	0.34

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Time of Concentration Calculations

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Mannings Values (n)			
Overland Flow		Channel Flow	
Short Grass	0.15	Grass	0.03
Dense Grass	0.24	Concrete	0.015
Pavement	0.011	Rip-Rap	0.035

2 Yr, 24 Hr Rainfall= 2.92

Tc minimum= 5

Overland Flow Travel Time: $T_t = \frac{0.0043\,(nL)^{0.8}}{S^{0.4}}$

Shallow Conc Flow Travel Time:
Channel Flow Travel Time: $T_t = \frac{L}{60\,V}$

Shallow Conc Flow (Unpaved): $V = 16.1345\,(S)^{0.5}$

Shallow Conc Flow (Paved): $V = 20.3282\,(S)^{0.5}$

Paved Gutter & Channel Flow $V = \frac{1.486}{n} R^{2/3} S^{1/2}$; $R = \frac{A}{P_w}$

Basin	Overland Flow				Overland Flow				Shallow Conc. Flow					Channel Flow								Tc
	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	Pave/Un P or U	Vel (ft/s)	T_t (min)	Len (ft)	A (sf)	Pw (ft)	r (ft)	S %	n	Vel (ft/s)	T_t (min)	(min)
404	62	1.00	0.24	13				0	205	0.70	P	1.70	2								0	15.5
405	100	1.00	0.24	20				0	160	0.70	P	1.70	2								0	21.3
406	73	1.00	0.24	15	10	2.10	0.24	2	244	1.00	U	1.61	3								0	20.2
407A	90	1.00	0.24	18	10	7.10	0.24	1	70	1.00	U	1.61	1								0	20.3
408	45	3.00	0.24	7				0	33	0.60	P	1.57	0								0	7.1
409	41	1.00	0.24	10				0	196	0.60	P	1.57	2								0	11.7
410	0	1.00	0.24	0				0	0	1.00	P	2.03	0								0	5.0
412	100	1.00	0.24	20				0	30	1.60	U	2.04	0								0	20.0
414	41	1.00	0.24	10				0	210	0.60	P	1.57	2								0	11.9
415	41	1.00	0.24	10				0	229	0.60	P	1.57	2								0	12.1
416	90	1.00	0.24	18	10	10.30	0.24	1	160	1.00	U	1.61	2								0	21.0
417	52	2.00	0.24	9				0	66	0.60	P	1.57	1								0	9.6
418	41	1.00	0.24	10				0	159	0.60	P	1.57	2								0	11.3
419	90	1.00	0.24	18	10	3.10	0.24	2	80	1.00	U	1.61	1								0	20.9
419A	0	1.00	0.24	0				0	0	1.00	P	2.03	0								0	5.0
420	41	1.00	0.24	10				0	230	0.60	P	1.57	2								0	12.1
421	41	1.00	0.24	10				0	230	0.60	P	1.57	2								0	12.1
422	90	1.00	0.24	18	10	2.50	0.24	2	160	1.00	U	1.61	2								0	21.9
423	52	1.50	0.24	10				0	70	0.60	P	1.57	1								0	10.7
424	61	1.00	0.24	13				0	131	0.88	P	1.91	1								0	14.4
425	41	1.00	0.24	10				0	231	0.60	P	1.57	2								0	12.1
426	81	1.00	0.24	17				0	90	0.60	P	1.57	1								0	17.6
428	43	1.00	0.24	10	10	1.20	0.24	3	80	1.10	U	1.69	1								0	13.7
429	48	2.60	0.24	7				0	67	0.60	P	1.57	1								0	8.2
430	41	1.00	0.24	10				0	92	0.60	P	1.57	1								0	10.6
431	90	1.00	0.24	18	10	5.30	0.24	2	92	1.00	U	1.61	1								0	20.7
431A	0	1.00	0.24	0				0	0	1.00	P	2.03	0								0	5.0
434	71	1.00	0.24	15				0	50	0.60	P	1.57	1								0	15.5
435	61	1.00	0.24	13				0	79	0.60	P	1.57	1								0	14.1

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Time of Concentration Calculations

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Mannings Values (n)			
Overland Flow		Channel Flow	
Short Grass	0.15	Grass	0.03
Dense Grass	0.24	Concrete	0.015
Pavement	0.011	Rip-Rap	0.035

2 Yr, 24 Hr Rainfall= 2.92

Tc minimum= 5

Overland Flow Travel Time: $T_t = \frac{0.0043\,(nL)^{0.8}}{S^{0.4}}$

Shallow Conc Flow Travel Time:
Channel Flow Travel Time: $T_t = \frac{L}{60\,V}$

Shallow Conc Flow (Unpaved): $V = 16.1345\,(S)^{0.5}$

Shallow Conc Flow (Paved): $V = 20.3282\,(S)^{0.5}$

Paved Gutter & Channel Flow $V = \frac{1.486}{n} R^{2/3} S^{1/2}$; $R = \frac{A}{P_w}$

Basin	Overland Flow				Overland Flow				Shallow Conc. Flow					Channel Flow								Tc
	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	Pave/Un P or U	Vel (ft/s)	T_t (min)	Len (ft)	A (sf)	Pw (ft)	r (ft)	S %	n	Vel (ft/s)	T_t (min)	(min)
436	90	1.00	0.24	18	10	10.30	0.24	1	240	1.00	U	1.61	2								0	21.8
437	45	3.00	0.24	7				0	79	1.27	P	2.29	1								0	7.3
438	61	1.00	0.24	13				0	79	1.27	P	2.29	1								0	13.8
439	93	1.00	0.24	19	7	1.40	0.24	2	160	1.00	U	1.61	2								0	22.3
440	41	1.00	0.24	10				0	239	1.39	P	2.40	2								0	11.3
441	61	1.00	0.24	13				0	79	0.60	P	1.57	1								0	14.1
442	90	1.00	0.24	18	10	10.10	0.24	1	240	1.00	U	1.61	2								0	21.8
443	41	1.00	0.24	10				0	240	1.22	P	2.25	2								0	11.4
444	41	1.00	0.24	10				0	230	1.22	P	2.25	2								0	11.4
446	80	1.00	0.24	16	10	9.60	0.24	1	239	1.00	P	2.03	2								0	19.7
448	46	2.40	0.24	7				0	80	0.60	P	1.57	1								0	8.3
449	81	1.00	0.24	17				0	59	0.60	P	1.57	1								0	17.3
451	53	1.00	0.24	12	10	2.00	0.24	2	87	1.00	U	1.61	1								0	15.1
452	54	1.00	0.24	12	10	12.30	0.24	1	76	1.60	U	2.04	1								0	13.8
453	77	5.00	0.24	8				0	60	2.00	P	2.87	0								0	8.7
454	71	1.00	0.24	15				0	33	0.60	P	1.57	0								0	15.3
455	0	1.00	0.24	0				0	0	1.00	P	2.03	0								0	5.0
456	100	2.00	0.24	15				0	56	2.00	U	2.28	0								0	15.3
457	100	1.40	0.24	17				0	2000	1.57	U	2.02	16								0	33.7
458	41	1.00	0.24	10				0	167	2.00	P	2.87	1								0	10.6
460	100	1.00	0.24	20				0	102	1.00	U	1.61	1								0	20.8
461	51	1.00	0.24	12				0	239	2.00	P	2.87	1								0	12.9
462	41	1.00	0.24	10				0	289	2.00	P	2.87	2								0	11.3
463	87	1.00	0.24	18	10	1.80	0.24	2	103	1.70	U	2.10	1								0	20.9
464	61	1.00	0.24	13	10	1.40	0.24	3	79	1.70	U	2.10	1								0	16.6
465	83	1.00	0.24	17				0	0	1.00	P	2.03	0								0	17.0
466	100	3.00	0.24	13				0	506	1.96	U	2.26	4								0	16.4
467	100	2.20	0.24	14				0	796	2.60	U	2.60	5								0	19.5
468A	100	1.50	0.24	17				0	821	2.50	U	2.55	5								0	22.1
470	61	1.00	0.24	13				0	91	1.37	P	2.38	1								0	13.9

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Time of Concentration Calculations

Project:	Deerfield
Date:	8/17/2022
Job No.:	W21-0353
Checked By:	JEP
Prepared By:	TPG

Mannings Values (n)			
Overland Flow		Channel Flow	
Short Grass	0.15	Grass	0.03
Dense Grass	0.24	Concrete	0.015
Pavement	0.011	Rip-Rap	0.035

2 Yr, 24 Hr Rainfall= 2.92

Tc minimum= 5

Overland Flow Travel Time: $T_t = \frac{0.0043\,(nL)^{0.8}}{S^{0.4}}$

Shallow Conc Flow Travel Time:
Channel Flow Travel Time: $T_t = \frac{L}{60\,V}$

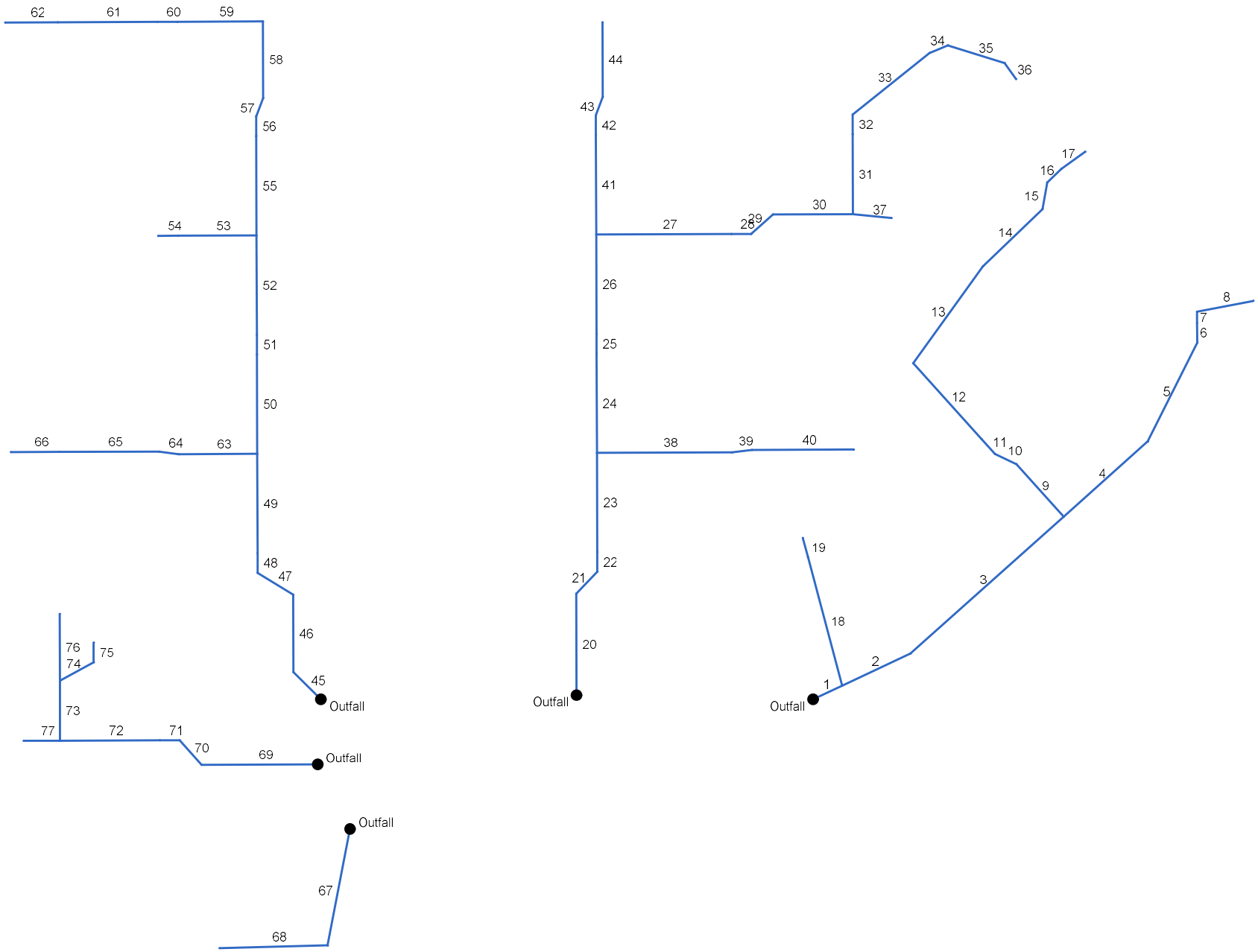
Shallow Conc Flow (Unpaved): $V = 16.1345\,(S)^{0.5}$

Shallow Conc Flow (Paved): $V = 20.3282\,(S)^{0.5}$

Paved Gutter & Channel Flow $V = \frac{1.486}{n} R^{2/3} S^{1/2}$; $R = \frac{A}{P_w}$

Basin	Overland Flow				Overland Flow				Shallow Conc. Flow					Channel Flow								Tc
	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	n	T_t (min)	Len (ft)	S %	Pave/Un P or U	Vel (ft/s)	T_t (min)	Len (ft)	A (sf)	Pw (ft)	r (ft)	S %	n	Vel (ft/s)	T_t (min)	(min)
471	74	1.00	0.24	15				0	223	1.37	P	2.38	2								0	17.1
472	70	1.00	0.24	15	24	4.00	0.24	4	79	1.00	U	1.61	1								0	19.2
473	70	1.00	0.24	15				0	80	3.30	U	2.93	0								0	15.3
475	81	1.00	0.24	17				0	57	0.60	P	1.57	1								0	17.3
476	91	2.00	0.24	14				0	181	2.79	P	3.40	1								0	14.7
477	100	1.50	0.24	17				0	533	1.50	U	1.98	4								0	21.3
480	0	1.00	0.24	0				0	0	1.00	P	2.03	0								0	5.0

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: W210353-STM.stm	Number of lines: 77	Date: 8/15/2022

Storm Sewers v2021.00

Rational

Line No.	Inlet ID	Known Q (cfs)	Drng Area (ac)	Total Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Pipe Travel (min)	Tc (min)	i Inlet (in/hr)	i Sys (in/hr)	Incr Q (cfs)	Flow Rate (cfs)
1	460	0.00	0.35	18.47	0.23	0.08	6.39	20.8	0.11	26.9	3.98	3.43	0.32	21.93
2	463	0.00	0.55	16.96	0.37	0.20	5.66	20.9	0.29	26.6	3.97	3.45	0.81	19.55
3	464	0.00	0.24	16.41	0.47	0.11	5.46	16.6	0.78	25.8	4.49	3.52	0.51	19.18
4	465	0.00	0.12	10.53	0.20	0.02	2.97	17.0	0.43	22.9	4.44	3.77	0.11	11.18
5	466	0.00	1.53	10.41	0.22	0.34	2.94	16.4	0.42	22.5	4.52	3.81	1.52	11.20
6	467	0.00	0.96	8.88	0.24	0.23	2.61	19.5	0.08	22.4	4.12	3.81	0.95	9.94
7	468	0.00	0.00	7.92	0.00	0.00	2.38	0.0	0.05	22.4	0.00	3.82	0.00	9.08
8	468A	0.00	7.92	7.92	0.30	2.38	2.38	22.1	0.26	22.1	3.85	3.85	9.14	9.14
9	469	0.00	0.00	5.64	0.00	0.00	2.38	0.0	0.61	25.2	0.00	3.57	0.00	8.47
10	470	0.00	0.55	5.64	0.50	0.28	2.38	13.9	0.20	25.0	4.91	3.58	1.35	8.51
11	471	0.00	0.45	5.09	0.51	0.23	2.10	17.1	0.15	24.8	4.42	3.60	1.02	7.55
12	472	0.00	0.68	4.64	0.35	0.24	1.87	19.2	0.84	24.0	4.16	3.67	0.99	6.86
13	473	0.00	0.30	3.96	0.41	0.12	1.63	15.3	1.09	22.9	4.68	3.77	0.58	6.15
14	474	0.00	0.00	3.66	0.00	0.00	1.51	0.0	0.80	22.1	0.00	3.85	0.00	5.81
15	475	0.00	0.78	3.66	0.57	0.44	1.51	17.3	0.26	21.8	4.40	3.87	1.95	5.85
16	476	0.00	0.75	2.88	0.54	0.41	1.07	14.7	0.20	21.6	4.78	3.89	1.94	4.15
17	477	0.00	2.13	2.13	0.31	0.66	0.66	21.3	0.33	21.3	3.93	3.93	2.59	2.59
18	461	0.00	0.72	1.16	0.58	0.42	0.65	12.9	1.16	12.9	5.09	5.09	2.13	3.31
19	462	0.00	0.44	0.44	0.53	0.23	0.23	11.3	0.45	11.3	5.41	5.41	1.26	1.26
20	433	0.00	0.00	24.55	0.00	0.00	10.28	0.0	0.63	39.0	0.00	2.72	0.00	27.97
21	434	0.00	0.90	24.55	0.61	0.55	10.28	15.5	0.19	38.8	4.65	2.73	2.55	28.06
22	435	0.00	0.80	23.65	0.61	0.49	9.73	14.1	0.13	38.7	4.88	2.74	2.38	26.62
23	436	0.00	1.33	22.85	0.44	0.59	9.24	21.8	0.67	38.0	3.87	2.77	2.27	25.57

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: Intensity = 57.18 / (Inlet time + 8.60) ^ 0.79 -- Return period = 10 Yrs. ; ** Critical depth

Rational

Line No.	Inlet ID	Known Q (cfs)	Drng Area (ac)	Total Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Pipe Travel (min)	Tc (min)	i Inlet (in/hr)	i Sys (in/hr)	Incr Q (cfs)	Flow Rate (cfs)
24	440	0.00	0.77	19.79	0.62	0.48	7.86	11.3	0.77	37.2	5.41	2.80	2.58	22.04
25	441	0.00	0.81	19.02	0.61	0.49	7.39	14.1	0.11	37.1	4.88	2.81	2.41	20.75
26	442	0.00	1.47	18.21	0.43	0.63	6.89	21.8	0.60	36.5	3.87	2.84	2.45	19.56
27	448	0.00	0.32	13.34	0.45	0.14	4.65	8.3	0.76	35.8	6.16	2.88	0.89	13.38
28	449	0.00	0.55	13.02	0.58	0.32	4.51	17.3	0.12	35.6	4.40	2.88	1.40	12.99
29	450	0.00	0.00	12.47	0.00	0.00	4.19	0.0	0.18	35.5	0.00	2.89	0.00	12.11
30	451	0.00	0.53	12.47	0.37	0.20	4.19	15.1	0.49	35.0	4.72	2.92	0.92	12.22
31	453	0.00	0.34	11.38	0.45	0.15	3.81	8.7	0.41	34.6	6.04	2.94	0.92	11.19
32	454	0.00	0.48	11.04	0.52	0.25	3.65	15.3	0.11	34.4	4.68	2.95	1.17	10.76
33	455	0.00	0.09	10.56	0.67	0.06	3.40	5.0	0.41	34.0	7.31	2.97	0.44	10.10
34	456	0.00	0.36	10.47	0.34	0.12	3.34	15.3	0.08	34.0	4.68	2.97	0.57	9.94
35	457	0.00	9.70	10.11	0.31	3.01	3.22	33.7	0.26	33.7	2.99	2.99	8.98	9.62
36	458	0.00	0.41	0.41	0.52	0.21	0.21	10.6	0.48	10.6	5.57	5.57	1.19	1.19
37	452	0.00	0.56	0.56	0.33	0.18	0.18	13.8	1.23	13.8	4.93	4.93	0.91	0.91
38	437	0.00	0.40	1.73	0.48	0.19	0.79	7.3	1.32	25.2	6.46	3.57	1.24	2.83
39	438	0.00	0.51	1.33	0.60	0.31	0.60	13.8	0.26	24.9	4.93	3.59	1.51	2.16
40	439	0.00	0.82	0.82	0.36	0.30	0.30	22.3	2.61	22.3	3.83	3.83	1.13	1.13
41	443	0.00	0.75	3.40	0.62	0.47	1.61	11.4	0.64	20.9	5.39	3.97	2.51	6.39
42	444	0.00	0.84	2.65	0.61	0.51	1.15	11.4	0.12	20.8	5.39	3.98	2.76	4.56
43	445	0.00	0.00	1.81	0.00	0.00	0.63	0.0	0.22	20.5	0.00	4.01	0.00	2.54
44	446	0.00	1.81	1.81	0.35	0.63	0.63	19.7	0.84	19.7	4.10	4.10	2.60	2.60
45	412	0.00	0.29	11.72	0.36	0.10	5.63	20.0	0.24	27.6	4.07	3.37	0.42	19.00
46	413	0.00	0.00	11.43	0.00	0.00	5.53	0.0	0.48	27.2	0.00	3.41	0.00	18.84

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: Intensity = 57.18 / (Inlet time + 8.60) ^ 0.79 -- Return period = 10 Yrs. ; ** Critical depth

Rational

Line No.	Inlet ID	Known Q (cfs)	Drng Area (ac)	Total Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Pipe Travel (min)	Tc (min)	i Inlet (in/hr)	i Sys (in/hr)	Incr Q (cfs)	Flow Rate (cfs)
47	414	0.00	0.50	11.43	0.57	0.29	5.53	11.9	0.16	27.0	5.29	3.42	1.51	18.91
48	415	0.00	0.62	10.93	0.63	0.39	5.24	12.1	0.08	26.9	5.25	3.43	2.05	17.97
49	416	0.00	0.96	10.31	0.43	0.41	4.85	21.0	0.43	26.5	3.96	3.46	1.63	16.79
50	420	0.00	0.62	6.70	0.63	0.39	3.29	12.1	0.63	25.9	5.25	3.51	2.05	11.54
51	421	0.00	0.62	6.08	0.63	0.39	2.90	12.1	0.11	25.8	5.25	3.52	2.05	10.19
52	422	0.00	0.91	5.46	0.44	0.40	2.51	21.9	0.62	25.1	3.86	3.57	1.55	8.94
53	423	0.00	0.28	0.94	0.46	0.13	0.44	10.7	1.08	14.8	5.54	4.77	0.71	2.09
54	424	0.00	0.66	0.66	0.47	0.31	0.31	14.4	0.38	14.4	4.83	4.83	1.50	1.50
55	425	0.00	0.60	3.61	0.63	0.38	1.67	12.1	0.67	24.5	5.25	3.63	1.98	6.04
56	426	0.00	0.67	3.01	0.60	0.40	1.29	17.6	0.17	24.3	4.36	3.64	1.75	4.69
57	427	0.00	0.00	2.34	0.00	0.00	0.89	0.0	0.17	24.1	0.00	3.66	0.00	3.24
58	428	0.00	0.46	2.34	0.38	0.17	0.89	13.7	0.66	23.5	4.95	3.71	0.86	3.29
59	429	0.00	0.24	1.88	0.40	0.10	0.71	8.2	0.89	22.6	6.18	3.80	0.59	2.70
60	430	0.00	0.30	1.64	0.58	0.17	0.62	10.6	0.24	22.3	5.57	3.82	0.97	2.35
61	431	0.00	0.97	1.34	0.31	0.30	0.44	20.7	1.64	20.7	3.99	3.99	1.20	1.76
62	431A	0.00	0.37	0.37	0.38	0.14	0.14	5.0	1.48	5.0	7.31	7.31	1.03	1.03
63	417	0.00	0.26	2.65	0.45	0.12	1.15	9.6	0.51	22.1	5.81	3.85	0.68	4.43
64	418	0.00	0.52	2.39	0.61	0.32	1.03	11.3	0.14	21.9	5.41	3.86	1.72	4.00
65	419	0.00	1.10	1.87	0.33	0.36	0.72	20.9	1.01	20.9	3.97	3.97	1.44	2.85
66	419A	0.00	0.77	0.77	0.46	0.35	0.35	5.0	0.54	5.0	7.31	7.31	2.59	2.59
67	479	0.00	0.00	0.05	0.00	0.00	0.02	0.0	29.08	30.1	0.00	3.20	0.00	0.05
68	480	0.00	0.05	0.05	0.34	0.02	0.02	5.0	25.14	5.0	7.31	7.31	0.12	0.12
69	403	0.00	0.00	4.30	0.00	0.00	2.21	0.0	0.57	26.6	0.00	3.45	0.00	7.63

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: Intensity = 57.18 / (Inlet time + 8.60) ^ 0.79 -- Return period = 10 Yrs. ; ** Critical depth

Rational

Line No.	Inlet ID	Known Q (cfs)	Drng Area (ac)	Total Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Pipe Travel (min)	Tc (min)	i Inlet (in/hr)	i Sys (in/hr)	Incr Q (cfs)	Flow Rate (cfs)
70	404	0.00	1.05	4.30	0.59	0.62	2.21	15.5	0.16	26.4	4.65	3.47	2.88	7.66
71	405	0.00	0.91	3.25	0.55	0.50	1.59	21.3	0.09	26.3	3.93	3.47	1.96	5.52
72	406	0.00	0.94	2.34	0.35	0.33	1.09	20.2	0.67	25.6	4.04	3.53	1.33	3.84
73	407	0.00	0.00	0.95	0.00	0.00	0.48	0.0	0.91	24.7	0.00	3.60	0.00	1.73
74	408	0.00	0.23	0.64	0.57	0.13	0.37	7.1	0.56	12.1	6.52	5.24	0.86	1.95
75	409	0.00	0.41	0.41	0.59	0.24	0.24	11.7	0.44	11.7	5.33	5.33	1.29	1.29
76	407A	0.00	0.31	0.31	0.35	0.11	0.11	20.3	4.44	20.3	4.03	4.03	0.44	0.44
77	410	0.00	0.45	0.45	0.62	0.28	0.28	5.0	0.52	5.0	7.31	7.31	2.04	2.04

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: Intensity = 57.18 / (Inlet time + 8.60) ^ 0.79 -- Return period = 10 Yrs. ; ** Critical depth

Pipe Calc

Line No.	Inlet ID	Line Length (ft)	Line Size (in)	Line Slope (%)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	Invert Up (ft)	Invert Dn (ft)	Cover Up (ft)	Cover Dn (ft)	HGL Up (ft)	HGL Dn (ft)
1	460	45.317	24	1.77	0.013	21.93	30.05	9.13	706.45	701.02	700.30	699.50	4.15	-0.48	701.97	700.77
2	463	106.739	24	1.03	0.013	19.55	22.96	7.14	707.45	706.45	701.40	700.30	4.05	4.15	702.99 j	701.97
3	464	291.031	24	1.00	0.013	19.18	22.58	7.20	712.36	707.45	704.30	701.40	6.06	4.05	705.87 j	702.99
4	465	159.659	18	1.57	0.013	11.18	13.14	7.66	715.05	712.36	707.80	705.30	5.75	5.56	709.08	706.36
5	466	156.683	18	1.44	0.013	11.20	12.58	6.98	716.23	715.05	710.05	707.80	4.68	5.75	711.33	709.08
6	467	28.000	18	1.07	0.013	9.94	10.87	6.34	716.23	716.23	710.35	710.05	4.38	4.68	711.56 j	711.33
7	468	16.000	18	0.94	0.013	9.08	10.17	6.04	716.55	716.23	710.50	710.35	4.55	4.38	711.66	711.56
8	468A	80.881	18	0.88	0.013	9.14	9.84	6.20	714.91	716.55	711.21	710.50	2.20	4.55	712.38	711.66
9	469	100.000	24	0.19	0.013	8.47	9.86	3.24	713.04	712.36	704.49	704.30	6.55	6.06	706.02	705.87
10	470	33.561	24	0.18	0.013	8.51	9.56	3.16	712.45	713.04	704.55	704.49	5.90	6.55	706.14	706.10
11	471	28.000	21	0.36	0.013	7.55	9.47	3.69	712.45	712.45	704.90	704.80	5.80	5.90	706.26	706.21
12	472	144.961	21	0.26	0.013	6.86	8.00	3.44	709.27	712.45	705.27	704.90	2.25	5.80	706.58	706.30
13	473	169.019	21	0.22	0.013	6.15	7.51	2.94	711.00	709.27	705.65	705.27	3.60	2.25	707.01	706.77
14	474	117.159	21	0.18	0.013	5.81	6.71	2.88	711.28	711.00	705.86	705.65	3.67	3.60	707.21	707.04
15	475	38.444	21	0.18	0.013	5.85	6.76	2.79	710.78	711.28	705.93	705.86	3.10	3.67	707.34	707.29
16	476	28.000	18	0.36	0.013	4.15	6.28	2.72	710.78	710.78	706.28	706.18	3.00	3.10	707.46	707.42
17	477	41.435	15	1.67	0.013	2.59	8.33	3.33	710.67	710.78	707.22	706.53	2.20	3.00	707.86 j	707.48
18	461	188.650	15	0.87	0.013	3.31	6.04	3.92	707.05	706.45	702.70	701.05	3.10	4.15	703.43 j	701.97
19	462	28.000	15	0.36	0.013	1.26	3.86	1.82	707.05	707.05	702.80	702.70	3.00	3.10	703.45	703.43
20	433	144.000	36	0.21	0.013	27.97	30.44	4.89	706.85	701.02	699.80	699.50	4.05	-1.48	702.07	701.77
21	434	43.139	36	0.21	0.013	28.06	30.47	4.41	706.29	706.85	699.89	699.80	3.40	4.05	702.41	702.34
22	435	28.000	36	0.21	0.013	26.62	30.87	3.94	706.29	706.29	699.95	699.89	3.34	3.40	702.67	702.63
23	436	141.000	36	0.16	0.013	25.57	26.94	3.79	705.55	706.29	700.18	699.95	2.37	3.34	702.88	702.71

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: ** Critical depth

Pipe Calc

Line No.	Inlet ID	Line Length (ft)	Line Size (in)	Line Slope (%)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	Invert Up (ft)	Invert Dn (ft)	Cover Up (ft)	Cover Dn (ft)	HGL Up (ft)	HGL Dn (ft)
24	440	141.000	36	0.12	0.013	22.04	23.16	3.15	706.66	705.55	700.35	700.18	3.31	2.37	703.24	703.11
25	441	28.000	30	0.32	0.013	20.75	23.25	4.23	706.66	706.66	700.44	700.35	3.72	3.81	703.34	703.26
26	442	141.000	30	0.26	0.013	19.56	20.72	3.99	705.80	706.66	700.80	700.44	2.50	3.72	703.70	703.38
27	448	191.000	24	0.43	0.013	13.38	14.82	4.26	707.25	705.80	701.82	701.00	3.43	2.80	704.61	703.94
28	449	28.000	24	0.43	0.013	12.99	14.81	4.13	707.25	707.25	701.94	701.82	3.31	3.43	704.75	704.66
29	450	41.318	24	0.34	0.013	12.11	13.17	3.85	707.78	707.25	702.08	701.94	3.70	3.31	705.06	704.94
30	451	113.000	24	0.33	0.013	12.22	12.94	3.89	706.85	707.78	702.45	702.08	2.40	3.70	705.55	705.22
31	453	113.684	21	1.13	0.013	11.19	16.87	4.65	708.94	706.85	703.99	702.70	3.20	2.40	706.35	705.78
32	454	28.000	21	0.71	0.013	10.76	13.39	4.47	708.94	708.94	704.19	703.99	3.00	3.20	706.53	706.40
33	455	139.339	18	1.14	0.013	10.10	11.22	5.72	710.83	708.94	706.03	704.44	3.30	3.00	708.08	706.79
34	456	28.000	18	1.07	0.013	9.94	10.87	5.62	710.83	710.83	706.33	706.03	3.00	3.30	708.49	708.24
35	457	83.959	18	0.95	0.013	9.62	10.25	5.44	711.73	710.83	707.13	706.33	3.10	3.00	709.54	708.83
36	458	28.000	15	0.36	0.013	1.19	3.86	0.97	711.73	711.73	707.48	707.38	3.00	3.10	709.85	709.84
37	452	54.599	15	3.39	0.013	0.91	11.89	0.98	709.00	706.85	705.05	703.20	2.70	2.40	705.79	705.78
38	437	191.000	15	0.45	0.013	2.83	4.33	2.31	706.39	705.55	702.04	701.18	3.10	3.12	703.47	703.11
39	438	28.196	15	0.35	0.013	2.16	3.85	1.76	706.39	706.39	702.14	702.04	3.00	3.10	703.52	703.49
40	439	144.000	15	0.32	0.013	1.13	3.65	1.01	706.05	706.39	702.60	702.14	2.20	3.00	703.57	703.52
41	443	141.000	18	0.48	0.013	6.39	7.29	3.62	707.75	705.80	701.88	701.20	4.37	3.10	704.47	703.94
42	444	28.000	15	0.71	0.013	4.56	5.46	3.72	707.75	707.75	702.08	701.88	4.42	4.62	704.64	704.50
43	445	27.857	15	0.32	0.013	2.54	3.67	2.07	707.82	707.75	702.17	702.08	4.40	4.42	704.77	704.73
44	446	106.157	15	0.26	0.013	2.60	3.32	2.12	705.90	707.82	702.45	702.17	2.20	4.40	704.97	704.80
45	412	54.711	30	0.46	0.013	19.00	27.72	6.08	706.50	701.02	699.75	699.50	4.25	-0.98	701.27	701.02
46	413	110.000	30	0.32	0.013	18.84	23.13	4.74	708.26	706.50	700.10	699.75	5.66	4.25	701.93	701.70

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: ** Critical depth

Pipe Calc

Line No.	Inlet ID	Line Length (ft)	Line Size (in)	Line Slope (%)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	Invert Up (ft)	Invert Dn (ft)	Cover Up (ft)	Cover Dn (ft)	HGL Up (ft)	HGL Dn (ft)
47	414	58.830	24	0.76	0.013	18.91	19.78	6.02	708.13	708.26	700.55	700.10	5.58	6.16	702.67	702.26
48	415	28.000	24	0.71	0.013	17.97	19.12	5.72	708.13	708.13	700.75	700.55	5.38	5.58	703.34	703.16
49	416	141.000	24	0.57	0.013	16.79	17.04	5.34	706.00	708.13	701.55	700.75	2.45	5.38	704.19	703.42
50	420	141.000	24	0.30	0.013	11.54	12.49	3.67	708.35	706.00	701.98	701.55	4.37	2.45	705.01	704.64
51	421	28.000	21	0.50	0.013	10.19	11.20	4.24	708.35	708.35	702.12	701.98	4.48	4.62	705.15	705.04
52	422	141.000	21	0.34	0.013	8.94	9.24	3.72	707.00	708.35	702.60	702.12	2.65	4.48	705.65	705.20
53	423	111.000	15	1.85	0.013	2.09	8.78	1.79	709.25	707.00	704.90	702.85	3.10	2.90	705.96	705.86
54	424	28.000	15	0.36	0.013	1.50	3.86	1.39	709.25	709.25	705.00	704.90	3.00	3.10	705.98	705.97
55	425	141.000	18	0.38	0.013	6.04	6.44	3.42	709.07	707.00	703.13	702.60	4.44	2.90	706.33	705.86
56	426	28.000	18	0.25	0.013	4.69	5.25	2.65	709.07	709.07	703.20	703.13	4.37	4.44	706.41	706.35
57	427	27.857	15	0.36	0.013	3.24	3.87	2.64	710.21	709.07	703.30	703.20	5.66	4.62	706.53	706.46
58	428	108.811	15	0.30	0.013	3.29	3.56	2.68	709.00	710.21	703.63	703.30	4.12	5.66	706.85	706.57
59	429	121.000	15	0.29	0.013	2.70	3.47	2.20	709.59	709.00	703.98	703.63	4.36	4.12	707.18	706.96
60	430	28.000	15	0.29	0.013	2.35	3.45	1.92	709.59	709.59	704.06	703.98	4.28	4.36	707.22	707.19
61	431	141.000	15	0.23	0.013	1.76	3.08	1.43	708.28	709.59	704.38	704.06	2.65	4.28	707.34	707.23
62	431A	74.126	15	0.23	0.013	1.03	3.09	0.84	708.00	708.28	704.55	704.38	2.20	2.65	707.36	707.34
63	417	111.000	15	1.13	0.013	4.43	6.85	3.61	708.64	706.00	703.55	702.30	3.84	2.45	705.16	704.64
64	418	28.259	15	0.50	0.013	4.00	4.55	3.26	708.64	708.64	703.69	703.55	3.70	3.84	705.30	705.20
65	419	141.000	15	0.28	0.013	2.85	3.40	2.32	707.53	708.64	704.08	703.69	2.20	3.70	705.61	705.33
66	419A	68.052	15	0.53	0.013	2.59	4.70	2.11	707.89	707.53	704.44	704.08	2.20	2.20	705.69	705.62
67	479	168.353	15	2.79	0.013	0.05	10.79	1.84	710.23	701.02	704.20	699.50	4.78	0.27	704.29	699.56
68	480	152.645	15	0.29	0.013	0.12	3.51	1.34	708.10	710.23	704.65	704.20	2.20	4.78	704.81	704.36
69	403	164.000	18	1.16	0.013	7.63	11.30	6.26	707.56	701.02	701.40	699.50	4.66	0.02	702.47	700.40

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: ** Critical depth

Pipe Calc

Line No.	Inlet ID	Line Length (ft)	Line Size (in)	Line Slope (%)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	Invert Up (ft)	Invert Dn (ft)	Cover Up (ft)	Cover Dn (ft)	HGL Up (ft)	HGL Dn (ft)
70	404	46.617	18	0.75	0.013	7.66	9.10	5.68	707.40	707.56	701.75	701.40	4.15	4.66	702.82	702.47
71	405	28.000	15	1.07	0.013	5.52	6.68	5.80	707.40	707.40	702.30	702.00	3.85	4.15	703.25	702.87
72	406	141.000	15	0.50	0.013	3.84	4.55	4.05	707.09	707.40	703.00	702.30	2.84	3.85	703.86	703.25
73	407	85.000	15	0.47	0.013	1.73	4.43	1.80	708.33	707.09	703.40	703.00	3.68	2.84	704.19	704.14
74	408	54.503	15	0.44	0.013	1.95	4.28	2.54	707.99	708.33	703.64	703.40	3.10	3.68	704.31	704.25
75	409	28.000	15	0.36	0.013	1.29	3.86	1.69	707.99	707.99	703.74	703.64	3.00	3.10	704.44	704.43
76	407A	95.000	15	0.40	0.013	0.44	4.08	1.70	707.63	708.33	704.18	703.80	2.20	3.28	704.44	704.25
77	410	51.422	15	2.51	0.013	2.04	10.23	4.08	708.38	707.09	704.93	703.64	2.20	2.20	705.50	704.14

Project File: W210353-STM.stm | Number of lines: 77 | Date: 8/15/2022

NOTES: ** Critical depth

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture Build with confidence	**Curb Inlet Capacity Calculations**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

Neenah R-3501-TR/TL	Single Inlet	Double Inlet
Open Area, A (ft^2) =	1.4	2.8
Weir Perimeter, P (ft) =	4.6	9.2
A, 50% Clogged (ft^2) =	0.7	1.4
P, 50% Clogged (ft) =	3.45	6.9

Weir Condition (d<0.3') $Q = 3.0Pd^{3/2}$

Orifice Condition (d>0.4') $Q = 4.89Ad^{1/2}$

Str. #	Q (cfs)	Depth Weir (ft)	Depth Orifice (ft)	Depth Controlling (ft)	Maximum Depth 0.5 ft
408	0.89	0.19	0.07	0.19	OK
409	1.28	0.25	0.14	0.25	OK
404	2.86	0.42	0.70	0.70	DOUBLE INLET
405	2.01	0.34	0.34	0.34	OK
417	0.68	0.16	0.04	0.16	OK
418	1.68	0.30	0.24	0.30	OK
423	0.71	0.17	0.04	0.17	OK
424	1.48	0.27	0.19	0.27	OK
420	2.03	0.34	0.35	0.34	OK
421	2.03	0.34	0.35	0.34	OK
440	2.58	0.40	0.57	0.40	OK
441	2.38	0.37	0.48	0.37	OK
437	1.25	0.24	0.13	0.24	OK
438	1.50	0.28	0.19	0.28	OK
414	1.49	0.28	0.19	0.28	OK
415	2.03	0.34	0.35	0.34	OK
434	2.52	0.39	0.54	0.39	OK
435	2.34	0.37	0.47	0.37	OK

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Beehive Inlet** **Capacity Calculations**	**Project:**	Deerfield
		Date:	8/17/2022
		Job No.:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

Neenah R-4342	Single Inlet	Double Inlet
Open Area, A (ft^2) =	2	4
Weir Perimeter, P (ft) =	6	12
A, 50% Clogged (ft^2) =	1	2
P, 50% Clogged (ft) =	3	6

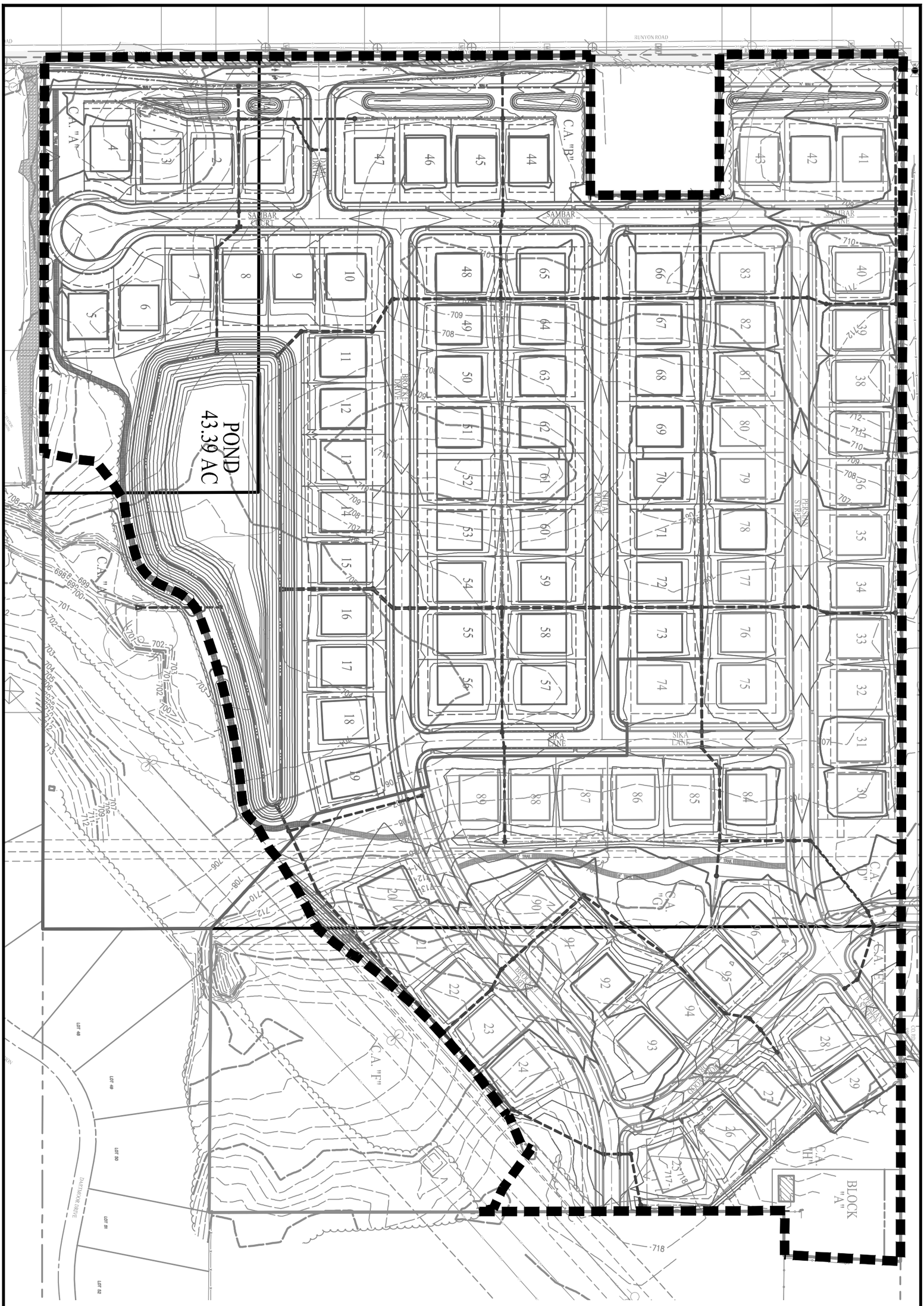
Weir Condition (d<0.3') $Q = 3.0Pd^{3/2}$

Orifice Condition (d>0.4') $Q = 4.89Ad^{1/2}$

Str. #	Q (cfs)	Depth Weir (ft)	Depth Orifice (ft)	Depth Controlling (ft)	Maximum Depth 0.8 ft
480	0.13	0.06	0.00	0.06	OK
406	1.34	0.28	0.08	0.28	OK
410	2.06	0.37	0.18	0.37	OK
407A	0.45	0.14	0.01	0.14	OK
412	0.43	0.13	0.01	0.13	OK
416	1.67	0.33	0.12	0.33	OK
419	1.47	0.30	0.09	0.30	OK
419A	2.58	0.43	0.28	0.28	OK
422	1.59	0.32	0.11	0.32	OK
436	2.31	0.40	0.22	0.22	OK
442	2.54	0.43	0.27	0.27	OK

WATER QUALITY CALCULATIONS

LOCATION: H:\2021\W210353\Engineering\design\drainage\basin maps\W210353-Drainage Exhibits.dwg
DATE/TIME: August 15, 2022 - 3:37pm
PLOTTED BY: Gaithert



DEERFIELD
JOHNSON COUNTY, IN

WEIHE ENGINEERS
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611

SCALE: 1" = 140'
0 35 70 140

FIGURE 5.1

WATER QUALITY BASIN MAP

Date: August 17, 2022

WEIHE ENGINEERS Land Surveying | Civil Engineering Landscape Architecture *Build with confidence.*	**Water Quality Volume and Stage Storage** **Pond**	**Project:**	Deerfield
		Date:	August 17, 2022
		Job No:	W21-0353
		Checked By:	JEP
		Prepared By:	TPG

POND	I (Percent of Impervious Area)	42.00	percent
	P	1.00	inch of rainfall
	Rv (0.05 + 0.009 (I))	0.43	
	A (Area)	43.4	acres
	WQv = P*Rv*A/12	1.548	ac-ft
		67,552	cubic ft
	Required Volume	4.643	ac-ft
		202,655	cubic ft

Elevation	Area (sf)	Area (ac)	Volume (cf)	Volume (ac-ft)
691.5	25,532	0.586	0	0
698.0	67,593	1.552	302,656	6.948
698.0	77,065	1.769	302,729	6.950
699.5	86,762	1.992	425,517	9.769

Provided Volume at	699.5	9.769
3*WQV		4.643