Post Construction Stormwater Management Calculations

Project:	**Tidal Wave Auto Spa Fairfield, OH** 3003 Bridgewater Landing Drive Fairfield Township Butler County, Ohio
Client:	**New Potato Creek Holding, LLC c/o PJ Land Development, LLC** 71 Carolyn Boulevard Indianapolis, IN 11735
Project Number:	**PAD220070.00**
Date:	**05/18/2023**
Revised:	

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GENERAL PROJECT DESCRIPTION

PJ Land Development, LLC is proposing to develop a lot in the Bridgewater Landings Development located at 3003 Bridgewater Landings Drive, Fairfield Township, Butler County, OH into a 3,610 SF Tidal Wave Auto Spa and cleaning facility. The parcel is currently vacant with no existing structures on site and consists primarily of meadow area. The proposal includes the installation of the Tidal Wave Auto Spa car wash facility, parking lot, utilities, landscaping, and stormwater management controls necessary to support the development.

This lot is part of an overall planned unit development and therefore a regional stormwater management system exists. Stormwater runoff will tie into the existing system and will eliminate the need for an on-lot stormwater system.

Pertinent data characterizing the existing and future site conditions are shown on the accompanying Planned Unit Development Plans.

General PCSM Planning and Design

1. The following measures were taken to preserve the integrity of stream channels and to maintain and protect the physical, biological, and chemical qualities of the receiving stream:
- Direct runoff from impervious surfaces including roadways to BMPs.
- Use native species, which require less fertilization and chemical application than non-native species.
- Maintain generally the same drainage patterns as in the existing condition

2. The following measures were taken to prevent an increase in the rate of storm water runoff:
- Minimize impervious areas where practical.
- Maintain generally the same drainage patterns as in the existing condition

3. The following measures were taken to minimize any increase in storm water runoff volume:
- Minimize impervious areas where practical.
- Maintain generally the same drainage patterns as in the existing condition

4. The following measures were taken to minimize impervious areas:
- Minimize impervious areas where practical.

5. The following measures are taken to maximize protection of existing drainage features and vegetation:
- Access the site thru designated construction entrance.

6. The following measures were taken to minimize land clearing and grading:
- Adjust road slope and site grading so there are no drastic proposed cuts or fills to existing grades.

7. The following measures are taken to minimize soil compaction:
- Access the site thru designated construction entrance.
- Grade site to minimize extent of cuts/fills.

8. the following measures were taken to utilize other structural or nonstructural BMPs that prevent or minimize changes in storm water runoff:
- Minimize impervious areas where practical.

Types, Depth, Slope, Locations, and Limitations of the Soils and Geologic Formations

Soil Descriptions:

Soil	Description	Soil Group
DaB	Dana Silt Loam, 2 to 6 percent slopes	C
WyB2	Wynn Silt Loam, 2 to 6 percent slopes	C

- **No geologic mapping features were identified.**

Past, Present and Proposed Land Uses and Proposed Alteration to Project Site

During the past 20 years, this land has been vacant.

Geologic Formations or Soil Conditions

There are no geologic formations or soil conditions that could cause contaminant pollution during earth disturbance activities.

Riparian Forest Buffer Management Plan

Regarding existing or proposed riparian forest buffers, note the following:

- There are no existing/proposed riparian forest buffers located within or outside the limits of disturbance for this project.

Stormwater Management

Watershed

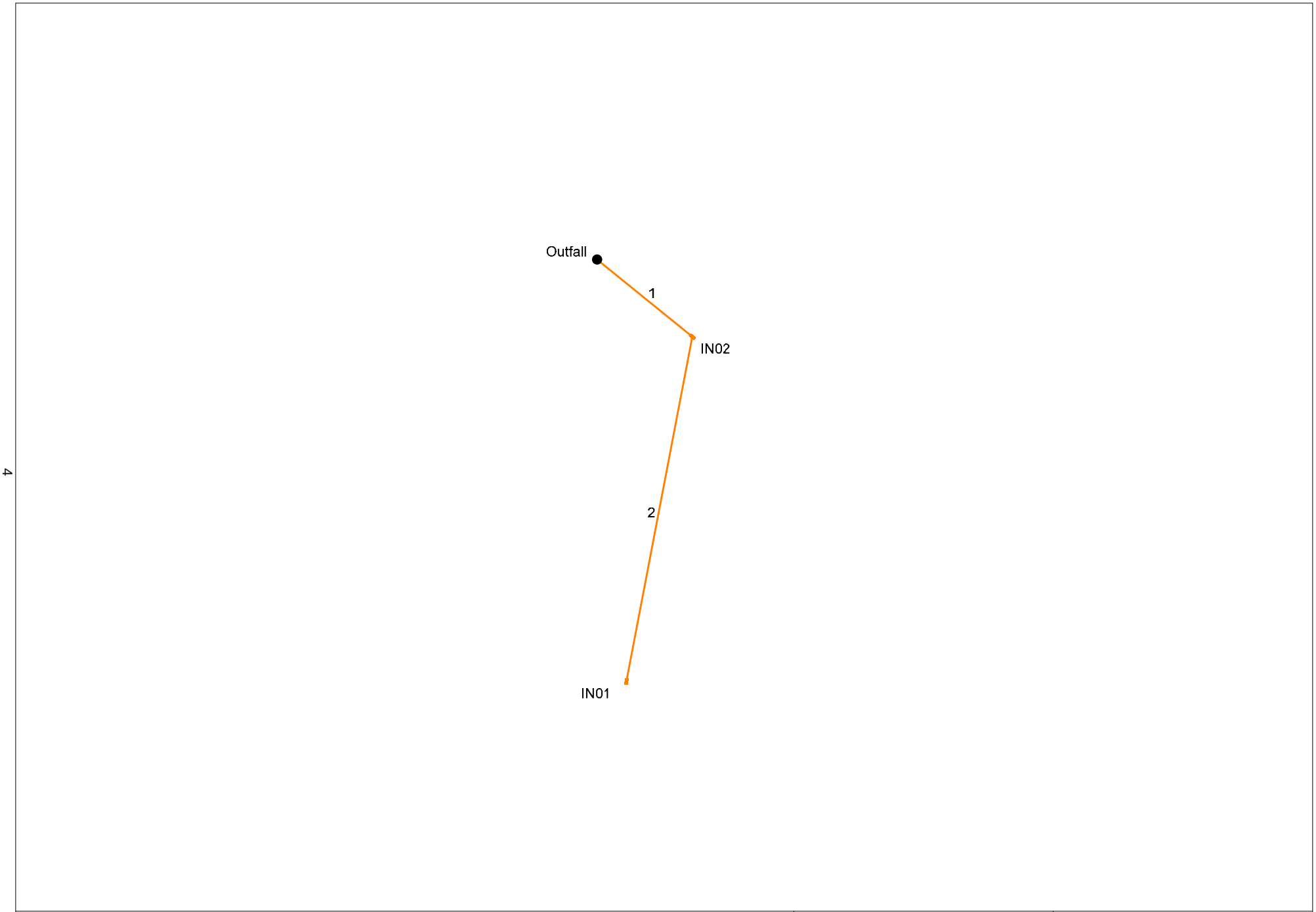
The overall property is within the Great Miami River (lower) Watershed.

Peak Rate Points of Interest

POI #1 discharges to an existing inlet north of the site in Gilmore Road and ultimately drains to a regional aboveground stormwater detention system.

Stormwater Management Calculations

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



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Storm Sewers v2022.00

25-yr Storm

Gutter

Line No.	Inlet ID	Junct Type	Inlet Loc	Gnd/Rim El Up (ft)	Q Capt (cfs)	Q Carry (cfs)	Flow Rate (cfs)	Inlet Eff (%)	Q Byp (cfs)	Byp Ln No	Gutter Depth (ft)	Gutter Spread (ft)	Cross Sl, Sx (ft/ft)	Gutter Slope (ft/ft)	
1	IN02	Curb	Sag	754.09	3.19	0.00	4.83	100	0.00	Sag	0.38	16.06	0.020	Sag	
2	IN01	Curb	Sag	754.29	2.20	0.00	2.20	100	0.00	Sag	0.31	12.55	0.020	Sag	

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NOTES: ** Critical depth

Node

Line No.	Inlet ID	Junct Type	Inlet Loc	Gnd/Rim El Up (ft)	Invert Up (ft)	Drng Area (ac)	Runoff Coeff (C)	i Inlet (in/hr)	Tc (min)	Q Capt (cfs)	Q Carry (cfs)	Flow Rate (cfs)	Known Q (cfs)
1	IN02	Curb	Sag	754.09	746.77	0.47	0.92	7.37	8.2	3.19	0.00	4.83	0.00
2	IN01	Curb	Sag	754.29	749.28	0.36	0.83	7.37	6.0	2.20	0.00	2.20	0.00

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NOTES: Intensity = 50.17 / (Inlet time + 7.50) ^ 0.74 -- Return period = 25 Yrs. ; ** Critical depth

25-yr Storm

Pipe

Line No.	Inlet ID	Line ID	Line Size (in)	n-val Pipe	Line Length (ft)	Line Slope (%)	Capac Full (cfs)	Flow Rate (cfs)	Vel Ave (ft/s)	Invert Up (ft)	Cover Up (ft)	Gnd/Rim El Up (ft)	HGL Up (ft)	EGL Up (ft)	Invert Dn (ft)	Cover Dn (ft)	Gnd/Rim El Dn (ft)	HGL Dn (ft)	EGL Dn (ft)	
1	IN02	Pipe - (5)	15	0.012	80.566	0.61	5.46	4.83	5.04	746.77	6.07	754.09	747.70	748.08	746.28	3.09	750.62	747.17	747.59	
2	IN01	Pipe - (1)	15	0.012	231.476	1.00	6.99	2.20	2.82	749.28	3.76	754.29	749.87 j	750.10	746.97	5.87	754.09	748.21	748.44	

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25-yr Storm

Peak Discharge Calculations

Project: **Tidal Wave Auto Spa Fairfield, OH**

Description: **POI #1**

Runoff Coefficients

Impervious	0.96
Lawn	0.23

	5
Conversion Factor, *k**	1.0083

*Q = *k* CIA

Catchment Areas

Name	Tc (min.)	Groundcover Areas (Ac.)					Total Area (Ac)	C	Q (cfs)			
		Impervious	Lawn						2-year	10-year	25-year	100-year
POI #1	6.00	0.73	0.09				0.82	0.88	3.76	4.96	5.61	6.57

Pipe Capacity Calculations

Project: **Tidal Wave Auto Spa Fairfield, OH**

Description: **Existing Pipe Capacity (25-year)**

Q:	**5.61**	cfs
Rise:	**15.00**	in
Span:	**15.00**	in
Barrels:	**1**	
Eq. Circular Pipe Size:	**15.00**	in
Material:	**HDPE**	
Slope:	**0.0161**	ft/ft
Manning's n:	**0.0120**	
Flow Area:	0.73	s.f.
Wetted Perimeter:	2.16	ft
Top Width:	1.24	ft
Percent Full:	57.66	%
Velocity:	7.66	ft/s
Maximum Discharge:	**9.55**	cfs
Full Flow Capacity:	8.88	cfs
Flow Depth:	**0.72**	ft