DRAINAGE REPORT FOR:

SARTA TRANSIT CENTER

TOMMY HENDRICH DR NW MASSILLON, OH 44647

PREPARED FOR:

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RLB #13064.12

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SUMMARY

STORMWATER MANAGEMENT SARTA TRANSIT CENTER MASSILLON, OHIO RLB #13064.12

1.1 Introduction

The new SARTA Transit Center will be located at on Tommy Hendrich Dr NW in Massillon, Stark County, Ohio. The site is partially located on parcels 10003717 and 10003719 which are being combined as part of this project. The site is bound by State Route 21 to the north and west, Tommy Hendrich Dr NW to the east, and a commercial retail outlet building to the south. The 1.512 acre site is vacant and partially covered by an abandoned asphalt parking lot. SARTA recently erected a temporary bus shelter on site which is being utilized while the permanent transit SARTA is being developed.

The existing topography of the site generally slopes from north to south with an approximate elevation difference of 2 feet. The existing site is tributary to the Tuscarawas River, which discharges into the Muskingham River, which discharges into the Ohio River.

The proposed improvements include a 5,565 SF single story bus transit center building, a bus drive loop around the building, a 10-space parking lot to the north, and associated drive aisles, aprons, and pedestrian hardscape. Approximately 0.55 Acres of impervious surface will be added due to the improvements. A stormwater management system consisting of site grading, curbs, pavement, extended dry detention pond, and drainage piping has been developed to safely capture, store, and convey runoff through the site.

Stormwater management is a device for controlling stormwater runoff for the purpose of reducing the negative effects of urbanization, including downstream erosion, flooding, and degradation of water resources. Stormwater discharge from the site will be controlled in accordance with current local requirements and the Ohio Environmental Protection Agency (OEPA) National Pollutant Discharge Elimination System (NPDES) General Permit No. OHC000005 for Construction activity.

1.2 Stormwater Quantity Control

According to the local criteria, "the post-development rate of runoff is not permitted to exceed the predevelopment rate of runoff". To meet these requirements, the project will incorporate a dry extended detention basin located on northwest portion of the site.

Description	Tributary Area (ac.)	Percent Impervious	Run-Off Curve Number	Time of Concentration (min.)
Pre-Developed	0.12	0	80	5
Post-Developed	1.00	64	92	19

Table 1 Tributary Area Characteristics

The stormwater management analysis is based on the tributary area characteristics shown in Table 1 shown above and on attached Drawing D1.1-Detention Pond Drainage Area Map.

Existing and proposed run-off curve numbers are based on factors such as hydrologic soil groups (HSG), and ground cover type and condition. The HSG was determined from the USDA NRCS Web Soil Survey (see attached map). Run-off curve numbers were estimated based on Table 2-2a from 'TR-55 NRCS USDA Urban Hydrology for Small Watersheds, 1986'. The percent impervious represents the percent of building, pavement and other impervious surfaces that restricted restrict

infiltration of rainfall into the ground. These estimates are shown on attached Drawing D1.2-Storm Sewer Drainage Area Map.

The Time of Concentration (Tc) is the time for run-off to travel from the hydraulically most remote point of the watershed to the outlet, and is affected by such factors as slope, conveyance type, and surface roughness. The path used to estimate the pre-developed Tc is shown on attached Drawing D1.1. The Hydraflow Hydrographs software program was used to calculate the pre-developed Tc and is shown in the attached 'TR55 Tc Worksheet', using the equations shown below. The post-developed Tc was obtained from the attached proposed Storm Sewer Calculations

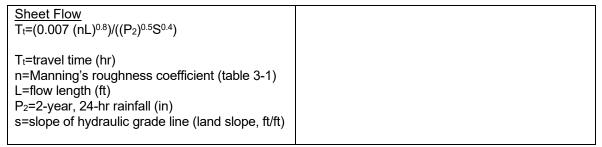


Table 2 Time of Concentration (Tc) Equations

The following is a summary of results of the storm water management analysis performed, based on the proposed extended dry detention pond and outlet control structure. As shown below, the post-development discharge rate is less than the pre-development runoff rate for each storm frequency.

Storm Frequency	Pre- Developed Peak Flow	Developed Peak Flow (cfs)	Routed Peak Flow	Storage Volume Required	Max. Water Elevation
	(cfs)		(cfs)	(cf)	(ft)
1-Year	0.119	1.474	0.017	3,859	930.53
2-Year	0.173	1.886	0.019	5,069	930.91
5-Year	0.261	2.507	0.022	6,964	931.38
10-Year	0.341	3.045	0.024	8,654	931.78
25-Year	0.469	3.850	0.099	9,846	932.05
50-Year	0.582	4.537	0.257	10,259	932.12
100-Year	0.709	5.292	0.635	10,936	932.25

Table 3 Runoff Summary

1.3 Stormwater Quality Control

Storm water quality will be provided in the dry extended detention basin conforming to OEPA and local requirements. Discharge from the extended detention basin will be controlled by a water quality orifice, which will discharge the required water quality volume over the required minimum drain time. See attached Drawings C1.6, C4.1, & C6.1 for additional basin and outlet control structure information. See attached Hydraflow Hydrographs for additional water elevation and drain time information. The required Water Quality Volume (WQv) was calculated as follows:

Rv = 0.05 + 0.9i (volumetric runoff coefficient)

P = precipitation depth (0.90 in)

A = area draining into the BMP (1.51 ac)

 $R_{v1} = 0.05 + 0.9(0.23) = 0.25$ (Pre-Development)

 $R_{v2} = 0.05 + 0.9(0.64) = 0.63$ (Post-Development)

WQv = 0.90*1.51*[(0.25*0.2) + (0.64-0.25)]/12 = 0.05 Acre-FT = 2,121 CF

Note: WQv should be increased by 20% for capacity lost over time due to sediment accumulation.

See attached Drawing C1.6 for orifice sizing and drain times summary. As required for dry extended detention basins, a fore bay and micro pool will be provided, each sized at a minimum 10% of the WQv. Following is a summary of WQv:

	Required	Provided
Water Quality Volume (WQv)	2,121 cf	3,077 cf
Water Quality Volume + 20%	2,546 cf	3,077 cf
Sediment Storage (20%)	509 cf	509 cf
Forebay (10% WQv)	255 cf	608 cf
Micropool (10% WQv)	255 cf	302 cf
Drain Time	48 hours	51 hours

Table 4 Water Quality Volume (WQv) Data

1.4 Temporary Sediment Trap

The proposed stormwater management basin will be used as a temporary sediment trap during construction to capture and store sediment resulting from construction activity. See attached Drawing C1.1 for temporary sediment trap design data.

1.5 Conclusion

The proposed stormwater management system will control discharge from the areas being developed to satisfy local and OEPA requirements. The post-development peak discharge rates will be controlled to be less than pre-development peak discharge rates by a new outlet control structure. Stormwater quality control will be provided in the proposed dry extended detention basin utilizing a water quality orifice, as well as a fore bay and micro pool. The proposed extended dry detention pond will provide sufficient storage volume to safely store runoff being restricted by the outlet control structures. In the rare circumstance that the water level within the detention basins exceeds the top of bank elevation, an emergency path has been provided for the water to flow safely downstream.



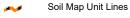
MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons



Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot
Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Δ

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15.800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Stark County, Ohio Survey Area Data: Version 18, Sep 14, 2021

Soil map units are labeled (as space allows) for map scales 1:50.000 or larger.

Date(s) aerial images were photographed: Jul 15, 2020—Aug 21, 2020

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

Soil Map—Stark County, Ohio SARTA - Massillon Transit Center

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ur	Urban land	1.7	100.0%
Totals for Area of Interest		1.7	100.0%



NOAA Atlas 14, Volume 2, Version 3 Location name: Massillon, Ohio, USA* Latitude: 40.7965°, Longitude: -81.5277° Elevation: 930.6 ft**

* source: ESRI Maps ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PD	S-based p	oint preci	ipitation fi	requency	estimates	with 90%	confiden	ce interva	ls (in inch	es) ¹
Duration				Avera	ge recurrenc	e interval (y	rears)			
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	0.323 (0.295-0.354)	0.385 (0.352-0.422)	0.467 (0.425-0.511)	0.529 (0.481-0.579)	0.608 (0.550-0.664)	0.669 (0.603-0.730)	0.727 (0.653-0.792)	0.786 (0.704-0.857)	0.866 (0.770-0.942)	0.924 (0.817-1.00)
10-min	0.501 (0.458-0.550)	0.602 (0.549-0.659)	0.726 (0.660-0.795)	0.817 (0.742-0.893)	0.930 (0.842-1.02)	1.01 (0.914-1.11)	1.10 (0.983-1.19)	1.17 (1.05-1.28)	1.27 (1.13-1.38)	1.35 (1.19-1.46)
15-min	0.615 (0.561-0.675)	0.736 (0.671-0.806)	0.892 (0.811-0.976)	1.00 (0.913-1.10)	1.15 (1.04-1.25)	1.25 (1.13-1.37)	1.36 (1.22-1.48)	1.46 (1.31-1.59)	1.59 (1.41-1.73)	1.68 (1.49-1.83)
30-min	0.813 (0.743-0.893)	0.985 (0.898-1.08)	1.22 (1.11-1.34)	1.40 (1.27-1.53)	1.62 (1.47-1.77)	1.79 (1.62-1.96)	1.96 (1.76-2.14)	2.13 (1.91-2.32)	2.35 (2.09-2.56)	2.52 (2.23-2.74)
60-min	0.993 (0.907-1.09)	1.21 (1.10-1.32)	1.53 (1.39-1.68)	1.78 (1.61-1.94)	2.11 (1.90-2.30)	2.36 (2.13-2.58)	2.63 (2.36-2.86)	2.89 (2.59-3.15)	3.26 (2.90-3.54)	3.54 (3.13-3.85)
2-hr	1.14 (1.03-1.25)	1.38 (1.25-1.52)	1.78 (1.61-1.96)	2.10 (1.90-2.30)	2.57 (2.31-2.81)	2.96 (2.66-3.24)	3.38 (3.03-3.69)	3.84 (3.42-4.18)	4.50 (3.98-4.89)	5.06 (4.45-5.49)
3-hr	1.21 (1.09-1.33)	1.46 (1.33-1.62)	1.88 (1.70-2.07)	2.22 (2.01-2.45)	2.72 (2.45-2.99)	3.14 (2.81-3.44)	3.60 (3.21-3.94)	4.11 (3.64-4.48)	4.84 (4.26-5.26)	5.46 (4.77-5.92)
6-hr	1.46 (1.32-1.63)	1.76 (1.59-1.96)	2.24 (2.02-2.49)	2.64 (2.38-2.93)	3.24 (2.91-3.59)	3.75 (3.35-4.14)	4.32 (3.83-4.75)	4.94 (4.36-5.42)	5.86 (5.12-6.41)	6.65 (5.76-7.26)
12-hr	1.73 (1.57-1.93)	2.08 (1.89-2.32)	2.61 (2.37-2.91)	3.08 (2.78-3.42)	3.77 (3.39-4.18)	4.37 (3.91-4.83)	5.04 (4.48-5.55)	5.78 (5.10-6.34)	6.89 (6.02-7.53)	7.84 (6.80-8.56)
24-hr	2.04 (1.86-2.24)	2.44 (2.23-2.69)	3.04 (2.78-3.35)	3.56 (3.25-3.91)	4.34 (3.93-4.76)	5.01 (4.51-5.48)	5.75 (5.13-6.28)	6.57 (5.81-7.18)	7.80 (6.79-8.51)	8.85 (7.60-9.66)
2-day	2.35 (2.16-2.58)	2.81 (2.58-3.08)	3.46 (3.18-3.80)	4.02 (3.68-4.41)	4.85 (4.41-5.31)	5.56 (5.02-6.08)	6.33 (5.67-6.93)	7.17 (6.36-7.85)	8.41 (7.35-9.22)	9.46 (8.15-10.4)
3-day	2.51 (2.32-2.75)	3.00 (2.76-3.27)	3.68 (3.38-4.01)	4.25 (3.90-4.63)	5.08 (4.64-5.54)	5.79 (5.25-6.30)	6.55 (5.90-7.13)	7.37 (6.58-8.03)	8.58 (7.56-9.36)	9.62 (8.37-10.5)
4-day	2.68 (2.47-2.91)	3.19 (2.94-3.46)	3.89 (3.59-4.22)	4.47 (4.11-4.85)	5.32 (4.87-5.76)	6.01 (5.48-6.52)	6.76 (6.12-7.33)	7.56 (6.80-8.20)	8.75 (7.77-9.51)	9.77 (8.59-10.7)
7-day	3.20 (2.97-3.46)	3.81 (3.53-4.11)	4.60 (4.26-4.97)	5.26 (4.87-5.68)	6.21 (5.71-6.70)	6.99 (6.40-7.54)	7.82 (7.11-8.43)	8.69 (7.86-9.38)	9.93 (8.88-10.7)	10.9 (9.70-11.8)
10-day	3.69 (3.43-3.97)	4.37 (4.07-4.70)	5.23 (4.87-5.63)	5.93 (5.51-6.37)	6.90 (6.39-7.41)	7.69 (7.08-8.25)	8.49 (7.79-9.12)	9.33 (8.51-10.0)	10.5 (9.49-11.3)	11.4 (10.2-12.3)
20-day	5.15 (4.83-5.49)	6.08 (5.71-6.49)	7.17 (6.72-7.66)	8.02 (7.51-8.57)	9.15 (8.54-9.77)	10.0 (9.33-10.7)	10.9 (10.1-11.6)	11.7 (10.9-12.6)	12.9 (11.8-13.8)	13.7 (12.6-14.7)
30-day	6.46 (6.06-6.87)	7.61 (7.15-8.10)	8.87 (8.32-9.44)	9.83 (9.21-10.5)	11.1 (10.4-11.8)	12.1 (11.2-12.8)	13.0 (12.1-13.8)	13.9 (12.9-14.8)	15.0 (13.9-16.0)	15.9 (14.6-17.0)
45-day	8.26 (7.79-8.76)	9.69 (9.14-10.3)	11.1 (10.5-11.8)	12.2 (11.5-13.0)	13.6 (12.8-14.4)	14.6 (13.7-15.5)	15.6 (14.6-16.6)	16.5 (15.4-17.5)	17.7 (16.4-18.8)	18.5 (17.2-19.7)
60-day	9.99 (9.45-10.5)	11.7 (11.1-12.3)	13.3 (12.6-14.1)	14.5 (13.8-15.3)	16.0 (15.2-16.9)	17.1 (16.2-18.1)	18.2 (17.1-19.2)	19.1 (18.0-20.2)	20.2 (19.0-21.5)	21.0 (19.7-22.3)

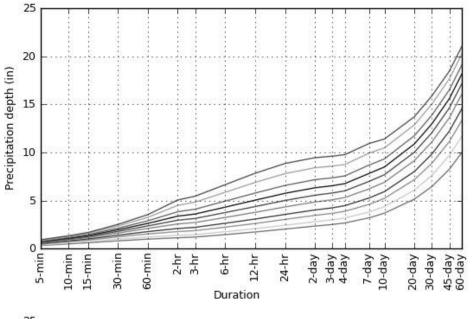
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

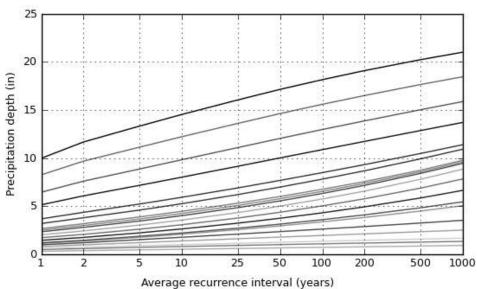
Please refer to NOAA Atlas 14 document for more information.

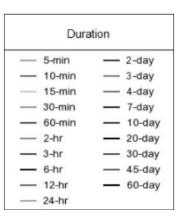
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PDS-based depth-duration-frequency (DDF) curves Latitude: 40.7965°, Longitude: -81.5277°



int	recurrence erval ears)
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_	2
	5
_	10
_	25
-	50
) - 1	100
1	200
-	500
	1000





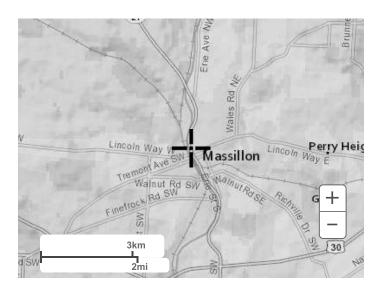
NOAA Atlas 14, Volume 2, Version 3

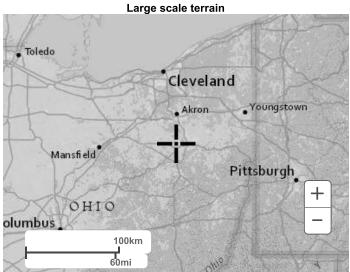
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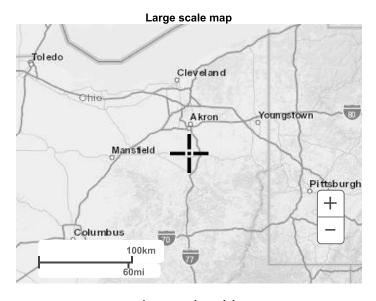
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Maps & aerials

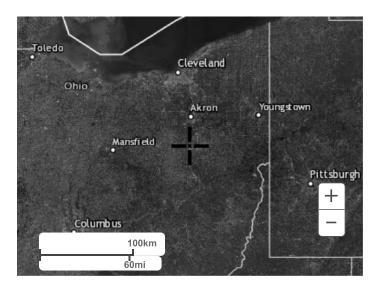
Small scale terrain







Large scale aerial



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US Department of Commerce National Oceanic and Atmospheric Administration

National Weather Service National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

<u>Disclaimer</u>

Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Return Period	Intensity-Duration-Frequency Equation Coefficients (FHA)							
(Yrs)	В	D	E	(N/A)				
1	41.2648	9.8000	0.8779					
2	49.3678	10.1000	0.8726					
3	0.0000	0.0000	0.0000					
5	50.4399	9.4000	0.8244					
10	50.5524	8.8000	0.7909					
25	44.3016	7.1000	0.7238					
50	42.9511	6.3000	0.6918					
100	39.5863	5.3000	0.6488					

File name: Massillon Rain Intensity.IDF

Intensity = B / (Tc + D)^E

Intensity Values (in/hr)											
5 min	10	15	20	25	30	35	40	45	50	55	60
3.87	3.00	2.46	2.10	1.83	1.63	1.47	1.34	1.23	1.14	1.06	0.99
4.62	3.60	2.96	2.53	2.21	1.97	1.78	1.62	1.49	1.38	1.29	1.21
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.59	4.38	3.62	3.11	2.73	2.44	2.21	2.02	1.87	1.74	1.63	1.53
6.34	4.97	4.12	3.54	3.12	2.80	2.54	2.34	2.16	2.02	1.89	1.78
7.29	5.68	4.71	4.07	3.60	3.24	2.96	2.73	2.53	2.37	2.23	2.11
8.03	6.23	5.18	4.47	3.97	3.58	3.27	3.03	2.82	2.64	2.49	2.36
8.72	6.74	5.61	4.87	4.33	3.92	3.60	3.33	3.12	2.93	2.77	2.63
	3.87 4.62 0.00 5.59 6.34 7.29 8.03	3.87 3.00 4.62 3.60 0.00 0.00 5.59 4.38 6.34 4.97 7.29 5.68 8.03 6.23	3.87 3.00 2.46 4.62 3.60 2.96 0.00 0.00 0.00 5.59 4.38 3.62 6.34 4.97 4.12 7.29 5.68 4.71 8.03 6.23 5.18	3.87 3.00 2.46 2.10 4.62 3.60 2.96 2.53 0.00 0.00 0.00 0.00 5.59 4.38 3.62 3.11 6.34 4.97 4.12 3.54 7.29 5.68 4.71 4.07 8.03 6.23 5.18 4.47	5 min 10 15 20 25 3.87 3.00 2.46 2.10 1.83 4.62 3.60 2.96 2.53 2.21 0.00 0.00 0.00 0.00 0.00 5.59 4.38 3.62 3.11 2.73 6.34 4.97 4.12 3.54 3.12 7.29 5.68 4.71 4.07 3.60 8.03 6.23 5.18 4.47 3.97	5 min 10 15 20 25 30 3.87 3.00 2.46 2.10 1.83 1.63 4.62 3.60 2.96 2.53 2.21 1.97 0.00 0.00 0.00 0.00 0.00 0.00 5.59 4.38 3.62 3.11 2.73 2.44 6.34 4.97 4.12 3.54 3.12 2.80 7.29 5.68 4.71 4.07 3.60 3.24 8.03 6.23 5.18 4.47 3.97 3.58	5 min 10 15 20 25 30 35 3.87 3.00 2.46 2.10 1.83 1.63 1.47 4.62 3.60 2.96 2.53 2.21 1.97 1.78 0.00 0.00 0.00 0.00 0.00 0.00 0.00 5.59 4.38 3.62 3.11 2.73 2.44 2.21 6.34 4.97 4.12 3.54 3.12 2.80 2.54 7.29 5.68 4.71 4.07 3.60 3.24 2.96 8.03 6.23 5.18 4.47 3.97 3.58 3.27	5 min 10 15 20 25 30 35 40 3.87 3.00 2.46 2.10 1.83 1.63 1.47 1.34 4.62 3.60 2.96 2.53 2.21 1.97 1.78 1.62 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 5.59 4.38 3.62 3.11 2.73 2.44 2.21 2.02 6.34 4.97 4.12 3.54 3.12 2.80 2.54 2.34 7.29 5.68 4.71 4.07 3.60 3.24 2.96 2.73 8.03 6.23 5.18 4.47 3.97 3.58 3.27 3.03	5 min 10 15 20 25 30 35 40 45 3.87 3.00 2.46 2.10 1.83 1.63 1.47 1.34 1.23 4.62 3.60 2.96 2.53 2.21 1.97 1.78 1.62 1.49 0.00 0	5 min 10 15 20 25 30 35 40 45 50 3.87 3.00 2.46 2.10 1.83 1.63 1.47 1.34 1.23 1.14 4.62 3.60 2.96 2.53 2.21 1.97 1.78 1.62 1.49 1.38 0.00 0.0	5 min 10 15 20 25 30 35 40 45 50 55 3.87 3.00 2.46 2.10 1.83 1.63 1.47 1.34 1.23 1.14 1.06 4.62 3.60 2.96 2.53 2.21 1.97 1.78 1.62 1.49 1.38 1.29 0.00<

Tc = time in minutes. Values may exceed 60.

s01\9000-<u>13500\13064\13064.12 SARTA Task 12 - Massillon Transit Center\Civil\Drainage\Massillon Precipitation.pcp</u>

	Rainfall Precipitation Table (in)							
Storm Distribution	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.04	2.44	0.00	3.04	3.56	4.34	5.01	5.75
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2-2a Runoff curve numbers for urban areas 1/

Cover description			Curve nu hydrologic-	umbers for soil group	
	Average percent		-		
Cover type and hydrologic condition is	mpervious area ² /	A	В	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) 3/:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc.					
(excluding right-of-way)	••••	98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding					
right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) $^{4/}$		63	77	85	88
Artificial desert landscaping (impervious weed barrier,					
desert shrub with 1- to 2-inch sand or gravel mulch					
and basin borders)		96	96	96	96
Urban districts:					
Commercial and business		89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)		77	85	90	92
1/4 acre		61	7 5	83	87
1/3 acre		57	72	81	86
1/2 acre		54	70	80	85
1 acre		51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas					
(pervious areas only, no vegetation) 5/		77	86	91	94
Idle lands (CN's are determined using cover types					
similar to those in table 2-2c).					

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

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

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

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

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

 Table 2-2b
 Runoff curve numbers for cultivated agricultural lands \underline{V}

	Cover description	Curve numbers for					
	cover description	Hydrologic		11, 01 010 610 0	on group		
Cover type	Treatment 2/	condition 3/	A	В	С	D	
Fallow	Bare soil	_	77	86	91	94	
	Crop residue cover (CR)	Poor	76	85	90	93	
		Good	74	83	88	90	
Row crops	Straight row (SR)	Poor	72	81	88	91	
-		Good	67	78	85	89	
	SR + CR	Poor	71	80	87	90	
		Good	64	75	82	85	
	Contoured (C)	Poor	70	79	84	88	
		Good	65	75	82	86	
	C + CR	Poor	69	78	83	87	
		Good	64	74	81	85	
	Contoured & terraced (C&T)	Poor	66	74	80	82	
		Good	62	71	78	81	
	C&T+ CR	Poor	65	73	79	81	
		Good	61	70	77	80	
Small grain	SR	Poor	65	76	84	88	
		Good	63	7 5	83	87	
	SR + CR	Poor	64	75	83	86	
		Good	60	72	80	84	
	C	Poor	63	74	82	85	
		Good	61	73	81	84	
	C + CR	Poor	62	73	81	84	
		Good	60	72	80	83	
	C&T	Poor	61	72	79	82	
		Good	59	70	78	81	
	C&T+ CR	Poor	60	71	78	81	
		Good	58	69	77	80	
Close-seeded	SR	Poor	66	77	85	89	
or broadcast	_	Good	58	72	81	85	
legumes or	C	Poor	64	75	83	85	
rotation		Good	55	69	78	83	
meadow	C&T	Poor	63	73	80	83	
		Good	51	67	76	80	

 $^{^{1}}$ Average runoff condition, and I_a =0.2S

Poor: Factors impair infiltration and tend to increase runoff.

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

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

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

 $\textbf{Table 2-2c} \qquad \text{Runoff curve numbers for other agricultural lands } \underline{1}{}^{\underline{1}}$

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

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

² *Poor:* <50%) ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

³ *Poor*: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

⁴ Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

⁶ Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

 $\textbf{Table 2-2d} \qquad \text{Runoff curve numbers for arid and semiarid rangelands } \bot$

Cover description			Curve nui hydrologi	mbers for c soil group	
Cover type	Hydrologic condition 2/	A 3/	В	C	D
Herbaceous—mixture of grass, weeds, and	Poor		80	87	93
low-growing brush, with brush the	Fair		71	81	89
minor element.	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush,	Poor		66	74	79
aspen, mountain mahogany, bitter brush, maple,	Fair		48	57	63
and other brush.	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both;	Poor		75	85	89
grass understory.	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush,	Poor	63	77	85	88
greasewood, creosotebush, blackbrush, bursage,	Fair	55	72	81	86
palo verde, mesquite, and cactus.	Good	49	68	79	84

 $^{^{\, 1}}$ $\,$ Average runoff condition, and $I_a,$ = 0.2S. For range in humid regions, use table 2-2c.

Good: > 70% ground cover.

Poor: <30% ground cover (litter, grass, and brush overstory).
 Fair: 30 to 70% ground cover.

 $^{^{\}scriptscriptstyle 3}$ $\,$ Curve numbers for group A have been developed only for desert shrub.

PART 2 STORMWATER MANAGEMENT ANALYSIS

Hyd. No. 1Pre-Development

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>
Sheet Flow Manning's n-value Flow length (ft) Two-year 24-hr precip. (in) Land slope (%)	= 0.150 = 38.0 = 2.35 = 2.30		0.011 0.0 0.00 0.00		0.011 0.0 0.00 0.00		
Travel Time (min)	= 4.99	+	0.00	+	0.00	=	4.99
Shallow Concentrated Flow Flow length (ft) Watercourse slope (%) Surface description Average velocity (ft/s)	= 0.00 = 0.00 = Paved =0.00		0.00 0.00 Paved 0.00		0.00 0.00 Paved 0.00		
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow X sectional flow area (sqft) Wetted perimeter (ft) Channel slope (%) Manning's n-value Velocity (ft/s)	= 0.00 = 0.00 = 0.00 = 0.015 =0.00		0.00 0.00 0.00 0.015 0.00		0.00 0.00 0.00 0.015		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Total Travel Time, Tc							5.00 min

Hydrograph Return Period Recap

lyd.	Hydrograph	Inflow				Peak Out	tflow (cfs))			Hydrograph
lo.	type (origin)	hyd(s)	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	Description
1	SCS Runoff		0.119	0.173		0.261	0.341	0.469	0.582	0.709	Pre-Development
2	SCS Runoff		1.474	1.886		2.507	3.045	3.850	4.537	5.292	Post-Development
3	Reservoir	2	0.017	0.019		0.022	0.024	0.099	0.257	0.635	Routed

Proj. file: 1306412SWM5.gpw Tuesday, 12 / 6 / 2022

		Hydraflow Hydrographs Extension for Autodesk® Civi							
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.119	2	718	240				Pre-Development
2	SCS Runoff	1.474	2	724	4,621				Post-Development
2 3	SCS Runoff Reservoir	1.474	2 2	724 1448	4,621	2	930.53	3,859	Post-Development Routed
130	06412SWM5.	gpw			Return F	Period: 1 Ye	ear	Tuesday, 1	2 / 6 / 2022

łyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.173	2	718	346				Pre-Development
2	SCS Runoff	1.886	2	724	5,945				Post-Development
3	Reservoir	0.019	2	1448	4,754	2	930.91	5,069	Routed
)6412SWM5.					Period: 2 Ye		—	2/6/2022

łyd. lo.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.261	2	718	523				Pre-Development
2	SCS Runoff	2.507	2	724	7,982				Post-Development
3	Reservoir	0.022	2	1450	5,654	2	931.38	6,964	Routed
120	 6412SWM5.	gpw.			Poture !	Period: 5 Ye	ear	Tuosday 4	2 / 6 / 2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.341	2	718	688				Pre-Development
2	SCS Runoff	3.045	2	724	9,780				Post-Development
3	Reservoir	0.024	2	1452	6,341	2	931.78	8,654	Routed
130)6412SWM5.	gpw			Return	Period: 10 `	Year	Tuesday, 1	12 / 6 / 2022

iya. lo.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.469	2	716	950				Pre-Development
2	SCS Runoff	3.850	2	724	12,511				Post-Development
3	Reservoir	0.099	2	970	8,377	2	932.05	9,846	Routed

		_	T	· •		Hydran	ow Hydrograpns ⊤	Extension for Au	utodesk® Civil 3D® by Autodesk, Inc. v20
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.582	2	716	1,185				Pre-Development
2	SCS Runoff	4.537	2	724	14,880				Post-Development
2 3	SCS Runoff Reservoir	4.537 0.257	2 2	724 812	14,880	2	932.12	10,259	Post-Development Routed
130	06412SWM5.	gpw			Return F	Period: 50 \	/ear	Tuesday, 1	2 / 6 / 2022

lyd. Io.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.709	2	716	1,452				Pre-Development
2	SCS Runoff	5.292	2	724	17,511				Post-Development
3	Reservoir	0.635	2	758	13,359	2	932.25	10,936	Routed
	06412SWM5.	apw			Return	Period: 100	Vear	Tuesday 1	12 / 6 / 2022

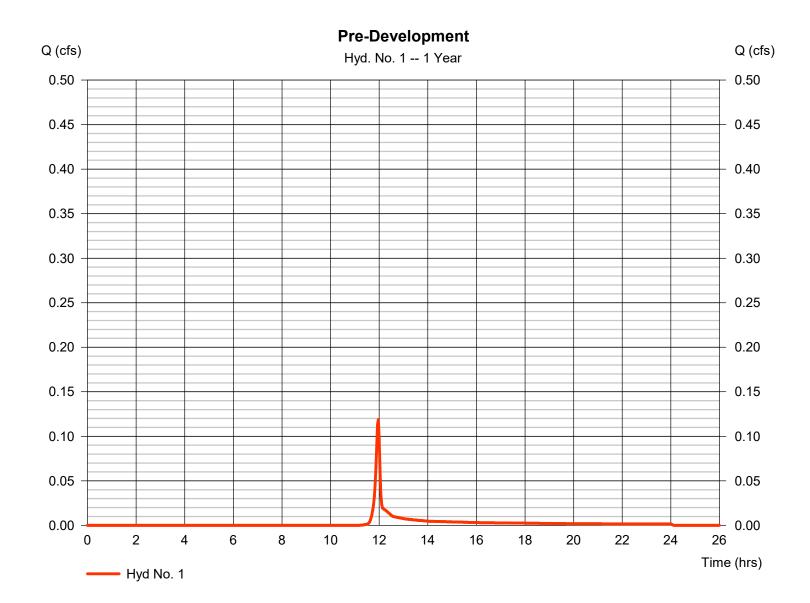
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.119 cfsStorm frequency = 1 yrsTime to peak $= 11.97 \, hrs$ Time interval = 2 min Hyd. volume = 240 cuft Drainage area = 0.120 acCurve number = 80 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. = 2.04 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



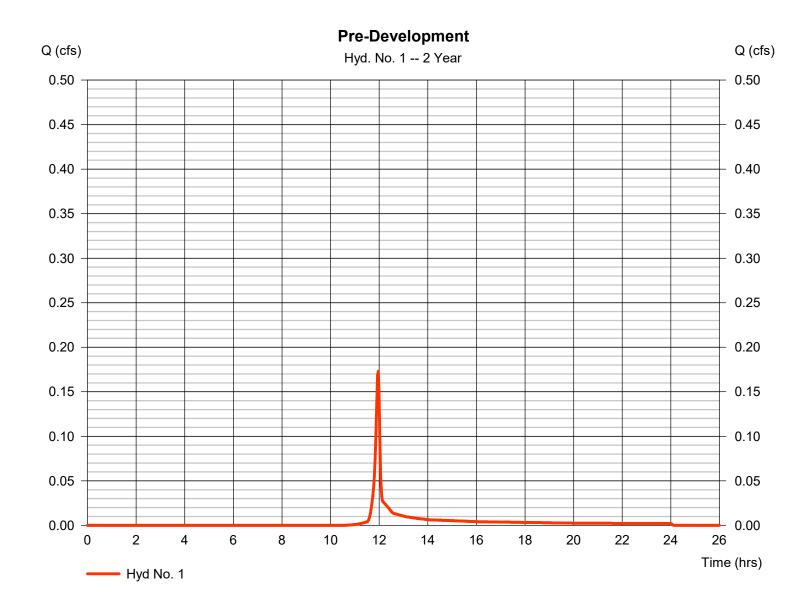
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.173 cfsStorm frequency = 2 yrsTime to peak $= 11.97 \, hrs$ Time interval = 2 min Hyd. volume = 346 cuft Drainage area = 0.120 acCurve number = 80 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. = 2.44 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



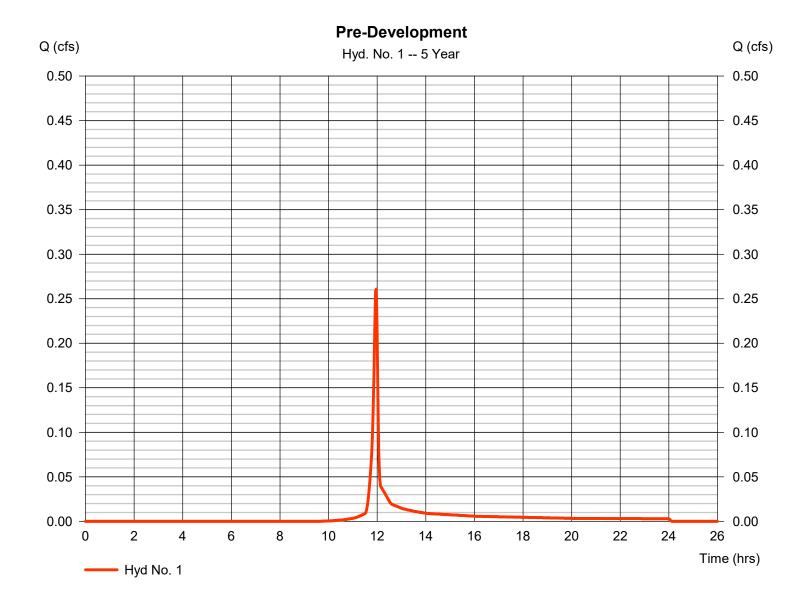
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.261 cfsStorm frequency = 5 yrsTime to peak $= 11.97 \, hrs$ Time interval = 2 min Hyd. volume = 523 cuft Drainage area = 0.120 acCurve number = 80 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. = 3.04 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



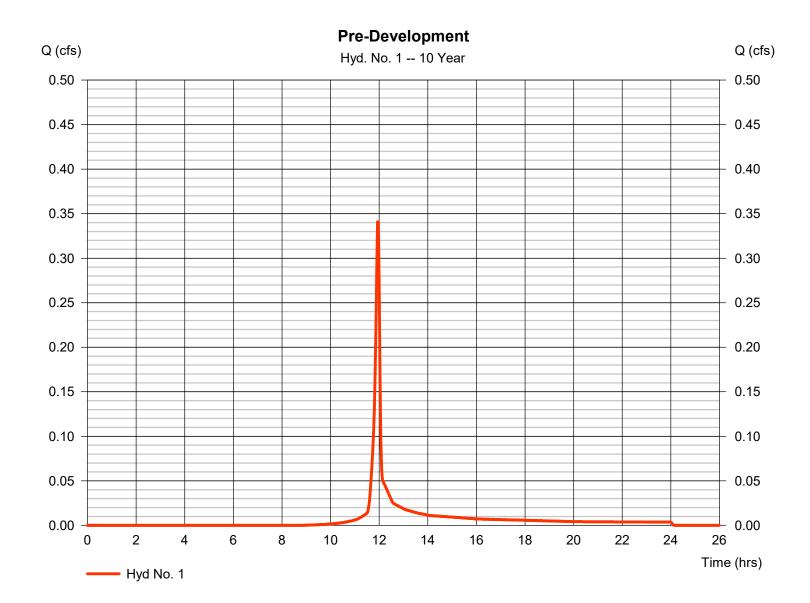
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.341 cfsStorm frequency = 10 yrsTime to peak $= 11.97 \, hrs$ Time interval = 2 min Hyd. volume = 688 cuft Drainage area Curve number = 0.120 ac= 80 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. = 3.56 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



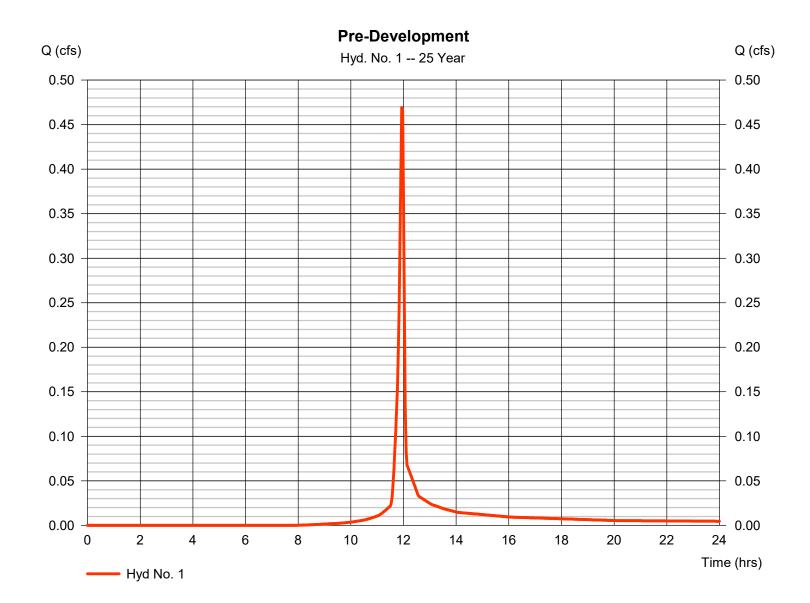
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.469 cfsStorm frequency = 25 yrs Time to peak $= 11.93 \, hrs$ Time interval = 2 min Hyd. volume = 950 cuft Drainage area Curve number = 80 = 0.120 acHydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. = 4.34 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



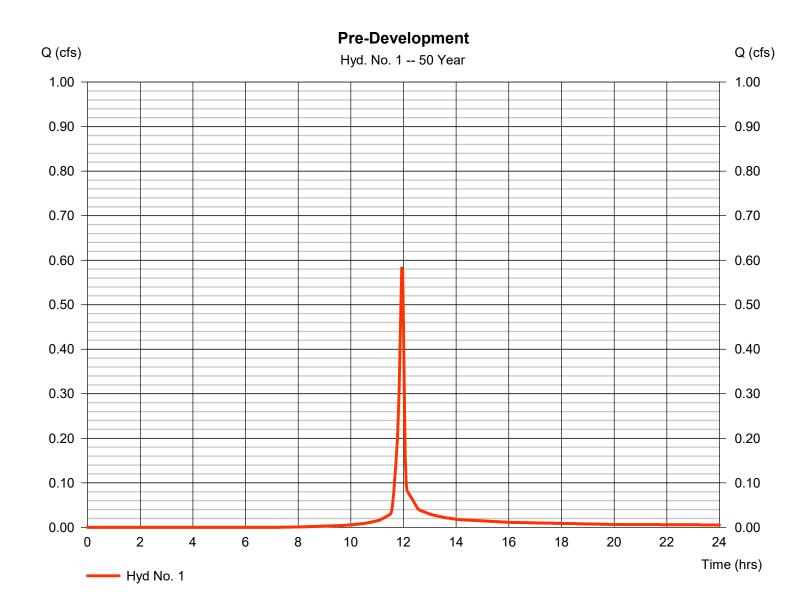
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.582 cfsStorm frequency = 50 yrsTime to peak $= 11.93 \, hrs$ Time interval = 2 min Hyd. volume = 1,185 cuft Drainage area Curve number = 0.120 ac= 80 Hydraulic length Basin Slope = 0.0 %= 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. Distribution = Type II = 5.01 inStorm duration = 24 hrs Shape factor = 484



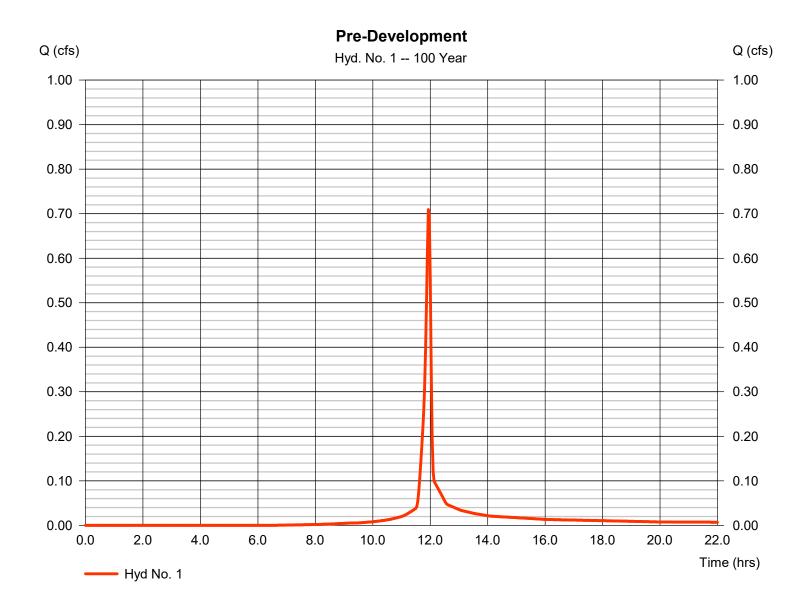
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 1

Pre-Development

Hydrograph type = SCS Runoff Peak discharge = 0.709 cfsStorm frequency = 100 yrsTime to peak $= 11.93 \, hrs$ Time interval = 2 min Hyd. volume = 1,452 cuftDrainage area Curve number = 0.120 ac= 80 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) $= 5.00 \, \text{min}$ = TR55 Total precip. Distribution = Type II = 5.75 inStorm duration = 24 hrs Shape factor = 484



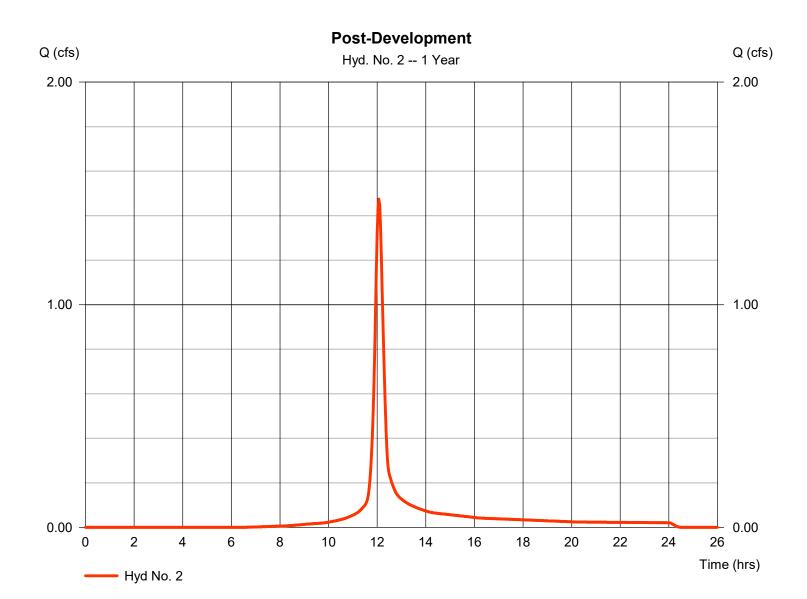
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 1.474 cfsStorm frequency = 1 yrsTime to peak = 12.07 hrsTime interval = 2 min Hyd. volume = 4,621 cuftDrainage area Curve number = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 2.04 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



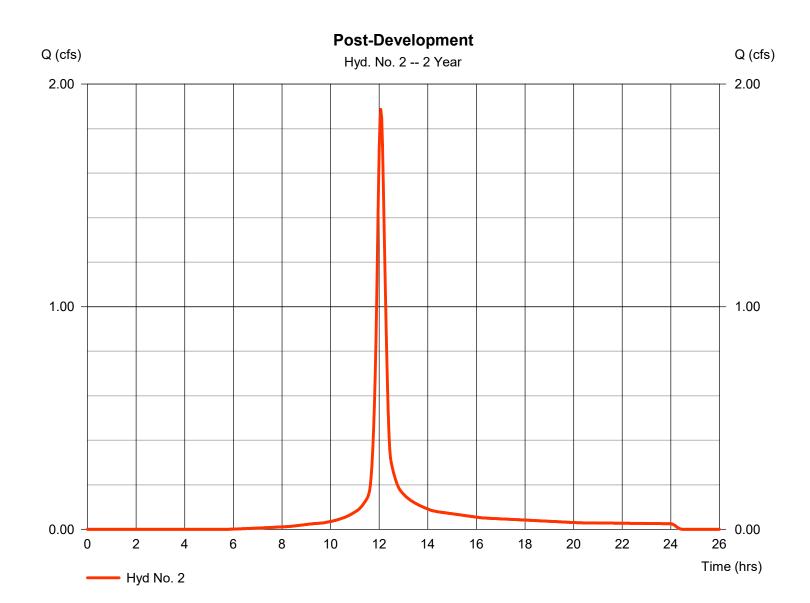
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 1.886 cfsStorm frequency = 2 yrsTime to peak $= 12.07 \, hrs$ Time interval = 2 min Hyd. volume = 5,945 cuftDrainage area Curve number = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 2.44 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



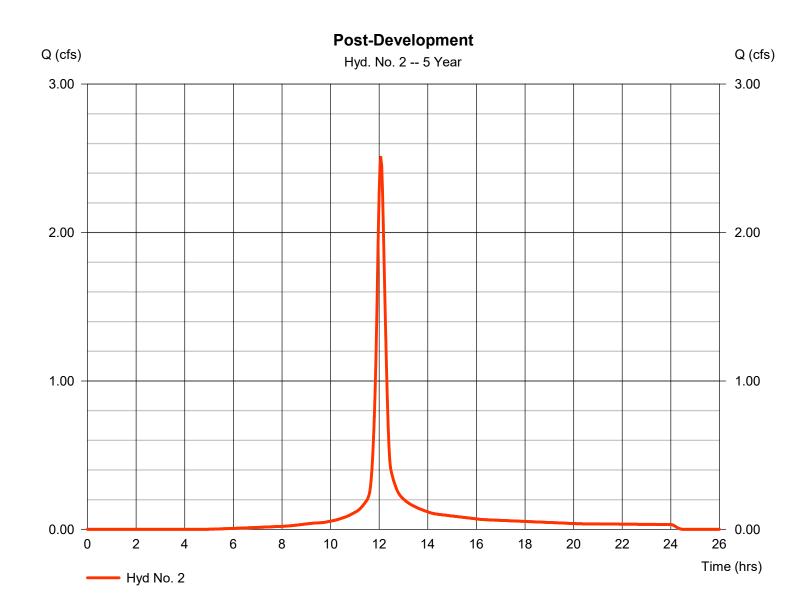
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 2.507 cfsStorm frequency = 5 yrsTime to peak = 12.07 hrsTime interval = 2 min Hyd. volume = 7,982 cuft Drainage area Curve number = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 3.04 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



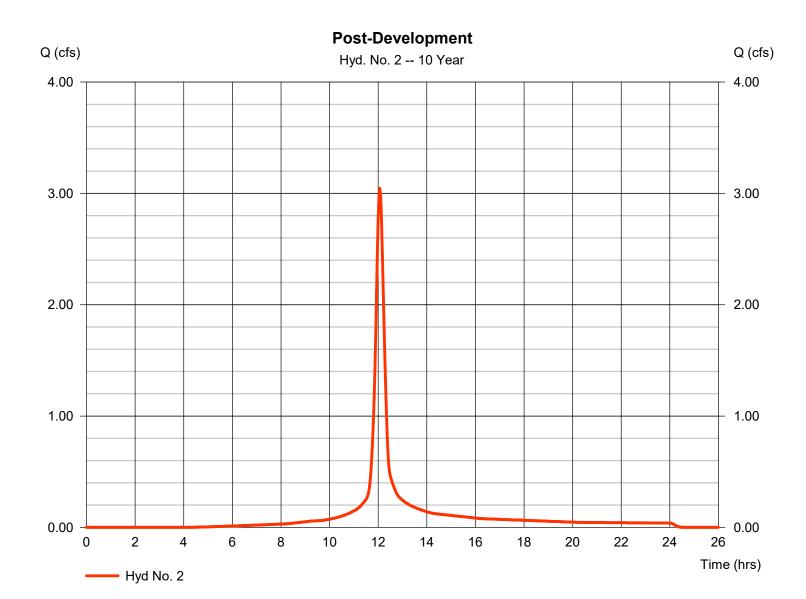
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 3.045 cfsStorm frequency = 10 yrsTime to peak = 12.07 hrsTime interval = 2 min Hyd. volume = 9,780 cuftDrainage area Curve number = 1.000 ac= 92 Basin Slope = 0.0 %Hydraulic length = 0 ftTc method Time of conc. (Tc) = 18.90 min = User Total precip. = 3.56 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



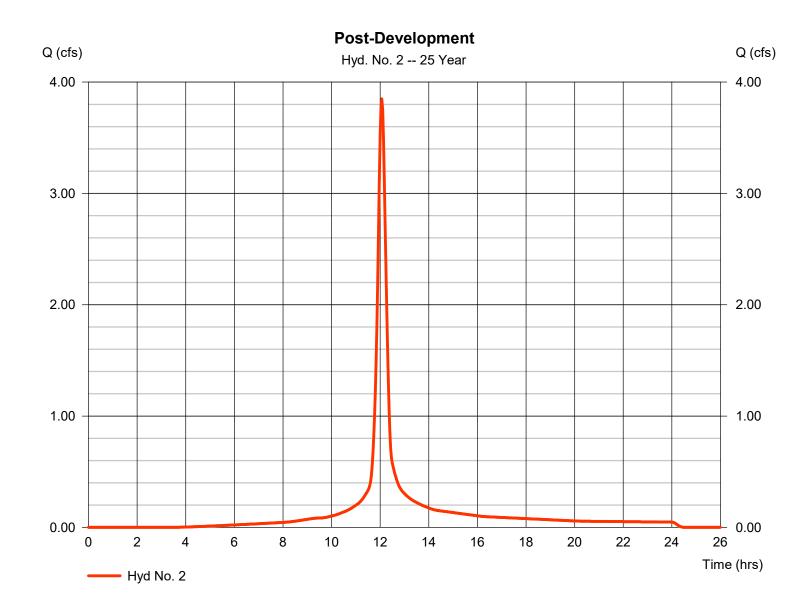
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 3.850 cfsStorm frequency = 25 yrs Time to peak $= 12.07 \, hrs$ Time interval = 2 min Hyd. volume = 12,511 cuft Drainage area Curve number = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 4.34 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



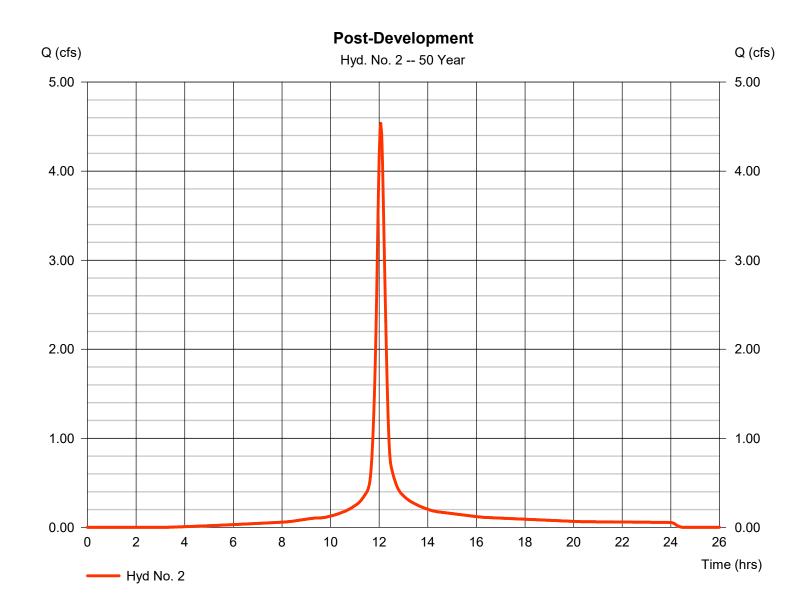
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 4.537 cfsStorm frequency = 50 yrsTime to peak $= 12.07 \, hrs$ Time interval = 2 min Hyd. volume = 14,880 cuftDrainage area Curve number = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 5.01 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



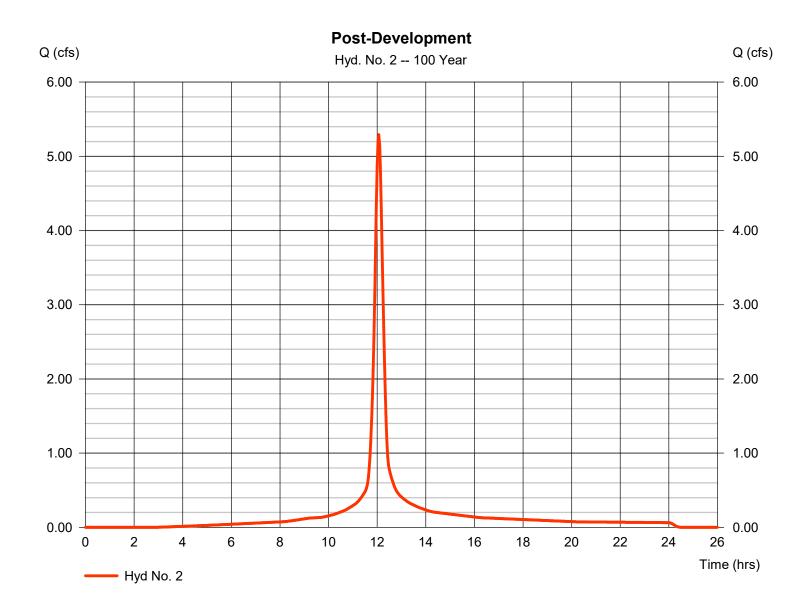
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 2

Post-Development

Hydrograph type = SCS Runoff Peak discharge = 5.292 cfsStorm frequency = 100 yrsTime to peak $= 12.07 \, hrs$ Time interval = 2 min Hyd. volume = 17,511 cuft Curve number Drainage area = 1.000 ac= 92 = 0 ftBasin Slope = 0.0 %Hydraulic length Tc method Time of conc. (Tc) = 18.90 min = User Total precip. = 5.75 inDistribution = Type II Storm duration = 24 hrs Shape factor = 484



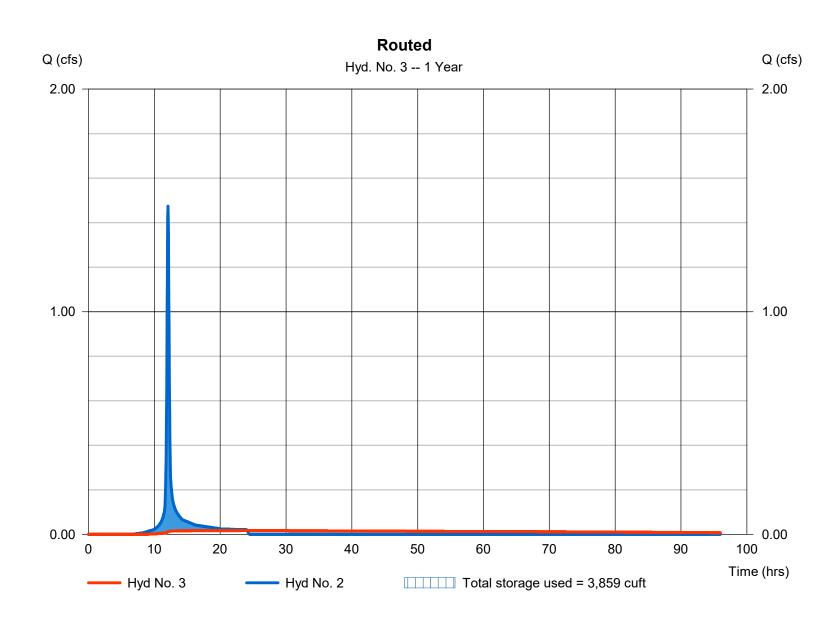
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type Peak discharge = 0.017 cfs= Reservoir Storm frequency = 1 yrsTime to peak $= 24.13 \, hrs$ Time interval = 2 min Hyd. volume = 4,024 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation $= 930.53 \, \text{ft}$ = Ext Dry Det Pond Reservoir name Max. Storage = 3,859 cuft



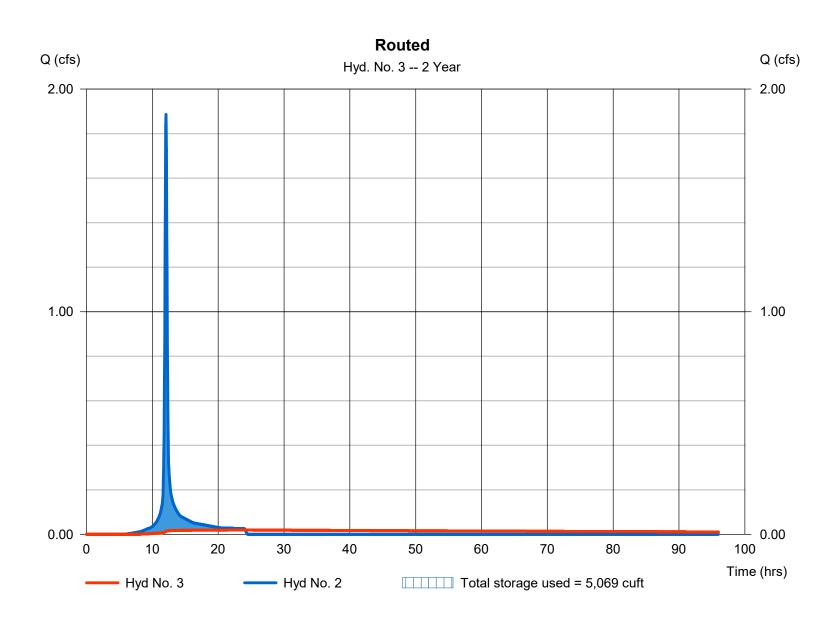
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

= Reservoir Hydrograph type Peak discharge = 0.019 cfsStorm frequency = 2 yrsTime to peak $= 24.13 \, hrs$ Time interval = 2 min Hyd. volume = 4,754 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation $= 930.91 \, \text{ft}$ = Ext Dry Det Pond Reservoir name Max. Storage = 5,069 cuft



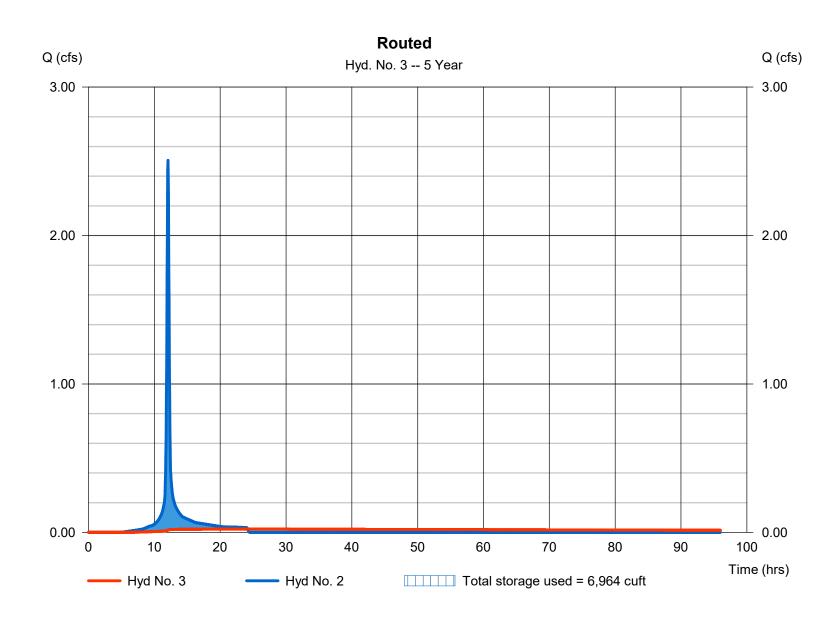
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type Peak discharge = 0.022 cfs= Reservoir Storm frequency = 5 yrsTime to peak $= 24.17 \, hrs$ Time interval = 2 min Hyd. volume = 5,654 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation = 931.38 ft= Ext Dry Det Pond Reservoir name Max. Storage = 6,964 cuft



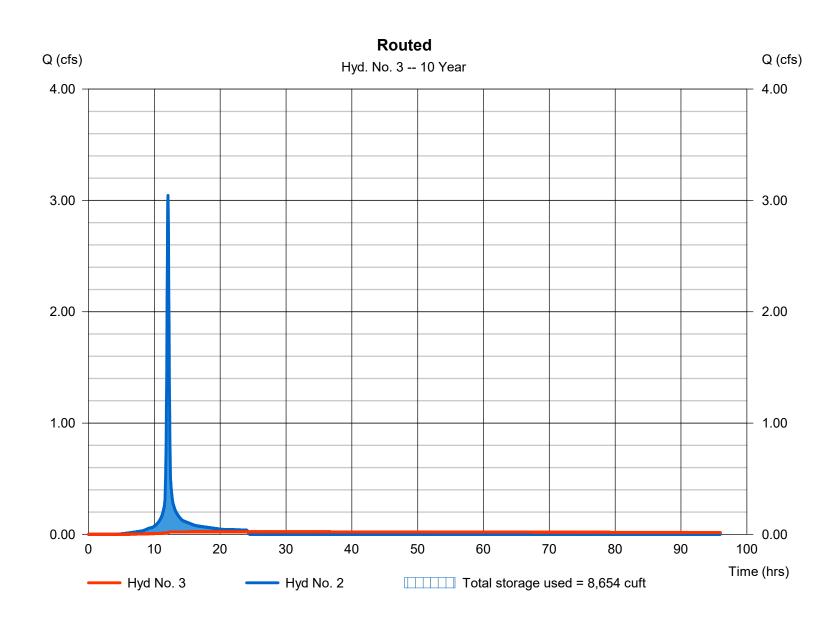
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type Peak discharge = 0.024 cfs= Reservoir Storm frequency = 10 yrsTime to peak $= 24.20 \, hrs$ Time interval = 2 min Hyd. volume = 6,341 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation = 931.78 ft= Ext Dry Det Pond Reservoir name Max. Storage = 8,654 cuft



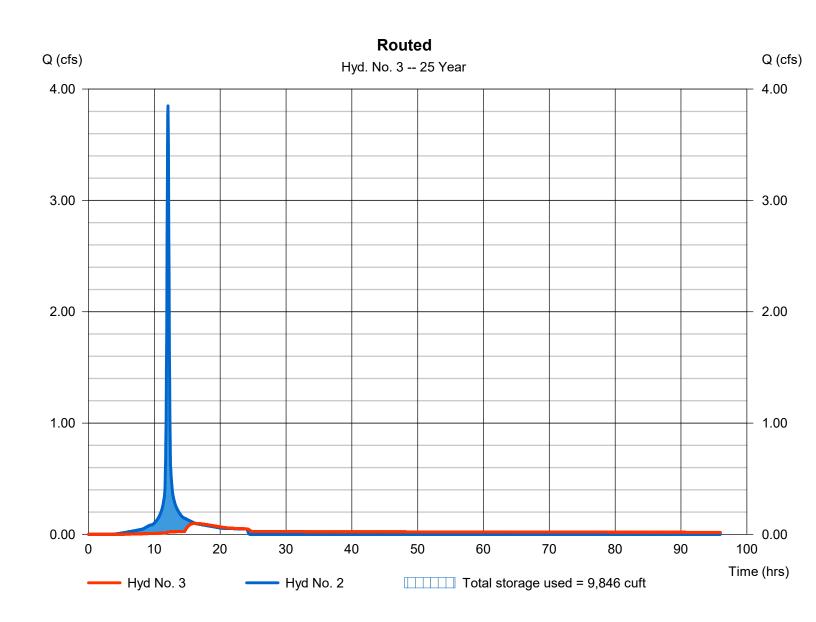
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type = Reservoir Peak discharge = 0.099 cfsStorm frequency = 25 yrsTime to peak $= 16.17 \, hrs$ Time interval = 2 min Hyd. volume = 8,377 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation $= 932.05 \, \text{ft}$ = Ext Dry Det Pond Reservoir name Max. Storage = 9,846 cuft



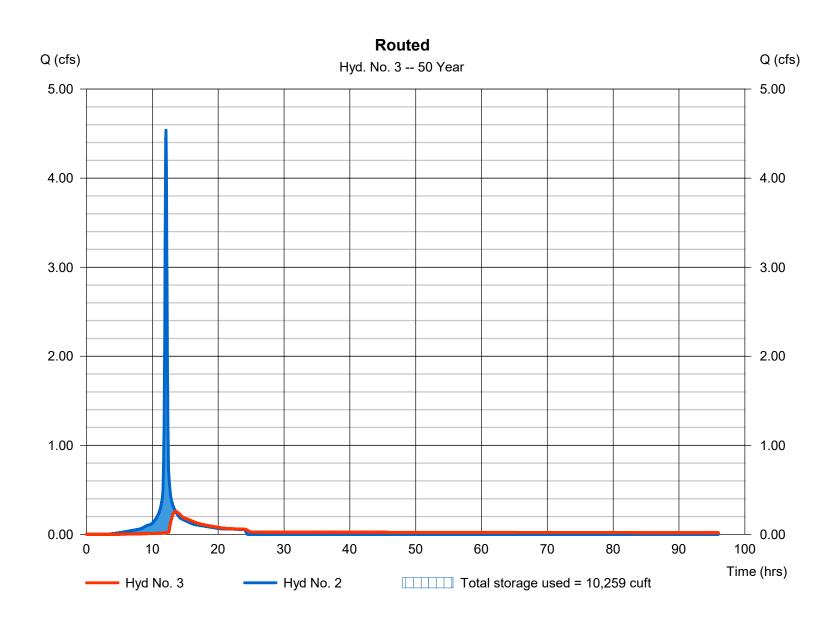
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type Peak discharge = 0.257 cfs= Reservoir Storm frequency = 50 yrsTime to peak $= 13.53 \, hrs$ Time interval = 2 min Hyd. volume = 10,736 cuft= 2 - Post-Development Inflow hyd. No. Max. Elevation = 932.12 ft= Ext Dry Det Pond Reservoir name Max. Storage = 10,259 cuft



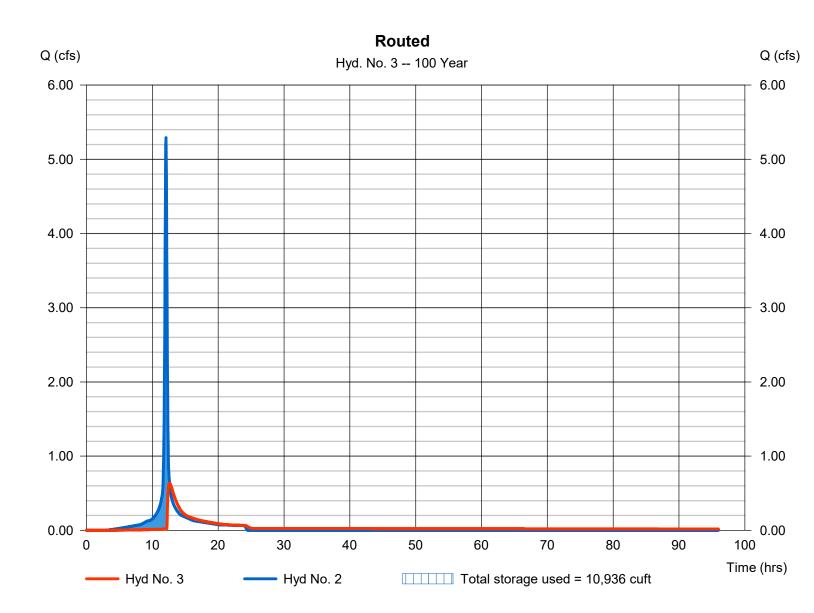
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Hyd. No. 3

Routed

Hydrograph type Peak discharge = 0.635 cfs= Reservoir Storm frequency = 100 yrsTime to peak $= 12.63 \, hrs$ Time interval = 2 min Hyd. volume = 13,359 cuftInflow hyd. No. Max. Elevation $= 932.25 \, ft$ = 2 - Post-Development = Ext Dry Det Pond Reservoir name Max. Storage = 10,936 cuft



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Tuesday, 12 / 6 / 2022

Pond No. 1 - Ext Dry Det Pond

Pond Data

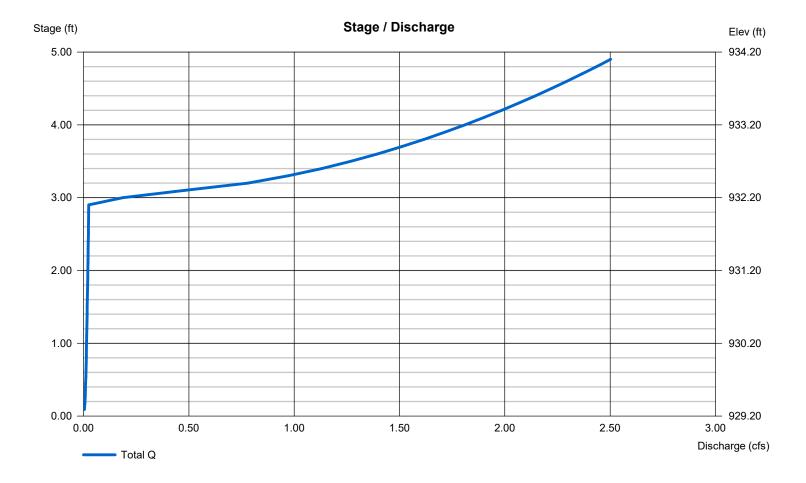
Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 929.20 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	929.20	2,001	0	0
0.90	930.00	2,751	2,138	2,138
1.90	931.00	3,715	3,233	5,371
2.90	932.00	4,747	4,231	9,602
3.90	933.00	5,865	5,306	14,908
4.90	934.00	6,935	6,400	21,308

Culvert / Orifice Structures Weir Structures [A] [B] [C] [PrfRsr] [A] [B] [C] [D] = 15.00 0.75 3.00 = 0.000.00 0.00 0.00 Rise (in) 0.00 Crest Len (ft) Span (in) = 15.000.75 18.00 0.00 Crest El. (ft) = 934.00 0.00 0.00 0.00 No. Barrels 0 Weir Coeff. = 3.333.33 3.33 3.33 = 1 Invert El. (ft) = 929.00 929.00 932.00 0.00 Weir Type = Rect = 113.00 0.00 0.00 0.00 Multi-Stage No Length (ft) = Yes No No Slope (%) = 0.440.00 0.00 n/a N-Value = .013 .013 .013 n/a = 0.600.60 0.60 0.60 Exfil.(in/hr) = 0.000 (by Contour) Orifice Coeff. Multi-Stage = n/a Yes Yes No TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



PART 3 EXHIBITS

STATE AVE NE

SWPPP GENERAL NOTES

ENVIRONMENTAL PROTECTION AGENCY (OEPA), AND THE LOCAL MUNICIPALITY. IF CONFLICTS EXIST, THE MORE RESTRICTIVE REQUIREMENT SHALL APPLY. ALL SEDIMENT & EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE START OF ANY EARTHWORK ACTIVITY AND WITHIN 7 DAYS OF FIRST GRUBBING, AND SHALL BE MAINTAINED IN PROPER

i. When seasonal conditions prohibit the application of temporary or permanent seeding, NON-VEGETATIVE SOIL STABILIZATION PRACTICES SUCH AS MULCHING OR MATTING SHALL BE USED.

WORKING ORDER UNTILL ALL DISTURBED AREAS ARE STABALIZED AND GROUND COVER IS ESTABLISHED.

NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORM WATER RUNOFF. THE PERMITEE MUST IMPLEMENT ALL NECESSARY BMPS TO PREVENT THE DISCHARGE OF NON-SEDIMENT POLLUTANTS TO THE DRAINAGE SYSTEM OF THE SITE OF SURFACE WATERS OF THE STATE. UNDER NO CIRCUMSTANCES SHALL CONCRETE TRUCKS WASH OUT DIRECTLY INTO A DRAINAGE CHANNEL, STORM SEWER, OR SURFACE WATER OF THE STATE.

OFF-SITE TRACKING OF SEDIMENTS SHALL BE MINIMIZED THROUGH THE USE OF TEMPORARY GRAVE

DEWATERING ACTIVITIES. IF TRENCH OR GROUND WATER CONTAINS SEDIMENT, IT MUST PASS THROUGH

A SEDIMENT SETTLING POND OR OTHER EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE, PRIOR TO

OR RIGID PAVEMENT CONSTRUCTION DRIVES AND WASH DOWN AREAS AT VEHICLE ACCESS POINTS; AND BY CONDUCTING SCHEDULED SWEEPING AND FOLLOWING GOOD HOUSEKEEPING ACTIVITIES. THERE SHALL BE NO TURBID DISCHARGES TO SURFACE WATERS OF THE STATE RESULTING FROM

BEING DISCHARGED FROM THE CONSTRUCTION SITE. UNDISTURBED AREAS SHALL BE PROTECTED THROUGHOUT CONSTRUCTION. VEHICULAR TRAFFIC AND

ANY DEVIATIONS OR DIFFICULTIES IN MAINTAINING SEDIMENT AND EROSION CONTROL PRACTICES

MATERIAL STORAGE IS PROHIBITED IN THESE AREAS.

During any phase of construction shall be reported to the engineer immediately. CONTRACTOR SHALL REVIEW SEDIMENT & EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE THEY ARE IN PROPER WORKING ORDER.

INSPECTIONS OF ALL SEDIMENT AND EROSION CONTROLS MUST BE CONDUCTED AT LEAST ONCE EVERY SEVEN DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH OF RAIN PER 24 PERIOD. A WRITTEN RECORD OF MAINTENANCE AND INSPECTION ACTIVITY SHALL BE MAINTAINED FOR THREE (3) YEARS FOLLOWING THE SUBMITTAL OF THE NOTICE OF TERMINATION (NOT) FORM TO TH OEPA. THE WRITTEN RECORD SHALL INCLUDE THE NAME OF THE QUALIFIED INSPECTOR, DATE OF INSPECTION, MAJOR OBSERVATIONS AND/OR CORRECTIVE MEASURES TAKEN, AND CERTIFICATION OF

1. IF INSPECTIONS OF BMPS REVEAL THAT A CONTROL PRACTICE IS IN NEED OF REPAIR OR MAINTENANCE, WITH THE EXCEPTION OF A SEDIMENT SETTLING POND, IT SHALL BE REPAIRED OR MAINTAINED WITHIN 3 DAYS OF THE INSPECTION. SEDIMENT SETTLING PONDS SHALL BE REPAIRED WITHIN 10 DAYS OF THE INSPECTION.

12. IF INSPECTIONS OF BMPS REVEAL THAT A CONTROL PRACTICE FAILS TO PERFORM ITS INTENDED FUNCTION AND THAT ANOTHER, MORE APPROPRIATE CONTROL PRACTICE IS REQUIRED, THE SWP3 SHALL BE AMENDED AND THE NEW CONTROL PRACTICE SHALL BE INSTALLED WITHIN 10 DAYS OF THE

13. IF INSPECTIONS OF BMPS REVEAL THAT A CONTROL PRACTICE HAS NOT BEEN IMPLEMENTED IN ACCORDANCE WITH THE SCHEDULE CONTAINED IN PART III.G.1.g OF THE OEPA GENERAL CONSTRUCTION NPDES PERMIT, THE CONTROL PRACTICE SHALL BE IMPLEMENTED WITHIN 10 DAYS FROM THE DATE OF THE INSPECTION. IF THE INSPECTION REVEALS THAT THE PLANNED CONTROL PRACTICE IS NOT NEEDED. THE RECORD SHALL CONTAIN A STATEMENT OF EXPLANATION AS TO WHY THE CONTROL PRACTICE IS

14. ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE REMOVED AND DISPOSED OF WITHIN THIRTY (30) DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY PRACTICES ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.

CONSTRUCTION SITE OPERATOR (CONSTRUCTION MANAGER OR GENERAL CONTRATOR) SHALL BECOME A CO-PERMITTEE TO THE OWNER ON THE OEPA NOTICE OF INTENT (NOI) TO COMPLY WITH THE OEPA NPDES STORMWATER GENERAL PERMIT. CONSTRUCTION COORDINATOR WILL BE RESPONSIBLE FOR BEING FAMILIAR WITH, AND COMPLYING WITH ALL APPLICABLE REQUIREMENTS OF THE SWP3, AS WELL AS OTHER APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.

16. CONSTRUCTION SITE OPERATOR (CONSTRUCTION MANAGER OR GENERAL CONTRACTOR) SHALL BE RESPONSIBLE FOR TRAINING OF THEIR STAFF AND SUBCONTRACTORS REGARDING THE BMPS IN ACCORDANCE WITH THE SWPPP REQUIREMENTS.

7. ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH THE IMPLEMENTATION OF THE SWPPP SHALL BE INFORMED BY THE PERMITEE (OWNER), AND BECOME FAMILIAR WITH, THE TERMS AND CONDITIONS OF THE NPDES CONSTRUCTION GENERAL PERMIT. THE PERMITEE SHALL MAINTAIN A WRITTEN DOCUMENT CONTAINING THE SIGNATURES OF ALL CONTRACTORS AND RESPONSIBILITIES OF THE SWPPP.

18. A NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO THE OEPA WITHIN 45 DAYS AFTER

FINAL SITE STABILIZATION HAS BEEN ACHIEVED.

Dwg No.

C1.2

C1.3

C1.4

C1.5

C1.6

19. THE CONTRACTOR SHALL PREVENT AND/OR REDUCE AND CONTROL SOIL EROSION RESULTING FROM THE PROPOSED IMPROVEMENTS. THE USE OF SILT FENCING, JUTE MATTING, TEMPORARY SEEDING, SILT CHECKS, INLET PROTECTION AROUND ALL CATCH BASINS, STABILIZED CONSTRUCTION ENTRANCE(S), ETC WILL BE REQUIRED. SEDIMENT CONTROL STRUCTURES/DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL <u>RAINWATER AND LAND DEVELOPMENT - OHIO'S STANDARDS</u> FOR STORM WATER MANAGEMENT, LAND DEVELOPMENT AND URBAN STREAM PROTECTION. SEDIMENT CONTROL DEVICES MUST BE INSTALLED PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUED INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL DEVICES. THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS SET FORTH ON THE APPROVED STORM WATER POLLUTION PREVENTION PLAN IF APPLICABLE, OR AS DETAILED ON THE CONSTRUCTION PLANS, AS SPECIFIED BY THE CITY OF MASSILLON.

SWP3 INDEX OF DRAWINGS

SWP3 COVER SHEET SWP3 PHASE 1 - CONSTRUCTION SITE RUNOFF CONTROL PLAN

SWP3 PHASE 1 DETAILS

SWP3 PHASE 1 DETAILS

SWP3 PHASE 2 - POST-CONSTRUTION BMPS

SWP3 PHASE 2 - POST-CONSTRUCTION BMP DETAILS

MULCHING SCHEDULE OF CONSTRUCTION ACTIVITY — TENTATIVE ROUGH GRADING TEMP. EROSION CONTROL FINE GRADING

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PERMISSABLE TIMETABLE OF

PERMANENT SEEDING

TOPSOIL & SEEDING

TEMP. EROSION CONTROL

CONCRETE WASHOUT, ETC...)

COMMENCE ROUGH GRADING.

INSTALL NEW INLET PROTECTION.

CONSTRUCT CURBING AND WALKS.

INSTALL SITE UTILITIES.

IN THESE AREAS.

INSTALL PAVEMENT SURFACE.

SURFACES ARE STABILIZED.

PERFORM FINAL GRADING.

SWPPP CONSTRUCTION SEQUENCE OF SITE WORK

STAKE-OUT AND INSTALL TREE PROTECTION BARRIERS.

BUILDING AND/OR GRADING COMMENCING WITHIN 14 DAYS.

DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.

FINALIZE PAVEMENT SUBGRADE PREPARATION

INSTALL TOPSOIL AND PERMANENT SEEDING.

VEGETATIVE DENSITY OF SITE IS ACHIEVED.

ANY AREAS THAT LIE DORMANT FOR ONE YEAR OR

ANY AREAS WITHIN 50 FEET OF A SURFACE WATER

ANY OTHER AREAS AT FINAL GRADE

ANY DISTURBED AREAS WITHIN 50 FEET OF A

FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED

50 FEET OF A SURFACE WATER OF THE STATE

OF THE STATE AND AT FINAL GRADE

OTHERWISE SPECIFIED BY THE ENGINEER OR CONSTRUCTION COORDINATOR.

A PRE-CONSTRUCTION MEETING SHALL BE PERFORMED BY THE CONSTRUCTION PROJECT

CONSTRUCT TEMPORARY AGGREGATE CONSTRUCTION DRIVES AS SHOWN PER THE SWPPP.

COORDINATOR PRIOR TO LAND DISTURBING ACTIVITIES. COORD. W/ SSWCD (330-451-7644).

INSTALL TEMPORARY EROSION & SEDIMENT CONTROL MEASURES PER PLAN (I.E. — PERIMETER SIL

FENCE, EXISTING INLET PROTECTION, DIVERSION SWALES, ROCK CHECK DAMS, SEDIMENT TRAPS,

COMMENCE CLEARING & GRUBBING. CLEARING & GRUBBING SHALL BE LIMITED TO AREAS OF

STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON PLAN, OR AS APPROVED BY ENGINEER

DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL REMAIN DORMANT FOR MORE THAN 14

INSTALL PAVEMENT AGGREGATE BASE MATERIAL. INLET PROTECTION IN PAVEMENT AREAS SHALL

NOT BE REMOVED MORE THAN 48 HOURS PRIOR TO PLACEMENT OF STABILIZED BASE MATERIAL.

18. INSTALL STORM WATER QUALITY MEASURES (I.E. — DRY EXTENDED DETENTION BASIN) UPON 70%

REMOVE REMAINING TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING

NOTE: ALL WORK LISTED ABOVE IS THE RESPONSIBILITY OF THE SITEWORK CONTRACTOR, UNLESS

OHIO EPA CGP PART III.G.2 TABLE 1

PERMANENT STABILIZATION

AREA REQUIRING PERMANENT STABILIZATION | TIME FRAME TO APPLY EROSION CONTROLS

OHIO EPA CGP PART III.G.2 TABLE 2

TEMPORARY STABILIZATION

AREA REQUIRING TEMPORARY STABILIZATION | TIMEFRAME TO APPLY EROSION CONTROLS

SURFACE WATER OF THE STATE AND NOT AT FINAL | DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR

AREAS THAT WILL BE DORMANT FOR MORE THAN 14 | FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS

DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN | MUST BE STABILIZED AT LEAST SEVEN DAYS PRIOR

DISTURBED AREAS THAT WILL BE IDLE OVER WINTER | PRIOR TO THE ONSET OF WINTER WEATHER

WHERE VEGETATIVE STABILIZATION TECHNIQUES MAY CAUSE STRUCTURAL INTABILITY OR ARE OTHERWISE

UNOBTAINABLE, ALTERNATIVE STABILIZATION TECHNIQUES MUST BE EMPLOYED

WITHIN SEVEN DAYS OF THE MOST RECENT

DISTURBANCE

WITHIN TWO DAYS OF REACHING FINAL GRADE

WITHIN SEVEN DAYS OF REACHING FINAL GRADE

WITHIN THAT AREA

WITHIN TWO DAYS OF THE MOST RECENT

MORE THAN 14 DAYS

WITHIN SEVEN DAYS OF THE MOST RECENT

DISTURBANCE WITHIN THE AREA

TO TRANSFER OF PERMIT COVERAGE FOR THE

INDIVIDUAL LOT(S).

REMOVE TEMPORARY AGGREGATE CONSTRUCTION DRIVES ONLY PRIOR TO PAVEMENT CONSTRUCTION

DECOMMISSIONING OF SEDIMENT TRAP(S), ONLY AFTER ALL PAVING IS COMPLETE AND ALL EXPOSED

LANDSCAPING

MAINTENANCE OF

SEDIMENT & EROSION CONTROL PRACTICES

PROJECT DESCRIPTION

PROJECT LOCATION & INFO

<u>LATITUDE (APPROX.)</u>

RECEIVING STREAM/WATERSHED

1600 GATEWAY BLVD SE

CANTON, OH 44707

PHONE:330-477-2782

WHICH DISCHARGES INTO THE OHIO RIVER.

STARK AREA REGIONAL TRANSIT AUTHORITY

40°47'50"N

THE PROJECT INCLUDES THE CONSTRUCTION OF A NEW ±5,565 S.F. TRANSIT CENTER AND AN ADJACENT ±7.668 S.F. PARKING LOT

THE SITE IMPROVEMENTS CONSIST OF NEW GRADING, UTILITY, PAVEMENT, AND LANDSCAPING WORK. THE SITE IS LOCATED ON TOMMY HENRICH DR. THE SITE IS CURRENTLY OCCUPIED BY A COMBINATION OF

UNDEVELOPED GRASS COVERED LAND AND AN ASPHALT PARKING LOT. TOTAL AREA OF PARCEL = ± 1.512 ACRES

THE SITE IS LOCATED IN MASSILLON, STARK COUNTY, OHIO, AND IS BOUND BY COMMERCIAL

81°31'41"W

THE SITE IS TRIBUTARY TO THE TUSCARAWAS RIVER, WHICH DISCHARGES INTO THE MUSKINGUM,

LONGITUDE (APPROX.)

PROPERTIES TO THE NORTH, EAST, AND SOUTH AND STATE ROUTE 21 TO THE WEST.

TOTAL AREA OF CONSTRUCTION SITE = ± 1.33 ACRES TOTAL AREA OF SITE EXPECTED TO BE DISTURBED = ± 1.33 ACRES

ESTIMATED ULTIMATE PROPOSED IMPERVIOUS AREA = ± 0.86 ACRES

ESTIMATED ULTIMATE PERCENTAGE OF PROPOSED IMPERVIOUS AREA = 64%

UPON TOTAL PROJECT COMPLETION. THE PROPOSED PAVED AND GRASSED AREAS WILL PERMANENTLY STABILIZE THE AREA THEY COVER. THE PROPOSED STORM WATER MANAGEMENT SYSTEM WILL COLLECT AND TRANSPORT RUNOFF IN A SAFE, CONTROLLED, AND NON-EROSION TYPE MANNER THROUGH A SYSTEM OF PROPOSED UNDERGROUND PIPES AND UNDERGROUND DETENTION AREAS. STORM WATER DISCHARGE FROM THE SITE WILL BE CONTROLLED ACCORDING TO THE CITY OF MASSILLON'S REQUIREMENTS. THE SITE IS TRIBUTARY TO A LOCAL STORM SEWER SYSTEM WHICH DISCHARGES TO THE TUSCARAWAS RIVER. BIORETENTION AREAS WILL BE PROVIDED TO COMPLY WITH STORMWATER QUALITY REQUIREMENTS FOR THE SITE.

<u>SOILS INFORMATIOI</u>

RESTRIC	TIVE SOIL	. FEATURE	S				
		BUILDII	NG SITE DEVELO	PMENT	W.	ATER MANAGEMEI	NT
SOIL SYMBOL	HYDROLOGIC SOIL GROUP	SHALLOW EXCAVATIONS	LOCAL ROADS & STREETS	SMALL COMM. BUILDINGS	POND RESERVOIR AREAS	EMBANKMENTS, DIKES, & LEVEES	DRAINAGE
Ur	С	TBD	TBD	TBD	TBD	TBD	TBD

<u>Legend</u> NL — Not limited SL - SOMEWHAT LIMITED VL — VERY LIMITED

<u>Ur – URBAN LAND</u>

JRBAN SOILS ARE CREATED IN THE PROCESS OF URBANIZATION, IT IS DESCRIBED AS HAVING A NON-AGRICULTURAL, MANMADE SURFACE LAYER, THAT HAS BEEN PRODUCED BY MIXING, FILLING, OR B CONTAMINATION OF LAND SURFACE IN URBAN AND SUBURBAN AREAS. IT IS ASSUMED THAT THE SOIL HAS BEEN PARTIALLY DISTURBED IN SOME PORTION OF THE PROFILE OR PERHAPS THE ENTIRE PROFILE MAY CONSIST OF FILL. FILLING REFERS TO THE PROCESS OF DUMPING AND SPREADING SOIL MATERIAL OVER AN EXISTING SURFACE TO RAISE IT TO A HIGHER LEVEL, TO BACKFILL DITCHES AND FOUNDATION WALLS OR TO CONSTRUCT BERMS. THE MATERIALS FOUND IN FILL MAY BE SOLIDS SUCH AS GLASS, WOOD, METAL, ASPHALT, MASONRY, AND PLASTIC. THE SOIL MATERIAL PRESENTS ISSUES WITH PLANT SURVIVAL AND GROWTH.

RESTRIC	TIVE SOIL	. FEATURE	S				
		BUILDII	NG SITE DEVELO	PMENT	W.	ATER MANAGEMEI	NT
SOIL SYMBOL	HYDROLOGIC SOIL GROUP	SHALLOW EXCAVATIONS	LOCAL ROADS & STREETS	SMALL COMM. BUILDINGS	POND RESERVOIR AREAS	EMBANKMENTS, DIKES, & LEVEES	DRAINAGE
Ur	С	TBD	TBD	TBD	TBD	TBD	TBD

TBD - UNKNOWN

CERTIFICATION

I, THE UNDERSIGNED, CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGED THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

WALNUT RD SW

OVERLOOK AVE SW

MASSILLON

VICINITY MAP / USGS TOPO MAP

9.600

9.600

West Park

Lawndale

RUNOFF COEFFICIENT (C) AREA (AC.)

AVERAGE C =



SEDIMENT TRAP 1.00 TRIBUTARY DRAINAGE AREA (AC.) REQUIRED DEWATERING VOLUME (C.F.) 1800 (1,800 C.F./ACRE) REQUIRED SEDIMENT STORAGE VOLUME (C.F.) (1,000 C.F./ACRE) TOTAL VOLUME REQUIRED 2800 4.0 (SEE OHIO R&LD CH. 6, PG 25) SEDIMENT TRAP WEIR LENGTH (FT) ELEVATION | CONTOUR | INCREMENTAL | CUMULATIVE **VOLUME PROVIDED:** (FT) AREA (S.F.) VOLUME (C.F.) VOLUME (C.F.) TOP OF BASIN | 934.00 6935 6400.00 24346.30 4747 931.00 3715 930.00 2751 1900.80 SEDIMENT CLEAN—OUT ELEVATION 2001 385.50 3275.50 929.20 (PERMANENT BOTTOM OF BASIN) 1854 1618.50 929.00 2890.00

TEMPORARY SEDIMENT TRAP CHARACTERISTICS

1383

1160

1271.50

3 TEMPORARY SEDIMENT TRAP CHARACTERISTICS C1.1 SCALE: N.T.S.

TEMPORARY BOTTOM OF BASIN | 927.00

ROCK SPILLWAY: SEE DETAILS ON DWG. C1.3 TOP OF BANK EL. 934.00 DEWATERING ZONE OUTLET EL. 929.20

SEDIMENT TRAP (SHOWN CONCEPTUALLY)

SEDIMENT TRAP NOTES:

1. REMOVE SEDIMENT AND RESTORE THE SEDIMENT TRAP TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO THE TOP OF THE SEDIMENT STORAGE ZONE. THIS ELEVATION SHALL BE SIGNIFIED BY THE TOP OF A STAKE NEAR THE CENTER OF THE TRAP. REMOVING SEDIMENT BY HAND MAY BE NECESSARY ADJACENT TO THE OUTLET SECTION OF THE EMBANKMENT TO PREVENT EQUIPMENT DAMAGE. PLACE THE REMOVED SEDIMENT AND STABILIZE WITH VEGETATION IN A DESIGNATED AREA WHERE IT WILL NOT EASILY ERODE AGAIN. RESTORE TRAP TO ITS ORIGINAL DIMENSIONS AND REPLACE STONE AS NEEDED ON THE OUTLET. 2. UPON PROJECT COMPLETION, THE SEDIMENT TRAP SHALL BE REMOVED AND THE BASIN SHALL BE FINAL GRADED PER C3.1, INCLUDING INSTALLATION OF THE PERMANENT MICROPOOL.

PROPOSED RUNOFF COEFFICIENT (C) HYDROLOGIC | GROUND COVER | RUNOFF COEFFICIENT (C) | AREA (AC.) | SOIL NAME **SYMBOL** 37.600 URBAN LAND OPEN SPACE/LAWN 0.47 84.280 URBAN LAND **IMPERVIOUS** 121.880 92 AVERAGE C =

EXISTING RUNOFF COEFFICIENT (C)

OPEN SPACE/LAWN

(SARTA - Massillon Transit Center

Map Scale: 1:955 if printed on A portrait (8.5" x 11") sheet.

SYMBOL

Web Soil Survey

SOIL NAME

URBAN LAND

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OIL & GAS PRODUCERS PROTECTIVE SERVICE CALL: 1-800-925-0988

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DIFRANCO

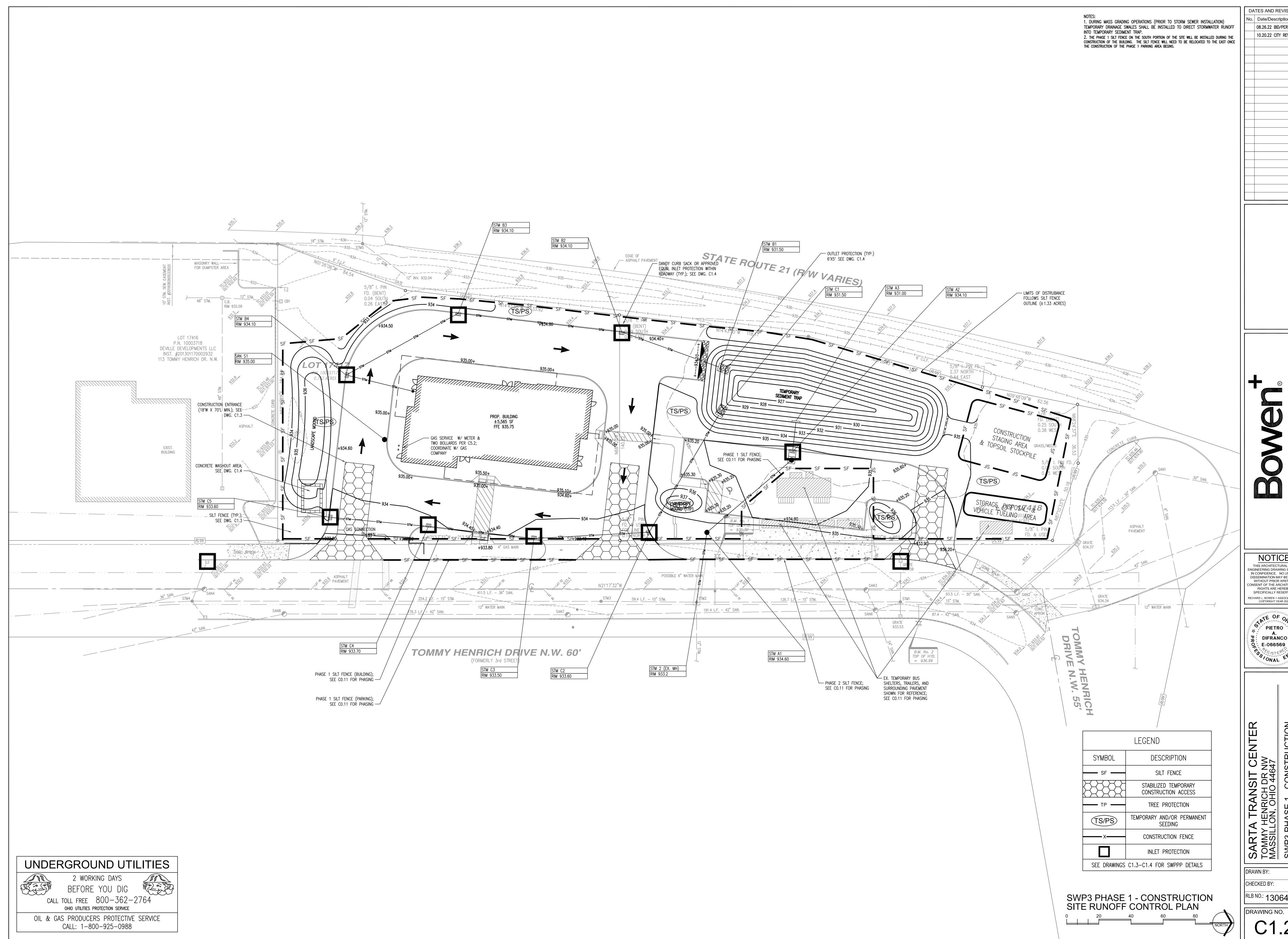
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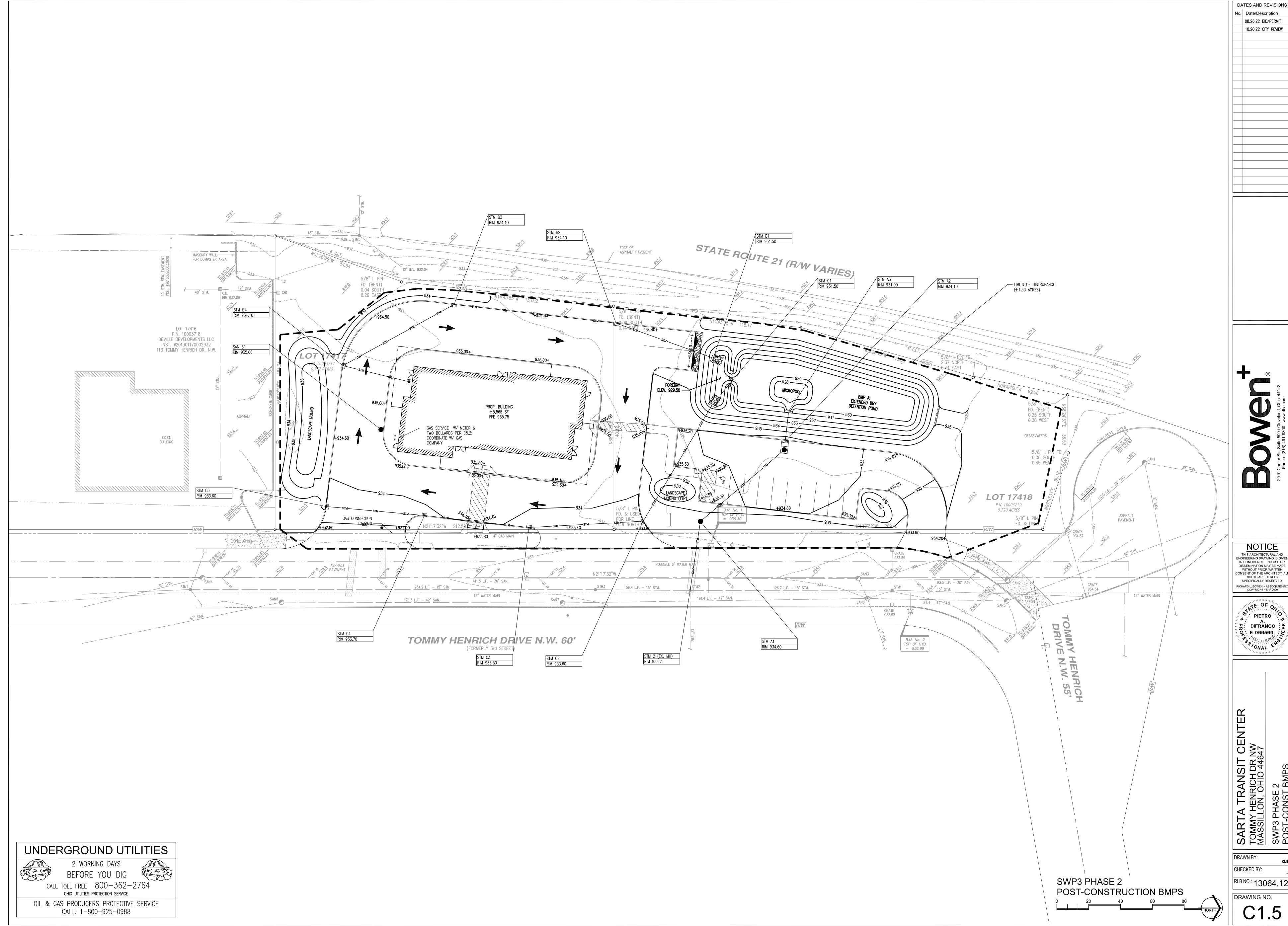
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TE OF ON PIETRO O DIFRANCO : E-066569

SARTA TRANSIT CENTER
TOMMY HENRICH DR NW
MASSILLON, OHIO 44647
SWP3 PHASE 1 - CONSTRUCTION
SITE RUNOFF CONTROL PLAN

CHECKED BY: RLB NO.: 13064.12



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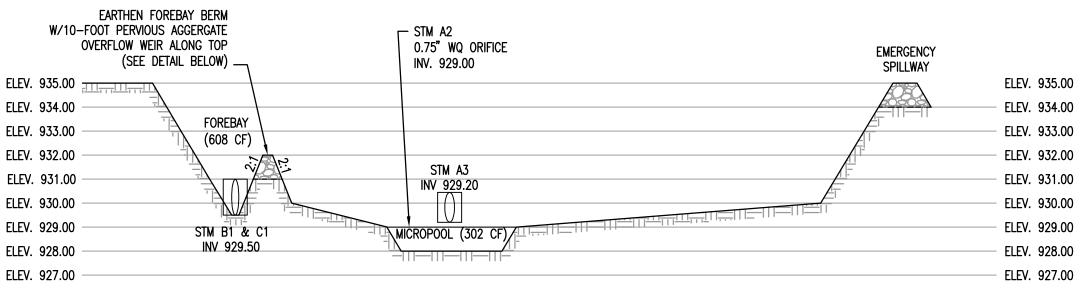
PIETRO O
A.
DIFRANCO E-066569

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/-- PAVEMENT UNDERDRAINS (TYP); SEE DWG C5.2 & GEOTECHNICAL NOTES ON THIS SHEET



TYPICAL CROSS SECTION EXTENDED DRY DETENTION POND C1.6 HORIZONTAL SCALE: 1"=20' VERTICAL SCALE: 1"=4'

EJIW 7035 (M6 & T4) —

3" RISE X 18" SPAN WINDOW

W/ ¾" DOWELS AT 12" C/C ——

PRECAST STRUCTURES JOINED

INV. ELEV. 932.00

15"ø INLET PIPE

INV. ELEV. 929.00 —

6"ø PVC PIPE W/ DOWN-TURNED ELBOW —

__FLOW_

C6.1 SCALE: 1/2"=1'

FRAMÈ & GRATÉ

OHIO EPA PERMIT OHCO00005 (EFFECTIVE 4/23/18-4/22/23): WATER QUALITY CALCULATIONS – PREVIOUSLY DEVELOPED AREAS $WQ_V = P*A*[(R_{V1}*0.2)+(R_{V2}-R_{V1})]/12$

P = 0.90 INCH A = 1.51 ACRES

 $R_V = 0.05 + 0.9I$ (VOLUMETRIC RUNOFF COEFFICIENT) $R_{V1} = 0.05 + 0.9(0.23) = 0.25 (PRE-DEVELOPMENT)$ $R_{V2} = 0.05 + 0.9(0.64) = 0.63 (POST-DEVELOPMENT)$

 $WQ_V = 1.51*0.90*[(0.25*0.2)+(0.63-0.25)]/12 = 0.05 ACRE-FT = 2,121 CF 1.20*WQV = 2,546 CF$

SEDIMENT STORAGE = $20\% \text{ WQ}_{V} = 509 \text{ CF}$

A. OVERALL DETENTION POND REQUIRED VOLUME = WQ_V + SEDIMENT STORAGE = 3,055 CF

B. MICROPOOL REQUIRED VOLUME = 10% WQ_V = 255 CF

<u>C. FOREBAY</u> REQUIRED VOLUME = 10% WQ_V = 255 CF

 $\frac{\text{D. WQ ORIFICE SIZING}}{\text{A}_{\text{ORIFICE}}} = \text{Q}_{\text{AVG}}/[\text{C*}(2*g*H_{\text{AVG}})^{0.5}]$

 $Q_{AVG}=WQ_V/t_d=2,121/48=44.2$ CF/HR = 0.012 CFS $t_d=MINIMUM$ DRAIN TIME = 48 HR C = COEFFICIENT OF DISCHARGE = 0.6 FOR SHARP-EDGE ORIFICE g = ACCELERATION OF GRAVITY = 32.2 FT/S² $H_{AVG} = H_{MAX}/2 = 1.2/2 = 0.6 \text{ FT}$

 $A_{ORIFICE} = 0.012/[0.6*(2*32.2*0.6)^{0.5}] = 0.0033 \text{ FT}^2 = 0.48 \text{ IN}^2$ $D_{ORIFICE} = [(4*A_{ORIFICE})/\pi]^{0.5} = [(4*0.48)/3.14]^{0.5} = 0.78 \text{ INCH}$

E. DRAIN TIME $D_{ORIFICE} = 0.75$ INCH = 0.0625 FT

DORIFICE = 0.75 INCH = 0.0025 T1 $A_{ORIFICE} = D_{ORIFICE}^2 \times \pi/4 = 0.0625^2 \times 3.14/4 = 0.0031 \text{ FT}^2$ $Q = A_{ORIFICE} \times C \times (2 \times g \times H_{AVG})^{0.5} = 0.0031 \times 0.6 \times (2 \times 32.2 \times 0.6)^{0.5} = 0.011 \text{ CFS}$ $t_d = WQ_V/Q = 2,121/0.011 = 187547 \text{ SEC} = 52.09 \text{ HRS}$

OVERALL P	OND CHARACTERISTIC	S
CONTOUR AREA (SF)	INCREMENTAL VOLUME (CF)	CUMULATIVE VOLUME (CF
6935	6400	21048
5865	5306	14648
4747	4231	9342
3715	3233	5111
2751	1576	1878
401	302	302
202	0	0
	CONTOUR AREA (SF) 6935 5865 4747 3715 2751 401	6935 6400 5865 5306 4747 4231 3715 3233 2751 1576 401 302

	MICROPO	OL CHARACTERISTICS	
ELEVATION (FT)	CONTOUR AREA (SF)	INCREMENTAL VOLUME (CF)	CUMULATIVE VOLUME (CF)
929	401	302	302
928	202	0	0

	FOREBA	Y CHARACTERISTICS	
ELEVATION (FT)	CONTOUR AREA (SF)	INCREMENTAL VOLUME (CF)	CUMULATIVE VOLUME (CF)
932	522	407	608
931	292	201	201
930	110	0.00	0.00

— EJIW V−1700

FLOW

ELEV. 929.00

FRAME & COVER

__ (2)~ODOT 2−3 CB

15"ø OUTLET PIPE

6"Ø PVC CAP W/ 0.75"Ø WATER
—— QUALITY ORIFICE AT INV. ELEV. 929.00

`— INV. ELEV. 929.00

RIM ELEV. 934.10

4 STORMWATER CONTROL STRUCTURE (STM A2)

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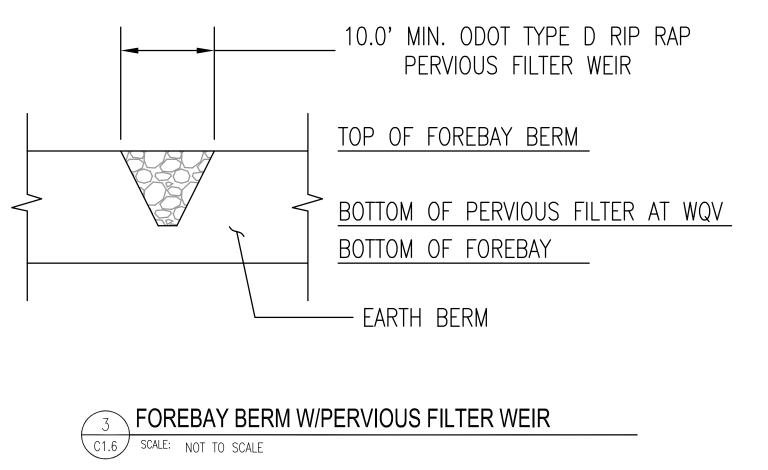
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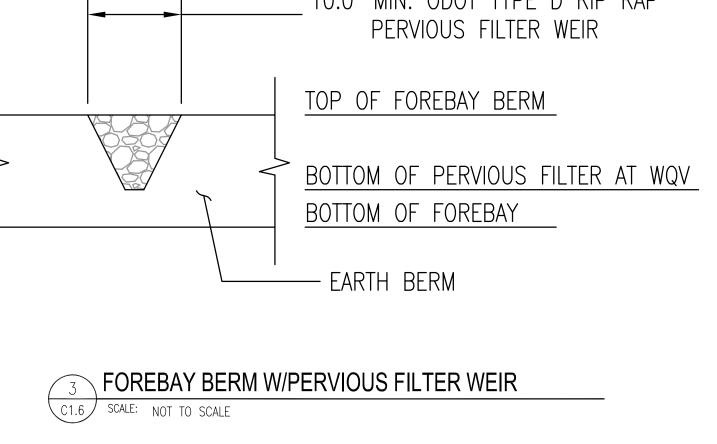
SARTA TRANSIT CENTER
TOMMY HENRICH DR NW
MASSILLON, OHIO 44647
SWP3 PHASE 2
POST-CONST BMPS

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DRAWING NO. C1.6

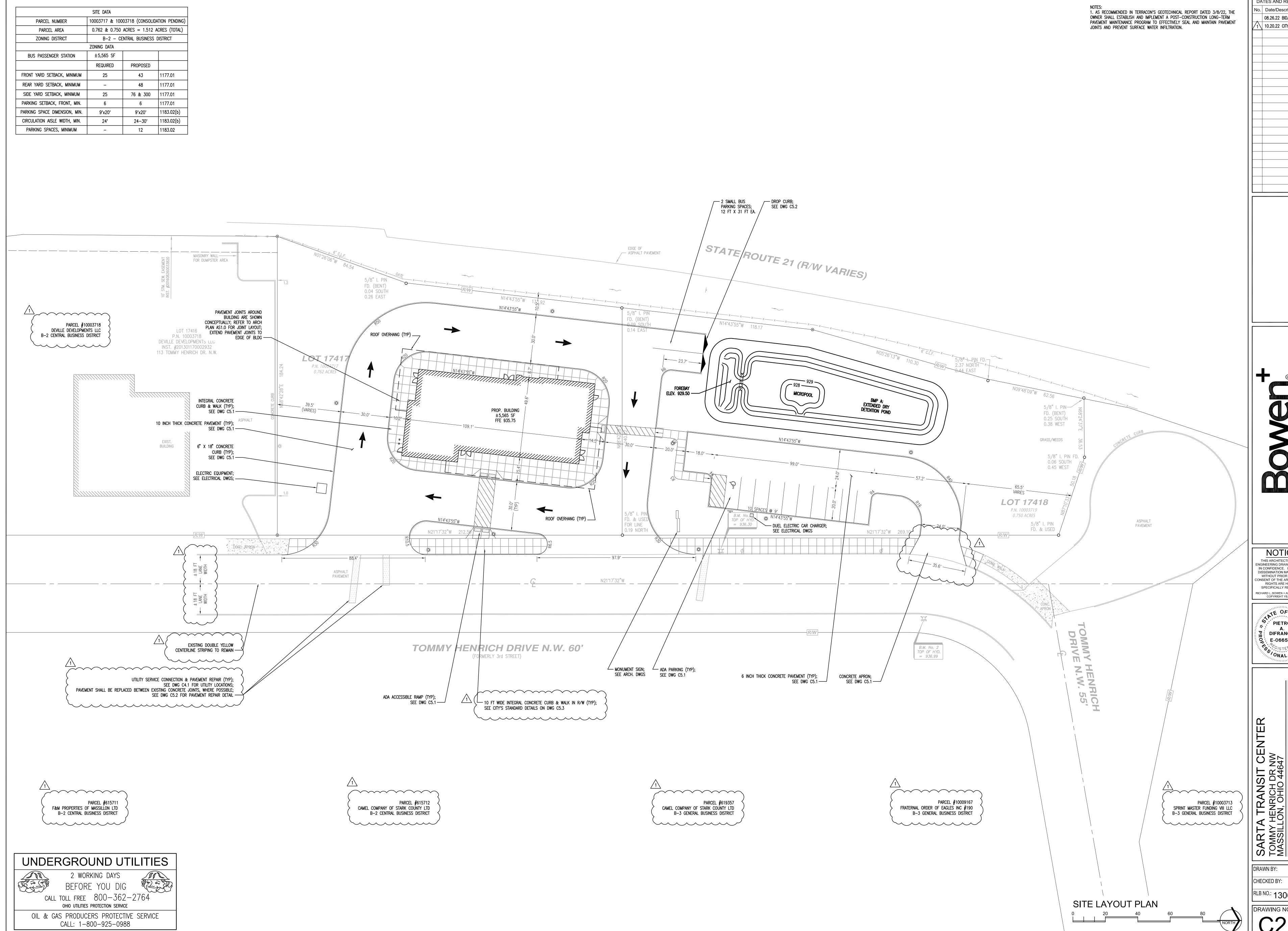




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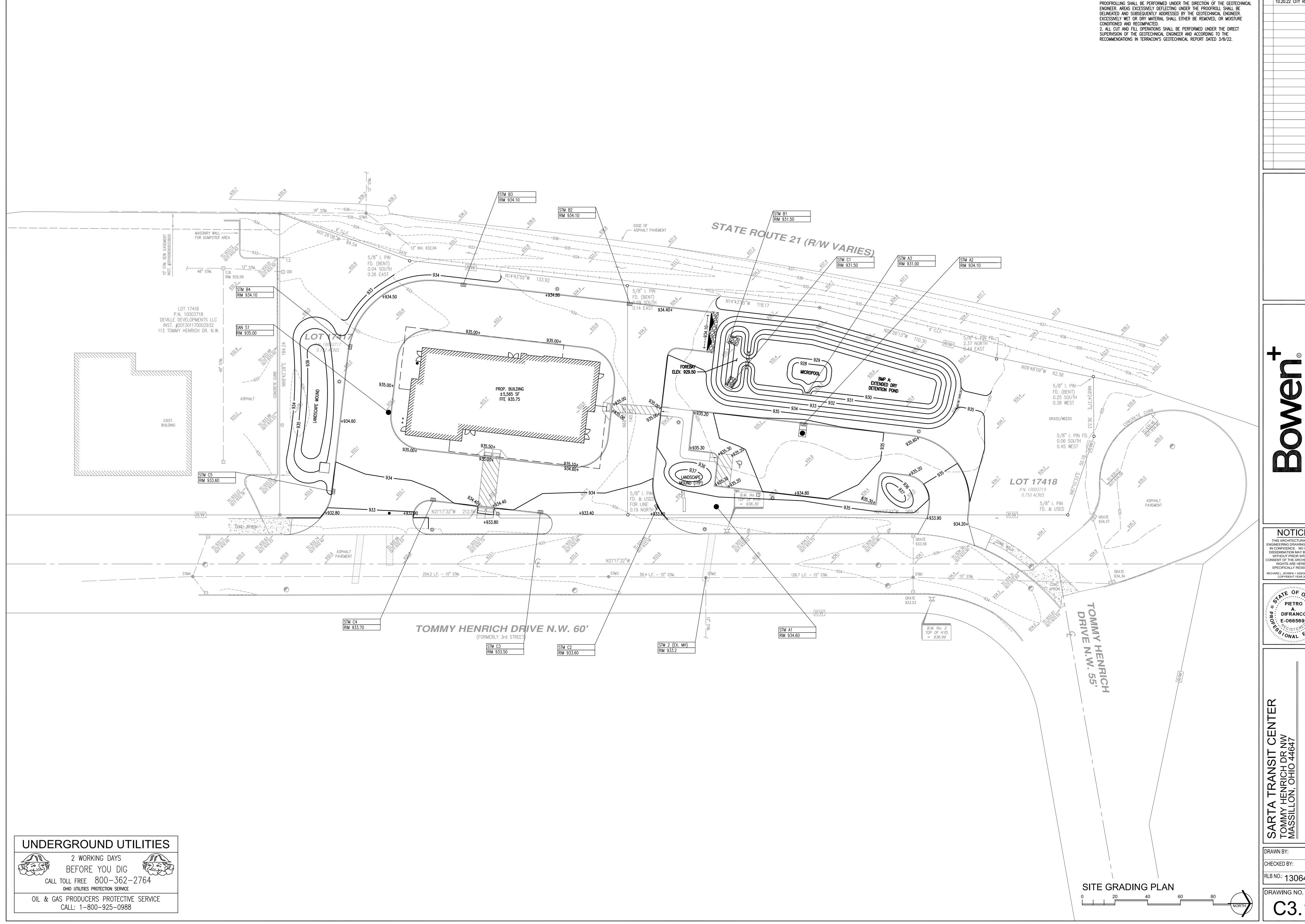
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NOTES:
1. AS RECOMMENDED IN TERRACON'S GEOTECHNICAL REPORT DATED 3/8/22, THE SITE'S SUBGRADE SHALL BE PROOFROLLED WITH A FULLY-LOADED TANDEM-AXLE DUMP TRUCK HAVING A MINIMUM GROSS VEHICLE WEIGHT (GVW) OF 20 TONS. THE

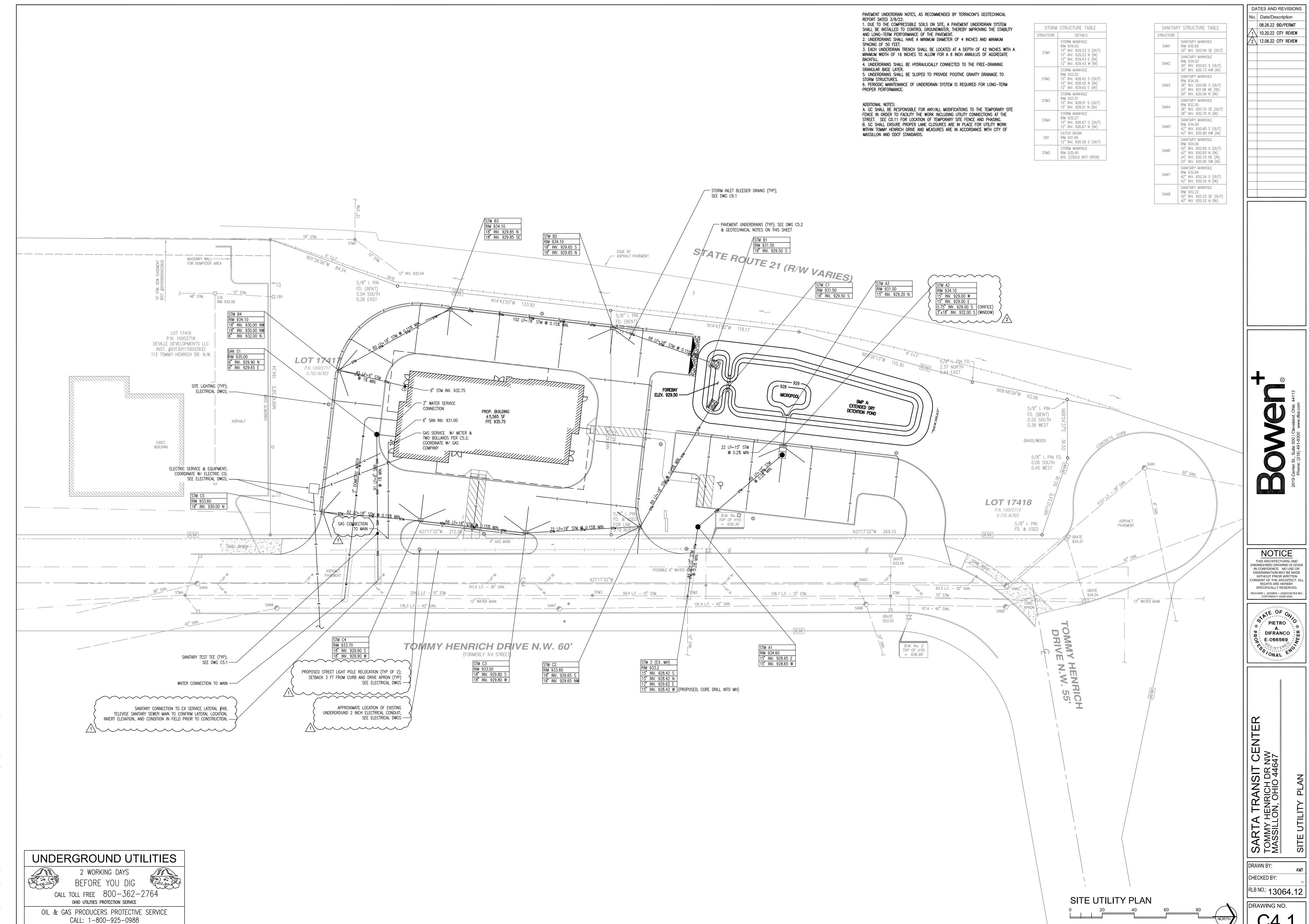
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TATE OF ON PIETRO O
A.
7 DIFRANCO E-066569

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NOTES GENERAL: With normal soil and site conditions this standard precast manhole may be used for any required manhole depth. Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for TOP AND TRANSITION (or reducer) sections may be either eccentric cone or flat slab. BASES for Number 3 Manholes are shown with monolithic floor and riser which may be cast in one or two operations. A per— missible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction as shown on MH-1 and MH-2. OPENINGS IN RISER SECTIONS for 15" and smaller inlet pipes may be prefabricated or cut in the field provided the sides of the pipe at the springline do not project into the manhole. CONNECTIONS between precast manhole sections and pipes on sanitary sewers may be sealed with resilient connetors con- forming to ASTM C923. JOINT SEAL between precast manhole sections on sanitary sewers shall be resilient and flexible gasket joints per 706.11. MATERIALS for bases and other precast sections, including reinforcement not specified hereon, shall comply with the requirements of 706.13. DROP PIPE, when specified on the plans, shall be constructed as shown on MH-2. STEPS, FRAMES AND COVERS shall conform with the requirements set forth on MH-1.

R/W -C.I. DISC CAP FINISH— MAGNETICALLY GRADE LOCATABLE IN PAVEMENT TOP OF TEE SHALL BE FLUSH WITH FINISHED GRADE. 2' X 2' X 4" PAD REQUIRED IN PAVEMENT. CONCRETE

TEST TEE SCALE: NOT TO SCALE

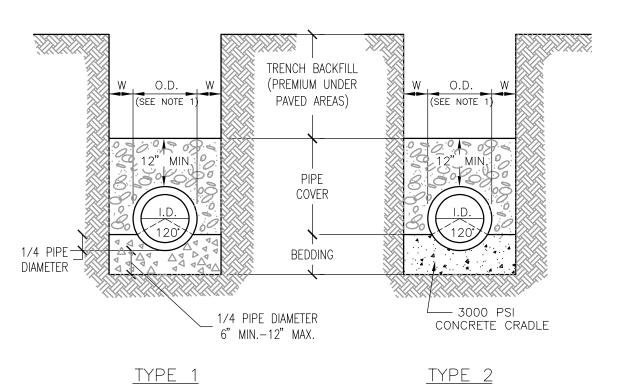
5%"∅ Reinforcing Steel 🃉 -- 5⁄8"ø REINF. 5%"ø Reinforcing Steel 1 1 ₩ Ħ ₩ **ELEVATION** SECTION A-A 1. CONCRETE SHALL BE ODOT CLASS "C".
2. REINFORCING STEEL BARS SHALL BE 5/8" ROUND. ONE HEADWALL

CONCRETE REINFORCING 2. DIMENSIONS AND QUANTITIES SHOWN ARE FOR CIRCULAR PIPE ONLY.
DIMENSIONS AND QUANTITIES FOR ELLIPTICAL OR ARCHED PIPE SHALL BE CALCULATED ACCORDING TO EQUATIONS SHOWN ON THIS DRAWING.

4. CHAMFER ALL EXPOSED CORNERS 3/4".

5. WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 POUNDS PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF

HEADWALL



(TYPICAL) (W/CONCRETE CRADDLE)

TRENCH AND BEDDING NOTES

1. PREMIUM BACKFILL SHALL CONSIST OF ODOT 304 LIMESTONE. 2. PIPE COVER SHALL CONSIST OF COARSE INTERLOCKING AGGREGATE NO. 6, 67, 68, 7, 78, OR 8. 3. BEDDING SHALL CONSIST OF COARSE INTERLOCKING AGGREGATE NO. 6, 67, 68, 7, 78, OR 8 FOR 60" OR SMALLER DIAMETER PIPE, FOR 66" OR LARGER DIAMETER PIPE NO. 4 MAY ALSO BE USED. 5. BACKFILL SHALL BE PLACED AND WELL COMPACTED IN 6" LIFTS. 6. MAXIMUM TRENCH WIDTH AT TOP OF PIPE SHALL BE O.D.+W. 7. PREMIUM BACKFILL SHALL BE USED UNDER OR WITHIN 3 FEET OF ALL BUILDING OR PAVED AREAS.

8. SEWER TRENCH TYPE 1 SHALL BE USED EXCEPT WHERE GROUND CONDITIONS, AS DETERMINED BY GEOTECHNICAL ENGINEER, INDICATE USE OF TYPE 2 IS PREFERABLE.

SEWER TRENCH DETAIL

C6.1 SCALE: NOT TO SCALE

TRENCH WRAPPED W/FILTER FABRIC

(MIN. SLOPE 0.5%)

MANUFACTURER (TYP.)

PLUG PER

4 SIDES OF CATCH BASINS 15' LONG MIN.)

STORM INLET BLEEDER DRAINS SCALE: NOT TO SCALE

<u>PLAN VIEW</u>

NOTE: BLEEDER DRAINS SHALL BE USED AT ALL STORM INLET STRUCTURES IN PAVED AREAS U.N.O.

TYPICAL SECTION

STORM SEWER-

(PER PLAN)

<u>CATCH BASINS</u>

STORM SEWER

(PER PLAN)

CURB INLETS

—— 4" PERF. UNDERDRAIN

FABRIC 3 SIDES OF CURB INLETS (MIN. 15'

LONG @ 0.5% SLOPE)

TRENCH WRAPPED W/FILTER

Reinf. steel ب | -- -- | -- -- -- | ب Std. No. 2-3 = 3'-0" = 8"-> Std. No. 2-3 = 3'-0" Std. No. 2-4 = 4'-0" ╒╣╪╠══┼══╬╪╠ SECTION A-A SECTION B-B SECTION C-C

↑ Cast-in-place concrete is to be CONCRETE: Class C. All precast concrete shall meet the requirements of CMS 706.13 with 6 \pm 2% air void content in the hardened concrete and be marked with the catch basin REINFORCING in the top to be No. 4 bars 6" center to center. For Standard No. 2—3 use 8 bars and for Standard No. 2—4 use OPENINGS for pipes shall be O.D.+2" when prefabricated or field cut. LOCATION and elevation when given on the plans is top center of grate. When side openings are provided, elevation shall be the flow line of the side inlet. A SIDE INLETS shall be provided only when

GRATING: The design shall be essentially the

shown heron. Minimum weight 120 pounds.

BRICK, concrete block or cast—in place walls

shall have a nominal thickness of 8 inches. Precast walls shall have a minimum thickness of 6 inches and be reinforced

sufficiently to permit shipping and handling

without damage.

same and equally as strong as the one

specified on the plans. STEPS shall be provided where the depth exceeds 72" and shall meet the requirements of MH-1. INLETS OVER 12 FEET IN DEPTH shall be precast or cast—in—place concrete; reinforced with No. 4 bars on 12" centers both vertically and horizontally with 2" clearance from inside wall face.

CATCH BASIN SIZE OUTLET PIPE SIZE 2-3 12" to 33" 2-4 36" to 42"

ODOT TYPE 2-3 & 2-4 CATCH BASIN

CAST IRON CAP AND MASTIC SEAL MIN. 24"X24" CONC. PAD ___LAST LENGTH CAST IRON CUT (IN PAVED AREAS ONLY) TO FIELD MEASUREMENT GRADE — ANSI CLASS 25 SAND CUSHION 8" CLEAN OUT SHALL BE USED FOR 8" SEWER AND LARGER. -MASTIC SEALED JOINT SMALLER SIZE SEWERS AND LAMP HOLES SHALL HAVE SAME SIZE PIPE. PIPE ENCASED IN 3,000 PSI CONCRETE AS SHOWN (MIN. 6" ALL SIDES) 30" CURVE ── 2' LENGTH OF PIPE -

SEWER CLEAN-OUT

HEADWALL IF REQUIRED PER PLAN ----ROCK APRON THICKNESS PER PLAN — GEOTEXTILE FABRIC — LENGTH OF OUTLET PROTECTION PER PLAN ———— . GEOTEXTILE FABRIC SHALL BE ODOT 712.09 TYPE B. SIZE OF ROCK RIP RAP SHALL BE AS SPECIFIED ON PLAN. 3. WIDTH OF ROCK APRON = WIDTH OF HEADWALL OR PIPE DIAMETER +4' MIN. **OUTLET PROTECTION**

─_BELL OR SPIGOT END BELL OR SPIGOT END-LIMITS OF WATER MAIN LOWERING NOTE:
1) WATER MAIN SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS
350, CEMENT LINED RETAINED MECHANICAL JOINT FITTINGS. WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS "A" & "B" AND/OR "C" & "D" THE ENTIRE LOWERING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT <u>ONLY</u> BETWEEN STATIONS "B" & "C", AND PIPE JOINTS ARE AS INDICATED IN NOTE "1" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE II.

*) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT <u>ONLY</u> BETWEEN 'B" AND "C' AND PIPE JOINTS ARE AS INDICATED IN NOTE "2" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE I. DETAIL FOR WATER MAIN LOWERING UNDER OBSTRUCTIONS LESS THAN 24" IN DIAMETER OR WIDTH FOR "NEW CONSTRUCTION" STD-L04

DATE: 10-1-97 BY: RSK - NOT TO SCALE -WATER MAIN LOWERIN UNDER OBSTRUCTIONS LESS THAN 24" (NEW)

DRAWN BY: CHECKED BY:

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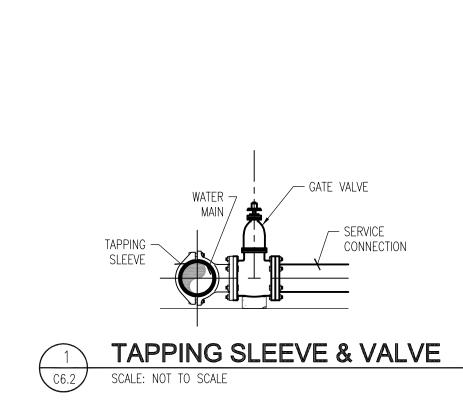
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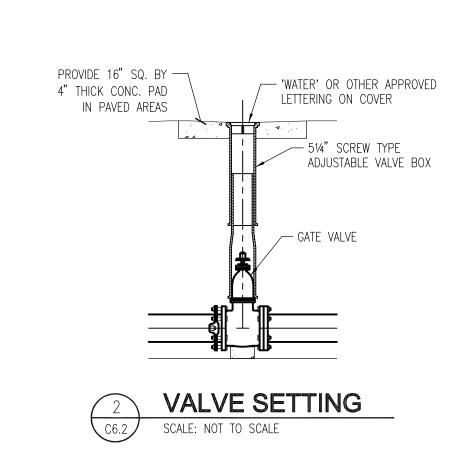
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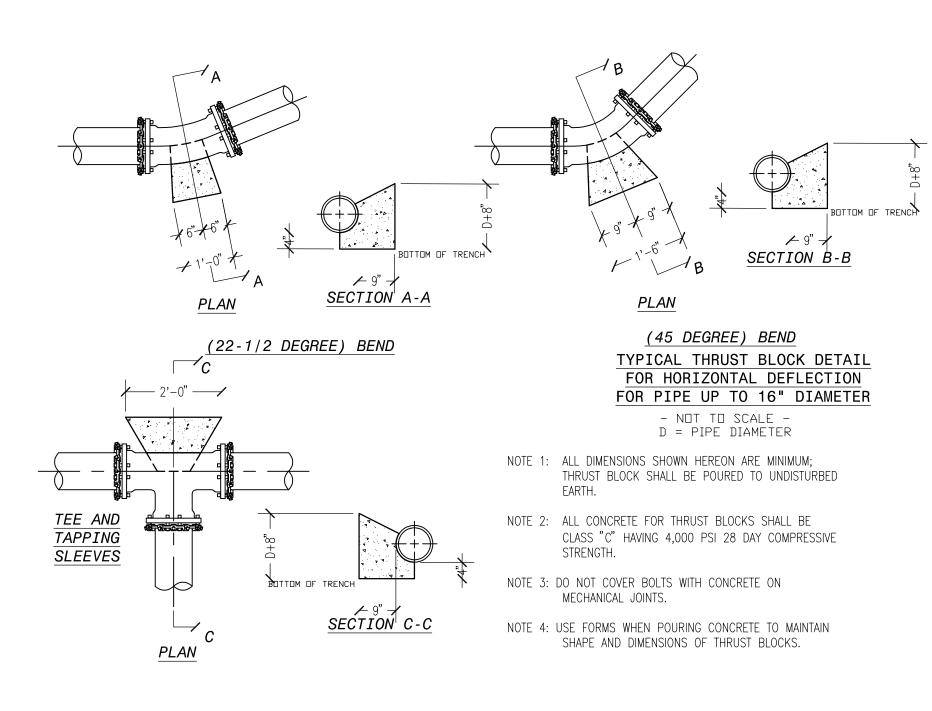
No. Date/Description

RLB NO.: 13064.12

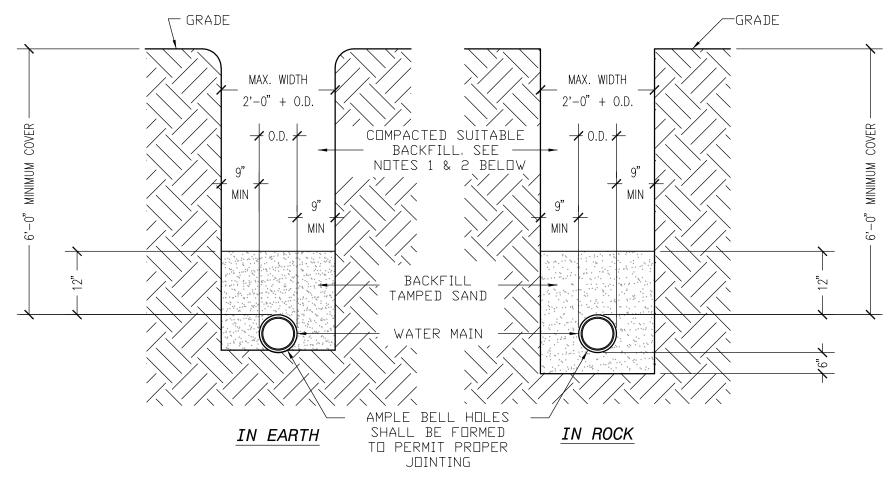
DRAWING NO.











1) PREMIUM BACKFILL REQUIRED UNDER OR WITHIN 3 FEET OF EXISTING OR FUTURE BUILDINGS, PAVEMENTS, SIDEWALKS, AND/OR DRIVES OR WHEN REQUIRED BY LOCAL MUNICIPALITY.

2) PREMIUM BACKFILL SHALL BE LIMESTONE SCREENINGS GRADED PER ODOT 304.02 OR ODOT 411. NO SLAG IS PERMITTED. 3) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE SAND BEDDING BACKFILL, SO AS TO AVOID SCRAPING OF THE EXTERIOR COATING, INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN COMPACTING THE SAME. THE SAND BEDDING BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.

4) MINIMUM COMPACTION FOR ALL SAND BEDDING BACKFILL, BACKFILL AND PREMIUM BACKFILL SHALL BE ACCORDING TO SPEC 312000.

WATER MAIN TRENCH

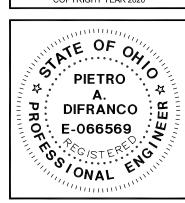
5) PAVEMENT, SIDEWALK OR DRIVES TO BE INSTALLED IN ACCORDANCE WITH LOCAL MUNICIPALITY'S SPECIFICATIONS.

DATES AND REVISIONS

08.26.22 BID/PERMIT 10.20.22 CITY REVIEW

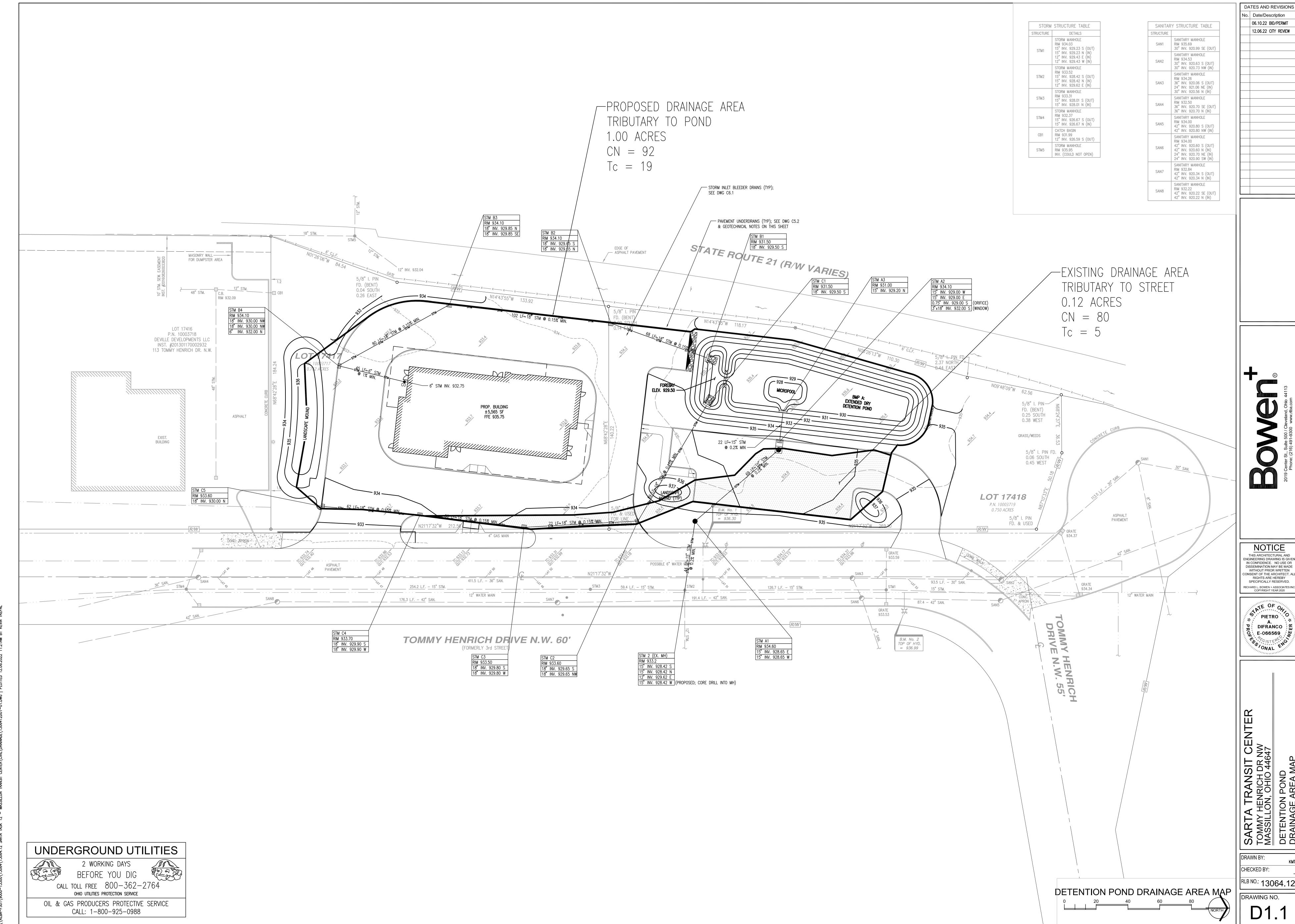
No. Date/Description

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RLB NO.: 13064.12

DRAWING NO. C6.2

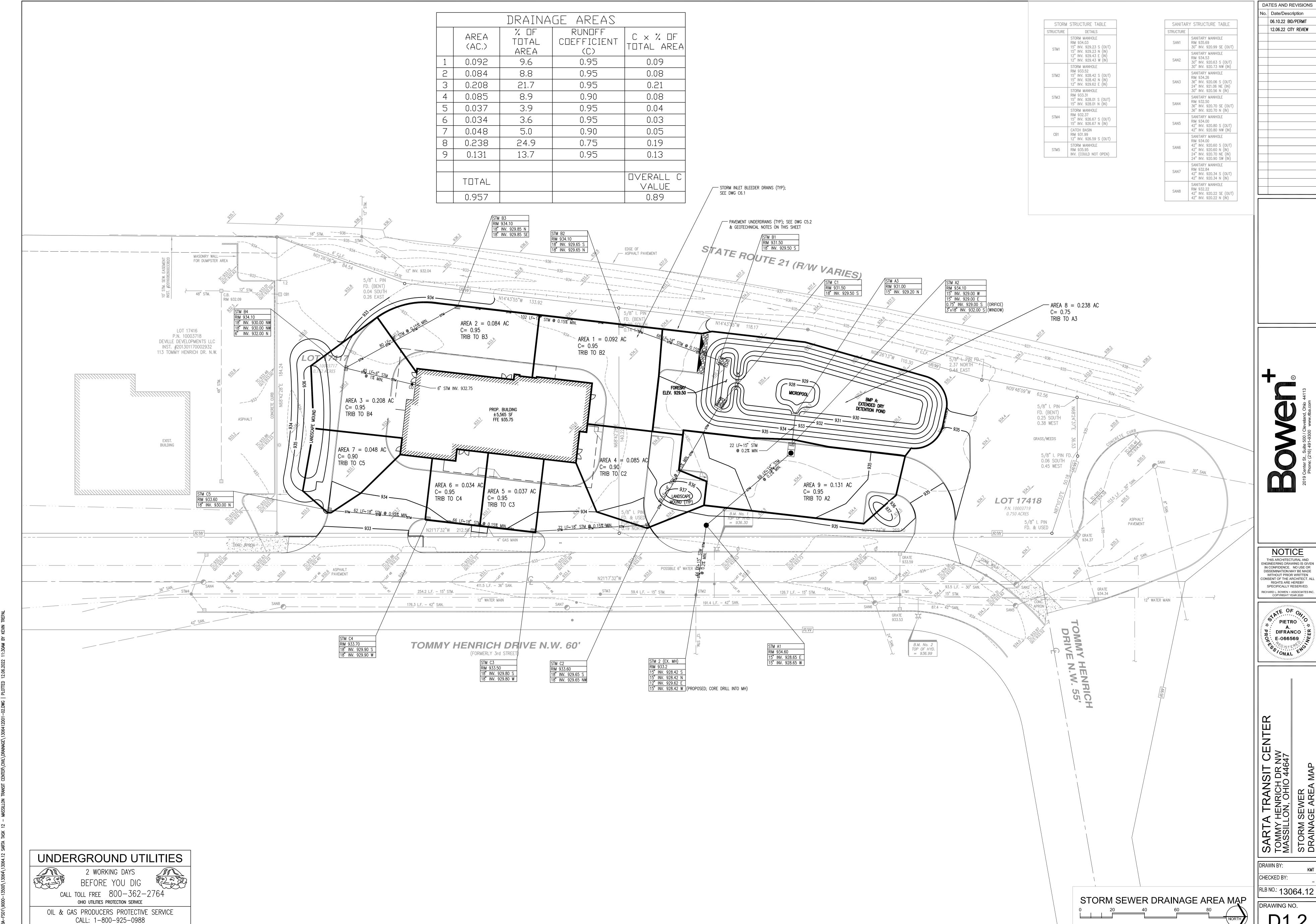


06.10.22 BID/PERMIT 12.06.22 CITY REVIEW

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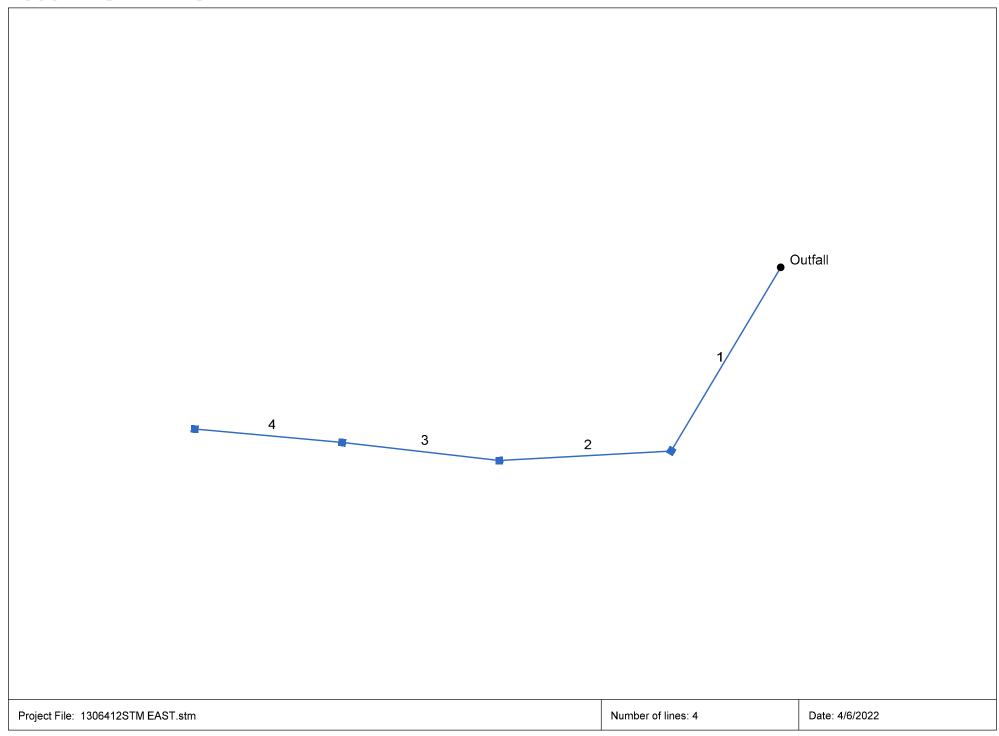
PIETRO A.

RLB NO.: 13064.12



D1.2

1306412STM EAST2



Storm Sewer Tabulation

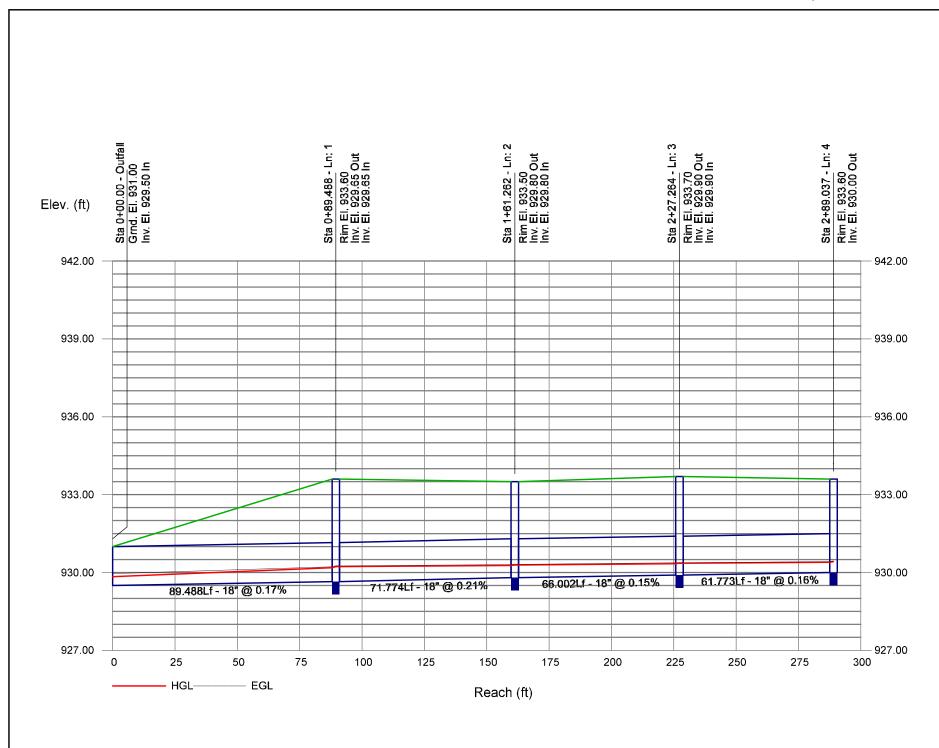
		Rnoff	Area x	C	Тс			Total	Сар	Size Slope Dn				ev	HGL Ele	v	Grnd / Ri	im Elev	Line ID			
Line	То		Incr	Total	coeff	Incr	Total	Inlet	Syst	(I)	flow	full		Size	Slope	Dn	Up	Dn	Up	Dn	Up	
	Line	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
4	-	00.400	0.00	0.04	0.00	0.00	0.40	40.0	24.4	4.0	0.00	4.00	2.00	40	0.47	020 50	000.05	000.04	020.40	024.50	000.00	02.04
1		89.488		0.21	0.90	0.08	0.19	10.0	24.4	4.2	0.80	4.30	2.08	18	0.17	929.50	929.65	929.84	930.16	931.50	933.60	C2-C1
2		71.774		0.12	0.95	0.04	0.11	10.0	21.1	4.5	0.50	4.80	1.00	18	0.21	929.65	929.80	930.21	930.23	933.60	933.50	C3-C2
3		66.002		0.08	0.95	0.03	0.07	10.0	16.7	5.0	0.37	4.09	0.95	18	0.15	929.80	929.90	930.24	930.27	933.50	933.70	C4-C3
4	3	61.773	0.05	0.05	0.90	0.05	0.05	10.0	10.0	6.0	0.27	4.22	0.90	18	0.16	929.90	930.00	930.28	930.31	933.70	933.60	C5-C4

Number of lines: 4

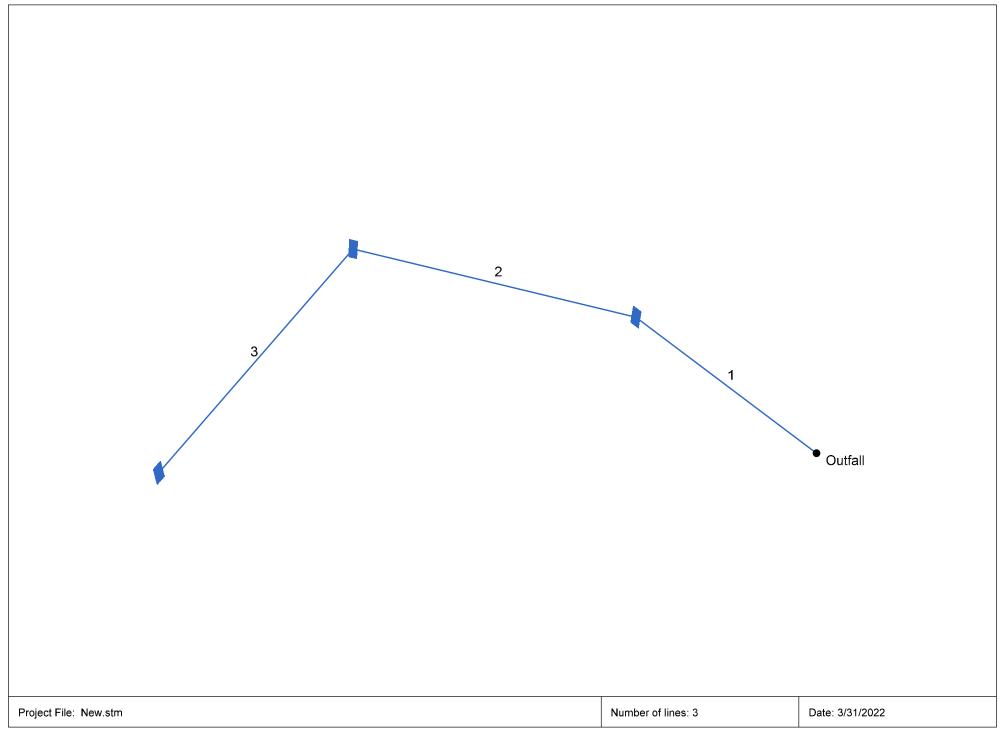
NOTES:Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83; Return period =Yrs. 10; c = cir e = ellip b = box

1306412STM EAST2

Run Date: 10/11/2022



1306412STM WEST



Storm Sewer Tabulation

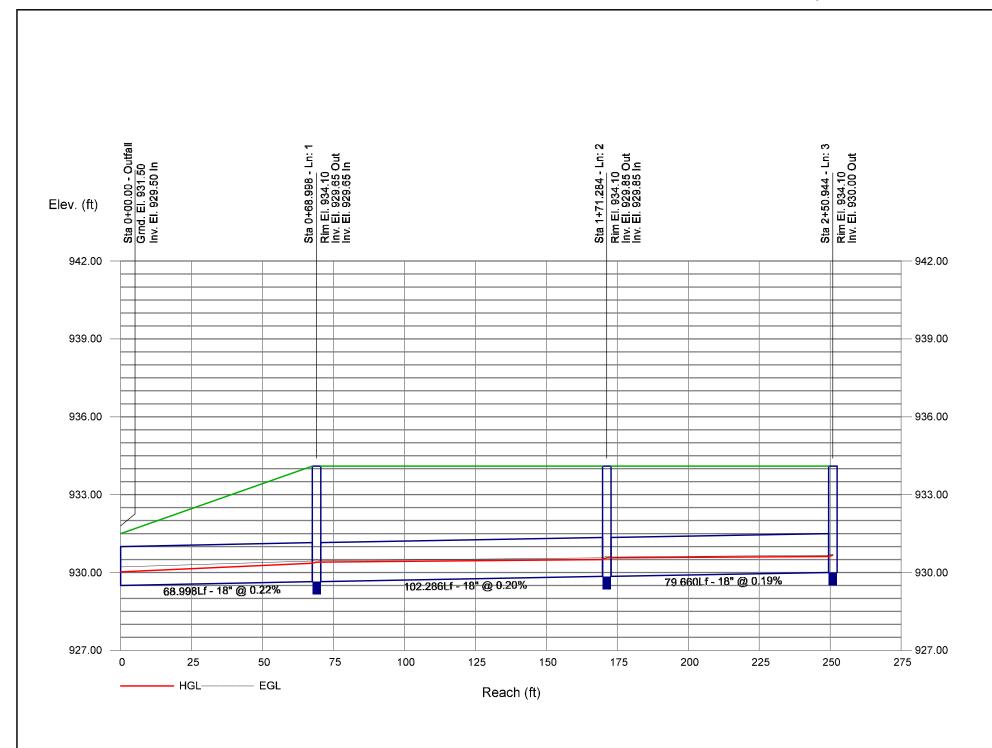
Statio	n	Len	Drng A	Area	Rnoff	Area x	C	Тс			Total	Сар	Vel	Pipe		Invert El	ev	HGL Ele	v	Grnd / Ri	Line ID	
Line	То		Incr	Total	coeff	Incr	Total	Inlet	Syst	(I)	flow	full		Size	Slope	Dn	Up	Dn	Up	Dn	Up	
	Line	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	68.998	0.09	0.38	0.95	0.09	0.36	10.0	13.8	5.4	1.93	4.90	2.94	18	0.22	929.50	929.65	930.02	930.36	931.50	934.10	B2-B1
2		102.286		0.29	0.95	0.08	0.27	10.0	12.0	5.7	1.55	4.64	1.94	18	0.20	929.65	929.85	930.40	930.50	934.10	934.10	B3-B2
3		79.660		0.21	0.95	0.20	0.20	10.0	10.0	6.0	1.19	4.56	1.59	18	0.19	929.85	930.00	930.57	930.62	934.10	934.10	B4-B3

Number of lines: 3

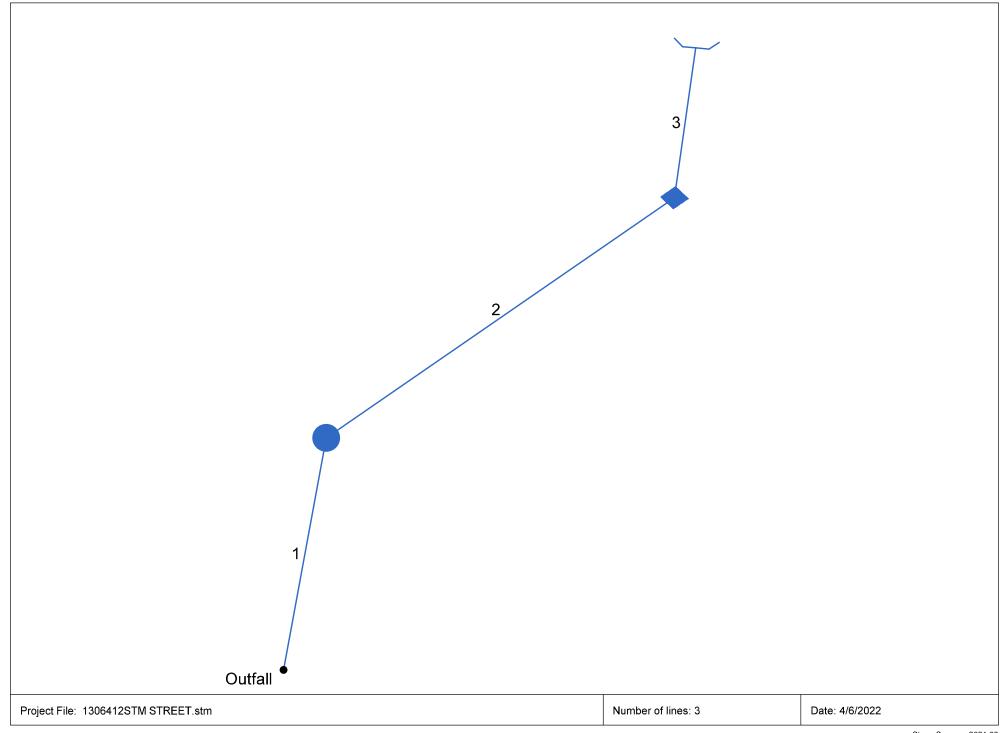
NOTES:Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83; Return period =Yrs. 10; c = cir e = ellip b = box

1306412STM WEST

Run Date: 5/26/2022



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



Storm Sewer Tabulation

Static	n	Len	Drng /	Area	Rnoff	Area x	(C	Тс			Total	Сар	Vel	Pipe		Invert El	ev	HGL Ele	v	Grnd / Ri	m Elev	Line ID
Line	То		Incr	Total	coeff	Incr	Total	Inlet	Syst	(I)	flow	full		Size	Slope	Dn	Up	Dn	Up	Dn	Up	
	Line	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	43.866	0.00	0.37	0.95	0.00	0.30	10.0	11.3	5.8	1.76	4.68	3.54	15	0.52	928.42	928.65	928.95	929.18	933.20	934.60	A1-EX
2		69.166		0.37	0.95	0.12	0.30	10.0	10.5	5.9	1.80	4.59	3.14	15	0.51	928.65	929.00	929.32	929.54	934.60	934.10	A2-A1
3		28.200		0.24	0.75	0.18	0.18	10.0	10.0	6.0	1.09	5.44	2.25	15	0.71	929.00	929.20	929.75	929.61	934.10	931.00	A3-A2

Number of lines: 3

NOTES:Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83; Return period =Yrs. 10; c = cir e = ellip b = box

Project File: 1306412STM STREET.stm

Run Date: 5/26/2022

