



“Your Project is Our Priority”

DRAINAGE REPORT

for

RESERVE AT RONALD REAGAN INFRASTRUCTURE PHASE 1

In

**Town of Brownsburg
Hendricks County, Indiana**

Prepared for:

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02/16/2026

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Drainage Narrative for: Reserve at Ronald Reagan Infrastructure Phase 1

I. INTRODUCTION:

This drainage report was prepared for a 49.9± acre development known as Reserve at Ronald Reagan, located at the southwest corner of Ronald Reagan Parkway and E. County Road 300 N; in the northwest quarter of Section 30; Township 16 North; Range 2 East; Town of Brownsburg; Hendricks County, Indiana. The overall development will include both commercial and multi-family projects. The development will be completed in phases. This report includes a master drainage design for the entire development and Infrastructure, Phase 1 alone, which will be developed now. Phase 1 includes access drives for commercial lots along with utility infrastructure, storm sewers, and a detention pond.

II. ADJOINING LAND CONDITIONS:

North: Residential
 South: Residential
 East: Agricultural
 West: Residential

III. EXISTING SOIL TYPES:

<u>Symbol</u>	<u>Name</u>	<u>Hydrologic Soil Group</u>
CrA	Crosby silt loam	C
CsB2	Crosby-Miami silt loams	C
MmC2	Miami silt loam	C
ThrA	Treaty silty clay loam	B
YclA	Brookston silty clay loam	B
YbvA	Crosby silt loam	C
TcmB2	Crosby-Urban land Miami silt loams	C

IV. SITE DRAINAGE ANALYSIS:

a. Stormwater Discharge Requirements

Stormwater discharges from the project site at three locations. BNDY-1 (a 4'x8' box culvert located at the southeast corner of the site) and BNDY-2 (a 36" dia. culvert located at the northeast corner of the site) each flow east under Ronald Ragan Parkway, ultimately to Bullard Creek within the corporate limits of the Town of Brownsburg. For BNDY-1 and BNDY-2, allowable Stormwater discharge is based on requirements found under Title XV, Chapter 151 of the Brownsburg, Indiana Code of Ordinances. BNDY-3 (an 18" dia. culvert located at the north end of the site) flows north under E. CR 300 N. to Lakewood Terrace within the corporate limits of Hendricks County. allowable Stormwater discharge for BNDY 3 is based on requirements found in the Hendricks

County Stormwater Management Ordinance. **Table 1** below provides a summary of the stormwater discharge requirements from the Brownsburg, Indiana Code of Ordinances. **Table 2** below provides a summary of the stormwater discharge requirements from the Hendricks County Stormwater Management Ordinance.

TABLE 1
STORMWATER DISCHARGE REQUIREMENTS AT BNDY-1 & BNDY-2
TOWN OF BROWNSBURG, INDIANA CODE OF ORDINANCES

<p>$Q_{10p} \leq 0.2$ cfs / acre of development $Q_{100p} \leq 0.4$ cfs / acre of development</p>	<p>Where: Q_{10p} = Developed release rate up to and including 10-year return period storm event Q_{100p} = Developed release rate for 11 to 100-year return period storm event</p>
--	--

TABLE 2
STORMWATER DISCHARGE REQUIREMENTS AT BNDY-3
HENDRICKS COUNTY STORMWATER MANAGEMENT ORDINANCE

<p>$Q_{10p} \leq 0.1$ cfs / acre of development $Q_{100p} \leq 0.3$ cfs / acre of development</p>	<p>Where: Q_{10p} = Developed release rate up to and including 10-year return period storm event Q_{100p} = Developed release rate for 11 to 100-year return period storm event</p>
--	--

b. MASTER DRAINAGE DESIGN

i. EXISTING CONDITIONS

The majority of the 49.9± acre site consists of farm field (row crops), along with small patches of wooded areas and a couple buildings at the north end of the site. There is also an existing 3± acre pond located in the central portion of the site. A Wawa convenient store was recently developed at the northeast corner of the site. The Wawa project is located on a 2.5± acre lot and has its own onsite detention that drains to BNDY-2. The Wawa project is not included in this drainage plan.

Approximately 28.2± acres of existing onsite area drain north to BNDY-3. This includes about 8.1± acres that drains to the existing pond, which outlets through an 8-inch dia. pipe that discharges north into a broad swale that ultimately drains to BNDY-3. Since the existing pond is a depressional area providing detention, an H&H model of the existing drainage to BNDY-3 was completed to show that

the existing discharge to BNDY-3 is not lower than the required allowable. Table 3 below provides a summary of the existing condition discharge to BNDY-3 compared to the allowable from the drainage ordinance.

TABLE 3				
MASTER DRAINAGE DESIGN EXSITING CONDITION				
STORMWATER DISCHARGE AT BNDY-3 (ONSITE ONLY)				
Discharge Point	Existing Discharge (CFS)		Allowable Discharge (CFS)	
BNDY-3	Q_{10p} = 10.7	<	0.1 CFS / ACRE = 2.8	OK
	Q_{100p} = 18.3	<	0.3 CFS / ACRE = 8.5	OK

Approximately 13.3± acres of existing onsite area (EX-1) drain to BNDY-1 and about 8.4± acres (EX-2) drain to BNDY-2.

ii. DEVELOPED CONDITIONS

In the developed condition, approximately 10.5± acres of development (DEV-1) will drain to Pond 1 located at the southeast corner of the site. This is the area that is being developed under Phase 1. Approximately 13.7± acres of future development (DEV-2) will have its own detention system that will outlet to Pond 1. For this preliminary master plan, the detention for DEV-2 is referred to as Pond 2 in the H&H model. Approximately 15.9± acres of future development (DEV-3) will have its own detention system that will outlet to BNDY-3. For this preliminary master plan, the detention for DEV-3 is referred to as Pond 3 in the H&H model. Approximately 4.8± acres of future development (DEV-4) will have its own detention system that will outlet to BNDY-3. For this preliminary master plan, the detention for DEV-4 is referred to as Pond 4 in the H&H model. The existing pond will remain as an aesthetic feature with only about 5.1 acres (DEV-5) tributary area, including the 3.0± acre pond itself. The existing pond will have an outlet, but there is currently no plan to use the existing pond as detention for any of the proposed or future developments. The existing pond is included in the H&H model to ensure it drains properly and the total discharge to BNDY-3 meets the allowable requirements.

The following **TABLE 4** shows the allowable and developed discharge rates. **TABLE 5** on the following page shows the developed 100-year detention pond stage elevations.

TABLE 4				
MASTER DRAINAGE DESIGN DEVELOPED CONDITION				
STORMWATER DISCHARGE (ONSITE ONLY)				
Discharge Point	Developed Discharge (CFS)		Allowable Discharge (CFS)	
BNDY-1	Q_{10p} = 1.6	<	0.2 CFS / ACRE = 2.7	OK
	Q_{100p} = 3.3	<	0.4 CFS / ACRE = 5.3	OK
BNDY-3	Q_{10p} = 2.1	<	0.1 CFS / ACRE = 2.8	OK
	Q_{100p} = 6.0	<	0.3 CFS / ACRE = 8.5	OK

TABLE 5		
MASTER DRAINAGE DESIGN DEVELOPED CONDITION		
DETENTION PONDS STAGES		
Discharge Point	Normal Pool Elevation	100-year Stage Elevation
POND 1	854.5	858.1
POND 2	856.5	860.4
POND 3	863.0	867.0
POND 4	861.0	863.7
EX POND	863.5	864.1

c. PHASE 1 INFRASTRUCTURE DRAINAGE DESIGN

For Phase 1, approximately 10.5± acres of onsite area (DEV-1) will be developed. This includes access drives, out lots, and a detention pond (POND 1). Approximately 11.4 acres of undeveloped areas (UNDEV-1 & UNDEV-2) will be intercepted by a swale along the west side of the north/south access drive and routed to Pond 1. UNDEV-1 is part of the existing area that currently drains to BNDY-1. UNDEV-2 is part of the area the currently drains to BNDY-2 but will be diverted to Pond 1 with the Phase 1 development. Two scenarios have been modeled in the H&H model for phase 1. Scenario 1 includes DEV-1 and UNDEV-2 to show that the Pond 1 discharge with both areas included meets the allowable. The top of the outlet structure (Structure 101) is set at an elevation above the 100-year stage for Scenario 1. Scenario 2 adds UNDEV-1 allowing it to bypass through the top of structure 101. The following **TABLE 6** shows the allowable and developed discharge rates for Scenario 1. **TABLE 7** shows the developed 100-year detention pond stage elevations for Scenario 2.

TABLE 6				
INFRASTRUCTURE PHASE 1 DEVELOPED CONDITION				
STORMWATER DISCHARGE (Scenario 1)				
Discharge Point	Developed Discharge (CFS)		Allowable Discharge (CFS)	
BNDY-1	Q_{10p} = 1.0	<	0.2 CFS / ACRE = 1.0	OK
	Q_{100p} = 2.0	<	0.4 CFS / ACRE = 2.1	OK

TABLE 7		
INFRASTRUCTURE PHASE 1 DEVELOPED CONDITION		
DETENTION PONDS STAGES (Scenario 2)		
Discharge Point	Normal Pool Elevation	100-year Stage Elevation
POND 1	854.5	858.5

Storm sewers were designed to provide capacity for a 10-year storm event. The rational method was used to model the runoff rates, and Manning's Equation was used to calculate the capacity of the pipes. Calculations can be found in the appendix.

The wet bottom detention pond will provide a "best management practice" (BMP) for stormwater quality. A Hydrodynamic Separator Structure will be installed as a pre-treatment measure for the detention ponds. Calculations can be found in the appendix.

In conclusion, the calculations in this report show that drainage from the project will not cause any adverse impacts to the surrounding areas or the project site itself. We believe the project falls within the requirements of the Town of Brownsburg and Hendricks County drainage ordinances.

References:

Design data and methods are based on the following reference materials:

1. NRCS Web Soil Survey (<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>)
2. USGS Mapping
3. ICPR v4.05.01, Streamline Technologies, Inc.
4. Technical Report 55, Small Watershed Hydrology, NRCS
5. Town of Brownsburg, Indiana Code of Ordinances
6. Hendricks County Stormwater Technical Standards Manual (April 2024 Edition)

A. AREA & SITE MAPS



Drawn By: WCZ
 Date: 1/20/2026
 Project No.: 22370
 Scale: NONE
 Page: 1 of 1

AREA MAP
RESERVE AT RONALD REAGAN
INFRASTRUCTURE PHASE 1
HENDRICKS COUNTY
BROWNSBURG, INDIANA


 853 COLUMBIA ROAD, SUITE #101
 PLAINFIELD, IN 46168
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 02/16/2026 Page



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Drawn By: WCZ
 Date: 1/20/2026
 Project No.: 22370
 Scale: NONE
 Page: 1 of 1

SITE MAP
RESERVE AT RONALD REAGAN
INFRASTRUCTURE PHASE 1
HENDRICKS COUNTY
BROWNSBURG, INDIANA

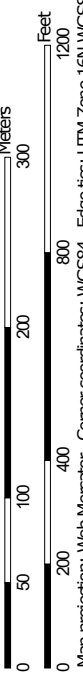
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 WEB: www.BanningEngineering.com

B. SOILS MAP



Soil Map may not be valid at this scale.

Map Scale: 1:4,440 if printed on A landscape (11" x 8.5") sheet.



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



MAP LEGEND

Area of Interest (AOI)
 Area of Interest (AOI)

Soils
 Soil Rating Polygons
 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines
 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Water Features
 Streams and Canals

Transportation
 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background
 Aerial Photography

Soil Rating Points
 A
 A/D
 B
 B/D

C
 C/D
D
 Not rated or not available

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: Hendricks County, Indiana
 Survey Area Data: Version 29, Sep 3, 2025

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

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	32.9	55.5%
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	C/D	3.5	6.0%
MmC2	Miami silt loam, 6 to 12 percent slopes, eroded	C	1.0	1.7%
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	B/D	17.3	29.2%
W	Water		2.9	5.0%
YbvA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	B/D	0.3	0.5%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	1.2	2.0%
YcmB2	Crosby-Urban land-Miami silt loams complex, 2 to 4 percent slopes, eroded	C/D	0.1	0.1%
Totals for Area of Interest			59.3	100.0%

Description

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

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

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

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

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

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

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

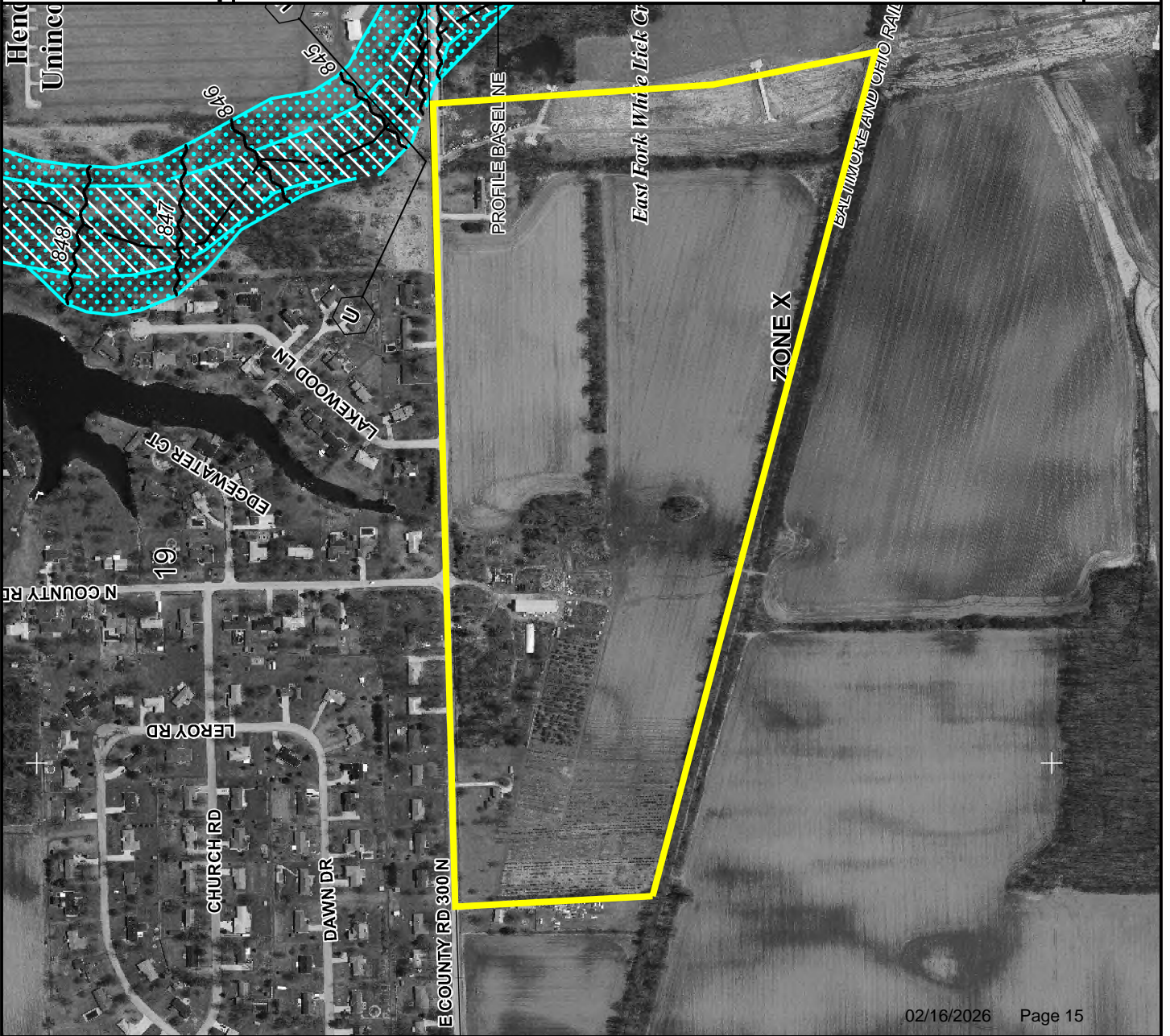
Rating Options

Aggregation Method: Dominant Condition

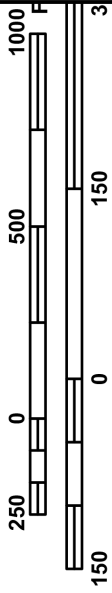
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

C. FLOOD MAP



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
HENDRICKS COUNTY, INDIANA
AND INCORPORATED AREAS
PANEL 186 OF 375
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AVON, TOWN OF	180520	0186	D
HENDRICKS COUNTY	180415	0186	D

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



MAP NUMBER
18063C0186D

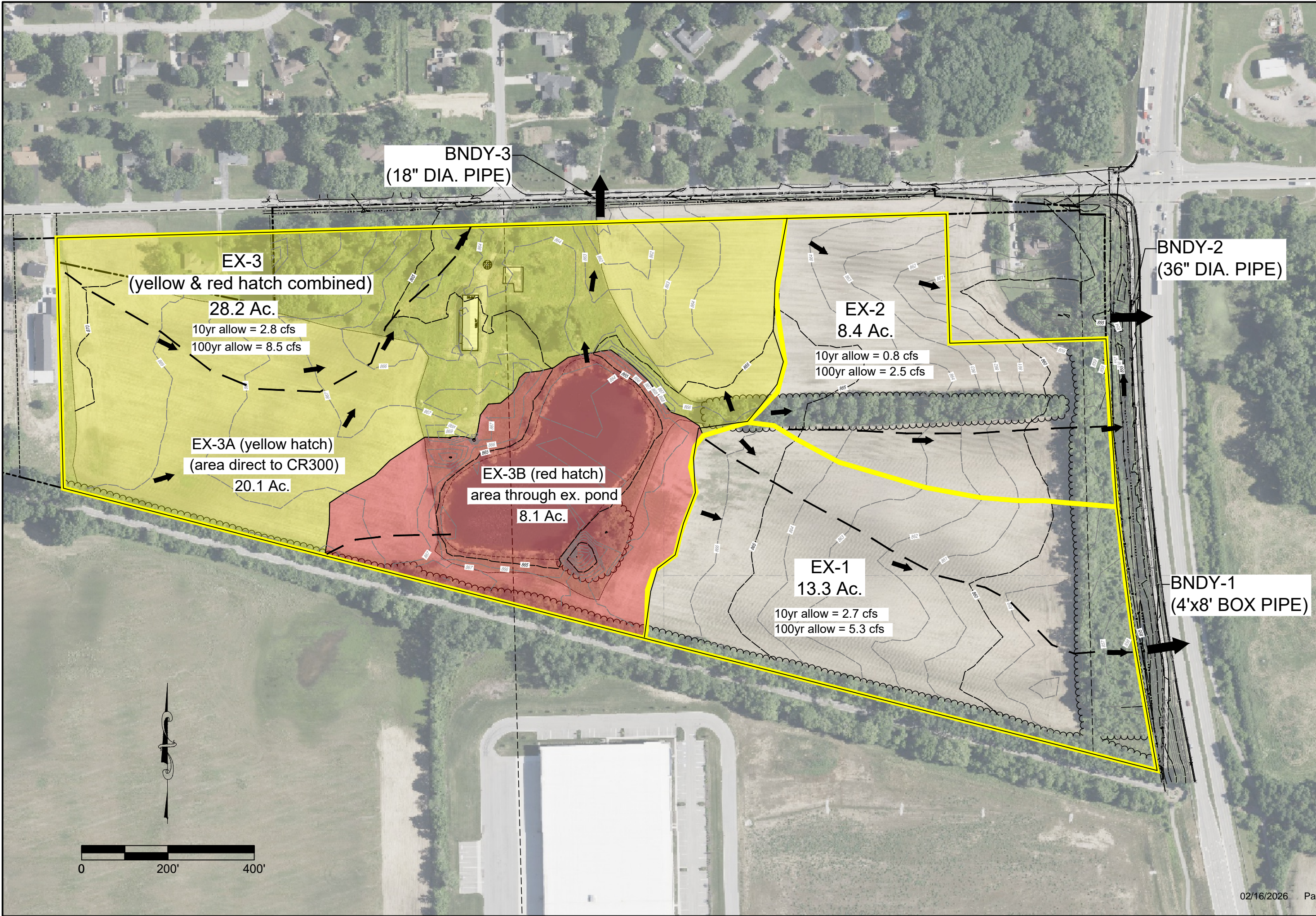
EFFECTIVE DATE
SEPTEMBER 25, 2009

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.

D. MASTER DRAINAGE DESIGN

**D1. EXISTING CONDITION
BASIN MAP**



D2. EXISTING CONDITION CALCULATIONS

Node Max Conditions : Multi Item | (name, sim) [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
BNDY-1	002yr 024hr	853.10	853.10	853.00	0.0000	14.60	0.00	0
BNDY-1	010yr 024hr	853.10	853.10	853.00	0.0000	27.11	0.00	0
BNDY-1	100yr 024hr	853.10	853.10	853.00	0.0000	48.74	0.00	0
BNDY-2	002yr 024hr	852.10	852.10	852.00	0.0000	10.41	0.00	0
BNDY-2	010yr 024hr	852.10	852.10	852.00	0.0000	19.25	0.00	0
BNDY-2	100yr 024hr	852.10	852.10	852.00	0.0000	34.48	0.00	0
BNDY-3	002yr 024hr	859.10	859.10	859.00	0.0000	7.90	0.00	0
BNDY-3	010yr 024hr	859.10	859.10	859.00	0.0000	10.67	0.00	0
BNDY-3	100yr 024hr	859.10	859.10	859.00	0.0000	18.27	0.00	0
DS EX. Pond Outlet	002yr 024hr	866.00	0.00	863.67	0.0001	0.41	0.41	6546
DS EX. Pond Outlet	010yr 024hr	866.00	0.00	863.71	0.0001	0.98	0.99	9172
DS EX. Pond Outlet	100yr 024hr	866.00	0.00	863.75	0.0004	2.33	2.33	11909
Ex. Pond	002yr 024hr	865.00	0.00	864.24	0.0002	14.29	0.41	132997
Ex. Pond	010yr 024hr	865.00	0.00	864.39	0.0003	24.23	0.98	134439
Ex. Pond	100yr 024hr	865.00	0.00	864.63	0.0003	40.60	2.33	136824
U.S. Ex 18in CMP	002yr 024hr	862.80	0.00	861.57	0.0010	15.87	7.90	23285
U.S. Ex 18in CMP	010yr 024hr	862.80	0.00	862.39	-0.0010	31.07	10.67	49558
U.S. Ex 18in CMP	100yr 024hr	862.80	0.00	863.22	-0.0010	58.38	18.27	98913

**D3. EXISTING CONDITION
Tc AND Cn VALUES**

TR-55
 -COMPOSITE CN-VALUES & TIME OF CONCENTRATION-
 Master Drainage Design

PROJECT: Reserve at Ronald Reagan JOB #: 22370 DATE: 1/22/26 COMPUTED BY: WCZ
--

BASINS					
BASIN	Composite CN	Area (ft ²)	Area (acres)	Area (miles)	Tc
EX-1	79.00	579348	13.30	0.02	25.4
EX-2	79.00	365904	8.40	0.01	20.5
EX-3A	77.00	875556	20.10	0.03	35.5
EX-3B	84.00	352836	8.10	0.01	16.7

Basin	Cover Description	Soil Group	Area (Acres)	CN	CN * Acres	number	Basin #	CN	Acres	CN * Acres
EX-1	Row Crop Straight row (SR) GOOD	B	4	78	312	3				
EX-1	Row Crop Straight row (SR) GOOD	C	7.1	85	603.5	4				
EX-1	Brush - brush, weed, grass mix GOOD	B	0.7	48	33.6	3	EX-1	79	13.3	1046.6
EX-1	Brush - brush, weed, grass mix GOOD	C	1.5	65	97.5	4	EX-2	79	8.4	664
EX-2	Row Crop Straight row (SR) GOOD	B	0.5	78	39	3	EX-3A	77	20.1	1541.3
EX-2	Row Crop Straight row (SR) GOOD	C	6	85	510	4	EX-3B	84	8.1	678.5
EX-2	Brush - brush, weed, grass mix GOOD	B	0.5	48	24	3				
EX-2	Brush - brush, weed, grass mix GOOD	C	1.4	65	91	4				
EX-3A	Paved parking lots, roofs, driveways	C	0.2	98	19.6	4				
EX-3A	Row Crop Straight row (SR) GOOD	C	5.3	85	450.5	4				
EX-3A	Row Crop Straight row (SR) GOOD	B	4.2	78	327.6	3				
EX-3A	Good condition; grass cover > 75%	B	2	61	122	3				
EX-3A	Good condition; grass cover > 75%	C	8.4	74	621.6	4				
EX-3B	Paved parking lots, roofs, driveways	C	3	98	294	4				
EX-3B	Row Crop Straight row (SR) GOOD	C	1.7	85	144.5	4				
EX-3B	Row Crop Straight row (SR) GOOD	B	1	78	78	3				
EX-3B	Good condition; grass cover > 75%	C	1.2	74	88.8	4				
EX-3B	Good condition; grass cover > 75%	B	1.2	61	73.2	3				

PROJECT: Reserve at Ronald Reagan
JOB #: 22370

Time of Concentration Worksheet
Based on TR-55

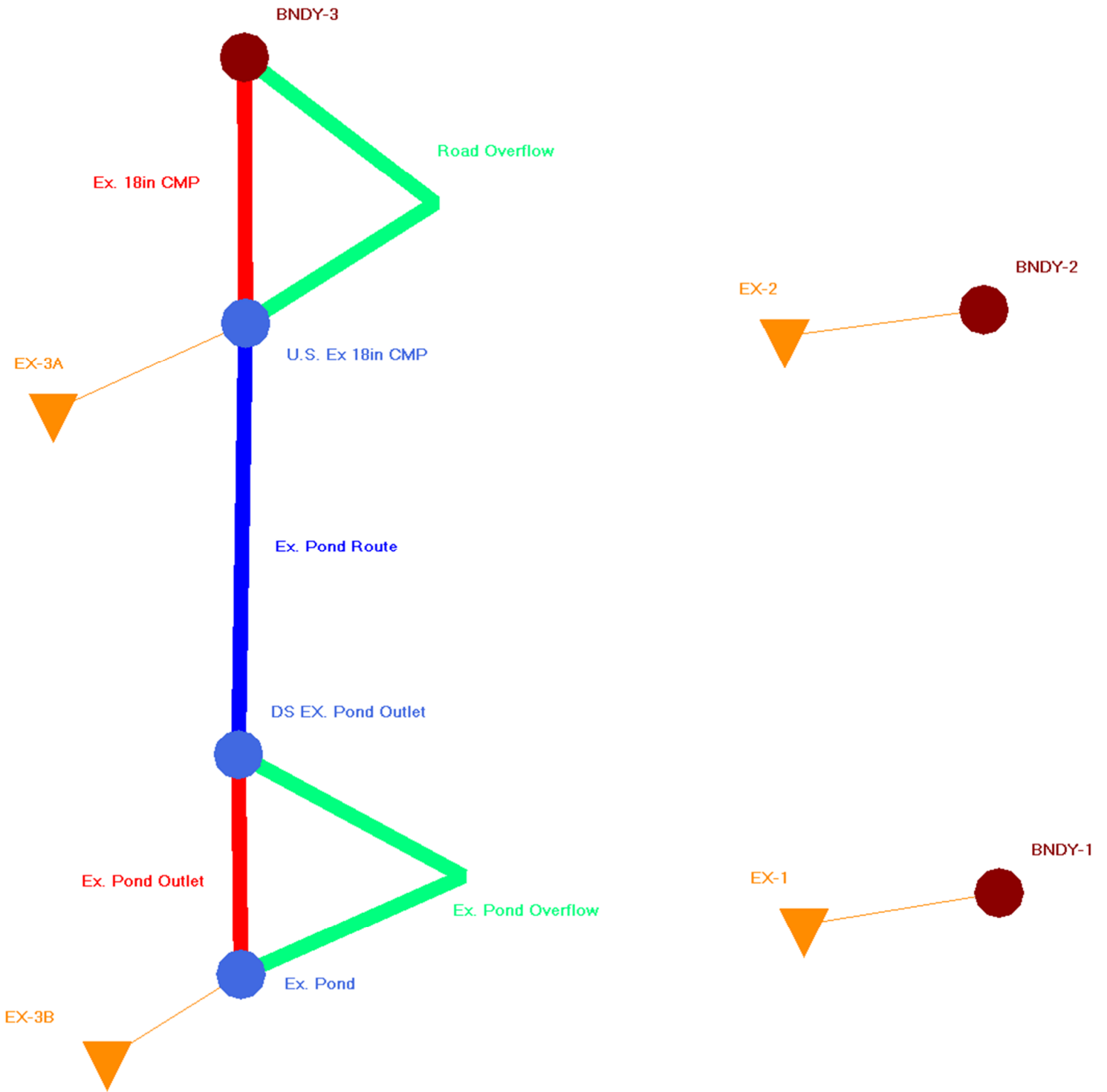
Typical values for Manning's n	
Overland Flow	Channel Flow
short grass 0.15	grass 0.03
dense grass 0.24	concrete 0.02
pavement 0.011	rip-rap 0.04
woods light cultivated > 20% 0.4	

2 year, 24 hour rainfall = 3.02 inches
minimum T_c = 5 minutes

Basin name	Overland flow				Shallow Concentrated Flow (1)				Shallow Concentrated Flow (2)				Channel Flow				T _c (min)				
	Length (ft)	S %	n	T _t (min)	Length (ft)	S %	Paved/Un Paved (P or U)	Vel. (ft/s)	T _t (min)	Length (ft)	S %	Paved/Un Paved (P or U)	Vel. (ft/s)	T _t (min)	Length (ft)	Width (ft)		S %	Vel. (ft/s)	T _t (min)	
EX-1	100	1	0.17	15	1035	1	U	1.6	11	0	0	0	0	0	0	0	0	0	0	25	
EX-2	100	1	0.17	15	640	1.3	U	1.8	6	0	0	0	0	0	0	0	0	0	0	21	
EX-3A	100	0.5	0.17	19	1100	0.5	U	1.1	16	0	0	0	0	0	0	0	0	0	0	35	
EX-3B	100	1	0.17	15	195	1	U	1.6	2	0	0	0	0	0	0	0	0	0	0	17	
				0					0					0						0	

**D4. EXISTING CONDITION
ICPR INPUT DATA**

Master Drainage Design
Existing Condition Node Diagram



Simple Basin: EX-1

Scenario: Scenario1
Node: BNDY-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 25.4000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 13.3000 ac
Curve Number: 79.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: EX-2

Scenario: Scenario1
Node: BNDY-2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 20.5000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 8.4000 ac
Curve Number: 79.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: EX-3A

Scenario: Scenario1
Node: U.S. Ex 18in CMP
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 35.5000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 20.1000 ac

Curve Number: 77.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Simple Basin: EX-3B

Scenario: Scenario1
 Node: Ex. Pond
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 16.7000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 8.1000 ac
 Curve Number: 84.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Node: BNDY-1

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 853.00 ft
 Warning Stage: 853.10 ft
 Alert Stage: 853.10 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	853.00
0	0	0	24.0000	853.00

Comment:

Node: BNDY-2

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs

Initial Stage: 852.00 ft
 Warning Stage: 852.10 ft
 Alert Stage: 852.10 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	852.00
0	0	0	24.0000	852.00

Comment:

Node: BNDY-3

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 859.00 ft
 Warning Stage: 859.10 ft
 Alert Stage: 859.10 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	859.00
0	0	0	24.0000	859.00

Comment:

Node: DS EX. Pond Outlet

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 863.60 ft
 Warning Stage: 866.00 ft
 Alert Stage: 0.00 ft

Comment:

Node: Ex. Pond

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 864.00 ft
 Warning Stage: 865.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
864.00	3.0000	130680
864.90	3.2000	139392

Stage [ft]	Area [ac]	Area [ft2]
865.00	3.5000	152460

Comment:

Node: U.S. Ex 18in CMP

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 859.80 ft
 Warning Stage: 862.80 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
859.80	0.0000	0
860.00	0.0100	436
861.00	0.0600	2614
862.00	0.4000	17424
863.00	1.2000	52272
864.00	3.2000	139392

Comment:

Pipe Link: Ex. 18in CMP

	Upstream	Downstream
Scenario:	Scenario1	
From Node:	U.S. Ex 18in CMP	
To Node:	BNDY-3	
Link Count:	1	
Flow Direction:	Both	
Damping:	0.0000 ft	
Length:	46.00 ft	
FHWA Code:	0	
Entr Loss Coef:	1	
Exit Loss Coef:	0	
Bend Loss Coef:	0	
Bend Location:	0.00 dec	
Energy Switch:	Energy	
	Invert: 859.80 ft	Invert: 859.12 ft
	Manning's N: 0.0240	Manning's N: 0.0240
	Geometry: Circular	Geometry: Circular
	Max Depth: 1.50 ft	Max Depth: 1.50 ft
	Bottom Clip	
	Default: 0.00 ft	Default: 0.00 ft
	Op Table:	Op Table:
	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000
	Top Clip	
	Default: 0.00 ft	Default: 0.00 ft
	Op Table:	Op Table:
	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Pipe Link: Ex. Pond Outlet

	Upstream	Downstream
Scenario:	Scenario1	
From Node:	Ex. Pond	
To Node:	DS EX. Pond Outlet	
Link Count:	2	
Flow Direction:	Both	
Damping:	0.0000 ft	
Length:	18.00 ft	
	Invert: 864.00 ft	Invert: 863.60 ft
	Manning's N: 0.0130	Manning's N: 0.0130
	Geometry: Circular	Geometry: Circular
	Max Depth: 0.67 ft	Max Depth: 0.67 ft
	Bottom Clip	
	Default: 0.00 ft	Default: 0.00 ft
	Op Table:	Op Table:

FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 1	Manning's N: 0.0000	Manning's N: 0.0000
Exit Loss Coef: 0	Top Clip	
Bend Loss Coef: 0	Default: 0.00 ft	Default: 0.00 ft
Bend Location: 0.00 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.0000	Manning's N: 0.0000

Comment:

Weir Link: Ex. Pond Overflow

Scenario: Scenario1	Bottom Clip	
From Node: Ex. Pond	Default: 0.00 ft	
To Node: DS EX. Pond Outlet	Op Table:	
Link Count: 1	Ref Node:	
Flow Direction: Both	Top Clip	
Damping: 0.0000 ft	Default: 0.00 ft	
Weir Type: Broad Crested Vertical	Op Table:	
Geometry Type: Irregular	Ref Node:	
Invert: 864.90 ft	Discharge Coefficients	
Control Elevation: 864.90 ft	Weir Default: 2.800	
Cross Section: Ex. Pond Overflow	Weir Table:	
	Orifice Default: 0.600	
	Orifice Table:	

Comment:

Channel Link: Ex. Pond Route

	Upstream	Downstream
Scenario: Scenario1	Invert: 863.60 ft	Invert: 859.80 ft
From Node: DS EX. Pond Outlet	Manning's N: 0.0000	Manning's N: 0.0000
To Node: U.S. Ex 18in CMP	Geometry: Irregular	Geometry: Irregular
Link Count: 1	Cross Section: US Ex. Pond Route	Cross Section: DS Ex. Pond Route
Flow Direction: Both		
Damping: 0.0000 ft		
Length: 340.00 ft		
Contraction Coef: 0		
Expansion Coef: 0		
Entr Loss Coef: 0		
Exit Loss Coef: 0		
Bend Loss Coef: 0		
Bend Location: 0.00 dec		
Energy Switch: Energy		

Comment:

Weir Link: Road Overflow

Scenario: Scenario1	Bottom Clip	
From Node: U.S. Ex 18in CMP	Default: 0.00 ft	
To Node: BNDY-3	Op Table:	
Link Count: 1	Ref Node:	
Flow Direction: Both	Top Clip	

Damping: 0.0000 ft
 Weir Type: Broad Crested Vertical
 Geometry Type: Irregular
 Invert: 863.02 ft
 Control Elevation: 863.02 ft
 Cross Section: Road Overflow

Default: 0.00 ft
 Op Table:
 Ref Node:
Discharge Coefficients
 Weir Default: 2.800
 Weir Table:
 Orifice Default: 0.600
 Orifice Table:

Comment:

Simulation: 002yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 4:47:55 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

 Unit Hydrograph Folder:

Lookup Tables

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

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

Tolerances & Options

Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 6	
Over-Relax Weight 0.5 dec	Ia/S: 0.20 dec
Fact:	
dZ Tolerance: 0.0010 ft	
Max dZ: 1.0000 ft	Smp/Man Basin Rain Global
	Opt:
Link Optimizer Tol: 0.0001 ft	
	Rainfall Name: ~SCSII-24
	Rainfall Amount: 3.02 in
	Storm Duration: 24.0000 hr
	Dflt Damping (1D): 0.0050 ft
	Min Node Srf Area 100 ft2
	(1D):
	Energy Switch (1D): Energy

Comment:

Simulation: 010yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 4:47:59 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

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

Tolerances & Options

Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 6	
Over-Relax Weight Fact: 0.5 dec	Ia/S: 0.20 dec
dZ Tolerance: 0.0010 ft	
Max dZ: 1.0000 ft	Smp/Man Basin Rain Opt: Global
Link Optimizer Tol: 0.0001 ft	
	Rainfall Name: ~SCSII-24
	Rainfall Amount: 4.28 in
	Storm Duration: 24.0000 hr
	Dflt Damping (1D): 0.0050 ft
	Min Node Srf Area (1D): 100 ft2
	Energy Switch (1D): Energy

Comment:

Simulation: 100yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 4:48:02 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set:

Green-Ampt Set:

Vertical Layers Set:

Impervious Set:

Tolerances & Options

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

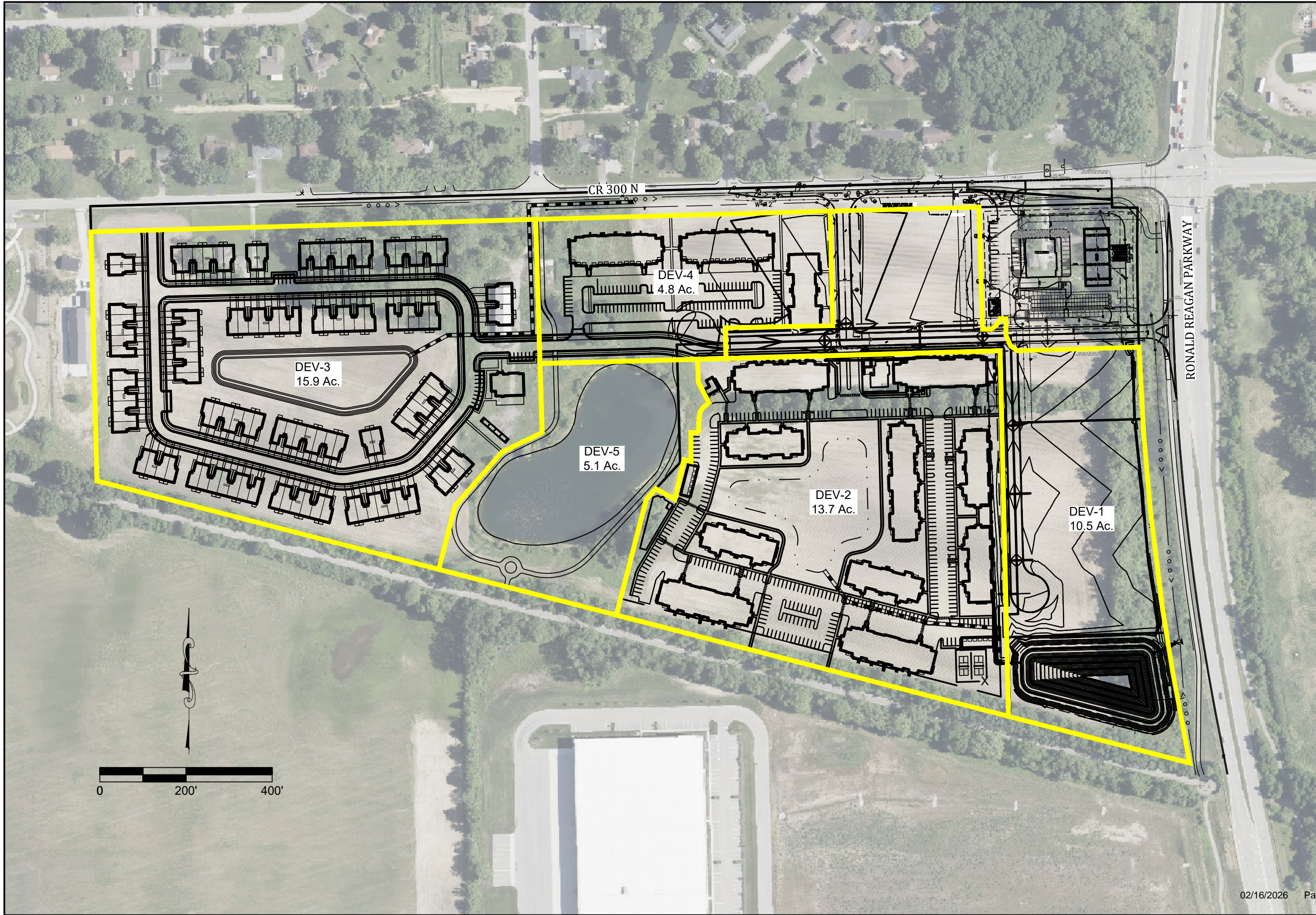
IA Recovery Time: 24.0000 hr
 Ia/S: 0.20 dec

Smp/Man Basin Rain: Global
 Opt:

Rainfall Name: ~SCSII-24
 Rainfall Amount: 6.30 in
 Storm Duration: 24.0000 hr
 Dfit Damping (1D): 0.0050 ft
 Min Node Srf Area: 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

**D5. DEVELOPED CONDITION
BASIN MAP**



DEVELOPED BASIN MAP- MASTER DRAINAGE PLAN
 RECERVE AT RONALD REAGAN
 HENDRICKS COUNTY
 BROWNSBURG, INDIANA

Drawn By: WCZ
 Date: 01/20/2026
 Project No.: 22370
 Scale: AS SHOWN
 Page: 1 of 1

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D6. DEVELOPED CONDITION CALCULATIONS

Node Max Conditions : Multi Item | (name, sim) [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
BNDY-1	002yr 024hr	854.10	0.00	854.00	0.0000	0.91	0.00	0
BNDY-1	010yr 024hr	854.10	0.00	854.00	0.0000	1.59	0.00	0
BNDY-1	100yr 024hr	854.10	0.00	854.00	0.0000	3.34	0.00	0
BNDY-3	002yr 024hr	859.10	0.00	859.00	0.0000	1.04	0.00	0
BNDY-3	010yr 024hr	859.10	0.00	859.00	0.0000	2.05	0.00	0
BNDY-3	100yr 024hr	859.10	0.00	859.00	0.0000	5.95	0.00	0
EX Pond	002yr 024hr	867.50	0.00	863.76	0.0002	13.72	0.14	127476
EX Pond	010yr 024hr	867.50	0.00	863.89	0.0002	21.00	0.28	128031
EX Pond	100yr 024hr	867.50	0.00	864.10	0.0002	32.53	0.57	128935
Pond 1	002yr 024hr	858.50	0.00	856.74	0.0010	33.24	0.91	55714
Pond 1	010yr 024hr	858.50	0.00	857.48	0.0010	48.56	1.59	57681
Pond 1	100yr 024hr	858.50	0.00	858.09	0.0010	72.65	3.34	59070
Pond 2	002yr 024hr	860.50	0.00	858.06	0.0009	34.74	1.35	49012
Pond 2	010yr 024hr	860.50	0.00	858.94	0.0009	52.68	1.70	52076
Pond 2	100yr 024hr	860.50	0.00	860.38	0.0010	81.09	1.96	55340
Pond 3	002yr 024hr	867.00	0.00	864.97	0.0010	37.61	0.52	50025
Pond 3	010yr 024hr	867.00	0.00	865.99	0.0010	58.51	1.28	52240
Pond 3	100yr 024hr	867.00	0.00	866.95	-0.0010	91.75	4.80	56412
POND 4	002yr 024hr	865.00	0.00	862.25	0.0010	15.87	0.40	27234
POND 4	010yr 024hr	865.00	0.00	862.83	0.0010	23.10	0.50	29753
POND 4	100yr 024hr	865.00	0.00	863.70	0.0010	34.56	0.62	33543

**D7. DEVELOPED CONDITION
T_c AND C_n VALUES**

TR-55
 -COMPOSITE CN-VALUES & TIME OF CONCENTRATION-

PROJECT: Reserve at Ronald Reagan JOB #: 22370 DATE: 1/22/26 COMPUTED BY: WCZ
--

BASINS					
BASIN	Composite CN	Area (ft ²)	Area (acres)	Area (miles)	Tc
DEV-1	95.00	457380	10.50	0.02	10.0
DEV-2	92.00	596772	13.70	0.02	15.0
DEV-3	90.00	692604	15.90	0.02	15.0
DEV-4	95.00	209088	4.80	0.01	5.0
DEV-5	91.00	222156	5.10	0.01	11.0

Basin	Cover Description	Soil Group	Area (Acres)	CN	CN * Acres	number	Basin #	CN	Acres	CN * Acres
DEV-1	Commercial & business	D	10.5	95	997.5	5				
DEV-2	Paved parking lots, roofs, driveways	D	9	98	882	5	DEV-1	95	10.5	997.5
DEV-2	Good condition; grass cover > 75%	D	4.7	80	376	5	DEV-2	92	13.7	1258
DEV-3	Paved parking lots, roofs, driveways	D	9	98	882	5	DEV-3	90	15.9	1434
DEV-3	Good condition; grass cover > 75%	D	6.9	80	552	5	DEV-4	95	4.8	456
DEV-4	Commercial & business	D	4.8	95	456	5	DEV-5	91	5.1	462
DEV-5	Paved parking lots, roofs, driveways	D	3	98	294	5				
DEV-5	Good condition; grass cover > 75%	D	2.1	80	168	5				

PROJECT: Reserve at Ronald Reagan
JOB #: 22370

Time of Concentration Worksheet
Based on TR-55

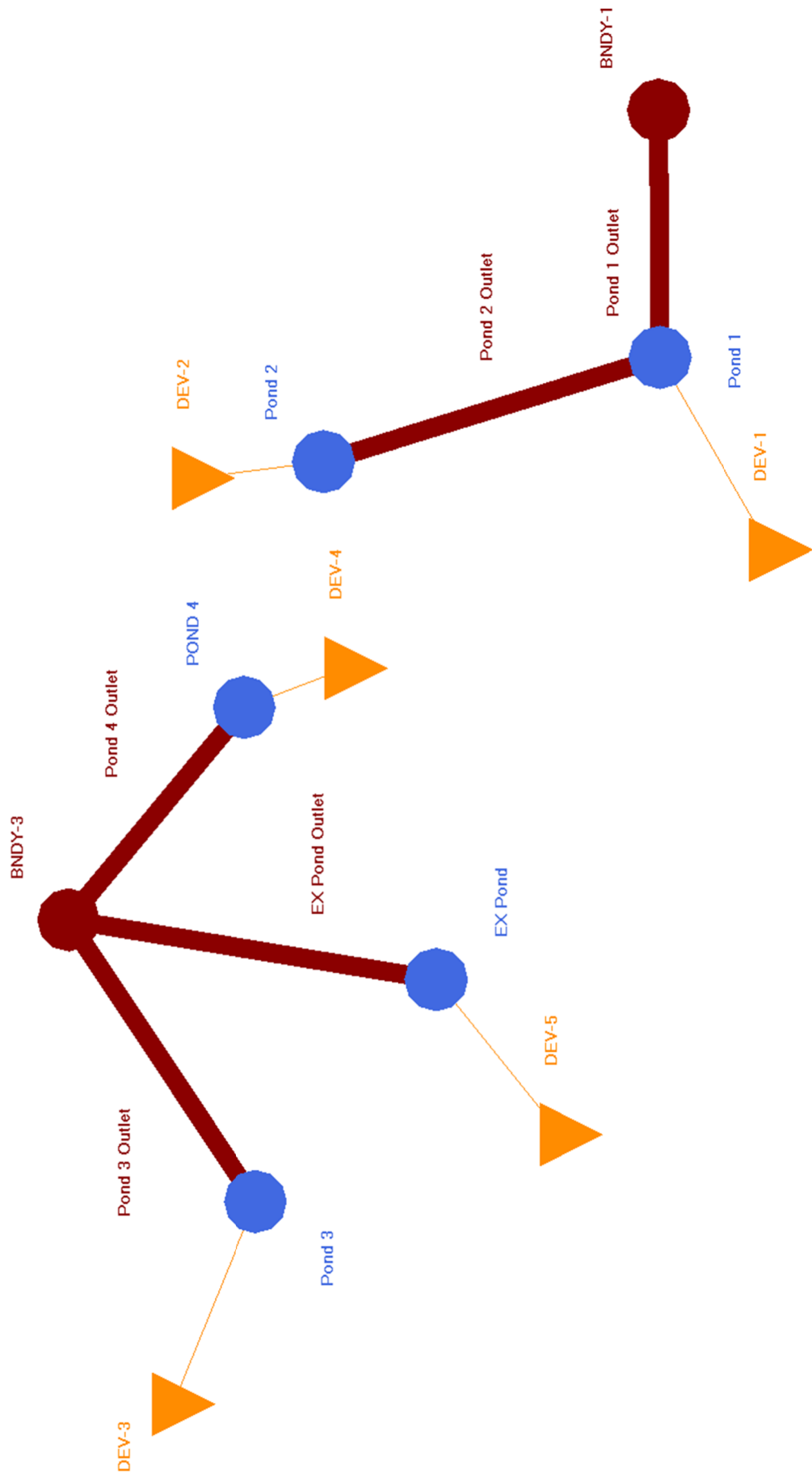
Typical values for Manning's n	
Overland Flow	Channel Flow
short grass 0.15	grass 0.03
dense grass 0.24	concrete 0.02
pavement 0.011	rip-rap 0.04
woods light cultivated > 20% 0.4	

2 year, 24 hour rainfall = 3.02 inches
minimum T_c = 5 minutes

Basin name	Overland flow			Shallow Concentrated Flow (1)			Shallow Concentrated Flow (2)			Channel Flow			T _c (min)	
	Length (ft)	S %	n	Length (ft)	S %	Paved/Un Paved (P or U)	Length (ft)	S %	Paved/Un Paved (P or U)	Length (ft)	r (ft)	S %		n
DEV-1	100	1.5	0.01	100	2	P	100	2	P	1200				10
DEV-2	65	2	0.24	100	2	P	100	2	P	600				15
DEV-3	65	2	0.24	100	2	P	100	2	P	600				15
DEV-4	50	2	0.01	50	2	P	50	2	P					5
DEV-5	70	2	0.24											11
														0
														0

**D8. DEVELOPED CONDITION
ICPR INPUT DATA**

Master Drainage Design
Developed Condition Node Diagram



Simple Basin: DEV-1

Scenario: Scenario1
 Node: Pond 1
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 10.5000 ac
 Curve Number: 95.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Simple Basin: DEV-2

Scenario: Scenario1
 Node: Pond 2
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 15.0000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 13.7000 ac
 Curve Number: 92.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Simple Basin: DEV-3

Scenario: Scenario1
 Node: Pond 3
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 15.0000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 15.9000 ac

Curve Number: 90.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Simple Basin: DEV-4

Scenario: Scenario1
 Node: POND 4
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 5.0000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 4.8000 ac
 Curve Number: 95.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Simple Basin: DEV-5

Scenario: Scenario1
 Node: EX Pond
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 11.0000 min
 Max Allowable Q: 99999.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH484
 Peaking Factor: 484.0
 Area: 5.1000 ac
 Curve Number: 91.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Node: BNDY-1

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 854.00 ft
 Warning Stage: 854.10 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	854.00
0	0	0	24.0000	854.00

Comment:

Node: BNDY-3

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 859.00 ft
 Warning Stage: 859.10 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	859.00
0	0	0	24.0000	859.00

Comment:

Node: EX Pond

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 863.50 ft
 Warning Stage: 867.50 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
863.50	2.9000	126324
864.50	3.0000	130680
865.50	3.1000	135036
866.50	3.2000	139392
867.50	3.3000	143748

Comment:

Node: Pond 1

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 854.50 ft
 Warning Stage: 858.50 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
854.50	1.0000	43560
855.00	1.0300	44867
856.00	1.2200	53143
857.00	1.3000	56628
858.00	1.3500	58806
859.00	1.4200	61855

Comment:

Node: Pond 2

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 856.50 ft
 Warning Stage: 860.50 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
856.50	1.0000	43560
857.00	1.0500	45738
858.00	1.1200	48787
859.00	1.2000	52272
860.00	1.2400	54014
861.00	1.3200	57499

Comment:

Node: Pond 3

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 863.00 ft
 Warning Stage: 867.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
863.00	1.0000	43560
864.00	1.1000	47916
865.00	1.1500	50094
866.00	1.2000	52272
867.00	1.3000	56628

Comment:

Node: POND 4

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 861.00 ft
 Warning Stage: 865.00 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
861.00	0.5000	21780
862.00	0.6000	26136
863.00	0.7000	30492
864.00	0.8000	34848
865.00	0.9000	39204

Comment:

Drop Structure Link: EX Pond Outlet	Upstream Pipe	Downstream Pipe
Scenario: Scenario1	Invert: 863.50 ft	Invert: 862.75 ft
From Node: EX Pond	Manning's N: 0.0130	Manning's N: 0.0130
To Node: BNDY-3	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.00 ft	Max Depth: 1.00 ft
Pipe Flow Direction: Both	Bottom Clip	
Solution: Combine	Default: 0.00 ft	Default: 0.00 ft
Increments: 0	Op Table:	Op Table:
Pipe Count: 1	Ref Node:	Ref Node:
Damping: 0.0000 ft	Manning's N: 0.0000	Manning's N: 0.0000
Length: 250.00 ft	Top Clip	
FHWA Code: 0	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef: 1	Op Table:	Op Table:
Exit Loss Coef: 0	Ref Node:	Ref Node:
Bend Loss Coef: 0	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location: 0.00 dec		
Energy Switch: Energy		

Pipe Comment:

Weir Component	
Weir: 1	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Circular	Default: 0.00 ft
Invert: 863.50 ft	Op Table:
Control Elevation: 863.50 ft	Ref Node:
Max Depth: 0.67 ft	Discharge Coefficients
	Weir Default: 3.200
	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Pond 1 Outlet		Upstream Pipe	Downstream Pipe
Scenario:	Scenario1	Invert: 854.50 ft	Invert: 854.30 ft
From Node:	Pond 1	Manning's N: 0.0130	Manning's N: 0.0130
To Node:	BNDY-1	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 2.00 ft	Max Depth: 2.00 ft
Pipe Flow Direction:	Both	Bottom Clip	
Solution:	Combine	Default: 0.00 ft	Default: 0.00 ft
Increments:	0	Op Table:	Op Table:
Pipe Count:	1	Ref Node:	Ref Node:
Damping:	0.0000 ft	Manning's N: 0.0000	Manning's N: 0.0000
Length:	45.00 ft	Top Clip	
FHWA Code:	0	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef:	1	Op Table:	Op Table:
Exit Loss Coef:	0	Ref Node:	Ref Node:
Bend Loss Coef:	0	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location:	0.00 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component		Bottom Clip
Weir:	1	Default: 0.00 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Sharp Crested Vertical	Default: 0.00 ft
Geometry Type:	Circular	Op Table:
Invert:	854.50 ft	Ref Node:
Control Elevation:	854.50 ft	Discharge Coefficients
Max Depth:	0.42 ft	Weir Default: 3.200
		Weir Table:
		Orifice Default: 0.600
		Orifice Table:

Weir Comment:

Weir Component		Bottom Clip
Weir:	2	Default: 0.00 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Sharp Crested Vertical	Default: 0.00 ft
Geometry Type:	Circular	Op Table:
Invert:	856.90 ft	Ref Node:
Control Elevation:	856.90 ft	Discharge Coefficients
Max Depth:	0.50 ft	Weir Default: 3.200
		Weir Table:
		Orifice Default: 0.600
		Orifice Table:

Weir Comment:

Weir Component		Bottom Clip
Weir:	3	Default: 0.00 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	

Weir Type: Horizontal
 Geometry Type: Rectangular
 Invert: 858.00 ft
 Control Elevation: 858.00 ft
 Max Depth: 4.00 ft
 Max Width: 4.00 ft
 Fillet: 0.00 ft

Top Clip
 Default: 0.00 ft
 Op Table:
 Ref Node:
Discharge Coefficients
 Weir Default: 3.200
 Weir Table:
 Orifice Default: 0.600
 Orifice Table:

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Pond 2 Outlet	Upstream Pipe	Downstream Pipe
Scenario: Scenario1	Invert: 856.50 ft	Invert: 855.00 ft
From Node: Pond 2	Manning's N: 0.0130	Manning's N: 0.0130
To Node: Pond 1	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.00 ft	Max Depth: 2.00 ft
Pipe Flow Direction: Both	Bottom Clip	
Solution: Combine	Default: 0.00 ft	Default: 0.00 ft
Increments: 0	Op Table:	Op Table:
Pipe Count: 1	Ref Node:	Ref Node:
Damping: 0.0000 ft	Manning's N: 0.0000	Manning's N: 0.0000
Length: 530.00 ft	Top Clip	
FHWA Code: 0	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef: 1	Op Table:	Op Table:
Exit Loss Coef: 0	Ref Node:	Ref Node:
Bend Loss Coef: 0	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location: 0.00 dec		
Energy Switch: Energy		

Pipe Comment:

Weir Component	
Weir: 1	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Circular	Default: 0.00 ft
Invert: 856.50 ft	Op Table:
Control Elevation: 856.50 ft	Ref Node:
Max Depth: 0.58 ft	Discharge Coefficients
	Weir Default: 3.200
	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Pond 3 Outlet		Upstream Pipe	Downstream Pipe
Scenario:	Scenario1	Invert: 863.00 ft	Invert: 860.20 ft
From Node:	Pond 3	Manning's N: 0.0130	Manning's N: 0.0130
To Node:	BNDY-3	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 1.25 ft	Max Depth: 1.25 ft
Pipe Flow Direction:	Both	Bottom Clip	
Solution:	Combine	Default: 0.00 ft	Default: 0.00 ft
Increments:	0	Op Table:	Op Table:
Pipe Count:	1	Ref Node:	Ref Node:
Damping:	0.0000 ft	Manning's N: 0.0000	Manning's N: 0.0000
Length:	865.00 ft	Top Clip	
FHWA Code:	0	Default: 0.00 ft	Default: 0.00 ft
Entr Loss Coef:	1	Op Table:	Op Table:
Exit Loss Coef:	0	Ref Node:	Ref Node:
Bend Loss Coef:	0	Manning's N: 0.0000	Manning's N: 0.0000
Bend Location:	0.00 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component		Bottom Clip
Weir:	1	Default: 0.00 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Sharp Crested Vertical	Default: 0.00 ft
Geometry Type:	Circular	Op Table:
Invert:	863.00 ft	Ref Node:
Control Elevation:	863.00 ft	Discharge Coefficients
Max Depth:	0.33 ft	Weir Default: 3.200
		Weir Table:
		Orifice Default: 0.600
		Orifice Table:

Weir Comment:

Weir Component		Bottom Clip
Weir:	2	Default: 0.00 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Horizontal	Default: 0.00 ft
Geometry Type:	Rectangular	Op Table:
Invert:	865.90 ft	Ref Node:
Control Elevation:	865.90 ft	Discharge Coefficients
Max Depth:	2.00 ft	Weir Default: 3.200
Max Width:	2.00 ft	Weir Table:
Fillet:	0.00 ft	Orifice Default: 0.600
		Orifice Table:

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Pond 4 Outlet	Upstream Pipe	Downstream Pipe
------------------------------------	---------------	-----------------

Scenario:	Scenario1	Invert:	861.00 ft	Invert:	860.00 ft
From Node:	POND 4	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	BNDY-3	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Pipe Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	300.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	1	Op Table:		Op Table:	
Exit Loss Coef:	0	Ref Node:		Ref Node:	
Bend Loss Coef:	0	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	861.00 ft
Control Elevation:	861.00 ft
Max Depth:	0.33 ft
Bottom Clip	
Default: 0.00 ft	
Op Table:	
Ref Node:	
Top Clip	
Default: 0.00 ft	
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default: 3.200	
Weir Table:	
Orifice Default: 0.600	
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Simulation: 002yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 4:55:21 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

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

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

Tolerances & Options

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

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr
Ia/S: 0.20 dec

Smp/Man Basin Rain Opt: Global

Rainfall Name: ~SCSII-24
Rainfall Amount: 3.02 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 010yr 024hr

Scenario: Scenario1
Run Date/Time: 1/22/2026 4:55:25 PM
Program Version: StormWise 4.08.03

General

Run Mode: Normal

Year	Month	Day	Hour [hr]
------	-------	-----	-----------

Start Time: 0 0 0 0.0000
 End Time: 0 0 0 24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

 Unit Hydrograph
 Folder:

Lookup Tables

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

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

Tolerances & Options

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

 Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

 Ia/S: 0.20 dec

 Smp/Man Basin Rain: Global
 Opt:

 Rainfall Name: ~SCSII-24
 Rainfall Amount: 4.28 in
 Storm Duration: 24.0000 hr
 Dflt Damping (1D): 0.0050 ft
 Min Node Srf Area: 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

Simulation: 100yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 4:55:29 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

 Unit Hydrograph Folder:

Lookup Tables

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

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

Tolerances & Options

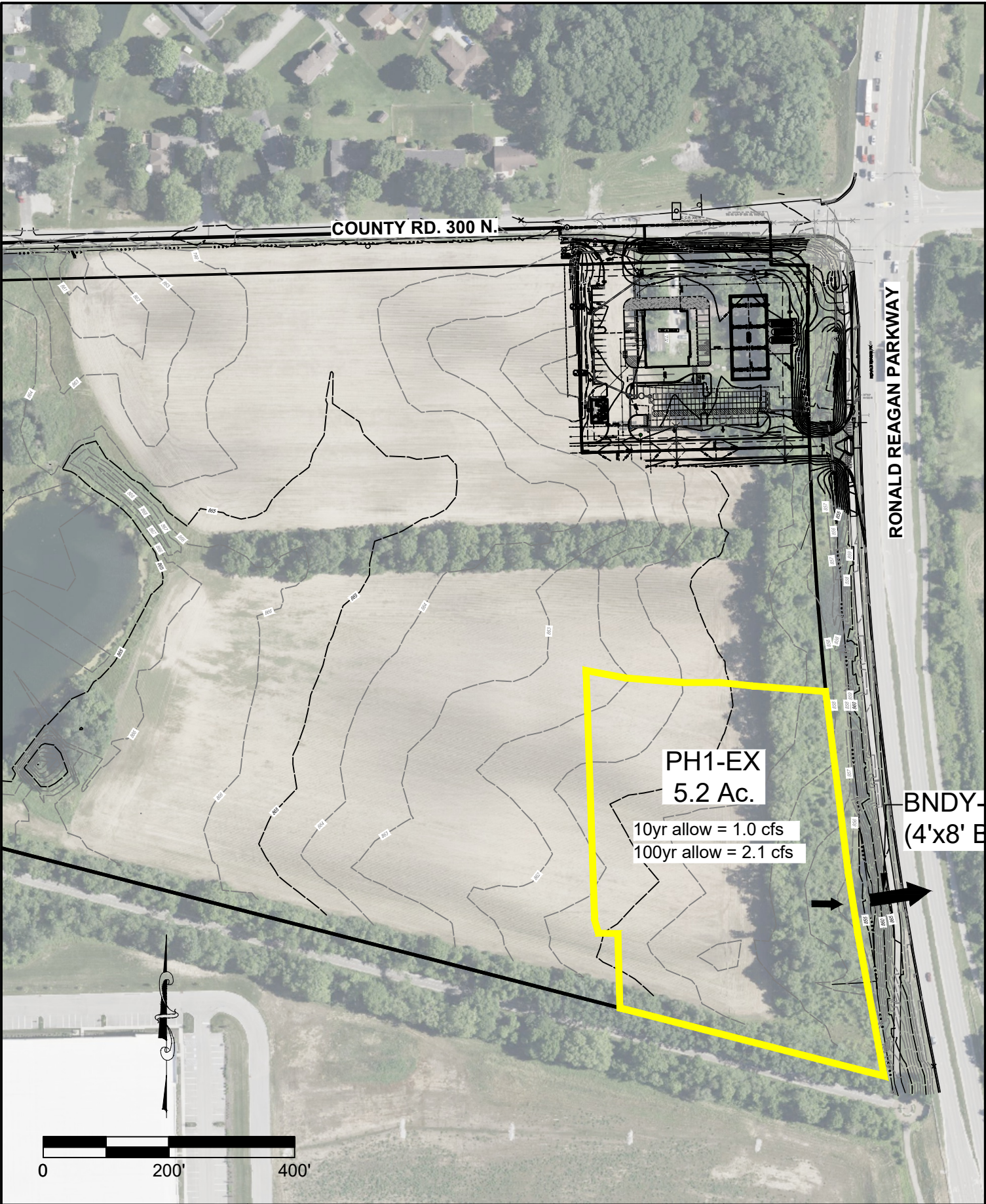
Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 6	
Over-Relax Weight 0.5 dec	la/S: 0.20 dec
Fact:	
dZ Tolerance: 0.0010 ft	
Max dZ: 1.0000 ft	Smp/Man Basin Rain Global
	Opt:
Link Optimizer Tol: 0.0001 ft	
	Rainfall Name: ~SCSII-24
	Rainfall Amount: 6.30 in
	Storm Duration: 24.0000 hr

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

Comment:

**E. PHASE 1 INFRASTRUCTURE
DRAINAGE DESIGN**

**E1. EXISTING CONDITION
BASIN MAP**

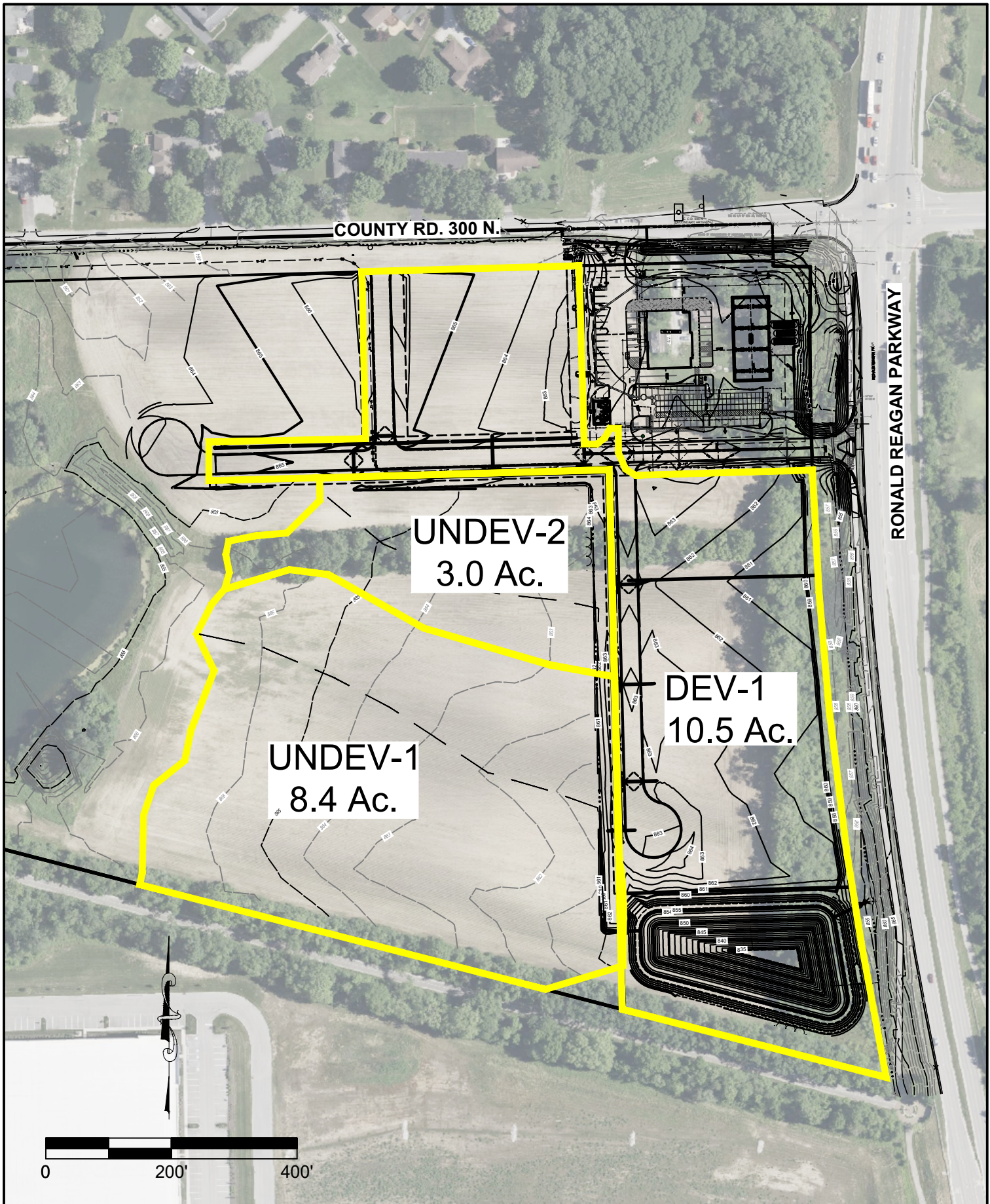


Drawn By: WCZ
 Date: 1/20/2026
 Project No.: 22370
 Scale: AS SHOWN
 Page: 1 of 1

EXISTING BASIN MAP
 RESERVE AT RONALD REAGAN
 INFRASTRUCTURE PHASE 1
 HENDRICKS COUNTY
 BROWNSBURG, INDIANA


 853 COLUMBIA ROAD, SUITE #101
 PLAINFIELD, IN 46168
 BUS: (317) 707-3700, FAX: (317) 707-3800
 E-MAIL: Banning@BanningEngineering.com
 02/16/2026 Page 6
 WEB: www.BanningEngineering.com

**E2. DEVELOPED CONDITION
BASIN MAP**



Drawn By: WCZ
 Date: 1/20/2026
 Project No.: 22370
 Scale: AS SHOWN
 Page: 1 of 1

DEVELOPED BASIN MAP
 RESERVE AT RONALD REAGAN
 INFRASTRUCTURE PHASE 1
 HENDRICKS COUNTY
 BROWNSBURG, INDIANA

BANNING
 ENGINEERING
 853 COLUMBIA ROAD, SUITE #101
 PLAINFIELD, IN 46168
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 E-MAIL: Banning@BanningEngineering.com
 02/16/2026 Page 6

E3. DEVELOPED CONDITION CALCULATIONS

Node Max Conditions : Multi Item | (name, sim) [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
BNDY-1	002yr 024hr	854.10	0.00	854.00	0.0000	0.74	0.00	0
BNDY-1	010yr 024hr	854.10	0.00	854.00	0.0000	0.95	0.00	0
BNDY-1	100yr 024hr	854.10	0.00	854.00	0.0000	2.00	0.00	0
Pond 1	002yr 024hr	858.50	0.00	856.08	0.0010	35.24	0.74	56801
Pond 1	010yr 024hr	858.50	0.00	856.90	0.0010	52.83	0.95	58580
Pond 1	100yr 024hr	858.50	0.00	857.98	0.0010	81.16	2.00	60944

Node Max Conditions : Multi Item | (name, sim) [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Alert Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
BNDY-1	002yr 024hr	854.10	0.00	854.00	0.0000	0.90	0.00	0
BNDY-1	010yr 024hr	854.10	0.00	854.00	0.0000	1.81	0.00	0
BNDY-1	100yr 024hr	854.10	0.00	854.00	0.0000	21.41	0.00	0
Pond 1	002yr 024hr	858.50	0.00	856.67	0.0010	43.13	0.90	58081
Pond 1	010yr 024hr	858.50	0.00	857.72	0.0010	67.35	1.81	60382
Pond 1	100yr 024hr	858.50	0.00	858.52	0.0010	107.07	21.41	62127

**E4. DEVELOPED CONDITION
T_c AND C_n VALUES**

TR-55
 -COMPOSITE CN-VALUES & TIME OF CONCENTRATION-

PROJECT: Reserve at Ronald Reagan Phase 1 JOB #: 22370 DATE: 1/22/26 COMPUTED BY: WCZ
--

BASINS					
BASIN	Composite CN	Area (ft ²)	Area (acres)	Area (miles)	Tc
DEV-1	95.00	457380	10.50	0.02	10.0
UNDEV-1	82.00	365904	8.40	0.01	25.0
UNDEV-2	79.00	130680	3.00	0.00	20.7

Basin	Cover Description	Soil Group	Area (Acres)	CN	CN * Acres	number	Basin #	CN	Acres	CN * Acres
DEV-1	Commercial & business	D	10.5	95	997.5	5				
UNDEV-1	Row Crop Straight row (SR) GOOD	B	3.4	78	265.2	3	DEV-1	95	10.5	997.5
UNDEV-1	Row Crop Straight row (SR) GOOD	C	5	85	425	4	UNDEV-1	82	8.4	690.2
UNDEV-2	Row Crop Straight row (SR) GOOD	B	0.5	78	39	3	UNDEV-2	79	3	235.7
UNDEV-2	Row Crop Straight row (SR) GOOD	C	1.5	85	127.5	4				
UNDEV-2	Woods - grass combination GOOD	B	0.2	58	11.6	3				
UNDEV-2	Woods - grass combination GOOD	C	0.8	72	57.6	4				

Time of Concentration Worksheet

Based on TR-55

PROJECT: Reserve at Ron-
JOB #: 22370

Typical values for Manning's n

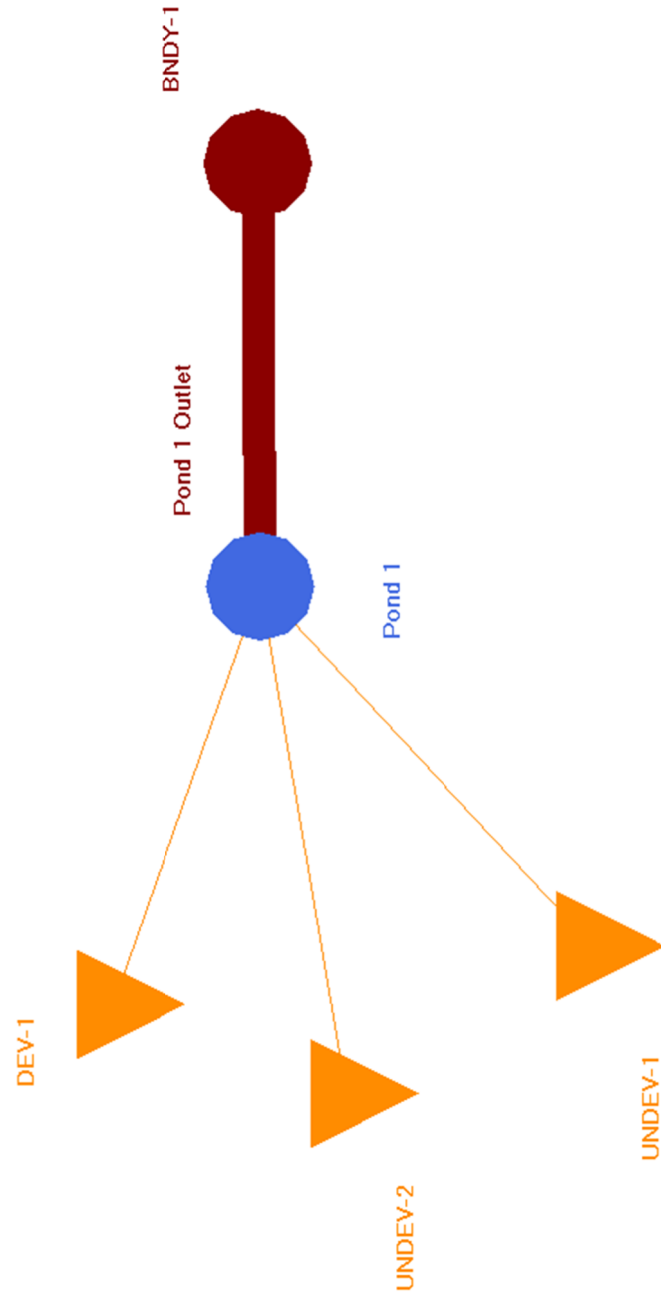
Overland Flow	Channel Flow
short grass 0.15	grass 0.03
dense grass 0.24	concrete 0.02
pavement 0.011	rip-rap 0.04
woods light cultivated > 20% 0.4	

2 year, 24 hour rainfall = 3.02 inches
minimum T_c = 5 minutes

Basin name	Overland flow			Shallow Concentrated Flow (1)			Shallow Concentrated Flow (2)			Channel Flow			T _c (min)		
	Length (ft)	S %	n	Length (ft)	S Paved/Un Paved %	Vel. (ft/s)	Length (ft)	S Paved/Un Paved %	Vel. (ft/s)	Length (ft)	r (ft)	S %		n	Vel. (ft/s)
DEV-1	100	1.5	0.01	100	2	P 2.9	0	0	0	1200				2.50	0
UNDEV-1	100	1	0.2	670	1	U 1.6	1	0	0	200				2.50	8
UNDEV-2	100	1	0.2	380	1	U 1.6	7	0	0	100				0.00	1
				0			4	0	0						0
				0			0	0	0						0
				0			0	0	0						0
				0			0	0	0						0

**E5. DEVELOPED CONDITION
ICPR INPUT DATA**

Phase 1 Infrastructure Drainage Design
Developed Condition Node Diagram



Simple Basin: DEV-1

Scenario: Scenario1
Node: Pond 1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 10.5000 ac
Curve Number: 95.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: UNDEV-1

Scenario: Scenario1
Node: Pond 1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 25.0000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 8.4000 ac
Curve Number: 82.0
Ia/S: 0.00
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Simple Basin: UNDEV-2

Scenario: Scenario1
Node: Pond 1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 20.7000 min
Max Allowable Q: 99999.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 3.0000 ac

Curve Number: 79.0
 Ia/S: 0.00
 % Impervious: 0.00
 % DCIA: 0.00
 % Direct: 0.00
 Rainfall Name:

Comment:

Node: BNDY-1

Scenario: Scenario1
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 854.00 ft
 Warning Stage: 854.10 ft
 Alert Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	854.00
0	0	0	24.0000	854.00

Comment:

Node: Pond 1

Scenario: Scenario1
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 854.50 ft
 Warning Stage: 858.50 ft
 Alert Stage: 0.00 ft

Stage [ft]	Area [ac]	Area [ft2]
854.50	1.0000	43560
855.00	1.1000	47916
856.00	1.3000	56628
857.00	1.3500	58806
858.00	1.4000	60984
859.00	1.4500	63162

Comment:

Drop Structure Link: Pond 1 Outlet	Upstream Pipe	Downstream Pipe
Scenario: Scenario1	Invert: 854.50 ft	Invert: 854.30 ft
From Node: Pond 1	Manning's N: 0.0130	Manning's N: 0.0130
To Node: BNDY-1	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.00 ft	Max Depth: 2.00 ft
Pipe Flow Direction: Both	Bottom Clip	

Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	45.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	1	Op Table:		Op Table:	
Exit Loss Coef:	0	Ref Node:		Ref Node:	
Bend Loss Coef:	0	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Bottom Clip	
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Top Clip	
Geometry Type:	Circular
Invert:	854.50 ft
Op Table:	
Control Elevation:	854.50 ft
Ref Node:	
Max Depth:	0.42 ft
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	2
Bottom Clip	
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Top Clip	
Geometry Type:	Circular
Invert:	856.90 ft
Op Table:	
Control Elevation:	856.90 ft
Ref Node:	
Max Depth:	0.50 ft
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	3
Bottom Clip	
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Top Clip	
Geometry Type:	Rectangular
Invert:	858.00 ft
Op Table:	
Control Elevation:	858.00 ft
Ref Node:	
Max Depth:	4.00 ft
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	
Orifice Table:	

Fillet: 0.00 ft

Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 002yr 024hr
Scenario: Scenario1
Run Date/Time: 1/22/2026 5:16:51 PM
Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

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

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

Tolerances & Options

Time Marching: SAOR

IA Recovery Time: 24.0000 hr

Max Iterations: 6
 Over-Relax Weight 0.5 dec
 Fact:
 dZ Tolerance: 0.0010 ft
 Max dZ: 1.0000 ft
 Link Optimizer Tol: 0.0001 ft
 Ia/S: 0.20 dec
 Smp/Man Basin Rain Global
 Opt:
 Rainfall Name: ~SCSII-24
 Rainfall Amount: 3.02 in
 Storm Duration: 24.0000 hr
 Dflt Damping (1D): 0.0050 ft
 Min Node Srf Area 100 ft2
 (1D):
 Energy Switch (1D): Energy

Comment:

Simulation: 010yr 024hr

Scenario: Scenario1
 Run Date/Time: 1/22/2026 5:16:54 PM
 Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Lookup Tables

Boundary Stage Set:
 Extern Hydrograph Set:

Unit Hydrograph
Folder:

Curve Number Set:

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

Tolerances & Options

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

Link Optimizer Tol: 0.0001 ft

IA Recovery Time: 24.0000 hr

Ia/S: 0.20 dec

Smp/Man Basin Rain Global
Opt:

Rainfall Name: ~SCSII-24
Rainfall Amount: 4.28 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2
(1D):
Energy Switch (1D): Energy

Comment:

Simulation: 100yr 024hr

Scenario: Scenario1
Run Date/Time: 1/22/2026 5:16:57 PM
Program Version: StormWise 4.08.03

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

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

Surface Hydraulics

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

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph
Folder:

Lookup Tables

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

Tolerances & Options

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

IA Recovery Time: 24.0000 hr

Ia/S: 0.20 dec

Smp/Man Basin Rain Global
Opt:Rainfall Name: ~SCSII-24
Rainfall Amount: 6.30 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2
(1D):
Energy Switch (1D): Energy

Comment:

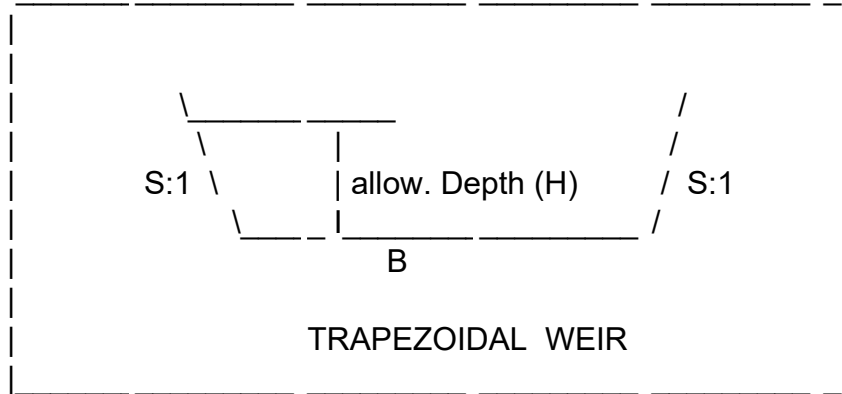
E6. POND EMERGENCY SPILLWAY CALCULATIONS

Detention Pond - Emergency Overflow Weir Calculation

PROJECT NAME: Reserve at Ronald Reagan
 DESIGNER: WCZ

DATE: 10/25/2019
 JOB No.: 22370

Purpose: To compute the maximum discharge for a weir section and compare it to the required design discharge.



=====

INPUT:

Enter Weir No. : POND 1
 Enter Bottom Width, (B): 60 ft.
 Enter Side Slopes, (S): 3 : 1
 Enter Allowable Depth (H): 1.00 ft.

=====

OUTPUT CALCULATIONS:

Area	:	63.00	sft.	
Velocity	:	2.48	fps.	
Discharge	:	156.0	cfs.	Q=2.6(b)(H)^(3/2)
				Weir Equation

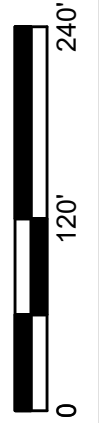
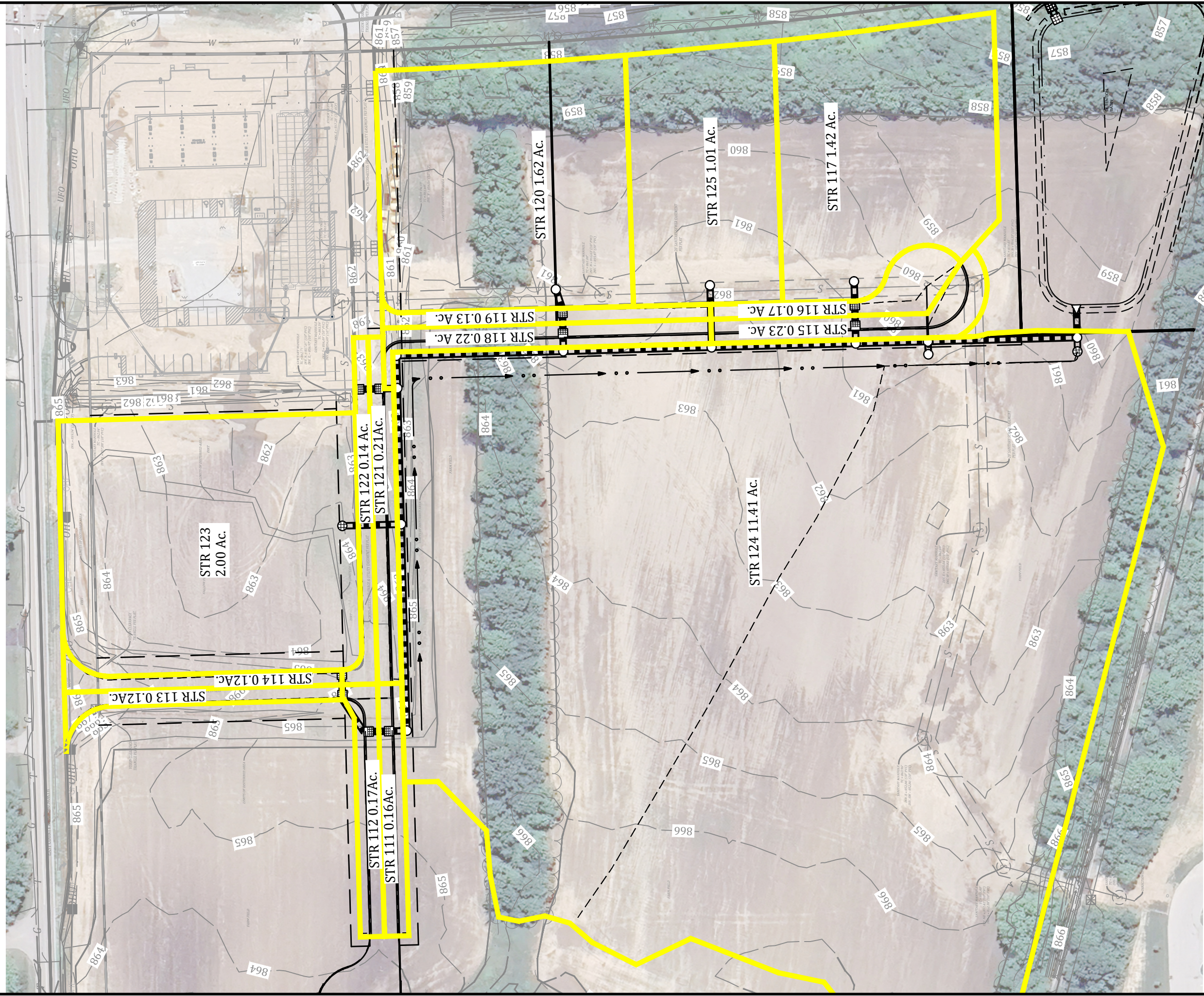
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SUMMARY:

Pond Inflow :	107.1	
Design Discharge :	134 cfs. }	SATISFACTORY
	}	
Maximum Discharge :	156 cfs. }	

=====

E7. STORM SEWER CALCULATIONS



STORM SEWER BASIN MAP
 RESERVE AT RONALD REAGAN
 HENDRICKS COUNTY
 BROWNSBURG, INDIANA

Drawn By: SJH
 Date: 00-00-2026
 Project No.: 22370
 Scale: AS SHOWN
 Page: 1 of 1

STORM SEWER DESIGN CALCULATIONS
-PIPE DESIGN-

PROJECT:	Reserve at Ronald Reagan Phase 1 Infrastructure	STORM:	10 Year
JOB #:	22370	COMPUTED BY:	SJH
DATE:	1/22/26	SHEET NO.:	

Manning's Roughness Coefficient (n) = 0.013

STRUCTURE		DESIGN Q (cfs)	L (ft)	DIA. (in)	SLOPE %	CAP.		RIM ELEV.		INVERT ELEV.		COVER (ft)
FROM	TO					Q (cfs)	VEL. (ft/s)	UP	DOWN	UP	DOWN	
114	113	0.78	32	12	0.30	1.97	2.51	865.27	865.41	861.04	860.94	3.06
113	112	1.53	41	12	0.30	1.97	2.51	865.41	864.71	860.64	860.52	3.60
112	111	2.27	32	12	0.40	2.28	2.90	864.71	864.71	860.42	860.29	3.12
111	110	2.95	14	15	0.23	3.13	2.55	864.71	864.99	860.04	860.01	3.23
110	109	2.93	221	15	0.23	3.13	2.55	864.99	864.08	859.91	859.40	3.64
109	108	13.23	146	24	0.35	13.48	4.29	864.08	863.36	858.65	858.14	3.18
108	107	14.49	35	24	0.43	14.94	4.76	863.36	863.39	858.04	857.89	3.07
107	106	14.39	179	24	0.42	14.77	4.70	863.39	862.14	857.79	857.04	3.35
106	105A	23.68	159	36	0.17	27.63	3.91	862.14	863.73	856.64	856.37	2.17
105A	105	28.62	155	36	0.19	29.21	4.13	863.73	862.80	856.27	855.98	4.13
105	DIV1	36.29	77	36	0.30	36.70	5.19	862.80	863.27	855.88	855.65	3.59
DIV1	104	35.77	160	36	0.30	36.70	5.19	863.27	859.68	855.55	855.07	4.39
104	103	37.82	35	36	0.32	37.90	5.36	859.68	ES	854.61	854.50	1.74
											854.50	
117	116	8.34	20	24	0.26	11.62	3.70	862.92	862.52	856.97	856.92	3.70
116	115	9.38	32	24	0.32	12.89	4.10	862.52	862.52	856.82	856.72	3.45
115	105	10.77	14	24	0.38	14.05	4.47	862.52	862.80	856.12	856.07	4.15
											855.88	
120	119	9.51	21	24	0.32	12.89	4.10	862.29	861.86	857.48	857.41	2.56
119	118	10.30	32	24	0.35	13.48	4.29	861.86	861.86	857.01	856.90	2.60
118	106	11.63	14	24	0.42	14.77	4.70	861.86	862.14	856.80	856.74	2.81
											856.64	
122	121	0.92	32	12	0.30	1.97	2.51	863.08	863.08	858.85	858.75	3.06
121	108	1.77	14	12	0.30	1.97	2.51	863.08	863.36	858.65	858.61	3.26
											858.04	
123	109	11.74	63	24	0.28	12.06	3.84	864.09	864.08	858.93	858.75	2.91
											858.65	
124	104	13.18	15	24	0.35	13.48	4.29	859.00	859.68	854.77	854.72	1.98
											854.61	
125	105A	5.93	66	24	0.32	12.89	4.10	863.84	863.73	857.66	857.45	3.93

STORM SEWER DESIGN CALCULATIONS
-RATIONAL METHOD-

PROJECT: Reserve at Ronald Reagan Phase 1 Infrastructure	STORM: 10 Year
JOB #: 22370	COMPUTED BY: SJH
DATE: 1/22/26	SHEET NO.:

STRUCTURE		BASINS							COMPOSITE BASINS				TRAVEL
FROM	TO	BASIN #	c	A (acres)	c*A	Tc (min)	I (in/hr)	Q (cfs)	SUM (c*A)	Tc (min)	I (in/hr)	Q (cfs)	TIME (min)
114	113	114	0.85	0.12	0.10	5	7.48	0.78	0.10	5	7.48	0.78	0.21
113	112	113	0.85	0.12	0.10	5	7.48	0.77	0.21	5	7.41	1.53	0.27
112	111	112	0.62	0.17	0.10	6	7.27	0.76	0.31	6	7.27	2.27	0.18
111	110	111	0.60	0.16	0.10	6	7.27	0.71	0.41	6	7.21	2.95	0.09
110	109	110	0.00	0.00	0.00	5	7.48	0.00	0.41	6	7.18	2.93	1.44
109	108	109	0.00	0.00	0.00	5	7.48	0.00	1.98	7	6.68	13.23	0.57
108	107	108	0.00	0.00	0.00	5	7.48	0.00	2.23	8	6.49	14.49	0.12
107	106	107	0.00	0.00	0.00	5	7.48	0.00	2.23	8	6.45	14.39	0.63
106	105A	106	0.00	0.00	0.00	5	7.48	0.00	3.80	9	6.23	23.68	0.68
105A	105	105A	0.00	0.00	0.00	5	7.48	0.00	4.59	9	6.23	28.62	0.68
105	DIV1	105	0.00	0.00	0.00	5	7.48	0.00	6.05	9	6.00	36.29	0.25
DIV1	104	DIV1	0.00	0.00	0.00	5	7.48	0.00	6.05	10	5.91	35.77	0.51
104	103	104	0.00	0.00	0.00	5	7.48	0.00	9.28	22	4.07	37.82	0.11
117	116	117	0.79	1.42	1.11	5	7.48	8.34	1.11	5	7.48	8.34	0.09
116	115	116	0.85	0.17	0.14	5	7.48	1.08	1.26	5	7.45	9.38	0.13
115	105	115	0.85	0.23	0.20	5	7.48	1.46	1.45	5	7.40	10.77	0.05
120	119	120	0.79	1.62	1.27	5	7.48	9.51	1.27	5	7.48	9.51	0.09
119	118	119	0.85	0.13	0.11	5	7.48	0.83	1.38	5	7.45	10.30	0.12
118	106	118	0.85	0.22	0.19	5	7.44	1.39	1.57	5	7.41	11.63	0.05
122	121	122	0.85	0.14	0.12	5	7.48	0.92	0.12	5	7.48	0.92	0.21
121	108	121	0.62	0.21	0.13	6	7.00	0.91	0.25	6	7.00	1.77	0.09
123	109	123	0.79	2.00	1.57	5	7.48	11.74	1.57	5	7.48	11.74	0.27
124	104	124	0.28	11.41	3.24	22	4.07	13.18	3.24	22	4.07	13.18	0.06
125	105A	125	0.78	1.01	0.79	5	7.48	5.93	0.79	5	7.48	5.93	0.27

STORM SEWER DESIGN CALCULATIONS
-COMPOSITE C-VALUES-

PROJECT:	Reserve at Ronald Reagar	STORM:	10 Year
JOB #:	22370	COMPUTED BY:	SJH
DATE:	1/22/26		

BASIN #	c	BASINS			RUNOFF COEFFICIENTS				
		Area (ft2)	Area (acres)	c*A	Pavement 0.85 Area (ft ²)	Lawns 0.20 Area (ft ²)	Crop 0.30 Area (ft ²)	Other Area (ft ²)	Other Area (ft ²)
114	0.85	5321	0.12	0.10	5321				
113	0.85	5279	0.12	0.10	5279				
112	0.62	7329	0.17	0.11	4770	2559			
111	0.60	7043	0.16	0.10	4337	2706			
110	0.00	0	0.00	0.00					
109	0.00	0	0.00	0.00					
108	0.00	0	0.00	0.00					
107	0.00	0	0.00	0.00					
106	0.00	0	0.00	0.00					
105A	0.00	0	0.00	0.00					
105	0.00	0	0.00	0.00					
DIV1	0.00	0	0.00	0.00					
104	0.00	0	0.00	0.00					
117	0.79	61855	1.42	1.11	55670	6185			
116	0.85	7405	0.17	0.14	7405				
115	0.85	10019	0.23	0.20	10019				
120	0.79	70567	1.62	1.27	63511	7056			
119	0.85	5663	0.13	0.11	5663				
118	0.85	9583	0.22	0.19	9583				
122	0.85	6295	0.14	0.12	6295				
121	0.62	9103	0.21	0.13	5941	3162			
123	0.79	87120	2.00	1.57	78408	8712			
124	0.28	497039	11.41	3.24		81732	415307		
125	0.78	43996	1.01	0.79	39596	4400			

Time of Concentration Worksheet
Based on TR-55

PROJECT: Reserve at Ronald Reagan Phase 1 Infrastructure
JOB #: 22370

Typical values for Manning's 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 year, 24 hour rainfall = 3.02 inches
minimum T_c = 5 minutes

Basin name	Overland flow seg. 1				Overland flow seg. 2				Shallow Concentrated Flow				Channel Flow					T _c (min)				
	Length (ft)	S %	n	T _t (min)	Length (ft)	S %	n	T _t (min)	Length (ft)	S %	Paved/Un (P or U)	Vel. (ft/s)	T _t (min)	Length (ft)	a (s.f.)	Pw (ft)	r (ft)		S %	n	Vel. (ft/s)	T _t (min)
114	100	1	0.01	2				0	210	1	P	2	2								0	5
113	100	1	0.01	2				0	210	1	P	2	2								0	5
112	10	1	0.24	3	90	1	0	2	125	1	P	2	1								0	6
111	10	1	0.24	3	90	1	0	2	125	1	P	2	1								0	6
110				0				0					0								0	5
109				0				0					0								0	5
108				0				0					0								0	5
107				0				0					0								0	5
106				0				0					0								0	5
105A				0				0					0								0	5
105				0				0					0								0	5
DIV1				0				0					0								0	5
104				0				0					0								0	5
				0				0					0								0	
117				0				0					0								0	5
116	100	1	0.01	2				0	60	1	P	2	0								0	5
115	100	1	0.01	2				0	100	1	P	2	1								0	5
				0				0					0								0	
				0				0					0								0	
120				0				0					0								0	5
119	100	1	0.01	2				0	60	1	P	2	0								0	5
118	10	1	0.24	3	90	1	0	2	65	1	P	2	1								0	5
				0				0					0								0	
				0				0					0								0	
122	100	1	0.01	2				0	210	1	P	2	2								0	5
121	10	1	0.24	3	90	1	0	2	222	1	P	2	2								0	6
				0				0					0								0	
				0				0					0								0	
123				0				0					0								0	5
				0				0					0								0	
				0				0					0								0	
124	100	1	0.17	15				0	580	1	U	1.6	6	215					3.00	1	22	
				0				0					0								0	
				0				0					0								0	
125				0				0					0								0	5
				0				0					0								0	
				0				0					0								0	

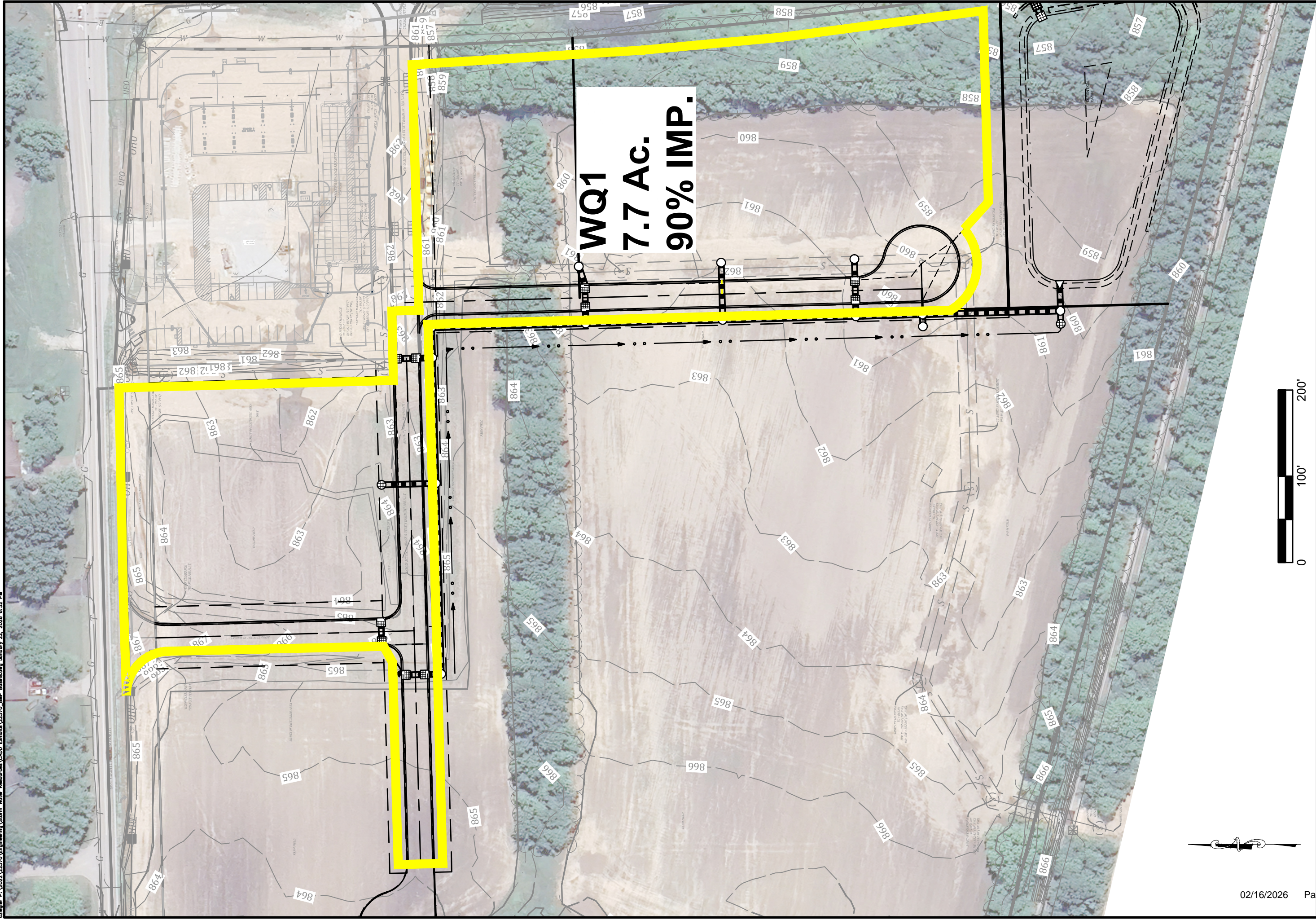
STORM SEWER DESIGN CALCULATIONS
-INLET CAPACITY / PONDING LIMITS-

PROJECT: Reserve at Ronald Reagan Phase 1 Infrastructure STORM: 10 Year
JOB #: 22370 COMPUTED BY: SJH
DATE: 1/22/2026 SHEET NO.:

Inlet #	Basin CFS	Bypass CFS to Inlet	Total CFS	Grade At Inlet	Cross Slope (ft/ft)	Longitudinal Slope (ft/ft)	Casting Model / Name	# of Castings	SAG Only Multiple Inlet Separation (ft)	SAG Only Inlet Depression (ft)	Allowable Spread (ft)	Actual Spread (ft)	Maximum Depth (ft) *At Gutter	Inlet Width (in)	Inlet Length (in)	50% Clogged Inlet Perimeter (ft)	Bypass Inlet	Bypass CFS
114	0.78	0.00	0.78	Continuous	0.0208	0.0100	R-3287-10V	1			10.5	5.93	0.12	15.625	34.625		112	0.00
113	0.77	0.00	0.77	Continuous	0.0208	0.0100	R-3287-10V	1			10.5	5.90	0.12	15.625	34.625		122	0.00
112	0.76	0.00	0.76	SAG	0.0208		R-3287-10V	1			10.5	6.95	0.14	15.625	34.625	4.19		
111	0.71	0.00	0.71	SAG	0.0208		R-3287-10V	1			10.5	6.64	0.14	15.625	34.625	4.19		
116	1.08	0.00	1.08	SAG	0.0208		R-3287-10V	1			9.5	8.79	0.18	15.625	34.625	4.19		
115	1.46	0.00	1.46	SAG	0.0208		R-3287-10V	1			11.5	10.74	0.22	15.625	34.625	4.19		
119	0.83	0.00	0.83	SAG	0.0208		R-3287-10V	1			10.5	7.37	0.15	15.625	34.625	4.19		
118	1.39	0.00	1.39	SAG	0.0208		R-3287-10V	1			10.5	10.40	0.22	15.625	34.625	4.19		
122	0.92	0.00	0.92	SAG	0.0208		R-3287-10V	1			10.5	7.90	0.16	15.625	34.625	4.19		
121	0.91	0.00	0.91	SAG	0.0208		R-3287-10V	1			10.5	7.84	0.16	15.625	34.625	4.19		

*Takes into account inlet depression. Depth from curb flowline.

E8. STORMWATER QUALITY CALCULATIONS



Drawn By: SJH
 Date: 00-00-2026
 Project No.: 22370
 Scale: AS SHOWN
 Page: 1 of 1

BMP BASIN MAP
RESERVE AT RONALD REAGAN
HENDRICKS COUNTY
BROWNSBURG, INDIANA

WATER QUALITY FLOW RATE DESIGN CALCULATIONS
- MODIFIED RATIONAL METHOD-

PROJECT: Project	STORM: 2 Year
JOB #: Job No	COMPUTED BY: WCZ
DATE: 2/16/26	SHEET NO.:

Where: Q_{wq} = Water Quality Flow Rate (cfs)
 C = Runoff Coefficient for Land Use
 p = one-half (0.5) of the two-year (2-yr)(50%
chance/year) storm intensity (inches/hr)
 A = Area (acres)

$$Q_{wq} = C \times p \times A$$

STRUCTURE	BASINS						
	BASIN #	C	A (acres)	Tc (min)	I (in/hr)	p (in/hr)	Q _{wq} (cfs)
WQ1	WQ1	0.80	7.70	8.8	4.61	2.31	14.20

Time of Concentration Worksheet
Based on TR-55

PROJECT: Project
JOB #: Job No

Typical values for Manning's 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 year, 24 hour rainfall = 2.92 inches
minimum T_c = 5 minutes

Basin name	Overland flow seg. 1			Overland flow seg. 2			Shallow Concentrated Flow				Channel Flow				T _c (min)						
	Length (ft)	S %	n	Length (ft)	S %	n	Length (ft)	S %	Paved/Un Paved (P or U)	Vel. (ft/s)	T _t (min)	Length (ft)	a (s.f.)	Pw (ft)		r (ft)	S %	n	Vel. (ft/s)	T _t (min)	
WQ1	100	1	0.01				210	1	P	2	2	932						2.90	5	9	



Aqua-Swirl™ Sizing Chart

Aqua-Swirl™ Model	Swirl Chamber Diameter (ft.)	Maximum Stub-Out Pipe Outer Diameter (in.)		Water Quality Treatment Flow ² (cfs)	Oil/Debris Storage Capacity (gal)	Sediment Storage Capacity (ft ³)
		On/Offline	BYP ¹			
AS-2	2.50	8	15	1.1	37	10
AS-3	3.25	10	21	1.8	110	20
AS-4	4.25	12	27	3.2	190	32
AS-5	5.00	12	30	4.4	270	45
AS-6	6.00	14	36	6.3	390	65
AS-7	7.00	16	42	8.6	540	90
AS-8	8.00	18	48	11.2	710	115
AS-9	9.00	20	>48 *	14.2	910	145
AS-10	10.0	22	>48 *	17.5	1130	180
AS-11	11.0	24	>48 *	21.2	1422	222
AS-12	12.0	26	>48 *	25.2	1698	270
AS-13	13.0	28	>48 *	29.6	1986	310
AS-XX	Custom	--	--	>26 **	--	--

* See Representative for larger pipe diameters available **Higher water quality treatment flow rates can be designed with multiple swirls.

- 1) The **Aqua-Swirl™ Internal Bypass (BYP)** provides full treatment of the "first flush," while the peak design storm is diverted and channeled through the main conveyance pipe. Please refer to your local representative for more information.
- 2) Many regulatory agencies are establishing "water quality treatment flow rates" for their areas based on the initial movement of pollutants into the storm drainage system. The treatment flow rate of the Aqua-Swirl™ system is engineered to meet or exceed the local water quality treatment criteria. This "**water quality treatment flow rate**" typically represents approximately 90% to 95% of the total annual runoff volume.

The design and orientation of the Aqua-Filter™ generally entails some degree of customization. For assistance in design and specific sizing using historical rainfall data, please refer to an AquaShield™ representative or visit our website at www.AquaShieldInc.com. CAD details and specifications are available upon request.