STORM DRAINAGE MANAGEMENT REPORT

31 Independence Drive

Devens, Massachusetts

June 29, 2022

Prepared by:

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1.0 INTRODUCTION:

This Stormwater Report represents the hydraulic analysis for the proposed 100,300 square foot Industrial Building and associated site improvements for 31 Independence, Devens, Massachusetts. New Stormwater systems components will be constructed to provide the ability to capture sediments, trap oil and grease, and use groundwater recharge principles through recharge thru porous pavement and infiltration basins for the site. All new pavement run-off after the site improvements will be routed thru a deep sump catch basins and a Contechs water quality unit prior to discharge into the subsurface infiltration system. The purpose of this analysis is to demonstrate that the proposed project will not cause any adverse impact on the downstream site in accordance with the Department of Environmental Protection Regulations under the two, ten, twenty-five and one-hundred-year storm events.

The storm run-off management systems were analyzed using a 2-year, 10-year, 25-year, 50-year and 100-year frequency storm event. The rainfall data used in this study is based on NOAA Atlas 14. Based upon the Data, a 2-year frequency, 24-hour duration storm results in a precipitation of 3.13 inches, a 10-year frequency storm results in a precipitation of 4.68 inches, a 25-year frequency storm results in a precipitation of 5.88 inches, a 50-year frequency storm results in a precipitation of 7.00 inches, and a 100-year frequency storm results into a precipitation of 8.34 inches for the property location.

The Analysis was performed using the Hydro CAD Version 10.00-25 software. Using the USDA SCS method of estimated runoff, the program uses the measured hydraulic characteristics of drainage structures to predict hydrologic conditions in the various drainage areas of the site. The model computes runoff for the given rainfall events, produces runoffs hydrographs and routes the flow through the designated detention facilities to calculate one outflow hydrograph per drainage basin. The results generated by this analysis are used to evaluate the suitability of the proposed storm run-off management system.

The drainage areas boundaries are based upon a site survey and the proposed site plans for the project. Hydrologic soil groups and curve numbers [CN] were estimated using available soil information obtained from the NCRS Soil Maps and onsite Soil test pits. The soils are classified as sands [NCRS Hydrologic Soil Group “A”]. The infiltration rate of 8.27 inches per hour was taken from Volume 3, Documenting Compliance with the Massachusetts Stormwater Management Standards, Table 2.3.3 Rawls Rates.

2.0 EXISTING WATERSHED ANALYSIS

The existing conditions stormwater runoff consists of two separate sub catchments. A portion of the existing site is directed to the north of the property towards the abutting property located at 45 Independence Drive. Most of the site remains on site.

3.0 POST DEVELOPMENT WATERSHED ANALYSIS AND METHODLOGY

Post-development Conditions
The project has been designed to capture and recharge the required recharge volume for post-development stormwater runoff on-site. A HydroCAD report has been included demonstrating that the proposed stormwater

systems can attenuate the 100-year storm. The sub catchment that is directed to the north of the property has been proposed to remain on site, with any stormwater leaving the site to be considered a de minimus stormwater discharge.

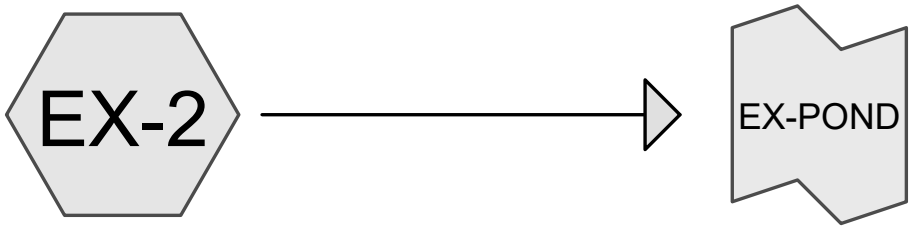
Subcatchment #1– 31 Independence Drive

Storm		Existing	Proposed	Difference
2-Year (3.35")		0.00 cfs	0.00 cfs	-0.00 cfs
10-Year (4.95")		0.00 cfs	0.00 cfs	-0.00 cfs
25-Year (6.19")		0.00 cfs	0.00 cfs	-0.00 cfs
100-Year (8.68")		0.03 cfs	0.00 cfs	-0.03 cfs

4.0 SUMMARY:

The new drainage system will provide the ability to capture sediments, trap oil and grease, and use groundwater recharge principles through the porous pavement and Infiltration Basins. All runoff generated by this property will be recharged which is a significant upgrade over the existing condition.

PRE-DEVELOPMENT CALCULATIONS



Existing Subcatchment

45 Independence Drive Detention Pond

Subcat Reach Pond Link

Routing Diagram for Hydrology
Prepared by Dana F. Perkins, Inc.
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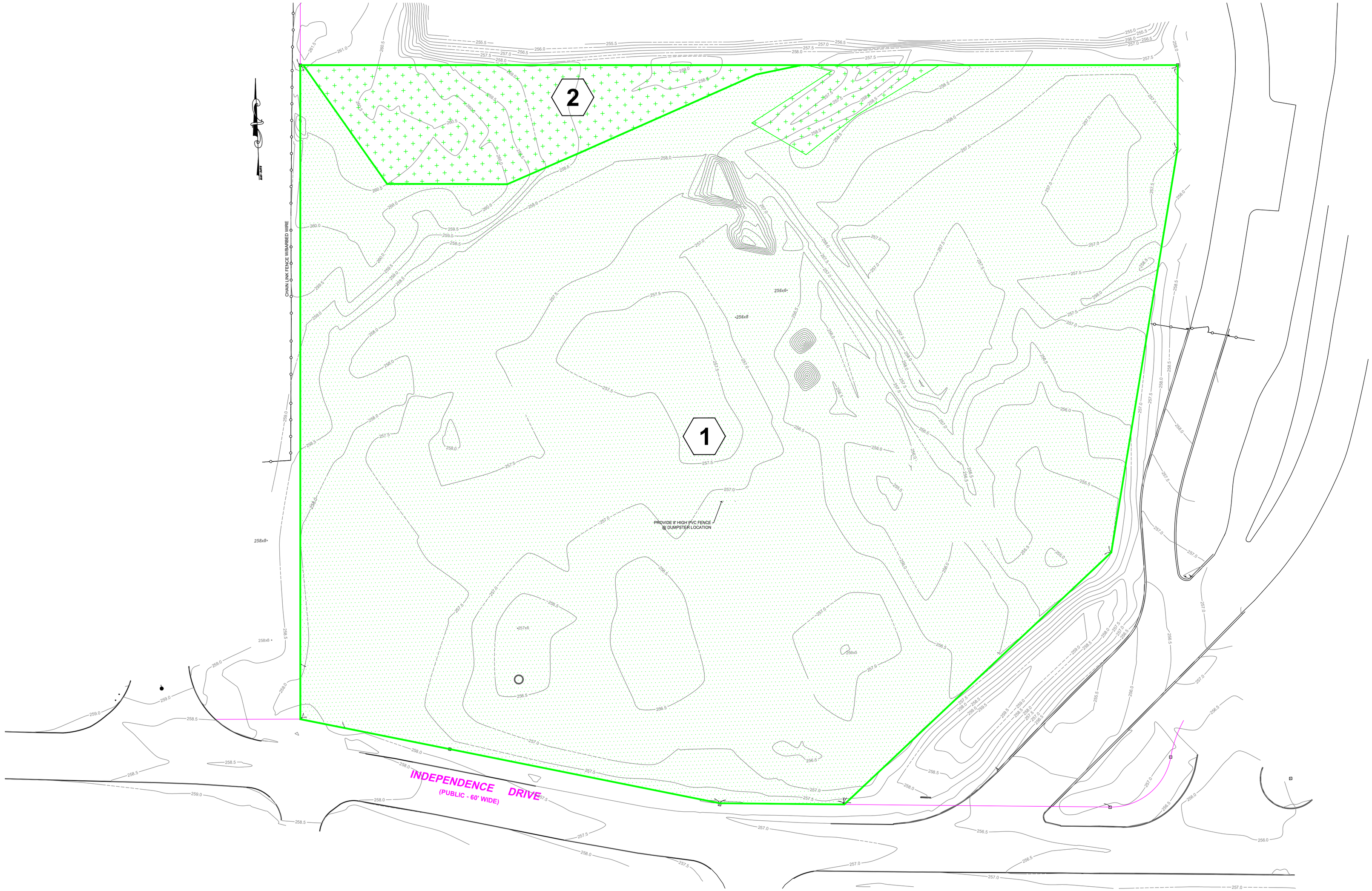

PRE DEVELOPMENT WATERSHED MAP
PD.1 SCALE: 1" = 30'-0"

GRAPHIC SCALE

30 15 0 15 30 60 120

COMMONWEALTH OF MASSACHUSETTS
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NO	DATE	REVISIONS

PREPARED FOR:
31 INDEPENDENCE DRIVE, LLC
133 PEARL STREET
BOSTON, MA

PROJECT:
PROPOSED INDUSTRIAL BUILDING
31 INDEPENDENCE DRIVE
DEVENS, MA

DRAWING:
PRE DEVELOPMENT WATERSHED

SCALE: 1" = 30'-0"
DATE: JUNE 29, 2022

DRAWING NUMBER
PRE-1

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-2: Existing Subcatchment Runoff Area=18,391 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Link EX-POND: 45 Independence Drive Detention Pond Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.422 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 0.422 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-2: Existing Subcatchment

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
11,814	30	Woods, Good, HSG A
6,577	30	Brush, Good, HSG A
18,391	30	Weighted Average
18,391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Link EX-POND: 45 Independence Drive Detention Pond

Inflow Area = 0.422 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-2: Existing Subcatchment Runoff Area=18,391 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.000 af

Link EX-POND: 45 Independence Drive Detention Pond Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.422 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 0.422 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-2: Existing Subcatchment

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
11,814	30	Woods, Good, HSG A
6,577	30	Brush, Good, HSG A
18,391	30	Weighted Average
18,391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Link EX-POND: 45 Independence Drive Detention Pond

Inflow Area = 0.422 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-2: Existing Subcatchment Runoff Area=18,391 sf 0.00% Impervious Runoff Depth=0.04"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0.001 af

Link EX-POND: 45 Independence Drive Detention Pond Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 0.422 ac Runoff Volume = 0.001 af Average Runoff Depth = 0.04"
100.00% Pervious = 0.422 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-2: Existing Subcatchment

Runoff = 0.00 cfs @ 22.33 hrs, Volume= 0.001 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=5.60"

Area (sf)	CN	Description
11,814	30	Woods, Good, HSG A
6,577	30	Brush, Good, HSG A
18,391	30	Weighted Average
18,391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Link EX-POND: 45 Independence Drive Detention Pond

Inflow Area = 0.422 ac, 0.00% Impervious, Inflow Depth = 0.04" for 25-Year event
Inflow = 0.00 cfs @ 22.33 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 22.33 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-2: Existing Subcatchment Runoff Area=18,391 sf 0.00% Impervious Runoff Depth=0.40"
Tc=5.0 min CN=30 Runoff=0.03 cfs 0.014 af

Link EX-POND: 45 Independence Drive Detention Pond Inflow=0.03 cfs 0.014 af
Primary=0.03 cfs 0.014 af

Total Runoff Area = 0.422 ac Runoff Volume = 0.014 af Average Runoff Depth = 0.40"
100.00% Pervious = 0.422 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-2: Existing Subcatchment

Runoff = 0.03 cfs @ 12.53 hrs, Volume= 0.014 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
11,814	30	Woods, Good, HSG A
6,577	30	Brush, Good, HSG A
18,391	30	Weighted Average
18,391		100.00% Pervious Area

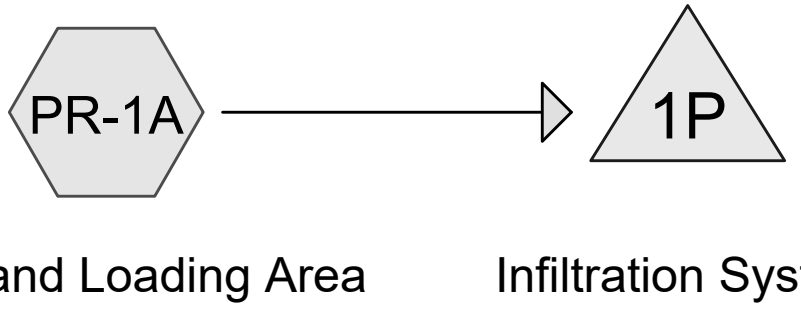
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Link EX-POND: 45 Independence Drive Detention Pond

Inflow Area = 0.422 ac, 0.00% Impervious, Inflow Depth = 0.40" for 100-Year event
Inflow = 0.03 cfs @ 12.53 hrs, Volume= 0.014 af
Primary = 0.03 cfs @ 12.53 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

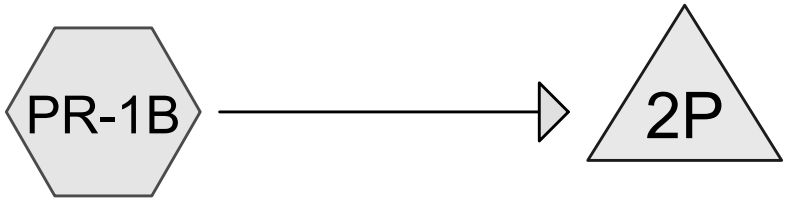
Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

POST DEVELOPMENT CALCULATIONS



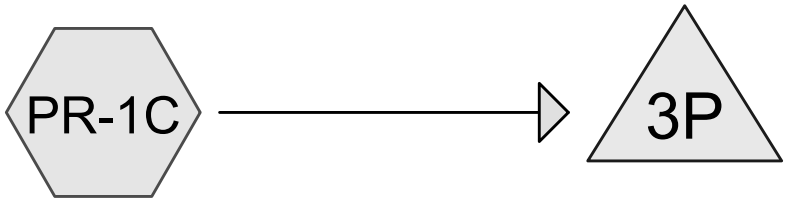
Roofs and Loading Area

Infiltration System



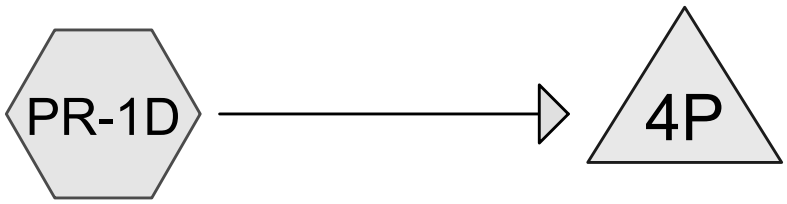
Porous Parking Lot - West

Porous Pavement - Reservoir Course



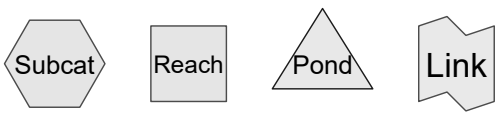
Porous Parking Lot - east

Porous Pavement - Reservoir Course



East Pond - Grassed Area

Infiltration Pond



Routing Diagram for Hydrology.2022-EMAIL
Prepared by Dana F. Perkins, Inc.
HydroCAD® 10.00-22 s/n 00444 © 2018 HydroCAD Software Solutions LLC

20'-0" WIDE FIRE ACCESS

465.00'

24" HDPE ROOF COLLECTION SYSTEM [SLOPE=0.005 MIN.]

6" HDPE LATERALS TO DOWNSPOUTS [TYP].

PROP. AREA DRAIN (TYP) CONNECT TO 24" COLLECTION SYSTEM

PROP. AREA DRAIN (TYP) CONNECT TO 24" COLLECTION SYSTEM

PROP. AREA DRAIN (TYP) CONNECT TO 24" COLLECTION SYSTEM

PROP. DMH-3:
RIM=257.25
INV(IN)=251.10
INV(OUT)=251.00

PROPOSED
INDUSTRIAL BUILDING
111,050 SF FOOTPRINT
F.F. ELEV.= 262.00

1A

1B

1C

1D

203.00'

230.00'

20'-0" WIDE FIRE ACCESS

CHAIN LINK FENCE W/BARBED WIRE

ELEC. TRANS. 1000 KVA

SPRK. ROOM

PROP. DMH-2:
RIM=256.00
INV(IN)=250.74
INV(OUT)=250.64

DUMPSTER

BOLLARDS

TYP.

SIX (6) FOOT HIGH PVC FENCE @ DUMPSTER LOCATION

PROP. DMH-3:
RIM=260.50
INV(IN)=250.74
INV(OUT)=250.64

PROP. INFILTRATION SYSTEM:
(450) CULTEC R902HD CHAMBERS
BOTTOM OF STONE ELEV.=247.67
BOTTOM OF CHAMBERS ELEV.=248.42
TOP OF STONE ELEV.=253.42
INV(IN=18")=250.92
(INV(IN=24")=250.42

18" HDPE
L=6± S=0.005

PROP. GS-4
RIM=258.50
INV(IN)=250.95
INV(OUT)=250.95

18" HDPE
L=10± S=0.005

PROP. DMH-1:
RIM=258.50
INV(IN)=251.10
INV(OUT)=251.00

18" HDPE
L=80± S=0.005

PROP. CB-1:
RIM=255.50(DBL)
INV(OUT)=251.50

10" WATER MAIN (APPROX.)

CB (EX):
RIM= 255.14

10" WATER MAIN (APPROX.)

CB (EX):
RIM= 258.23

DMH (EX):
RIM= 258.47
CL TROUGH= 244.55

36" RCP DRAIN

INDEPENDENCE DRIVE
(PUBLIC - 60' WIDE)

36" RCP DRAIN

DMH (EX):
RIM= 257.45
CL TROUGH= 243.89

36" RCP DRAIN

6" GAS MAIN (APPROX.)

6" GAS MAIN (APPROX.)

36" RCP DRAIN

CB (EX):
RIM= 255.99

36" RCP DRAIN

6" GAS MAIN (APPROX.)

CB (EX):
RIM= 255.98

COMMONWEALTH OF MASSACHUSETTS
EUGENE T. SULLIVAN
CIVIL
No. 45737
REGISTERED PROFESSIONAL ENGINEER

POST DEVELOPMENT WATERSHED MAP

PD.2

SCALE: 1" = 30'-0"

GRAPHIC SCALE

15 0 15 30 60 120

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NO	DATE	REVISIONS

PREPARED FOR:
31 INDEPENDENCE DRIVE, LLC
133 PEARL STREET
BOSTON, MA

PROJECT:
PROPOSED INDUSTRIAL BUILDING
31 INDEPENDENCE DRIVE
DEVENS, MA

DRAWING:
POST DEVELOPMENT WATERSHED

SCALE: 1" = 30'-0"

DATE: JUNE 29, 2022

DRAWING NUMBER
POST-1

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: Roofs and Loading Runoff Area=216,048 sf 79.77% Impervious Runoff Depth=1.66"
Tc=5.0 min CN=86 Runoff=10.90 cfs 0.687 af

Subcatchment PR-1B: Porous Parking Lot - Runoff Area=6,956 sf 81.35% Impervious Runoff Depth=1.74"
Tc=5.0 min CN=87 Runoff=0.37 cfs 0.023 af

Subcatchment PR-1C: Porous Parking Lot Runoff Area=8,795 sf 100.00% Impervious Runoff Depth=2.77"
Tc=5.0 min CN=98 Runoff=0.64 cfs 0.047 af

Subcatchment PR-1D: East Pond - Grassed Runoff Area=12,284 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond 1P: Infiltration System Peak Elev=248.62' Storage=0.134 af Inflow=10.90 cfs 0.687 af
Outflow=2.37 cfs 0.687 af

Pond 2P: Porous Pavement - Reservoir Course Peak Elev=256.50' Storage=8 cf Inflow=0.37 cfs 0.023 af
Outflow=0.36 cfs 0.023 af

Pond 3P: Porous Pavement - Reservoir Course Peak Elev=257.00' Storage=13 cf Inflow=0.64 cfs 0.047 af
Outflow=0.64 cfs 0.047 af

Pond 4P: Infiltration Pond Peak Elev=255.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 5.603 ac Runoff Volume = 0.757 af Average Runoff Depth = 1.62"
23.47% Pervious = 1.315 ac 76.53% Impervious = 4.288 ac

Summary for Subcatchment PR-1A: Roofs and Loading Area

Runoff = 10.90 cfs @ 12.12 hrs, Volume= 0.687 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
43,713	39	>75% Grass cover, Good, HSG A
111,051	98	Roofs, HSG A
61,284	98	Paved parking, HSG A
216,048	86	Weighted Average
43,713		20.23% Pervious Area
172,335		79.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1B: Porous Parking Lot - West

Runoff = 0.37 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
5,659	98	Paved parking, HSG A
1,297	39	>75% Grass cover, Good, HSG A
6,956	87	Weighted Average
1,297		18.65% Pervious Area
5,659		81.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1C: Porous Parking Lot - east

Runoff = 0.64 cfs @ 12.12 hrs, Volume= 0.047 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
8,795	98	Paved parking, HSG A
8,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1D: East Pond - Grassed Area

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 2-Year Rainfall=3.00"

Area (sf)	CN	Description
12,284	39	>75% Grass cover, Good, HSG A
12,284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Pond 1P: Infiltration System

Inflow Area = 4.960 ac, 79.77% Impervious, Inflow Depth = 1.66" for 2-Year event
Inflow = 10.90 cfs @ 12.12 hrs, Volume= 0.687 af
Outflow = 2.37 cfs @ 11.89 hrs, Volume= 0.687 af, Atten= 78%, Lag= 0.0 min
Discarded = 2.37 cfs @ 11.89 hrs, Volume= 0.687 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 248.62' @ 12.38 hrs Surf.Area= 0.284 ac Storage= 0.134 af

Plug-Flow detention time= 13.8 min calculated for 0.687 af (100% of inflow)
Center-of-Mass det. time= 13.8 min (847.7 - 833.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	247.67'	0.386 af	**73.75'W x 168.03'L x 5.75'H Field A** 1.636 af Overall - 0.670 af Embedded = 0.966 af x 40.0% Voids
#2A	248.42'	0.670 af	**Cultec R-902HD** x 450 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 45 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		1.056 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	247.67'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=2.37 cfs @ 11.89 hrs HW=247.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Summary for Pond 2P: Porous Pavement - Reservoir Course

Inflow Area = 0.160 ac, 81.35% Impervious, Inflow Depth = 1.74" for 2-Year event
Inflow = 0.37 cfs @ 12.12 hrs, Volume= 0.023 af
Outflow = 0.36 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.36 cfs @ 12.13 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 256.50' @ 12.13 hrs Surf.Area= 5,659 sf Storage= 8 cf

Plug-Flow detention time= 0.3 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (830.1 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	256.50'	2,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 5,659 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
256.50	5,659	0	0
257.50	5,659	5,659	5,659

Device	Routing	Invert	Outlet Devices
#1	Discarded	256.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.08 cfs @ 12.13 hrs HW=256.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.08 cfs)

Summary for Pond 3P: Porous Pavement - Reservoir Course

Inflow Area = 0.202 ac,100.00% Impervious, Inflow Depth = 2.77" for 2-Year event
Inflow = 0.64 cfs @ 12.12 hrs, Volume= 0.047 af
Outflow = 0.64 cfs @ 12.13 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.64 cfs @ 12.13 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 257.00' @ 12.13 hrs Surf.Area= 8,795 sf Storage= 13 cf

Plug-Flow detention time= 0.3 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (759.3 - 759.0)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	3,518 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 8,795 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	8,795	0	0
258.00	8,795	8,795	8,795

Device	Routing	Invert	Outlet Devices
#1	Discarded	257.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 12.13 hrs HW=257.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.68 cfs)

Summary for Pond 4P: Infiltration Pond

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 255.00' @ 0.00 hrs Surf.Area= 922 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	3,693 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	922	0	0
256.00	1,782	1,352	1,352
257.00	2,900	2,341	3,693

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=255.00' (Free Discharge)
└**1=Exfiltration** (Passes 0.00 cfs of 0.18 cfs potential flow)

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: Roofs and Loading Runoff Area=216,048 sf 79.77% Impervious Runoff Depth=2.97"
Tc=5.0 min CN=86 Runoff=19.03 cfs 1.226 af

Subcatchment PR-1B: Porous Parking Lot - Runoff Area=6,956 sf 81.35% Impervious Runoff Depth=3.06"
Tc=5.0 min CN=87 Runoff=0.63 cfs 0.041 af

Subcatchment PR-1C: Porous Parking Lot Runoff Area=8,795 sf 100.00% Impervious Runoff Depth=4.22"
Tc=5.0 min CN=98 Runoff=0.96 cfs 0.071 af

Subcatchment PR-1D: East Pond - Grassed Runoff Area=12,284 sf 0.00% Impervious Runoff Depth=0.10"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.002 af

Pond 1P: Infiltration System Peak Elev=249.49' Storage=0.345 af Inflow=19.03 cfs 1.226 af
Outflow=2.37 cfs 1.226 af

Pond 2P: Porous Pavement - Reservoir Course Peak Elev=256.51' Storage=13 cf Inflow=0.63 cfs 0.041 af
Outflow=0.63 cfs 0.041 af

Pond 3P: Porous Pavement - Reservoir Course Peak Elev=257.01' Storage=20 cf Inflow=0.96 cfs 0.071 af
Outflow=0.96 cfs 0.071 af

Pond 4P: Infiltration Pond Peak Elev=255.00' Storage=0 cf Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Total Runoff Area = 5.603 ac Runoff Volume = 1.340 af Average Runoff Depth = 2.87"
23.47% Pervious = 1.315 ac 76.53% Impervious = 4.288 ac

Summary for Subcatchment PR-1A: Roofs and Loading Area

Runoff = 19.03 cfs @ 12.12 hrs, Volume= 1.226 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
43,713	39	>75% Grass cover, Good, HSG A
111,051	98	Roofs, HSG A
61,284	98	Paved parking, HSG A
216,048	86	Weighted Average
43,713		20.23% Pervious Area
172,335		79.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1B: Porous Parking Lot - West

Runoff = 0.63 cfs @ 12.12 hrs, Volume= 0.041 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
5,659	98	Paved parking, HSG A
1,297	39	>75% Grass cover, Good, HSG A
6,956	87	Weighted Average
1,297		18.65% Pervious Area
5,659		81.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1C: Porous Parking Lot - east

Runoff = 0.96 cfs @ 12.12 hrs, Volume= 0.071 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
8,795	98	Paved parking, HSG A
8,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1D: East Pond - Grassed Area

Runoff = 0.00 cfs @ 14.34 hrs, Volume= 0.002 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 10-Year Rainfall=4.46"

Area (sf)	CN	Description
12,284	39	>75% Grass cover, Good, HSG A
12,284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Pond 1P: Infiltration System

Inflow Area = 4.960 ac, 79.77% Impervious, Inflow Depth = 2.97" for 10-Year event
Inflow = 19.03 cfs @ 12.12 hrs, Volume= 1.226 af
Outflow = 2.37 cfs @ 11.65 hrs, Volume= 1.226 af, Atten= 88%, Lag= 0.0 min
Discarded = 2.37 cfs @ 11.65 hrs, Volume= 1.226 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 249.49' @ 12.70 hrs Surf.Area= 0.284 ac Storage= 0.345 af

Plug-Flow detention time= 41.5 min calculated for 1.226 af (100% of inflow)
Center-of-Mass det. time= 41.4 min (857.0 - 815.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	247.67'	0.386 af	**73.75'W x 168.03'L x 5.75'H Field A** 1.636 af Overall - 0.670 af Embedded = 0.966 af x 40.0% Voids
#2A	248.42'	0.670 af	**Cultec R-902HD** x 450 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 45 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		1.056 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	247.67'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=2.37 cfs @ 11.65 hrs HW=247.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Summary for Pond 2P: Porous Pavement - Reservoir Course

Inflow Area = 0.160 ac, 81.35% Impervious, Inflow Depth = 3.06" for 10-Year event
Inflow = 0.63 cfs @ 12.12 hrs, Volume= 0.041 af
Outflow = 0.63 cfs @ 12.13 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.63 cfs @ 12.13 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 256.51' @ 12.13 hrs Surf.Area= 5,659 sf Storage= 13 cf

Plug-Flow detention time= 0.3 min calculated for 0.041 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (812.3 - 811.9)

Volume	Invert	Avail.Storage	Storage Description
#1	256.50'	2,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 5,659 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
256.50	5,659	0	0
257.50	5,659	5,659	5,659

Device	Routing	Invert	Outlet Devices
#1	Discarded	256.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.08 cfs @ 12.13 hrs HW=256.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.08 cfs)

Summary for Pond 3P: Porous Pavement - Reservoir Course

Inflow Area = 0.202 ac,100.00% Impervious, Inflow Depth = 4.22" for 10-Year event
Inflow = 0.96 cfs @ 12.12 hrs, Volume= 0.071 af
Outflow = 0.96 cfs @ 12.13 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.96 cfs @ 12.13 hrs, Volume= 0.071 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 257.01' @ 12.13 hrs Surf.Area= 8,795 sf Storage= 20 cf

Plug-Flow detention time= 0.3 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (750.9 - 750.5)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	3,518 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 8,795 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	8,795	0	0
258.00	8,795	8,795	8,795

Device	Routing	Invert	Outlet Devices
#1	Discarded	257.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 12.13 hrs HW=257.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.68 cfs)

Summary for Pond 4P: Infiltration Pond

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth = 0.10" for 10-Year event
Inflow = 0.00 cfs @ 14.34 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 14.36 hrs, Volume= 0.002 af, Atten= 0%, Lag= 1.1 min
Discarded = 0.00 cfs @ 14.36 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 255.00' @ 14.36 hrs Surf.Area= 922 sf Storage= 0 cf

Plug-Flow detention time= 1.7 min calculated for 0.002 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (1,087.6 - 1,085.9)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	3,693 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	922	0	0
256.00	1,782	1,352	1,352
257.00	2,900	2,341	3,693

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 14.36 hrs HW=255.00' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: Roofs and Loading Runoff Area=216,048 sf 79.77% Impervious Runoff Depth=4.03"
Tc=5.0 min CN=86 Runoff=25.43 cfs 1.666 af

Subcatchment PR-1B: Porous Parking Lot - Runoff Area=6,956 sf 81.35% Impervious Runoff Depth=4.14"
Tc=5.0 min CN=87 Runoff=0.83 cfs 0.055 af

Subcatchment PR-1C: Porous Parking Lot Runoff Area=8,795 sf 100.00% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=98 Runoff=1.21 cfs 0.090 af

Subcatchment PR-1D: East Pond - Grassed Runoff Area=12,284 sf 0.00% Impervious Runoff Depth=0.34"
Tc=5.0 min CN=39 Runoff=0.02 cfs 0.008 af

Pond 1P: Infiltration System Peak Elev=250.37' Storage=0.550 af Inflow=25.43 cfs 1.666 af
Outflow=2.37 cfs 1.666 af

Pond 2P: Porous Pavement - Reservoir Course Peak Elev=256.51' Storage=17 cf Inflow=0.83 cfs 0.055 af
Outflow=0.83 cfs 0.055 af

Pond 3P: Porous Pavement - Reservoir Course Peak Elev=257.01' Storage=25 cf Inflow=1.21 cfs 0.090 af
Outflow=1.20 cfs 0.090 af

Pond 4P: Infiltration Pond Peak Elev=255.00' Storage=2 cf Inflow=0.02 cfs 0.008 af
Outflow=0.02 cfs 0.008 af

Total Runoff Area = 5.603 ac Runoff Volume = 1.819 af Average Runoff Depth = 3.90"
23.47% Pervious = 1.315 ac 76.53% Impervious = 4.288 ac

Summary for Subcatchment PR-1A: Roofs and Loading Area

Runoff = 25.43 cfs @ 12.12 hrs, Volume= 1.666 af, Depth= 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=5.60"

Area (sf)	CN	Description
43,713	39	>75% Grass cover, Good, HSG A
111,051	98	Roofs, HSG A
61,284	98	Paved parking, HSG A
216,048	86	Weighted Average
43,713		20.23% Pervious Area
172,335		79.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1B: Porous Parking Lot - West

Runoff = 0.83 cfs @ 12.12 hrs, Volume= 0.055 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=5.60"

Area (sf)	CN	Description
5,659	98	Paved parking, HSG A
1,297	39	>75% Grass cover, Good, HSG A
6,956	87	Weighted Average
1,297		18.65% Pervious Area
5,659		81.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1C: Porous Parking Lot - east

Runoff = 1.21 cfs @ 12.12 hrs, Volume= 0.090 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=5.60"

Area (sf)	CN	Description
8,795	98	Paved parking, HSG A
8,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1D: East Pond - Grassed Area

Runoff = 0.02 cfs @ 12.34 hrs, Volume= 0.008 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 25-Year Rainfall=5.60"

Area (sf)	CN	Description
12,284	39	>75% Grass cover, Good, HSG A
12,284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Pond 1P: Infiltration System

Inflow Area = 4.960 ac, 79.77% Impervious, Inflow Depth = 4.03" for 25-Year event
Inflow = 25.43 cfs @ 12.12 hrs, Volume= 1.666 af
Outflow = 2.37 cfs @ 11.48 hrs, Volume= 1.666 af, Atten= 91%, Lag= 0.0 min
Discarded = 2.37 cfs @ 11.48 hrs, Volume= 1.666 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 250.37' @ 13.00 hrs Surf.Area= 0.284 ac Storage= 0.550 af

Plug-Flow detention time= 71.5 min calculated for 1.665 af (100% of inflow)
Center-of-Mass det. time= 71.5 min (877.5 - 806.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	247.67'	0.386 af	**73.75'W x 168.03'L x 5.75'H Field A** 1.636 af Overall - 0.670 af Embedded = 0.966 af x 40.0% Voids
#2A	248.42'	0.670 af	**Cultec R-902HD** x 450 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 45 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		1.056 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	247.67'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=2.37 cfs @ 11.48 hrs HW=247.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Summary for Pond 2P: Porous Pavement - Reservoir Course

Inflow Area = 0.160 ac, 81.35% Impervious, Inflow Depth = 4.14" for 25-Year event
Inflow = 0.83 cfs @ 12.12 hrs, Volume= 0.055 af
Outflow = 0.83 cfs @ 12.13 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.83 cfs @ 12.13 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 256.51' @ 12.13 hrs Surf.Area= 5,659 sf Storage= 17 cf

Plug-Flow detention time= 0.3 min calculated for 0.055 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (802.9 - 802.5)

Volume	Invert	Avail.Storage	Storage Description
#1	256.50'	2,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 5,659 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
256.50	5,659	0	0
257.50	5,659	5,659	5,659

Device	Routing	Invert	Outlet Devices
#1	Discarded	256.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.08 cfs @ 12.13 hrs HW=256.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.08 cfs)

Summary for Pond 3P: Porous Pavement - Reservoir Course

Inflow Area = 0.202 ac,100.00% Impervious, Inflow Depth = 5.36" for 25-Year event
Inflow = 1.21 cfs @ 12.12 hrs, Volume= 0.090 af
Outflow = 1.20 cfs @ 12.13 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.3 min
Discarded = 1.20 cfs @ 12.13 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 257.01' @ 12.13 hrs Surf.Area= 8,795 sf Storage= 25 cf

Plug-Flow detention time= 0.3 min calculated for 0.090 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (746.8 - 746.5)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	3,518 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 8,795 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	8,795	0	0
258.00	8,795	8,795	8,795

Device	Routing	Invert	Outlet Devices
#1	Discarded	257.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 12.13 hrs HW=257.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.68 cfs)

Summary for Pond 4P: Infiltration Pond

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth = 0.34" for 25-Year event
Inflow = 0.02 cfs @ 12.34 hrs, Volume= 0.008 af
Outflow = 0.02 cfs @ 12.35 hrs, Volume= 0.008 af, Atten= 2%, Lag= 1.1 min
Discarded = 0.02 cfs @ 12.35 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 255.00' @ 12.35 hrs Surf.Area= 924 sf Storage= 2 cf

Plug-Flow detention time= 1.7 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (999.5 - 997.8)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	3,693 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	922	0	0
256.00	1,782	1,352	1,352
257.00	2,900	2,341	3,693

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 12.35 hrs HW=255.00' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.18 cfs)

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: Roofs and Loading Runoff Area=216,048 sf 79.77% Impervious Runoff Depth=5.04"
Tc=5.0 min CN=86 Runoff=31.37 cfs 2.083 af

Subcatchment PR-1B: Porous Parking Lot - Runoff Area=6,956 sf 81.35% Impervious Runoff Depth=5.15"
Tc=5.0 min CN=87 Runoff=1.03 cfs 0.069 af

Subcatchment PR-1C: Porous Parking Lot Runoff Area=8,795 sf 100.00% Impervious Runoff Depth=6.42"
Tc=5.0 min CN=98 Runoff=1.44 cfs 0.108 af

Subcatchment PR-1D: East Pond - Grassed Runoff Area=12,284 sf 0.00% Impervious Runoff Depth=0.65"
Tc=5.0 min CN=39 Runoff=0.12 cfs 0.015 af

Pond 1P: Infiltration System Peak Elev=251.35' Storage=0.763 af Inflow=31.37 cfs 2.083 af
Outflow=2.37 cfs 2.083 af

Pond 2P: Porous Pavement - Reservoir Course Peak Elev=256.51' Storage=21 cf Inflow=1.03 cfs 0.069 af
Outflow=1.02 cfs 0.069 af

Pond 3P: Porous Pavement - Reservoir Course Peak Elev=257.01' Storage=30 cf Inflow=1.44 cfs 0.108 af
Outflow=1.43 cfs 0.108 af

Pond 4P: Infiltration Pond Peak Elev=255.01' Storage=11 cf Inflow=0.12 cfs 0.015 af
Outflow=0.10 cfs 0.015 af

Total Runoff Area = 5.603 ac Runoff Volume = 2.275 af Average Runoff Depth = 4.87"
23.47% Pervious = 1.315 ac 76.53% Impervious = 4.288 ac

Summary for Subcatchment PR-1A: Roofs and Loading Area

Runoff = 31.37 cfs @ 12.12 hrs, Volume= 2.083 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=6.66"

Area (sf)	CN	Description
43,713	39	>75% Grass cover, Good, HSG A
111,051	98	Roofs, HSG A
61,284	98	Paved parking, HSG A
216,048	86	Weighted Average
43,713		20.23% Pervious Area
172,335		79.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1B: Porous Parking Lot - West

Runoff = 1.03 cfs @ 12.12 hrs, Volume= 0.069 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=6.66"

Area (sf)	CN	Description
5,659	98	Paved parking, HSG A
1,297	39	>75% Grass cover, Good, HSG A
6,956	87	Weighted Average
1,297		18.65% Pervious Area
5,659		81.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1C: Porous Parking Lot - east

Runoff = 1.44 cfs @ 12.12 hrs, Volume= 0.108 af, Depth= 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=6.66"

Area (sf)	CN	Description
8,795	98	Paved parking, HSG A
8,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1D: East Pond - Grassed Area

Runoff = 0.12 cfs @ 12.14 hrs, Volume= 0.015 af, Depth= 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 50-Year Rainfall=6.66"

Area (sf)	CN	Description
12,284	39	>75% Grass cover, Good, HSG A
12,284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Pond 1P: Infiltration System

Inflow Area = 4.960 ac, 79.77% Impervious, Inflow Depth = 5.04" for 50-Year event
Inflow = 31.37 cfs @ 12.12 hrs, Volume= 2.083 af
Outflow = 2.37 cfs @ 11.24 hrs, Volume= 2.083 af, Atten= 92%, Lag= 0.0 min
Discarded = 2.37 cfs @ 11.24 hrs, Volume= 2.083 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 251.35' @ 13.22 hrs Surf.Area= 0.284 ac Storage= 0.763 af

Plug-Flow detention time= 105.2 min calculated for 2.082 af (100% of inflow)
Center-of-Mass det. time= 105.2 min (904.2 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	247.67'	0.386 af	**73.75'W x 168.03'L x 5.75'H Field A** 1.636 af Overall - 0.670 af Embedded = 0.966 af x 40.0% Voids
#2A	248.42'	0.670 af	**Cultec R-902HD** x 450 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 45 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		1.056 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	247.67'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=2.37 cfs @ 11.24 hrs HW=247.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Summary for Pond 2P: Porous Pavement - Reservoir Course

Inflow Area = 0.160 ac, 81.35% Impervious, Inflow Depth = 5.15" for 50-Year event
Inflow = 1.03 cfs @ 12.12 hrs, Volume= 0.069 af
Outflow = 1.02 cfs @ 12.13 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.3 min
Discarded = 1.02 cfs @ 12.13 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 256.51' @ 12.13 hrs Surf.Area= 5,659 sf Storage= 21 cf

Plug-Flow detention time= 0.3 min calculated for 0.069 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (796.1 - 795.8)

Volume	Invert	Avail.Storage	Storage Description
#1	256.50'	2,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 5,659 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
256.50	5,659	0	0
257.50	5,659	5,659	5,659

Device	Routing	Invert	Outlet Devices
#1	Discarded	256.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.08 cfs @ 12.13 hrs HW=256.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.08 cfs)

Summary for Pond 3P: Porous Pavement - Reservoir Course

Inflow Area = 0.202 ac,100.00% Impervious, Inflow Depth = 6.42" for 50-Year event
Inflow = 1.44 cfs @ 12.12 hrs, Volume= 0.108 af
Outflow = 1.43 cfs @ 12.13 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.3 min
Discarded = 1.43 cfs @ 12.13 hrs, Volume= 0.108 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 257.01' @ 12.13 hrs Surf.Area= 8,795 sf Storage= 30 cf

Plug-Flow detention time= 0.3 min calculated for 0.108 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (744.1 - 743.7)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	3,518 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 8,795 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	8,795	0	0
258.00	8,795	8,795	8,795

Device	Routing	Invert	Outlet Devices
#1	Discarded	257.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 12.13 hrs HW=257.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.68 cfs)

Summary for Pond 4P: Infiltration Pond

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth = 0.65" for 50-Year event
Inflow = 0.12 cfs @ 12.14 hrs, Volume= 0.015 af
Outflow = 0.10 cfs @ 12.17 hrs, Volume= 0.015 af, Atten= 13%, Lag= 1.7 min
Discarded = 0.10 cfs @ 12.17 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 255.01' @ 12.17 hrs Surf.Area= 932 sf Storage= 11 cf

Plug-Flow detention time= 1.7 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (959.5 - 957.8)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	3,693 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	922	0	0
256.00	1,782	1,352	1,352
257.00	2,900	2,341	3,693

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 12.17 hrs HW=255.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-1A: Roofs and Loading Runoff Area=216,048 sf 79.77% Impervious Runoff Depth=6.25"
Tc=5.0 min CN=86 Runoff=38.40 cfs 2.585 af

Subcatchment PR-1B: Porous Parking Lot - Runoff Area=6,956 sf 81.35% Impervious Runoff Depth=6.37"
Tc=5.0 min CN=87 Runoff=1.25 cfs 0.085 af

Subcatchment PR-1C: Porous Parking Lot Runoff Area=8,795 sf 100.00% Impervious Runoff Depth=7.68"
Tc=5.0 min CN=98 Runoff=1.71 cfs 0.129 af

Subcatchment PR-1D: East Pond - Grassed Runoff Area=12,284 sf 0.00% Impervious Runoff Depth=1.12"
Tc=5.0 min CN=39 Runoff=0.31 cfs 0.026 af

Pond 1P: Infiltration System Peak Elev=253.25' Storage=1.037 af Inflow=38.40 cfs 2.585 af
Outflow=2.37 cfs 2.585 af

Pond 2P: Porous Pavement - Reservoir Course Peak Elev=256.52' Storage=51 cf Inflow=1.25 cfs 0.085 af
Outflow=1.08 cfs 0.085 af

Pond 3P: Porous Pavement - Reservoir Course Peak Elev=257.01' Storage=36 cf Inflow=1.71 cfs 0.129 af
Outflow=1.68 cfs 0.129 af

Pond 4P: Infiltration Pond Peak Elev=255.05' Storage=48 cf Inflow=0.31 cfs 0.026 af
Outflow=0.18 cfs 0.026 af

Total Runoff Area = 5.603 ac Runoff Volume = 2.825 af Average Runoff Depth = 6.05"
23.47% Pervious = 1.315 ac 76.53% Impervious = 4.288 ac

Summary for Subcatchment PR-1A: Roofs and Loading Area

Runoff = 38.40 cfs @ 12.12 hrs, Volume= 2.585 af, Depth= 6.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
43,713	39	>75% Grass cover, Good, HSG A
111,051	98	Roofs, HSG A
61,284	98	Paved parking, HSG A
216,048	86	Weighted Average
43,713		20.23% Pervious Area
172,335		79.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1B: Porous Parking Lot - West

Runoff = 1.25 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 6.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
5,659	98	Paved parking, HSG A
1,297	39	>75% Grass cover, Good, HSG A
6,956	87	Weighted Average
1,297		18.65% Pervious Area
5,659		81.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1C: Porous Parking Lot - east

Runoff = 1.71 cfs @ 12.12 hrs, Volume= 0.129 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
8,795	98	Paved parking, HSG A
8,795		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Subcatchment PR-1D: East Pond - Grassed Area

Runoff = 0.31 cfs @ 12.14 hrs, Volume= 0.026 af, Depth= 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
NRCC 24-hr C 100-Year Rainfall=7.92"

Area (sf)	CN	Description
12,284	39	>75% Grass cover, Good, HSG A
12,284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Tc (min)**

Summary for Pond 1P: Infiltration System

Inflow Area = 4.960 ac, 79.77% Impervious, Inflow Depth = 6.25" for 100-Year event
Inflow = 38.40 cfs @ 12.12 hrs, Volume= 2.585 af
Outflow = 2.37 cfs @ 11.03 hrs, Volume= 2.585 af, Atten= 94%, Lag= 0.0 min
Discarded = 2.37 cfs @ 11.03 hrs, Volume= 2.585 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 253.25' @ 13.46 hrs Surf.Area= 0.284 ac Storage= 1.037 af

Plug-Flow detention time= 151.4 min calculated for 2.584 af (100% of inflow)
Center-of-Mass det. time= 151.3 min (943.8 - 792.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	247.67'	0.386 af	**73.75'W x 168.03'L x 5.75'H Field A** 1.636 af Overall - 0.670 af Embedded = 0.966 af x 40.0% Voids
#2A	248.42'	0.670 af	**Cultec R-902HD** x 450 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 45 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		1.056 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	247.67'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=2.37 cfs @ 11.03 hrs HW=247.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 2.37 cfs)

Summary for Pond 2P: Porous Pavement - Reservoir Course

Inflow Area = 0.160 ac, 81.35% Impervious, Inflow Depth = 6.37" for 100-Year event
Inflow = 1.25 cfs @ 12.12 hrs, Volume= 0.085 af
Outflow = 1.08 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 13%, Lag= 0.0 min
Discarded = 1.08 cfs @ 12.09 hrs, Volume= 0.085 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 256.52' @ 12.15 hrs Surf.Area= 5,659 sf Storage= 51 cf

Plug-Flow detention time= 0.4 min calculated for 0.085 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (789.8 - 789.4)

Volume	Invert	Avail.Storage	Storage Description
#1	256.50'	2,264 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 5,659 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
256.50	5,659	0	0
257.50	5,659	5,659	5,659

Device	Routing	Invert	Outlet Devices
#1	Discarded	256.50'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.08 cfs @ 12.09 hrs HW=256.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.08 cfs)

Summary for Pond 3P: Porous Pavement - Reservoir Course

Inflow Area = 0.202 ac,100.00% Impervious, Inflow Depth = 7.68" for 100-Year event
Inflow = 1.71 cfs @ 12.12 hrs, Volume= 0.129 af
Outflow = 1.68 cfs @ 12.12 hrs, Volume= 0.129 af, Atten= 2%, Lag= 0.0 min
Discarded = 1.68 cfs @ 12.12 hrs, Volume= 0.129 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 257.01' @ 12.13 hrs Surf.Area= 8,795 sf Storage= 36 cf

Plug-Flow detention time= 0.3 min calculated for 0.129 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (741.6 - 741.3)

Volume	Invert	Avail.Storage	Storage Description
#1	257.00'	3,518 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 8,795 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
257.00	8,795	0	0
258.00	8,795	8,795	8,795

Device	Routing	Invert	Outlet Devices
#1	Discarded	257.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.68 cfs @ 12.12 hrs HW=257.01' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.68 cfs)

Summary for Pond 4P: Infiltration Pond

Inflow Area = 0.282 ac, 0.00% Impervious, Inflow Depth = 1.12" for 100-Year event
Inflow = 0.31 cfs @ 12.14 hrs, Volume= 0.026 af
Outflow = 0.18 cfs @ 12.21 hrs, Volume= 0.026 af, Atten= 40%, Lag= 4.4 min
Discarded = 0.18 cfs @ 12.21 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Peak Elev= 255.05' @ 12.21 hrs Surf.Area= 966 sf Storage= 48 cf

Plug-Flow detention time= 2.0 min calculated for 0.026 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (931.9 - 929.9)

Volume	Invert	Avail.Storage	Storage Description
#1	255.00'	3,693 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
255.00	922	0	0
256.00	1,782	1,352	1,352
257.00	2,900	2,341	3,693

Device	Routing	Invert	Outlet Devices
#1	Discarded	255.00'	**8.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 12.21 hrs HW=255.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.18 cfs)

DEP STORMWATER CHECKLIST/ ILLICIT DISCHARGE STATEMENT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

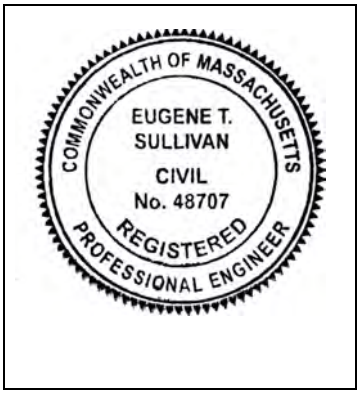
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Grant T. Sullivan P.E. 6/29/2022

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

ILLICIT DISCHARGE COMPLIANCE STATEMENT

SITE ADDRESS: 31 INDEPENDENCE DRIVE, DEVENS, MASSACHUSETTS

OWNER: 31 INDEPENDENCE DRIVE, LLC

PLAN REFERENCE: DRAINAGE & UTILITIES PLAN PREPARED BY EUGENE T. SULLIVAN, INC.

DATE: JUNE 29, 2022

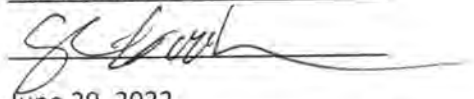
As required by Standard 10 of the Massachusetts Stormwater Standards, I, the undersigned, being the authorized owner/responsible party of the above referenced property do hereby certify that no illicit discharges exist on the site and that the stormwater management system, as shown on the above referenced plan, does not contain or permit any illicit discharges to enter the stormwater management system. Furthermore discharges from interior building drains or plumbing within the buildings are prohibited. Illicit discharges do not include discharges from the following activities or facilities: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

The pollution prevention plan measures to implements in this project to prevent illicit discharges to the stormwater management system, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease, include:

1. Identifying the responsible personnel for the implementation of an effective Illicit Discharge Detection and Elimination [IDDE] program.
2. Identify potential sources of Illicit Discharges.
3. Implement the Spill Prevention and Control Plan contained in the property Stormwater Pollution Prevention Plan [SWPPP].

Further, I certify that the stormwater management system ass shown on the referenced plan will be maintained in accordance with the conditions of the Long Term Pollution Prevention Plan.

NAME: Steve Goodman

SIGNED: 

DATE: June 29, 2022

TSS REMOVAL / RECHARGE CALCS

Project: 31 Independence Drive
Location: Devens, MA
Prepared For: Eugene T Sullivan Inc.

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
WQS	1.42	0.0022234	6.0	0.100	1.00	774.00	1.72

The WQf sizing calculation selects the minimum size CDS/Cascade/StormCeptor model capable of operating at the computed WQf peak flowrate prior to bypassing. It assumes free discharge of the WQf through the unit and ignores the routing effect of any upstream storm drain piping. As with all hydrodynamic separators, there will be some impact to the Hydraulic Gradient of the corresponding drainage system, and evaluation of this impact should be considered in the design.

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

CONTECH ENGINEERED SOLUTIONS

CASCADE separator™

31 INDEPENDENCE DRIVE

DEVENS

SITE DESIGNATION - WQS

AREA	1.42	acres	**CASCADE MODEL**	CS-4	
WEIGHTED C	0.90		**PARTICLE SIZE**	110	microns
TC	6.00	minutes	**RAINFALL STATION**	69	

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Hydraulic Loading Rate (gpm/ft2)	Removal Efficiency (%)	Incremental Removal (%)
0.02	10.2%	0.91	100.0	10.2
0.04	9.6%	1.83	100.0	9.6
0.06	9.4%	2.74	100.0	9.4
0.08	7.7%	3.65	100.0	7.7
0.10	8.6%	4.56	100.0	8.6
0.12	6.3%	5.48	100.0	6.3
0.14	4.7%	6.39	100.0	4.7
0.16	4.6%	7.30	100.0	4.6
0.18	3.5%	8.22	100.0	3.5
0.20	4.3%	9.13	100.0	4.3
0.25	8.0%	11.41	100.0	8.0
0.30	5.6%	13.69	99.0	5.5
0.35	4.4%	15.98	96.9	4.2
0.40	2.5%	18.26	94.7	2.4
0.45	2.5%	20.54	92.6	2.3
0.50	1.4%	22.82	90.4	1.2
0.75	5.0%	34.23	79.7	4.0
1.00	1.0%	45.65	69.0	0.7
1.50	0.0%	68.47	47.5	0.0
2.00	0.0%	76.08	33.7	0.0
3.00	0.5%	76.08	22.4	0.1
				97.6
			Removal Efficiency Adjustment[2] =	6.5%
			Predicted % Annual Rainfall Treated =	93.3%
			Predicted Net Annual Load Removal Efficiency =	**91.2%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

TSS REMOVAL CALCULATION WORKSHEET					
PROJECT:	***PROPOSED BUILDING***				
	31 INDEPENDENCE DRIVE				
	DEVENS, MASSACHUSETTS				
LOCATION:	***Pavement Runoff to Recharge Chambers***				
BMP	***TSS REMOVAL RATE***	***STARTING TSS LOAD***	***AMOUNT REMOVED***	***REMAINING LOAD***	
DEEP SUMP CATCH BASIN	***$ 0.25***	***$ 1.00***	$ 0.25	$ 0.75	
CDS 2014-5 WATER QUALITY STRUCTURE [WC-1]	***$ 0.65***	***$ 0.75***	$ 0.49	$ 0.26	
INFILTRATION CHAMBERS	***$ 0.70***	***$ 0.26***	$ 0.18	$ 0.08	
TOTAL TSS REMOVAL	***$ 0.92***				

STORMWATER CALCULATIONS

Proposed Warehouse
31 Independence Drive
Devens, Massachusetts

See attached Stage/Storage calculations for volumes provided.

Required Recharge Volume

Total Proposed Impervious Area = 172,335 SF ± ("A" Soils)

Infiltration Standard for "A" Soils = 0.60 inches of runoff

Required Recharge Volume = Impervious Area x Infiltration Standard

Required Volume to Recharge = 172,335 SF x (0.60 IN x 1 FT/12 IN) »» **8,617 CF**

Volume Provided in Infiltration Chambers

Storage volume provided per Cultec infiltration system = 45,999 CF ±

Storage volume provided per infiltration pond = 3,693 CF ±

Total storage volume provided = 45,999 + 3,693 = 49,692 CF±

49,692 CF > 7,148 CF (satisfies the infiltration standard)

SOILS DATA

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

National Ind. Portfolio Borrower, LLC
Owner Name

31 Independence Drive
Street Address

26-13-1800
Map/Lot #

Devens
City

MA
State

01434
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS WEB SOIL SURVEY 653 Soil Map Unit

Udorthents, sandy
Soil Name

Excessively drained
Soil Limitations

N/A
Soil Parent material

Outwash plain
Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: MassGIS Oliver
Year Published/Source

Sand and Gravel
Map Unit

Sand and Gravel
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer:
Wetland Type

7. Current Water Resource Conditions (USGS): 5/5/21
Month/Day/ Year
Range: ☒ Above Normal ☐ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-1 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded portion of rear of parcel

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-32	Fill	SL									
32-38	Ab	FSL	10YR 3/2						M	F	
38-46	Bw	LS	10YR 6/8						M	F	
46-125	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-2 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded portion of rear of parcel

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	A	FSL	10YR 3/2						Gr.	F	
12-28	Bw	LS	10YR 6/8						M	F	
28-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-3 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded portion of rear of parcel

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-32	Fill	SL									
32-36	Ab	FSL	10YR 3/2						M	F	
36-44	Bw	LS	10YR 6/8						M	F	
44-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-4 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded portion of rear of parcel

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-28	Fill	SL									
28-34	Ab	FSL	10YR 3/2						M	F	
34-42	Bw	LS	10YR 6/8						M	F	
42-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-5 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Slightly more open area along easterly portion of property

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-18	A	FSL	10YR 3/2						Gr.	F	
18-30	Bw	LS	10YR 6/8						M	F	
30-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-6 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded section along Independence Drive

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-20	Fill	SL									
20-26	Ab	FSL	10YR 3/2						M	F	
26-34	Bw	LS	10YR 6/8						M	F	
34-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-7 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded section along Independence Drive

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	FSL	10YR 3/2						Gr.	F	
10-26	Bw	LS	10YR 6/8						M	F	
26-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-8 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded section along Independence Drive

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-16	A	FSL	10YR 3/2						Gr.	F	
16-30	Bw	LS	10YR 6/8						M	F	
30-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: TP-9 (Hole #) | 5/5/21 (Date) | (Time) | Sun, 65 (Weather) | 42.547130 (Latitude) | -71.601110 (Longitude:)

1. Land Use: Commercial/industrial – currently vacant (e.g., woodland, agricultural field, vacant lot, etc.) | Shrubs/Trees (Vegetation) | None (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-3% (Slope (%))

Description of Location: Wooded section along Independence Drive – along semi-open internal path

2. Soil Parent Material: N/A - Sandy | Outwash plain (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body 100+ feet | Drainage Way 100+ feet | Wetlands 100+ feet | Property Line 10+ feet | Drinking Water Well 100+ feet | Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: __ Depth Weeping from Pit __ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	FSL	10YR 3/2						Gr.	F	
10-26	Bw	LS	10YR 6/8						M	F	
26-120	C	Md. Sand	10YR 4/6						Sg.	Loose	

Additional Notes:
No ESHGW observed – slightly more gravely

Commonwealth of Massachusetts
City/Town of Devens

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Thorsen Akerley
Signature of Soil Evaluator

5/12/2021
Date

Thorsen Akerley / #14016
Typed or Printed Name of Soil Evaluator / License #

6/30/2022
Expiration Date of License

Name of Approving Authority Witness

Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

LONG TERM POLLUTION PREVENTION PLAN AND OPERATION / MAINTENANCE PLAN

LONG TERM POLLUTION PREVENTION PLAN

31 INDEPENDENCE DRIVE

Devens, Massachusetts

JUNE 29, 2022

Prepared by:

Eugene T. Sullivan, Inc.

230 Lowell Street, Suite 2A

Wilmington, MA 01887

[978] 657.646

Contact Information/ Responsable Parties

Operator(s) / Emergency Contact:

31 Independence Drive, LLC
133 Pearl Street
Boston, MA 02110
Attention: Will Deshler
Phone: 617.292.0101
Email: wdeshler@gfipartners.com

OPERATION & MAINTENANCE

MANUAL

FOR THE STORM

DRAINAGE FACILITIES

LOCATED AT:

31 INDEPENDENCE DRIVE

Devens, Massachusetts

JUNE 29, 2022

Prepared By:

Eugene T. Sullivan, Inc.
Consulting Engineers
230 Lowell Street – Suite 2A
Wilmington, Massachusetts
978.657.6469

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1.0 INTRODUCTION

The Site Stormwater management system for the new parking area have been designed to capture solids. Proper maintenance is essential to the continued effectiveness of the storm drainage facilities.

The drainage facility components include deep sump catch basin, water quality structure, and a Subsurface Infiltration Basin. The drainage facility is designed to limit peak runoff to below the predevelopment conditions, reduce solids load to the outfall and recharge groundwater.

An estimated annual budget of $ 15,000 should be allocated by the site operator for the maintenance and proper operation of the stormwater system.

The following outline contains the procedures and frequency of tasks necessary to manage the system and avoid costly premature component failure. Refer to the labeled project site plan to assist in locating all drainage structures.

2.0 INITIAL NEW SYSTEM INSPECTION

The new system must be initially inspected within the first two months.

2.1 Deep Sump Catch Basin

The drainage system includes new catch basin. All catch basins shall be inspected initially after a major rainfall event for the first couple of months. Initial inspection is intended to observe proper stabilization of the catch basin foundation. There after the catch basins shall be inspected regularly as outlined in Section 3.1.

2.2 CONTECH Water Quality Structure

The drainage system includes a Contechs Water Quality CDS Unit. The unit should be inspected after any major rainfall events for the first couple of months. Initial Inspection is intended to observe proper stabilization of the tank's foundation. There after the tanks should be inspected regularly as outlined in Section 3.2.

2.3 Porous Pavement

Visual inspections are an integral part of system maintenance, this includes monitoring pavement to ensure water drainage, debris accumulation and surface deterioration.

- Check for standing water on the surface of the pavement after a precipitation event. If standing water remains on the pavement 30 minutes after the rainfall has ended, cleaning of the porous pavement is recommended.
- Controlling run-on and debris tracking is key to extending the life of the porous surface. Erosion and sedimentation control of adjacent areas is critical.
- Do not store materials such as sand/salt, and other stockpiles on the porous surfaces.
- Stockpiling snow on porous surfaces is not recommended and will lead to premature clogging.

2.4 Permeable Pavers

Periodic Visual inspections are an integral part of system maintenance, this includes monitoring pavement to ensure water drainage, debris accumulation and surface deterioration. The visual inspections determine that the stormwater is infiltrating into the system. Areas that have pooled standing water on the surface need to be addressed as a remedial repair as opposed to maintenance

- Controlling run-on and debris tracking is key to extending the life of the porous surface. Erosion and sedimentation control of adjacent areas is critical.
- Do not store materials such as sand/salt, and other stockpiles on the porous surfaces.
- Stockpiling snow on porous surfaces is not recommended and will lead to premature clogging.

2.5 Cultec Recharge Chambers

The drainage system includes new Cultec recharge chambers. The chambers operate at peak performance when installed in series with pretreatment. Without proper pretreatment, the effectiveness of the chambers will be severely compromised. The chamber rows will be equipped with 6" diameter access ports located on the piping. These access ports will allow access to the piping rows below to measure sediment.

3.0 REGULAR INSPECTION AND MAINTENANCE OF STRUCTURES

3.1 Deep Sump Catch Basins

The actual removal of sediments, associated pollutants and trash occurs only when sumps are cleaned out; therefore, regular maintenance is required. Most studies have linked the failure of deep sumps to lack of regular maintenance. The more frequent the cleaning, the less likely sediments will be re-suspended and subsequently discharged or carried over.

Inspection
Inspect for sediment accumulation every month.

Maintenance:

Deep sumps shall be cleaned at least four times a year and at the end of the foliage and snow removal seasons or whenever the depth of the sediments is greater than or equal to ½ the depth from the bottom of the Invert of the lowest pipe in the basin. *See sediment disposal section*.

3.2 CONTECH Water Quality CDS Unit

Inspection of the CDS Unit is essential to effective maintenance to ensure optimum performance.

Inspection:

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 accumulations of hydrocarbons, trash, and sediment in the system.
Inspect for sediment accumulation.
Inspect for cracking on the walls.
Inspect for sediment accumulation around the outlet.
Inspect for oil and grease accumulation after every major storm event but at least every month.

Cleaning:
Access to the CDS Units is typically achieved through manhole access covers. This allows for the inspection and cleanout of the separation chamber [cylinder and screen] and isolated sump. Also inspect and cleanout the sediment captured and retained outside the screen.

The CDS system should be cleaned when the level of the sediment has reached 75% of the capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated.

Cleaning of the CDS system should be done during dry weather conditions when no flow is entering the system. Cleanout of the CDS system with a vacuum truck is the most effective method of removing pollutants from the separator. Cleaning of the CDS system is typically done by inserting a vacuum hose into the sump and evacuating the sump of water and pollutants. The area outside the screen should also be cleaned out. In installations were the risk of petroleum spills is small, liquid containments may not accumulate as quickly as sediments. However, the system should be cleaned out immediately in the event of an oil or gasoline spill.

Maintenance:

The Separator unit shall be cleaned as necessary or as required by inspection. At minimum the separator tanks should be cleaned at least two times a year, (fall and spring). *See sediment disposal section*.

3.3 Porous Pavement

Regular inspection and maintenance are critical to the effective operation of porous pavement.

Maintenance:

Pavement vacuuming should occur in the spring and fall at a minimum.
A vacuum sweeper shall be used to remove sediment and organic debris on the pavement surface. The sweeper may be fitted with water jets.
Power washing can be an effective tool for cleaning clogged areas. This should occur at mid=pressure typically less than 500 psi and at angle of 30 degrees or less.
For loose debris accumulating on the pavement, a power/leaf blower or gutter broom can be used.

3.4 Permeable Pavers

Regular inspection and maintenance are critical to the effective operation of the permeable pavers. The pavers will require standard BMP practices for pavements surfaces regarding sweeping procedures.

Normal Maintenance:

For loose debris accumulating on the pavement, a power/leaf blower or gutter broom can be used. A dry vacuum type sweeper vacuuming should occur in the spring and fall at a minimum. Additional void materials may be swept into joints and voids if necessary.

Remedial Maintenance:

A vacuum sweeper with water jets, sweeper, and vacuum bar attachment will evacuate clogged void materials from joint and void openings. Joint and void materials shall then be replaced by sweeping until the voids are full.

3.5 ***Cultec Recharge Chambers***

The chamber rows will be equipped with a 6" pipe to the chamber rows below. The pipe will be capped with an at grade circular cast box placed in a rectangular concrete collar. From the surface thru the access ports sediment may be measured using a stadia rod. If the depth of the sediment is greater than 3", then the row shall be cleaned with high pressure water and back-flushed out thru an upstream manhole. The sediment and water are then removed from the manhole using a vacuum truck.

Maintenance:

Monthly in the first year:	Check inlets and outlets for clogging and remove any debris as required:
Spring and Fall:	Check inlets and outlets for clogging and remove any debris as required:

The Inspection and Cleaning of all deep sump catch basins, water quality units and recharge chambers shall be performed in April and October of each year. A report detailing the inspections and cleaning of the structures is to be submitted to the Public Works Department after each cleaning and shall be prepared by an appropriate Professional.

4.0 PAVED AREA AND PARKING LOT SWEEPING

An effective measure to the removal of total suspended solids is through frequent sweeping. Based on data collected throughout the country, effective regular sweeping can reduce the total suspended solids by 50% to 80%. Infrequent sweepings have shown that the removal efficiencies are 20% of the total suspended solids. Vacuum type sweepers have demonstrated higher efficiencies.

Maintenance

Sweeping shall occur a minimum of 4 times per year [each quarter] and additionally as necessary to control yard sediments from entering the drainage systems.

5.0 SEDIMENT DISPOSAL

All sediments, grease and hydrocarbons are considered hazardous waste and therefore should be handled properly and disposed of in accordance with applicable local, state, and federal laws and regulations.

6.0 SPILL KITS

A Spill Kit, absorbent pads and/or socks shall always be provided onsite to prevent any spills from entering the stormwater collection system.

THE MAINTENANCE OF THE STORM DRAINAGE SYSTEMS IS THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY.

POLLUTION PREVENTION PLAN
FOR
31 INDEPENDENCE DRIVE
Devens, Massachusetts

PROPERTY OWNER:

31 INDEPENDENCE DRIVE, LLC
133 PEARL STREET
BOSTON, MASSACHUSETTS 02110
617.292.0101

PREPARED BY:
EUGENE T. SULLIVAN INC.
230 Lowell Street
Wilmington, Massachusetts

DATE:
JUNE 29, 2022

LANDSCAPE MAINTENANCE AND WATER MANAGEMENT PLAN

Spring and Fall Clean-up:

A general clean-up in the spring shall include the removal of all leaves, branches, twigs and debris from all lawn areas, tree, and shrub beds and from individual tree beds. Also included is de-thatching of all lawn areas and cutting of the grass. The work shall take place between April 15 and May 15. An annual Fall clean up should include the removal of leaves, tree branches, debris and refuse due to deciduous cycles and other conditions. The work shall take place between mid-October to mid-November after the leaves have fallen and before the first snowfall of the season. All debris shall be removed from the site and disposed of legally.

Blanket applications of pesticides are prohibited. Targeted treatment of pesticides is permitted only by a licensed applicator.

Manual Weed Control:

During establishment, weed growth shall be manually or chemically removed, including grass from tree and shrub beds and from individual tree beds. Woody growth, vines, and other undesirable plants shall be removed and legally disposed of. Weed control activities shall be performed in such a manner so as not to disturb or destroy plant material or mulched areas.
Chemical weed control of seeded areas and plant beds shall be by pre- and post-emergent herbicides in the spring and fall according to manufacturer's instructions.

Watering of Plants and Seeded Areas:

Use of manual watering should be by rain harvesting whenever possible to reduce use of potable water irrigation. Generally, plantings and seeding selections for the NE Resource Recovery are specified for low maintenance and easy establishment. It is anticipated that beyond initial establishment, watering will not need to be done on a regular basis, but only in extremely dry conditions.
All new plantings shall be watered by soaking the plants thoroughly at the time of installation and again within a twenty-four (24) hour period after the initial planting. Additional watering shall be made at least once every three weeks, unless otherwise directed, until final acceptance of the plant material.
At the time of seeding, water all areas within 72 hours of seeding operation water grass to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is the equivalent of one (1") of absorbed water per week that is delivered at weekly intervals in the form of natural rain or is augmented by periodic watering.

Irrigation system subject to approval by the Devens Enterprise Commission and shall comply with the installation requirements in 974 CMR 8.09 (11) including being equipped with soil moisture sensor devices and backflow prevention.

Soil Testing:

Soil should be tested once a year by a Mass. Soil testing agency. Soils should be tested for organic content, soil ph and nitrogen, phosphorous and potassium levels. A sieve analysis shall also be performed. Tests results shall be provided along with recommended fertilization and treatment schedule.

Blanket applications of pesticides are prohibited. Targeted treatment of pesticides is permitted only by a licensed applicator.

Infiltration Basins:

Trash and debris should be removed periodically keeping outlet structures and headwalls clear. Prune and maintain vegetation and grasses within these areas a minimum of two times between May and September. Weed growth should be monitored and removed monthly until establishment of specified plant material. The filter media soil should be replaced every 4 years or when it becomes clogged and infiltration has slowed. An indication of clogged filter media is ponded water longer than 72-hours after rainfall. Vegetated swales should be inspected for sediment build-up and erosion and should be corrected in a timely manner.

Fertilization:

The seeded areas should be inspected visually at the time of each scheduled mowing to determine if the turf has developed insect or disease problems. Over-seeding and other industry standard treatments should be done on an as-needed basis. Plantings should be inspected for healthy growth seasonally. When fertilizers are necessary, coated time-release fertilizers are the preferred method.

Blanket applications of pesticides are prohibited. Targeted treatment of pesticides is permitted only by a licensed applicator. Fertilizers, Herbicides, and pesticides are not to be stored onsite.

Mulching:

Mulching shall be performed between April 15 and May 30. All shrub and tree beds and individual trees previously mulched shall be mulched with one inch (1") of fine-shredded pine bark mulch. Immediately before the installation of mulch, all areas shall receive an application of pre-emergent herbicide applied at the manufacturer's recommended rates.

Grass Mowing:

All lawn areas shall be cut at least once every seven (7) days from May 1 thru October 31 to maintain a height of two inches (2”). The mowing frequency may be increased or decreased depending on the growth rate of the grass. The mowing operation shall result in a stand of evenly mowed grass two inches (2") tall. As a rule, the grass should be cut so that only one third (1/3) of its total length is removed during cutting operations. To maintain a height of two inches (2"), the grass shall be cut when it reaches a height of three inches (3").
Neat trimming shall be performed around all poles, curbs, posts, signs, mulched areas, and other structures falling within the lawn areas. Trimming shall be conducted simultaneously with the mowing operation. All sidewalks, mulch areas, and road surfaces shall be left free of all grass clippings. Extreme care shall be taken to prevent trimming damage of any kind to trees and shrubs.

INVASIVE SPECIES CONTROL:

Invasive species are plants that are non-native to the surrounding ecosystem and whose introduction causes or is likely to cause harm.

Inventory/Survey and Mapping:

- Review the Invasive Plant Atlas of New England to become familiar with invasive and potentially invasive plants. This will assist in the early detection and rapid response to invasions.
- Assess the status of invasive plant populations [i.e. location, distribution, abundance]
- Identify areas free of invasive plants
- Detect new invasive plant species/populations

Risk Assessment:

- Assess the relative risk of invasive plant species/populations [i.e. prioritizing and ranking] and control methods

Management Methods:

- Select appropriate methods [physical, chemical, biocontrol, prescribed burning, prescribed grazing] for eradication, suppression, containment, or restoration

Monitoring:

- Assess trends of invasive species populations to determine the effectiveness of management methods or species invasiveness
- Detect new invasive plant species/populations

INSECTS AND DISEASE CONTROL:

Periodic inspection of all plants by trained personnel is necessary to detect problems during early stages of insect or disease infestation. A good faith and reasonable effort shall be made in a timely manner to control any infestation or disease. Application of all chemicals including insecticides and fungicides shall be carried out in accordance with State laws and only by individuals with current State Pesticide Applicators License. All insecticides and fungicides shall be approved of by the Owner prior to application.

Refer to the Integrated Pest Management tools listed on the Landscape Nursery and Urban Forestry website http://www.umassgreenifo.org

RODENT CONTROL:

The primary pests found in institutional sites are insects and rodents. Good sanitation and cleanliness are the keys to control and management of pests and rodents in institutional sites. Prevention is an essential management practice that includes sanitation and exclusion. Pests and rodents must have food, water, and shelter to survive. Remove these and pest problems will be significantly reduced.

Food:

Clean food preparation areas and other site problem areas frequently. Thorough cleaning under and behind equipment, shelving and appliances may be necessary to remove all food sources. Remove trash regularly and use trash can liners. Keep the areas around dumpsters clean. Store food in rodent proof and insect proof containers.

Water:

Pests find water in numerous places. Wring out and hang wet mops to dry. Clogged rain gutters and leaking faucets are also important water sources for rodents. Clean floor drains routinely as they are sources of both food and water.

Shelter:

Restrict rodents' access to shelter and food by sealing the entry points. Install door sweeps and window screens. Seal cracks and crevices with screens, silicone, or other sealant materials. Eliminate clutter and keep stored products on shelving off the floor.

Routine Monitoring is an important part of managing pests and rodents. Monitoring not only includes surveying for pests and rodents but also observing conditions that are favorable for them, including unsanitary conditions, entry sites, and shelter locations. When conditions favoring pests and rodents are found, they should be corrected as soon as possible. When monitoring, look for pests and evidence of pests, such as fecal material, shed skins, tracks and grease marks left by rodents. Routine monitoring will indicate if pests and rodents are present and help to evaluate whether the management strategies are successful.
Pesticides and Rodenticides may be applied as intended by certified applicators and should be used in combination with preventative measures, including exclusion and sanitation.

MATERIALS STORAGE:

All storage of materials and waste products is to be within the building. However, if outdoor storge is required the following procedures must be followed:

- Storage of materials must be enclosed or covered to prevent exposure to precipitation
- Absorbent materials shall be stored within the building and the spill prevention procedures outlined below must be followed to prevent materials from entering the stormwater management systems.

Vehicle maintenance and washing is strictly prohibited on this property.

SPILL PREVENTION AND CONTROL PLAN

Contractor awareness is the key to an effective spill prevention and response program. Anticipated spills for this project would be a result of oil or gas leaks. These spills should be brought to the attention of the project manager immediately. The project manager should have an adequate supply of absorbent compounds, rags etc. readily available at all time. The project manager will be trained to handle small spill events using the following procedures:

Stop the spill at the source.
Contain the spilled materials.
Collect the spilled materials as necessary using absorbent compounds, rags etc.
Dispose of the materials properly.

If the spill occurs near a storm drain structure, absorbent pads and/or socks shall be placed around the drains to prevent the spill from entering the collection system.

Spills should not be washed down with water unless the water can be contained and disposed of properly.

If a significant spill event occurs and cannot be handled by the project manager, contact the Fire Department or Local Environmental Emergency Response Team as required.

SNOW MANAGEMENT PLAN:

SNOW REMOVAL PROCEDURE:

Reduced salt zones have been established primarily for the purpose of reducing sodium levels. This is accomplished by substituting or reducing the amount of sodium-based deicer (i.e. granular road salt. For this property, the parking and driveway areas will be treated using “Ice B’Gone”. Ice B’Gone “IBG” is a highly effective liquid deicing agent made from a blend of magnesium chloride combined with an agricultural byproduct of the distilling process [i.e. grain and/or sugar based]. IBG allows for lower salt applications rates and has less impact on the environment [i.e. wells, plantings, vegetation etc.]
BG treated salt is a highly effective solid granular deicer. IBG treated salt starts out as ordinary rock salt which is treated with the liquid IBG transforming the rock salt into a new deicing material. This product reduces the levels of sodium and chloride ion exposure, eliminates the need for sand, provides lower working temperatures, provides better adherence to roadways resulting in a 30-40% salt reduction when compared to dry salt.

1. When Roads become icy, treatment will begin

2. When the depth of snow on the roadways is approximately two inches plowing shall begin

3. When snow in the parking lots is between two and four inches, parking lot plowing will begin. It should be noted that it is virtually impossible to clear parking spaces in the parking lots when cars are parked there. Snowstorms which happen during a workday are handled by keeping parking lot entrances and aisles open. The parking spaces areas for vehicles are cleared overnight after the cars have vacated.

4. During an especially concentrated storm, it may be necessary to continually return to plowing the roadways and aisles lanes of the parking lot. Areas on the lower end of the priority list may have to wait until the storm subsides to be cleared.

NOTE: Storage of deicing materials must be done in a contained area protected from the elements and stormwater runoff. Ensure spreading equipment is properly calibrated. No snow storage is allowed in Zone 2 areas from areas outside of Zone 2 areas.

PRIORITIES FOR SNOWPLOWING:

1. Roadways, parking aisles and ADA spaces and access

2. Parking Lot Spaces

3. Walkways [not ADA access routes]

SNOW STORAGE:

1. Snow is to be plowed to and stored in the locations indicated on C.2. Snow shall be stockpiled onsite until there is not enough space. As necessary, the snow will be removed and disposed of off-site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according to the Massachusetts DEP, Bureau of Resource Protection- Snow Disposal Guidelines BRP001-01. It is the responsibility of the snow removal contractor to follow these guidelines and all applicable laws and regulations.

2. Under no circumstances shall snow be placed in the Infiltration Basins.

STORMWATER POLLUTION PREVENTION PLAN

STORMWATER POLLUTION PREVENTION PLAN [SWPPP]

31 Independence Drive

Devens, Massachusetts

June 29, 2022

Prepared by:

EUGENE T. SULLIVAN, INC.

230 Lowell Street, Suite 2A

Wilmington, MA 01887

[978] 657.6469

EROSION AND SEDIMENT CONTROLS PLAN:

This report represents the Erosion and Sediment Controls Plan for the proposed Industrial Building at 31 Independence Drive, Devens, Massachusetts.

The purpose of this report is to outline the methods and procedures to provide Erosion and Sediment controls to eliminate any adverse impact thru stormwater runoff or sediment accumulations to the adjacent properties, wetlands, and or roadways.

Erosion Control Notes and a Construction Sequence are identified on drawing C.1. As outlined on drawing EC.1, the following Erosion Controls are to be Installed and Maintained throughout the Construction Project:

- Siltsoxx are to be installed around the perimeter of the Limit of Work.

Additional Erosion Controls Measures and Procedures are contained in the attached Stormwater Pollution Prevention Plan prepared for this project.

INSPECTIONS OF EROSION CONTROLS:

To ensure that ensure that erosion controls are installed and maintained throughout the construction project, the project Civil Engineer, Eugene T. Sullivan, Inc. will conduct onsite inspections of all erosion control measures at least once every fourteen [14] calendar days and within 24 hours of the end of a ½" or greater storm event from the start of construction until the site is permanently stabilized. For each inspection, a site inspection log [contained in Appendix A of the SWPPP] must be completed. The Inspection logs must be maintained and available for review by the Planning Commission or its representatives.

All erosion and sediment controls and other protective measures identified in the SWPPP must be maintained in effective condition. If the Inspections identify measures which need to be maintained or are not functioning effectively, repairs, maintenance or additional erosion control measures must be implemented immediately to correct any deficiencies.

Stormwater Pollution Prevention Plan

for:

31 Independence Drive
Devens, Massachusetts

Operators and Contacts:

31 Independence Drive, LLC
133 Pearl Street
Boston, Massachusetts

Prepared by:

EUGENE T. SULLIVAN, INC.
230 Lowell Street, Suite 2A
Wilmington, Massachusetts

SWPPP Preparation Date:

June 29, 2022

Estimated Project Dates:

Project Start Date: **09 / 01 / 2022**
Project Completion Date: **12 / 31 / 2023**

Contact Information/ Responsible Parties

Operator(s) / Emergency Contact:
31 Independence Drive, LLC
133 Pearl Street
Boston, MA 02110
Attention: Will Deshler
Phone: 617.292.0101
Email: wdeshler@gfipartners.com

This SWPPP was Prepared by:
Eugene T. Sullivan Inc.
Gene Sullivan
230 Lowell Street, Suite 2A
Wilmington, MA 01887
978.657.6469
etspe@outlook.com

SECTION 1: PROJECT DESCRIPTION

1.0 Nature 0f Construction Activity

The proposed project consists of a 111,050 SF Industrial Building and associated parking areas.

What is the function of the construction activity?

Residential Commercial X Industrial ☐ Road Construction ☐ Linear Utility

Other (please specify):

Estimated Project Start Date: 09 / 01 / 2022

Estimated Project Completion Date: 12 / 31 / 2023

1.1 Soils, Slopes, Vegetation, and Current Drainage Patterns

Soil type(s): Sands

Slopes (describe current slopes and note any changes due to grading or fill activities):
The property is relatively flat.

Drainage Patterns: The existing building and paved area runoff sheet flow untreated into a drainage system along the northern property line.

Vegetation: Existing vegetation will remain to the maximum extent possible.

1.2 Site Features and Sensitive Areas to be Protected

Siltsoxx will be installed at the limit of work perimeter. The erosion controls will be maintained throughout construction activities.

1.3 Potential Sources of Pollution

Potential sources of sediment to Stormwater runoff:
Clearing and Grubbing Operations
Topsoil stripping and stockpiling operations.
Grading and Site Excavation Operations
Landscaping Operations
Potential pollutants and sources, other than sediment, to Stormwater runoff:
Ordinary Construction Activities
Concrete washout of trucks.

1.4 Maps

Site Plans and Maps are attached to this SWPPP.

SECTION 2: EROSION AND SEDIMENT CONTROL BMPS

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

After the installation of erosion controls has been completed, Topsoil will be removed from the construction area. The erosion controls shall be inspected weekly and after every significant [greater than ½"] storm event. Any erosion will be addressed and stabilized immediately.

2.2 Stabilize Soils

Temporary Stabilization:

The site topography has very little slope, therefore there should not be much need to stabilize exposed soils temporarily during construction activities. However, if stabilization is required, straw mulch will be applied to eliminate erosion. Disturbed areas will be inspected weekly or after storm events to check for movement or erosion. If erosion occurs, the surface will be repaired, and more mulch will be applied.

Permanent Stabilization:

Permanent stabilization will be done after final design grades have been achieved. All areas disturbed during construction will be loamed and seeded. All seeded areas will be inspected weekly and after during storm events after installation, if failure is noticed, the area will be addressed and reseeded.

Dust Control:

Dust from the site will be controlled using a mobile pressure-type water truck to apply water to disturbed areas as necessary.

2.3 Protect Slopes

If slopes need to be protected, Geotextile Erosion Control Blankets will be used on the slopes.

2.4 Protect Storm Drain Inlets

Catch basin siltsacks will be installed in the existing and new catch basins throughout the construction process until the drainage system is completed. The siltsacks will installed on the top of the structure beneath the catch basin grate to capture any sediments.

2.5 Establish Perimeter Controls and Sediment Barriers

Prior to any disturbances on-site siltsoxx will be installed along the project limit as indicated on the Erosion Controls drawing C.2. These erosion controls will prevent sediment from leaving the site. The siltsoxx will be secured using 2x2 wooden stakes.

2.6 Retain Sediment On-Site

Any sediment which may be created during the construction process will be collected by the erosion controls along the limit of work. The erosion controls will be inspected weekly and after every storm event. Any erosion will be addressed and stabilized immediately. Sediments which may be collected will be removed, hauled, and disposed of off-site as necessary.

2.7 Establish Stabilized Construction Exits

A deep stone mud trap will be constructed at the southern driveway entrance from Dunham Road to prevent the off-site transport of sediment by construction vehicles. The stabilized exit will be installed before construction begins on the site. The stone will remain in place until the sub-base of the pavement is installed. The exit will be inspected weekly, after significant storm events, and after periods of heavy use. The exit will be maintained so that it will prevent the tracking of sediment off-site.

2.8 Additional BMPs

Eugene T. Sullivan Inc. [the project Civil Engineer] will perform bi-weekly inspections of the site to ensure compliance with this SWPPP. ETS Inc. will maintain the SWPPP documentation and will conduct and document inspections in all areas of the site.

SECTION 3: GOOD HOUSEKEEPING BMPS

3.1 Material Handling and Waste Management

Construction Waste:

All waste materials will be collected and disposed of into metal trash dumpsters. The dumpsters will be located away from the wetlands and/or property lines, stormwater conveyances and drains and will meet all federal, state, and municipal regulations. Only trash and construction debris from the site will be deposited in the dumpster. No debris and/or construction materials will be buried on-site. The dumpsters will be inspected weekly and after storm events. The dumpsters will be emptied as necessary and disposed of in accordance with regulations.

Sanitary Waste:

At a minimum, two temporary portable toilets will be provided onsite throughout the construction phase. The portable toilets will be located away from the wetland areas and/or property lines, stormwater conveyances and drains. Sanitary waste will be cleaned and collected from the portable toilets weekly.

3.2 Establish Proper Building Material Staging Areas

Construction Equipment and Materials will be staged around the site away from the drainage systems and wetlands. The storage areas will be inspected weekly and after significant storm events to ensure that materials and/or sediment are not being created by the staging area. If necessary, erosion controls will be installed around the perimeter of the staging area.

3.3 Designate Washout Areas

A temporary above-grade concrete washout area will be constructed prior to any concrete deliveries to the site. A 10' x 10' washout will be constructed of staked hay bales and filter fabric. The washout area will be located adjacent to the materials staging area.

Concrete pours will not be conducted during or before an anticipated storm event. Concrete trucks and chutes will be washed in the designated area or concrete wastes will be properly disposed off-site. When the temporary washout area is no longer needed, the hardened concrete and materials used to construct the area will be removed and disposed of properly.

3.4 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Vehicles and Equipment to be used on-site throughout the project include excavators, loaders, dump trucks and trailers, paving equipment etc. All major equipment/vehicle fueling will occur within the materials staging area. Absorbent, spill-cleanup materials will be available at the materials staging area. Vehicles and equipment will be inspected each day for leaks, leaks will be repaired immediately, or the problem equipment will be removed from the site immediately.

3.6 Spill Prevention and Control Plan

Contractor awareness is the key to an effective spill prevention and response program. Anticipated spills for this project would be a result of oil or gas leaks. These spills should be brought to the attention of the project manager immediately. The project manager should have an adequate supply of absorbent compounds, rags etc. readily available always. The project manager will be trained to handle small spill events using the following procedures:

1. Stop the spill at the source.
2. Contain the spilled materials.
3. Collect the spilled materials as necessary using absorbent compounds, rags etc.
4. Dispose of the materials properly.

If the spill occurs near a storm drain structure, absorbent pads and/or socks shall be placed around the drains to prevent the spill from entering the collection system.

Spills should not be washed down with water unless the water can be contained and disposed of properly.

If a significant spill event occurs and cannot be handled by the project manager, contact the Fire Department or Local Environmental Emergency Response Team as required.

SECTION 4: INSPECTIONS

4.1 Inspections

Eugene Sullivan PE, the Project Civil Engineer who prepared the Civil Engineering Drawings for the project, prepared this SWPPP is responsible for site compliance with this SWPPP and the EPA's Construction General Permit. Inspections will be conducted for all areas of the site disturbed during construction activities. Inspections will be performed weekly and after storm events as detailed in this SWPPP. These inspections will verify that all BMP's required in sections 2 and 3 of this plan are implemented, maintained and effectively minimizing erosion and preventing Stormwater contamination from construction activities.

4.2 Delegation of Authority

Duly Authorized Representative(s) or Position(s):

EUGENE T. SULLIVAN, INC.
Gene Sullivan
President
230 Lowell Street, Suite 2A
Wilmington, MA 01887
978.657.6469
etspe@outlook.com

SECTION 5: FINAL STABILIZATION

After the entire site has been stabilized, any sediment collected during the construction process will be removed and hauled off-site. Construction debris, trash and temporary BMP's [material and equipment storage areas, portable toilets etc.] will be removed and areas disturbed will be prepared for final seeding. Permanent seeding will be applied after all final grades have been established.

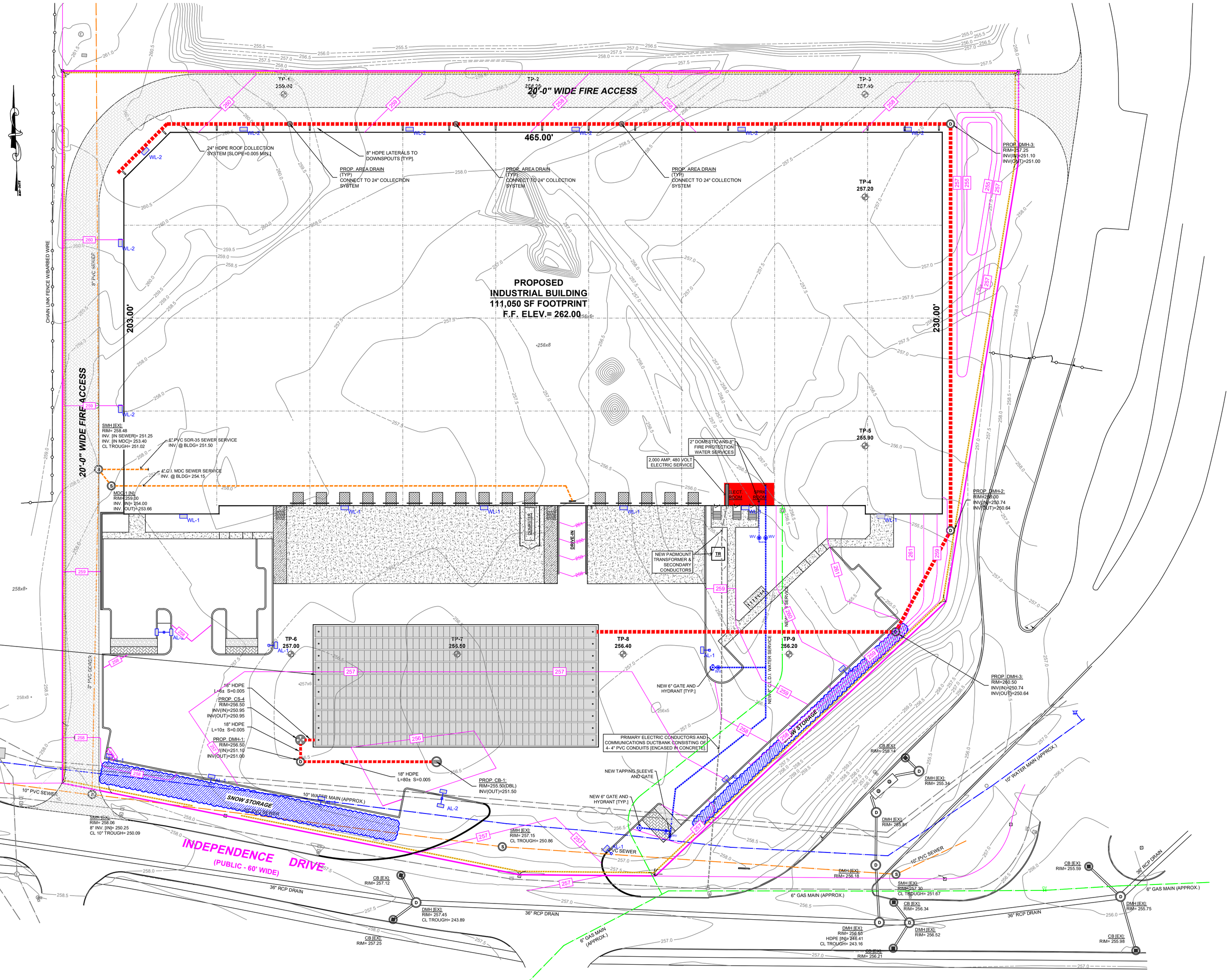
SECTION 6: CERTIFICATION AND NOTIFICATION

I certify 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 manage 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.

Name: Eugene T. Sullivan PE Title: President

Signature:

Date: _____



LEGEND:

- EXISTING CONTOUR
- PROPOSED CONTOUR SPOT GRADE
- UTILITY POLE
- EDGE OF BORDERING VEGETATED WETLANDS
- SILT FENCE AND HAY BALES
- PROPOSED DRAIN PIPE
- DRAIN MANHOLE
- CATCH BASIN
- SEWER PIPE
- SEWER MANHOLE
- WATER LINE
- WATER GATE VALVE
- HYDRANT
- GAS LINE
- GAS GATE VALVE
- ELECTRIC LINE
- GUARDRAIL
- CHAIN LINK FENCE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH UNIFORM INSTRUCTIONS FOR THE PREPARATION OF PLANS AS SET FORTH BY THE REGISTERS OF DEEDS.

PROFESSIONAL LAND SURVEYOR DATE

FOR REGISTRY USE ONLY

C.3 **EXISTING CONDITIONS PLAN**
SCALE: 1" = 30'-0"

GRAPHIC SCALE
30 15 0 15 30 60 120

COMMONWEALTH OF MASSACHUSETTS
EUGENE T. SULLIVAN
CIVIL
No. 45797
REGISTERED PROFESSIONAL ENGINEER

NO	DATE	REVISIONS

Eugene T. Sullivan, Inc.
Consulting Engineers
230 Lowell Street - Suite 2A
Wilmington, MA 01887
Phone: 978.657.6469
Fax: 978.657.8563
Email: etspe@outlook.com

PREPARED FOR:
31 INDEPENDENCE DRIVE, LLC
133 PEARL STREET
BOSTON, MA

DRAWING:
DRAINAGE AND UTILITIES PLAN

PROJECT:
PROPOSED INDUSTRIAL BUILDING
31 INDEPENDENCE DRIVE
DEVENS, MA

SCALE: 1" = 30'-0"
DATE: JUNE 29, 2022
DRAWING NUMBER
C.3

APPENDIX “A”

Appendix A:

Stormwater Construction Site Inspection Report

General Information			
Project Name	***PROPOSED BUILDING***		
NPDES Tracking No.		**Location**	31 Independence Drive, Devens, MA
Date of Inspection		**Start/End Time**	
Inspector's Name(s)	GENE SULLIVAN, P.E.		
Inspector's Title(s)	PROJECT ENGINEER		
Inspector's Contact Information	978.657.6469 etspe@outlook.com		
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
4	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
10	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
11				

CERTIFICATION STATEMENT

I certify 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 manage 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.

Signature:_____ **Date:**_____