



**“Your Project is Our Priority”**

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# **PRELIMINARY DRAINAGE REPORT**

for

## **PROMENADE, SECTION 3**

In

Town of Brownsburg  
Hendricks County, Indiana

Prepared for:

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# Drainage Narrative for: Promenade, Section 3

## I. INTRODUCTION:

The Promenade, Section 3 project is an 8.0± acre proposed residential development that will serve as an additional section to existing Promenade subdivision which was finalized in the spring of 2024. The Promenade project is located about 0.3 miles east of Hornaday Road near the northwest corner of E County Rd 300N and the new extension of Northfield Dr., in the southwest quarter; Section 24; Township 16 North; Range 1 East; Town of Brownsburg; Hendricks County, Indiana. The Promenade, Section 3 project is a proposed residential development that will contain 20 single family residences. This report includes the results of a preliminary drainage analysis for the project, summarizing the existing and developed conditions of the site.

## II. ADJOINING LAND CONDITIONS:

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

## III. EXISTING SOIL TYPES:

<u>Symbol</u>	<u>Name</u>	<u>Hydrologic Soil Group</u>
CrA	Crosby silt loam	C
ThrA	Treaty silty clay loam	B
YbvA	Brookston silty clay loam	B
YclA	Crosby silt loam	C

## IV. SITE DRAINAGE ANALYSIS:

### a. Stormwater Discharge Requirements

Allowable Stormwater discharge is based on requirements found in the Hendricks County Stormwater Management Ordinance. Allowable discharge is based on a rate of discharge (CFS) per acre of development. The following **Table 1** are summaries of the stormwater discharge requirements.

**TABLE 1**  
**STORMWATER DISCHARGE REQUIREMENTS**  
**HENDRICKS COUNTY**

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

**b. DRAINAGE DESIGN**

**i. EXISTING CONDITIONS**

The majority of the 8.0± acre site consists of wood and shrubs. The existing 8.0± acres to be developed (EX-1 & EX-2) currently drain into the Pollard Todd Legal Drain to an existing 48” culvert under a trail at the south end of the site (BNDY). Approximately 6.15± acres drain east to an existing 24” end section designed to capture the site in Promenade Sections 1A and 1B. Approximately 1.84± acres drains south along the west border of the Promenade Section 1A and 1B site directly to the Pollard Todd Legal Drain.

**ii. DEVELOPED CONDITIONS**

In the developed condition, stormwater from the site will be routed to a proposed wet bottom pond to reduce the discharge rates. Approximately 8.0± acres of developed onsite area (DEV-1) drain through a proposed storm sewer system to the proposed Pond, which will outlet to Existing Storm Sewer System via an Inline structure connection just south of Existing Structure 130 from Promenade, Section 1A and 1B. Structure 130 drains south to existing “Pond 2” from Promenade Section A and 1B before out letting into the Pollard Todd Legal Drain. In addition, approximately 7.1± acres of offsite area (OFF-1) will be routed through a proposed storm sewer network into the proposed pond.

A preliminary hydrologic/hydraulic model of the developed site was completed to calculate the developed stormwater discharges and stage elevations. The discharge from the developed project site to the boundary is less than the allowable discharge. **Table 2** below provides a summary of the allowable and developed discharge rates for the project. **Table 3** below provides a summary of the developed 100-year detention pond stage elevations including offsite areas. Complete calculations can be found in the appendix.

<b>TABLE 2</b>				
<b>MASTER DRAINAGE DESIGN DEVELOPED CONDITION</b>				
<b>STORMWATER DISCHARGE (ONSITE ONLY)</b>				
<b>Discharge Point</b>	<b>Developed Discharge (CFS)</b>		<b>Allowable Discharge (CFS)</b>	
<b>BNDY</b>	<b>Q<sub>10p</sub> = 0.78</b>	<b>&lt;</b>	<b>0.1 CFS / ACRE = 0.8</b>	<b>OK</b>
	<b>Q<sub>100p</sub> = 2.35</b>	<b>&lt;</b>	<b>0.3 CFS / ACRE = 2.4</b>	<b>OK</b>

<b>TABLE 3</b>		
<b>MASTER DRAINAGE DESIGN DEVELOPED CONDITION</b>		
<b>DETENTION PONDS STAGES (WITH OFFSITE &amp; TAILWATER)</b>		
<b>Discharge Point</b>	<b>Normal Pool Elevation</b>	<b>100-year Stage Elevation</b>
<b>POND 1</b>	<b>867.5</b>	<b>870.95</b>

Storm sewers will be designed to provide capacity for a 10-year storm event. The rational method will be used to model the runoff rates, and Manning’s Equation will be used to calculate the capacity of the pipes. Calculations will be provided with the final design

The wet bottom detention pond will provide a best management practice (BMP) for stormwater quality. A stormwater quality structure that treats 80% total suspended solids will be installed as a pre-treatment measure for the detention ponds. Calculations will be provided with the final design.

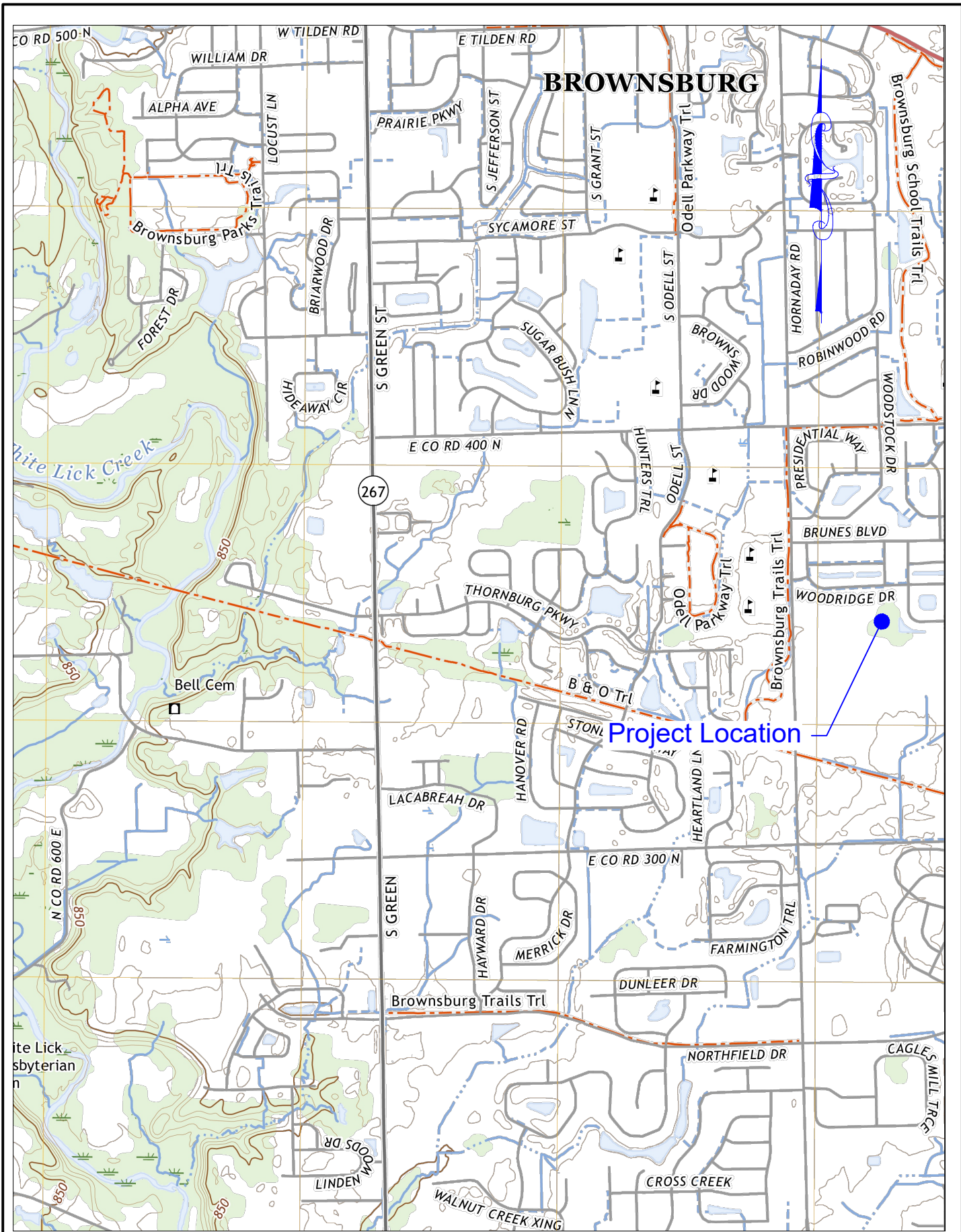
In conclusion, the calculations in this report show that drainage from the project will not cause any adverse impacts to the surrounding areas or the project site itself. We believe the project falls within the requirements of the Town of Brownsburg and Hendricks County drainage ordinances.

### **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. StormWise v4.08.03, Streamline Technologies, Inc.
4. Technical Report 55, Small Watershed Hydrology, NRCS
5. Hendricks County Stormwater Technical Standards Manual (December 2004 Edition)

## **A. USGS AREA MAP**

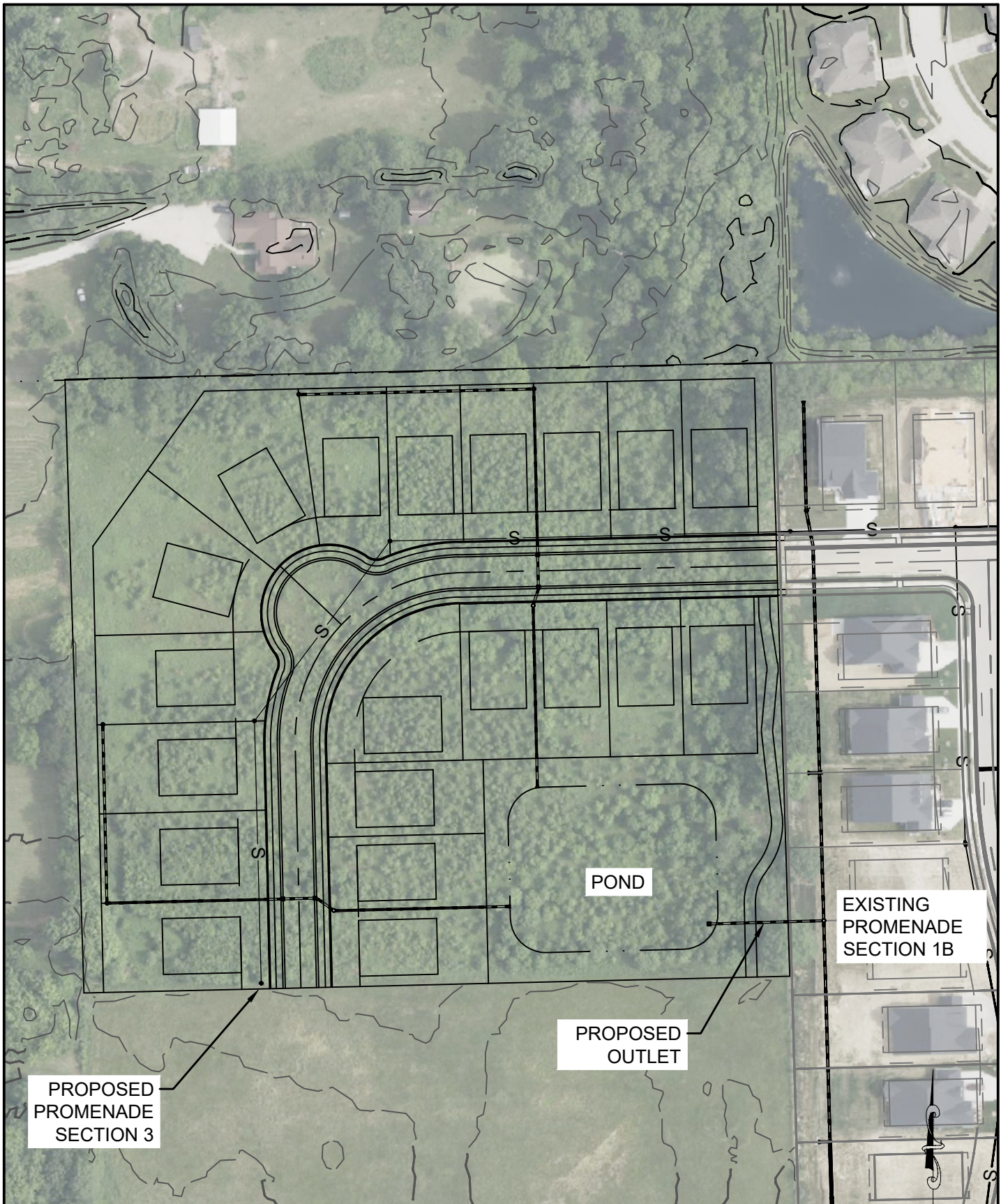


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 Date: 12/02/2025  
 Project No.: 25155  
 Scale: NONE  
 Page: 1 of 1

**AREA MAP**  
**PROMENADE, SECTION 3**  
**HENDRICKS COUNTY**  
**AVON, INDIANA**

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## **B. SITE MAP**

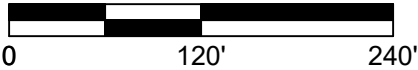


PROPOSED  
PROMENADE  
SECTION 3

PROPOSED  
OUTLET

EXISTING  
PROMENADE  
SECTION 1B

POND



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Page: 1 of 1

**SITE MAP**  
**PROMENADE, SECTION 3**  
**HENDRICKS COUNTY**  
**BROWNSBURG, INDIANA**

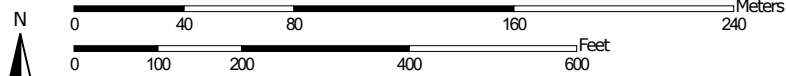
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## C. SOILS MAP

Hydrologic Soil Group—Hendricks County, Indiana



Map Scale: 1:2,750 if printed on A portrait (8.5" x 11") 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	1.6	4.9%
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	B/D	9.0	27.1%
YbvA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	B/D	9.2	27.8%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	13.3	40.2%
<b>Totals for Area of Interest</b>			<b>33.2</b>	<b>100.0%</b>

## 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

## **D. FLOOD MAP**

# National Flood Hazard Layer FIRMette

86°23'W 39°49'3"N



## Legend

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

**SPECIAL FLOOD HAZARD AREAS**

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

0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*

**OTHER AREAS OF FLOOD HAZARD**

- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**

- Area of Minimal Flood Hazard *Zone X*
- Effective LOMRS *Zone D*
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**

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

**OTHER FEATURES**

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

**MAP PANELS**

- Digital Data Available
- No Digital Data Available
- Unmapped

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

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

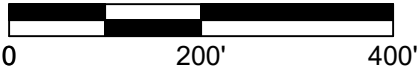
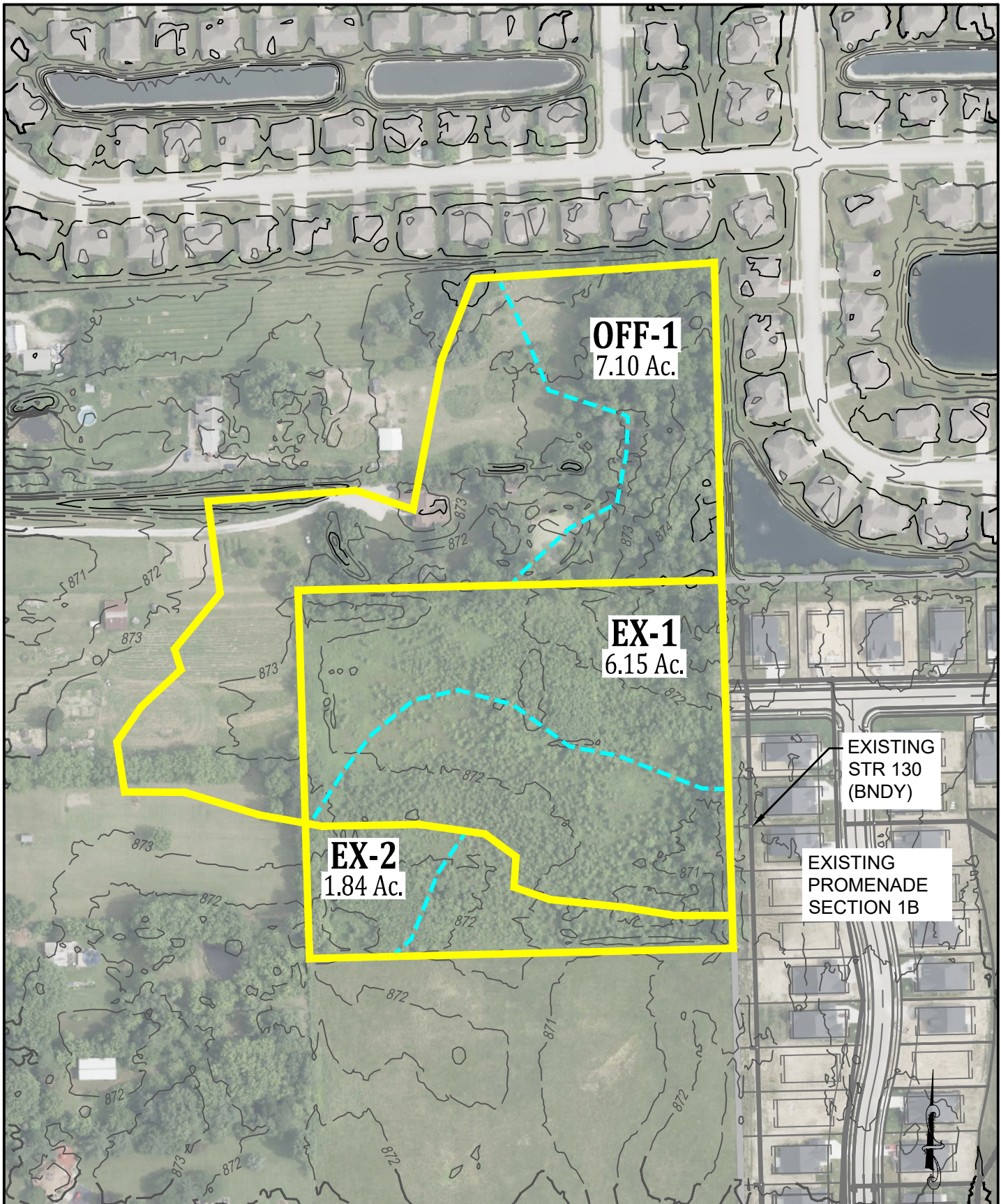
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/25/2025 at 1:16 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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



## **E. DRAINAGE DESIGN**

**E1. EXISTING CONDITION  
BASIN MAP**

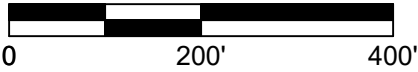
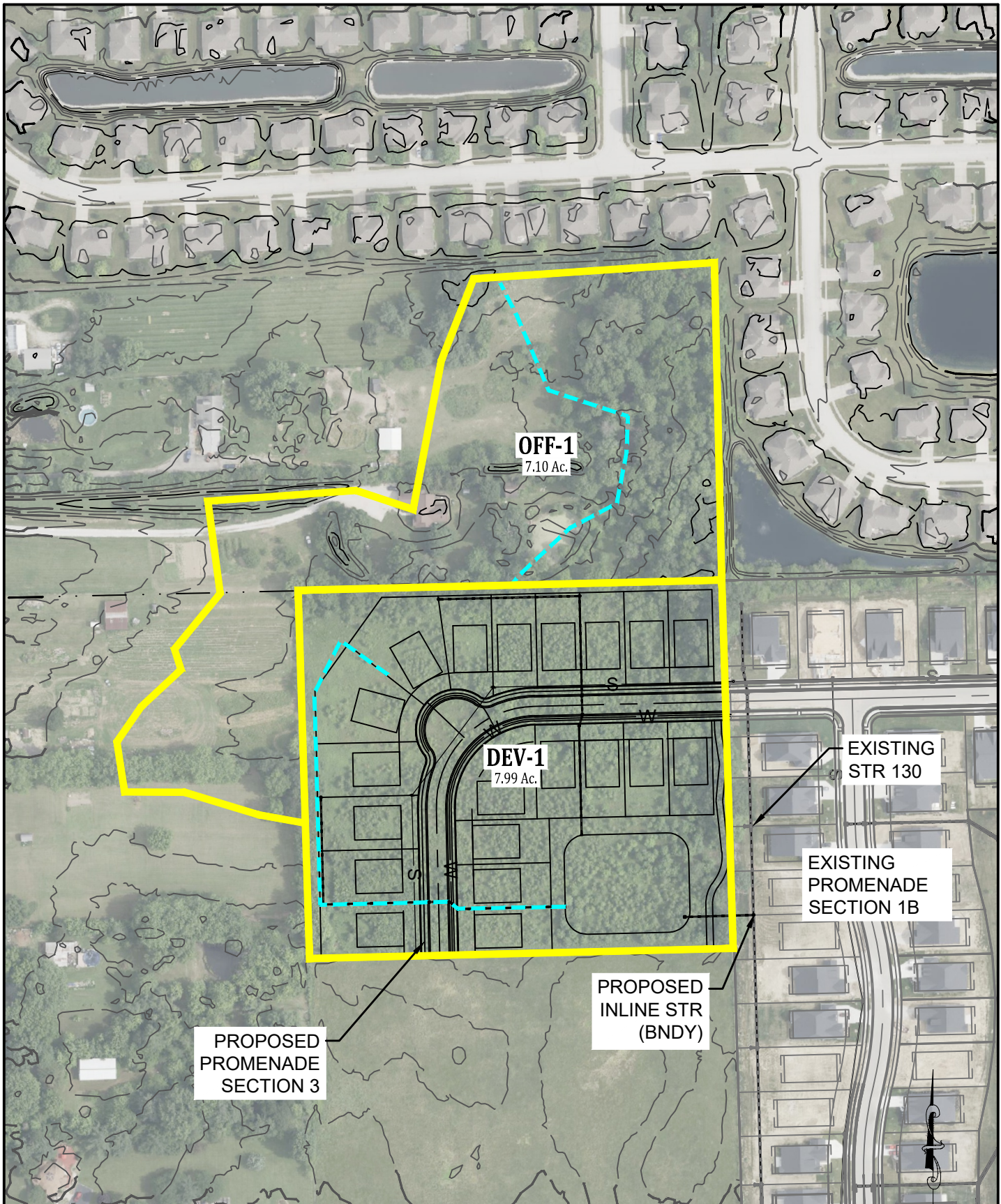


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 Project No.: 25155  
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**EXISTING BASIN MAP  
 PROMENADE, SECTION 3  
 HENDRICKS COUNTY  
 BROWNSBURG, INDIANA**

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**E2. DEVELOPED CONDITION  
BASIN MAP**

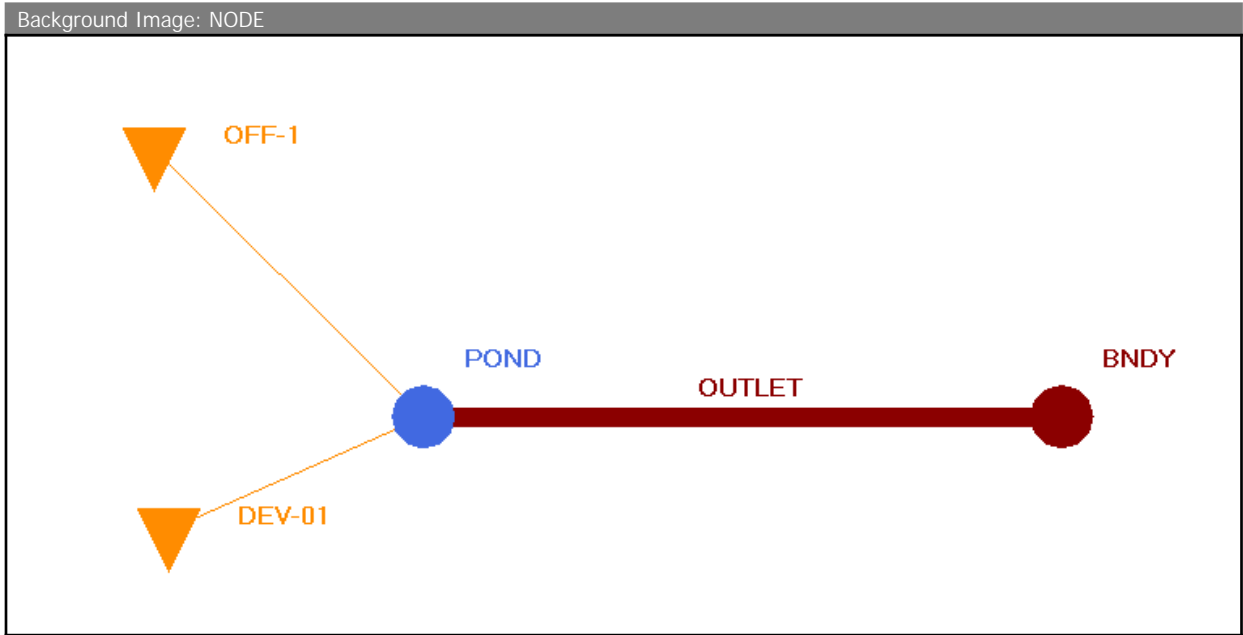


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 Project No.: 25155  
 Scale: AS SHOWN  
 Page: 1 of 1

**DEVELOPED BASIN MAP**  
**PROMENADE, SECTION 3**  
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## **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	010yr-24hr	867.10	867.10	867.00	0.0000	0.78	0.00	0
BNDY	100yr-24hr	867.10	867.10	867.00	0.0000	2.35	0.00	0
POND	010yr-24hr	871.50	871.50	869.31	0.0010	23.54	0.78	31033
POND	100yr-24hr	871.50	871.50	870.27	0.0010	39.49	2.35	33036

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	010yr-24hr	867.10	867.10	867.00	0.0000	1.78	0.00	0
BNDY	100yr-24hr	867.10	867.10	867.00	0.0000	9.48	0.00	0
POND	010yr-24hr	871.50	871.50	869.86	0.0010	30.61	1.78	32156
POND	100yr-24hr	871.50	871.50	870.95	0.0010	55.35	9.48	34521

**E4. DEVELOPED CONDITION  
T<sub>c</sub> AND C<sub>n</sub> VALUES**

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

PROJECT: Promenade, Section 3 JOB #: 25155 DATE: 12/3/25 COMPUTED BY: JET
--

BASINS					
BASIN	Composite CN	Area (ft <sup>2</sup> )	Area (acres)	Area (miles)	Tc
DEV-1	84.00	348044	7.99	0.01	17.3
OFF-1	68.00	309276	7.10	0.01	26.5

Basin	Cover Description	Soil Group	Area (Acres)	CN	CN * Acres
DEV-1	Paved parking lots, roofs, driveways	C	3	98	294
DEV-1	Good condition; grass cover > 75%	C	3.65	74	270.1
DEV-1	Good condition; grass cover > 75%	D	1.34	80	107.2
OFF-1	Paved parking lots, roofs, driveways	C	0.2	98	19.6
OFF-1	Woods - grass combination GOOD	B	1.27	58	73.66
OFF-1	Woods - grass combination GOOD	C	2	72	144
OFF-1	Good condition; grass cover > 75%	B	1.63	61	99.43
OFF-1	Good condition; grass cover > 75%	C	2	74	148

**Time of Concentration Worksheet**  
Based on TR-55

PROJECT: Promenade, Section 3  
JOB #: 25155

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		
	0.17		

2 year, 24 hour rainfall = 3.02 inches  
minimum T<sub>c</sub> = 5 minutes

Basin name	Overland flow			Shallow Concentrated Flow (1)			Shallow Concentrated Flow (2)			Channel Flow			T <sub>c</sub> (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)	S %	n	
DEV-1	85	2.5	0.24	320	1	U	1.6	3	0	391			0
OFF-1	100	1	0.24	531	0.6	U	1.2	7	0				0
				0			0	0	0				0
				0			0	0	0				0
				19			0	0	0				17
				0			0	0	0				26
				0			0	0	0				0

**E5. DEVELOPED CONDITION  
ICPR INPUT DATA**

## Simple Basin: DEV-01

Scenario: Scenario1  
 Node: POND  
 Hydrograph Method: NRCS Unit Hydrograph  
 Infiltration Method: Curve Number  
 Time of Concentration: 17.3000 min  
 Max Allowable Q: 9999.00 cfs  
 Time Shift: 0.0000 hr  
 Unit Hydrograph: UH484  
 Peaking Factor: 484.0  
 Area: 7.9900 ac  
 Curve Number: 84.0  
 Ia/S: 0.00  
 % Impervious: 0.00  
 % DCIA: 0.00  
 % Direct: 0.00  
 Rainfall Name:

Comment:

## Simple Basin: OFF-1

Scenario: Scenario1  
 Node: POND  
 Hydrograph Method: NRCS Unit Hydrograph  
 Infiltration Method: Curve Number  
 Time of Concentration: 26.5000 min  
 Max Allowable Q: 9999.00 cfs  
 Time Shift: 0.0000 hr  
 Unit Hydrograph: UH484  
 Peaking Factor: 484.0  
 Area: 7.1000 ac  
 Curve Number: 68.0  
 Ia/S: 0.00  
 % Impervious: 0.00  
 % DCIA: 0.00  
 % Direct: 0.00  
 Rainfall Name:

Comment:

## Node: BNDY

Scenario: Scenario1  
 Type: Time/Stage  
 Base Flow: 0.00 cfs  
 Initial Stage: 867.00 ft

Warning Stage: 867.10 ft  
 Alert Stage: 867.10 ft  
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	867.00
0	0	0	30.0000	867.00

Comment:

**Node: POND**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 867.50 ft  
 Warning Stage: 871.50 ft  
 Alert Stage: 871.50 ft

Stage [ft]	Area [ac]	Area [ft2]
867.50	0.5500	23958
868.50	0.6800	29621
869.50	0.7200	31363
870.50	0.7700	33541
871.50	0.8200	35719

Comment:

Drop Structure Link: OUTLET	Upstream Pipe	Downstream Pipe
Scenario: Scenario1	Invert: 867.50 ft	Invert: 867.20 ft
From Node: POND	Manning's N: 0.0130	Manning's N: 0.0130
To Node: BNDY	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: 100.00 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: 867.50 ft	Op Table:
Control Elevation: 867.50 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	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 869.30 ft	Op Table:
Control Elevation: 869.30 ft	Ref Node:
Max Depth: 0.50 ft	Discharge Coefficients
Max Width: 0.70 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Weir Component	
Weir: 3	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 870.27 ft	Op Table:
Control Elevation: 870.27 ft	Ref Node:
Max Depth: 3.00 ft	Discharge Coefficients
Max Width: 3.00 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 010yr-24hr

Scenario: Scenario1  
 Run Date/Time: 11/26/2025 3:25:10 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  
 Link Optimizer Tol: 0.0001 ft

Smp/Man Basin Rain Global  
 Opt:  
 Rainfall Name: ~SCSII-24  
 Rainfall Amount: 4.28 in  
 Storm Duration: 24.0000 hr  
 Dfit Damping (1D): 0.0050 ft  
 Min Node Srf Area 100 ft2  
 (1D):  
 Energy Switch (1D): Energy

Comment:

Simulation: 100yr-24hr

Scenario: Scenario1  
 Run Date/Time: 11/26/2025 3:25:15 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	30.0000

	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 0.5 dec	Ia/S: 0.20 dec
Fact:	
dZ Tolerance: 0.0010 ft	Smp/Man Basin Rain Global
Max dZ: 1.0000 ft	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:

**F. PREVIOUS DRAINAGE  
CALCULATIONS & SUPPORTING  
DOCUMENTS**



**“Your Project is Our Priority”**

---

## **DRAINAGE REPORT**

for

**PROMENADE, SECTIONS 1A & 1B**

In

Town of Brownsburg  
Hendricks County, Indiana

Prepared for:

Pulte Group – Indianapolis Division  
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Revision 2: March 24, 2022  
Revision 1: February 23, 2022  
Original Submittal: January 10, 2022  
(Submittal to Town of Brownsburg)

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# Drainage Narrative for: Promenade, Sections 1A & 1B

## I. INTRODUCTION:

This drainage report was prepared for a 54.2± acre residential subdivisions known as Promenade, located about 0.3 miles east of Hornaday Road near the northwest corner of E County Rd 300N and the new extension of Northfield Dr., in the southwest quarter; Section 24; Township 16 North; Range 1 East; Town of Brownsburg; Hendricks County, Indiana. The Promenade project is a proposed residential development that will contain 124 single family residences. The project will be developed in sections, with Sections 1A & 1B developed first. Sections 1A & 1B consists of 34.3± acres of development resulting in 72 lots of single-family dwellings. This report includes the result of a master drainage design for the entire development and the result of Sections 1A & 1B alone.

## 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
ThrA	Treaty silty clay loam	B
YclA	Brookston silty clay loam	B
YbvA	Crosby silt loam	C

## IV. SITE DRAINAGE ANALYSIS:

### a. Stormwater Discharge Requirements

Allowable Stormwater discharge is based on requirements found in the Hendricks County Stormwater Management Ordinance. Allowable discharge is based on a rate of discharge (CFS) per acre of development. The project is located within a watershed area that has a more restrictive release rate. The following **Table 1** are summaries of the stormwater discharge requirements.

**TABLE 1**  
 STORMWATER DISCHARGE REQUIREMENTS  
 HENDRICKS COUNTY

$Q_{10p} \leq 0.025 \text{ cfs / acre of development}$ $Q_{100p} \leq 0.073 \text{ cfs / acre of development}$	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
---	--

## **b. MASTER DRAINAGE DESIGN**

### **i. EXISTING CONDITIONS**

The majority of the 54.2± acre site consists of farm field (row crops), with the Pollard Todd Legal Drain running from the northeast to southwest corner of the site. The existing 50.6± acres to be developed (EX-1 & EX-2) currently drain directly into the Pollard Todd Legal Drain to an existing 48” culvert under a trail at the south end of the site (BNDY). Several offsite/undeveloped areas also drain through the Pollard Todd legal drain. OFF-1 is a 13.3± acre area directly west of the site that drains east to the west property line, then south into the legal drain. OFF-2 is an 8.5± acre area located east of the site that drains west into the legal drain. OFF-3 is a 26.0± acre area located west of the site that drains southeast into the legal drain. UNDEV is a 0.7± acre area at the northeast corner of the site that drains into the legal drain. BEACON PND A is a 71.6± acre area that drains to Pond A in Beacon Point subdivision. Pond A routes to Pond B in Beacon Point, which receives 27.0± acres and outlets to the Pollard Todd Legal Drain. Calculations and supporting data from the previous Beacon Point drainage report and Northfield Drive drainage report can be found under Appendix F. About 39.3± acres in Holiday Pine subdivision (HOL PINE PND N1, HOL PINE PND N2, HOL PINE PND N3 & HOL PINE PND N4) are all interconnected and discharge into the Pollard Todd Legal Drain. Calculations and supporting data from the previous Holiday Pines drainage report can be found under Appendix F. A hydrologic/hydraulic model of the existing conditions for the entire watershed to BNDY was completed using Streamline Technologies Interconnected Channel and Pond Routing software (ICPR-4). Results can be found under Appendix D.

### **ii. DEVELOPED CONDITIONS**

In the developed condition, there are three ponds that will receive runoff from the development, providing stormwater detention (POND-1, POND-2, POND-3). Approximately 20.4± acres of developed onsite area (DEV-1) drains to POND-1, which outlets to POND-2. About 6.7± acres of developed onsite area (108, 110, 111 & 112) drains to the storm system that interconnects Pond-1 & Pond-2. About 5.6± acres of developed onsite area (DEV-2) and 13.3± acres of existing offsite area (OFF-1) drains to POND-2, which outlets into the Pollard Todd Legal Drain. About 0.7± acres of undeveloped area (UNDEV), located at the northeast corner of the site, drains directly to the legal drain. About 19.4± acres of developed onsite area (DEV-3) drains to POND-3, which outlets into the Pollard Todd Drain. The Pollard Todd Legal Drain and tributary watershed was included in the developed hydrologic/hydraulic model for analyzing the tailwater condition at the pond outlets. Results are provided in the appendix showing discharge from the site with onsite conditions only, and with offsite conditions that include tailwater conditions in the Pollard Todd Drain. There are two locations where a new roadway will cross the Pollard Todd Legal Drain. Box culverts will be installed at the crossings to ensure continuous flow through the legal drain. Design of the culverts are included in the hydrologic/hydraulic model. The allowable discharge rate at BNDY is based on the 50.6± acres that are being developed. The following **TABLE 2** shows the allowable and developed discharge rates. **TABLE 3** shows the developed 100-year detention pond stage elevations with offsite areas and tailwater from the Pollard Todd Legal Drain included.

<b>TABLE 2</b>				
<b>MASTER DRAINAGE DESIGN DEVELOPED CONDITION</b>				
<b>STORMWATER DISCHARGE (ONSITE ONLY)</b>				
<b>Discharge Point</b>	<b>Developed Discharge (CFS)</b>		<b>Allowable Discharge (CFS)</b>	
<b>BNDY</b>	<b>Q<sub>10p</sub> = 1.2</b>	<b>&lt;</b>	<b>0.025 CFS / ACRE = 1.3</b>	<b>OK</b>
	<b>Q<sub>100p</sub> = 2.6</b>	<b>&lt;</b>	<b>0.073 CFS / ACRE = 3.7</b>	<b>OK</b>

<b>TABLE 3</b>		
<b>MASTER DRAINAGE DESIGN DEVELOPED CONDITION</b>		
<b>DETENTION PONDS STAGES (WITH OFFSITE &amp; TAILWATER)</b>		
<b>Discharge Point</b>	<b>Normal Pool Elevation</b>	<b>100-year Stage Elevation</b>
<b>POND 1</b>	<b>867</b>	<b>869.8</b>
<b>POND 2</b>	<b>865.5</b>	<b>870.2</b>
<b>POND 3</b>	<b>866</b>	<b>870.4</b>

**c. SECTIONS 1A & 1B DRAINAGE DESIGN**

Approximately 31.1± acres will be developed for Promenade, Sections 1A & 1B. Two ponds will be developed (POND-1, POND-2) to provide stormwater detention. Approximately 20.4± acres of developed onsite area (DEV-1) drains to POND-1, which outlets to POND-2. About 6.7± acres of developed onsite area (108, 110, 111 & 112) drains to the storm system that interconnects Pond-1 & Pond-2. About 5.6± acres of developed onsite area (DEV-2) and 13.3± acres of existing offsite area (OFF-1) drains to POND-2, which outlets into the Pollard Todd Legal Drain. About 0.7± acres of undeveloped area (UNDEV), located at the northeast corner of the site, drains directly to the legal drain. As with the Master Drainage Design, the Pollard Todd Legal Drain and tributary watershed was included in the developed Sections 1A & 1B hydrologic/hydraulic model for analyzing the tailwater condition at the pond outlet. Results are provided in the appendix showing discharge from the site with onsite conditions only, and with offsite conditions that include tailwater conditions in the Pollard Todd Drain. There is one location where a new roadway will cross the Pollard Todd Legal Drain in Sections 1A & 1B. A 6'x5' Box culvert (with on-foot sump below the flowline) will be installed at the crossings to ensure continuous flow through the legal drain. Design of the culvert is included in the hydrologic/hydraulic model. The allowable discharge rate at BNDY is based on the 31.1± acres that are being developed. The following **TABLE 4** on the following page shows the allowable and developed discharge rates. **TABLE 5** shows the developed 100-year detention pond stage elevations with offsite areas and tailwater from the Pollard Todd Legal Drain included.

<b>TABLE 4</b>				
<b>SECTIONS 1A &amp; 1B DEVELOPED CONDITION</b>				
<b>STORMWATER DISCHARGE (ONSITE ONLY)</b>				
<b>Discharge Point</b>	<b>Developed Discharge (CFS)</b>		<b>Allowable Discharge (CFS)</b>	
<b>BNDY</b>	<b>Q<sub>10p</sub> = 0.6</b>	<b>&lt;</b>	<b>0.025 CFS / ACRE = 0.8</b>	<b>OK</b>
	<b>Q<sub>100p</sub> = 1.8</b>	<b>&lt;</b>	<b>0.073 CFS / ACRE = 2.3</b>	<b>OK</b>

<b>TABLE 5</b>		
<b>SECTIONS 1A &amp; 1B DEVELOPED CONDITION</b>		
<b>DETENTION PONDS STAGES (WITH OFFSITE &amp; TAILWATER)</b>		
<b>Discharge Point</b>	<b>Normal Pool Elevation</b>	<b>100-year Stage Elevation</b>
<b>POND 1</b>	<b>867</b>	<b>869.8</b>
<b>POND 2</b>	<b>865.5</b>	<b>870.3</b>

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 proposed 6’x5’ box culvert for the crossing of the Pollard Todd Legal Drain was designed with capacity to convey the emergency flood routing from the upstream watershed during a 100-yr storm event. About 98.6± acres (BEACON PND A & BEACON PND B) flood routes from Pond B in Beacon Point heading to the south along the east side of Northfield Rd. About 39.3± acres in Holiday Pine subdivision (HOL PINE PND N1, HOL PINE PND N2, HOL PINE PND N3 & HOL PINE PND N4) flood routes from Pond N1 and into the Pollard Todd Legal Drain just north of the proposed culvert. A hydrologic/hydraulic model was developed to analyze this scenario. In this model, all the links upstream of the proposed culvert are designed as broad crested weirs to simulate overland flow. The 24-inch outlet from Pond B in Beacon Pointe to the proposed culvert remains active to model the discharge from the headwater generated by the flood routing along the east side of Northfield Rd. Calculations can be found in the appendix.

The wet bottom detention pond will provide a best management practice (BMP) for stormwater quality. A stormwater quality structure that treats 80% total suspended solids will be installed as a pre-treatment measure for the detention ponds.

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.

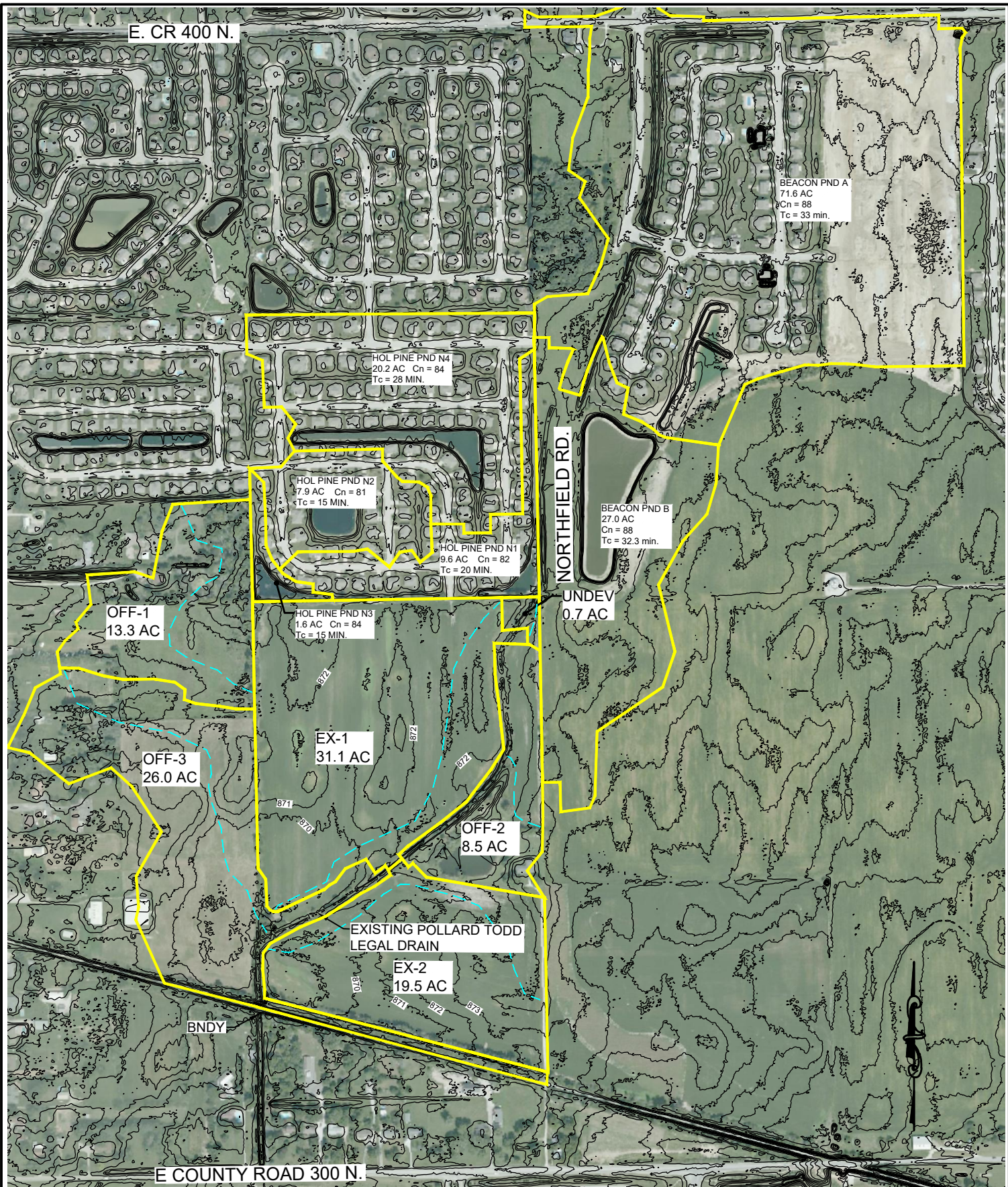
**References:**

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. Hendricks County Stormwater Technical Standards Manual (December 2004 Edition)

## **D. MASTER DRAINAGE DESIGN**

**D1. EXISTING CONDITION  
BASIN MAP**

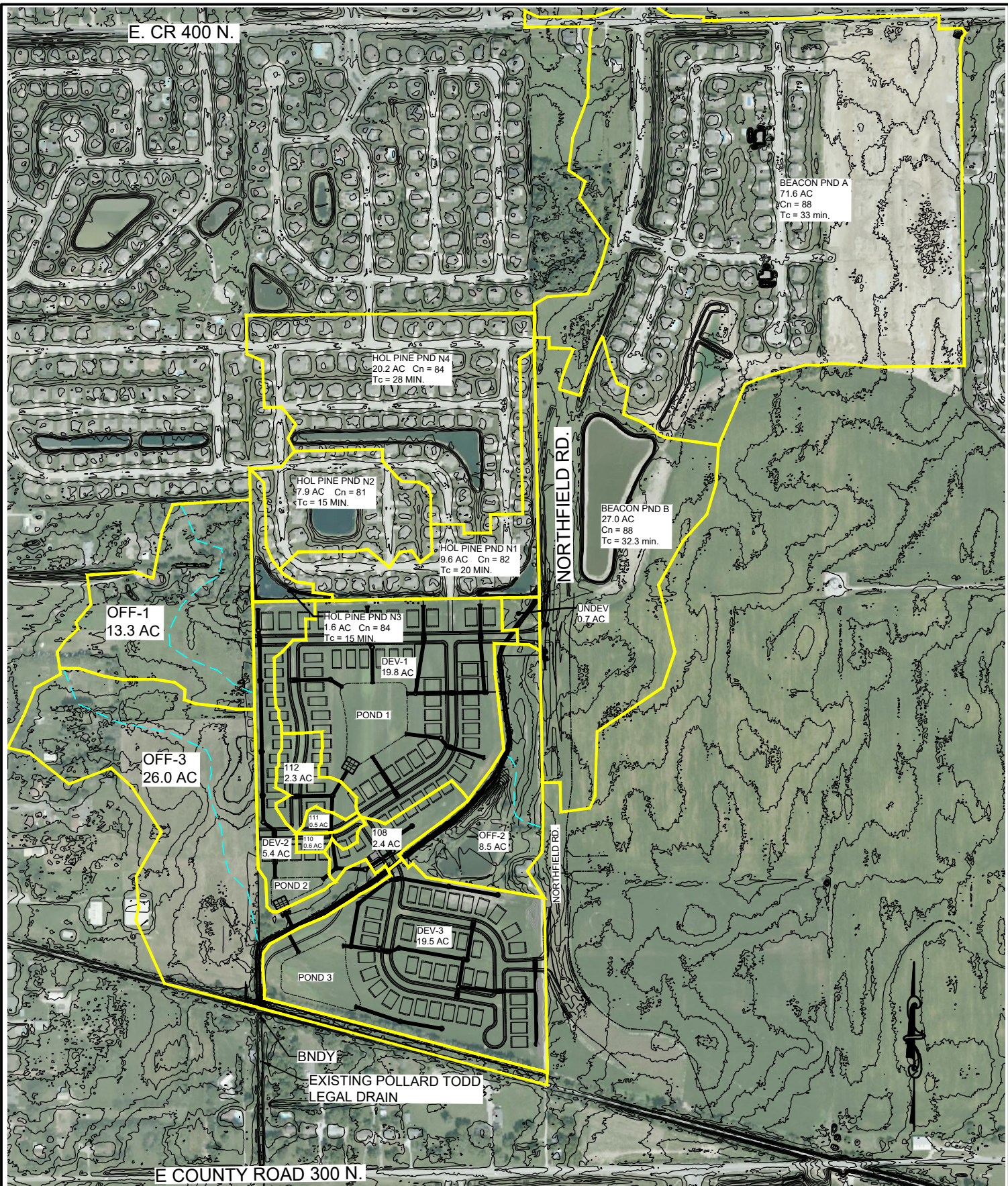


Drawn By: JET  
 Date: 12/31/2021  
 Project No.: 21113  
 Scale: AS SHOWN  
 Page: 1 of 1

EXISTING CONDITIONS  
 MASTER DRAINAGE DESIGN  
 PROMENADE  
 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](mailto:Banning@BanningEngineering.com)  
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**D5. DEVELOPED CONDITION  
BASIN MAP**



E. CR 400 N.

BEACON PND A  
71.6 AC  
Cn = 88  
Tc = 33 min.

HOL PINE PND N4  
20.2 AC Cn = 84  
Tc = 28 MIN.

HOL PINE PND N2  
7.9 AC Cn = 81  
Tc = 15 MIN.

HOL PINE PND N1  
9.6 AC Cn = 82  
Tc = 20 MIN.

BEACON PND B  
27.0 AC  
Cn = 88  
Tc = 32.3 min.

NORTHFIELD RD.

UNDEV  
0.7 AC

OFF-1  
13.3 AC

HOL PINE PND N3  
1.6 AC Cn = 84  
Tc = 15 MIN.

DEV-1  
19.8 AC

POND 1

OFF-3  
26.0 AC

112  
2.3 AC

111  
0.5 AC

108  
2.4 AC

OFF-2  
8.5 AC

DEV-2  
5.4 AC

POND 2

DEV-3  
19.5 AC

POND 3

NORTHFIELD RD.

BNDY

EXISTING POLLARD TODD  
LEGAL DRAIN

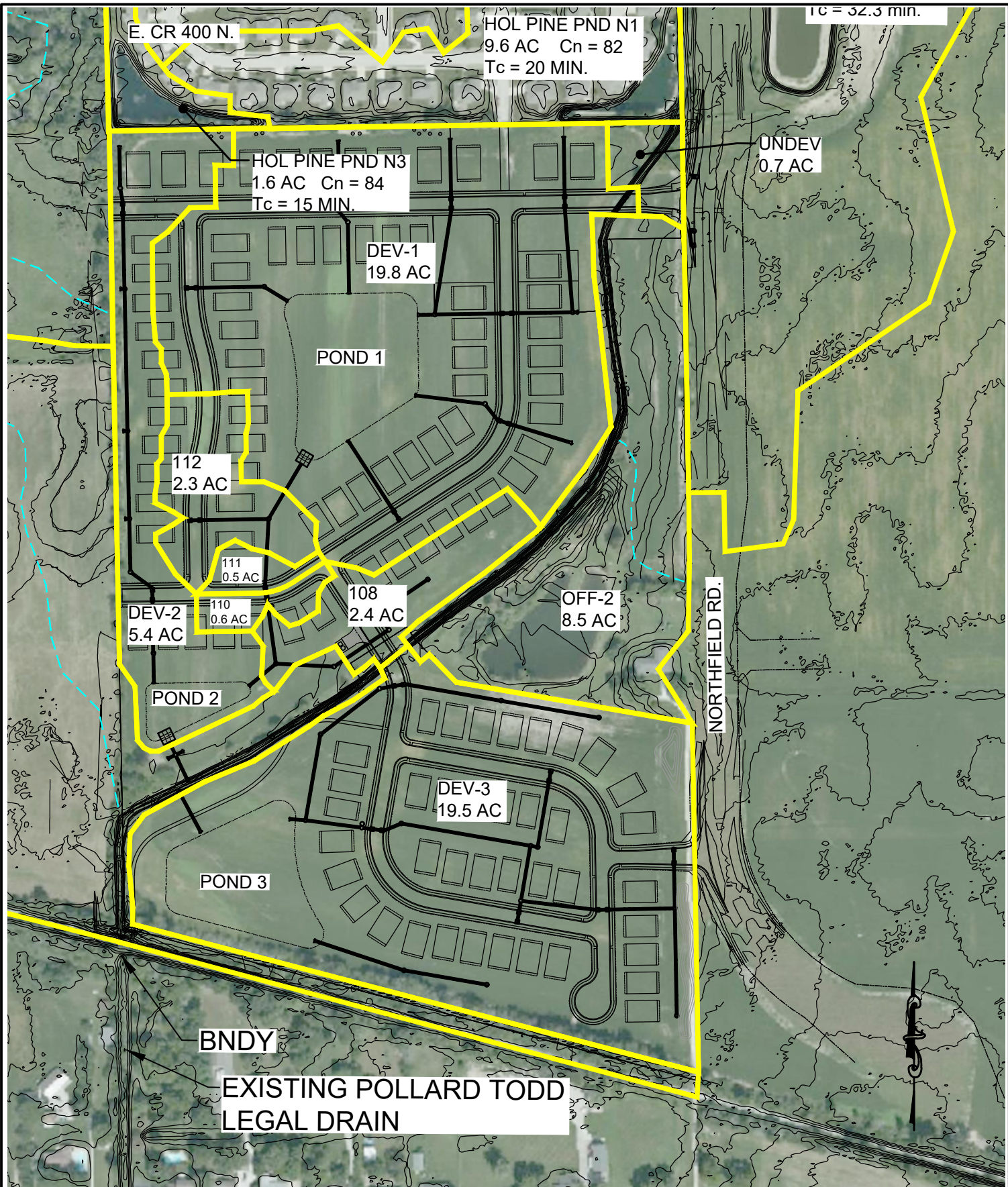
E COUNTY ROAD 300 N.



Drawn By: JET  
Date: 11/30/2021  
Project No.: 21113  
Scale: AS SHOWN  
Page: 1 of 1

DEVELOPED OVERALL BASINS  
MASTER DRAINAGE DESIGN  
PROMENADE  
HENDRICKS COUNTY  
BROWNSBURG, INDIANA

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WEB: [www.BanningEngineering.com](http://www.BanningEngineering.com)



TC = 32.3 min.

E. CR 400 N.

HOL PINE PND N1  
9.6 AC Cn = 82  
Tc = 20 MIN.

UNDEV  
0.7 AC

HOL PINE PND N3  
1.6 AC Cn = 84  
Tc = 15 MIN.

DEV-1  
19.8 AC

POND 1

112  
2.3 AC

111  
0.5 AC

DEV-2  
5.4 AC

110  
0.6 AC

108  
2.4 AC

OFF-2  
8.5 AC

POND 2

DEV-3  
19.5 AC

POND 3

NORTHFIELD RD.

BNDY

EXISTING POLLARD TODD  
LEGAL DRAIN



Drawn By: JET  
Date: 11/30/2021  
Project No.: 21113  
Scale: AS SHOWN  
Page: 1 of 1

DEVELOPED SITE BASINS  
MASTER DRAINAGE DESIGN  
PROMENADE  
HENDRICKS COUNTY  
BROWNSBURG, INDIANA

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## **D6. DEVELOPED CONDITION CALCULATIONS**

## Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
0+06.69	10 -yr 24-hour	867.00	864.49	0.00	1.23	1.23	234.9
0+06.69	100-yr 24-hour	867.00	864.65	0.00	2.55	2.56	298.4
0+94.92	10 -yr 24-hour	871.00	864.94	0.00	1.23	1.23	1475.4
0+94.92	100-yr 24-hour	871.00	865.12	0.00	2.55	2.55	1944.3
10+49.75	10 -yr 24-hour	871.00	865.40	0.00	0.00	0.00	454.4
10+49.75	100-yr 24-hour	871.00	865.55	0.00	0.02	0.01	508.1
108	10 -yr 24-hour	868.50	868.17	0.00	18.67	18.67	214.8
108	100-yr 24-hour	868.50	869.15	0.00	27.30	27.40	214.8
109	10 -yr 24-hour	870.60	868.59	0.00	11.00	11.25	151.9
109	100-yr 24-hour	870.60	869.85	0.00	14.46	14.56	151.9
110	10 -yr 24-hour	870.20	868.72	0.00	10.96	11.00	100.0
110	100-yr 24-hour	870.20	870.09	0.00	14.44	14.46	100.0
111	10 -yr 24-hour	870.20	868.83	0.00	8.68	8.73	186.8
111	100-yr 24-hour	870.20	870.26	0.00	11.37	10.99	186.8
112	10 -yr 24-hour	870.30	869.02	0.00	7.50	7.51	155.0
112	100-yr 24-hour	870.30	870.50	0.00	12.15	12.19	155.0
15+76.08	10 -yr 24-hour	871.00	866.06	0.00	0.00	0.00	318.1
15+76.08	100-yr 24-hour	871.00	866.07	0.00	0.00	0.00	395.8
19+73.33	10 -yr 24-hour	871.00	866.36	0.00	0.00	0.00	129.1
19+73.33	100-yr 24-hour	871.00	866.36	0.00	0.00	0.00	141.1
22+28.59	10 -yr 24-hour	871.00	866.52	0.00	0.00	0.00	283.3
22+28.59	100-yr 24-hour	871.00	866.52	0.00	0.00	0.00	286.6
23+85.21	10 -yr 24-hour	871.00	866.60	0.00	0.00	0.00	512.1
23+85.21	100-yr 24-hour	871.00	866.60	0.00	0.00	0.00	512.1
24+96.7	10 -yr 24-hour	871.00	866.63	0.00	0.00	0.00	100.0
24+96.7	100-yr 24-hour	871.00	866.63	0.00	0.00	0.00	100.0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
4+70.06	10 -yr 24-hour	871.00	865.37	0.00	1.23	1.23	2839.8
4+70.06	100-yr 24-hour	871.00	865.55	0.00	2.56	2.55	3420.1
9+39.55	10 -yr 24-hour	871.00	865.37	0.00	0.07	0.00	1023.1
9+39.55	100-yr 24-hour	871.00	865.55	0.00	0.09	0.02	1259.4
BNDY	10 -yr 24-hour	863.10	863.00	0.00	1.23	0.00	0.0
BNDY	100-yr 24-hour	863.10	863.00	0.00	2.56	0.00	0.0
Beacon Pnd A	10 -yr 24-hour	873.00	868.50	0.00	0.00	0.00	87296.4
Beacon Pnd A	100-yr 24-hour	873.00	868.50	0.00	0.00	0.00	87302.7
Beacon Pnd B	10 -yr 24-hour	872.00	868.50	0.00	0.00	0.00	152635.9
Beacon Pnd B	100-yr 24-hour	872.00	868.50	0.00	0.00	0.00	152641.6
HOL PINE N1	10 -yr 24-hour	872.00	868.00	0.00	0.00	0.00	19230.8
HOL PINE N1	100-yr 24-hour	872.00	868.01	0.00	0.00	0.00	19282.2
HOL PINE N2	10 -yr 24-hour	873.00	869.00	0.00	0.00	0.00	31392.2
HOL PINE N2	100-yr 24-hour	873.00	869.00	0.00	0.00	0.00	31417.2
HOL PINE N3	10 -yr 24-hour	873.50	870.00	0.00	0.00	0.00	18764.0
HOL PINE N3	100-yr 24-hour	873.50	870.01	0.00	0.00	0.00	18788.8
HOL PINE N4	10 -yr 24-hour	873.00	869.00	0.00	0.00	0.00	61001.9
HOL PINE N4	100-yr 24-hour	873.00	869.00	0.00	0.00	0.00	61016.6
POND 1	10 -yr 24-hour	871.00	868.64	0.00	59.26	0.36	129092.9
POND 1	100-yr 24-hour	871.00	869.70	0.00	98.04	0.48	133707.5
POND 2	10 -yr 24-hour	870.00	867.97	0.00	33.33	0.60	47799.1
POND 2	100-yr 24-hour	870.00	868.74	0.00	51.59	1.77	49209.5
POND 3	10 -yr 24-hour	871.00	868.72	0.00	54.76	0.63	72849.7
POND 3	100-yr 24-hour	871.00	870.37	0.00	89.15	0.82	80028.6
STR 101	10 -yr 24-hour	870.00	865.48	0.00	0.60	0.60	100.0
STR 101	100-yr 24-hour	870.00	865.71	0.00	1.77	1.77	100.0

## Node Max Conditions [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
0+06.69	10 -yr 24-hour	867.00	867.11	0.00	59.04	58.80	2156.6
0+06.69	100-yr 24-hour	867.00	868.04	0.00	88.52	85.99	8664.6
0+94.92	10 -yr 24-hour	871.00	867.16	0.00	59.03	59.04	4001.9
0+94.92	100-yr 24-hour	871.00	868.06	0.00	87.79	88.52	7697.5
10+49.75	10 -yr 24-hour	871.00	867.84	0.00	29.42	28.15	2936.8
10+49.75	100-yr 24-hour	871.00	868.60	0.00	54.00	51.71	3596.0
108	10 -yr 24-hour	868.50	868.94	0.00	18.67	18.68	214.8
108	100-yr 24-hour	868.50	870.20	0.00	26.65	26.52	214.7
109	10 -yr 24-hour	870.60	868.95	0.00	11.00	11.27	151.9
109	100-yr 24-hour	870.60	870.19	0.00	14.19	14.04	151.9
110	10 -yr 24-hour	870.20	868.95	0.00	10.96	11.00	100.0
110	100-yr 24-hour	870.20	870.27	0.00	14.37	14.19	100.0
111	10 -yr 24-hour	870.20	868.95	0.00	8.70	8.74	186.8
111	100-yr 24-hour	870.20	870.41	0.00	11.40	11.02	186.8
112	10 -yr 24-hour	870.30	869.02	0.00	7.50	7.52	155.0
112	100-yr 24-hour	870.30	870.62	0.00	12.15	12.13	155.0
15+76.08	10 -yr 24-hour	871.00	868.39	0.00	31.17	29.42	5923.6
15+76.08	100-yr 24-hour	871.00	869.12	0.00	56.90	54.00	7222.6
19+73.33	10 -yr 24-hour	871.00	868.78	0.00	32.12	31.17	3709.7
19+73.33	100-yr 24-hour	871.00	869.51	0.00	58.53	56.90	4538.6
22+28.59	10 -yr 24-hour	871.00	868.98	0.00	24.37	24.38	1766.0
22+28.59	100-yr 24-hour	871.00	869.64	0.00	37.52	37.73	2042.3
23+85.21	10 -yr 24-hour	871.00	869.03	0.00	24.32	24.37	977.9
23+85.21	100-yr 24-hour	871.00	869.71	0.00	37.43	37.52	1096.4
24+96.7	10 -yr 24-hour	871.00	869.09	0.00	24.14	24.13	992.5
24+96.7	100-yr 24-hour	871.00	869.76	0.00	36.64	36.74	1039.7

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
4+70.06	10 -yr 24-hour	871.00	867.58	0.00	59.60	59.03	6437.6
4+70.06	100-yr 24-hour	871.00	868.36	0.00	90.86	87.79	7468.9
9+39.55	10 -yr 24-hour	871.00	867.79	0.00	28.15	28.28	3341.5
9+39.55	100-yr 24-hour	871.00	868.52	0.00	51.71	49.76	3872.6
BNDY	10 -yr 24-hour	863.10	863.00	0.00	58.80	0.00	0.0
BNDY	100-yr 24-hour	863.10	863.00	0.00	85.99	0.00	0.0
Beacon Pnd A	10 -yr 24-hour	873.00	871.33	0.00	168.44	65.28	101642.1
Beacon Pnd A	100-yr 24-hour	873.00	873.12	0.00	271.95	93.41	109434.7
Beacon Pnd B	10 -yr 24-hour	872.00	871.32	0.00	123.07	12.45	174317.5
Beacon Pnd B	100-yr 24-hour	872.00	873.03	0.00	185.62	19.82	187317.9
HOL PINE N1	10 -yr 24-hour	872.00	869.51	0.00	28.76	15.24	23825.0
HOL PINE N1	100-yr 24-hour	872.00	870.50	0.00	48.78	23.76	26631.3
HOL PINE N2	10 -yr 24-hour	873.00	870.14	0.00	22.39	2.19	33199.7
HOL PINE N2	100-yr 24-hour	873.00	871.20	0.00	38.83	2.62	34684.5
HOL PINE N3	10 -yr 24-hour	873.50	870.40	0.00	5.00	0.90	19953.6
HOL PINE N3	100-yr 24-hour	873.50	870.68	0.00	8.36	1.71	20676.6
HOL PINE N4	10 -yr 24-hour	873.00	870.63	0.00	46.46	5.30	70763.8
HOL PINE N4	100-yr 24-hour	873.00	871.89	0.00	78.39	6.89	78638.1
POND 1	10 -yr 24-hour	871.00	868.79	0.00	59.26	0.28	129783.7
POND 1	100-yr 24-hour	871.00	869.78	0.00	98.99	0.49	134090.1
POND 2	10 -yr 24-hour	870.00	868.94	0.00	44.44	2.19	49551.5
POND 2	100-yr 24-hour	870.00	870.19	0.00	71.42	23.87	53097.0
POND 3	10 -yr 24-hour	871.00	868.75	0.00	54.76	0.63	72983.1
POND 3	100-yr 24-hour	871.00	870.43	0.00	89.15	0.89	80264.0
STR 101	10 -yr 24-hour	870.00	868.31	0.00	32.53	32.52	106.7
STR 101	100-yr 24-hour	870.00	869.72	-0.02	67.74	51.26	197099.2

**D7. DEVELOPED CONDITION  
T<sub>c</sub> AND C<sub>n</sub> VALUES**

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

PROJECT: Promenade  
JOB #: 21113  
DATE: 1/7/22  
COMPUTED BY: JET

BASINS					
BASIN	Composite CN	Area (ft <sup>2</sup> )	Area (acres)	Area (miles)	Tc
DEV-1	88.00	862488	19.80	0.03	21.9
DEV-2	84.00	235224	5.40	0.01	20.5
DEV-3	87.00	849420	19.50	0.03	23.1
108	85.00	104544	2.40	0.00	14.4
110	92.00	26136	0.60	0.00	14.1
111	87.00	21780	0.50	0.00	13.8
112	87.00	100188	2.30	0.00	16.8

Basin	Cover Description	Soil Group	Area (Acres)	CN	CN * Acres	number	Basin #	CN	Acres	CN * Acres
DEV-1	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	10.5	80	840	5	DEV-1	88	19.8	1751.4
DEV-1				98	911.4		84	5.4	455.4	
DEV-3				98	911.4		87	19.5	1702.2	
DEV-2	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	4.1	80	328	5	108	85	2.4	202.8
DEV-2				98	127.4		110	0.6	55.2	
DEV-3	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	11.6	80	928	5	111	87	0.5	43.6
DEV-3				98	774.2		112	2.3	200.2	
108	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	1.8	80	144	5				
108				98	58.8					
110	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	0.2	80	16	5				
110				98	39.2					
111	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	0.3	80	24	5				
111				98	19.6					
112	Good condition; grass cover > 75% Paved parking lots, roofs, driveways	D	1.4	80	112	5				
112				98	88.2					

**Time of Concentration Worksheet**

Based on TR-55

PROJECT: Promenade  
JOB #: 21113

Typical values for Manning's n

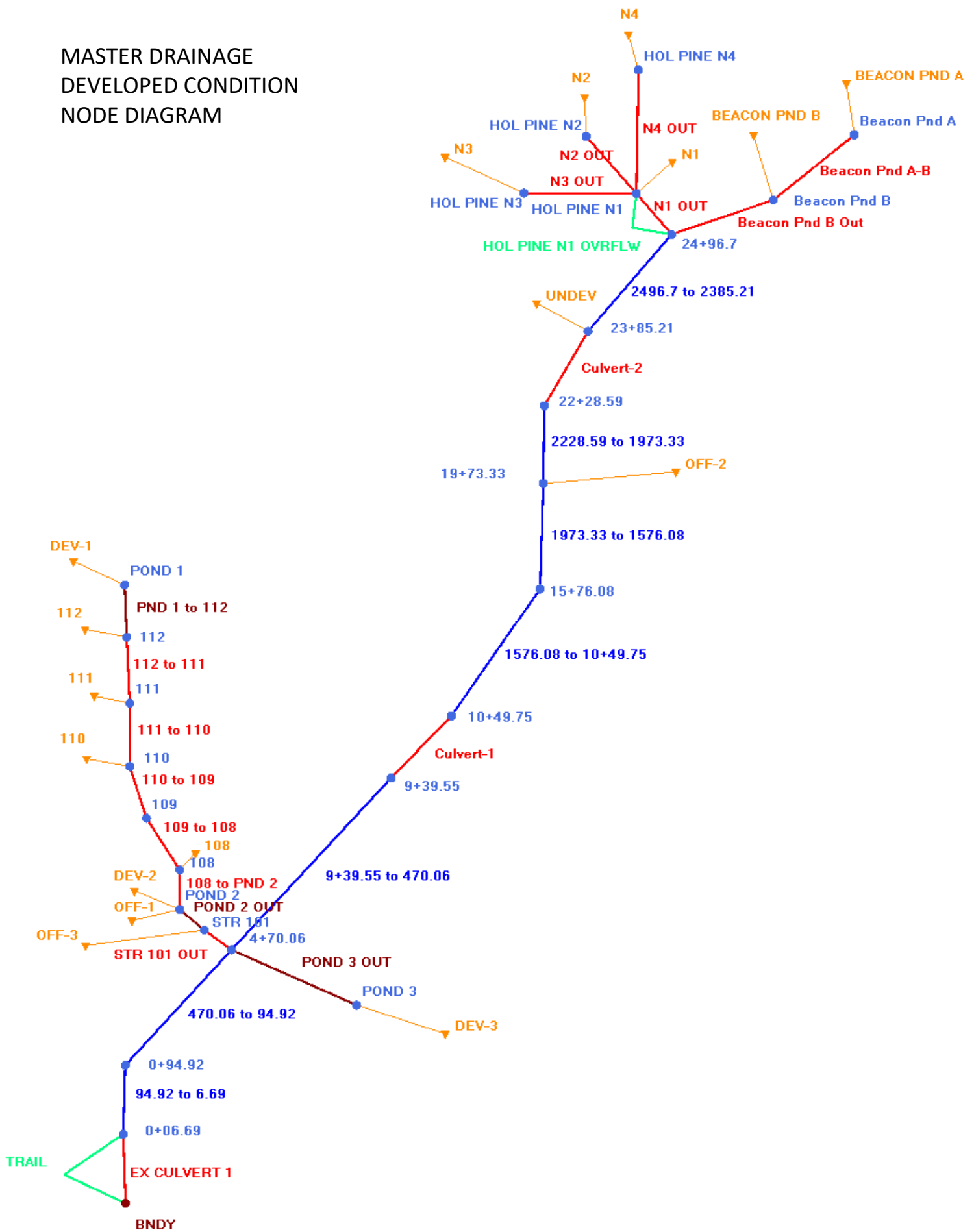
Overland Flow		Channel Flow	
short grass	0.15	grass	0.03
dense grass	0.24	concrete	0.02
pavement	0.011	rip-rap	0.04
woods light	0.4		
cultivated > 20%	0.17		

2 year, 24 hour rainfall = 2.66 inches  
minimum T<sub>c</sub> = 5 minutes

Basin name	Overland flow			Shallow Concentrated Flow (1)			Shallow Concentrated Flow (2)			Channel Flow			T <sub>c</sub> (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)	S %	n		Vel. (ft/s)	T <sub>t</sub> (min)
DEV-1	75	2	0.24	175	1	U	0			0				0	22
DEV-2	80	1	0.24	75	1	P	2			0			2.50	8	20
DEV-3	75	1.6	0.24	129	1	U	1	259	1	P	2	913.5	2.50	3	23
108	75	2	0.24	195	1	U	1.6			0				0	14
110	75	2	0.24	135	0.7	U	1.3			0				0	14
111	80	2	0.24	60	0.7	U	1.3			0				0	14
112	75	2	0.24	350	0.7	U	1.3			0				0	17
				0			0			0				0	0
				0			0			0				0	0

**D8. DEVELOPED CONDITION  
ICPR INPUT DATA**

MASTER DRAINAGE  
DEVELOPED CONDITION  
NODE DIAGRAM



## Simple Basin: 108

Scenario: Scenario1  
Node: 108  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 14.4 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 2.4 ac  
Curve Number: 85.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

## Simple Basin: 110

Scenario: Scenario1  
Node: 110  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 14.1 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 0.6 ac  
Curve Number: 92.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

## Simple Basin: 111

Scenario: Scenario1  
Node: 111  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 13.8 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 0.5 ac  
Curve Number: 87.0  
% Impervious: 0.0

% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: 112

Scenario: Scenario1  
Node: 112  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 16.8 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 2.3 ac  
Curve Number: 87.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: BEACON PND A

Scenario: Scenario1  
Node: Beacon Pnd A  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 33.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 71.6 ac  
Curve Number: 88.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: BEACON PND B

Scenario: Scenario1  
Node: Beacon Pnd B  
Hydrograph Method: NRCS Unit Hydrograph

Infiltration Method: Curve Number  
Time of Concentration: 32.3 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 27.0 ac  
Curve Number: 88.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: DEV-1

Scenario: Scenario1  
Node: POND 1  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 21.9 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 19.8 ac  
Curve Number: 88.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: DEV-2

Scenario: Scenario1  
Node: POND 2  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 20.5 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 5.4 ac  
Curve Number: 84.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: DEV-3

Scenario: Scenario1  
Node: POND 3  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 23.1 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 19.5 ac  
Curve Number: 87.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: N1

Scenario: Scenario1  
Node: HOL PINE N1  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 20.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 9.6 ac  
Curve Number: 82.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: N2

Scenario: Scenario1  
Node: HOL PINE N2  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 15.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr

Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 7.9 ac  
Curve Number: 81.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: N3

Scenario: Scenario1  
Node: HOL PINE N3  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 15.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 1.6 ac  
Curve Number: 84.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: N4

Scenario: Scenario1  
Node: HOL PINE N4  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 28.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 20.2 ac  
Curve Number: 84.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

## Simple Basin: OFF-1

Scenario: Scenario1  
Node: POND 2  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 45.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 13.3 ac  
Curve Number: 78.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

## Simple Basin: OFF-2

Scenario: Scenario1  
Node: 19+73.33  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 17.0 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 8.5 ac  
Curve Number: 78.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

## Simple Basin: OFF-3

Scenario: Scenario1  
Node: STR 101  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 53.7 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 26.0 ac  
Curve Number: 79.0  
% Impervious: 0.0

% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Simple Basin: UNDEV

Scenario: Scenario1  
Node: 23+85.21  
Hydrograph Method: NRCS Unit Hydrograph  
Infiltration Method: Curve Number  
Time of Concentration: 18.1 min  
Max Allowable Q: 99999.00 cfs  
Time Shift: 0.0 hr  
Unit Hydrograph: UH484  
Peaking Factor: 484.0  
Area: 0.7 ac  
Curve Number: 74.0  
% Impervious: 0.0  
% DCIA: 0.0  
% Direct: 0.0  
Rainfall Name:

Comment:

Node: 0+06.69

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 864.10 ft  
Warning Stage: 867.00 ft

Comment:

Node: 0+94.92

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 864.46 ft  
Warning Stage: 871.00 ft

Comment:

Node: 10+49.75

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 865.38 ft  
Warning Stage: 871.00 ft

Comment:

Node: 108

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 865.68 ft  
Warning Stage: 868.50 ft

Comment:

Node: 109

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 865.94 ft  
Warning Stage: 870.60 ft

Comment:

Node: 110

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.06 ft  
Warning Stage: 870.20 ft

Comment:

Node: 111

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.20 ft  
Warning Stage: 870.20 ft

Comment:

Node: 112

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.49 ft  
Warning Stage: 870.30 ft

Comment:

Node: 15+76.08

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.03 ft  
Warning Stage: 871.00 ft

Comment:

Node: 19+73.33

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.31 ft  
Warning Stage: 871.00 ft

Comment:

Node: 22+28.59

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.49 ft  
Warning Stage: 871.00 ft

Comment:

Node: 23+85.21

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.60 ft  
Warning Stage: 871.00 ft

Comment:

Node: 24+96.7

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 866.61 ft  
Warning Stage: 871.00 ft

Comment:

Node: 4+70.06

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 864.77 ft  
Warning Stage: 871.00 ft

Comment:

Node: 9+39.55

Scenario: Scenario1  
Type: Stage/Area  
Base Flow: 0.00 cfs  
Initial Stage: 864.88 ft  
Warning Stage: 871.00 ft

Comment:

Node: BNDY

Scenario: Scenario1  
Type: Time/Stage  
Base Flow: 0.00 cfs  
Initial Stage: 863.00 ft  
Warning Stage: 863.10 ft

Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0	863.00
0	0	0	30.0	863.00

Comment:

**Node: Beacon Pnd A**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 868.50 ft  
 Warning Stage: 873.00 ft

Stage [ft]	Area [ac]	Area [ft2]
861.00	1.1	47916.0
868.50	2.0	87120.0
869.00	2.1	91476.0
872.00	2.4	104544.0
874.00	2.6	113256.0
875.00	2.8	121968.0

Comment:

**Node: Beacon Pnd B**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 868.50 ft  
 Warning Stage: 872.00 ft

Stage [ft]	Area [ac]	Area [ft2]
861.00	2.2	95832.0
867.00	2.9	126324.0
868.00	3.3	143748.0
868.50	3.5	152460.0
873.00	4.3	187308.0

Comment:

**Node: HOL PINE N1**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 868.00 ft  
 Warning Stage: 872.00 ft

Stage [ft]	Area [ac]	Area [ft2]
868.00	0.4	19166.4
869.00	0.5	22215.6
870.00	0.6	24829.2
871.00	0.7	28314.0

Comment:

**Node: HOL PINE N2**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 869.00 ft  
 Warning Stage: 873.00 ft

Stage [ft]	Area [ac]	Area [ft2]
869.00	0.7	31363.2
870.00	0.8	32670.0
871.00	0.8	34412.4
872.00	0.8	35719.2

Comment:

**Node: HOL PINE N3**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 870.00 ft  
 Warning Stage: 873.50 ft

Stage [ft]	Area [ac]	Area [ft2]
870.00	0.4	18730.8
871.00	0.5	21344.4
872.00	0.5	23522.4
872.50	0.6	26136.0

Comment:

**Node: HOL PINE N4**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 869.00 ft  
 Warning Stage: 873.00 ft

Stage [ft]	Area [ac]	Area [ft2]
869.00	1.4	60984.0
870.00	1.5	66646.8

Stage [ft]	Area [ac]	Area [ft2]
871.00	1.7	73180.8
872.00	1.8	79279.2

Comment:

**Node: POND 1**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 867.00 ft  
 Warning Stage: 871.00 ft

Stage [ft]	Area [ac]	Area [ft2]
867.00	2.6	113256.0
868.00	2.9	126324.0
869.00	3.0	130680.0
870.00	3.1	135036.0
871.00	3.2	139392.0
872.00	3.3	143748.0

Comment:

**Node: POND 2**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 865.50 ft  
 Warning Stage: 870.00 ft

Stage [ft]	Area [ac]	Area [ft2]
865.50	0.6	26136.0
866.00	0.8	34848.0
867.00	1.0	43560.0
868.00	1.1	47916.0
869.00	1.1	49658.4
870.00	1.2	52272.0
871.00	1.3	56628.0
872.00	1.4	60984.0

Comment:

**Node: POND 3**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 866.00 ft  
 Warning Stage: 871.00 ft

Stage [ft]	Area [ac]	Area [ft2]
866.00	1.2	52272.0
867.00	1.5	65340.0
868.00	1.6	69696.0
869.00	1.7	74052.0
870.00	1.8	78408.0
871.00	1.9	82764.0

Comment:

**Node: STR 101**

Scenario: Scenario1  
 Type: Stage/Area  
 Base Flow: 0.00 cfs  
 Initial Stage: 865.19 ft  
 Warning Stage: 870.00 ft

Stage [ft]	Area [ac]	Area [ft2]
865.19	0.0	21.8
869.45	0.0	21.8
869.50	3.0	130680.0
870.00	6.5	283140.0

Comment:

**Pipe Link: 108 to PND 2**

	Upstream	Downstream
Scenario:	Scenario1	Scenario1
From Node:	108	108
To Node:	POND 2	POND 2
Link Count:	1	1
Flow Direction:	Both	Both
Damping:	0.0000 ft	0.0000 ft
Length:	81.0 ft	81.0 ft
FHWA Code:	0	0
Entr Loss Coef:	0.50	0.50
Exit Loss Coef:	0.00	0.00
Bend Loss Coef:	0.00	0.00
Bend Location:	0.0 dec	0.0 dec
Energy Switch:	Energy	Energy
	Invert: 865.68 ft	Invert: 865.50 ft
	Manning's N: 0.013	Manning's N: 0.013
	Geometry: Circular	Geometry: Circular
	Max Depth: 2.0 ft	Max Depth: 2.0 ft
	Bottom Clip	
	Default: 0.0 ft	Default: 0.0 ft
	Op Table:	Op Table:
	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000
	Top Clip	
	Default: 0.0 ft	Default: 0.0 ft
	Op Table:	Op Table:
	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000

Comment:

**Pipe Link: 109 to 108**

	Upstream	Downstream
Scenario:	Scenario1	Scenario1
From Node:	109	108
To Node:	108	108
Link Count:	1	1
	Invert: 865.94 ft	Invert: 865.78 ft
	Manning's N: 0.013	Manning's N: 0.013
	Geometry: Circular	Geometry: Circular
	Max Depth: 2.0 ft	Max Depth: 2.0 ft

Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 134.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000
Comment:		

Pipe Link: 110 to 109	Upstream	Downstream
Scenario: Scenario1	Invert: 866.06 ft	Invert: 866.04 ft
From Node: 110	Manning's N: 0.013	Manning's N: 0.013
To Node: 109	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.0 ft	Max Depth: 2.0 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 18.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000
Comment:		

Pipe Link: 111 to 110	Upstream	Downstream
Scenario: Scenario1	Invert: 866.20 ft	Invert: 866.16 ft
From Node: 111	Manning's N: 0.013	Manning's N: 0.013
To Node: 110	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.0 ft	Max Depth: 2.0 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 32.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000
Comment:		

Pipe Link: 112 to 111	Upstream	Downstream
Scenario: Scenario1	Invert: 866.49 ft	Invert: 866.30 ft

From Node:	112	Manning's N:	0.013	Manning's N:	0.013
To Node:	111	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	2.0 ft	Max Depth:	2.0 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.0 ft	Default:	0.0 ft
Length:	155.0 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.0 ft	Default:	0.0 ft
Bend Location:	0.0 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Channel Link: 1576.08 to 10+49.75		Upstream	Downstream		
Scenario:	Scenario1	Invert:	866.03 ft	Invert:	865.38 ft
From Node:	15+76.08	Manning's N:	0.000	Manning's N:	0.000
To Node:	10+49.75	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	15+76.08	Cross Section:	10+49.75
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	526.3 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.0 dec				
Energy Switch:	Energy				

Comment:

Channel Link: 1973.33 to 1576.08		Upstream	Downstream		
Scenario:	Scenario1	Invert:	866.31 ft	Invert:	866.03 ft
From Node:	19+73.33	Manning's N:	0.000	Manning's N:	0.000
To Node:	15+76.08	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	19+73.33	Cross Section:	15+76.08
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	397.3 ft				
Contraction Coef:	0.10				
Expansion Coef:	0.30				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.0 dec				
Energy Switch:	Energy				

Comment:

Channel Link: 2228.59 to 1973.33		Upstream	Downstream
Scenario:	Scenario1	Invert: 866.49 ft	Invert: 866.31 ft
From Node:	22+28.59	Manning's N: 0.000	Manning's N: 0.000
To Node:	19+73.33	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: 22+28.59	Cross Section: 19+73.33
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	255.3 ft		
Contraction Coef:	0.10		
Expansion Coef:	0.30		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.0 dec		
Energy Switch:	Energy		
Comment:			

Channel Link: 2496.7 to 2385.21		Upstream	Downstream
Scenario:	Scenario1	Invert: 866.61 ft	Invert: 866.60 ft
From Node:	24+96.7	Manning's N: 0.000	Manning's N: 0.000
To Node:	23+85.21	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: 24+96.7	Cross Section: 23+85.21
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	111.5 ft		
Contraction Coef:	0.10		
Expansion Coef:	0.30		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.0 dec		
Energy Switch:	Energy		
Comment:			

Channel Link: 470.06 to 94.92		Upstream	Downstream
Scenario:	Scenario1	Invert: 864.77 ft	Invert: 864.46 ft
From Node:	4+70.06	Manning's N: 0.000	Manning's N: 0.000
To Node:	0+94.92	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: 4+70.06	Cross Section: 0+94.92
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	375.1 ft		
Contraction Coef:	0.10		
Expansion Coef:	0.30		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.0 dec		
Energy Switch:	Energy		
Comment:			

Channel Link: 9+39.55 to 470.06		Upstream	Downstream
Scenario:	Scenario1	Invert: 864.88 ft	Invert: 864.77 ft
From Node:	9+39.55	Manning's N: 0.000	Manning's N: 0.000
To Node:	4+70.06	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: 9+39.55	Cross Section: 4+70.06
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	469.5 ft		
Contraction Coef:	0.10		
Expansion Coef:	0.30		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.0 dec		
Energy Switch:	Energy		
Comment:			

Channel Link: 94.92 to 6.69		Upstream	Downstream
Scenario:	Scenario1	Invert: 864.46 ft	Invert: 864.10 ft
From Node:	0+94.92	Manning's N: 0.000	Manning's N: 0.000
To Node:	0+06.69	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: 0+94.92	Cross Section: 0+06.69
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	88.2 ft		
Contraction Coef:	0.10		
Expansion Coef:	0.30		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.0 dec		
Energy Switch:	Energy		
Comment:			

Pipe Link: Beacon Pnd A-B		Upstream	Downstream
Scenario:	Scenario1	Invert: 866.00 ft	Invert: 866.00 ft
From Node:	Beacon Pnd A	Manning's N: 0.013	Manning's N: 0.013
To Node:	Beacon Pnd B	Geometry: Circular	Geometry: Circular
Link Count:	2	Max Depth: 3.0 ft	Max Depth: 3.0 ft
Flow Direction:	Both	Bottom Clip	
Damping:	0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length:	75.0 ft	Op Table:	Op Table:
FHWA Code:	0	Ref Node:	Ref Node:
Entr Loss Coef:	0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef:	1.00	Top Clip	
Bend Loss Coef:	0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location:	0.0 dec	Op Table:	Op Table:
Energy Switch:	Energy	Ref Node:	Ref Node:
		Manning's N: 0.000	Manning's N: 0.000
Comment:			

Pipe Link: Beacon Pnd B Out		Upstream	Downstream
Scenario:	Scenario1	Invert: 868.50 ft	Invert: 868.20 ft
From Node:	Beacon Pnd B	Manning's N: 0.013	Manning's N: 0.013
To Node:	24+96.7	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 2.0 ft	Max Depth: 2.0 ft
Flow Direction:	Both	Bottom Clip	
Damping:	0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length:	271.0 ft	Op Table:	Op Table:
FHWA Code:	0	Ref Node:	Ref Node:
Entr Loss Coef:	0.20	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef:	1.00	Top Clip	
Bend Loss Coef:	0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location:	0.0 dec	Op Table:	Op Table:
Energy Switch:	Energy	Ref Node:	Ref Node:
		Manning's N: 0.000	Manning's N: 0.000
Comment:			

Pipe Link: Culvert-1		Upstream	Downstream
Scenario:	Scenario1	Invert: 865.40 ft	Invert: 865.20 ft
From Node:	10+49.75	Manning's N: 0.020	Manning's N: 0.020
To Node:	9+39.55	Geometry: Rectangular	Geometry: Rectangular
Link Count:	1	Max Depth: 4.0 ft	Max Depth: 4.0 ft
Flow Direction:	Both	Max Width: 6.0 ft	Max Width: 6.0 ft
Damping:	0.0000 ft	Fillet: 0.0 ft	Fillet: 0.0 ft
Length:	65.0 ft	Bottom Clip	
FHWA Code:	0	Default: 0.0 ft	Default: 0.0 ft
Entr Loss Coef:	0.50	Op Table:	Op Table:
Exit Loss Coef:	0.00	Ref Node:	Ref Node:
Bend Loss Coef:	0.00	Manning's N: 0.000	Manning's N: 0.000
Bend Location:	0.0 dec	Top Clip	
Energy Switch:	Energy	Default: 0.0 ft	Default: 0.0 ft
		Op Table:	Op Table:
		Ref Node:	Ref Node:
		Manning's N: 0.000	Manning's N: 0.000
Comment:			

Pipe Link: Culvert-2		Upstream	Downstream
Scenario:	Scenario1	Invert: 866.60 ft	Invert: 866.50 ft
From Node:	23+85.21	Manning's N: 0.020	Manning's N: 0.020
To Node:	22+28.59	Geometry: Rectangular	Geometry: Rectangular
Link Count:	1	Max Depth: 4.0 ft	Max Depth: 4.0 ft
Flow Direction:	Both	Max Width: 6.0 ft	Max Width: 6.0 ft
Damping:	0.0000 ft	Fillet: 0.0 ft	Fillet: 0.0 ft
Length:	85.0 ft	Bottom Clip	
FHWA Code:	0	Default: 0.0 ft	Default: 0.0 ft
Entr Loss Coef:	0.50	Op Table:	Op Table:
Exit Loss Coef:	0.00	Ref Node:	Ref Node:
Bend Loss Coef:	0.00	Manning's N: 0.000	Manning's N: 0.000
Bend Location:	0.0 dec	Top Clip	
Energy Switch:	Energy	Default: 0.0 ft	Default: 0.0 ft
		Op Table:	Op Table:

Ref Node: Manning's N: 0.000      Ref Node: Manning's N: 0.000

Comment:

Pipe Link: EX CULVERT 1	Upstream	Downstream
Scenario: Scenario1	Invert: 864.10 ft	Invert: 863.67 ft
From Node: 0+06.69	Manning's N: 0.024	Manning's N: 0.024
To Node: BNDY	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 4.0 ft	Max Depth: 4.0 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 45.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000

Comment:

Weir Link: HOL PINE N1 OVRFLW	Bottom Clip	
Scenario: Scenario1	Default: 0.0 ft	
From Node: HOL PINE N1	Op Table:	
To Node: 24+96.7	Ref Node:	
Link Count: 1	Top Clip	
Flow Direction: Both	Default: 0.0 ft	
Damping: 0.0000 ft	Op Table:	
Weir Type: Broad Crested Vertical	Ref Node:	
Geometry Type: Irregular	Discharge Coefficients	
Invert: 870.33 ft	Weir Default: 2.80	
Control Elevation: 870.33 ft	Weir Table:	
Cross Section: HOL PINE N1 OVRFLW	Orifice Default: 0.60	
	Orifice Table:	

Comment:

Pipe Link: N1 OUT	Upstream	Downstream
Scenario: Scenario1	Invert: 868.00 ft	Invert: 867.50 ft
From Node: HOL PINE N1	Manning's N: 0.013	Manning's N: 0.013
To Node: 24+96.7	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.0 ft	Max Depth: 2.0 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 40.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	

Bend Loss Coef:	0.00	Default:	0.0 ft	Default:	0.0 ft
Bend Location:	0.0 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: N2 OUT	Upstream	Downstream
Scenario: Scenario1	Invert: 869.00 ft	Invert: 868.00 ft
From Node: HOL PINE N2	Manning's N: 0.013	Manning's N: 0.013
To Node: HOL PINE N1	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.3 ft	Max Depth: 1.3 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 902.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000

Comment:

Pipe Link: N3 OUT	Upstream	Downstream
Scenario: Scenario1	Invert: 870.00 ft	Invert: 869.00 ft
From Node: HOL PINE N3	Manning's N: 0.013	Manning's N: 0.013
To Node: HOL PINE N1	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.3 ft	Max Depth: 1.3 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 315.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000

Comment:

Pipe Link: N4 OUT	Upstream	Downstream
Scenario: Scenario1	Invert: 869.00 ft	Invert: 868.00 ft
From Node: HOL PINE N4	Manning's N: 0.013	Manning's N: 0.013
To Node: HOL PINE N1	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 1.5 ft	Max Depth: 1.5 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 504.0 ft	Op Table:	Op Table:

FHWA Code:	0	Ref Node:	Ref Node:
Entr Loss Coef:	0.50	Manning's N:	0.000
Exit Loss Coef:	0.00	Top Clip	
Bend Loss Coef:	0.00	Default:	0.0 ft
Bend Location:	0.0 dec	Op Table:	Op Table:
Energy Switch:	Energy	Ref Node:	Ref Node:
		Manning's N:	0.000

Comment:

Drop Structure Link: PND 1 to 112		Upstream Pipe	Downstream Pipe
Scenario:	Scenario1	Invert:	867.00 ft
From Node:	POND 1	Manning's N:	0.013
To Node:	112	Geometry:	Circular
Link Count:	1	Max Depth:	1.5 ft
Flow Direction:	Both	Bottom Clip	
Solution:	Combine	Default:	0.0 ft
Increments:	0	Op Table:	Op Table:
Pipe Count:	1	Ref Node:	Ref Node:
Damping:	0.0000 ft	Manning's N:	0.000
Length:	165.0 ft	Top Clip	
FHWA Code:	0	Default:	0.0 ft
Entr Loss Coef:	0.50	Op Table:	Op Table:
Exit Loss Coef:	0.00	Ref Node:	Ref Node:
Bend Loss Coef:	0.00	Manning's N:	0.000
Bend Location:	0.0 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component		
Weir:	1	Bottom Clip
Weir Count:	1	Default:
Weir Flow Direction:	Both	Op Table:
Damping:	0.0000 ft	Ref Node:
Weir Type:	Sharp Crested Vertical	Top Clip
Geometry Type:	Circular	Default:
Invert:	867.00 ft	Op Table:
Control Elevation:	867.00 ft	Ref Node:
Max Depth:	0.3 ft	Discharge Coefficients
		Weir Default:
		Weir Table:
		Orifice Default:
		Orifice Table:

Weir Comment:

Weir Component		
Weir:	2	Bottom Clip
Weir Count:	1	Default:
Weir Flow Direction:	Both	Op Table:
Damping:	0.0000 ft	Ref Node:
Weir Type:	Horizontal	Top Clip
Geometry Type:	Rectangular	Default:
Invert:	870.00 ft	Op Table:
Control Elevation:	870.00 ft	Ref Node:
Max Depth:	3.0 ft	Discharge Coefficients

Max Width: 3.0 ft  
 Fillet: 0.0 ft

Weir Default: 3.20  
 Weir Table:  
 Orifice Default: 0.60  
 Orifice Table:

Weir Comment:

Drop Structure Comment:

Drop Structure Link: POND 2 OUT		Upstream Pipe	Downstream Pipe
Scenario:	Scenario1	Invert: 865.50 ft	Invert: 865.39 ft
From Node:	POND 2	Manning's N: 0.013	Manning's N: 0.013
To Node:	STR 101	Geometry: Circular	Geometry: Circular
Link Count:	1	Max Depth: 2.0 ft	Max Depth: 2.0 ft
Flow Direction:	Both	Bottom Clip	
Solution:	Combine	Default: 0.0 ft	Default: 0.0 ft
Increments:	0	Op Table:	Op Table:
Pipe Count:	1	Ref Node:	Ref Node:
Damping:	0.0000 ft	Manning's N: 0.000	Manning's N: 0.000
Length:	48.0 ft	Top Clip	
FHWA Code:	0	Default: 0.0 ft	Default: 0.0 ft
Entr Loss Coef:	0.50	Op Table:	Op Table:
Exit Loss Coef:	0.00	Ref Node:	Ref Node:
Bend Loss Coef:	0.00	Manning's N: 0.000	Manning's N: 0.000
Bend Location:	0.0 dec		
Energy Switch:	Energy		

Pipe Comment:

Weir Component		Bottom Clip
Weir:	1	Default: 0.0 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Sharp Crested Vertical	Default: 0.0 ft
Geometry Type:	Circular	Op Table:
Invert:	865.50 ft	Ref Node:
Control Elevation:	865.50 ft	Discharge Coefficients
Max Depth:	0.3 ft	Weir Default: 3.20
		Weir Table:
		Orifice Default: 0.60
		Orifice Table:

Weir Comment:

Weir Component		Bottom Clip
Weir:	2	Default: 0.0 ft
Weir Count:	1	Op Table:
Weir Flow Direction:	Both	Ref Node:
Damping:	0.0000 ft	Top Clip
Weir Type:	Sharp Crested Vertical	Default: 0.0 ft
Geometry Type:	Rectangular	Op Table:
Invert:	868.10 ft	Ref Node:
Control Elevation:	868.10 ft	Discharge Coefficients
Max Depth:	0.3 ft	

Max Width: 1.0 ft  
 Fillet: 0.0 ft

Weir Default: 3.20  
 Weir Table:  
 Orifice Default: 0.60  
 Orifice Table:

Weir Comment:

**Weir Component**

Weir: 3  
 Weir Count: 1  
 Weir Flow Direction: Both  
 Damping: 0.0000 ft  
 Weir Type: Horizontal  
 Geometry Type: Rectangular  
 Invert: 868.90 ft  
 Control Elevation: 868.90 ft  
 Max Depth: 3.0 ft  
 Max Width: 3.0 ft  
 Fillet: 0.0 ft

**Bottom Clip**  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
**Top Clip**  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
**Discharge Coefficients**  
 Weir Default: 3.20  
 Weir Table:  
 Orifice Default: 0.60  
 Orifice Table:

Weir Comment:

Drop Structure Comment:

**Drop Structure Link: POND 3 OUT**

Scenario: Scenario1  
 From Node: POND 3  
 To Node: 4+70.06  
 Link Count: 1  
 Flow Direction: Both  
 Solution: Combine  
 Increments: 0  
 Pipe Count: 1  
 Damping: 0.0000 ft  
 Length: 114.0 ft  
 FHWA Code: 0  
 Entr Loss Coef: 0.50  
 Exit Loss Coef: 0.00  
 Bend Loss Coef: 0.00  
 Bend Location: 0.0 dec  
 Energy Switch: Energy

**Upstream Pipe**  
 Invert: 866.00 ft  
 Manning's N: 0.013  
 Geometry: Circular  
 Max Depth: 1.0 ft  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
 Manning's N: 0.000  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
 Manning's N: 0.000

**Downstream Pipe**  
 Invert: 865.50 ft  
 Manning's N: 0.013  
 Geometry: Circular  
 Max Depth: 1.0 ft  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
 Manning's N: 0.000  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
 Manning's N: 0.000

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: 866.00 ft  
 Control Elevation: 866.00 ft  
 Max Depth: 0.3 ft

**Bottom Clip**  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
**Top Clip**  
 Default: 0.0 ft  
 Op Table:  
 Ref Node:  
**Discharge Coefficients**

Weir Default: 3.20  
 Weir Table:  
 Orifice Default: 0.60  
 Orifice Table:

Weir Comment:

Weir Component	
Weir: 2	Bottom Clip
Weir Count: 1	Default: 0.0 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.0 ft
Invert: 870.40 ft	Op Table:
Control Elevation: 870.40 ft	Ref Node:
Max Depth: 2.0 ft	Discharge Coefficients
Max Width: 2.0 ft	Weir Default: 3.20
Fillet: 0.0 ft	Weir Table:
	Orifice Default: 0.60
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Pipe Link: STR 101 OUT	Upstream	Downstream
Scenario: Scenario1	Invert: 865.19 ft	Invert: 865.00 ft
From Node: STR 101	Manning's N: 0.013	Manning's N: 0.013
To Node: 4+70.06	Geometry: Circular	Geometry: Circular
Link Count: 1	Max Depth: 2.5 ft	Max Depth: 2.5 ft
Flow Direction: Both	Bottom Clip	
Damping: 0.0000 ft	Default: 0.0 ft	Default: 0.0 ft
Length: 68.0 ft	Op Table:	Op Table:
FHWA Code: 0	Ref Node:	Ref Node:
Entr Loss Coef: 0.50	Manning's N: 0.000	Manning's N: 0.000
Exit Loss Coef: 0.00	Top Clip	
Bend Loss Coef: 0.00	Default: 0.0 ft	Default: 0.0 ft
Bend Location: 0.0 dec	Op Table:	Op Table:
Energy Switch: Energy	Ref Node:	Ref Node:
	Manning's N: 0.000	Manning's N: 0.000

Comment:

Weir Link: TRAIL	
Scenario: Scenario1	Bottom Clip
From Node: 0+06.69	Default: 0.0 ft
To Node: BNDY	Op Table:
Link Count: 1	Ref Node:
Flow Direction: Both	Top Clip
Damping: 0.0000 ft	Default: 0.0 ft
Weir Type: Broad Crested Vertical	Op Table:
Geometry Type: Irregular	Ref Node:

Invert: 872.01 ft  
 Control Elevation: 872.01 ft  
 Cross Section: Trail

Discharge Coefficients	
Weir Default:	2.80
Weir Table:	
Orifice Default:	0.60
Orifice Table:	

Comment:

Simulation: 10 -yr 24-hour

Scenario: Scenario1  
 Run Date/Time: 2/22/2022 11:34:16 AM  
 Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0
End Time:	0	0	0	30.0

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0	0.1
Max Calculation Time:		30.0

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

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: 24.0 hr

Max Iterations: 6  
 Over-Relax Weight: 0.5 dec  
 Fact:  
 dZ Tolerance: 0.0010 ft  
 Smp/Man Basin Rain: Global  
 Opt:  
 Max dZ: 1.00 ft  
 Link Optimizer Tol: 0.0001 ft  
 Rainfall Name: ~SCSII-24  
 Rainfall Amount: 4.3 in  
 Storm Duration: 24.0 hr  
 Edge Length Option: Automatic  
 Dflt Damping (1D): 0.0050 ft  
 Min Node Srf Area (1D): 100.0 ft2  
 Energy Switch (1D): Momentum

Comment:

Simulation: 100-yr 24-hour

Scenario: Scenario1  
 Run Date/Time: 2/22/2022 11:34:31 AM  
 Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0
End Time:	0	0	0	48.0

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0	0.1
Max Calculation Time:		30.0

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

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	IA Recovery Time: 24.0 hr
Max Iterations: 6	
Over-Relax Weight 0.5 dec	
Fact:	
dZ Tolerance: 0.0010 ft	Smp/Man Basin Rain Global
	Opt:
Max dZ: 1.00 ft	Rainfall Name: ~SCSII-24
Link Optimizer Tol: 0.0001 ft	Rainfall Amount: 6.3 in
	Storm Duration: 24.0 hr
Edge Length Option: Automatic	
	Dflt Damping (1D): 0.0050 ft
	Min Node Srf Area 100.0 ft2
	(1D):
	Energy Switch (1D): Momentum

Comment:

Simulation: 2-yr 24-hour

Scenario: Scenario1  
Run Date/Time: 1/26/2022 5:38:26 PM  
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0
End Time:	0	0	0	30.0

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0	0.1
Max Calculation Time:		30.0

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0	15.0

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: 1.00 ft  
Link Optimizer Tol: 0.0001 ft  
  
Edge Length Option: Automatic

IA Recovery Time: 24.0 hr  
  
Smp/Man Basin Rain Global  
Opt:  
  
Rainfall Name: ~SCSII-24  
Rainfall Amount: 3.0 in  
Storm Duration: 24.0 hr  
  
Dflt Damping (1D): 0.0050 ft  
Min Node Srf Area 100.0 ft2  
(1D):  
Energy Switch (1D): Momentum

Comment:

## **E6. STORM SEWER CALCULATIONS**



STORM SEWER DESIGN CALCULATIONS  
-PIPE DESIGN-

PROJECT:	Promenade, Sections 1A & 1B	STORM:	10 Year
JOB #:	21113-S1	COMPUTED BY:	JET
DATE:	3/24/22	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	
134	133	0.83	98	12	1.39	4.25	5.41	ES	871.90	870.00	868.64	ES
133	132	0.96	32	12	0.30	1.97	2.51	871.90	872.01	868.54	868.44	2.19
132	131	1.77	32	12	0.30	1.97	2.51	872.01	872.01	868.34	868.24	2.50
131	130	2.21	171	15	0.23	3.13	2.55	872.01	872.20	868.14	867.75	2.43
130	129	8.93	331	24	0.16	9.12	2.90	872.20	871.00	867.20	866.67	2.75
129	128	9.29	206	24	0.17	9.40	2.99	871.00	871.00	866.67	866.32	2.08
128	127	9.85	124	24	0.19	9.93	3.16	871.00	870.09	866.32	866.08	2.43
127	126	9.75	63	24	0.19	9.93	3.16	870.09	869.90	866.08	865.96	1.76
126	125	9.94	32	24	0.20	10.19	3.24	869.90	869.91	865.96	865.90	1.69
125	124A	10.31	16	24	0.21	10.44	3.32	869.91	869.98	865.90	865.87	1.76
124A	124	10.30	24	24	0.21	10.44	3.32	869.98	869.90	865.87	865.82	1.86
124	121	10.33	80	24	0.21	10.44	3.32	869.90	869.50	865.82	865.65	1.83
121	120	10.33	70	24	0.21	10.44	3.32	869.50	ES	865.65	865.50	1.60
176	130	7.59	10	24	1.50	27.91	8.88	ES	872.20	868.60	868.45	ES
178	129	1.15	10	12	2.00	5.10	6.49	ES	871.00	867.90	867.70	ES
180	128	1.31	10	12	2.00	5.10	6.49	ES	871.00	867.90	867.70	ES
158	157	1.33	75	12	2.26	5.42	6.90	ES	871.50	870.00	868.31	ES
157	156	1.32	60	12	0.30	1.97	2.51	871.50	871.71	868.21	868.03	2.12
156	155	3.64	32	15	0.32	3.69	3.01	871.71	871.71	867.93	867.83	2.34
155	WQ8	5.93	23	18	0.42	6.87	3.89	871.71	872.04	867.73	867.63	2.27
WQ8	153	5.92	177	18	0.36	6.32	3.57	872.04	ES	867.63	867.00	2.70
169	168	0.88	10	12	0.30	1.97	2.51	ES	874.61	870.00	869.97	#VALUE!
168	167	1.59	130	12	0.30	1.97	2.51	874.61	874.61	869.03	868.64	4.41
167	166	2.57	32	15	0.23	3.13	2.55	874.61	874.61	868.54	868.47	4.63
166	165	3.23	242	18	0.18	4.50	2.55	874.61	871.83	868.37	867.93	4.53
165	164	4.26	137	24	0.12	7.89	2.51	871.83	873.96	867.83	867.67	1.75
164	163	5.06	32	24	0.12	7.89	2.51	873.96	873.96	867.57	867.53	4.14
163	162A	5.64	16	24	0.12	7.89	2.51	873.96	874.57	867.43	867.41	4.28
162A	162	5.62	136	24	0.12	7.89	2.51	874.57	871.27	867.31	867.15	5.01
162	161	7.11	40	24	0.12	7.89	2.51	871.27	ES	867.05	867.00	1.97
174	165	1.19	12	12	3.00	6.25	7.95	ES	871.83	869.20	868.84	ES
172	171	1.48	135	15	0.23	3.13	2.55	ES	874.71	870.00	869.69	ES
171	170	1.93	32	15	0.23	3.13	2.55	874.71	874.71	869.59	869.52	3.68
170	WQ7	2.19	13	15	0.99	6.49	5.29	874.71	875.10	869.42	869.29	3.85
WQ7	162	2.19	232	15	0.92	6.26	5.10	875.10	871.27	869.29	867.16	4.37
147	146	1.60	32	12	0.30	1.97	2.51	871.51	871.51	867.97	867.87	2.37
146	WQ9	3.25	13	15	0.27	3.39	2.76	871.51	871.99	867.77	867.73	2.30
WQ9	145	3.24	140	15	0.27	3.36	2.74	871.99	870.80	867.73	867.36	2.82
145	144	3.85	64	15	0.40	4.13	3.36	870.80	ES	867.26	867.00	2.10
141	140	2.11	149	12	1.03	3.66	4.66	ES	871.21	869.50	867.97	ES
140	139	4.45	32	15	0.47	4.48	3.65	871.21	871.21	867.82	867.67	1.95
139	WQ6	6.14	5	18	0.34	6.18	3.50	871.21	871.50	867.57	867.55	1.93
WQ6	138	6.13	47	18	0.34	6.18	3.50	871.50	871.25	867.55	867.39	2.24
138	137	6.11	158	24	0.12	7.89	2.51	871.25	ES	867.19	867.00	1.81
150	149	1.69	32	12	0.30	1.97	2.51	871.21	871.21	867.75	867.65	2.29
149	WQ5	3.41	4	15	0.30	3.58	2.91	871.21	871.47	867.55	867.54	2.22
WQ5	148	3.41	188	15	0.29	3.49	2.84	871.47	ES	867.54	867.00	2.49

STORM SEWER DESIGN CALCULATIONS  
-PIPE DESIGN-

PROJECT:	Promenade, Sections 1A & 1B	STORM:	10 Year
JOB #:	21113-S1	COMPUTED BY:	JET
DATE:	3/24/22	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	
113	112	0.00	165	18	0.25	5.30	3.00	OUTLET	870.50	867.00	866.59	OUTLET
112	111	4.66	155	24	0.12	7.89	2.51	870.50	870.65	866.49	866.30	1.76
111	110	5.46	32	24	0.12	7.89	2.51	870.65	870.65	866.20	866.16	2.20
110	109	6.74	13	24	0.16	9.12	2.90	870.65	870.89	866.06	866.04	2.34
109	108	6.73	138	24	0.12	7.89	2.51	870.89	869.00	865.94	865.77	2.70
108	107	10.05	81	24	0.21	10.44	3.32	869.00	ES	865.67	865.50	1.08
123	122	1.74	32	18	0.18	4.50	2.55	871.21	871.21	867.03	866.97	2.47
122	112	3.39	155	18	0.18	4.50	2.55	871.21	870.50	866.87	866.59	2.63
119	118	1.01	32	12	0.30	1.97	2.51	870.46	870.46	866.95	866.85	2.34
118	117	1.71	20	12	0.30	1.97	2.51	870.46	870.88	866.75	866.69	2.54
117	WQ4	3.83	47	18	0.18	4.50	2.55	870.88	871.45	866.49	866.41	2.68
WQ4	115	3.77	145	18	0.19	4.62	2.62	871.45	870.88	866.41	866.13	3.33
115	108	3.62	136	18	0.18	4.50	2.55	870.88	869.00	866.03	865.79	3.14
114	117	1.74	141	12	0.30	1.97	2.51	869.56	870.88	867.12	866.70	1.27
104	101	13.84	20	24	0.40	14.41	4.59	ES	869.50	865.80	865.72	ES
103	101	0.64	20	12	0.30	1.97	2.51	ES	869.50	866.00	865.94	ES
502	501	0.24	34	12	0.30	1.97	2.51	874.86	874.90	871.55	871.45	2.14
501	500	1.22	10	12	0.30	1.97	2.51	874.90	874.56	871.45	871.42	2.28
500	EX1	1.22	34	12	1.48	4.39	5.58	874.56	875.76	871.42	870.92	1.97
504	503	1.78	12	12	0.30	1.97	2.51	875.16	874.88	871.34	871.30	2.65
102	101	0.00	48	24	0.23	10.93	3.48	OUTLET	869.50	865.50	865.39	OUTLET
101	100	14.22	68	30	0.28	21.83	4.45	869.50	ES	865.19	865.00	1.52
182	181	0.55	32	12	0.30	1.97	2.51	872.92	872.92	869.70	869.60	2.05
181	168	1.13	125	12	0.30	1.97	2.51	872.92	874.61	869.50	869.13	2.25
EX127	EX124	0.12	28	12	0.30	1.97	2.51	872.00	872.00	868.86	868.78	1.97
EX124	EX103	0.23	93	12	0.30	1.97	2.51	872.00	873.60	868.78	868.50	2.05

STORM SEWER DESIGN CALCULATIONS  
-RATIONAL METHOD-

PROJECT: Promenade, Sections 1A & 1B	STORM: 10 Year
JOB #: 21113-S1	COMPUTED BY: JET
DATE: 3/24/22	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)
134	133	134	0.39	0.42	0.16	12	5.06	0.83	0.16	12	5.06	0.83	0.30
133	132	133	0.42	0.07	0.03	7	6.44	0.18	0.19	13	5.00	0.96	0.21
132	131	132	0.52	0.45	0.23	19	4.16	0.97	0.43	19	4.16	1.77	0.21
131	130	131	0.51	0.21	0.11	9	5.66	0.62	0.54	19	4.14	2.21	1.12
130	129	130	0.00	0.00	0.00	5	6.99	0.00	3.56	45	2.51	8.93	1.90
129	128	129	0.00	0.00	0.00	5	6.99	0.00	3.81	47	2.44	9.29	1.15
128	127	128	0.00	0.00	0.00	5	6.99	0.00	4.12	48	2.39	9.85	0.65
127	126	127	0.00	0.00	0.00	5	6.99	0.00	4.12	49	2.37	9.75	0.33
126	125	126	0.43	0.24	0.10	20	4.02	0.42	4.22	49	2.36	9.94	0.16
125	124A	125	0.62	0.27	0.17	16	4.45	0.75	4.39	50	2.35	10.31	0.08
124A	124	124A	0.00	0.00	0.00	5	6.99	0.00	4.39	50	2.35	10.30	0.12
124	121	124	0.41	0.05	0.02	8	6.12	0.13	4.41	50	2.34	10.33	0.40
121	120	121	0.43	0.06	0.03	12	5.13	0.14	4.44	50	2.33	10.33	0.35
176	130	176	0.22	13.92	3.03	45	2.51	7.59	3.03	45	2.51	7.59	0.02
178	129	178	0.34	0.73	0.25	15	4.61	1.15	0.25	15	4.61	1.15	0.03
180	128	180	0.29	1.07	0.30	18	4.29	1.31	0.30	18	4.29	1.31	0.03
158	157	158	0.36	0.75	0.27	13	4.94	1.33	0.27	13	4.94	1.33	0.18
157	156	157	0.00	0.00	0.00	5	6.99	0.00	0.27	13	4.91	1.32	0.40
156	155	156	0.52	1.12	0.58	18	4.26	2.49	0.85	18	4.26	3.64	0.18
155	WQ8	155	0.51	1.07	0.54	16	4.43	2.41	1.40	18	4.24	5.93	0.10
WQ8	153	WQ8	0.00	0.00	0.00	5	6.99	0.00	1.40	18	4.23	5.92	0.83
169	168	169	0.25	0.82	0.20	17	4.36	0.88	0.20	17	4.36	0.88	0.07
168	167	168	0.00	0.00	0.00	5	6.99	0.00	0.36	17	4.35	1.59	0.86
167	166	167	0.63	0.38	0.24	15	4.55	1.08	0.60	18	4.27	2.57	0.21
166	165	166	0.50	0.31	0.16	8	5.96	0.94	0.76	18	4.25	3.23	1.58
165	164	165	0.00	0.00	0.00	5	6.99	0.00	1.04	20	4.09	4.26	0.91
164	163	164	0.51	0.43	0.22	14	4.72	1.05	1.26	21	4.01	5.06	0.21
163	162A	163	0.60	0.25	0.15	5	6.91	1.05	1.41	21	3.98	5.64	0.11
162A	162	162A	0.00	0.00	0.00	5	6.99	0.00	1.41	21	3.97	5.62	0.90
162	161	162	0.00	0.00	0.00	5	6.99	0.00	1.83	22	3.89	7.11	0.27
174	165	174	0.30	0.95	0.28	18	4.23	1.19	0.28	18	4.23	1.19	0.03
172	171	172	0.32	0.82	0.27	10	5.59	1.48	0.27	10	5.59	1.48	0.88
171	170	171	0.59	0.16	0.10	11	5.33	0.52	0.36	11	5.33	1.93	0.21
170	WQ7	170	0.72	0.07	0.05	5	6.99	0.37	0.41	11	5.29	2.19	0.04
WQ7	162	WQ7	0.00	0.00	0.00	5	6.99	0.00	0.41	11	5.29	2.19	0.76
147	146	147	0.50	0.79	0.40	20	4.03	1.60	0.40	20	4.03	1.60	0.21
146	WQ9	146	0.50	0.83	0.41	20	4.08	1.68	0.81	21	4.01	3.25	0.08
WQ9	145	WQ9	0.00	0.00	0.00	5	6.99	0.00	0.81	21	4.00	3.24	0.85
145	144	145	0.41	0.42	0.17	13	4.86	0.84	0.98	21	3.92	3.85	0.32
141	140	141	0.30	1.46	0.44	13	4.85	2.11	0.44	13	4.85	2.11	0.53
140	139	140	0.57	0.96	0.54	15	4.54	2.47	0.98	15	4.54	4.45	0.15
139	WQ6	139	0.54	0.69	0.38	15	4.54	1.70	1.35	15	4.53	6.14	0.02
WQ6	138	WQ6	0.00	0.00	0.00	5	6.99	0.00	1.35	15	4.53	6.13	0.22
138	137	138	0.00	0.00	0.00	5	6.99	0.00	1.35	15	4.51	6.11	1.05
150	149	150	0.57	0.66	0.38	16	4.50	1.69	0.38	16	4.50	1.69	0.21
149	WQ5	149	0.57	0.68	0.39	16	4.47	1.73	0.76	16	4.47	3.41	0.02
WQ5	148	WQ5	0.00	0.00	0.00	5	6.99	0.00	0.76	16	4.47	3.41	1.10
113	112	113	0.00	0.00	0.00	5	6.99	0.00	0.00	5	6.99	0.00	0.92
112	111	112	0.30	0.74	0.22	17	4.38	0.96	1.06	17	4.38	4.66	1.03
111	110	111	0.39	0.54	0.21	14	4.80	1.02	1.28	18	4.28	5.46	0.21
110	109	110	0.55	0.56	0.31	14	4.78	1.47	1.58	18	4.26	6.74	0.07
109	108	109	0.00	0.00	0.00	5	6.99	0.00	1.58	18	4.25	6.73	0.92
108	107	108	0.32	0.51	0.16	14	4.65	0.75	2.42	19	4.16	10.05	0.41
123	122	123	0.51	0.84	0.43	20	4.04	1.74	0.43	20	4.04	1.74	0.21
122	112	122	0.52	0.80	0.41	19	4.12	1.70	0.84	20	4.02	3.39	1.01

STORM SEWER DESIGN CALCULATIONS  
-RATIONAL METHOD-

PROJECT: Promenade, Sections 1A & 1B	STORM: 10 Year
JOB #: 21113-S1	COMPUTED BY: JET
DATE: 3/24/22	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)
119	118	119	0.64	0.26	0.17	8	6.07	1.01	0.17	8	6.07	1.01	0.21
118	117	118	0.62	0.21	0.13	9	5.75	0.75	0.30	9	5.75	1.71	0.13
117	WQ4	117	0.00	0.00	0.00	5	6.99	0.00	0.67	9	5.71	3.83	0.31
WQ4	115	WQ4	0.00	0.00	0.00	5	6.99	0.00	0.67	10	5.62	3.77	0.92
115	108	115	0.00	0.00	0.00	5	6.99	0.00	0.67	10	5.39	3.62	0.89
114	117	114	0.31	1.22	0.37	14	4.66	1.74	0.37	14	4.66	1.74	0.93
104	101	104	0.29	22.10	6.34	54	2.18	13.84	6.34	54	2.18	13.84	0.07
103	101	103	0.20	0.88	0.18	25	3.60	0.64	0.18	25	3.60	0.64	0.13
502	501	502	0.74	0.05	0.03	5	6.99	0.24	0.03	5	6.99	0.24	0.23
501	500	501	0.76	0.19	0.14	5	6.99	1.00	0.18	5	6.92	1.22	0.07
500	EX1	500	0.00	0.00	0.00	5	6.99	0.00	0.18	5	6.90	1.22	0.10
504	503	504	0.74	0.34	0.25	5	6.99	1.78	0.25	5	6.99	1.78	0.08
503	EX2	503	0.00	0.00	0.00	5	6.99	0.00	0.25	5	6.97	1.78	0.00
102	101	102	0.00	0.00	0.00	5	6.99	0.00	0.00	5	6.99	0.00	0.23
101	100	101	0.00	0.00	0.00	5	6.99	0.00	6.52	54	2.18	14.22	0.25
182	181	182	0.44	0.18	0.08	5	6.99	0.55	0.08	5	6.99	0.55	0.21
181	168	181	0.41	0.20	0.08	5	6.99	0.59	0.16	5	6.93	1.13	0.83
EX127	EX124	EX127	0.72	0.02	0.02	5	6.99	0.12	0.02	5	6.99	0.12	0.19
EX124	EX103	EX124	0.72	0.02	0.02	5	6.99	0.12	0.03	5	6.93	0.23	0.62

STORM SEWER DESIGN CALCULATIONS  
-COMPOSITE C-VALUES-

PROJECT:	Promenade, Sections 1A &	STORM:	10 Year
JOB #:	21113-S1	COMPUTED BY:	JET
DATE:	3/24/22		

BASIN #	c	BASINS			RUNOFF COEFFICIENTS				
		Area (ft2)	Area (acres)	c*A	Pavement 0.85 Area (ft <sup>2</sup> )	Lawns 0.20 Area (ft <sup>2</sup> )	Other 0.30 Area (ft <sup>2</sup> )	Other Area (ft <sup>2</sup> )	Other Area (ft <sup>2</sup> )
134	0.39	18279	0.42	0.16	5400	12879			
133	0.42	2913	0.07	0.03	1000	1913			
132	0.52	19475	0.45	0.24	9662	9813			
131	0.51	9237	0.21	0.11	4455	4782			
130	0.00	0	0.00	0.00					
129	0.00	0	0.00	0.00					
128	0.00	0	0.00	0.00					
127	0.00	0	0.00	0.00					
126	0.43	10506	0.24	0.10	3684	6822			
125	0.62	11863	0.27	0.17	7613	4250			
124A	0.00	0	0.00	0.00					
124	0.41	2180	0.05	0.02	700	1480			
121	0.43	2828	0.06	0.03	1000	1828			
176	0.22	606511	13.92	3.03	16170	590341			
178	0.34	31833	0.73	0.25	7000	24833			
180	0.29	46482	1.07	0.31	6125	40357			
158	0.36	32727	0.75	0.27	8000	24727			
157	0.00	0	0.00	0.00					
156	0.52	48574	1.12	0.59	24194	24380			
155	0.51	46457	1.07	0.55	22160	24297			
WQ8	0.00	0	0.00	0.00					
169	0.25	35794	0.82	0.20	2500	33294			
168	0.00	0	0.00	0.00					
167	0.63	16456	0.38	0.24	10889	5567			
166	0.50	13634	0.31	0.16	6341	7293			
165	0.00	0	0.00	0.00					
164	0.51	18864	0.43	0.22	9058	9806			
163	0.60	10953	0.25	0.15	6813	4140			
162A	0.00	0	0.00	0.00					
162	0.00	0	0.00	0.00					
174	0.30	41405	0.95	0.28	6125	35280			
172	0.32	35897	0.82	0.26	6744	29153			
171	0.59	7175	0.16	0.09	4276	2899			
170	0.72	3159	0.07	0.05	2538	621			
WQ7	0.00	0	0.00	0.00					
147	0.50	34516	0.79	0.40	16000	18516			
146	0.50	36137	0.83	0.41	16500	19637			
WQ9	0.00	0	0.00	0.00					
145	0.41	18361	0.42	0.17	6000	12361			
141	0.30	63645	1.46	0.44	9625	54020			
140	0.57	41667	0.96	0.55	23621	18046			
139	0.54	30085	0.69	0.37	15883	14202			
WQ6	0.00	0	0.00	0.00					
138	0.00	0	0.00	0.00					
150	0.57	28680	0.66	0.38	16403	12277			
149	0.57	29732	0.68	0.38	16747	12985			
WQ5	0.00	0	0.00	0.00					

STORM SEWER DESIGN CALCULATIONS  
-COMPOSITE C-VALUES-

PROJECT:	Promenade, Sections 1A &	STORM:	10 Year
JOB #:	21113-S1	COMPUTED BY:	JET
DATE:	3/24/22		

BASIN #	c	BASINS			RUNOFF COEFFICIENTS				
		Area (ft2)	Area (acres)	c*A	Pavement 0.85	Lawns 0.20	Other 0.30	Other	Other
		Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )	Area (ft <sup>2</sup> )
113	0.00	0	0.00	0.00					
112	0.30	32273	0.74	0.22	4795	27478			
111	0.39	23600	0.54	0.21	7000	16600			
110	0.55	24179	0.56	0.31	13169	11010			
109	0.00	0	0.00	0.00					
108	0.32	22057	0.51	0.16	4000	18057			
123	0.51	36727	0.84	0.43	17500	19227			
122	0.52	34837	0.80	0.41	17000	17837			
119	0.64	11245	0.26	0.17	7680	3565			
118	0.62	9257	0.21	0.13	5916	3341			
117	0.00	0	0.00	0.00					
WQ4	0.00	0	0.00	0.00					
115	0.00	0	0.00	0.00					
114	0.31	53040	1.22	0.37	8750	44290			
104	0.29	962551	22.10	6.34	7000	162971	792580		
103	0.20	38463	0.88	0.18		38463			
502	0.74	2008	0.05	0.04	1658	350			
501	0.76	8222	0.19	0.14	7022	1200			
500	0.00	0	0.00	0.00					
504	0.74	14973	0.34	0.25	12473	2500			
503	0.00	0	0.00	0.00					
102	0.00	0	0.00	0.00					
101	0.00	0	0.00	0.00					
182	0.44	7698	0.18	0.08	2876	4822			
181	0.41	8900	0.20	0.08	2920	5980			
EX127	0.72	1000	0.02	0.01	800	200			
EX124	0.72	1000	0.02	0.01	800	200			





STORM SEWER DESIGN CALCULATIONS																
-INLET CAPACITY - 50% CLOGGED DEPTH OVER CASING-																
PROJECT: Promenade, Sections 1A & 1B										STORM: 10 Year						
JOB #: 21113-S1										COMPUTED BY: JET						
DATE: 3/24/2022										SHEET NO.:						
Inlet #	Basin CFS	Bypass CFS to Inlet	Total CFS	Grade At Inlet	Cross Slope (f/ft)	Longitudinal Slope (f/ft)	Casing Model / Name	# of Castings	SAG Only Multiple Inlet Separation (ft)	SAG Only Inlet Depression (ft)	Maximum Depth (ft) *At Gutter	Inlet Width (in)	Inlet Length (in)	50% Clogged Inlet Perimeter (ft)	Bypass Inlet	Bypass CFS
133	0.18	0.00	0.18	SAG	0.0208		R-4342	1		0.083	0.07	18.7	28.625	3.00		
132	0.97	0.00	0.97	SAG	0.0208		R-3501-R	1		0.083	0.14	18.7	28.625	2.75		
131	0.62	0.00	0.62	SAG	0.0208		R-3501-R	1		0.083	0.08	18.7	28.625	2.75		
126	0.42	0.00	0.42	SAG	0.0208		R-3501-R	1		0.083	0.05	18.7	28.625	2.75		
125	0.75	0.00	0.75	SAG	0.0208		R-3501-R	1		0.083	0.11	18.7	28.625	2.75		
124	0.13	0.00	0.13	SAG	0.0208		R-4342	1			0.06	18.7	28.625	3.00		
121	0.14	0.00	0.14	SAG	0.0208		R-4342	1			0.06	18.7	28.625	3.00		
166	2.49	0.00	2.49	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.18	18.7	28.625	5.50		
155	2.41	0.00	2.41	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.18	18.7	28.625	5.50		
167	1.08	0.00	1.08	SAG	0.0208		R-3501-R	1		0.083	0.16	18.7	28.625	2.75		
166	0.94	0.00	0.94	SAG	0.0208		R-3501-R	1		0.083	0.14	18.7	28.625	2.75		
164	1.05	0.00	1.05	Continuous	0.0208	0.0080	R-3501-R	1		0.083	0.06	18.7	28.625	2.75		0.00
163	1.05	0.00	1.05	Continuous	0.0208	0.0080	R-3501-R	1		0.083	0.06	18.7	28.625	2.75		0.00
171	0.52	0.00	0.52	Continuous	0.0208	0.0130	R-3501-R	1		0.083	0.02	18.7	28.625	2.75		0.00
170	0.37	0.00	0.37	Continuous	0.0208	0.0130	R-3501-R	1		0.083	0.01	18.7	28.625	2.75		0.00
147	1.60	0.00	1.6	SAG	0.0208		R-3501-R	1		0.083	0.23	18.7	28.625	2.75		
146	1.68	0.00	1.68	SAG	0.0208		R-3501-R	2		0.083	0.12	18.7	28.625	5.50		
WQ9	0.00	0.00	0	SAG	0.0208		R-4342	1	2* Inlet Width	0.083	0.00	18.7	28.625	3.00		
140	2.47	0.00	2.47	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.18	18.7	28.625	5.50		
139	1.70	0.00	1.7	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.12	18.7	28.625	5.50		
150	1.69	0.00	1.69	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.12	18.7	28.625	5.50		
149	1.73	0.00	1.73	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.13	18.7	28.625	5.50		
112	0.96	0.00	0.96	SAG	0.0208		R-4342	1		0.21	0.21	18.7	28.625	3.00		
111	1.02	0.00	1.02	SAG	0.0208		R-3501-R	1		0.083	0.15	18.7	28.625	2.75		
110	1.47	0.00	1.47	SAG	0.0208		R-3501-R	1		0.083	0.21	18.7	28.625	2.75		
108	0.75	0.00	0.75	SAG	0.0208		R-4342	1			0.18	18.7	28.625	3.00		
123	1.74	0.00	1.74	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.13	18.7	28.625	5.50		
122	1.70	0.00	1.7	SAG	0.0208		R-3501-R	2	2* Inlet Width	0.083	0.12	18.7	28.625	5.50		
119	1.01	0.00	1.01	SAG	0.0208		R-3501-R	1		0.083	0.15	18.7	28.625	2.75		
118	0.75	0.00	0.75	SAG	0.0208		R-3501-R	1		0.083	0.11	18.7	28.625	2.75		
114	1.74	0.00	1.74	SAG	0.0208		R-4342	1			0.31	22.5	45	3.00		0.00
502	0.24	0.00	0.24	Continuous	0.0208	0.0050	R-3287-15	1			0.09	22.5	45	3.75		0.00
501	1.00	0.00	1	SAG	0.0208		R-3287-15	1			0.19	22.5	45	3.75		0.00
504	1.78	0.00	1.78	SAG	0.0208		R-3287-15	2	2* Inlet Width		0.17	22.5	45	7.50		0.00
182	0.55	0.00	0.55	Continuous	0.0208	0.0070	R-3501-R	1		0.083	0.03	18.7	28.625	2.75		0.00
181	0.59	0.00	0.59	Continuous	0.0208	0.0070	R-3501-R	1		0.083	0.04	18.7	28.625	2.75		0.00

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



# 10-YEAR HGL CALCULATION RESULTS

## Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Flow (cfs)	Length (User Defined) (ft)	Diameter (in)	Slope (Calculated) (ft/ft)	Capacity (Design) (cfs)	Velocity (ft/s)	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Headloss (ft)
504	503	1.78	12.0	12.0	0.003	2.10	3.00	875.16	871.99	871.34	874.88	871.87	871.30	0.12
501	500	1.22	10.2	12.0	0.003	1.96	2.63	874.90	871.98	871.45	874.56	871.89	871.42	0.10
502	501	0.24	34.3	12.0	0.003	1.94	1.69	874.86	872.00	871.55	874.90	872.00	871.45	0.00
171	170	1.93	32.0	15.0	0.002	3.09	2.65	874.71	870.27	869.59	874.71	870.07	869.52	0.19
170	WQ7	2.19	12.5	15.0	0.011	6.64	4.85	874.71	870.01	869.42	875.10	869.88	869.29	0.13
166	165	3.23	242.4	18.0	0.002	4.48	2.76	874.61	869.31	868.37	871.83	868.84	867.93	0.47
167	166	2.57	32.0	15.0	0.002	3.02	2.76	874.61	869.40	868.54	874.61	869.31	868.47	0.08
162A	162	5.62	136.0	24.0	0.001	7.76	2.69	874.57	868.48	867.31	871.27	868.23	867.15	0.26
164	163	5.06	32.0	24.0	0.001	8.00	2.69	873.96	868.60	867.57	873.96	868.52	867.53	0.08
163	162A	5.64	16.0	24.0	0.001	8.00	2.76	873.96	868.52	867.43	874.57	868.48	867.41	0.04
165	164	4.26	137.0	24.0	0.001	7.73	2.52	871.83	868.84	867.83	873.96	868.60	867.67	0.24
WQ8	153	5.92	177.0	18.0	0.004	6.26	4.03	872.04	868.79	867.63	868.71	867.94	867.00	0.85
132	131	1.77	32.0	12.0	0.003	1.96	2.83	872.01	869.11	868.34	872.01	869.02	868.24	0.09
131	130	2.21	171.0	15.0	0.002	3.09	2.73	872.01	869.02	868.14	872.00	868.81	867.75	0.20
130	129	8.93	330.5	24.0	0.002	9.06	3.29	872.00	868.81	867.20	871.84	868.28	866.67	0.53
133	132	0.96	32.4	12.0	0.003	1.96	2.48	871.90	869.14	868.54	872.01	869.11	868.44	0.03
128	127	9.85	124.0	24.0	0.002	9.91	3.60	871.85	867.91	866.32	870.09	867.66	866.08	0.26
129	128	9.29	204.8	24.0	0.002	9.35	3.39	871.84	868.28	866.67	871.85	867.91	866.32	0.36
156	155	3.64	32.0	15.0	0.003	3.65	3.39	871.71	868.98	867.93	871.71	868.88	867.83	0.10
155	WQ8	5.93	23.0	18.0	0.004	6.86	4.37	871.71	868.87	867.73	872.04	868.80	867.63	0.07
147	146	1.60	32.0	12.0	0.003	1.96	2.78	871.51	868.79	867.97	871.51	868.74	867.87	0.06
146	WQ9	3.25	13.0	15.0	0.003	3.58	3.31	871.51	868.73	867.77	871.99	868.70	867.73	0.04
157	156	1.32	60.1	12.0	0.003	1.95	2.67	871.50	869.04	868.21	871.71	868.98	868.03	0.06
162	161	7.11	40.0	24.0	0.001	7.61	2.75	871.27	868.23	867.05	869.25	867.95	867.00	0.27
138	137	6.11	157.8	24.0	0.001	7.81	2.75	871.25	868.40	867.19	869.25	867.88	867.00	0.52
150	149	1.69	32.0	12.0	0.003	2.00	2.85	871.21	868.61	867.75	871.21	868.55	867.65	0.06
149	WQ5	3.41	4.0	15.0	0.003	3.50	3.25	871.21	868.54	867.55	871.47	868.53	867.54	0.01
140	139	4.45	32.0	15.0	0.005	4.42	4.11	871.21	868.87	867.82	871.21	868.72	867.67	0.14
139	WQ6	6.14	5.0	18.0	0.004	6.64	4.27	871.21	868.71	867.57	871.50	868.69	867.55	0.02
123	122	1.74	32.0	18.0	0.002	4.47	2.37	871.21	867.87	867.03	871.21	867.86	866.97	0.02
122	112	3.39	155.0	18.0	0.002	4.46	2.78	871.21	867.86	866.87	869.90	867.59	866.59	0.27
116	115	3.77	153.6	18.0	0.002	4.48	2.84	871.20	867.49	866.41	870.88	867.24	866.13	0.25
109	108	6.73	133.7	24.0	0.001	7.82	2.80	871.01	867.30	865.94	868.50	867.09	865.78	0.20
117	116	3.83	45.9	18.0	0.002	4.44	2.83	870.88	867.60	866.59	871.20	867.50	866.51	0.11
115	108	3.62	135.6	18.0	0.002	4.42	2.79	870.88	867.24	866.03	868.50	867.09	865.79	0.15

# 10-YEAR HGL CALCULATION RESULTS

Conduit FlexTable: Combined Pipe/Node Report

Start Node	Stop Node	Flow (cfs)	Length (User Defined) (ft)	Diameter (in)	Slope (Calculated) (ft/ft)	Capacity (Design) (cfs)	Velocity (ft/s)	Elevation Ground (Start) (ft)	Hydraulic Grade Line (In) (ft)	Invert (Start) (ft)	Elevation Ground (Stop) (ft)	Hydraulic Grade Line (Out) (ft)	Invert (Stop) (ft)	Headloss (ft)
145	144	3.85	64.2	15.0	0.004	4.10	3.80	870.80	868.20	867.26	868.44	867.80	867.00	0.41
110	109	6.74	17.6	24.0	0.001	7.82	2.80	870.65	867.33	866.06	871.01	867.30	866.04	0.03
111	110	5.46	32.0	24.0	0.001	8.00	2.74	870.65	867.38	866.20	870.65	867.33	866.16	0.05
119	118	1.01	32.0	12.0	0.003	1.96	2.52	870.46	867.67	866.95	870.46	867.65	866.85	0.02
118	117	1.71	20.1	12.0	0.003	1.94	2.79	870.46	867.65	866.75	870.88	867.61	866.69	0.04
127	126	9.75	63.1	24.0	0.002	9.87	3.58	870.09	867.65	866.08	869.91	867.51	865.96	0.13
114	117	1.74	140.9	12.0	0.003	1.95	2.80	869.56	867.91	867.12	870.88	867.61	866.70	0.30
124A	124	10.30	24.0	24.0	0.002	10.30	3.74	869.98	867.38	865.87	869.60	867.32	865.82	0.06
125	124A	10.31	16.0	24.0	0.002	10.30	3.74	869.91	867.43	865.90	869.98	867.39	865.87	0.04
126	125	9.94	32.0	24.0	0.002	10.04	3.64	869.91	867.50	865.96	869.91	867.43	865.90	0.07
112	111	4.66	155.4	24.0	0.001	7.91	2.62	869.90	867.58	866.49	870.65	867.38	866.30	0.20
124	121	10.33	80.0	24.0	0.002	10.43	3.78	869.60	867.32	865.82	869.50	867.08	865.65	0.24
121	120	10.33	70.0	24.0	0.002	10.47	3.80	869.50	867.07	865.65	867.75	866.65	865.50	0.42
101	100	14.48	68.0	30.0	0.003	21.68	4.73	869.42	866.65	865.19	867.79	866.28	865.00	0.37
108	107	10.05	81.3	24.0	0.002	10.64	3.85	868.50	867.09	865.68	867.75	866.64	865.50	0.45
134	133	0.83	98.0	12.0	0.014	4.20	4.16	871.17	870.38	870.00	871.90	869.14	868.64	1.24
176	130	7.59	10.0	24.0	0.015	27.70	7.52	870.85	869.58	868.60	872.00	869.27	868.45	0.32
178	129	1.15	10.0	12.0	0.020	5.04	5.20	869.78	868.35	867.90	871.84	868.29	867.70	0.06
180	128	1.31	10.0	12.0	0.020	5.04	5.39	869.77	868.38	867.90	871.85	868.07	867.70	0.31
174	165	1.19	12.0	12.0	0.030	6.17	6.07	871.17	869.66	869.20	871.83	869.16	868.84	0.50
172	171	1.48	135.0	15.0	0.002	3.10	2.50	871.44	870.61	870.00	874.71	870.27	869.69	0.34
141	140	2.11	148.8	12.0	0.010	3.61	4.78	871.17	870.12	869.50	871.21	868.87	867.97	1.25
113	112	0.00	164.7	18.0	0.002	5.24	0.00	870.00	867.59	867.00	869.90	867.59	866.59	0.00
104	101	13.84	20.0	24.0	0.004	14.31	5.19	868.05	867.27	865.80	869.42	867.06	865.72	0.21
103	101	0.64	20.0	12.0	0.003	1.95	2.22	868.00	866.67	866.00	869.42	866.66	865.94	0.01
102	101	0.00	47.9	24.0	0.002	10.84	0.00	868.90	866.65	865.50	869.42	866.65	865.39	0.00
158	157	1.33	74.9	12.0	0.023	5.35	5.65	871.17	870.49	870.00	871.50	869.04	868.31	1.44
168	167	1.59	130.0	12.0	0.003	1.95	2.77	874.61	869.73	869.03	874.61	869.40	868.64	0.33
169	168	0.88	10.0	12.0	0.003	1.95	2.42	873.00	870.45	870.00	874.61	870.36	869.97	0.08
182	181	0.55	32.0	12.0	0.003	1.99	2.17	872.92	870.09	869.70	872.92	870.05	869.60	0.04
181	168	1.13	125.0	12.0	0.003	1.94	2.56	872.92	870.05	869.50	874.61	869.73	869.13	0.32
WQ5	148	3.41	188.0	15.0	0.003	3.46	3.21	871.47	868.53	867.54	868.44	867.75	867.00	0.78
WQ6	138	6.13	47.0	18.0	0.003	6.13	3.95	871.50	868.69	867.55	871.25	868.40	867.39	0.29
WQ7	162	2.19	233.2	15.0	0.009	6.17	4.60	875.10	869.88	869.29	871.27	868.23	867.16	1.65
WQ9	145	3.24	140.0	15.0	0.003	3.32	3.08	871.99	868.70	867.73	870.80	868.21	867.36	0.48