Stormwater Pollution Prevention Plan

For

DAIM Logistics, Inc.

At

128 Park Drive

Fultonville, NY

Prepared By:

Empire Engineering, PLLC

1900 Duanesburg Road

Duanesburg, NY 12056

November 3, 2021

Revised:

December 10, 2021

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Project/Site Information

The subject project is the proposed 54,000 SF construction of a warehouse on site. The subject site is located at 128 Park Drive in Fultonville, NY. The parcel area is approximately 8.10 AC. The property is identified by Tax Map # 52.-4-3.12.

Anticipated Construction Start Date: November 2021

Anticipated Completion Date: August 2022

The total area of disturbance for the project including buildings, roadways, utilities, stormwater management and site grading is approximately 4.9± Acres. In accordance with the NYS DEC General Permit 0-20-001 Section II.D.3., the owner or operator of a construction activity shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Regulated MS4.

Contact Information

Owner/Operator:

DAIM Logistics, Inc.
128 Park Drive
Fultonville, NY 12072

Engineer:

Empire Engineering, PLLC
1900 Duanesburg Road
Duanesburg, NY 12056
Contact: Christopher Longo, PE

Contractor:

Owner/Operator

Drainage Patterns & Topography

Runoff from the project area drains southeasterly toward an on-site wetland which drains off-site. The topography of the site can be generally described as rolling with a slope near the center of the site. The site currently exists as a vacant forested area.

Soils on the site are silt loam as identified by the USDA Natural Resource Conservation Service web soil survey and an on-site soils investigation. The on-site soils investigation confirmed the soils to be silt over shale bedrock. Infiltration tests were performed in the intermediate layer indicating permeability at a rate of 5 minutes per inch. All test pit logs and infiltration results are indicated on the site plan.

Mapped Soils (Per USDA NRCS Mapping)				
Symbol	Soil Name	Soil Description	Percentage of Site	Hydrologic Soil Group
Fr	Fredon	Silt Loam	35.0%	B
GP	Gravel Pits	Gravelly Sand	57.3%	B
HrB	Howard	Gravelly Silt Loam	0.9%	A
LaB	Lansing	Silt Loam	4.0%	B
PsB	Plainfield	Loamy Sand	2.8%	A

Potential Sources of Pollution

The primary sources of pollution from an active construction site are erosion, siltation, debris transport, accidental spills or leakage of oils from equipment.

Implementation Schedule

The construction sequence outlined below should be followed or amended as necessary to minimize the susceptibility of the site to erosion and sediment transport during construction. Proper construction of the following Erosion & Sediment Controls are detailed on Sheet C503 "E & SC Details".

1. Establish perimeter protections and stabilized construction entrances within work area
2. Construct temporary sediment traps in the location of permanent stormwater controls.
3. Once all erosion and sediment control measures are constructed and functional, disturbance may begin within that subject area.
4. Rough grade the project area, establish any swales and/or temporary check dams to divert runoff to storage areas.
5. Stabilize cut/fill slopes and stabilize internal roadway areas with subbase course as necessary.
6. Upon completion of grading, final seeding and full vegetative cover shall be established.
7. Prior to finalizing connection to the storm sewer system, all catch basins and drainage lines shall be cleaned of all silt and sediment.
8. Once final stabilization is achieved remove all temporary erosion and sediment control measures including silt fence, storm structure protections and temporary sediment basin components.

Notice of Intent

The owner shall submit a Notice of Intent (NOI) to the New York State Department of Environmental Conservation and obtain authorization of construction activities before commencing work. A copy of this NOI is included within Appendix A.

Historic Preservation

The Office of Parks, Recreation & Historic Preservation database was reviewed for potential Historic or Cultural significant data at or near the project site. The database revealed that the site is within an "archeologically sensitive bubble." A Phase 1A/1B cultural resource survey and Stage 2 was conducted as part of the SEQR process for the Glen Business Park, available mapping information is included within Appendix B.

Endangered Species

The NYSDEC Environmental Resource Mapper was reviewed for potential records of state or federally listed threatened or endangered species. The site is not within an area designated as a "significant natural community" and therefore no additional review is warranted. The database results are included within Appendix C.

Maps & Figures

Additional Maps indicating the site are included within Appendix D such as:

USGS Soils Map

Rainfall Quantities

Best Management Practices

Objectives

The primary objective of the Stormwater Pollution Prevention Plan is protecting adjacent areas from erosion and sediment transport and ensuring the quality of discharge water is acceptable. This is done by minimizing disturbed areas, protecting natural features and soil, phasing construction, stabilizing soils, and protecting storm inlets.

Phasing

Construction of the subject site is intended to be conducted in one phase. The phase includes, first an expansion of the existing use with the construction of a new metal frame building for additional storage. Within the phase, attention should be paid to the required sequencing to ensure minimal sediment transport.

Good Housekeeping

The owner/operator shall implement the following for the duration of construction:

- All stored materials shall be in a neat, orderly manner and under cover.
- Products shall be kept in original containers with a legible original manufacturer's label.
- Substances shall not be mixed with one another unless recommended by the manufacturer.
- Original labels and material safety data sheets (MSDS) shall be procured and used for each material.
- Whenever possible, the entire product shall be used up before disposing of a container.
- If surplus product must be disposed of, manufacturers or local/state/federal recommended methods for proper disposal shall be followed.
- Manufacturer's recommendations for proper use and disposal shall be followed.
- The job site superintendent shall be responsible for daily inspections to ensure proper use and disposal of materials, litter, chemicals and debris.

Spill Prevention Controls

The following spill prevention controls shall be implemented for the duration of construction:

- The job site superintendent shall be the spill prevention and cleanup coordinator. He/she shall designate the individuals who will receive spill prevention and cleanup training. These individuals shall each become responsible for a phase of prevention and cleanup. The names of these personnel shall be posted in the material storage area and in the office trailer onsite.
- Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be trained regarding these procedures as well as the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup shall be kept in the material storage area onsite in spill control and containment kit (containing, for example, absorbent such as kitty litter

or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.).

- All spills shall be cleaned up immediately after discovery.
- The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with the hazardous substances.
- Spills of toxic or hazardous materials shall be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 302 list and oil) shall be immediately reported to:
    - EPA National Response Center, telephone 1-800-424-8802.
    - N.Y.S.D.E.C. 24 hour Spill Hotline, telephone 1-800-457-7362.

Temporary Erosion & Sediment Controls

Temporary stormwater control measures shall be installed prior to active construction within each tributary area. Such temporary controls include but are not limited to:

Control:

- Silt fencing.
- Stabilized construction entrances.
- Inlet protection devises shall be installed around all storm basins within active disturbance areas or areas not yet finally stabilized.
- Dust shall be controlled with water on site and adjacent roadways.
- Designate a protected area to stockpile topsoil or other material stripped during excavation.
- Other temporary erosion and sediment control devices including catch basin sediment traps as necessary.
- Any refuse storage onsite shall be only in designated areas where runoff will not directly discharge through.
- See Sheet C503 - E&SC Details for further detail on installation and implementation of control practices

Maintenance:

- Once no longer active, disturbed areas shall be mulched to prevent sediment transport. Areas that are at or near finish grade shall be finally stabilized.
- Stockpiles of soil materials shall be stabilized with geotextile or seeding and be surrounded by silt fencing or berming.
- No area shall be left unstabilized more than 14 days after completion of construction activities within that area.
- Erosion control devices should be cleaned and repaired as necessary.
- Litter and construction debris shall be collected daily by the contractor, and properly disposed of.

Winter Shutdown

The site may be considered within ‘winter shutdown’ if the following conditions are met. During winter shutdown, the site inspection frequency may be reduced to once per 30-days. All disturbed areas shall be temporarily stabilized and sediment basins shall be cleaned of silt and debris. During shutdown,

access road shall be kept clear of snow and snow shall not be stockpiled in a location which inhibits runoff to sediment basin areas.

Final Stabilization

Prior to the site being operational the following measures shall be implemented:

- All disturbed areas other than structures or pavement shall receive final seeding and vegetative growth.
- Catch basins shall be cleaned of silt for proper sump.
- Ponds and swales shall be finally shaped in accordance with the sizing details and shall be vegetated accordingly.
- Maintenance of ponds, swales and vegetative areas shall continue into operation of the site.
- All disturbed areas which will be vegetated shall be de-compacted, aerated and 6" of topsoil applied prior to vegetating. Additional soil restoration may be required for heavy trafficked areas. Additional restoration shall be conducted in accordance with the NYSDEC Stormwater Design Manual Table 5.3.
- Upon achieving greater than 75% vegetative growth on the disturbed site, temporary erosion and sediment controls may be removed.

Ownership & Maintenance

The proposed stormwater management facilities indicated on the site are intended to be privately owned and maintained. The owner/operator shall adhere to the Ownership and Maintenance Manual within Appendix E. A maintenance agreement with the Municipality, the Regulated MS4, will also be required to ensure long term operation and maintenance.

Inspections & Recordkeeping

Inspection Requirements

The owner/operation shall perform routine inspections and either correct or direct the contractor to correct deficiencies as they arise in a timely manner. The contractor shall familiarize themselves with this document and its required components prior to commencing work. Each day that the contractor is performing work on-site there shall be a 'trained individual' who is responsible for implementation of the SWPPP components.

The owner shall have a qualified inspector conduct a site inspection at least one per seven calendar days while disturbance activities are on-going. The inspector shall at a minimum, inspect erosion & sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved final stabilization, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

The qualified inspector shall prepare and inspection report in accordance with the General Permit and distribute to the owner and appropriate contractor within 24 hours.

Certifications

The SWPPP preparer, owner and contractor shall sign the applicable certification forms included within Appendix F.

Documents Required On-Site

The owner or operator shall maintain a copy of the current General Permit, NOI, NYSDEC Acknowledgment of NOI, SWPPP, MS4 SWPPP Acceptance form, inspection reports, and all documentation necessary to demonstrate eligibility with this permit at the construction site until all disturbed areas have achieved final stabilization and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

Drainage Analysis

Existing Runoff Condition

The existing site drainage characteristics include a rolling east to west heavily wooded area that were analyzed to determine baseline peak flow rates for the project. Stormwater runoff from the site was analyzed utilizing software applying the TR-55 hydrologic analysis method. The channel protection volume was determined utilizing the peak discharge from the TR-55 method and the Hydrologic Analysis tolls in Appendix B of the New York State Stormwater Management Design Manual. A summary of these peak flow rates is included below as well as the full drainage map & analysis within Appendix G.

Channel Protection Volume (acre-feet)	
	1-Year (Cpv)
Analysis Point A	0.036

Peak Flow Rates (CFS)		
	10-Year Storm (Qp)	100-Year Storm (Qf)
Analysis Point A	2.81	11.08

Proposed Development Condition

The proposed site drainage characteristics were analyzed in relation to the existing baseline to determine required storage volumes for the site. Changes in impervious cover, sub-catchment area and times of concentration were all considered in conducting the analysis. A summary of these peak flow rates is included below as well as the full drainage map & analysis within Appendix H.

Channel Protection Volume (acre-feet)		
	EX 1-Year Storm (Cpv)	PR 1-Year Storm (Cpv)
Analysis Point A	0.036	0.269

In addition to the channel protection volume indicated above, the proposed conditions provide 24-hour extended detention of the 1-year, 24-hour storm event in accordance with the NYS DEC General Permit 0-20-001 Section I.C.2.a.ii. This is indicated on the hydrograph storage plot provided in Appendix H.

Peak Flow Rates (CFS)				
	EX 10-Year Storm (Qp)	PR 10-Year Storm (Qp)	EX 100-Year Storm (Qf)	PR 100-Year Storm (Qf)
Analysis Point A	2.81	2.40	11.08	10.15

Water Quality & Quantity Controls

Selecting Post-Construction Practices

Post-construction stormwater management practices were carefully selected considering the matrices provided by the NYS DEC Stormwater Management Design Manual. Screening factors included 1. Land Use 2. Physical Feasibility 3. Watershed/Regional Factors 4. Stormwater Management Capability 5. Community & Environmental Factors.

Part of the consideration in selecting stormwater practices was the runoff reduction capacity of the practice. In accordance with the NYSDEC General Permit and Stormwater Design Manual each site must meet the minimum runoff reduction requirement through a combination of Green Infrastructure Practices and SMP's with runoff reduction capacity.

As part of the post construction practice selection, green infrastructure techniques were considered and either applied or not utilized. Appendix I includes a table of the planning and practice selection process in accordance with the NYSDEC Stormwater Design Manual Sections 5.2 & 5.3. Many of the planning techniques are intrinsically apparent within the development of the Concept Site Plan. The following Green Infrastructure practices suggested by NYSDEC in Section 5.3 of the SWMDM have not been applied:

Conservation of Natural Areas – Not a large enough area for conservation

Disconnection of Rooftops – All rooftops treated by other runoff reduction means

Stream Daylighting – No streams available to daylight

Rain Gardens – All impervious treated by other runoff reduction means

Green Roofs – All rooftops treated by other runoff reduction means

Stormwater Planters – All rooftops treated by other runoff reduction means

Rain Barrels – All rooftops treated by other runoff reduction means

Porous Pavement – All impervious treated by other runoff reduction means

Water Quality

Practices selected for treatment of water quality include:

Dry Swale (O-1)

Alternative Underground Storage Chambers

All water quality practices have been designed to treat the calculated water quality volume as well as safely convey the 10-year storm event. Worksheets showing sizing criteria and calculations for each practice are included within Appendix I.

Water Quantity

Stormwater controls for water quantity include:

Micropool Extended Detention Pond (P-1)

Alternative Underground Storage Chambers

Part of the consideration in selecting stormwater practices for control of water quantity was soil conditions, infiltration rates, groundwater conditions and elevation changes. The selection process was conducted in accordance with the NYSDEC General Permit and Stormwater Design Manual through use of the Physical Feasibility Matrix, Table 7.2 of the NYSSWDM. The sizing of stormwater practices was achieved utilizing the TR-55 hydraulic analysis method, dimensions, depth and elevations for various design storm events are included within Appendix H. Installation details and short form specifications are included on the project plan sheets in Appendix J.

Water quantity practices have been designed to attenuate flows from both the Overbank Flood (10-year) and the Extreme Flood (100-year) storm events. The proposed stormwater detention areas do not meet the requirements for consideration as a “dam” as prescribed by NYSDEC. It can be assumed that in the unlikely event for a failure or misoperation losses would be limited to the owner’s property. Pond storage elevation and sizing information is included in the post development drainage calculations within Appendix H.

Conclusion

The subject activity is listed within Appendix B Table 2 of the NYSDEC General Permit 0-20-001 for stormwater discharges from construction activities. This project type requires preparation of a SWPPP that includes Erosion & Sediment Control measures as well as post-construction stormwater management practices. This Stormwater Pollution Prevention Plan has been developed in accordance with the NYSDEC General Permit 0-20-001 as well as the 2015 NYS DEC Stormwater Design Manual. It is not anticipated that the drainage from the subject property will have any adverse effect on adjacent downstream properties.

Appendix A

Notice of Intent

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Water, Bureau of Water Permits
625 Broadway, Albany, New York 12233-3505
P: (518) 402-8111 F: (518) 402-9029
www.dec.ny.gov

11/26/2021

DAIM Logistics, Inc.
Pat Oare
128 Park Drive
Fultonville, NY 12072

RE: ACKNOWLEDGMENT of NOTICE OF INTENT for Coverage Under SPDES General Permit for Storm Water Discharges from CONSTRUCTION ACTIVITY – General Permit No. GP-0-20-001

Dear Prospective Permittee:

This is to acknowledge that the New York State Department of Environmental Conservation (Department) has received a complete Notice of Intent (NOI) for coverage under General Permit No. GP-0-20-001 for the construction activities located at:

DAIM Park Drive
128 Park Drive
Town of Glen, NY 12072 County: **MONTGOMERY**

Pursuant to Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, and ECL Article 70, discharges in accordance with GP-0-20-001 from the above construction site will be authorized **5** business days from **11/23/2021,** which is the date we received your final NOI, unless notified differently by the Department.

The permit identification number for this site is: **NYR11J071**. Be sure to include this permit identification number on any forms or correspondence you send us. When coverage under the permit is no longer needed, you must submit a Notice of Termination to the Department.

This authorization is conditioned upon the following:

1. The information submitted in the NOI received by the Department on **11/23/2021** is accurate and complete.

2. You have developed a Stormwater Pollution Prevention Plan (SWPPP) that complies with GP-0-20-001 which must be implemented as the first element of construction at the above-noted construction site.

3. Activities related to the above construction site comply with all other requirements of GP-0-20-001.

4. Payment of the annual $110 regulatory fee, which is billed separately by the Department in the late fall. The regulatory fee covers a period of one calendar year. In addition, since September 1, 2004, construction stormwater permittees have been assessed an initial authorization fee which is now $110 per acre of land disturbed and $675 per acre of future impervious area. The initial authorization fee covers the duration of the authorized disturbance.

5. When applicable, project review pursuant to the State Environmental Quality Review Act (SEQRA) has been satisfied.

6. You have obtained all necessary Department permits subject to the Uniform Procedures Act (UPA). You should check with your Regional Permit Administrator for further information.

***Note: Construction activities cannot commence until project review pursuant to SEQRA has been satisfied, when SEQRA is applicable; and, where required, all necessary Department permits subject to the UPA have been obtained.**

Please be advised that the Department may request a copy of your SWPPP for review.

Should you have any questions regarding any aspect of the requirements specified in GP-0-20-001, please contact Dave Gasper at (518) 402-8114.

Sincerely,

David Gasper

David Gasper
Environmental Engineer

cc: RWE - **4**
SWPPP Preparer
Empire Engineering, PLLC
Longo, Christopher
1900 Duanesburg Rd.
Duanesburg, NY 12056

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NOI for coverage under Stormwater General Permit for Construction Activity

version 1.31

(Submission #: HPC-KSTC-ASPJ9, version 5)

Details

Submitted	11/23/2021 (16 days ago) by CHRISTOPHER LONGO
Alternate Identifier	DAIM Park Drive
Submission ID	HPC-KSTC-ASPJ9
Submission Reason	New
Status	Deemed Complete

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)
DAIM Logistics, Inc.

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Oare

Owner/Operator Contact Person First Name
Pat

Owner/Operator Mailing Address
128 Park Drive

City
Fultonville

State
NY

Zip
12072

Phone
518-853-1101

Email
poare@daimlogistics.com

Federal Tax ID
26-1563609

Project Location

Project/Site Name
DAIM Park Drive

Street Address (Not P.O. Box)
128 Park Drive

Side of Street
West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Glen

State
NY

Zip
12072

DEC Region
4

County
MONTGOMERY

Name of Nearest Cross Street
NY State Highway 5S

Distance to Nearest Cross Street (Feet)
1056

Project In Relation to Cross Street
South

Tax Map Numbers Section-Block-Parcel
52.-4-3.12

Tax Map Numbers
NONE PROVIDED

1. Coordinates

Provide the Geographic Coordinates for the project site. The two methods are:
- Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates.
- The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.

Navigate to your location and click on the map to get the X,Y coordinates
42.934539,-74.343688

Project Details

2. What is the nature of this project?
Redevelopment with increase in impervious area

3. Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Landuse
Commercial

Post-Development Future Land Use
Commercial

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.
NONE PROVIDED

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)
8.13

Total Area to be Disturbed (acres)
4.9

Existing Impervious Area to be Disturbed (acres)
.36

Future Impervious Area Within Disturbed Area (acres)
3.85

5. Do you plan to disturb more than 5 acres of soil at any one time?
No

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6. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.

A (%)
0

B (%)
100

C (%)
0

D (%)
0

7. Is this a phased project?
No

8. Enter the planned start and end dates of the disturbance activities.

Start Date
11/1/2021

End Date
7/31/2022

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
Off-Site Dry Dock Creek; Off-Site Tributary of Auries Creek

9a. Type of waterbody identified in question 9?
Stream/Creek Off Site

Other Waterbody Type Off Site Description
NONE PROVIDED

9b. If "wetland" was selected in 9A, how was the wetland identified?
NONE PROVIDED

10. Has the surface waterbody(ies in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001?
No

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001?
No

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?
No

If No, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey?
NONE PROVIDED

If Yes, what is the acreage to be disturbed?
NONE PROVIDED

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?
No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
No

16. What is the name of the municipality/entity that owns the separate storm sewer system?
NONE PROVIDED

17. Does any runoff from the site enter a sewer classified as a Combined Sewer?
No

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?
No

19. Is this property owned by a state authority, state agency, federal government or local government?
No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)
No

Required SWPPP Components

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?
Yes

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)?
Yes

If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?
Yes

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

SWPPP Preparer
Empire Engineering, PLLC

Contact Name (Last, Space, First)
Longo, Christopher

Mailing Address
1900 Duanesburg Rd.

City
Duanesburg

State
NY

Zip
12056

Phone
518-280-1371

Email
clongo@empireeng.net

Download SWPPP Preparer Certification Form
Please take the following steps to prepare and upload your preparer certification form:

1) Click on the link below to download a blank certification form
2) The certified SWPPP preparer should sign this form
3) Scan the signed form
4) Upload the scanned document
Download SWPPP Preparer Certification Form

Please upload the SWPPP Preparer Certification
SWPPP Preparer Certification - Signed.pdf - 10/21/2021 09:34 AM
Comment
NONE PROVIDED

Erosion & Sediment Control Criteria

25. Has a construction sequence schedule for the planned management practices been prepared?
Yes

26. Select all of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural
Check Dams
Silt Fence
Stabilized Construction Entrance
Dust Control
Storm Drain Inlet Protection

Biotechnical
None

Vegetative Measures
Mulching
Grassed Waterway
Protecting Vegetation
Seeding
Topsoiling

Permanent Structural
Riprap Slope Protection
Rock Outlet Protection

Other
NONE PROVIDED

Post-Construction Criteria

*** IMPORTANT: Completion of Questions 27-39 is not required if response to Question 22 is No.**

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.
Preservation of Undisturbed Area
Preservation of Buffers
Reduction of Clearing and Grading

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).
All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)
.30

29. Post-construction SMP Identification
Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28).

Identify the SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)
.12

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28)?
No

If Yes, go to question 36. If No, go to question 32.

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)
.12

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?
Yes

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs
Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30).

Also, provide the total impervious area that contributes runoff to each practice selected.

NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)
.18

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).
.30

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?
Yes

If Yes, go to question 36.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv required and provided or select waiver (#36a), if applicable.

CPv Required (acre-feet)
.036

CPv Provided (acre-feet)
.269

36a. The need to provide channel protection has been waived because:
NONE PROVIDED

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (#37a), if applicable.

Overbank Flood Control Criteria (Qp)

Pre-Development (CFS)
2.81

Post-Development (CFS)
2.4

Total Extreme Flood Control Criteria (Qf)

Pre-Development (CFS)
11.08

Post-Development (CFS)
10.15

37a. The need to meet the Qp and Qf criteria has been waived because:
NONE PROVIDED

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?
Yes

If Yes, Identify the entity responsible for the long term Operation and Maintenance
Land Owner

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.
High groundwater

Post-Construction SMP Identification

Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs
Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)
NONE PROVIDED

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)
NONE PROVIDED

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
NONE PROVIDED

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)
NONE PROVIDED

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)
NONE PROVIDED

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)
NONE PROVIDED

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)
NONE PROVIDED

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)
NONE PROVIDED

Total Contributing Impervious Acres for Vegetated Swale (RR-5)
NONE PROVIDED

Total Contributing Impervious Acres for Rain Garden (RR-6)
NONE PROVIDED

Total Contributing Impervious Acres for Stormwater Planter (RR-7)
NONE PROVIDED

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)
NONE PROVIDED

Total Contributing Impervious Acres for Porous Pavement (RR-9)
NONE PROVIDED

Total Contributing Impervious Acres for Green Roof (RR-10)
NONE PROVIDED

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)
NONE PROVIDED

Total Contributing Impervious Acres for Infiltration Basin (I-2)
NONE PROVIDED

Total Contributing Impervious Acres for Dry Well (I-3)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Infiltration System (I-4)
NONE PROVIDED

Total Contributing Impervious Acres for Bioretention (F-5)
NONE PROVIDED

Total Contributing Impervious Acres for Dry Swale (O-1)
1.5

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Pond (P-2)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Extended Detention (P-3)
NONE PROVIDED

Total Contributing Impervious Acres for Multiple Pond System (P-4)
NONE PROVIDED

Total Contributing Impervious Acres for Pocket Pond (P-5)
NONE PROVIDED

Total Contributing Impervious Acres for Surface Sand Filter (F-1)
NONE PROVIDED

Total Contributing Impervious Acres for Underground Sand Filter (F-2)
NONE PROVIDED

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)
NONE PROVIDED

Total Contributing Impervious Acres for Organic Filter (F-4)
NONE PROVIDED

Total Contributing Impervious Acres for Shallow Wetland (W-1)
NONE PROVIDED

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)
NONE PROVIDED

Total Contributing Impervious Acres for Pond/Wetland System (W-3)
NONE PROVIDED

Total Contributing Impervious Acres for Pocket Wetland (W-4)
NONE PROVIDED

Total Contributing Impervious Acres for Wet Swale (O-2)
NONE PROVIDED

Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Total Contributing Impervious Area for Hydrodynamic
NONE PROVIDED

Total Contributing Impervious Area for Wet Vault
NONE PROVIDED

Total Contributing Impervious Area for Media Filter
NONE PROVIDED

"Other" Alternative SMP?
1.55

Total Contributing Impervious Area for "Other"
NONE PROVIDED

Provide the name and manufaturer of the alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide

SMPs used, total WQv required and total WQv provided for the project.

Manufacturer of Alternative SMP
Lane

Name of Alternative SMP
Stormkeeper SK180

Other Permits

40. Identify other DEC permits, existing and new, that are required for this project/facility.
None

If SPDES Multi-Sector GP, then give permit ID
NONE PROVIDED

If Other, then identify
NONE PROVIDED

41. Does this project require a US Army Corps of Engineers Wetland Permit?
No

If "Yes," then indicate Size of Impact, in acres, to the nearest tenth
NONE PROVIDED

42. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.
NONE PROVIDED

MS4 SWPPP Acceptance

43. Is this project subject to the requirements of a regulated, traditional land use control MS4?
No

If No, skip question 44

44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?
NONE PROVIDED

MS4 SWPPP Acceptance Form Download
Download form from the link below. Complete, sign, and upload.
MS4 SWPPP Acceptance Form

MS4 Acceptance Form Upload
NONE PROVIDED
Comment
NONE PROVIDED

Owner/Operator Certification

Owner/Operator Certification Form Download
Download the certification form by clicking the link below. Complete, sign, scan, and upload the form.
Owner/Operator Certification Form (PDF, 45KB)

Upload Owner/Operator Certification Form
Owner-Op Cert Form Signed.pdf - 11/16/2021 04:22 PM
Comment
NONE PROVIDED

Attachments

Date	Attachment Name	Context	User
11/16/2021 4:22 PM	Owner-Op Cert Form Signed.pdf	Attachment	CHRISTOPHER LONGO
10/21/2021 9:34 AM	SWPPP Preparer Certification - Signed.pdf	Attachment	CHRISTOPHER LONGO

Status History

	User	Processing Status
11/23/2021 1:59:37 PM	CHRISTOPHER LONGO	Draft
11/23/2021 2:00:34 PM	CHRISTOPHER LONGO	Submitting
11/23/2021 2:00:48 PM	CHRISTOPHER LONGO	Submitted
11/23/2021 2:20:16 PM	DAVID GASPER	Deemed Complete

Processing Steps

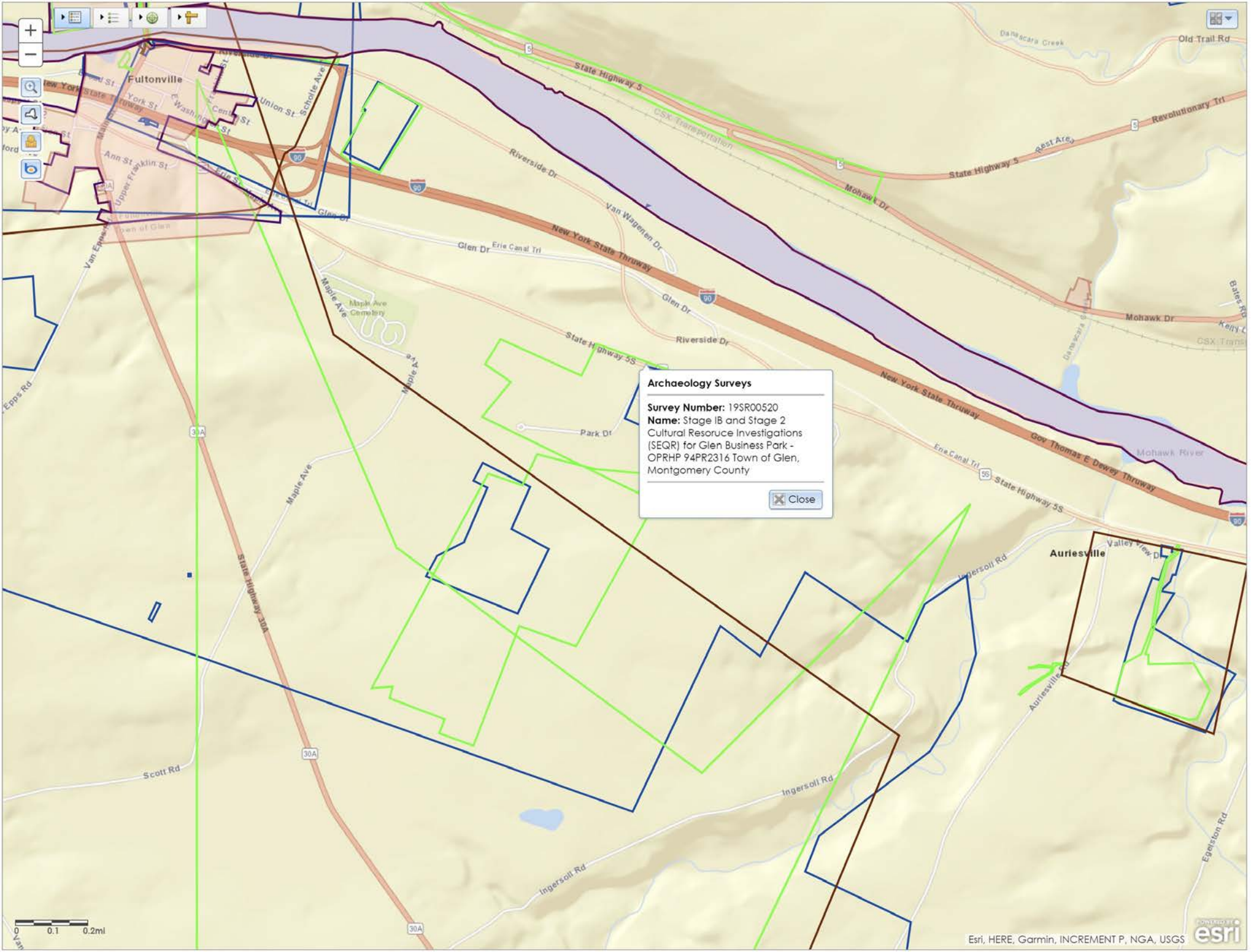
Step Name	Assigned To/Completed By	Date Completed
Form Submitted	CHRISTOPHER LONGO	11/23/2021 2:00:47 PM
Under Review	DAVID GASPER	11/23/2021 2:20:06 PM

Revisions

Revision	Revision Date	Revision By
Revision 1	10/20/2021 9:36 AM	CHRISTOPHER LONGO
Revision 2	11/23/2021 7:29 AM	CHRISTOPHER LONGO
Revision 3	11/23/2021 8:24 AM	CHRISTOPHER LONGO
Revision 4	11/23/2021 10:40 AM	CHRISTOPHER LONGO
Revision 5	11/23/2021 1:59 PM	CHRISTOPHER LONGO

Appendix B

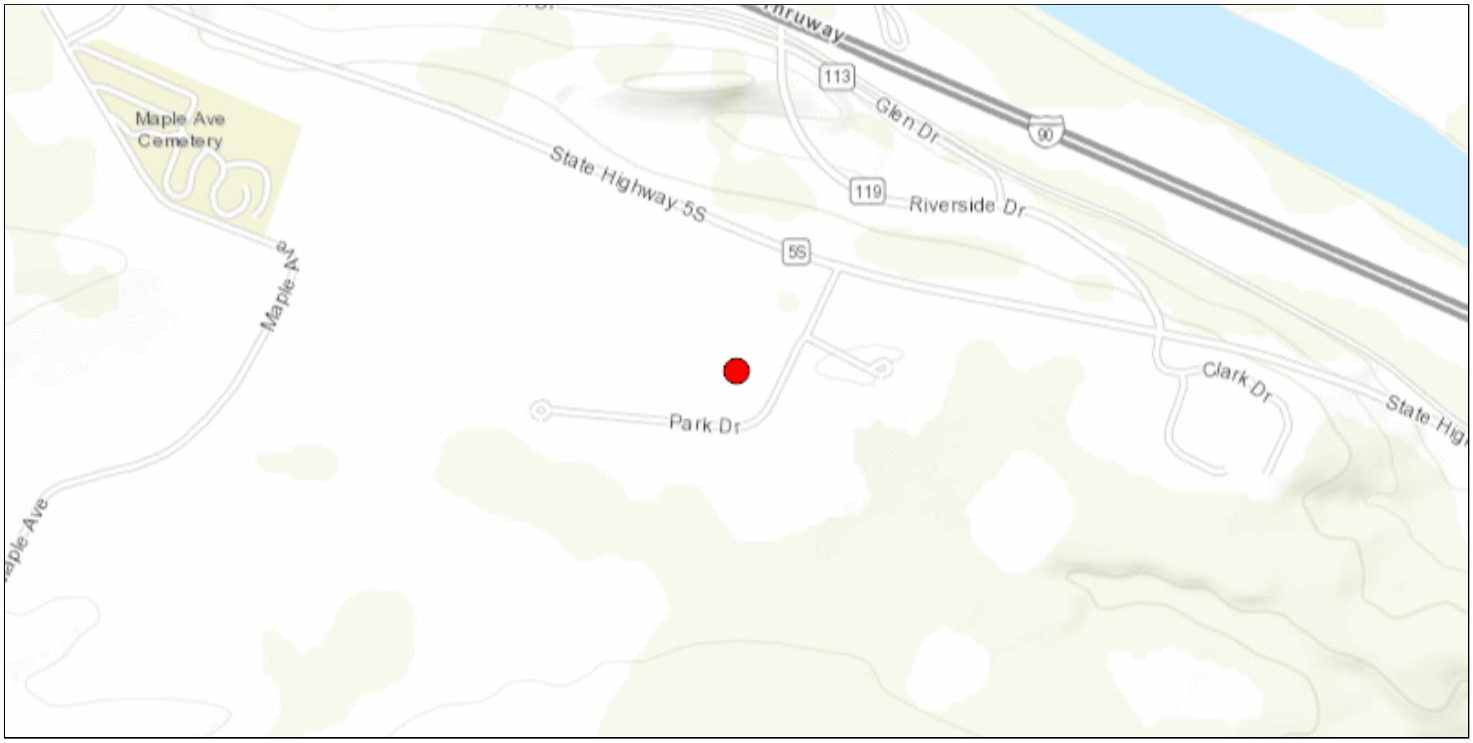
OPRHP Correspondence


Archaeology Surveys
Survey Number: 19SR00520
Name: Stage IB and Stage 2 Cultural Resoruce Investigations (SEQR) for Glen Business Park - OPRHP 94PR2316 Town of Glen, Montgomery County
Close
Fultonville
Auriesville
State Highway 5
New York State Thruway
Gov Thomas E Dewey Thruway
State Highway 5S
State Highway 30A
Riverside Dr
Glen Dr
Erie Canal Trl
Maple Ave
Maple Ave Cemetery
Park Dr
Van Wagenen Dr
Mohawk Dr
Revolutionary Trl
Old Trail Rd
Ingersoll Rd
Scott Rd
Auriesville Rd
Valley View Dr
Egelston Rd
Mohawk River
Union St
Scholte Ave
Ann St
Upper Franklin St
Van Epps Rd
Epps Rd
Rest Area
CSX Transportation
0 0.1 0.2mi
Esri, HERE, Garmin, INCREMENT P, NGA, USGS
esri

Appendix C

T&E Correspondence

Environmental Resource Mapper



The coordinates of the point you clicked on are:

UTM 18	**Easting:**	553529.9328955059	**Northing:**	4753785.384532315
Longitude/Latitude	**Longitude:**	-74.34395410626085	**Latitude:**	42.93482792642571

The approximate address of the point you clicked on is:
128 Park Dr, Fultonville, New York, 12072

County: Montgomery
Town: Glen
USGS Quad: TRIBES HILL

If your project or action is within or near an area with a rare animal, a permit may be required if the species is listed as endangered or threatened and the department determines the action may be harmful to the species or its habitat.

If your project or action is within or near an area with rare plants and/or significant natural communities, the environmental impacts may need to be addressed.

The presence of a unique geological feature or landform near a project, unto itself, does not trigger a requirement for a NYS DEC permit. Readers are advised, however, that there is the chance that a unique feature may also show in another data layer (ie. a wetland) and thus be subject to permit jurisdiction.

Please refer to the "Need a Permit?" tab for permit information or other authorizations regarding these natural resources.

Disclaimer: If you are considering a project or action in, or near, a wetland or a stream, a NYS DEC permit may be required. The Environmental Resources Mapper does not show all natural resources which are regulated by NYS DEC, and for which permits from NYS DEC are required. For example, Regulated Tidal Wetlands, and Wild, Scenic, and Recreational Rivers, are currently not included on the maps.

Appendix D

Maps & Figures

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	74.453 degrees West
Latitude	42.916 degrees North
Elevation	0 feet
Date/Time	Mon, 11 Oct 2021 12:33:04 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.39	0.48	0.64	0.79	0.99	**1yr**	0.69	0.94	1.14	1.41	1.75	2.16	2.45	**1yr**	1.91	2.36	2.78	3.38	3.90	**1yr**
2yr	0.31	0.48	0.60	0.79	1.00	1.24	**2yr**	0.86	1.10	1.41	1.72	2.07	2.48	2.80	**2yr**	2.19	2.69	3.15	3.80	4.35	**2yr**
5yr	0.37	0.58	0.72	0.97	1.24	1.54	**5yr**	1.07	1.36	1.76	2.13	2.54	3.01	3.43	**5yr**	2.66	3.29	3.83	4.51	5.14	**5yr**
10yr	0.41	0.65	0.82	1.12	1.46	1.83	**10yr**	1.26	1.60	2.09	2.51	2.98	3.49	4.00	**10yr**	3.09	3.85	4.44	5.14	5.84	**10yr**
25yr	0.49	0.77	0.99	1.36	1.80	2.27	**25yr**	1.56	1.99	2.60	3.12	3.67	4.25	4.91	**25yr**	3.76	4.72	5.41	6.11	6.92	**25yr**
50yr	0.55	0.88	1.13	1.58	2.13	2.69	**50yr**	1.84	2.34	3.08	3.68	4.30	4.94	5.74	**50yr**	4.37	5.52	6.29	6.97	7.87	**50yr**
100yr	0.62	1.00	1.29	1.83	2.50	3.18	**100yr**	2.16	2.76	3.64	4.33	5.03	5.74	6.70	**100yr**	5.08	6.45	7.31	7.95	8.96	**100yr**
200yr	0.71	1.15	1.50	2.14	2.96	3.77	**200yr**	2.55	3.25	4.30	5.10	5.89	6.68	7.84	**200yr**	5.91	7.54	8.50	9.07	10.19	**200yr**
500yr	0.84	1.38	1.81	2.62	3.68	4.70	**500yr**	3.18	4.04	5.37	6.33	7.27	8.17	9.65	**500yr**	7.23	9.28	10.40	10.81	12.10	**500yr**

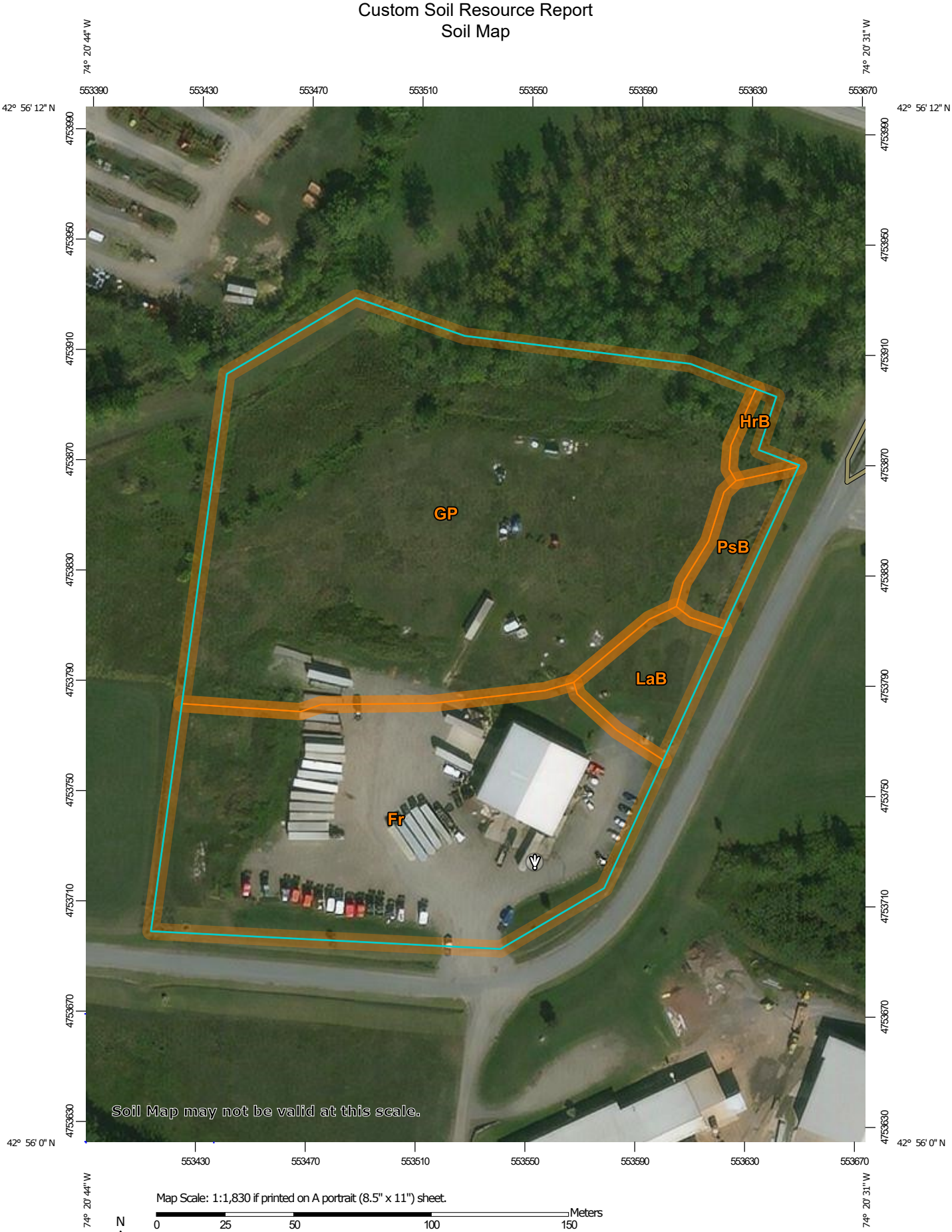
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.40	0.53	0.66	0.88	**1yr**	0.57	0.86	0.96	1.18	1.58	1.97	2.25	**1yr**	1.75	2.16	2.50	3.17	3.62	**1yr**
2yr	0.30	0.46	0.57	0.77	0.96	1.09	**2yr**	0.82	1.07	1.21	1.58	1.96	2.41	2.72	**2yr**	2.14	2.61	3.07	3.71	4.25	**2yr**
5yr	0.34	0.53	0.66	0.90	1.15	1.30	**5yr**	0.99	1.27	1.48	1.87	2.29	2.79	3.19	**5yr**	2.47	3.07	3.58	4.26	4.83	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.47	**10yr**	1.14	1.44	1.68	2.10	2.58	3.11	3.61	**10yr**	2.75	3.47	4.02	4.71	5.30	**10yr**
25yr	0.44	0.67	0.84	1.19	1.57	1.75	**25yr**	1.36	1.71	1.99	2.45	3.02	3.57	4.23	**25yr**	3.16	4.07	4.66	5.38	5.99	**25yr**
50yr	0.49	0.74	0.92	1.32	1.78	1.98	**50yr**	1.54	1.94	2.25	2.76	3.39	3.93	4.77	**50yr**	3.48	4.58	5.22	5.94	6.55	**50yr**
100yr	0.54	0.82	1.03	1.49	2.04	2.26	**100yr**	1.76	2.21	2.55	3.11	3.81	4.33	5.35	**100yr**	3.83	5.15	5.85	6.57	7.15	**100yr**
200yr	0.61	0.91	1.16	1.67	2.33	2.58	**200yr**	2.01	2.52	2.88	3.52	4.28	4.72	6.02	**200yr**	4.18	5.79	6.55	7.26	7.80	**200yr**
500yr	0.71	1.05	1.35	1.97	2.80	3.07	**500yr**	2.41	3.00	3.40	4.15	5.01	5.25	7.00	**500yr**	4.65	6.73	7.60	8.27	8.71	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.52	0.70	0.86	1.04	**1yr**	0.75	1.02	1.17	1.49	1.85	2.31	2.66	**1yr**	2.04	2.55	3.02	3.60	4.15	**1yr**
2yr	0.32	0.50	0.62	0.84	1.03	1.15	**2yr**	0.89	1.13	1.32	1.67	2.06	2.55	2.89	**2yr**	2.26	2.78	3.25	3.90	4.47	**2yr**
5yr	0.39	0.61	0.76	1.04	1.32	1.48	**5yr**	1.14	1.45	1.66	2.08	2.59	3.24	3.65	**5yr**	2.87	3.51	4.07	4.79	5.45	**5yr**
10yr	0.47	0.72	0.90	1.25	1.62	1.79	**10yr**	1.40	1.75	2.03	2.51	3.10	3.91	4.38	**10yr**	3.46	4.21	4.86	5.60	6.35	**10yr**
25yr	0.59	0.90	1.12	1.61	2.11	2.30	**25yr**	1.82	2.25	2.64	3.10	3.92	5.02	5.58	**25yr**	4.45	5.37	6.12	6.89	7.79	**25yr**
50yr	0.71	1.07	1.34	1.92	2.59	2.79	**50yr**	2.23	2.72	3.23	3.68	4.67	6.09	6.72	**50yr**	5.39	6.46	7.31	8.07	9.11	**50yr**
100yr	0.85	1.28	1.60	2.32	3.18	3.36	**100yr**	2.74	3.29	3.95	4.37	5.58	7.43	8.10	**100yr**	6.57	7.79	8.75	9.47	10.67	**100yr**
200yr	1.01	1.52	1.92	2.78	3.88	4.08	**200yr**	3.35	3.99	4.84	5.20	6.67	9.04	9.76	**200yr**	8.00	9.39	10.48	11.11	12.52	**200yr**
500yr	1.28	1.91	2.46	3.57	5.08	5.25	**500yr**	4.38	5.13	6.31	6.54	8.45	11.86	12.53	**500yr**	10.49	12.05	13.32	13.73	15.46	**500yr**

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,830 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Montgomery County, New York
Survey Area Data: Version 18, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 7, 2013—Nov 9, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Fr	Fredon silt loam	3.5	35.0%
GP	Gravel pits	5.7	57.3%
HrB	Howard gravelly silt loam, 3 to 8 percent slopes	0.1	0.9%
LaB	Lansing silt loam, 3 to 8 percent slopes	0.4	4.0%
PsB	Plainfield loamy sand, 3 to 10 percent slopes	0.3	2.8%
Totals for Area of Interest		**10.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Montgomery County, New York

Fr—Fredon silt loam

Map Unit Setting

National map unit symbol: 9tpp
Elevation: 250 to 1,200 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fredon, poorly drained, and similar soils: 50 percent
Fredon, somewhat poorly drained, and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredon, Poorly Drained

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

Ap - 0 to 9 inches: silt loam
B21 - 9 to 19 inches: gravelly silt loam
B22 - 19 to 31 inches: very gravelly loam
2C - 31 to 45 inches: stratified very gravelly sand
3C - 45 to 60 inches: stratified silt loam to very fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Fredon, Somewhat Poorly Drained

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

Ap - 0 to 9 inches: silt loam
B21 - 9 to 19 inches: gravelly silt loam
B22 - 19 to 31 inches: very gravelly loam
2C - 31 to 45 inches: stratified very gravelly sand
3C - 45 to 60 inches: stratified silt loam to very fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Ilion

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Phelps

Percent of map unit: 5 percent
Hydric soil rating: No

Howard

Percent of map unit: 5 percent
Hydric soil rating: No

Raynham

Percent of map unit: 5 percent
Hydric soil rating: No

GP—Gravel pits

Map Unit Setting

National map unit symbol: 9tpq
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Gravel pits: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravel Pits

Typical profile

H1 - 0 to 6 inches: very gravelly sand
H2 - 6 to 60 inches: very gravelly coarse sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Howard

Percent of map unit: 5 percent
Hydric soil rating: No

Palmyra

Percent of map unit: 5 percent
Hydric soil rating: No

Herkimer

Percent of map unit: 5 percent
Hydric soil rating: No

Farmington

Percent of map unit: 5 percent
Hydric soil rating: No

Ilion

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Fredon

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

HrB—Howard gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9tq2
Elevation: 210 to 1,030 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 19 inches: very gravelly sandy loam
H3 - 19 to 60 inches: very gravelly sandy loam
H4 - 60 to 64 inches: stratified very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Palmyra
Percent of map unit: 5 percent
Hydric soil rating: No

Colonie
Percent of map unit: 5 percent
Hydric soil rating: No

Alton
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils
Percent of map unit: 5 percent
Hydric soil rating: No

Phelps
Percent of map unit: 5 percent
Hydric soil rating: No

LaB—Lansing silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2w3mg
Elevation: 330 to 1,970 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Lansing and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lansing

Setting
Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy lodgment till derived from limestone, sandstone, and shale

Typical profile
Ap - 0 to 8 inches: silt loam
E - 8 to 13 inches: gravelly silt loam

Bt/E - 13 to 21 inches: gravelly silt loam
Bt1 - 21 to 28 inches: gravelly silt loam
Bt2 - 28 to 39 inches: gravelly silt loam
C - 39 to 79 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water capacity: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F101XY012NY - Till Upland
Hydric soil rating: No

Minor Components

Conesus

Percent of map unit: 8 percent
Landform: Till plains, drumlins, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Kendaia

Percent of map unit: 3 percent
Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Appleton

Percent of map unit: 2 percent
Landform: Drumlins, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Palatine

Percent of map unit: 1 percent
Landform: Benches, ridges

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Danley

Percent of map unit: 1 percent
Landform: Till plains, drumlinoid ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

PsB—Plainfield loamy sand, 3 to 10 percent slopes

Map Unit Setting

National map unit symbol: 9trr
Elevation: 720 to 1,150 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Plainfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plainfield

Setting

Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciofluvial or deltaic deposits

Typical profile

H1 - 0 to 8 inches: loamy sand
H2 - 8 to 32 inches: coarse sand
H3 - 32 to 78 inches: coarse sand

Properties and qualities

Slope: 3 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Otisville

Percent of map unit: 5 percent
Hydric soil rating: No

Colonie

Percent of map unit: 5 percent
Hydric soil rating: No

Alton

Percent of map unit: 5 percent
Hydric soil rating: No

Elnora

Percent of map unit: 5 percent
Hydric soil rating: No

Appendix E

O&M Manual

Operation & Maintenance Manual

For

DAIM Logistics, Inc.

Stormwater Management Facilities

At

128 Park Drive

Fultonville, NY

Site Information

The subject project is the proposed 54,000 SF expansion of an existing warehouse site. The subject site is located at 128 Park Drive in Fultonville, NY. The parcel area is approximately 8.10 AC. The property is identified by Tax Map # 52.-4-3.12.

Engineer of Record

Empire Engineering, PLLC
1900 Duanesburg Road
Duanesburg, NY 12056
Contact: Christopher Longo, PE
Phone: (518) 858-4117

Construction Phase

Submittals

The shop drawing design plans for all structures shall be reviewed by a NYS Licensed Professional Engineer. Specification sheets for all pipe materials and particle analyses for all aggregate to be used on site shall also be approved by the Engineer. Shop drawing and/or submittal approvals will be distributed to the owner and the contractor. No unit shall be constructed without having the Engineer's approval.

Inspections

The Engineer shall inspect and document the installation of any structure, pipe, controlled fill and stormwater management feature. Inspections shall include documentation of the subsurface conditions and/or the soil profile including material thickness. It is the owner's responsibility to contact the engineer to witness construction. Failure to do so may result in the facility not being certified. Additional lab or field geotechnical tests may be specified by the inspecting Engineer to verify conformance with the plans. Such test would be at the owner's expense.

Certifications

The inspecting Engineer shall issue a daily work report to the owner for each occurrence that construction is witnessed. The Engineer shall issue a letter of approval certifying stormwater components which they have witnessed and found to be in conformance with the plans, shop drawings, and any supplemental documents. If any modifications are made to the plans or stormwater facilities the Engineer shall document such in their certification.

Operation & Maintenance

Recordkeeping

The owner/operation shall keep and maintain all Plans, SWPPP documents, inspection reports, and certifications generated during design and construction. These plans and reports shall be readily accessible for use by any interested party.

Inspections

The owner should check the condition of all devices after each rainfall event for the first 30 days. Issues should be identified such as blockages or obstructions within the inlet or outlet. The owner should also inspect for accumulating sediment and conditions of slopes and embankments.

A comprehensive inspection should be completed at the end of construction in accordance with the enclosed inspection form. During operation, the owner should continue to routinely inspect all stormwater devices weekly during the rainy season. Each devise should be thoroughly inspection annually. A frequency of cleaning should be determined based on the inspection findings.

Maintenance

The owner shall maintain all stormwater devices in perpetuity. Routine maintenance should be scheduled at least annually and should address any issues identified during inspection. The enclosed maintenance checklists should be utilized for each device.

Emergency Action Plan

In the event of an emergency condition resulting from extreme weather or a structural failure, the owner shall be contacted immediately. The local Town officials and emergency response authorities should be contacted if there is immediate danger. If the failure does not pose an immediate threat to the health or welfare of the subject adjacent properties, the engineer of record should be contacted to determine potential remedies.

Construction Inspection Checklists

Stormwater/Wetland Pond Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Pre-Construction/Materials and Equipment		
Pre-construction meeting		
Pipe and appurtenances on-site prior to construction and dimensions checked		
1. Material (including protective coating, if specified)		
2. Diameter		
3. Dimensions of metal riser or pre-cast concrete outlet structure		
4. Required dimensions between water control structures (orifices, weirs, etc.) are in accordance with approved plans		
5. Barrel stub for prefabricated pipe structures at proper angle for design barrel slope		
6. Number and dimensions of prefabricated anti-seep collars		
7. Watertight connectors and gaskets		
8. Outlet drain valve		
Project benchmark near pond site		
Equipment for temporary de-watering		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
2. Subgrade Preparation		
Area beneath embankment stripped of all vegetation, topsoil, and organic matter		
3. Pipe Spillway Installation		
Method of installation detailed on plans		
A. Bed preparation		
Installation trench excavated with specified side slopes		
Stable, uniform, dry subgrade of relatively impervious material (If subgrade is wet, contractor shall have defined steps before proceeding with installation)		
Invert at proper elevation and grade		
B. Pipe placement		
Metal / plastic pipe		
1. Watertight connectors and gaskets properly installed		
2. Anti-seep collars properly spaced and having watertight connections to pipe		
3. Backfill placed and tamped by hand under “haunches” of pipe		
4. Remaining backfill placed in max. 8 inch lifts using small power tamping equipment until 2 feet cover over pipe is reached		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
3. Pipe Spillway Installation		
Concrete pipe		
1. Pipe set on blocks or concrete slab for pouring of low cradle		
2. Pipe installed with rubber gasket joints with no spalling in gasket interface area		
3. Excavation for lower half of anti-seep collar(s) with reinforcing steel set		
4. Entire area where anti-seep collar(s) will come in contact with pipe coated with mastic or other approved waterproof sealant		
5. Low cradle and bottom half of anti-seep collar installed as monolithic pour and of an approved mix		
6. Upper half of anti-seep collar(s) formed with reinforcing steel set		
7. Concrete for collar of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
8. Forms stripped and collar inspected for honeycomb prior to backfilling. Parge if necessary.		
C. Backfilling		
Fill placed in maximum 8 inch lifts		
Backfill taken minimum 2 feet above top of anti-seep collar elevation before traversing with heavy equipment		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
4. Riser / Outlet Structure Installation		
Riser located within embankment		
A. Metal riser		
Riser base excavated or formed on stable subgrade to design dimensions		
Set on blocks to design elevations and plumbed		
Reinforcing bars placed at right angles and projecting into sides of riser		
Concrete poured so as to fill inside of riser to invert of barrel		
B. Pre-cast concrete structure		
Dry and stable subgrade		
Riser base set to design elevation		
If more than one section, no spalling in gasket interface area; gasket or approved caulking material placed securely		
Watertight and structurally sound collar or gasket joint where structure connects to pipe spillway		
C. Poured concrete structure		
Footing excavated or formed on stable subgrade, to design dimensions with reinforcing steel set		
Structure formed to design dimensions, with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
Forms stripped & inspected for “honeycomb” prior to backfilling; parge if necessary		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Embankment Construction		
Fill material		
Compaction		
Embankment		
1. Fill placed in specified lifts and compacted with appropriate equipment		
2. Constructed to design cross-section, side slopes and top width		
3. Constructed to design elevation plus allowance for settlement		
6. Impounded Area Construction		
Excavated / graded to design contours and side slopes		
Inlet pipes have adequate outfall protection		
Forebay(s)		
Pond benches		
7. Earth Emergency Spillway Construction		
Spillway located in cut or structurally stabilized with riprap, gabions, concrete, etc.		
Excavated to proper cross-section, side slopes and bottom width		
Entrance channel, crest, and exit channel constructed to design grades and elevations		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
8. Outlet Protection		
A. End section		
Securely in place and properly backfilled		
B. Endwall		
Footing excavated or formed on stable subgrade, to design dimensions and reinforcing steel set, if specified		
Endwall formed to design dimensions with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing, if necessary)		
Forms stripped and structure inspected for “honeycomb” prior to backfilling; parge if necessary		
C. Riprap apron / channel		
Apron / channel excavated to design cross-section with proper transition to existing ground		
Filter fabric in place		
Stone sized as per plan and uniformly place at the thickness specified		
9. Vegetative Stabilization		
Approved seed mixture or sod		
Proper surface preparation and required soil amendments		
Excelsior mat or other stabilization, as per plan		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
10. Miscellaneous		
Drain for ponds having a permanent pool		
Trash rack / anti-vortex device secured to outlet structure		
Trash protection for low flow pipes, orifices, etc.		
Fencing (when required)		
Access road		
Set aside for clean-out maintenance		
11. Stormwater Wetlands		
Adequate water balance		
Variety of depth zones present		
Approved pondscaping plan in place Reinforcement budget for additional plantings		
Plants and materials ordered 6 months prior to construction		
Construction planned to allow for adequate planting and establishment of plant community (April-June planting window)		
Wetland buffer area preserved to maximum extent possible		

Comments:

Actions to be Taken:

Open Channel System Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility location staked out		
2. Excavation		
Size and location		
Side slope stable		
Soil permeability		
Groundwater / bedrock		
Lateral slopes completely level		
Longitudinal slopes within design range		
Excavation does not compact subsoils		
3. Check dams		
Dimensions		
Spacing		
Materials		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Structural Components		
Underdrain installed correctly		
Inflow installed correctly		
Pretreatment devices installed		
5. Vegetation		
Complies with planting specifications		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
6. Final inspection		
Dimensions		
Check dams		
Proper outlet		
Effective stand of vegetation and stabilization		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

Maintenance Inspection Checklists

Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project _____
Location: _____
Site Status: _____

Date: _____
Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe		
downstream		
upstream		
d. Emergency spillway		
6.Pond, toe & chimney drains clear and functioning		
7.Seeps/leaks on downstream face		
8.Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam “As-Built”		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
10. Emergency spillway clear of obstructions and debris		
11. Other (specify)		
2. Riser and principal spillway (Annual)		
Type: Reinforced concrete _____ Corrugated pipe _____ Masonry _____ 1. Low flow orifice obstructed		
2. Low flow trash rack. a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (rebars exposed)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
10. Other (specify)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
3. Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
5. Other (specify)		
4. Sediment Forebays		
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
5. Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
7. Other (specify)		
6. Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4.Endwalls / Headwalls		
5. Other (specify)		
7. Other (Monthly)		
1. Encroachment on pond, wetland or easement area		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
2. Complaints from residents		
3.Aesthetics a. Grass growing required		
b. Graffiti removal needed		
c. Other (specify)		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants: Survival of desired wetland plant species Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants “choked” with sediment		
7. Eutrophication level of the wetland.		
8. Other (specify)		

Comments:

Actions to be Taken:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

Appendix F

Certifications

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges From Construction Activity (GP-0-20-001)

Project Site Information

Project/Site Name

DAIM Park Drive

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

DAIM Logistics, Inc.

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Christopher	D	Longo
First name	MI	Last Name

Signature

10/21/21

Date

Revised: January 2020

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Owner/Operator Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity (GP-0-20-001)

Project/Site Name: DAIM Park Drive

eNOI Submission Number: HPC-KSTC-ASPJ9

eNOI Submitted by: ☐ **Owner/Operator** ☑ **SWPPP Preparer** ☐ **Other**

Certification Statement - Owner/Operator

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Owner/Operator First Name M.I. Last Name

_____

Signature

_____

Date

Appendix G

Existing Drainage Map & Analysis

PROJECT INFORMATION:

OWNER:
SCOTT P EMERLE & ANTHONY A FAZZONE

APPLICANT:
SCOTT P EMERLE & ANTHONY A FAZZONE
1536 UNION ST
SCHENECTADY, NY 12309

PROPERTY TAX MAP NUMBERS:
48.17-1-1.11, 2.2, 3 & 4

PROPERTY DEED: L1931 P329

TOTAL PROJECT AREA:
5.87± AC

MUNICIPALITY:
TOWN OF ROTTERDAM, SCHENECTADY COUNTY

GENERAL NOTES:

1. ALL SURVEY INFORMATION SHOWN HEREON IS REFERENCED TO THE FOLLOWING:
   1.1. MAP ENTITLED "LANDS OF FAZZONE & EMERLE BURDECK STREET & MARIAVILLE ROAD" PREPARED BY GERALD R. GRAY, PLS DATED FEBRUARY 24, 2016.
2. THIS MAP IS NOT A SURVEY. INFORMATION SHOWN IS FOR GENERAL INFORMATION AND DESIGN PURPOSES ONLY. ALL SURVEY INFORMATION SHOWN HEREON PER THE ABOVE REFERENCED SURVEY, AVAILABLE TAX MAP AND AERIAL IMAGERY.
3. ELEVATION DATUM PER MAP REFERENCE.
4. NORTH PER MAP REFERENCE.

PRIOR TO ANY EARTH DISTURBANCE THE CONTRACTOR SHALL CALL IN A TICKET TO DIG SAFE NY AND OBTAIN A CLEAR TO DIG

IT IS A VIOLATION OF SECTION 7209 OF THE NYS EDUCATION LAW FOR ANY PERSON TO ALTER ANY ITEM ON THIS PLAN IN ANY WAY UNLESS HE/SHE IS ACTING UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER.

No.	Revision Description	Date

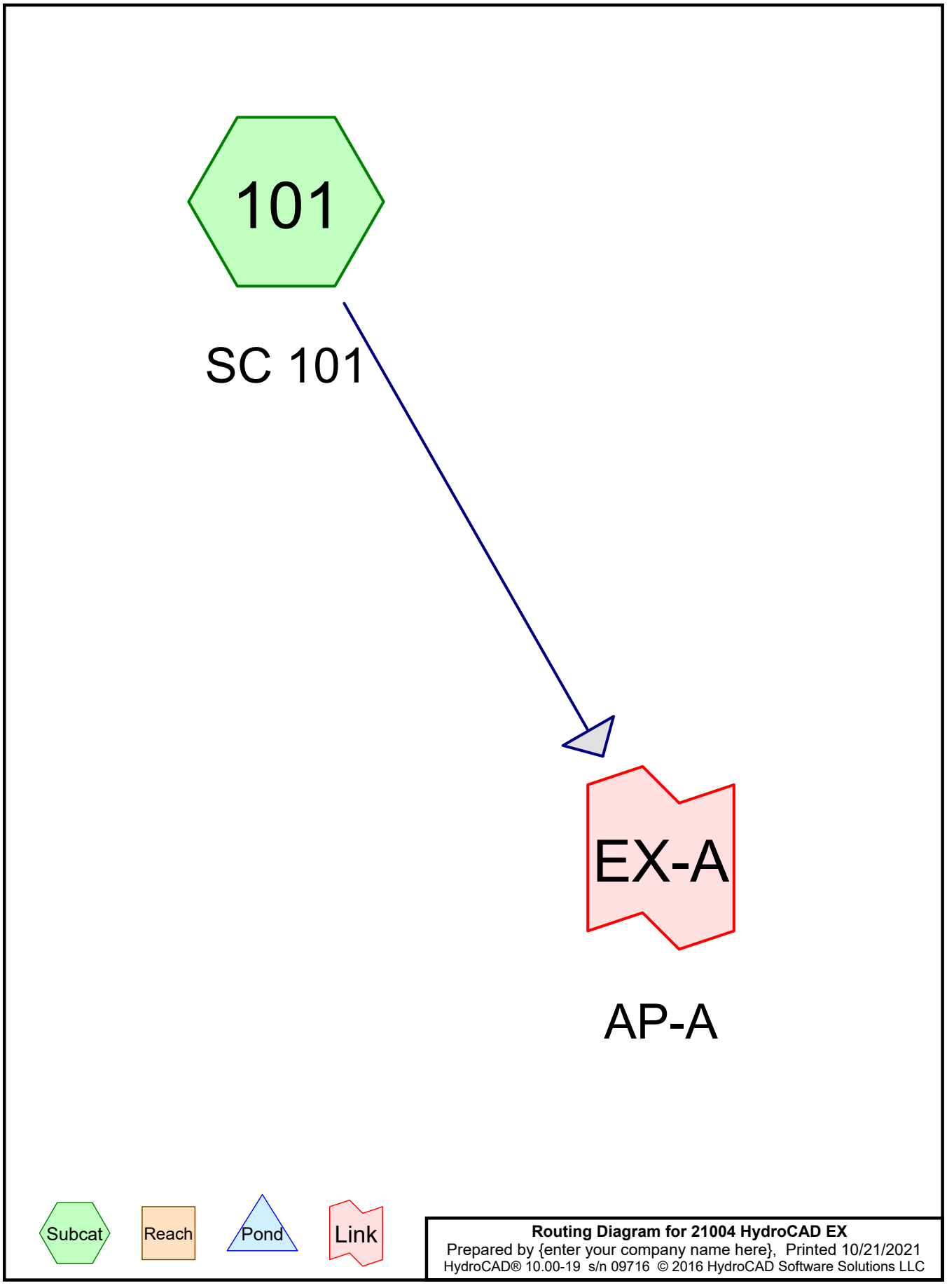
CHRISTOPHER D. LONGO, PE
N.Y.S. LIC. # 095840

EMPIRE ENGINEERING, PLLC
1900 DUANESBURG ROAD
DUANESBURG, NY 12056
PH: (518) 858-4117
EMAIL: CLONGO@EMPIREENG.NET

PROJECT
DAIM LOGISTICS, INC.

128 PARK DRIVE
GLEN PARK
FULTONVILLE, NY 12072

Title: EXISTING DRAINAGE MAP
Date: 10/20/2021
Scale: 1"=80'
Sheet: DR-1



Routing Diagram for 21004 HydroCAD EX
Prepared by {enter your company name here}, Printed 10/21/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 101: SC 101 Runoff Area=204,100 sf 0.00% Impervious Runoff Depth>0.09"
Flow Length=555' Tc=13.3 min CN=61 Runoff=0.14 cfs 0.036 af

Link EX-A: AP-A Inflow=0.14 cfs 0.036 af
Primary=0.14 cfs 0.036 af

Total Runoff Area = 4.685 ac Runoff Volume = 0.036 af Average Runoff Depth = 0.09"
100.00% Pervious = 4.685 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 101: SC 101

Runoff = 0.14 cfs @ 12.17 hrs, Volume= 0.036 af, Depth> 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
204,100	61	>75% Grass cover, Good, HSG B
204,100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
2.2	455	0.0450	3.42		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
13.3	555	Total			

Summary for Link EX-A: AP-A

Inflow Area = 4.685 ac, 0.00% Impervious, Inflow Depth > 0.09" for 1-Yr event
Inflow = 0.14 cfs @ 12.17 hrs, Volume= 0.036 af
Primary = 0.14 cfs @ 12.17 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 101: SC 101 Runoff Area=204,100 sf 0.00% Impervious Runoff Depth>0.50"
Flow Length=555' Tc=13.3 min CN=61 Runoff=2.81 cfs 0.193 af

Link EX-A: AP-A Inflow=2.81 cfs 0.193 af
Primary=2.81 cfs 0.193 af

Total Runoff Area = 4.685 ac Runoff Volume = 0.193 af Average Runoff Depth = 0.50"
100.00% Pervious = 4.685 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 101: SC 101

Runoff = 2.81 cfs @ 12.08 hrs, Volume= 0.193 af, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
204,100	61	>75% Grass cover, Good, HSG B
204,100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
2.2	455	0.0450	3.42		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
13.3	555	Total			

Summary for Link EX-A: AP-A

Inflow Area = 4.685 ac, 0.00% Impervious, Inflow Depth > 0.50" for 10-Yr event
Inflow = 2.81 cfs @ 12.08 hrs, Volume= 0.193 af
Primary = 2.81 cfs @ 12.08 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 101: SC 101 Runoff Area=204,100 sf 0.00% Impervious Runoff Depth>1.62"
Flow Length=555' Tc=13.3 min CN=61 Runoff=11.08 cfs 0.634 af

Link EX-A: AP-A Inflow=11.08 cfs 0.634 af
Primary=11.08 cfs 0.634 af

Total Runoff Area = 4.685 ac Runoff Volume = 0.634 af Average Runoff Depth = 1.62"
100.00% Pervious = 4.685 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 101: SC 101

Runoff = 11.08 cfs @ 12.06 hrs, Volume= 0.634 af, Depth> 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=5.70"

Area (sf)	CN	Description
204,100	61	>75% Grass cover, Good, HSG B
204,100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
2.2	455	0.0450	3.42		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
13.3	555	Total			

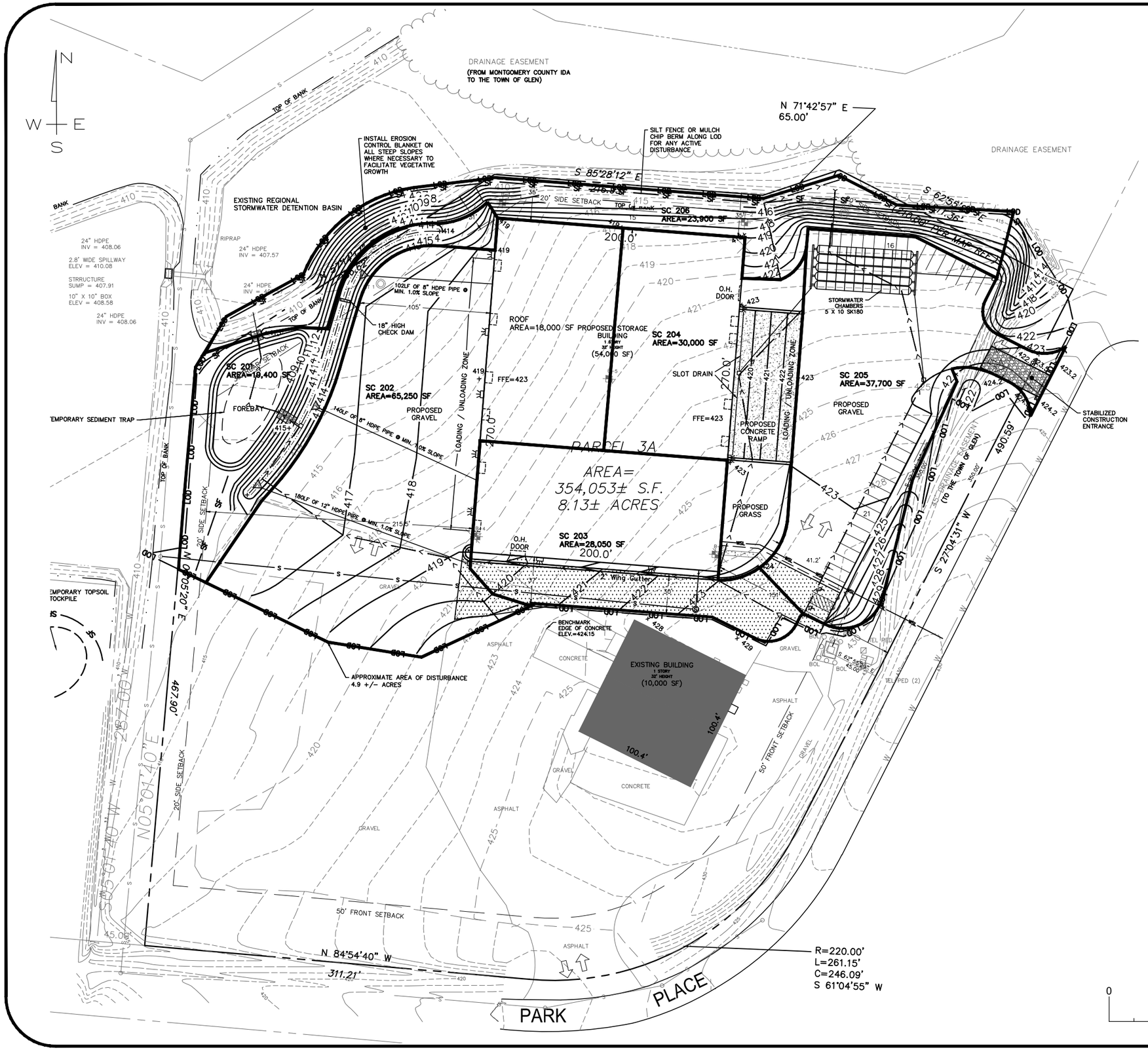
Summary for Link EX-A: AP-A

Inflow Area = 4.685 ac, 0.00% Impervious, Inflow Depth > 1.62" for 100-Yr event
Inflow = 11.08 cfs @ 12.06 hrs, Volume= 0.634 af
Primary = 11.08 cfs @ 12.06 hrs, Volume= 0.634 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Appendix H

Proposed Drainage Map & Analysis



PROJECT INFORMATION:

OWNER/APPLICANT:
DAIM LOGISTICS, INC.
128 PARK DRIVE
FULTONVILLE, NY 12072

PROPERTY TAX MAP NUMBER
52.–4–3.12

PARCEL AREA:
354,053± SF / 8.13± AC

MUNICIPALITY:
TOWN OF GLEN, MONTGOMERY COUNTY

TOTAL PROJECT AREA:
4.9± ACRES

GENERAL NOTES:

1. ALL SURVEY INFORMATION IS REFERENCED TO:
   1.1. MAP ENTITLED "SITE PLAN DAIM LOGISTICS, LOT 3 GLEN CANAL VIEW BUSINESS PARK" PREPARED BY ABD ENGINEERS DATED FEBRUARY 2009 AND LAST REVISED MARCH 27, 2009.
   1.2. SURVEY UPDATE PREPARED BY GERALD R GRAY PLS, FROM A FEBRUARY 2021 FIELD SURVEY. FIELD SURVEY WAS CONDUCTED IN THE AREA OF THE PROPOSED IMPROVEMENTS. OTHER PLANIMETRIC AND UTILITY FEATURES SHOWN ARE BASED UPON MAP REFERENCE 1.
2. THIS MAP IS NOT A SURVEY. INFORMATION SHOWN IS FROM MAP REFERENCES ABOVE AND FOR GENERAL INFORMATION AND DESIGN PURPOSES ONLY. A LICENSED LAND SURVEYOR SHALL STAKE OUT ANY BUILDINGS OR SEPTIC AREAS TO CONFIRM THE SETBACKS INDICATED.
3. NORTH IS REFERENCED TO NAD 83 NEW YORK STATE PLANES EAST ZONE. ELEVATIONS ARE BASED ON MAP REFERENCE 1.

PRIOR TO ANY EARTH DISTURBANCE THE CONTRACTOR SHALL CALL IN A TICKET TO DIG SAFE NY AND OBTAIN A CLEAR TO DIG

IT IS A VIOLATION OF SECTION 7209 OF THE NYS EDUCATION LAW FOR ANY PERSON TO ALTER ANY ITEM ON THIS PLAN IN ANY WAY UNLESS HE/SHE IS ACTING UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER.

No.	Revision Description	Date
1	MISC. REVISIONS	11/03/21
2	REVISED PER TDE COMM.	12/10/21

CHRISTOPHER D. LONGO, PE
N.Y.S. LIC. # 095840

EMPIRE ENGINEERING, PLLC
1900 DUANESBURG ROAD
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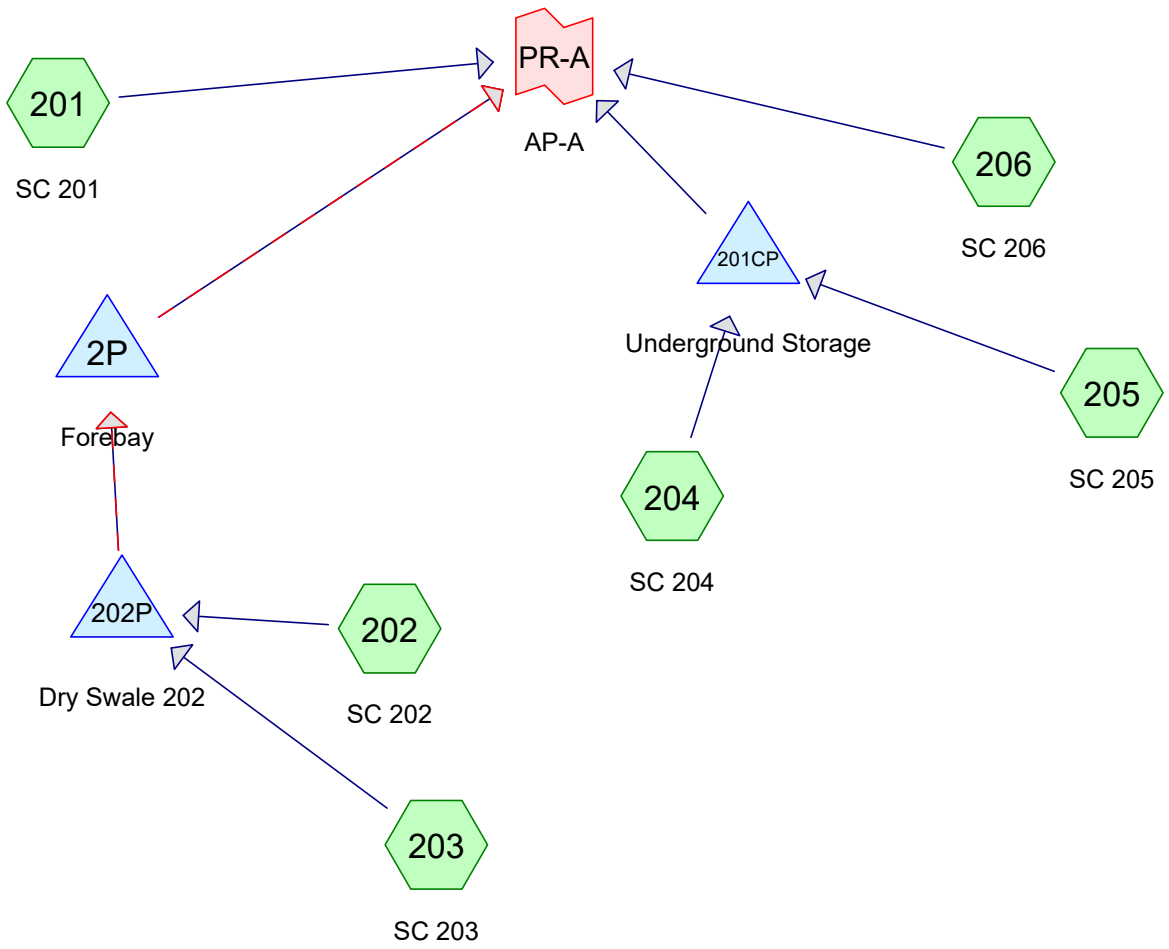
PH: (518) 858–4117
EMAIL: CLONGO@EMPIREENG.NET

PROJECT
DAIM LOGISTICS, INC.

128 PARK DRIVE
GLEN PARK
FULTONVILLE, NY 12072

Title
PROPOSED DRAINAGE PLAN

Date	Sheet
10/20/2021	DR–2
Scale 1"=80'	



Subcat Reach Pond Link

Routing Diagram for 21004 HydroCAD PR Rev
Prepared by {enter your company name here}, Printed 11/4/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 201: SC 201 Runoff Area=19,400 sf 26.29% Impervious Runoff Depth>0.30"
Flow Length=903' Slope=0.0200 '/' Tc=17.0 min CN=71 Runoff=0.14 cfs 0.011 af

Subcatchment 202: SC 202 Runoff Area=65,250 sf 27.59% Impervious Runoff Depth>1.10"
Flow Length=567' Slope=0.0200 '/' Tc=14.5 min CN=89 Runoff=2.34 cfs 0.138 af

Subcatchment 203: SC 203 Runoff Area=28,050 sf 100.00% Impervious Runoff Depth>1.84"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.92 cfs 0.099 af

Subcatchment 204: SC 204 Runoff Area=30,000 sf 80.33% Impervious Runoff Depth>1.31"
Flow Length=1,250' Tc=23.0 min CN=92 Runoff=0.99 cfs 0.075 af

Subcatchment 205: SC 205 Runoff Area=37,700 sf 0.00% Impervious Runoff Depth>0.71"
Tc=6.0 min CN=82 Runoff=1.18 cfs 0.051 af

Subcatchment 206: SC 206 Runoff Area=23,900 sf 0.00% Impervious Runoff Depth>0.09"
Tc=6.0 min CN=61 Runoff=0.02 cfs 0.004 af

Pond 2P: Forebay Peak Elev=410.21' Storage=5,787 cf Inflow=3.69 cfs 0.215 af
Primary=0.25 cfs 0.130 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.130 af

Pond 201CP: Underground Storage Peak Elev=414.06' Storage=0.037 af Inflow=1.76 cfs 0.127 af
Outflow=0.68 cfs 0.123 af

Pond 202P: Dry Swale 202 Peak Elev=413.27' Storage=1,257 cf Inflow=3.77 cfs 0.236 af
Primary=3.69 cfs 0.215 af Secondary=0.00 cfs 0.000 af Outflow=3.69 cfs 0.215 af

Link PR-A: AP-A Inflow=0.98 cfs 0.269 af
Primary=0.98 cfs 0.269 af

Total Runoff Area = 4.690 ac Runoff Volume = 0.378 af Average Runoff Depth = 0.97"
63.17% Pervious = 2.963 ac 36.83% Impervious = 1.728 ac

Summary for Subcatchment 201: SC 201

Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.011 af, Depth> 0.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
5,100	98	Water Surface, HSG B
14,300	61	>75% Grass cover, Good, HSG B
19,400	71	Weighted Average
14,300		73.71% Pervious Area
5,100		26.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
5.9	803	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
17.0	903	Total			

Summary for Subcatchment 202: SC 202

Runoff = 2.34 cfs @ 12.07 hrs, Volume= 0.138 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
18,000	98	Roofs, HSG B
47,250	85	Gravel roads, HSG B
65,250	89	Weighted Average
47,250		72.41% Pervious Area
18,000		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
3.4	467	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
14.5	567	Total			

Summary for Subcatchment 203: SC 203

Runoff = 1.92 cfs @ 11.96 hrs, Volume= 0.099 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
28,050	98	Paved parking, HSG D
28,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	200		0.56		**Direct Entry, Direct Entry**

Summary for Subcatchment 204: SC 204

Runoff = 0.99 cfs @ 12.16 hrs, Volume= 0.075 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
18,000	98	Unconnected roofs, HSG B
4,400	61	>75% Grass cover, Good, HSG B
6,100	98	Paved parking, HSG B
1,500	85	Gravel roads, HSG B
30,000	92	Weighted Average
5,900		19.67% Pervious Area
24,100		80.33% Impervious Area
18,000		74.69% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0200	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.50"
6.9	1,150	0.0300	2.79		**Shallow Concentrated Flow, Shallow Flow** Unpaved Kv= 16.1 fps
23.0	1,250	Total			

Summary for Subcatchment 205: SC 205

Runoff = 1.18 cfs @ 11.98 hrs, Volume= 0.051 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
4,450	61	>75% Grass cover, Good, HSG B
33,250	85	Gravel roads, HSG B
37,700	82	Weighted Average
37,700		100.00% Pervious Area

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

Summary for Subcatchment 206: SC 206

Runoff = 0.02 cfs @ 12.05 hrs, Volume= 0.004 af, Depth> 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.20"

Area (sf)	CN	Description
23,900	61	>75% Grass cover, Good, HSG B
23,900		100.00% Pervious Area

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

Summary for Pond 2P: Forebay

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 1.21" for 1-Yr event
Inflow = 3.69 cfs @ 12.02 hrs, Volume= 0.215 af
Outflow = 0.25 cfs @ 13.25 hrs, Volume= 0.130 af, Atten= 93%, Lag= 73.7 min
Primary = 0.25 cfs @ 13.25 hrs, Volume= 0.130 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 410.21' @ 13.25 hrs Surf.Area= 5,293 sf Storage= 5,787 cf

Plug-Flow detention time= 218.6 min calculated for 0.130 af (60% of inflow)
Center-of-Mass det. time= 148.5 min (938.9 - 790.3)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	16,725 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	4,250	0	0
410.00	5,100	4,675	4,675
411.00	6,000	5,550	10,225
412.00	7,000	6,500	16,725

Device	Routing	Invert	Outlet Devices
#1	Primary	411.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir X 0.40** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Secondary	412.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

#3	Primary	409.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

Primary OutFlow Max=0.25 cfs @ 13.25 hrs HW=410.21' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Inlet Controls 0.25 cfs @ 2.81 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=409.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 201CP: Underground Storage

Inflow Area = 1.554 ac, 35.60% Impervious, Inflow Depth > 0.98" for 1-Yr event
Inflow = 1.76 cfs @ 12.00 hrs, Volume= 0.127 af
Outflow = 0.68 cfs @ 12.38 hrs, Volume= 0.123 af, Atten= 61%, Lag= 22.9 min
Primary = 0.68 cfs @ 12.38 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 414.06' @ 12.38 hrs Surf.Area= 0.066 ac Storage= 0.037 af

Plug-Flow detention time= 38.0 min calculated for 0.123 af (97% of inflow)
Center-of-Mass det. time= 27.7 min (820.4 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	413.00'	0.091 af	**37.17'W x 77.48'L x 5.50'H Field A** 0.364 af Overall - 0.135 af Embedded = 0.228 af x 40.0% Voids
#2A	413.75'	0.135 af	**Lane StormKeeper SK180** x 50 Inside #1 Effective Size= 70.5"W x 45.0"H => 15.97 sf x 7.11'L = 113.5 cf Overall Size= 78.0"W x 45.5"H x 7.39'L with 0.28' Overlap 5 Rows of 10 Chambers Cap Storage= +22.3 cf x 2 x 5 rows = 223.0 cf
		0.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 413.00' / 411.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	414.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 414.00' / 412.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.68 cfs @ 12.38 hrs HW=414.06' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.67 cfs @ 3.42 fps)
└**2=Culvert** (Inlet Controls 0.01 cfs @ 0.67 fps)

Summary for Pond 202P: Dry Swale 202

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 1.32" for 1-Yr event
Inflow = 3.77 cfs @ 12.00 hrs, Volume= 0.236 af
Outflow = 3.69 cfs @ 12.02 hrs, Volume= 0.215 af, Atten= 2%, Lag= 1.3 min
Primary = 3.69 cfs @ 12.02 hrs, Volume= 0.215 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 413.27' @ 12.02 hrs Surf.Area= 2,697 sf Storage= 1,257 cf

Plug-Flow detention time= 53.4 min calculated for 0.215 af (91% of inflow)
Center-of-Mass det. time= 22.6 min (790.3 - 767.8)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,230 cf Overall x 40.0% Voids
#2	413.00'	3,618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		4,510 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	1,115	0	0
413.00	1,115	2,230	2,230

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
413.00	1,115	0	0
414.00	2,840	1,978	1,978
414.50	3,720	1,640	3,618

Device	Routing	Invert	Outlet Devices
#1	Primary	409.50'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	413.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	414.50'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=3.61 cfs @ 12.02 hrs HW=413.27' (Free Discharge)
↑**1=Culvert** (Passes 3.61 cfs of 5.40 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 3.61 cfs @ 1.69 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=411.00' (Free Discharge)
↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PR-A: AP-A

Inflow Area = 4.690 ac, 36.83% Impervious, Inflow Depth > 0.69" for 1-Yr event
Inflow = 0.98 cfs @ 12.34 hrs, Volume= 0.269 af
Primary = 0.98 cfs @ 12.34 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 201: SC 201 Runoff Area=19,400 sf 26.29% Impervious Runoff Depth>0.95"
Flow Length=903' Slope=0.0200 '/' Tc=17.0 min CN=71 Runoff=0.54 cfs 0.035 af

Subcatchment 202: SC 202 Runoff Area=65,250 sf 27.59% Impervious Runoff Depth>2.19"
Flow Length=567' Slope=0.0200 '/' Tc=14.5 min CN=89 Runoff=4.55 cfs 0.274 af

Subcatchment 203: SC 203 Runoff Area=28,050 sf 100.00% Impervious Runoff Depth>3.02"
Flow Length=200' Tc=6.0 min CN=98 Runoff=3.10 cfs 0.162 af

Subcatchment 204: SC 204 Runoff Area=30,000 sf 80.33% Impervious Runoff Depth>2.46"
Flow Length=1,250' Tc=23.0 min CN=92 Runoff=1.81 cfs 0.141 af

Subcatchment 205: SC 205 Runoff Area=37,700 sf 0.00% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=82 Runoff=2.65 cfs 0.118 af

Subcatchment 206: SC 206 Runoff Area=23,900 sf 0.00% Impervious Runoff Depth>0.50"
Tc=6.0 min CN=61 Runoff=0.47 cfs 0.023 af

Pond 2P: Forebay Peak Elev=411.14' Storage=11,070 cf Inflow=5.64 cfs 0.415 af
Primary=0.81 cfs 0.264 af Secondary=0.00 cfs 0.000 af Outflow=0.81 cfs 0.264 af

Pond 201CP: Underground Storage Peak Elev=414.79' Storage=0.077 af Inflow=3.74 cfs 0.260 af
Outflow=1.48 cfs 0.255 af

Pond 202P: Dry Swale 202 Peak Elev=413.57' Storage=1,805 cf Inflow=6.84 cfs 0.436 af
Primary=5.64 cfs 0.415 af Secondary=0.00 cfs 0.000 af Outflow=5.64 cfs 0.415 af

Link PR-A: AP-A Inflow=2.40 cfs 0.577 af
Primary=2.40 cfs 0.577 af

Total Runoff Area = 4.690 ac Runoff Volume = 0.753 af Average Runoff Depth = 1.93"
63.17% Pervious = 2.963 ac 36.83% Impervious = 1.728 ac

Summary for Subcatchment 201: SC 201

Runoff = 0.54 cfs @ 12.11 hrs, Volume= 0.035 af, Depth> 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
5,100	98	Water Surface, HSG B
14,300	61	>75% Grass cover, Good, HSG B
19,400	71	Weighted Average
14,300		73.71% Pervious Area
5,100		26.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
5.9	803	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
17.0	903	Total			

Summary for Subcatchment 202: SC 202

Runoff = 4.55 cfs @ 12.06 hrs, Volume= 0.274 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
18,000	98	Roofs, HSG B
47,250	85	Gravel roads, HSG B
65,250	89	Weighted Average
47,250		72.41% Pervious Area
18,000		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
3.4	467	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
14.5	567	Total			

Summary for Subcatchment 203: SC 203

Runoff = 3.10 cfs @ 11.96 hrs, Volume= 0.162 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
28,050	98	Paved parking, HSG D
28,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	200		0.56		**Direct Entry, Direct Entry**

Summary for Subcatchment 204: SC 204

Runoff = 1.81 cfs @ 12.15 hrs, Volume= 0.141 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
18,000	98	Unconnected roofs, HSG B
4,400	61	>75% Grass cover, Good, HSG B
6,100	98	Paved parking, HSG B
1,500	85	Gravel roads, HSG B
30,000	92	Weighted Average
5,900		19.67% Pervious Area
24,100		80.33% Impervious Area
18,000		74.69% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0200	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.50"
6.9	1,150	0.0300	2.79		**Shallow Concentrated Flow, Shallow Flow** Unpaved Kv= 16.1 fps
23.0	1,250	Total			

Summary for Subcatchment 205: SC 205

Runoff = 2.65 cfs @ 11.97 hrs, Volume= 0.118 af, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
4,450	61	>75% Grass cover, Good, HSG B
33,250	85	Gravel roads, HSG B
37,700	82	Weighted Average
37,700		100.00% Pervious Area

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

Summary for Subcatchment 206: SC 206

Runoff = 0.47 cfs @ 11.99 hrs, Volume= 0.023 af, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=3.50"

Area (sf)	CN	Description
23,900	61	>75% Grass cover, Good, HSG B
23,900		100.00% Pervious Area

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

Summary for Pond 2P: Forebay

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 2.32" for 10-Yr event
Inflow = 5.64 cfs @ 12.08 hrs, Volume= 0.415 af
Outflow = 0.81 cfs @ 12.61 hrs, Volume= 0.264 af, Atten= 86%, Lag= 31.7 min
Primary = 0.81 cfs @ 12.61 hrs, Volume= 0.264 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 411.14' @ 12.61 hrs Surf.Area= 6,139 sf Storage= 11,070 cf

Plug-Flow detention time= 216.6 min calculated for 0.264 af (64% of inflow)
Center-of-Mass det. time= 150.0 min (925.5 - 775.5)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	16,725 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	4,250	0	0
410.00	5,100	4,675	4,675
411.00	6,000	5,550	10,225
412.00	7,000	6,500	16,725

Device	Routing	Invert	Outlet Devices
#1	Primary	411.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir X 0.40** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Secondary	412.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

#3	Primary	409.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

Primary OutFlow Max=0.81 cfs @ 12.61 hrs HW=411.14' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 0.36 fps)
└**3=Culvert** (Inlet Controls 0.40 cfs @ 4.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=409.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 201CP: Underground Storage

Inflow Area = 1.554 ac, 35.60% Impervious, Inflow Depth > 2.00" for 10-Yr event
Inflow = 3.74 cfs @ 11.99 hrs, Volume= 0.260 af
Outflow = 1.48 cfs @ 12.34 hrs, Volume= 0.255 af, Atten= 60%, Lag= 20.8 min
Primary = 1.48 cfs @ 12.34 hrs, Volume= 0.255 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 414.79' @ 12.34 hrs Surf.Area= 0.066 ac Storage= 0.077 af

Plug-Flow detention time= 36.9 min calculated for 0.255 af (98% of inflow)
Center-of-Mass det. time= 29.7 min (807.5 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	413.00'	0.091 af	**37.17'W x 77.48'L x 5.50'H Field A** 0.364 af Overall - 0.135 af Embedded = 0.228 af x 40.0% Voids
#2A	413.75'	0.135 af	**Lane StormKeeper SK180** x 50 Inside #1 Effective Size= 70.5"W x 45.0"H => 15.97 sf x 7.11'L = 113.5 cf Overall Size= 78.0"W x 45.5"H x 7.39'L with 0.28' Overlap 5 Rows of 10 Chambers Cap Storage= +22.3 cf x 2 x 5 rows = 223.0 cf
		0.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 413.00' / 411.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	414.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 414.00' / 412.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.48 cfs @ 12.34 hrs HW=414.79' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.93 cfs @ 4.72 fps)
└**2=Culvert** (Inlet Controls 0.55 cfs @ 2.80 fps)

Summary for Pond 202P: Dry Swale 202

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 2.44" for 10-Yr event
Inflow = 6.84 cfs @ 12.00 hrs, Volume= 0.436 af
Outflow = 5.64 cfs @ 12.08 hrs, Volume= 0.415 af, Atten= 18%, Lag= 4.6 min
Primary = 5.64 cfs @ 12.08 hrs, Volume= 0.415 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 413.57' @ 12.08 hrs Surf.Area= 3,211 sf Storage= 1,805 cf

Plug-Flow detention time= 35.8 min calculated for 0.415 af (95% of inflow)
Center-of-Mass det. time= 16.8 min (775.5 - 758.7)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,230 cf Overall x 40.0% Voids
#2	413.00'	3,618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		4,510 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	1,115	0	0
413.00	1,115	2,230	2,230

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
413.00	1,115	0	0
414.00	2,840	1,978	1,978
414.50	3,720	1,640	3,618

Device	Routing	Invert	Outlet Devices
#1	Primary	409.50'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	413.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	414.50'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=5.63 cfs @ 12.08 hrs HW=413.56' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.63 cfs @ 7.17 fps)
└**2=Orifice/Grate** (Passes 5.63 cfs of 10.87 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=411.01' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PR-A: AP-A

Inflow Area = 4.690 ac, 36.83% Impervious, Inflow Depth > 1.48" for 10-Yr event
Inflow = 2.40 cfs @ 12.45 hrs, Volume= 0.577 af
Primary = 2.40 cfs @ 12.45 hrs, Volume= 0.577 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 201: SC 201 Runoff Area=19,400 sf 26.29% Impervious Runoff Depth>2.80"
Flow Length=903' Slope=0.0200 '/' Tc=17.0 min CN=71 Runoff=1.64 cfs 0.104 af

Subcatchment 202: SC 202 Runoff Area=65,250 sf 27.59% Impervious Runoff Depth>4.61"
Flow Length=567' Slope=0.0200 '/' Tc=14.5 min CN=89 Runoff=9.17 cfs 0.575 af

Subcatchment 203: SC 203 Runoff Area=28,050 sf 100.00% Impervious Runoff Depth>5.44"
Flow Length=200' Tc=6.0 min CN=98 Runoff=5.53 cfs 0.292 af

Subcatchment 204: SC 204 Runoff Area=30,000 sf 80.33% Impervious Runoff Depth>4.91"
Flow Length=1,250' Tc=23.0 min CN=92 Runoff=3.50 cfs 0.282 af

Subcatchment 205: SC 205 Runoff Area=37,700 sf 0.00% Impervious Runoff Depth>3.88"
Tc=6.0 min CN=82 Runoff=6.02 cfs 0.280 af

Subcatchment 206: SC 206 Runoff Area=23,900 sf 0.00% Impervious Runoff Depth>1.93"
Tc=6.0 min CN=61 Runoff=2.03 cfs 0.088 af

Pond 2P: Forebay Peak Elev=411.76' Storage=15,044 cf Inflow=13.16 cfs 0.845 af
Primary=6.14 cfs 0.650 af Secondary=0.00 cfs 0.000 af Outflow=6.14 cfs 0.650 af

Pond 201CP: Underground Storage Peak Elev=416.91' Storage=0.181 af Inflow=8.11 cfs 0.562 af
Outflow=2.64 cfs 0.555 af

Pond 202P: Dry Swale 202 Peak Elev=414.99' Storage=4,510 cf Inflow=13.25 cfs 0.867 af
Primary=6.67 cfs 0.798 af Secondary=6.50 cfs 0.048 af Outflow=13.16 cfs 0.845 af

Link PR-A: AP-A Inflow=10.15 cfs 1.397 af
Primary=10.15 cfs 1.397 af

Total Runoff Area = 4.690 ac Runoff Volume = 1.620 af Average Runoff Depth = 4.15"
63.17% Pervious = 2.963 ac 36.83% Impervious = 1.728 ac

Summary for Subcatchment 201: SC 201

Runoff = 1.64 cfs @ 12.10 hrs, Volume= 0.104 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
5,100	98	Water Surface, HSG B
14,300	61	>75% Grass cover, Good, HSG B
19,400	71	Weighted Average
14,300		73.71% Pervious Area
5,100		26.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
5.9	803	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
17.0	903	Total			

Summary for Subcatchment 202: SC 202

Runoff = 9.17 cfs @ 12.06 hrs, Volume= 0.575 af, Depth> 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
18,000	98	Roofs, HSG B
47,250	85	Gravel roads, HSG B
65,250	89	Weighted Average
47,250		72.41% Pervious Area
18,000		27.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
3.4	467	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc Flow** Unpaved Kv= 16.1 fps
14.5	567	Total			

Summary for Subcatchment 203: SC 203

Runoff = 5.53 cfs @ 11.96 hrs, Volume= 0.292 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
28,050	98	Paved parking, HSG D
28,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	200		0.56		**Direct Entry, Direct Entry**

Summary for Subcatchment 204: SC 204

Runoff = 3.50 cfs @ 12.15 hrs, Volume= 0.282 af, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
18,000	98	Unconnected roofs, HSG B
4,400	61	>75% Grass cover, Good, HSG B
6,100	98	Paved parking, HSG B
1,500	85	Gravel roads, HSG B
30,000	92	Weighted Average
5,900		19.67% Pervious Area
24,100		80.33% Impervious Area
18,000		74.69% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	100	0.0200	0.10		**Sheet Flow, Sheet Flow** Grass: Dense n= 0.240 P2= 2.50"
6.9	1,150	0.0300	2.79		**Shallow Concentrated Flow, Shallow Flow** Unpaved Kv= 16.1 fps
23.0	1,250	Total			

Summary for Subcatchment 205: SC 205

Runoff = 6.02 cfs @ 11.97 hrs, Volume= 0.280 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
4,450	61	>75% Grass cover, Good, HSG B
33,250	85	Gravel roads, HSG B
37,700	82	Weighted Average
37,700		100.00% Pervious Area

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

Summary for Subcatchment 206: SC 206

Runoff = 2.03 cfs @ 11.98 hrs, Volume= 0.088 af, Depth> 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=6.19"

Area (sf)	CN	Description
23,900	61	>75% Grass cover, Good, HSG B
23,900		100.00% Pervious Area

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

Summary for Pond 2P: Forebay

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 4.74" for 100-Yr event
Inflow = 13.16 cfs @ 12.06 hrs, Volume= 0.845 af
Outflow = 6.14 cfs @ 12.32 hrs, Volume= 0.650 af, Atten= 53%, Lag= 15.8 min
Primary = 6.14 cfs @ 12.32 hrs, Volume= 0.650 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 411.76' @ 12.32 hrs Surf.Area= 6,756 sf Storage= 15,044 cf

Plug-Flow detention time= 125.9 min calculated for 0.648 af (77% of inflow)
Center-of-Mass det. time= 71.1 min (832.0 - 760.9)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	16,725 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	4,250	0	0
410.00	5,100	4,675	4,675
411.00	6,000	5,550	10,225
412.00	7,000	6,500	16,725

Device	Routing	Invert	Outlet Devices
#1	Primary	411.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir X 0.40** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Secondary	412.00'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00

2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64
2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

#3	Primary	409.50'	**4.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf

Primary OutFlow Max=6.13 cfs @ 12.32 hrs HW=411.76' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.65 cfs @ 0.94 fps)
└**3=Culvert** (Inlet Controls 0.48 cfs @ 5.49 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=409.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 201CP: Underground Storage

Inflow Area = 1.554 ac, 35.60% Impervious, Inflow Depth > 4.34" for 100-Yr event
Inflow = 8.11 cfs @ 11.98 hrs, Volume= 0.562 af
Outflow = 2.64 cfs @ 12.36 hrs, Volume= 0.555 af, Atten= 67%, Lag= 22.6 min
Primary = 2.64 cfs @ 12.36 hrs, Volume= 0.555 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 416.91' @ 12.36 hrs Surf.Area= 0.066 ac Storage= 0.181 af

Plug-Flow detention time= 39.5 min calculated for 0.553 af (98% of inflow)
Center-of-Mass det. time= 34.5 min (796.7 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	413.00'	0.091 af	**37.17'W x 77.48'L x 5.50'H Field A** 0.364 af Overall - 0.135 af Embedded = 0.228 af x 40.0% Voids
#2A	413.75'	0.135 af	**Lane StormKeeper SK180** x 50 Inside #1 Effective Size= 70.5"W x 45.0"H => 15.97 sf x 7.11'L = 113.5 cf Overall Size= 78.0"W x 45.5"H x 7.39'L with 0.28' Overlap 5 Rows of 10 Chambers Cap Storage= +22.3 cf x 2 x 5 rows = 223.0 cf
		0.227 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	413.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 413.00' / 411.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Primary	414.00'	**6.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 414.00' / 412.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=2.64 cfs @ 12.36 hrs HW=416.90' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.43 cfs @ 7.27 fps)
└**2=Culvert** (Inlet Controls 1.22 cfs @ 6.19 fps)

Summary for Pond 202P: Dry Swale 202

Inflow Area = 2.142 ac, 49.36% Impervious, Inflow Depth > 4.86" for 100-Yr event
Inflow = 13.25 cfs @ 12.00 hrs, Volume= 0.867 af
Outflow = 13.16 cfs @ 12.06 hrs, Volume= 0.845 af, Atten= 1%, Lag= 3.2 min
Primary = 6.67 cfs @ 12.06 hrs, Volume= 0.798 af
Secondary = 6.50 cfs @ 12.06 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 414.99' @ 12.06 hrs Surf.Area= 4,835 sf Storage= 4,510 cf

Plug-Flow detention time= 23.3 min calculated for 0.845 af (98% of inflow)
Center-of-Mass det. time= 12.8 min (760.9 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	892 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) 2,230 cf Overall x 40.0% Voids
#2	413.00'	3,618 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)
		4,510 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	1,115	0	0
413.00	1,115	2,230	2,230

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
413.00	1,115	0	0
414.00	2,840	1,978	1,978
414.50	3,720	1,640	3,618

Device	Routing	Invert	Outlet Devices
#1	Primary	409.50'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 409.50' / 409.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	413.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	414.50'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=6.61 cfs @ 12.06 hrs HW=414.91' (Free Discharge)
└**1=Culvert** (Inlet Controls 6.61 cfs @ 8.42 fps)
└**2=Orifice/Grate** (Passes 6.61 cfs of 26.60 cfs potential flow)

Secondary OutFlow Max=5.79 cfs @ 12.06 hrs HW=414.93' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 5.79 cfs @ 1.68 fps)

Summary for Link PR-A: AP-A

Inflow Area = 4.690 ac, 36.83% Impervious, Inflow Depth > 3.58" for 100-Yr event
Inflow = 10.15 cfs @ 12.20 hrs, Volume= 1.397 af
Primary = 10.15 cfs @ 12.20 hrs, Volume= 1.397 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Appendix I

Water Quality Worksheets

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1	
P=	1.10	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	0.55	0.00	0%	0.05	110	No Impervious
2	1.50	1.50	100%	0.95	5,690	Dry Swale
3	0.64	0.64	100%	0.95	2,428	Dry Swale
4	0.69	0.59	86%	0.82	2,258	Underground Storage
5	0.86	0.76	88%	0.85	2,903	Underground Storage
6	0.44	0.00	0%	0.05	88	No Impervious
7						
8						
9						
10						
Subtotal (1-30)	4.68	3.49	75%	0.72	**13,476**	**Subtotal 1**
Total	4.68	3.49	75%	0.72	**13,476**	**Initial WQv**

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**0.00**	**0.00**	

Recalculate WQv after application of Area Reduction Techniques

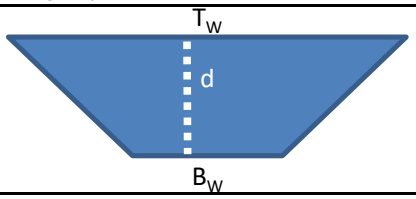
	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
"<<Initial WQv"	4.68	3.49	75%	0.72	13,476
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**4.68**	**3.49**	75%	0.72	13,476
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	4.68	3.49	75%	0.72	**13,476**
WQv reduced by Area Reduction techniques					0

Dry Swale Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	1.50	1.50	1.00	0.95	5690.03	1.10	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	100%	0.95	5,690	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	569	ft^3	Check Dam

Calculate Available Storage Capacity			
Bottom Width	5	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	4	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	1%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	2	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	21	*ft*	
Area	26.00	*sf*	
Minimum Length	197	*ft*	
Actual Length	270	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	7,589	ft^3	
Soil Group (HSG)		B	

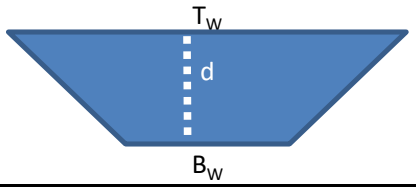
Runoff Reduction				
Is the Dry Swale contributing flow to another practice?			No	Select Practice
RRv	**3,036**	ft^3	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**	
Volume Treated	2,654	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale	
Volume Directed	0	ft^3	This volume is directed another practice	

Dry Swale Worksheet

Design Point:	1

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
3	0.64	0.64	1.00	0.95	2427.74	1.10	Dry Swale
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	100%	0.95	2,428	<<WQv after adjusting for Disconnected Rooftops	

Pretreatment Provided			Pretreatment Technique
Pretreatment (10% of WQv)	243	ft^3	Check Dam

Calculate Available Storage Capacity			
Bottom Width	5	*ft*	Design with a bottom width no greater than eight feet to avoid potential gullying and channel braiding, but no less than two feet
Side Slope (X:1)	3	*Okay*	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope
Longitudinal Slope	1%	*Okay*	*Maximum longitudinal slope shall be 4%*
Flow Depth	2	*ft*	*Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Top Width	17	*ft*	
Area	22.00	*sf*	
Minimum Length	99	*ft*	
Actual Length	270	*ft*	
End Point Depth check	1.50	*Okay*	*A maximum depth of 18" at the end point of the channel (for storage of the WQv)*
Storage Capacity	6,183	ft^3	
Soil Group (HSG)		B	

Runoff Reduction					
Is the Dry Swale contributing flow to another practice?			Yes	Select Practice	Other/Standard SMP
RRv	**2,428**	***ft^3***	**Runnoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv**		
Volume Treated	0	ft^3	This is the difference between the WQv calculated and the runoff reduction achieved in the swale		
Volume Directed	0	ft^3	This volume is directed another practice		

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	0.14	55%
B	4.54	40%
C		30%
D		20%
Total Area	4.68	
Calculate the Minimum RRv		
S =	**0.40**	
Impervious =	3.49	*acre*
Precipitation	1.1	*in*
Rv	0.95	
Minimum RRv	**5,355**	***ft3***
	0.12	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	13476	*0.309*
30	Total RRV Provided	5463	*0.125*
31	Is RRv Provided ≥WQv Required?	No	
32	Minimum RRv	5355	*0.123*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	8118	*0.186*
34	Sum of Volume Reduced & Treated	13582	*0.312*
34	Sum of Volume Reduced and Treated	13582	*0.312*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?	*Yes*	Plan Completed

STORMKEEPER™
STORMWATER CHAMBER

StormKeeper SK180

The StormKeeper family of products are the highest quality and structurally sound stormwater chambers available on the market. The StormKeeper family of chambers are designed utilizing the most sophisticated and comprehensive techniques to meet the stringent AASHTO LRFD and ASTM requirements. Intended for use under traffic and nontraffic areas, StormKeeper provides a truly cost-effective and structurally superior system to provide underground stormwater storage saving valuable land and protecting the environment.

StormKeeper SK180

Nominal Dimensions

Size (L x W x H)	88.7" x 77.8" x 45.5"
Chamber Storage	113.6 cf
Min. Installed Storage	180.0 cf
Weight	127 lbs

StormKeeper SK180 End Caps

Nominal Dimensions

Size (L x W x H)	23.99" x 78.5" x 44.71"
End Cap Storage	15.3 cf
Min. Installed Storage	53.9 cf
Weight	52 lbs

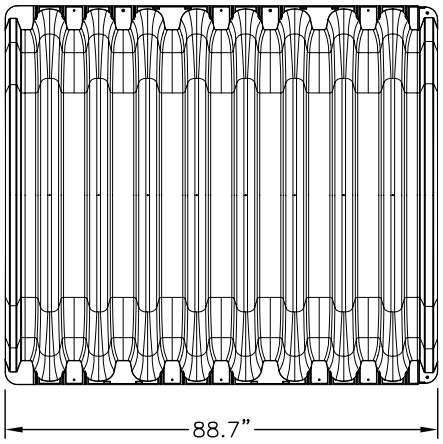
Shipping

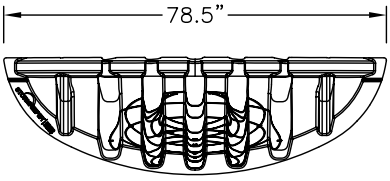
Nominal Dimensions

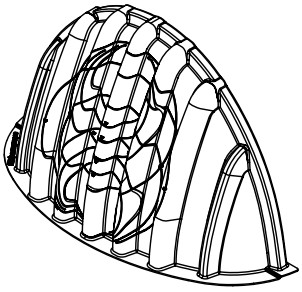
17 chambers per pallet

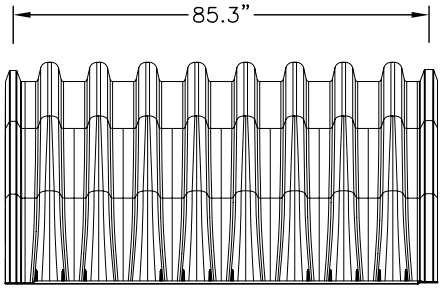
12 end caps per pallet

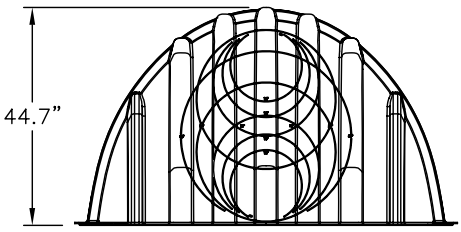
8 pallets per truck

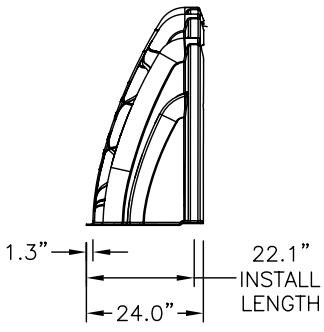












StormKeeper SK180

Volume of Excavation Required Per Chamber/End Cap

	Stone Bedding Depth			
	9"	12"	15"	18"
StormKeeper SK180	12.3 cy	12.8 cy	13.3 cy	13.7 cy
StormKeeper SK180 End Cap	4.9 cy	5.1 cy	5.3 cy	5.5 cy

Assumes 8" of separation between chamber rows, 12" of perimeter in front of end caps, and 24" of cover minimum. Should depth of cover exceed 24" the volume of excavation will increase accordingly.

Storage Volume Per Chamber/End Cap

	Chamber Volume Only	Chamber and Stone Volume Stone Bedding Depths			
		9"	12"	15"	18"
StormKeeper SK180	113.6 cf	180.0 cf	185.0 cf	190.1 cf	195.2 cf
StormKeeper SK180 End Cap	15.3 cf	53.9 cf	55.9 cf	57.9 cf	60.0 cf

Assumes 11.5" of stone above chambers, 8" of stone between chambers and 40% stone porosity. End cap volume assumes 12" of perimeter stone.

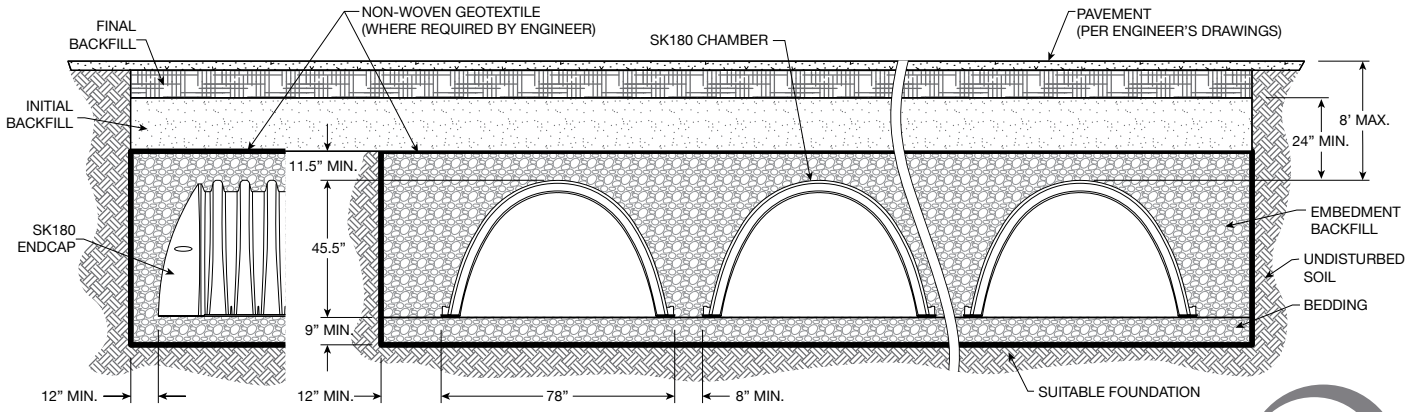
Amount of Stone Per Chamber/End Cap

	Stone Bedding Depth			
	9"	12"	15"	18"
StormKeeper SK180	6.1 cy	6.6 cy	7.1 cy	7.6 cy
StormKeeper SK180 End Cap	3.6 cy	3.8 cy	3.9 cy	4.1 cy

Assumes 11.5" of stone above, 8" row spacing, and 12" of perimeter stone in front of the end caps.

Stage vs. Storage for StormKeeper SK180

Depth (in)	Chamber Volume (cf)	Installed Volume (cf)	Depth (in)	Chamber Volume (cf)	Installed Volume (cf)
0	0.00	0.00	34	79.47	105.28
1	0.00	1.69	35	82.14	108.58
2	0.00	3.39	36	84.74	111.83
3	0.00	5.08	37	87.28	115.05
4	0.00	6.78	38	89.76	118.23
5	0.00	8.47	39	92.16	121.37
6	0.00	10.16	40	94.50	124.47
7	0.00	11.86	41	96.75	127.51
8	0.00	13.55	42	98.93	130.51
9	0.00	15.25	43	101.01	133.45
10	3.55	19.07	44	103.00	136.34
11	7.06	22.87	45	104.87	139.16
12	10.55	26.66	46	106.63	141.91
13	14.01	30.43	47	108.25	144.58
14	17.45	34.19	48	109.71	147.15
15	20.85	37.92	49	110.98	149.60
16	24.23	41.64	50	112.01	151.91
17	27.58	45.35	51	112.63	153.98
18	30.90	49.03	52	113.08	155.94
19	34.19	52.70	53	113.39	157.82
20	37.45	56.35	54	113.57	159.63
21	40.68	59.99	55	113.57	161.32
22	43.89	63.61	56	113.57	163.01
23	47.06	67.20	57	113.57	164.71
24	50.19	70.77	58	113.57	166.40
25	53.30	74.33	59	113.57	168.10
26	56.37	77.87	60	113.57	169.79
27	59.41	81.39	61	113.57	171.49
28	62.40	84.88	62	113.57	173.18
29	65.37	88.35	63	113.57	174.87
30	68.29	91.80	64	113.57	176.57
31	71.16	95.21	65	113.57	178.26
32	73.98	98.60	66	113.57	179.96
33	76.75	101.96			



MANUFACTURER'S WARRANTY

Lane ensures, certifies and documents that SK180 StormKeeper Stormwater Chambers shipped to the job site meets the above claims and standards, and warranties the product is free of any material or workmanship defects.

Lane Enterprises, Inc.
3905 Hartzdale Drive, Suite 514
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P: 717.761.8175 • F: 717.761.5055
lane-enterprises.com/StormKeeper

Appendix J

Project Plan Sheets

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(See Site Plan Set)