SPACECO INC.

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

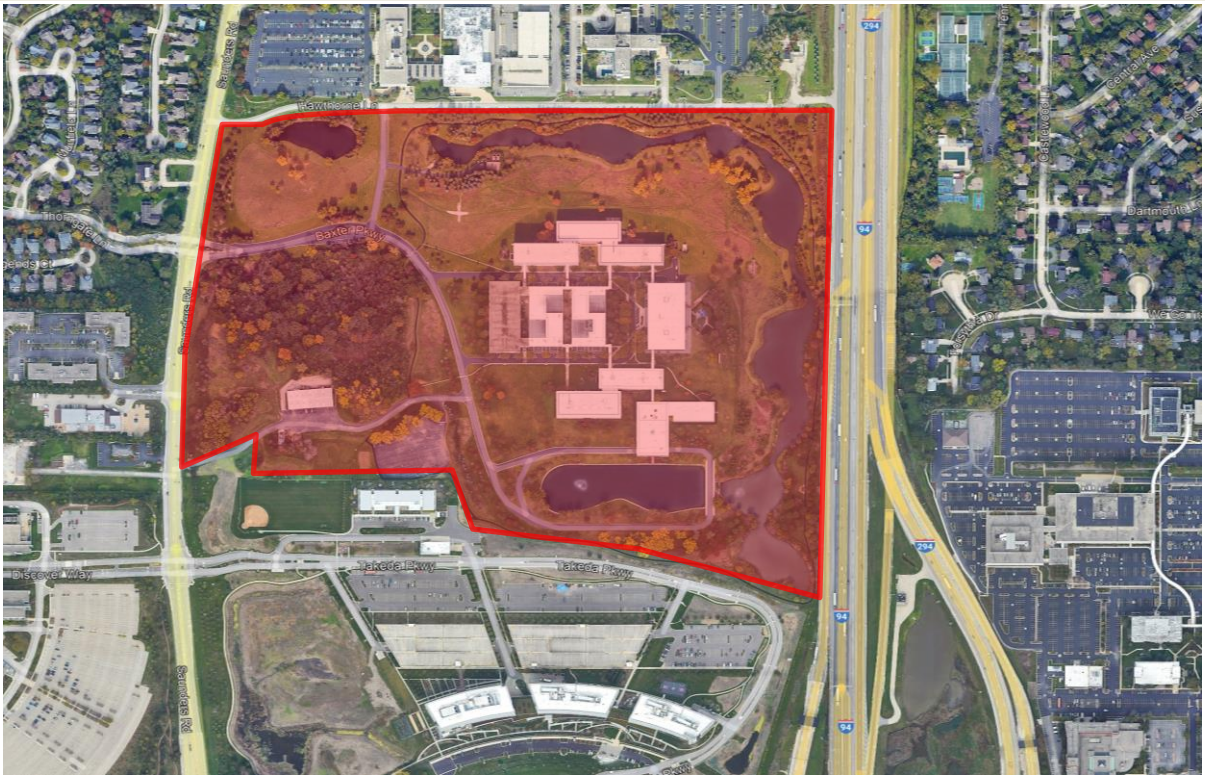
STORMWATER

MANAGEMENT REPORT

FOR

BRIDGE POINT O'HARE NORTH

VILLAGE OF DEERFIELD, IL



Prepared For:

BRIDGE INDUSTRIAL

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SPACECO PROJ #:	12271
ORIGINAL DATE:	March 2023
LAST REVISED:	

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TAB 1
GENERAL STORMWATER INFORMATION

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
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PROJECT NARRATIVE

INTRODUCTION

This report summarizes the final stormwater management calculations for the proposed development at 1 Baxter Parkway located in the Village of Deerfield, Lake County, IL. The total property ownership is 101.021 acres.

The stormwater analysis was performed based on the land plan prepared by the project architect, the topographic survey prepared by Spaceco, Inc., and Site Improvement Plans in accordance with the requirements of the Lake County Watershed Development Ordinance, Effective October 13, 2020, as adopted by the Village of Deerfield. This ordinance was consulted as the basis of the design requirements.

EXISTING CONDITIONS

Under existing conditions, the project area is a corporate headquarters consisting of multiple buildings, access drives, ponds, a woodland area with multiple wetlands and grass areas.

The is an existing watershed divide that runs North/South in the west portion of the site. The majority of the site drains east to the on-site ponds and ultimately to the I-94 ROW drainage system. The area west of the watershed divide sheet drains to the Sounders Road ROW. The east portion of the site is tributary to North Branch Chicago River Watershed – West Fork. The west portion of the site is tributary to Des Plaines River Watershed – Lower Des Plaines River. See **Tab 4** for existing depressional storage volumes calculations. A watershed exhibit for the site is provided as **Exhibit 5** in **Tab 2**.

There is no regulatory floodplain or floodway located on the site per the Flood Insurance Rate Map (FIRM) 17097C0267K & 17097C0286K with an effective date of September 18, 2013. A partial copy of the FIRM panel is included as **Exhibit 3** under **Tab 2**.

There are existing wetlands on-site per the Wetland Delineation prepared by Midwest Ecological. The delineation is provided under **Tab 7** of this report. See **Tab 7** for further discussion.

There is off-site flow tributary to the site from the south as indicated by the previous plans for Takeda Pharmaceuticals North America Headquarters. The delineated off-site areas are shown in the Existing Drainage Exhibit provided as **Exhibit 7** in **Tab 2**. The previous drainage plans for Takeda Pharmaceuticals are provided under **Exhibit 11** in **Tab 2**.

PROPOSED CONDITIONS

General Stormwater Information

The proposed development will include the construction of two (2) office/warehouse buildings with passenger vehicle parking lot, loading docks, truck pavement area, and associated underground utilities, and a Recreational Center Facility. These activities are

concentrated in the East Drainage Area. No major improvement are proposed within the West Drainage Area, therefore, this will be excluded from the following analysis.

The total East Drainage Area of site is 94.436 acres, and 85.731 acres of the site is proposed to be disturbed as part of the proposed development. The required detention will be provided in a native vegetated bottom storage basins and wet detention basins.

Downstream Capacity Analysis

Per the Ordinance, an analysis of the capacity of the downstream adjacent property receiving the proposed stormwater discharges is required. The peak flow rates to the I-94 ROW were analyzed by a HEC-HMS hydrologic model using the 100-year critical duration storm events, as specified by Bulletin 75 for Northeast Illinois, and the corresponding Huff Quartile Distribution to demonstrate that the proposed flow rate tributary to the I-94 ROW is less than the existing flows. See **Exhibit 7** in **Tab 2** for the Existing Drainage Exhibit and **Tab 4** for existing condition calculations and HEC HMS summary. See **Exhibit 9, Tab 2** for the Proposed Drainage Exhibit. See **Tab 4** for HEC-HMS results and supporting calculations.

100-YR Downstream Capacity Analysis Summary Table

Existing Peak Flow (cfs)	Proposed Peak Flow (cfs)
63.151	13.895

Site Runoff Requirements

Basins #2A-2D will discharge into Basin #1. Basin #1 will control the site's release rate and will discharge to the existing storm sewer systems in the I-94 ROW which is tributary to the North Branch Chicago River Watershed – West Fork.

Storm Sewer Design Criteria

Stormwater Studio Version 3.0.0.17 was used to size the storm sewer and determine the Hydraulic Grade Line and water surface elevations. Calculations can be found in **Tab 3**.

- Rainfall Return Period: 10-Year
- Peak Discharge Method: Rational Formula, Q=CIA
- Computer Software: Stormwater Studio For Windows By Hydrology Studio
- Rainfall Intensity: Use ISWS Bulletin 75, Table 7 for Northeast Zone
  $I_{10} = 37.89/(T_c + 6)^{0.67}$
  $I_{100} = 432.28/(T_c + 24.75)^{1.08}$
- Runoff Coefficient: Impervious area: C = 0.90
  Pervious area: C = 0.45
- Inlet Time: 10 Minutes (minimum)
- Pipe Capacity: Use Manning's equation for full pipe flow capacity.
  Use n = 0.013 for RCP.

All storm sewer systems have been designed to convey the 10-year storm event to the proposed stormwater basin, except for the equalizer sewer.

Site Detention Requirements

Detention volume will be required for the entire development area within the East Drainage Area per the criteria of the Lake County WDO. A drainage exhibit showing the limits of on-site development area of the proposed improvement is provided in **Exhibit 8** of **Tab 2**.

East Drainage Area On-Site Area Summary Table

	Area Description					
Units	Total Property Interest	Undisturbed Property Area	Development Area	Unrestricted (Pervious/ Impervious)	Unrestricted (Native Plantings)	Development Area Tributary to Stormwater Basins
Acre	94.436	8.705	85.731	1.115	0.000	84.616

Detention storage required for the site is based on the development area tributary to the stormwater basins with a 2-year and 100-year watershed release rates of 0.04 cfs/acres and 0.15 cfs/acre, respectively, as required by Ordinance.

East Drainage Area 2-Year Release Rate Summary Table

Areas (ac.)		Flows (cfs)		
Development Area (Ac.)	Unrestricted (Ac.)	2-YR Gross Allowable Release Rate	2-yr 24 hr, Unrestr. Release (cfs)	2-YR Allowable Release Rate (cfs)
85.731	1.115	3.429	0.219	3.210

100-Year Release Rate Summary Table

Areas (ac.)		Flows (cfs)		
Development Area (Ac.)	Unrestricted (Ac.)	100-YR Gross Allowable Release Rate	100-yr 24 hr, Unrestr. Release (cfs)	100-YR Allowable Release Rate (cfs)
85.731	1.115	12.860	0.754	12.106

Basin #1 controls the release from site to I-94; Basins #2A-2D discharges into Basin #1 and is not subject to release rate requirements.

The required detention was analyzed with a HEC-HMS hydrologic model using the 2-year and 100-year 24-hour storm events, as specified by Bulletin 75 for Northeast Illinois, and Huff Quartile Distribution to demonstrate that the required storage and allowable release rates will be met for the tributary area. The Runoff Curve Number (CN) was determined based on the proposed land cover type (pervious or impervious) within each development area.

Detention Volume Required for Development Area Tributary to Basin #1 Summary Table

Development Area Tributary to Stormwater Basin (ac.)	Curve Number (CN)	2 YR, 24HR Volume Required (ac-ft)	100-YR, 24HR Volume Required (ac-ft)
20.288 (84.616 total)	93.19	2.808	6.133

Detention Volume Required for Development Area Tributary to Basins #2A-2D Summary Table

Development Area Tributary to Stormwater Basins (ac.)	Curve Number (CN)	2 YR, 24HR Volume Required (ac-ft)	100-YR, 24HR Volume Required (ac-ft)
64.328	94.34	14.038	42.009

Per ordinance, since off-site areas are tributary to the proposed stormwater Basin #1, a Detention Volume Safety Factor is required. The Detention Volume Safety Factor is equal to one (1) plus 0.05 times the ratio of off-site tributary area to on-site detained tributary drainage area.

Detention Volume Safety Factor Summary Table

Off-Site Tributary Area (Acres)	On-Site Detained Tributary Area (Acres)	Ratio	Detention Volume Safety Factor
37.045	84.616	0.438	1.022

The Detention Volume Safety Factor is applied to both the 2-Yr and 100-Yr Required Detention Volumes calculated for the Development Area.

Required Detention Volume For Basin #1 with Detention Volume Safety Factor Summary Table

2-YR, 24-HR Volume Required (ac-ft)	100-YR, 24-HR Volume Required (ac-ft)	Detention Volume Safety Factor	Adjusted 2-YR, 24-HR Volume Required (ac-ft)	Adjusted 100-YR, 24-HR Volume Required (ac-ft)
2.808	6.133	1.022	2.870	6.268

Per ordinance, the existing lost depressional storage volume is required to be compensated for on a 1:1 ratio in addition to the calculated required 100-yr detention volume.

Total 100-YR, 24-HR Detention Volume Required Summary Table

100-YR, 24-HR Volume Required for Basins #2A-2D (ac-ft)	Adjusted 100-YR, 24-HR Volume Required for Basin #1 (ac-ft)	Depressional Storage Volume Lost (ac-ft)	Total 100-YR, 24-HR Volume Required (ac-ft)
42.009	7.871	0.162	48.439

A stage-storage table was also prepared for the detention facilities. The storage values were calculated based on the proposed contours of the stormwater basins.

Total Detention Volume Provided Summary Table

Total 2-YR, 24-HR Volume Required (ac-ft)	Total 2-YR, 24-HR Volume Provided (ac-ft)	Total 100-YR, 24-HR Volume Required (ac-ft)	Total 100-YR, 24-HR Volume Provided (ac-ft)
16.908	18.074	48.439	57.636

See **Tab 4** for Proposed Conditions/Required Detention HEC-HMS inputs/outputs and corresponding support calculations.

Emergency Overflow Routes

The overflow weir calculations for the Stormwater Basin #1 and #2A are included in **Tab 3** of the report.

Basin Overflow Weir Summary Table

		Areas (acres)	**Flows (cfs)**	
Weir I.D.	Overflow Elevation	Tributary-Area	**Peak Inflow**	**Provided**
Basin #1	678.70	91.943	**589.000**	**1,691.399**
Basin #2A	682.00	71.129	**444.641**	**1,205.165**

Site Best Management Practice (BMP) Requirements

The required RVR will be provided by combination of storage below the detention outfall of the stormwater basins, the existing 2-year, 24-hour runoff volume to the preserved Isolated Wetlands, and the volume utilized to meet the Water Quality Treatment Volume.

See **Tab 4** for calculations of the RVR volume provided below the detention outfall of the stormwater basin. The RVR volume provided below the detention outfall of the stormwater basin will be infiltrated in less than 96 hours as required by ordinance. See **Tab 4** for infiltration time calculations.

See **Tab 7** for existing 2-year, 24-hour runoff volume to the preserved Isolated Wetlands.

The required Water Quality Treatment is met with providing stormwater quality units placed downstream of the restrictors. The water quality device are designed to treat the volume of 0.5" of runoff for the detained new impervious areas with a minimum 70% hydrocarbon removal rate. See **Tab 4** for removal calculations provided by the manufacturer.

Runoff Volume Reduction (RVR) Provided Summary Table

Type of RVR Credit	Volume (ac-ft)	% of RVR provided
Detention Facility (The volume provided below outfall of the stormwater basin)	0.857	14.57%
Isolated Wetland Hydrology (The existing 2-year, 24-hour runoff volume to a preserved IWLC)	2.553	43.40%
Water Quality Treatment (0.5" x New Impervious Area)	2.472	42.03%
Total	**5.882**	**100%**

TAB 2
EXHIBITS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
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9575 W. HIGGINS ROAD, SUITE 700
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SPACECO PROJECT # 12271

MARCH 2023

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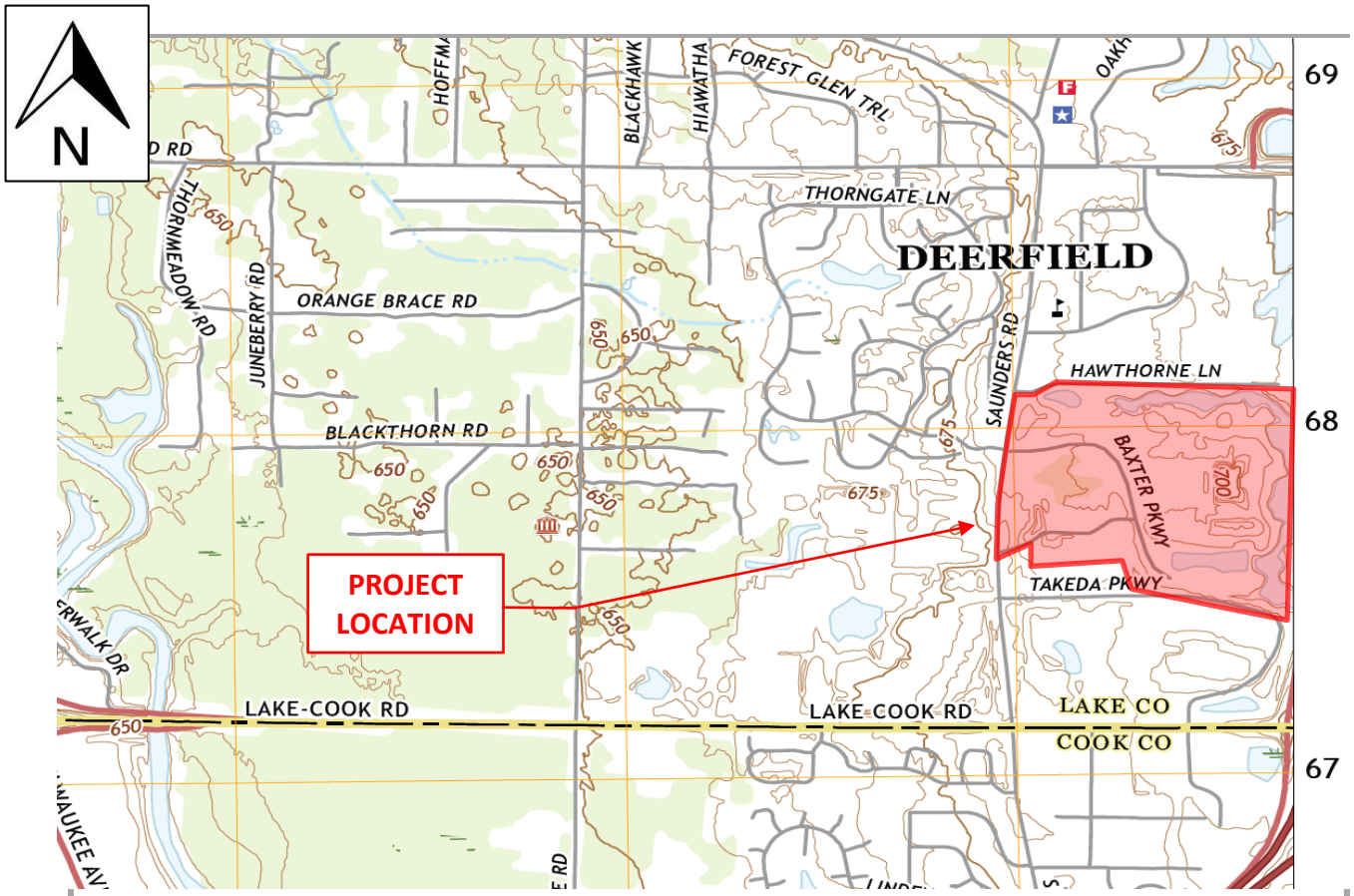
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

EXHIBIT TITLE: **USGS MAP**
DESCRIPTION: WHEELING QUADRANGLE



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 16T
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, August 2019 - August 2019
Roads.....U.S. Census Bureau, 2017
Names.....GNIS, 1980 - 2020
Hydrography.....National Hydrography Dataset, 2002 - 2020
Contours.....National Elevation Dataset, 2011
Boundaries.....multiple sources; see metadata file 2018 - 2019
Public Land Survey System.....BLM, 2020
Wetlands.....FWS National Wetlands Inventory Not Available

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000
KILOMETERS
METERS
MILES
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

ILLINOIS
QUADRANGLE LOCATION

ADJOINING QUADRANGLES
1 Grayslake
2 Libertyville
3 Waukegan
4 Lake Zurich
5 Highland Park
6 Palatine
7 Arlington Heights
8 Park Ridge

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

WHEELING, IL
2021

USGS 24k72639

EXHIBIT # 1

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

EXHIBIT TITLE: **NRCS SOILS MAP**
DESCRIPTION: HYDROLOGIC SOIL GROUP D



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
320A	Frankfort silt loam, 0 to 2 percent slopes	42.4	42.2%
320B	Frankfort silt loam, 2 to 4 percent slopes	3.0	3.0%
465A	Montgomery silty clay loam, 0 to 2 percent slopes	41.1	40.9%
W	Water	14.0	13.9%
Totals for Area of Interest		**100.5**	**100.0%**

EXHIBIT # 2

SPACECO INC.
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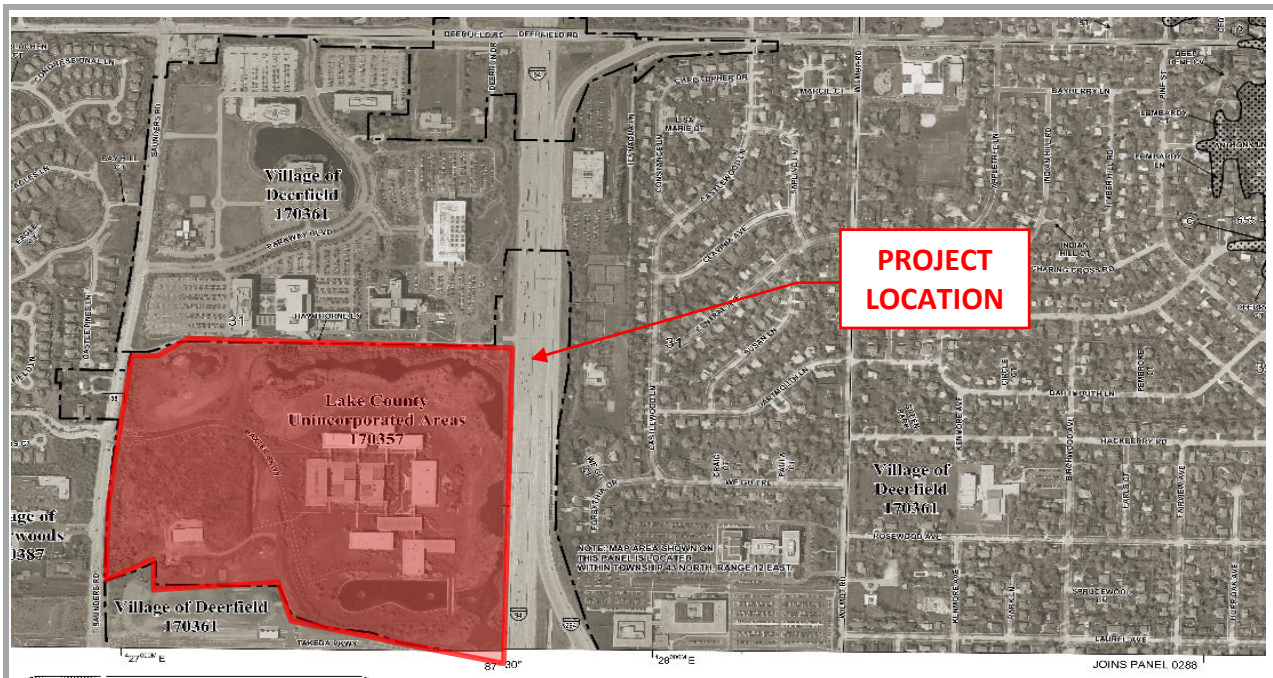
EXHIBIT TITLE: **FEMA MAP**

DESCRIPTION: MAP NUMBER 17097C0267K & 17097C0286K ; NO FLOODPLAINS/FLOODWAYS ON-SITE (SEE TAB 6)



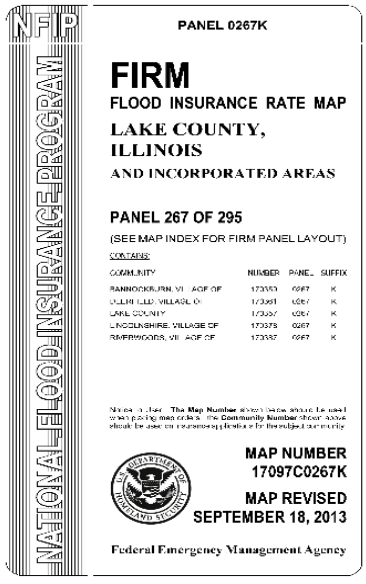
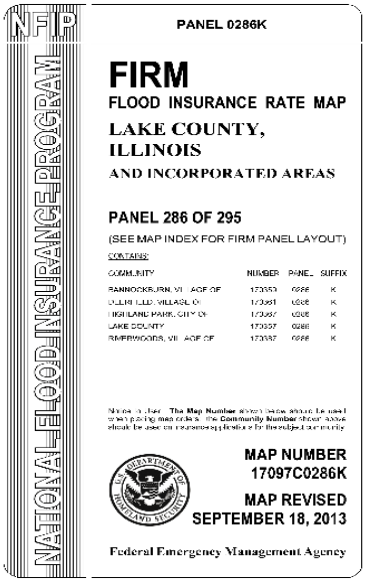


EXHIBIT # 3



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		LAST REVISED:	

EXHIBIT TITLE: NATIONAL WETLAND INVENTORY MAP

DESCRIPTION: NO WETLANDS ON-SITE; SEE TAB 7 FOR FURTHER INFORMATION

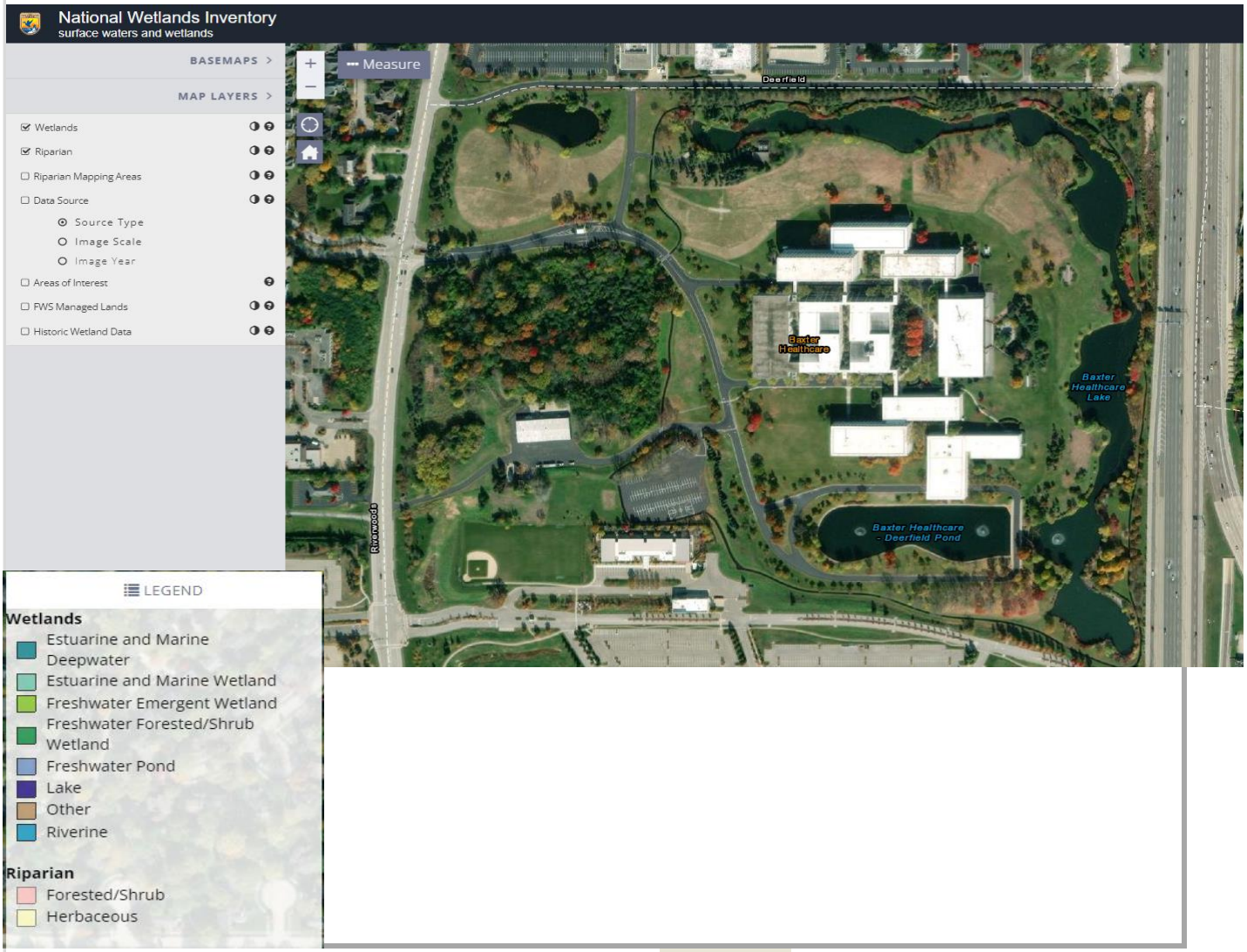

EXHIBIT # 4

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

EXHIBIT TITLE: LAKE COUNTY WATERSHED MAP

DESCRIPTION: DES PLAINES RIVER WATERSHED-LOWER DES PLAINES RIVER & NORTH BRANCH CHICAGO RIVER WATERSHED-WEST FORK

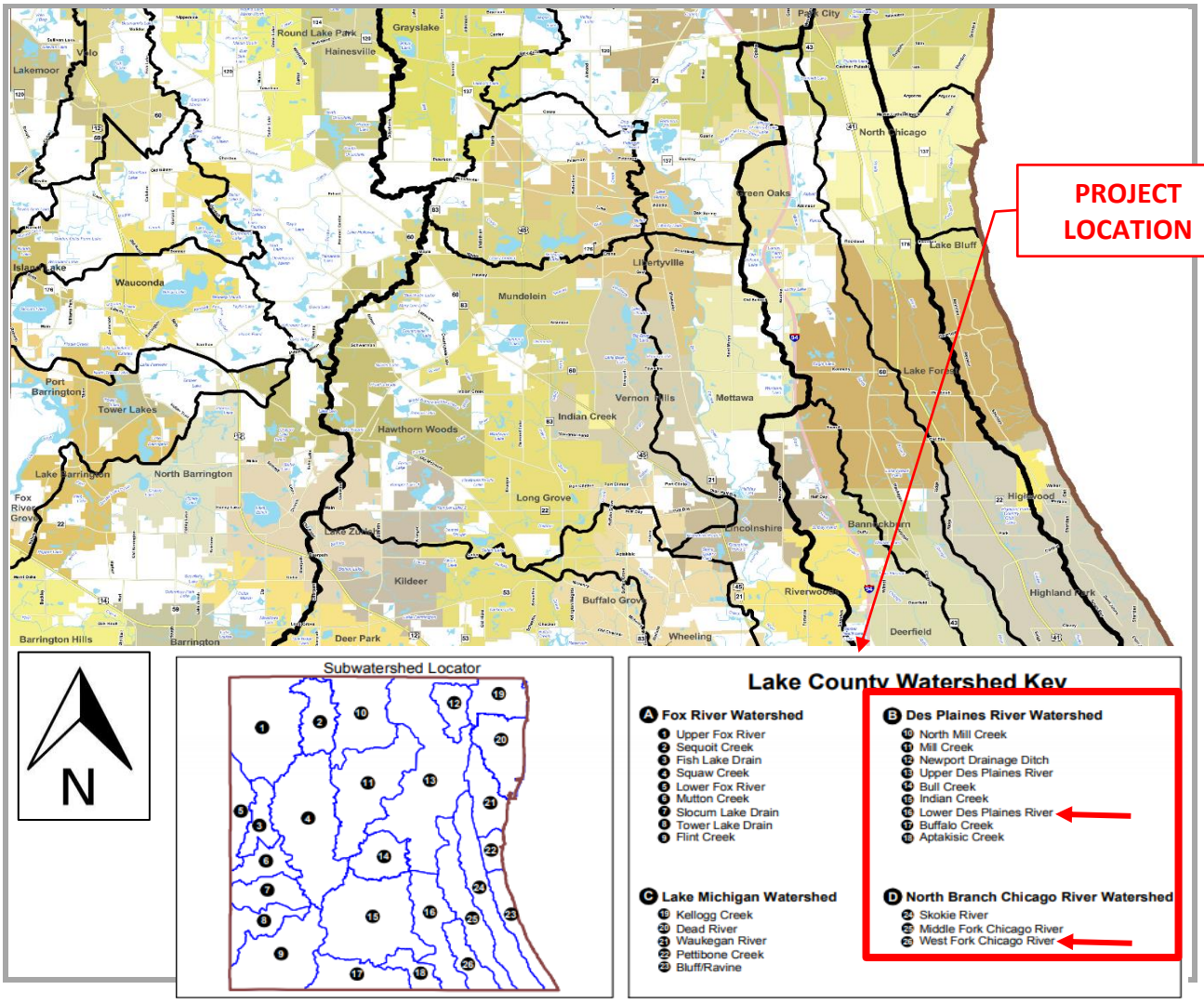

EXHIBIT # 5

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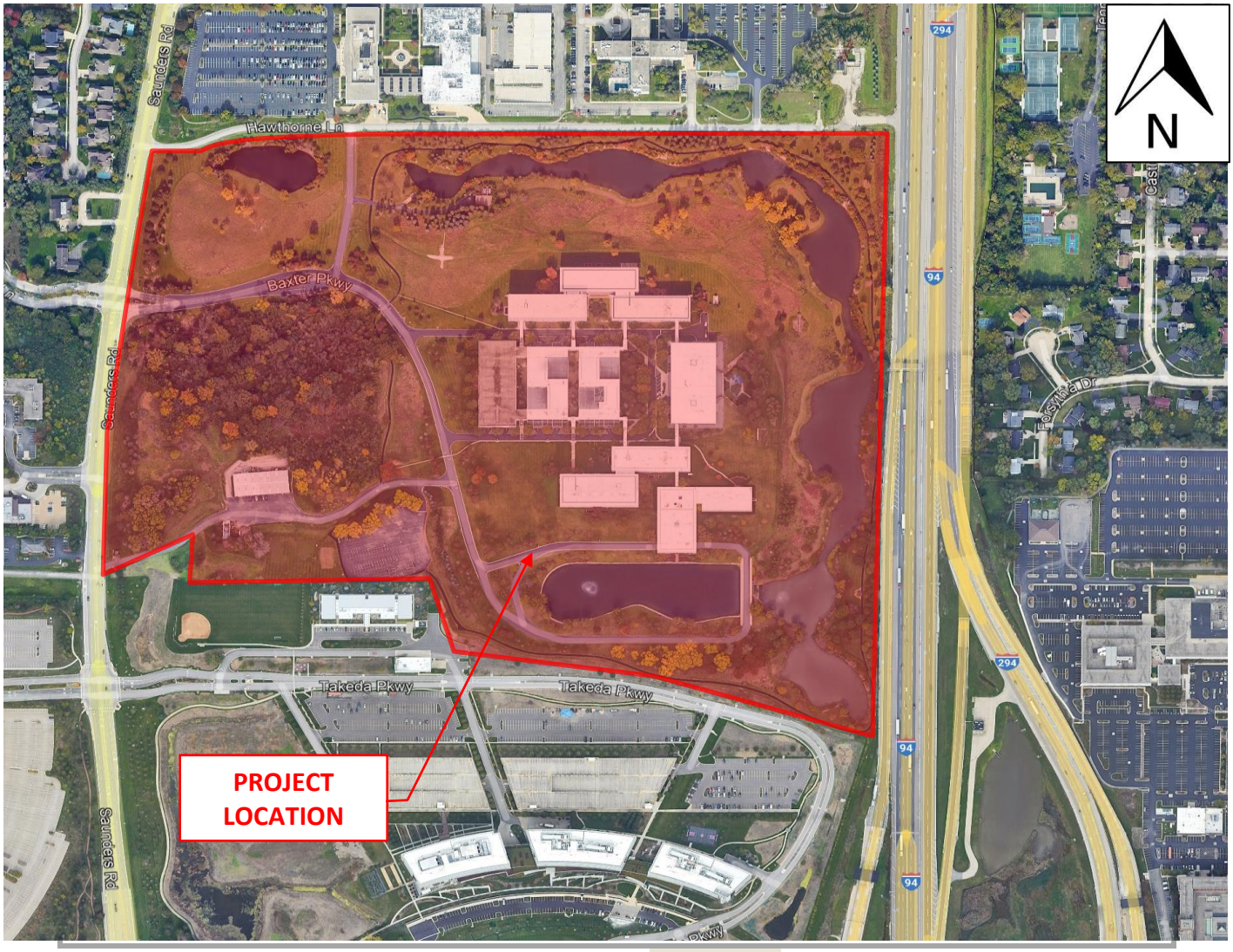
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

EXHIBIT TITLE: AERIAL MAP
DESCRIPTION: GOOGLE EARTH



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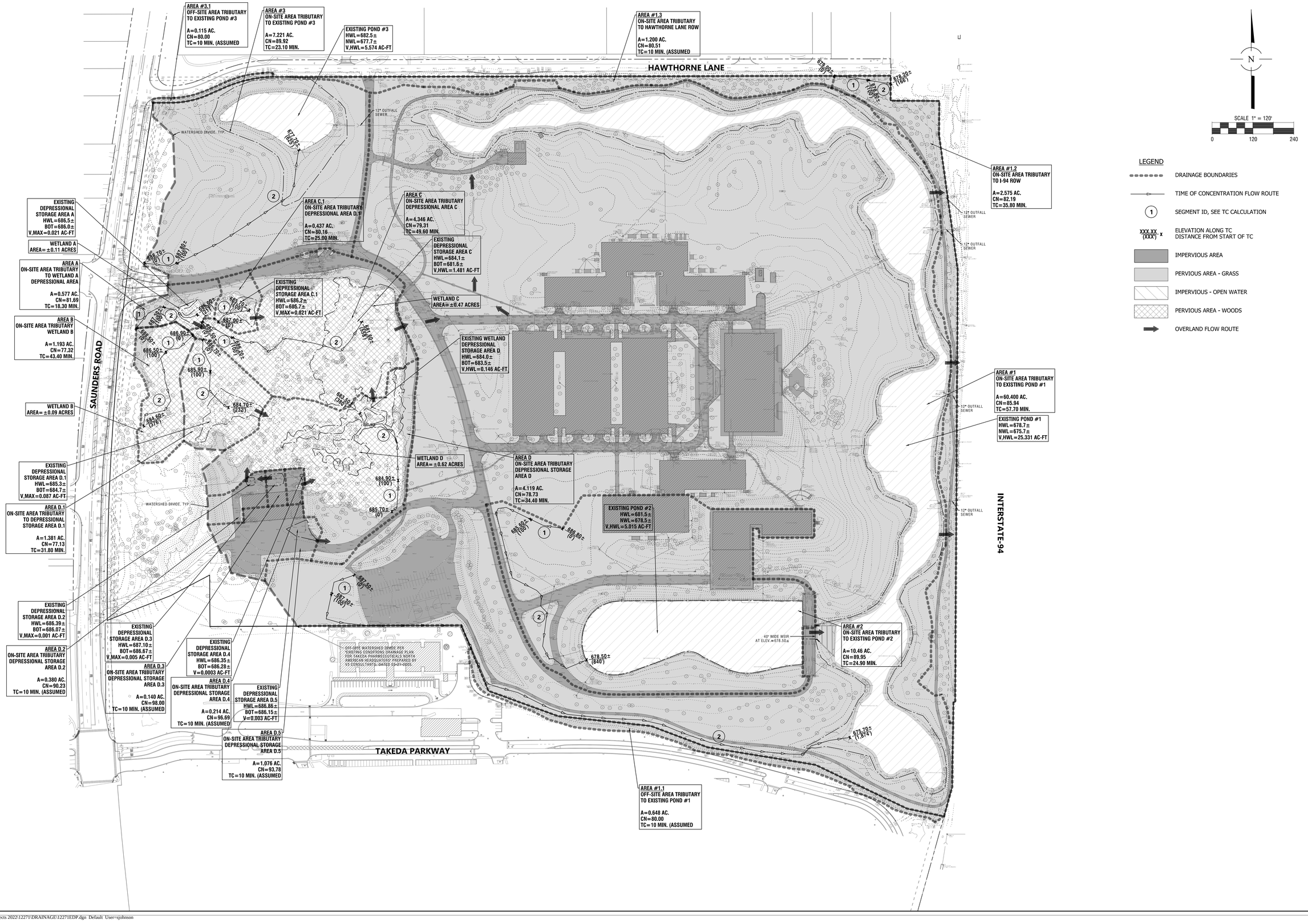

NO.	DATE	REMARKS

NO.	DATE	REMARKS

EXISTING DRAINAGE PLAN

BRIDGE POINT O'HARE NORTH
DEERFIELD, ILLINOIS

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SPACECO INC.

FILENAME: 12271EDP

DATE: 03/24/2023

JOB NO. 12271

SHEET **EDP** 1 OF 1

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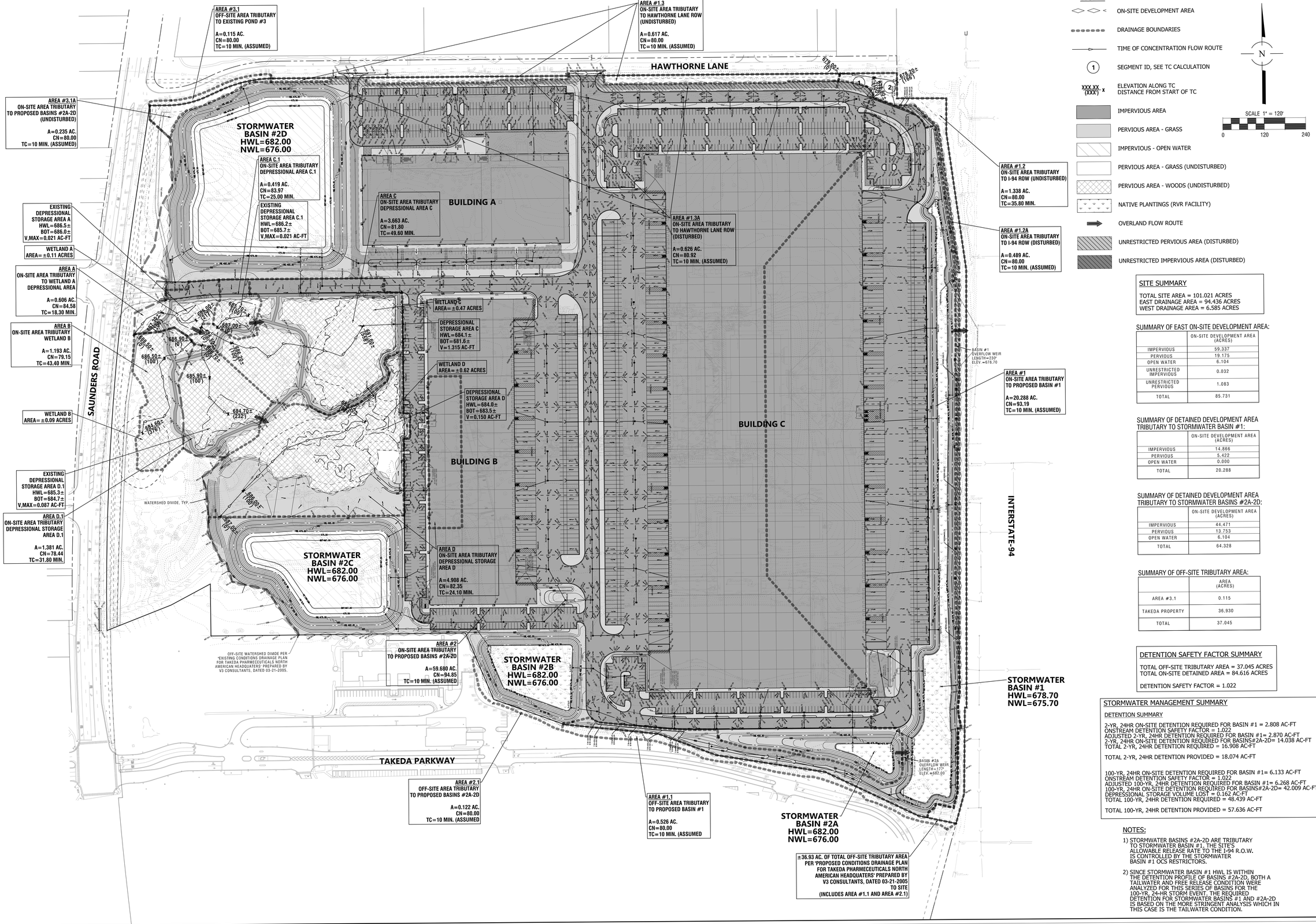

SITE SUMMARY

TOTAL SITE AREA = 101.021 ACRES
EAST DRAINAGE AREA = 94.436 ACRES
WEST DRAINAGE AREA = 6.585 ACRES

SUMMARY OF EAST ON-SITE DEVELOPMENT AREA:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	59.337
PERVIOUS	19.175
OPEN WATER	6.104
UNRESTRICTED IMPERVIOUS	0.032
UNRESTRICTED PERVIOUS	1.083
TOTAL	85.731

SUMMARY OF DETAINED DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASIN #1:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	14.866
PERVIOUS	5.422
OPEN WATER	0.000
TOTAL	20.288

SUMMARY OF DETAINED DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASINS #2A-2D:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	44.471
PERVIOUS	13.753
OPEN WATER	6.104
TOTAL	64.328

SUMMARY OF OFF-SITE TRIBUTARY AREA:

	AREA (ACRES)
AREA #3.1	0.115
TAKEDA PROPERTY	36.930
TOTAL	37.045

DETENTION SAFETY FACTOR SUMMARY

TOTAL OFF-SITE TRIBUTARY AREA = 37.045 ACRES
TOTAL ON-SITE DETAINED AREA = 84.616 ACRES

DETENTION SAFETY FACTOR = 1.022

STORMWATER MANAGEMENT SUMMARY

DETENTION SUMMARY

2-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASIN #1 = 2.808 AC-FT
ONSTREAM DETENTION SAFETY FACTOR = 1.022
ADJUSTED 2-YR, 24HR DETENTION REQUIRED FOR BASIN #1= 2.870 AC-FT
2-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASINS#2A-2D= 14.038 AC-FT
TOTAL 2-YR, 24HR DETENTION REQUIRED = 16.908 AC-FT

TOTAL 2-YR, 24HR DETENTION PROVIDED = 18.074 AC-FT

100-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASIN #1= 6.133 AC-FT
ONSTREAM DETENTION SAFETY FACTOR = 1.022
ADJUSTED 100-YR, 24HR DETENTION REQUIRED FOR BASIN #1= 6.268 AC-FT
100-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASINS#2A-2D= 42.009 AC-FT
DEPRESSIONAL STORAGE VOLUME LOST = 0.162 AC-FT
TOTAL 100-YR, 24HR DETENTION REQUIRED = 48.439 AC-FT

TOTAL 100-YR, 24HR DETENTION PROVIDED = 57.636 AC-FT

NOTES:

1) STORMWATER BASINS #2A-2D ARE TRIBUTARY TO STORMWATER BASIN #1. THE SITE'S ALLOWABLE RELEASE RATE TO THE I-94 R.O.W. IS CONTROLLED BY THE STORMWATER BASIN #1 OCS RESTRICTORS.

2) SINCE STORMWATER BASIN #1 HWL IS WITHIN THE DETENTION PROFILE OF BASINS #2A-2D, BOTH A TAILWATER AND FREE RELEASE CONDITION WERE ANALYZED FOR THIS SERIES OF BASINS FOR THE 100-YR, 24-HR STORM EVENT. THE REQUIRED DETENTION FOR STORMWATER BASINS #1 AND #2A-2D IS BASED ON THE MORE STRINGENT ANALYSIS WHICH IN THIS CASE IS THE TAILWATER CONDITION.

NO.	DATE	REMARKS

NO.	DATE	REMARKS

PROPOSED DRAINAGE PLAN

BRIDGE POINT O'HARE NORTH

DEERFIELD, ILLINOIS

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

SPACECO INC.

FILENAME: 12271PDP

DATE: 03/24/2023

JOB NO. 12271

SHEET **PDP**

1 OF 1

N:\Projects 2022\12271\DRAINAGE\12271PDP.dgn Default User=sjohnson

MATCH LINE SEE SHEET - IAM-3

KEY MAP
SHEET LOCATION
N.T.S.
TAKEDA PARKWAY
I-94

SCALE 1" = 40'
0 40 80

MATCH LINE SEE SHEET - IAM-2

TAKEDA PARKWAY

CB-106B
C=0.90
A=0.33
R=679.00

CB-104B
C=0.90
A=0.35
R=679.00

CB-806
C=0.90
A=0.13
R=683.70

CB-804
C=0.90
A=0.13
R=683.70

CB-802
C=0.90
A=0.14
R=683.70

CB-822
C=0.90
A=0.21
R=684.70

I-820
C=0.90
A=0.27
R=684.70

CB-818
C=0.90
A=0.23
R=684.70

18" TRANSITION BETWEEN DEPRESSED AND FULL HEIGHT CURB

CB-704A
C=0.90
A=0.16
R=685.00 (PR.)
R=685.00 (FUT.)

CB-702A
C=0.90
A=0.44
R=681.00

ROOF DRAIN
C=0.90
A=1.25

ROOF DRAIN
C=0.90
A=0.57

ROOF DRAIN
C=0.90
A=1.27

ROOF DRAIN
C=0.90
A=0.48

PROPOSED
BUILDING C
FF=687.00

ROOF DRAIN
C=0.90
A=1.39

I-602A
C=0.90
A=0.43
R=683.50 (PR.)
R=684.50 (FUT.)

I-504A
C=0.90
A=0.37

CB-502A
C=0.90
A=0.37

I-406A
C=0.90
A=0.37

CB-402A
C=0.90
A=0.37

I-404A
C=0.90
A=0.37

I-306A
C=0.90
A=0.37

STORMWATER
BASIN #2A
HWL=682.00
NWL=676.00
BOT=675.50

STORMWATER
BASIN #1
HWL=678.70
NWL=675.70
BOT=675.20

T/BERM=680.70

NO.	DATE	REMARKS

NO.	DATE	REMARKS

INLET AREA MAP - 1

BRIDGE POINT O'HARE NORTH
DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS
9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

SPACECO INC.

FILENAME: 12271IAM1

DATE: 03/24/23

JOB NO. 12271

SHEET
IAM-1
1 OF 8

N:\Projects 2022\12271\DRAINAGE\INLET AREA MAP\12271IAM1.dgn Default User=shermanas

MATCH LINE SEE SHEET - IAM-4

MATCH LINE SEE SHEET - IAM-1

ROOF DRAIN
C=0.90
A=1.73

ROOF DRAIN
C=0.90
A=1.39

ROOF DRAIN
C=0.90
A=1.27

ROOF DRAIN
C=0.90
A=1.25

ROOF DRAIN
C=0.90
A=0.57

ROOF DRAIN
C=0.90
A=0.48

PROPOSED
BUILDING C
FF=687.00

18' TRANSITION
BETWEEN DEPRESSED
AND FULL HEIGHT CURB

18' TRANSITION
BETWEEN DEPRESSED
AND FULL HEIGHT CURB

HAWTHORNE LANE

CB-142
C=0.90
A=0.42

I-150
C=0.90
A=0.17

I-148
C=0.90
A=0.16

CB-144
C=0.90
A=0.42

I-146
C=0.90
A=0.23

I-508
C=0.90
A=0.21

I-510
C=0.90
A=0.82

CB-504
C=0.90
A=0.72

CB-506
C=0.90
A=0.28

CB-302A
C=0.90
A=0.37

I-304A
C=0.90
A=0.37

I-206A
C=0.90
A=0.37

CB-202A
C=0.90
A=0.37

I-204A
C=0.90
A=0.37

CB-102A
C=0.90
A=0.37

I-104A
C=0.90
A=0.37

CB-502
C=0.90
A=0.40

STORMWATER
BASIN #1
HWL=678.70
NWL=675.70
BOT=675.20

I-94

SCALE 1" = 40'
0 40 80

KEY MAP
SHEET LOCATION
N.T.S.

NO.	DATE	REMARKS

NO.	DATE	REMARKS

INLET AREA MAP - 2

BRIDGE POINT O'HARE NORTH
DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS
9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
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SPACECO INC.

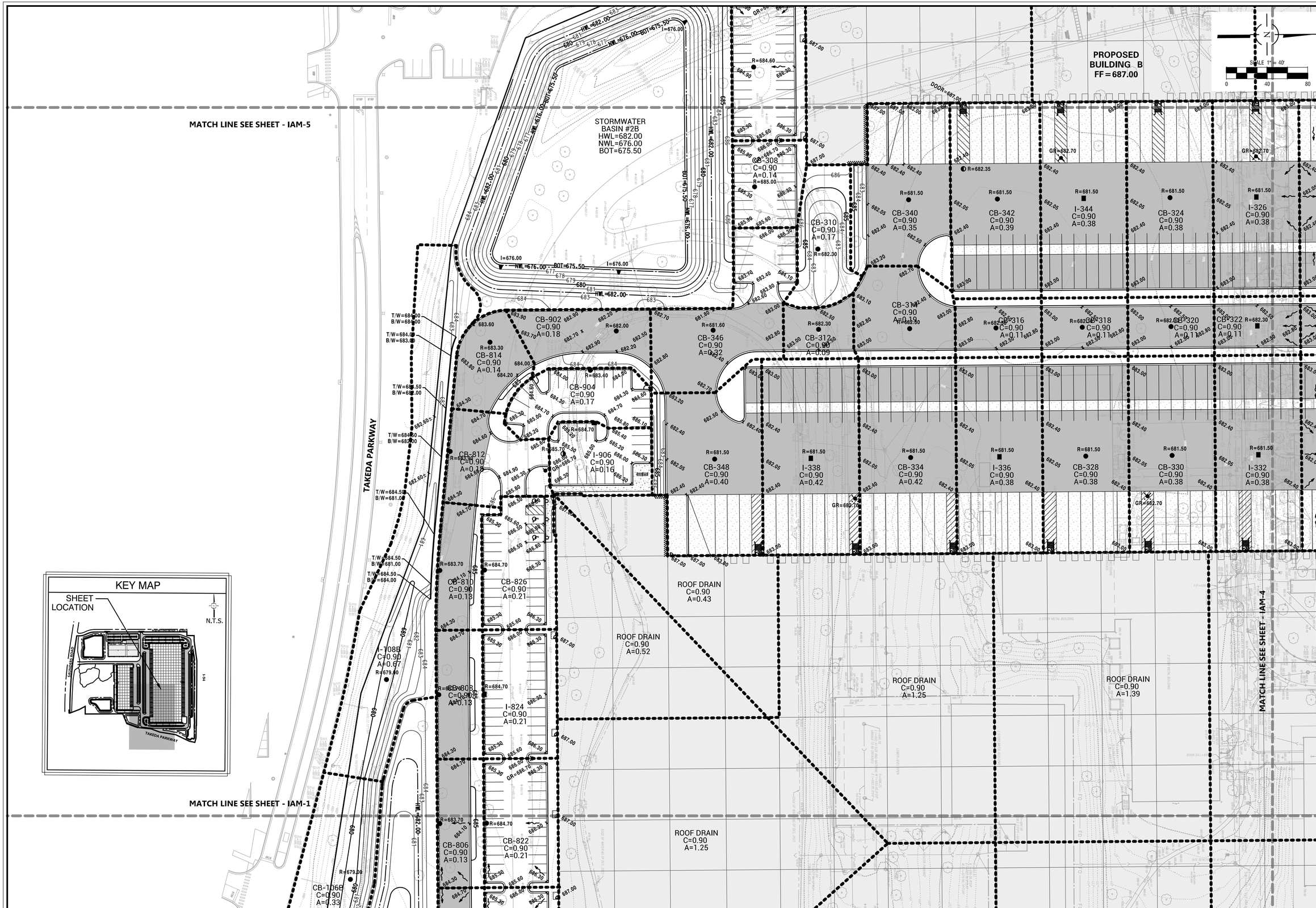
FILENAME: 12271IAM2

DATE: 03/24/23

JOB NO. 12271

SHEET
IAM-2
2 OF 8

N:\Projects 2022\12271\DRAINAGE\INLET AREA MAP\12271IAM2.dgn Default User=shermanas



NO.	DATE	REMARKS

NO.	DATE	REMARKS

INLET AREA MAP - 3

BRIDGE POINT O'HARE NORTH

DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
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SPACECO INC.

FILENAME: 12271IAM3

DATE: 03/24/23

JOB NO. 12271

SHEET IAM-3

3 OF 8

N:\Projects 2022\12271\DRAINAGE\INLET AREA MAP\12271IAM3.dgn Default User=shermanas

PROPOSED BUILDING B FF = 687.00

PROPOSED BUILDING A FF = 687.00

PROPOSED BUILDING C FF = 687.00

MATCH LINE SEE SHEET - IAM-6

MATCH LINE SEE SHEET - IAM-3

MATCH LINE SEE SHEET - IAM-2

ROOF DRAIN C=0.90 A=0.60

ROOF DRAIN C=0.90 A=0.43

ROOF DRAIN C=0.90 A=0.52

ROOF DRAIN C=0.90 A=1.25

ROOF DRAIN C=0.90 A=1.73

ROOF DRAIN C=0.90 A=1.39

ROOF DRAIN C=0.90 A=1.27

CB-208 C=0.90 A=0.35

CB-412 C=0.90 A=0.22

CB-210 C=0.90 A=0.14

CB-126 C=0.90 A=0.33

CB-124 C=0.90 A=0.35

CB-118 C=0.90 A=0.34

CB-120 C=0.90 A=0.19

CB-112 C=0.90 A=0.61

CB-114 C=0.90 A=0.20

CB-116 C=0.90 A=0.21

CB-220 C=0.90 A=0.38

I-228 C=0.90 A=0.38

CB-226 C=0.90 A=0.38

CB-224 C=0.90 A=0.52

CB-218 C=0.90 A=0.11

CB-216 C=0.90 A=0.11

CB-214 C=0.90 A=0.11

CB-212 C=0.90 A=0.22

CB-222 C=0.90 A=0.38

I-234 C=0.90 A=0.38

CB-232 C=0.90 A=0.38

CB-230 C=0.90 A=0.38

I-236 C=0.90 A=0.46

CB-130 C=0.90 A=0.40

CB-128 C=0.90 A=0.43

CB-132 C=0.90 A=0.32

CB-136 C=0.90 A=0.40

I-156 C=0.90 A=0.15

CB-138 C=0.90 A=0.42

I-154 C=0.90 A=0.17

CB-140 C=0.90 A=0.42

I-152 C=0.90 A=0.17

CB-142 C=0.90 A=0.42

I-150 C=0.90 A=0.17

LOWERED/STEPPED FOUNDATION. SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR DESIGN AND DETAILS.

18" TRANSITION BETWEEN DEPRESSED AND FULL HEIGHT CURB

HAWTHORNE LANE

KEY MAP

SHEET LOCATION

N.T.S.

SAUNDERS ROAD

TAKEDA PARKWAY

SCALE 1" = 40'

0 40 80

NO.	DATE	REMARKS

INLET AREA MAP - 4

BRIDGE POINT O'HARE NORTH

DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

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SPACECO INC.

FILENAME: 12271IAM4

DATE: 03/24/23

JOB NO. 12271

SHEET IAM-4

4 OF 8

MATCH LINE SEE SHEET - IAM-7

TAKEDA PARKWAY

STORMWATER BASIN #2C
HWL=682.00
NWL=676.00
BOT=667.50

EXISTING WETLAND - D

MATCH LINE SEE SHEET - IAM-6

SCALE 1" = 40'
0 40 80

CB-302
C=0.90
A=0.08

CB-902B
C=0.90
A=0.23

CB-602
C=0.90
A=0.24

CB-604
C=0.90
A=0.24

CB-304
C=0.90
A=0.23

CB-306
C=0.90
A=0.24

18" TRANSITION BETWEEN DEPRESSED AND FULL HEIGHT CURB

ROOF DRAIN
C=0.90
A=0.49

ROOF DRAIN
C=0.90
A=0.48

ROOF DRAIN
C=0.90
A=0.87

ROOF DRAIN
C=0.90
A=0.78

PROPOSED BUILDING B
FF=687.00

DOOR=687.00

LOWERED/STEPPED FOUNDATION. SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR DESIGN AND DETAILS

STORMWATER BASIN #2B
HWL=682.00
NWL=676.00
BOT=675.50

MATCH LINE SEE SHEET - IAM-3

KEY MAP

SHEET LOCATION

N.T.S.

SANDMEIER ROAD

I-90

TAKEDA PARKWAY

NO.	DATE	REMARKS

NO.	DATE	REMARKS

INLET AREA MAP - 5

BRIDGE POINT O'HARE NORTH
DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

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Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

SPACECO INC.

FILENAME: 12271IAM5

DATE: 03/24/23

JOB NO. 12271

SHEET IAM-5
5 OF 8

N:\Projects 2022\12271\DRAINAGE\INLET AREA MAP\12271IAM5.dgn Default User=shermanas

MATCH LINE SEE SHEET - IAM-5

MATCH LINE SEE SHEET - IAM-8

MATCH LINE SEE SHEET - IAM-4

EXISTING WETLAND - C

EXISTING WETLAND - D

STORMWATER BASIN #2D
HWL=682.00
NWL=676.00
BOT=667.50

HWL=576.00
BOT=664.00
NWL=676.00
HWL=682.00

CB-606 C=0.90 A=0.11
CB-608 C=0.90 A=0.24
CB-612 C=0.90 A=0.23
CB-614 C=0.90 A=0.17
CB-404 C=0.90 A=0.24
CB-406 C=0.90 A=0.24
CB-204 C=0.90 A=0.29
CB-206 C=0.90 A=0.29
CB-410 C=0.90 A=0.24
CB-208 C=0.90 A=0.35
CB-412 C=0.90 A=0.22
CB-102 C=0.90 A=0.15
CB-104 C=0.90 A=0.52
CB-106 C=0.90 A=0.61
CB-108 C=0.90 A=0.22
CB-110 C=0.90 A=0.61
CB-112 C=0.90 A=0.61
CB-220
I-228
CB-226
CB-224

ROOF DRAIN C=0.90 A=0.48
ROOF DRAIN C=0.90 A=0.78
ROOF DRAIN C=0.90 A=0.87
ROOF DRAIN C=0.90 A=0.60

PROPOSED BUILDING A
FF=687.00

PROPOSED BUILDING B
FF=687.00

18" TRANSITION BETWEEN DEPRESSED AND FULL HEIGHT CURB

LOWERED STEPPED FOUNDATION. SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR DESIGN AND DETAILS.

HAWTHORNE LANE

KEY MAP
SHEET LOCATION
N.T.S.
SAUNDERS ROAD
TAKEDA PARKWAY
I-94

SCALE 1" = 40'
0 40 80

NO.	DATE	REMARKS

SCALE 1" = 40'
0 40 80

SAUNDERS ROAD

TAKEDA PARKWAY

677.09± 677.21± 677.36±
677.50± 677.32±

EXISTING WETLAND - B

MATCH LINE SEE SHEET - IAM-8

MATCH LINE SEE SHEET - IAM-5

KEY MAP
SHEET LOCATION
N.T.S.
SAUNDERS ROAD
I-94
TAKEDA PARKWAY

NO.	DATE	REMARKS

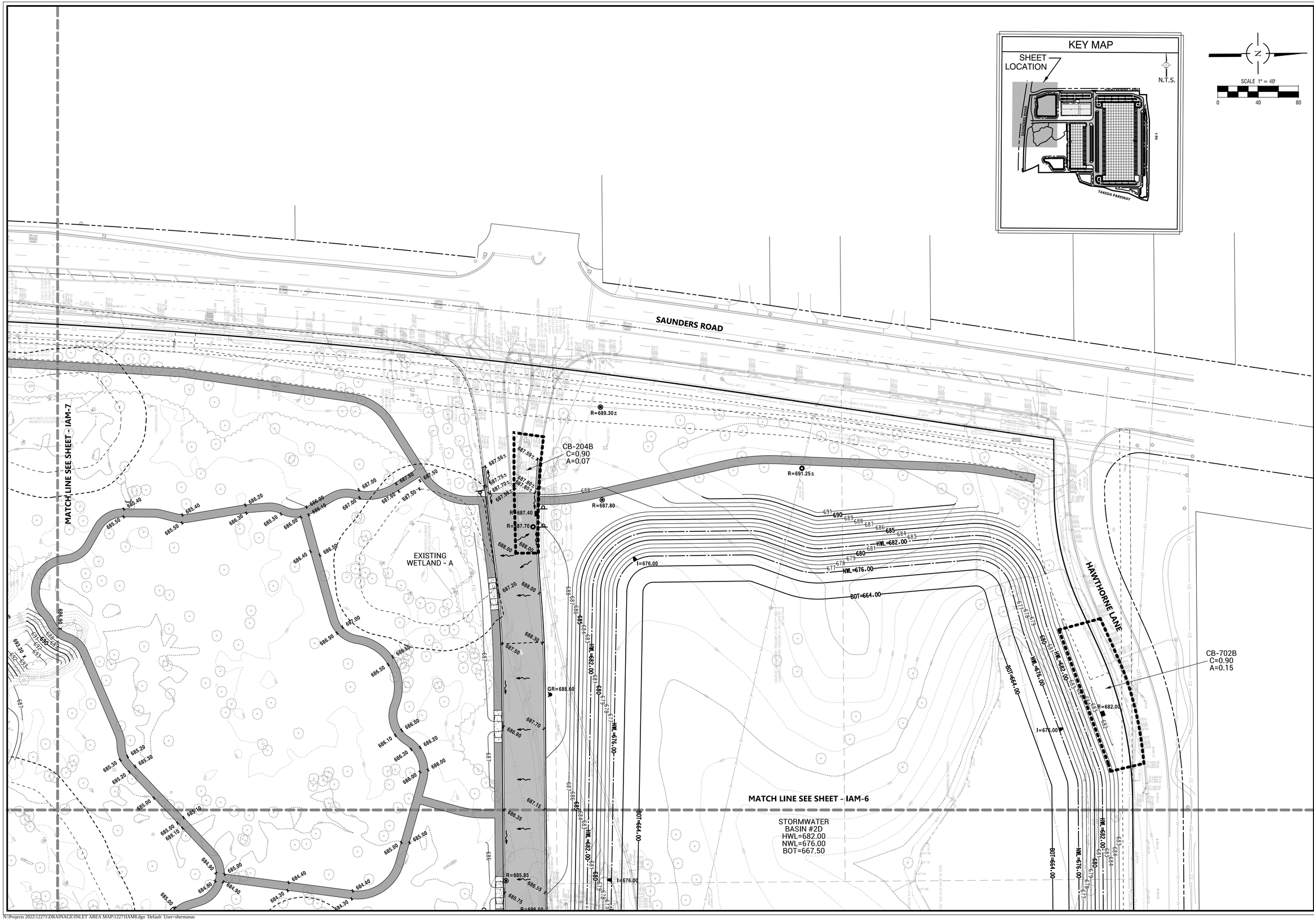
NO.	DATE	REMARKS

INLET AREA MAP - 7

BRIDGE POINT O'HARE NORTH
DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS
9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065
SPACECO INC.

FILENAME: 12271IAM7
DATE: 03/24/23
JOB NO. 12271
SHEET IAM-7
7 OF 8



NO.	DATE	REMARKS

NO.	DATE	REMARKS

INLET AREA MAP - 8

BRIDGE POINT O'HARE NORTH
DEERFIELD, IL

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

SPACECO INC.

FILENAME: 12271IAM8

DATE: 03/24/23

JOB NO. 12271

SHEET **IAM-8**
8 OF 8

N:\Projects 2022\12271\DRAINAGE\INLET AREA MAP\12271IAM8.dgn Default User=shermanas

SITE IMPROVEMENT PLANS
for
BRIDGE POINT O'HARE NORTH

DEERFIELD, IL

PROJECT NO:12271

DEVELOPER

BRIDGE INDUSTRIAL
9525 W. BRYN MAWR, SUITE 700
ROSEMONT, IL 60018
PHONE: (847) 531-3980

CALL J.U.L.I.E. 1-800-892-0123
WITH THE FOLLOWING:

COUNTY: LAKE
CITY, TOWNSHIP: DEERFIELD
SEC. & ¼ SEC. NO.: S31, T43N, R12E

48 HOURS BEFORE YOU DIG.
EXCLUDING SAT., SUN. & HOLIDAYS

BENCHMARK

ELEVATION:

DESCRIPTION: SEE SHEET C3.0 FOR BENCHMARK INFORMATION

NOTE:

SPACECO, INC. IS TO BE NOTIFIED AT LEAST THREE (3) DAYS PRIOR TO STARTING CONSTRUCTION AND SHALL BE INCLUDED IN THE PRECONSTRUCTION MEETINGS

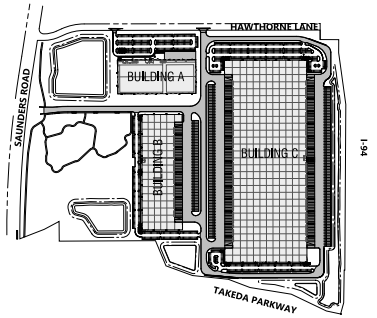
INDEX

SHEET #	SHEET I.D.	SHEET DESCRIPTION
1	C1.0	COVER SHEET
2	C2.0	GENERAL NOTES AND TYPICAL SECTIONS
3	C3.0	OVERALL EXISTING CONDITIONS PLAN
4-11	C3.1-C3.8	EXISTING CONDITIONS PLAN
12-19	C4.1-C4.8	DEMOLITION PLAN
20	C5.0	OVERALL SITE PLAN
21-28	C6.1-C6.8	GEOMETRIC PLAN
29-36	C7.1-C7.8	GRADING PLAN
37-44	C8.1-C8.8	UTILITY PLAN
45-46	C9.1-C9.2	PLAN AND PROFILE
47-56	C10.1-C10.10	SOIL EROSION & SEDIMENT CONTROL PLANS
57	C11.1	SPECIFICATIONS
58	C11.2	LAKE COUNTY PUBLIC WORK SPECIFICATIONS
59-63	C12.1-C12.5	DETAILS

LOCATION MAP



KEY MAP



REVISIONS

ORIGINAL PLAN DATE: MARCH 24, 2023

#	SHEET #	REMARKS	DATE

ENGINEER
BRETT M. DUFFY, P.E.
ILLINOIS REGISTRATION NO.: 062-053198
EXPIRATION DATE: 11/30/2023

PROFESSIONAL DESIGN FIRM NO.: 184-001157
EXPIRATION DATE: 04/30/2023

03/24/23
DATE

LICENSED PROFESSIONAL ENGINEER
BRETT M. DUFFY
NO. 062-053198
ILLINOIS

THESE PLANS OR ANY PART THEREOF SHALL BE CONSIDERED VOID WITHOUT THE SIGNATURE, SEAL, AND EXPIRATION DATE OF SEAL OF THE ENGINEER.

BRIDGE POINT
O'HARE NORTH
DEERFIELD, IL

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

SPACECO INC.

FILENAME: 12271TITLE
DATE: 03/24/23
JOB NO. 12271
SHEET C1.0
1 OF 63

N:\Projects 2022\12271\ENG\12271TITLE.dgn Default User=sjohnson

Critical Duration Analysis (2-year Storm) - Chicago River Watershed

Basin	2-yr 3 hr Runoff	2-yr 6 hr Runoff	2-yr 12 hr Runoff	2-yr 18 hr Runoff	2-yr 24 hr Runoff
C1	8.20	6.70	6.06	5.63	4.73
C2	2.01	1.58	1.39	1.27	1.08
C3	0.52	0.39	0.33	0.31	0.25
C4	2.85	2.25	1.97	1.81	1.51
C5	0.44	0.41	0.47	0.54	0.48
C6	0.40	0.34	0.33	0.31	0.27

Critical Duration Analysis (100-year Storm) - Chicago River Watershed

Basin	100-yr 3 hr Runoff	100-yr 6 hr Runoff	100-yr 12 hr Runoff	100-yr 18 hr Runoff	100-yr 24 hr Runoff
C1	31.70	24.62	18.89	16.15	13.25
C2	7.51	5.68	4.17	3.54	2.88
C3	1.95	1.45	1.00	0.85	0.68
C4	10.62	8.06	5.93	5.04	4.11
C5	3.22	2.69	2.50	2.37	2.01
C6	1.64	1.34	1.10	0.96	0.80

Critical Duration Analysis (2-year Storm) - DesPlaines River Watershed

Basin	2-yr 3 hr Runoff	2-yr 6 hr Runoff	2-yr 12 hr Runoff	2-yr 18 hr Runoff	2-yr 24 hr Runoff
D1	4.85	3.78	3.33	2.53	2.57
D2	2.24	1.87	1.76	1.39	1.43
D3	2.70	2.02	1.74	1.31	1.32
D4	4.26	3.38	2.96	2.26	2.26
D5	0.09	0.07	0.07	0.06	0.07

Critical Duration Analysis (100-year Storm) - DesPlaines River Watershed

Basin	100-yr 3 hr Runoff	100-yr 6 hr Runoff	100-yr 12 hr Runoff	100-yr 18 hr Runoff	100-yr 24 hr Runoff
D1	18.92	14.06	10.29	8.81	7.17
D2	9.31	7.35	6.81	5.10	4.21
D3	10.13	7.52	5.22	4.43	3.59
D4	15.90	12.10	8.92	7.58	6.19
D5	0.54	0.36	0.30	0.28	0.23

NOTES:

1. DRAINAGE AREAS SUMMARIZED FOR ON-SITE AREAS AND OFFSITE DRAINAGE AREAS TO SITE.
2. Q100YR AND Q2YR QUANTIFIED FOR THE CRITICAL STORM EVENT PRODUCING THE PEAK RELEASE.
3. THE SITE IS DOMINATED BY MONTGOMERY SILT CLAY (SOIL GROUP D) AND FRANKFORT SILT LOAM (SOIL GROUP C) PER NRCS SOIL SURVEY.
4. WETLAND BOUNDARIES SHOWN ARE BASED ON THE WETLAND DELINEATION REPORT DATED 04.19.04 AS PREPARED BY V3 CONSULTANTS.

1"=80' SCALE (80 0 80 160 FEET)

THOMPSON, VENTULETT, STAINBACK & ASSOCIATES, INC.
ARCHITECTS
THE ROOKERY BUILDING, 209 SOUTH LASALLE STREET, SUITE 400
CHICAGO, ILLINOIS 60604
T 312-251-1654
F 312-251-1669

Scales as stated hereon are valid on the original drawing, the dimensions of which are 30x45 inches. These scales noted hereon are hereby changed by the ratio of the overall sheet dimensions of the print to the corresponding dimensions of the orgiinal drawing.

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V3 CONSULTANTS — 5 YEARS OF EXCELLENCE
Engineers
Scientists
Surveyors
7325 Janes Avenue, Suite 100
Woodridge, IL 60517
630.724.9200 voice
630.724.9202 fax
v3consultants.com

KEYNOTE LEGEND

- EXISTING WETLAND
- TIME OF CONCENTRATION TRAVEL PATH
- OVERLAND OVERFLOW ROUTE
- WATERSHED DIVIDE
- RIDGE LINE
- FLOW DIRECTION

No.	REVISIONS/SUBMISSIONS	Date
8	ISSUED FOR PERMIT	03-21-05
7	ADDENDUM #2	02-18-05
6	ISSUED FOR CONTRACT	01-21-05
5	ISSUED FOR 50% CONSTRUCTION DOCUMENTS - IN PROGRESS	12-23-04
4	ISSUED FOR REVISED DESIGN DEVELOPMENT	12-01-04
3	REVISED PRELIMINARY PUD SUBMITTAL	11-01-04
2	ISSUED FOR DESIGN DEVELOPMENT	10-08-04
1	ISSUED FOR SCHEMATIC DESIGN	03-01-04

Takeda

TAKEDA PHARMACEUTICALS
NORTH AMERICA HEADQUARTERS
DEERFIELD, IL

Drawing Title
EXISTING CONDITIONS DRAINAGE PLAN

Seal

Project No. 03225-S04

Drawing No. C1.3

Date 03/01/04

Scale 1"= 80'

RELEASED FOR CONSTRUCTION

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Pond A- Master Plan & Phase I (West Section)

ELEVATION	AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
679.50	1.201			0.00	*wet*
		1.228	0.614		
680.00	1.255			0.61	
		1.310	1.310		
681.00	1.364			1.92	
		1.421	1.421		
682.00	1.477			3.34	
		1.529	1.376		
682.90	1.581			4.72	*detention bwl*
		1.587	0.159		
683.00	1.592			4.88	*phase 1 bwl*
		1.651	1.651		
684.00	1.710			6.53	
		1.770	1.770		
685.00	1.830			8.30	

CUMMULATIVE VOLUME FOR POND A (acre-feet)
0.00
0.76
2.42
4.25
6.07
6.28
8.30
10.04

Pond A- Master Plan & Phase I (East Section)

ELEVATION	AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
679.50	0.278			0.00	*wet*
		0.294	0.147		
680.00	0.310			0.15	
		0.345	0.345		
681.00	0.379			0.49	
		0.415	0.415		
682.00	0.451			0.91	
		0.488	0.439		
682.90	0.524			1.35	*detention bwl*
		0.528	0.053		
683.00	0.532			1.40	*phase 1 bwl*
		0.577	0.577		
684.00	0.621			1.97	
		0.668	0.668		
685.00	0.714			2.64	

Pond B- Master Plan & Phase I

ELEVATION	AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
678.50	0.000			0.00	
		0.008	0.004		
679.00	0.015			0.00	
		0.020	0.010		
679.50	0.024			0.01	
		0.028	0.014		
680.00	0.032			0.03	
		0.043	0.043		
681.00	0.054			0.07	
		0.069	0.069		
682.00	0.084			0.14	
		0.110	0.055		
682.90	0.136			0.24	*detention bwl*
		0.129	0.014		
683.00	0.142			0.25	*phase 1 bwl*
		0.196	0.196		
684.00	0.250			0.45	
		0.294	0.294		
685.00	0.337			0.74	

Ponds C&D - Phase 1

ELEVATION	COMBINED AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
675.00	0.000			0.000	
		0.028	0.008		
675.30	0.055			0.008	
		0.113	0.079		
676.0	0.172			0.088	
		0.283	0.283		
677.0	0.395			0.371	
		0.664	0.664		
678.0	0.932			1.035	
		1.880	1.241		
678.66	2.828			2.275	
		2.871	0.086		
678.69	2.914			2.361	*detention bwl*
		3.287	0.855		
678.95	3.660			3.216	
		3.675	0.037		
678.96	3.689			3.253	
		3.747	0.150		
679.0	3.804			3.403	
		3.871	0.310		
679.08	3.937			3.712	*phase 1 bwl*
		4.286	1.800		
679.50	4.635			5.512	
		5.052	2.526		
680.0	5.468			8.038	
		6.463	3.231		
680.5	7.458			11.270	
		8.453	4.226		
681.0	9.448			15.496	

Existing Depression - Area D6

ELEVATION	AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
680.40	0.000			0.000	
		0.076	0.038		
680.90	0.152			0.038	
		0.174	0.017		
681.00	0.196			0.055	
		0.557	0.278		
681.50	0.917			0.334	*Overflow Elevation*
		0.991	0.099		
681.60	1.065			0.433	

Existing Depression - Area D7

ELEVATION	AREA (acres)	AVERAGE AREA (acres)	STAGE VOLUME (acre-feet)	CUMMULATIVE VOLUME (acre-feet)	COMMENT
680.20	0.000			0.000	
		0.298	0.209		
681.00	0.596			0.209	
		0.807	0.323		
681.40	1.017			0.531	*Overflow Elevation*
		1.080	0.108		
681.59	1.143			0.639	

PHASE I AREA SUMMARY

DISTURBED AREA = 41.29 AC.

TRIBUTARY TO CHICAGO RIVER WATERSHED = 36.93 AC.
DETENTION REQUIRED = 5.89 AC.-FT
APPROXIMATE COMPENSATORY STORAGE REQUIRED = 0.17 AC.-FT
TOTAL REQUIRED STORAGE = 6.05 AC.-FT
VOLUME PROVIDED = 6.09 AC.-FT

TRIBUTARY TO DES PLAINES WATERSHED = 33.45 AC.
DETENTION REQUIRED = 2.36 AC.-FT
APPROXIMATE COMPENSATORY STORAGE REQUIRED = 1.31 AC.-FT
TOTAL REQUIRED STORAGE = 3.68 AC.-FT
VOLUME PROVIDED = 3.71 AC.-FT

1"=80' SCALE: 80 0 80 160 FEET

FUTURE DAYCARE CENTER (N.I.C.)

REMOTE DELIVERY FACILITY

BAXTER INTERNATIONAL CORPORATE CAMPUS

EXISTING DETENTION POND NWE = 678 +/-

LAND BANK PARKING AREA

PARKING STRUCTURE 3 LEVELS

BUILDING II

BUILDING I

PONDA NWL = 679.5 HWL = 683.02

DRY BASIN B HWL= 683.0

DRY BASIN C HWL = 679.08

DRY BASIN D HWL=679.08

SAUNDERS ROAD

DISCOVER FINANCIAL SERVICES CORPORATE CAMPUS

LAKE COOK ROAD

TRI - STATE TOLLWAY (I-94)

KEYNOTE LEGEND

BIOSWALE (W/UNDERDRAIN)

INTERCEPTOR DITCH (W/UNDERDRAIN)

THOMPSON, VENTULETT, STAINBACK & ASSOCIATES, INC.
ARCHITECTS
THE ROOKERY BUILDING, 209 SOUTH LASALLE STREET, SUITE 400
CHICAGO, ILLINOIS 60604
T 312-251-1854
F 312-251-1669

Scales as stated hereon are valid on the original drawing, the dimensions of which are 30x45 inches. These scales noted hereon are hereby changed by the ratio of the overall sheet dimensions of the print to the corresponding dimensions of the original drawing.

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Engineers
Scientists
Surveyors
7325 Janes Avenue, Suite 100
Woodridge, IL 60517
630.724.9200 voice
630.724.9202 fax
v2consultants.com

No.	REVISIONS/SUBMISSIONS	Date
12	BULLETIN #2	05-27-05
11	REVISED FOR PERMIT	04-25-05
10	ADDENDUM #4	04-07-05
9	ISSUED FOR PERMIT	03-21-05
8	ADDENDUM #3	03-18-05
7	ADDENDUM #2	02-18-05
6	ISSUED FOR CONTRACT	01-21-05
5	ISSUED FOR 50% CONSTRUCTION DOCUMENTS - IN PROGRESS	12-23-04
4	ISSUED FOR REVISED DESIGN DEVELOPMENT	12-01-04
3	REVISED PRELIMINARY PUD SUBMITTAL	11-01-04
2	ISSUED FOR DESIGN DEVELOPMENT	10-08-04
1	ISSUED FOR SCHEMATIC DESIGN	03-01-04

Takeda

TAKEDA PHARMACEUTICALS NORTH AMERICA HEADQUARTERS

DEERFIELD, IL

Drawing Title

PHASE 1 - MASTER STORMWATER MANAGEMENT PLAN

Seal

Project No. 03225-S04

Drawing No.

C4.0

Date 03/01/04

Scale 1"= 80'

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TAB 3
SITE RUNOFF REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

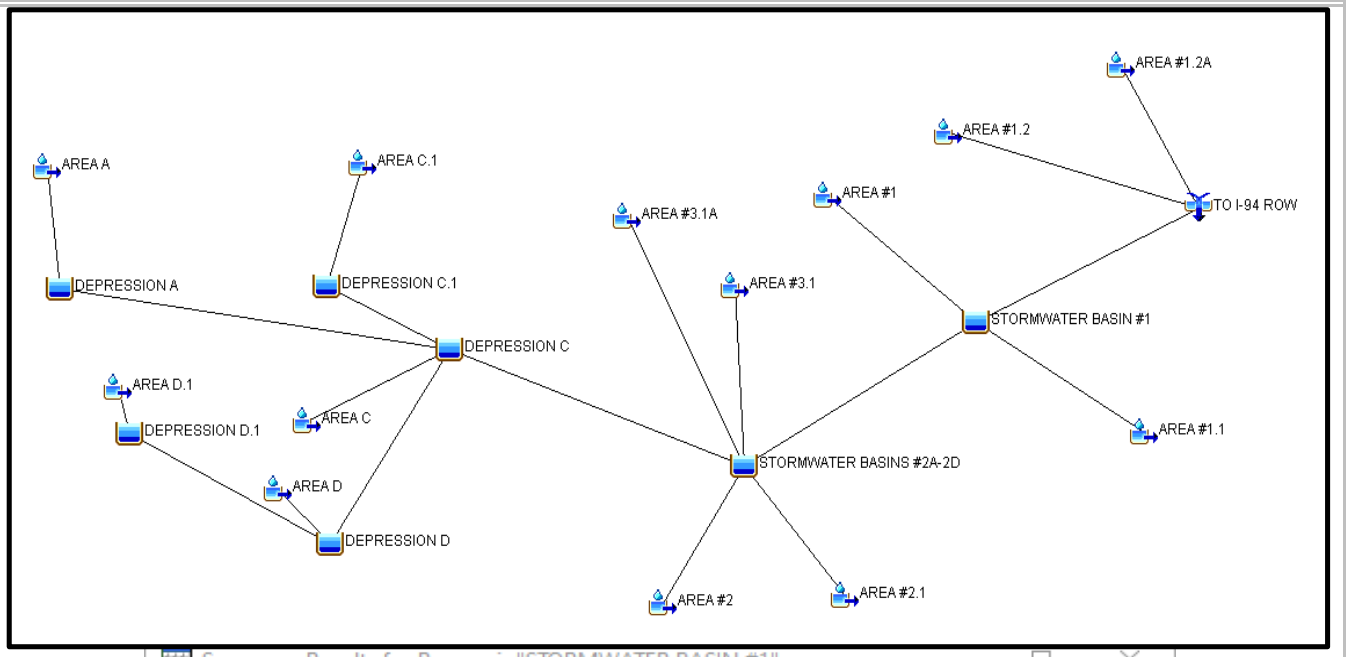
Emergency Overflow Basin Weir Calculations & Critical Duration HEC-HMS Results

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS**
DESCRIPTION:	PROPOSED PEAK INFLOWS TO BASIN #1 WEIR
SITE CONDITION:	PROPOSED
STORM EVENT:	100-YEAR, 1-HOUR



Summary Results for Reservoir "STORMWATER BASIN #1"

Project: PROPOSED CONDITIONS Simulation Run: 100YR__1HR
Reservoir: STORMWATER BASIN #1

Start of Run:	01Jan2000, 00:00	Basin Model:	Development Template
End of Run:	03Jan2000, 00:00	Meteorologic Model:	100YR_1HR
Compute Time:	24Mar2023, 09:31:43	Control Specifications:	_1HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	144.359 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 00:18
Peak Discharge:	8.734 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 01:09
Inflow Volume:	7.979 (ACRE-FT)	Peak Storage:	5.172 (ACRE-FT)
Discharge Volume:	7.071 (ACRE-FT)	Peak Elevation:	677.96 (FT)

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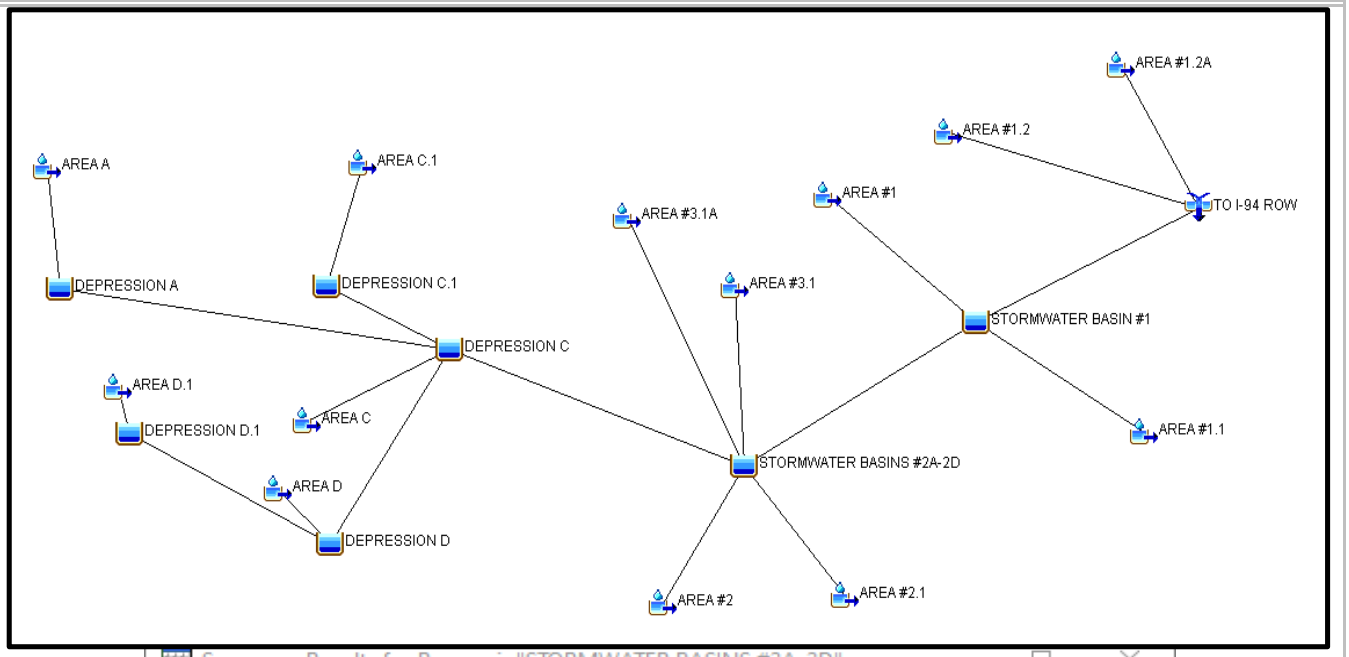
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS**
DESCRIPTION:	PROPOSED PEAK FLOWS TO BASIN #2A WEIR
SITE CONDITION:	PROPOSED
STORM EVENT:	100-YEAR, 1-HOUR



Summary Results for Reservoir "STORMWATER BASINS #2A-2D"

Project: PROPOSED CONDITIONS Simulation Run: 100YR__1HR
Reservoir: STORMWATER BASINS #2A-2D

Start of Run:	01Jan2000, 00:00	Basin Model:	Development Template
End of Run:	03Jan2000, 00:00	Meteorologic Model:	100YR_1HR
Compute Time:	24Mar2023, 09:31:43	Control Specifications:	_1HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	444.641 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 00:17
Peak Discharge:	0.616 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 01:23
Inflow Volume:	17.647 (ACRE-FT)	Peak Storage:	17.159 (ACRE-FT)
Discharge Volume:	2.362 (ACRE-FT)	Peak Elevation:	678.26 (FT)

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **OVERFLOW WEIR CAPACITY CALCULATION**
DESCRIPTION: STORMWATER BASIN #1 OVERFLOW WEIR
SITE CONDITION: PROPOSED

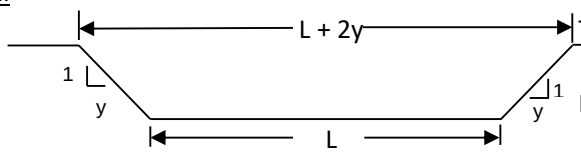
OVERFLOW WEIR DESIGN

- Size Q_{100} REQUIRED for a minimum of 1 cfs per tributary area

TRIBUTARY AREA **91.943** AC.

Q_{100} REQUIRED= **589.000** CFS (Peak Inflows to Basin #1 & Basins #2A-2D from HEC HMS MODEL)

WEIR:



TOP OF CURB ELEV. 680.70 ELEV

PAVEMENT ELEV. 678.70 ELEV

VARIABLES

L =	230.0	FT	(LENGTH)
Y =	0	FT	(SIDESLOPE)
H =	2.0	FT	

USE WEIR FORMULA

$$Q = CLH^{3/2}$$

C = 2.6

Q_{100} REQUIRED = 589.000 CFS (Peak Inflow from Critical Duration HEC-HMS Analysis)

Q_{WEIR} PROVIDED = 1691.399 CFS

Q_{WEIR} PROV. > Q_{100} REQ. TRUE

FLOW DEPTH OVER THE WEIR:

- For Q_{100} REQUIRED (Peak Inflow from Critical Duration HEC-HMS Analysis)

$$H = \left(\frac{Q_{100}\text{REQUIRED}}{CL}\right)^{\frac{2}{3}}$$

Q_{100} REQUIRED= 589.00 CFS
L = 230.00 FT
C = 2.6

H= **0.99** **FEET**

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Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **OVERFLOW WEIR CAPACITY CALCULATION**
DESCRIPTION: STORMWATER BASIN #2A OVERFLOW WEIR
SITE CONDITION: PROPOSED

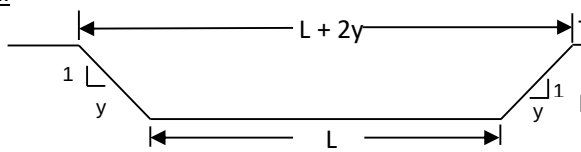
OVERFLOW WEIR DESIGN

- Size Q_{100} REQUIRED for a minimum of 1 cfs per tributary area

TRIBUTARY AREA **71.129** AC.

Q_{100} REQUIRED= **444.641** CFS (Peak Inflows to Basins #2A-2D from HEC HMS MODEL)

WEIR:



TOP OF CURB ELEV. 684.00 ELEV

PAVEMENT ELEV. 682.00 ELEV

VARIABLES

L =	170.0	FT	(LENGTH)
Y =	0	FT	(SIDESLOPE)
H =	2.0	FT	

USE WEIR FORMULA

$$Q = CLH^{3/2}$$

C = 2.6

Q_{100} REQUIRED = 444.641 CFS (Peak Inflow from Critical Duration HEC-HMS Analysis)

Q_{WEIR} PROVIDED = 1250.165 CFS

Q_{WEIR} PROV. > Q_{100} REQ. TRUE

FLOW DEPTH OVER THE WEIR:

- For Q_{100} REQUIRED (Peak Inflow from Critical Duration HEC-HMS Analysis)

$$H = \left(\frac{Q_{100}\text{REQUIRED}}{CL}\right)^{\frac{2}{3}}$$

Q_{100} REQUIRED= 444.64 CFS
L = 170.00 FT
C = 2.6

H= **1.00** **FEET**

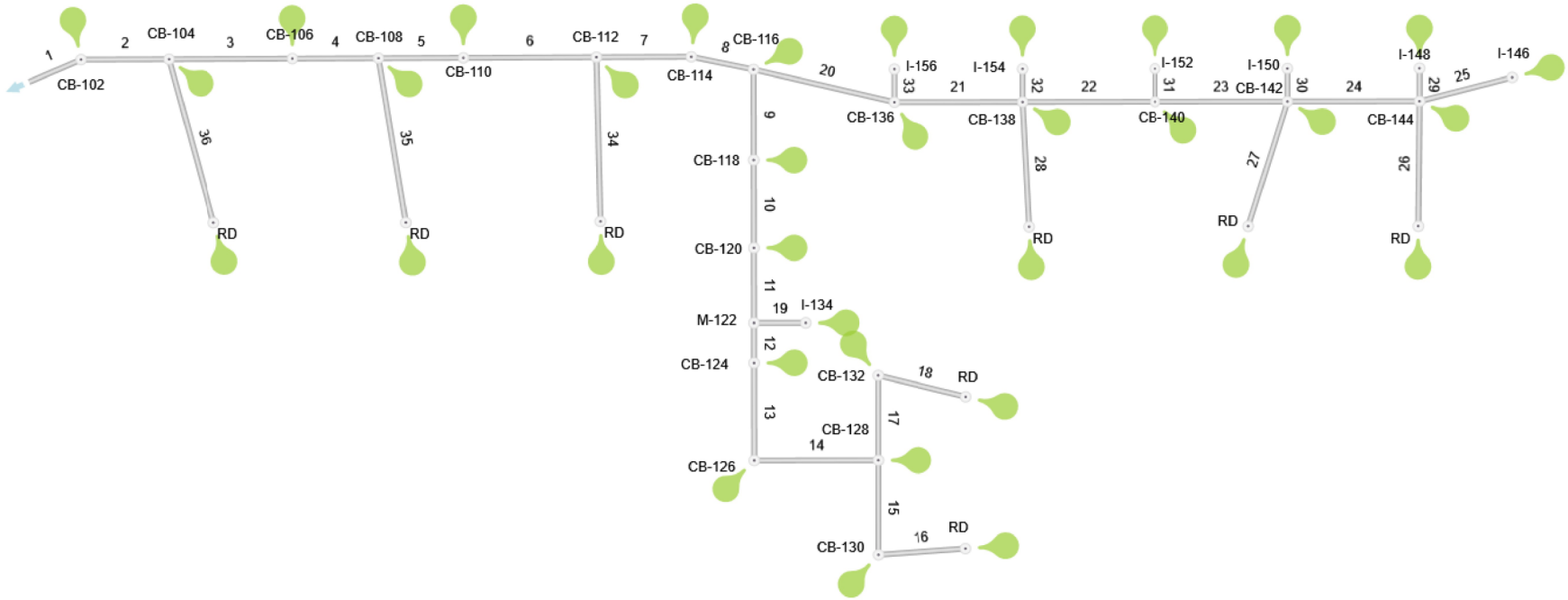
Proposed Storm Sewer Design

Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Project File: 12271-SYS100.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	57.00	0.160	14.980	0.90	0.14	13.21	10.0	16.84	5.31	70.13	59.97	3.57	60	0.05	675.03	675.00	680.03	680.00	683.00	682.00	1
Line 2	90.00	0.520	14.820	0.90	0.47	13.07	10.0	16.40	5.38	70.32	61.39	3.58	60	0.06	675.08	675.03	680.08	680.03	683.00	683.00	2
Line 3	127.00	0.610	13.700	0.90	0.55	12.06	10.0	15.75	5.49	66.26	56.67	3.38	60	0.05	675.14	675.08	680.14	680.10	683.00	683.00	3
Line 4	88.00	0.220	13.090	0.90	0.20	11.51	10.0	15.28	5.58	64.22	55.60	3.27	60	0.05	675.18	675.14	680.18	680.15	683.00	683.00	4
Line 5	88.00	0.610	12.270	0.90	0.55	10.77	10.0	14.82	5.66	61.02	55.52	3.11	60	0.05	675.22	675.18	680.22	680.20	683.00	683.00	5
Line 6	136.00	0.610	11.660	0.90	0.55	10.22	10.0	14.16	5.79	59.23	59.15	3.02	60	0.05	675.29	675.22	680.29	680.23	683.00	683.00	6
Line 7	98.00	0.200	10.150	0.90	0.18	9.14	10.0	13.68	5.89	53.82	58.90	2.74	60	0.05	675.34	675.29	680.34	680.31	683.00	683.00	7
Line 8	65.00	0.210	9.950	0.90	0.19	8.96	10.0	13.34	5.96	53.39	42.27	3.36	54	0.05	675.37	675.34	680.33	680.28	682.00	683.00	8
Line 9	93.00	0.340	4.290	0.90	0.31	3.86	10.0	12.78	6.08	23.49	23.33	2.44	42	0.05	675.42	675.37	680.46	680.41	682.00	682.00	9
Line 10	90.00	0.190	3.950	0.90	0.17	3.56	10.0	12.24	6.21	22.06	23.74	2.29	42	0.06	675.47	675.42	680.52	680.47	682.00	682.00	10
Line 11	77.00	0.000	3.760	0.00	0.00	3.38	0.0	11.77	6.32	21.39	22.94	2.22	42	0.05	675.51	675.47	680.56	680.52	682.45	682.00	11
Line 12	41.00	0.350	3.510	0.90	0.32	3.16	10.0	11.50	6.38	20.17	22.23	2.10	42	0.05	675.53	675.51	680.58	680.57	682.00	682.45	12
Line 13	100.00	0.330	3.160	0.90	0.30	2.84	10.0	11.16	6.47	18.41	33.35	2.60	36	0.25	675.78	675.53	680.62	680.54	682.30	682.00	13
Line 14	127.00	0.430	2.830	0.90	0.39	2.55	10.0	10.73	6.58	16.77	22.14	3.42	30	0.29	676.15	675.78	680.76	680.55	681.50	682.30	14
Line 15	97.00	0.400	1.650	0.90	0.36	1.49	10.0	10.22	6.72	9.98	10.27	3.18	24	0.21	676.35	676.15	680.97	680.78	681.50	681.50	15
Line 16	90.00	1.250	1.250	0.90	1.13	1.13	10.0	10.00	6.78	7.63	7.30	6.22	15	1.28	677.50	676.35	681.78	680.53	683.00	681.50	16
Line 17	87.00	0.320	0.750	0.90	0.29	0.68	10.0	10.29	6.70	4.52	10.84	1.44	24	0.23	676.35	676.15	680.94	680.91	681.50	681.50	17
Line 18	93.00	0.430	0.430	0.90	0.39	0.39	10.0	10.00	6.78	2.63	3.96	3.34	12	1.24	677.50	676.35	681.31	680.80	683.00	681.50	18
Line 19	53.00	0.250	0.250	0.90	0.23	0.23	10.0	10.00	6.78	1.53	5.58	2.80	12	2.45	680.20	678.90	680.72	680.58	683.70	682.45	19
Line 20	148.00	0.400	5.450	0.90	0.36	4.91	10.0	12.46	6.16	30.19	34.67	4.27	36	0.27	677.10	676.70	680.52	680.22	683.60	682.00	20
Line 21	132.00	0.420	4.900	0.90	0.38	4.41	10.0	12.03	6.26	27.60	31.79	4.02	36	0.23	678.00	677.70	680.75	680.56	683.60	683.60	21
Line 22	136.00	0.420	3.810	0.90	0.38	3.43	10.0	11.55	6.37	21.85	31.32	3.22	36	0.22	678.30	678.00	680.96	680.85	683.60	683.60	22

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

Project File: 12271-SYS100.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 23	136.00	0.420	3.220	0.90	0.38	2.90	10.0	11.04	6.50	18.84	19.26	3.84	30	0.22	678.60	678.30	681.19	680.90	683.60	683.60	23
Line 24	136.00	0.420	1.380	0.90	0.38	1.24	10.0	10.43	6.66	8.28	10.62	2.63	24	0.22	678.90	678.60	681.49	681.31	683.60	683.60	24
Line 25	98.00	0.230	0.230	0.90	0.21	0.21	10.0	10.00	6.78	1.40	3.01	1.79	12	0.71	679.60	678.90	681.70	681.55	683.10	683.60	25
Line 26	128.00	0.570	0.570	0.90	0.51	0.51	10.0	10.00	6.78	3.48	4.45	4.43	12	1.56	681.50	679.50	682.50	681.30	687.00	683.60	26
Line 27	134.00	1.250	1.250	0.90	1.13	1.13	10.0	10.00	6.78	7.63	7.89	6.45	15	1.49	681.50	679.50	682.60	680.82	687.00	683.60	27
Line 28	128.00	0.520	0.520	0.90	0.47	0.47	10.0	10.00	6.78	3.17	8.07	3.49	15	1.56	681.50	679.50	682.21	680.90	687.00	683.60	28
Line 29	34.00	0.160	0.160	0.90	0.14	0.14	10.0	10.00	6.78	0.98	2.73	1.24	12	0.59	679.40	679.20	681.60	681.58	682.90	683.60	29
Line 30	34.00	0.170	0.170	0.90	0.15	0.15	10.0	10.00	6.78	1.04	2.73	1.32	12	0.59	679.40	679.20	681.42	681.39	682.90	683.60	30
Line 31	34.00	0.170	0.170	0.90	0.15	0.15	10.0	10.00	6.78	1.04	2.73	1.32	12	0.59	679.40	679.20	681.13	681.11	682.90	683.60	31
Line 32	34.00	0.150	0.150	0.90	0.14	0.14	10.0	10.00	6.78	0.92	2.73	1.17	12	0.59	679.40	679.20	681.01	680.98	682.90	683.60	32
Line 33	34.00	0.150	0.150	0.90	0.14	0.14	10.0	10.00	6.78	0.92	2.73	1.17	12	0.59	679.40	679.20	680.81	680.79	682.90	683.60	33
Line 34	168.57	0.900	0.900	0.60	0.54	0.54	10.0	10.00	6.78	3.66	3.88	4.66	12	1.19	677.50	675.50	681.88	680.09	687.00	683.00	34
Line 35	171.00	0.600	0.600	0.90	0.54	0.54	10.0	10.00	6.78	3.66	3.85	4.66	12	1.17	677.50	675.50	681.82	680.01	687.00	683.00	35
Line 36	174.00	0.600	0.600	0.90	0.54	0.54	10.0	10.00	6.78	3.66	3.82	4.66	12	1.15	677.50	675.50	681.78	679.94	687.00	683.00	36

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

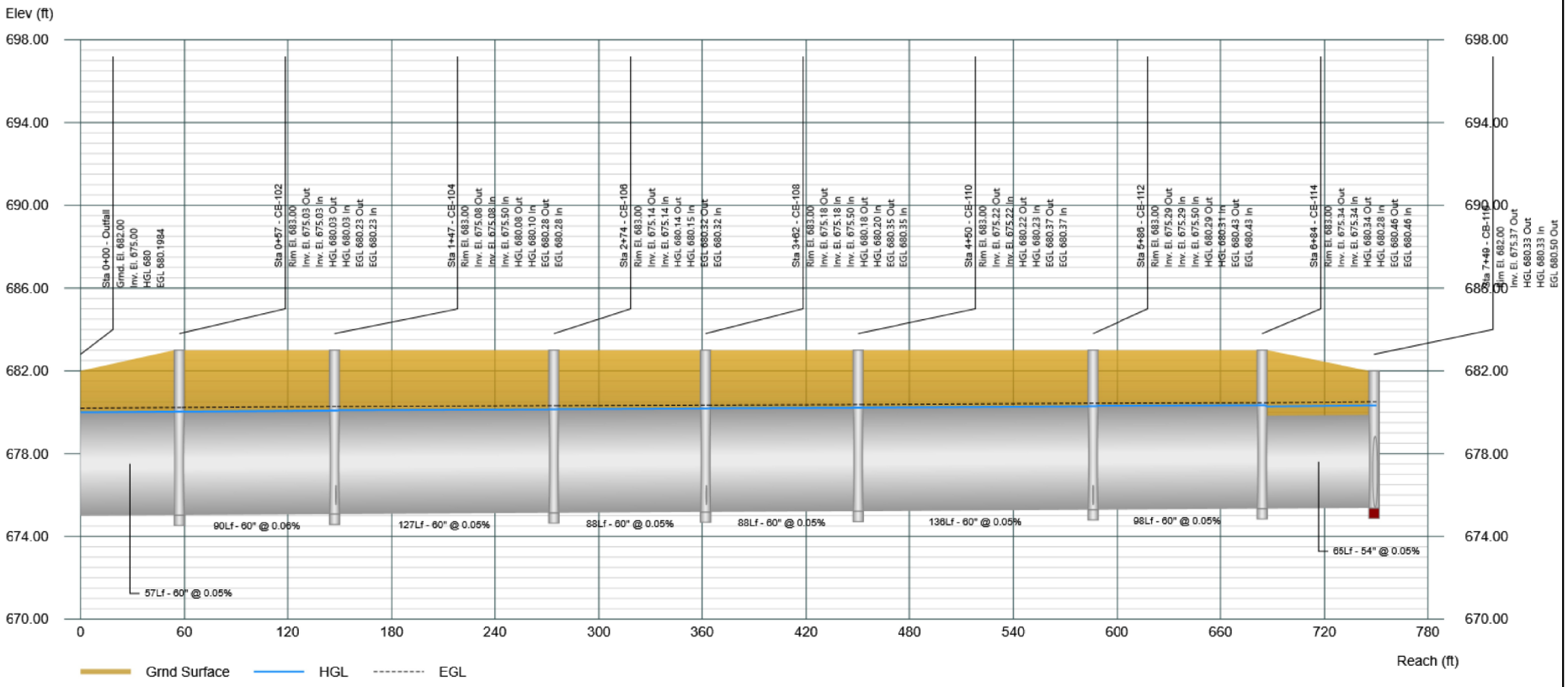
Project File: 12271-SYS100.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



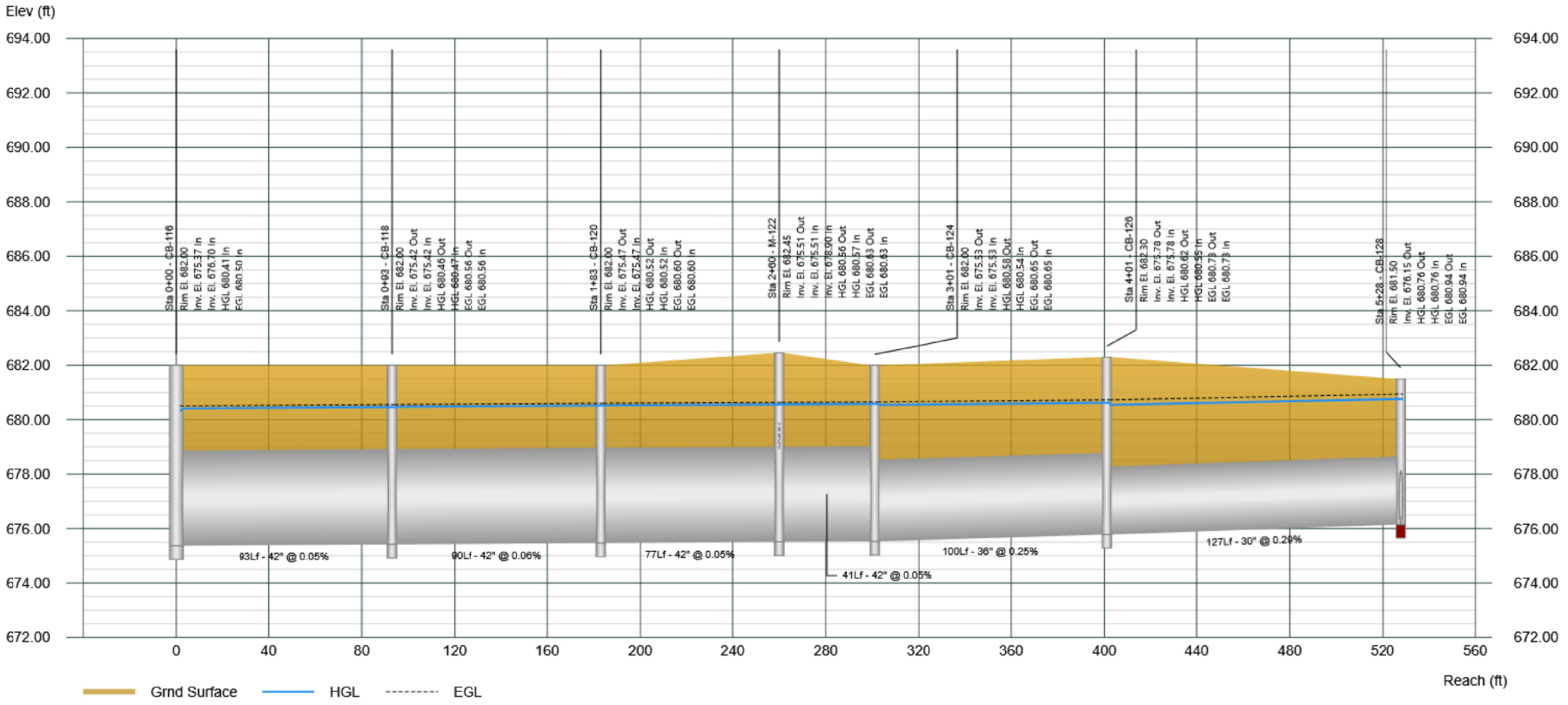
Project File: 12271-SYS100.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

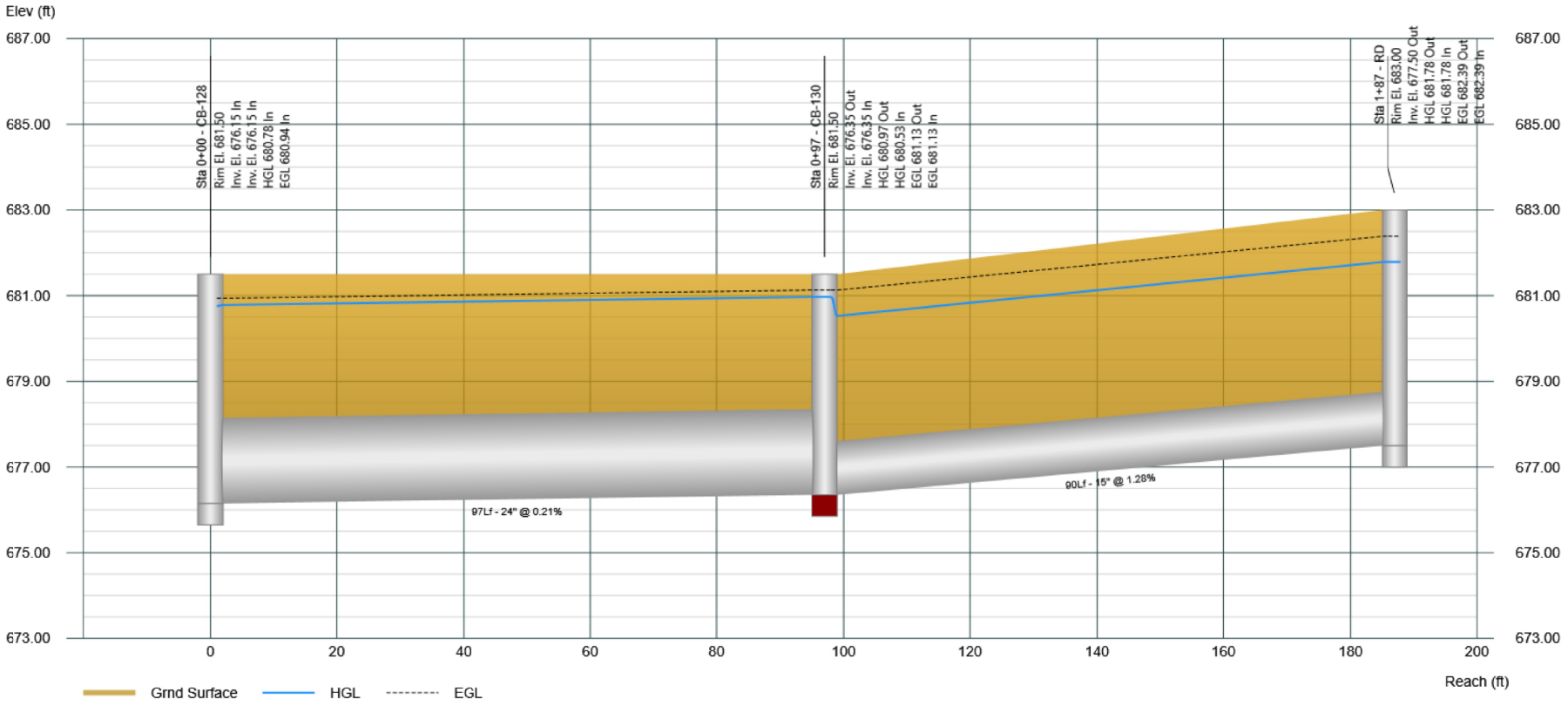


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

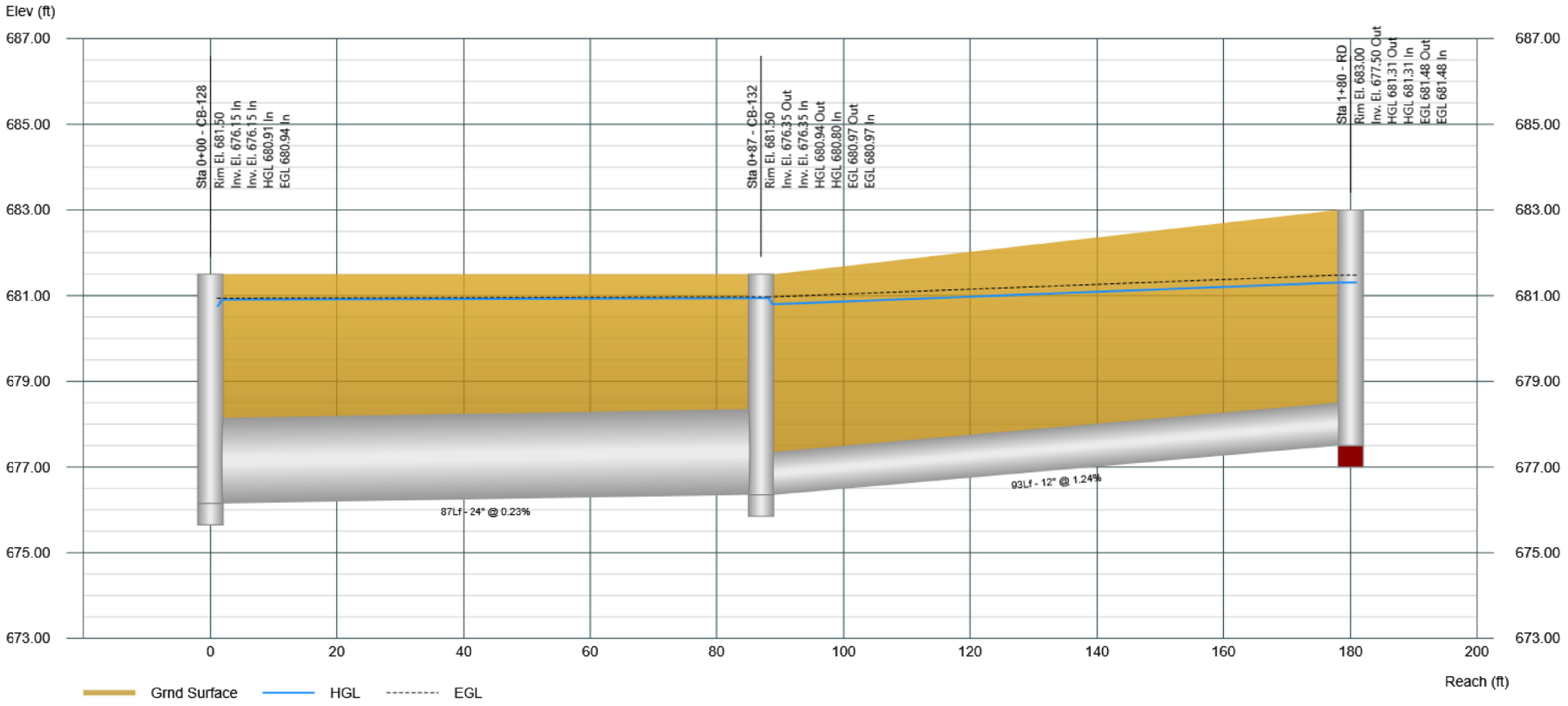


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

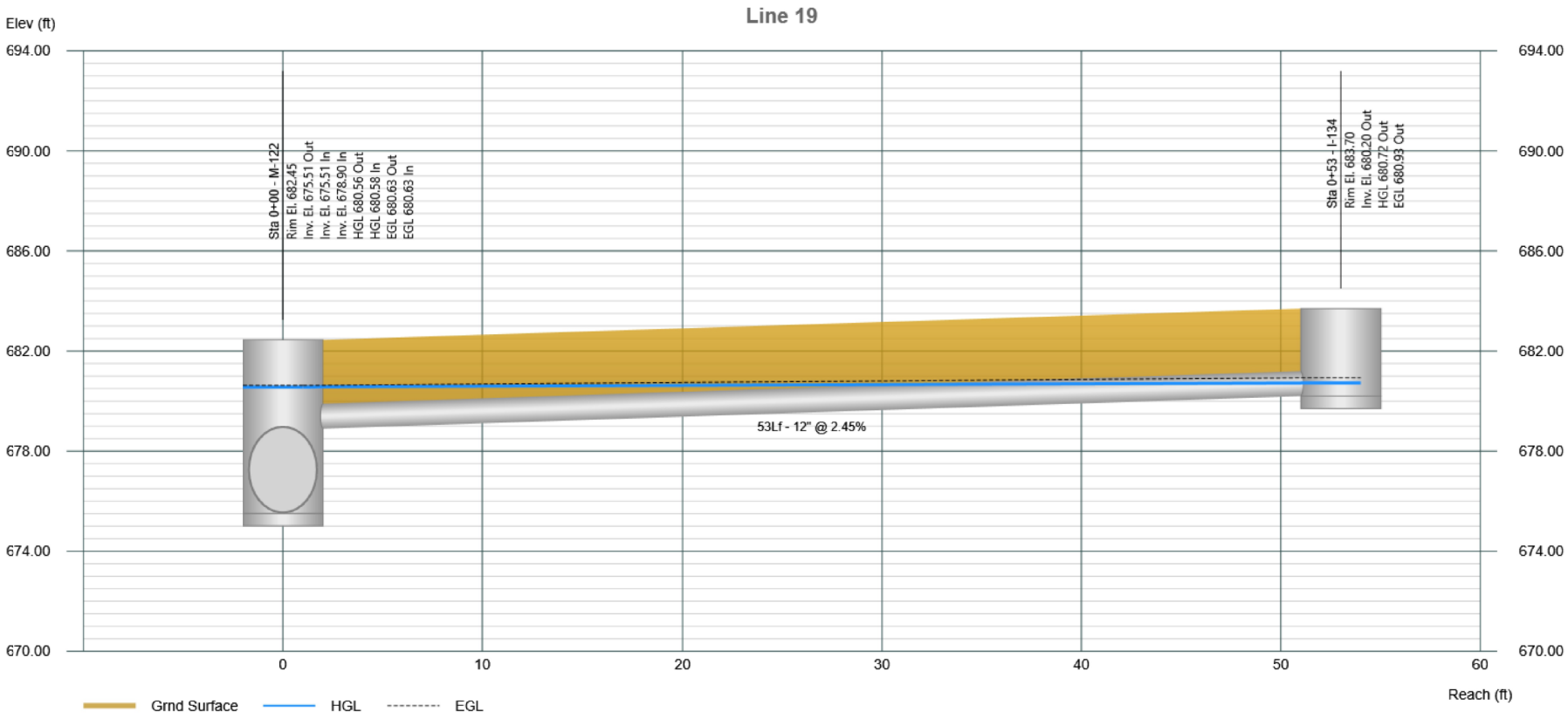


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

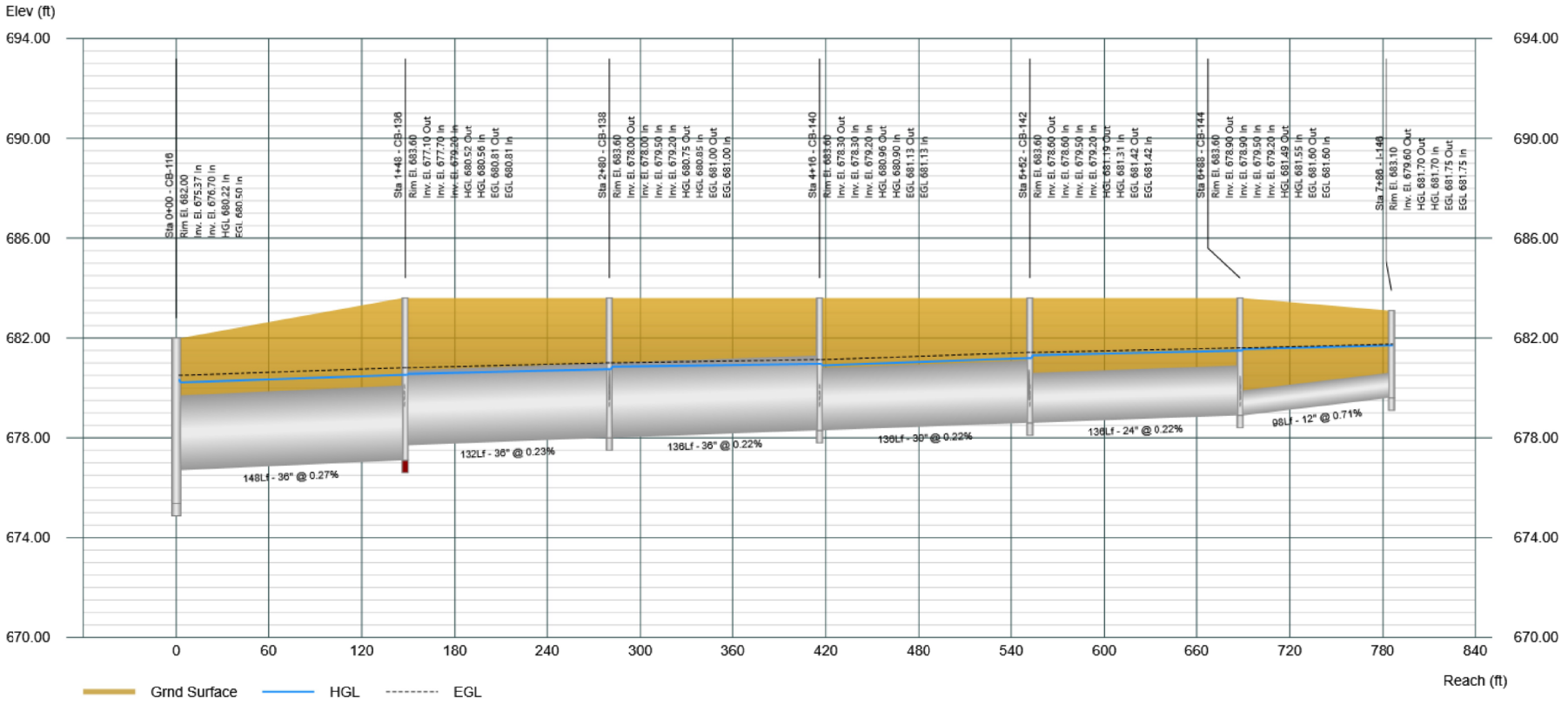


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

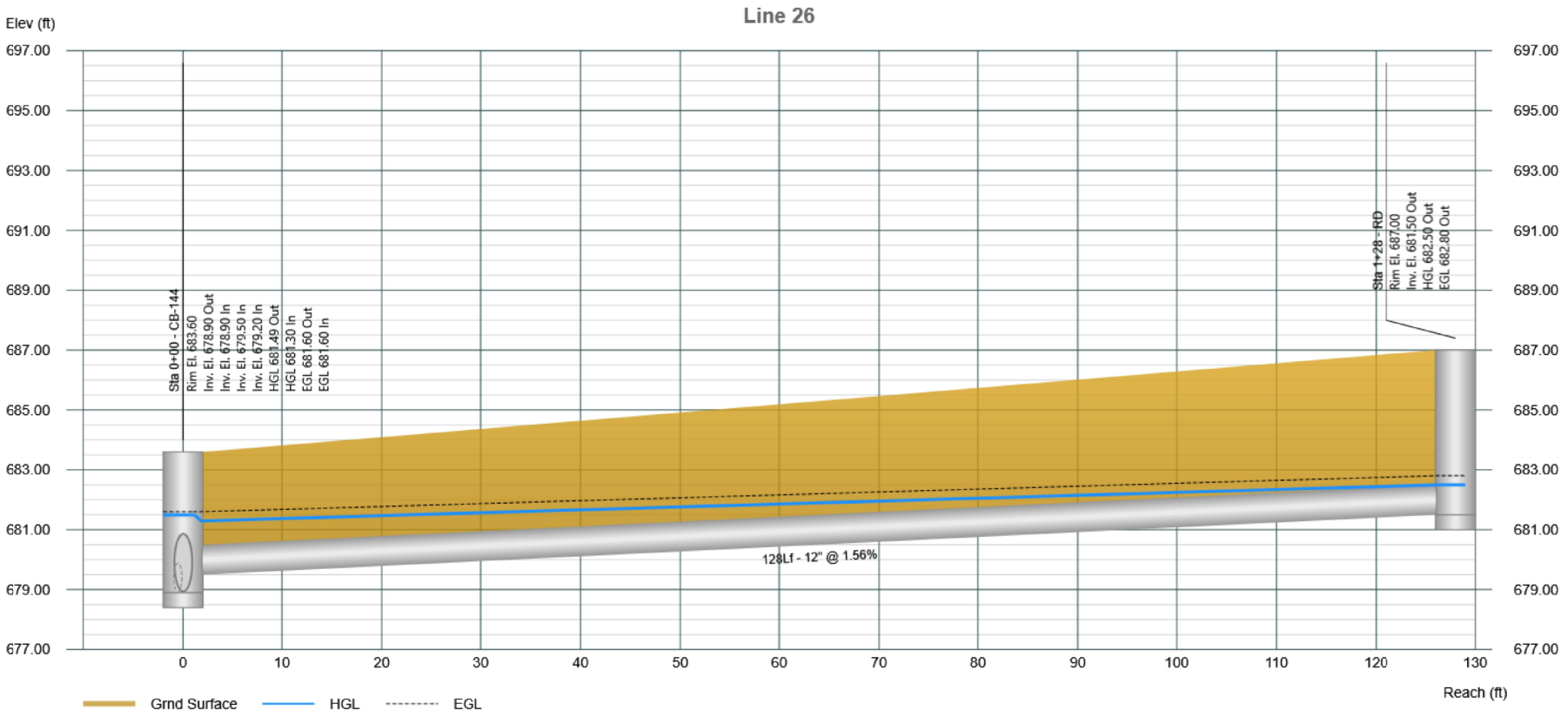


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

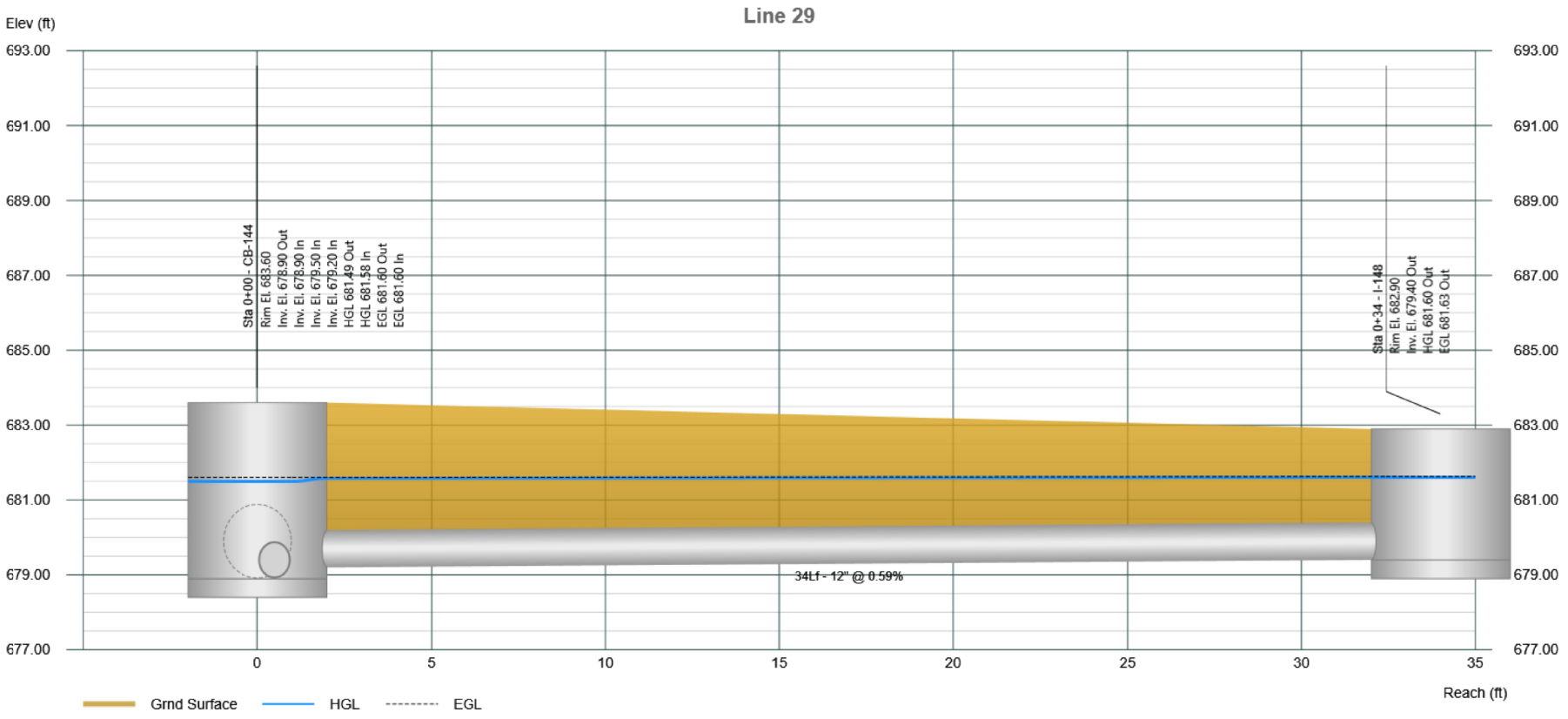


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

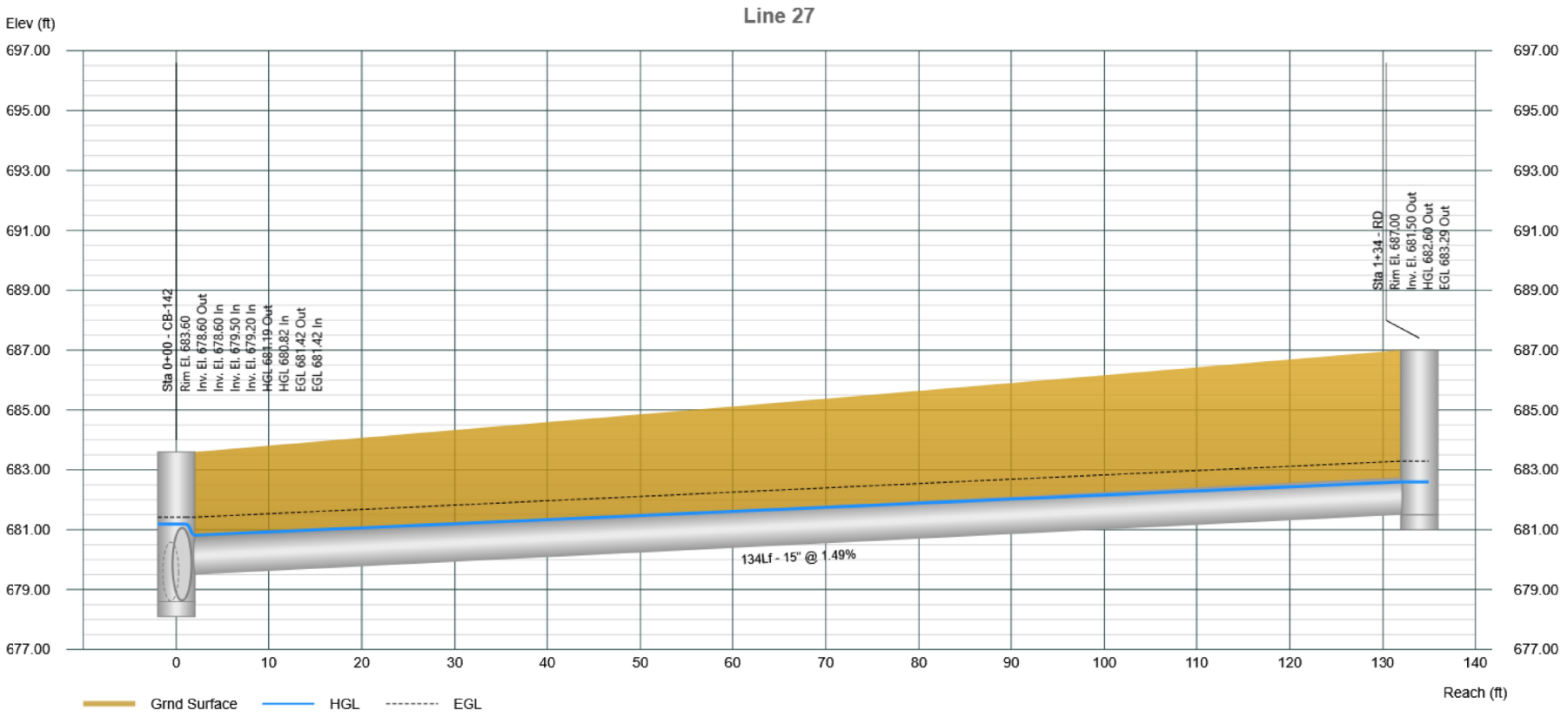


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

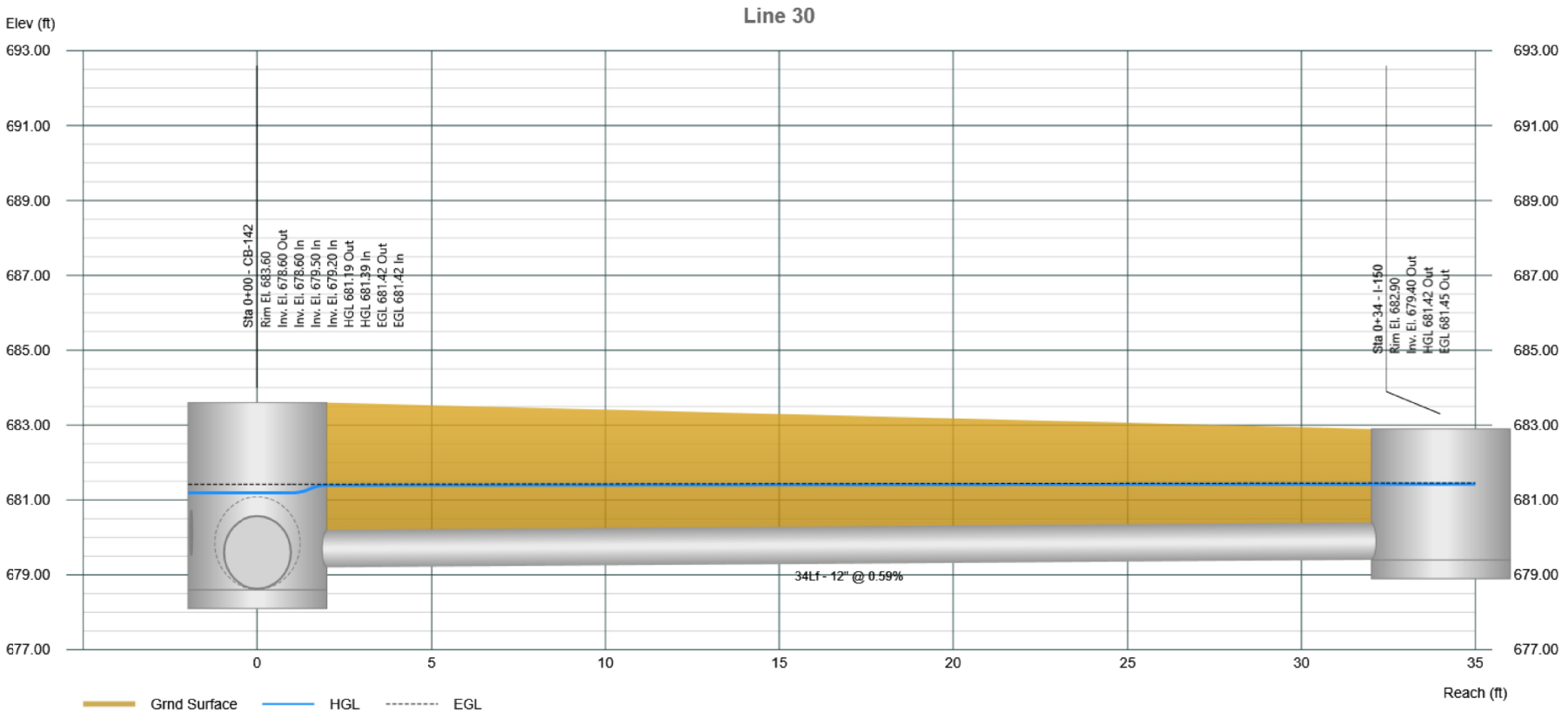


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

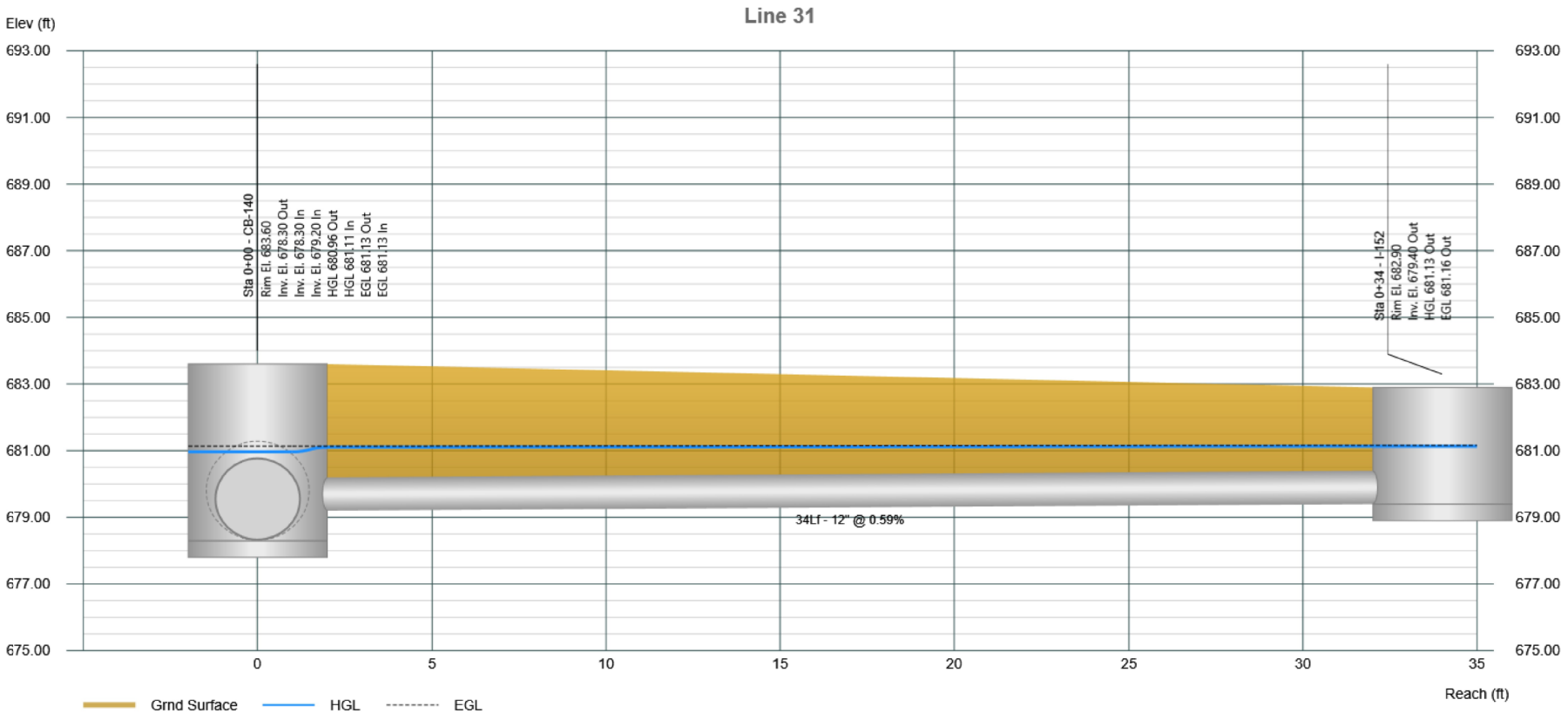


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

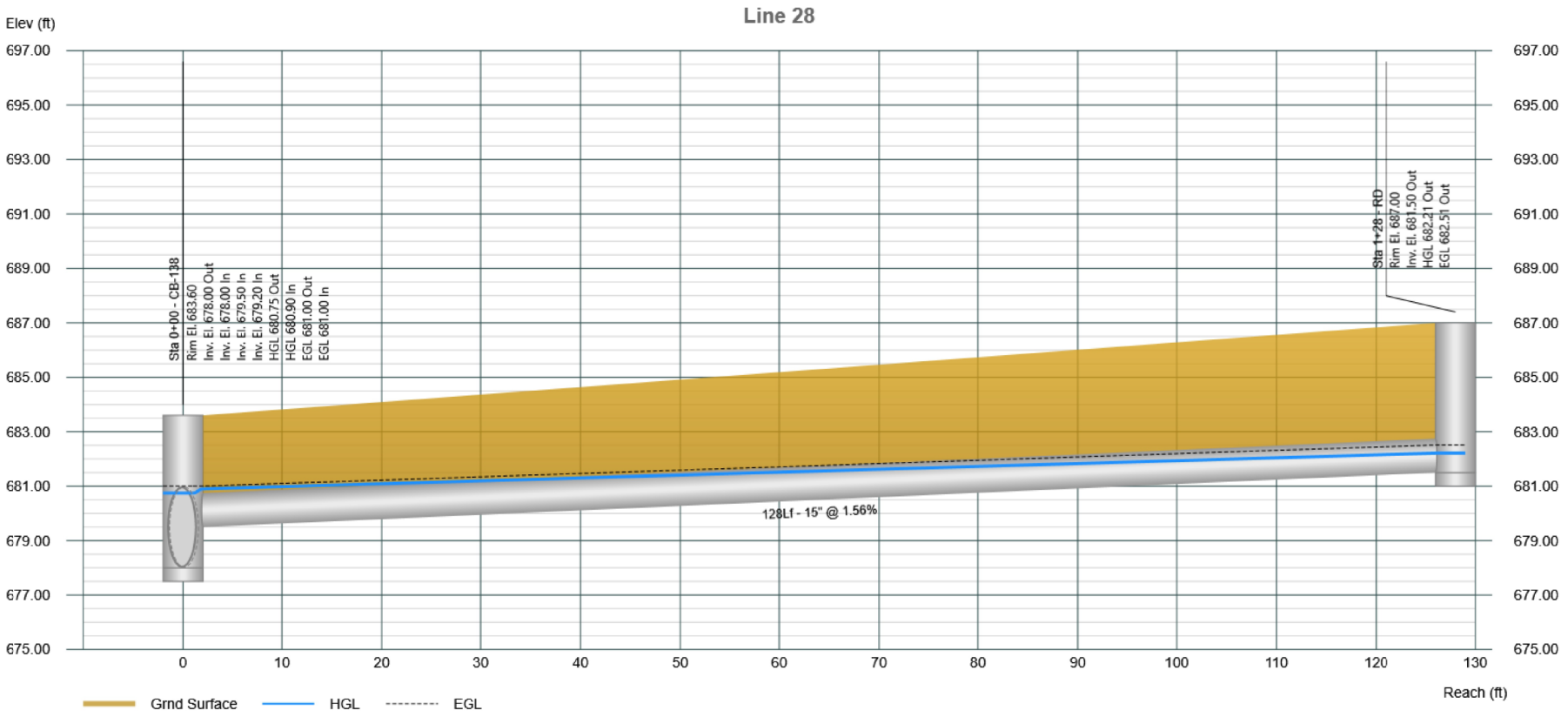


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

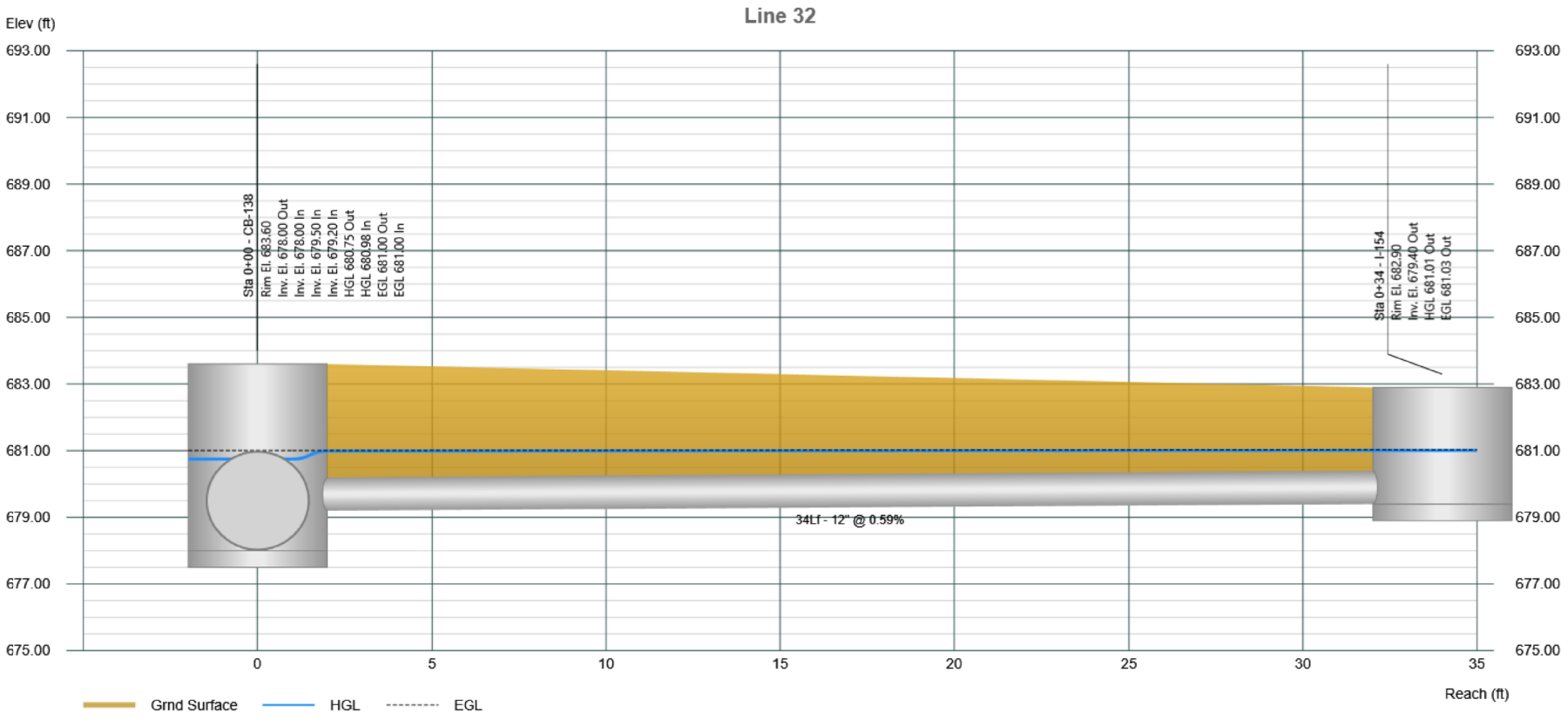


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

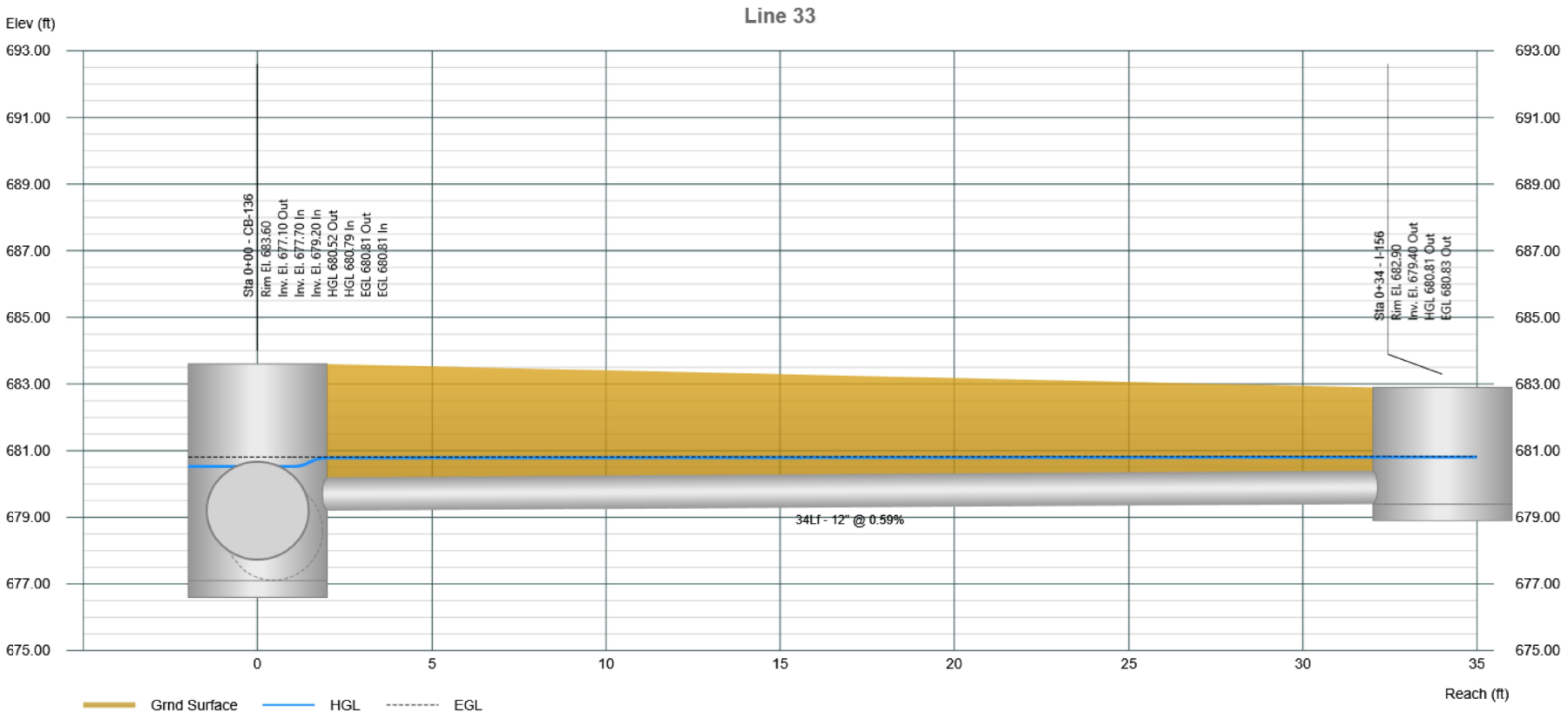


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

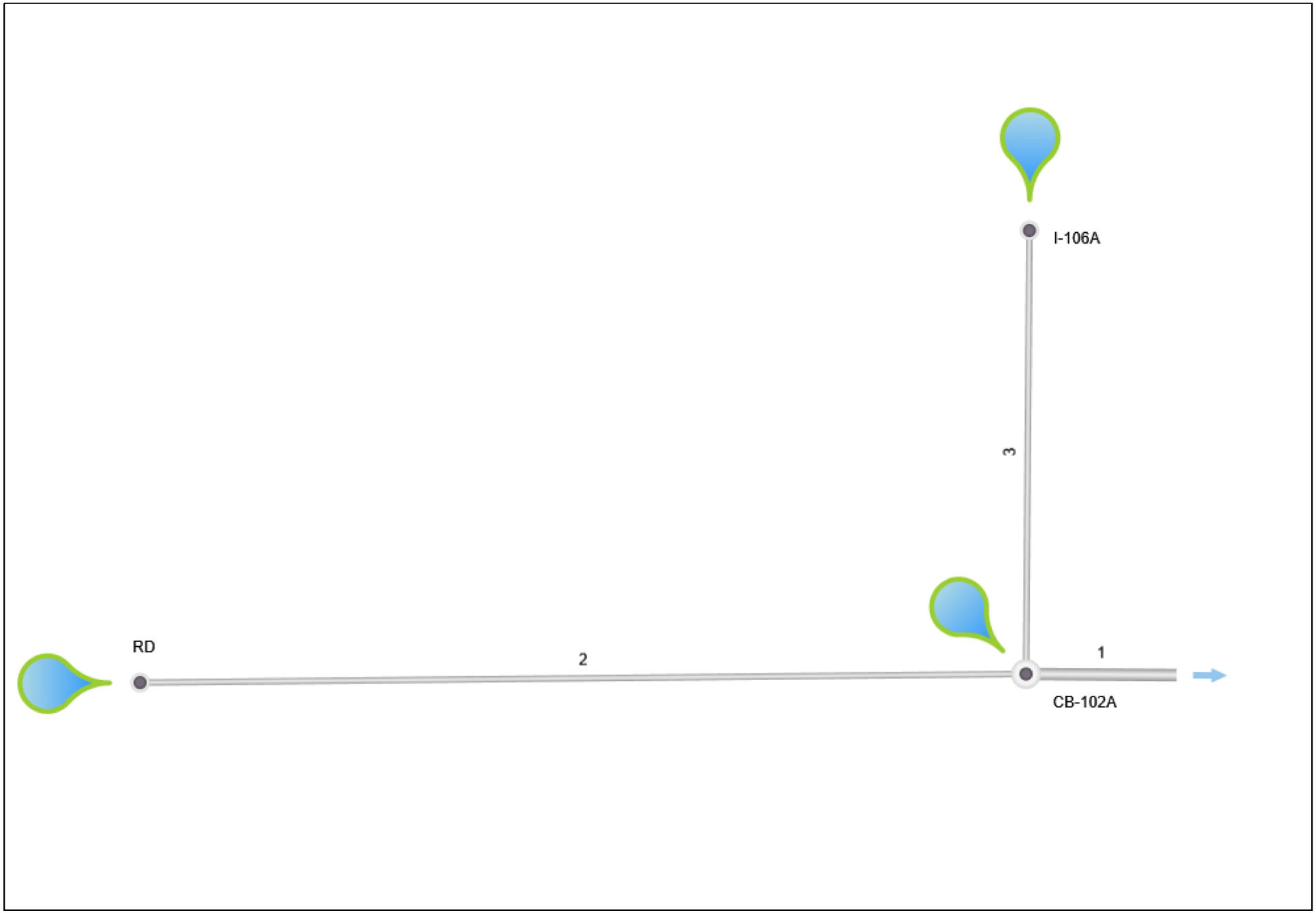


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	30.00	0.370	2.470	0.90	0.33	2.22	10.0	10.43	6.66	14.82	23.68	3.03	30	0.33	675.80	675.70	678.24	678.20	680.60	680.60	1
Line 2	178.00	1.730	1.730	0.90	1.56	1.56	10.0	10.00	6.78	10.56	6.31	8.61	15	0.95	677.50	675.80	681.99	677.23	684.00	680.60	2
Line 3	89.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.61	678.25	680.60	680.60	3

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

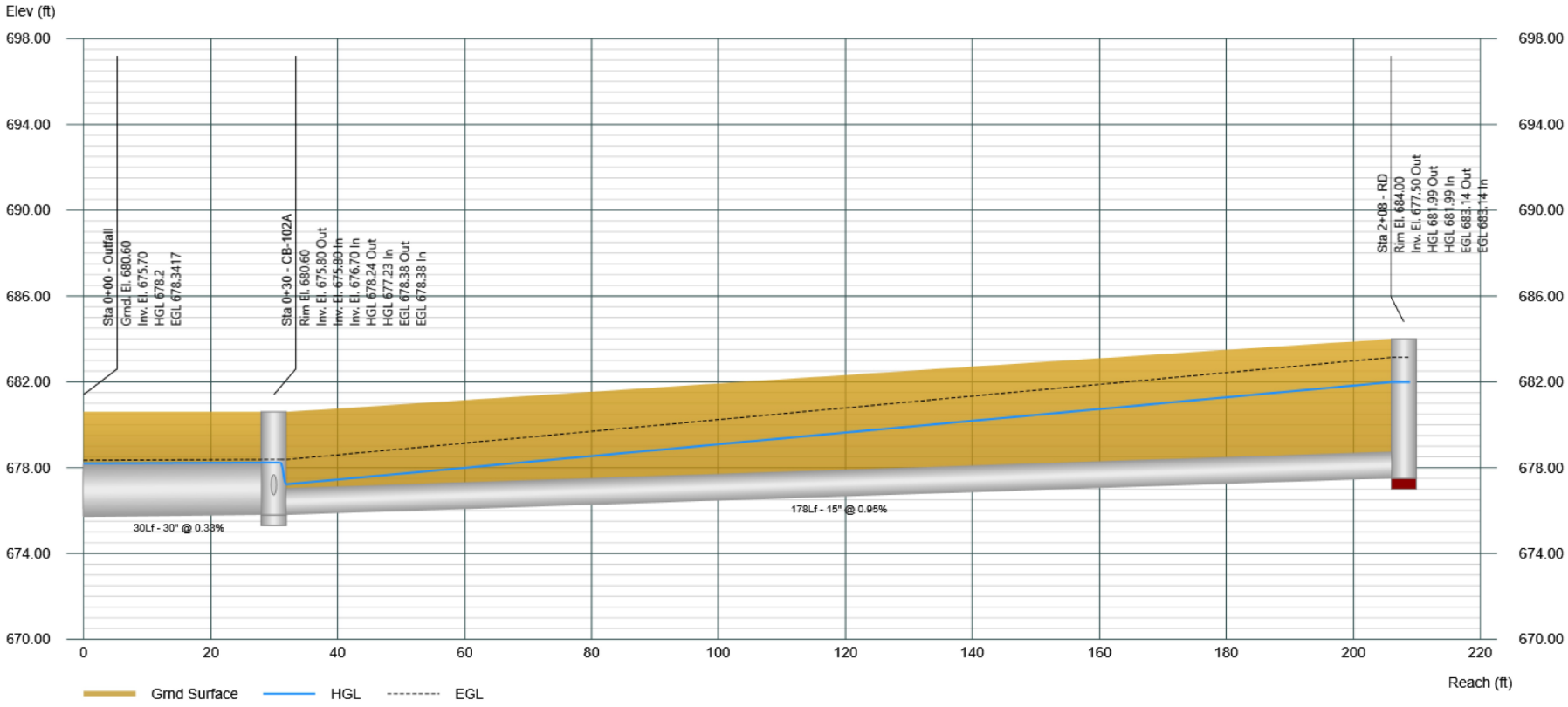
Project File: 12271-SYS100A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



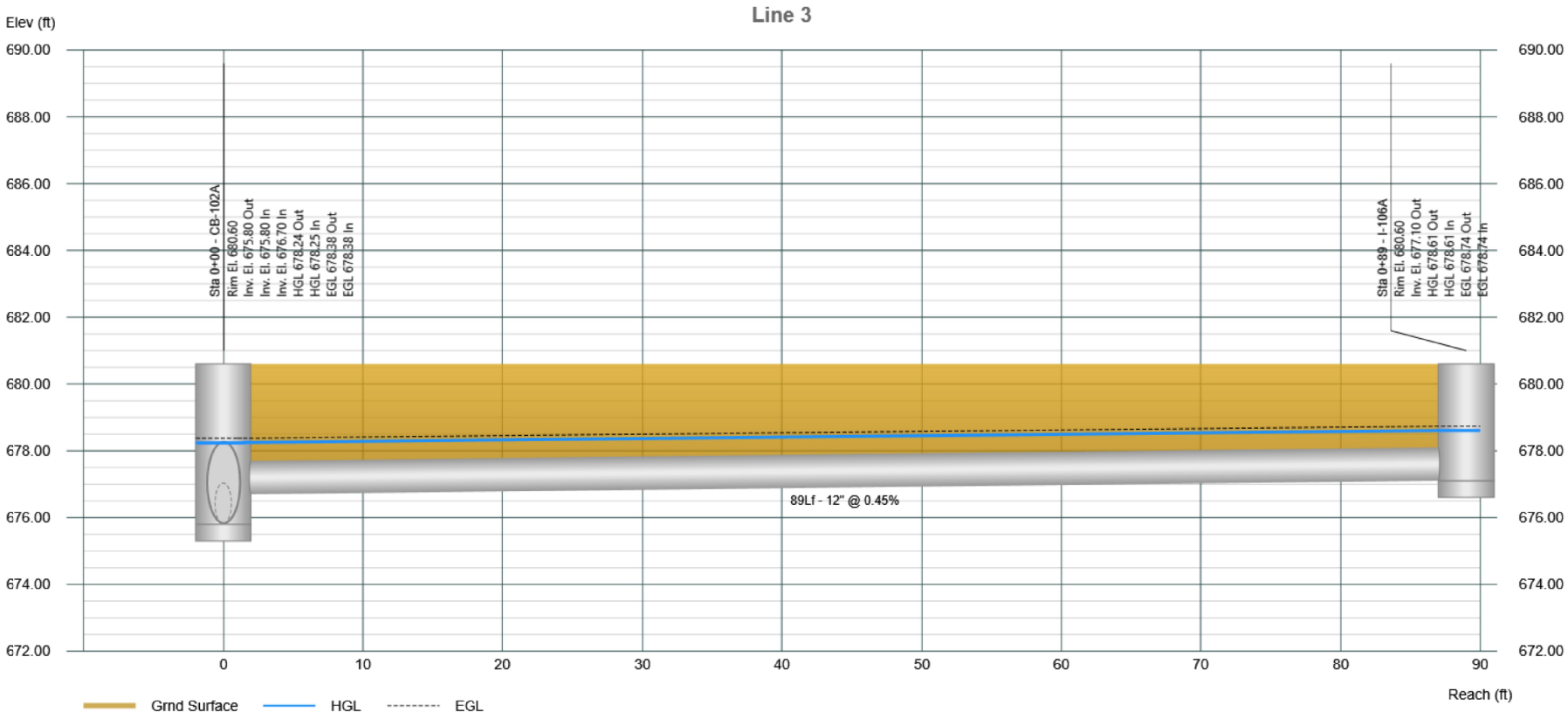
Project File: 12271-SYS100A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

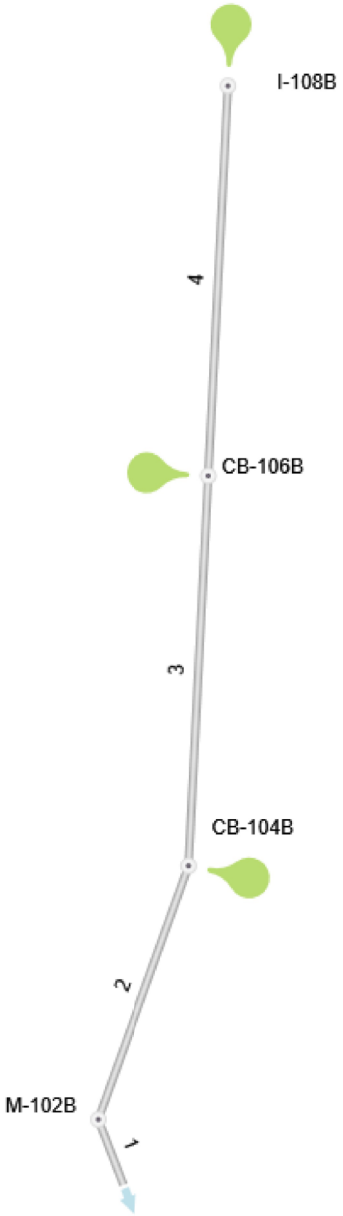


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	35.00	0.000	1.350	0.00	0.00	1.22	0.0	13.56	5.91	7.19	7.64	2.77	24	0.11	675.24	675.20	676.78	676.74	680.00	678.70	1
Line 2	138.00	0.350	1.350	0.90	0.32	1.22	10.0	12.68	6.11	7.42	7.20	2.61	24	0.10	675.38	675.24	677.08	676.94	679.00	680.00	2
Line 3	200.00	0.330	1.000	0.90	0.30	0.90	10.0	11.37	6.42	5.78	7.15	2.03	24	0.10	675.58	675.38	677.24	677.12	679.00	679.00	3
Line 4	200.00	0.670	0.670	0.90	0.60	0.60	10.0	10.00	6.78	4.09	7.50	1.51	24	0.11	675.80	675.58	677.34	677.27	679.00	679.00	4

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

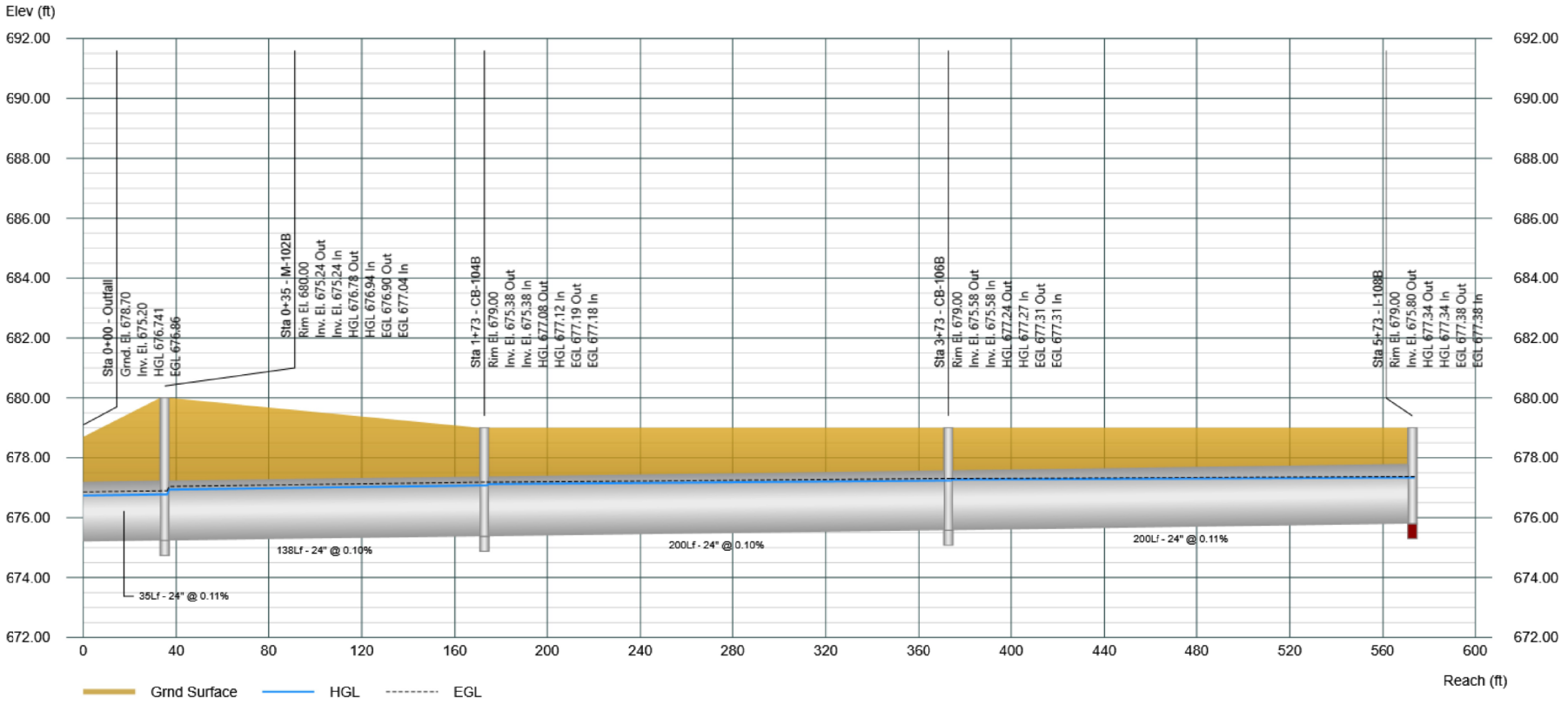
Project File: SYS-100B.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

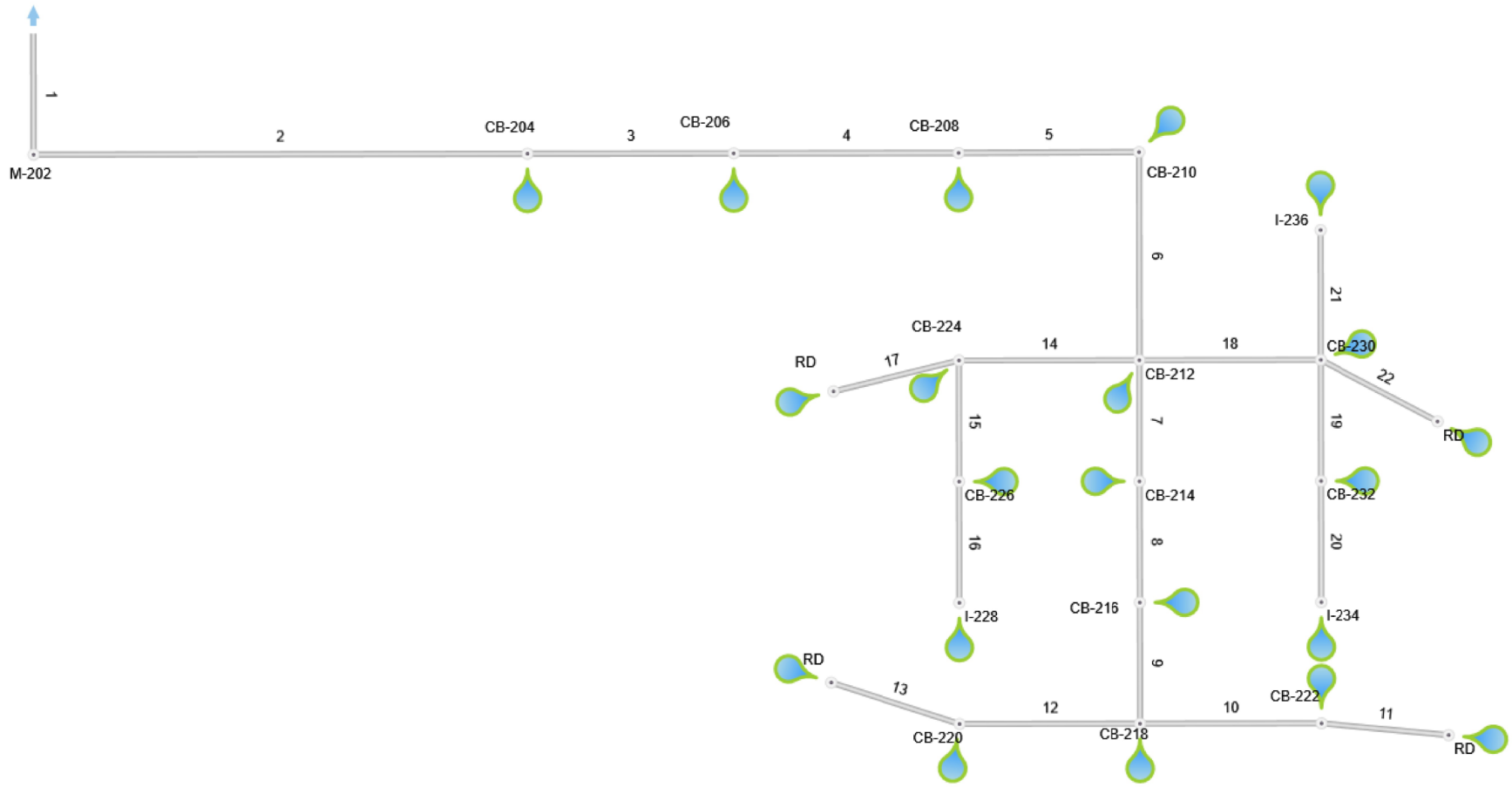


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	84.00	0.000	10.030	0.00	0.00	9.03	0.0	17.43	5.21	47.06	44.51	3.16	54	0.05	675.54	675.50	679.53	679.48	686.20	681.00	1
Line 2	347.00	0.290	10.030	0.90	0.26	9.03	10.0	15.57	5.53	49.88	43.38	3.14	54	0.05	675.71	675.54	680.26	680.04	686.20	686.20	2
Line 3	145.00	0.290	9.740	0.90	0.26	8.77	10.0	14.79	5.67	49.70	43.21	3.13	54	0.05	675.78	675.71	680.36	680.26	683.90	686.20	3
Line 4	158.00	0.350	9.450	0.90	0.32	8.50	10.0	13.94	5.84	49.64	44.24	3.12	54	0.05	675.86	675.78	680.46	680.36	683.90	683.90	4
Line 5	127.00	0.140	9.100	0.90	0.13	8.19	10.0	13.25	5.98	48.99	42.75	3.08	54	0.05	675.92	675.86	680.54	680.46	683.00	683.90	5
Line 6	146.00	0.220	8.960	0.90	0.20	8.06	10.0	12.50	6.15	49.57	46.04	3.12	54	0.05	676.00	675.92	680.63	680.54	683.50	683.00	6
Line 7	85.00	0.110	3.600	0.90	0.10	3.24	10.0	11.95	6.28	20.33	21.82	2.11	42	0.05	676.04	676.00	680.75	680.71	682.30	683.50	7
Line 8	85.00	0.110	3.490	0.90	0.10	3.14	10.0	11.40	6.41	20.14	21.84	2.09	42	0.05	676.08	676.04	680.78	680.75	682.30	682.30	8
Line 9	85.00	0.110	3.380	0.90	0.10	3.04	10.0	10.84	6.55	19.93	21.82	2.07	42	0.05	676.12	676.08	680.82	680.78	682.30	682.30	9
Line 10	127.00	0.380	2.110	0.90	0.34	1.90	10.0	10.17	6.73	12.79	10.70	4.07	24	0.22	676.40	676.12	681.03	680.63	681.50	682.30	10
Line 11	90.00	1.730	1.730	0.90	1.56	1.56	10.0	10.00	6.78	10.56	7.14	8.61	15	1.22	677.50	676.40	682.55	680.14	684.00	681.50	11
Line 12	127.00	0.380	1.160	0.90	0.34	1.04	10.0	10.26	6.71	7.01	10.69	2.23	24	0.22	676.40	676.12	680.93	680.81	681.50	682.30	12
Line 13	95.00	0.780	0.780	0.90	0.70	0.70	10.0	10.00	6.78	4.76	6.95	3.88	15	1.16	677.50	676.40	681.29	680.77	684.00	681.50	13
Line 14	127.00	0.520	2.150	0.90	0.47	1.94	10.0	10.73	6.58	12.74	19.93	2.60	30	0.24	676.30	676.00	680.80	680.68	681.60	683.50	14
Line 15	85.00	0.380	0.760	0.90	0.34	0.68	10.0	10.40	6.67	4.56	7.20	2.58	18	0.47	677.60	677.20	680.96	680.80	681.50	681.60	15
Line 16	85.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.44	2.95	12	0.47	678.00	677.60	681.29	680.93	681.50	681.50	16
Line 17	91.00	0.870	0.870	0.90	0.78	0.78	10.0	10.00	6.78	5.31	7.43	4.33	15	1.32	677.50	676.30	681.23	680.61	684.00	681.60	17
Line 18	127.00	0.380	2.990	0.90	0.34	2.69	10.0	10.73	6.58	17.72	19.93	3.61	30	0.24	676.30	676.00	680.82	680.58	681.60	683.50	18
Line 19	85.00	0.380	0.760	0.90	0.34	0.68	10.0	10.40	6.67	4.56	7.20	2.58	18	0.47	677.60	677.20	681.08	680.91	681.50	681.60	19
Line 20	85.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.44	2.95	12	0.47	678.00	677.60	681.40	681.04	681.50	681.50	20
1	91.00	0.460	0.460	0.90	0.41	0.41	10.0	10.00	6.78	2.81	2.89	3.58	12	0.66	678.00	677.40	681.39	680.82	681.50	681.60	21
Line 22	93.00	1.390	1.390	0.90	1.25	1.25	10.0	10.00	6.78	8.49	7.35	6.92	15	1.29	677.50	676.30	681.88	680.27	684.00	681.60	22

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

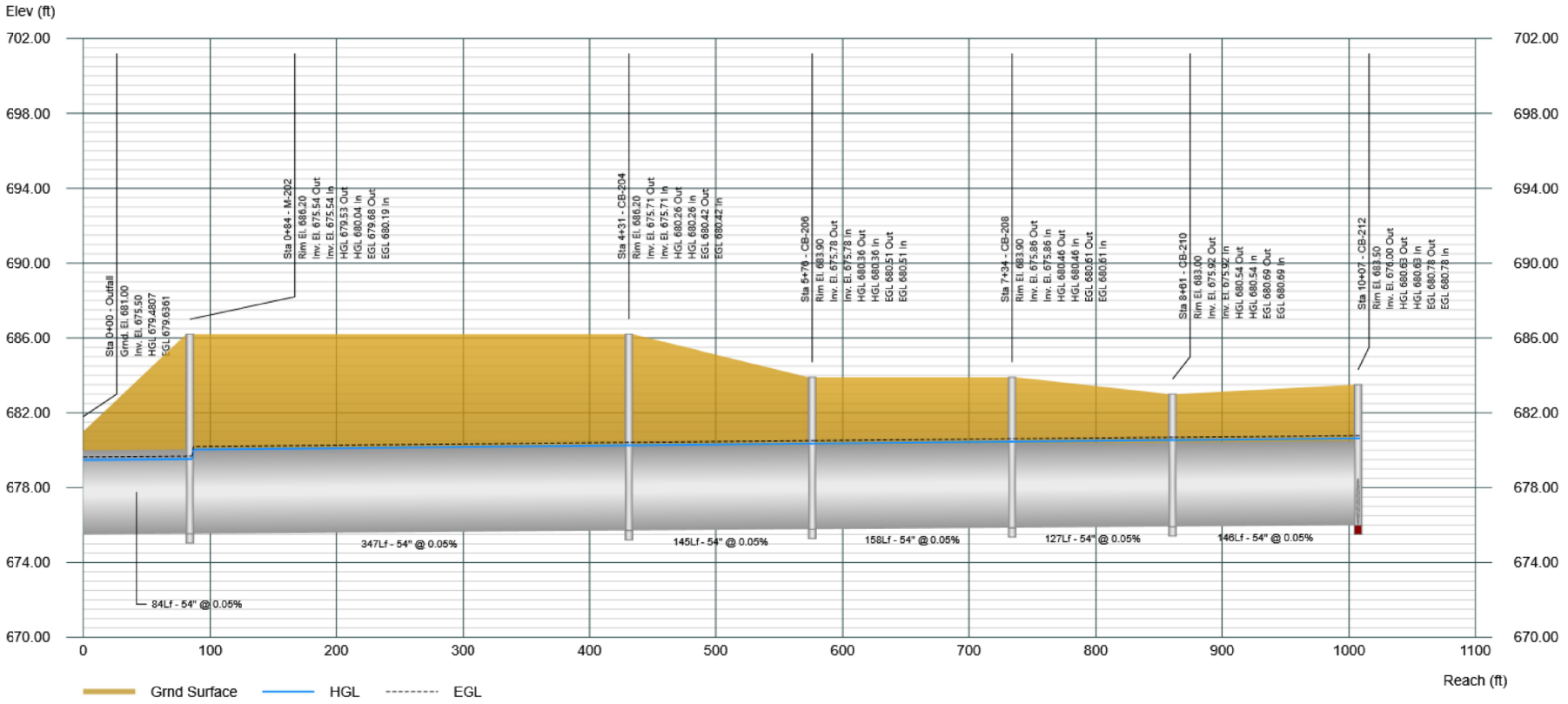
Project File: 12271-SYS200.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



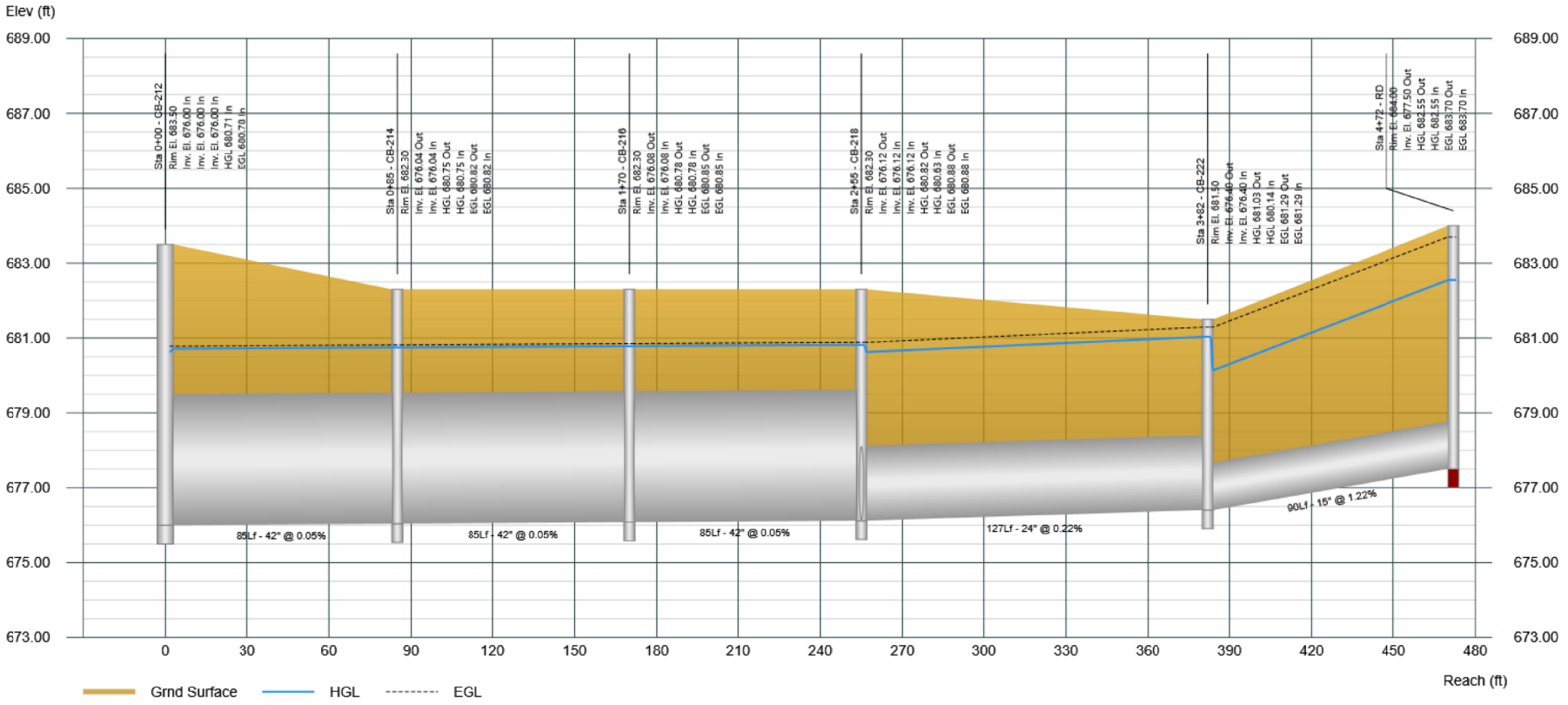
Project File: 12271-SYS200.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

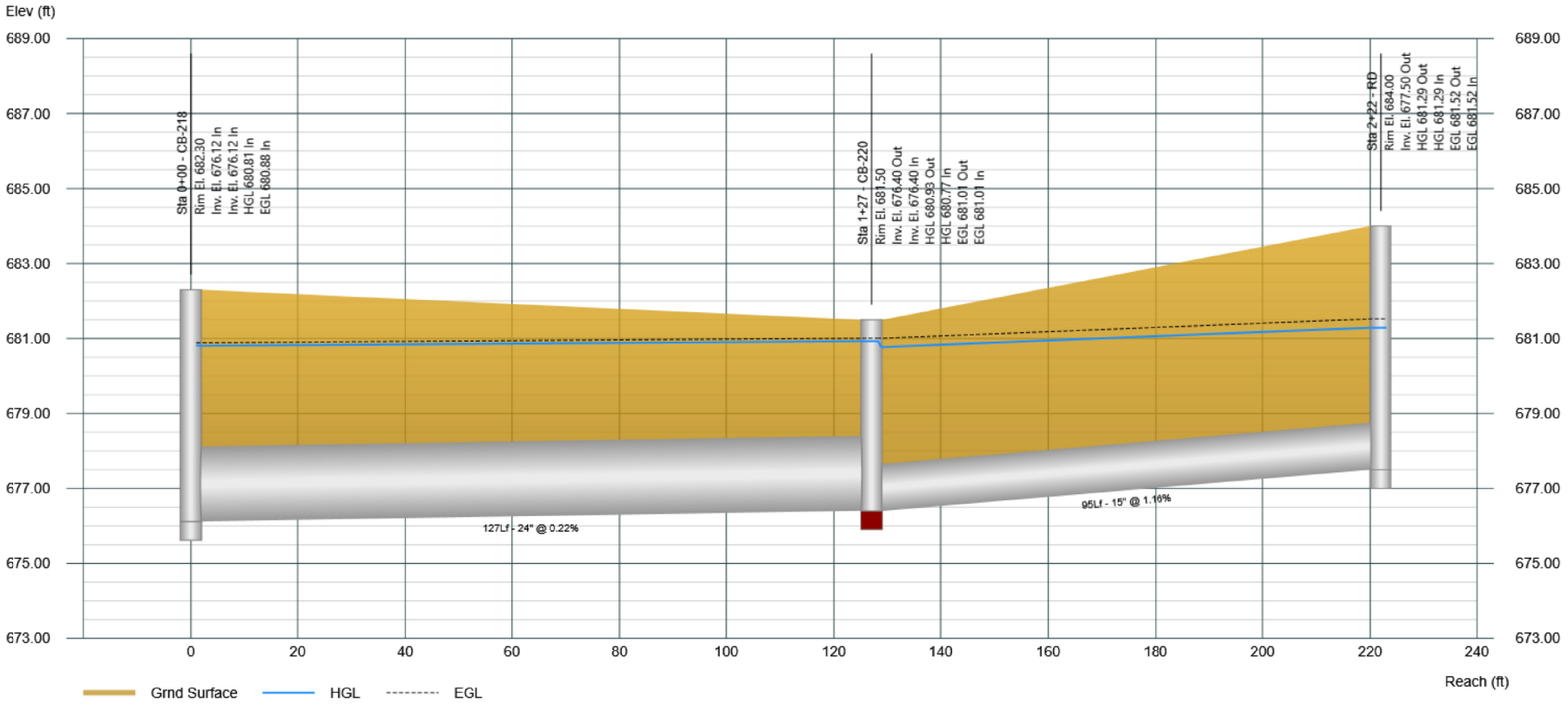


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



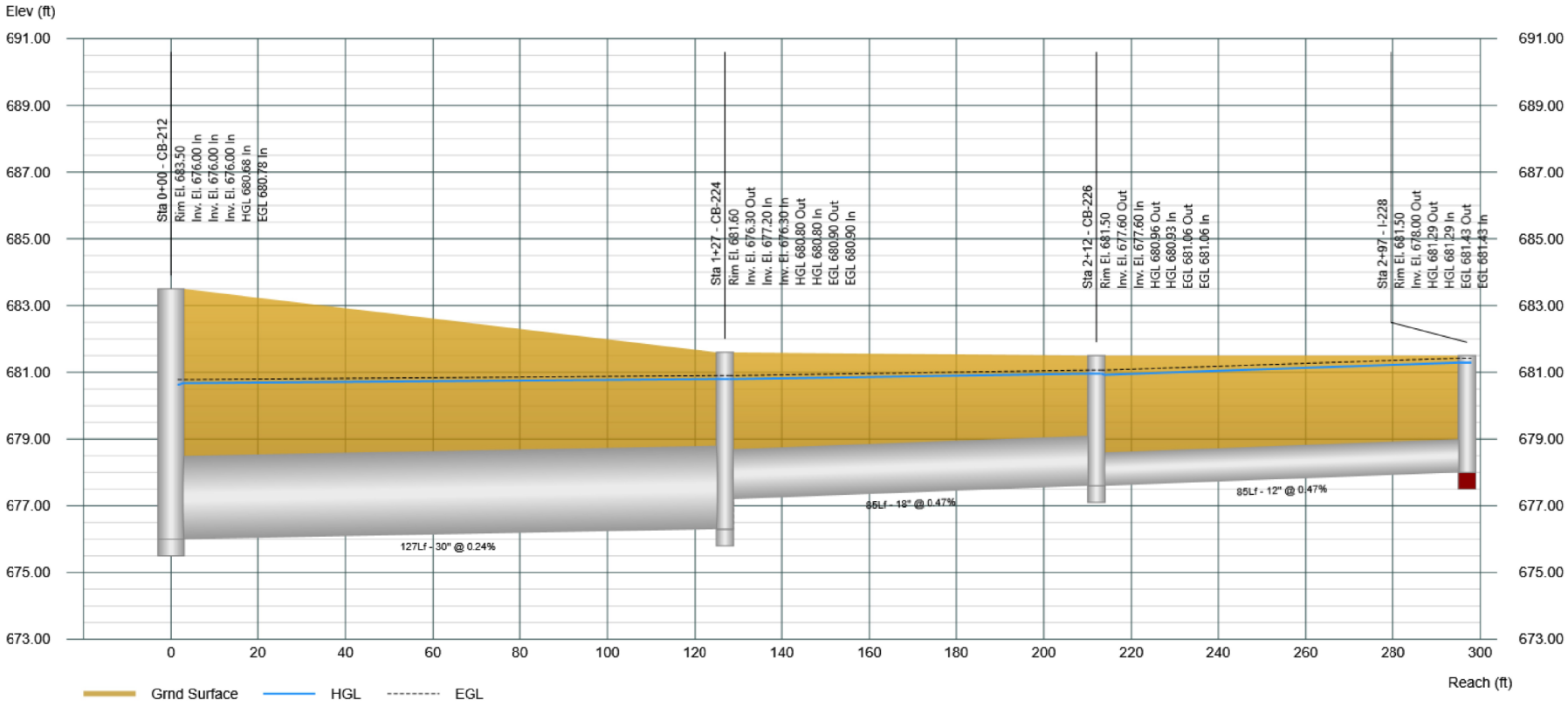
Project File: 12271-SYS200.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

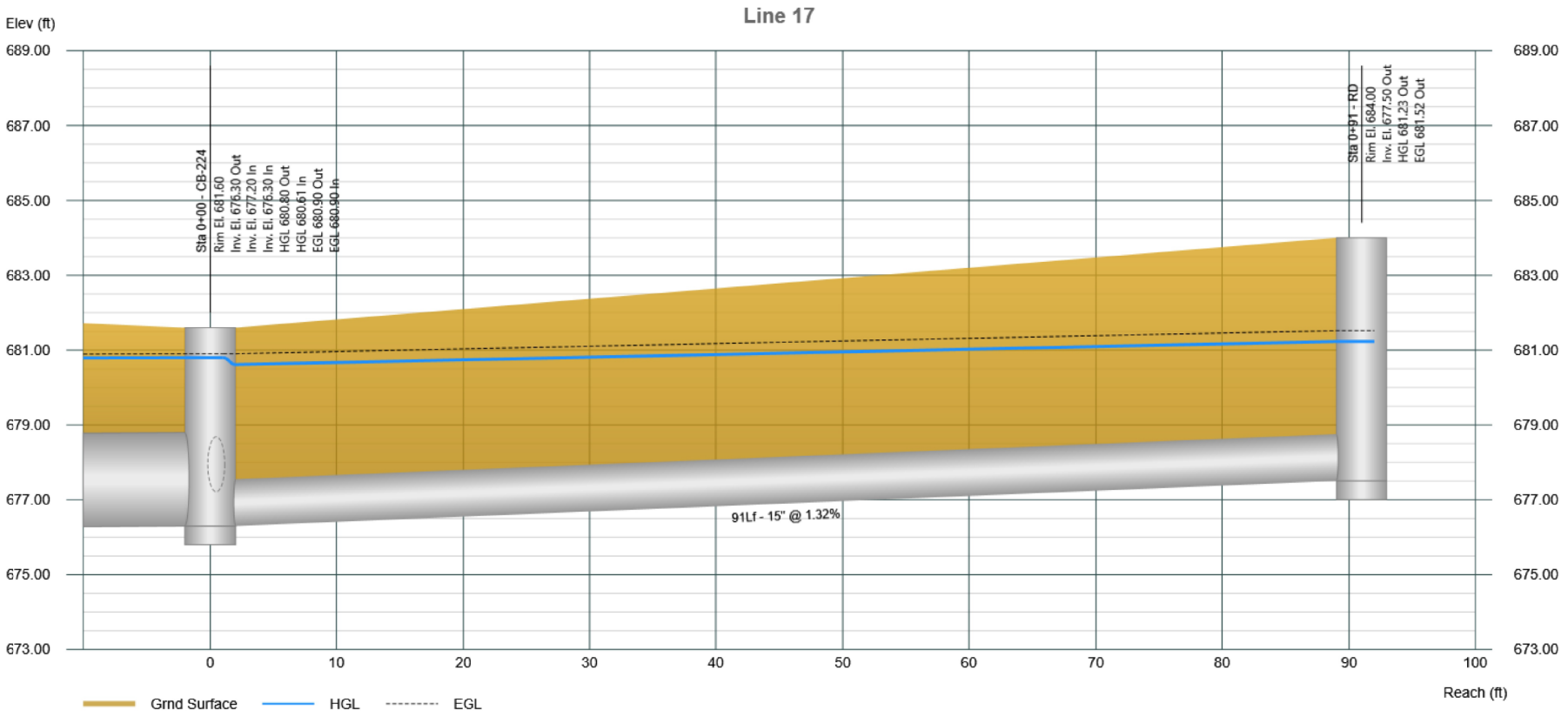


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

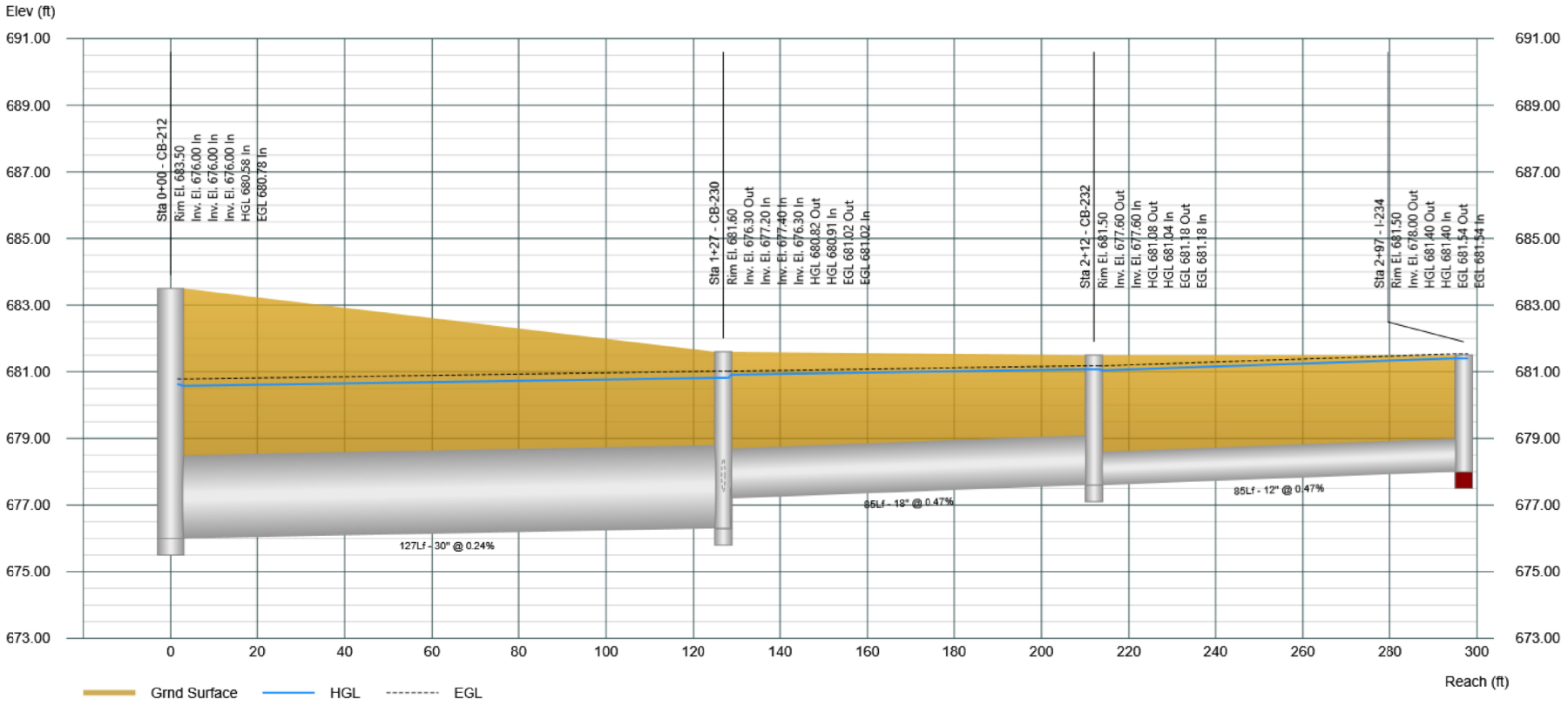


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

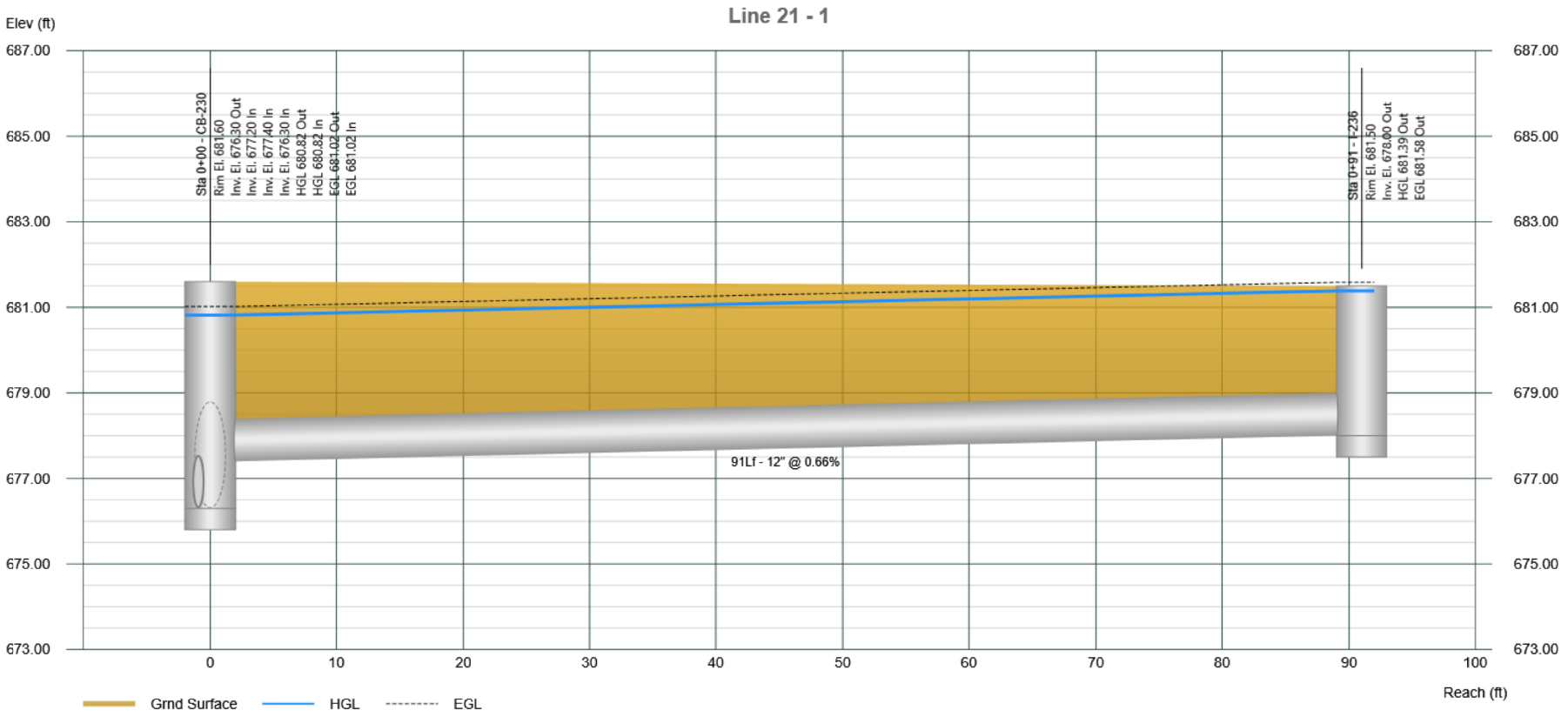


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

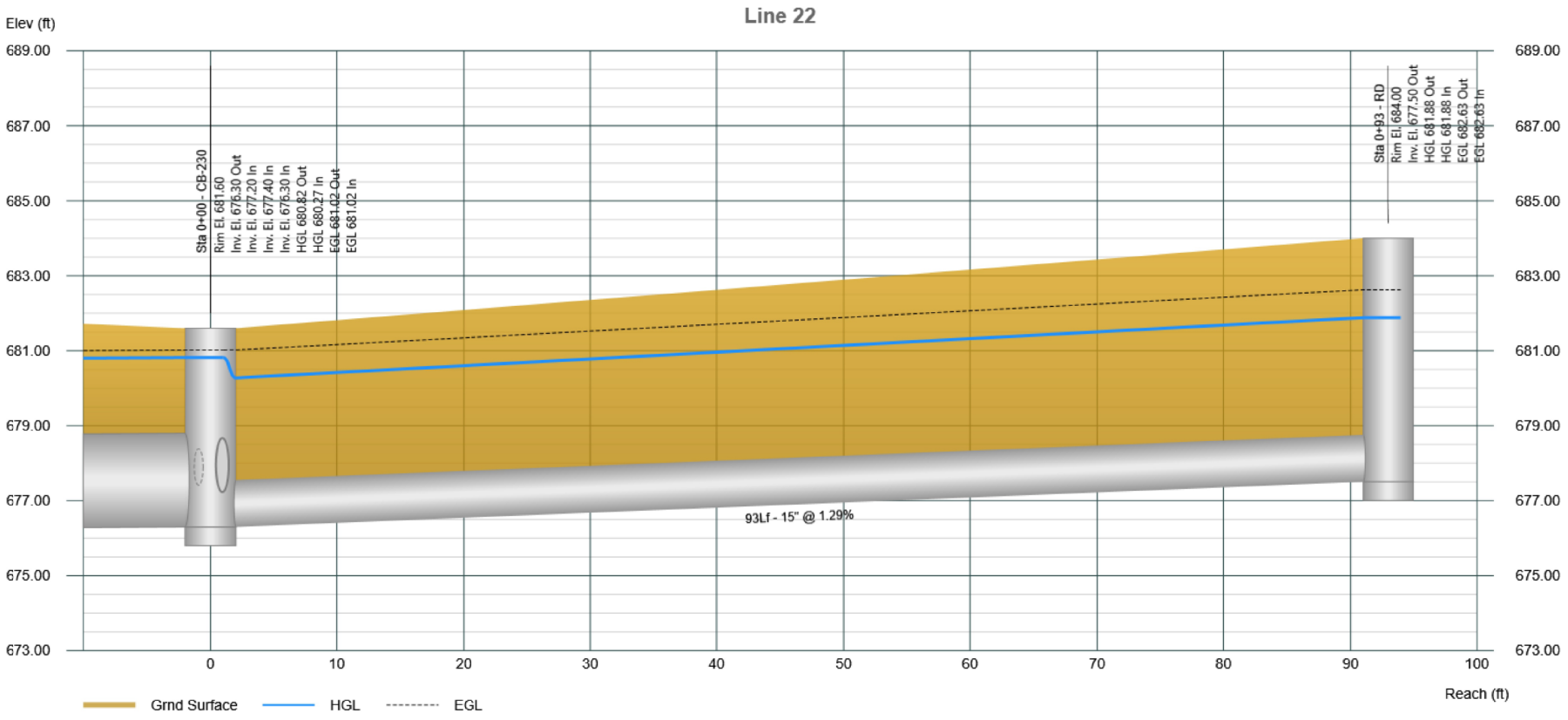


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

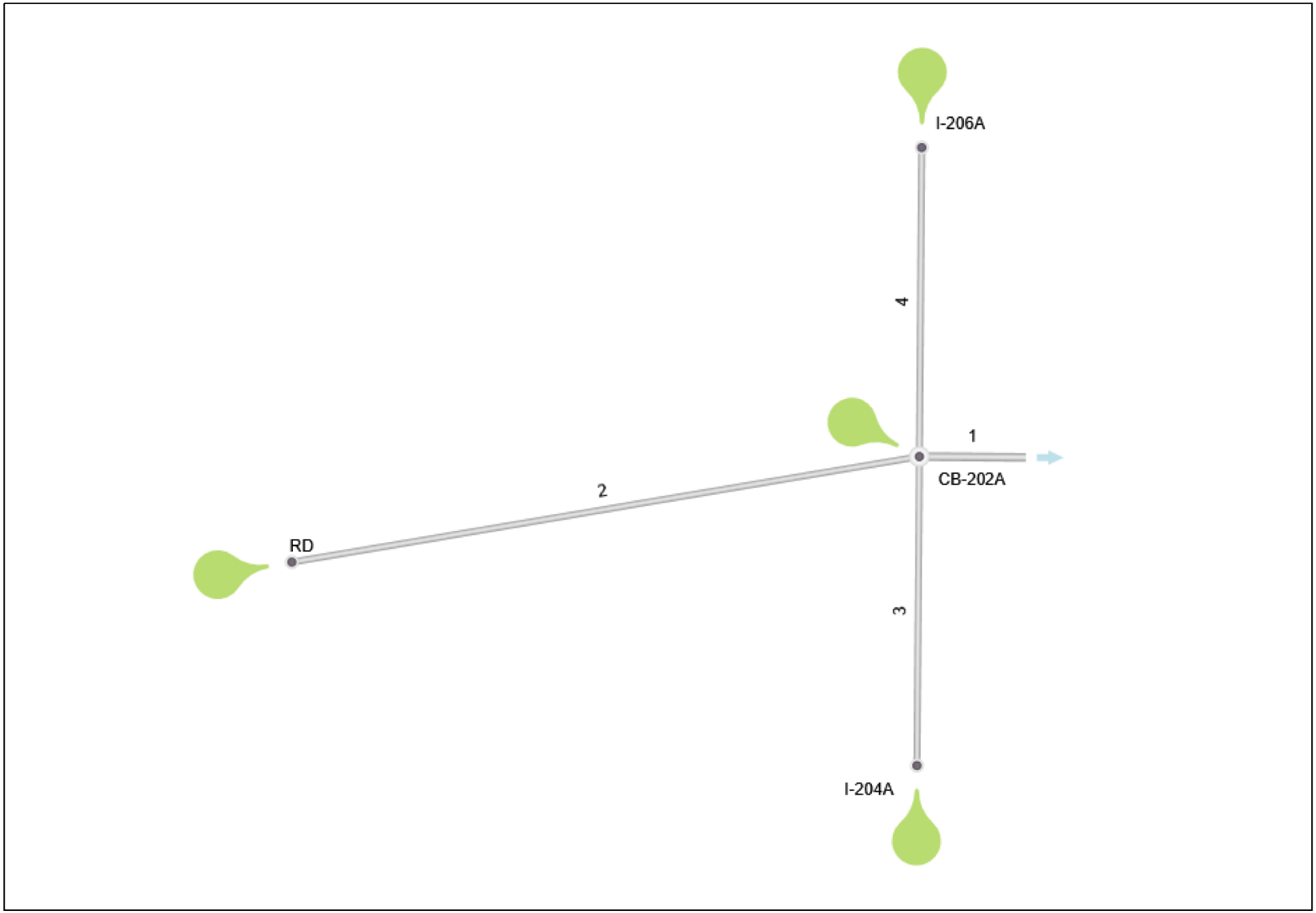


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	30.00	0.370	2.840	0.90	0.33	2.56	10.0	10.42	6.67	17.04	23.68	3.48	30	0.33	675.80	675.70	678.25	678.20	680.60	680.60	1
Line 2	181.00	1.730	1.730	0.90	1.56	1.56	10.0	10.00	6.78	10.56	6.27	8.61	15	0.94	677.50	675.80	682.13	677.28	684.00	680.60	2
Line 3	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.66	678.31	680.60	680.60	3
Line 4	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.66	678.31	680.60	680.60	4

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

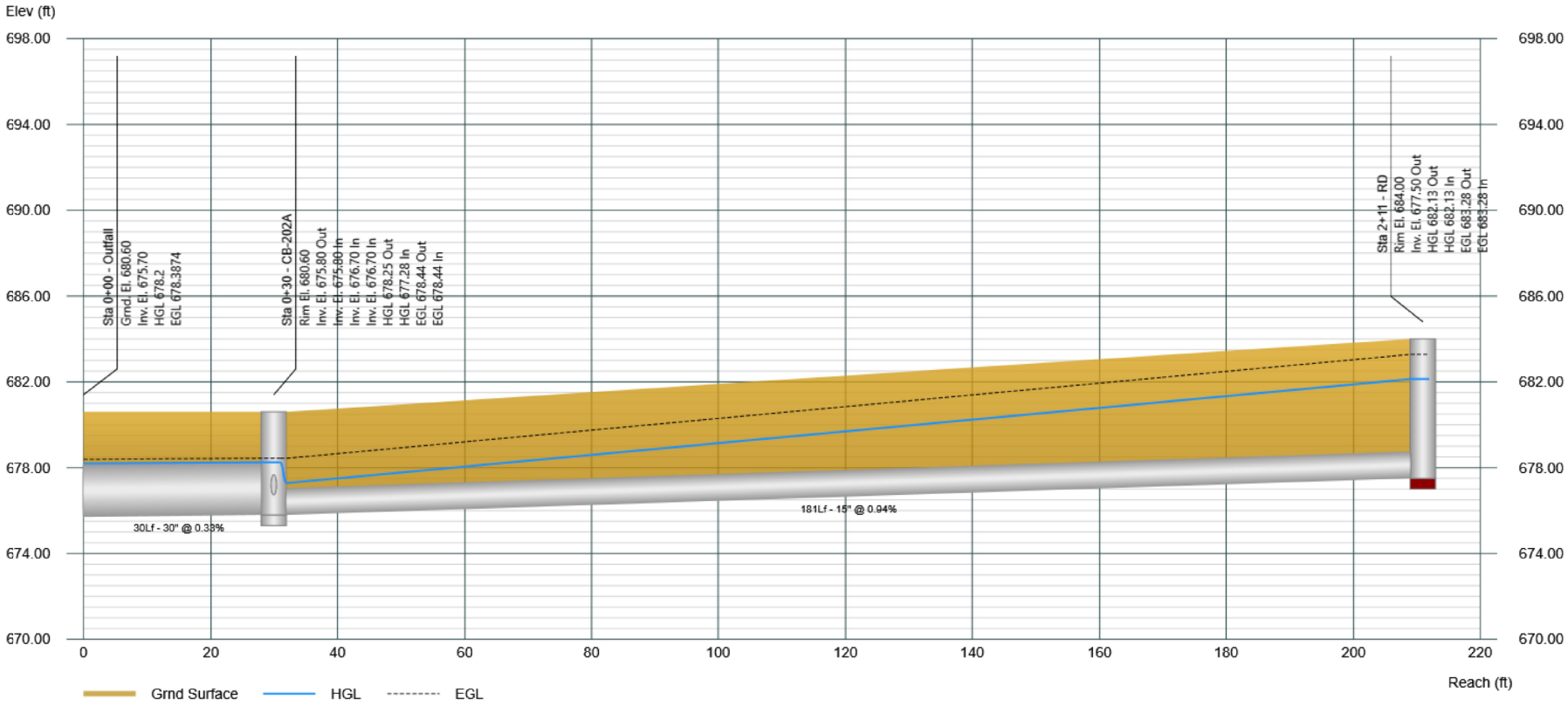
Project File: 12271-SYS200A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



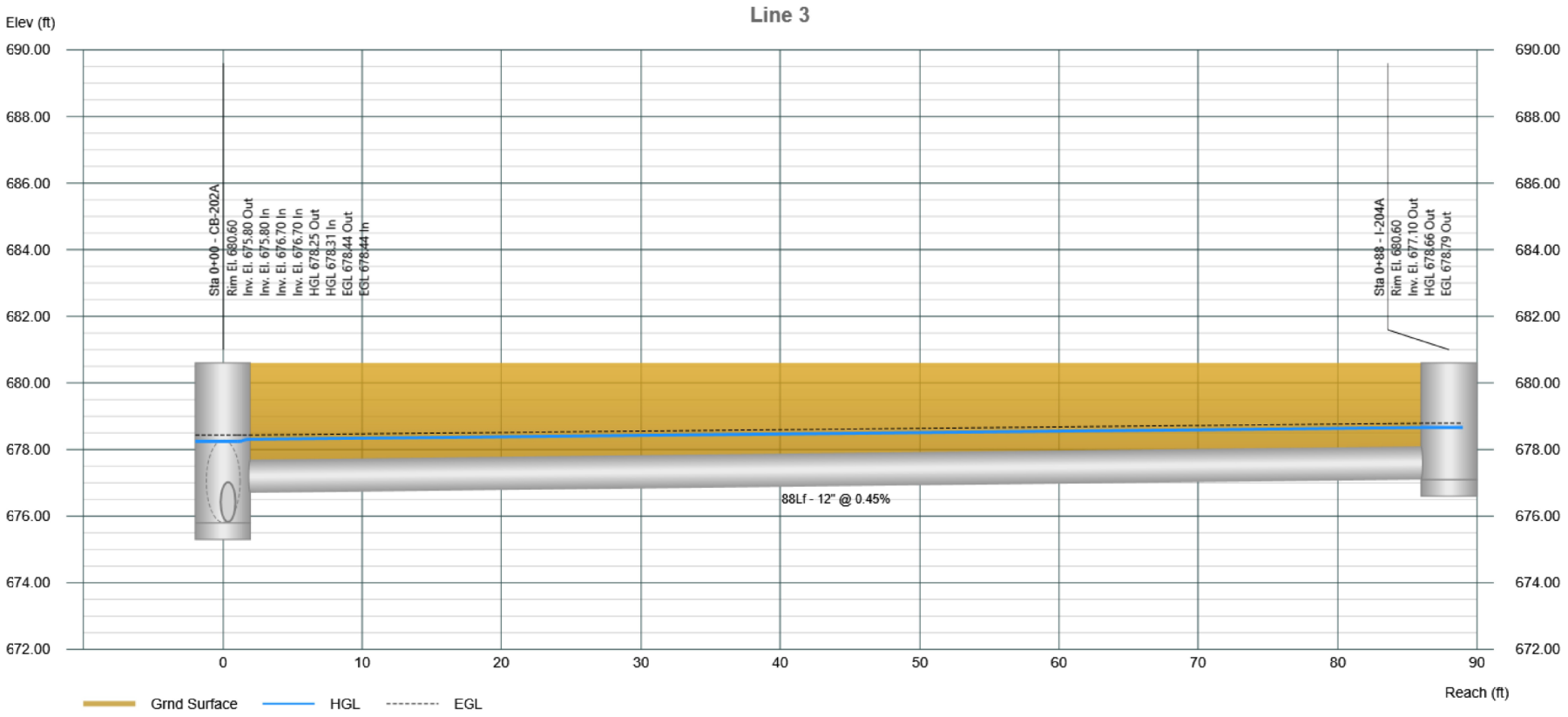
Project File: 12271-SYS200A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

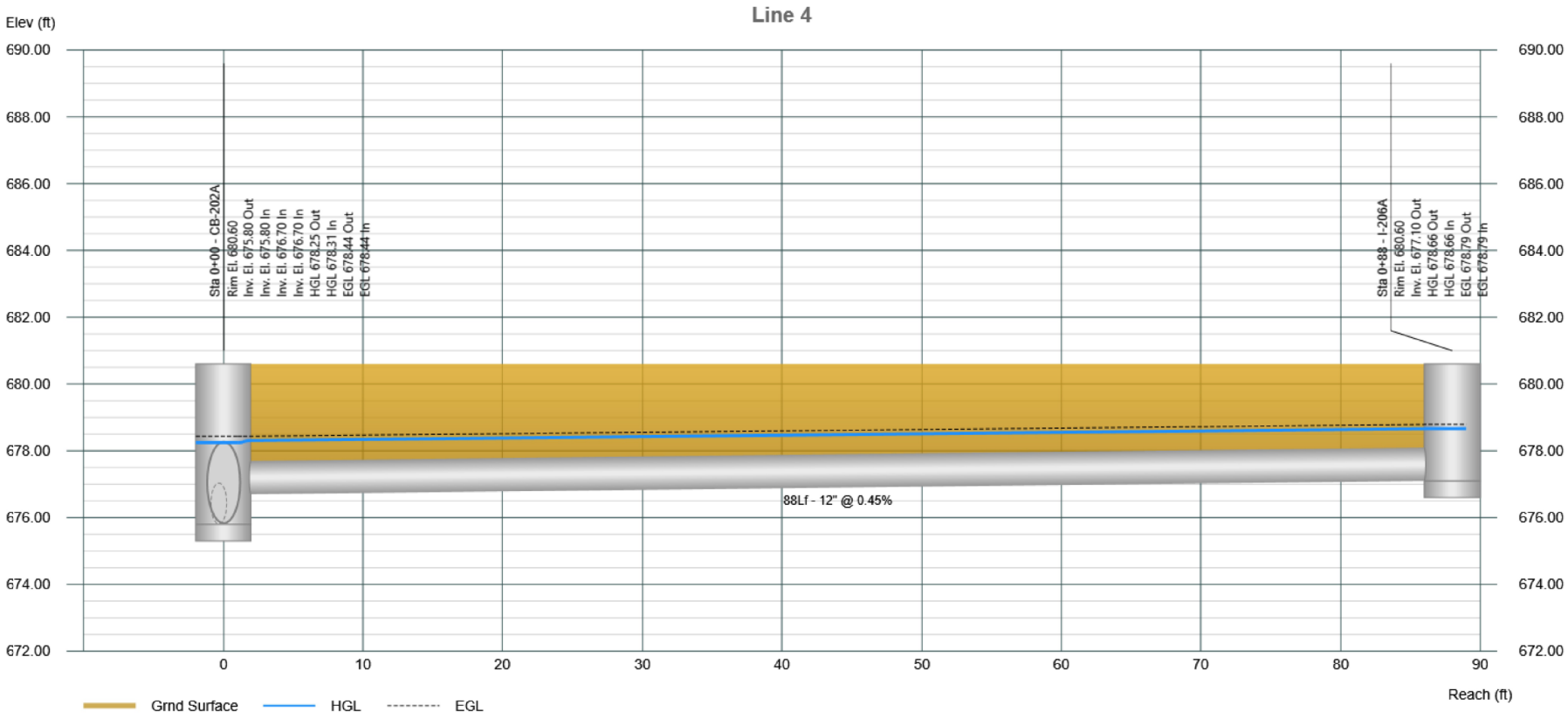


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

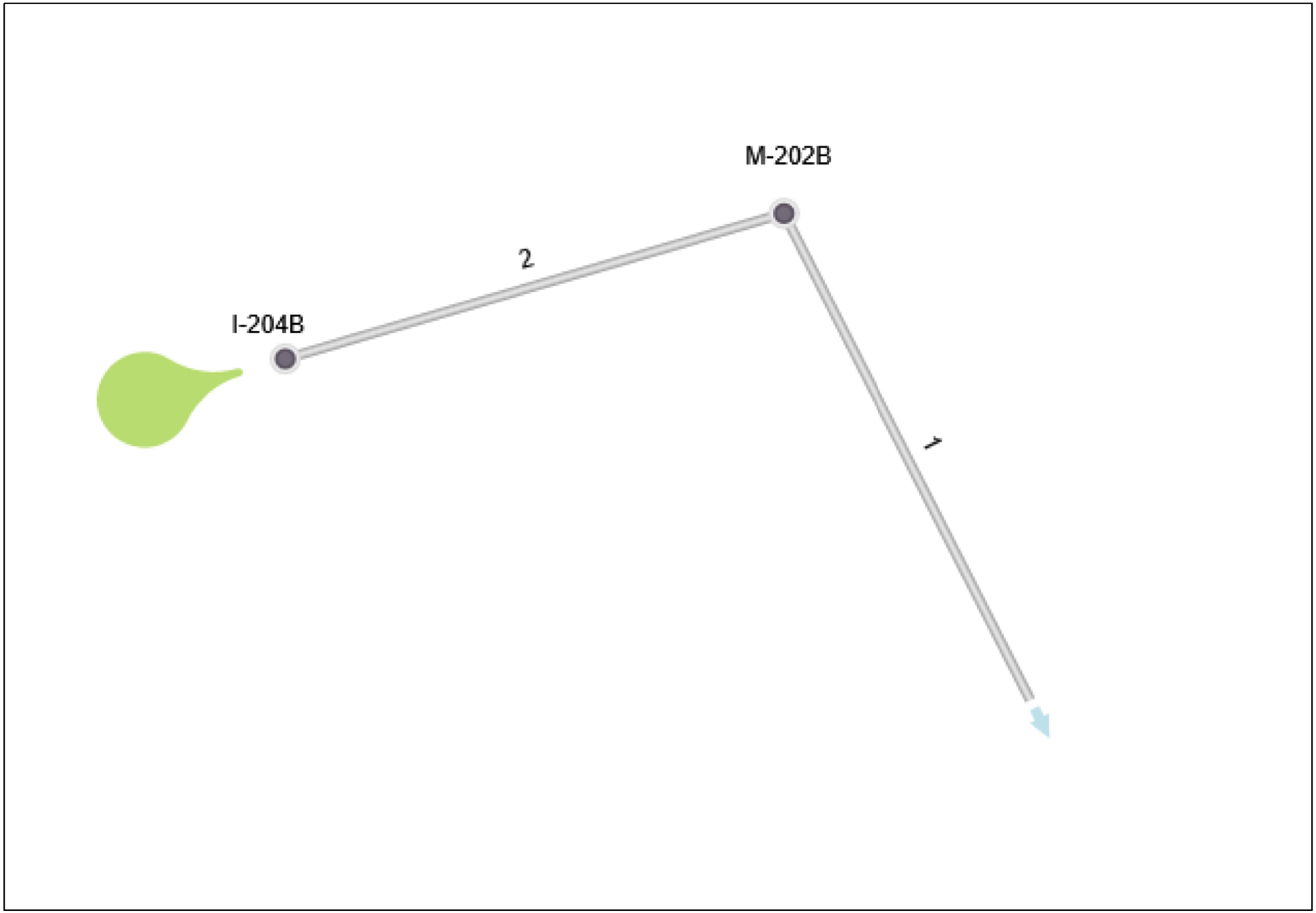


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	69.00	0.000	0.070	0.00	0.00	0.06	0.0	10.37	6.45	0.41	3.60	1.15	12	1.02	676.71	676.00	677.04	677.00	687.80	682.00	1
Line 2	66.00	0.070	0.070	0.90	0.06	0.06	10.0	10.00	6.53	0.41	4.42	2.38	12	1.54	684.52	683.50	684.79	683.77	687.40	687.80	2

Notes: IDF File = SampleIDF.idf, Return Period = 10-yrs.

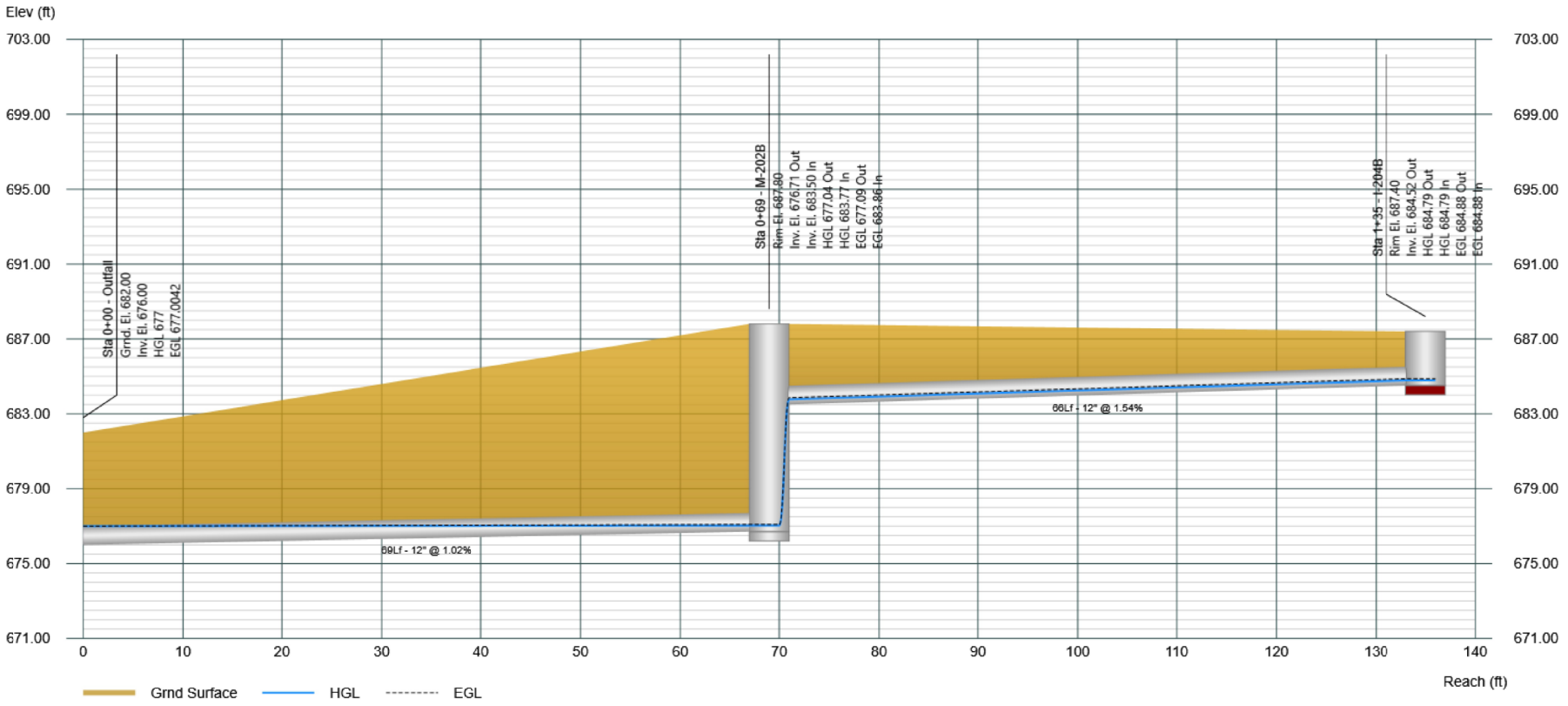
Project File: SYSTEM 200B.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

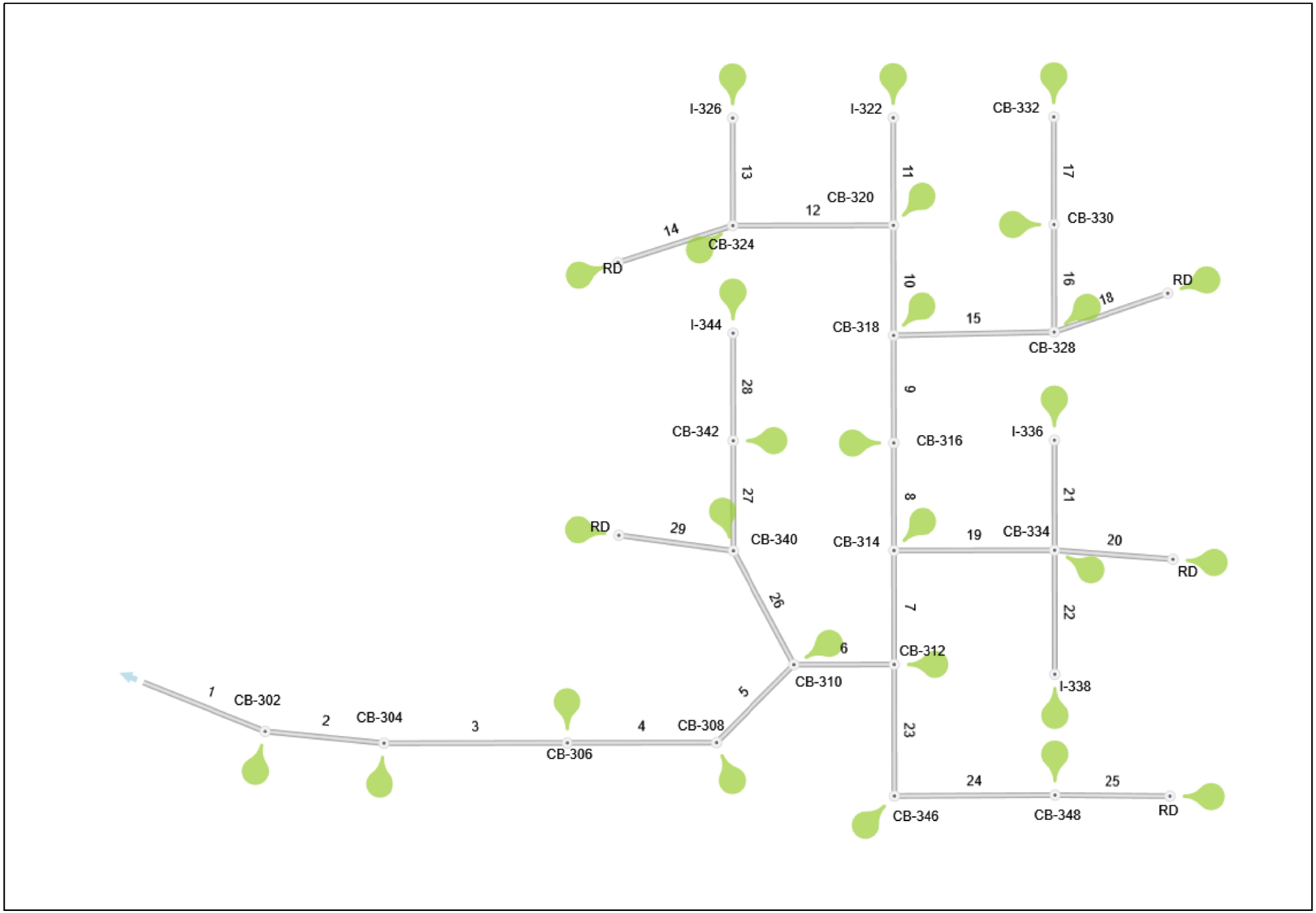


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Project File: 12271-SYS300.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	103.00	0.080	11.120	0.90	0.07	9.79	10.0	15.69	5.50	53.88	43.46	3.39	54	0.05	675.55	675.50	680.05	680.00	685.00	681.00	1
Line 2	94.00	0.230	11.040	0.90	0.21	9.72	10.0	15.23	5.59	54.30	42.17	3.41	54	0.05	675.59	675.55	680.09	680.05	684.60	685.00	2
Line 3	145.00	0.240	10.810	0.90	0.22	9.51	10.0	14.52	5.72	54.42	43.19	3.42	54	0.05	675.66	675.59	680.16	680.09	684.60	684.60	3
Line 4	118.00	0.140	10.570	0.90	0.13	9.29	10.0	13.94	5.84	54.26	44.39	3.41	54	0.05	675.72	675.66	680.22	680.16	685.00	684.60	4
Line 5	87.00	0.170	10.430	0.90	0.15	9.17	10.0	13.51	5.93	54.33	42.19	3.42	54	0.05	675.76	675.72	680.26	680.22	682.60	685.00	5
Line 6	79.00	0.090	8.270	0.90	0.08	7.22	10.0	13.13	6.01	43.40	32.31	3.45	48	0.05	675.80	675.76	680.33	680.26	682.30	682.60	6
Line 7	90.00	0.190	7.030	0.90	0.17	6.11	10.0	12.74	6.09	37.21	23.73	3.87	42	0.06	675.85	675.80	680.40	680.28	682.30	682.30	7
Line 8	85.00	0.110	4.410	0.90	0.10	3.97	10.0	12.19	6.22	24.68	21.84	2.57	42	0.05	675.89	675.85	680.59	680.53	682.30	682.30	8
Line 9	85.00	0.110	4.300	0.90	0.10	3.87	10.0	11.64	6.35	24.58	21.79	2.56	42	0.05	675.93	675.89	680.64	680.59	682.30	682.30	9
Line 10	87.00	0.110	1.760	0.90	0.10	1.58	10.0	10.98	6.52	10.32	21.57	1.07	42	0.05	675.97	675.93	680.73	680.72	682.30	682.30	10
Line 11	85.00	0.110	0.110	0.90	0.10	0.10	10.0	10.00	6.78	0.67	2.44	0.86	12	0.47	678.80	678.40	680.77	680.74	682.30	682.30	11
Line 12	127.00	0.380	1.540	0.90	0.34	1.39	10.0	10.40	6.67	9.25	10.12	2.94	24	0.20	676.25	676.00	680.83	680.61	681.50	682.30	12
Line 13	85.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.44	2.95	12	0.47	678.00	677.60	681.19	680.82	681.50	681.50	13
Line 14	95.00	0.780	0.780	0.90	0.70	0.70	10.0	10.00	6.78	4.76	7.41	3.88	15	1.32	677.50	676.25	681.24	680.73	684.00	681.50	14
Line 15	127.00	0.380	2.430	0.90	0.34	2.19	10.0	10.73	6.58	14.40	21.53	2.93	30	0.28	676.30	675.95	680.76	680.61	681.60	682.30	15
Line 16	85.00	0.380	0.760	0.90	0.34	0.68	10.0	10.40	6.67	4.56	7.20	2.58	18	0.47	677.60	677.20	680.95	680.79	681.50	681.60	16
Line 17	85.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.44	2.95	12	0.47	678.00	677.60	681.28	680.92	681.50	681.50	17
Line 18	95.00	1.290	1.290	0.90	1.16	1.16	10.0	10.00	6.78	7.88	7.26	6.42	15	1.27	677.50	676.30	681.67	680.25	684.00	681.60	18
Line 19	127.00	0.420	2.430	0.38	0.16	1.97	10.0	10.44	6.66	13.11	24.41	2.67	30	0.35	676.30	675.85	680.66	680.53	681.60	682.30	19
Line 20	94.00	1.250	1.250	0.90	1.13	1.13	10.0	10.00	6.78	7.63	7.30	6.22	15	1.28	677.50	676.30	681.48	680.17	684.00	681.60	20
Line 21	87.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.70	2.95	12	0.57	678.00	677.50	681.00	680.63	681.50	681.60	21
Line 22	98.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.54	2.95	12	0.51	678.00	677.50	681.05	680.63	681.50	681.60	22

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

Project File: 12271-SYS300.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 23	104.00	0.320	1.150	0.90	0.29	1.04	10.0	10.86	6.55	6.78	12.15	2.16	24	0.29	676.10	675.80	680.53	680.44	681.50	682.30	23
Line 24	127.00	0.400	0.830	0.90	0.36	0.75	10.0	10.29	6.70	5.01	5.89	2.83	18	0.31	676.50	676.10	680.77	680.48	681.50	681.50	24
Line 25	91.00	0.430	0.430	0.90	0.39	0.39	10.0	10.00	6.78	2.63	3.73	3.34	12	1.10	677.50	676.50	681.22	680.72	684.00	681.50	25
Line 26	102.00	0.350	1.990	0.90	0.32	1.79	10.0	10.78	6.57	11.77	22.39	2.40	30	0.30	676.10	675.80	680.44	680.35	681.50	682.60	26
Line 27	87.00	0.390	0.770	0.90	0.35	0.69	10.0	10.40	6.67	4.62	6.08	2.62	18	0.34	677.60	677.30	680.59	680.42	681.50	681.50	27
Line 28	85.00	0.380	0.380	0.90	0.34	0.34	10.0	10.00	6.78	2.32	2.45	2.95	12	0.47	678.00	677.60	680.92	680.56	681.50	681.50	28
Line 29	91.00	0.870	0.870	0.90	0.78	0.78	10.0	10.00	6.78	5.31	8.01	4.33	15	1.54	677.50	676.10	680.85	680.23	684.00	681.50	29

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

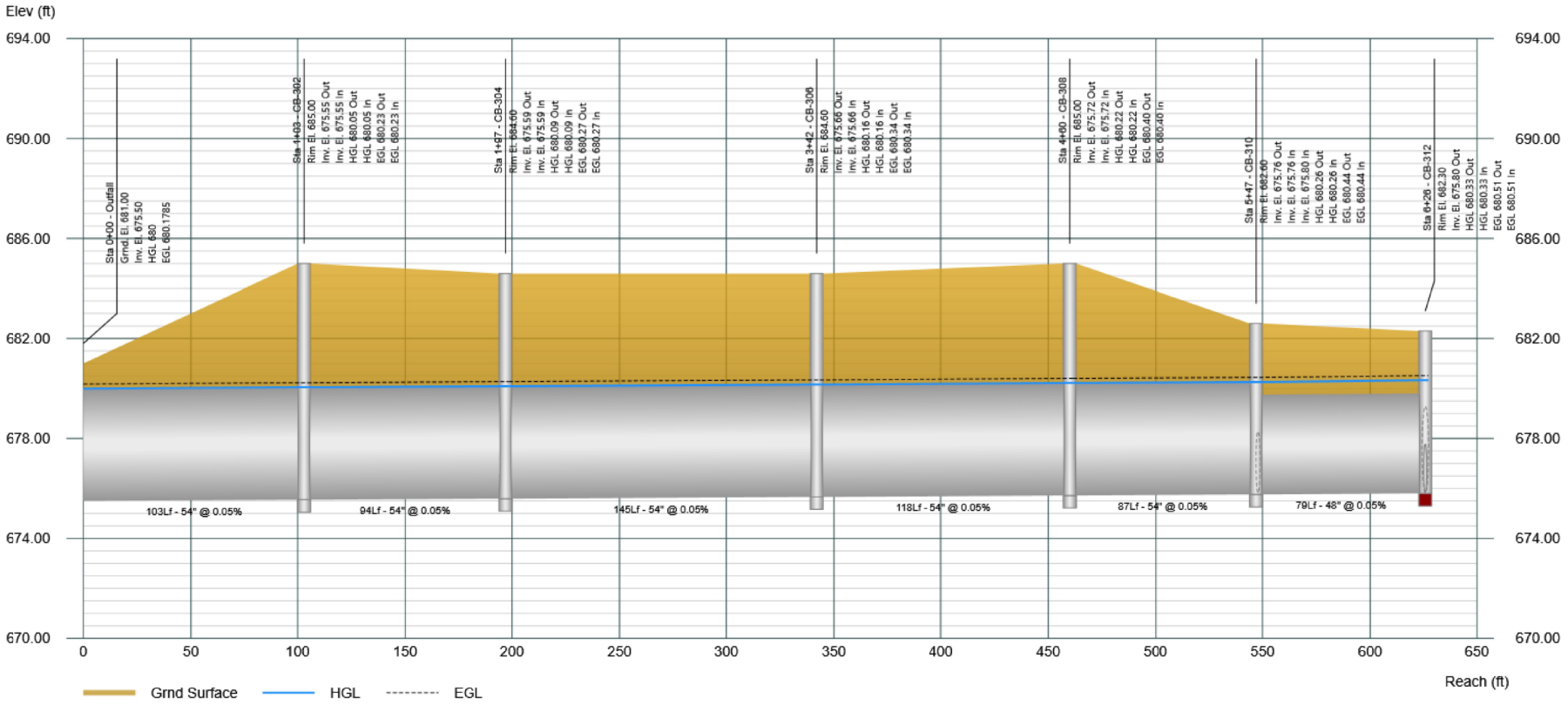
Project File: 12271-SYS300.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

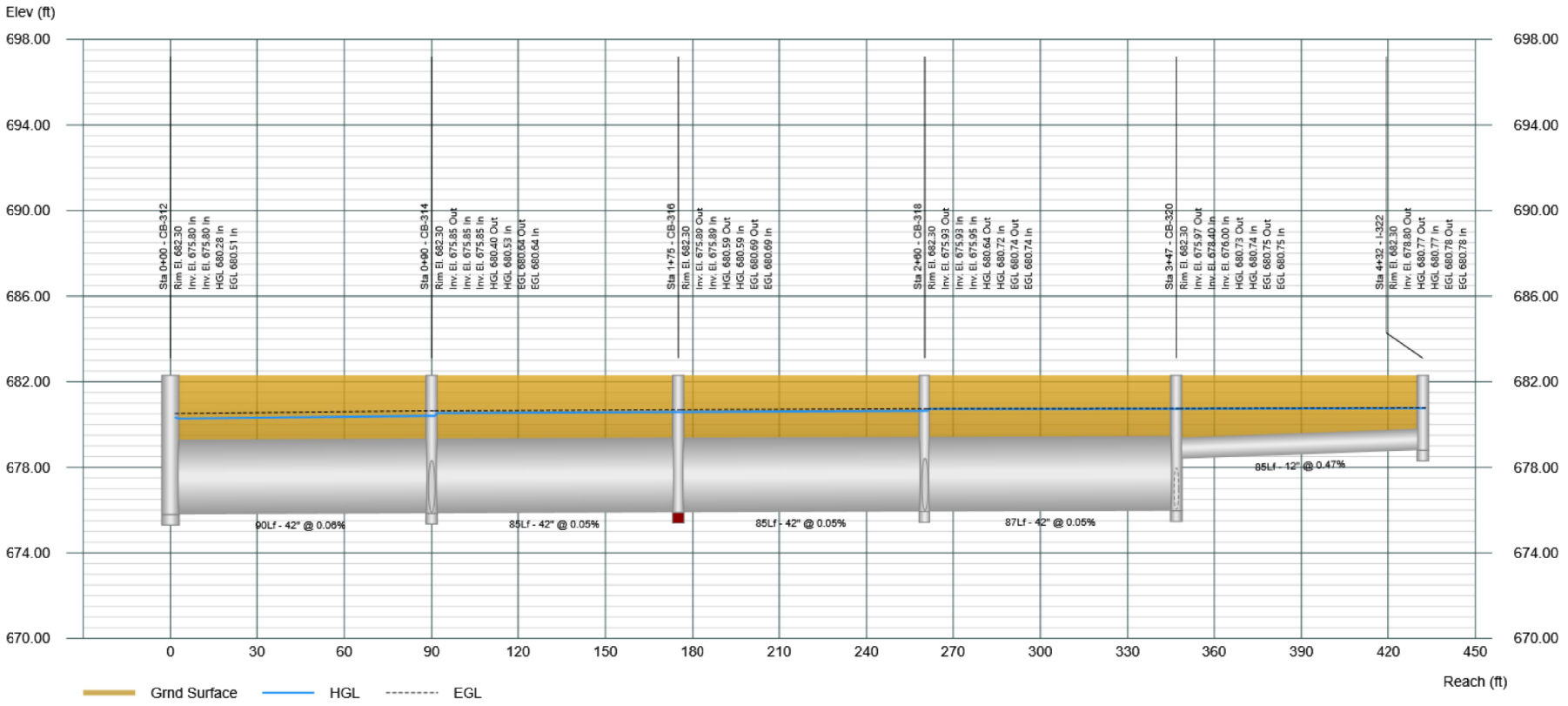


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



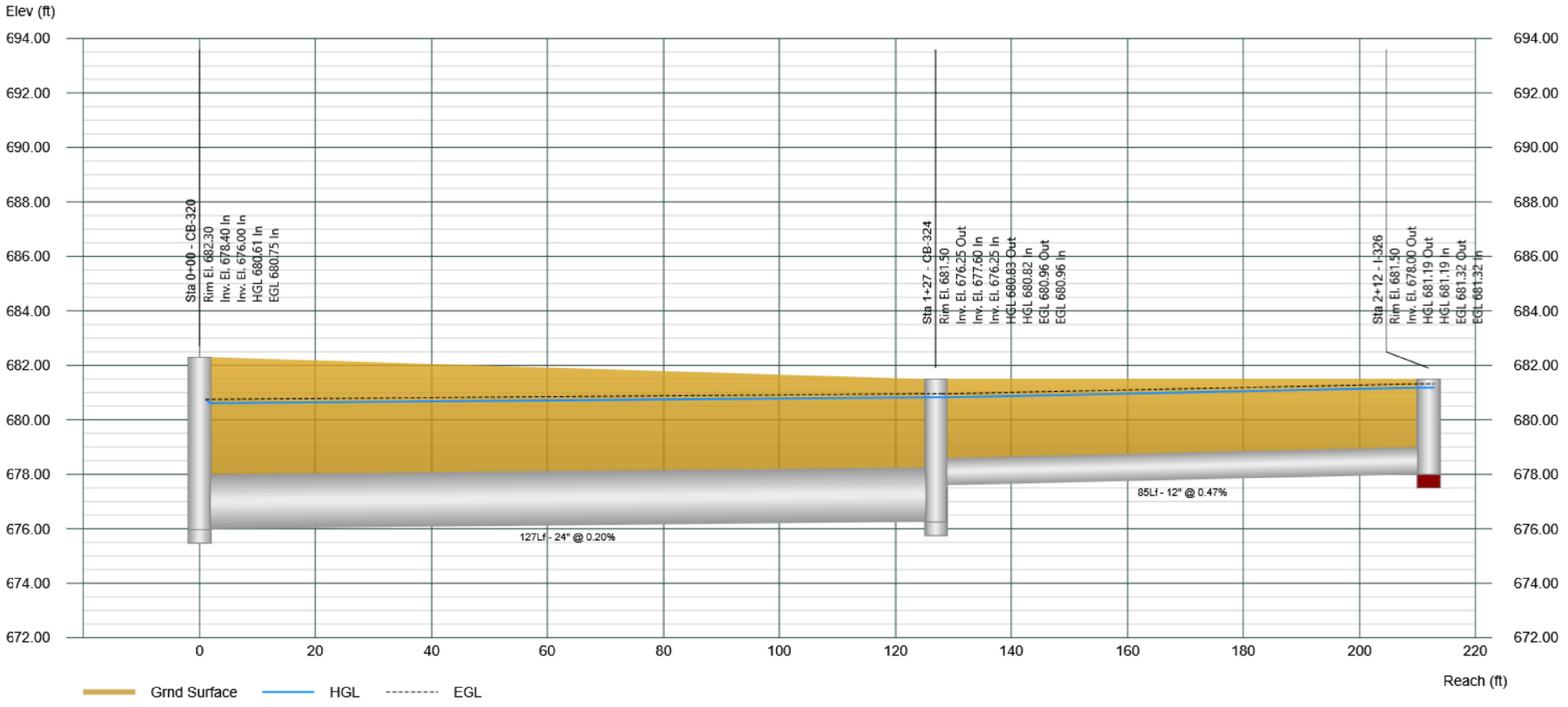
Project File: 12271-SYS300.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



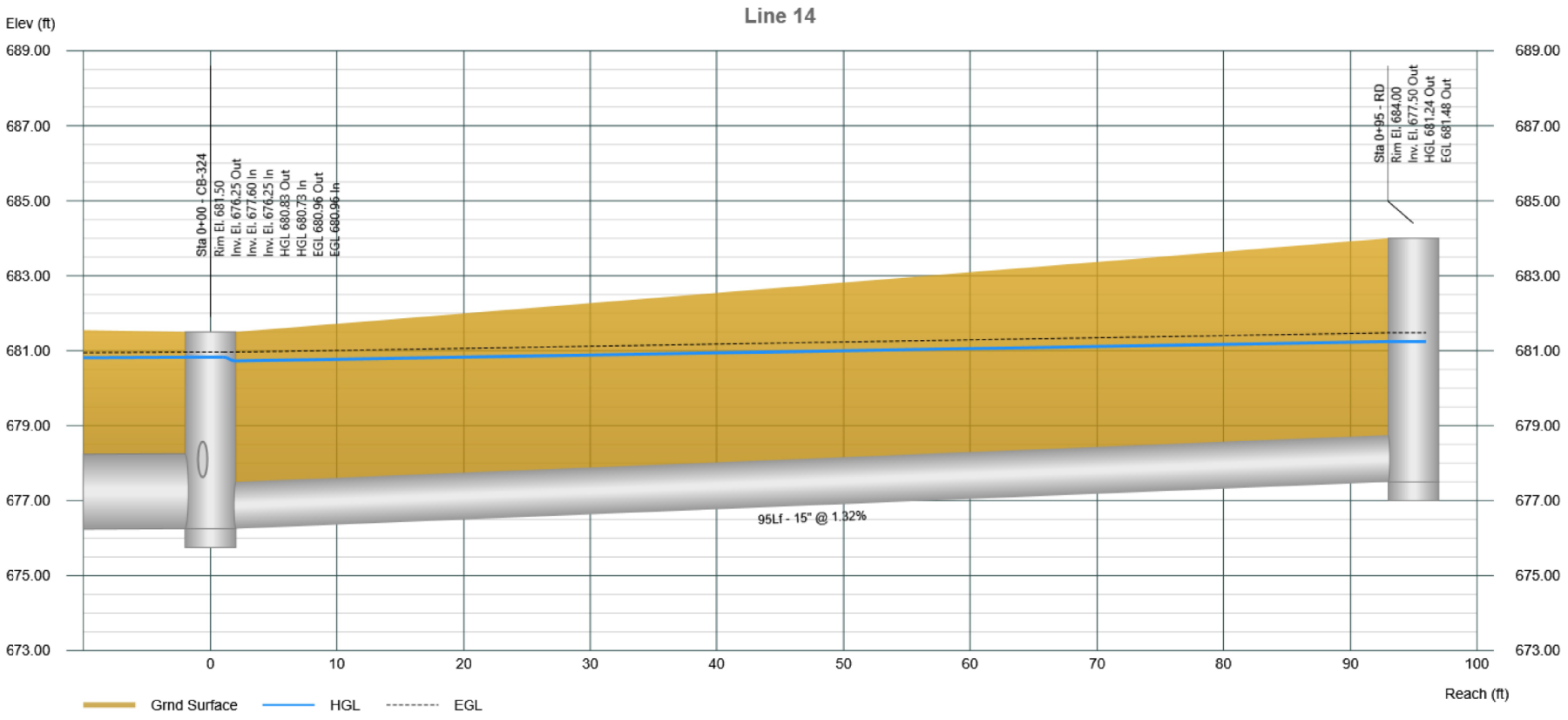
Project File: 12271-SYS300.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

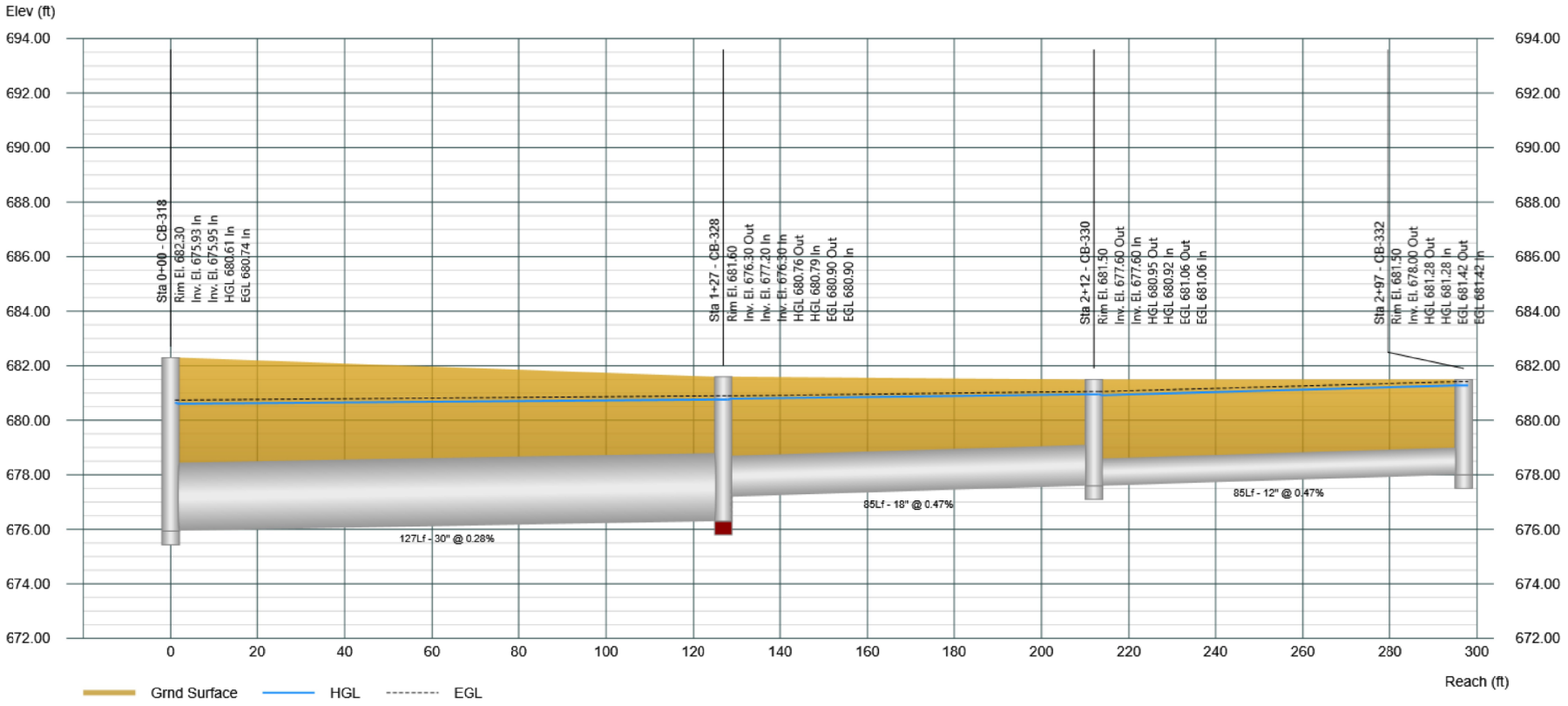


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

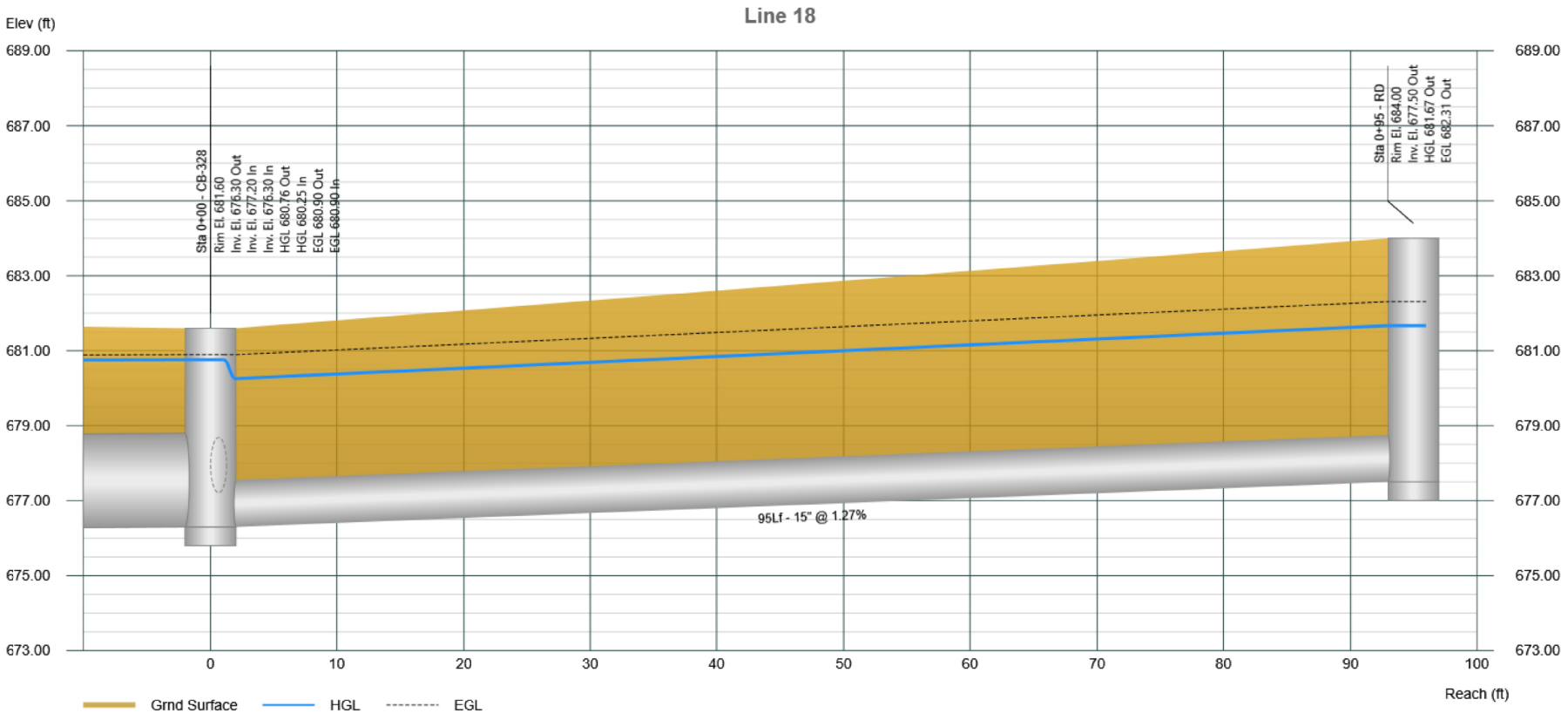


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

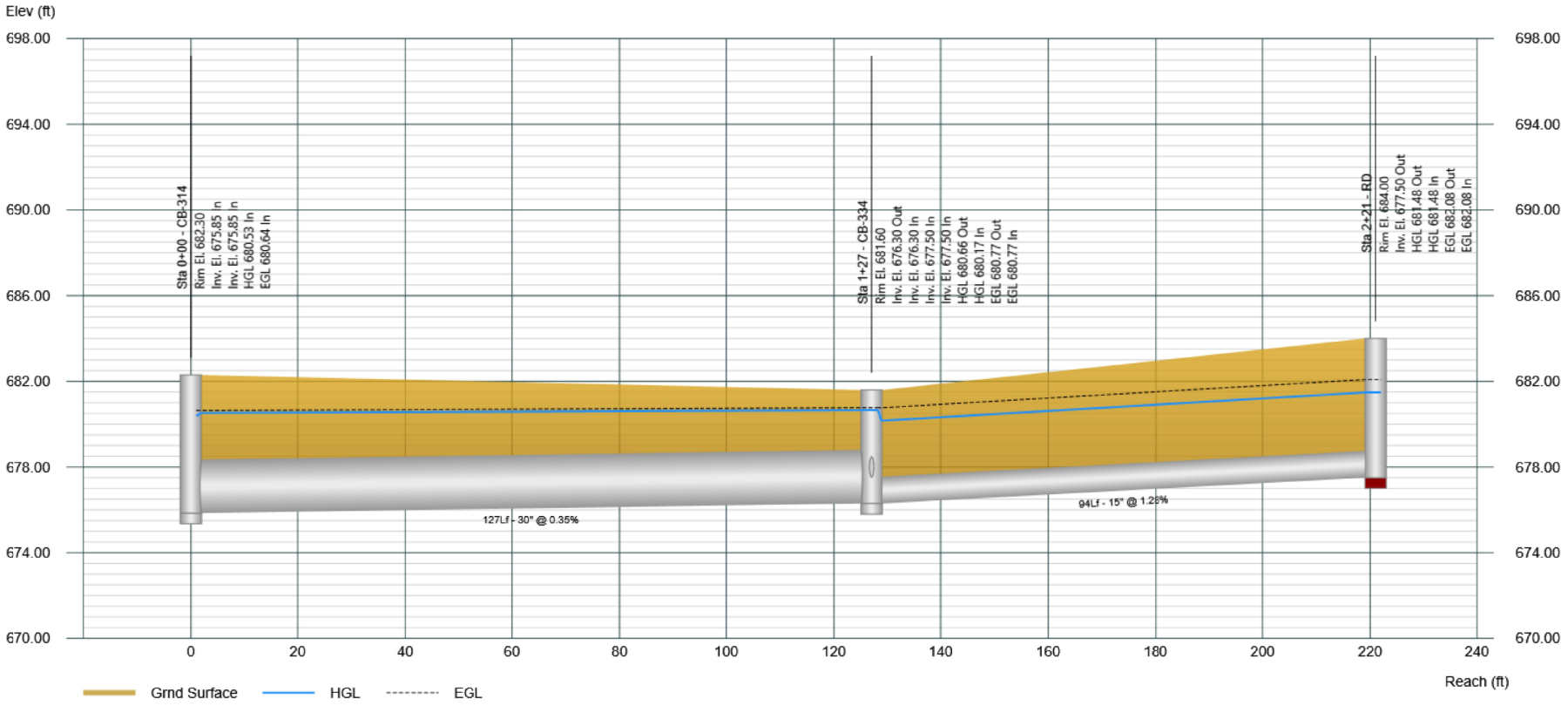


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

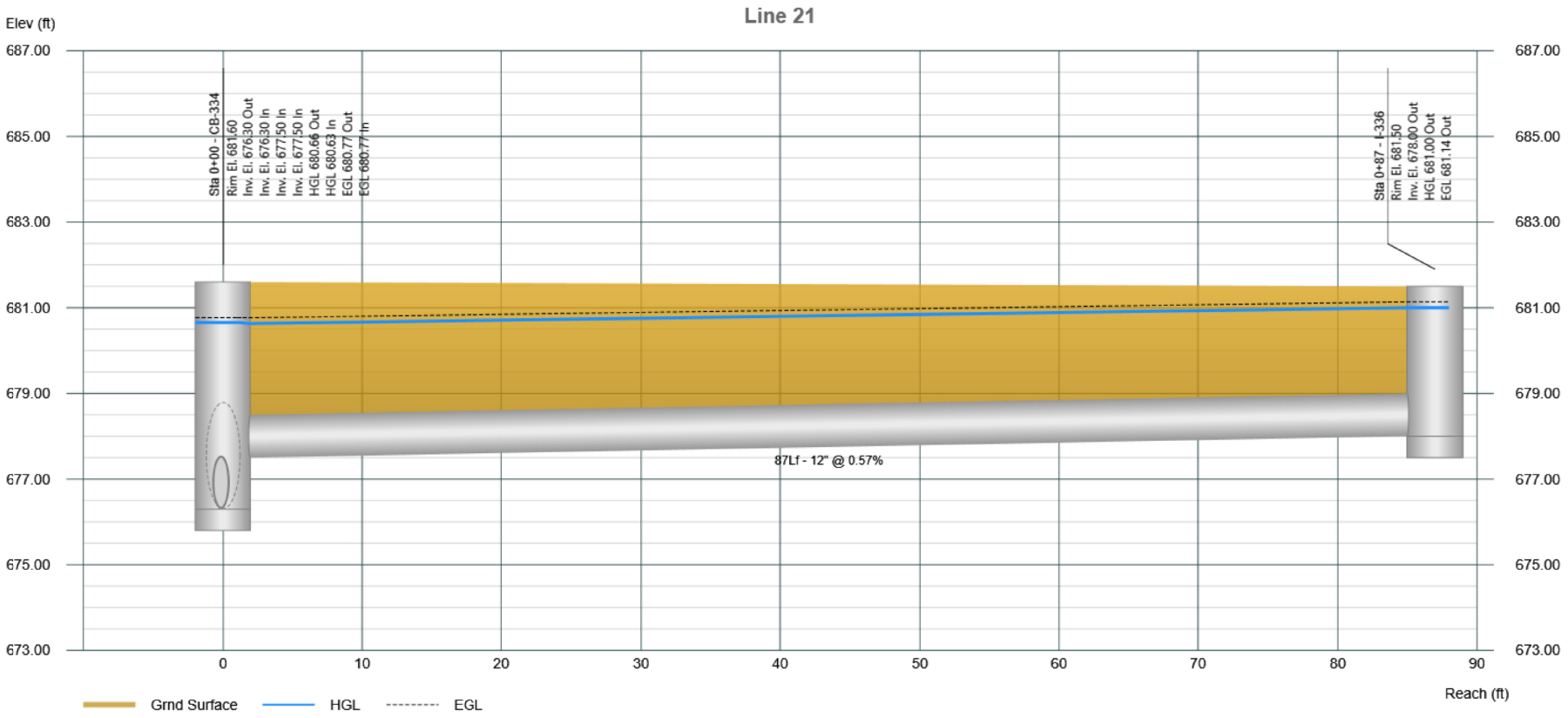


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

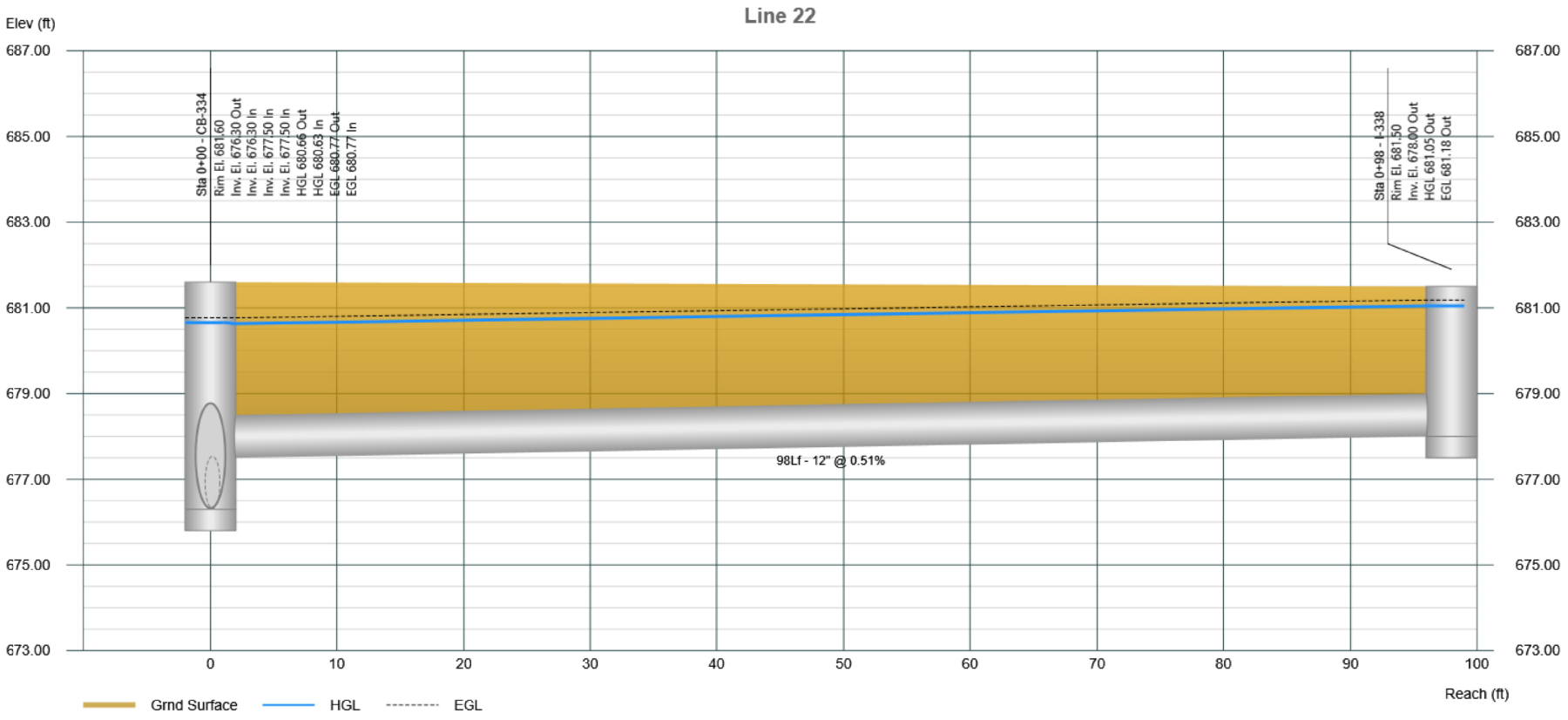


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

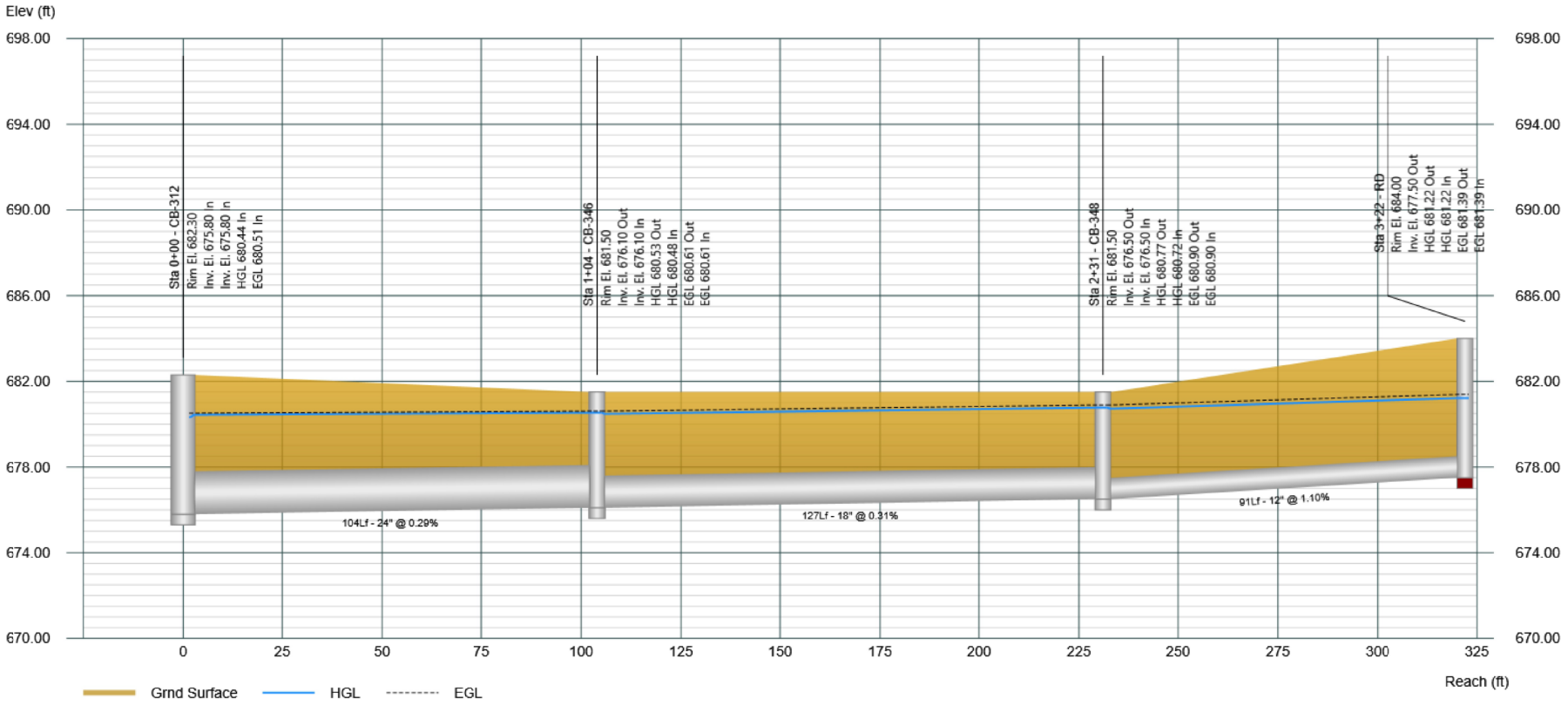


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

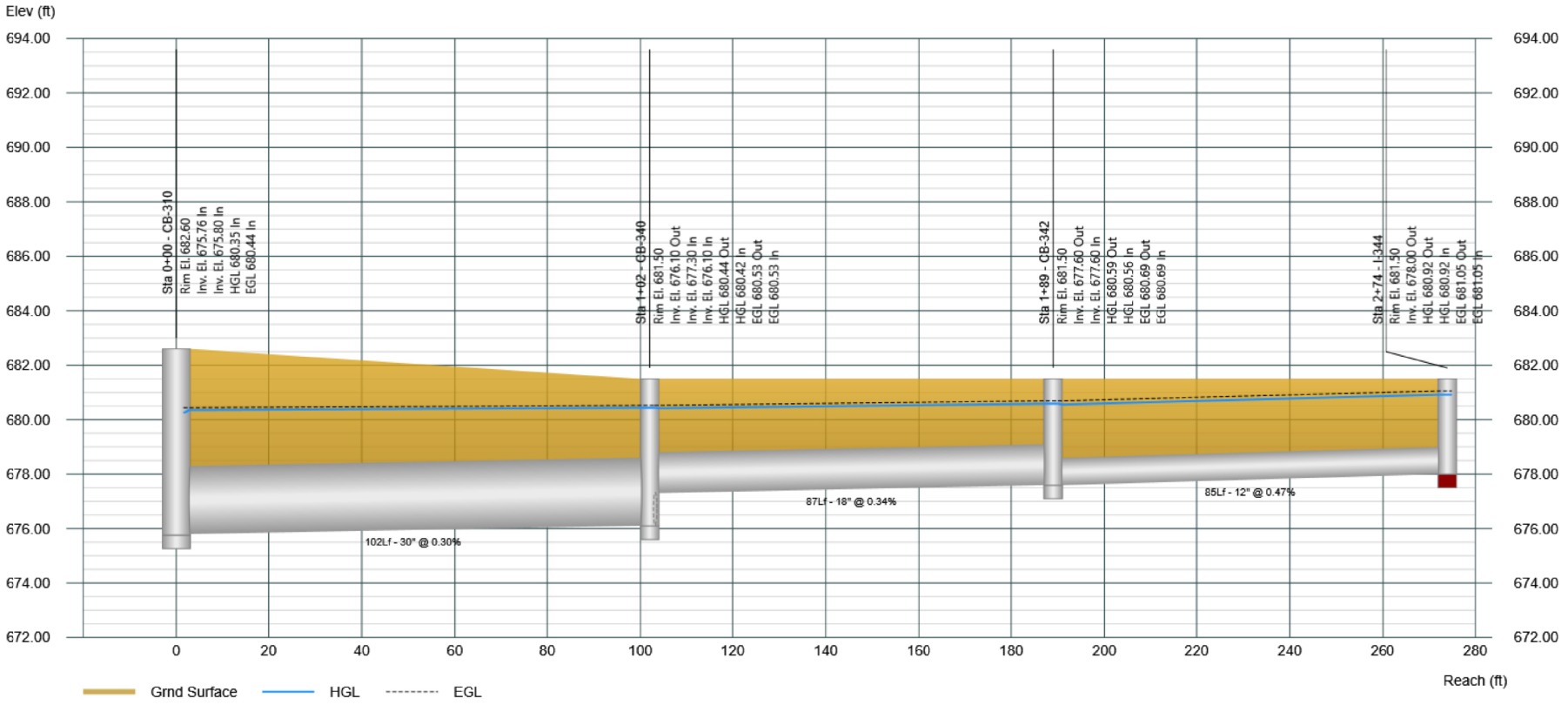


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



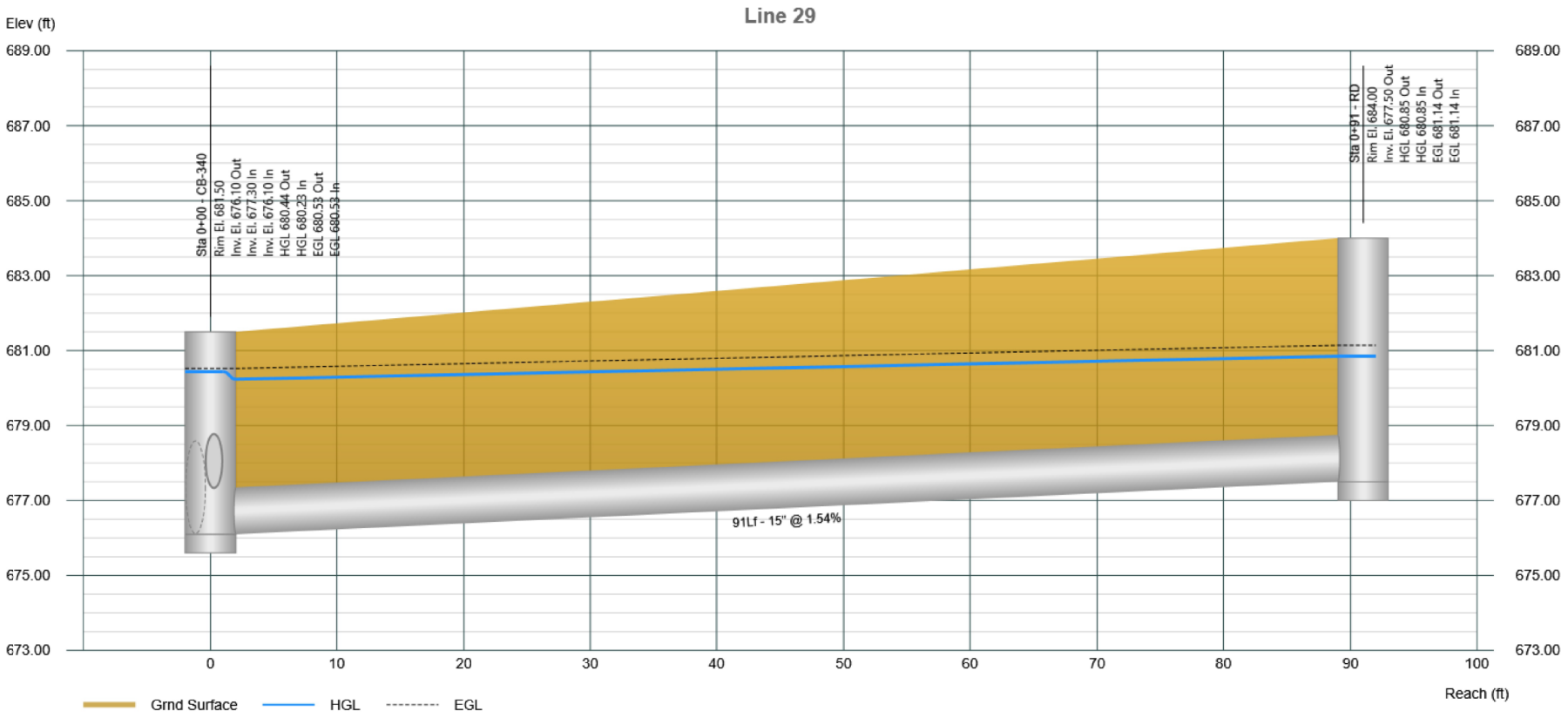
Project File: 12271-SYS300.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

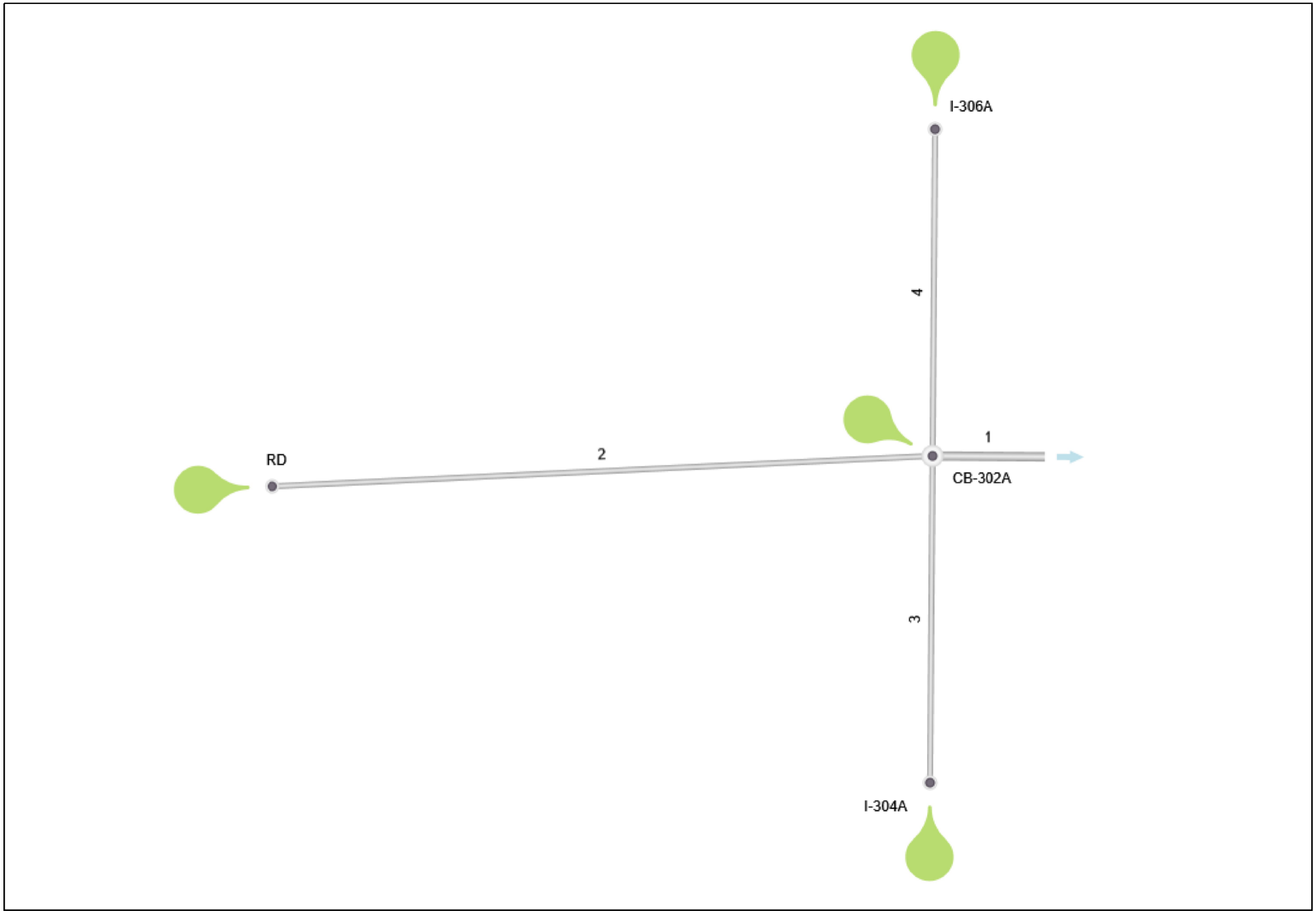


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	30.00	0.370	2.840	0.90	0.33	2.56	10.0	10.42	6.67	17.04	23.68	3.48	30	0.33	675.80	675.70	678.25	678.20	680.60	680.60	1
Line 2	178.00	1.730	1.730	0.90	1.56	1.56	10.0	10.00	6.78	10.56	6.31	8.61	15	0.95	677.50	675.80	682.05	677.28	684.00	680.60	2
Line 3	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.66	678.31	680.60	680.60	3
Line 4	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.66	678.31	680.60	680.60	4

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

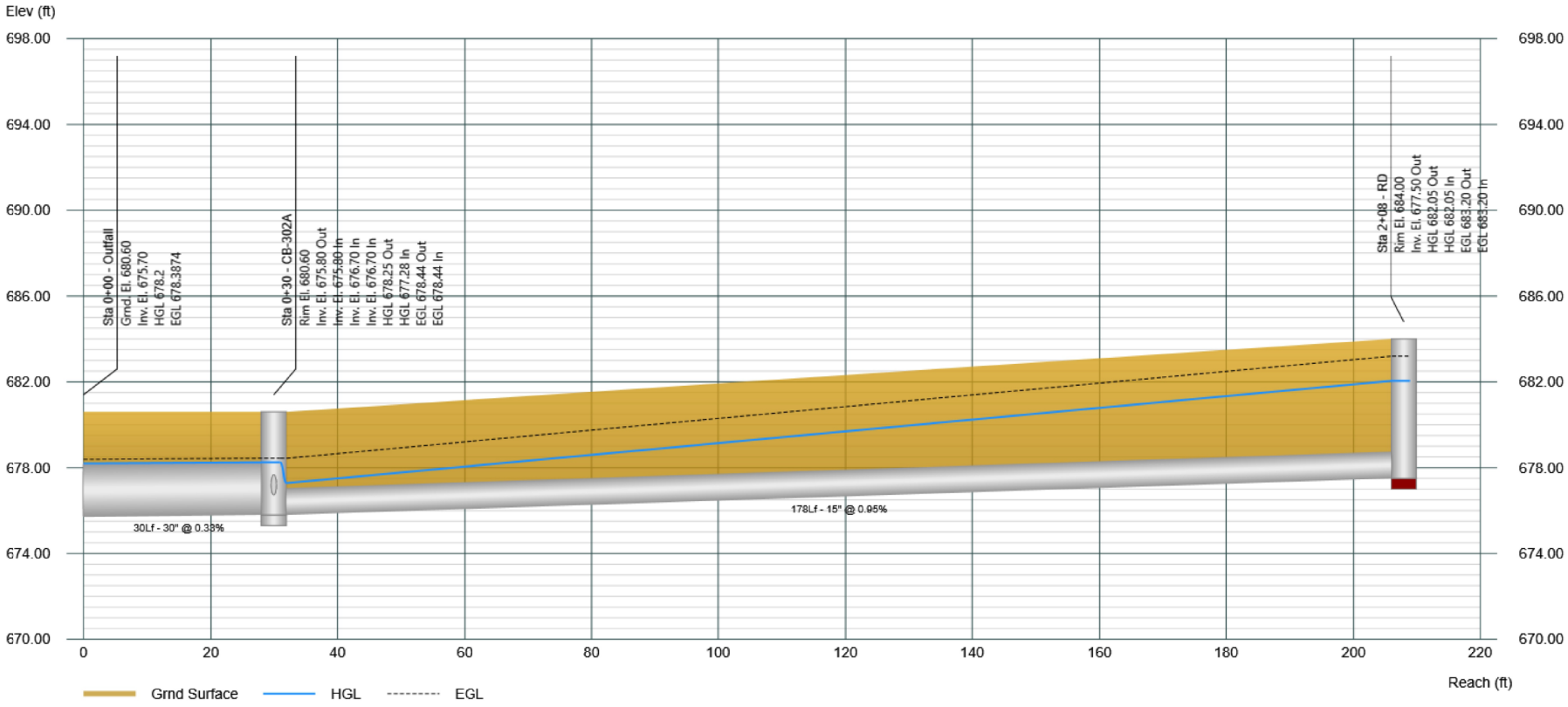
Project File: 12271-SYS300A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

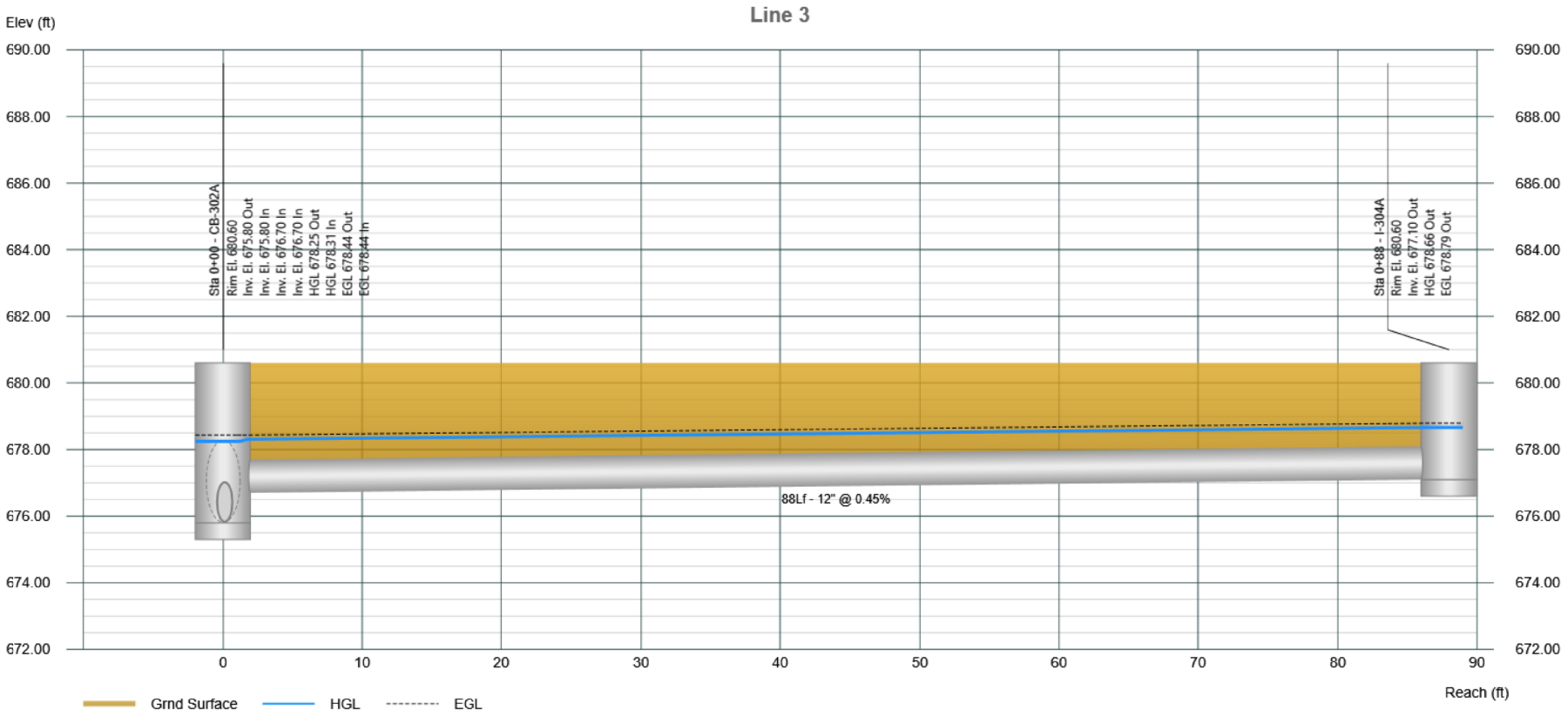


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

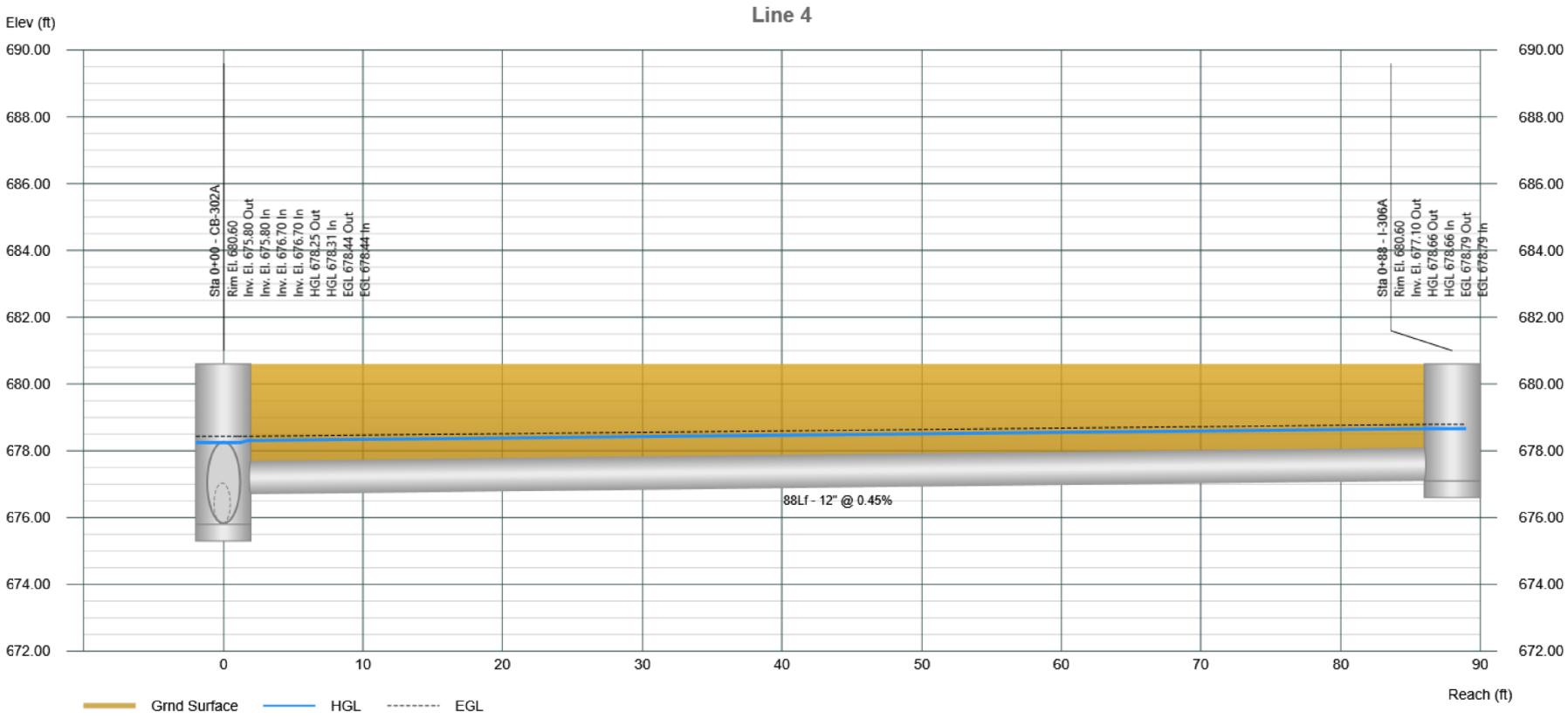


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

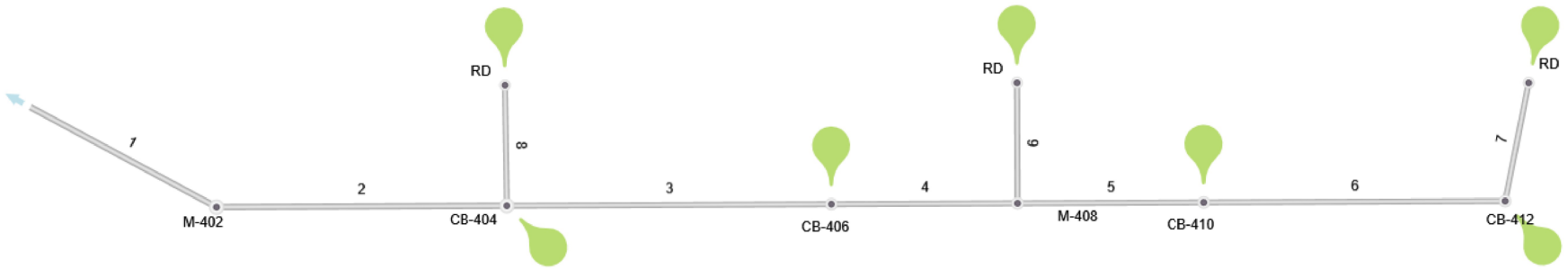


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	82.00	0.000	2.740	0.00	0.00	2.47	0.0	12.07	6.25	15.40	24.92	3.20	30	0.37	676.30	676.00	678.59	678.50	686.00	685.00	1
Line 2	114.00	0.240	2.740	0.90	0.22	2.47	10.0	11.67	6.34	15.64	21.04	4.70	30	0.26	679.40	679.10	681.00	680.71	684.50	686.00	2
Line 3	127.00	0.240	1.900	0.90	0.22	1.71	10.0	11.20	6.46	11.05	12.69	4.00	24	0.31	679.80	679.40	681.38	681.11	684.20	684.50	3
Line 4	73.00	0.000	1.660	0.00	0.00	1.49	0.0	10.91	6.54	9.76	11.81	3.60	24	0.27	680.00	679.80	681.57	681.45	685.10	684.20	4
Line 5	73.00	0.240	1.060	0.90	0.22	0.95	10.0	10.63	6.61	6.31	6.78	3.57	18	0.42	680.30	680.00	681.80	681.59	684.20	685.10	5
Line 6	118.00	0.220	0.820	0.90	0.20	0.74	10.0	10.12	6.75	4.98	6.11	2.85	18	0.34	680.70	680.30	682.12	681.88	684.20	684.20	6
Line 7	47.00	0.600	0.600	0.90	0.54	0.54	10.0	10.00	6.78	3.66	4.65	5.01	12	1.70	681.50	680.70	682.31	681.91	687.00	684.20	7
Line 8	47.00	0.600	0.600	0.90	0.54	0.54	10.0	10.00	6.78	3.66	3.67	5.33	12	1.06	681.50	681.00	682.32	681.82	687.00	684.50	8
Line 9	47.00	0.600	0.600	0.90	0.54	0.54	10.0	10.00	6.78	3.66	3.67	5.33	12	1.06	681.50	681.00	682.32	681.82	687.00	685.10	9

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

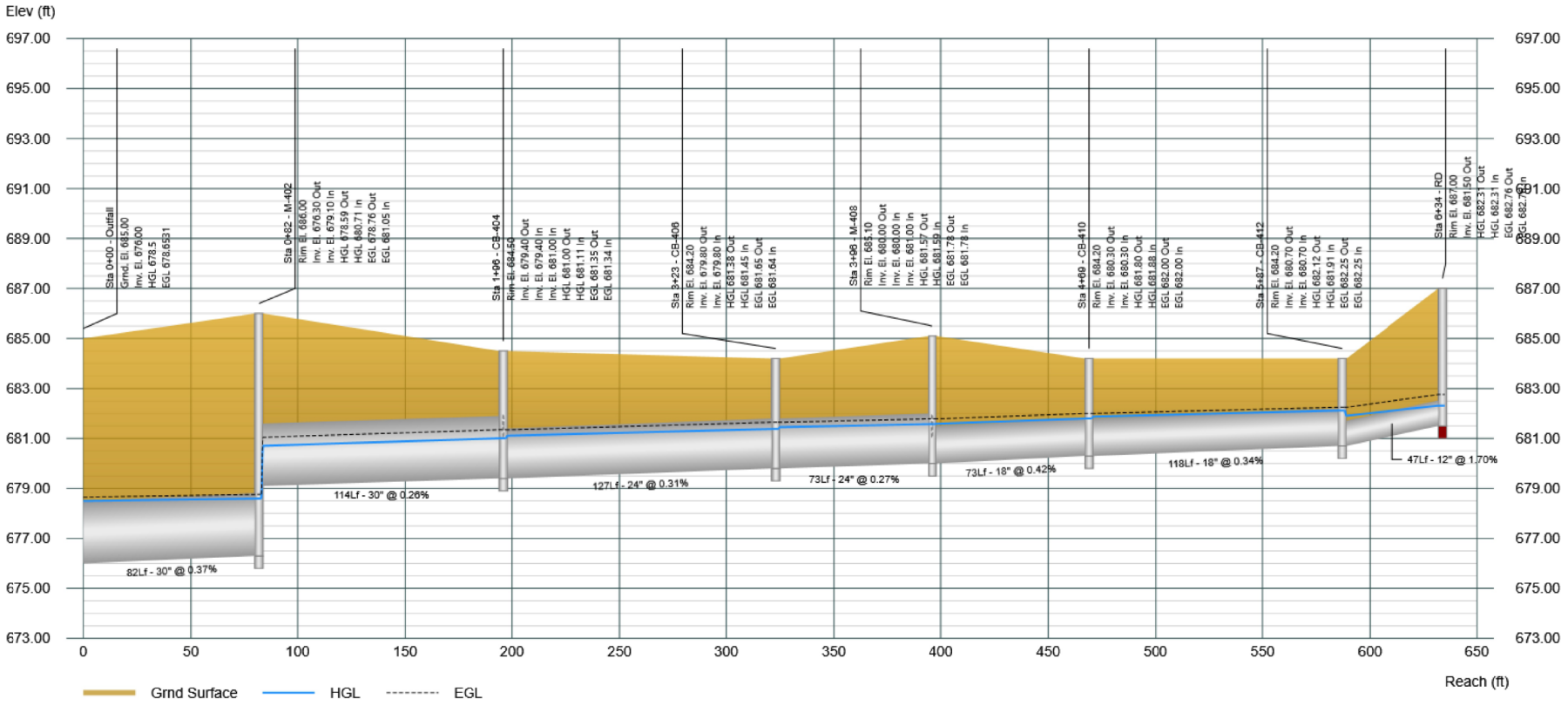
Project File: 12271-SYS400.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

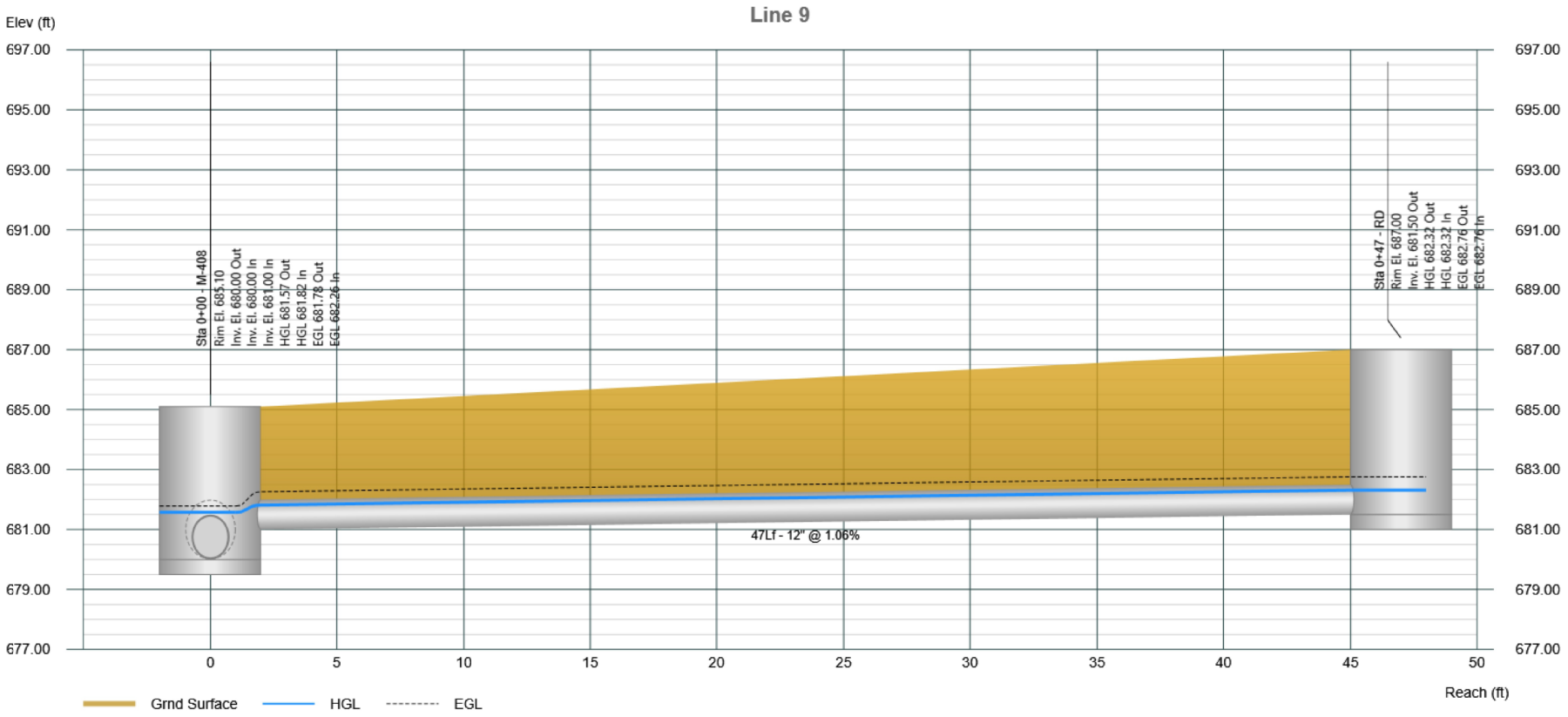


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

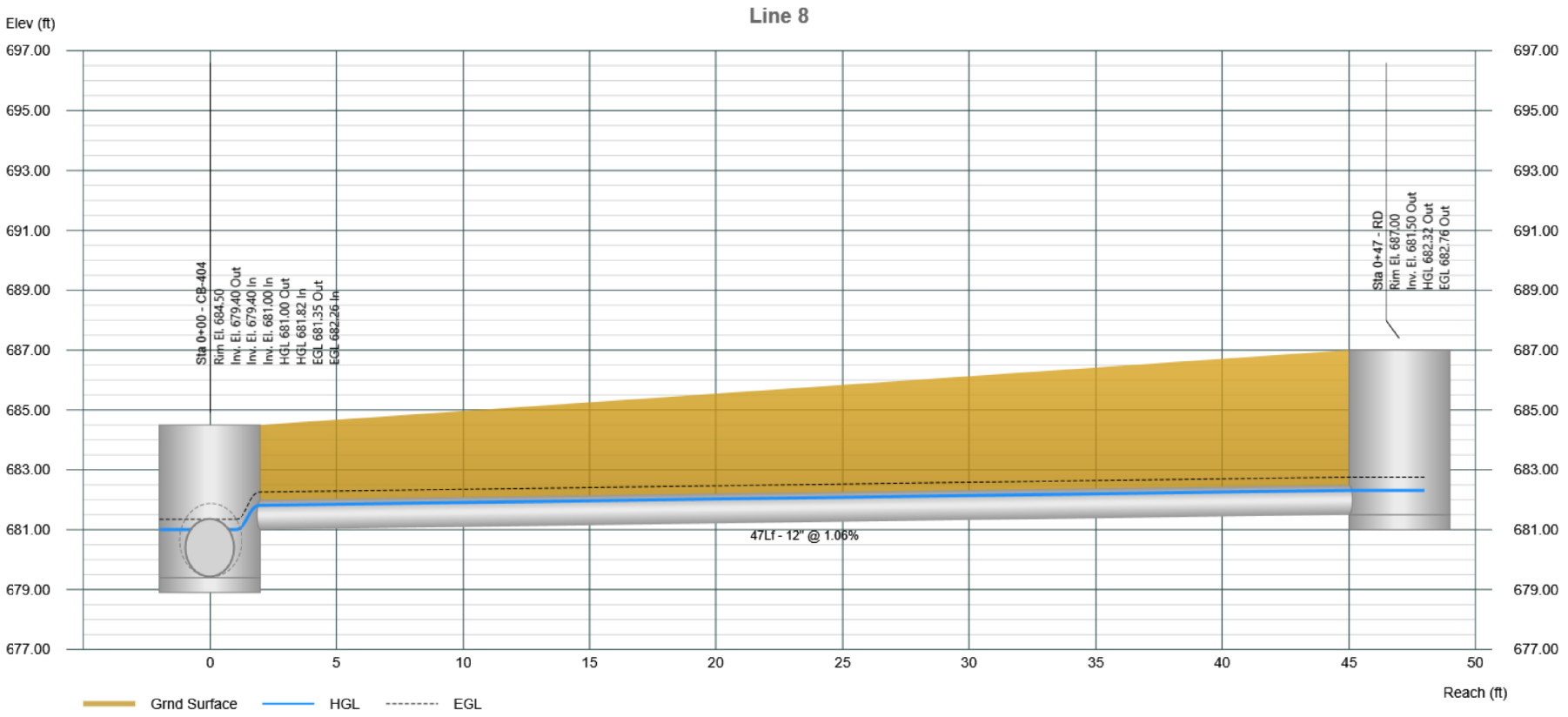


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

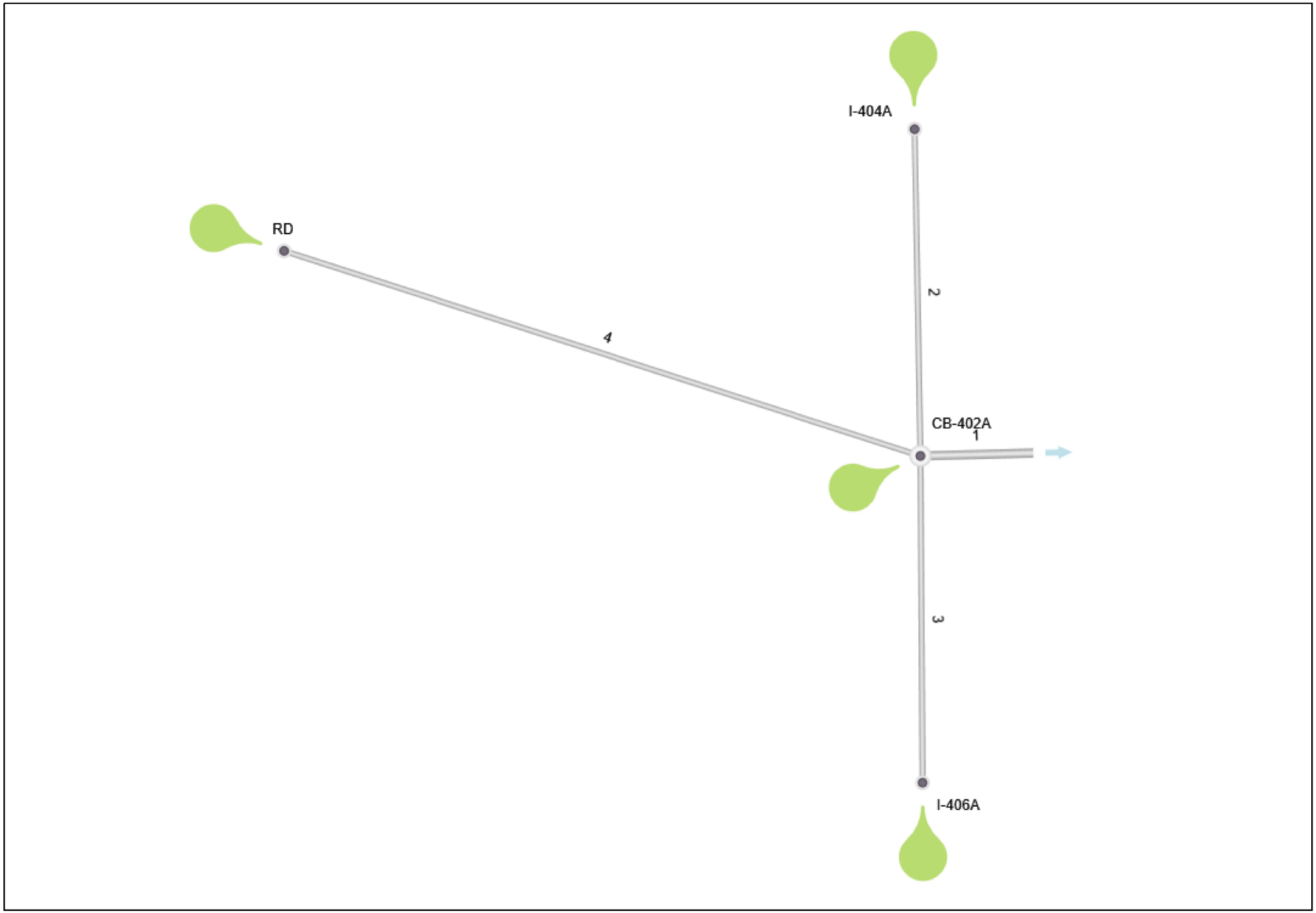


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	30.00	0.370	2.500	0.90	0.33	2.25	10.0	10.43	6.66	14.99	23.68	3.06	30	0.33	675.80	675.70	678.24	678.20	680.60	680.60	1
Line 2	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.61	678.25	680.60	680.60	2
Line 3	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.61	678.25	680.60	680.60	3
Line 4	180.00	1.390	1.390	0.90	1.25	1.25	10.0	10.00	6.78	8.49	6.28	6.92	15	0.94	677.50	675.80	680.75	677.64	684.00	680.60	4

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

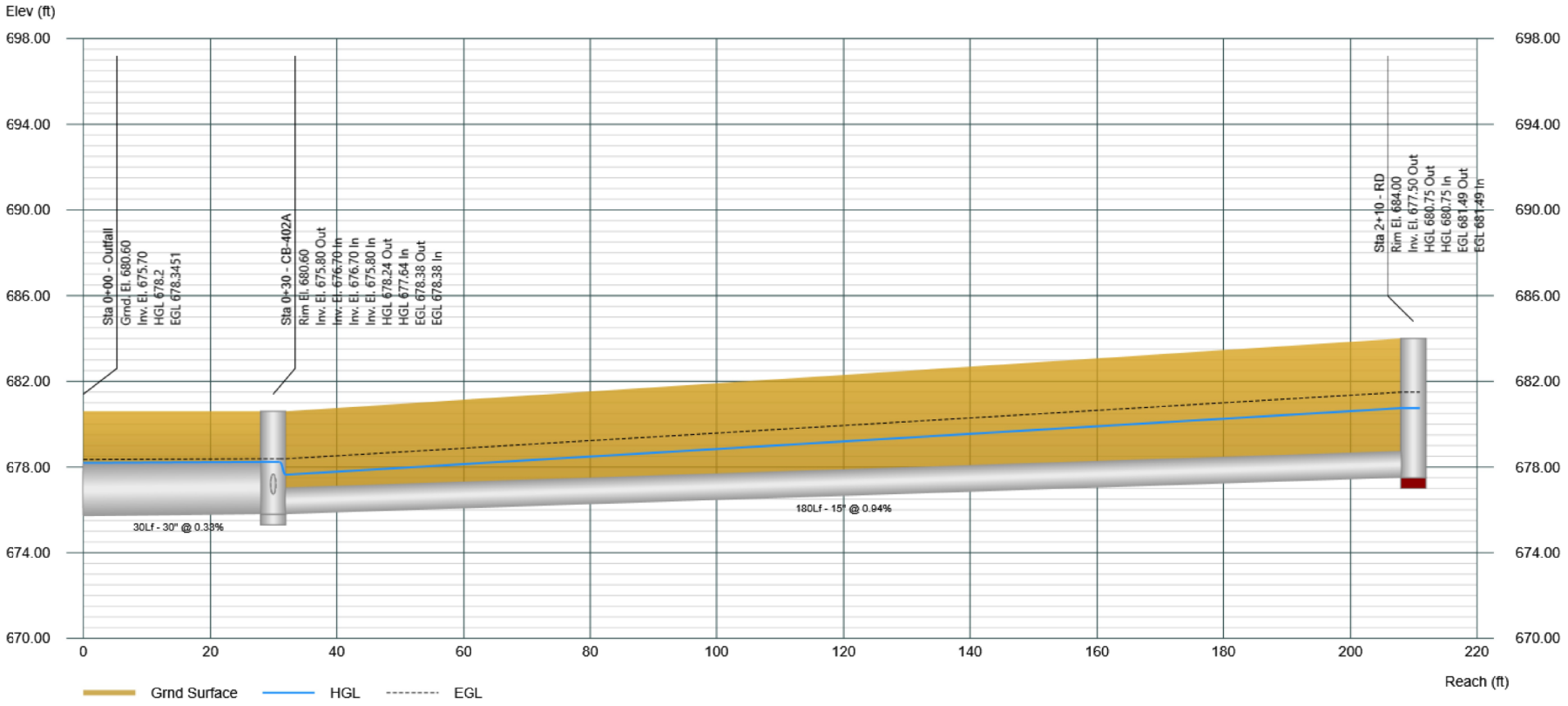
Project File: 12271-SYS400A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

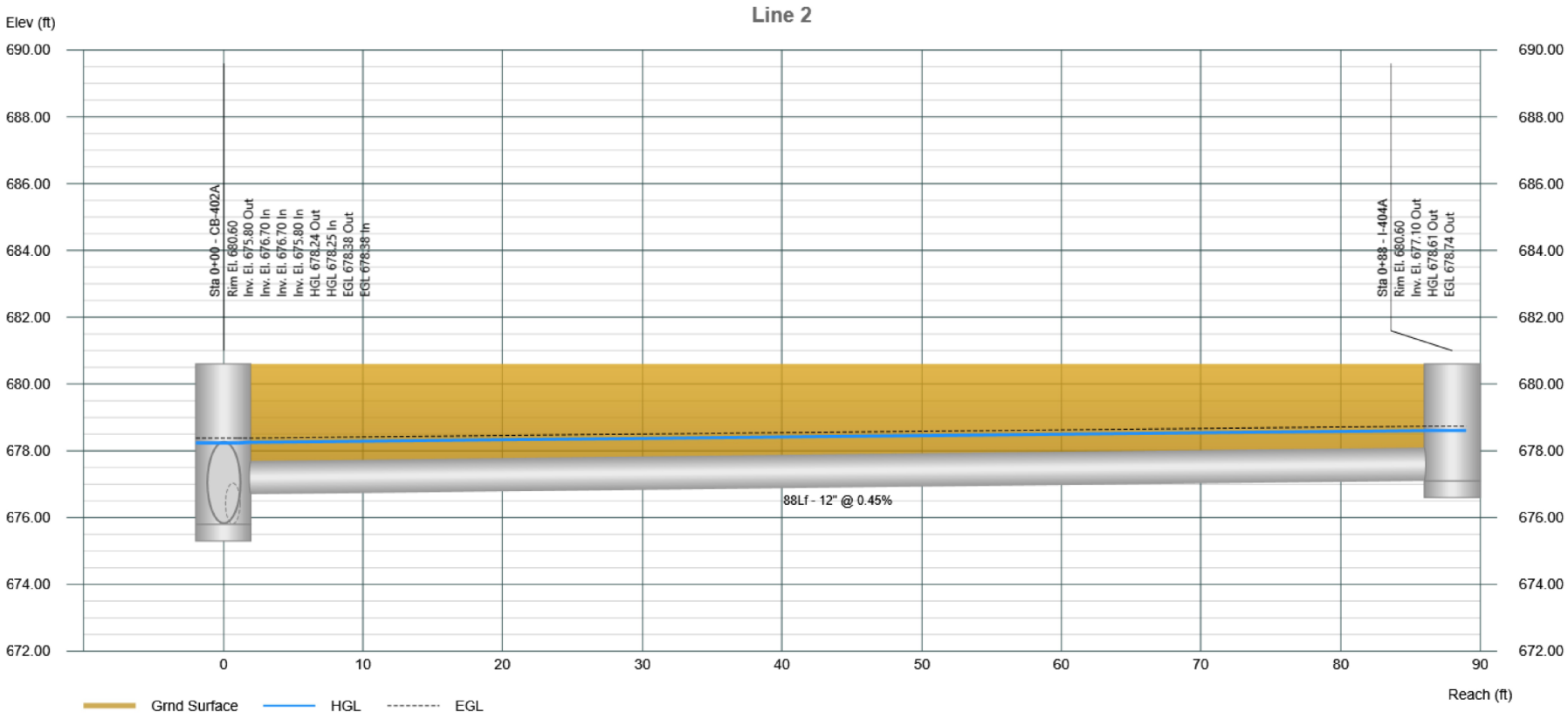


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

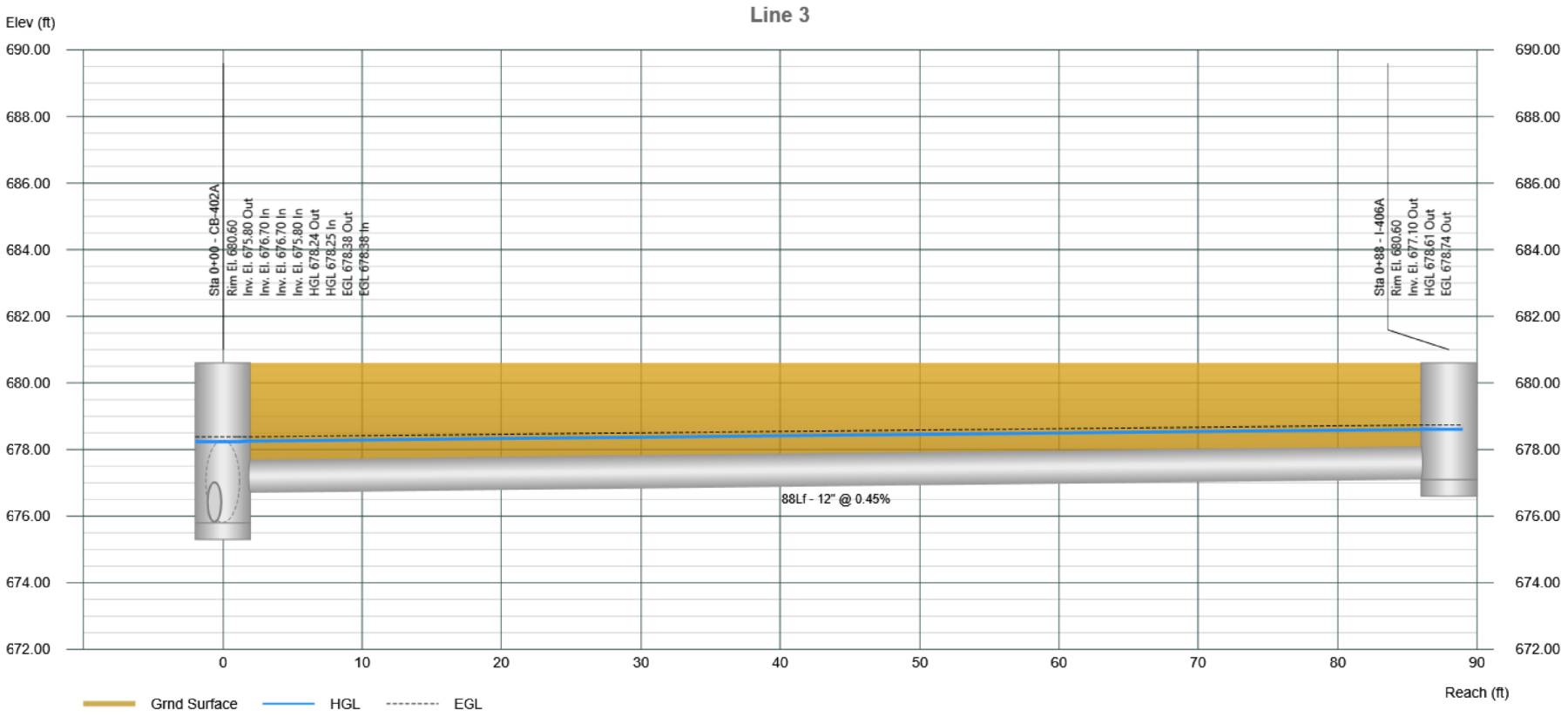


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

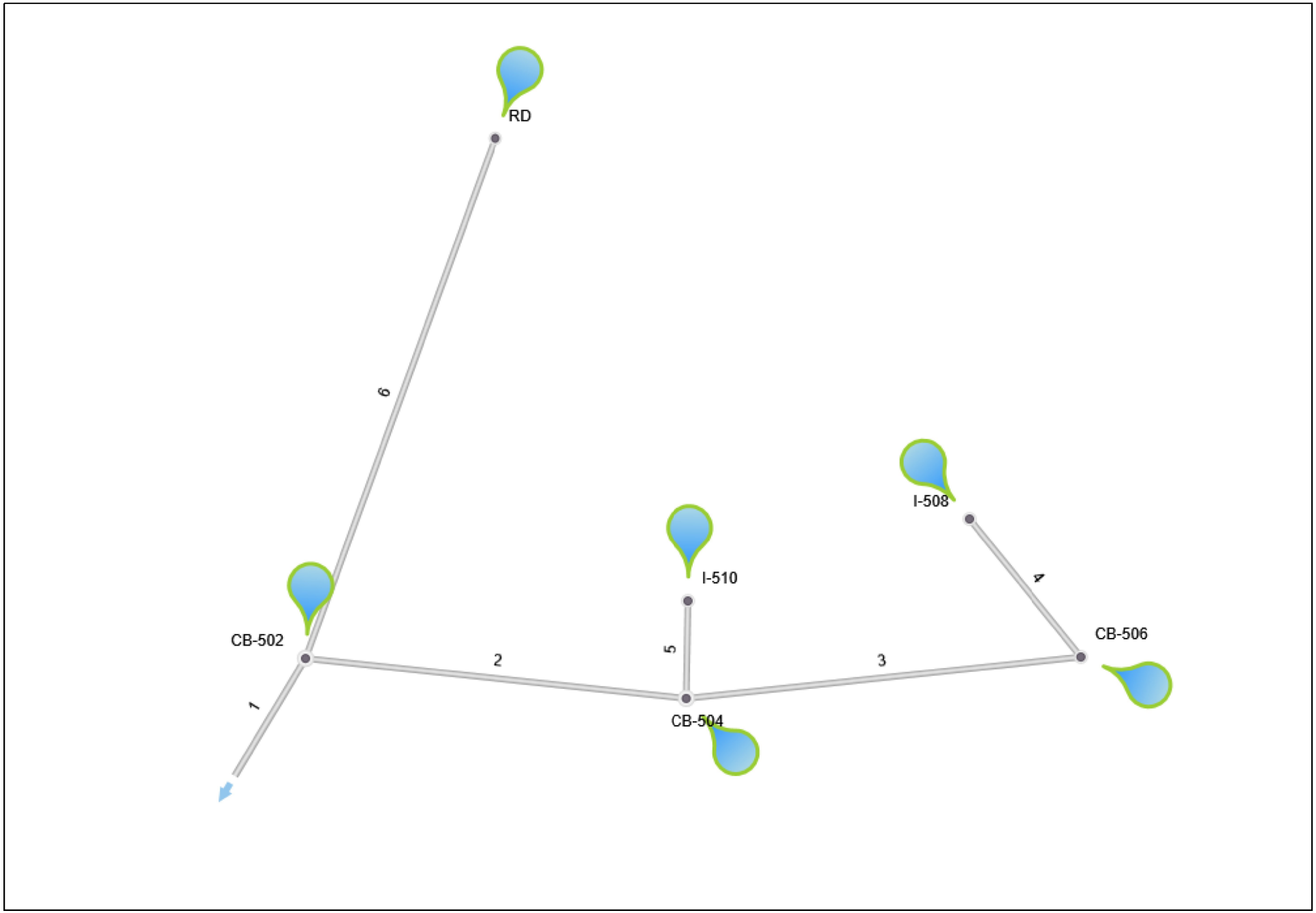


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	39.00	0.400	1.810	0.90	0.36	1.63	10.0	11.09	6.49	10.57	11.45	3.37	24	0.26	675.80	675.70	677.78	677.70	680.60	680.00	1
Line 2	110.00	0.120	0.930	0.90	0.11	0.84	10.0	10.64	6.61	5.53	6.30	3.13	18	0.36	676.50	676.10	678.11	677.81	680.60	680.60	2
Line 3	114.00	0.280	0.490	0.90	0.25	0.44	10.0	10.13	6.75	2.98	2.59	3.79	12	0.53	677.10	676.50	678.84	678.04	680.60	680.60	3
Line 4	51.00	0.210	0.210	0.90	0.19	0.19	10.0	10.00	6.78	1.28	6.50	2.54	12	3.33	678.80	677.10	679.28	679.02	682.30	680.60	4
Line 5	28.00	0.320	0.320	0.90	0.29	0.29	10.0	10.00	6.78	1.95	7.97	3.26	12	5.01	678.50	677.10	679.10	678.17	682.00	680.60	5
Line 6	159.00	0.480	0.480	0.90	0.43	0.43	10.0	10.00	6.78	2.93	3.68	3.73	12	1.07	677.50	675.80	678.82	677.74	684.00	680.60	6

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

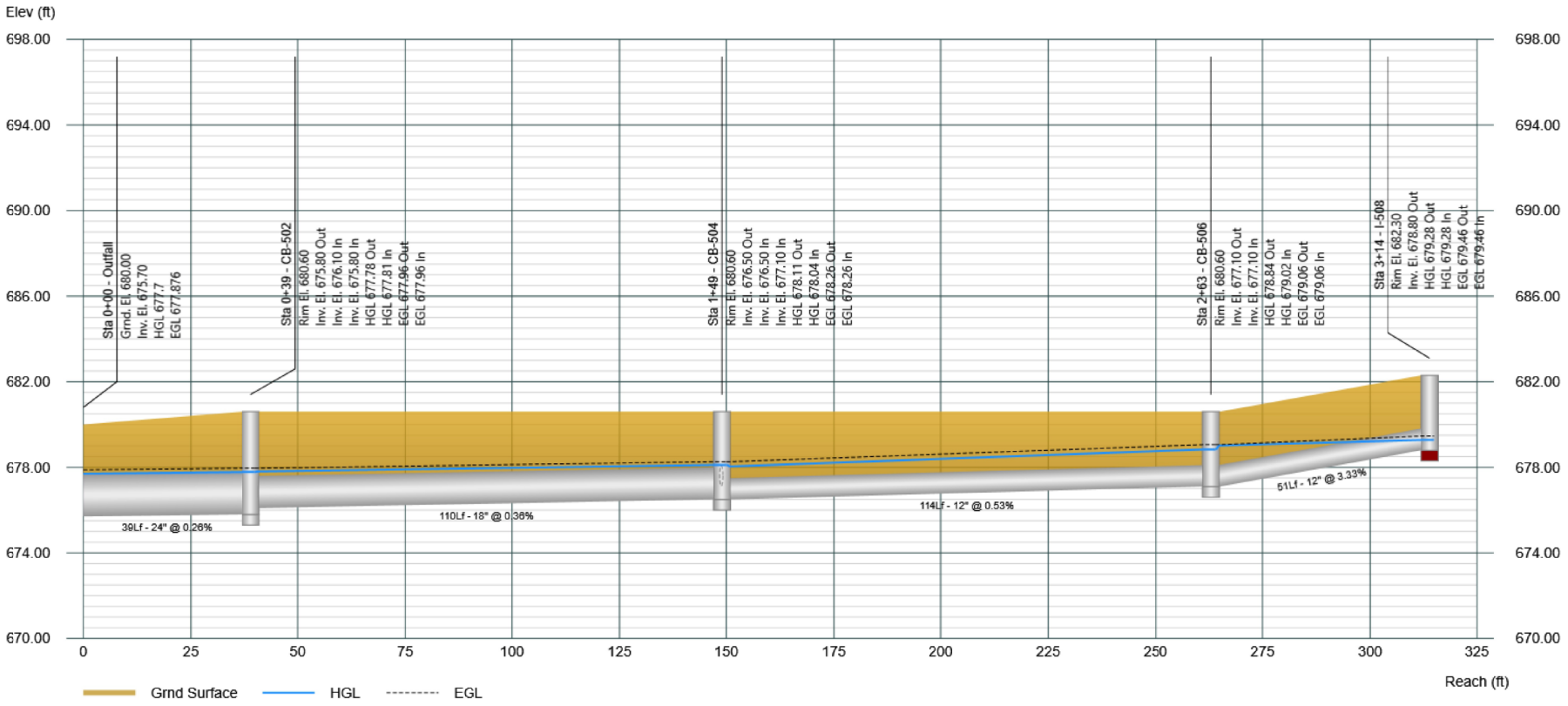
Project File: 12271-SYS500.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



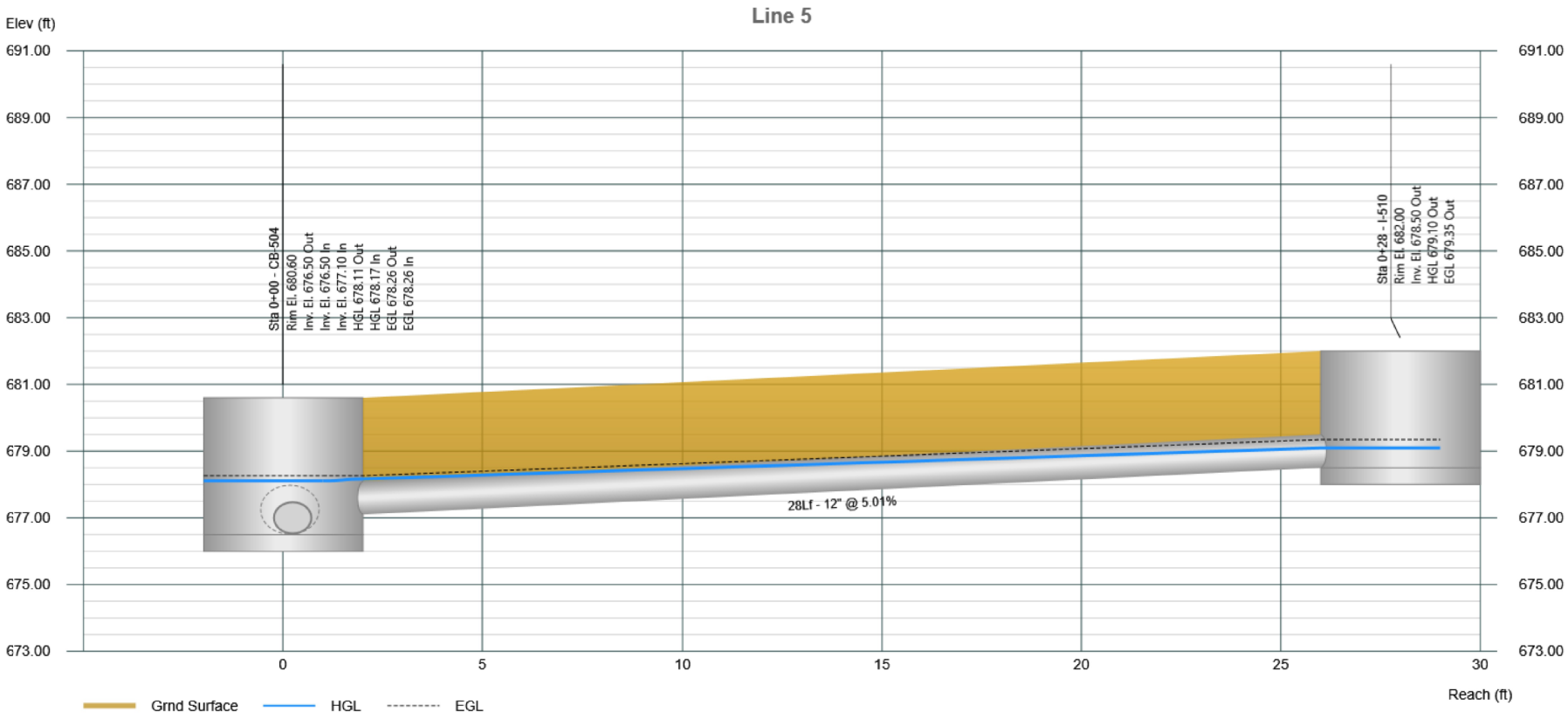
Project File: 12271-SYS500.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

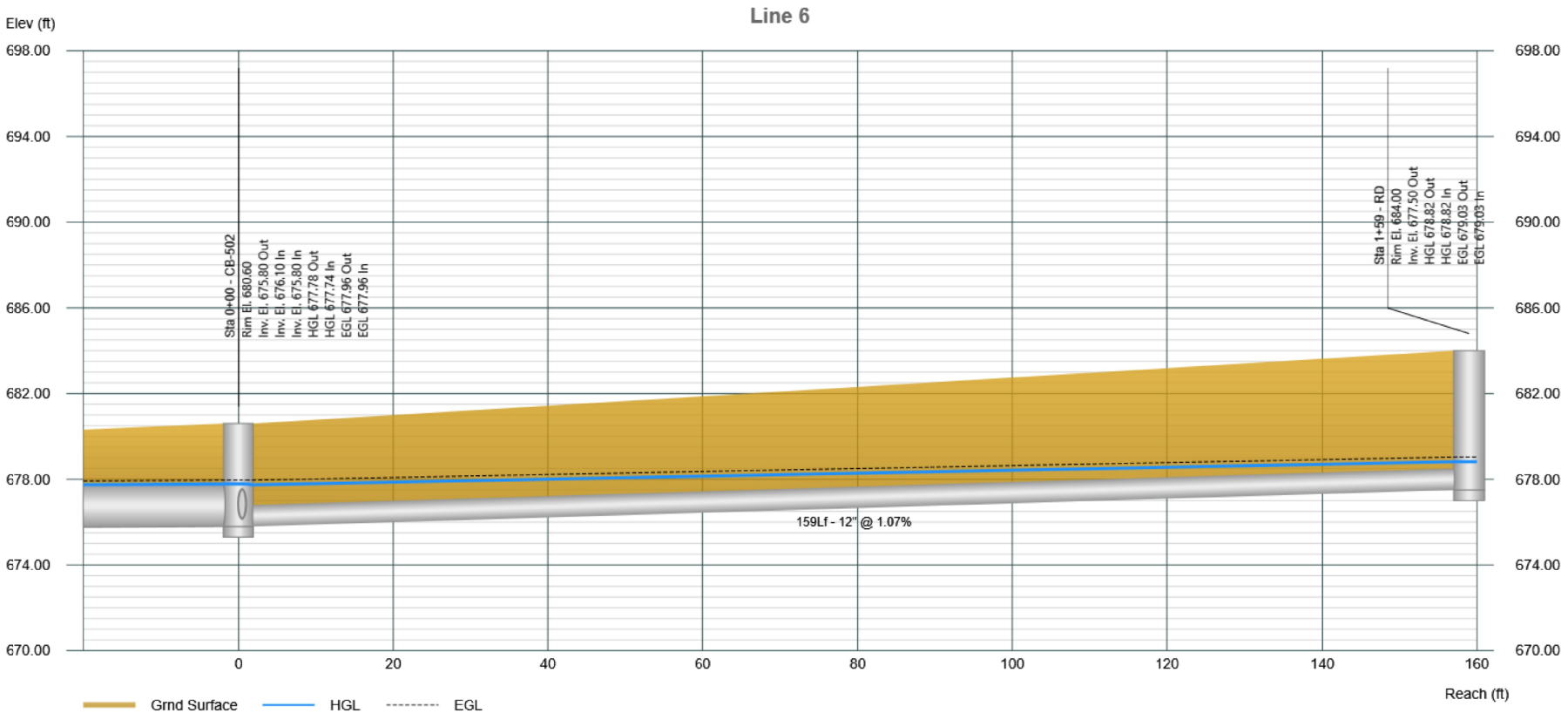


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

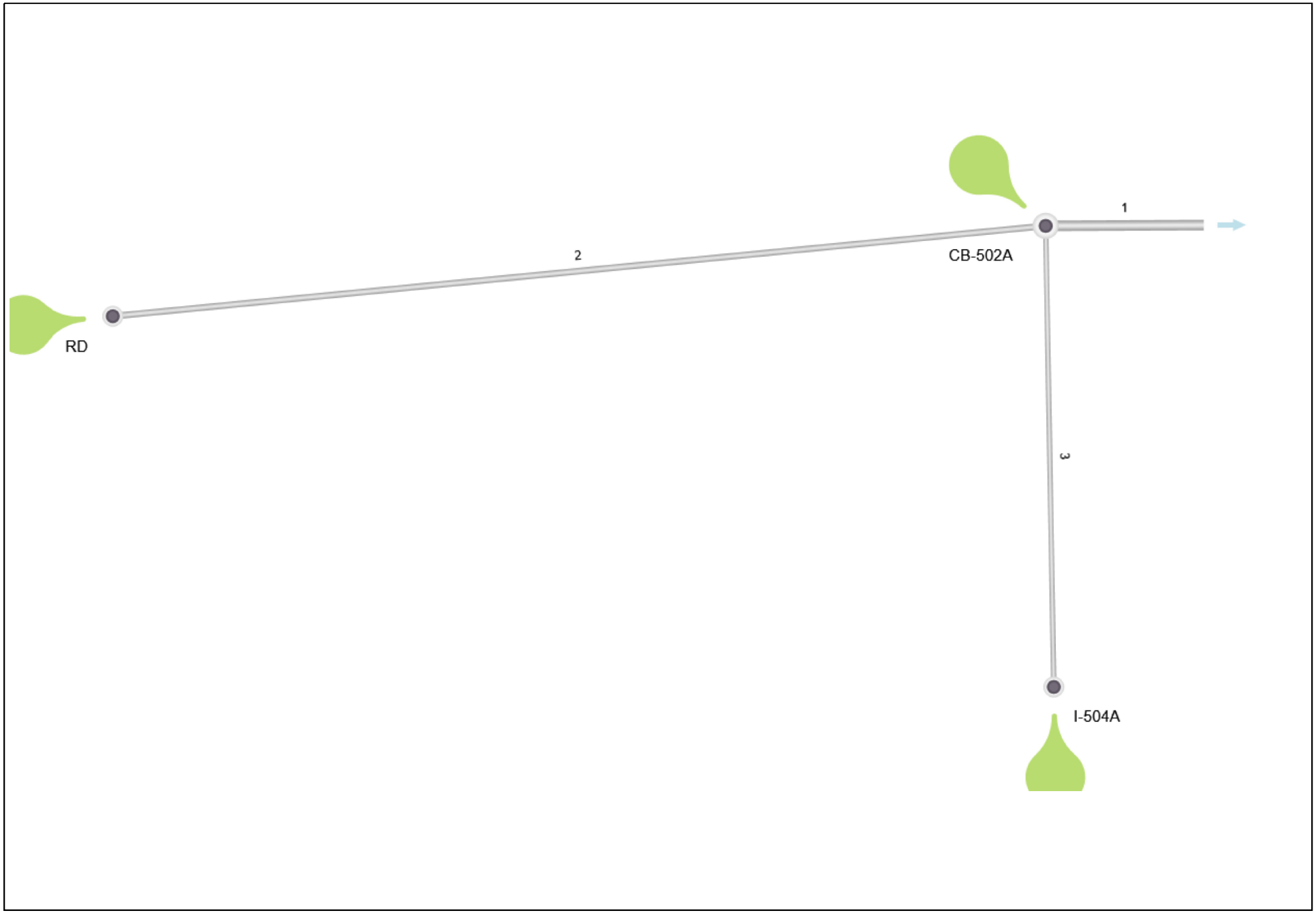


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	30.00	0.370	2.010	0.90	0.33	1.81	10.0	10.47	6.65	12.03	13.06	3.83	24	0.33	675.80	675.70	677.78	677.70	680.60	680.60	1
Line 2	179.00	1.270	1.270	0.90	1.14	1.14	10.0	10.00	6.78	7.75	6.29	6.32	15	0.95	677.50	675.80	679.97	677.39	684.00	680.60	2
Line 3	88.00	0.370	0.370	0.90	0.33	0.33	10.0	10.00	6.78	2.26	2.40	2.88	12	0.45	677.10	676.70	678.24	677.88	680.60	680.60	3

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

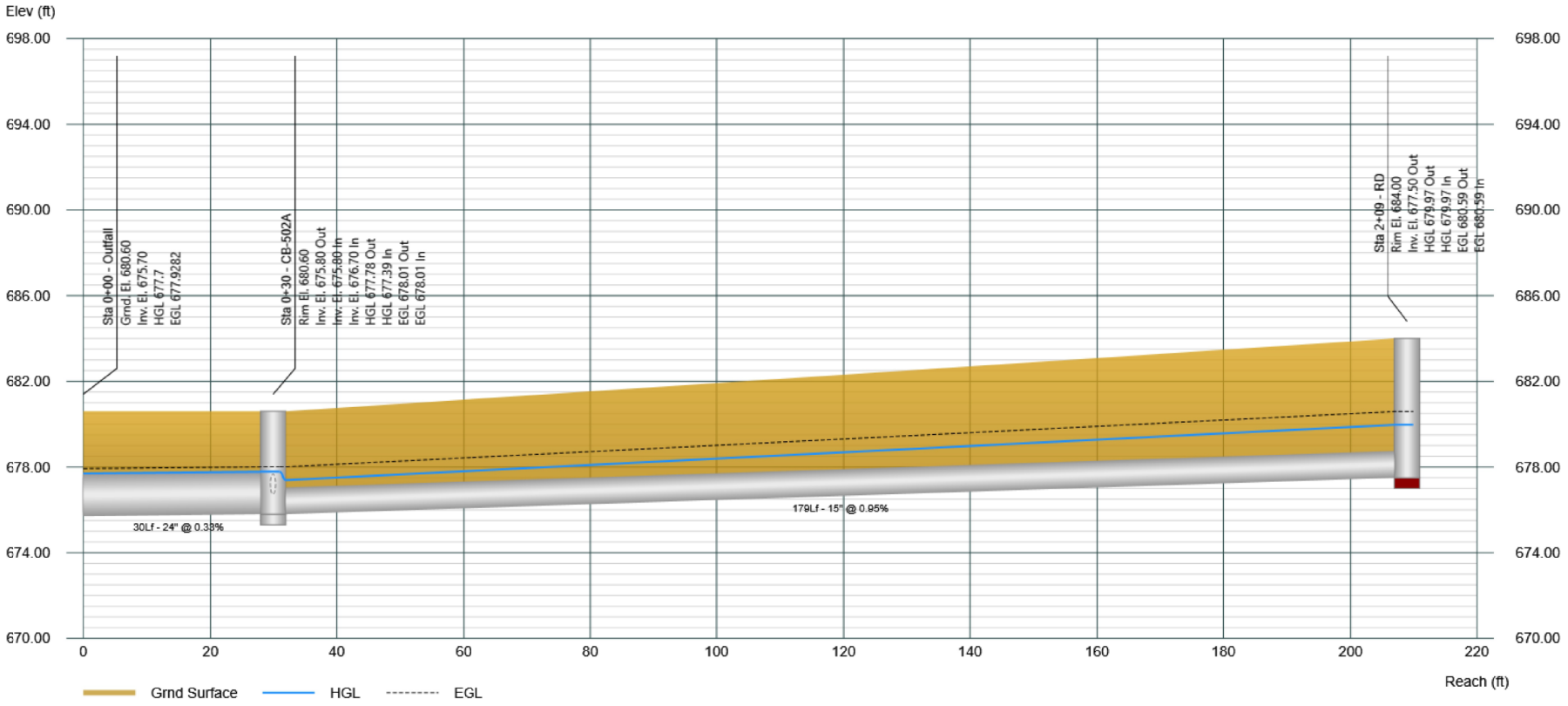
Project File: 12271-SYS500A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

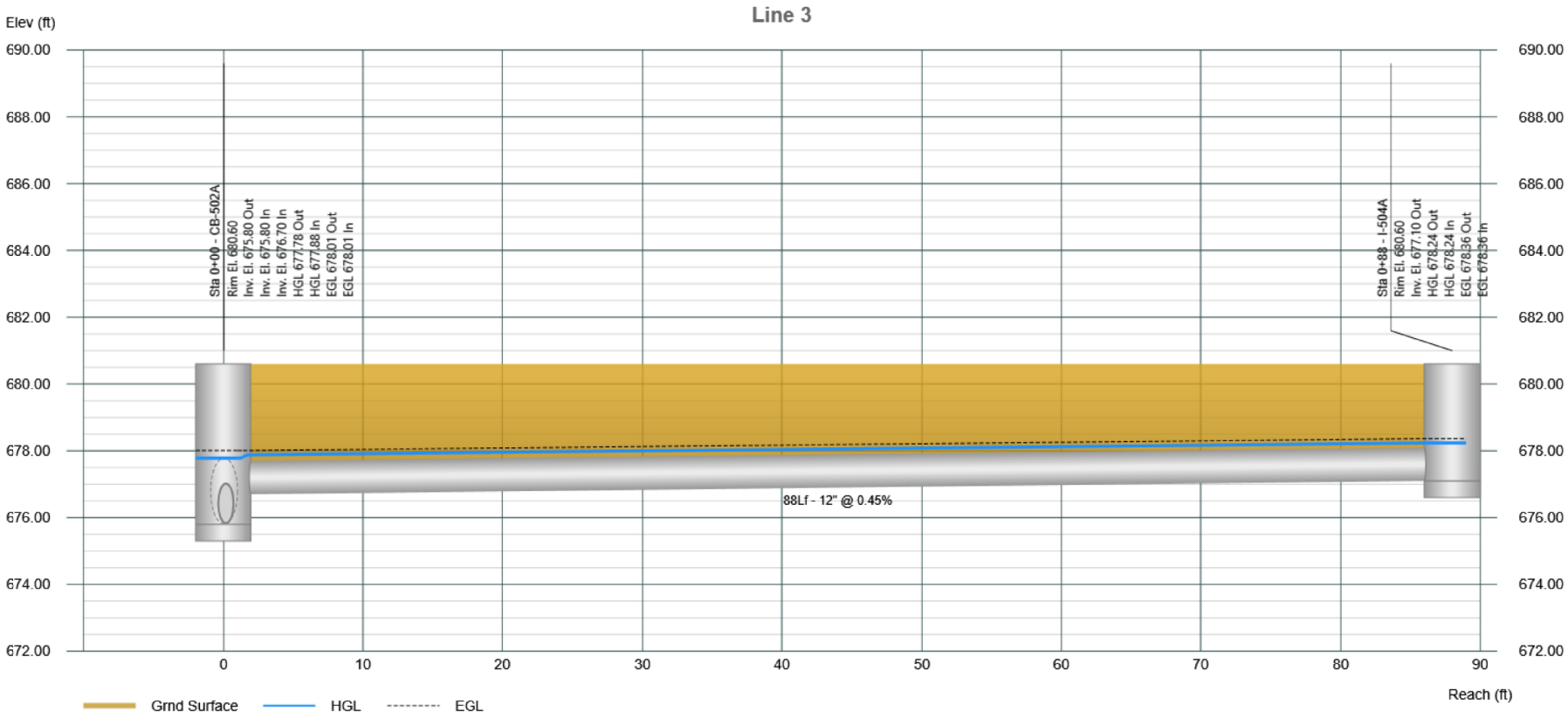


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

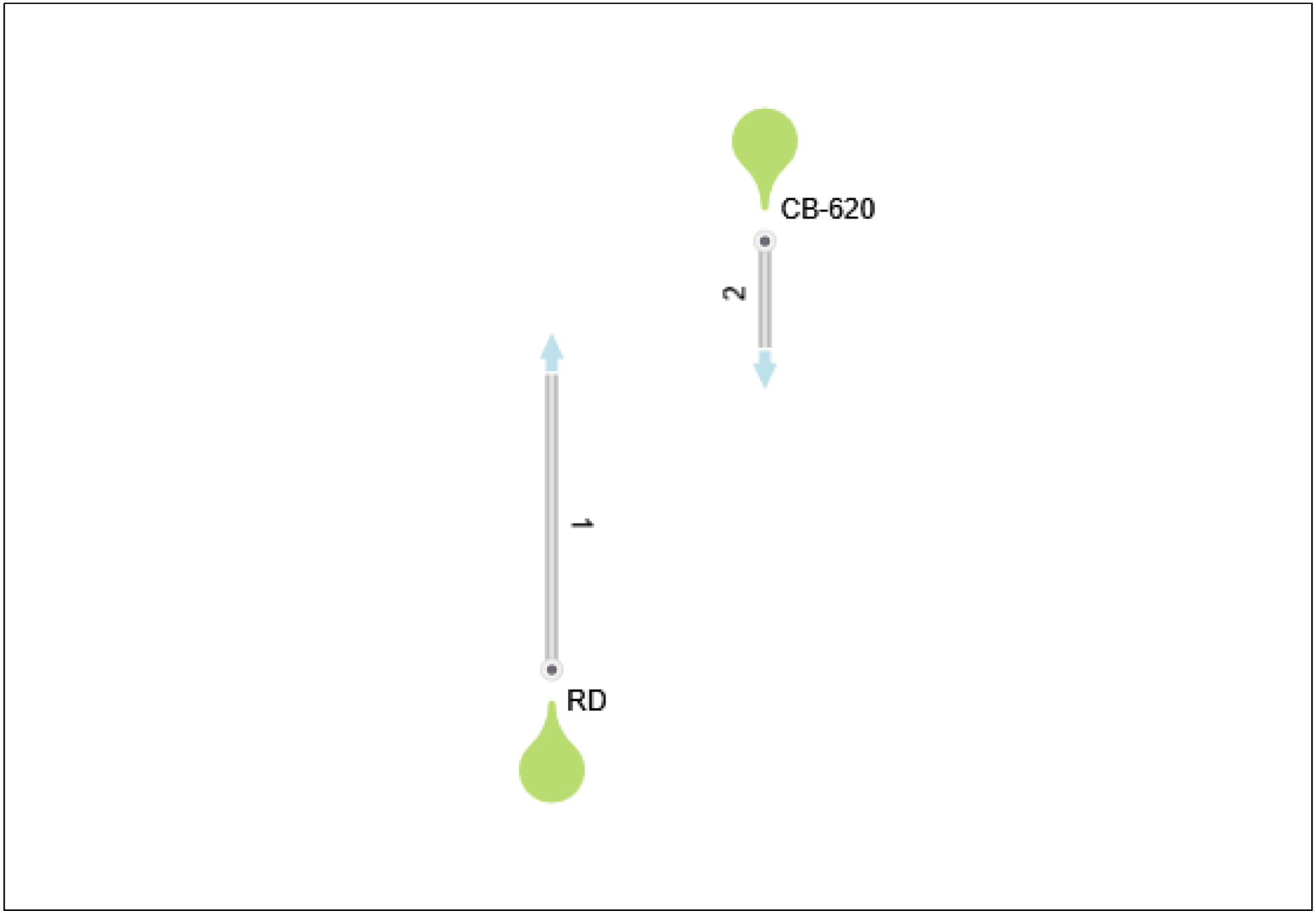


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
RD-M610	76.00	0.480	0.480	0.90	0.43	0.43	10.0	10.00	6.78	2.93	4.08	4.27	12	1.32	681.50	680.50	682.23	681.50	687.00	684.50	1
CB620-CB612	27.00	0.000	0.000	0.00	0.00	0.00	0.0	0.00	6.78	3.87	6.81	3.43	15	1.11	681.00	680.70	681.99	681.95	684.10	684.50	2

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

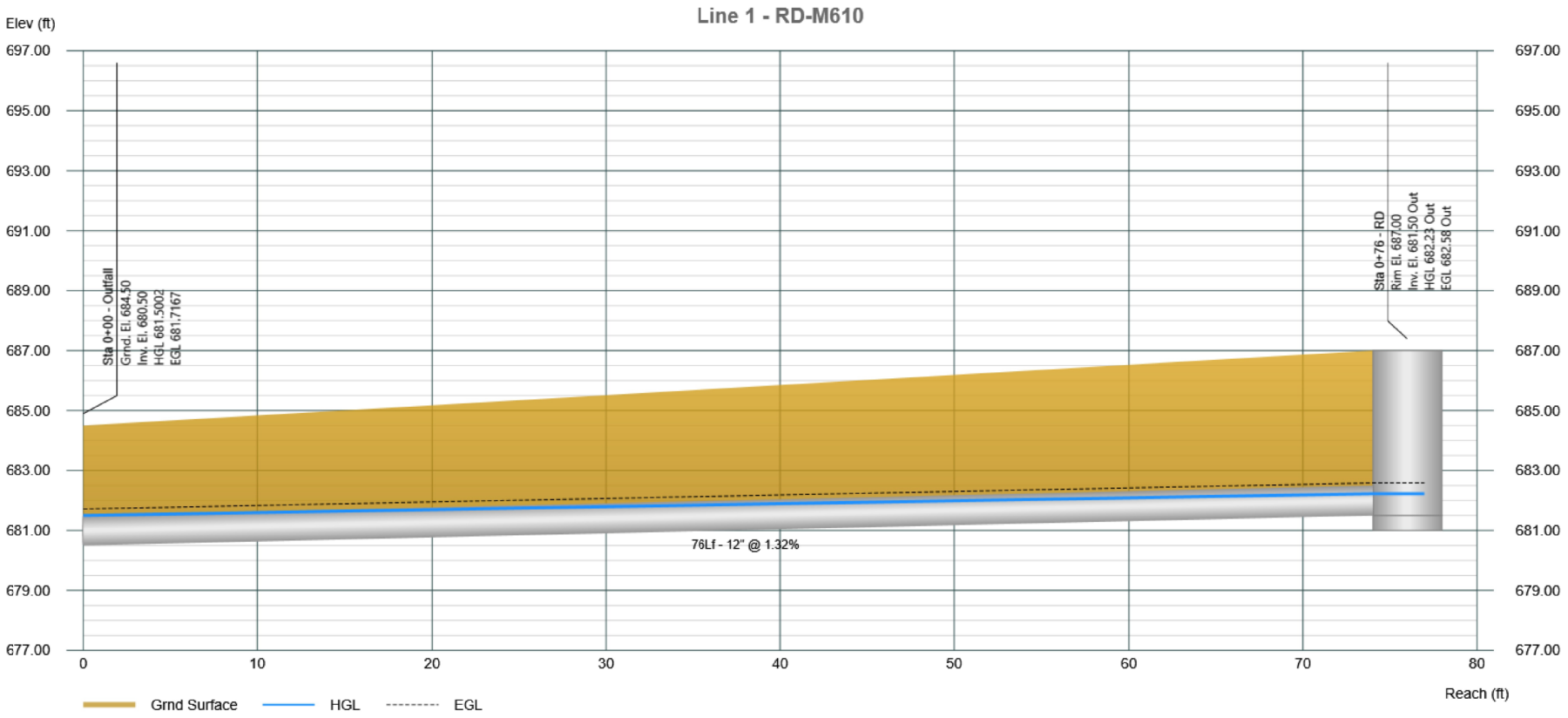
Project File: 12271-SYS600(ROOF DRAIN).sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

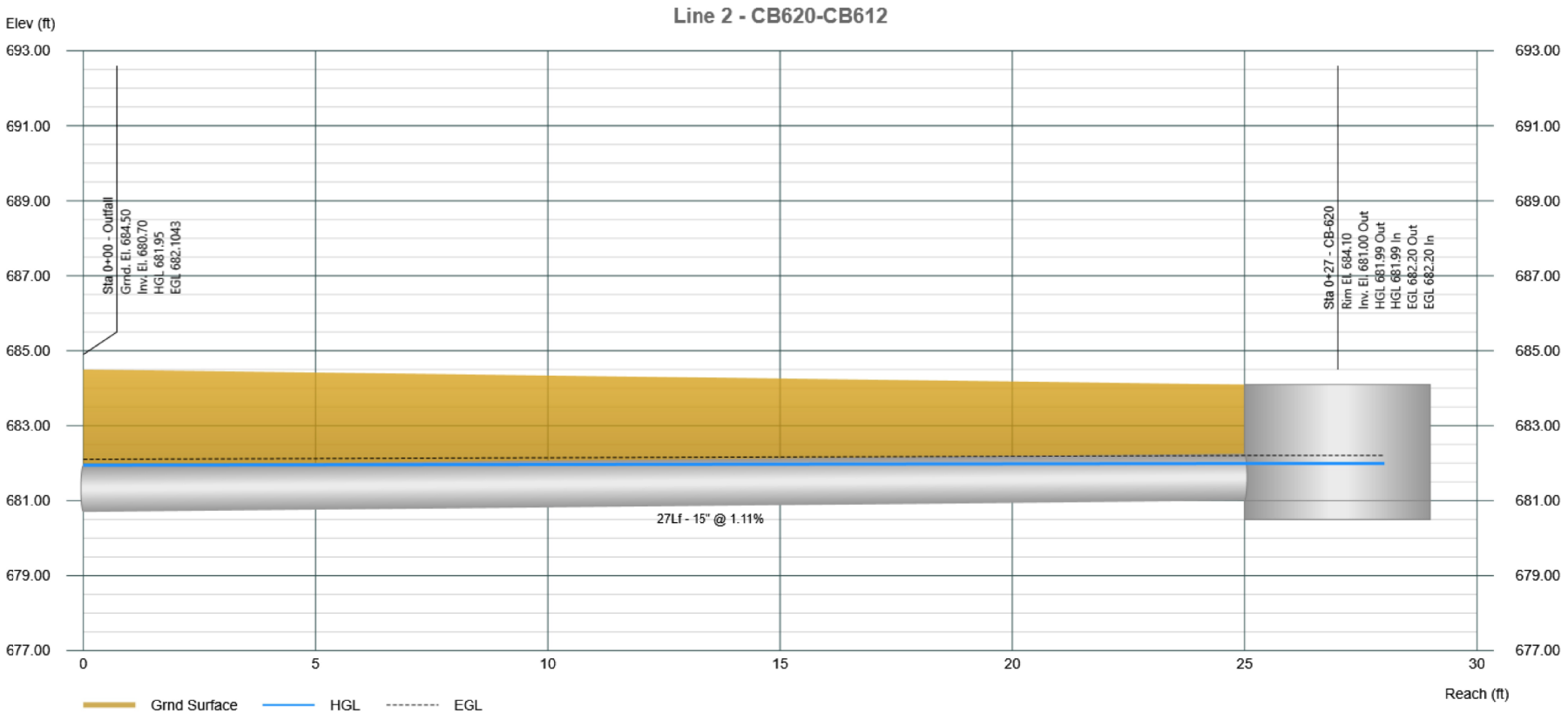


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

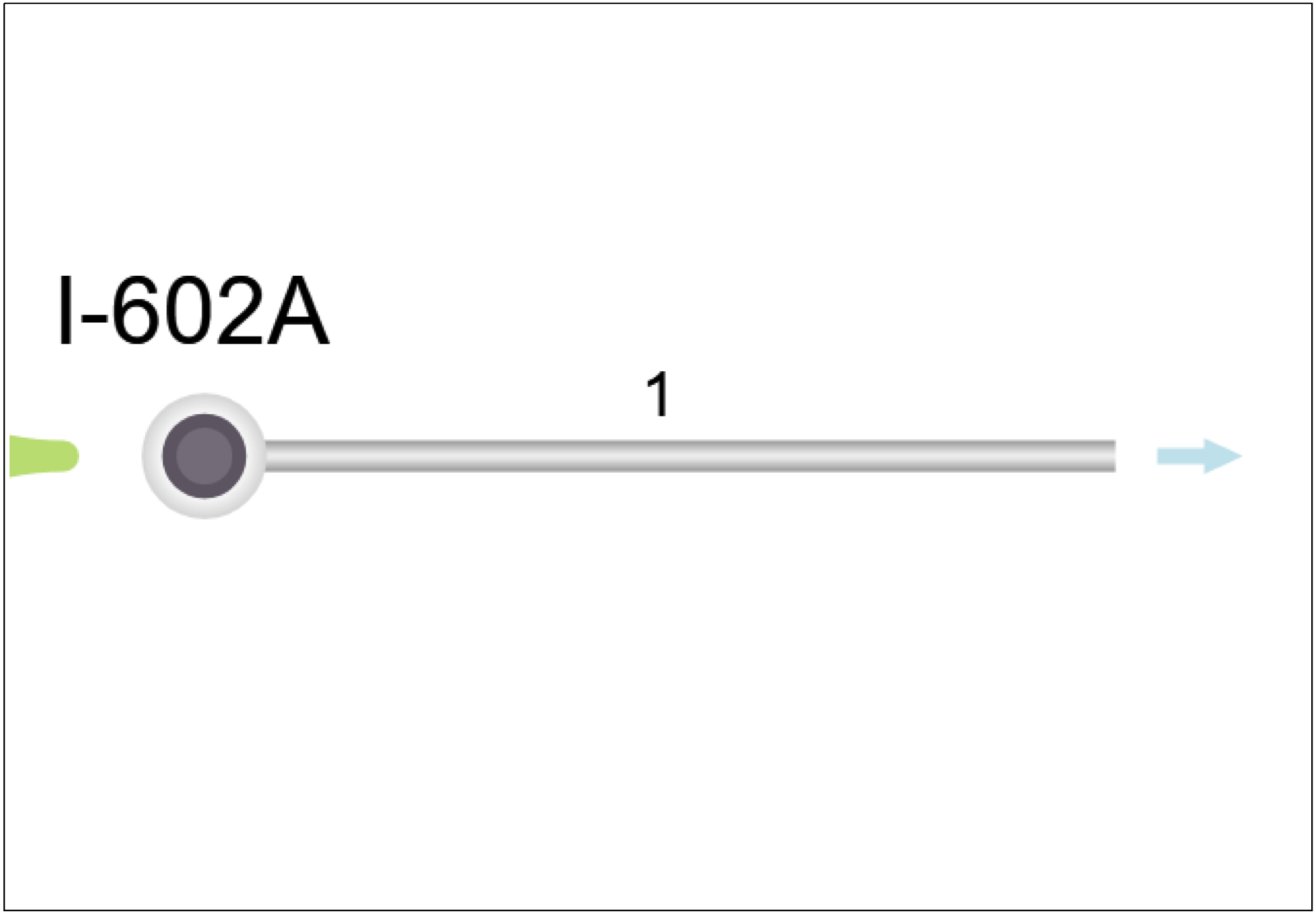


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	29.00	0.430	0.430	0.90	0.39	0.39	10.0	10.00	6.78	2.63	7.82	4.56	12	4.83	677.10	675.70	677.79	676.39	680.60	680.60	1

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

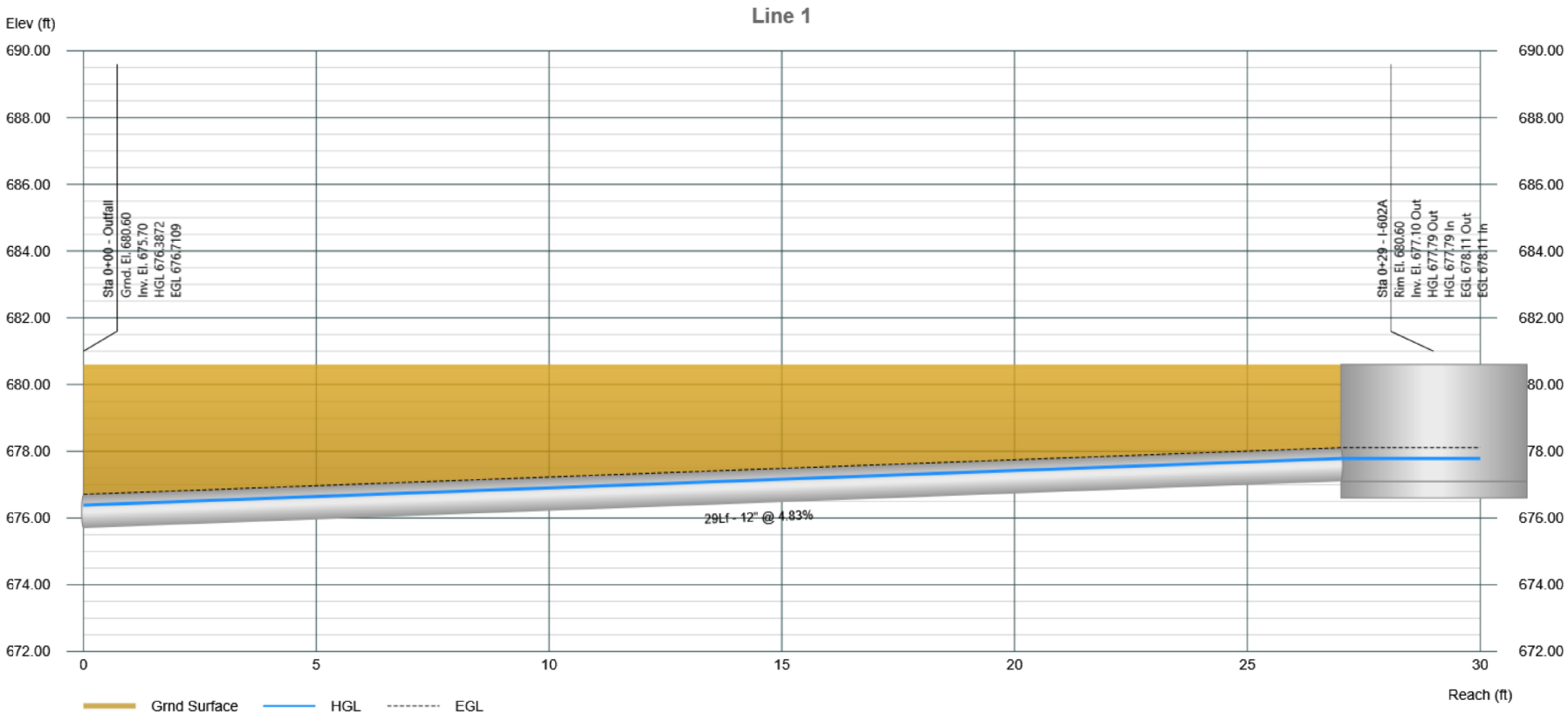
Project File: 12271-SYS600A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

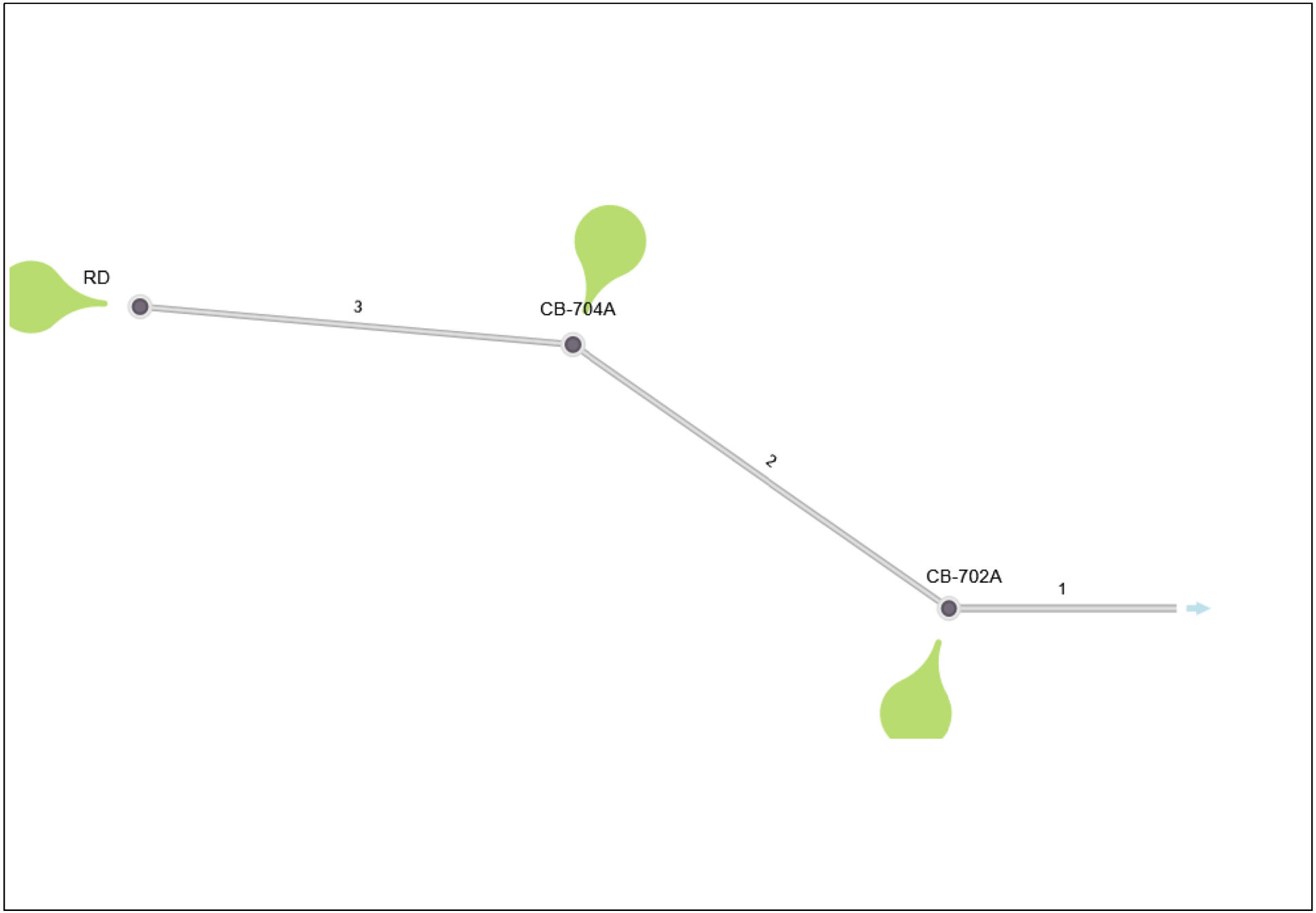


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	36.00	0.440	1.080	0.90	0.40	0.97	10.0	10.37	6.68	6.49	6.80	5.38	15	1.11	676.10	675.70	677.26	676.95	681.00	680.60	1
Line 2	73.00	0.160	0.640	0.90	0.14	0.58	10.0	10.20	6.73	3.88	5.11	5.53	12	2.06	679.00	677.50	679.84	678.34	683.50	681.00	2
Line 3	69.00	0.480	0.480	0.90	0.43	0.43	10.0	10.00	6.78	2.93	4.29	4.80	12	1.45	681.50	680.50	682.23	681.23	687.00	683.50	3

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

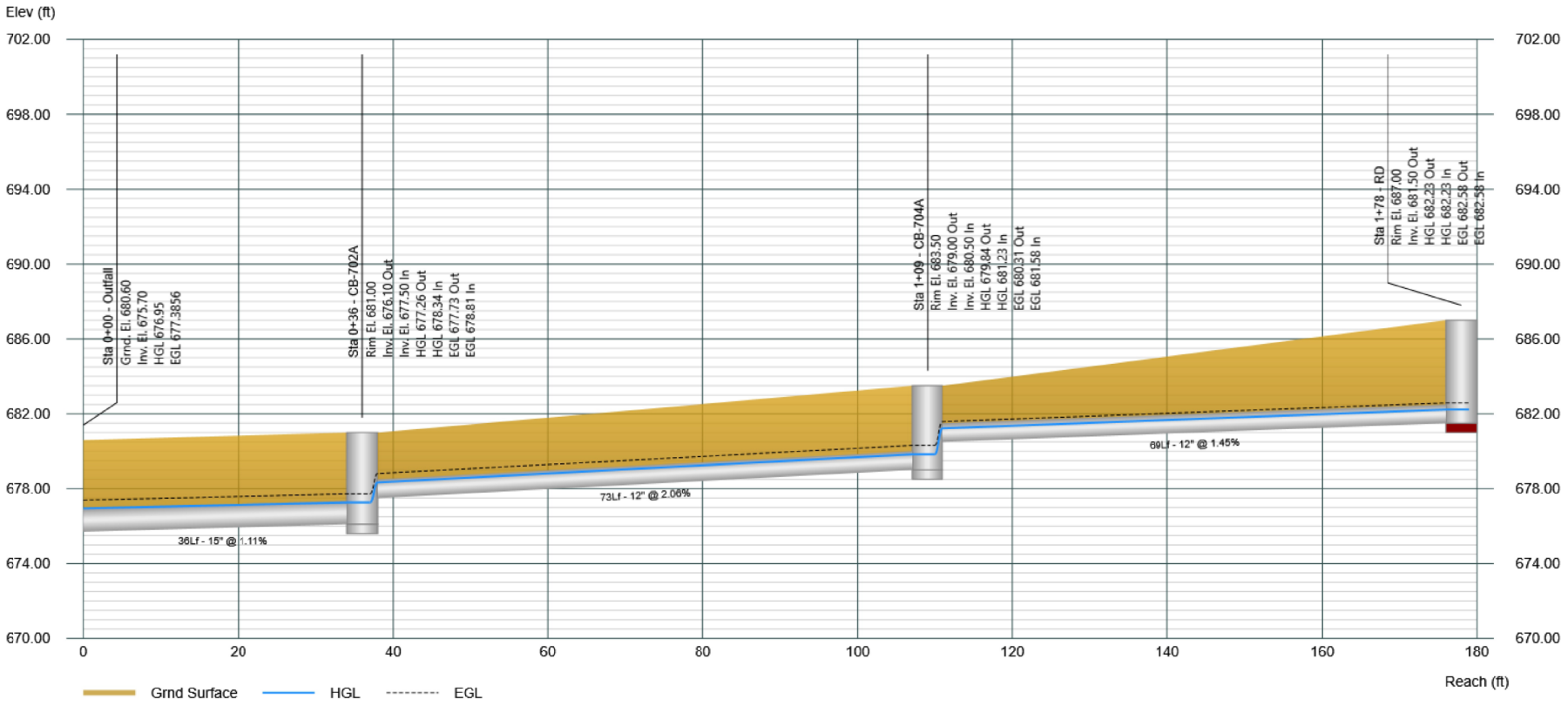
Project File: 12271-SYS700A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



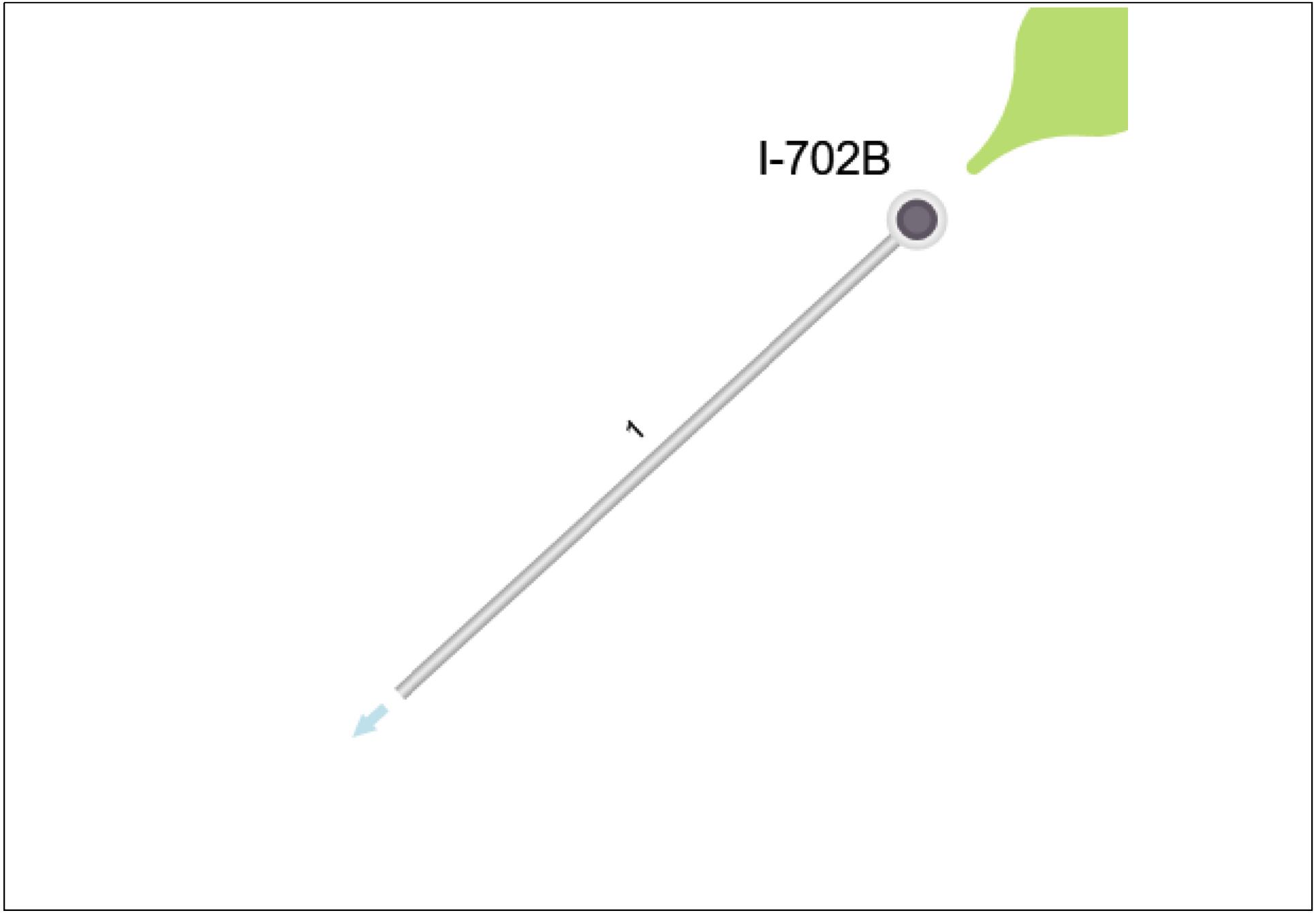
Project File: 12271-SYS700A.sws

Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Project File: SYSTEM-700B.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	46.00	0.150	0.150	0.90	0.14	0.14	10.0	10.00	6.78	0.92	8.30	2.11	12	5.43	678.50	676.00	678.91	677.00	682.00	682.00	1

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

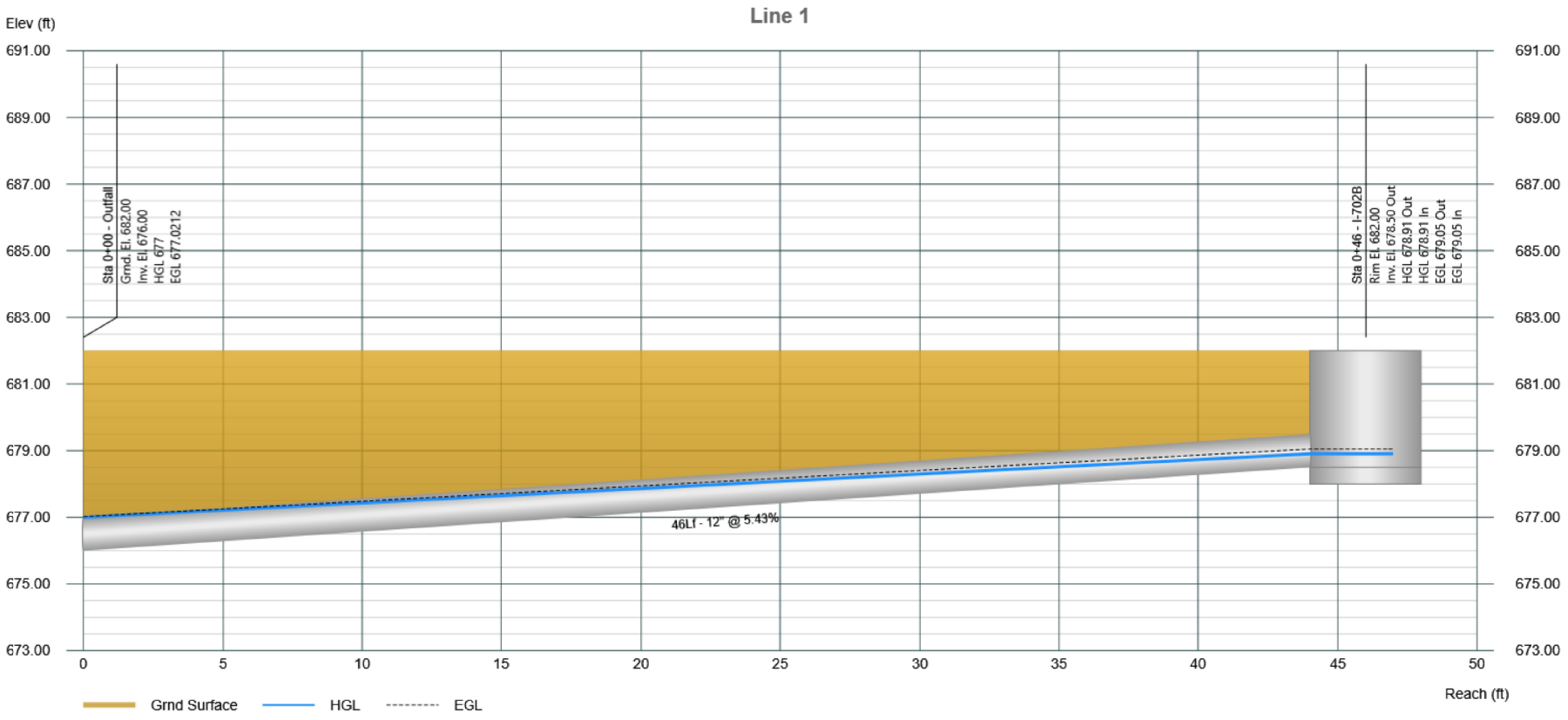
Project File: SYSTEM-700B.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

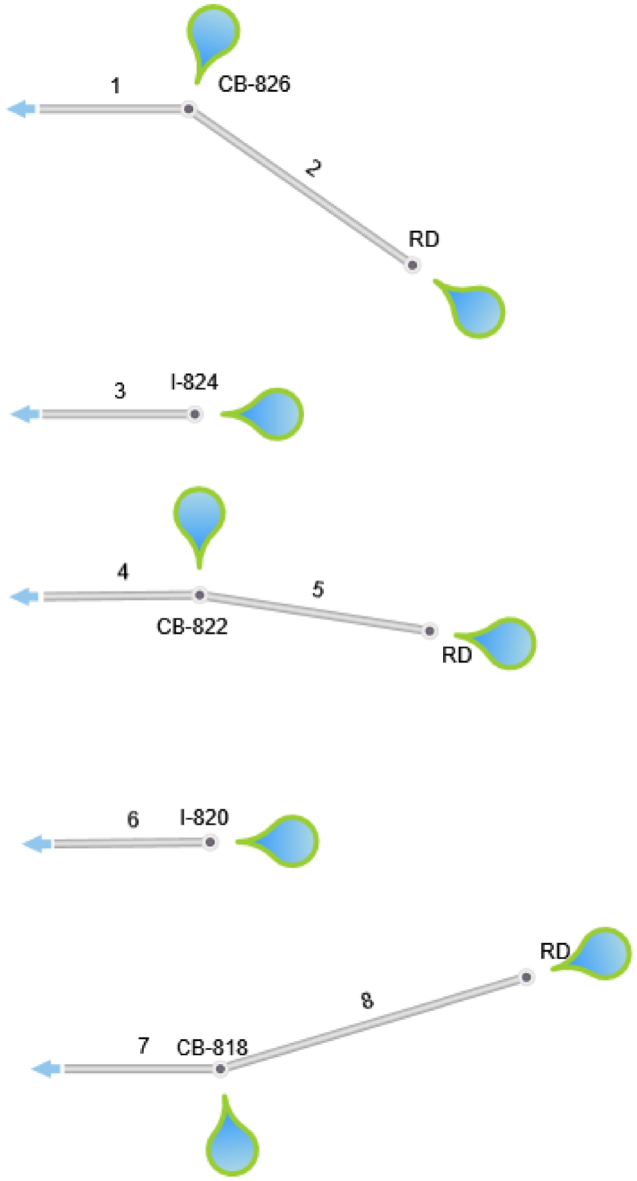


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
CB804-CB814	44.00	0.210	0.730	0.90	0.19	0.66	10.0	10.24	6.72	4.41	6.88	4.30	15	1.14	680.50	680.00	681.34	681.25	684.70	683.70	1
RD-CB814	81.00	0.520	0.520	0.90	0.47	0.47	10.0	10.00	6.78	3.17	3.96	4.53	12	1.23	681.50	680.50	682.26	681.47	687.00	684.70	2
CB802-I812	45.00	0.210	0.210	0.90	0.19	0.19	10.0	10.00	6.78	1.28	5.31	2.54	12	2.22	681.20	680.20	681.68	681.20	684.70	683.70	3
CB822-CB806	46.00	0.210	1.460	0.90	0.19	1.31	10.0	10.16	6.74	8.85	10.89	5.43	18	1.08	680.50	680.00	681.69	681.50	684.70	683.70	4
RD-CB822	69.00	1.250	1.250	0.90	1.13	1.13	10.0	10.00	6.78	7.63	7.76	6.62	15	1.44	681.50	680.50	682.59	681.62	687.00	684.70	5
CB804-I820	46.00	0.210	0.210	0.90	0.19	0.19	10.0	10.00	6.78	1.28	5.24	2.54	12	2.17	681.20	680.20	681.68	681.20	684.70	683.70	6
CB802-CB818	46.00	0.230	0.800	0.90	0.21	0.72	10.0	10.30	6.70	4.82	6.74	4.57	15	1.09	680.50	680.00	681.38	681.25	684.70	683.70	7
RD-CB802	95.00	0.570	0.570	0.90	0.51	0.51	10.0	10.00	6.78	3.48	3.65	4.81	12	1.05	681.50	680.50	682.30	681.50	687.00	684.70	8

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

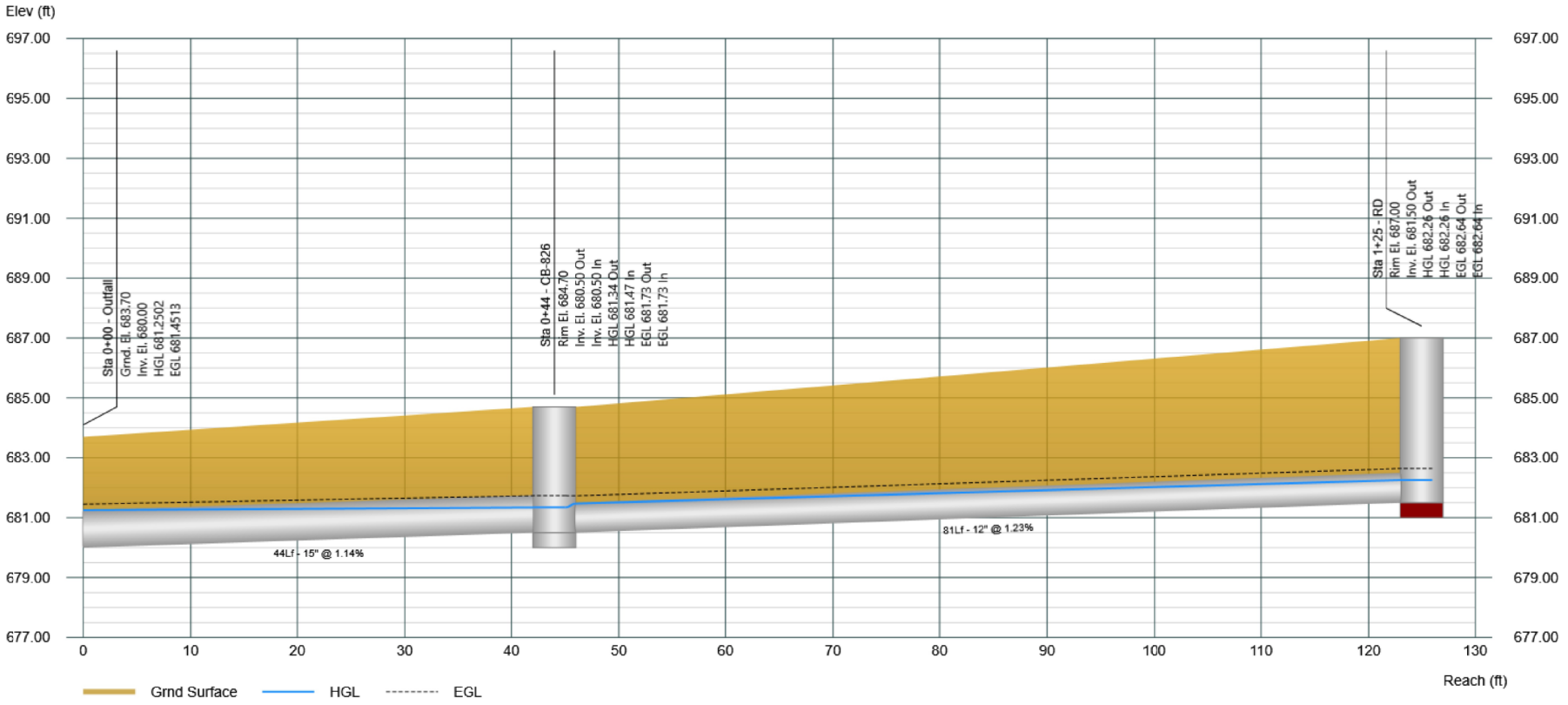
Project File: 12271-SYS800.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

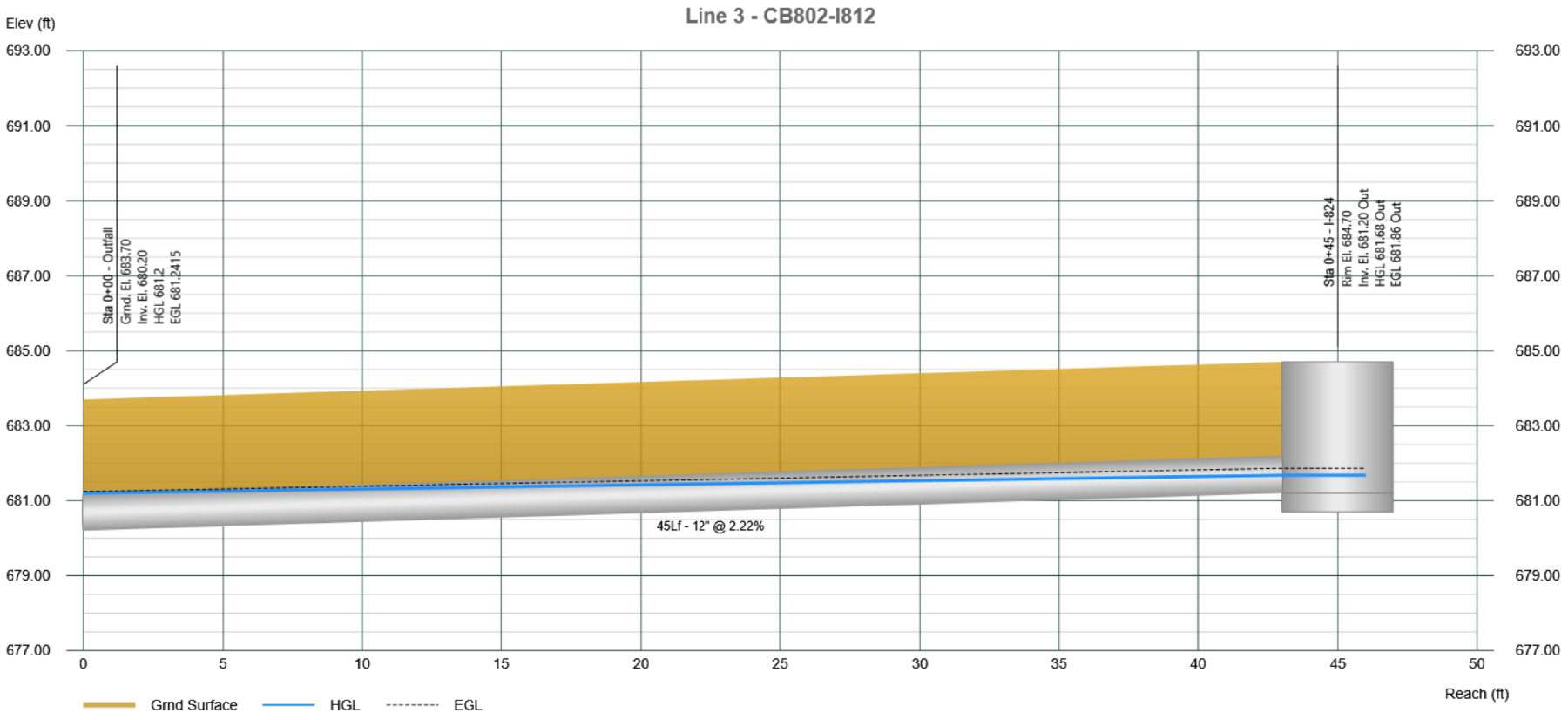


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

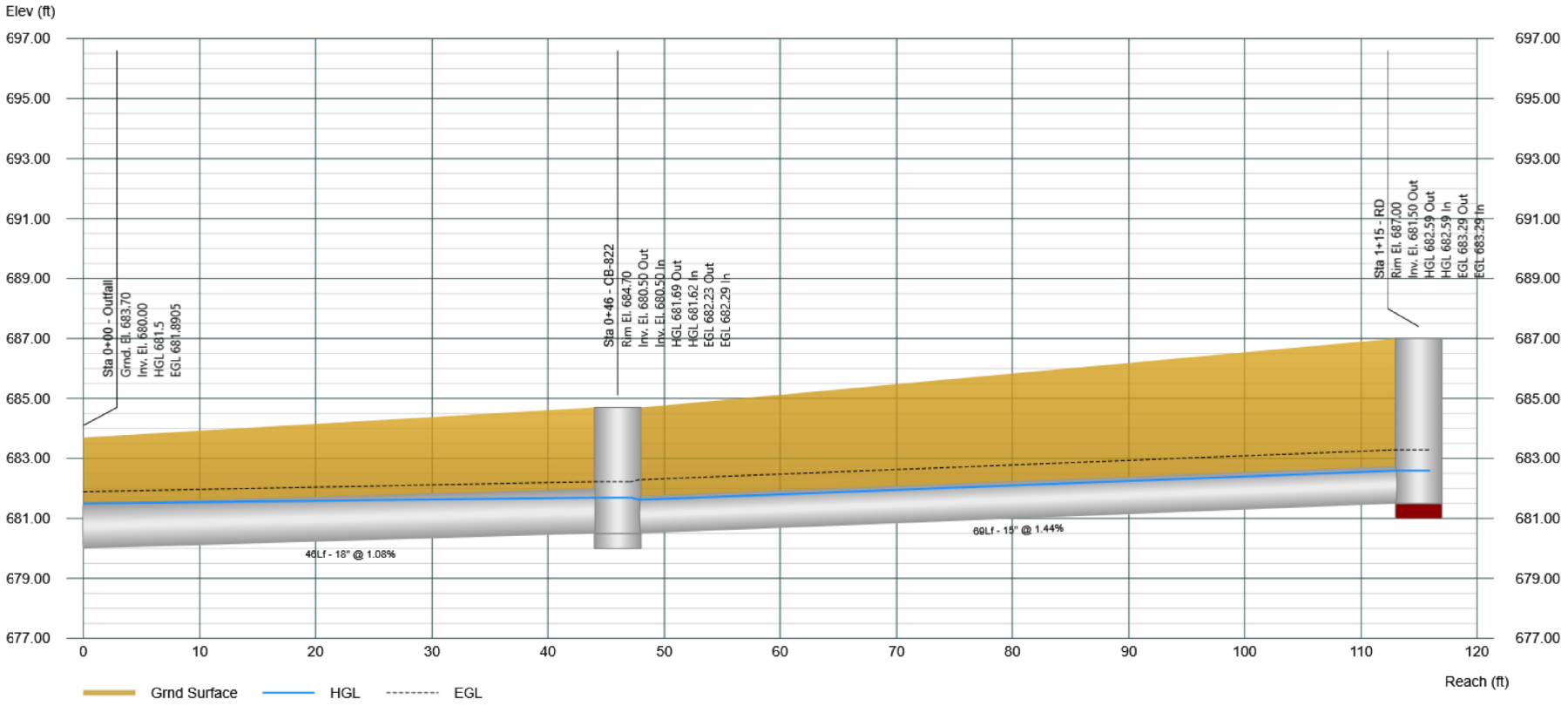


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

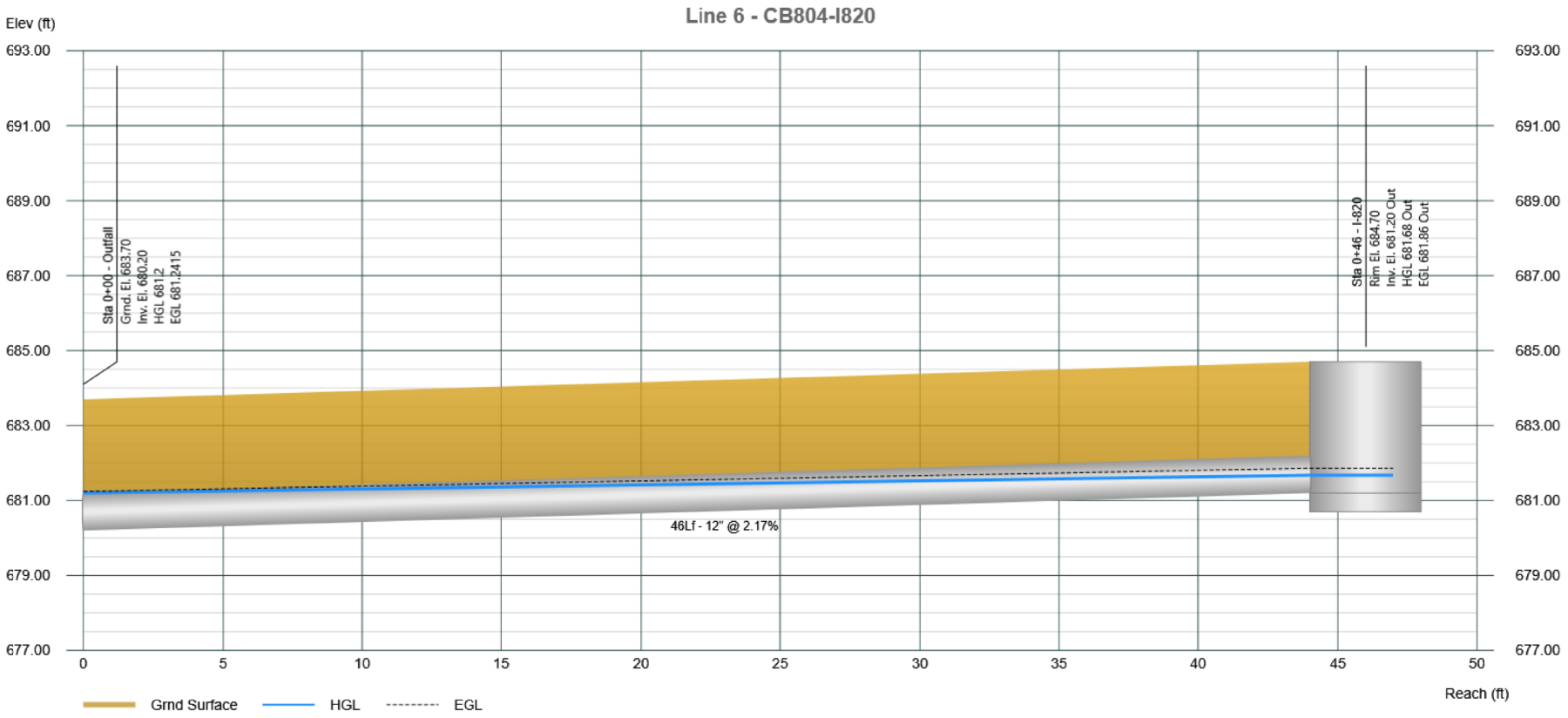


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

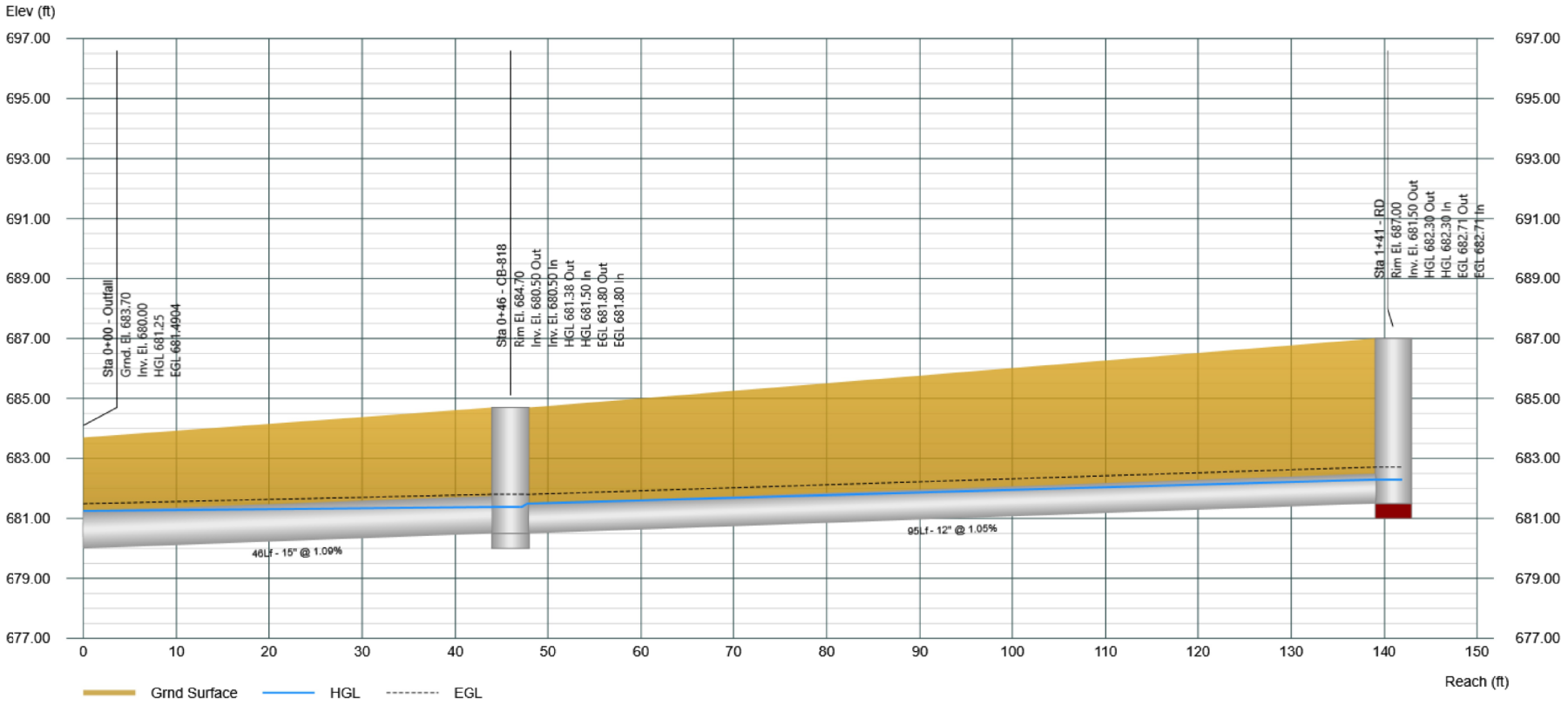


Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

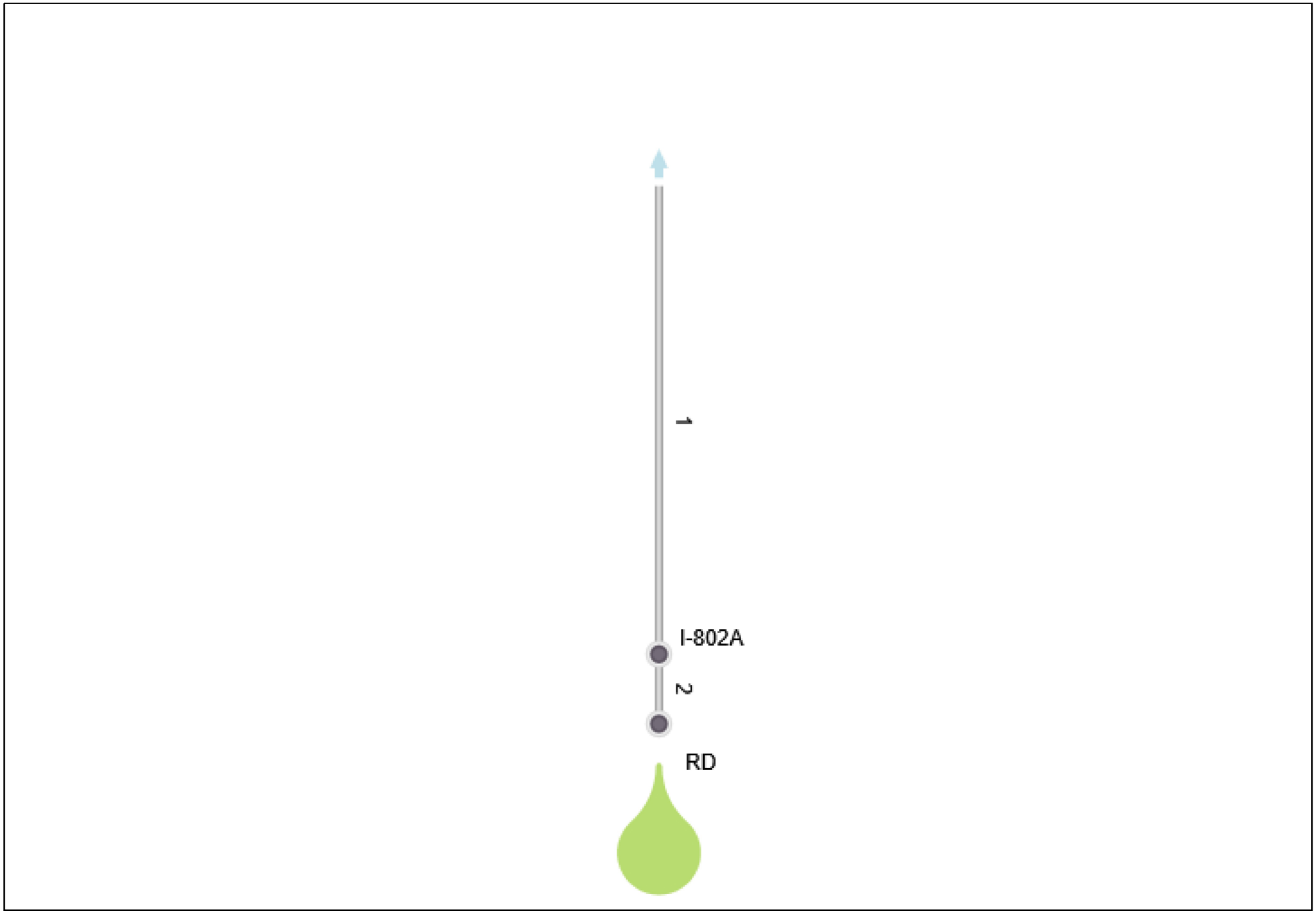


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Project File: 12271-800A.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	67.00	0.000	0.480	0.00	0.00	0.43	10.0	10.03	6.77	2.93	2.37	3.73	12	0.44	684.30	684.00	685.45	685.00	686.30	685.00	1
Line 2	10.00	0.480	0.480	0.90	0.43	0.43	10.0	10.00	6.78	2.93	3.56	3.73	12	1.00	684.40	684.30	685.52	685.45	687.00	686.30	2

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

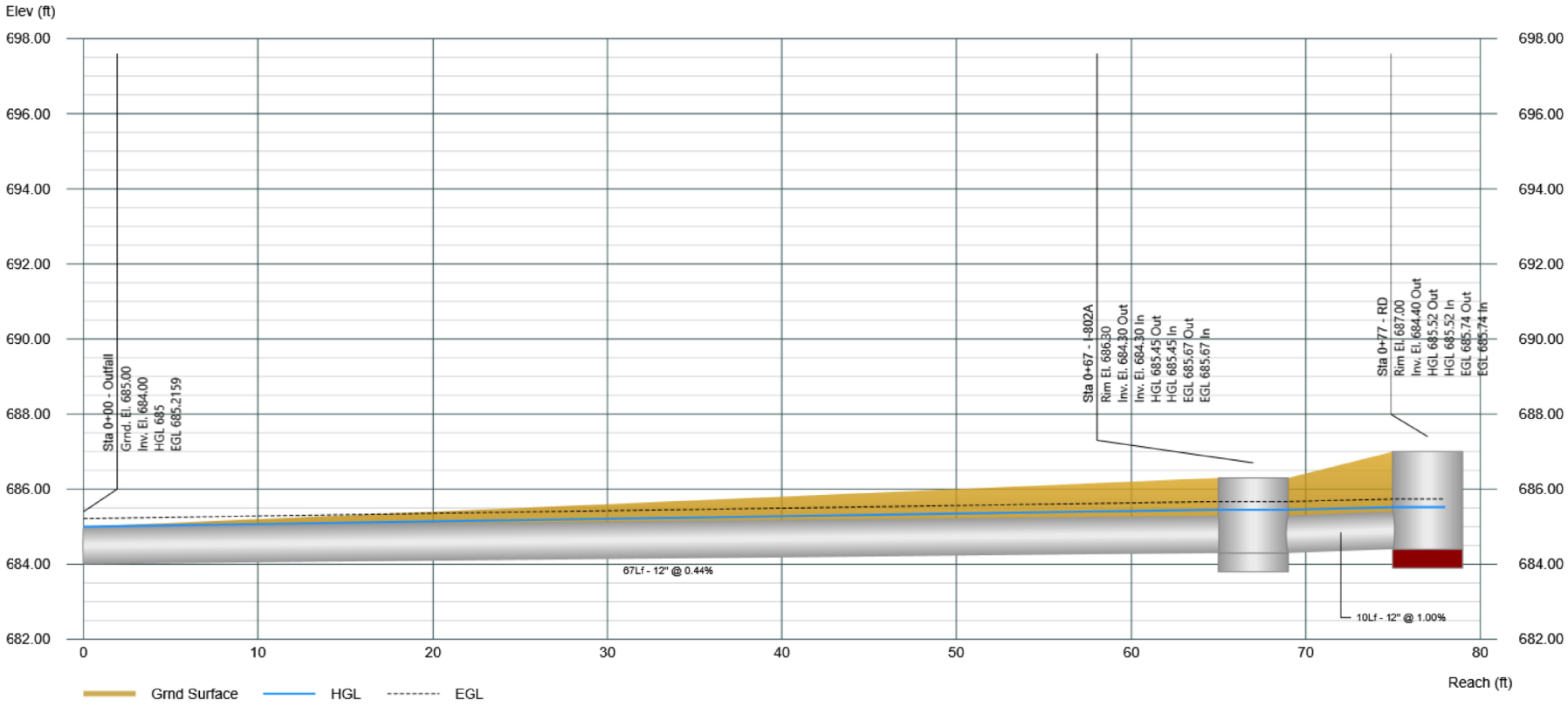
Project File: 12271-800A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

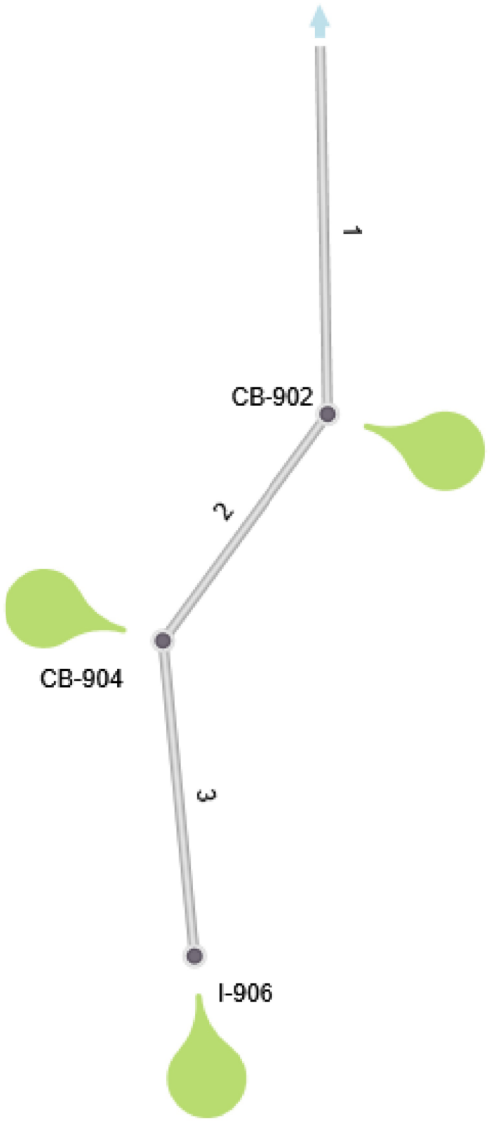


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	60.00	0.180	0.510	0.90	0.16	0.46	10.0	10.27	6.71	3.08	4.57	2.64	15	0.50	676.30	676.00	677.36	677.25	682.00	682.00	1
Line 2	46.00	0.170	0.330	0.90	0.15	0.30	10.0	10.16	6.74	2.00	6.21	4.07	12	3.04	679.90	678.50	680.50	679.10	683.40	682.00	2
Line 3	52.00	0.160	0.160	0.90	0.14	0.14	10.0	10.00	6.78	0.98	5.63	2.27	12	2.50	681.20	679.90	681.62	680.73	684.70	683.40	3

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

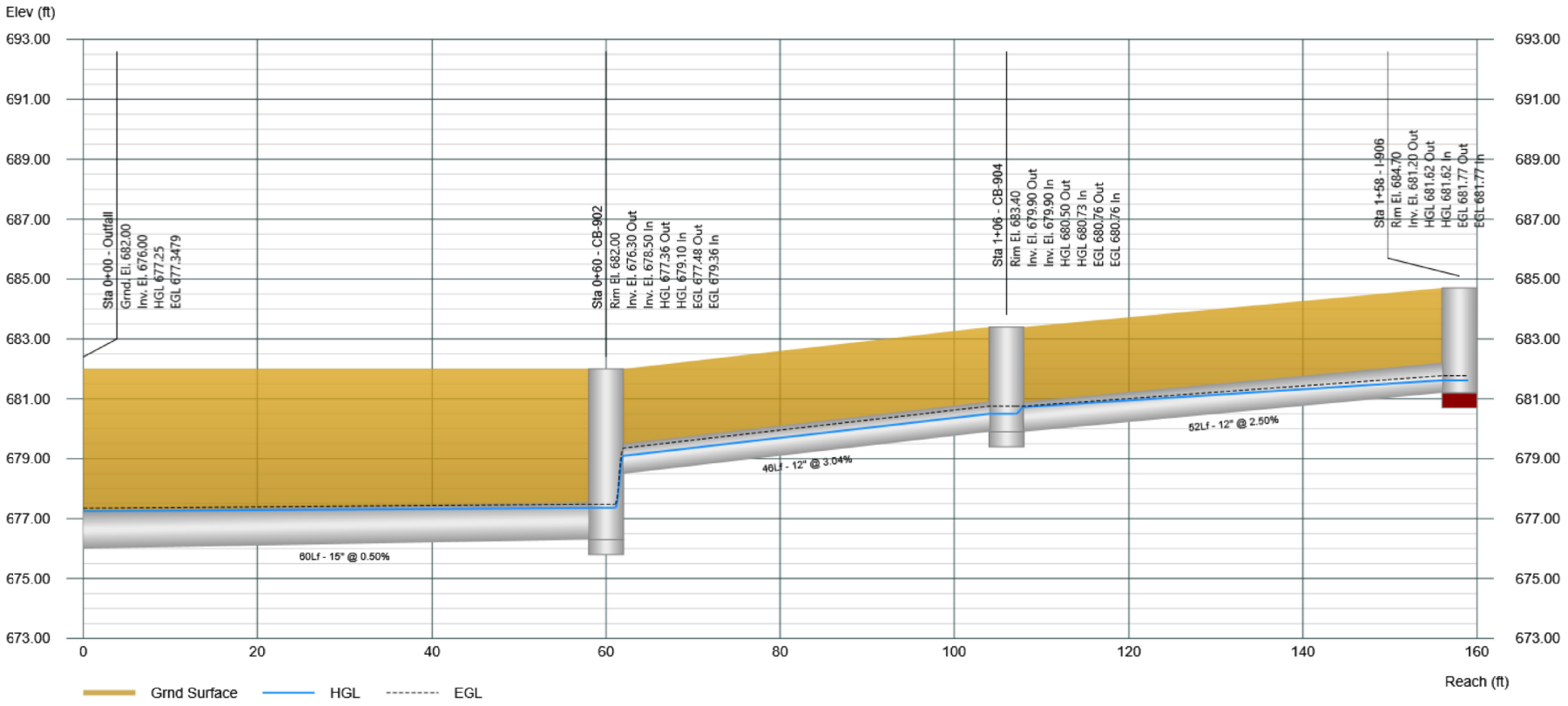
Project File: 12271-SYS900.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

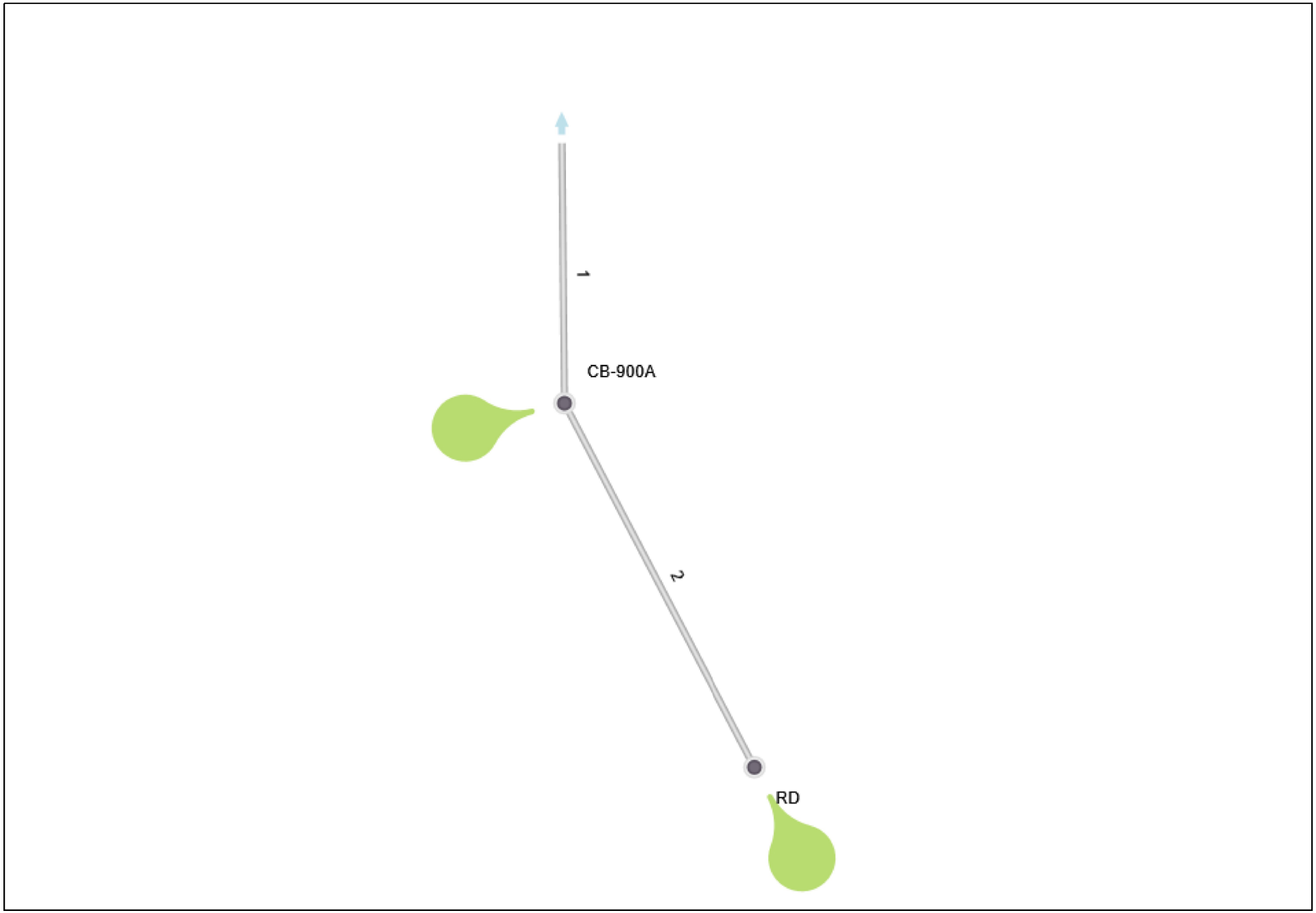


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	46.00	0.230	0.720	0.90	0.21	0.65	10.0	10.21	6.72	4.36	6.21	5.75	12	3.04	677.40	676.00	678.28	677.00	684.50	684.50	1
Line 2	73.00	0.490	0.490	0.90	0.44	0.44	10.0	10.00	6.78	2.99	4.17	4.85	12	1.37	681.50	680.50	682.23	681.23	687.00	684.50	2

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

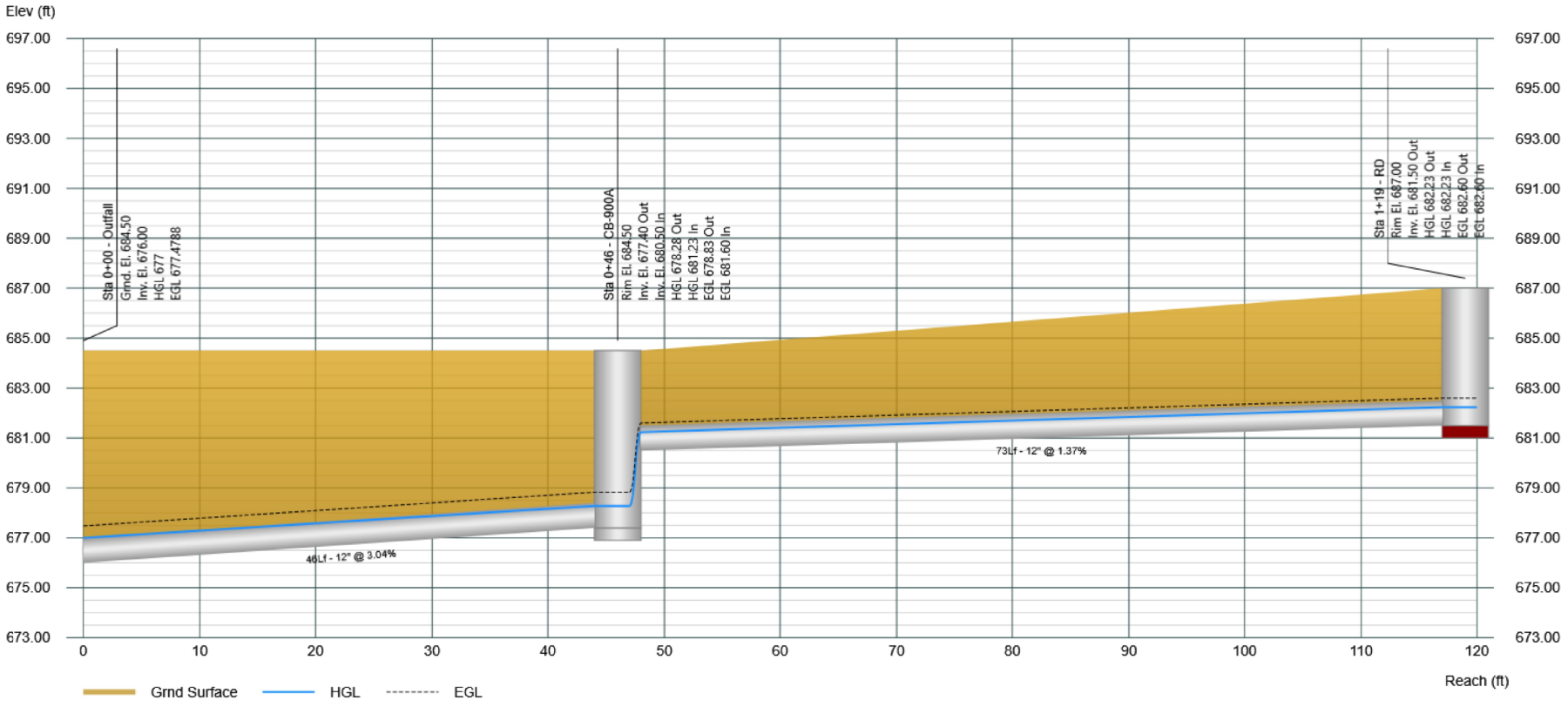
Project File: 12271-SYS900A.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023

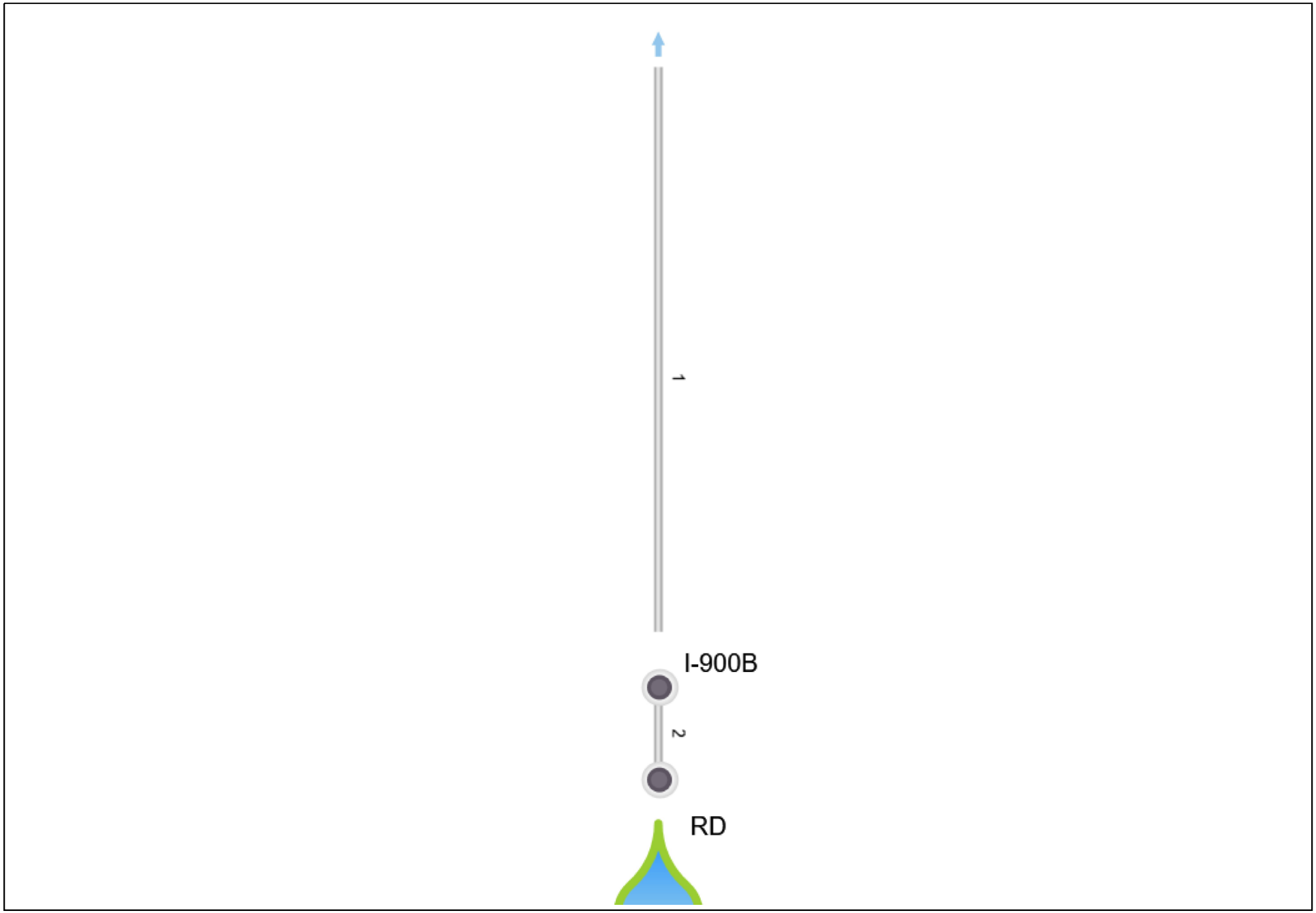


Plan View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



Project File: 12271-900B.sws

Storm Sewer Tabulation

Project Name: Enter Project Name...

Stormwater Studio 2022 v 3.0.0.29

03-24-2023

Line ID	Length	Drng Area		Rational	C x A		Tc		Intensity	Total Q	Capacity	Velocity	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 1	67.00	0.000	0.480	0.00	0.00	0.43	10.0	10.03	6.77	2.93	2.37	3.73	12	0.44	684.30	684.00	685.45	685.00	686.30	685.00	1
Line 2	10.00	0.480	0.480	0.90	0.43	0.43	10.0	10.00	6.78	2.93	3.56	3.73	12	1.00	684.40	684.30	685.52	685.45	687.00	686.30	2

Notes: IDF File = BULL 75Modified-2020.idf, Return Period = 10-yrs.

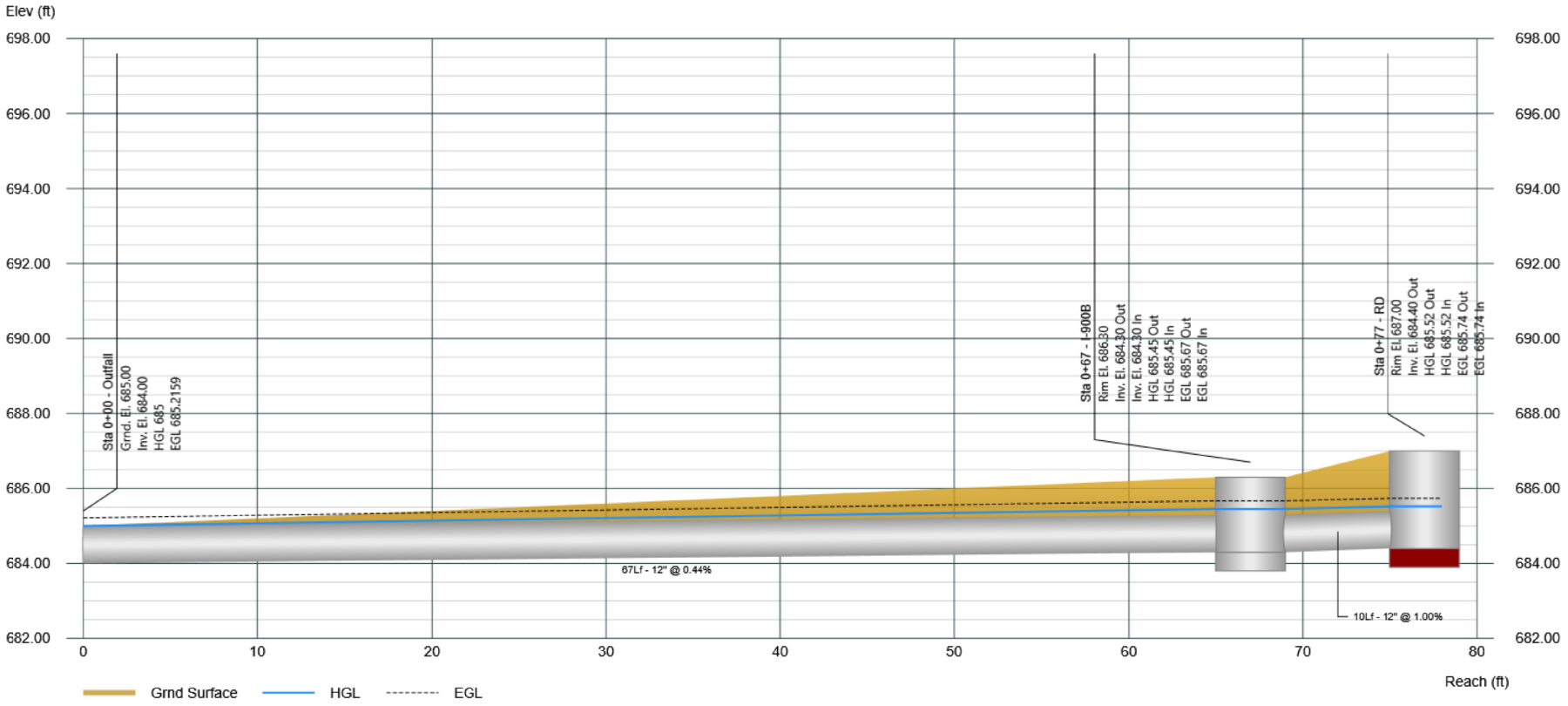
Project File: 12271-900B.sws

Profile View

Stormwater Studio 2022 v 3.0.0.29

Project Name: Enter Project Name...

03-24-2023



TAB 4
SITE DETENTION REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

Existing Depressional Storage Calculations

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.00	60						
OVERFLOW	686.50	3,544	1,802	0.50	901	33	0.021	0.021
T/BERM	686.90	7,477	5,510	0.40	2,204	82	0.051	0.071

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.50***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.50***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.00	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.50	0.000			0.000	
TOP OF BERM	686.90	0.000	25.00	16.44	16.444	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	681.60	0						
	682.00	3,186	1,062	0.40	425	16	0.010	0.010
	683.00	19,925	11,555	1.00	11,555	428	0.265	0.275
	684.00	65,872	42,898	1.0	42,898	1,589	0.985	1.260
	684.00	90,672	78,272	0.0	0	0	0.000	1.260
OVERFLOW	684.10	102,209	96,441	0.1	9,644	357	0.221	1.481
	684.50	179,199	140,704	0.4	56,282	2,085	1.292	2.773

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

OVERFLOW ELEVATION ***684.10*** ***FT***

NOTES:
1) Weir Equation = $CLH^{1.5}$
2) C=2.6

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	681.60	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	684.10	0.000			0.000	
T/BERM	684.50	0.000	275.00	180.882	180.882	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	685.70	0						
	686.00	2,320	773	0.30	232	9	0.005	0.005
OVERFLOW	686.20	4,366	3,343	0.20	669	25	0.015	0.021
T/BERM	686.50	12,545	8,456	0.30	2,537	94	0.058	0.079

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.20***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.20***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	685.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.20	0.000			0.000	
T/BERM	686.50	0.000	165.00	70.49	70.492	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	683.50	674						
OVERFLOW	684.00	24,800	12,737	0.50	6,368	236	0.146	0.146
	684.50	80,182	52,491	0.50	26,246	972	0.603	0.749

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

OVERFLOW ELEVATION ***684.00*** ***FT***

NOTES:
1) Weir Equation = $CLH^{1.5}$
2) C=2.6

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	683.50	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	684.00	0.000			0.000	
T/BERM	684.50	0.000	84.00	77.216	77.216	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	684.70	1,687						
	685.00	5,944	3,815	0.30	1,145	42	0.026	0.026
OVERFLOW	685.30	11,823	8,883	0.30	2,665	99	0.061	0.087
T/BERM	685.70	28,874	20,349	0.40	8,139	301	0.187	0.274

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***685.30***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***685.30***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	684.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	685.30	0.000			0.000	
T/BERM	685.70	0.000	165.00	108.53	108.529	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.2
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.07	0						
OVERFLOW	686.39	554	185	0.32	59	2	0.001	0.001
T/BERM	687.00	4,054	2,304	0.61	1,405	52	0.032	0.034

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.2
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.39***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.39***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.07	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.39	0.000			0.000	
T/BERM	687.00	0.000	104.00	128.83	128.825	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.3
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.67	0						
	687.00	896	299	0.33	99	4	0.002	0.002
OVERFLOW	687.10	1,604	1,250	0.10	125	5	0.003	0.005
T/BERM	687.30	3,233	2,418	0.20	484	18	0.011	0.016

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.3
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***687.10***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***687.10***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.67	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	687.10	0.000			0.000	
T/BERM	687.30	0.000	60.00	13.95	13.953	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.4
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.28	0						
OVERFLOW	686.35	554	185	0.07	13	0	0.000	0.0003
T/BERM	686.50	4,054	2,304	0.15	346	13	0.008	0.008

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.4
SITE CONDITION: EXISTING

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.35***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.35***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.28	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.35	0.000			0.000	
T/BERM	686.50	0.000	75.00	11.33	11.328	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.5
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.15	0						
OVERFLOW	686.86	554	185	0.71	131	5	0.003	0.003
T/BERM	687.20	11,224	5,889	0.34	2,002	74	0.046	0.049

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.5
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.86***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.86***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.15	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.86	0.000			0.000	
T/BERM	687.20	0.000	44.00	22.68	22.680	

Existing Condition Calculations & Existing Peak Flow to I-94 ROW HEC-HMS Summary

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA A
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.088	8.624
D	PERVIOUS - GRASS	80	0.286	22.88
D	PERVIOUS - WOODS	77	0.203	15.631
		TOTALS =	0.577	47
			0.00090 sq. mi	

CN (weighted) = Total Product / Total Area = 47.14 / 0.58 = 81.69

Total Pervious	0.29
Total Impervious	0.09
% Impervious	15.3%

USE CN = 81.69

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA A
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.012	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.29	HR
		17.13	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	117	FEET
9.	LAND SLOPE, S	0.011	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.70	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.1	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.30**	**HR**
		18.3	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA B
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.128	10.24
D	PERVIOUS - WOODS	77	1.065	82.005
		TOTALS =	1.193	92
			0.00186 sq. mi	

CN (weighted) = Total Product / Total Area = 92.25 / 1.19 = 77.32

Total Pervious	0.13
Total Impervious	0.00
% Impervious	0.0%

USE CN = 77.32

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA B
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.004	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.67	HR
		40.01	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	276	FEET
9.	LAND SLOPE, S	0.007	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.34	
11.	$T_t = \frac{L}{3600\,V}$	0.06	HR
		3.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.72**	**HR**
		43.4	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.404	39.592
D	PERVIOUS - GRASS	80	0.521	41.68
D	PERVIOUS - WOODS	77	3.421	263.417
		TOTALS =	4.346	345
			0.00679 sq. mi	

CN (weighted) = Total Product / Total Area = 344.69 / 4.35 = 79.31

Total Pervious	0.52
Total Impervious	0.40
% Impervious	9.3%

USE CN = 79.31

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.003	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.75	HR
		44.89	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	458	FEET
9.	LAND SLOPE, S	0.010	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.62	
11.	$T_t = \frac{L}{3600\,V}$	0.08	HR
		4.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.83**	**HR**
		49.6	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.047	4.606
D	PERVIOUS - GRASS	80	0.131	10.48
D	PERVIOUS - WOODS	77	0.259	19.943
		TOTALS =	0.437	35
			0.00068 sq. mi	

CN (weighted) = Total Product / Total Area = 35.03 / 0.44 = 80.16

Total Pervious	0.13
Total Impervious	0.05
% Impervious	10.8%

USE CN = 80.16

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C.1
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.013	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.42	HR
		24.97	MIN
7.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.42**	**HR**
		25.0	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.181	17.738
D	PERVIOUS - GRASS	80	1.109	88.72
D	PERVIOUS - WOODS	77	2.829	217.833
		TOTALS =	4.119	324
			0.00644 sq. mi	

CN (weighted) = Total Product / Total Area = 324.29 / 4.12 = 78.73

Total Pervious	1.11
Total Impervious	0.18
% Impervious	4.4%

USE CN = 78.73

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	280	FEET
9.	LAND SLOPE, S	0.005	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.14	
11.	$T_t = \frac{L}{3600\,V}$	0.07	HR
		4.1	MIN

12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.57**	**HR**
		34.4	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X / Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.061	4.88
D	PERVIOUS - WOODS	77	1.32	101.64
		TOTALS =	1.381	107
			0.00216 sq. mi	

CN (weighted) = Total Product / Total Area = 106.52 / 1.38 = 77.13

Total Pervious	0.06
Total Impervious	0.00
% Impervious	0.0%

USE CN = 77.13

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D.1
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	132	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.53**	**HR**
		31.8	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.2
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.216	21.168
D	PERVIOUS - GRASS	80	0.164	13.12
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.380	34
			0.00059 sq. mi	

CN (weighted) = Total Product / Total Area = 34.29 / 0.38 = 90.23

Total Pervious	0.16
Total Impervious	0.22
% Impervious	56.8%

USE CN = 90.23

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.3
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.14	13.72
D	PERVIOUS - GRASS	80	0	0
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.140	14
			0.00022 sq. mi	

CN (weighted) = Total Product / Total Area = 13.72 / 0.14 = 98.00

Total Pervious	0.00
Total Impervious	0.14
% Impervious	100.0%

USE CN = **98.00**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.4
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.115	11.27
D	PERVIOUS - GRASS	80	0.009	0.72
D	PERVIOUS - WOODS	77	0	0
TOTALS =			0.124	12
			0.00019 sq. mi	

CN (weighted) = Total Product / Total Area = 11.99 / 0.12 = 96.69

Total Pervious	0.01
Total Impervious	0.12
% Impervious	92.7%

USE CN = 96.69

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.5
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.824	80.752
D	PERVIOUS - GRASS	80	0.252	20.16
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	1.076	101
			0.00168 sq. mi	

CN (weighted) = Total Product / Total Area = 100.91 / 1.08 = 93.78

Total Pervious	0.25
Total Impervious	0.82
% Impervious	76.6%

USE CN = 93.78

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LOCATION: VILLAGE OF DEERFIELD, IL

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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	12.249	1200.402
D	PERVIOUS - GRASS	80	41.238	3299.04
D	OPEN WATER	100	6.913	691.3
		TOTALS =	60.400	5,191
			0.09438 sq. mi	

CN (weighted) = Total Product / Total Area = 5190.74 / 60.40 = 85.94

Total Pervious	41.24
Total Impervious	12.25
% Impervious	20.3%

USE CN = 85.94

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CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #1
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.002	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.58	HR
		35.09	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	1774	FEET
9.	LAND SLOPE, S	0.007	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.30	
11.	$T_t = \frac{L}{3600\,V}$	0.38	HR
		22.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.96**	**HR**
		57.7	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.648	51.84
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.648	52
			0.00101 sq. mi	

CN (weighted) = Total Product / Total Area = 51.84 / 0.65 = 80.00

Total Pervious	0.65
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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LOCATION: VILLAGE OF DEERFIELD, IL

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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.2
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.313	30.674
D	PERVIOUS - GRASS	80	2.262	180.96
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	2.575	212
			0.00402 sq. mi	

CN (weighted) = Total Product / Total Area = 211.63 / 2.58 = 82.19

Total Pervious	2.26
Total Impervious	0.31
% Impervious	12.2%

USE CN = 82.19

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
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CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #1.2
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.002	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.58	HR
		35.09	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	66	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.01	HR
		0.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.60**	**HR**
		35.8	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.3
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.034	3.332
D	PERVIOUS - GRASS	80	1.166	93.28
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	1.200	97
			0.00188 sq. mi	

CN (weighted) = Total Product / Total Area = 96.61 / 1.20 = 80.51

Total Pervious	1.17
Total Impervious	0.03
% Impervious	2.8%

USE CN = 80.51

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LAND SURVEYORS

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #2
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	2.691	263.718
D	PERVIOUS - GRASS	80	4.986	398.88
D	OPEN WATER	100	2.784	278.4
		TOTALS =	10.461	941
			0.01635 sq. mi	

CN (weighted) = Total Product / Total Area = 941.00 / 10.46 = 89.95

Total Pervious	4.99
Total Impervious	2.69
% Impervious	25.7%

USE CN = 89.95

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #2
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.012	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.29	HR
		17.13	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	740	FEET
9.	LAND SLOPE, S	0.010	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.58	
11.	$T_t = \frac{L}{3600\,V}$	0.13	HR
		7.8	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.42**	**HR**
		24.9	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #3
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.838	82.124
D	PERVIOUS - GRASS	80	3.554	284.32
D	OPEN WATER	100	2.829	282.9
		TOTALS =	7.221	649
			0.01128 sq. mi	

CN (weighted) = Total Product / Total Area = 649.34 / 7.22 = 89.92

Total Pervious	3.55
Total Impervious	0.84
% Impervious	11.6%

USE CN = 89.92

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #3
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.009	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.32	HR
		19.22	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	525	FEET
9.	LAND SLOPE, S	0.019	
10.	AVERAGE VELOCITY (FIGURE 3-1)	2.24	
11.	$T_t = \frac{L}{3600\,V}$	0.07	HR
		3.9	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.39**	**HR**
		23.1	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #3.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.115	9.2
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.115	9
			0.00018 sq. mi	

CN (weighted) = Total Product / Total Area = 9.20 / 0.12 = 80.00

Total Pervious	0.12
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **VOLUME PROVIDED**
DESCRIPTION: POND #1
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL/LOWER OUTLETS	675.70	301,258						
			318,489	0.6	191,093	7,078	4.387	4.387
UPPER OUTLETS	676.30	335,720						
			343,838	0.7	240,687	8,914	5.525	9.912
	677.00	351,956						
			376,398	1.0	376,398	13,941	8.641	18.553
	678.00	400,840						
			421,795	0.7	295,256	10,935	6.778	25.331
OVERFLOW	678.70	442,749						
			455,718	0.3	136,716	5,064	3.139	28.470
	679.00	468,688						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE (DUAL ELEVATION OUTLET)**
DESCRIPTION: POND #1
SITE CONDITION: EXISTING

ORFICE, C 0.61

LOWER ORIFICE			UPPER ORIFICE		
OUTLET ELEVATION	675.70	FT	OUTLET ELEVATION	676.30	FT
PIPE/OPENING SIZE	12	IN	PIPE/OPENING SIZE	12	IN
# OPENINGS	2	EACH	# OPENINGS	2	EACH
TOTAL AREA OPENING	1.570	S.F.	TOTAL AREA OPENING	1.570	S.F.
OVERFLOW ELEVATION	***678.70***	FT			

DESCRIPTION	ELEV FT	ORFICE #1 Q, FLOW CFS	ORFICE #2 Q, FLOW CFS	WEIR LEN. @ ELEV. FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL/LOWER OUTLETS	675.70	0.000	0.000		0.00	0.000	START OUTLET PIPE FLOW
UPPER OUTLETS	676.30	2.430	0.000		0.00	2.430	
	677.00	6.874	3.437		0.00	10.311	
	678.00	10.311	8.419		0.00	18.730	
OVERFLOW	678.70	12.152	10.594		0.00	22.746	
	679.00	12.860	11.399	373.00	159.354	183.614	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **VOLUME PROVIDED**
DESCRIPTION: POND #2
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL/OVERFLOW	678.50	69,797						
			69,797	0.5	34,898	1,293	0.801	0.801
	679.00	69,797						
			71,751	1.0	71,751	2,657	1.647	2.448
	680.00	73,705						
			74,550	1.5	111,825	4,142	2.567	5.015
	681.50	75,395						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE**
DESCRIPTION: POND #2
SITE CONDITION: EXISTING

ORIFICE, C	0.61		
OUTLET ELEVATION	***678.50***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS	1	EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***678.50***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	ORIFICE Q, FLOW CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL/OVERFLOW	678.50	0.000	40.00	0.000	0.000	START OUTLET PIPE FLOW
	679.00	0.000	40.00	36.770	36.770	
	680.00	0.000	40.00	191.060	191.060	
	681.50	0.000	40.00	540.400	540.400	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: VOLUME PROVIDED
DESCRIPTION: POND #3
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	677.70	36,838						
			36,920	0.3	11,076	410	0.254	0.254
	678.00	37,001						
			38,891	1.0	38,891	1,440	0.893	1.147
	679.00	40,781						
			43,356	1.0	43,356	1,606	0.995	2.142
	680.00	45,931						
			49,715	1.0	49,715	1,841	1.141	3.284
	681.00	53,499						
			61,659	1.0	61,659	2,284	1.415	4.699
	682.00	69,818						
			76,235	0.5	38,118	1,412	0.875	5.574
OVERFLOW	682.50	82,653						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE**
DESCRIPTION: POND #3
SITE CONDITION: EXISTING

ORIFICE, C	0.61	
OUTLET ELEVATION	***677.70***	***FT***
PIPE/OPENING SIZE	12.00	IN[5]
# OPENINGS	1	EACH
TOTAL AREA OPENING	0.785	S.F.
OVERFLOW ELEVATION	***682.50***	FT (C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$
5) Per Previous Design Plans

DESCRIPTION	ELEV FT	ORIFICE Q, FLOW CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL	677.70	0.000			0.000	START OUTLET PIPE FLOW
	678.00	0.520			0.520	FLOW PER PARTIALLY FULL PIPE FLOW EQUATIONS
	679.00	3.437			3.437	
	680.00	5.156			5.156	
	681.00	6.430			6.430	
	682.00	7.491			7.491	
OVERFLOW	682.50	7.969			7.969	

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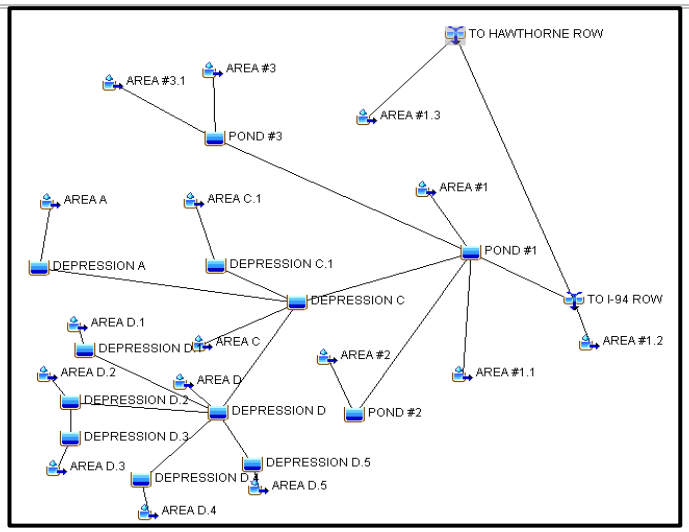
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS FOR ADEQUATE CAPACITY ANALYSIS**
DESCRIPTION:	EXISTING PEAK FLOWS TO I-94 ROW
SITE CONDITION:	EXISTING
STORM EVENT:	100-YEAR CRITICAL DURATION



Summary Results for Junction "TO I-94 ROW"

Project: EXISTING CONDITIONS Simulation Run: 100YR_18HR
Junction: TO I-94 ROW

Start of Run: 01Jan2000, 00:00
End of Run: 03Jan2000, 06:00
Compute Time: 24Mar2023, 10:10:20

Basin Model: Development Template
Meteorologic Model: 100YR18HR
Control Specifications: 18HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Discharge: 63.151 (CFS)
Volume: 46.156 (ACRE-FT)

Date/Time of Peak Discharge: 01Jan2000, 13:54

Required Detention Calculations & HEC-HMS inputs/outputs

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DRAINAGE DIVIDE AREA**
DESCRIPTION: EAST AND WEST DRAINAGE SITE AREAS
SITE CONDITION: EXISTING/PROPOSED

		AREA (ACRE)
EAST AREA	=	94.436
WEST AREA	=	6.585
TOTAL PROPERTY AREA	=	**101.021**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEVELOPMENT AREA**
DESCRIPTION: EAST AREA
SITE CONDITION: PROPOSED

		AREA (ACRE)
EAST AREA	=	**94.436**
	–	
EAST UNDISTURBED AREA		8.705
EAST DEVELOPMENT AREA	=	**85.731**
EAST UNRESTRICTED AREAS (PERVIOUS & IMPERVIOUS)		1.115
EAST DEVELOPMENT AREA TRIBUTARY TO PROPOSED STORMWATER BASIN	=	**84.616**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **CURVE NUMBER - UNRESTRICTED AREAS**
DESCRIPTION: DISTURBED SITE AREA NOT TRIBUTARY TO PROPOSED STORMWATER BASINS
SITE CONDITION: PROPOSED / REQUIRED STORMWATER MANAGEMENT

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number Table 5-7			Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98			0.032	3.136
D	PERVIOUS	80			1.083	86.64
				TOTALS =	1.115	89.78
					0.0017 sq. mi	

CN (weighted) =	Total Product / Total Area	=	89.78 / 1.115	= 80.52
Total Pervious	1.083			
Total Impervious	0.032			
% Impervious	2.87%			

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **CURVE NUMBER - DETAINED DEVELOPMENT AREA**
DESCRIPTION: ON-SITE DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASIN #1
SITE CONDITION: PROPOSED / REQUIRED STORMWATER MANAGEMENT

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio)	Curve Number Table 5-7	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	14.866	1456.868
D	PERVIOUS	80	5.422	433.76
		TOTALS =	20.288	1,890.63
			0.0317 sq. mi	

CN (weighted) = Total Product / Total Area = 1890.63 / 20.29 = 93.19

Total Pervious	5.42
Total Impervious	14.87
% Impervious	73%

USE CN = **93.19**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **CURVE NUMBER - DETAINED DEVELOPMENT AREA**
DESCRIPTION: ON-SITE DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASINS #2A-2D
SITE CONDITION: PROPOSED / REQUIRED STORMWATER MANAGEMENT

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio)	Curve Number Table 5-7	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	44.471	4358.158
D	OPEN WATER	100	6.104	610.4
D	PERVIOUS	80	13.753	1100.24
		TOTALS =	64.328	6,068.80
			0.1005 sq. mi	

CN (weighted) = Total Product / Total Area = 6068.80 / 64.33 = 94.34

Total Pervious	13.75
Total Impervious	50.58
% Impervious	79%

USE CN = **94.34**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS SUMMARY**
DESCRIPTION:	INPUTS/OUTPUTS OF ON-SITE UNRESTRICTED AREA
STORM EVENT:	2-YEAR & 100-YEAR
DURATION:	24-HOUR

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: ON-SITE UNRESTRICTED

Description:	
Downstream:	--None--
*Area (MI2)	0.0017
Latitude Degrees:	
Longitude Degrees:	
Discretization Method:	--None---
Canopy Method:	--None--
Snow Method:	--None--
Surface Method:	--None--
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: ON-SITE UNRESTRICTED

Initial Abstraction (IN)	
*Curve Number:	80.52
*Impervious (%)	0.0

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: ON-SITE UNRESTRICTED

Graph Type:	Standard (PRF 484)
*Lag Time (MIN)	6

Summary Results for Subbasin "ON-SITE UNRESTRICTED"

Project: REQUIRED DETENTION Simulation Run: 2YR_24HR
Subbasin: ON-SITE UNRESTRICTED

Start of Run:	01Jan2000, 00:00	Basin Model:	Development Template
End of Run:	10Jan2000, 00:00	Meteorologic Model:	2YR24HR
Compute Time:	24Mar2023, 00:26:12	Control Specifications:	24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Discharge:	0.219 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:01
Precipitation Volume:	0.303 (ACRE-FT)	Direct Runoff Volume:	0.140 (ACRE-FT)
Loss Volume:	0.163 (ACRE-FT)	Baseflow Volume:	0.000 (ACRE-FT)
Excess Volume:	0.140 (ACRE-FT)	Discharge Volume:	0.140 (ACRE-FT)

Summary Results for Subbasin "ON-SITE UNRESTRICTED"

Project: REQUIRED DETENTION Simulation Run: 100YR_24HR
Subbasin: ON-SITE UNRESTRICTED

Start of Run:	01Jan2000, 00:00	Basin Model:	Development Template
End of Run:	10Jan2000, 00:00	Meteorologic Model:	100YR24HR
Compute Time:	24Mar2023, 00:30:17	Control Specifications:	24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Discharge:	0.754 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:00
Precipitation Volume:	0.777 (ACRE-FT)	Direct Runoff Volume:	0.564 (ACRE-FT)
Loss Volume:	0.213 (ACRE-FT)	Baseflow Volume:	0.000 (ACRE-FT)
Excess Volume:	0.564 (ACRE-FT)	Discharge Volume:	0.564 (ACRE-FT)

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **NET ALLOWABLE RELEASE RATE**
DESCRIPTION: TOTAL SITE AREA TRIBUTARY TO STORMWATER BASIN
SITE CONDITION: PROPOSED / REQUIRED STORMWATER MANAGEMENT

1)	EAST DEVELOPMENT AREA		85.731	ACRES			
2)	2 YEAR WATERSHED RELEASE RATE		0.04	CFS/ACRE		*Per Lake County WDO Des Plaines River Watershed	
3)	2 YEAR GROSS ALLOWABLE RELEASE RATE		3.429	CFS			
4)	2 YEAR UNRESTRICTED RELEASE RATE		0.219	CFS		*2 YR - 24 HR EVENT	
5)	TOTAL 2 YEAR ALLOWABLE RELEASE RATE		3.210	CFS			
6)	INVERT OF LOWER ORIFICE #1		675.70	FT		*4" Minimum Orifice Per Lake County WDO	
7)	INVERT OF LOWER ORIFICE #2		676.30	FT		*4" Minimum Orifice Per Lake County WDO	
8)	2 YEAR HIGH WATER LEVEL BASIN		677.10	FT			
9)	LOWER ORIFICE #1 SIZE		5.25	IN	2	# OPENINGS	0.301 SF
10)	HEAD	UNSUBMERGED ORIFICE	1.18	FT	X	TYPE IN X TO SELECT	
		SUBMERGED ORFICE		FT			
11)	**LOWER ORIFICE #1 DISCHARGE @ 2YR HWL**		1.600	CFS			
	$Q = C \times A \times (2gh)^{0.5}$						
	g = 32.2 C = 0.61						
12)	LOWER ORIFICE #2 SIZE		6.25	IN	2	# OPENINGS	0.426 SF
13)	HEAD	UNSUBMERGED ORIFICE	0.54	FT	X	TYPE IN X TO SELECT	
		SUBMERGED ORFICE		FT			
14)	**LOWER ORIFICE #2 DISCHARGE @ 2YR HWL**		1.532	CFS			
	$Q = C \times A \times (2gh)^{0.5}$						
	g = 32.2 C = 0.61						
15)	**TOTAL DISCHARGE @ 2YR HWL**		**3.132**	**CFS**			
			RESTRICTOR DESIGN MEETS RELEASE REQUIREMENTS				
16)	100 YEAR WATERSHED RELEASE RATE		0.15	CFS/ACRE		*Per Lake County WDO Des Plaines River Watershed	
17)	100 YEAR TOTAL ALLOWABLE RELEASE		12.860	CFS			
18)	100 YEAR UNRESTRICTED RELEASE RATE		0.754	CFS		*100 YR - 24 HR EVENT	
19)	TOTAL 100 YEAR ALLOWABLE RELEASE RATE		12.106	CFS			
20)	100 YEAR HIGH WATER LEVEL BASIN		678.70	FT			
21)	UPPER ORIFICE SIZE		7.25	IN	4	# OPENINGS	1.147 SF
22)	HEAD	UNSUBMERGED ORIFICE	1.30	FT			
23)	**TOTAL DISCHARGE @ 100YR HWL**		**11.901**	**CFS**			
	$Q = C \times A \times (2gh)^{0.5}$						
	g = 32.2 C = 0.61		**RESTRICTOR DESIGN MEETS RELEASE REQUIREMENTS**				

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE (DUAL ELEVATION RESTRICTOR)**
DESCRIPTION: OUTLET CONTROL STRUCTURE
SITE CONDITION: PROPOSED / REQUIRED STORMWATER MANAGEMENT

ORFICE, C	0.61								
LOWER ORIFICES #1			LOWER ORIFICES #2			UPPER ORIFICES			
OUTLET ELEVATION	675.70	FT	OUTLET ELEVATION	676.30	FT	OUTLET ELEVATION	677.10	FT	
PIPE/OPENING SIZE	5.25	IN	PIPE/OPENING SIZE	6.25	IN	PIPE/OPENING SIZE	7.25	IN	
# OPENINGS	2	EACH	# OPENINGS	2	EACH	# OPENINGS	4	EACH	
TOTAL AREA OPENING	0.301	S.F.	TOTAL AREA OPENING	0.426	S.F.	TOTAL AREA OPENING	1.147	S.F.	
OVERFLOW ELEVATION	678.70	FT							

DESCRIPTION	ELEV FT	LOWER ORIFICES #1 Q, FLOW CFS	LOWER ORIFICES #2 Q, FLOW CFS	UPPER ORIFICE Q, FLOW CFS	WEIR LEN. @ ELEV. FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL	675.70	0.000	0.000	0.000		0.000	0.000	START OUTLET PIPE FLOW
	676.00	0.420	0.000	0.000		0.000	0.420	
LOWER ORIFICES #2	676.30	0.909	0.000	0.000		0.000	0.909	
UPPER ORIFICE/2-YR HWL	677.10	1.600	1.532	0.000		0.000	3.132	
	678.00	2.123	2.503	4.341		0.000	8.967	
100-YR HWL/OVERFLOW	678.70	2.455	3.051	6.395	230.00	0.000	11.901	
	679.00	2.584	3.258	7.096	230.00	98.261	111.199	
	680.00	2.973	3.869	9.048	230.00	886.372	902.262	
TOP OF BERM	680.70	3.218	4.244	10.194	230.00	1691.399	1709.056	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE**
DESCRIPTION: OUTLET CONTROL STRUCTURE - STORMWATER BASINS #2A-2D - FREE RELEASE CONDITION
SITE CONDITION: PROPOSED

ORIFICE, C	0.61	
OUTLET ELEVATION	***676.00***	***FT***
PIPE/OPENING SIZE	4.00	IN
# OPENINGS	1	EACH
TOTAL AREA OPENING	0.087	S.F.
OVERFLOW ELEVATION	***682.00***	FT (C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	ORIFICE Q, FLOW CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL	676.00	0.000			0.000	START OUTLET PIPE FLOW
	677.00	0.390			0.390	FLOW PER PARTIALLY FULL PIPE FLOW EQUATIONS
	678.00	0.578			0.578	
BASIN #1 100-YR HWL	678.70	0.680			0.680	
	679.00	0.719			0.719	
	680.00	0.836			0.836	
	681.00	0.939			0.939	
100-YR HWL	682.00	1.032	170.00		1.032	
	683.00	1.117	170.00	442.00	443.117	
TOP OF BERM	684.00	1.196	170.00	1,250.16	1251.360	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **STAGE DISCHARGE TABLE**
DESCRIPTION: OUTLET CONTROL STRUCTURE - STORMWATER BASINS #2A-2D - TAILWATER CONDITION
SITE CONDITION: PROPOSED

ORFICE, C	0.61		
OUTLET ELEVATION	***676.00***	***FT***	
BASIN #1 -100-YR HWL	**678.70**	***FT***	
PIPE/OPENING SIZE	4.00	IN	
# OPENINGS	1	EACH	
TOTAL AREA OPENING	0.087	S.F.	
OVERFLOW ELEVATION	***682.00***	FT (C = 2.6)	

NOTES:

1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	ORIFICE Q, FLOW CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
NWL	676.00	0.000			0.000	START OUTLET PIPE FLOW
	677.00	0.000			0.000	FLOW PER PARTIALLY FULL PIPE FLOW EQUATIONS
	678.00	0.000			0.000	
BASIN #1 100-YR HWL	678.70	0.000			0.000	
	679.00	0.234			0.234	
	680.00	0.487			0.487	
	681.00	0.648			0.648	
100-YR HWL	682.00	0.776	170.00		0.776	
	683.00	0.886	170.00	442.00	442.886	
TOP OF BERM	684.00	0.983	**170.00**	1,250.16	1251.148	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: STORMWATER BASIN #1
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	675.70	81,150						
			84,887	0.3	25,466	943	0.585	0.585
	676.00	88,623						
			90,861	0.3	27,258	1,010	0.626	1.210
	676.30	93,099						
			97,662	0.8	78,130	2,894	1.794	3.004
2-YR, 24-HR HWL	677.10	102,226						
			109,276	0.9	98,349	3,643	2.258	5.262
	678.00	116,327						
			121,963	0.7	85,374	3,162	1.960	**7.222**
100-YR, 24-HR HWL	678.70	127,599						
			130,059	0.3	39,018	1,445	0.896	8.117
	679.00	132,519						
			141,622	1.0	141,622	5,245	3.251	11.369
	680.00	150,724						
			160,682	0.7	112,477	4,166	2.582	13.951
TOP OF BERM	680.70	170,640						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: TOTAL VOLUME PROVIDED WITHIN STORMWATER BASINS #2A-2D
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	676.00	310,769						
			319,353	1.0	319,353	11,828	7.331	7.331
	677.00	327,937						
			337,096	1.0	337,096	12,485	7.739	15.070
2-YR, 24-HR HWL	678.00	346,256						
			352,716	0.7	246,901	9,144	5.668	20.738
BASIN #1 100-YR HWL	678.70	359,176						
			361,991	0.3	108,597	4,022	2.493	23.231
	679.00	364,806						
			374,389	1.0	374,389	13,866	8.595	31.826
	680.00	383,972						
			394,343	1.0	394,343	14,605	9.053	40.879
	681.00	404,715						
			415,344	1.0	415,344	15,383	9.535	**50.414**
100-YR HWL	682.00	425,974						
			437,518	1.0	437,518	16,204	10.044	60.458
	683.00	449,062						
			459,848	1.0	459,848	17,031	10.557	71.014
TOP OF BERM	684.00	470,635						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: STORMWATER BASIN #2A
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	676.00	8,929						
			10,189	1.0	10,189	377	0.234	0.234
	677.00	11,450						
			13,136	1.0	13,136	487	0.302	0.535
	678.00	14,821						
			15,960	0.7	11,172	414	0.256	0.792
BASIN #1 100-YR HWL	678.70	17,099						
			17,610	0.3	5,283	196	0.121	0.913
	679.00	18,122						
			19,929	1.0	19,929	738	0.458	1.371
	680.00	21,737						
			24,182	1.0	24,182	896	0.555	1.926
	681.00	26,628						
			29,180	1.0	29,180	1,081	0.670	**2.596**
100-YR HWL	682.00	31,732						
			34,229	1.0	34,229	1,268	0.786	3.382
	683.00	36,726						
			38,969	1.0	38,969	1,443	0.895	4.276
TOP OF BERM	684.00	41,213						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: STORMWATER BASIN #2B
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	676.00	35,966						
			37,537	1.0	37,537	1,390	0.862	0.862
	677.00	39,109						
			40,730	1.0	40,730	1,509	0.935	1.797
	678.00	42,352						
			43,517	0.7	30,462	1,128	0.699	2.496
BASIN #1 100-YR HWL	678.70	44,682						
			45,188	0.3	13,557	502	0.311	2.807
	679.00	45,695						
			47,417	1.0	47,417	1,756	1.089	3.896
	680.00	49,139						
			50,912	1.0	50,912	1,886	1.169	5.065
	681.00	52,684						
			54,507	1.0	54,507	2,019	1.251	**6.316**
100-YR HWL	682.00	56,329						
			59,022	1.0	59,022	2,186	1.355	7.671
	683.00	61,714						
			63,801	1.0	63,801	2,363	1.465	9.136
TOP OF BERM	684.00	65,889						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: STORMWATER BASIN #2C
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	676.00	85,047						
			87,487	1.0	87,487	3,240	2.008	2.008
	677.00	89,927						
			92,418	1.0	92,418	3,423	2.122	4.130
	678.00	94,908						
			96,681	0.7	67,677	2,507	1.554	5.684
BASIN #1 100-YR HWL	678.70	98,454						
			99,222	0.3	29,767	1,102	0.683	6.367
	679.00	99,989						
			102,580	1.0	102,580	3,799	2.355	8.722
	680.00	105,171						
			107,812	1.0	107,812	3,993	2.475	11.197
	681.00	110,453						
			113,145	1.0	113,145	4,191	2.597	**13.794**
100-YR HWL	682.00	115,836						
			118,578	1.0	118,578	4,392	2.722	16.517
	683.00	121,319						
			124,111	1.0	124,111	4,597	2.849	19.366
TOP OF BERM	684.00	126,903						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DETENTION VOLUME PROVIDED**
DESCRIPTION: STORMWATER BASIN #2D
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
NWL	676.00	180,828						
			184,139	1.0	184,139	6,820	4.227	4.227
	677.00	187,451						
			190,813	1.0	190,813	7,067	4.380	8.608
	678.00	194,175						
			196,558	0.7	137,591	5,096	3.159	11.766
BASIN #1 100-YR HWL	678.70	198,942						
			199,971	0.3	59,991	2,222	1.377	13.144
	679.00	200,999						
			204,462	1.0	204,462	7,573	4.694	17.837
	680.00	207,925						
			211,437	1.0	211,437	7,831	4.854	22.691
	681.00	214,950						
			218,513	1.0	218,513	8,093	5.016	**27.708**
100-YR HWL	682.00	222,076						
			225,690	1.0	225,690	8,359	5.181	32.889
	683.00	229,303						
			232,966	1.0	232,966	8,628	5.348	38.237
TOP OF BERM	684.00	236,630						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **HEC-HMS INPUTS SUMMARY FOR REQUIRED DETENTION ANALYSIS**
DESCRIPTION: DETAINED DEVELOPMENT AREA
SITE CONDITION: PROPOSED
STORM EVENT: 2-YEAR, 24-HOUR AND 100-YEAR, 24-HOUR

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A (BASIN #1)

Description:	
Downstream:	STORMWATER BASIN #1
*Area (MI2)	0.0317
Latitude Degrees:	
Longitude Degrees:	
Discretization Method:	--None---
Canopy Method:	--None--
Snow Method:	--None--
Surface Method:	--None--
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A (BASIN #1)

Initial Abstraction (IN)	
*Curve Number:	93.19
*Impervious (%)	0.0

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A (BASIN #1)

Graph Type:	Standard (PRF 484)
*Lag Time (MIN)	6

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A. (BASINS #2A-

Description:	
Downstream:	STORMWATER BASINS #2A-2D
*Area (MI2)	0.1005
Latitude Degrees:	
Longitude Degrees:	
Discretization Method:	--None---
Canopy Method:	--None--
Snow Method:	--None--
Surface Method:	--None--
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A. (BASINS #2A-

Initial Abstraction (IN)	
*Curve Number:	94.34
*Impervious (%)	0.0

Subbasin | Loss | Transform | Options

Basin Name: Development Template
Element Name: DETAINED D.A. (BASINS #2A-2D

Graph Type:	Standard (PRF 484)
*Lag Time (MIN)	6

BASIN #1

Elevation (FT)	Storage (ACRE-FT)	Discharge (CFS)
675.70	0.000	0.000
676.00	0.585	0.420
676.30	1.210	0.909
677.10	3.004	3.132
678.00	5.262	8.967
678.70	7.222	11.901

BASINS #2A-2D (FREE RELEASE)

Elevation (FT)	Storage (ACRE-FT)	Discharge (CFS)
676.0	0.000	0.000
677.0	7.331	0.390
678.0	15.070	0.578
678.7	20.738	0.680
679.0	23.231	0.719
680.0	31.826	0.836
681.0	40.879	0.939
682.0	50.414	1.032

BASINS #2A-2D (TAILWATER CONDITION)

Elevation (FT)	Storage (ACRE-FT)	Discharge (CFS)
676.0	0.000	0.000
677.0	7.331	0.001
678.0	15.070	0.002
678.7	20.738	0.003
679.0	23.231	0.004
680.0	31.826	0.234
681.0	40.879	0.487
682.0	50.414	0.776

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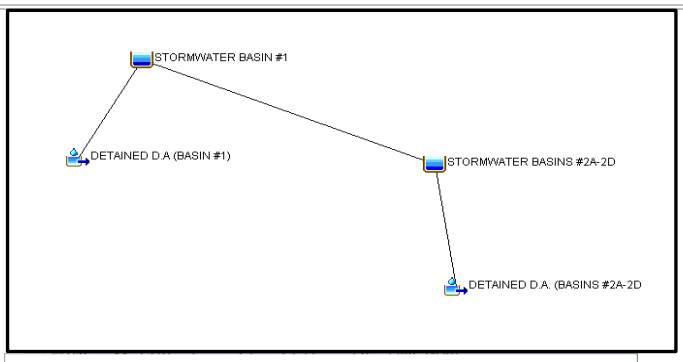
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **HEC-HMS RESULTS FOR REQUIRED DETENTION ANALYSIS**
DESCRIPTION: DETAINED DEVELOPMENT AREA; FREE RELEASE CONDITION
SITE CONDITION: PROPOSED
STORM EVENT: 2-YEAR, 24-HOUR AND 100-YEAR, 24-HOUR



Summary Results for Reservoir "STORMWATER BASIN #1"

Project: REQUIRED DETENTION Simulation Run: 2YR_24HR
Reservoir: STORMWATER BASIN #1

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 24Mar2023, 01:41:21 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	6.100 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:00
Peak Discharge:	2.889 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 19:11
Inflow Volume:	12.166 (ACRE-FT)	Peak Storage:	2.808 (ACRE-FT)
Discharge Volume:	11.632 (ACRE-FT)	Peak Elevation:	677.01 (FT)

Summary Results for Reservoir "STORMWATER BASIN #1"

Project: REQUIRED DETENTION Simulation Run: 100YR_24HR
Reservoir: STORMWATER BASIN #1

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 100YR24HR
Compute Time: 24Mar2023, 01:43:45 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	16.131 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:00
Peak Discharge:	10.663 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:00
Inflow Volume:	27.798 (ACRE-FT)	Peak Storage:	6.395 (ACRE-FT)
Discharge Volume:	26.738 (ACRE-FT)	Peak Elevation:	678.40 (FT)

Summary Results for Reservoir "STORMWATER BASINS #2A-2D"

Project: REQUIRED DETENTION Simulation Run: 2YR_24HR
Reservoir: STORMWATER BASINS #2A-2D

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 24Mar2023, 01:41:21 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	18.316 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:00
Peak Discharge:	0.553 (CFS)	Date/Time of Peak Discharge:	02Jan2000, 00:11
Inflow Volume:	14.549 (ACRE-FT)	Peak Storage:	14.038 (ACRE-FT)
Discharge Volume:	7.771 (ACRE-FT)	Peak Elevation:	677.87 (FT)

Summary Results for Reservoir "STORMWATER BASINS #2A-2D"

Project: REQUIRED DETENTION Simulation Run: 100YR_24HR
Reservoir: STORMWATER BASINS #2A-2D

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 100YR24HR
Compute Time: 24Mar2023, 01:43:45 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	48.957 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 15:01
Peak Discharge:	0.943 (CFS)	Date/Time of Peak Discharge:	02Jan2000, 00:13
Inflow Volume:	42.289 (ACRE-FT)	Peak Storage:	41.246 (ACRE-FT)
Discharge Volume:	14.693 (ACRE-FT)	Peak Elevation:	681.04 (FT)

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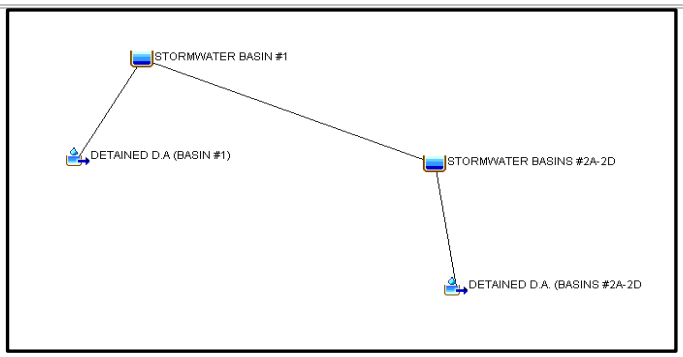
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **HEC-HMS RESULTS FOR REQUIRED DETENTION ANALYSIS**
DESCRIPTION: DETAINED DEVELOPMENT AREA; TAILWATER CONDITION ON BASINS #2A-2D
SITE CONDITION: PROPOSED
STORM EVENT: 100-YEAR, 24-HOUR



Summary Results for Reservoir "STORMWATER BASIN #1"

Project: REQUIRED DETENTION Simulation Run: 100YR_24HR
Reservoir: STORMWATER BASIN #1

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 100YR24HR
Compute Time: 24Mar2023, 02:05:38 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	15.484 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:00
Peak Discharge:	10.271 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 18:07
Inflow Volume:	20.026 (ACRE-FT)	Peak Storage:	6.133 (ACRE-FT)
Discharge Volume:	19.543 (ACRE-FT)	Peak Elevation:	678.31 (FT)

Summary Results for Reservoir "STORMWATER BASINS #2A-2D"

Project: REQUIRED DETENTION Simulation Run: 100YR_24HR
Reservoir: STORMWATER BASINS #2A-2D

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 10Jan2000, 00:00 Meteorologic Model: 100YR24HR
Compute Time: 24Mar2023, 02:05:38 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	48.957 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 15:01
Peak Discharge:	0.521 (CFS)	Date/Time of Peak Discharge:	02Jan2000, 00:15
Inflow Volume:	42.289 (ACRE-FT)	Peak Storage:	42.009 (ACRE-FT)
Discharge Volume:	6.920 (ACRE-FT)	Peak Elevation:	681.12 (FT)

Proposed Depressional Storage Calculations

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.00	60						
OVERFLOW	686.50	3,544	1,802	0.50	901	33	0.021	0.021
T/BERM	686.90	7,477	5,510	0.40	2,204	82	0.051	0.071

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.50***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.50***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.00	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.50	0.000			0.000	
TOP OF BERM	686.90	0.000	25.00	16.44	16.444	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	681.60	0						
	682.00	3,186	1,062	0.40	425	16	0.010	0.010
	683.00	19,886	11,536	1.00	11,536	427	0.265	0.275
	684.00	54,041	36,963	1.0	36,963	1,369	0.849	1.123
	684.00	79,449	66,745	0.0	0	0	0.000	1.123
OUTLET GRATE	684.10	87,290	83,369	0.1	8,337	309	0.191	1.315
	684.50	147,341	117,316	0.4	46,926	1,738	1.077	2.392
OVERFLOW	685.00	188,595	167,968	0.5	83,984	3,111	1.928	4.320

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***684.10***	***FT***	
GRATE TYPE	R-4341-A	IN	
# OF GRATES	1	EACH	
TOTAL AREA OPENING	2.500	S.F.	
OVERFLOW ELEVATION	***685.00***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	GRATE RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	681.60	0.000			0.000	START OUTLET PIPE FLOW
OUTLET	684.10	0.000			0.000	
OVERFLOW	685.00	11.610			11.610	
	685.50	14.480	50.00	45.962	60.442	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	685.70	0						
	686.00	2,320	773	0.30	232	9	0.005	0.005
OVERFLOW	686.20	4,366	3,343	0.20	669	25	0.015	0.021
T/BERM	686.50	12,545	8,456	0.30	2,537	94	0.058	0.079

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.20***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.20***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	685.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.20	0.000			0.000	
T/BERM	686.50	0.000	165.00	70.49	70.492	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	683.50	674						
OUTLET	684.00	25,408	13,041	0.50	6,521	242	0.150	0.150
	684.50	76,633	51,020	0.50	25,510	945	0.586	0.735
OVERFLOW	685.00	92,808	84,720	0.50	42,360	1,569	0.972	1.708

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

ORIFICE, C	0.61	
OUTLET ELEVATION	***684.00***	***FT***
PIPE/OPENING SIZE	12.00	IN
# OPENINGS	1	EACH
TOTAL AREA OPENING	0.785	S.F.
OVERFLOW ELEVATION	***685.00***	FT (C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	OUTLET RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	683.50	0.000			0.000	START OUTLET PIPE FLOW
OUTLET	684.00	0.000			0.000	
OVERFLOW	685.00	2.717			2.717	
	685.50	3.843	380.00	349.31	353.154	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	684.70	1,687						
	685.00	5,944	3,815	0.30	1,145	42	0.026	0.026
OVERFLOW	685.30	11,823	8,883	0.30	2,665	99	0.061	0.087
T/BERM	685.70	28,874	20,349	0.40	8,139	301	0.187	0.274

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: PROPOSED

ORFICE, C	0.61		
OUTLET ELEVATION	***685.30***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***685.30***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	684.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	685.30	0.000			0.000	
T/BERM	685.70	0.000	165.00	108.53	108.529	

Proposed Condition Calculations & Proposed Peak Flow to I-94 ROW HEC-HMS Summary

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA A
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.184	18.032
D	PERVIOUS - GRASS	80	0.244	19.52
D	PERVIOUS - WOODS	77	0.178	13.706
		TOTALS =	0.606	51
			0.00095 sq. mi	

CN (weighted) = Total Product / Total Area = 51.26 / 0.61 = 84.58

Total Pervious	0.24
Total Impervious	0.18
% Impervious	30.4%

USE CN = 84.58

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA A
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.012	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.29	HR
		17.13	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	117	FEET
9.	LAND SLOPE, S	0.011	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.70	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.1	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.30**	**HR**
		18.3	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA B
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.084	8.232
D	PERVIOUS - GRASS	80	0.268	21.44
D	PERVIOUS - WOODS	77	0.841	64.757
TOTALS =			1.193	94
			0.00186 sq. mi	

CN (weighted) = Total Product / Total Area = 94.43 / 1.19 = 79.15

Total Pervious	0.27
Total Impervious	0.08
% Impervious	7.0%

USE CN = 79.15

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA B
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.004	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.67	HR
		40.01	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	276	FEET
9.	LAND SLOPE, S	0.007	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.34	
11.	$T_t = \frac{L}{3600\,V}$	0.06	HR
		3.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.72**	**HR**
		43.4	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.662	64.876
D	PERVIOUS - GRASS	80	0.467	37.36
D	PERVIOUS - WOODS	77	2.534	195.118
TOTALS =			3.663	297
			0.00572 sq. mi	

CN (weighted) = Total Product / Total Area = 297.35 / 3.66 = 81.18

Total Pervious	0.47
Total Impervious	0.66
% Impervious	18.1%

USE CN = 81.18

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.003	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.75	HR
		44.89	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	458	FEET
9.	LAND SLOPE, S	0.010	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.62	
11.	$T_t = \frac{L}{3600\,V}$	0.08	HR
		4.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.83**	**HR**
		49.6	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.125	12.25
D	PERVIOUS - GRASS	80	0.099	7.92
D	PERVIOUS - WOODS	77	0.195	15.015
		TOTALS =	0.419	35
			0.00065 sq. mi	

CN (weighted) = Total Product / Total Area = 35.19 / 0.42 = 83.97

Total Pervious	0.10
Total Impervious	0.13
% Impervious	29.8%

USE CN = 83.97

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C.1
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.013	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.42	HR
		24.97	MIN
7.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.42**	**HR**
		25.0	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.974	95.452
D	PERVIOUS - GRASS	80	1.929	154.32
D	PERVIOUS - WOODS	77	2.005	154.385
TOTALS =			4.908	404
			0.00767 sq. mi	

CN (weighted) = Total Product / Total Area = 404.16 / 4.91 = 82.35

Total Pervious	1.93
Total Impervious	0.97
% Impervious	19.8%

USE CN = 82.35

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LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
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CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.010	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.31	HR
		18.43	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	424	FEET
9.	LAND SLOPE, S	0.006	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.24	
11.	$T_t = \frac{L}{3600\,V}$	0.10	HR
		5.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.40**	**HR**
		24.1	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.067	6.566
D	PERVIOUS - GRASS	80	0.192	15.36
D	PERVIOUS - WOODS	77	1.122	86.394
TOTALS =			1.381	108
			0.00216 sq. mi	

CN (weighted) = Total Product / Total Area = 108.32 / 1.38 = 78.44

Total Pervious	0.19
Total Impervious	0.07
% Impervious	4.9%

USE CN = 78.44

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
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CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D.1
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	132	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.53**	**HR**
		31.8	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	14.866	1456.868
D	PERVIOUS - GRASS	80	5.422	433.76
		TOTALS =	20.288	1,891
			0.03170 sq. mi	

CN (weighted) = Total Product / Total Area = 1890.63 / 20.29 = 93.19

Total Pervious	5.42
Total Impervious	14.87
% Impervious	73.3%

USE CN = 93.19

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.526	42.08
		TOTALS =	0.526	42
			0.00082 sq. mi	

CN (weighted) = Total Product / Total Area = 42.08 / 0.53 = 80.00

Total Pervious	0.53
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.2
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	1.338	107.04
		TOTALS =	1.338	107
			0.00209 sq. mi	

CN (weighted) = Total Product / Total Area = 107.04 / 1.34 = 80.00

Total Pervious	1.34
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #1.2
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.002	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.58	HR
		35.09	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	66	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.01	HR
		0.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.60**	**HR**
		35.8	**MIN**

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.2A
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.489	39.12
	TOTALS =		0.489	39
			0.00076 sq. mi	

CN (weighted) = Total Product / Total Area = 39.12 / 0.49 = 80.00

Total Pervious	0.49
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.3
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.617	49.36
	TOTALS =		0.617	49
			0.00096 sq. mi	

CN (weighted) = Total Product / Total Area = 49.36 / 0.62 = 80.00

Total Pervious	0.62
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #1.3A
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.032	3.136
D	PERVIOUS - GRASS	80	0.594	47.52
		TOTALS =	0.626	51
			0.00098 sq. mi	

CN (weighted) = Total Product / Total Area = 50.66 / 0.63 = 80.92

Total Pervious	0.59
Total Impervious	0.03
% Impervious	5.1%

USE CN = 80.92

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #2
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	42.459	4160.982
D	PERVIOUS - GRASS	80	11.117	889.36
D	OPEN WATER	100	6.104	610.4
		TOTALS =	59.680	5,661
			0.09325 sq. mi	

CN (weighted) = Total Product / Total Area = 5660.74 / 59.68 = 94.85

Total Pervious	11.12
Total Impervious	42.46
% Impervious	71.1%

USE CN = 94.85

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
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CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #2.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.122	9.76
		TOTALS =	0.122	10
			0.00019 sq. mi	

CN (weighted) = Total Product / Total Area = 9.76 / 0.12 = 80.00

Total Pervious	0.12
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

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LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #3.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.115	9.2
	TOTALS =		0.115	9
			0.00018 sq. mi	

CN (weighted) = Total Product / Total Area = 9.20 / 0.12 = 80.00

Total Pervious	0.12
Total Impervious	0.00
% Impervious	0.0%

USE CN = **80.00**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #3.1A
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.235	18.8
		TOTALS =	0.235	19
			0.00037 sq. mi	

CN (weighted) = Total Product / Total Area = 18.80 / 0.24 = 80.00

Total Pervious	0.24
Total Impervious	0.00
% Impervious	0.0%

USE CN = 80.00

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA #4
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.32	31.36
D	PERVIOUS - GRASS	80	3.734	298.72
D	PERVIOUS - WOODS	77	1.338	103.026
		TOTALS =	5.392	433
			0.00843 sq. mi	

CN (weighted) = Total Product / Total Area = 433.11 / 5.39 = 80.32

Total Pervious	3.73
Total Impervious	0.32
% Impervious	5.9%

USE CN = 80.32

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA #4
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.007	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.53	HR
		31.99	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	392	FEET
9.	LAND SLOPE, S	0.021	
10.	AVERAGE VELOCITY (FIGURE 3-1)	2.32	
11.	$T_t = \frac{L}{3600\,V}$	0.05	HR
		2.8	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.58**	**HR**
		34.8	**MIN**

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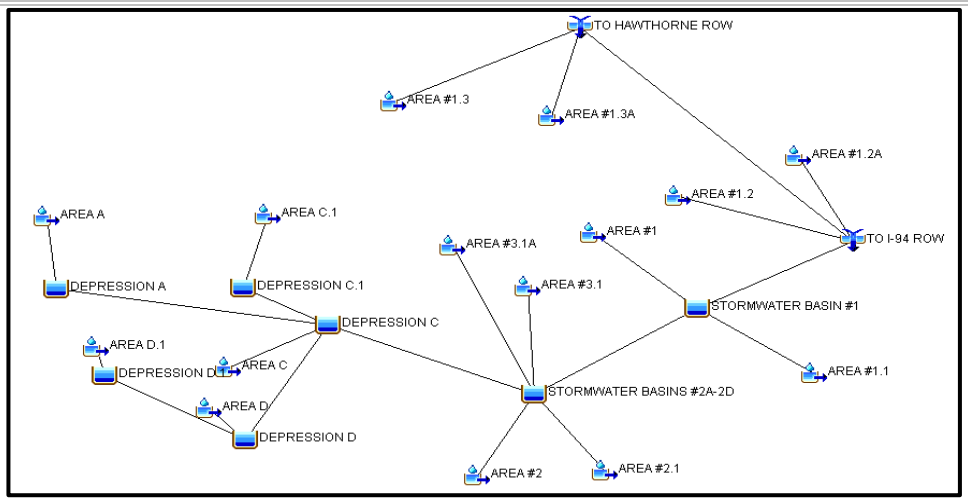
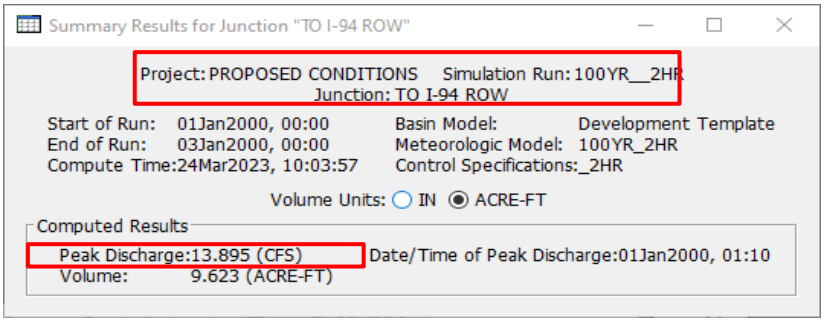
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS FOR ADEQUATE CAPACITY ANALYSIS**
DESCRIPTION:	PROPOSED PEAK FLOWS TO I-94 ROW
SITE CONDITION:	PROPOSED
STORM EVENT:	100-YEAR CRITICAL DURATION





RVR Calculations

SPACECO INC.
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SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **RUNOFF VOLUME REDUCTION**
DESCRIPTION: NATIVE PLANTED BASINS - PROVIDED BELOW OUTLET
SITE CONDITION: PROPOSED

RVR VOLUME PROVIDED IN BASIN

BASIN #1 DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOTTOM	675.50	73,725						
			77,437	0.2	15,487	574	0.356	**0.356**
NWL	675.70	81,150						

BASIN #2A DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOTTOM	675.50	8,044						
			8,486	0.5	4,243	157	0.097	**0.097**
NWL	676.00	8,929						

BASIN #2B DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOTTOM	675.50	34,432						
			35,199	0.5	17,600	652	0.404	**0.404**
NWL	676.00	35,966						

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **INFILTRATION RATE**
DESCRIPTION: BASIN RVR VOLUME
SITE CONDITION: PROPOSED

(1) **Table 3-1** Design Infiltration Rates for USDA Soil Textures (Univ. of Wisconsin, Madison, 2006)

USDA Soil Texture	Design Infiltration Rate (in/hr)
Sand	3.60
Loamy Sand	1.63
Sandy Loam	0.50
Loam	0.24
Silt Loam	0.13
Sandy Clay Loam	0.11
Silty Clay Loam	0.19
Clay Loam	0.03
Sandy Clay	0.04
Silty Clay	0.07
Clay	0.07

NOTES:

(1) Table 3-1 per Chicago Stormwater Ordinance Manual.
See Exhibit 13 of Tab 8 for Geotechnical Report

DESCRIPTION	DEPTH OF RVR FT	DEPTH OF RVR IN	SOIL NFILTRATION RATI IN/HR	INFILTRATION TIME HR
STORMWATER BASIN	0.50	6.00	0.07	**85.714**

TAB 5
SOIL EROSION AND SEDIMENTS CONTROL REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

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Schedule and Description of Maintenance for the Sediment and Erosion Control Plan

Construction will commence with the installation of silt fence that will act as a filter between the site construction and the adjacent properties, followed by installation of additional erosion control measures to be designed as part of the construction documents. Erosion control measures will remain in place and will be maintained until the site has been stabilized at which time they will be removed.

The erosion control measures shall be installed prior to initial land disturbance activities or as soon as practical. Specific measures will be included in the construction documents.

Except when prevented by inclement weather conditions, all disturbed areas to remain inactive for more than 14 days will be stabilized by seeding, sodding, mulching, covering, or equivalent erosion control measures, within seven days.

Permanent soil stabilization shall be provided for all disturbed areas within seven days after final grade is established.

All temporary erosion and sediment control practices shall be removed and disposed of within thirty days after final site stabilization is achieved or after the temporary practices are no longer necessary. Trapped sediment shall be permanently stabilized to prevent further erosion.

TAB 6
FLOODPLAIN REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

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There is no regulatory floodplain shown on the project site, per the FIRM map on Exhibit 3.

TAB 7
WETLAND/BUFFER REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

WETLAND DELINEATION REPORT

PREPARED FOR:

BRIDGE DEVELOPMENT PARTNERS, LLC

SUBJECT SITE:

1 Baxter Parkway
Unincorporated Lake County, West Deerfield Township,
Lake County Illinois 60015
Latitude 42.159349 - Longitude -87.879436

March 6, 2023

MIDWEST ECOLOGICAL
PO BOX 321 | GILBERTS, ILLINOIS 60136 | 847-514-5476

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WETLAND DELINEATION REPORT

EXECUTIVE SUMMARY

In response to the request of Bridge Development Partners LLC., Midwest Ecological, Inc. (MEI) has performed and completed a wetland delineation for the approximate 100-acre development located a 1 Baxter Parkway. Geographically the site is found within Sections 31, Township 43 North, Range 12 East of the Third Principal Meridian within the Unincorporated Lake County, West Deerfield Township, Lake County Illinois. Utilizing the methods and criteria established by the U.S. Army Corps of Engineers (USACE) in their Corps of Engineers Wetlands Delineation Manual (1987), Midwest Regional Supplement (2008), United States Department of Agriculture/Natural Resource Conservation Service, in their Wetland Mapping Conventions – NRCS, Illinois (1998) a wetland investigation of the property was performed. Based on the on-site investigation using the information obtained from the field samples Midwest Ecological, Inc. (MEI) identified four (4) wetland areas totaling 1.29 acres in size.

Site	On-site Acreage	Native Mean Conservatism	Floristic Quality Index	Anticipated Regulatory Agency	ADID (Y/N)
Wetland A	0.11 acres	2.27	8.78	IWLC	No
Wetland B	0.09 acres	1.89	5.67	IWLC	No
Wetland C	0.47 acres	2.74	14.24	IWLC	No
Wetland D	0.62 acres	2.45	11.51	IWLC	No
SWMB 1	*	*	*	Exempt Water Feature	No
SWMB 2	*	*	*	Exempt Water Feature	No
SWMB 3	*	*	*	Exempt Water Feature	No

Please Note: The three stormwater management basins were constructed from upland soil for the purpose of stormwater management. The basins are not recognized as wetlands within this report.

It should be noted that under the current guidelines, any disturbance of a wetland area requires a permit through the USACE and/or Lake County Stormwater Management Commission (LCSMC). However, mitigation may or may not be required, depending on the overall impact (> 0.10) to the wetland, Waters of the United States or Isolated Wetland of Lake County. This jurisdiction of the identified wetland is at the discretion of the USACE.

PURPOSE OF VISIT

The purpose of the site visit is to determine if any Wetlands (various types), Open water pockets, Creeks or Rivers exist on-site and to determine their approximate size, location, quality and jurisdiction. Wetlands encountered were delineated using standard methods sanctioned by the United States Army Corps of Engineers in their Corps of Engineers Wetlands Delineation Manual (1987), Regional Supplement (2008) and Wetland Mapping Conventions – NRCS, Illinois (1998).

DEFINITION OF A WETLAND

The USACE and the U.S. Environmental Protections Agency (USEPA) define wetlands as:

"areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions..." (33 CFR 328.3[b], 1977).

Although not defined by regulation, "normal circumstances" are interpreted by both the USACE and the Natural Resources Conservation Service to be "the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed" (7 CFR 12.31[b][2][*i*]).

METHODOLOGY

Prior to visiting the site, Midwest Ecological, Inc. (MEI) performed a review of the aforementioned National Wetland Inventory map, Lake County Soil Survey map and aerial photograph in order to determine existing site conditions. Site visits were then conducted by an Environmental Wetland Specialist from MEI on September 22 & October 5, 2022. The USACE Wetland Delineation Manual, dated January 1987, identifies the mandatory technical criteria for wetland identification. The three essential characteristics of a wetland are: 1) hydrophytic vegetation; 2) hydric soils; and 3) wetland hydrology. These characteristics are described below:

Hydrophytic Vegetation: The hydrophytic vegetation criterion is based on a separation of plants into five basic groups:

1) Obligate wetland plants (OBL) almost always occur (estimated probability >99%) in wetlands under natural conditions;
2) Facultative wetland plants (FACW) usually occur in wetlands (estimated probability 67-99%), but occasionally are found in non-wetlands;
3) Facultative plants (FAC) are equally likely to occur in wetland or non-wetlands (estimated probability 34-66%);
4) Facultative upland plants (FACU) usually occur in non-wetlands (estimated probability 67-99%), but occasionally are found in wetlands (estimated probability 1-33%); and
5) Obligate upland plants (UPL) almost always occur (estimated probability >99%) in non-wetlands under natural conditions.

Within each data point, vegetation is sampled in plots of varying size based on the type of vegetation being sampled. The following plot sizes are recommended by the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Midwest Region:

Trees	- 30-ft radius
Saplings/Shrubs	- 15-ft radius
Herbaceous Plants	- 1 m2 plot
Woody vines	- 30-ft radius

If greater than 50% of the plants present in each stratum or layer of the plant community are FAC, FACW, or OBL the subject area is considered a wetland in terms of vegetation (Dominance Test). If the vegetation does not meet the requirements of the Dominance Test, the Prevalence Index (PI) should be utilized.

The PI evaluates the coverage, on a weighted basis of coverage over all strata, of the vegetation within the plot. The PI ranges between 1.0 and 5.0, with a 3.0 or less indicating hydrophytic vegetation is present. If the PI is greater than 3.0, the dominance test is failed, but there are still hydric soil and wetland hydrology presence, the observation of morphological adaptations by vegetation can be used to indicate that the hydrophytic vegetation criteria is met.

Morphological adaptations are changes in the structure of vegetation in response to conditions outside the normal character of the plant. These adaptations include adventitious roots, multi-stemmed trunks, shallow root systems developed at or near the surface, and buttressing in tree species. To meet this indicator, more than 50% of the individuals of FACU species must exhibit the morphological adaptations. Care must be given that the adaptations observed are due wetter conditions that the species is used to as opposed to other factors such as shallow roots present because of erosion of the surface.

Hydric Soils: Hydric soils are defined in the manual as "soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part." Hydric soil indicators are distinctive characteristics that persist in the soil during both wet and dry periods and are used to identify hydric soils in the field. Field indicators include color, mottling, gleying, and sulfidic odor. A specific set of indicators has been developed by the USDA Natural Resource Conservation Service (Field Indicators of Hydric Soils in the United States) which provides a detailed description of how to identify the indicators in during a site visit. A soil meets the definition of a hydric soil if it exhibits at least one of these indicators.

Wetland Hydrology: Indicators of hydric soil and hydrophytic vegetation typically reflect the middle and long-term conditions of a site, but not the short-term conditions. The wetland hydrology criterion is often the most difficult to determine because of climatological variation. Typically, the presence of water for a week or more during the growing season creates anaerobic conditions indicative of wetland hydrology. Anaerobic conditions lead to the prevalence of wetland plants. The 2010 USACE Regional Supplement for the Midwest Region provides specific indicators in four different groups for wetland hydrology: Observation of Surface Water or Saturated Soils, Evidence of Recent Inundation, Evidence of Current or Recent Soil Saturation, and Evidence from Other Site Conditions or Data. If a site exhibits 1 primary indicator or 2 secondary indicators, then it meets the hydrology criteria for a wetland.

REFERENCE MATERIALS

The following materials were reviewed and utilized to assist in the field reconnaissance and completion of this report. See Appendix A for the Reference Materials.

Location

The approximate 100-acre study area is the Baxter Corporate Campus found at common address 1 Baxter Parkway. Geographically the site is found within Sections 31, Township 43 North, Range 12 East of the Third Principal Meridian within the Unincorporated Lake County, West Deerfield Township, Lake County Illinois (Latitude 42.159349 - Longitude -87.879436).

National & Lake County Advanced Identification Wetland Inventory Maps

The National & Lake County Advanced Identification Wetland Maps were reviewed to determine the location of wetland areas on the subject site. It should be noted that these maps are only large-scale guides, actual wetland locations and types may vary. Ultimate qualification occurs during field reconnaissance. Per our review of the NWI map the site contain one wetland area.

PFO1A: Palustrine, Forested, Broad-leaved Deciduous, Temporarily Flooded
PUBGx: Palustrine, Unconsolidated Bottom, Intermittently Exposed, excavated

Per our review of the Lake County Advanced Identification Map, two wetlands are found within woodland along the west property line along within the existing stormwater management basins. The wetlands noted are considered standard wetlands and not considered High Quality Aquatic Resources.

Lake County Soil Survey Map

The Soil Survey of Lake County, Illinois was investigated to determine the location of hydric soils on the subject site. Mapped hydric soils can indicate wetland areas. The following soils were found to be present on the subject site during our investigation.

320A – Frankfort silt loam, 0-2% slopes (somewhat poorly drained)
320B – Frankfort silt loam, 2-4% slopes (somewhat poorly drained)
465A – Montgomery silty clay loam, 0 to 2 percent slopes (somewhat poorly drained)
W – Water

United States Geological Survey Map

The United States Geological Survey Map & Hydrological Atlas (HA-69 & 71) as illustrated on the Wheeling and Highland Park Quadrangle U.S.G.S. Maps and Hydrological Atlas. These maps were reviewed to determine the historical local drainage patterns. Upon review of this drainage

patterns the majority of the site drains east to the North Branch of the Chicago River while the SW corner is conveyed to Des Plaines River.

Flood Insurance Rate Map

The Flood Insurance Rate Map (F.I.R.M.), for Lake County, Illinois, Community Panel No. 17097C0286K & 17097C0267K effective date September 13, 2013, were reviewed to determine the location of regulatory floodplains and floodways within the subject site. Mapped floodplains can be indicative of wetland hydrology.

Based on the Flood Insurance Rate Map, the study area does not contain a flood plain zone.

WETLAND FIELD DELINEATION

An on-site wetland delineation of the property was conducted on September 22 & October 5, 2022. Wetland boundaries were determined using the USACE guidelines and the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) guidelines, as stated previously. The routine method of wetland delineation was used, incorporating information on vegetation, hydrology and soils. The full width of the property was traversed and when a suspected wetland was encountered, the plant species present were determined by making several random passes through the area. If wetland plant species were found to be comprised of 50% or more of plant cover (i.e., wetland vegetation was dominant), the suspected wetland was further examined for the necessary field indicators of hydric soil and hydrology. The wetland boundaries were then defined and all observed plant species were recorded.

The plant taxonomic nomenclature and the Natural Area Index (NAI) used in this report follow's the Chicago Region FQA Index (2017). A more detailed survey would be necessary for a more complete plant list and while more species might be obtained from additional surveys, this would not change the areas delineated as wetlands.

Study Area: The Baxter Corporate Headquarters was developed in the early 1970's, where the site was mass graded. The development consists of Eleven buildings, with several internal roadways and parking areas. Three open-water stormwater management basins were constructed along the north and east property line. The areas constructed around basins and building consist of manicured turf grass.

A 14-acre woodland is found along the west property line. The woodland was avoided from the historical mass graded development and contains several wetland areas.

Wetland A: The delineated wetland is an emergent wetland located at the Baxter parkway and Saunders Road intersection. The wetland is surrounded by woodland on east, south and west and manicured grass to the north. Wetland A receives surface flow from the surrounding upland areas and roadway runoff. The delineated wetland area is **0.11-acres** in size.

The dominant vegetation observed was determined to be Narrow-leaved Cattail (*Typha angustifolia*). During our investigation positive wetland hydrology is met with the primary indicators of Saturation (A3) and Water marks (B1). The mapped soil is identified as Frankfort silt loam (320A) which is a somewhat poorly drained soil.

Said vegetation soils and hydrology information noted above can be found in the data sheets section of this report. Please note data sheets 1A & 2A references wetland A.

Study Information

Site: Baxter Campus

Locale: Wetland A

By: Robert Vanni

Conservatism-Based Metrics		Additional Metrics	
Mean C (native species)	2.27	Species Richness (all)	21.00
Mean C (all species)	1.62	Species Richness (native)	15.00
Mean C (native trees)	3.00	% Non-native	0.29
Mean C (native shrubs)	2.00	Wet Indicator (all)	-0.76
Mean C (native herbaceous)	2.22	Wet Indicator (native)	-0.80
FQAI (native species)	8.78	% hydrophyte (Midwest)	0.86
FQAI (all species)	7.42	% native perennial	0.57
Adjusted FQAI	19.16	% native annual	0.14
% C value 0	0.48	% annual	0.14
% C Value 1-3	0.33	% perennial	0.86
% C value 4-6	0.19		
% C value 7-10	0.00		

Species Acronym	Species Name (NWPL/Mohlenbrock)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
alisub	*Alisma subcordatum*	American Water-Plantain	3	OBL	-2	Forb	Perennial	Native
bidfro	*Bidens frondosa*	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
cxcris	*Carex cristatella*	Crested Sedge	4	FACW	-1	Sedge	Perennial	Native
cirarv	*Cirsium arvense*	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
epicol	*Epilobium coloratum*	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
frapen	*Fraxinus pennsylvanica*	Green Ash	4	FACW	-1	Tree	Perennial	Native
glystr	*Glyceria striata*	Fowl Manna Grass	4	OBL	-2	Grass	Perennial	Native
lytsal	*Lythrum salicaria*	Purple Loosestrife	0	OBL	-2	Forb	Perennial	Adventive
parins	*Parthenocissus inserta*	Thicket-Creeper	0	FACU	1	Vine	Perennial	Native
perpen	*Persicaria pensylvanica*	Pinkweed	0	FACW	-1	Forb	Annual	Native
phaaru	*Phalaris arundinacea*	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
pilpum	*Pilea pumila*	Canadian Clearweed	2	FACW	-1	Forb	Annual	Native
poapra	*Poa pratensis*	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
popdel	*Populus deltoides*	Eastern Cottonwood	0	FAC	0	Tree	Perennial	Native
quebic	*Quercus bicolor*	Swamp White Oak	5	FACW	-1	Tree	Perennial	Native
rhacat	*Rhamnus cathartica*	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
salint	*Salix interior*	Sandbar Willow	2	FACW	-1	Shrub	Perennial	Native
astsim	*Symphyotrichum lanceolatum*	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
astpil	*Symphyotrichum pilosum*	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
typang	*Typha angustifolia*	Narrow-Leaf Cat-Tail	0	OBL	-2	Forb	Perennial	Adventive
ulmame	*Ulmus americana*	American Elm	3	FACW	-1	Tree	Perennial	Native

Wetland A Jurisdictional Determination Opinion: It is MEI's opinion that Wetland A is an Isolated wetland of Lake County due to a lack of a tributary connection to a navigable waterway.

Wetland B: The delineated wetland is a depressional pocket found along Saunders Road along the west property line. The wetland is on the west edge of the woodland, within a contained

depression. Wetland B receives surface flow from the surrounding upland areas and roadway runoff. The delineated wetland area is 0.09-acres in size.

The dominant vegetation observed was determined to be Reed Canary Grass (*Phalaris arundinacea*). During our investigation positive wetland hydrology is met with the primary indicator of Saturation (A3). The soil is identified as Frankfort silt loam (320B) which is a somewhat poorly drained soil.

Said vegetation soils and hydrology information noted above can be found in the data sheets section of this report. Please note data sheets 1B & 2B references wetland B.

Study Information

Site: Baxter Campus

Locale: Wetland B

By: Robert Vanni

Conservatism-Based Metrics		**Additional Metrics**	
Mean C (native species)	1.89	Species Richness (all)	15.00
Mean C (all species)	1.13	Species Richness (native)	9.00
Mean C (native trees)	n/a	% Non-native	0.40
Mean C (native shrubs)	0.00	Wet Indicator (all)	-0.53
Mean C (native herbaceous)	2.00	Wet Indicator (native)	-0.56
FQAI (native species)	5.67	% hydrophyte (Midwest)	0.73
FQAI (all species)	4.39	% native perennial	0.47
Adjusted FQAI	14.63	% native annual	0.13
% C value 0	0.53	% annual	0.13
% C Value 1-3	0.33	% perennial	0.73
% C value 4-6	0.13		
% C value 7-10	0.00		

Species Acronym	Species Name (NWPL/Mohlenbrock)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
arcmin	*Arctium minus*	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
bidfro	*Bidens frondosa*	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
dipful	*Dipsacus fullonum*	Fuller's Teasel	0	FACU	1	Forb	Biennial	Adventive
epicol	*Epilobium coloratum*	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
lytsal	*Lythrum salicaria*	Purple Loosestrife	0	OBL	-2	Forb	Perennial	Adventive
perpen	*Persicaria pensylvanica*	Pinkweed	0	FACW	-1	Forb	Annual	Native
phaaru	*Phalaris arundinacea*	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
rhacat	*Rhamnus cathartica*	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
solalt	*Solidago altissima*	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
solgig	*Solidago gigantea*	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
astsim	*Symphyotrichum lanceolatum*	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
astpil	*Symphyotrichum pilosum*	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
typang	*Typha angustifolia*	Narrow-Leaf Cat-Tail	0	OBL	-2	Forb	Perennial	Adventive
verhas	*Verbena hastata*	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
vitrip	*Vitis riparia*	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native

Wetland B Jurisdictional Determination Opinion: It is MEI's opinion that Wetland B is an Isolated wetland of Lake County due to a lack of a tributary connection to a navigable waterway.

Wetland C: Wetland C is a wooded wetland pocket within the existing forest. The wetland is depressional where water ponds for a short time and infiltrates. The wetland receives surface

flow from the surrounding upland areas, but long periods of inundation was not observed. The wetland is mostly devoid of herbaceous vegetation; however a few pockets of vegetation was noted. The delineated wetland area is 0.47-acres in size.

The dominant vegetation found was determined to be Devil's pitchfork (*Bidens frondosa*), Common Buckthorn (*Rhamnus cathartica*), Ash-leaf Maple (Acer negundo) and Eastern Cottonwood (*Populus deltoides*). During our investigation, positive wetland hydrology was met with the primary indicators of Saturation (A3), Water Marks (B1) and Sparsely Vegetated Concave Surface (B8). Mapped soils are identified as Frankfort silt loam (320A) which is a somewhat poorly drained soil and Montgomery silty clay loam (465A) which is a poorly drained hydric soil. Primary soil indicators of thick dark surface (A12) are noted within the flagged boundary.

Said vegetation soils and hydrology information noted above can be found in the datasheets section of this report. Please note data sheets 1C-3C references wetland C.

Study Information

Site: Baxter Campus

Locale: Wetland C

By: Robert Vanni

Conservatism-Based Metrics		**Additional Metrics**	
Mean C (native species)	2.74	Species Richness (all)	38.00
Mean C (all species)	1.95	Species Richness (native)	27.00
Mean C (native trees)	2.40	% Non-native	0.29
Mean C (native shrubs)	2.00	Wet Indicator (all)	-0.55
Mean C (native herbaceous)	3.12	Wet Indicator (native)	-0.78
FQAI (native species)	14.24	% hydrophyte (Midwest)	0.79
FQAI (all species)	12.00	% native perennial	0.58
Adjusted FQAI	23.10	% native annual	0.13
% C value 0	0.42	% annual	0.16
% C Value 1-3	0.29	% perennial	0.82
% C value 4-6	0.26		
% C value 7-10	0.03		

Species Acronym	Species Name (NWPL/Mohlenbrock)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
aceneg	*Acer negundo*	Ash-Leaf Maple	0	FAC	0	Tree	Perennial	Native
arcmin	*Arctium minus*	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
bidfro	*Bidens frondosa*	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
cxanne	*Carex annectens*	Yellow-Fruit Sedge	3	FACW	-1	Sedge	Perennial	Native
cirarv	*Cirsium arvense*	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
epicol	*Epilobium coloratum*	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
eutmac	*Eutrochium maculatum*	Spotted Trumpetweed	5	OBL	-2	Forb	Perennial	Native
frapen	*Fraxinus pennsylvanica*	Green Ash	4	FACW	-1	Tree	Perennial	Native
glystr	*Glyceria striata*	Fowl Manna Grass	4	OBL	-2	Grass	Perennial	Native
impcap	*Impatiens capensis*	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
lycame	*Lycopus americanus*	Cut-Leaf Water-Horehound	4	OBL	-2	Forb	Perennial	Native
lytsal	*Lythrum salicaria*	Purple Loosestrife	0	OBL	-2	Forb	Perennial	Adventive
moralb	*Morus alba*	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
osmcin	*Osmunda cinnamomeum*	Cinnamon Fern	8	FACW	-1	Fern	Perennial	Native
parins	*Parthenocissus inserta*	Thicket-Creeper	0	FACU	1	Vine	Perennial	Native
parqui	*Parthenocissus quinquefolia*	Virginia-Creeper	4	FACU	1	Vine	Perennial	Native

perpen	*Persicaria pensylvanica*	Pinkweed	0	FACW	-1	Forb	Annual	Native
phaaru	*Phalaris arundinacea*	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
pilpum	*Pilea pumila*	Canadian Clearweed	2	FACW	-1	Forb	Annual	Native
poapra	*Poa pratensis*	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
popdel	*Populus deltoides*	Eastern Cottonwood	0	FAC	0	Tree	Perennial	Native
quebic	*Quercus bicolor*	Swamp White Oak	5	FACW	-1	Tree	Perennial	Native
ransce	*Ranunculus sceleratus*	Cursed Buttercup	4	OBL	-2	Forb	Annual	Native
rhacat	*Rhamnus cathartica*	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
rosmul	*Rosa multiflora*	Rambler Rose	0	FACU	1	Shrub	Perennial	Adventive
rumcri	*Rumex crispus*	Curly Dock	0	FAC	0	Forb	Perennial	Adventive
salint	*Salix interior*	Sandbar Willow	2	FACW	-1	Shrub	Perennial	Native
sciatv	*Scirpus atrovirens*	Dark-Green Bulrush	4	OBL	-2	Sedge	Perennial	Native
senvul	*Senecio vulgaris*	Common Groundsel	0	UPL	2	Forb	Annual	Adventive
solalt	*Solidago altissima*	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
solgig	*Solidago gigantea*	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
astsim	*Symphyotrichum lanceolatum*	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
astpil	*Symphyotrichum pilosum*	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
rhurad	*Toxicodendron radicans*	Eastern Poison-Ivy	2	FAC	0	Vine	Perennial	Native
typang	*Typha angustifolia*	Narrow-Leaf Cat-Tail	0	OBL	-2	Forb	Perennial	Adventive
ulmame	*Ulmus americana*	American Elm	3	FACW	-1	Tree	Perennial	Native
verhas	*Verbena hastata*	Simpler's-Joy	4	FACW	-1	Forb	Perennial	Native
vitrip	*Vitis riparia*	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native

Wetland C Jurisdictional Determination Opinion: It is MEI's opinion that Wetland C is an Isolated wetland of Lake County.

Wetland D: The delineated wetland is an emergent wetland pocket located at the south end of the woodland adjacent to the maintenance shed. Wetland A receives surface flow from the surrounding upland areas and roadway runoff. The delineated wetland area is **0.62-acres** in size.

The dominant vegetation observed was determined to be Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*), Common Buckthorn (*Rhamnus cathartica*) and Eastern Cottonwood (*Populus deltoides*). During our investigation positive wetland hydrology is met with the primary indicators of Saturation (A3), Water marks (B1) and secondary indicator of Drainage Patterns (B10). Mapped soil is identified as Montgomery silty clay loam (465A) which is a poorly drained hydric soil. Primary soil indicators of thick dark surface (A12) are noted within the flagged boundary.

Said vegetation soils and hydrology information noted above can be found in the datasheets section of this report. Please note data sheets 1D-3D references wetland D.

Study Information

Site: Baxter Campus

Locale: Wetland D

By: Robert Vanni

Conservatism-Based Metrics		**Additional Metrics**	
Mean C (native species)	2.45	Species Richness (all)	32.00
Mean C (all species)	1.69	Species Richness (native)	22.00
Mean C (native trees)	2.40	% Non-native	0.31
Mean C (native shrubs)	2.67	Wet Indicator (all)	-0.28
Mean C (native herbaceous)	2.70	Wet Indicator (native)	-0.50
FQAI (native species)	11.51	% hydrophyte (Midwest)	0.72
FQAI (all species)	9.55	% native perennial	0.56
Adjusted FQAI	20.35	% native annual	0.13

% C value 0	0.47	% annual	0.16
% C Value 1-3	0.34	% perennial	0.81
% C value 4-6	0.16		
% C value 7-10	0.03		

Species Acronym	Species Name (NWPL/Mohlenbrock)	Common Name	C Value	Midwest WET indicator	WET indicator (numeric)	Habit	Duration	Nativity
aceneg	*Acer negundo*	Ash-Leaf Maple	0	FAC	0	Tree	Perennial	Native
arcmin	*Arctium minus*	Lesser Burrdock	0	FACU	1	Forb	Biennial	Adventive
bidfro	*Bidens frondosa*	Devil's-Pitchfork	1	FACW	-1	Forb	Annual	Native
cxgray	*Carex grayi*	Gray's Sedge	7	FACW	-1	Sedge	Perennial	Native
epicol	*Epilobium coloratum*	Purple-Leaf Willowherb	3	OBL	-2	Forb	Perennial	Native
eupper	*Eupatorium perfoliatum*	Common Boneset	4	OBL	-2	Forb	Perennial	Native
frapen	*Fraxinus pennsylvanica*	Green Ash	4	FACW	-1	Tree	Perennial	Native
glystr	*Glyceria striata*	Fowl Manna Grass	4	OBL	-2	Grass	Perennial	Native
impcap	*Impatiens capensis*	Spotted Touch-Me-Not	3	FACW	-1	Forb	Annual	Native
lontat	*Lonicera tatarica*	Twinsisters	0	FACU	1	Shrub	Perennial	Adventive
moralb	*Morus alba*	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
parins	*Parthenocissus inserta*	Thicket-Creeper	0	FACU	1	Vine	Perennial	Native
parqui	*Parthenocissus quinquefolia*	Virginia-Creeper	4	FACU	1	Vine	Perennial	Native
perpen	*Persicaria pensylvanica*	Pinkweed	0	FACW	-1	Forb	Annual	Native
phaaru	*Phalaris arundinacea*	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
pilpum	*Pilea pumila*	Canadian Clearweed	2	FACW	-1	Forb	Annual	Native
poapra	*Poa pratensis*	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
popdel	*Populus deltoides*	Eastern Cottonwood	0	FAC	0	Tree	Perennial	Native
pruvir	*Prunus virginiana*	Choke Cherry	3	FACU	1	Shrub	Perennial	Native
quebic	*Quercus bicolor*	Swamp White Oak	5	FACW	-1	Tree	Perennial	Native
rhacat	*Rhamnus cathartica*	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
rosmul	*Rosa multiflora*	Rambler Rose	0	FACU	1	Shrub	Perennial	Adventive
ruball	*Rubus allegheniensis*	Allegheny Blackberry	3	FACU	1	Shrub	Perennial	Native
rumcri	*Rumex crispus*	Curly Dock	0	FAC	0	Forb	Perennial	Adventive
salint	*Salix interior*	Sandbar Willow	2	FACW	-1	Shrub	Perennial	Native
senvul	*Senecio vulgaris*	Common Groundsel	0	UPL	2	Forb	Annual	Adventive
astsim	*Symphyotrichum lanceolatum*	White Panicled American-Aster	3	FAC	0	Forb	Perennial	Native
astpil	*Symphyotrichum pilosum*	White Oldfield American-Aster	0	FACU	1	Forb	Perennial	Native
rhurad	*Toxicodendron radicans*	Eastern Poison-Ivy	2	FAC	0	Vine	Perennial	Native
typang	*Typha angustifolia*	Narrow-Leaf Cat-Tail	0	OBL	-2	Forb	Perennial	Adventive
ulmame	*Ulmus americana*	American Elm	3	FACW	-1	Tree	Perennial	Native
vitrip	*Vitis riparia*	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native

Wetland D Jurisdictional Determination Opinion: It is Midwest Ecological Inc.'s opinion that Wetland D is an isolated wetland of Lake County.

CONCLUSIONS

The site was evaluated using U.S. Army Corps of Engineers and USDA guidelines for identifying wetlands. After evaluation of all data obtained, the site contains four (4) non-farmed wetlands totaling 1.29 acres in size.

FEDERAL REGULATIONS

Jurisdictional Waters of the United States will be regulated under Section 404 of the Clean Water Act and the Section 401 Water Quality Certification requirements. Under Section 404, the United States Army Corps of Engineers regulates the discharge of dredged or fill material into jurisdictional Waters of the United States (WOUS).

Letter of No-Objection (LONO): The project may require a letter of No-Objection (LONO)/No Permit Required (NPR) from the Chicago District Army Corps of Engineers to facilitate development. If the proposed project avoids impact to the jurisdictional WOUS/Wetland areas then a LONO/NPR can be petitioned.

Nationwide Permit 39 (NWP39): Commercial and Institutional Developments Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of commercial and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, wastewater treatment facilities, and recreation facilities such as playgrounds and playing fields. Examples of commercial developments include retail stores, industrial facilities, restaurants, business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship. The construction of new golf courses and new ski areas is not authorized by this NWP.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters. Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 32.) (Authorities: Sections 10 and 404)

Note: For any activity that involves the construction of a wind energy generating structure, solar tower, or overhead transmission line, a copy of the PCN and NWP verification will be provided by the Corps to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

LAKE COUNTY REGULATIONS

The four categories of wetland type regulated under the Lake County Unified Development ordinance (UDO), and Lake County Watershed Development Ordinance (WDO) are as follows:

(a) Category-I: Wetland impacts less than or equal to 1 acre and does not impact high-quality aquatic resources;
(b) Category-II: Wetland impacts greater than 1 acre and less than 2 acres and does not impact high-quality aquatic resources;
(c) Category-III: Wetland impacts greater than or equal to 2 acres or impacts high-quality aquatic resources; and
(d) Category-IV: Wetland impacts for the restoration, creation and enhancement of wetlands provided that there are net gains in aquatic resource function. Category-IV activities include shoreline and stream bank erosion restoration described in Article IV. Section C.2.d.3.

The WDO requires mitigation for wetland impacts greater than or equal to 0.10 acre of Isolated Wetlands of Lake County (IWLC). Mitigation shall provide replacement of the wetland environment lost to development at the following proportional rates (i.e., creation acreage to wetland impact acreage):

1) A minimum of 1.5:1 for wetland impacts under Categories I, II and III that are not high quality aquatic resources, except 1:1 for approved and fully certified wetland mitigation bank credits;
2) A minimum of 3:1 for wetland impacts that are high quality aquatic resources;
3) A minimum of 6:1 for wetland impacts that are forested wetlands.

Mitigation credit may also be obtained for enhancement. For example, the enhancement of farmed wetlands meeting the size criteria of the WDO may be used for up to 80% of the mitigation requirement. Enhancement of existing non-farmed wetlands may be credited up to 25% of the enhanced wetland acreage completed, provided the wetland impacted acreage created on-site is a minimum 1:1 ratio. Buffer width requirements for water bodies are as follows:

1) For all water bodies or wetlands with a total surface area greater than one third (1/3) acre but less than one (1) acre, a minimum buffer width of thirty (30) feet shall be established.
2) For all water bodies or wetlands with a total surface area greater than or equal to one (1) acre but less than two and one half (2 ½) acres, a minimum buffer width of forty (40) feet shall be established.
3) For all water bodies or wetlands with a total surface area greater than or equal to two and one half (2½) acres, a minimum buffer width of fifty (50) feet shall be established.
4) Non-linear high quality aquatic resources shall have a minimum buffer width of one hundred (100) feet.

Linear buffers shall be designated along both sides of all channels meeting the definition of Wetlands of Lake County. The buffer width shall be determined as follows:

1) When the channel has a watershed greater than 20-acres but less than one square mile, the minimum buffer shall be 50 feet on each side of the channel.
2) When the channel has a watershed greater than one square mile, the minimum buffer shall be 30 feet on each side of the channel.
3) Linear high quality aquatic resources and streams with an Index of Biotic Integrity (IBI) greater than 40 shall have a minimum buffer width of 100 feet on each side of the channel. (Initial IBI based on IEPA Illinois Water Quality Report, biannual. A site-specific IBI assessment may override this report.)

Should you have any questions, please do not hesitate to contact our office.

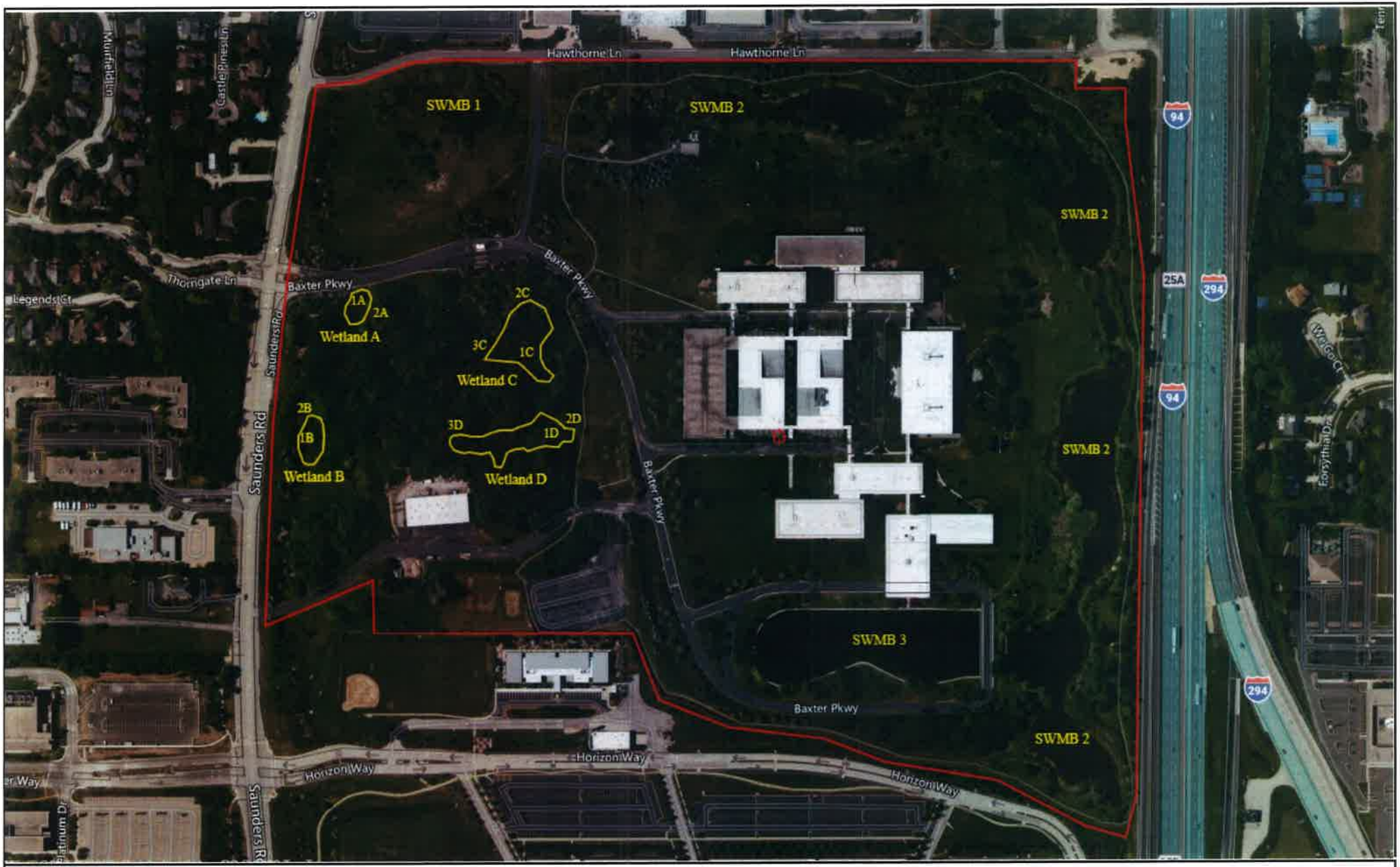
Sincerely,

Midwest Ecological, Inc. (MEI)

Robert L. Vanni
Senior Environmental Resources Specialist
Lake County Certified #C-059

APPENDIX A

Exhibits



Source: 2021 Bing Aerial photograph

MIDWEST ECOLOGICAL

Wetland Aerial Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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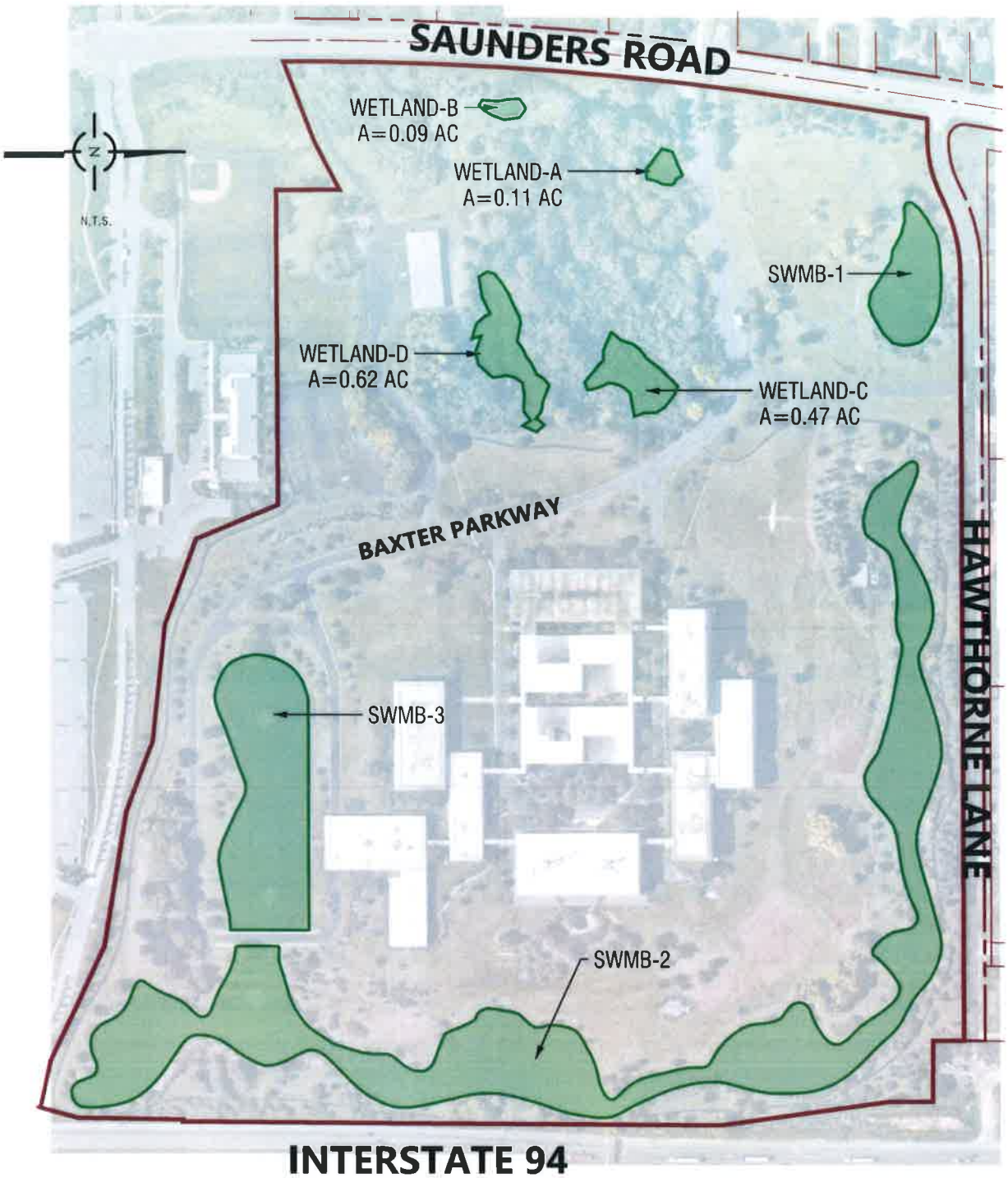


SPACECO INC.

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

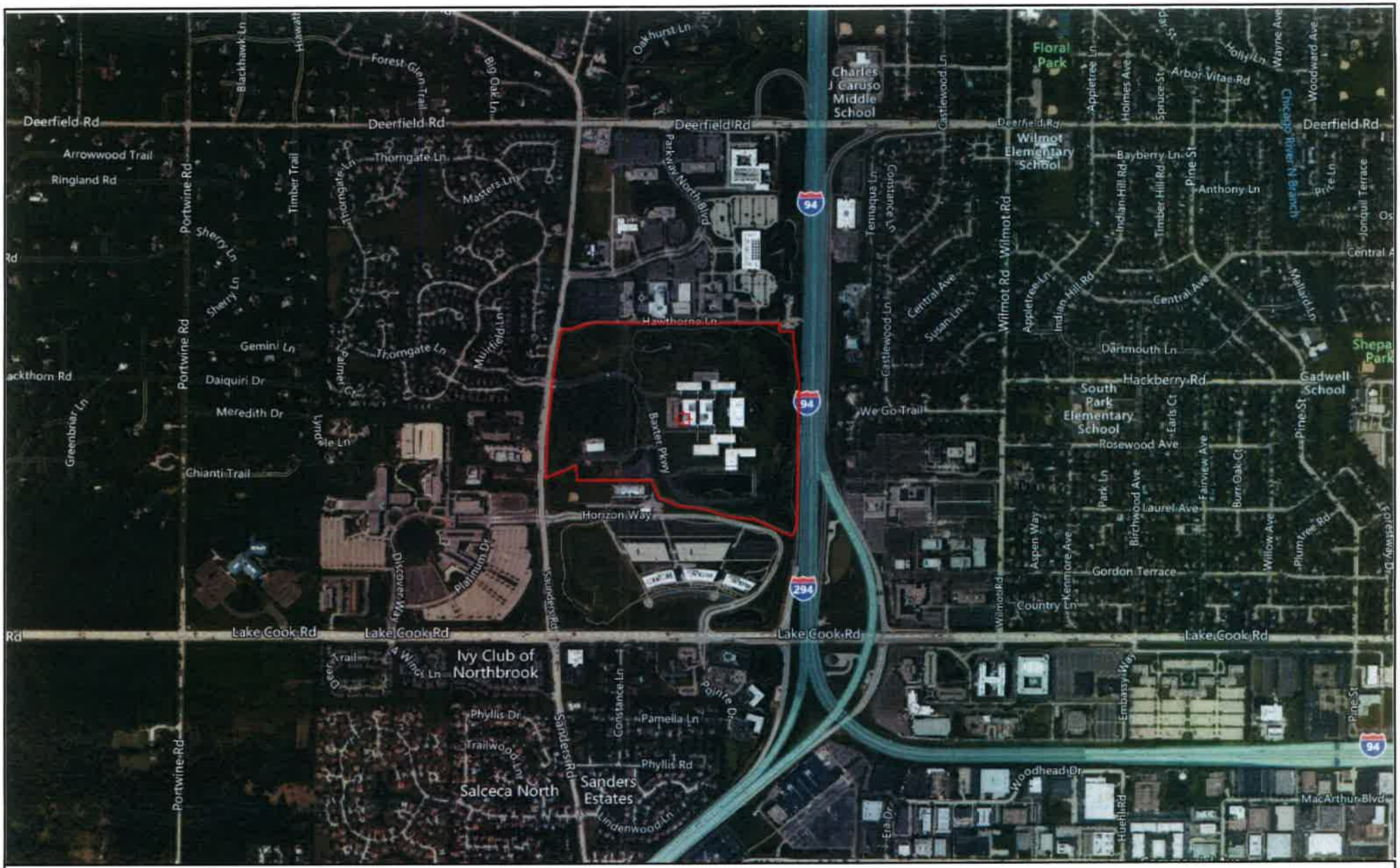
WETLAND EXHIBIT

BAXTER BUSINESS COMPLEX

DEERFIELD, ILLINOIS

DATE: 03/10/2023 | FILENAME: | JOB NO: 12271

N:\Projects 2022\12271\EXHIBITS\12271EXH-WET2.dgn Default User=adivinagracia



Source: Bing Street Finder Map

MIDWEST ECOLOGICAL

Location Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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Source: National Wetland Inventory Map

MIDWEST ECOLOGICAL

N.W.I. Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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Source: Lake County Advanced Identification Map (West Deerfield Township)

MIDWEST ECOLOGICAL

ADID Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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Source: Websoil Lake County Draiange Class Soil Survey Map

MIDWEST ECOLOGICAL

Lake County Drainage Class Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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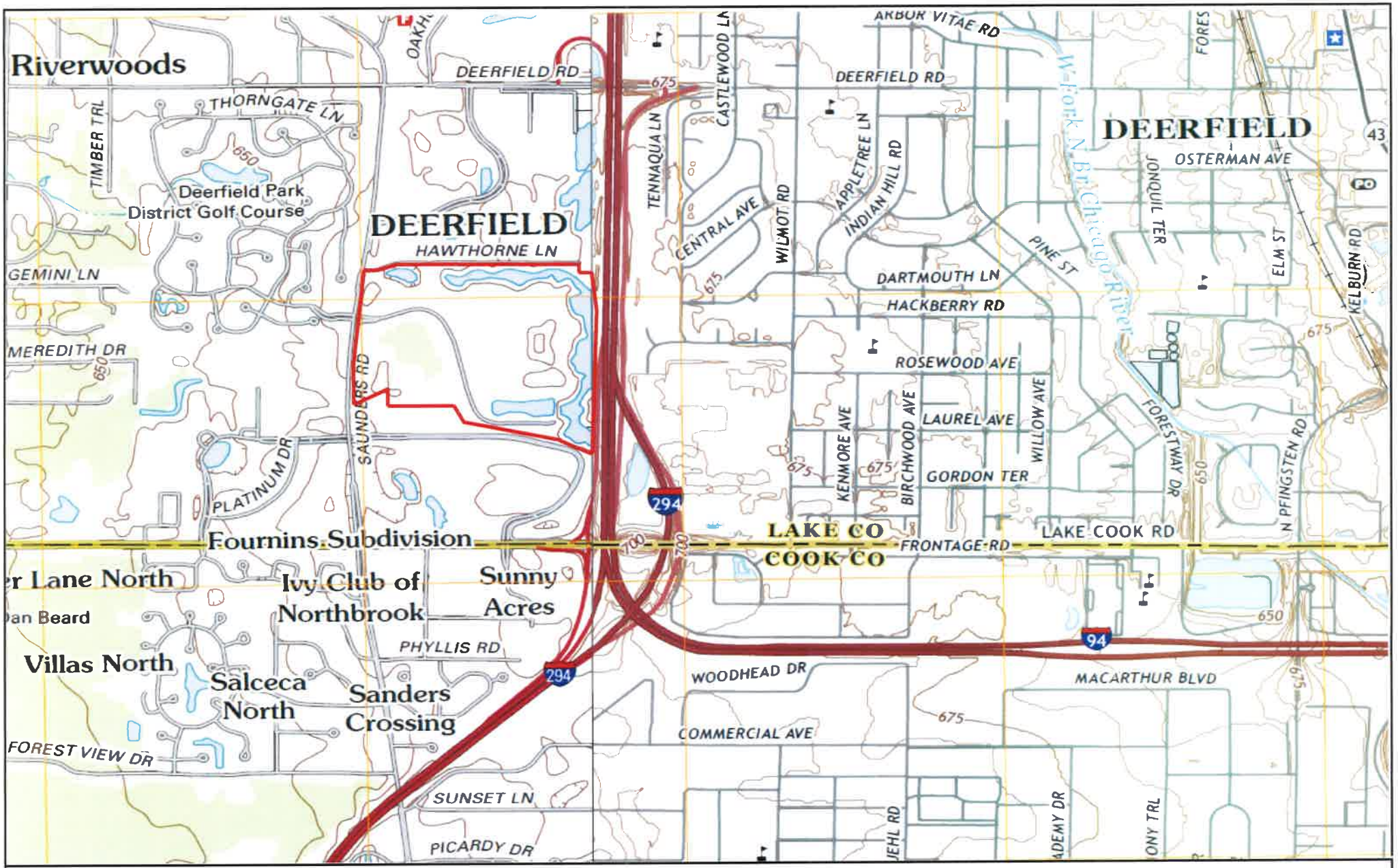

Source: United States Geological Survey (2015)

MIDWEST ECOLOGICAL

USGS Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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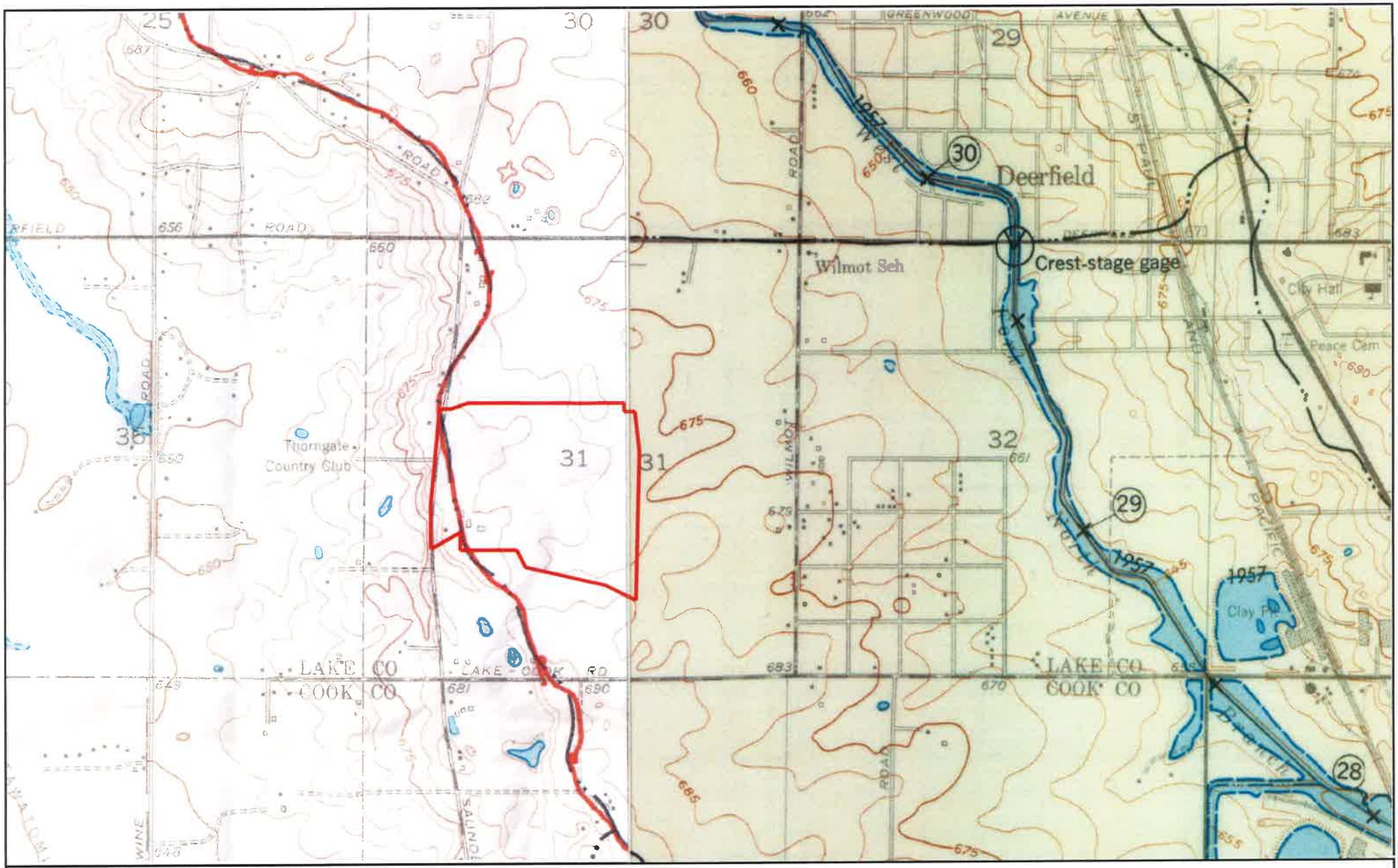

Source: United States Geological Survey - Hydrological Atlas Map (HA-69 & 71)

MIDWEST ECOLOGICAL

Hydrological Atlas Map

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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Source: Flood Insurance Rate Map (17097C0286K & 17097C0267K)

MIDWEST ECOLOGICAL

F.I.R.M.

Client: Mr. Mark Houser, Bridge Industrial Acquisition, LLC.
925 W. Bryn Mawr Avenue, Ste 700
Rosemont, Illinois 60018

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APPENDIX B

Photographs




Wetland A is a depressional pocket located on the west property line.




Data point 1A confirms a wetland field condition.




Wetland B is an emergent wetland pocket located at
the intersection of Saunders Road & Baxter Parkway.




Data point 1B confirms a wetland field condition.




Wetland C is a wooded wetland located within the tree canopy.




The dominant vegetation observed is Devil's pitchfork (*Bidens frondosa*), Common Buckthorn (*Rhamnus cathartica*), Ash-leaf Maple (Acer negundo) and Eastern Cottonwood (*Populus deltoides*).




Wetland D is an emergent wetland located on the south edge of the woodland.




The dominant vegetation observed is Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved Cattail (*Typha angustifolia*), Common Buckthorn (*Rhamnus cathartica*) and Eastern Cottonwood (*Populus deltoides*).




Stormwater management Basin (SWMB) 1 is an open water pond located on the NW corner of the site. SWMB 1 was constructed for the purpose of stormwater management and is maintained for that purpose.




Stormwater Management Basin (SWMB) 2 is an open water pond located on the North and East property line.




SWMB 2 was constructed for the purpose of stormwater management and is maintained for that purpose.




The basins are regularly maintained.




SWMB 2 has two stormwater outfalls located on the east property line.




SWMB 2 discharges to the R.O.W. swale of I294.




Stormwater Management Basin 3 has a rip/rap lined shoreline and located near the south property line

APPENDIX C

Data Sheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 1A
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.159935 | Long: -87.883088 | Datum:
Soil Map Unit Name: Frankfort silt loam (320A) | NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? **Yes** X **No**

Remarks:
Wetland A is a depressional emergent wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		

Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 =Total Cover		

Herb Stratum (Plot size: 5)			
1. *Typha angustifolia*	75	Yes	OBL
2. *Phalaris arundinacea*	15	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 =Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		135 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					Loamy/Clayey	
10-16	10YR 4/1	95	10YR 5/4	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:
Hydric soil was met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 4

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology critera was met.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 2A
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none):
Slope (%): | Lat: 42.159860 | Long: -87.882940 | Datum:
Soil Map Unit Name: Frankfort silt loam (320A) | NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
The upland area is dominated by thick woody vegeation

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus virginiana*	15	Yes	FACU
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	80	Yes	FAC
2. *Rosa multiflora*	5	No	FACU
3.			
4.			
5.			
	85	=Total Cover	
Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	100 (A)		320 (B)
Prevalence Index = B/A =			3.20

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					Loamy/Clayey	
6-16	10YR 3/2	95	10YR 6/2	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:
Hydric soil was not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology critera was not met.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 1B
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.158859 | Long: -87.883623 | Datum:
Soil Map Unit Name: Frankfort silt loam (320A) | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? **Yes** X **No**

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	85	Yes	FACW
2. *Dipsacus fullonum*	15	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	100 (A)		230 (B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Loamy/Clayey	
10-16	10YR 4/2	95	10YR 5/6	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:
Hydric soil was met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology critera was met.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 2B
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.158926 | Long: -87.883627 | Datum:
Soil Map Unit Name: Frankfort silt loam (320A) | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	45	Yes	FACW
2. *Dipsacus fullonum*	40	Yes	FACU
3. *Solidago altissima*	15	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	0	x 3 =	0
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 2B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Loamy/Clayey	
8-16	10YR 4/3	90	7.5YR 5/6	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Hydric soil was not observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology critera was not met.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 1C
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.159710 | Long: -87.881022 | Datum:
Soil Map Unit Name: Montgomery silty clay (465A) | NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? **Yes** X **No**

Remarks:
Wetland C is a depressional wooded wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	25	Yes	FAC
2. *Populus deltoides*	25	Yes	FAC
3.			
4.			
5.			
	50	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Pilea pumila*	15	Yes	FACW
2. *Bidens frondosa*	15	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		270 (B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					Loamy/Clayey	
14-18	2.5Y 4/2	95	10YR 3/3	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:
Hydric soil was noted within the sample.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
One primary and three secondary indicators were note within the sample.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 2C
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.160048 | Long: -87.881486 | Datum:
Soil Map Unit Name: Frankfort silt loam (320A) | NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
The data point was taken within upland areas of the woodland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	25	Yes	FAC
2. *Prunus virginiana*	10	Yes	FACU
3.			
4.			
5.			
	35	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Yes	FAC
2. *Lonicera tatarica*	30	Yes	FACU
3. *Rosa multiflora*	10	No	FACU
4.			
5.			
	65	=Total Cover	
Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus City/County: Deerfield/Lake Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners State: IL Sampling Point: 3C
Investigator(s): Robert Vanni Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): Local relief (concave, convex, none): concave
Slope (%): Lat: 42.159520 Long: -87.882202 Datum:
Soil Map Unit Name: Frankfort silt loam (320A) NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
The data point was taken within upland areas of the woodland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	30	Yes	FAC
2.			
3.			
4.			
5.			
	30 =Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Yes	FAC
2. *Lonicera tatarica*	30	Yes	FACU
3. *Rosa multiflora*	15	Yes	FACU
4.			
5.			
	70 =Total Cover		
Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	=Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	100 (A)		345 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 3C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Hydric soil was not observed within the sample.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydric soil was not noted within the sample.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Midwest Region** See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Baxter Campus City/County: Deerfield/Lake Sampling Date: 9-22-2022

Applicant/Owner: Bridge Development Partners State: IL Sampling Point: 1D

Investigator(s): Robert Vanni Section, Township, Range: S 31, T 43, R 12

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): concave

Slope (%): Lat: 42.159034 Long: -87.880977 Datum:

Soil Map Unit Name: Montgomery silty clay loam (465A) NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:
The data point was taken within the boundaries of wetland D.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20 =Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Yes	FAC
2.			
3.			
4.			
5.			
	25 =Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	50	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 =Total Cover		
Woody Vine Stratum (Plot size: 30)			
1. *Vitis riparia*	5	Yes	FACW
2.			
	5 =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	55	x 2 =	110
FAC species	45	x 3 =	135
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		245 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:
Hydric soil was noted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 4

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydric soil was noted within the sample.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus City/County: Deerfield/Lake Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners State: IL Sampling Point: 2D
Investigator(s): Robert Vanni Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): Local relief (concave, convex, none): concave
Slope (%): Lat: 42.159034 Long: -87.880977 Datum:
Soil Map Unit Name: Montgomery silty clay loam (465A) NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
The data point was taken within the mowed Reed Canary Grass area adjacent to the walking path. A dry swale was observed but is not considered a waters/wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Yes	FAC
2.			
3.			
4.			
5.			
	25 =Total Cover		
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	75	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75 =Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	75	x 2 =	150
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		225 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 2D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Loamy/Clayey	
12-16	10YR 3/2	80	10YR 5/3	20	C	M	Loamy/Clayey	traces of gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydric soil was noted within the sample.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Baxter Campus | City/County: Deerfield/Lake | Sampling Date: 9-22-2022
Applicant/Owner: Bridge Development Partners | State: IL | Sampling Point: 3D
Investigator(s): Robert Vanni | Section, Township, Range: S 31, T 43, R 12
Landform (hillside, terrace, etc.): | Local relief (concave, convex, none): concave
Slope (%): | Lat: 42.158932 | Long: -87.882116 | Datum:
Soil Map Unit Name: Montgomery silty clay loam (465A) | NWI classification: PFO1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20 =Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Yes	FAC
2. *Lonicera tatarica*	25	Yes	FACU
3. *Rosa multiflora*	20	Yes	FACU
4.			
5.			
	70 =Total Cover		
Herb Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	=Total Cover		
Woody Vine Stratum (Plot size: 30)			
1. *Parthenocissus inserta*	10	Yes	FACU
2.			
	10 =Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	100 (A)		355 (B)
Prevalence Index = B/A =			3.55

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 3D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Loamy/Clayey	
8-16	10YR 4/2	95	10YR 5/6	5	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- _X_ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- _X_ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No _X_ Depth (inches): ___

Water Table Present? Yes ___ No _X_ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No _X_ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** _X_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hydric soil was not noted within the sample.

APPENDIX D

Habitat Evaluation Score Sheets

OBSERVER: Rob Vanni
DATE: September 22, 2022
LOCATION: Wetland A

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this score sheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland being considered.

Applicants must document their basis for scoring decisions with field surveys, current photographs, aerial photographs, and other appropriate information.

A. Utilization by Wildlife

Wildlife Use	Score
Significant	3
Evident	2
Low	1
Occasional	0.5
Non-Existent	0

SUB-TOTAL SCORE = 1

Response: Two deer beds were observed within the grass.

B. Interspersion of Vegetative Cover

Interspersion	Score
High	3
Medium	2
Low	1

SUB-TOTAL SCORE = 1

C. Vegetative Cover to Open Water

Cover	Score
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<5% Cover	0.5

SUB-TOTAL SCORE = 0.5

Response: The wetland contains thick grassy vegetation.

TOTAL SCORE (A+B+C) = 2.5

Total score ≥ 5.00 apply Ludwig Wildlife Methodology.
Total score < 5.00 no further wildlife analysis is necessary.

OBSERVER: Rob Vanni
DATE: September 22, 2022
LOCATION: Wetland B

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this score sheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland being considered.

Applicants must document their basis for scoring decisions with field surveys, current photographs, aerial photographs, and other appropriate information.

A. Utilization by Wildlife

Wildlife Use	Score
Significant	3
Evident	2
Low	1
Occasional	0.5
Non-Existent	0

SUB-TOTAL SCORE = 1

Response: MEI did not observe any wildlife within the emergent wetland.

B. Interspersion of Vegetative Cover

Interspersion	Score
High	3
Medium	2
Low	1

SUB-TOTAL SCORE = 1

C. Vegetative Cover to Open Water

Cover	Score
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<5% Cover	0.5

SUB-TOTAL SCORE = 0.5

Response: The wetland contains thick grassy vegetation.

TOTAL SCORE (A+B+C) = 2.5

Total score ≥ 5.00 apply Ludwig Wildlife Methodology.
Total score < 5.00 no further wildlife analysis is necessary.

OBSERVER: Rob Vanni
DATE: September 22, 2022
LOCATION: Wetland C

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this score sheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland being considered.

Applicants must document their basis for scoring decisions with field surveys, current photographs, aerial photographs, and other appropriate information.

A. Utilization by Wildlife

Wildlife Use	Score
Significant	3
Evident	2
Low	1
Occasional	0.5
Non-Existent	0

SUB-TOTAL SCORE = 1

Response: Several deer tracks were noted within the wetland.

B. Interspersion of Vegetative Cover

Interspersion	Score
High	3
Medium	2
Low	1

SUB-TOTAL SCORE = 1

C. Vegetative Cover to Open Water

Cover	Score
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<5% Cover	0.5

SUB-TOTAL SCORE = 1.0

Response: Wetland C is wooded but is mostly devoid of herbaceous vegetation.

TOTAL SCORE (A+B+C) = 3.0

Total score ≥ 5.00 apply Ludwig Wildlife Methodology.
Total score < 5.00 no further wildlife analysis is necessary.

OBSERVER: Rob Vanni
DATE: September 22, 2022
LOCATION: Wetland D

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this score sheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland being considered.

Applicants must document their basis for scoring decisions with field surveys, current photographs, aerial photographs, and other appropriate information.

A. Utilization by Wildlife

Wildlife Use	Score
Significant	3
Evident	2
Low	1
Occasional	0.5
Non-Existent	0

SUB-TOTAL SCORE = 1

Response: MEI observed 8 deer within the wetland. No other wildlife was noted.

B. Interspersion of Vegetative Cover

Interspersion	Score
High	3
Medium	2
Low	1

SUB-TOTAL SCORE = 1

C. Vegetative Cover to Open Water

Cover	Score
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<5% Cover	0.5

SUB-TOTAL SCORE = 0.5

Response: The wetland is mostly dominated by Reed Canary Grass (*Phalaris arundinacea*). No open water pockets were observed.

TOTAL SCORE (A+B+C) = 2.5

Total score ≥ 5.00 apply Ludwig Wildlife Methodology.
Total score < 5.00 no further wildlife analysis is necessary.

Wildlife habitat use evaluation of any particular wetland should consider both the actual wildlife uses and an analysis of the habitat values related to wildlife. Habitat evaluation provides consideration of conditions for species of wildlife that may not be currently using a wetland, but preferred habitat for feeding, nesting, rearing of young, or cover is present.

Wildlife habitat/use, ideally, should be analyzed over an entire year and for some wetlands, several years' conditions should be documented. However, obvious time constraints do not allow this. Therefore, if the evaluator does not have personal knowledge of the wetland during other seasons/years and does not have training in wildlife, a degreed wildlife biologist or ecologist should be requested to complete this section of the evaluation.

A. Utilization by Wildlife

Complete the table on the evaluation form for each wildlife group for the uses listed across the top of the table using the following point system. Consider all seasons of the year in this evaluation.

Use by wildlife group within each habitat is significant in that loss or reduction of the habitat would have an adverse effect (i.e., loss of individuals) on the population of the species or overall wildlife population in the general area (township). **SCORE = 3**

Use by wildlife group within each habitat is evident or probable and loss or reduction of the habitat would have an adverse effect (i.e., loss of individuals) on the local wildlife population (surrounding sections). **SCORE = 2**

Use by wildlife group within each habitat is incidental or low in that loss or reduction of the habitat would have a negligible effect (i.e., loss of individuals) on the local wildlife population. **SCORE = 1**

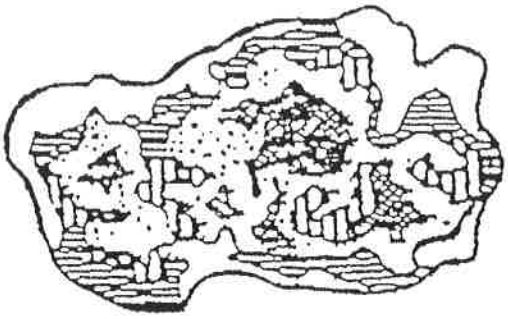
Use by wildlife group within each habitat is nonexistent at any time during any year. NOTE: Use 0.5 to signify occasional use. **SCORE = 0**

B. Interspersion of Vegetative Cover

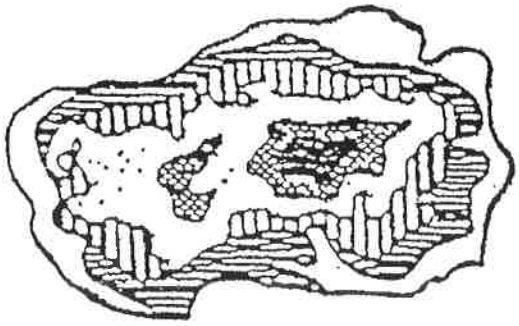
From recent aerial photographs of the wetland, determine which of the following criteria best describes the vegetative forms of the site. Determine from conditions at the peak of the growing season.

	COMMUNITY TYPE 1
	COMMUNITY TYPE 2
	COMMUNITY TYPE 3
	COMMUNITY TYPE 4
	COMMUNITY TYPE 5
	COMMUNITY TYPE 6

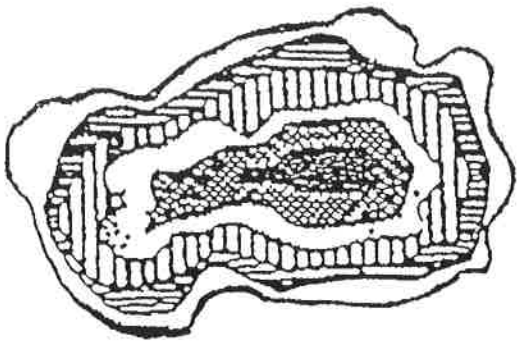
High interspersion of vegetation. Edge is abundant and consists of several species. Life form zones of vegetation are broken into segments of variable size and shape. Subforms of vegetation are small and scattered. **SCORE = 3**



Moderate interspersion of vegetation. Edge is moderate in length and diversity with some irregularity in the distribution of subform stands, but vegetation life forms remain largely intact. **SCORE = 2**



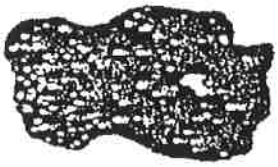
Low interspersion of vegetation. Length and types of edge are at a minimum. The wetland consists of concentric life forms and subforms. Subform stands are large and continuous. **SCORE = 1**



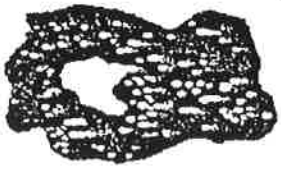
C. Vegetative Cover to Open Water

From a recent aerial photograph of the wetland, determine which of the following criteria best describes the vegetation/open water characteristics of the wetland. NOTE: Wetland cover types: white areas indicate water (with or without surface plants); black areas indicate emergents, shrubs, or trees.

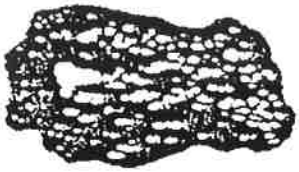
Cover occupies more than 95% of wetland **SCORE = 0.5**



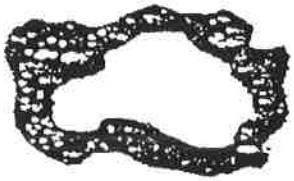
Cover occupies 76 - 95% of wetland occurring in peripheral band **SCORE = 1.5**



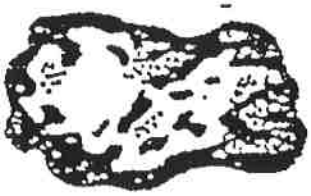
Cover occupies 76 – 95% of wetland with scattered open water **SCORE = 2.5**



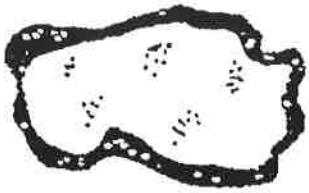
Cover occupies 26 – 75% of wetland occurring in peripheral band **SCORE = 2.0**



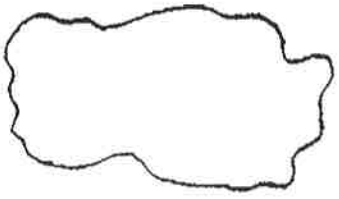
Cover occupies 26 – 75% of wetland occurring in dense patches or diffuse in open stands **SCORE = 3.0**



Cover occupies 5 – 25% of wetland occurring in peripheral band or diffuse in open stands **SCORE = 1.0**



Cover occupies less than 5% of wetland **SCORE = 0.5**



APPENDIX E

USFWS & IDNR Threatened & Endangered Species Consultations

November 10, 2022

Mr. Mark Houser
Bridge Development Partners
9525 W. Bryn Mawr Avenue, Ste. 700
Rosemont, Illinois 60018

Re: Baxter Corporate Campus, Deerfield Illinois - USFWS Section 7, Threatened and Endangered Species, **"No Effect"**.

Dear Mr. Houser,

Per your request, Midwest Ecological, Inc. (MEI) prepared this letter to address Section 7 Endangered Species Act Consultation. On October 5, 2022, MEI completed a review of the property for federally listed threatened and endangered species. This review follows protocol set by the U.S. Fish and Wildlife Service on their website www.fws.gov. In summary, attached to this letter is the Section 7 Consultation Technical Assistance flow chart with a finding of **"No Effect"** (End Consultation).

The approximate 100-acre study area is the Baxter Corporate Campus found at common address 1 Baxter Parkway. Geographically the site is found within Sections 31, Township 43 North, Range 12 East of the Third Principal Meridian within the Unincorporated Lake County, West Deerfield Township, Lake County Illinois (Latitude 42.159349 - Longitude -87.879436).

MEI carefully reviewed the listed species descriptions for Lake County on the U.S. Fish and Wildlife Service website prior to our site inspection. According to the website, ten (10) species be present in Lake County, Illinois: Northern long-eared bat (*Myotis septentrionalis*), Piping Plover (*Charadrius melodus*), Rufa Red knot (*Calidris canutus rufa*), Eastern massasauga (*Sistrurus catenatus*), Hine's emerald dragonfly (*Somatochlora hineana*), Rattlesnake-master borer moth (*Papaipema eryngii*), Eastern prairie fringed orchid (*Platanthera leucophaea*), Leafy-prairie clover (*Dalea foliosa*), Mead's milkweed (*Asclepias meadii*) and Prairie bush clover (*Lespedeza leptostachya*).

Species	Status	Habitat	Site Presence/Affect	Effects Determination	Response from USFWS
Northern long-eared bat (*Myotis septentrionalis*)	Proposed as Endangered	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods.	There are no known roosting Trees or identified by berniculum found within or adjacent to the site. The site does not contain appropriate habitat for this species.	No Effect (NE)	None
Piping Plover (*Charadrius melodus*)	Endangered	Lakeshore beaches	The site does not contain appropriate habitat for this species	No Effect (NE)	None
Rufa Red knot (*Calidris canutus rufa*)	Threatened	Only actions that occur along coastal areas or large wetland complexes during migratory window of May 1 - September 30	The site does not contain appropriate habitat for this species	No Effect (NE)	None
Eastern Massasauga (*Sistrurus catenatus*)	Candidate	Graminoid dominated plant communities (fens, sedge meadows, peatlands, wet prairies, open woodlands, and shrublands)	The site does not contain appropriate habitat for this species	No Effect (NE)	None
Hine's emerald dragonfly (*Somatochlora hineana*)	Endangered	Spring fed wetlands, wet meadows and marshes	The site does not contain appropriate habitat for this species	No Effect (NE)	None
Rattlesnake-master borer moth (*Papaipema eryngii*)	Candidate	Undisturbed prairie and woodland openings that contain their only food plant, rattlesnake-master (*Eryngium yuccifolium*)	The site does not contain appropriate habitat for this species	No Effect (NE)	None
Eastern prairie fringed orchid (*Platanthera leucophaea*)	Threatened	Moderate to high quality wetlands, sedge meadow, marsh, and mesic to wet prairie	The site does not contain appropriate habitat for this species	No Effect (NE)	None

Leafy-prairie clover (*Dalea foliosa*)	Endangered	Prairie remnants on thin soil over limestone	The site does not contain appropriate habitat for this species	**No Effect (NE)**	None
Mead's milkweed (*Asclepias meadii*)	Threatened	Late successional tallgrass prairie, tallgrass prairie converted to hay meadow, and glades or barrens with thin soil	The site does not contain appropriate habitat for this species	**No Effect (NE)**	None
Prairie bush clover (*Lespedeza leptostachya*)	Threatened	Dry to mesic prairies with gravelly soil	The site does not contain appropriate habitat for this species	**No Effect (NE)**	None

The assessment of the natural (and cultural) communities on the subject site indicates that the necessary habitat components for meeting the ecological communities or life cycle needs of the plants and animals referenced in the U.S. Fish and Wildlife correspondence are not present.

Northern Long-eared Bat (*Myotis septentrionalis*)

Habitat: Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods.

Response: Based on the review of the study area, there is no identified Northern long-eared bats hibernaculum found within or adjacent to the site. There are no known roost trees located on-site.

Piping Plover

Habitat: Wide, open, sandy beaches with very little grass or other vegetation.

Response: The study area does not contain the appropriate habitat.

Rufa Red Knot

Habitat: Only actions that occur along coastal areas or large wetland complexes during migratory window of May 1 - September 30

Response: The study area does not contain the appropriate habitat.

Eastern Massasauga

Habitat: Graminoid dominated plant communities (fens, sedge meadows, peatlands, wet prairies, open woodlands, and shrublands).

Response: The study area is a dense woodland with some mature trees but mostly scrub-shrub buckthorn. The site does not contain the appropriate habitat.

Hine's emerald dragonfly

Habitat: Spring fed wetlands, wet meadows and marshes

Response: The study area does not contain the appropriate habitat.

Rattlesnake-master borer moth

Habitat: Undisturbed prairie and woodland openings that contain their only food plant, rattlesnake-master (Eryngium yuccifolium).

Response: The study area does not contain the appropriate habitat.

Eastern prairie fringed orchid

Habitat: Moderate to high quality wetlands, sedge meadow, marsh, and mesic to wet prairie

Response: The study area does not contain the appropriate habitat.

Leafy-prairie clover

Habitat: Prairie remnants on thin soil over limestone

Response: The study area does not contain the appropriate habitat as identified above.

Mead's milkweed

Habitat: Late successional tallgrass prairie, tallgrass prairie converted to hay meadow, and glades or barrens with thin soil

Response: The study area does not contain the appropriate habitat.

Prairie bush clover

Habitat: Dry to mesic prairies with gravelly soil

Response: The study area does not contain the appropriate habitat.

Based on the above information, we conclude that the proposed project will have "no effect" on listed species, their habitats, or proposed or designated critical habitat. No further information from USFWS is necessary.

If you have additional comments, please do not hesitate to call.

Sincerely,
Midwest Ecological, Inc.

Robert L. Vanni
Senior Environmental Resources Specialist

EcoCAT
Ecological Compliance Assessment Tool

Applicant:	Spaceco Inc	*IDNR Project Number:*	2308769
Contact:	Grant Wagner	*Date:*	01/10/2023
Address:	9575 W Higgins Road, Suite 700 Rosemont, IL 60018	*Alternate Number:*	12271
Project:	Baxter Campus		
Address:	1 Baxter Pkwy, Deerfield		

Description: Demolition of existing office campus and construction of three distribution warehouse facilities with on-site utility improvements.

Natural Resource Review Results

Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Edward L. Ryerson Conservation Area INAI Site
Herrmann's Woods INAI Site
Edward L. Ryerson Nature Preserve
Black-Crowned Night Heron *(Nycticorax nycticorax)*
Northern Long-Eared Myotis *(Myotis septentrionalis)*

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location
The applicant is responsible for the accuracy of the location submitted for the project.

County: Lake

Township, Range, Section:
43N, 12E, 31



IL Department of Natural Resources Contact
Adam Rawe
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
IL Environmental Protection Agency
Amy Dragovich
1021 N. Grand Avenue East
Springfield, Illinois 62702

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

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1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

Illinois Department of
Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

JB Pritzker, Governor
Colleen Callahan, Director

January 10, 2023

Grant Wagner
Spaceco Inc
9575 W Higgins Road, Suite 700
Rosemont, IL 60018

RE: Baxter Campus
Project Number(s): 2308769 [12271]
County: Lake

Dear Applicant:

This letter is in reference to the project you recently submitted for consultation. The natural resource review provided by EcoCAT identified protected resources that may be in the vicinity of the proposed action. The Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation under 17 Ill. Adm. Code Part 1075 is terminated.

This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Adam Rawe
Division of Ecosystems and Environment
217-785-5500

ILLINOIS
DEPARTMENT OF NATURAL RESOURCES

Illinois Department of
Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

JB Pritzker, Governor
Colleen Callahan, Director

Lake County
Deerfield
Demolition and New Construction of 3 Industrial Office/Warehouse Facilities
1 Baxter Parkway
SPACECO-12271
SHPO Log #005011023

January 27, 2023

Brett Duffy
SPACECO, Inc.
9575 W. Higgins Road, Suite 700
Rosemont, IL 60018

Dear Mr. Duffy:

This letter is to inform you that we have reviewed the information provided concerning the referenced project.

Our review of the records indicates that no historic, architectural or archaeological sites exist within the project area.

Please retain this letter in your files as evidence of compliance with Section 4 of the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420/1 et. seq.). This clearance remains in effect for two years from date of issuance. It does not pertain to any discovery during construction, nor is it a clearance for purposes of the Illinois Human Skeletal Remains Protection Act (20 ILCS 3440).

If you have any further questions, please contact Rita Baker, Cultural Resources Manager, at 217/785-4998 or at Rita.E.Baker@illinois.gov.

Sincerely,

Carey L. Mayer

Carey L. Mayer , AIA
Deputy State Historic
Preservation Officer

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

Memorandum

To: Robert Vanni – Midwest Ecological Inc.

From: Scott A. Johnson, P.E.

Date: March 24, 2023

Re: Wetland Hydrology for Isolated Waters of Lake County Analysis
Bridge Point O'Hare North
Deerfield, Lake County, Illinois
SPACECO Project No. 12271

Enclosures:

- Existing Drainage Plan
- Existing Wetland Analysis Calculations & HEC HMS Summary
- Proposed Drainage Plan
- Proposed Wetland Analysis Calculations & HEC HMS Summary

The following summarizes the findings of the existing vs. proposed condition wetland impact analysis for the four (4) on-site wetlands to remain (Wetlands A, B, C, and D) as part of the proposed development. The wetland impact analysis was performed in accordance with Section 1006.1 of Lake County Watershed Development Ordinance, Effective October 13, 2020, as adopted by the Village of Deerfield.

EXISTING CONDITIONS WETLAND ANALYSIS

Wetlands A, B, C, and D are located in the wooded area in the west portion of the site adjacent to Saunders Road. There is an existing watershed divide that bisects this area. Wetlands A, C, and D are located within the North Branch Chicago River Watershed – West Fork and Wetland B is in the Des Plaines River Watershed – Lower Des Plaines River.

Under existing conditions, Wetland B is supplied with water by sheet and shallow concentrated flows from on-site areas.

Wetland A is supplied with water by sheet and shallow concentrated flows from on-site areas. There is a depressional area within Wetland A. When the 'Wetland A' Depressional Area fills-up, it spills to the southeast into Wetland C.

Area D.1 contains a non-wetland depressional area. Depressional Area D.1 is supplied with water by sheet and shallow concentrated flows from on-site areas. When Depressional Area D.1 fills-up, it spills to the southeast into Wetland D.

Wetland D is supplied with water by sheet and shallow concentrated flows from on-site areas and Depressional Area D.1. There is a depressional area within Wetland D. When the 'Wetland D' Depressional Area fills-up, it spills to the north into Wetland C.

Area C.1 contains a non-wetland depressional area. Depressional Area C.1 is supplied with water by sheet and shallow concentrated flows from on-site areas. When Depressional Area C.1 fills-up, it spills to the east into Wetland C.

Wetland C is supplied with water by sheet and shallow concentrated flows from on-site areas and overland overflow from 'Wetland A' Depressional Area, Depressional Area C.1, 'Wetland D' Depressional Area, and Depressional Area D.1. There is a depressional area within Wetland C. When the 'Wetland C' depressional area fills-up, it spills to the east into the site.

See the enclosed Existing Drainage Plan.

PROPOSED CONDITIONS WETLAND ANALYSIS

Under proposed conditions, Wetland B is supplied with water by sheet and shallow concentrated flows from on-site areas.

Wetland A is supplied with water by sheet and shallow concentrated flows from on-site areas. There is a depressional area within Wetland A. When the 'Wetland A' Depressional Area fills-up, it spills to the southeast into Wetland C.

Area D.1 contains a non-wetland depressional area. Depressional Area D.1 is supplied with water by sheet and shallow concentrated flows from on-site areas. When Depressional Area D.1 fills-up, it spills to the southeast into Wetland D.

Wetland D is supplied with water by sheet and shallow concentrated flows from on-site areas, overland overflows from Depressional Area D.1, and piped flows from the two (2) roof drains from Building B. There is a depressional area within Wetland D. When the 'Wetland D' Depressional Area fills-up, it spills to the north into Wetland C.

Area C.1 contains a non-wetland depressional area. Depressional Area C.1 is supplied with water by sheet and shallow concentrated flows from on-site areas. When Depressional Area C.1 fills-up, it spills to the east into Wetland C.

Wetland C is supplied with water by sheet and shallow concentrated flows from on-site areas and overland overflow from 'Wetland A' Depressional Area, Depressional Area C.1, 'Wetland D' Depressional Area, and Depressional Area D.1. There is a depressional area within Wetland C. When the 'Wetland C' depressional area fills-up, it spills through an overflow stool grate into the proposed storm sewer system. The proposed storm sewer is designed to convey the overflow from Wetland C into the proposed Stormwater Basins #2A-2D.

See the enclosed Proposed Drainage Plan.

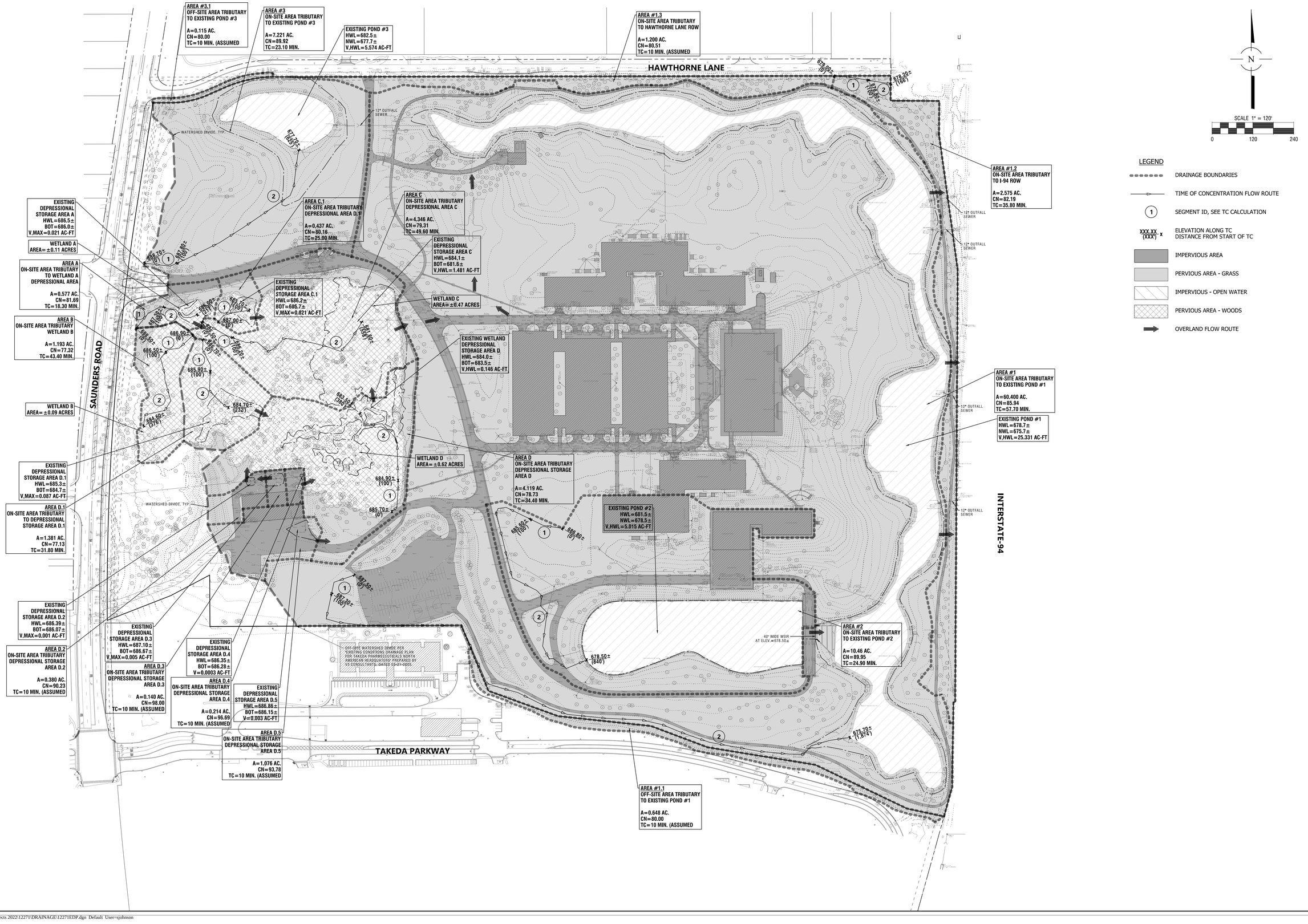
SUMMARY

The existing vs. proposed condition wetland impact analysis was analyzed with a HEC-HMS hydrologic model using the 2-year 24-hour storm event, as specified by Bulletin 75 for Northeast Illinois, and Huff Quartile Distribution to demonstrate that the proposed condition maintains between 80% and 150% of the existing condition 2-year, 24-hour storm event runoff volume from the on-site tributary drainage area. See the enclosed Existing and Proposed Wetland Analysis Calculations & HEC HMS Summaries.

2-YR 24-HR Existing vs. Proposed Runoff Volume Summary Table

Wetland I.D	Existing Runoff Volume (ac-ft)	Proposed Runoff Volume (ac-ft)	Proposed % of Existing Runoff Volume
Wetland A (Depression A)	0.078	0.093	119.23%
Wetland B	0.132	0.144	109.09%
Wetland C (Depression C)	1.412	1.211	85.76%
Wetland D (Depression D)	0.931	0.765	82.17%

Existing Drainage Plan



NO.	DATE	REMARKS

NO.	DATE	REMARKS

EXISTING DRAINAGE PLAN

BRIDGE POINT O'HARE NORTH
DEERFIELD, ILLINOIS

CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS
9575 W. Higgins Road, Suite 700,
Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065
SPACECO INC.

FILENAME: 12271EDP

DATE: 03/24/2023

JOB NO. 12271

SHEET **EDP** 1 OF 1

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Existing Wetland Analysis Calculations & HEC-HMS Summary

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA A
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.088	8.624
D	PERVIOUS - GRASS	80	0.286	22.88
D	PERVIOUS - WOODS	77	0.203	15.631
		TOTALS =	0.577	47
			0.00090 sq. mi	

CN (weighted) = Total Product / Total Area = 47.14 / 0.58 = 81.69

Total Pervious	0.29
Total Impervious	0.09
% Impervious	15.3%

USE CN = 81.69

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA A
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.012	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.29	HR
		17.13	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	117	FEET
9.	LAND SLOPE, S	0.011	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.70	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.1	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.30**	**HR**
		18.3	**MIN**

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA B
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.128	10.24
D	PERVIOUS - WOODS	77	1.065	82.005
		TOTALS =	1.193	92
			0.00186 sq. mi	

CN (weighted) = Total Product / Total Area = 92.25 / 1.19 = 77.32

Total Pervious	0.13
Total Impervious	0.00
% Impervious	0.0%

USE CN = 77.32

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
Phone: (847) 696-4060 Fax: (847) 696-4065

PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA B
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.004	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.67	HR
		40.01	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	276	FEET
9.	LAND SLOPE, S	0.007	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.34	
11.	$T_t = \frac{L}{3600\,V}$	0.06	HR
		3.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.72**	**HR**
		43.4	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.404	39.592
D	PERVIOUS - GRASS	80	0.521	41.68
D	PERVIOUS - WOODS	77	3.421	263.417
		TOTALS =	4.346	345
			0.00679 sq. mi	

CN (weighted) = Total Product / Total Area = 344.69 / 4.35 = 79.31

Total Pervious	0.52
Total Impervious	0.40
% Impervious	9.3%

USE CN = 79.31

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.003	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.75	HR
		44.89	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	458	FEET
9.	LAND SLOPE, S	0.010	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.62	
11.	$T_t = \frac{L}{3600\,V}$	0.08	HR
		4.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.83**	**HR**
		49.6	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.047	4.606
D	PERVIOUS - GRASS	80	0.131	10.48
D	PERVIOUS - WOODS	77	0.259	19.943
		TOTALS =	0.437	35
			0.00068 sq. mi	

CN (weighted) = Total Product / Total Area = 35.03 / 0.44 = 80.16

Total Pervious	0.13
Total Impervious	0.05
% Impervious	10.8%

USE CN = 80.16

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C.1
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.013	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.42	HR
		24.97	MIN
7.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.42**	**HR**
		25.0	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.181	17.738
D	PERVIOUS - GRASS	80	1.109	88.72
D	PERVIOUS - WOODS	77	2.829	217.833
		TOTALS =	4.119	324
			0.00644 sq. mi	

CN (weighted) = Total Product / Total Area = 324.29 / 4.12 = 78.73

Total Pervious	1.11
Total Impervious	0.18
% Impervious	4.4%

USE CN = 78.73

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	280	FEET
9.	LAND SLOPE, S	0.005	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.14	
11.	$T_t = \frac{L}{3600\,V}$	0.07	HR
		4.1	MIN

12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.57**	**HR**
		34.4	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.1
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X / Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0	0
D	PERVIOUS - GRASS	80	0.061	4.88
D	PERVIOUS - WOODS	77	1.32	101.64
		TOTALS =	1.381	107
			0.00216 sq. mi	

CN (weighted) = Total Product / Total Area = 106.52 / 1.38 = 77.13

Total Pervious	0.06
Total Impervious	0.00
% Impervious	0.0%

USE CN = 77.13

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D.1
SITE CONDITION: EXISTING

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	132	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.53**	**HR**
		31.8	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.2
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.216	21.168
D	PERVIOUS - GRASS	80	0.164	13.12
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.380	34
			0.00059 sq. mi	

CN (weighted) = Total Product / Total Area = 34.29 / 0.38 = 90.23

Total Pervious	0.16
Total Impervious	0.22
% Impervious	56.8%

USE CN = 90.23

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.3
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.14	13.72
D	PERVIOUS - GRASS	80	0	0
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	0.140	14
			0.00022 sq. mi	

CN (weighted) = Total Product / Total Area = 13.72 / 0.14 = 98.00

Total Pervious	0.00
Total Impervious	0.14
% Impervious	100.0%

USE CN = **98.00**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.4
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.115	11.27
D	PERVIOUS - GRASS	80	0.009	0.72
D	PERVIOUS - WOODS	77	0	0
TOTALS =			0.124	12
			0.00019 sq. mi	

CN (weighted) = Total Product / Total Area = 11.99 / 0.12 = 96.69

Total Pervious	0.01
Total Impervious	0.12
% Impervious	92.7%

USE CN = 96.69

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.5
SITE CONDITION: EXISTING

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.824	80.752
D	PERVIOUS - GRASS	80	0.252	20.16
D	PERVIOUS - WOODS	77	0	0
		TOTALS =	1.076	101
			0.00168 sq. mi	

CN (weighted) = Total Product / Total Area = 100.91 / 1.08 = 93.78

Total Pervious	0.25
Total Impervious	0.82
% Impervious	76.6%

USE CN = 93.78

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.00	60						
OVERFLOW	686.50	3,544	1,802	0.50	901	33	0.021	0.021
T/BERM	686.90	7,477	5,510	0.40	2,204	82	0.051	0.071

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.50***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.50***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.00	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.50	0.000			0.000	
TOP OF BERM	686.90	0.000	25.00	16.44	16.444	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	681.60	0						
	682.00	3,186	1,062	0.40	425	16	0.010	0.010
	683.00	19,925	11,555	1.00	11,555	428	0.265	0.275
	684.00	65,872	42,898	1.0	42,898	1,589	0.985	1.260
	684.00	90,672	78,272	0.0	0	0	0.000	1.260
OVERFLOW	684.10	102,209	96,441	0.1	9,644	357	0.221	1.481
	684.50	179,199	140,704	0.4	56,282	2,085	1.292	2.773

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

OVERFLOW ELEVATION ***684.10*** ***FT***

NOTES:
1) Weir Equation = $CLH^{1.5}$
2) C=2.6

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	681.60	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	684.10	0.000			0.000	
T/BERM	684.50	0.000	275.00	180.882	180.882	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	685.70	0						
	686.00	2,320	773	0.30	232	9	0.005	0.005
OVERFLOW	686.20	4,366	3,343	0.20	669	25	0.015	0.021
T/BERM	686.50	12,545	8,456	0.30	2,537	94	0.058	0.079

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.20***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.20***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	685.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.20	0.000			0.000	
T/BERM	686.50	0.000	165.00	70.49	70.492	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	683.50	674						
OVERFLOW	684.00	24,800	12,737	0.50	6,368	236	0.146	0.146
	684.50	80,182	52,491	0.50	26,246	972	0.603	0.749

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: EXISTING

OVERFLOW ELEVATION ***684.00*** ***FT***

NOTES:
1) Weir Equation = $CLH^{1.5}$
2) C=2.6

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	683.50	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	684.00	0.000			0.000	
T/BERM	684.50	0.000	84.00	77.216	77.216	

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LAND SURVEYORS

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	684.70	1,687						
	685.00	5,944	3,815	0.30	1,145	42	0.026	0.026
OVERFLOW	685.30	11,823	8,883	0.30	2,665	99	0.061	0.087
T/BERM	685.70	28,874	20,349	0.40	8,139	301	0.187	0.274

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***685.30***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***685.30***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	684.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	685.30	0.000			0.000	
T/BERM	685.70	0.000	165.00	108.53	108.529	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.2
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.07	0						
OVERFLOW	686.39	554	185	0.32	59	2	0.001	0.001
T/BERM	687.00	4,054	2,304	0.61	1,405	52	0.032	0.034

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.2
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.39***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.39***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.07	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.39	0.000			0.000	
T/BERM	687.00	0.000	104.00	128.83	128.825	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.3
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.67	0						
	687.00	896	299	0.33	99	4	0.002	0.002
OVERFLOW	687.10	1,604	1,250	0.10	125	5	0.003	0.005
T/BERM	687.30	3,233	2,418	0.20	484	18	0.011	0.016

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.3
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***687.10***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***687.10***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.67	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	687.10	0.000			0.000	
T/BERM	687.30	0.000	60.00	13.95	13.953	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.4
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.28	0						
OVERFLOW	686.35	554	185	0.07	13	0	0.000	0.0003
T/BERM	686.50	4,054	2,304	0.15	346	13	0.008	0.008

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.4
SITE CONDITION: EXISTING

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.35***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.35***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.28	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.35	0.000			0.000	
T/BERM	686.50	0.000	75.00	11.33	11.328	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.5
SITE CONDITION: EXISTING

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.15	0						
OVERFLOW	686.86	554	185	0.71	131	5	0.003	0.003
T/BERM	687.20	11,224	5,889	0.34	2,002	74	0.046	0.049

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.5
SITE CONDITION: EXISTING

ORFICE, C	0.61		
OUTLET ELEVATION	***686.86***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.86***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.15	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.86	0.000			0.000	
T/BERM	687.20	0.000	44.00	22.68	22.680	

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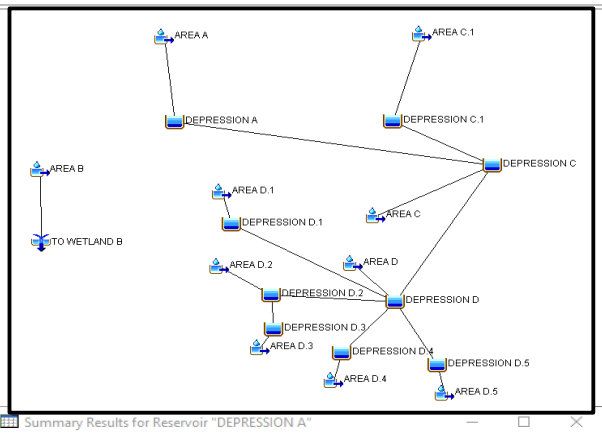
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS**
DESCRIPTION:	RUNOFF VOLUME TO WETLANDS A, B, C, D
SITE CONDITION:	EXISTING; **ON-SITE AREAS ONLY**
STORM EVENT:	2-YEAR, 24-HOUR



Summary Results for Reservoir "DEPRESSION A"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION A

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 21Mar2023, 11:15:01 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	0.120 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:04
Peak Discharge:	0.120 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:05
Inflow Volume:	0.078 (ACRE-FT)	Peak Storage:	0.021 (ACRE-FT)
Discharge Volume:	0.059 (ACRE-FT)	Peak Elevation:	686.50 (FT)

Summary Results for Junction "TO WETLAND B"

Project: Development Template Simulation Run: __2YR_24HR
Junction: TO WETLAND B

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 21Mar2023, 11:15:01 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Discharge:	0.210 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 17:07
Volume:	0.132 (ACRE-FT)		

Summary Results for Reservoir "DEPRESSION C"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION C

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 21Mar2023, 11:15:01 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	2.351 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 17:15
Peak Discharge:	0.004 (CFS)	Date/Time of Peak Discharge:	03Jan2000, 00:00
Inflow Volume:	1.412 (ACRE-FT)	Peak Storage:	1.402 (ACRE-FT)
Discharge Volume:	0.010 (ACRE-FT)	Peak Elevation:	684.06 (FT)

Summary Results for Reservoir "DEPRESSION D"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION D

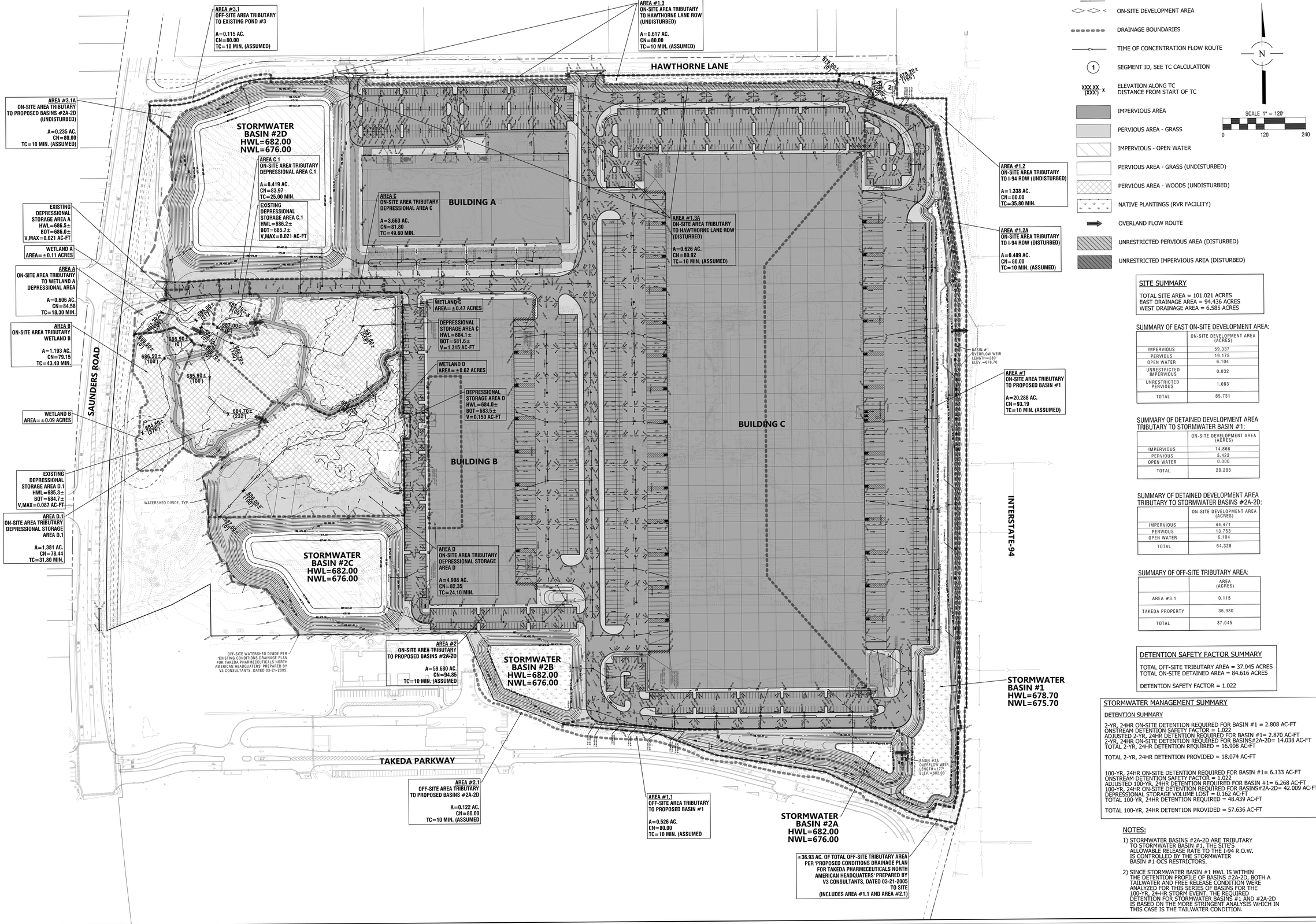
Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 21Mar2023, 11:15:01 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	1.402 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 17:09
Peak Discharge:	1.351 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 17:17
Inflow Volume:	0.931 (ACRE-FT)	Peak Storage:	0.157 (ACRE-FT)
Discharge Volume:	0.785 (ACRE-FT)	Peak Elevation:	684.01 (FT)

Proposed Drainage Plan



SITE SUMMARY

TOTAL SITE AREA = 101.021 ACRES
EAST DRAINAGE AREA = 94.436 ACRES
WEST DRAINAGE AREA = 6.585 ACRES

SUMMARY OF EAST ON-SITE DEVELOPMENT AREA:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	59.337
PERVIOUS	19.175
OPEN WATER	6.104
UNRESTRICTED IMPERVIOUS	0.032
UNRESTRICTED PERVIOUS	1.083
TOTAL	85.731

SUMMARY OF DETAINED DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASIN #1:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	14.866
PERVIOUS	5.422
OPEN WATER	0.000
TOTAL	20.288

SUMMARY OF DETAINED DEVELOPMENT AREA TRIBUTARY TO STORMWATER BASINS #2A-2D:

	ON-SITE DEVELOPMENT AREA (ACRES)
IMPERVIOUS	44.471
PERVIOUS	13.753
OPEN WATER	6.104
TOTAL	64.328

SUMMARY OF OFF-SITE TRIBUTARY AREA:

	AREA (ACRES)
AREA #3.1	0.115
TAKEDA PROPERTY	36.930
TOTAL	37.045

DETENTION SAFETY FACTOR SUMMARY

TOTAL OFF-SITE TRIBUTARY AREA = 37.045 ACRES
TOTAL ON-SITE DETAINED AREA = 84.616 ACRES

DETENTION SAFETY FACTOR = 1.022

STORMWATER MANAGEMENT SUMMARY

DETENTION SUMMARY

2-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASIN #1 = 2.808 AC-FT
ONSTREAM DETENTION SAFETY FACTOR = 1.022
ADJUSTED 2-YR, 24HR DETENTION REQUIRED FOR BASIN #1= 2.870 AC-FT
2-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASINS#2A-2D= 14.038 AC-FT
TOTAL 2-YR, 24HR DETENTION REQUIRED = 16.908 AC-FT

TOTAL 2-YR, 24HR DETENTION PROVIDED = 18.074 AC-FT

100-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASIN #1= 6.133 AC-FT
ONSTREAM DETENTION SAFETY FACTOR = 1.022
ADJUSTED 100-YR, 24HR DETENTION REQUIRED FOR BASIN #1= 6.268 AC-FT
100-YR, 24HR ON-SITE DETENTION REQUIRED FOR BASINS#2A-2D= 42.009 AC-FT
DEPRESSIONAL STORAGE VOLUME LOST = 0.162 AC-FT
TOTAL 100-YR, 24HR DETENTION REQUIRED = 48.439 AC-FT

TOTAL 100-YR, 24HR DETENTION PROVIDED = 57.636 AC-FT

NOTES:

1) STORMWATER BASINS #2A-2D ARE TRIBUTARY TO STORMWATER BASIN #1. THE SITE'S ALLOWABLE RELEASE RATE TO THE I-94 R.O.W. IS CONTROLLED BY THE STORMWATER BASIN #1 OCS RESTRICTORS.

2) SINCE STORMWATER BASIN #1 HWL IS WITHIN THE DETENTION PROFILE OF BASINS #2A-2D, BOTH A TAILWATER AND FREE RELEASE CONDITION WERE ANALYZED FOR THIS SERIES OF BASINS FOR THE 100-YR, 24-HR STORM EVENT. THE REQUIRED DETENTION FOR STORMWATER BASINS #1 AND #2A-2D IS BASED ON THE MORE STRINGENT ANALYSIS WHICH IN THIS CASE IS THE TAILWATER CONDITION.

NO.	DATE	REMARKS

NO.	DATE	REMARKS

PROPOSED DRAINAGE PLAN

BRIDGE POINT O'HARE NORTH

DEERFIELD, ILLINOIS

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SPACECO INC.

FILENAME: 12271PDP

DATE: 03/24/2023

JOB NO. 12271

SHEET **PDP**

1 OF 1

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Proposed Wetland Analysis Calculations & HEC-HMS Summary

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA A
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.184	18.032
D	PERVIOUS - GRASS	80	0.244	19.52
D	PERVIOUS - WOODS	77	0.178	13.706
		TOTALS =	0.606	51
			0.00095 sq. mi	

CN (weighted) = Total Product / Total Area = 51.26 / 0.61 = 84.58

Total Pervious	0.24
Total Impervious	0.18
% Impervious	30.4%

USE CN = 84.58

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA A
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.012	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.29	HR
		17.13	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	117	FEET
9.	LAND SLOPE, S	0.011	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.70	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.1	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.30**	**HR**
		18.3	**MIN**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **CURVE NUMBER CALCULATION**
DESCRIPTION: AREA B
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.084	8.232
D	PERVIOUS - GRASS	80	0.268	21.44
D	PERVIOUS - WOODS	77	0.841	64.757
		TOTALS =	1.193	94
			0.00186 sq. mi	

CN (weighted) = Total Product / Total Area = 94.43 / 1.19 = 79.15

Total Pervious	0.27
Total Impervious	0.08
% Impervious	7.0%

USE CN = 79.15

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA B
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.004	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.67	HR
		40.01	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	276	FEET
9.	LAND SLOPE, S	0.007	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.34	
11.	$T_t = \frac{L}{3600\,V}$	0.06	HR
		3.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.72**	**HR**
		43.4	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.662	64.876
D	PERVIOUS - GRASS	80	0.467	37.36
D	PERVIOUS - WOODS	77	2.534	195.118
TOTALS =			3.663	297
			0.00572 sq. mi	

CN (weighted) = Total Product / Total Area = 297.35 / 3.66 = 81.18

Total Pervious	0.47
Total Impervious	0.66
% Impervious	18.1%

USE CN = 81.18

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.003	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.75	HR
		44.89	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	458	FEET
9.	LAND SLOPE, S	0.010	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.62	
11.	$T_t = \frac{L}{3600\,V}$	0.08	HR
		4.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.83**	**HR**
		49.6	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA C.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.125	12.25
D	PERVIOUS - GRASS	80	0.099	7.92
D	PERVIOUS - WOODS	77	0.195	15.015
		TOTALS =	0.419	35
			0.00065 sq. mi	

CN (weighted) = Total Product / Total Area = 35.19 / 0.42 = 83.97

Total Pervious	0.10
Total Impervious	0.13
% Impervious	29.8%

USE CN = 83.97

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA C.1
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.013	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.42	HR
		24.97	MIN
7.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.42**	**HR**
		25.0	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.974	95.452
D	PERVIOUS - GRASS	80	1.929	154.32
D	PERVIOUS - WOODS	77	2.005	154.385
TOTALS =			4.908	404
			0.00767 sq. mi	

CN (weighted) = Total Product / Total Area = 404.16 / 4.91 = 82.35

Total Pervious	1.93
Total Impervious	0.97
% Impervious	19.8%

USE CN = 82.35

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	DENSE GRASS	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.24	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.010	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.31	HR
		18.43	MIN
SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	424	FEET
9.	LAND SLOPE, S	0.006	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.24	
11.	$T_t = \frac{L}{3600\,V}$	0.10	HR
		5.7	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.40**	**HR**
		24.1	**MIN**

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: CURVE NUMBER CALCULATION
DESCRIPTION: AREA D.1
SITE CONDITION: PROPOSED

Soil Name and Hydrologic Group (Appendix A)	Cover Description (Cover Type, Treatment, and hydrologic conditions; percent Impervious; unconnected/connected impervious area ratio	Curve Number	Area X Acres / Sq. M. / %	Product of Curve Number and Area
D	IMPERVIOUS	98	0.067	6.566
D	PERVIOUS - GRASS	80	0.192	15.36
D	PERVIOUS - WOODS	77	1.122	86.394
		TOTALS =	1.381	108
			0.00216 sq. mi	

CN (weighted) = Total Product / Total Area = 108.32 / 1.38 = 78.44

Total Pervious	0.19
Total Impervious	0.07
% Impervious	4.9%

USE CN = 78.44

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **TIME OF CONCENTRATION CALCULATION**
DESCRIPTION: AREA D.1
SITE CONDITION: PROPOSED

SHEET FLOW	SEGMENT ID	***1***	
1.	SUFACE DESCRIPTION (TABLE 3-1)	LIGHT UNDERBRUSH	
2.	MANNING'S ROUGHNESS COEFF., n (TABLE 3-1)	0.4	
3.	FLOW LENGTH, L (TOTAL <= 100 FT)	100	FEET
4.	TWO-YR 24-HR RAINFALL, P2	3.34	
5.	LAND SLOPE, S	0.008	
6.	$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,S^{0.4}}$	0.51	HR
		30.32	MIN

SHALLOW CONCENTRATED FLOW	SEGMENT ID	***2***	
7.	SUFACE DESCRIPTION (TABLE 3-1)	UNPAVED	
8.	FLOW LENGTH, L	132	FEET
9.	LAND SLOPE, S	0.009	
10.	AVERAGE VELOCITY (FIGURE 3-1)	1.54	
11.	$T_t = \frac{L}{3600\,V}$	0.02	HR
		1.4	MIN
12.	WATERSHED OR SUBAREA TC OR Tt TOTAL	**0.53**	**HR**
		31.8	**MIN**

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	686.00	60						
OVERFLOW	686.50	3,544	1,802	0.50	901	33	0.021	0.021
T/BERM	686.90	7,477	5,510	0.40	2,204	82	0.051	0.071

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA A
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.50***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.50***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	686.00	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.50	0.000			0.000	
TOP OF BERM	686.90	0.000	25.00	16.44	16.444	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	681.60	0						
	682.00	3,186	1,062	0.40	425	16	0.010	0.010
	683.00	19,886	11,536	1.00	11,536	427	0.265	0.275
	684.00	54,041	36,963	1.0	36,963	1,369	0.849	1.123
	684.00	79,449	66,745	0.0	0	0	0.000	1.123
OUTLET GRATE	684.10	87,290	83,369	0.1	8,337	309	0.191	1.315
	684.50	147,341	117,316	0.4	46,926	1,738	1.077	2.392
OVERFLOW	685.00	188,595	167,968	0.5	83,984	3,111	1.928	4.320

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***684.10***	***FT***	
GRATE TYPE	R-4341-A	IN	
# OF GRATES	1	EACH	
TOTAL AREA OPENING	2.500	S.F.	
OVERFLOW ELEVATION	***685.00***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	GRATE RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	681.60	0.000			0.000	START OUTLET PIPE FLOW
OUTLET	684.10	0.000			0.000	
OVERFLOW	685.00	11.610			11.610	
	685.50	14.480	50.00	45.962	60.442	

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PROJECT: BRIDGE POINT O'HARE NORTH
LOCATION: VILLAGE OF DEERFIELD, IL

PROJECT #: 12271
DATE: March 2023
LAST REVISED:

CALCULATION TITLE: DEPRESSIONAL STORAGE VOLUME CALCULATION
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	685.70	0						
	686.00	2,320	773	0.30	232	9	0.005	0.005
OVERFLOW	686.20	4,366	3,343	0.20	669	25	0.015	0.021
T/BERM	686.50	12,545	8,456	0.30	2,537	94	0.058	0.079

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C.1
SITE CONDITION: PROPOSED

ORIFICE, C	0.61		
OUTLET ELEVATION	***686.20***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***686.20***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	685.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	686.20	0.000			0.000	
T/BERM	686.50	0.000	165.00	70.49	70.492	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	683.50	674						
OUTLET	684.00	25,408	13,041	0.50	6,521	242	0.150	0.150
	684.50	76,633	51,020	0.50	25,510	945	0.586	0.735
OVERFLOW	685.00	92,808	84,720	0.50	42,360	1,569	0.972	1.708

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA C
SITE CONDITION: PROPOSED

ORIFICE, C	0.61	
OUTLET ELEVATION	***684.00***	***FT***
PIPE/OPENING SIZE	12.00	IN
# OPENINGS	1	EACH
TOTAL AREA OPENING	0.785	S.F.
OVERFLOW ELEVATION	***685.00***	FT (C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	OUTLET RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	683.50	0.000			0.000	START OUTLET PIPE FLOW
OUTLET	684.00	0.000			0.000	
OVERFLOW	685.00	2.717			2.717	
	685.50	3.843	380.00	349.31	353.154	

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE VOLUME CALCULATION**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: PROPOSED

DESCRIPTION	ELEV FT	AREA S.F.	AVG. AREA S.F.	D ELEV FT	VOLUME C.F.	VOLUME C.Y.	VOLUME ACRE-FT	ΣVOL. ACRE-FT
BOT	684.70	1,687						
	685.00	5,944	3,815	0.30	1,145	42	0.026	0.026
OVERFLOW	685.30	11,823	8,883	0.30	2,665	99	0.061	0.087
T/BERM	685.70	28,874	20,349	0.40	8,139	301	0.187	0.274

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PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE: **DEPRESSIONAL STORAGE AREA STAGE DISCHARGE TABLE**
DESCRIPTION: DEPRESSIONAL STORAGE AREA D.1
SITE CONDITION: PROPOSED

ORFICE, C	0.61		
OUTLET ELEVATION	***685.30***	***FT***	
PIPE/OPENING SIZE		IN	
# OPENINGS		EACH	
TOTAL AREA OPENING	0.000	S.F.	
OVERFLOW ELEVATION	***685.30***	FT	(C = 2.6)

NOTES:
1) N = 0.013
2) Orfice Equation = $CA(2gh)^{0.5}$
3) h is measured to center of orfice
4) Weir Equation = $CLH^{1.5}$

DESCRIPTION	ELEV FT	INFILTRATION RATE CFS	WEIR LENGTH @ ELEVATION FT	WEIR Q, FLOW CFS	FLOW TOTAL CFS	NOTES
BOTTOM	684.70	0.000			0.000	START OUTLET PIPE FLOW
OVERFLOW	685.30	0.000			0.000	
T/BERM	685.70	0.000	165.00	108.53	108.529	

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

9575 W. Higgins Road, Suite 700, Rosemont, Illinois 60018
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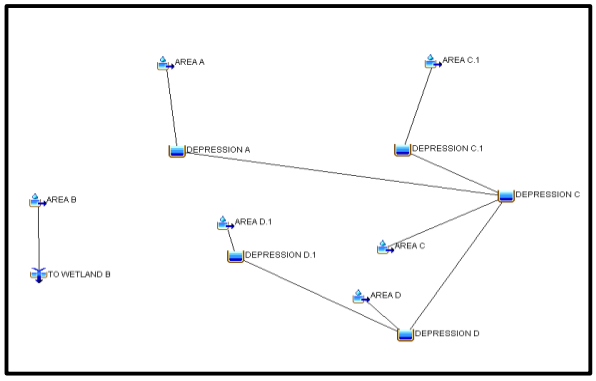
PROJECT:	**BRIDGE POINT O'HARE NORTH**	**PROJECT #:**	12271
LOCATION:	**VILLAGE OF DEERFIELD, IL**	**DATE:**	March 2023
		LAST REVISED:	

CALCULATION TITLE:	**HEC-HMS RESULTS**
DESCRIPTION:	RUNOFF VOLUME TO WETLANDS A, B, C, D
SITE CONDITION:	PROPOSED; **ON-SITE AREAS ONLY**
STORM EVENT:	2-YEAR, 24-HOUR



Summary Results for Reservoir "DEPRESSION A"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION A

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 23Mar2023, 10:04:44 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	0.138 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 16:03
Peak Discharge:	0.138 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:05
Inflow Volume:	0.093 (ACRE-FT)	Peak Storage:	0.021 (ACRE-FT)
Discharge Volume:	0.074 (ACRE-FT)	Peak Elevation:	686.50 (FT)

Summary Results for Junction "TO WETLAND B"

Project: Development Template Simulation Run: __2YR_24HR
Junction: TO WETLAND B

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 23Mar2023, 10:04:44 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Discharge:	0.224 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 16:16
Volume:	0.144 (ACRE-FT)		

Summary Results for Reservoir "DEPRESSION C"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION C

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 23Mar2023, 10:04:44 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	1.360 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 17:09
Peak Discharge:	0.003 (CFS)	Date/Time of Peak Discharge:	03Jan2000, 00:00
Inflow Volume:	1.211 (ACRE-FT)	Peak Storage:	1.202 (ACRE-FT)
Discharge Volume:	0.009 (ACRE-FT)	Peak Elevation:	684.04 (FT)

Summary Results for Reservoir "DEPRESSION D"

Project: Development Template Simulation Run: __2YR_24HR
Reservoir: DEPRESSION D

Start of Run: 01Jan2000, 00:00 Basin Model: Development Template
End of Run: 03Jan2000, 00:00 Meteorologic Model: 2YR24HR
Compute Time: 23Mar2023, 10:04:44 Control Specifications: 24HR

Volume Units: ○ IN ◉ ACRE-FT

Computed Results

Peak Inflow:	1.277 (CFS)	Date/Time of Peak Inflow:	01Jan2000, 17:02
Peak Discharge:	0.554 (CFS)	Date/Time of Peak Discharge:	01Jan2000, 20:06
Inflow Volume:	0.765 (ACRE-FT)	Peak Storage:	0.467 (ACRE-FT)
Discharge Volume:	0.606 (ACRE-FT)	Peak Elevation:	684.20 (FT)

TAB 8
RIPARIAN REQUIREMENTS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

There are no riparian environments located on the project site. Riparian requirements are not applicable.

TAB 9
MAINTENANCE & MONITORING SUBMITTALS

STORMWATER MANAGEMENT PERMIT APPLICATION
FOR
BRIDGE POINT O'HARE NORTH
VILLAGE OF DEERFIELD, LAKE COUNTY, IL

PREPARED FOR
BRIDGE INDUSTRIAL

PREPARED BY
SPACECO, INC.
9575 W. HIGGINS ROAD, SUITE 700
ROSEMONT, IL 60018

SPACECO PROJECT # 12271

MARCH 2023

SPACECO INC.
CONSULTING ENGINEERS
SITE DEVELOPMENT ENGINEERS
LAND SURVEYORS

Maintenance & Monitoring Requirements

1) General

Regular inspections and routine maintenance of general areas shall be performed on a monthly or as-needed basis by the owner. Specific items of concern include:

- Litter and debris shall be controlled
- Landscaped areas shall be maintained with regular mowing and restored with appropriate seeding/vegetation as needed
- Accumulated sediment shall be disposed of properly, along with any wastes generated during maintenance operations

2) Stormwater Management Facilities

All components of the stormwater facility (detention & runoff volume reduction components) shall be routinely checked and maintained by the owner, as necessary, to ensure proper performance. It is critical that all inflows to the stormwater facilities are clean and performing as designed. In addition, the design volume of the detention facilities shall be maintained. Inspections for the following specific items should be conducted between March and November:

As Needed:

- Side Slopes/Embankments
  - Inspect embankments for settlement and erosion
  - Remove woody growth from the embankment
  - Seed and sod any eroded areas
  - Signs of piping (leakage), repair
  - Signs of seepage or wet spots on the downstream face of a berm
  - Remove obstructions blocking emergency overflow spillways
- Outlet Control Structure
  - Inspect restrictor and remove debris if clogged or discharge reduced
  - Remove accumulated sediment at outlet
  - Any ice damage to outlet of pipe, repair if necessary
- Detention Volume
  - Inspect the stormwater detention facility to ensure that the constructed volume for detention is maintained. No sediment, topsoil, of other dumping into the facility shall be allowed.

Once per year:

- Inspect detention basins, potential problems include:
  - Erosion, tree growth on the embankment; damage to the emergency spillway; sediment accumulation around the outlet.

3) Runoff Volume Reduction Facilities

Routine inspections and maintenance of runoff volume reduction facilities shall be performed by the Owner. See Section 2) Stormwater Management Facilities for additional information.

4) Stormwater Collection System

The Owner shall perform routine inspections of all components of the stormwater collection system on an as-needed basis. The inspections shall occur between March and November and include the following specific areas of concern:

As Needed:

- Storm Inlets/Manholes
  - Remove accumulated leaves and other debris from grates
  - Reset covers/lids on as-need basis
  - Remove accumulated sediment from bottom of catchbasins when 50% of sump is filled

- Storm Sewers/Culverts
    - Visually inspect pipes by removing manhole lids, make repairs as necessary
    - Storm sewers and culverts shall be check for siltation deposits at inlets, outlets, and within the conduit, clean out as necessary

Once per year:

- Equalizer Sewer
    - Visually inspect pipes by removing manhole lids
    - Equalizer sewer shall be checked for sediment accumulation; clean out as necessary

5) Water Quality Treatment Units

The Owner shall perform routine inspections of all components of the water quality treatment system per the attached manufacturer's requirements. See CDS Inspection and Maintenance Guide.

CDS Inspection and Maintenance Guide

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CDS® Inspection and Maintenance Guide



CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities



Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.