Stormwater
Pollution Prevention Plan

Carmax Auto Superstores, Inc.

Proposed Motor Vehicle Sales
Establishment Redevelopment

1105-1115 Route 9
Town of Wappinger
Dutchess County, NY

September 30, 2022
Revised: February 6, 2023

Prepared by:

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VICINITY MAP

SCALE: NONE

CARMAX AUTO SUPERSTORES, INC.

1105-1115 US ROUTE 9
TOWN OF WAPPINGER
DUTCHESS COUNTY
STATE OF NEW YORK

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I. Introduction

Carmax Auto Superstores, Inc. is proposing to construct a new 7,700+/- square foot building containing a sales, service, and presentation area. Along with associated parking, vehicle storage, access drive, and utilities on a 7.5 +/- acre parcel of land located at 1105-1115 US Route 9, in the Town of Wappinger, Dutchess County, New York.

The 7.5 +/- acre parcel of land located along US Route 9 has been depicted on the site plans prepared by Bohler Engineering and Landscape Architecture, NY PLLC, included as part of this report.

This report will address the required components for a Stormwater Pollution Prevention Plan (SWPPP) as specified by the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-20-001.

II. Background Information

A. Existing Conditions

The 7.5 +/- acre parcel is currently developed with an existing 1-story building, 2-story building, and open greenhouse areas. Ground cover consists of impervious surfaces from buildings, associated parking areas, drive aisles and former landscape display areas. Additionally, the site contains existing greenspace, with a small, wooded area.

The topography of the site is split with a portion of the site sloped towards the east with stormwater flowing towards US Route 9. The remainder of the site is sloped towards the southern boundary of the site, with stormwater makings its way towards the south east corner of the lot.

The land uses in the immediate vicinity of the site consist of residential and commercial properties.

B. Proposed Conditions

The scope of the project includes the construction of a new 7,700+/- square foot building containing a sales, service, and presentation area with associated paved areas and utilities. Two access drives are proposed along Smithtown Road. The remaining areas will be open greenspace and undisturbed woodland areas. The stormwater will be directed to mimic existing stormwater flow paths. The surrounding topography will remain as it currently exists. All trash generated onsite will be stored inside a metal dumpster within an enclosure area. Trash will be removed from the site on a regular basis.

Carmax Auto Superstores, Inc will be responsible for all construction activities, post construction operations and maintenance of the system and all responsibilities specified in the SWPPP.

New parking, landscaping, lighting, utility improvements, stormwater management facilities and other miscellaneous site improvement are proposed as shown on the enclosed Site Development Plans prepared by Bohler Engineering and Landscape Architecture NY, PLLC.

III. Construction Drawings:

Included in this report are the following drawings:

- **Site Survey** – Existing condition for the parcel including all required existing information (watercourses, topography, vegetation, utilities, property boundaries, etc.).
- **Site Plan** – Comprehensive plan of all proposed improvements
- **Grading and Drainage Plan** – Plan illustrates existing and proposed slopes, proposed stormwater quantity and quality mitigation measures and limits of disturbance.
- **Utility Plan** – Plan includes detailed design information for the installation of all proposed utilities resulting in the disturbance of soil for this project.
- **Erosion and Sediment Control Plan** – Erosion and sediment control measures to be in place and inspected, prior to commencement of construction. The proposed measures were designed in accordance with the New York Guidelines for Urban Erosion and Sediment Control. Proposed measures include inlet protection, silt fence along the project perimeter, temporary stone outlet sediment traps, stabilized construction entrance and construction sequencing.
- **Landscaping Plan** – Included are all proposed landscaping for the project.

IV. Soil Description:

Data supplied by the USDA Natural Resources Conservation Service (NRCS) indicates that site soils are classified as DwB – Dutchess- Cardigan complex, undulating rocky, classified as Hydrologic Soil Group B and Ur – Urban Lands, without a Hydrologic Soil Group classification.

Soils were modelled as HSG B and verified with a Geotechnical Engineering Report, prepared by Intertek PSI, dated April 27, 2021. The Geotechnical Engineering Report and NRCS soil data can be found in the Stormwater Management Report included in the appendices.

V. Construction Phasing:

Construction sequencing, limits of clearing and grading, utility and infrastructure installation and all other associated activities resulting in soil disturbance are detailed on the Erosion and Sediment Control, Grading and Drainage and Utility Plans.

VI. Pollution Prevention Measures:

Pollution Prevention measures during construction are detailed on the SWPPP / Erosion and Sediment Control Plan. Construction waste will be disposed in on-site construction dumpsters immediately. The dumpsters shall be located such that any stormwater run-off will be directed to a sediment trap. Any materials or chemicals considered to be hazardous shall be covered or stored in construction trailers to ensure no discharge to stormwater will occur.

VII. Soil Stabilization Measures:

Initial clearing and grading will commence once the proposed erosion and sediment control practices are in place as detailed on the erosion and sediment control plan and approved by the SWPPP Monitoring Professional. All grading and excavation will be conducted such that associated stormwater run-off is directed to the temporary sediment trap. The trap will be abandoned when the drainage structures are in place with proper inlet protection installed and all disturbed areas are stabilized.

VIII. Erosion and Sediment Control Practices:

Specific types, sizes, lengths and dimensions for all erosion control practices and sizing for temporary sediment basins are detailed on the Erosion and Sediment Control Plan and Detail Sheet. All temporary erosion control practices shall be in place prior to construction and shall remain until the limits of disturbed areas are stabilized.

IX. Maintenance Schedule:

Maintenance of the proposed erosion and sediment control practices are detailed on the Erosion and Sediment Control Plan. Included in this report are Construction Inspection and Operations and Maintenance Checklists. The operator is ultimately responsible for inspection and maintenance during construction. Stabilization must be achieved prior to removal of temporary erosion and sediment control devices and filing of the NYSDEC Notice of Termination (NOT). The SWPPP Monitoring Professional must inspect and approve final stabilization prior to filing of the NOT. Following the NOT filing, which terminates permit coverage, the Property Owner or any subsequent owner shall follow the guidelines set forth in this report and will be responsible for operations and maintenance over the lifetime of the facility.

Carmax Auto Superstores, Inc will be responsible for all maintenance of the system and all responsibilities specified in the SWPPP.

X. Receiving Waters:

The proposed drainage system is designed to treat and release storm water below the pre-development flow rate for all subject storm events. Storm water discharges out of the development area and eventually to an unnamed tributary of Farrell Brook, located off-site to the northeast. The subject parcel is located within Zone X, outside the 0.2% annual chance floodplain according to FEMA's Flood Map Service Center.

XI. SWPPP Implementation:

Carmax Auto Superstores, Inc. as the operator, shall have each contractor and sub-contractors identify at least one (1) person responsible for SWPPP Implementation. This person must be trained and certified by the NYSDEC as stated on Page 12, Part III.A.6 of the NYSDEC General Permit GP-0-20-001 included in the appendix of this report. Carmax Auto Superstores, Inc. as the operator, shall designate an inspector meeting the qualifications as set forth on page 18, Part IV of the General Permit. The inspector shall be responsible for the construction phase of the project and the implementation of the pollution prevention measures set forth in this report. The designated individual shall have a complete understanding of all components of the stormwater management system. Delineation of SWPPP implementation responsibilities for the construction phase of the project are detailed in the Erosion and Sediment Control Plan. The plan details structural practices proposed to divert flows from exposed soils, store flows, and limit run-off and discharge of pollutants from exposed areas of the site during construction. Carmax Auto Superstores, Inc. shall also designate a qualified representative for the post development inspection and monitoring. The inspector shall follow the guidelines of the Operations and Maintenance Checklists included in this report. The inspector shall keep a continuous record of all inspection checklists, maintenance and repairs and shall make them available to the Town and The NYSDEC at their request.

XII. Stormwater Run-off Characteristics:

Existing and proposed data describing stormwater run-off characteristics are included in the Stormwater Management Report, prepared by Bohler Engineering. This report is included in the Appendix.

XIII. Archeological Sensitive Area

The Cultural Resource Information Systems Mapping shows the subject site is not located within an archeological sensitive area.

XIV. Construction Activities Meeting Conditions in Table 2 of Appendix B

This project includes construction activities that involve soil disturbances of one (1) or more acres of land and meets the criteria under Table 2 described in the permit section referenced above. Therefore, the following information is provided:

1. Descriptions of each post-construction stormwater control practice are included in the Stormwater Management Report and are detailed on the Grading and Drainage Plan included in the Appendix of this report.
2. Hydrologic and hydraulic analysis for all structural components of the stormwater control system for all applicable design storms are included in the Stormwater Management Report.
3. Comparison of pre and post development stormwater run-off conditions is included in the Stormwater Management Report.
4. Dimensions, materials and installation details for all post construction stormwater control practices are specified on the enclosed Grading and Drainage Plan.
5. A maintenance schedule is detailed on the Erosion and Sediment Control Plan and in the Operations and Maintenance Checklists included in this report.

XV. SWPPP Development – 6 Step Process:

1. Site Planning - Green Infrastructure
2. WQv Determination
3. Apply GI Practices and Standard SMP’s with RRv Capacity
4. Determine minimum RRv
5. Apply Standard SMP’s to address remaining WQv, if required
6. Apply volume and peak control

1. Site Planning – Green Infrastructure:

A. Preservation of Natural Resources:

1. Preservation of Undisturbed Areas

Construction and/or silt fence shall be constructed along the perimeter of the limits of disturbance of the site. The operator and contractors shall be instructed not to disturb any soil of vegetation beyond the limits of construction as noted on the plans. The size of the site and undisturbed area does not justify the delineation of permanent conservation easements.

2. Preservation of Buffers

Existing wetland buffers as listed within the Town code are not being disturbed for this project.

3. Reduction of Clearing and Grading

The limits of clearing and grading have been proposed at a minimum needed to construct the proposed facility.

4. Locating Development in Less Sensitive Areas

The proposed development will not result in adverse impact to sensitive resource areas such as floodplains, steep slopes, erodible soils, wetlands, mature forests and critical habitats.

5. Open Space Design

The proposed layout of this facility has been designed as conservatively as practical to reduce impervious coverage, preserve open space and protect water resources, while maintaining adequate space for access, parking and building area needed for the proposed use.

6. Soil Restoration / Preservation

The majority of the green space within the limits of disturbance will consist of the proposed stormwater management area as well as the proposed septic area. The original properties and porosity of the soil will be maintained within the limits of the basins by surrounding this area with construction fence to ensure no heavy equipment is allowed in this area. This will enhance the runoff reduction performance of practice and thus reduce the generation of runoff.

B. Reduction of Impervious Cover

1. Roadway Reduction

Roadway reduction is not applicable to this project.

2. Sidewalk Reduction

Sidewalk reduction is not applicable to this project.

3. Driveway Reduction

The access drives have been designed at a minimum width and length to provide safe access through the site.

4. Cul-de-sac Reduction

Cul-de-sac reduction is not applicable to this project.

5. Building Footprint Reduction

The building footprint has been designed at a minimum footprint to meet the needs of the intended use.

6. Parking Reduction

The parking areas have been designed to provide the minimum number of spaces needed for the intended use.

2. Determining Water Quality Volume:

The Water Quality Volume (WQv) has been calculated and is shown in the details section of the Storm Water Management Report.

3. Runoff Reduction:

The Runoff Reduction Volume (RRv) Criteria has been satisfied by providing the required minimum RRv in the proposed bioretention system which is outlined in the Stormwater Management Report.

4. Minimum RRv:

The minimum Runoff Reduction Volume (RRv) Criteria has been satisfied by providing stormwater treatment through a standard practice with RRv as detailed in the Stormwater Management Report.

5. Apply SMP's to address remaining WQv:

The remainder of the WQv has been treated in a standard practice as detailed in the Stormwater Management Report.

6. Apply volume and peak rate control practices:

Additional volume and peak rate controls are provided by the proposed detention basin.

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70

of the Environmental Conservation Law

Effective Date: January 29, 2020 Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator

1-23-20

Authorized Signature Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act (“CWA”), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System (“NPDES”)* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of “*construction activity*”, as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

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Part 1. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* (“SWPPP”) the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharges*;

   (ii) Control stormwater *discharge*s, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain *natural buffer*s around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and

   (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from *dewatering* activities, including *discharge*s from *dewatering* of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

   (i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

   (ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

   (iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharge*s.** The following *discharge*s are prohibited:

   (i) Wastewater from washout of concrete;

   (ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (“Cpv”): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
  (1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
  (2) The site discharges directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (“Qp”): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
  (1) the site discharges directly to tidal waters or fifth order or larger streams, or
  (2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (“Qf”): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
  (1) the site discharges directly to tidal waters or fifth order or larger streams, or
  (2) A downstream analysis reveals that *overbank* control is not required.

b. ***Sizing Criteria*** **for** ***New Development*** **in Enhanced Phosphorus Removal Watershed**

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) *Overbank* Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or

(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or

(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or

(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) *Overbank* Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: "Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned"; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharge*s from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

    a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

    b. Which are undertaken on land with no existing *impervious cover*; and

    c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

7. *Construction activities* for linear transportation projects and linear utility projects:

    a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

    b. Which are undertaken on land with no existing *impervious cover*; and

    c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

    a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

        - 1-5 acres of disturbance - 20 feet
        - 5-20 acres of disturbance - 50 feet
        - 20+ acres of disturbance - 100 feet, or

    b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
        (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP’s agreement with the resolution; or
        (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
        (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
        (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

    c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

  - (i) No Affect
  - (ii) No Adverse Affect
  - (iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the “MS4 SWPPP Acceptance” form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.

3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4* . This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

c. the final SWPPP has been prepared, and

d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

    a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

        (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

        (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

        (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor's or subcontractor's certification statement (see Part III.A.6.), 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.

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 Department or, in areas under the jurisdiction of a *regulated, traditional land* *use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..

5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of *a construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4,* the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.

2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:

   a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*;

c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority; and

d. to document the final construction conditions.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   > "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. A Stormwater Modeling and Analysis Report that includes:
   (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

   (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

   (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

   (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

   (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

   (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- New York State Erosion and Sediment Control Certificate Program holder
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

    a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

   c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* <u>and</u> all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and 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*.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This shall include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; <u>and</u> all areas of disturbance have achieved *final stabilization*; <u>and</u> all temporary, structural erosion and sediment control measures have been removed; <u>and</u> all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; <u>and</u> all areas disturbed as of the project shutdown date have achieved *final stabilization*; <u>and</u> all temporary, structural erosion and sediment control measures have been removed; <u>and</u> all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.

d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

   It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner’s or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property –means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "*Construction Activity(ies)*" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for "*Commence (Commencement of) Construction Activities"* and "*Larger Common Plan of Development or Sale" also.*

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or *point source*.

Embankment –means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department’s rules and regulations for definition of terms and requirements.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a *combined sewer*; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

Natural Buffer –means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank* Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint source*s. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint source*s, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1

Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other *agricultural building*, silo, stock yard or pen.

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Pond construction
- Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover
- Cross-country ski trails and walking/hiking trails
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State”, excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River **-** Figure 1
- Onondaga Lake Watershed **-** Figure 2
- Greenwood Lake Watershed **-**Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

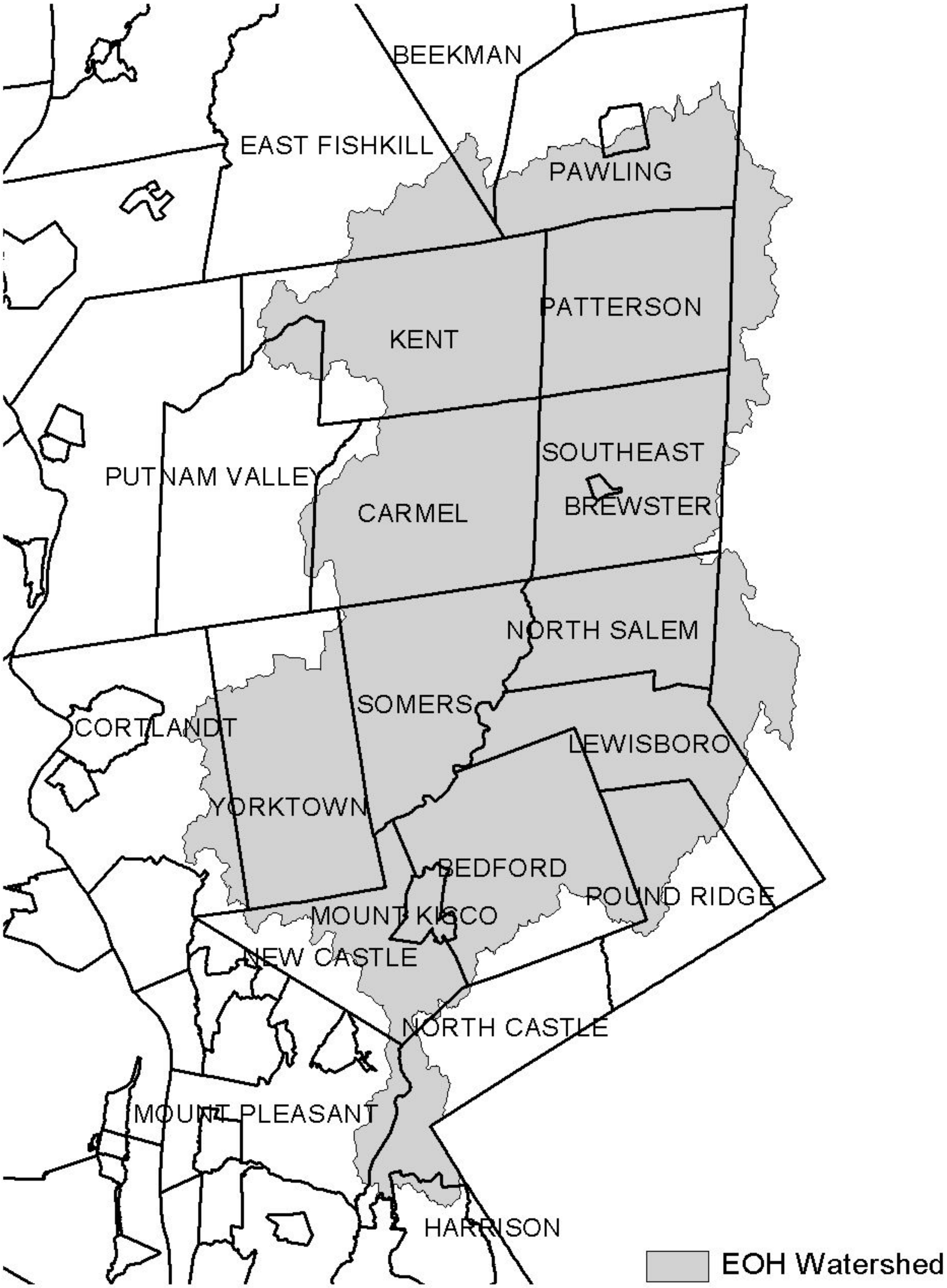


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

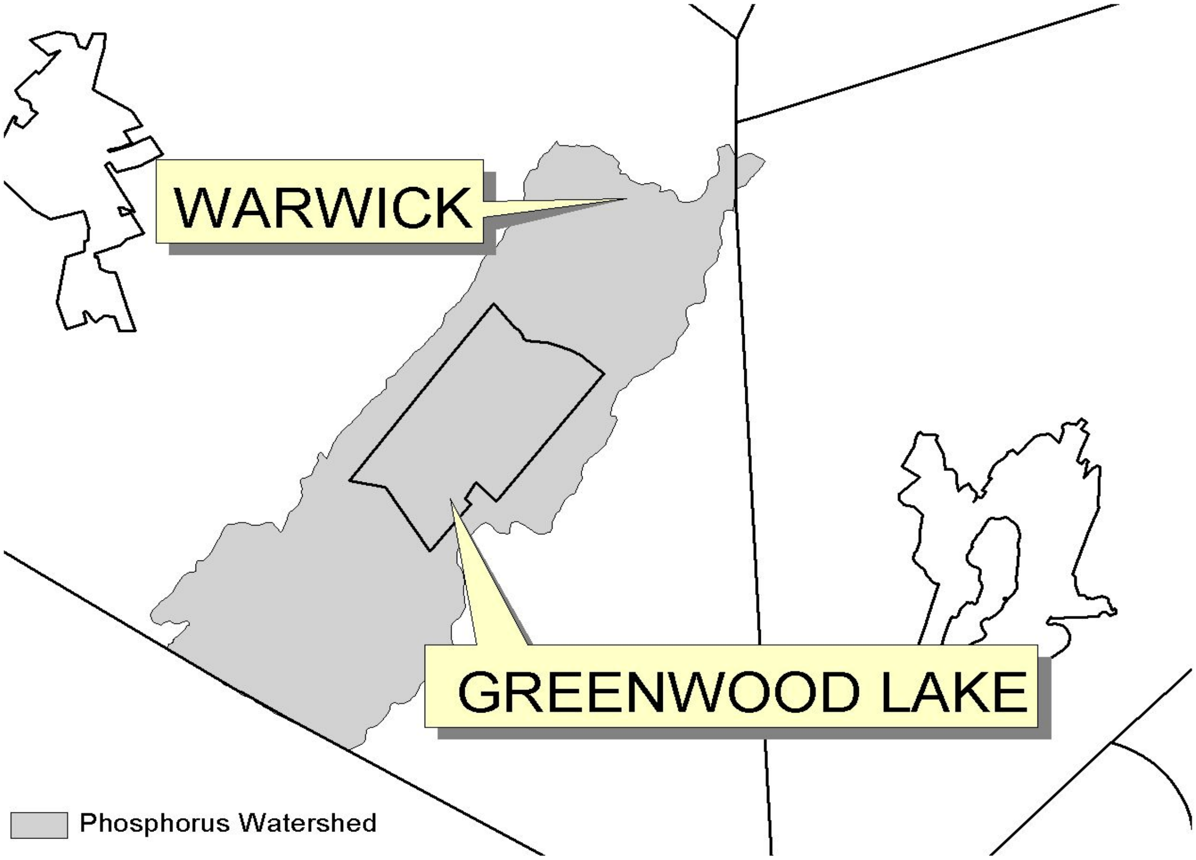


Figure 4 - Oscawana Lake Watershed

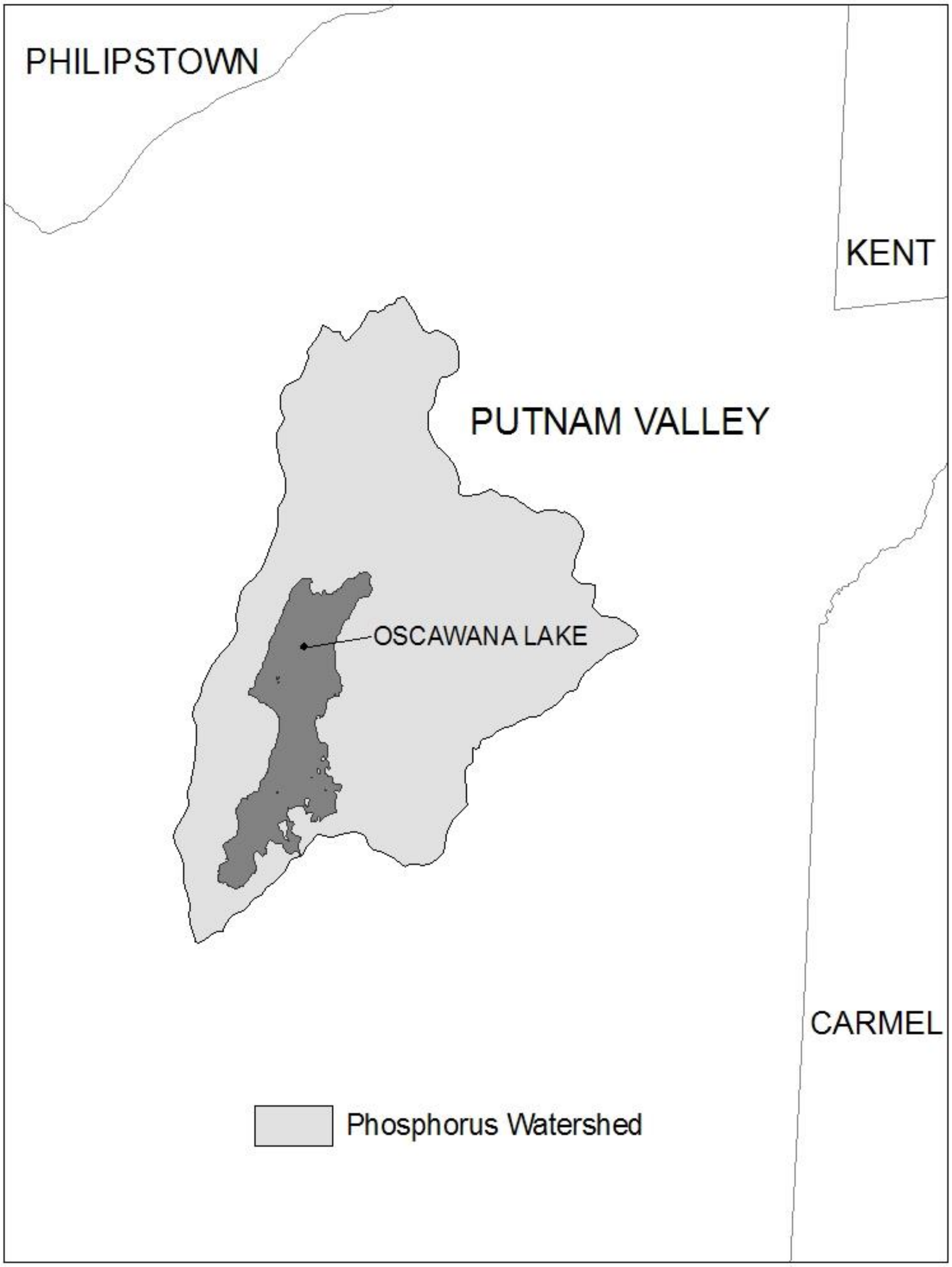
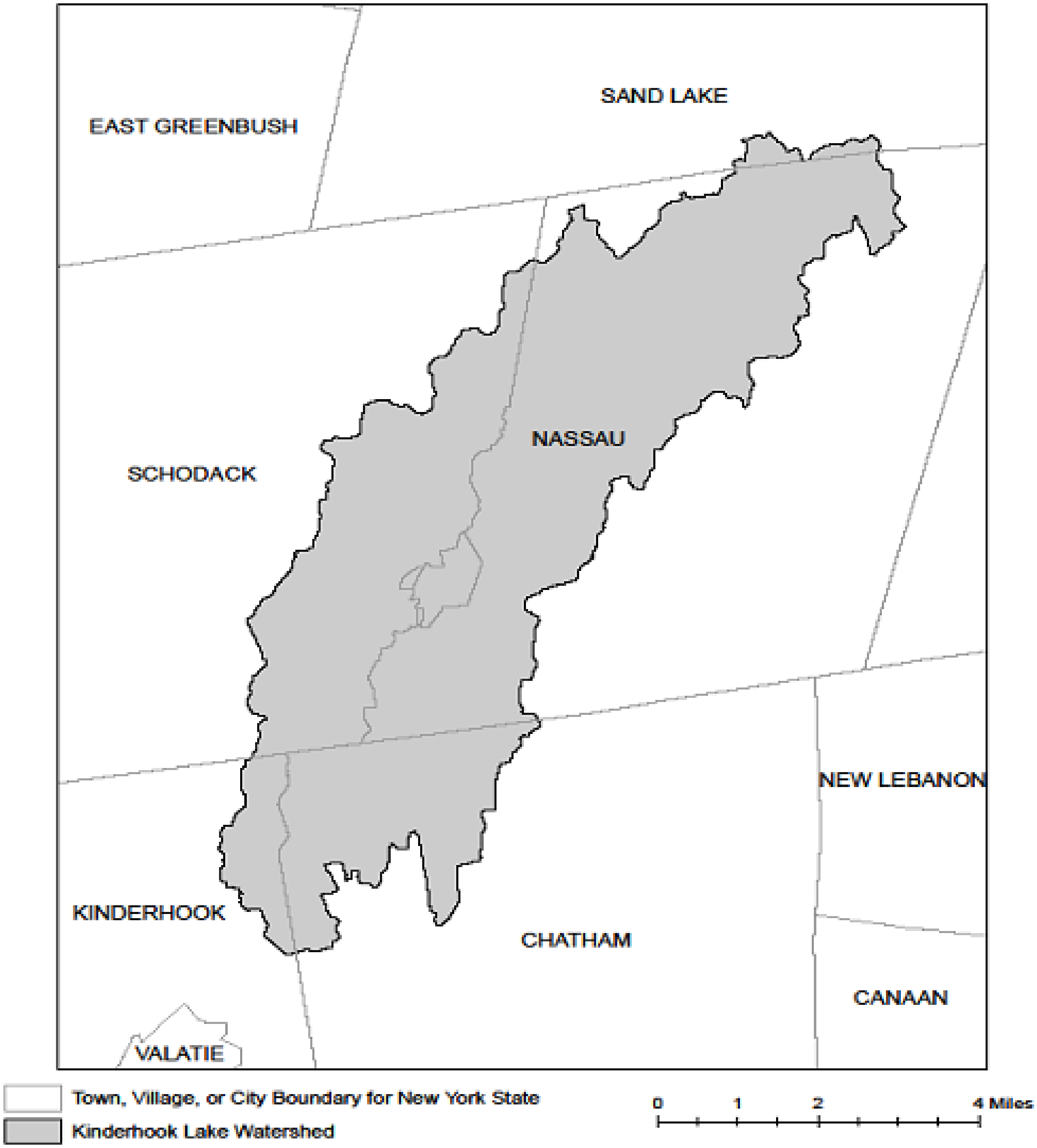


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River **-** See Figure 1 in Appendix C

APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using ”The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy” dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual (“Design Manual”), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

APPENDIX F – List of NYS DEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	50 Circle Road Stony Brook, NY 11790 Tel. (631) 444-0365	50 Circle Road Stony Brook, NY 11790-3409 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	100 Hillside Avenue, Suite 1w White Plains, NY 10603 Tel. (914) 428 - 2505
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1130 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	1115 State Route 86, Po Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Golf Course Road Warrensburg, NY 12885-1172 Tel. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

B. NYSDEC NOTICE OF INTENT (NOI) AND NOTICE OF TERMINATION FORMS

0644089821

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Carmax Auto Superstores, Inc.

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

Owner/Operator Contact Person First Name
Dan

Owner/Operator Mailing Address
12800 Tuckahoe Creek Pkwy

City
Richmond

State
VA

Zip
23238 -

Phone (Owner/Operator)
804-747-0422

Fax (Owner/Operator)
- -

Email (Owner/Operator)
dan bickett@carmax.com

FED TAX ID
54 0 6499499 (not required for individuals)

Project Site Information

Project/Site Name
Carmax - Wappinger

Street Address (NOT P.O. BOX)
1105-1115 US Route 9

Side of Street
○ North ○ South ○ East ● West

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Wappinger

State
NY

Zip
12524 -

County
Dutchess

DEC Region
3

Name of Nearest Cross Street
Smithtown Road

Distance to Nearest Cross Street (Feet)
0

Project In Relation to Cross Street
○ North ● South ○ East ○ West

Tax Map Numbers
Section-Block-Parcel
6156-02-664986

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site. To do this, go to the NYSDEC Stormwater Interactive Map on the DEC website at:

https://gisservices.dec.ny.gov/gis/stormwater/

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located the centroid of your project site, go to the bottom right hand corner of the map for the X, Y coordinates. Enter the coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)
-7 3907
Ex. -73.749

Y Coordinates (Northing)
41564
Ex. 42.652

2. What is the nature of this construction project?

○ **New Construction**

● **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ● COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ● COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

Number of Lots

*__Note__: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
7.57.5	7.17.1	4.74.7	5.05.0

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

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

A	**B**	**C**	**D**
0%	100%	0%	0%

7. Is this a phased project? ○ **Yes** ● **No**

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

Start Date 03/01/2023 - **End Date** 09/01/2023

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

NYS DOT Storm Sewer

On-Site Federal Wetland

9a. Type of waterbody identified in Question 9?

○ Wetland / State Jurisdiction On Site (Answer 9b)
○ Wetland / State Jurisdiction Off Site
● Wetland / Federal Jurisdiction On Site (Answer 9b)
○ Wetland / Federal Jurisdiction Off Site
○ Stream / Creek On Site
○ Stream / Creek Off Site
○ River On Site
○ River Off Site
○ Lake On Site
○ Lake Off Site
○ Other Type On Site
○ Other Type Off Site

9b. How was the wetland identified?

○ Regulatory Map
● Delineated by Consultant
○ Delineated by Army Corps of Engineers
○ Other (identify)

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

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

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ Yes ● 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? ○ Yes ● No
If Yes, what is the acreage to be disturbed?

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

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

16. What is the name of the municipality/entity that owns the separate storm sewer system?

NYS DOT

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

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

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

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

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 ○ No

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 ○ No
If No, skip questions 23 and 27-39.

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 ○ No

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

● **Professional Engineer (P.E.)**

○ **Soil and Water Conservation District (SWCD)**

○ **Registered Landscape Architect (R.L.A)**

○ **Certified Professional in Erosion and Sediment Control (CPESC)**

○ **Owner/Operator**

○ **Other**

SWPPP Preparer
Bohler Engineering -Matt Lessard, PE

Contact Name (Last, Space, First)
Lessard, Matt

Mailing Address
17 Computer Drive West

City
Albany

State NY Zip 12205 -

Phone 518-438-9900 Fax - -

Email
mlessard@bohlereng.com

SWPPP Preparer Certification

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.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

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

Temporary Structural

- ○ **Check Dams**
- ○ **Construction Road Stabilization**
- ○ **Dust Control**
- ○ **Earth Dike**
- ○ **Level Spreader**
- ○ **Perimeter Dike/Swale**
- ○ **Pipe Slope Drain**
- ○ **Portable Sediment Tank**
- ○ **Rock Dam**
- ● **Sediment Basin**
- ○ **Sediment Traps**
- ● **Silt Fence**
- ● **Stabilized Construction Entrance**
- ● **Storm Drain Inlet Protection**
- ○ **Straw/Hay Bale Dike**
- ○ **Temporary Access Waterway Crossing**
- ○ **Temporary Stormdrain Diversion**
- ○ **Temporary Swale**
- ○ **Turbidity Curtain**
- ○ **Water bars**

Biotechnical

- ○ **Brush Matting**
- ○ **Wattling**

Vegetative Measures

- ○ **Brush Matting**
- ○ **Dune Stabilization**
- ○ **Grassed Waterway**
- ● **Mulching**
- ○ **Protecting Vegetation**
- ○ **Recreation Area Improvement**
- ● **Seeding**
- ● **Sodding**
- ○ **Straw/Hay Bale Dike**
- ○ **Streambank Protection**
- ○ **Temporary Swale**
- ● **Topsoiling**
- ○ **Vegetating Waterways**

Permanent Structural

- ○ **Debris Basin**
- ○ **Diversion**
- ○ **Grade Stabilization Structure**
- ● **Land Grading**
- ○ **Lined Waterway (Rock)**
- ○ **Paved Channel (Concrete)**
- ○ **Paved Flume**
- ○ **Retaining Wall**
- ○ **Riprap Slope Protection**
- ○ **Rock Outlet Protection**
- ○ **Streambank Protection**

Other

Post-construction Stormwater Management Practice (SMP) Requirements

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 Areas**

● **Preservation of Buffers**

● **Reduction of Clearing and Grading**

● **Locating Development in Less Sensitive Areas**

○ **Roadway Reduction**

○ **Sidewalk Reduction**

● **Driveway Reduction**

○ **Cul-de-sac Reduction**

● **Building Footprint Reduction**

● **Parking Reduction**

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).

○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

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

Total WQv Required

.348.348 **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 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 Tables 1 and 2 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.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	.	and/or	.
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	.	and/or	.
○ Tree Planting/Tree Pit (RR-3)	.	and/or	.
○ Disconnection of Rooftop Runoff (RR-4)..	.	and/or	.
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			.
○ Rain Garden (RR-6)			.
○ Stormwater Planter (RR-7)			.
○ Rain Barrel/Cistern (RR-8)			.
○ Porous Pavement (RR-9)			.
○ Green Roof (RR-10)			.
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			.
○ Infiltration Basin (I-2)			.
○ Dry Well (I-3)			.
○ Underground Infiltration System (I-4)			.
● Bioretention (F-5)			0 . 3 0 4 . 3 4
○ Dry Swale (O-1)			.
Standard SMPs			
○ Micropool Extended Detention (P-1)			.
○ Wet Pond (P-2)			.
○ Wet Extended Detention (P-3)			.
○ Multiple Pond System (P-4)			.
○ Pocket Pond (P-5)			.
○ Surface Sand Filter (F-1)			.
○ Underground Sand Filter (F-2)			.
○ Perimeter Sand Filter (F-3)			.
○ Organic Filter (F-4)			.
○ Shallow Wetland (W-1)			.
○ Extended Detention Wetland (W-2)			.
○ Pond/Wetland System (W-3)			.
○ Pocket Wetland (W-4)			.
○ Wet Swale (O-2)			.

0762089822

Table 2 - Alternative SMPs
(DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	**Total Contributing Impervious Area(acres)**
● Hydrodynamic	4.74.7
○ Wet Vault	.
○ Media Filter	.
○ Other	.

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

Name CS-6

Manufacturer Contech Engineered Solutions

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.

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

Total RRv provided

0.002.323 **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ● **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)]

Minimum RRv Required

0.001.515 **acre-feet**

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

● **Yes** ○ **No**

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, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 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.

WQv Provided

0 . 50 4 . 51 4 1 **acre-feet**

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 - RRv 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).

0 . 50 6 . 54 6 4

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** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so 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**

CPv Provided

☐☐☐.☐☐☐ **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

● Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

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

Total Overbank Flood Control Criteria (Qp)

Pre-Development

2 92 .9 8 . 87 7 **CFS**

Post-development

1 81 .8 2 . 20 0 **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

6 16 .1 8 . 83 3 **CFS**

Post-development

3 73 .7 6 . 64 4 **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

● Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ● Yes ○ No

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

Carmax Auto Superstores, Inc.

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.

This redevelopment activity utilizes the water quality sizing criteria as laid out in Section 9.2.1.B.III. The site contains poor soils that preclude the use of RRv techniques for 100% treatment of the WQv for the additional impervious surfaces. A bioretention facility has been proposed to meet the minimum RRv requirement.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP NYR
- ○ Other
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ● **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ● **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ● **No**

44. 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. NYR

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

Carmax - Wappinger, NY

Owner/Operator Information

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

Carmax Auto Suerstores, 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.

Matthew	D	Lessard
First name	MI	Last Name

Signature

2/6/23
Date

Revised: January 2020

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information

1. Owner/Operator Name: Carmax Auto Superstores, INC.
2. Contact Person: Dan Bickett
3. Street Address: 12800 Tuckahoe Creek Pkwy
4. City/State/Zip: Richmond, VA 23238

II. Project Site Information

5. Project/Site Name: Proposed Carmax, Wappingers, NY
6. Street Address: 1105-1115 US Route 9,
7. City/State/Zip: Wappinger, NY 12524

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by: John Bodendorf, P.E.
9. Title/Position: Town Designated Engineer
10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4: Town of Wappinger
12. MS4 SPDES Permit Identification Number: NYR20A 055
13. Contact Person: Richard Thurston
14. Street Address: 20 Middlebush Road
15. City/State/Zip: Wappingers Falls, NY 12590
16. Telephone Number: 845-297-2744

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name: Richard Thurston

Title/Position: Town Supervisor

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name: Carmax Auto Superstores, INC.

2. Street Address: 12800 Tuckahoe Creek Pkwy

3. City/State/Zip: Richmond, VA23238

4. Contact Person: Dan Bickett

4a.Telephone: 804-747-0422

5. Contact Person E-Mail: dan_bickett@carmax.com

II. Project Site Information

5. Project/Site Name: Proposed Carmax, Wappingers, NY

6. Street Address: 1105-1115 US Route 9,

7. City/Zip: Fishkill, NY 12524

8. County: Dutchess

III. Reason for Termination

9a. ☐ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP.
***Date final stabilization completed** (month/year): ____

9b. ☐ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. ☐ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? ☐ yes ☐ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed?
☐ yes ☐ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? ☐ yes ☐ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):
- ☐ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- ☐ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- ☐ For post-construction stormwater management practices that are privately owned, the deed of record has been modified to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.
- ☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? ______________________________ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? ☐ yes ☐ no
(If Yes, complete section VI - “MS4 Acceptance” statement

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name: Richard Thurston

Title/Position: Town Supervisor

Signature: Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature: Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature: Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

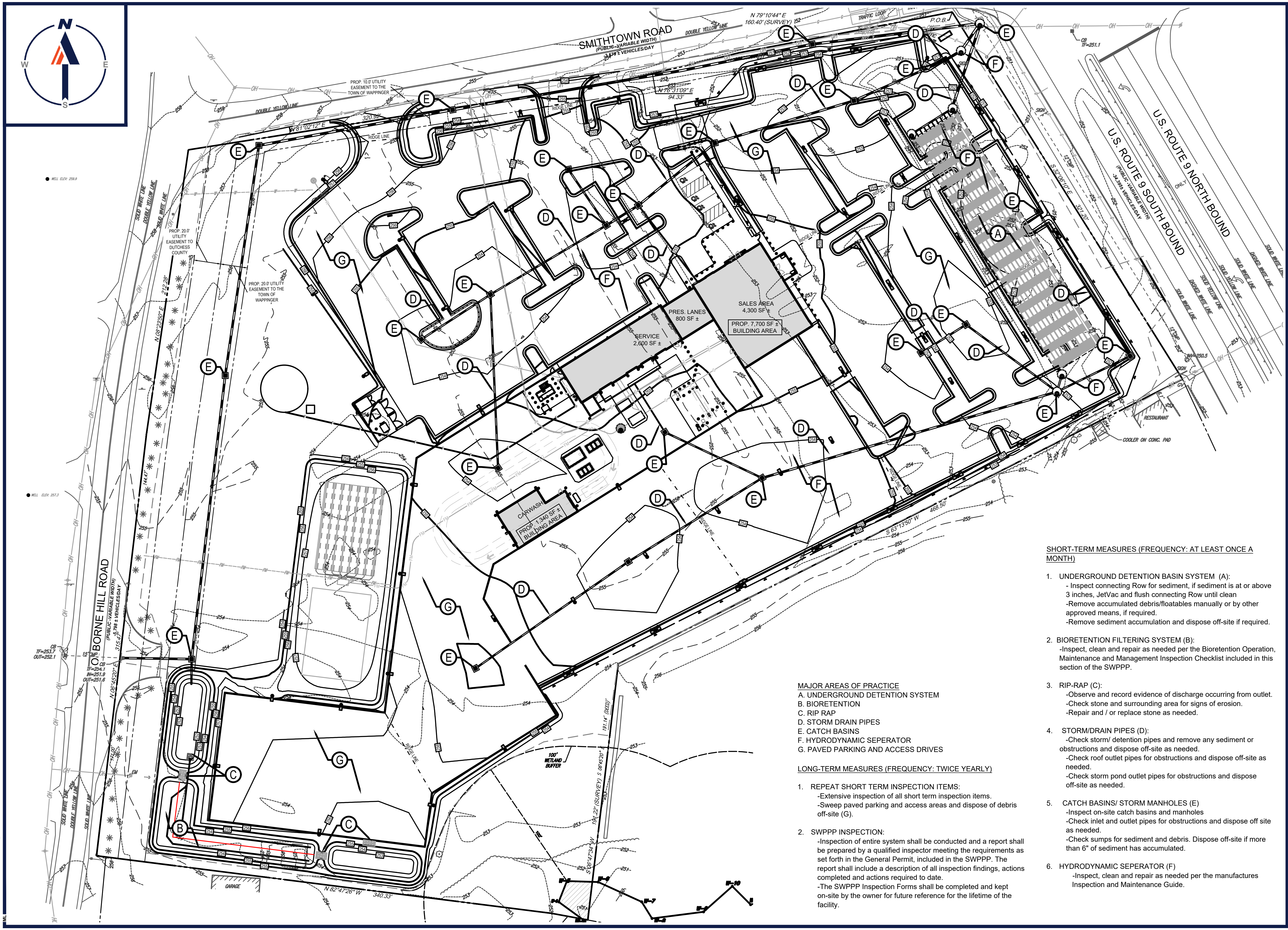
Printed Name:

Title/Position:

Signature: Date:

(NYS DEC Notice of Termination - January 2010)

C. INSPECTION NOTES, STORMWATER MANAGEMENT GENERAL OPERATION AND MAINTENANCE PLAN, CONSTRUCTION / OPERATION AND MAINTENANCE / INSPECTION REPORT FORMS, INSPECTOR CERTIFICATION FORM, AND CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK



MAJOR AREAS OF PRACTICE
A. UNDERGROUND DETENTION SYSTEM
B. BIORETENTION
C. RIP RAP
D. STORM DRAIN PIPES
E. CATCH BASINS
F. HYDRODYNAMIC SEPERATOR
G. PAVED PARKING AND ACCESS DRIVES

LONG-TERM MEASURES (FREQUENCY: TWICE YEARLY)

1. REPEAT SHORT TERM INSPECTION ITEMS:
   -Extensive inspection of all short term inspection items.
   -Sweep paved parking and access areas and dispose of debris off-site (G).

2. SWPPP INSPECTION:
   -Inspection of entire system shall be conducted and a report shall be prepared by a qualified inspector meeting the requirements as set forth in the General Permit, included in the SWPPP. The report shall include a description of all inspection findings, actions completed and actions required to date.
   -The SWPPP Inspection Forms shall be completed and kept on-site by the owner for future reference for the lifetime of the facility.

SHORT-TERM MEASURES (FREQUENCY: AT LEAST ONCE A MONTH)

1. UNDERGROUND DETENTION BASIN SYSTEM (A):
   - Inspect connecting Row for sediment, if sediment is at or above 3 inches, JetVac and flush connecting Row until clean
   -Remove accumulated debris/floatables manually or by other approved means, if required.
   -Remove sediment accumulation and dispose off-site if required.

2. BIORETENTION FILTERING SYSTEM (B):
   -Inspect, clean and repair as needed per the Bioretention Operation, Maintenance and Management Inspection Checklist included in this section of the SWPPP.

3. RIP-RAP (C):
   -Observe and record evidence of discharge occurring from outlet.
   -Check stone and surrounding area for signs of erosion.
   -Repair and / or replace stone as needed.

4. STORM/DRAIN PIPES (D):
   -Check storm/ detention pipes and remove any sediment or obstructions and dispose off-site as needed.
   -Check roof outlet pipes for obstructions and dispose off-site as needed.
   -Check storm pond outlet pipes for obstructions and dispose off-site as needed.

5. CATCH BASINS/ STORM MANHOLES (E)
   -Inspect on-site catch basins and manholes
   -Check inlet and outlet pipes for obstructions and dispose off site as needed.
   -Check sumps for sediment and debris. Dispose off-site if more than 6" of sediment has accumulated.

6. HYDRODYNAMIC SEPERATOR (F)
   -Inspect, clean and repair as needed per the manufactures Inspection and Maintenance Guide.

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SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY CHECKED BY
1	9/24/2021	CONCEPT DESIGN PLANS	MDL .
2	10/05/2021	FUTURE UTILITY CONNECTIONS	MDL .
3	12/17/2021	REVISED SITE LAYOUT	MDL .
4	01/11/2022	PER CLIENT COMMENTS	MDL .
5	02/07/2022	INITIAL DESIGN PLANS	MDL .
6	2/16/2022	PER CLIENT COMMENTS	MDL .
7	3/1/2022	PER CLIENT COMMENTS	MDL .
8	5/16/2022	PER TDE COMMENTS	MDL .
9	8/05/2022	PER TOWN COMMENTS	SWG .

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PRELIMINARY

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	B210118
DRAWN BY:	MDL
CHECKED BY:	RWO
DATE:	09/01/2021
CAD I.D.:	B210118SS00

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

CARMAX AUTO SUPERSTORES, INC.

PROPOSED DEVELOPMENT

SEC. 6156-02- PARCEL 664986
1105-1115 ROUTE 9
TOWN OF WAPPINGER
DUTCHESS COUNTY,
NEW YORK

BOHLER//

17 COMPUTER DRIVE WEST
ALBANY, NY 12205
Phone: (518) 438-9900
Fax: (518) 438-0900
www.BohlerEngineering.com

W.D. GOEBEL
PROFESSIONAL ENGINEER
MASSACHUSETTS LICENSE No. 42644-C
RHODE ISLAND LICENSE No. 7268
CONNECTICUT LICENSE No. 21854
NEW HAMPSHIRE LICENSE No. 10280
MAINE LICENSE No. 9490
NEW YORK LICENSE No. 071284-1
FLORIDA LICENSE No. 66202

SHEET TITLE:

OPERATION AND MAINTENANCE PLAN

SHEET NUMBER:

C-000

REVISION 9 - 8/05/2022

INSPECTION CERTIFICATION FORM

Name New York SPDES Permit number

(fill in when obtained)

Certification:

> ***"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."***

Signature Date Title

Bioretention Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility area cleared		
If designed as exfilter, soil testing for permeability		
Facility location staked out		
2. Excavation		
Size and location		
Lateral slopes completely level		
If designed as exfilter, ensure that excavation does not compact susoils.		
Longitudinal slopes within design range		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
3. Structural Components		
Stone diaphragm installed correctly		
Outlets installed correctly		
Underdrain		
Pretreatment devices installed		
Soil bed composition and texture		
4. Vegetation		
Complies with planting specs		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
5. Final Inspection		
Dimensions		
Proper stone diaphragm		
Proper outlet		
Soil/ filter bed permeability testing		
Effective stand of vegetation and stabilization		
Construction generated sediments removed		
Contributing watershed stabilized before flow is diverted to the practice		

Comments:

Actions to be Taken:

Bioretention Operation, Maintenance and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Bioretention and contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Vegetation (Monthly)		
Plant height not less than design water depth		
Fertilized per specifications		
Plant composition according to approved plans		
No placement of inappropriate plants		
Grass height not greater than 6 inches		
No evidence of erosion		
3. Check Dams/Energy Dissipaters/Sumps (Annual, After Major Storms)		
No evidence of sediment buildup		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Sumps should not be more than 50% full of sediment		
No evidence of erosion at downstream toe of drop structure		
4. Dewatering (Monthly)		
Dewaters between storms		
No evidence of standing water		
5. Sediment Deposition (Annual)		
Swale clean of sediments		
Sediments should not be > 20% of swale design depth		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good condition, no need for repair		
No evidence of erosion		
No evidence of any blockages		
7. Integrity of Filter Bed (Annual)		
Filter bed has not been blocked or filled inappropriately		

Comments:

____
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Actions to be Taken:

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____

CONTECH®
ENGINEERED SOLUTIONS

Cascade Separator® Inspection and Maintenance Guide

CASCADE
separator®

Maintenance

The Cascade Separator® system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects sediment and debris will depend upon on-site activities and site pollutant characteristics. For example, unstable soils or heavy winter sanding will cause the sediment storage sump to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (i.e. spring and fall). However, more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment wash-down areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

A visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet chamber, flumes or outlet channel. The inspection should also quantify the accumulation of hydrocarbons, trash and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided in this Inspection and Maintenance Guide.

Access to the Cascade Separator unit is typically achieved through one manhole access cover. The opening allows for inspection and cleanout of the center chamber (cylinder) and sediment storage sump, as well as inspection of the inlet chamber and slanted skirt. For large units, multiple manhole covers allow access to the chambers and sump.

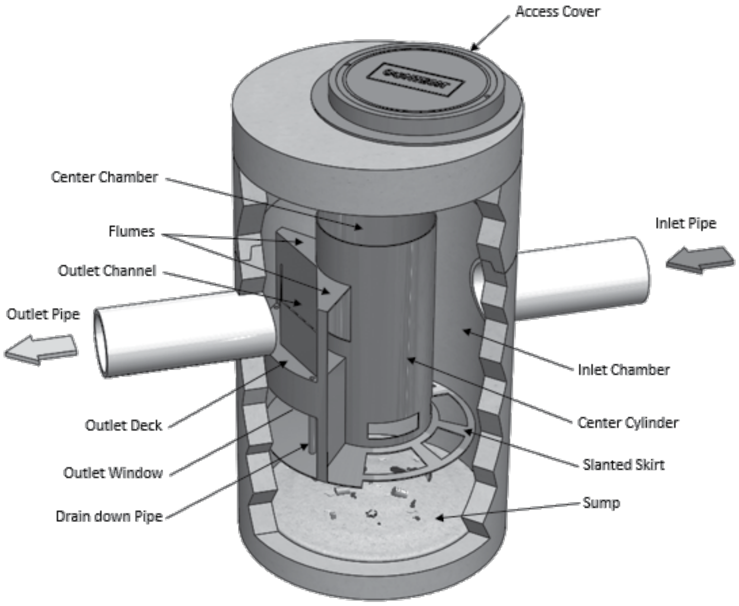
The Cascade Separator system should be cleaned before the level of sediment in the sump reaches the maximum sediment depth and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it must be replaced when significant discoloration has occurred. Performance may be impacted when maximum sediment storage capacity is exceeded. Contech recommends maintaining the system when sediment level reaches 50% of maximum storage volume. The level of sediment is easily determined by measuring the distance from the system outlet invert (standing water level) to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the chart in this document to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage.

Cleaning

Cleaning of a Cascade Separator system should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole cover and insert the vacuum tube down through the center chamber and into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The areas outside the center chamber and the slanted skirt should also be washed off if pollutant build-up exists in these areas.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. Then the system should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and to ensure proper safety precautions. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the Cascade Separator system must be done in accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal. If any components are damaged, replacement parts can be ordered from the manufacturer.



Cascade Separator® Maintenance Indicators and Sediment Storage Capacities

Model Number	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CS-3	3	0.9	1.5	0.5	0.4	0.3
CS-4	4	1.2	2.5	0.8	0.7	0.5
CS-5	5	1.3	3	0.9	1.1	0.8
CS-6	6	1.8	3.5	1	1.6	1.2
CS-8	8	2.4	4.8	1.4	2.8	2.1
CS-10	10	3.0	6.2	1.9	4.4	3.3
CS-12	12	3.6	7.5	2.3	6.3	4.8

Note: The information in the chart is for standard units. Units may have been designed with non-standard sediment storage depth.

A Cascade Separator unit can be easily cleaned in less than 30 minutes.

A vacuum truck excavates pollutants from the systems.

Cascade Separator® Inspection & Maintenance Log

Cascade Model:			Location:		
Date	Depth Below Invert to Top of Sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The depth to sediment is determined by taking a measurement from the manhole outlet invert (standing water level) to the top of the sediment pile. Once this measurement is recorded, it should be compared to the chart in the maintenance guide to determine if the height of the sediment pile off the bottom of the sump floor exceeds 50% of the maximum sediment storage. Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.
2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

SUPPORT

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, and earth stabilization products. For information, visit www.ContechES.com or call 800.338.1122

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www.ContechES.com

CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

Table of Contents

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name ____

Permit No. ________________________________ **Date of Authorization** _____________

Name of Operator ____

Prime Contractor ____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

---

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA
[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?________________________________
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_______________
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_______________
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA
[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA
[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA
[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA
[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA
[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page ______
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? ___________________

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

CONSTRUCTION DURATION INSPECTIONS **Page 1 of ______**

SITE PLAN/SKETCH

Inspector (print name)

Date of Inspection

Qualified Inspector (print name)

Qualified Inspector Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA
[ ] [ ] [ ] Is construction site litter, debris and spoils appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA
[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales
Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam
Yes No NA
[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection
Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles
Yes No NA
[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation
Yes No NA
[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers
Yes No NA
[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA
[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2” x 4” frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
[ ] [ ] [ ] Manufactured insert fabric is free of tears and punctures.
[ ] [ ] [ ] Filter Sock is not torn or flattened and fill material is contained within the mesh sock.
Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA
[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.
[ ] [ ] [ ] Sediment trap slopes and disturbed areas are stabilized.
Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA
[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
[ ] [ ] [ ] Sediment basin dewatering pool is dewatering at appropriate rate.
Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

SPDES GENERAL PERMIT GP-0-20-001
SWPPP CONSTRUCTION INSPECTION LOG

DATE	REASON	ASSESSMENT

D. CONTRACTOR / OWNER CERTIFICATION FORMS, CONSTRUCTION ACTIVITY FORM

CONTRACTOR CERTIFICATION FORM

Proposed Development
1105-1115 US Route 9
Town of Wappinger,
Dutchess County, NY

Contractor responsible for the implementation of the SWPPP:

Company Name Business Telephone Number

Business Address City, State, Zip Code

Business Facsimile E-mail Address

CERTIFICATION:

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Signature Date

Printed Name Title

Company Name Business Telephone Number

Business Address City, State, Zip Code

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: Carmax- Wappinger, NY

eNOI Submission Number: ____________________

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

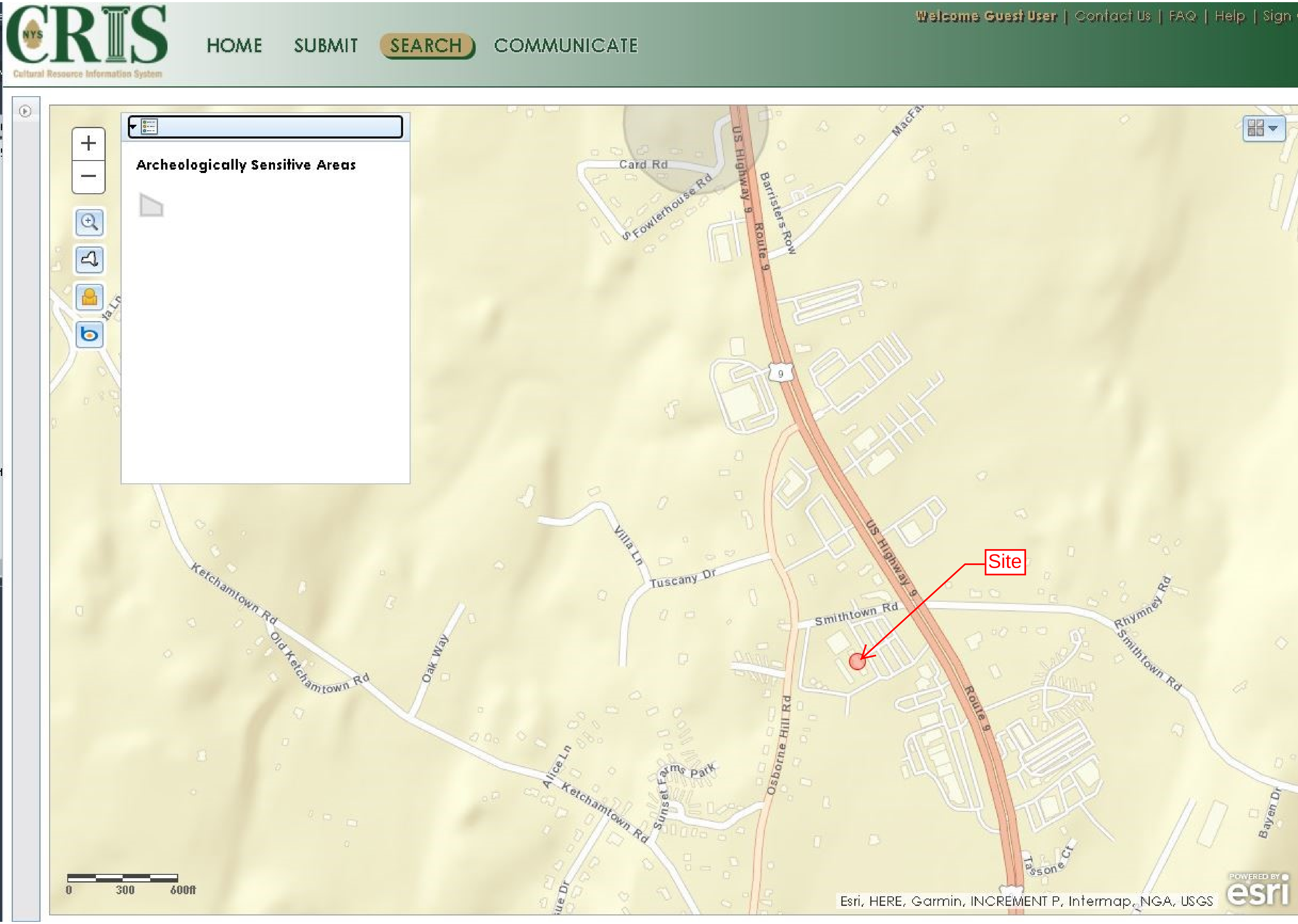
CONSTRUCTION ACTIVITY FORM

NOTE: The contractor is responsible for maintaining an accurate and complete log of construction activities, including, but not limited to, commencement of stabilization, major grading activities, timeframes when construction ceases on a portion of site (temporary or permanent) until the Notice of Termination (NOT) is filed.

MAJOR STABILIZATION AND GRADING ACTIVITIES

Construction Activity	Contractor Name	Start Date	End Date	Location

E. NYSOPRHP MAP


CRIS
NYS
Cultural Resource Information System
HOME
SUBMIT
SEARCH
COMMUNICATE
Welcome Guest User | Contact Us | FAQ | Help | Sign
Archeologically Sensitive Areas
Site
Card Rd
S Fowlerhouse Rd
US Highway 9
Route 9
Barristers Row
MacFa
9
Villa Ln
Tuscany Dr
Smithtown Rd
Rhymney Rd
Smithtown Rd
Ketchamtown Rd
Old Ketchamtown Rd
Oak Way
Osborne Hill Rd
Alice Ln
Ketchamtown Rd
Sunset Farms Park
Tassone Ct
Bayen Dr
0
300
600ft
Esri, HERE, Garmin, INCREMENT P, Intermap, NGA, USGS
POWERED BY esri

F. STORMWATER MANAGEMENT REPORT

Stormwater
Management Report

Carmax Auto Superstores, Inc.

Proposed Motor Vehicle Sales
Establishment Redevelopment

1105-1115 Route 9
Town of Wappinger
Dutchess County, NY

September 30, 2022
Revised: February 6, 2023

Prepared by:

BOHLER//

17 Computer Drive West, Albany, NY 12205
Phone: (518) 438-9900
Fax: (518) 438-0900

www.bohlereng.com

No. B210118

TABLE OF CONTENTS

I. Introduction

Carmax Auto Superstores, Inc. is proposing to construct a new 7,700+/- square foot building containing a sales, service, and presentation area; on an existing 7.5 +/- acre developed parcel of land located at 1105-1115 US Route 9, in the Town of Wappinger, Dutchess County, New York. Proposed features include landscaping, lighting, paved parking and access drives, trash enclosures, utilities and storm water management practices as shown on the Site Development Plan drawings prepared by Bohler Engineering and Landscape Architecture NY, PLLC.

This report will briefly discuss the proposed site development and provide a detailed analysis of the existing and proposed site conditions and the proposed stormwater management system. Hydraulic calculations included in this report were generated for the 1, 10 and 100 year storm events utilizing the SCS TR-20 and HydroCad Stormwater modeling software.

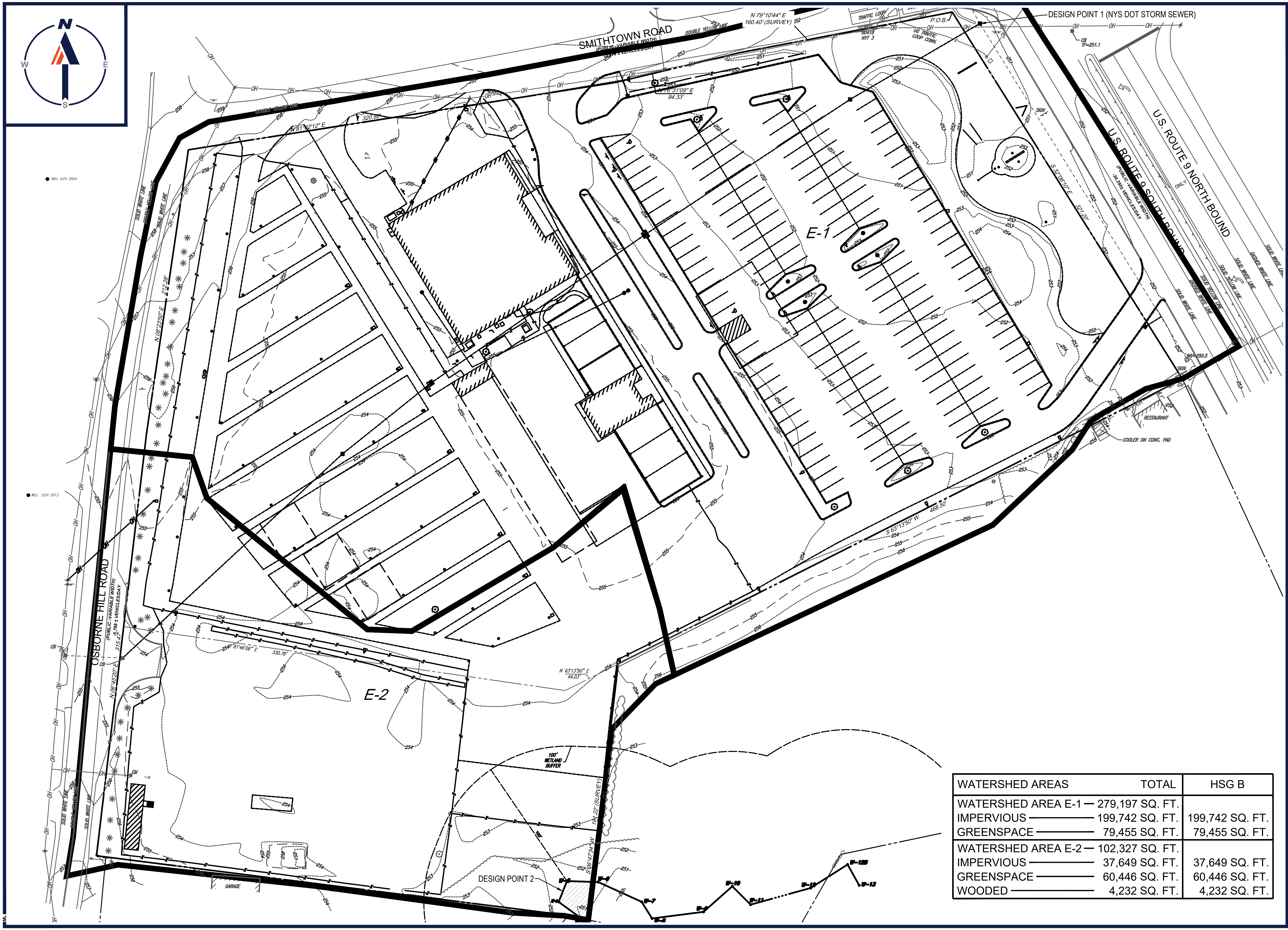
II. Existing Stormwater Conditions Summary:

The 7.5 +/- acre parcel is currently developed with an existing 1-story building, 2-story building, and open greenhouse areas. Ground cover consists of impervious surfaces from buildings, associated parking areas, drive aisles and former landscape display areas. Additionally, the site contains existing greenspace, with a small, wooded area. The topography of the site is split with a portion of the site sloped towards the east with stormwater flowing towards US Route 9. The remainder of the site is sloped towards the southern boundary of the site, with stormwater makings its way towards the south east corner of the lot.
The land uses in the immediate vicinity of the site consist of residential and commercial properties.

The existing project site has been analyzed as two watersheds, designated as Watershed Area E-1 and Watershed Area E-2.

Watershed Area E-1 is approximately 6.4 acres and is comprised of the existing single-story building, existing two-story building, associated parking areas, and asphalt driveways a portions of Smithtown Road, Osborne Hill Road, and US-Route 9 along with existing landscaped and grassed areas. Stormwater from E-1 travels via overland and shallow concentrated flow in an easterly direction towards existing catch basins that connect to an existing NYSDOT storm sewer or directly to the NYSDOT storm sewer, which is Design Point 1 (DP-1).

Watershed Area E-2 is approximately 2.3 acres and is comprised of existing impervious access aisles and display areas and a portion of Osborne Hill Road. Additional ground cover consists of existing greenspace and a small wooded area in the south east corner of the lot, which is Design Point 2 (DP-2).
The existing watershed area and topography are illustrated on the Existing Conditions Watershed Plan included on the next page of this report.



WATERSHED AREAS	TOTAL	HSG B
WATERSHED AREA E-1	279,197 SQ. FT.	
IMPERVIOUS	199,742 SQ. FT.	199,742 SQ. FT.
GREENSPACE	79,455 SQ. FT.	79,455 SQ. FT.
WATERSHED AREA E-2	102,327 SQ. FT.	
IMPERVIOUS	37,649 SQ. FT.	37,649 SQ. FT.
GREENSPACE	60,446 SQ. FT.	60,446 SQ. FT.
WOODED	4,232 SQ. FT.	4,232 SQ. FT.

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7	3/1/2022	PER CLIENT COMMENTS	MDL
8	5/16/2022	PER TDE COMMENTS	MDL
9	8/05/2022	PER TOWN COMMENTS	SWG
10	9/30/2022	PER TOWN COMMENTS	MDL
11	10/18/2022	DOT & DOH SUBMITTAL	MDL
12	11/30/2022	PER DOT COMMENT	MDL
13	2/03/2023	PER TOWN COMMENT	MDL

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PROJECT No.:	B210118
DRAWN BY:	MDL
CHECKED BY:	RWO
DATE:	09/01/2021
CAD I.D.:	B210118SS00

PROJECT:

PROPOSED SITE PLAN DOCUMENTS

FOR

CARMAX AUTO SUPERSTORES, INC.

PROPOSED DEVELOPMENT

SEC. 6156-02- PARCEL 664986
1105-1115 ROUTE 9
TOWN OF WAPPINGER
DUTCHESS COUNTY,
NEW YORK

BOHLER//

17 COMPUTER DRIVE WEST
ALBANY, NY 12205
Phone: (518) 438-9900
Fax: (518) 438-0900
www.BohlerEngineering.com

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CONNECTICUT LICENSE No. 21854
NEW HAMPSHIRE LICENSE No. 10230
MAINE LICENSE No. 9490
NEW YORK LICENSE No. 071284-1
FLORIDA LICENSE No. 66202

SHEET TITLE:

EXISTING CONDITIONS WATERSHED MAP

SHEET NUMBER:

WS-EX

REVISION 13 - 2/03/2023

III. Proposed Stormwater Conditions Summary:

The proposed development is designed to mimic the existing drainage patterns and reduce the discharge flow rate from the developed to re-developed condition.

This project includes 205,920 sq. ft. (4.73 acres) of existing onsite impervious areas. Along with 14,833 sq. ft. (0.34 acres) of new additional impervious area. Per section 9.2.1B.III, a construction project that includes both new development and redevelopment activities shall require treatment for 75% of the existing disturbed impervious and 100% treatment for the new impervious area. For WQv and RRv calculations please see Appendix F.

The proposed project site was analyzed as two watershed areas, designated as Watershed Area P-1 and Watershed Area P-2. Watershed Area P-1 has been further divided into three subcatchments designated as Watershed Area P-1A, P-1B, P-1C and P-1D. The watershed subcatchments have unique flow paths and therefore have been analyzed individually.

Watershed Area P-1A is approximately 2.7 acres comprised of impervious material such as the proposed building and surrounding vehicle storage area, sidewalks and greenspace along the south east boundary of the site. Stormwater from this area travels via overland and shallow concentrated flow towards a series of catch basins leading to a Hydrodynamic separator for treatment before flowing into an underground detention system designed to control peak flow for the watershed. Water is released from the underground detention system at a reduced rate through an outlet control structure before heading to the NYSDOT storm system designated as Design Point 1, (DP-1).

Watershed P-1B is approximately 2.1 acres and is comprised of existing off site impervious areas along with offsite and onsite greenspaces. Stormwater from this area travels via overland flow to a storm sewer running along Osborne Hill Road and Smithtown Road before connecting directly into the NYSDOT storm system, designate as Design Point 1, (DP-1).

Watershed Area P-1C is approximately 2.6 acres comprised of impervious areas from the parking lot and drive aisles, vehicle storage area, sidewalks. Along with proposed greenspace. Stormwater from this area travels via overland flow towards a series of catch basins leading to a Hydrodynamic separator for treatment before flowing directly to the NYSDOT storm system designated as Design Point 1, (DP-1)

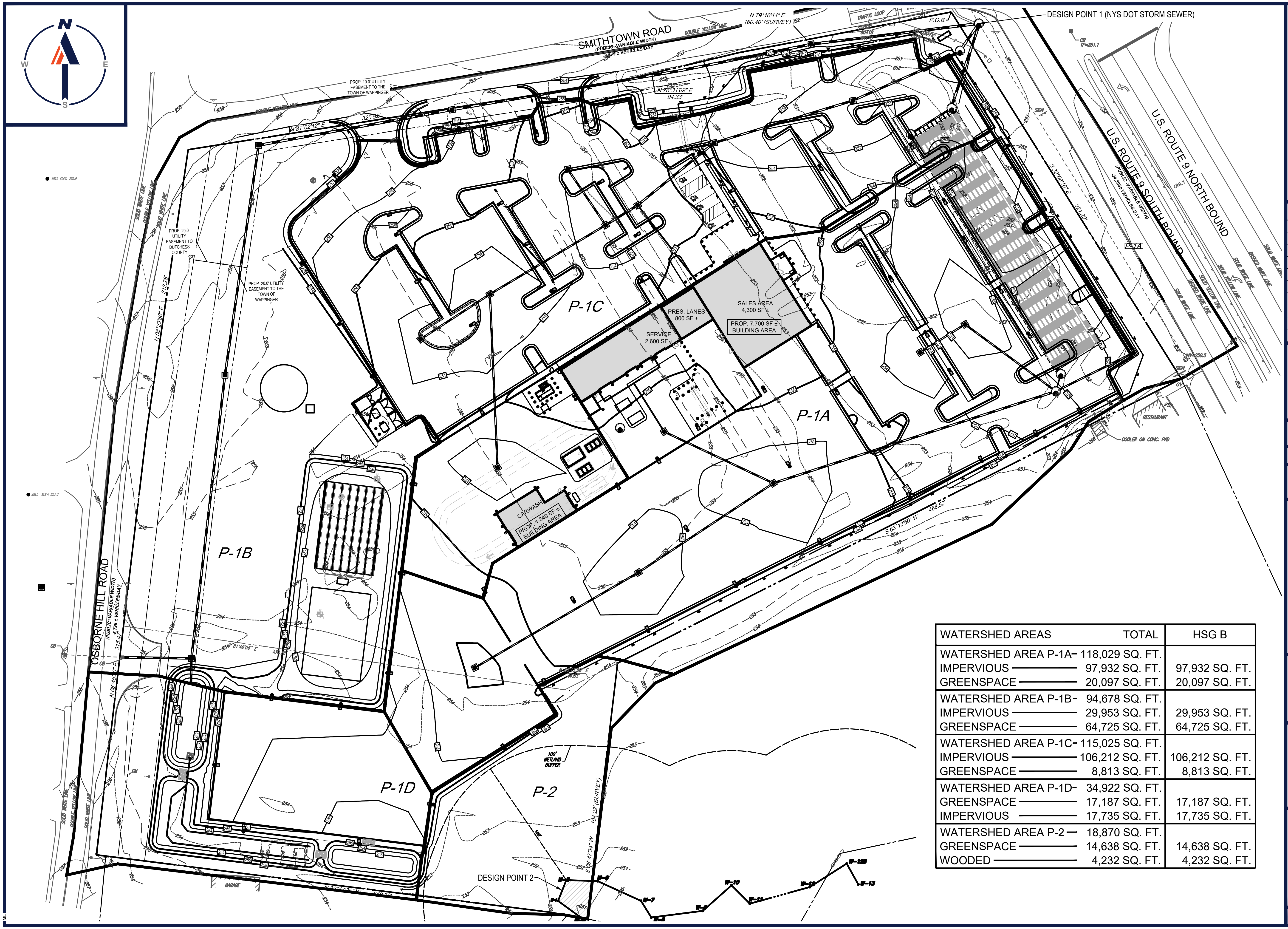
Watershed P-1D is approximately 0.8 acres and is comprised of impervious area from the vehicle storage area along with onsite greenspaces. Stormwater from this area travels via overland flow and shallow concentrated flow directly to a settling basin for pretreatment. Once the settling basin reaches its design capacity, 25% of the WQv, it overflows into a bioretention system designed to meet the RRV and WQv requirements for the project.

The proposed bioretention system is equipped with a spillway which will discharge stormwater above the WQv into a proposed detention basin while allowing the WQv to filter through the bioretention soil media to a underdrains which releases treated water to the detention basin.

Once into the detention basin stormwater is released at a reduced rate via a controlled outlet structure and is directed to a storm sewer running along Osborne Hill Road and Smithtown Road before connecting directly into the NYSDOT storm system, designate as Design Point 1, (DP-1). The bioretention area has been designed per the NYSDEC Stormwater Management Design Manual for a bioretention system (F-5).

Watershed Area P-2 is approximately 0.5 acres and is comprised of proposed greenspace and an existing undisturbed wooded area. Stormwater from P-2 travels via overland and shallow concentrated flow directly to the south east corner of the lot, which is Design Point 2 (DP-2).

The proposed watershed areas, topography and flow paths are illustrated on the Proposed Conditions Watershed Plan, included on the following page of this report.



WATERSHED AREAS	TOTAL	HSG B
WATERSHED AREA P-1A	118,029 SQ. FT.	
IMPERVIOUS	97,932 SQ. FT.	97,932 SQ. FT.
GREENSPACE	20,097 SQ. FT.	20,097 SQ. FT.
WATERSHED AREA P-1B	94,678 SQ. FT.	
IMPERVIOUS	29,953 SQ. FT.	29,953 SQ. FT.
GREENSPACE	64,725 SQ. FT.	64,725 SQ. FT.
WATERSHED AREA P-1C	115,025 SQ. FT.	
IMPERVIOUS	106,212 SQ. FT.	106,212 SQ. FT.
GREENSPACE	8,813 SQ. FT.	8,813 SQ. FT.
WATERSHED AREA P-1D	34,922 SQ. FT.	
GREENSPACE	17,187 SQ. FT.	17,187 SQ. FT.
IMPERVIOUS	17,735 SQ. FT.	17,735 SQ. FT.
WATERSHED AREA P-2	18,870 SQ. FT.	
GREENSPACE	14,638 SQ. FT.	14,638 SQ. FT.
WOODED	4,232 SQ. FT.	4,232 SQ. FT.

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FLORIDA LICENSE No. 66202

SHEET TITLE:

PROPOSED CONDITIONS WATERSHED MAP

SHEET NUMBER:

WS-PR

REVISION 13 - 2/03/2023

Conclusion:

The proposed development has been designed to release stormwater at a rate not to exceed pre-development conditions for each storm event. The facility is designed to provide stormwater detention storage, discharge control and quality treatment.

The stormwater management system is designed to meet the objectives set forth in the NYSDEC Stormwater Management Design Manual. Uniform sizing criteria were calculated as follows:

- The 90% Rule Water Quality Volume (WQv) is discharged to the (F-5) Bioretention. The bioretention has been designed per the requirements set forth by the NYSDEC. WQv calculations and requirements are illustrated on the enclosed detail sheet.

- The minimum Runoff Reduction Volume (RRv) requirement has been achieved by providing more than the minimum required RRv in the proposed bioretention.

- Channel Protection Volume (Cpv) is not required for redevelopment activities.

- Overbank Flood (Qp) protection was designed to control the peak discharge from the 10-year storm to the 10-year predevelopment rates. These calculations can be found in the 10-year storm analysis for each watershed and the total site volume comparison included in the report.

- Extreme Storm (Qf) protection was designed to control the peak discharge from the 100-year storm to rates less than the 100-year predevelopment rates by detaining the post development runoff. These calculations can be found in the 100-year storm analysis for each watershed and the total site volume comparison included in the report.

The proposed stormwater management system as designed will serve to mitigate the effects of the development of the parcel, such that the proposed use will not adversely affect any downstream or adjacent properties. Stormwater quality and quantity improvements to the existing condition are proposed as a part of this redevelopment project. These improvements meet or exceed the objectives set forth in the NYSDEC Stormwater Management Design Manual.

WATERSHED 1 - DEVELOPED AND REDEVELOPMENT STORM WATER DISCHARGE COMPARISON TABLE

STORM EVENT	PRE-DEVELOPMENT PEAK DISCHARGE (CFS)	POST-DEVELOPMENT PEAK DISCHARGE (CFS)	% REDUCTION PRE TO POST
1 YEAR	10.62	8.10	23%
10 YEAR	24.12	17.71	27%
100 YEAR	47.74	35.88	25%

WATERSHED 2 - DEVELOPED AND REDEVELOPMENT STORM WATER DISCHARGE COMPARISON TABLE

STORM EVENT	PRE-DEVELOPMENT PEAK DISCHARGE (CFS)	POST-DEVELOPMENT PEAK DISCHARGE (CFS)	% REDUCTION PRE TO POST
1 YEAR	1.67	0.04	98%
10 YEAR	5.75	0.49	91%
100 YEAR	14.09	1.76	87%

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	73.907 degrees West
Latitude	41.564 degrees North
Elevation	0 feet
Date/Time	Tue, 31 Aug 2021 13:30:56 -0400

Extreme Precipitation Estimates

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.32	0.50	0.62	0.81	1.01	1.26	**1yr**	0.87	1.18	1.44	1.76	2.15	2.62	2.95	**1yr**	2.32	2.84	3.28	3.97	4.58	**1yr**
2yr	0.38	0.59	0.74	0.97	1.22	1.52	**2yr**	1.05	1.42	1.74	2.13	2.60	3.16	3.56	**2yr**	2.79	3.43	3.92	4.64	5.27	**2yr**
5yr	0.45	0.71	0.89	1.19	1.52	1.91	**5yr**	1.31	1.75	2.19	2.69	3.27	3.95	4.51	**5yr**	3.49	4.34	4.99	5.77	6.52	**5yr**
10yr	0.51	0.80	1.02	1.38	1.79	2.27	**10yr**	1.55	2.05	2.61	3.21	3.89	4.67	5.39	**10yr**	4.14	5.19	5.99	6.82	7.66	**10yr**
25yr	0.60	0.95	1.21	1.68	2.23	2.86	**25yr**	1.93	2.54	3.30	4.05	4.90	5.85	6.84	**25yr**	5.18	6.58	7.63	8.51	9.48	**25yr**
50yr	0.68	1.09	1.40	1.96	2.64	3.40	**50yr**	2.28	2.98	3.94	4.83	5.83	6.94	8.19	**50yr**	6.14	7.87	9.17	10.06	11.15	**50yr**
100yr	0.78	1.26	1.62	2.30	3.14	4.06	**100yr**	2.71	3.51	4.70	5.77	6.94	8.23	9.81	**100yr**	7.28	9.43	11.02	11.90	13.12	**100yr**
200yr	0.89	1.45	1.88	2.69	3.72	4.84	**200yr**	3.21	4.13	5.62	6.89	8.26	9.76	11.75	**200yr**	8.64	11.30	13.26	14.09	15.44	**200yr**
500yr	1.07	1.76	2.30	3.34	4.67	6.11	**500yr**	4.03	5.12	7.10	8.70	10.41	12.25	14.93	**500yr**	10.84	14.36	16.94	17.61	19.17	**500yr**

Lower Confidence Limits

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.28	0.42	0.52	0.70	0.86	1.07	**1yr**	0.74	1.05	1.25	1.60	1.98	2.27	2.45	**1yr**	2.01	2.35	2.53	3.41	3.91	**1yr**
2yr	0.37	0.57	0.71	0.96	1.18	1.40	**2yr**	1.02	1.37	1.59	2.03	2.56	3.05	3.45	**2yr**	2.70	3.32	3.80	4.49	5.13	**2yr**
5yr	0.42	0.65	0.81	1.11	1.41	1.64	**5yr**	1.22	1.60	1.86	2.39	2.97	3.65	4.15	**5yr**	3.23	3.99	4.58	5.28	6.04	**5yr**
10yr	0.47	0.72	0.90	1.25	1.62	1.84	**10yr**	1.40	1.80	2.10	2.68	3.33	4.15	4.78	**10yr**	3.67	4.59	5.27	5.96	6.81	**10yr**
25yr	0.55	0.83	1.03	1.48	1.94	2.12	**25yr**	1.68	2.07	2.44	3.00	3.87	4.89	5.74	**25yr**	4.32	5.52	6.34	6.98	7.98	**25yr**
50yr	0.61	0.93	1.16	1.67	2.25	2.36	**50yr**	1.94	2.31	2.75	3.34	4.34	5.54	6.61	**50yr**	4.90	6.35	7.30	7.85	9.00	**50yr**
100yr	0.70	1.05	1.32	1.90	2.61	2.65	**100yr**	2.25	2.59	3.11	3.71	4.90	6.25	7.60	**100yr**	5.53	7.30	8.41	8.82	10.13	**100yr**
200yr	0.79	1.19	1.51	2.19	3.05	2.97	**200yr**	2.63	2.90	3.53	4.15	5.52	7.02	8.75	**200yr**	6.21	8.41	9.68	9.89	11.40	**200yr**
500yr	0.95	1.42	1.82	2.65	3.77	3.47	**500yr**	3.25	3.39	4.18	4.81	6.49	8.19	10.54	**500yr**	7.25	10.14	11.68	11.47	13.29	**500yr**

Upper Confidence Limits

	5min	**10min**	**15min**	**30min**	**60min**	**120min**		**1hr**	**2hr**	**3hr**	**6hr**	**12hr**	**24hr**	**48hr**		**1day**	**2day**	**4day**	**7day**	**10day**	
1yr	0.36	0.55	0.68	0.91	1.12	1.35	**1yr**	0.96	1.32	1.51	1.94	2.41	2.87	3.19	**1yr**	2.54	3.06	3.52	4.26	4.93	**1yr**
2yr	0.40	0.62	0.76	1.03	1.27	1.53	**2yr**	1.10	1.49	1.73	2.23	2.79	3.30	3.70	**2yr**	2.92	3.56	4.07	4.82	5.46	**2yr**
5yr	0.49	0.75	0.94	1.28	1.63	1.94	**5yr**	1.41	1.90	2.24	2.87	3.65	4.24	4.90	**5yr**	3.76	4.71	5.41	6.29	7.03	**5yr**
10yr	0.58	0.89	1.10	1.54	1.99	2.34	**10yr**	1.72	2.29	2.73	3.52	4.48	5.19	6.06	**10yr**	4.59	5.82	6.73	7.70	8.54	**10yr**
25yr	0.72	1.10	1.36	1.95	2.56	3.02	**25yr**	2.21	2.95	3.56	4.74	5.88	6.81	8.04	**25yr**	6.03	7.73	8.98	10.09	11.08	**25yr**
50yr	0.85	1.29	1.61	2.31	3.11	3.67	**50yr**	2.69	3.59	4.35	5.86	7.22	8.35	9.98	**50yr**	7.39	9.60	11.20	12.39	13.52	**50yr**
100yr	1.01	1.52	1.91	2.76	3.78	4.46	**100yr**	3.26	4.36	5.32	7.26	8.86	10.26	12.39	**100yr**	9.08	11.91	13.98	15.24	16.48	**100yr**
200yr	1.19	1.79	2.27	3.28	4.58	5.40	**200yr**	3.95	5.28	6.51	8.96	10.88	12.63	15.39	**200yr**	11.17	14.80	17.46	18.77	20.15	**200yr**
500yr	1.49	2.22	2.86	4.15	5.91	6.99	**500yr**	5.10	6.83	8.48	11.89	14.28	16.62	20.52	**500yr**	14.71	19.73	23.45	24.75	26.30	**500yr**

REDEVELOPMENT ACTIVITY
REQUIRED 75% ALTERNATE PRACTICE
WQv CALCULATION:

90% RULE:
P=1.4
I=100%
R_v=0.05+0.009(100)=0.95
A=4.73

WQ_v=[(P)(R_v)(A)]/12=
[(1.4)(0.95)(4.73)]/12=0.411 AF

0.411 AF= 17,903 CF REQUIRED

REQUIRED FOR REDEVELOPMENT (NYS DEC SECTION 9.2.1(III)

17,903 CF * 0.75 = 13,427 CF REQUIRED

PROVIDED TREATMENT AREA
WATERSHED AREA P1
100% OF NEW IMPERVIOUS
WQv CALCULATION:

90% RULE:
P=1.4
I=43%
R_v=0.05+0.009(43)=0.43
A= 0.80

WQ_v=[(P)(R_v)(A)]/12=
[(1.4)(0.43)(0.80)]/12=0.040AF

0.040 AF= 1,758 CF REQUIRED

TOTAL WQv REQUIRED:

13,427 CF + 1,758 CF = 15,185 CF

TOTAL WQv PROVIDED:

REFER TO ATTACHED GI WORKSHEETS FOR WQv CALCULATIONS

CATCHMENT AREA P-1A: 10,977 CF
CATCHMENT AREA P-1C: 11,817 CF
CATCHMENT AREA P-1D: 1,758 CF

TOTAL: 24,552 CF

Date: **9/26/2022**
Project: **Hydrodynamic Separator**
Location: **Wappingers NY**
Prepared For: **Bohler Engineering**

Purpose: To calculate the water quality flow rate (Qwq) over a given site area. In this situation the WQv to be analyzed is the runoff produced by the first 1.4 inch(es) of rainfall, per Fig 4.1 of the New York State Stormwater Management

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual, New York State Stormwater Management Design Manual - 2015

Formulas:

$$WQv = \frac{(P)(R_v)(A)}{12}$$

$$R_v = (0.05+0.009(I))$$

$$CN = 1000/[10+5P+10Qa-10(Qa^2+1.25QaP)^{1/2}]$$

$$Qwq = (q_u)*(A)*(Qa)$$

Structure:	P-1A		**Structure:**	P-1C	
P	**1.40**	in.	P	**1.40**	in.
A	2.710	ac	A	2.640	ac
I	82.97	%	I	92.34	%
t_c	6.0	min.	t_c	6.0	min.
t_c	0.100	hr.	t_c	0.100	hr.
R_v	0.797		R_v	0.881	
90% WQv	0.252	ac-ft	90% WQv	0.271	ac-ft
90% WQv	10977.12	ft^3	90% WQv	11817.83	ft^3
Qa	1.116	in.	Qa	1.233	in.
CN	97.31		CN	98.51	
I_a	0.055		I_a	0.041	
I_a/P	0.040		I_a/P	0.029	
qu	**650**	(csm/in)	qu	**650**	(csm/in)
A	0.00423	$miles^2$	A	0.00413	$miles^2$
Qwq	3.07	cfs	Qwq	3.31	cfs

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

Af=WQv*(df)/[k*(hf+df)(tf)]

Af	Required Surface Area (ft2)
WQv	Water Quality Volume (ft3)
df	Depth of the Soil Medium (feet)
hf	Average height of water above the planter bed
tf	Volume Through the Filter Media (days)

k The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: ***Sand*** - 3.5 ft/day (City of Austin 1988); ***Peat*** - 2.0 ft/day (Galli 1990); ***Leaf Compost*** - 8.7 ft/day (Claytor and Schueler, 1996); ***Bioretention Soil*** (0.5 ft/day (Claytor &

Design Point:	

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**
1	0.80	0.34	0.43	0.43	1758.37	1.40	
Enter Impervious Area Reduced by Disconnection of Rooftops			43%	0.43	1,758	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						*ft^3*	

Soil Information

Soil Group	B		
Soil Infiltration Rate	0.00	*in/hour*	*Okay*
Using Underdrains?	Yes	*Okay*	

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		1,758	*ft^3*	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	1.67	*days*	
Required Filter Area	***Af***	**1755**	***ft^2***	

Determine Actual Bio-Retention Area

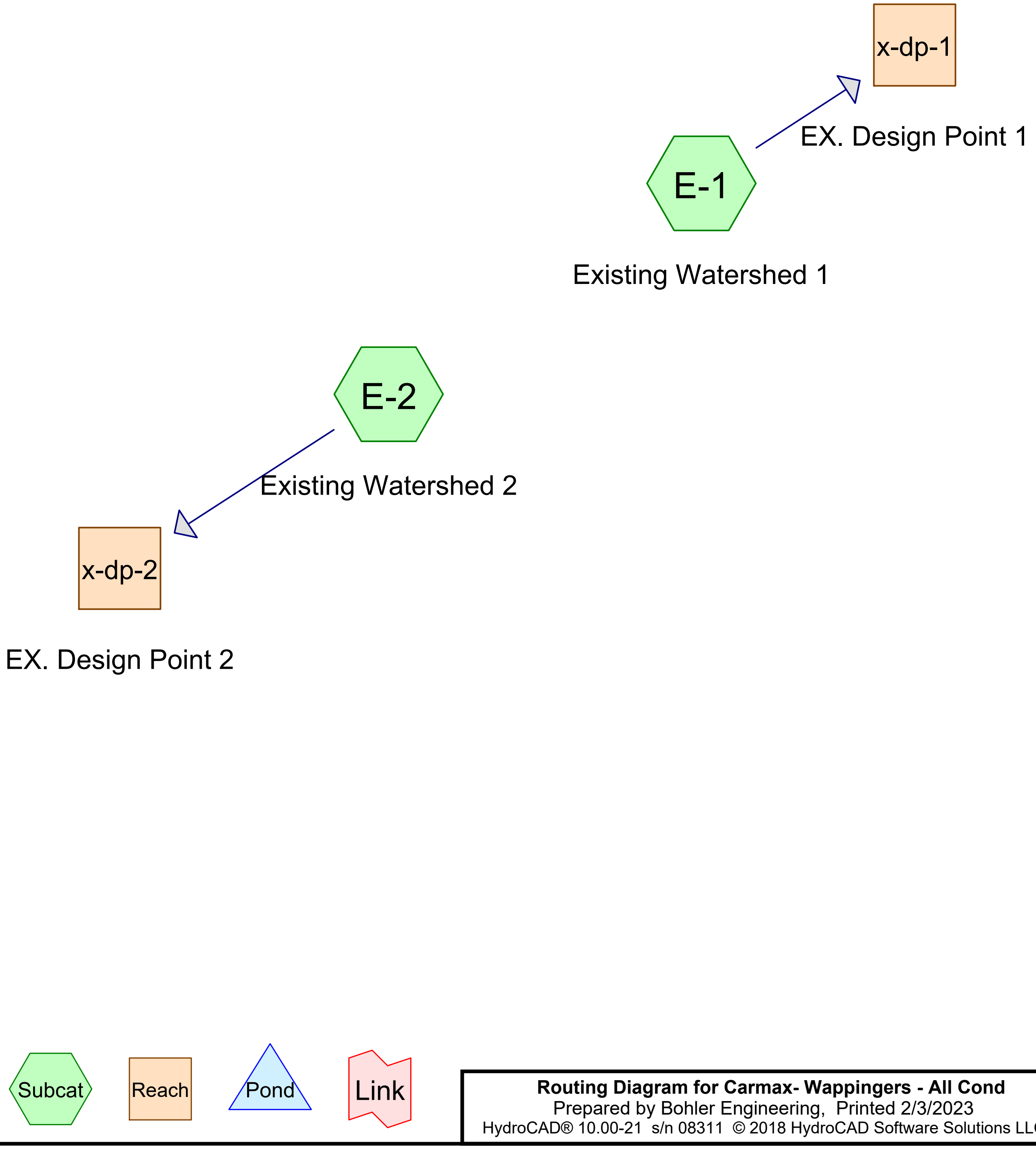
Filter Width	23	*ft*	
Filter Length	107	*ft*	
Filter Area	2461	*ft^2*	
Actual Volume Provided	2466	*ft^3*	

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	986		
RRv applied	**986**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	772	*ft^3*	*This is the portion of the WQv that is not reduced in the practice.*
Volume Directed	0	*ft^3*	This volume is directed another practice
Sizing √	OK		*Check to be sure Area provided ≥ Af*

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B	0.80	40%
C		30%
D		20%
Total Area	0.8	
Calculate the Minimum RRv		
S =	**0.40**	
Impervious =	0.34	*acre*
Precipitation	1.4	*in*
Rv	0.95	
Minimum RRv	**657**	***ft3***
	0.02	af



Routing Diagram for Carmax- Wappingers - All Cond
Prepared by Bohler Engineering, Printed 2/3/2023
HydroCAD® 10.00-21 s/n 08311 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.212	61	>75% Grass cover, Good, HSG B (E-1, E-2)
5.450	98	Paved parking, HSG B (E-1, E-2)
0.097	55	Woods, Good, HSG B (E-2)
8.759	**84**	**TOTAL AREA**

Summary for Subcatchment E-1: Existing Watershed 1

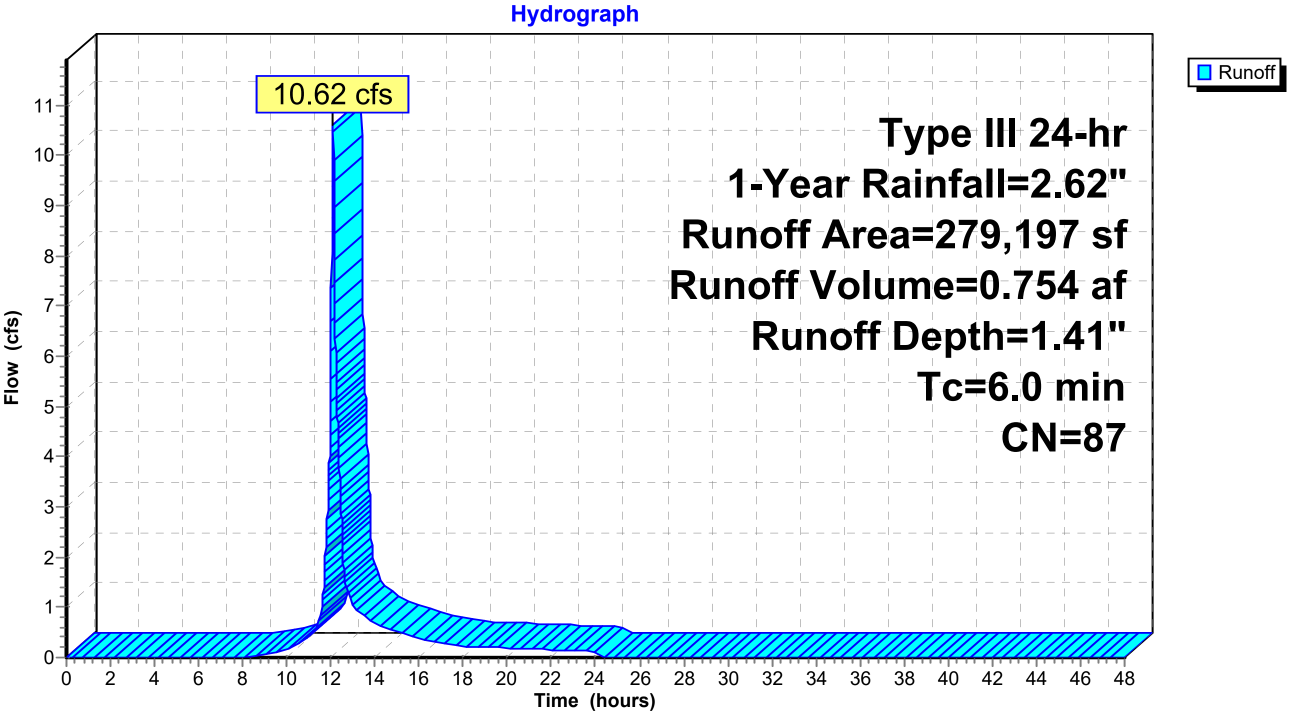
Runoff = 10.62 cfs @ 12.09 hrs, Volume= 0.754 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
199,742	98	Paved parking, HSG B
79,455	61	>75% Grass cover, Good, HSG B
279,197	87	Weighted Average
79,455		28.46% Pervious Area
199,742		71.54% Impervious Area

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

Subcatchment E-1: Existing Watershed 1



Summary for Subcatchment E-2: Existing Watershed 2

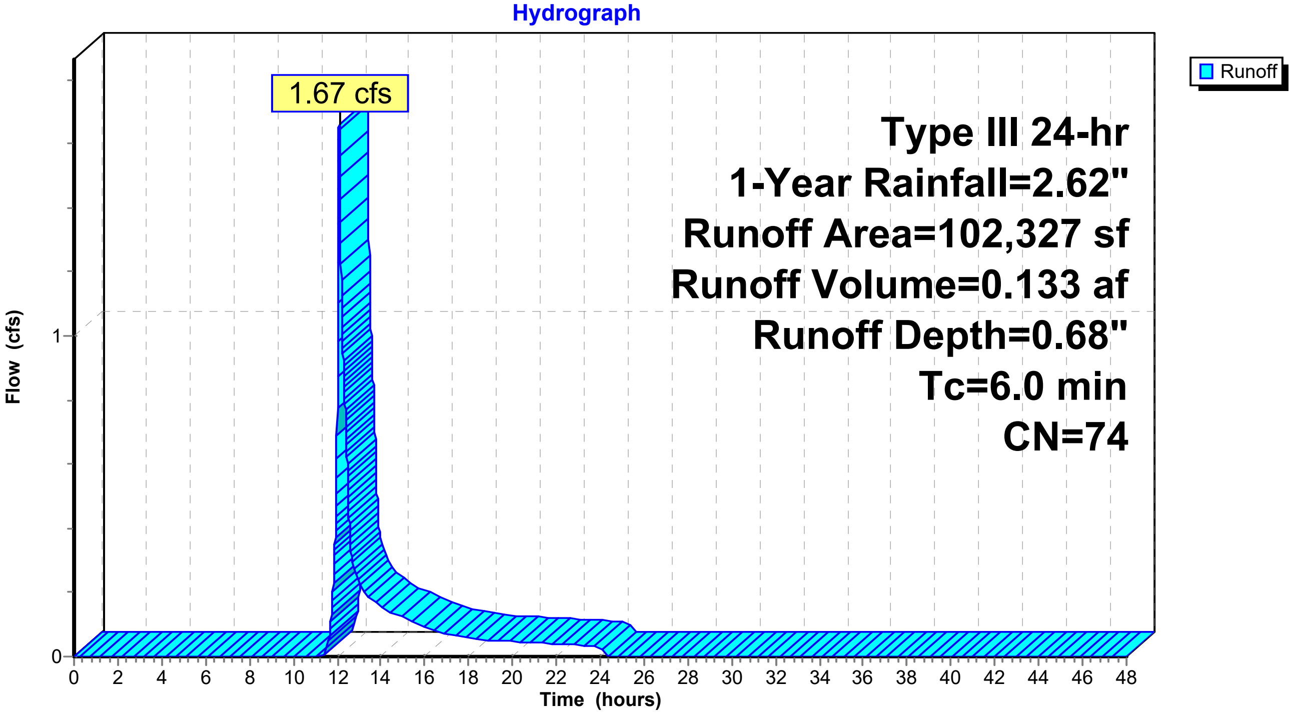
Runoff = 1.67 cfs @ 12.10 hrs, Volume= 0.133 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
37,649	98	Paved parking, HSG B
60,446	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
102,327	74	Weighted Average
64,678		63.21% Pervious Area
37,649		36.79% Impervious Area

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

Subcatchment E-2: Existing Watershed 2

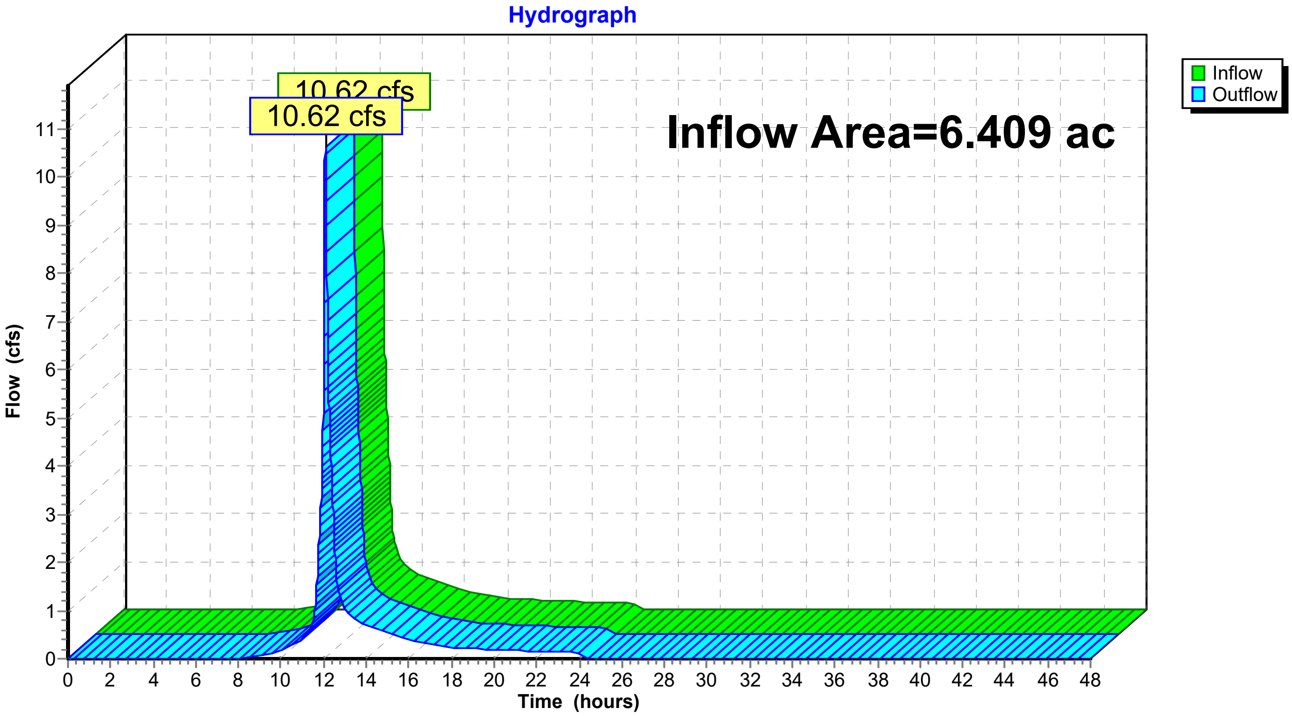


Summary for Reach x-dp-1: EX. Design Point 1

Inflow Area =	6.409 ac,	71.54% Impervious,	Inflow Depth = 1.41"	for 1-Year event	
Inflow =	10.62 cfs @	12.09 hrs,	Volume=	0.754 af	
Outflow =	10.62 cfs @	12.09 hrs,	Volume=	0.754 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach x-dp-1: EX. Design Point 1

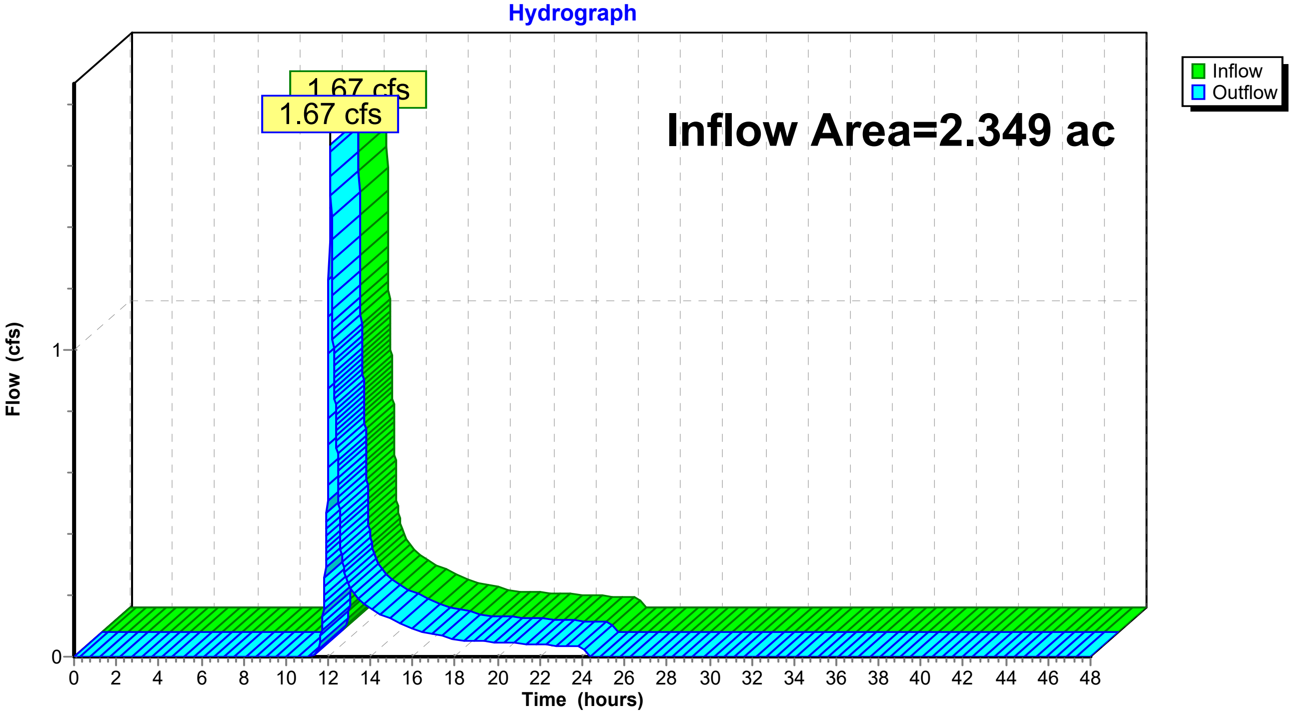


Summary for Reach x-dp-2: EX. Design Point 2

Inflow Area = 2.349 ac, 36.79% Impervious, Inflow Depth = 0.68" for 1-Year event
Inflow = 1.67 cfs @ 12.10 hrs, Volume= 0.133 af
Outflow = 1.67 cfs @ 12.10 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach x-dp-2: EX. Design Point 2



Summary for Subcatchment E-1: Existing Watershed 1

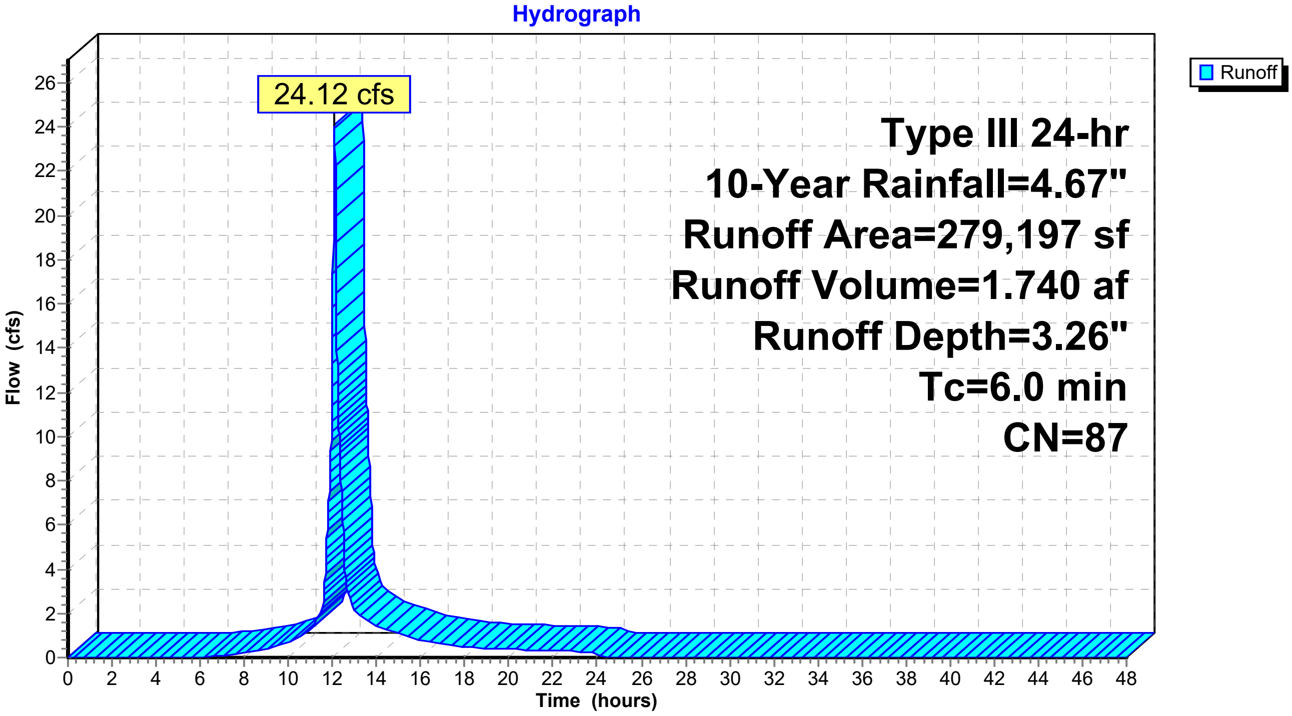
Runoff = 24.12 cfs @ 12.09 hrs, Volume= 1.740 af, Depth= 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
199,742	98	Paved parking, HSG B
79,455	61	>75% Grass cover, Good, HSG B
279,197	87	Weighted Average
79,455		28.46% Pervious Area
199,742		71.54% Impervious Area

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

Subcatchment E-1: Existing Watershed 1



Summary for Subcatchment E-2: Existing Watershed 2

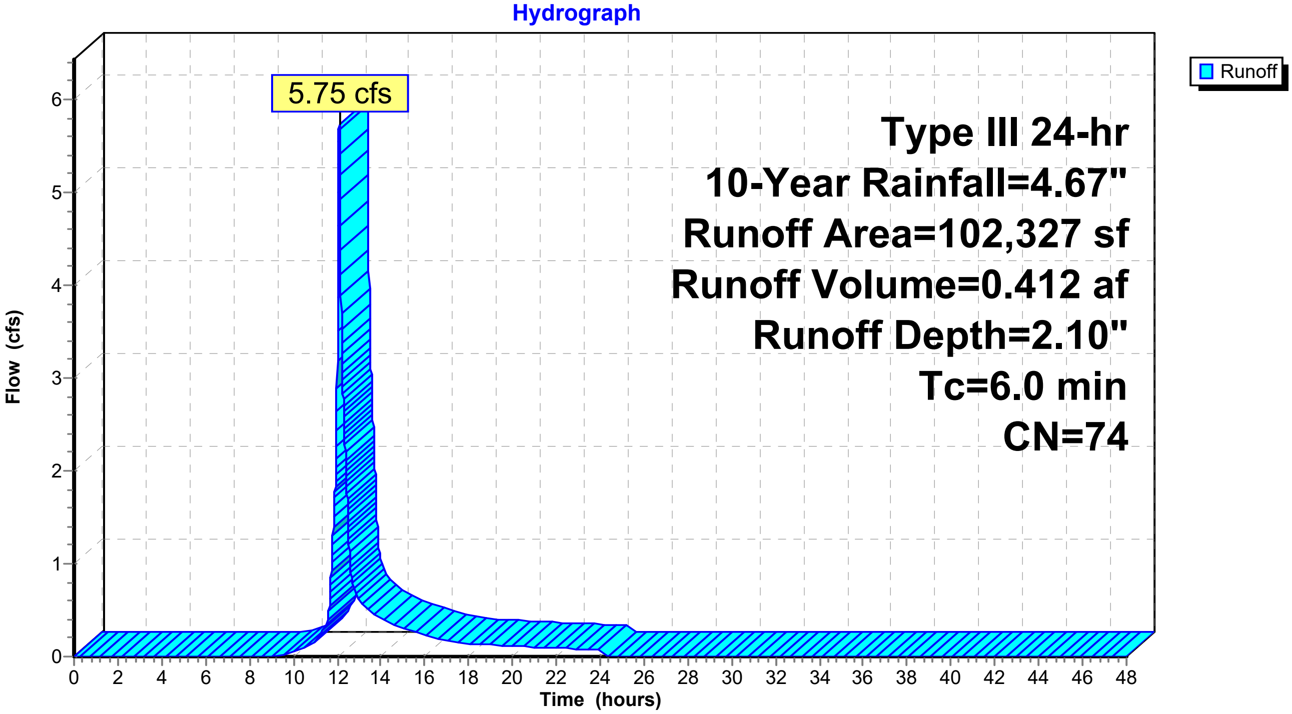
Runoff = 5.75 cfs @ 12.09 hrs, Volume= 0.412 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
37,649	98	Paved parking, HSG B
60,446	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
102,327	74	Weighted Average
64,678		63.21% Pervious Area
37,649		36.79% Impervious Area

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

Subcatchment E-2: Existing Watershed 2

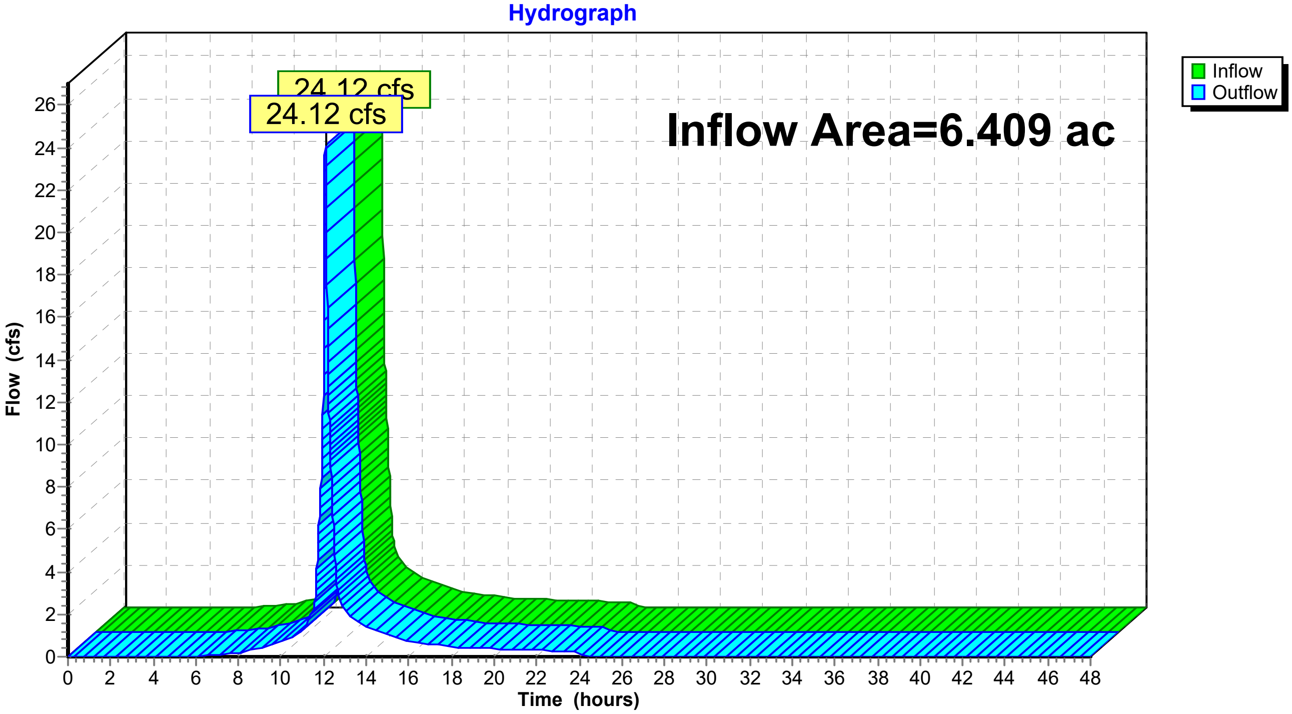


Summary for Reach x-dp-1: EX. Design Point 1

Inflow Area = 6.409 ac, 71.54% Impervious, Inflow Depth = 3.26" for 10-Year event
Inflow = 24.12 cfs @ 12.09 hrs, Volume= 1.740 af
Outflow = 24.12 cfs @ 12.09 hrs, Volume= 1.740 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

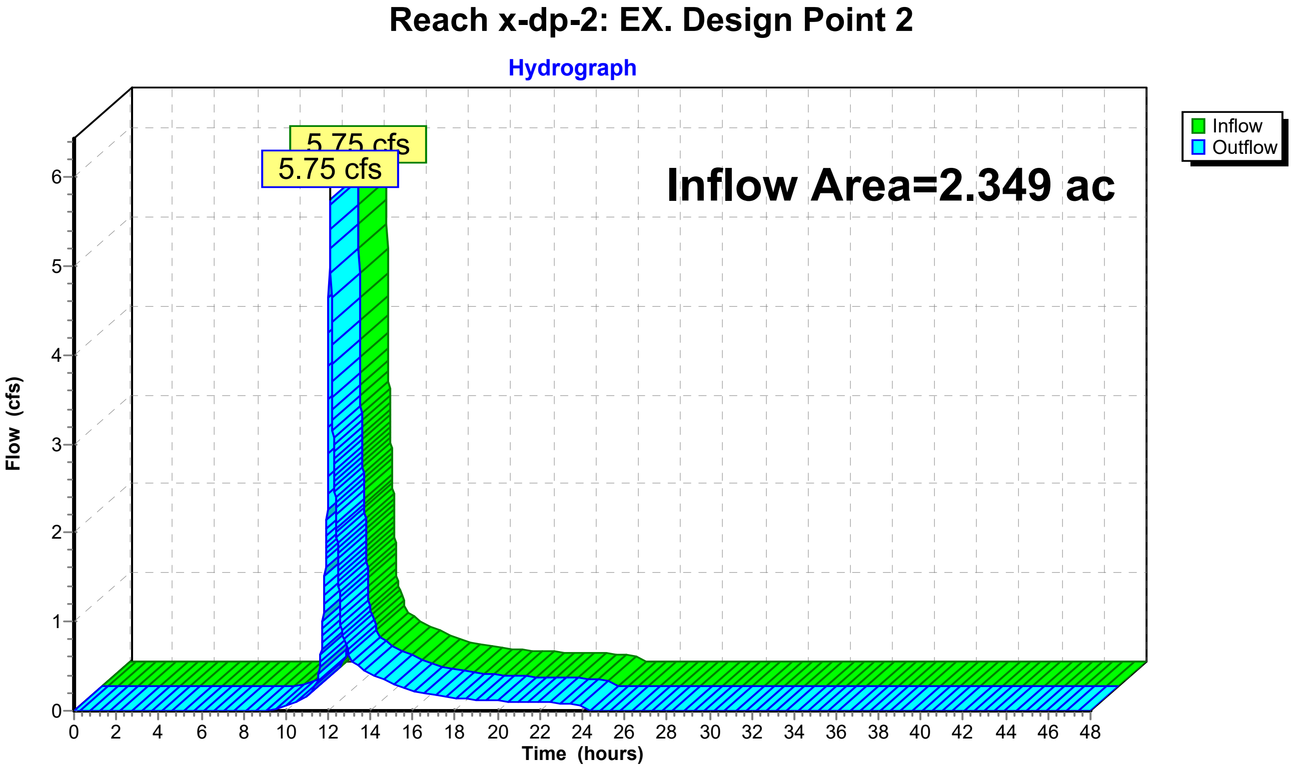
Reach x-dp-1: EX. Design Point 1



Summary for Reach x-dp-2: EX. Design Point 2

Inflow Area = 2.349 ac, 36.79% Impervious, Inflow Depth = 2.10" for 10-Year event
Inflow = 5.75 cfs @ 12.09 hrs, Volume= 0.412 af
Outflow = 5.75 cfs @ 12.09 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2



Summary for Subcatchment E-1: Existing Watershed 1

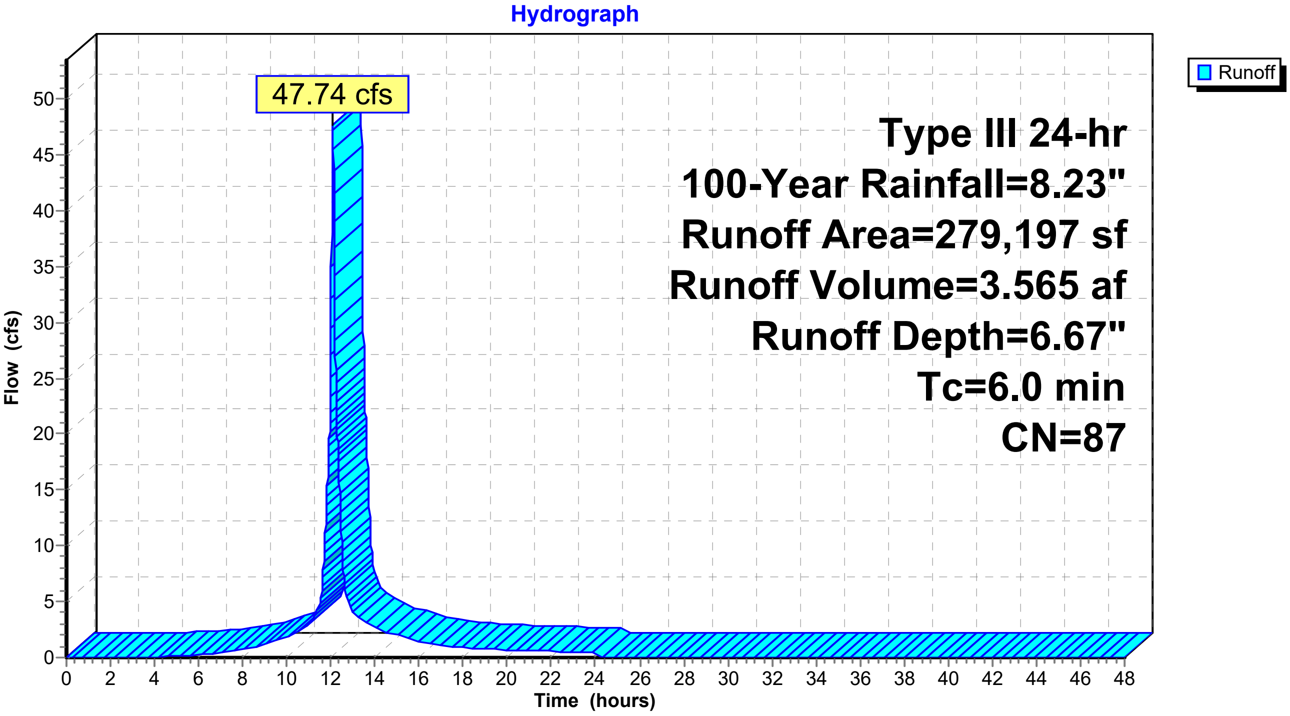
Runoff = 47.74 cfs @ 12.08 hrs, Volume= 3.565 af, Depth= 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
199,742	98	Paved parking, HSG B
79,455	61	>75% Grass cover, Good, HSG B
279,197	87	Weighted Average
79,455		28.46% Pervious Area
199,742		71.54% Impervious Area

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

Subcatchment E-1: Existing Watershed 1



Summary for Subcatchment E-2: Existing Watershed 2

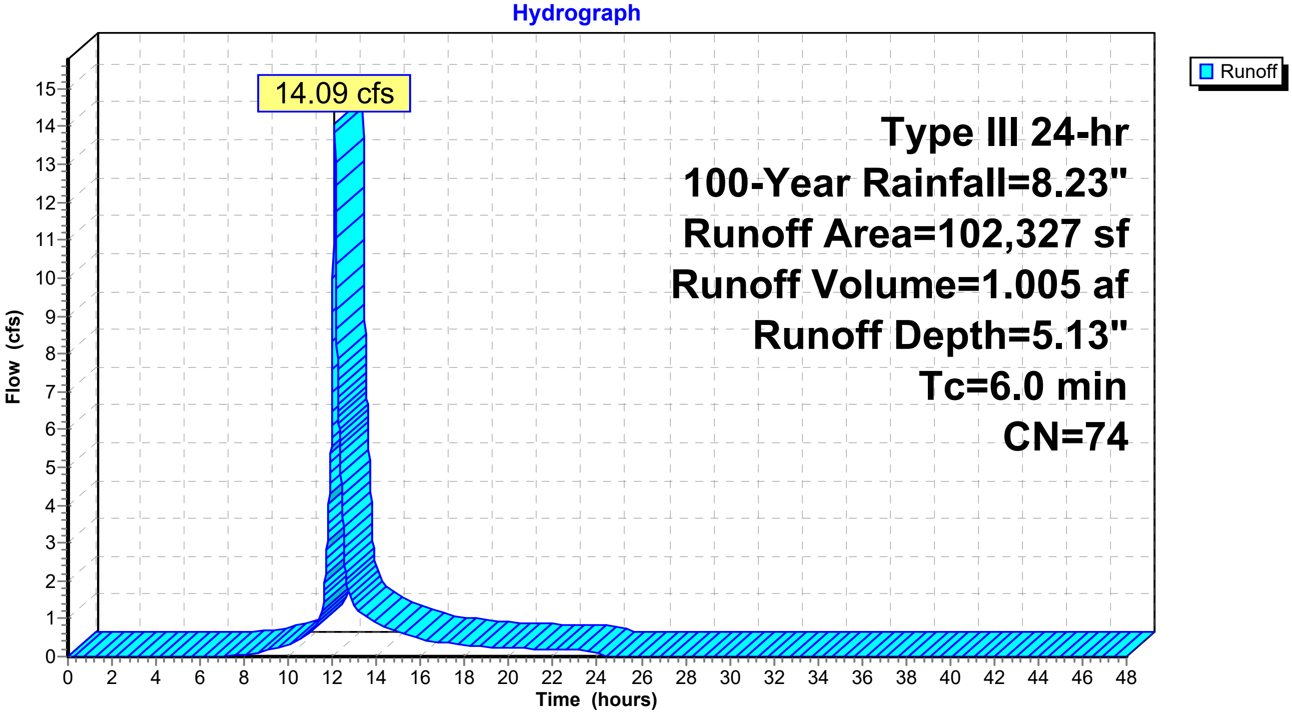
Runoff = 14.09 cfs @ 12.09 hrs, Volume= 1.005 af, Depth= 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
37,649	98	Paved parking, HSG B
60,446	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
102,327	74	Weighted Average
64,678		63.21% Pervious Area
37,649		36.79% Impervious Area

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

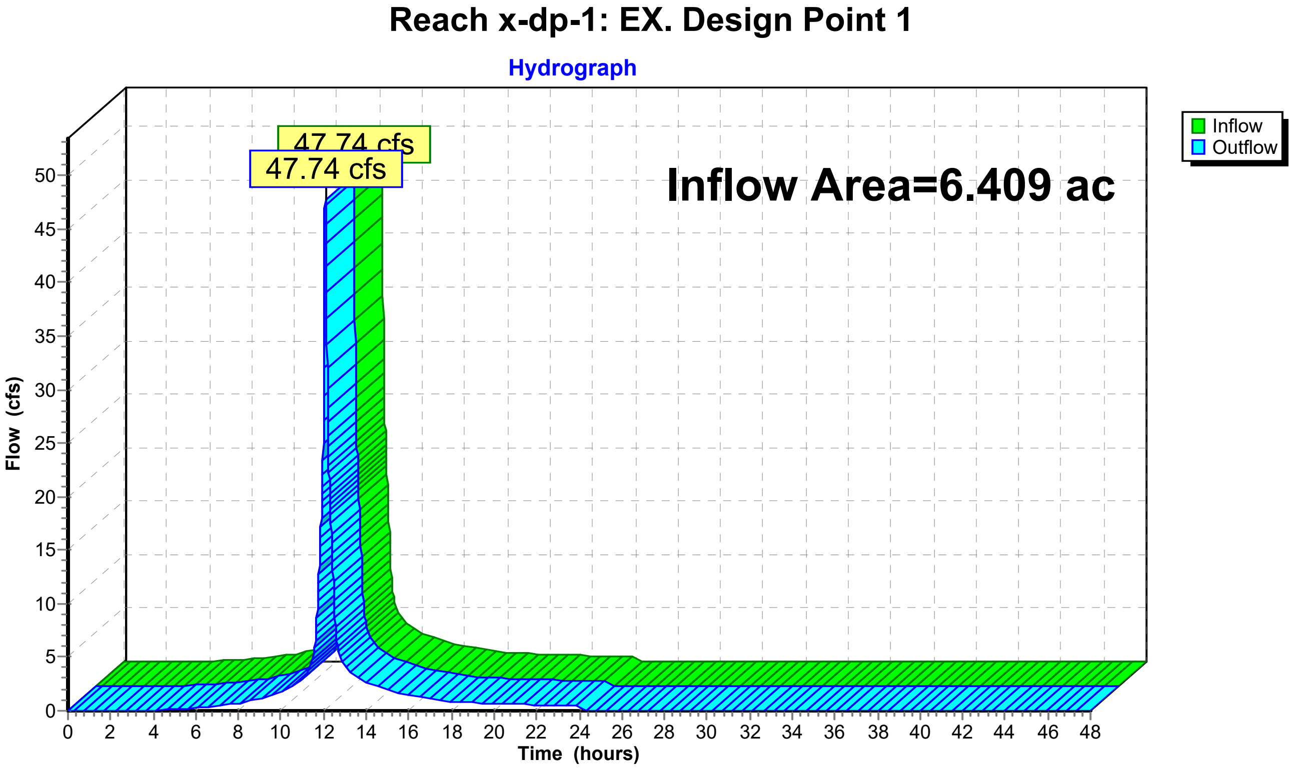
Subcatchment E-2: Existing Watershed 2



Summary for Reach x-dp-1: EX. Design Point 1

Inflow Area =	6.409 ac, 71.54% Impervious, Inflow Depth = 6.67"	for 100-Year event
Inflow =	47.74 cfs @ 12.08 hrs, Volume=	3.565 af
Outflow =	47.74 cfs @ 12.08 hrs, Volume=	3.565 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

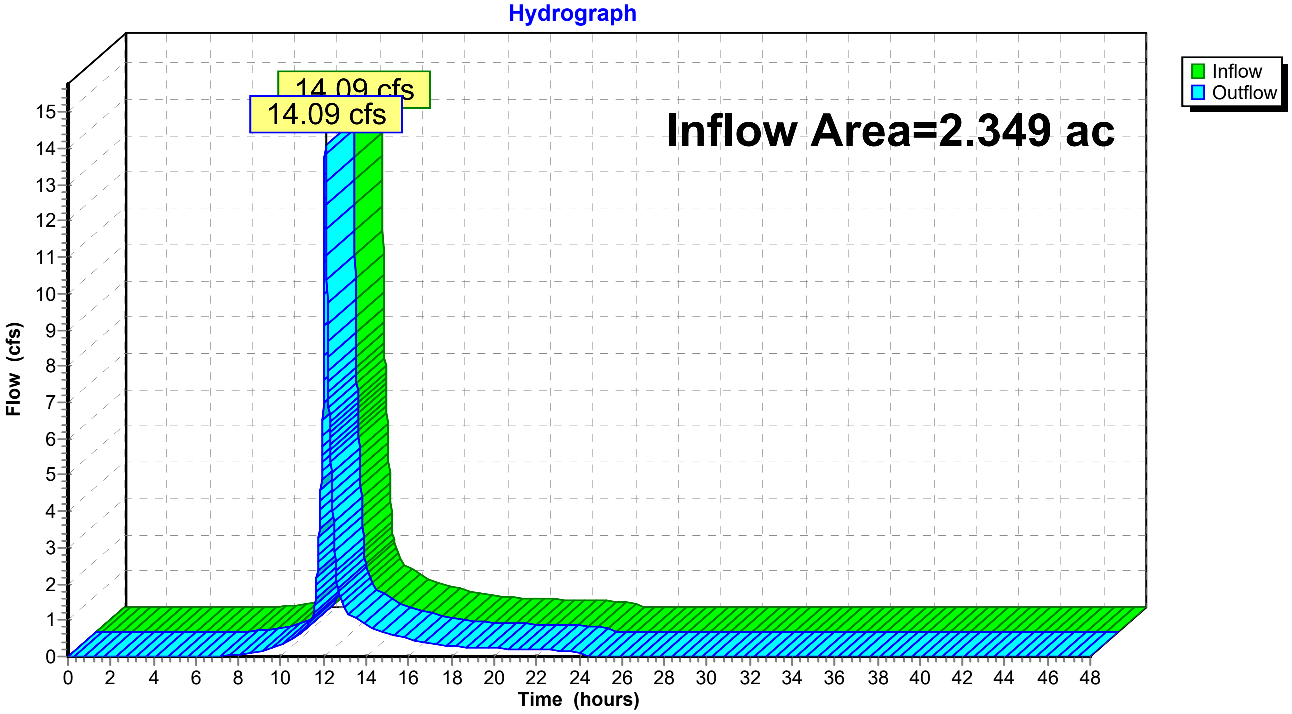


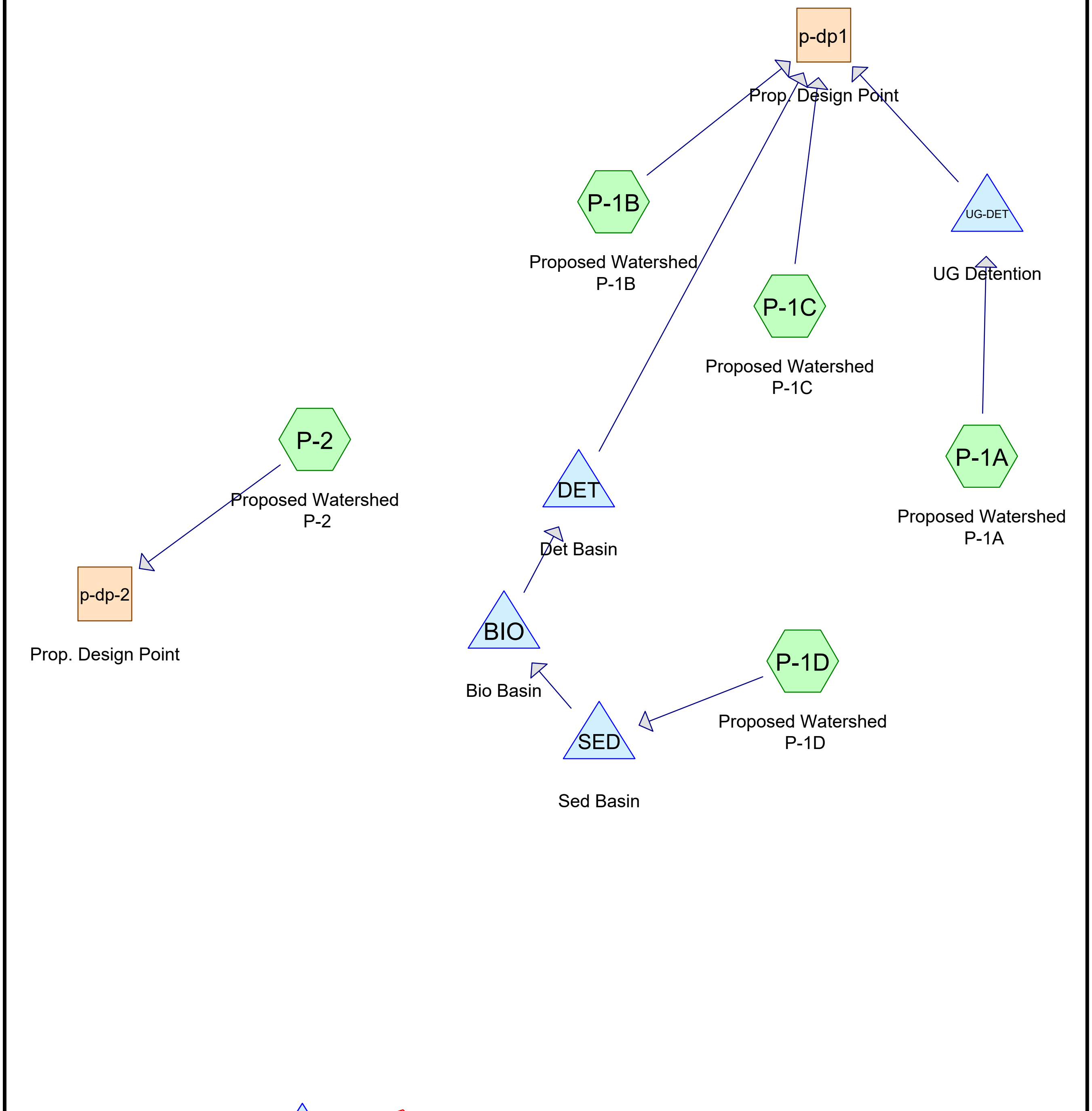
Summary for Reach x-dp-2: EX. Design Point 2

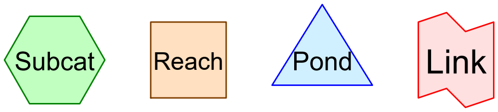
Inflow Area = 2.349 ac, 36.79% Impervious, Inflow Depth = 5.13" for 100-Year event
Inflow = 14.09 cfs @ 12.09 hrs, Volume= 1.005 af
Outflow = 14.09 cfs @ 12.09 hrs, Volume= 1.005 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach x-dp-2: EX. Design Point 2







Routing Diagram for Carmax- Wappingers - All Cond
Prepared by Bohler Engineering, Printed 2/3/2023
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.880	61	>75% Grass cover, Good, HSG B (P-1A, P-1B, P-1C, P-1D, P-2)
5.781	98	Paved parking, HSG B (P-1A, P-1B, P-1C, P-1D)
0.097	55	Woods, Good, HSG B (P-2)
8.759	**85**	**TOTAL AREA**

Summary for Subcatchment P-1A: Proposed Watershed P-1A

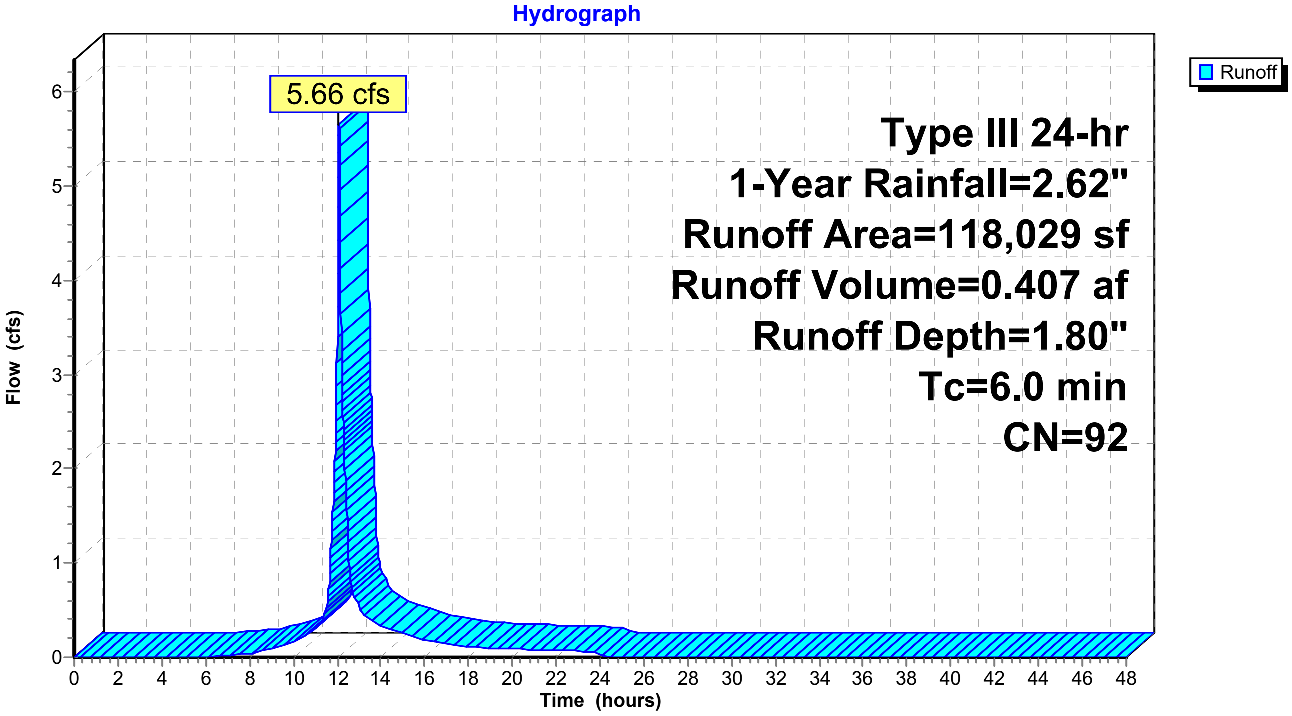
Runoff = 5.66 cfs @ 12.09 hrs, Volume= 0.407 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
97,932	98	Paved parking, HSG B
20,097	61	>75% Grass cover, Good, HSG B
118,029	92	Weighted Average
20,097		17.03% Pervious Area
97,932		82.97% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

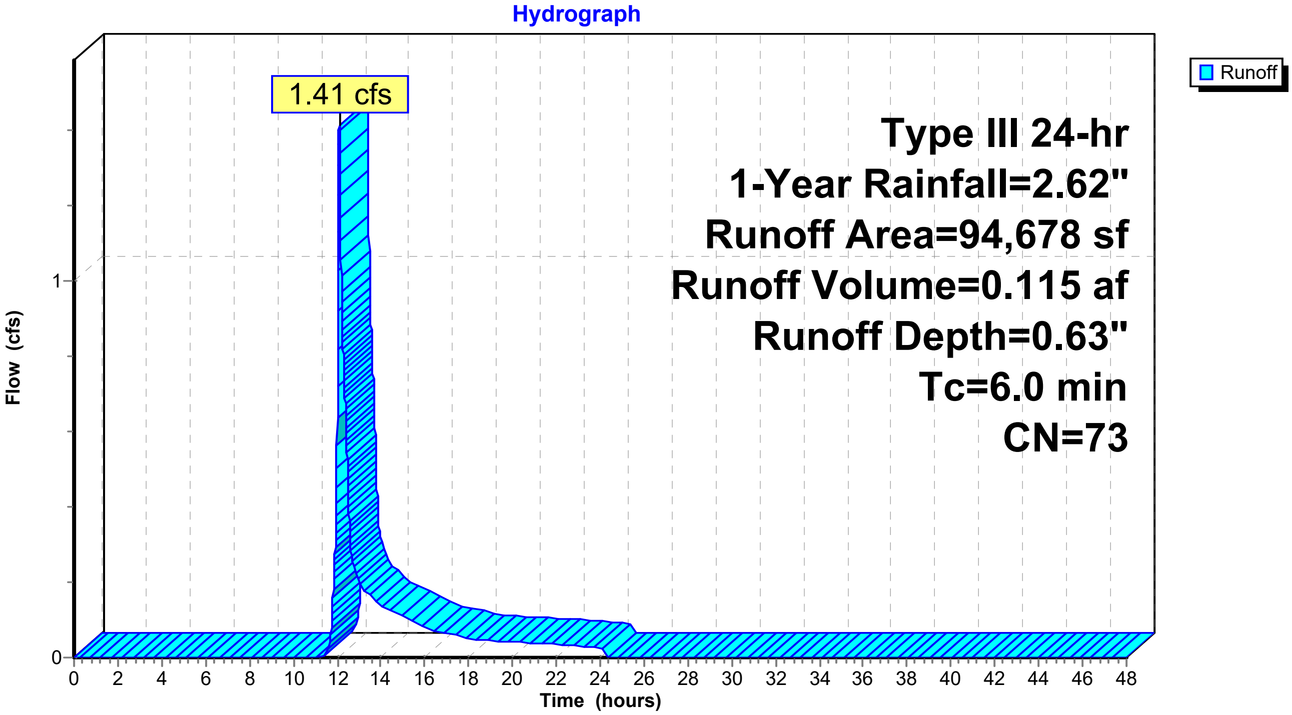
Runoff = 1.41 cfs @ 12.10 hrs, Volume= 0.115 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
29,953	98	Paved parking, HSG B
64,725	61	>75% Grass cover, Good, HSG B
94,678	73	Weighted Average
64,725		68.36% Pervious Area
29,953		31.64% Impervious Area

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

Subcatchment P-1B: Proposed Watershed P-1B



Summary for Subcatchment P-1C: Proposed Watershed P-1C

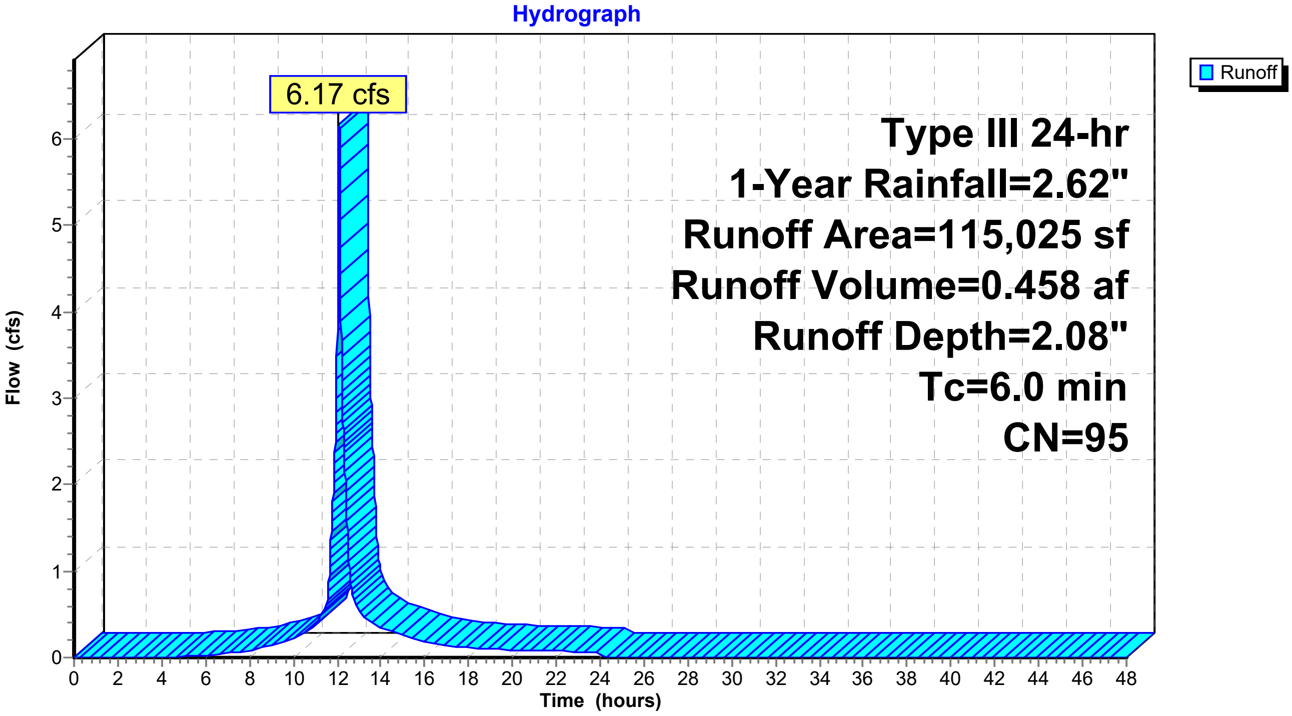
Runoff = 6.17 cfs @ 12.08 hrs, Volume= 0.458 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
106,212	98	Paved parking, HSG B
8,813	61	>75% Grass cover, Good, HSG B
115,025	95	Weighted Average
8,813		7.66% Pervious Area
106,212		92.34% Impervious Area

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

Subcatchment P-1C: Proposed Watershed P-1C



Summary for Subcatchment P-1D: Proposed Watershed P-1D

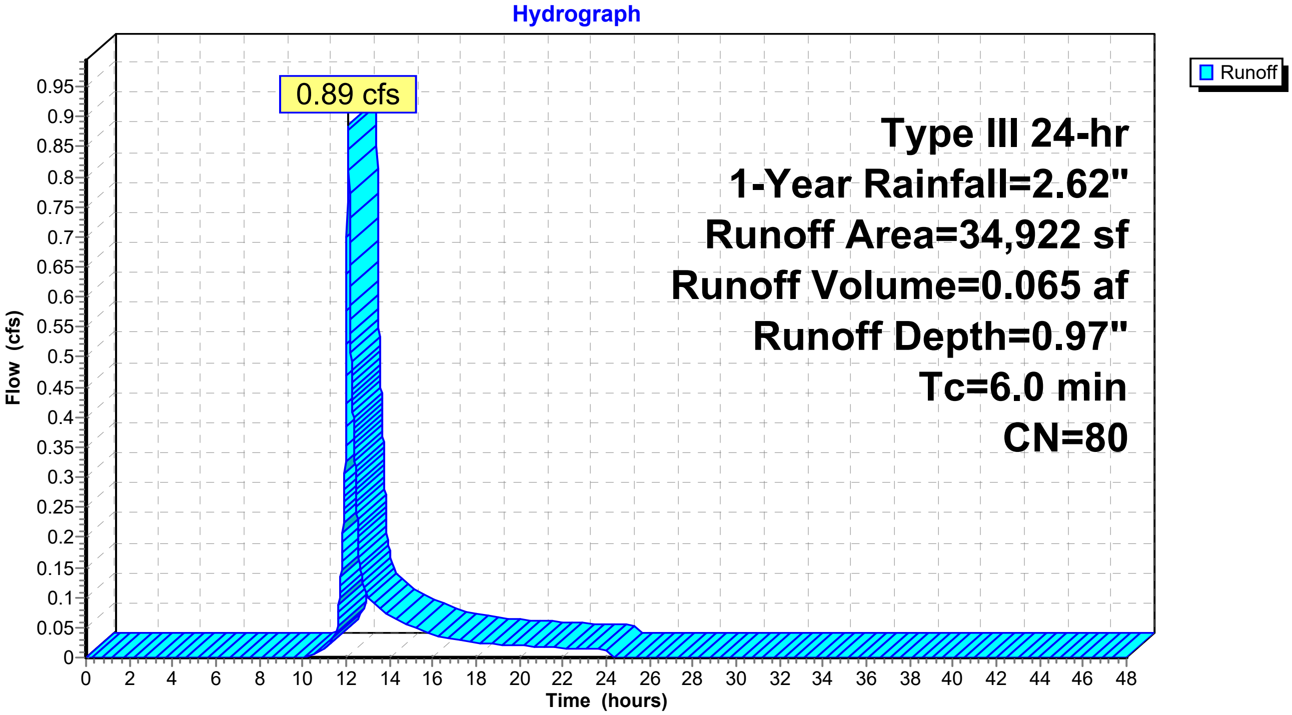
Runoff = 0.89 cfs @ 12.09 hrs, Volume= 0.065 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
17,187	61	>75% Grass cover, Good, HSG B
17,735	98	Paved parking, HSG B
34,922	80	Weighted Average
17,187		49.22% Pervious Area
17,735		50.78% Impervious Area

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

Subcatchment P-1D: Proposed Watershed P-1D



Summary for Subcatchment P-2: Proposed Watershed P-2

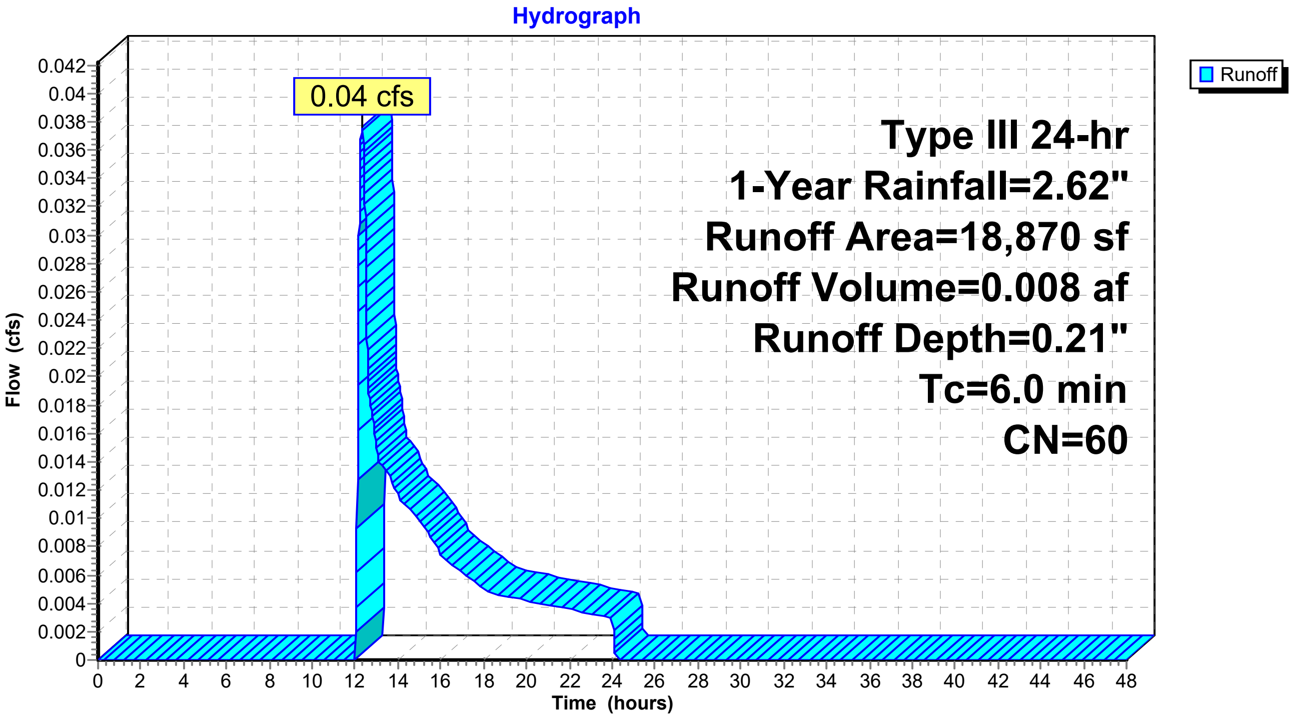
Runoff = 0.04 cfs @ 12.33 hrs, Volume= 0.008 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.62"

Area (sf)	CN	Description
14,638	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
18,870	60	Weighted Average
18,870		100.00% Pervious Area

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

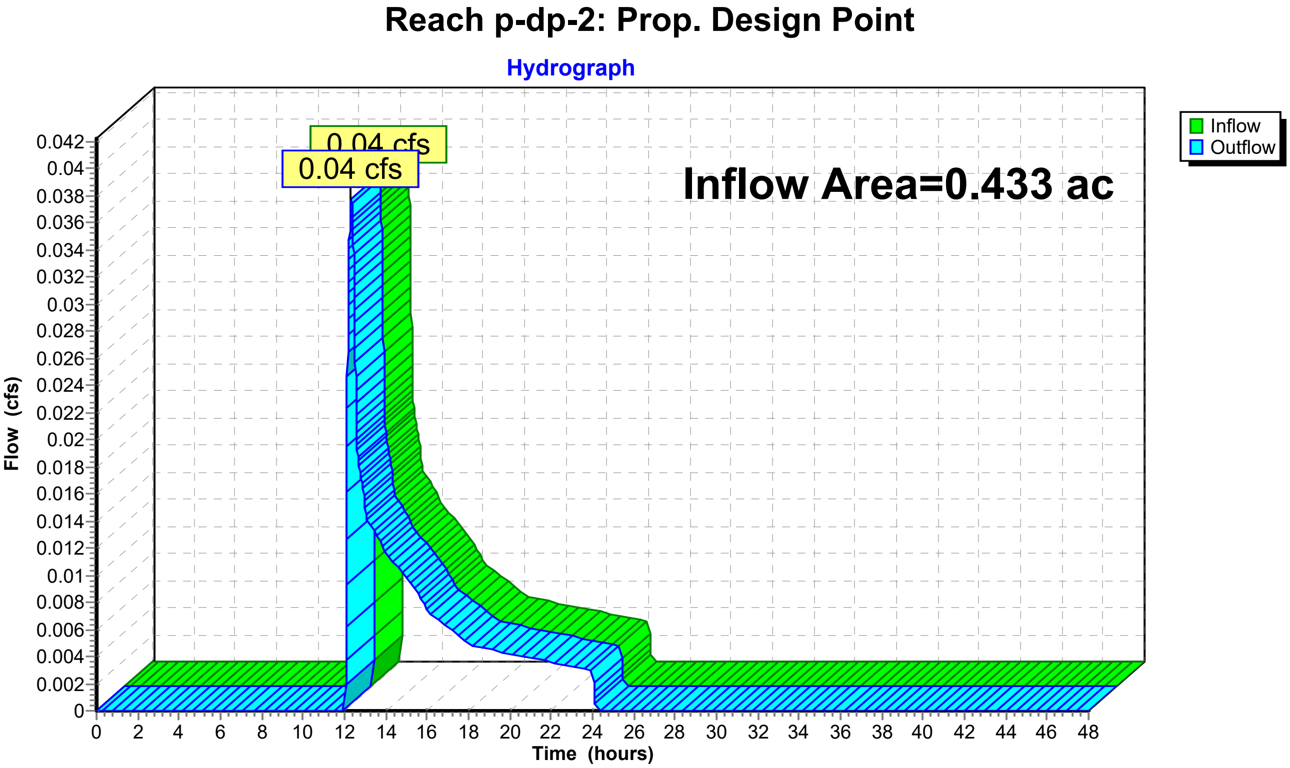
Subcatchment P-2: Proposed Watershed P-2



Summary for Reach p-dp-2: Prop. Design Point

Inflow Area =	0.433 ac,	0.00% Impervious,	Inflow Depth = 0.21"	for 1-Year event	
Inflow =	0.04 cfs @	12.33 hrs,	Volume=	0.008 af	
Outflow =	0.04 cfs @	12.33 hrs,	Volume=	0.008 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2



Summary for Reach p-dp1: Prop. Design Point

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Inflow Area =        8.325 ac, 69.44% Impervious, Inflow Depth >  1.42"   for 1-Year event
Inflow      =       8.10 cfs @  12.09 hrs, Volume=          0.986 af
Outflow     =       8.10 cfs @  12.09 hrs, Volume=          0.986 af, Atten= 0%, Lag= 0.0 min
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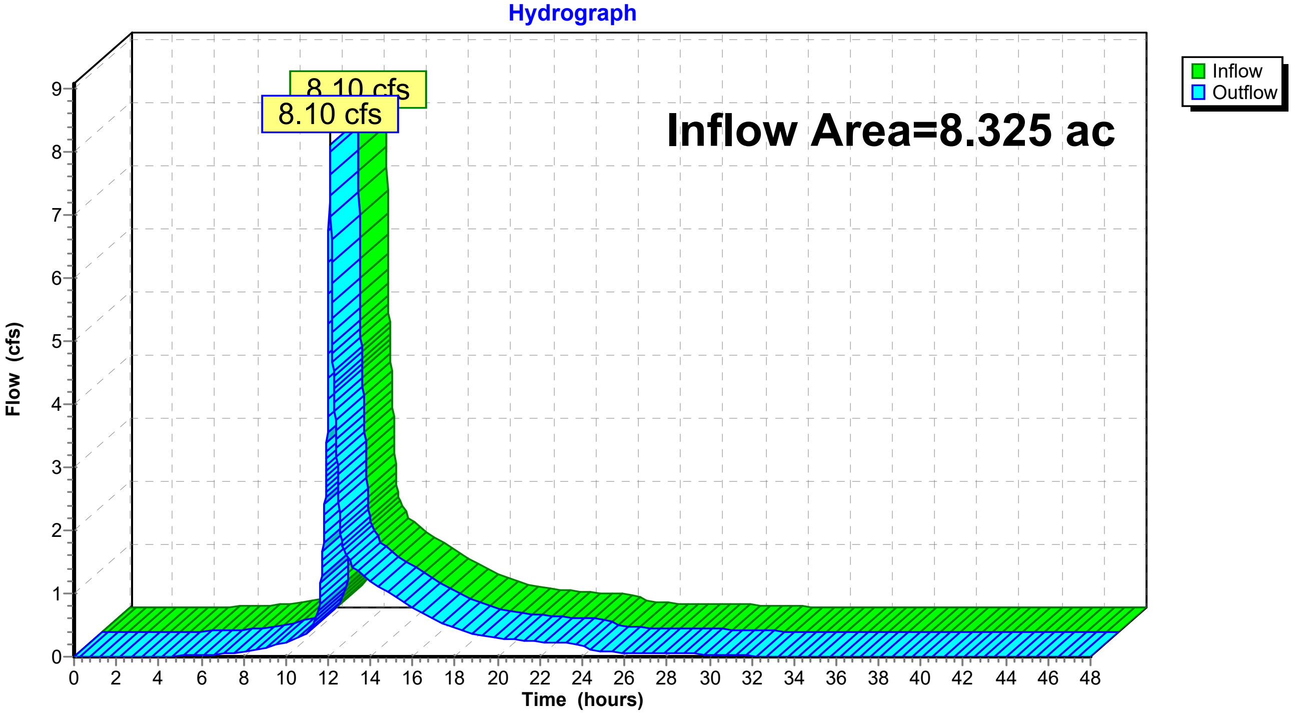
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach p-dp1: Prop. Design Point



Summary for Pond BIO: Bio Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 0.72" for 1-Year event
Inflow = 0.41 cfs @ 12.32 hrs, Volume= 0.048 af
Outflow = 0.03 cfs @ 16.76 hrs, Volume= 0.048 af, Atten= 92%, Lag= 266.5 min
Primary = 0.03 cfs @ 16.76 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.38' @ 16.76 hrs Surf.Area= 2,878 sf Storage= 1,006 cf

Plug-Flow detention time= 351.3 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 351.4 min (1,266.2 - 914.9)

Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	4,908 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
254.00	2,467	0	0
255.00	3,560	3,014	3,014
255.50	4,019	1,895	4,908

Device	Routing	Invert	Outlet Devices
#1	Primary	251.50'	**8.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.50' / 251.50' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Device 1	254.00'	**0.500 in/hr Soil Media over Surface area**
#3	Primary	254.50'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.03 cfs @ 16.76 hrs HW=254.38' TW=251.77' (Dynamic Tailwater)
```
↑—1=Culvert (Passes 0.03 cfs of 2.12 cfs potential flow)
   ↑—2=Soil Media (Exfiltration Controls 0.03 cfs)
└—3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
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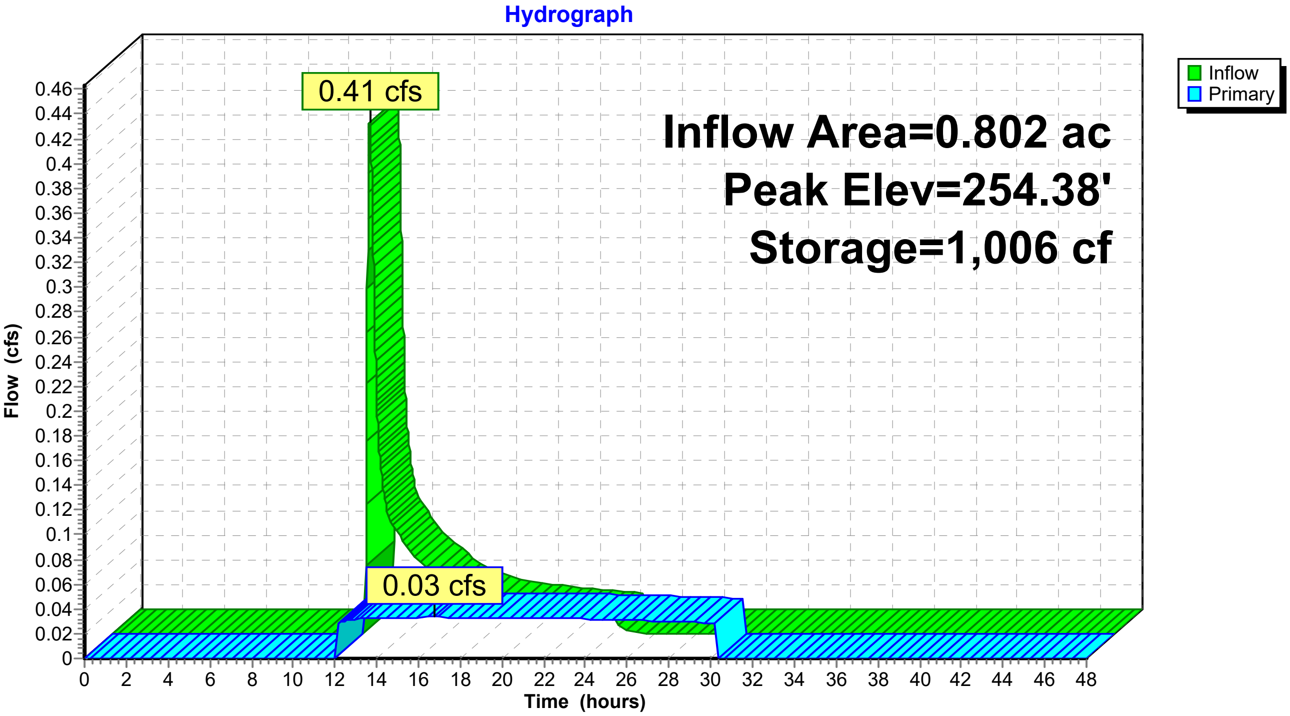
Pond BIO: Bio Basin



Summary for Pond DET: Det Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 0.72" for 1-Year event
Inflow = 0.03 cfs @ 16.76 hrs, Volume= 0.048 af
Outflow = 0.03 cfs @ 18.06 hrs, Volume= 0.048 af, Atten= 0%, Lag= 78.5 min
Primary = 0.03 cfs @ 18.06 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 251.77' @ 18.06 hrs Surf.Area= 692 sf Storage= 173 cf

Plug-Flow detention time= 95.7 min calculated for 0.048 af (99% of inflow)
Center-of-Mass det. time= 91.8 min (1,358.1 - 1,266.2)

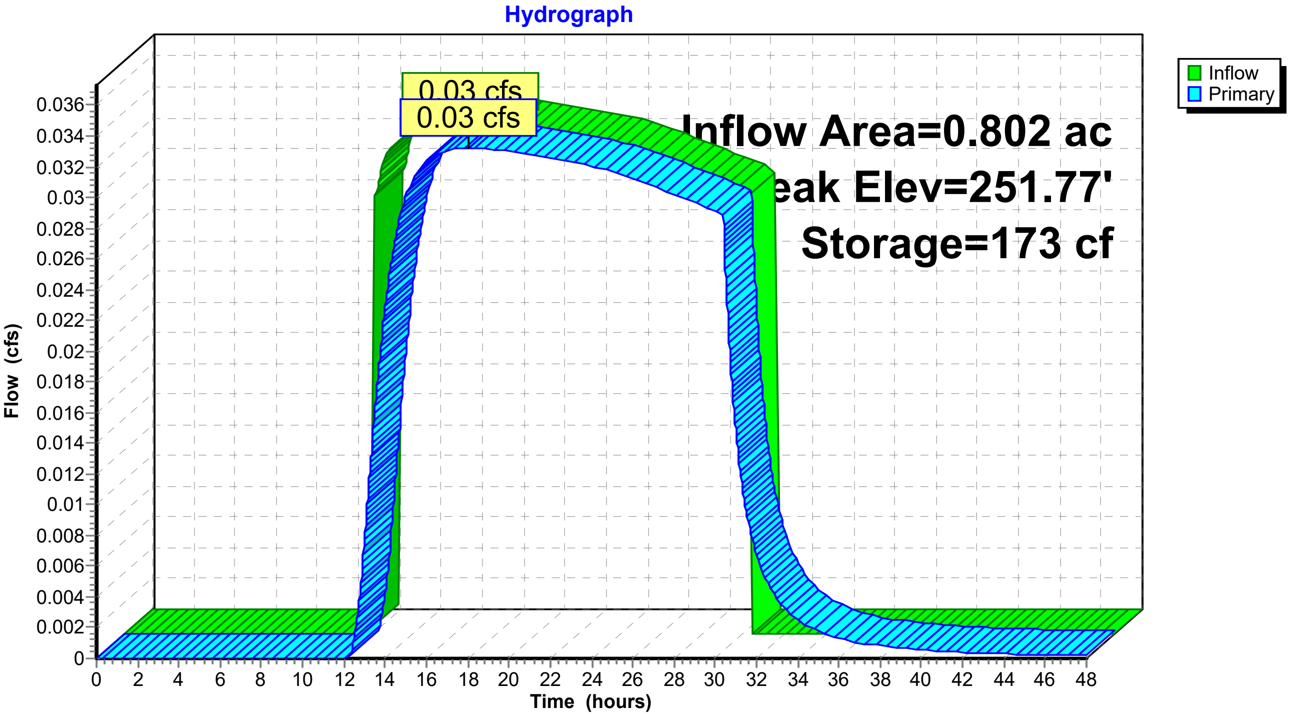
Volume	Invert	Avail.Storage	Storage Description
#1	251.50'	4,774 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.50	587	0	0
252.00	782	342	342
253.00	1,214	998	1,340
254.00	1,703	1,459	2,799
255.00	2,248	1,976	4,774

Device	Routing	Invert	Outlet Devices
#1	Primary	251.50'	**12.0" Round Culvert** L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 251.50' / 251.35' S= 0.0075 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Device 1	251.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	252.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 18.06 hrs HW=251.77' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.03 cfs @ 0.29 fps)
  ├─**2=Orifice/Grate** (Passes 0.03 cfs of 0.13 cfs potential flow)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond DET: Det Basin



Summary for Pond SED: Sed Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 0.97" for 1-Year event
Inflow = 0.89 cfs @ 12.09 hrs, Volume= 0.065 af
Outflow = 0.41 cfs @ 12.32 hrs, Volume= 0.048 af, Atten= 53%, Lag= 13.3 min
Primary = 0.41 cfs @ 12.32 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.71' @ 12.32 hrs Surf.Area= 1,444 sf Storage= 898 cf

Plug-Flow detention time= 156.4 min calculated for 0.048 af (74% of inflow)
Center-of-Mass det. time= 61.2 min (914.9 - 853.6)

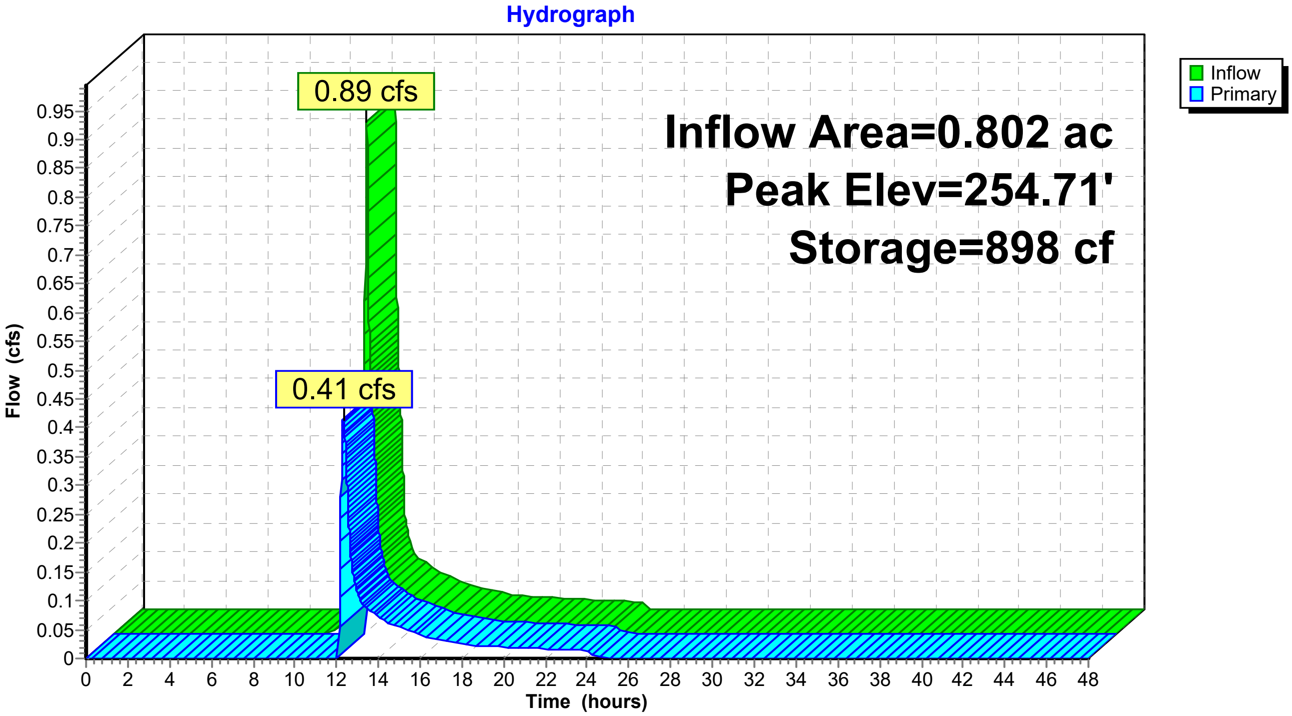
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	2,203 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
254.00	1,093	0	0
255.00	1,589	1,341	1,341
255.50	1,858	862	2,203

Device	Routing	Invert	Outlet Devices
#1	Primary	254.60'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.41 cfs @ 12.32 hrs HW=254.71' TW=254.06' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.77 fps)

Pond SED: Sed Basin



Summary for Pond UG-DET: UG Detention

Inflow Area = 2.710 ac, 82.97% Impervious, Inflow Depth = 1.80" for 1-Year event
Inflow = 5.66 cfs @ 12.09 hrs, Volume= 0.407 af
Outflow = 0.78 cfs @ 12.62 hrs, Volume= 0.366 af, Atten= 86%, Lag= 32.2 min
Primary = 0.78 cfs @ 12.62 hrs, Volume= 0.366 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 248.42' @ 12.62 hrs Surf.Area= 14,820 sf Storage= 9,027 cf

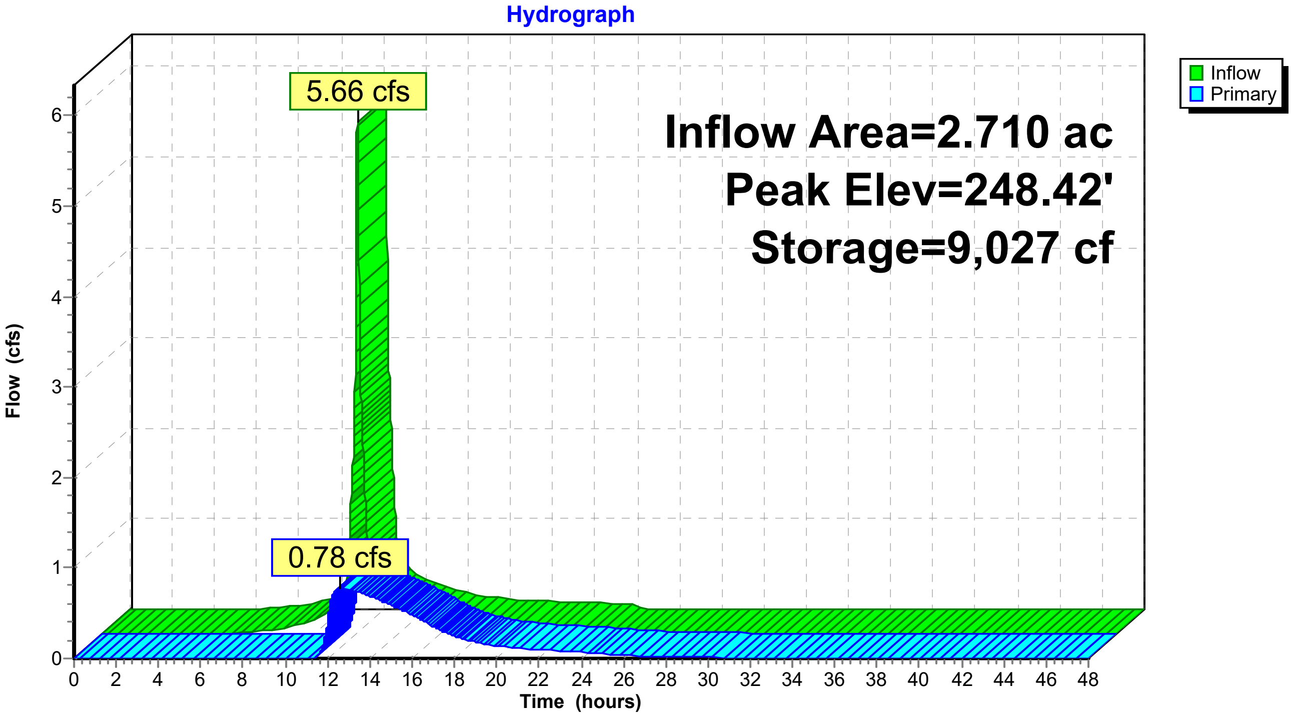
Plug-Flow detention time= 218.5 min calculated for 0.366 af (90% of inflow)
Center-of-Mass det. time= 169.5 min (974.7 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1	247.00'	13,965 cf	**43.00'W x 202.98'L x 4.00'H Field A** 34,913 cf Overall x 40.0% Voids
#2	247.50'	15,551 cf	**36.0" Round Pipe Storage** x 11 L= 200.0'
		29,516 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	247.50'	**18.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 247.50' / 246.29' S= 0.0202 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	247.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	249.90'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.78 cfs @ 12.62 hrs HW=248.42' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.78 cfs of 2.94 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.78 cfs @ 3.95 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond UG-DET: UG Detention



Summary for Subcatchment P-1A: Proposed Watershed P-1A

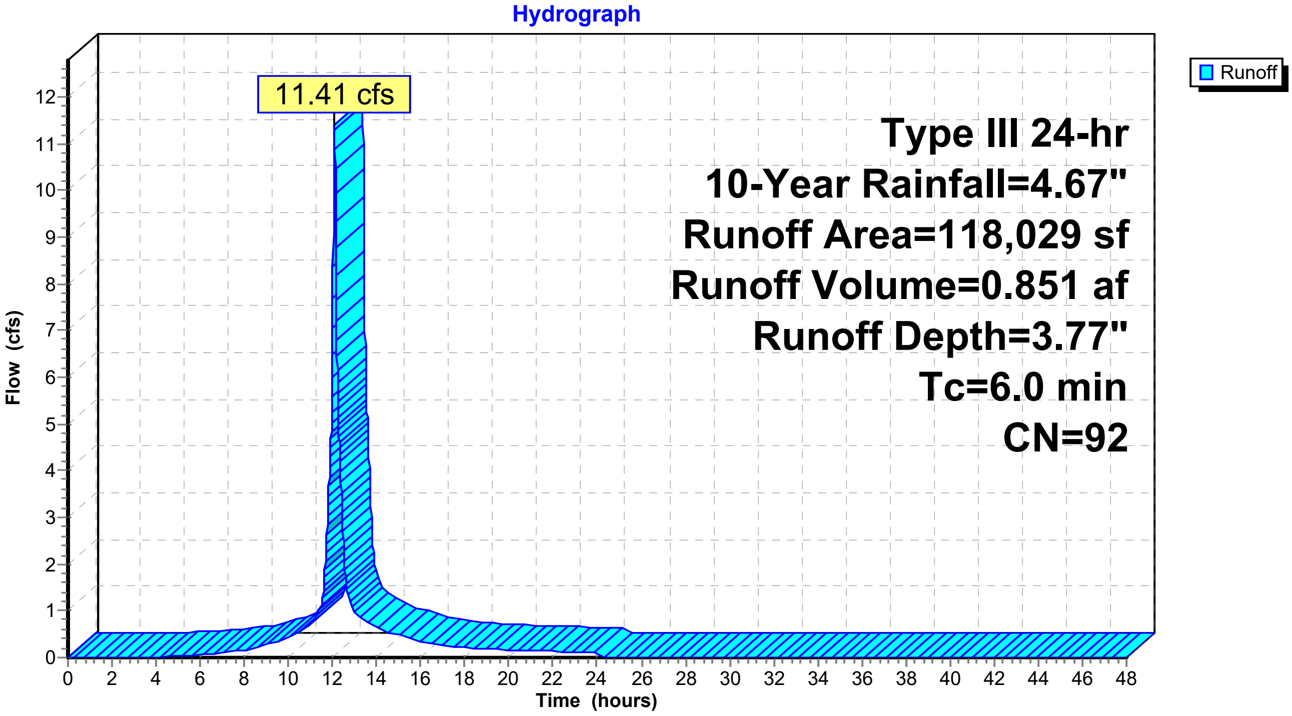
Runoff = 11.41 cfs @ 12.08 hrs, Volume= 0.851 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
97,932	98	Paved parking, HSG B
20,097	61	>75% Grass cover, Good, HSG B
118,029	92	Weighted Average
20,097		17.03% Pervious Area
97,932		82.97% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

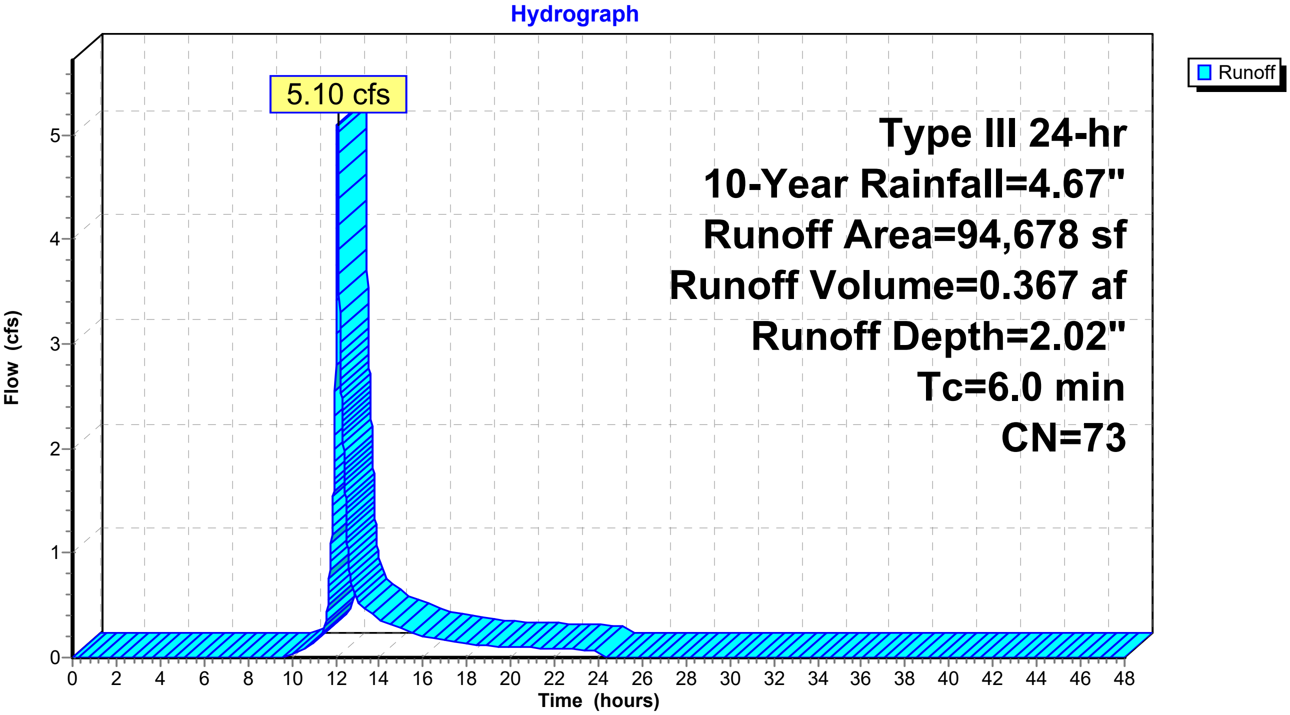
Runoff = 5.10 cfs @ 12.09 hrs, Volume= 0.367 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
29,953	98	Paved parking, HSG B
64,725	61	>75% Grass cover, Good, HSG B
94,678	73	Weighted Average
64,725		68.36% Pervious Area
29,953		31.64% Impervious Area

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

Subcatchment P-1B: Proposed Watershed P-1B



Summary for Subcatchment P-1C: Proposed Watershed P-1C

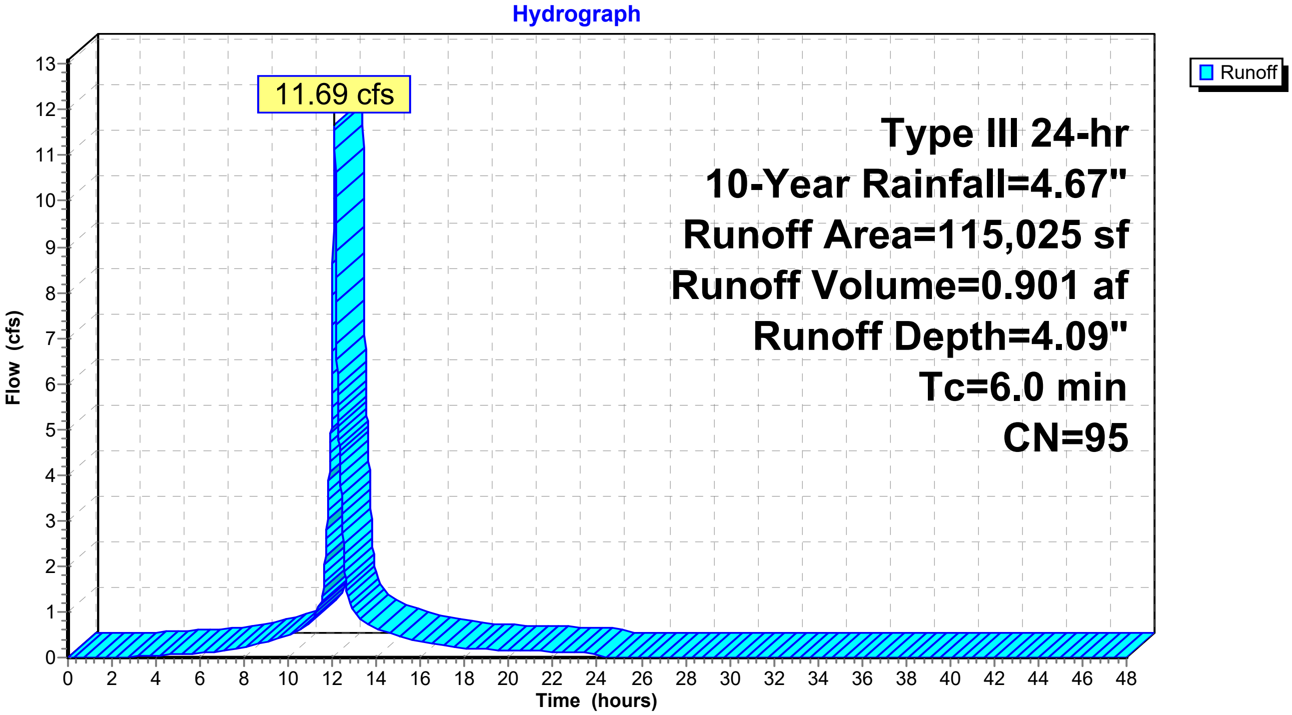
Runoff = 11.69 cfs @ 12.08 hrs, Volume= 0.901 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
106,212	98	Paved parking, HSG B
8,813	61	>75% Grass cover, Good, HSG B
115,025	95	Weighted Average
8,813		7.66% Pervious Area
106,212		92.34% Impervious Area

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

Subcatchment P-1C: Proposed Watershed P-1C



Summary for Subcatchment P-1D: Proposed Watershed P-1D

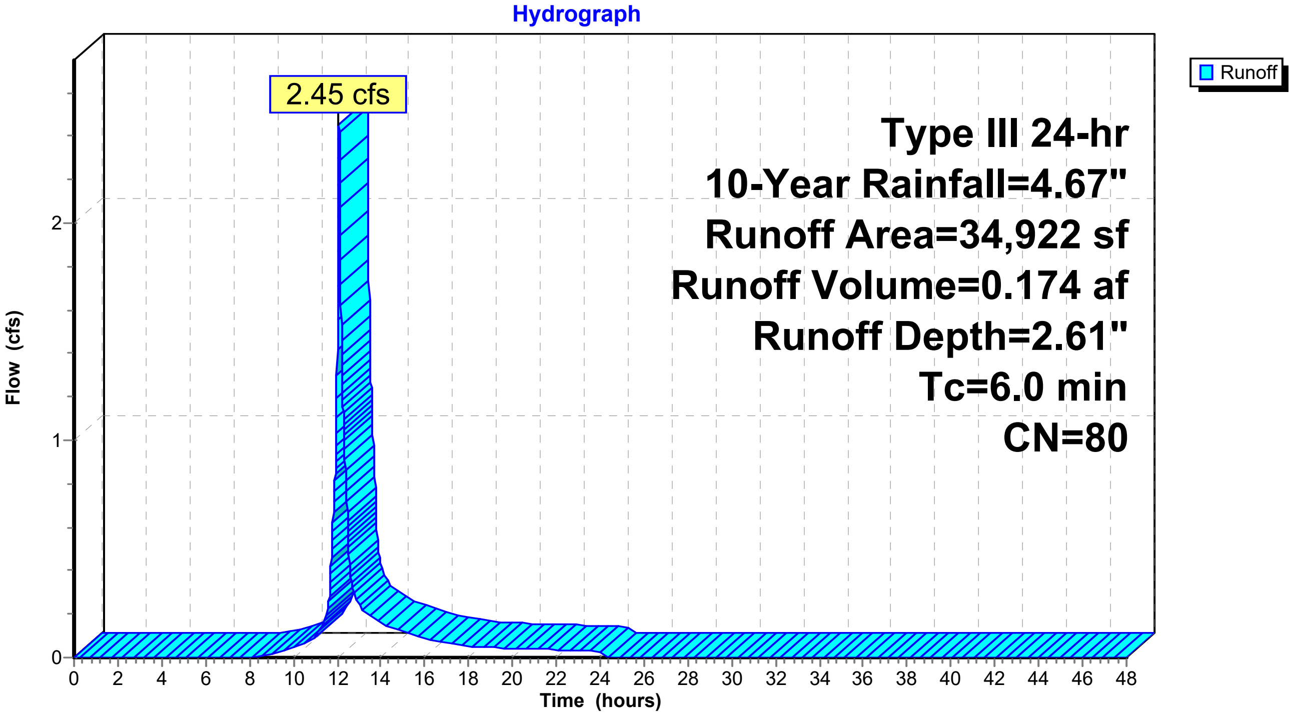
Runoff = 2.45 cfs @ 12.09 hrs, Volume= 0.174 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
17,187	61	>75% Grass cover, Good, HSG B
17,735	98	Paved parking, HSG B
34,922	80	Weighted Average
17,187		49.22% Pervious Area
17,735		50.78% Impervious Area

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

Subcatchment P-1D: Proposed Watershed P-1D



Summary for Subcatchment P-2: Proposed Watershed P-2

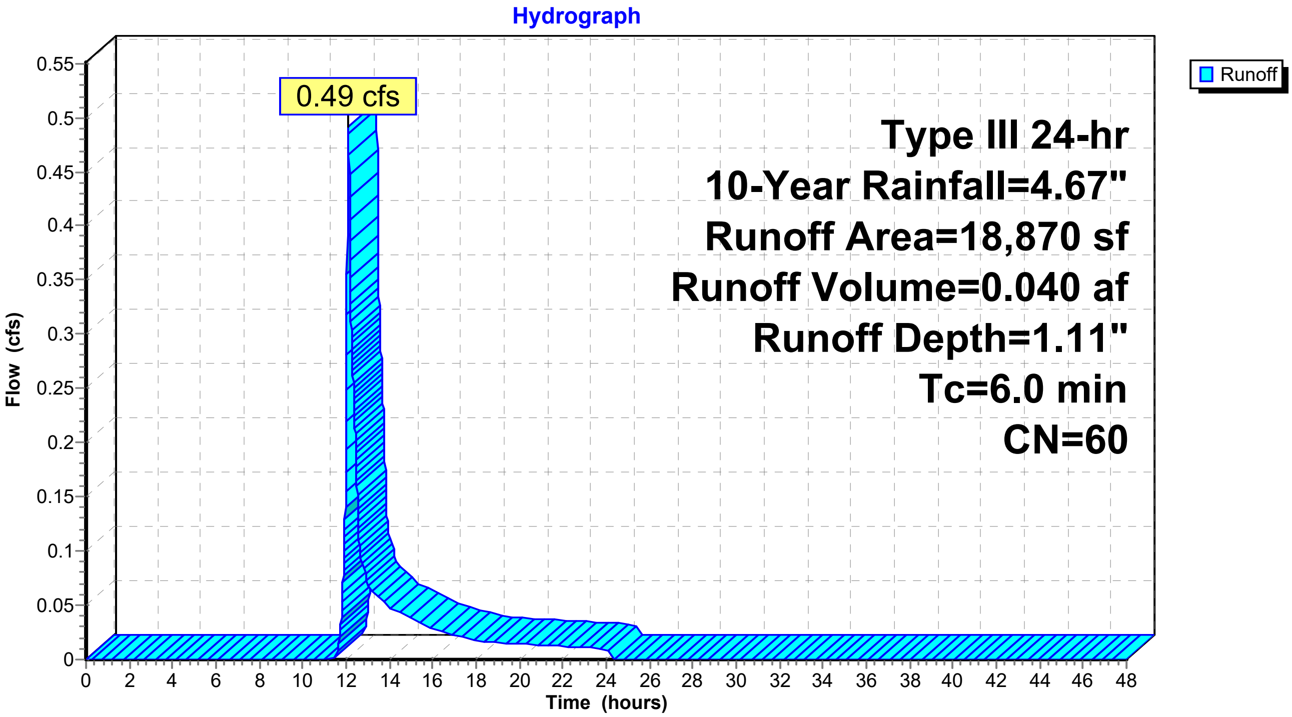
Runoff = 0.49 cfs @ 12.10 hrs, Volume= 0.040 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.67"

Area (sf)	CN	Description
14,638	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
18,870	60	Weighted Average
18,870		100.00% Pervious Area

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

Subcatchment P-2: Proposed Watershed P-2



Summary for Reach p-dp-2: Prop. Design Point

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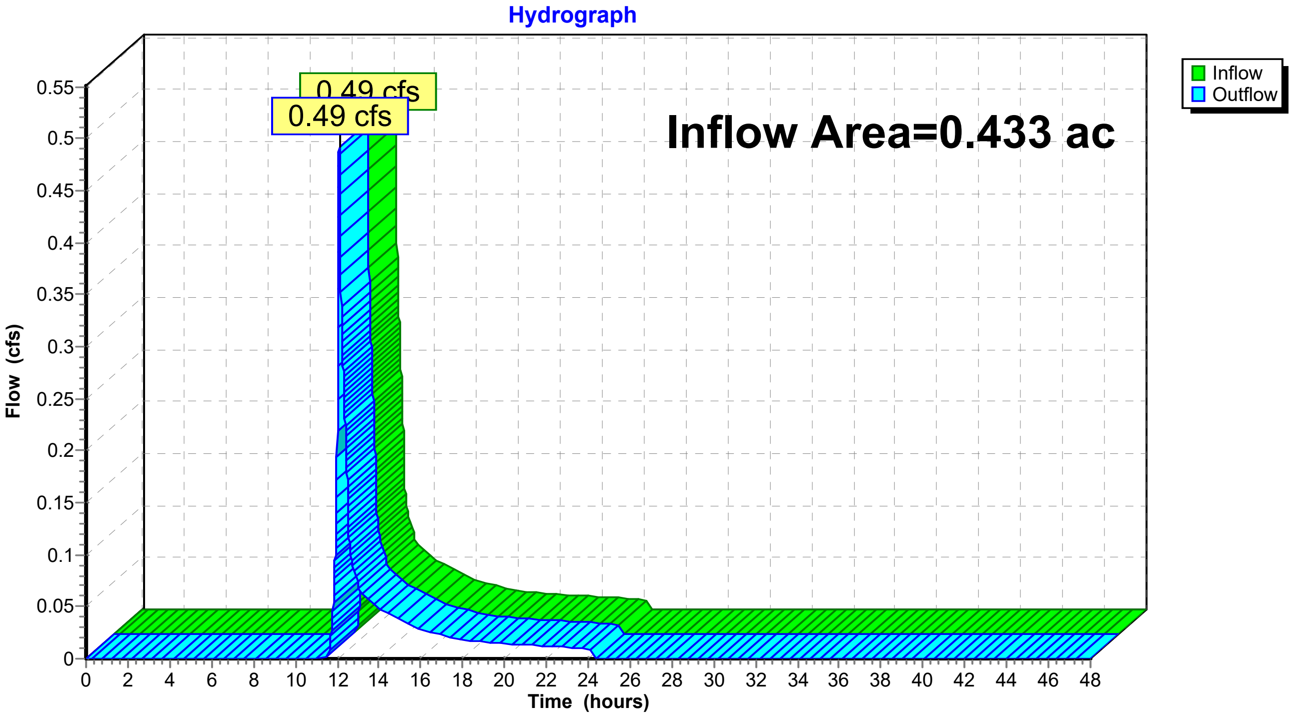
Inflow Area =        0.433 ac,    0.00% Impervious,  Inflow Depth =   1.11"    for  10-Year event
Inflow      =       0.49 cfs @   12.10 hrs,  Volume=           0.040 af
Outflow     =       0.49 cfs @   12.10 hrs,  Volume=           0.040 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach p-dp-2: Prop. Design Point

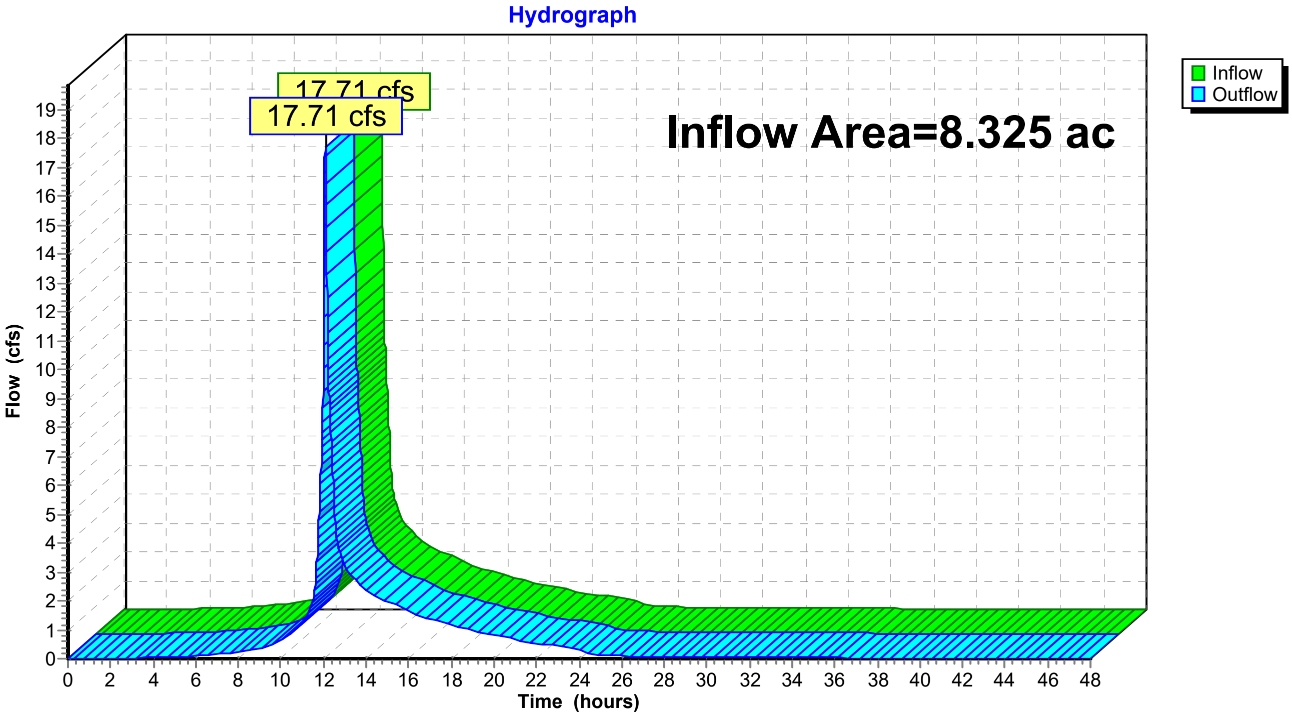


Summary for Reach p-dp1: Prop. Design Point

Inflow Area =	8.325 ac,	69.44% Impervious,	Inflow Depth =	3.22"	for 10-Year event	
Inflow =	17.71 cfs @	12.09 hrs,	Volume=	2.233 af		
Outflow =	17.71 cfs @	12.09 hrs,	Volume=	2.233 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach p-dp1: Prop. Design Point



Summary for Pond BIO: Bio Basin

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Inflow Area =        0.802 ac, 50.78% Impervious,  Inflow Depth =   2.35"    for  10-Year event
Inflow      =       2.24 cfs @   12.12 hrs,  Volume=           0.157 af
Outflow     =       1.07 cfs @   12.35 hrs,  Volume=           0.157 af,  Atten= 52%,  Lag= 13.4 min
Primary     =       1.07 cfs @   12.35 hrs,  Volume=           0.157 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.70' @ 12.35 hrs   Surf.Area= 3,230 sf   Storage= 1,988 cf

Plug-Flow detention time= 225.1 min calculated for 0.157 af (100% of inflow)
Center-of-Mass det. time= 225.2 min ( 1,076.8 - 851.6 )

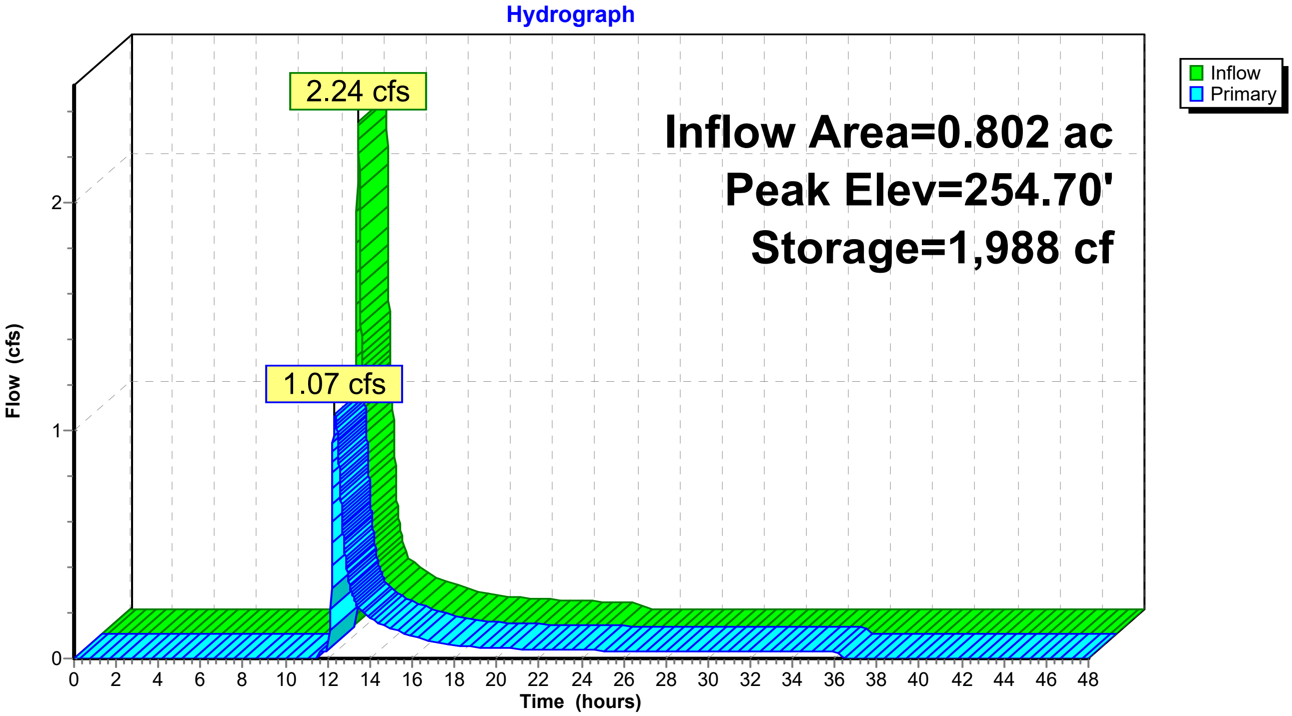
Volume      Invert    Avail.Storage   Storage Description
   #1       254.00'        4,908 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation        Surf.Area         Inc.Store        Cum.Store
    (feet)          (sq-ft)      (cubic-feet)      (cubic-feet)
   254.00            2,467                 0                0
   255.00            3,560             3,014            3,014
   255.50            4,019             1,895            4,908

Device   Routing          Invert   Outlet Devices
   #1    Primary          251.50'  8.0"  Round Culvert
                                   L= 20.0'   CPP, projecting, no headwall,  Ke= 0.900
                                   Inlet / Outlet Invert= 251.50' / 251.50'   S= 0.0000 '/'   Cc= 0.900
                                   n= 0.013,  Flow Area= 0.35 sf
   #2    Device 1         254.00'  0.500 in/hr Soil Media over Surface area
   #3    Primary          254.50'  5.0' long  x 5.0' 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)  2.34  2.50  2.70  2.68  2.68  2.66  2.65  2.65  2.65
                                   2.65  2.67  2.66  2.68  2.70  2.74  2.79  2.88

Primary OutFlow  Max=1.07 cfs @ 12.35 hrs  HW=254.70'  TW=252.25'   (Dynamic Tailwater)
↑
├─1=Culvert  (Passes 0.04 cfs of 2.08 cfs potential flow)
│  ↑
│  └─2=Soil Media  (Exfiltration Controls 0.04 cfs)
└─3=Broad-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 1.04 fps)
```

Pond BIO: Bio Basin



Summary for Pond DET: Det Basin

Inflow Area =	0.802 ac, 50.78% Impervious, Inflow Depth = 2.35"	for 10-Year event
Inflow =	1.07 cfs @ 12.35 hrs, Volume=	0.157 af
Outflow =	0.57 cfs @ 12.71 hrs, Volume=	0.157 af, Atten= 47%, Lag= 22.0 min
Primary =	0.57 cfs @ 12.71 hrs, Volume=	0.157 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 252.73' @ 12.71 hrs Surf.Area= 1,099 sf Storage= 1,032 cf

Plug-Flow detention time= 55.2 min calculated for 0.157 af (100% of inflow)
Center-of-Mass det. time= 51.9 min (1,128.7 - 1,076.8)

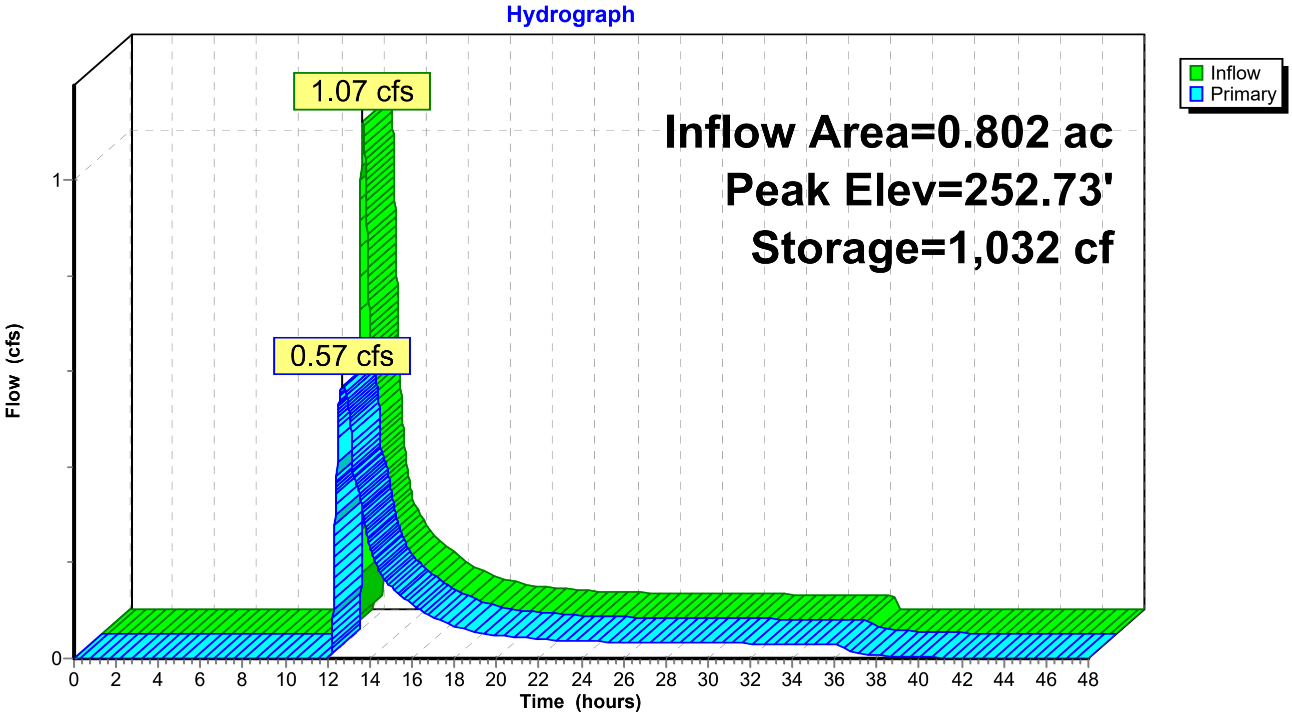
Volume	Invert	Avail.Storage	Storage Description
#1	251.50'	4,774 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.50	587	0	0
252.00	782	342	342
253.00	1,214	998	1,340
254.00	1,703	1,459	2,799
255.00	2,248	1,976	4,774

Device	Routing	Invert	Outlet Devices
#1	Primary	251.50'	**12.0" Round Culvert** L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 251.50' / 251.35' S= 0.0075 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Device 1	251.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	252.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.57 cfs @ 12.71 hrs HW=252.73' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.57 cfs @ 0.75 fps)
  ├─**2=Orifice/Grate** (Passes < 0.43 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 1.16 cfs potential flow)

Pond DET: Det Basin



Summary for Pond SED: Sed Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 2.61" for 10-Year event
Inflow = 2.45 cfs @ 12.09 hrs, Volume= 0.174 af
Outflow = 2.24 cfs @ 12.12 hrs, Volume= 0.157 af, Atten= 9%, Lag= 2.1 min
Primary = 2.24 cfs @ 12.12 hrs, Volume= 0.157 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.92' @ 12.12 hrs Surf.Area= 1,551 sf Storage= 1,221 cf

Plug-Flow detention time= 74.9 min calculated for 0.157 af (90% of inflow)
Center-of-Mass det. time= 26.8 min (851.6 - 824.8)

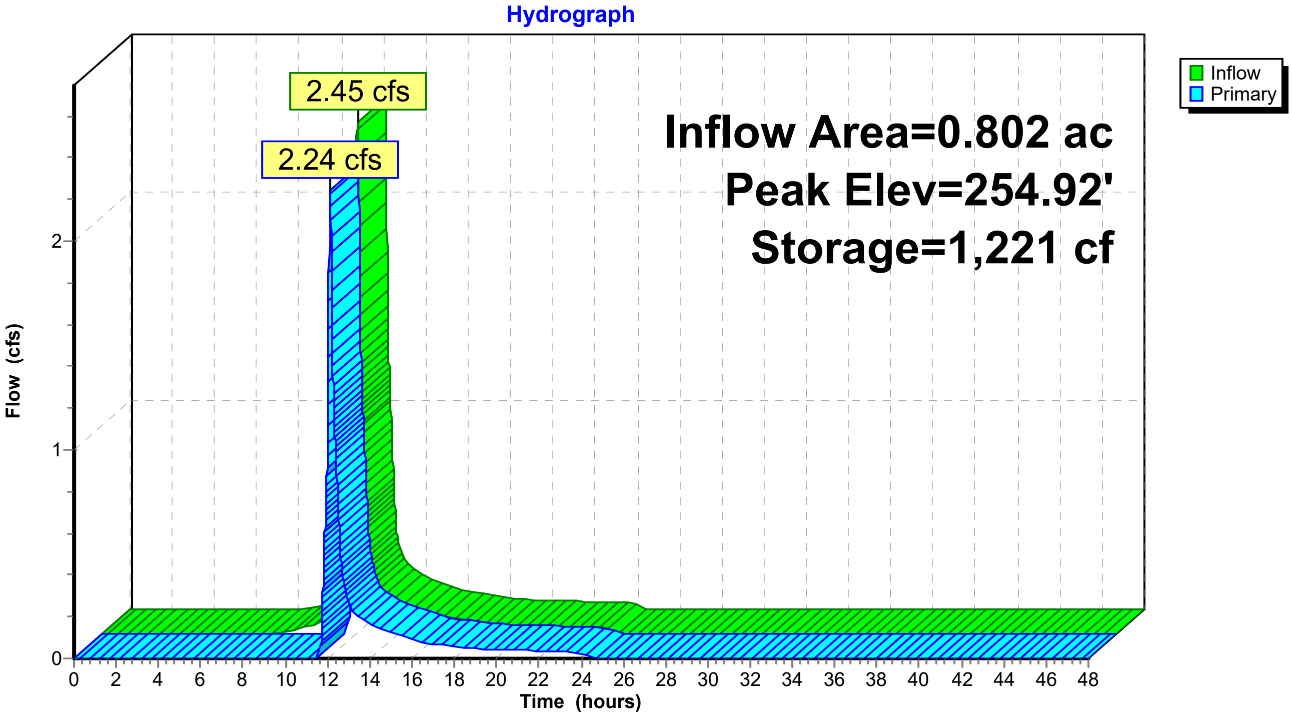
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	2,203 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
254.00	1,093	0	0
255.00	1,589	1,341	1,341
255.50	1,858	862	2,203

Device	Routing	Invert	Outlet Devices
#1	Primary	254.60'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.24 cfs @ 12.12 hrs HW=254.92' TW=254.47' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2.24 cfs @ 1.39 fps)

Pond SED: Sed Basin



Summary for Pond UG-DET: UG Detention

```
Inflow Area =        2.710 ac, 82.97% Impervious, Inflow Depth =  3.77"   for 10-Year event
Inflow      =      11.41 cfs @  12.08 hrs, Volume=          0.851 af
Outflow     =       1.22 cfs @  12.80 hrs, Volume=          0.809 af, Atten= 89%, Lag= 42.7 min
Primary     =       1.22 cfs @  12.80 hrs, Volume=          0.809 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 249.42' @ 12.80 hrs   Surf.Area= 15,063 sf   Storage= 18,966 cf

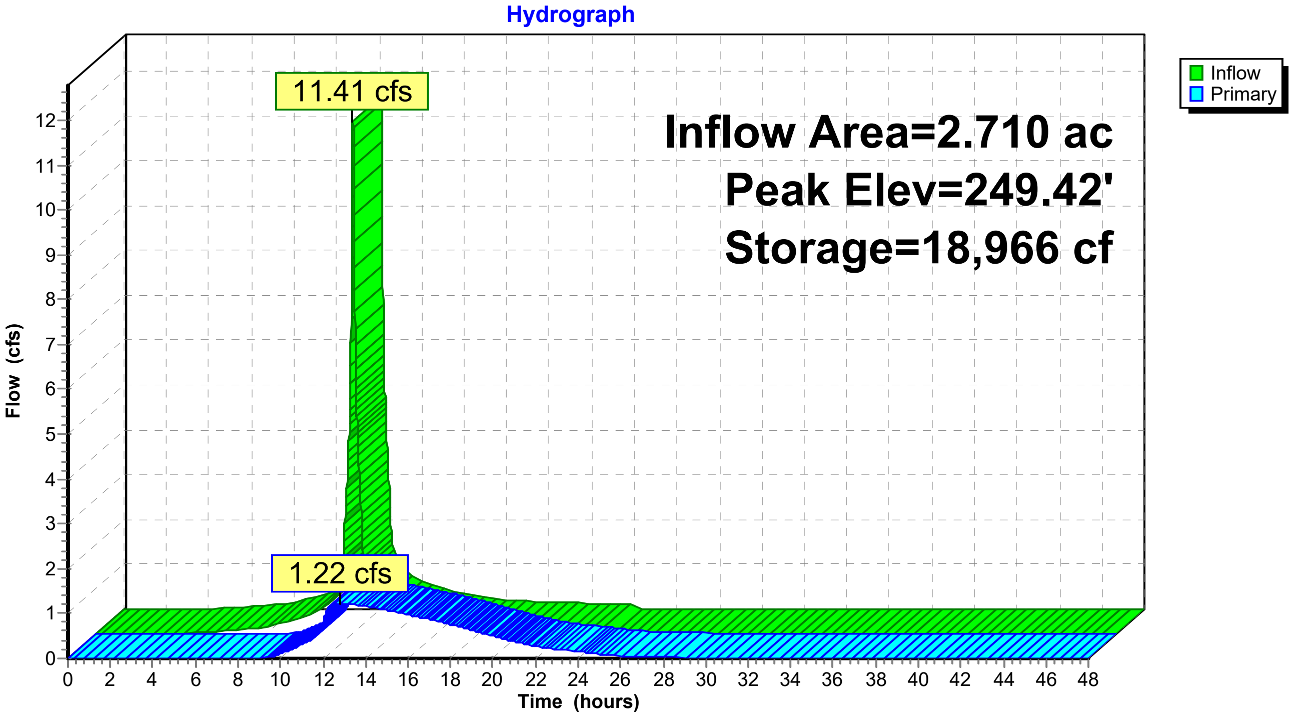
Plug-Flow detention time= 225.9 min calculated for 0.809 af (95% of inflow)
Center-of-Mass det. time= 198.2 min ( 983.0 - 784.9 )

Volume       Invert    Avail.Storage   Storage Description
   #1       247.00'        13,965 cf   43.00'W x 202.98'L x 4.00'H Field A
                                       34,913 cf Overall  x 40.0% Voids
   #2       247.50'        15,551 cf   36.0"  Round Pipe Storage x 11
                                       L= 200.0'
                           29,516 cf   Total Available Storage

Device   Routing           Invert   Outlet Devices
   #1    Primary          247.50'   18.0"  Round Culvert
                                    L= 60.0'   CPP, projecting, no headwall,  Ke= 0.900
                                    Inlet / Outlet Invert= 247.50' / 246.29'   S= 0.0202 '/'   Cc= 0.900
                                    n= 0.013  Corrugated PE, smooth interior,  Flow Area= 1.77 sf
   #2    Device 1         247.50'   6.0" Vert. Orifice/Grate   C= 0.600
   #3    Device 1         249.90'   18.0" Horiz. Orifice/Grate   C= 0.600
                                    Limited to weir flow at low heads

Primary OutFlow  Max=1.22 cfs @ 12.80 hrs  HW=249.42'  TW=0.00'   (Dynamic Tailwater)
└─1=Culvert  (Passes 1.22 cfs of 7.27 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 1.22 cfs @ 6.22 fps)
   └─3=Orifice/Grate  ( Controls 0.00 cfs)
```

Pond UG-DET: UG Detention



Summary for Subcatchment P-1A: Proposed Watershed P-1A

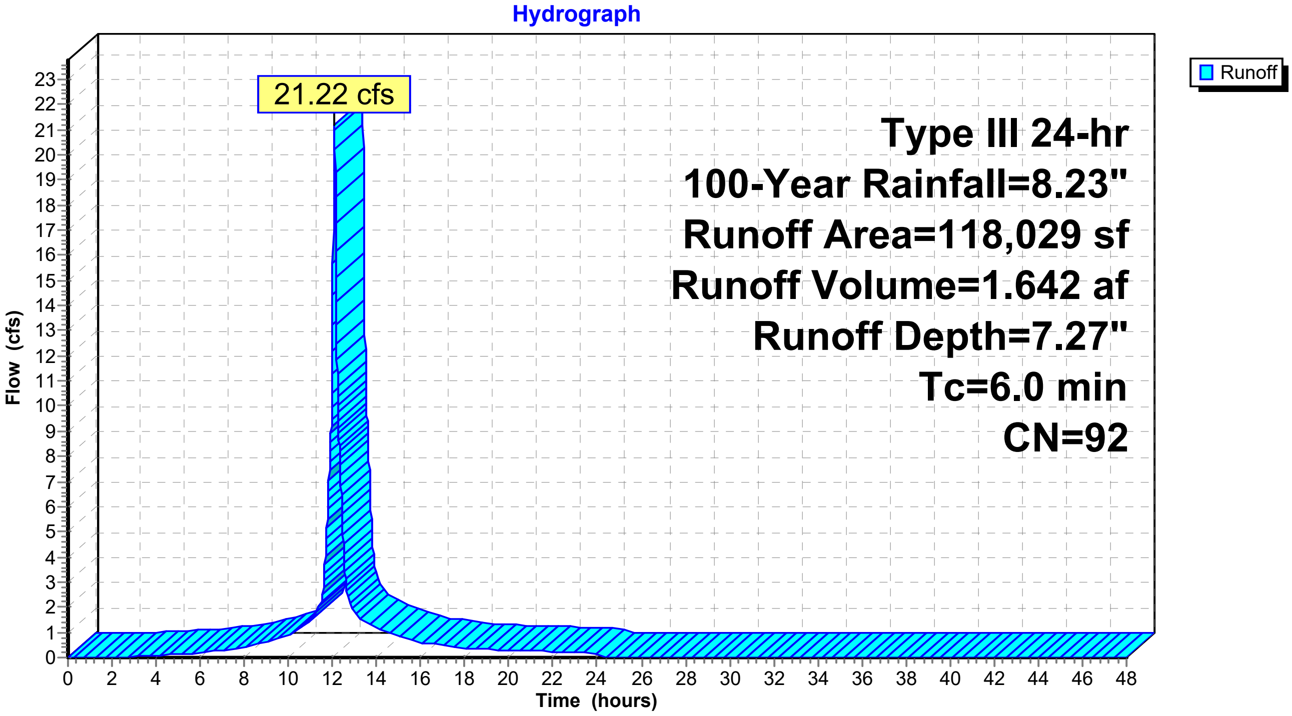
Runoff = 21.22 cfs @ 12.08 hrs, Volume= 1.642 af, Depth= 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
97,932	98	Paved parking, HSG B
20,097	61	>75% Grass cover, Good, HSG B
118,029	92	Weighted Average
20,097		17.03% Pervious Area
97,932		82.97% Impervious Area

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

Subcatchment P-1A: Proposed Watershed P-1A



Summary for Subcatchment P-1B: Proposed Watershed P-1B

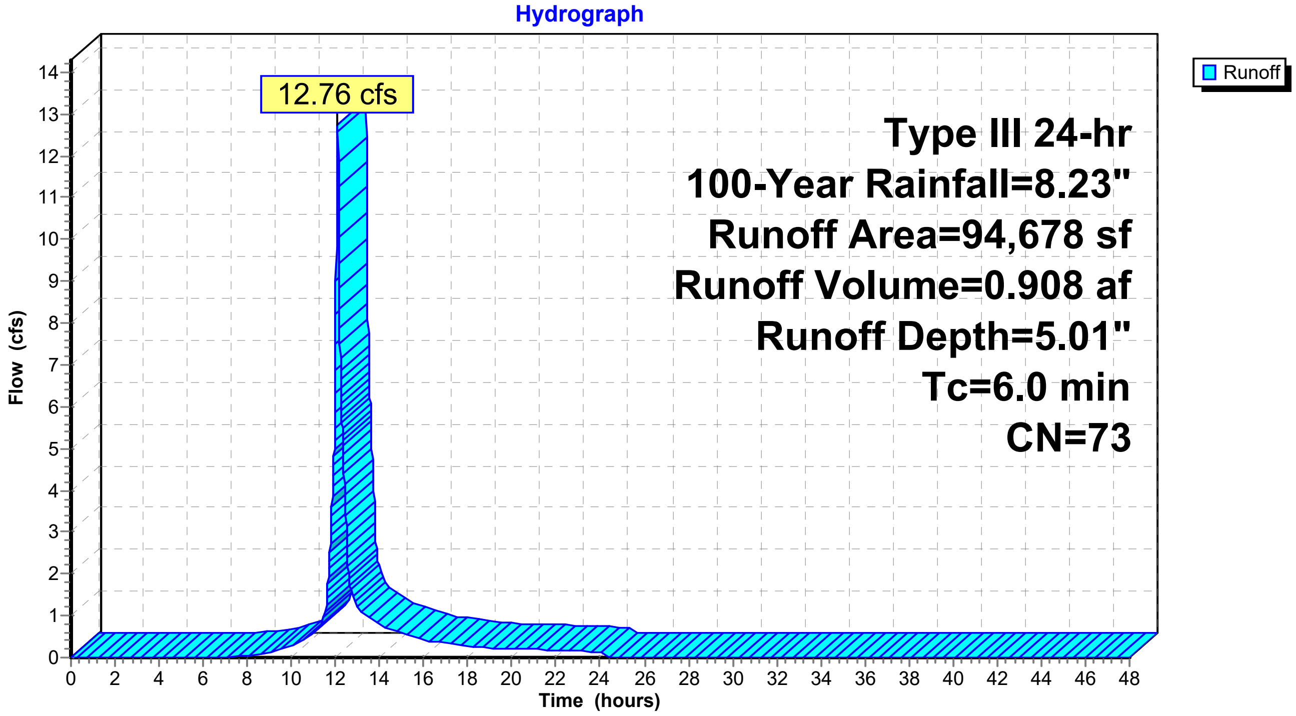
Runoff = 12.76 cfs @ 12.09 hrs, Volume= 0.908 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
29,953	98	Paved parking, HSG B
64,725	61	>75% Grass cover, Good, HSG B
94,678	73	Weighted Average
64,725		68.36% Pervious Area
29,953		31.64% Impervious Area

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

Subcatchment P-1B: Proposed Watershed P-1B



Summary for Subcatchment P-1C: Proposed Watershed P-1C

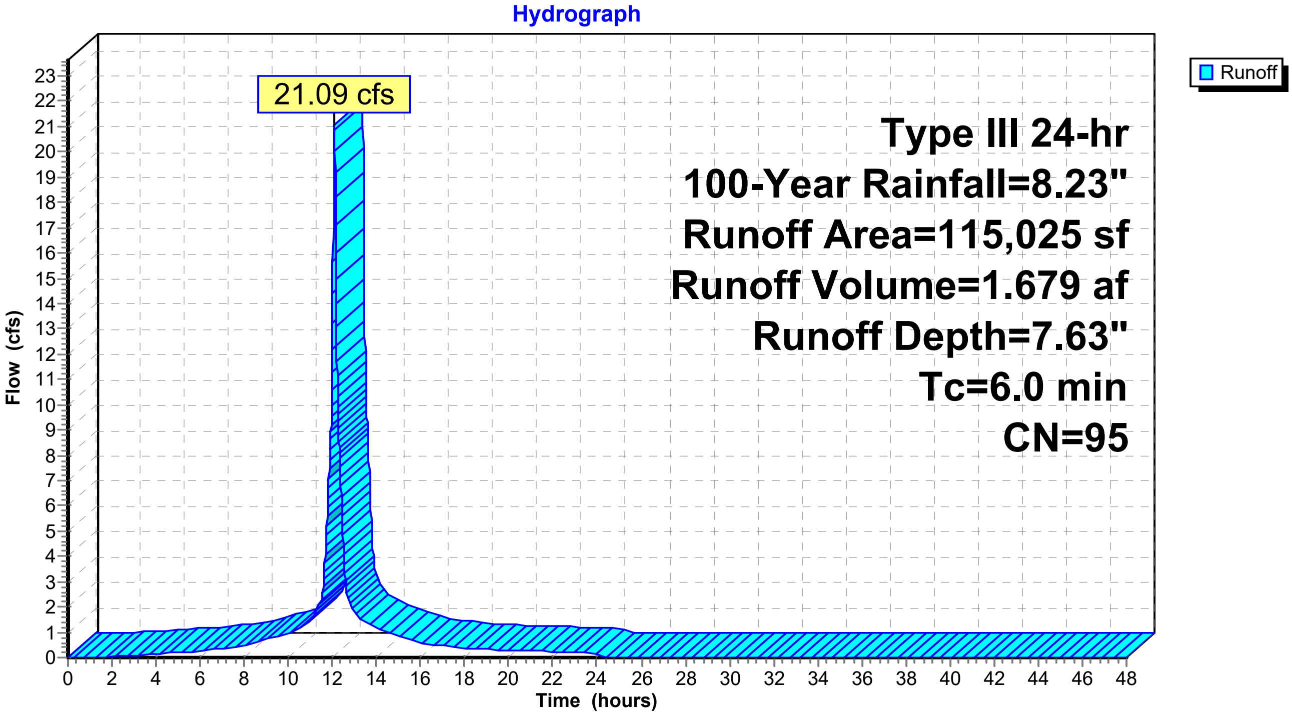
Runoff = 21.09 cfs @ 12.08 hrs, Volume= 1.679 af, Depth= 7.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
106,212	98	Paved parking, HSG B
8,813	61	>75% Grass cover, Good, HSG B
115,025	95	Weighted Average
8,813		7.66% Pervious Area
106,212		92.34% Impervious Area

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

Subcatchment P-1C: Proposed Watershed P-1C



Summary for Subcatchment P-1D: Proposed Watershed P-1D

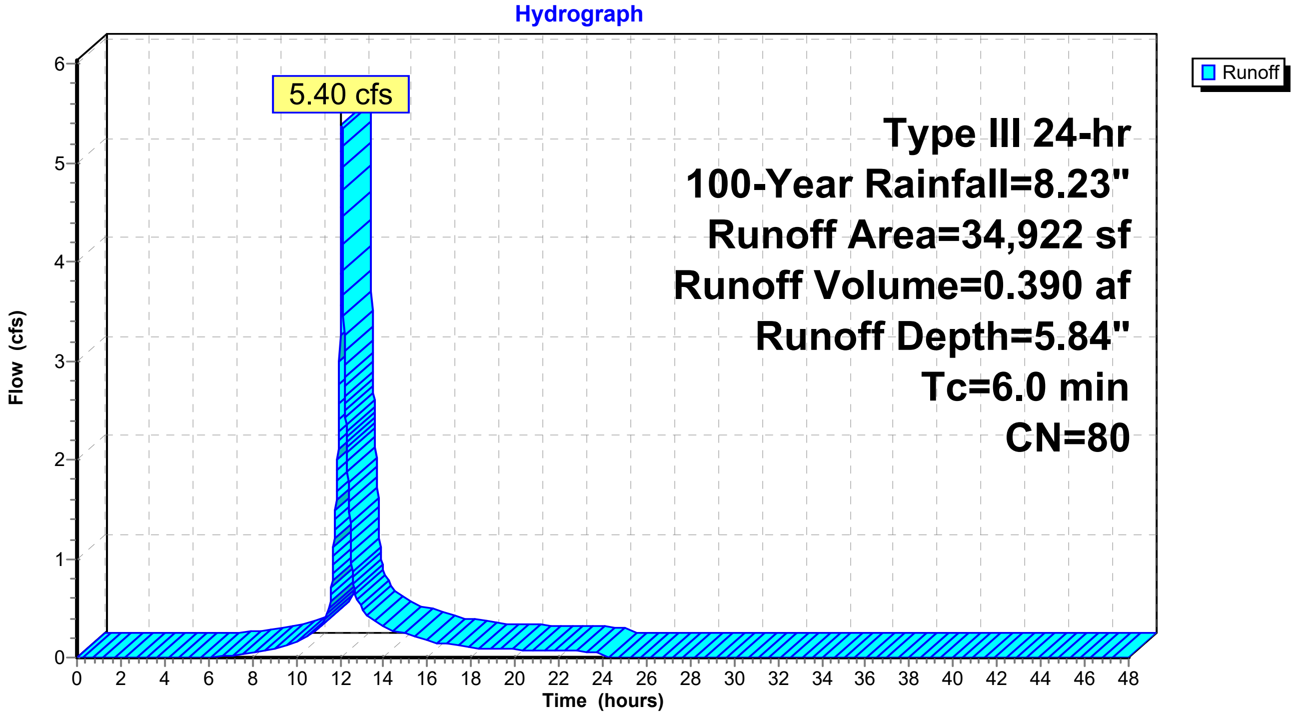
Runoff = 5.40 cfs @ 12.09 hrs, Volume= 0.390 af, Depth= 5.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
17,187	61	>75% Grass cover, Good, HSG B
17,735	98	Paved parking, HSG B
34,922	80	Weighted Average
17,187		49.22% Pervious Area
17,735		50.78% Impervious Area

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

Subcatchment P-1D: Proposed Watershed P-1D



Summary for Subcatchment P-2: Proposed Watershed P-2

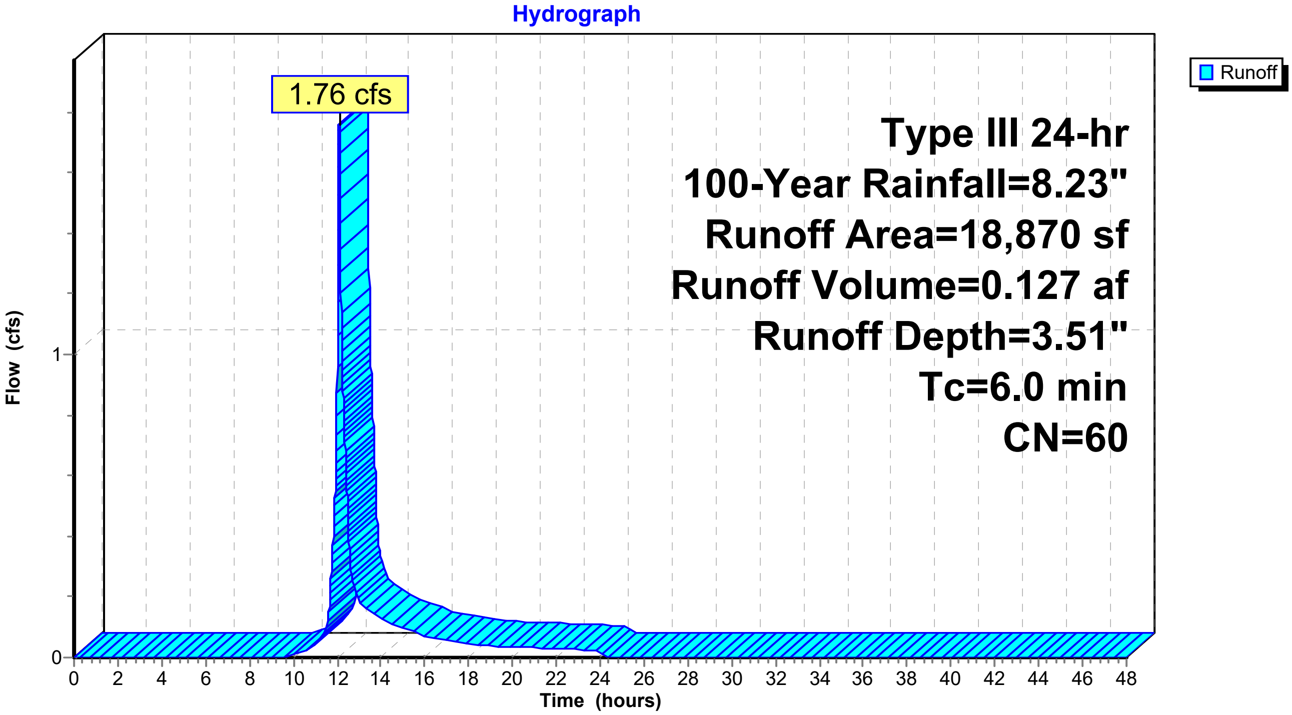
Runoff = 1.76 cfs @ 12.09 hrs, Volume= 0.127 af, Depth= 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.23"

Area (sf)	CN	Description
14,638	61	>75% Grass cover, Good, HSG B
4,232	55	Woods, Good, HSG B
18,870	60	Weighted Average
18,870		100.00% Pervious Area

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

Subcatchment P-2: Proposed Watershed P-2

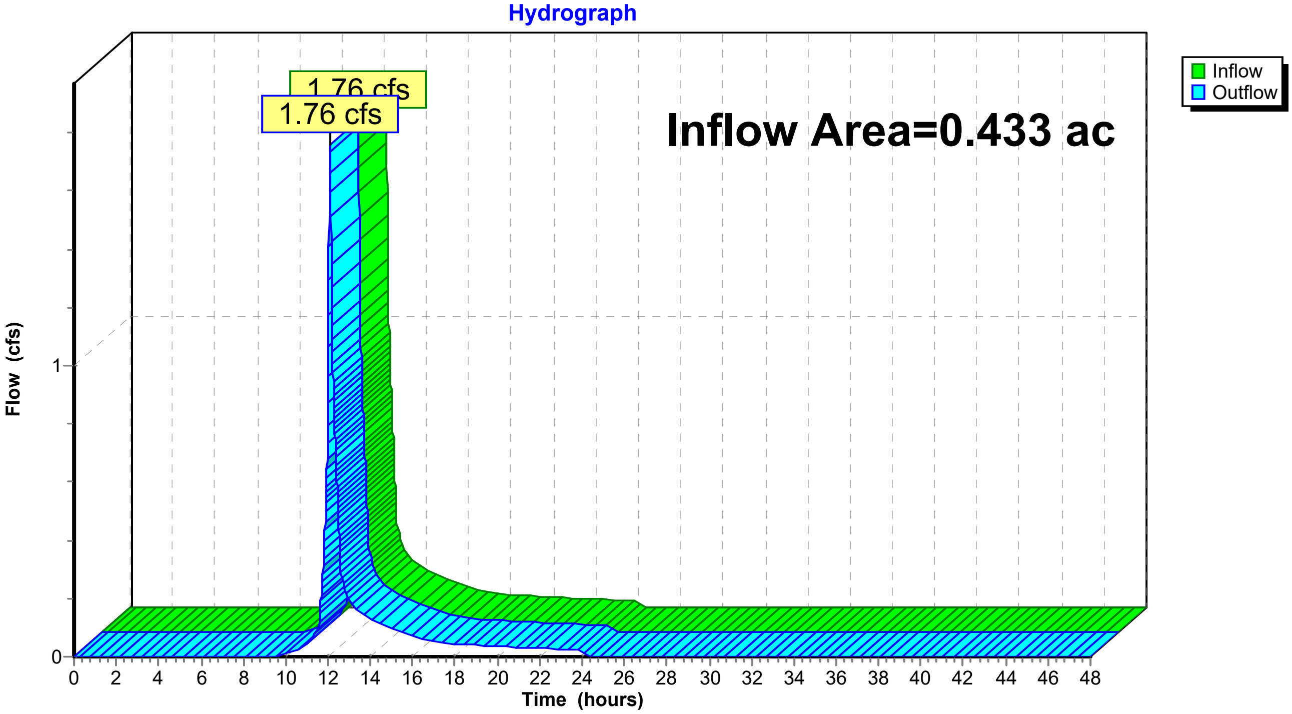


Summary for Reach p-dp-2: Prop. Design Point

Inflow Area = 0.433 ac, 0.00% Impervious, Inflow Depth = 3.51" for 100-Year event
Inflow = 1.76 cfs @ 12.09 hrs, Volume= 0.127 af
Outflow = 1.76 cfs @ 12.09 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach p-dp-2: Prop. Design Point

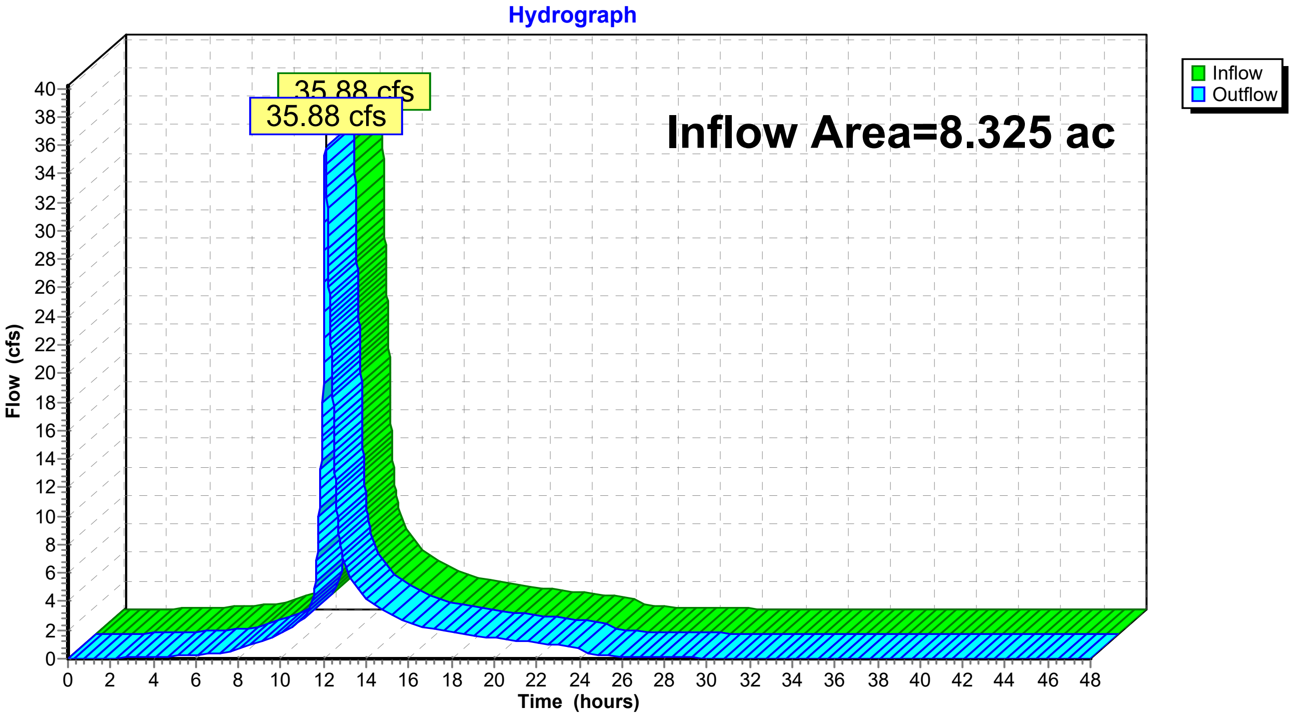


Summary for Reach p-dp1: Prop. Design Point

```
Inflow Area =        8.325 ac, 69.44% Impervious, Inflow Depth =  6.57"   for 100-Year event
Inflow      =       35.88 cfs @  12.09 hrs, Volume=          4.560 af
Outflow     =       35.88 cfs @  12.09 hrs, Volume=          4.560 af, Atten= 0%, Lag= 0.0 min
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2

Reach p-dp1: Prop. Design Point



Summary for Pond BIO: Bio Basin

```
Inflow Area =       0.802 ac, 50.78% Impervious, Inflow Depth =   5.58"   for 100-Year event
Inflow      =      4.91 cfs @  12.11 hrs, Volume=         0.373 af
Outflow     =      4.16 cfs @  12.17 hrs, Volume=         0.373 af, Atten= 15%, Lag= 3.5 min
Primary     =      4.16 cfs @  12.17 hrs, Volume=         0.373 af
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.97' @ 12.17 hrs Surf.Area= 3,526 sf Storage= 2,903 cf

Plug-Flow detention time= 108.7 min calculated for 0.373 af (100% of inflow)
Center-of-Mass det. time= 108.8 min (929.8 - 821.0)

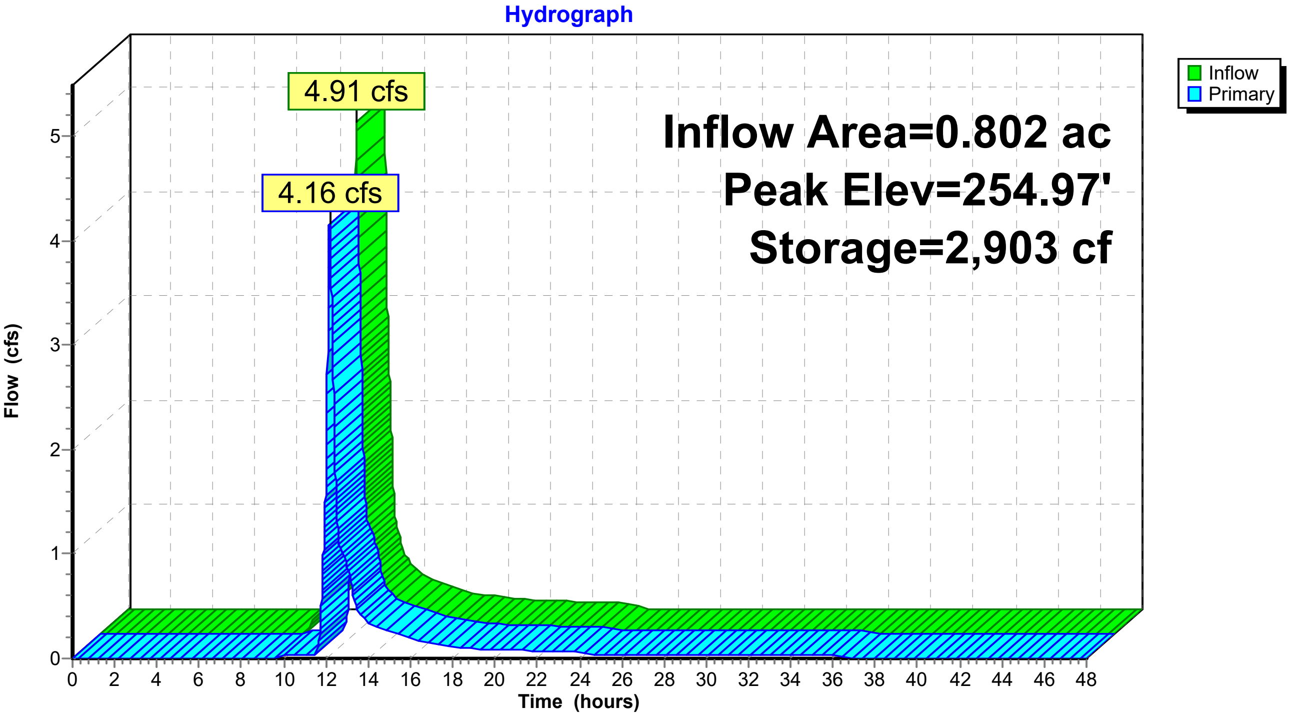
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	4,908 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
254.00	2,467	0	0
255.00	3,560	3,014	3,014
255.50	4,019	1,895	4,908

Device	Routing	Invert	Outlet Devices
#1	Primary	251.50'	**8.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 251.50' / 251.50' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Device 1	254.00'	**0.500 in/hr Soil Media over Surface area**
#3	Primary	254.50'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

```
Primary OutFlow  Max=4.16 cfs @ 12.17 hrs  HW=254.97'  TW=253.73'  (Dynamic Tailwater)
↑
├─1=Culvert  (Passes 0.04 cfs of 1.48 cfs potential flow)
│  ↑
│  └─2=Soil Media  (Exfiltration Controls 0.04 cfs)
└─3=Broad-Crested Rectangular Weir (Weir Controls 4.12 cfs @ 1.76 fps)
```

Pond BIO: Bio Basin



Summary for Pond DET: Det Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 4.16 cfs @ 12.17 hrs, Volume= 0.373 af
Outflow = 1.23 cfs @ 12.56 hrs, Volume= 0.373 af, Atten= 71%, Lag= 23.4 min
Primary = 1.23 cfs @ 12.56 hrs, Volume= 0.373 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 254.81' @ 12.56 hrs Surf.Area= 2,143 sf Storage= 4,350 cf

Plug-Flow detention time= 51.6 min calculated for 0.373 af (100% of inflow)
Center-of-Mass det. time= 50.1 min (979.9 - 929.8)

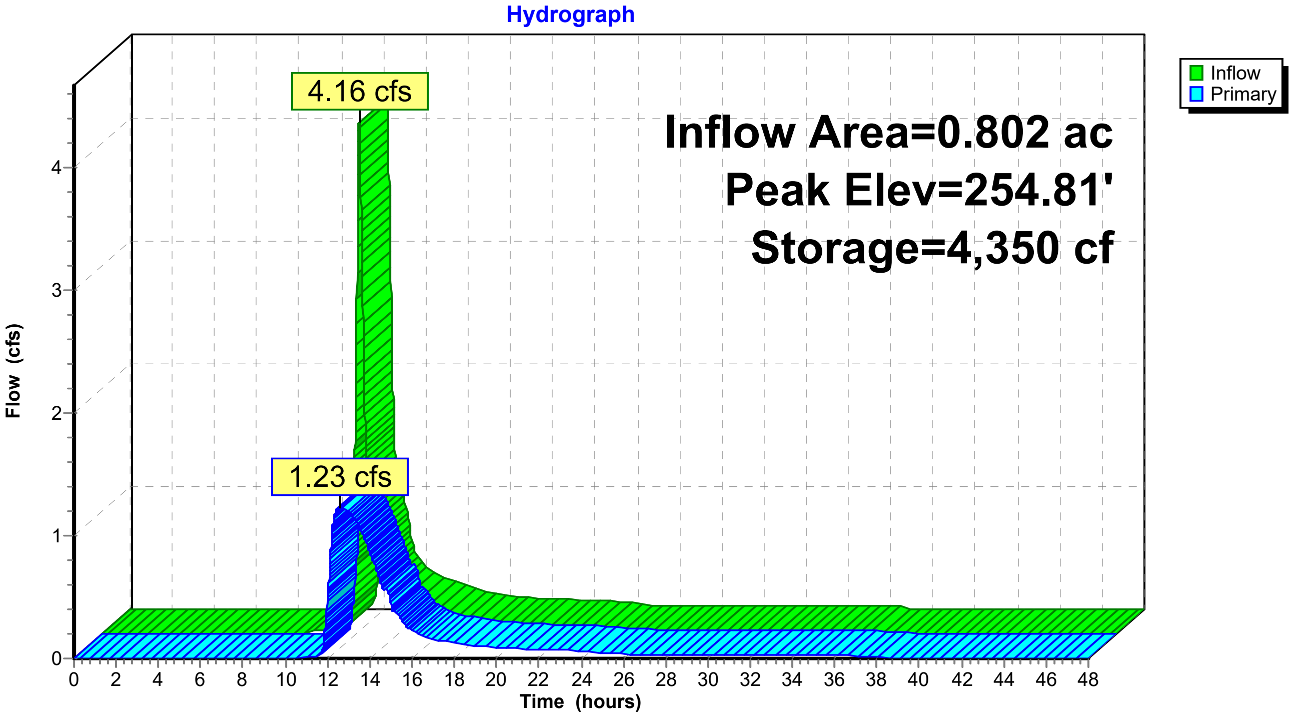
Volume	Invert	Avail.Storage	Storage Description
#1	251.50'	4,774 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.50	587	0	0
252.00	782	342	342
253.00	1,214	998	1,340
254.00	1,703	1,459	2,799
255.00	2,248	1,976	4,774

Device	Routing	Invert	Outlet Devices
#1	Primary	251.50'	**12.0" Round Culvert** L= 20.0' Ke= 0.900 Inlet / Outlet Invert= 251.50' / 251.35' S= 0.0075 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Device 1	251.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	252.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.23 cfs @ 12.56 hrs HW=254.81' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.23 cfs @ 1.56 fps)
  ├─**2=Orifice/Grate** (Passes < 0.74 cfs potential flow)
  └─**3=Orifice/Grate** (Passes < 5.74 cfs potential flow)

Pond DET: Det Basin



Summary for Pond SED: Sed Basin

Inflow Area = 0.802 ac, 50.78% Impervious, Inflow Depth = 5.84" for 100-Year event
Inflow = 5.40 cfs @ 12.09 hrs, Volume= 0.390 af
Outflow = 4.91 cfs @ 12.11 hrs, Volume= 0.373 af, Atten= 9%, Lag= 1.6 min
Primary = 4.91 cfs @ 12.11 hrs, Volume= 0.373 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 255.19' @ 12.12 hrs Surf.Area= 1,692 sf Storage= 1,654 cf

Plug-Flow detention time= 43.9 min calculated for 0.373 af (96% of inflow)
Center-of-Mass det. time= 19.2 min (821.0 - 801.8)

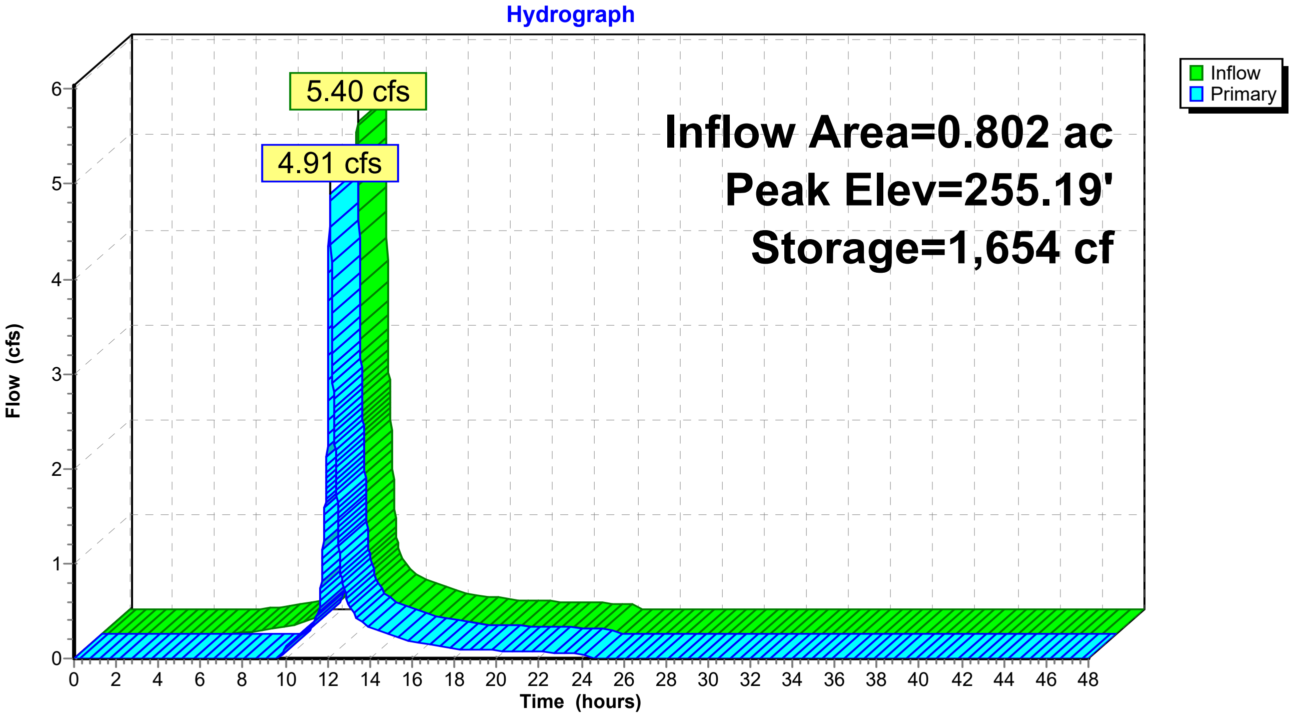
Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	2,203 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
254.00	1,093	0	0
255.00	1,589	1,341	1,341
255.50	1,858	862	2,203

Device	Routing	Invert	Outlet Devices
#1	Primary	254.60'	**5.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.90 cfs @ 12.11 hrs HW=255.19' TW=254.93' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.90 cfs @ 1.67 fps)

Pond SED: Sed Basin



Summary for Pond UG-DET: UG Detention

```
Inflow Area =        2.710 ac, 82.97% Impervious, Inflow Depth =  7.27"   for 100-Year event
Inflow      =      21.22 cfs @  12.08 hrs, Volume=          1.642 af
Outflow     =       9.11 cfs @  12.27 hrs, Volume=          1.600 af, Atten= 57%, Lag= 11.3 min
Primary     =       9.11 cfs @  12.27 hrs, Volume=          1.600 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 250.67' @ 12.27 hrs   Surf.Area= 8,728 sf   Storage= 28,381 cf

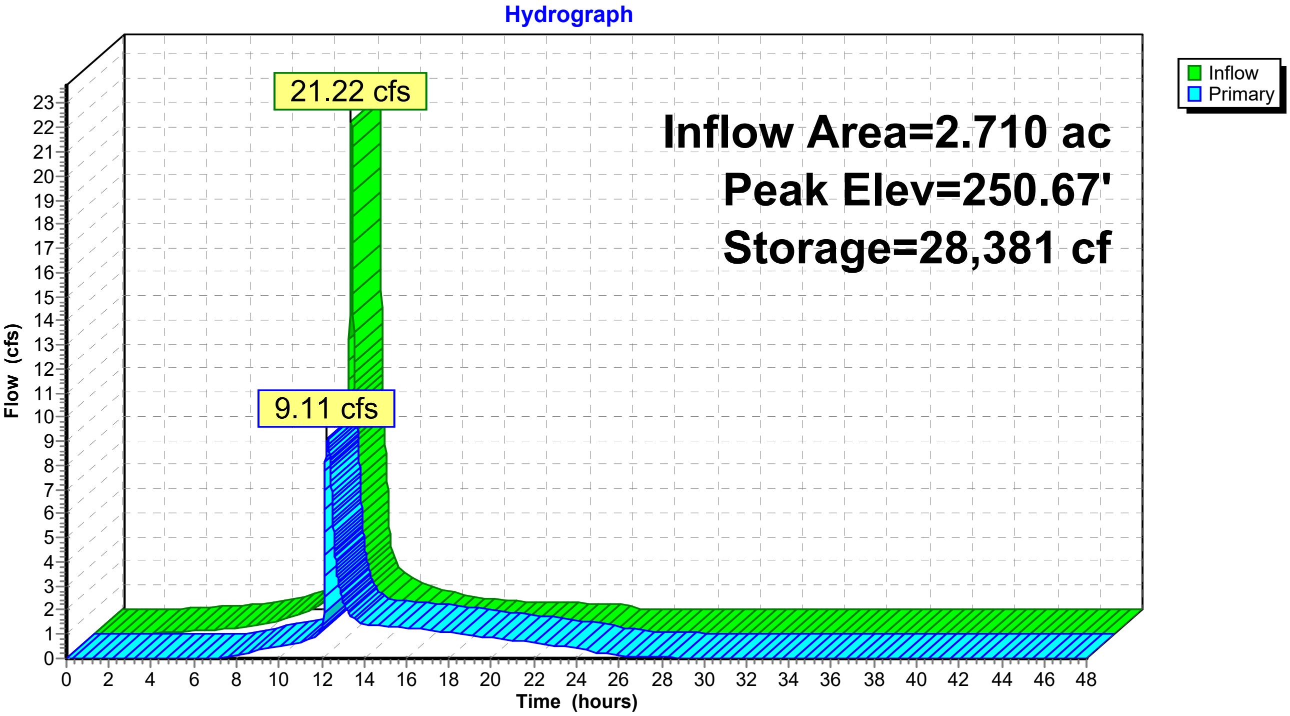
Plug-Flow detention time= 190.0 min calculated for 1.600 af (97% of inflow)
Center-of-Mass det. time= 174.5 min ( 942.8 - 768.3 )

Volume       Invert    Avail.Storage   Storage Description
   #1       247.00'        13,965 cf   43.00'W x 202.98'L x 4.00'H Field A
                                       34,913 cf Overall  x 40.0% Voids
   #2       247.50'        15,551 cf   36.0"  Round Pipe Storage x 11
                                       L= 200.0'
                           29,516 cf   Total Available Storage

Device   Routing           Invert   Outlet Devices
   #1    Primary          247.50'   18.0"  Round Culvert
                                    L= 60.0'   CPP, projecting, no headwall,  Ke= 0.900
                                    Inlet / Outlet Invert= 247.50' / 246.29'   S= 0.0202 '/'   Cc= 0.900
                                    n= 0.013  Corrugated PE, smooth interior,  Flow Area= 1.77 sf
   #2    Device 1         247.50'   6.0" Vert. Orifice/Grate   C= 0.600
   #3    Device 1         249.90'   18.0" Horiz. Orifice/Grate   C= 0.600
                                    Limited to weir flow at low heads

Primary OutFlow  Max=9.11 cfs @ 12.27 hrs  HW=250.67'  TW=0.00'   (Dynamic Tailwater)
└─1=Culvert  (Passes 9.11 cfs of 10.46 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 1.62 cfs @ 8.23 fps)
   └─3=Orifice/Grate  (Orifice Controls 7.49 cfs @ 4.24 fps)
```

Pond UG-DET: UG Detention



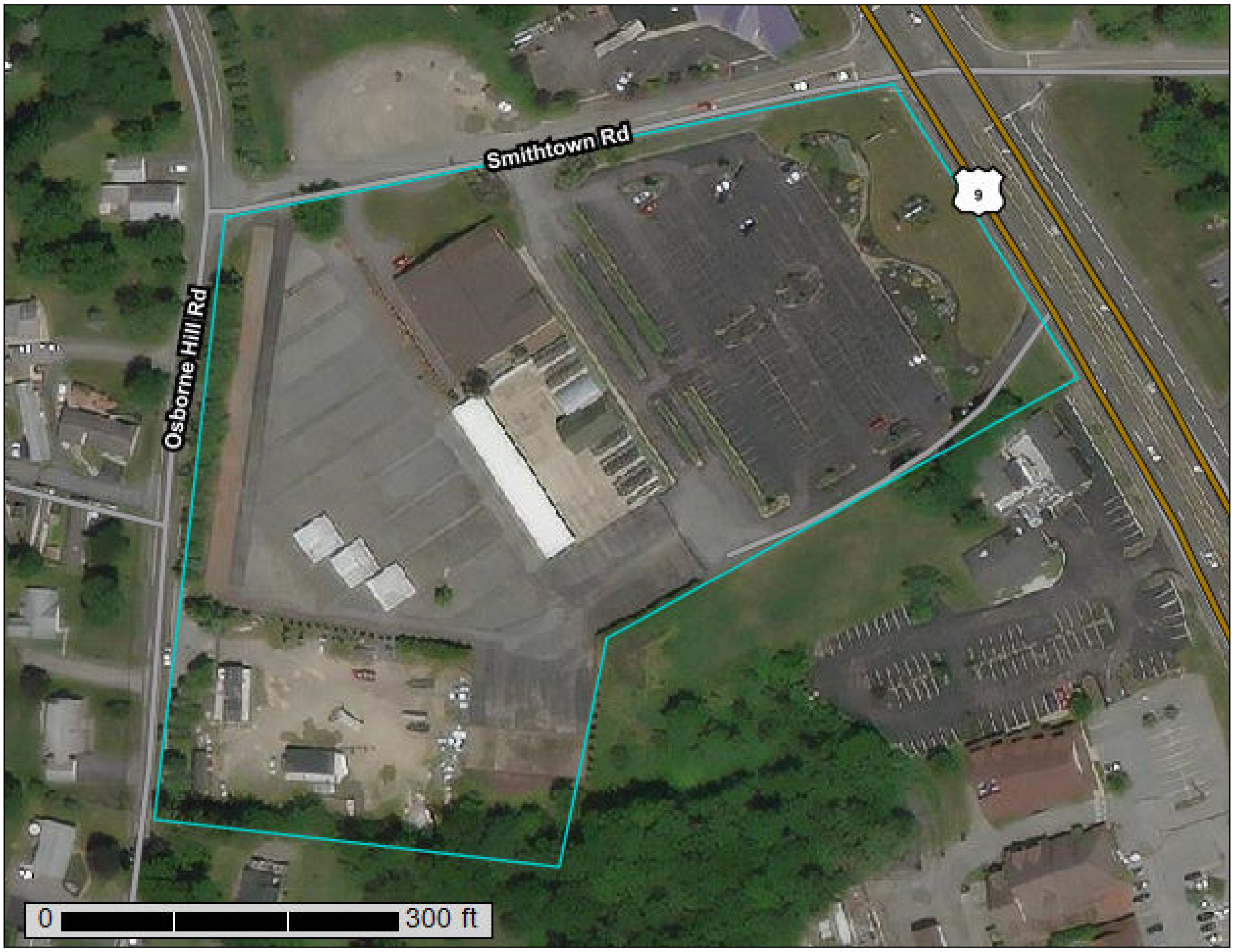
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for

Dutchess County, New York



April 15, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

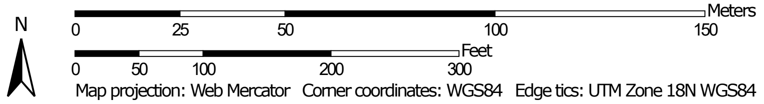
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:1,800 if printed on A landscape (11" x 8.5") sheet.



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: Dutchess County, New York
Survey Area Data: Version 17, 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—Feb 26, 2017

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
DwB	Dutchess-Cardigan complex, undulating, rocky	3.1	39.5%
Ur	Urban land	4.8	60.5%
Totals for Area of Interest		**8.0**	**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.

Dutchess County, New York

DwB—Dutchess-Cardigan complex, undulating, rocky

Map Unit Setting

National map unit symbol: 9rfn
Elevation: 0 to 1,330 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dutchess and similar soils: 40 percent
Cardigan and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 1 to 6 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 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 10 percent
Hydric soil rating: No

Massena

Percent of map unit: 9 percent
Hydric soil rating: No

Nassau

Percent of map unit: 9 percent
Hydric soil rating: No

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Ur—Urban land

Map Unit Setting

National map unit symbol: 9rjb
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

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

Minor Components

Udorthents, smoothed

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

Udorthents, wet substratum

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed soils, undisturbed

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

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Geotechnical Services Report

Proposed CarMax Auto Superstore

1115 Route 9

Wappinger, Dutchess County, NY 12524

PSI Report Number: 08061265
April 27, 2021

Intertek-PSI
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April 27, 2021

CenterPoint Integrated Solutions, LLC
355 Union Boulevard, Suite 301
Lakewood, CO 80228

Attn: Mr. John Thatcher
Development Manager
Jthatcher@centerpoint-is.com

Re: **Geotechnical Engineering Services Report**
Proposed CarMax Auto Superstore
1115 Route 9
Town of Wappinger, Dutchess County, New York 12524
PSI Report No.: 08061265

Professional Service Industries Engineering, PLLC (PSIE, PLLC), an Intertek Company, is pleased to submit this Geotechnical Engineering Services Report for the proposed CarMax located at 1115 Route 9 in the Town of Wappinger, Dutchess County, New York. This report includes the results of field and laboratory testing, and recommendations for foundation and pavement section design, as well as general site development.

After the plans and specifications are complete, Professional Service Industries Engineering, PLLC should review the final design and specifications in order to confirm that the earthwork and foundation recommendations are properly interpreted and implemented. **It is considered imperative that the geotechnical engineer and/or its representative be present during earthwork operations and foundation installation to observe the field conditions with respect to the design recommendations and specifications. Professional Service Industries Engineering, PLLC will not be held responsible for interpretations and field quality control observations made by others.**

Professional Service Industries Engineering, PLLC appreciates the opportunity to have provided CenterPoint Integrated Solutions, LLC with PSI's geotechnical engineering services. If you have any questions concerning this report or if we may be of further service in any manner, please contact our office.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES ENGINEERING, PLLC

Steven Pump

Steven P. Pump
Branch Manager

David B. Sabol, PE
Vice President

Steven Pump
for
Karl Suter
Principal Consultant

GEOTECHNICAL ENGINEERING SERVICES REPORT

For the Proposed

CARMAX AUTO SUPERSTORE
1115 ROUTE 9
TOWN OF WAPPINGER, DUTCHESS COUNTY, NY 12524

Prepared for

CENTERPOINT INTEGRATED
SOLUTIONS, LLC
1240 BERGEN PARKWAY, SUITE A-250
EVERGREEN, CO 80439

Prepared by

Professional Service Industries
Engineering, PLLC
3784 Commerce Court, Suite 300
North Tonawanda, New York 14120
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PSI REPORT NO.: 08061265

April 27, 2021

Steven Pump

Steven P. Pump
Branch Manager

Steven Pump for

Karl Suter
Principal Consultant

STATE OF NEW YORK
DAVID BERNARD SABOL
073984
LICENSED PROFESSIONAL ENGINEER

David B. Sabol, P.E.
Vice President

EXECUTIVE SUMMARY

An exploration and evaluation of the subsurface conditions has been completed for CenterPoint Integrated Solutions at the proposed CarMax Auto Superstore site located at 1115 Route 9 in the Town of Wappinger, Dutchess County, New York. The site is bordered to the east by Route 9, Smithtown Road to the north, Osborne Hill Road to the west, single-family residential structures to the southwest, and commercial/retail structures and associated asphaltic concrete pavement areas to the southeast. Professional Service Industries Engineering, PLLC drilled thirty (30) borings to approximate auger refusal depths ranging from six and eight-tenths (6.8) to eighteen (18) feet, performed select laboratory testing and completed this geotechnical report. Below the surficial materials (asphalt, concrete, topsoil, and/or aggregate fill) at all of the boring locations, the subsurface stratigraphy of the site consisted of both granular soils and cohesive soils overlying shale. Based on the Standard Penetration Test (SPT) N-values, the relative soil strength characteristics were generally described as very loose to very dense densities in granular soils or medium stiff to hard consistencies in cohesive soils. Organic material was also found interbedded in the native soils within boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30 at depths ranging from one-half (1/2) to six (6) feet below existing site grades. Groundwater was encountered within twenty-three (23) of the thirty (30) boring locations at depths between one-half (1/2) and eleven (11) below existing site grades during drilling of the boreholes. For safety reasons, boreholes were immediately backfilled upon completion; therefore, long-term water levels were unable to be recorded.

Geotechnical Evaluation

Professional Service Industries Engineering, PLLC has identified five (5) general geotechnical related concerns for this site, which will potentially impact design and construction. The following lists those concerns which are discussed in greater detail in the report:

1. Existing Development: including such items as structures, pavements, abandoned utilities.
2. The relatively shallow bedrock.
3. The organic materials interbedded in the native soils (boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30).
4. The presence of cobbles and boulders.
5. Moisture-sensitive granular soils containing varying amounts of fine-grained soils with associated weather and construction related concerns.

Building Foundations

PSI understands that the proposed building will bear on either the natural soils or a properly placed and compacted structural fill. Based on the recommended bearing material, and upon the maximum settlement criteria included herein, footings should be sized for a maximum net allowable soil bearing pressure of:

- 2,500 pounds per square foot (psf) for column footings.
- 2,500 psf for strip footings.

Pavements

After completion of site preparation activities, surface soils at soil boring locations B-1, B-2, B-3, B-4, B-7, B-9, B-10, B-11, B-12, B-13, B-15, B-16, B-17, B-18, B-21, & B-26 are considered suitable for support of typical pavement sections, based on the provided design traffic. Flexible type pavements consisting of four (4) inches of asphalt over eight (8) inches of base aggregate will be suitable for light and heavy duty pavements, respectively. However, a rigid concrete pavement consisting of eight (8) inches of concrete over six (6) inches aggregate base is recommended for areas that will receive relatively high concentrated sustained loads such as dumpster pads and loading areas.

Native soils interbedded with organic material were encountered at boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30, extending to approximate depths ranging from one-half (1/2) to six (6) feet below existing site grades. The organic material is considered to be highly compressible even when subjected to very small loadings and is NOT considered suitable for supporting any structural elements, including pavements. Therefore, where organic materials were encountered, the subgrades should be undercut to allow for the placement of a 4-inch lift of NYSDOT 304 aggregate beneath the bottom of the pavement section (i.e. asphalt and aggregate base). Tensar Geogrid TX 140 should be placed on undercut/existing soil subgrades with installation and overlaps per manufacturer's specifications. An aggregate material meeting NYSDOT 304 specifications should be placed upon the geogrid reinforced undercut subgrade.

The Owner/designer should not rely solely on this Executive Summary and must read and evaluate the entire contents of this report prior to utilizing our engineering recommendations in preparation of design / construction documents.

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1. PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries Engineering, PLLC (PSIE, PLLC), an Intertek Company, has completed a geotechnical engineering exploration for the proposed CarMax Auto Superstore located at 1115 Route 9 in the Town of Wappinger, Dutchess County, New York. The following table summarizes, in chronological order, the project authorization history for the services performed and represented in this report by Professional Service Industries Engineering, PLLC (PSIE, PLLC).

DOCUMENT	DATE	REQUESTED/PROVIDED BY
Request for Proposal for Geotechnical and Environmental Services	12/23/2020	Mr. Nathan Morin – Development Coordinator CenterPoint Integrated Solutions, LLC
PSI Proposal (**0806-330707)**	1/6/2021	Professional Service Industries Engineering, PLLC
Contract Agreement	1/25/2021	CenterPoint Integrated Solutions, LLC and PSI

1.2 PROJECT DESCRIPTION

Project information was provided by Mr. Nathan Morin of CenterPoint Integrated Solutions, LLC via a request for proposal (RFP) addressed to Professional Service Industries Engineering, PLLC. PSIE, PLLC has been provided with the following documents:

- The twelve-page "RFP for Geotechnical and Environmental Services" dated December 23, 2020, prepared by CenterPoint Integrated Solutions, LLC.
- One (1) CarMax project drawing numbered SP-02, dated December 21, 2020, and entitled "Prelim. Site Plan" containing the location existing surrounding structures, proposed building locations, proposed parking and drive areas, and existing property boundaries.

- One (1) John E. Railing PE, PC Consulting Engineers and Land Planers project drawing un-numbered, dated April 29, 1999 (revised May 17, 1999), and entitled "Plant Depot" containing the locations of the existing on-site structures, existing parking and drive areas, existing property boundaries, and locations of existing surrounding structures.

At this time, Professional Service Industries Engineering, PLLC understands that the new development will consist of four single story slab-on-grade structures with no basement and will consist of sales (4,312 SF), presentation (784 SF), retail service (2,641 SF), and carwash (936 SF) buildings. Existing grading plans and final design plans were not available at the time of this proposal; however, PSIE, PLLC anticipates the building will include exterior load bearing CMU walls supporting either a steel joist with metal deck roof system. Based on the information contained within the RFP, maximum column loads will be on the order of one-hundred twenty (120) kips and maximum wall loads on the order of four (4) kips/lf. Professional Service Industries Engineering, PLLC has not been provided with grading information at this time; however, this proposal is based on final grades being within two (2) +/- feet of existing grade.

Additional site development will include construction of new parking lots and driveways. Based on the RFP information, light duty pavements are designed for twenty (20) years and 7,500 ESALs over the life of the pavement. Heavy duty pavements will be designed for 75,000 ESALs over the life of the pavement. A minimum pavement section including two (2) inches of binder and one and one-half (1.5) inches of wearing course is required. Grades for the new pavements are not yet known; however, this proposal is based on final grades being within two (2) +/- feet of existing grade.

The proposed construction will also include car lifts with a ten thousand (10,000) pound capacity and a self-weight of two thousand (2,000) pounds. The rack post loads will be approximately three thousand (3,000) pounds supported on 4-inch by 4-inch base plates, and eight thousand (8,000) pound vehicles with 7-inch by 7-inch tire contact area (assume 2,000 lb. per tire). Light poles will also be installed at the site where foundations typically bear about seven (7) to nine (9) feet below final grade. There will be a 6-feet high concrete masonry unit (CMU) wall surrounding the sale staging area.

The following table lists the structural loads and site features that are required for or are the design basis for the conclusions contained in this report:

Structural load/property	**Requirement/design basis**	
BUILDING		
Maximum Column Loads	120 kips	R
Maximum Wall Loads	4 kips per linear foot	R
Finish Floor Elevation and type	Within 2 feet of existing grade	B
Typical/Maximum Floor Loads	200 psf	B
Minimum Sub-Grade Reaction	100 pci based on 12-inch square plate	R
Basement Elevation	No Basement or Below Grade Levels	B
Settlement Tolerances	1-inch total ; ½-inch differential over 40 feet	R
Specialty Structures		
Light Pole Loading	Shear 1.5 kips ; Vertical : 7 kips Moment : 50 kip-feet	B
Wheel and Rack Loading	3,000 pounds for rack post (4”x4”) 2,000 pounds wheel loads (7”x7”)	R
PAVEMENTS		
Pavement 18-kip ESAL (cycle & duration)	Light Duty Pavement - 7,500 ESAL Heavy Duty Pavement - 75,000 ESAL (with a life expectancy of 20 years)	R
GRADING		
Utility Depths	Within 5 feet of existing grade	B
Planned grade variations at site	Less than 2 feet from existing grade	B

R= Reported to PSI by Centerpoint Integrated Solutions, LLC
B= Report has been prepared based on this parameter or loading in the absence of client supplied information at the time of this report

The geotechnical recommendations presented in this report are based on the available project information, building location, laboratory testing, and the subsurface materials described in this report. If any of the noted information has changed or additional information becomes available, please inform Professional Service Industries Engineering, PLLC in writing so that we may amend the recommendations presented in this report, if appropriate. Professional Service Industries Engineering, PLLC will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

1.3 PURPOSE/SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site to provide foundation and pavement section recommendations for the proposed construction. Professional Service Industries Engineering, PLLC's scope of services included drilling a total of thirty (30) test borings within the proposed building structure and pavement areas, to approximate auger refusal depths ranging from six and eight-tenths (6.8) to eighteen (18) feet below the existing grades, select laboratory testing, and preparation of this geotechnical report. This report briefly outlines the project description, presents available project information, testing procedures, describes the site and subsurface conditions, and presents recommendations regarding the following:

- A discussion of subsurface conditions encountered including recommended soil properties including, site location plan, boring location plan, boring logs, site profiles, and laboratory data;
- An evaluation of the data as it pertains to foundations, slabs, and pavements for the proposed site development;
- Recommendations for site preparation, including placement and compaction of fill soils;
- Geotechnical recommendations for foundation types, depths, allowable bearing capacities, and an estimate of potential settlement;
- Geotechnical recommendations regarding floor and/or other at-grade slabs;
- Seismic site class and coefficients for use in seismic design (2020 New York State Building Code / 2018 International Building Code);
- Lateral earth pressures for at rest, active and passive conditions;
- Geotechnical recommendations for typical pavement section design and pavement subgrade preparation;
- Geotechnical recommendations regarding utilities trenching and siltation control;
- Comments on the use of various Portland cement types based on the sulfate concentration in the soils;
- Comments regarding factors that will impact construction and performance of the proposed construction.

The scope of services for this report did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater or air, on, or below or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or unexpected items or conditions are strictly for informational purposes. However, it should be noted that PSI has provided ESA Phase - I study of this property under a separate report cover.

2. DRILLING, FIELD AND LAB TESTING PROCEDURES

2.1 DRILLING AND SAMPLING PROCEDURES

The soil borings were performed with a drilling rig equipped with a rotary head and automatic hammer. Conventional hollow-stem augers were used to advance the holes. Representative soil samples were obtained employing split-spoon sampling procedures in general accordance with ASTM procedures.

2.2 FIELD TESTS AND MEASUREMENTS

PENETRATION TESTS AND SPLIT-BARREL SAMPLING - During the sampling procedure, standard penetration tests (SPT) were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of four (4) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

An automatic trip drop hammer was used for the standard penetration testing, which generally has a higher efficiency than a manual cathead-and-rope hammer. Typically, the automatic hammer yields lower standard penetration test resistances (N-values) than a manual cathead-and-rope hammer. This reduction has been taken into account in our evaluation. However, the N-values reported on the logs, and the consistency descriptions on the boring logs are based on the field-recorded values and were not corrected for hammer efficiency.

WATER LEVEL MEASUREMENTS - Water level observations were noted during and upon completion of boring operations and noted on the test boring logs. In relatively impervious soils, the accurate determination of the groundwater elevation may not be possible even after several days of observation. Seasonal variations, temperature and recent rainfall conditions may influence the levels of the groundwater table and volumes of water will depend on the permeability of the soils.

2.3 LABORATORY TESTING PROGRAM

In addition to the field investigation, a supplemental laboratory-testing program was conducted to determine additional pertinent engineering characteristics of the foundation materials necessary in analyzing the behavior of the proposed structure.

LABORATORY DETERMINATION OF WATER (MOISTURE) CONTENT OF SOIL BY MASS - For many materials, the water content is one of the most significant index properties used in establishing a correlation between soil behavior and its index properties. The water content is used in expressing the phase relationship of air, water, and solids in a given volume of material. In fine-grained cohesive soils, the consistency of a given soil type depends on its water content.

GRAIN SIZE ANALYSIS - The purpose of determining the grain or particle size distribution of a sample is to classify the material according to ASTM D2487, determine the potential packing arrangement of the particles and estimate the shear strength and permeability of the soil matrix. To determine the grain size of coarse particles, sieves of varying opening sizes are used. Hydrometer analysis is used to determine the grain size of materials finer than sand sized particles. In addition to classification, the grain size distribution is an important for use in filter design between two materials, estimating the permeability of a soil, and liquefaction and swell potential of a soil.

LABORATORY DETERMINATION OF ORGANIC MATTER CONTENT – The compressibility and/or decomposition of organic laden soils may result in uneven or excessive settlement. To determine the organic matter content of the soil, soils previously dried in a low-temperature oven for water content are placed in a high temperature muffle furnace. At room temperature, the sample is weighed and process repeated one or more times. The difference between the original weight and the final weight divided by the original weight of the dried soils indicates the percentage of organic matter by weight in the soil sample.

CORROSIVE POTENTIAL OF SOILS – A soil sample from a selected test boring was analyzed chemically to provide corrosion design parameter information. The laboratory testing included determination of pH, soluble sulfates and chloride ions. The summary of the test results are included in the Appendix of this report.

The laboratory testing program was conducted in general accordance with applicable ASTM standards unless otherwise indicated on laboratory reports. The results of these tests are to be found on the accompanying boring logs and laboratory summary reports located in the Appendix.

3. SITE AND SUBSURFACE CONDITIONS

3.1 SITE LOCATION AND DESCRIPTION

The project site is located at 1115 Route 9 in the Town of Wappinger, Dutchess County, New York. Primary access to the property is from Smithtown Road to the north, with an additional exit onto Route 9. The Boring Location Plan in the Appendix indicates the location of the proposed structure with respect to Route 9 to the east, Smithtown Road to the north, and Osborne Hill Road to the west. Surrounding properties consisted of Route 9 to the east, Smithtown Road to the north, Osborne Hill Road to the west, single-family residential structures to the southwest, and commercial/retail structures and associated asphaltic concrete pavement areas to the southeast.

Image obtained from Bing Maps ™

At the time of the drilling operations, the site contained a commercial/retail development, which was mostly vacant with the exception of the “Terra Tile & Marble” store located on the northern end of the northern building. The commercial/retail development consisted of two (2) buildings with associated asphaltic concrete pavements located on the west, south, and east sides of the structure. Additional wood framed structures were also observed to the west of the southern building, which were associated with the landscaping/nursery business that once occupied the structure. Various Portland cement concrete pavements and sidewalks were also observed on the property. The existing commercial/retail buildings are single-story structures with a combination of brick and CMU veneer with wood siding and are assumed to be supported on a shallow foundation system consisting of spread and strip footings. At the time of the field drilling operations and site visit by the Professional Service Industries Engineering, PLLC representative, limited exterior wall cracking within the mortar joints was observed. Due to the inability to enter the existing structure, observation of the floor slab was not performed. Observation of the existing asphaltic concrete pavement surfaces indicated moderate to severe joint, longitudinal, transverse, raveling, fatigue, and areas of alligator cracking (cracks with pattern resembling alligator skin). The alligator cracking is typical of an indication of pavement fatigue failure caused by repeated traffic loadings over a period of time. Isolated potholes were also observed within the pavement areas.

Based on visual observations of the site by a PSI representative, the ground surface at the proposed "Sales/Presentation/Retail Service" building footprint appears to have minimum elevational differences estimated between one (1) and two (2) feet. Within the area of the proposed "Carwash" building footprint, minimal elevational differences of one (1) to two (2) feet are also estimated. Within the proposed parking and drive areas, it appears that there are elevational differences estimated between two (2) to five (5) feet, with gradual elevation changes. At the time of drilling operations and boring layout, no ponded water surfaces or drainage ditches were observed within the proposed project area. However, various catch basins were observed within the asphaltic concrete parking and drive areas. During the field operations, the truck-mounted drill rig experienced little difficulty accessing and traversing the site surface and boring locations.

3.2 GENERAL AREA GEOLOGY

The project site in the Town of Wappinger, Dutchess County, New York area is located within the glaciated portion of the Lower Hudson physiographic province. As noted on the 1989 "Surficial Geologic Map of New York", surface soils in the area generally consist of variable texture till (e.g. clay, silt-clay, boulder clay). As noted on the 1970 "Geologic Map of New York", bedrock in the general site area is part of the Paleozoic, Middle Ordovician age, Trenton Group and Metamorphic Equivalents which generally consists of the Austin Glen Formation (graywacke, shale). Glacial imprints dominate the landscapes of central New York. Only small areas remain of the landforms that existed prior to the Pleistocene glaciation. Post-glacial processes have reshaped the flood plains and valley walls. In areas of steep slope, a cover of drift generally mantles the bedrock.

3.3 SUBSURFACE CONDITIONS

The site subsurface conditions were explored with a total of thirty (30) soil borings extending to approximate auger refusal depths ranging from six and eight-tenths (6.8) to eighteen (18) feet below the existing ground surface. For each boring, Standard Penetration Tests (SPT's) were performed and split spoon samples were obtained at regular intervals to the boring termination depth. The split spoon sampling procedures used during this exploration are in general accordance with ASTM Designation D-1586. The soil samples will be stored in our laboratory for further analysis, if requested. Unless notified otherwise, the samples will be disposed of after six (6) months. The number of test borings and boring locations were suggested by CenterPoint Integrated Solutions, LLC. Borings were marked in the field by PSIE, PLLC personnel, who are not surveyors, using standard taping and measuring techniques. Top-of-hole elevations were not determined or provided for this report. Professional Service Industries Engineering, PLLC notified Dig Safely New York for public utility clearance, prior to drilling the site.

The soil types encountered at the specific boring locations (see Boring Location Diagram) are presented in the form of individual soil profiles on the attached Boring Logs. The stratification presented is based on visual examination of the recovered soil samples and the interpretation of field logs by a geotechnical professional. Included on the profiles are the Standard Penetration Test values (N-values) for the borings. The N-values have been empirically correlated with various soil properties and are considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils. A brief description of the soils encountered at this site is presented in this section.

The following subsurface description is of a generalized nature and intended to highlight the major subsurface stratification features and material characteristics. Professional Service Industries Engineering, PLLC was not provided with existing topographic information; therefore, ground surface elevations are not presented on the boring logs or referenced in this report. The Boring Logs illustrated in the Appendix should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, penetration resistances, locations of the samples and laboratory test data. The stratifications shown on the Boring Logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

ASPHALTIC PAVEMENT: At the surface at boring locations B-1, B-3, B-4, B-5, B-7, B-8, B-9, B-10, B-11, B-12, B-15, B16, B-18, B-20, B-21, B-23, B-24, B-25, B-27, and B-30, asphaltic concrete paving with an approximate thickness ranging from two (2) to three and one-half (3-1/2) inches was encountered. No obvious signs of aggregate base were observed. The actual thickness of the pavement section may vary across the site.

TOPSOIL: At the ground surface at boring locations B-2, B-6, and B-17, topsoil was encountered. At those boring locations, the topsoil ranged from approximately three (3) to four (4) inches in thickness. Please note that the actual amount of topsoil may vary widely between boring locations. *The contractor should determine the depth of topsoil to quantify topsoil depths for removal purposes.*

CONCRETE: At the surface at boring locations B-13, B-14, and B-19, concrete having an approximate thickness of six (6) inches underlain by approximately zero (0) to one (1) inch thick aggregate stone base was encountered. The actual thickness of the concrete pavement section may vary across the site.

AGGREGATE FILL: At the ground surface at boring locations B-22, B-26, B-28, and B-29, a stone aggregate having an approximate thickness ranging from three (3) to four (4) inches was encountered. Please note that the actual amount of stone aggregate may vary widely between boring locations.

FINE GRAINED SOILS: Below the surficial materials at boring locations B-1, B-2, B-3, B-10, B-11, B-13, B-19, B-21, and B-23, and underlying the coarse grained soils at boring locations B-5, B-6, B-8, B-9, B-22, B-24, B-25, B-26, B-27, B-28, B-29, and B-30, fine grained soils of various textures/consistencies extended to approximate depths ranging from two (2) to eighteen (18) feet below existing site grades. Boring location B-18 experienced auger refusal in the fine-grained soils. The fine-grained soils were generally classified as CLAYEY SILT (ML), SILT (ML), SANDY SILT (ML), and/or SILTY CLAY (CL-ML). Organic material was also present in the fined grained soils within boring locations B-5, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30 from depths ranging from approximately one-half (1/2) to six (6) feet below existing site grade. Six (6) Loss of Ignition tests were performed on selected organic samples resulting in values ranging from three and one-tenth (3.1) to nine and one-half (9-1/2) percent. Soils possessing Loss of Ignition values of five (5) percent or less are considered an acceptable organic level. Organic soils are that possess Loss of Ignition values greater than five (5) percent are considered to be highly compressible even when subjected to very small loadings and are NOT considered suitable for supporting any structural elements. The Standard Penetration resistance (“N”-values) for the clayey soils ranged from five (5) blows per foot to fifty (50) blows per three (3) inches, indicating medium stiff to hard consistencies in cohesive soils or very loose to very dense densities in non-cohesive soils. Based on penetrometer measurements of the clayey soils, which are an approximate measure of soil strength, the soil unconfined compressive strength of selected samples ranged from 0.5 to 1.5 tsf. Moisture contents of selected samples from these soils ranged from nine (9) to forty-three (43) percent.

COARSE GRAINED SOILS: Below the surficial materials at boring locations B-4, B-5, B-6, B-7, B-8, B-9, B-12, B-14, B-15, B-16, B-17, B-18, B-20, B-22, B-24, B-25, B-26, B-27, B-28, B-29, and B-30, and underlying the fine-grained soils at boring locations B-1, B-2, B-10, B-11, B-13, B-19, B-21, and B-23, coarse grained soils of various textures extended to approximate depths ranging from two (2) to fifteen (15) feet below existing grades. Boring B-16 experienced auger refusal within the coarse-grained soils. The coarse-grained soils were generally sampled as POORLY GRADED SAND (SP), SILTY SAND (SM), and/or POORLY GRADED GRAVEL (GP). Organic material was also present in the granular soils within boring locations B-6 and B-24 from depths ranging from approximately one-half (1/2) to two (2) feet below existing site grade. One (1) Loss of Ignition test was performed on a selected organic sample resulting in a value of three and eight-tenths (3.8) percent. Soils possessing Loss of Ignition values of five (5) percent or less are considered an acceptable organic level. Standard Penetration Test values (“N”-values) ranged from nine (9) blows per foot to fifty (50) blows per one (1) inch, indicating loose to very dense relative densities. However, because of cobbles and boulders encountered in the soil profile, N-values in the granular soils may not be indicative of the actual relative density. Moisture contents of selected samples of the strata ranged from four (4) to eighteen (18) percent.

SEVERELY WEATHERED SHALE: Underlying the natural soils at all of the boring locations with the exception of boring locations B-5 and B-16, severely weathered shale was encountered at approximate depths ranging from three and one-half (3-1/2) to twelve and one-half (12-1/2) feet and extended to approximate auger refusal depths ranging from seven and one-half (7-1/2) to eighteen (18) feet below existing site grades. The Standard Penetration Test values (“N”-values) for the severely weathered shale ranged from thirty-two (32) blows per foot to one hundred (100) blows per zero (0) inches or split spoon refusal, indicating dense to very dense relative densities. Moisture contents of selected samples of the severely weathered shale ranged from five (5) to sixteen (16) percent.

3.4 GROUNDWATER CONDITIONS

At the time of the site fieldwork on March 9, 10, 11, and 12, 2021, the following table illustrates the infiltrating groundwater levels encountered at the test boring locations prior to auger removal during the field drilling operations:

Table 1 – Groundwater Levels (As Measured Beneath the Existing Site Grade)

Boring Number	Groundwater Levels		Borehole Cave Depth
	During Drilling Activities	At Completion of Drilling Activities	
	(feet)	(feet)	(feet)
B-1	No Water	No Water	No Hole Cave Noted
B-2	4.0	No Water	No Hole Cave Noted
B-3	No Water	No Water	No Hole Cave Noted
B-4	6.0	No Water	No Hole Cave Noted
B-5	6.0	No Water	No Hole Cave Noted
B-6	No Water	No Water	No Hole Cave Noted
B-7	6.0	No Water	No Hole Cave Noted
B-8	2.0	No Water	No Hole Cave Noted
B-9	No Water	No Water	No Hole Cave Noted
B-10	0.5	No Water	No Hole Cave Noted
B-11	8.0	No Water	No Hole Cave Noted
B-12	3.0	No Water	No Hole Cave Noted
B-13	2.0	No Water	No Hole Cave Noted
B-14	5.0	No Water	No Hole Cave Noted
B-15	8.0	No Water	No Hole Cave Noted
B-16	4.0	No Water	No Hole Cave Noted
B-17	No Water	No Water	No Hole Cave Noted
B-18	4.0	No Water	No Hole Cave Noted
B-19	5.0	No Water	No Hole Cave Noted
B-20	No Water	No Water	No Hole Cave Noted
B-21	No Water	No Water	No Hole Cave Noted
B-22	8.0	No Water	No Hole Cave Noted
B-23	2.0	No Water	No Hole Cave Noted
B-24	2.0	No Water	No Hole Cave Noted
B-25	11.0	No Water	No Hole Cave Noted
B-26	4.0	No Water	No Hole Cave Noted
B-27	7.0	No Water	No Hole Cave Noted
B-28	2.0	No Water	No Hole Cave Noted
B-29	3.0	No Water	No Hole Cave Noted
B-30	4.0	No Water	No Hole Cave Noted

For safety purposes, all test borings were backfilled at the time of drilling completion.

Fluctuations in the groundwater level should be anticipated throughout the year depending on variations in climatological conditions and other factors not apparent at the time the borings were performed. Additionally, discontinuous zones of perched water may exist within the soils. The interbedded sand and silt soils are subject to shallow perched water during wetter times of the year. The possibility of groundwater level fluctuation should be considered when developing the design and construction plans for the project. Professional Service Industries Engineering, PLLC recommends that the contractor determine the actual groundwater levels at the site at the time of the construction activities. However, long term observations in cased holes or piezometers would be necessary for a more accurate evaluation of the groundwater conditions at the site.

4. EVALUATION AND RECOMMENDATIONS

4.1 GEOTECHNICAL DISCUSSION

The following geotechnical design recommendations have been developed on the basis of the previously described project characteristics and encountered subsurface conditions. If there are any changes in these project criteria, including building location on the site of final floor elevations, a review should be made by Professional Service Industries Engineering, PLLC's to determine if modifications to the recommendations are necessary.

Once final design plans and specifications are available, a general review by PSI is recommended as a means to check that the evaluations made in preparation of this report are consistent with final construction plans and that earthwork and foundation recommendations are properly interpreted and implemented.

Considering the subsurface conditions and the proposed construction, the proposed building structure can be founded on shallow bearing isolated and/or continuous footing foundations. The following comments and recommendations should be considered in the earthwork and foundation design.

Professional Service Industries Engineering, PLLC has identified five (5) general geotechnical related concerns for this site, which will potentially impact design and construction. The following summarizes those concerns:

1. Existing Development: including such items as structures, pavements, abandoned utilities.
2. The relatively shallow bedrock.
3. The organic materials interbedded in the native soils (boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30).
4. The presence of cobbles and boulders.
5. Moisture-sensitive granular soils containing varying amounts of fine-grained soils with associated weather and construction related concerns.

1. EXISTING DEVELOPMENT

The current area of the proposed structures is currently occupied by a vacant commercial/retail structure, associated pavements and utilities. Professional Service Industries Engineering, PLLC understands that the existing structures and pavements will be demolished prior to new construction. Therefore, demolition debris such as masonry/concrete walls, foundation units, concrete slabs and pavements should be removed in their entirety beneath new construction. If the existing structures contain a below-grade level, or where USTs are removed, then the excavation left from demolition or UST removal activities should be re-established with controlled, compacted structural fill as outlined in this report (if applicable). Furthermore, Professional Service Industries Engineering, PLLC recommends that any abandoned utilities beneath new construction be removed and replaced with structural fill or grouted in place.

On previously developed sites, it not uncommon to find undocumented man-placed FILL or buried deleterious materials. Based Professional Service Industries Engineering, PLLC's test borings, no findings of undocumented man-placed fill soils were present. However, undocumented fill materials may exist to depths and amounts in localized areas not discovered in the soil borings performed.

Typically, it is recommended that the building foundations must extend through undocumented man-placed fill material (if encountered) and bear on the underlying undisturbed soils. However, PSIE, PLLC should be engaged to perform close observation of the foundation and floor slab subgrade areas as they are being excavated to evaluate any soft or otherwise unsuitable conditions such as prior construction or demolition debris that may be present at the footing and floor slab subgrade elevation. The owner and contractor should anticipate localized over-excavation and replacement of unsuitable conditions during construction.

Be aware that a significant portion of the proposed new building construction is located within the footprint of the existing vacant commercial/retail structure where drilling was not permitted. Therefore, the excavation of test pits and/or additional soil borings after demolition could be performed to explore the adequacy of removal of prior construction/demolition debris as well as the subsurface conditions of proposed new construction which was not able to be explored at the time of this report.

2. RELATIVELY SHALLOW BEDROCK

Rock excavation may be necessary for underground utility installation, underground tank installation, and/or foundation excavation. Based on past project experience and review of geologic maps, it is anticipated that the rock may not be rippable and require mechanical excavation means consisting of hoe-ram attachments connected to hydraulic excavators. The limits and characteristics of the area's rock formation should be defined by the contractor prior to bidding and construction. The individual boring logs and laboratory data in the Appendix should be reviewed relative to the engineering characteristics of the encountered rock formation.

3. ORGANIC MATERIAL ENCOUNTERED

Native soils interbedded with organic material were encountered at boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30, extends to approximate depths ranging from one-half (1/2) to six (6) feet below existing site grades. The organic material is considered to be highly compressible even when subjected to very small loadings and is NOT considered suitable for supporting any structural elements, including pavements.

4. COBBLES AND BOULDERS

The presence of cobbles and boulders encountered in the soils may present difficulty of their removal during trenching operations when utilizing standard backhoe type equipment; therefore, the utilization of large excavation equipment may be necessary.

5. MOISTURE-SENSITIVE FINE-GRAINED SOILS

The upper granular soils contain varying amounts of fine-grained soils that will be sensitive to increases in moisture content during construction activities. In addition, nearly one third of the borings encountered silt which is very moisture sensitive directly beneath the surface pavement and topsoil. Professional Service Industries Engineering, PLLC has been involved with similar project sites where these otherwise competent soils can undergo a significant loss of stability while construction activities take place during wetter portions of the year. Thus, during wetter portions of the year, there may be an increased difficulty with site grading. Soils that become disturbed would need to be excavated and replaced; however, this remedial excavation may expose progressively wetter soils with depth, thus compounding the problem condition. Therefore, a normal approach to subgrade preparation may not be possible.

If possible, it is recommended to adjust slab grade so that cutting is minimized. Placement of a "select" granular layer of soil in the upper one (1) to two (2) feet of the subgrade should improve subgrade stability. If select fill is placed, Professional Service Industries Engineering, PLLC anticipates less construction delays than would normally occur from on-going correction of on-site soils that would undergo disturbance from construction traffic.

Depending on weather and soil conditions at the time of construction, methods for accomplishing grading may include the use of wide-track, low-contact-pressure type equipment to perform the recommended site grading. The determination of the proper equipment for use in excavation would be dependent on the condition of the soils at the time of construction and the prevailing weather conditions. Narrow track equipment and rubber tired vehicles may experience difficulty moving about the site and may deteriorate otherwise suitable soils.

If a granular layer is used, it should be pushed out into the prepared excavation in an 8-inch thick loose lift, ahead of construction equipment. It may be beneficial to rework the upper 1-foot of subgrade soil and dry the soils to at or below the optimum moisture content and re-compact the soils. A small test area may aid in determining the usefulness of this approach. The select fill should be thoroughly surface compacted with a self-propelled vibratory roller. The fill should not be over compacted. The fill should meet the recommended criteria for gradation and should be compacted as recommended later in this report.

4.2 SITE PREPARATION

Unless specifically indicated otherwise in the drawings and/or specifications, the limits of this subsurface preparation are considered to be that portion directly beneath and ten (10) feet beyond the building and appurtenances. Appurtenances are those items attached to the building and typically include, but are not limited to, the building sidewalks, porches, stoops, etc.

After demolition activities have taken place and prior to new construction or fill placement, site preparation procedures should include the removal of demolition debris, pavements, vegetation, topsoil, roots, organics, over-sized rock, and any other deleterious material within the construction area. After stripping the surficial materials and excavating to the proposed subgrade level, if required, the subgrade should be thoroughly proof-rolled. Proof-rolling should be performed with using either a minimum fifteen (15) ton smooth drum vibratory roller, operating in the vibratory mode and/or a fully loaded tandem axle dump truck (exerting at least 9-ton per axle) or similar rubber tired vehicle. Soils that are observed to rut or deflect excessively under the moving load should be undercut and replaced with properly compacted structural fill. The proof-rolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be accomplished during a period of dry weather. Unstable soils which are revealed by proof-compaction and which cannot be adequately densified in place should be removed and replaced with crushed limestone (NYSDOT 304 Type 2) or choked with coarse aggregate such as NYSDOT No. 4 stone under the recommendations of the geotechnical engineer of record or his representative. Field conditions will dictate the extent of any undercuts.

During the site area grading, zones of perched groundwater may be encountered. Local undercutting and pumping to remove water may be required when such zones are encountered, and provisions should be made in this regard by the builder.

After subgrade preparation and observation have been completed, fill placement may begin. The first layer of fill material should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped subgrade soils. Placement of fill on frozen subgrades is not permitted or acceptable.

Since the near-surface granular soils contain fine-grained and/or cohesive soils, it may become difficult to achieve the required soil compaction and subgrade stability due to high soil moisture contents. Aeration and drying of some of the wetter on-site insitu soils will be required during site grading and compacting operations. Reducing the moisture content of the clay soils may be necessary to achieve proper compaction and establish stable subgrade conditions for support of foundations, floor slabs, and pavements. **If grading and compaction operations take place during a wet or cold season of the year, lime and/or lime-fly ash drying (or other form of chemical modification) may be necessary to expedite site grading and achieve the required level of soil compaction. Alternatively, the upper twelve (12) to twenty-four (24) inches of the soil could be replaced with crushed limestone (NYSDOT 304 Type 2) or choked with coarse aggregate such as NYSDOT No. 4 stone under the recommendations of the geotechnical engineer of record or his representative.**

Please note that the degree of soil drying or chemical modification required will depend to a large extent on the weather conditions, seasonal precipitation, construction schedule, and also the methods and techniques employed by the contractor. The most appropriate soil stabilization methodologies should be determined at the time of construction.

4.3 ROCK EXCAVATION

Rock excavation will be necessary for underground utility installation and/or foundation excavation. Based on past project experience and review of geologic maps, it is anticipated that the weathered shale will be rippable. However, the underlying competent bedrock may not be rippable and require the use of mechanical excavation equipment consisting of hoe-ram attachments connected to hydraulic excavators. The limits and characteristics of the area's rock formation should be defined by the contractor prior to bidding and construction. The individual boring logs and laboratory data in the Appendix should be reviewed relative to the engineering characteristics of the encountered rock formation. **Where mass excavation of hard rock is required to achieve grade, it may be advantageous to excavate a minimum depth below subgrade and replace the hard rock with fill material; thereby providing a minimum thickness of soil fill to minimize utility excavations in rock.**

4.4 FILL/BACKFILL REQUIREMENTS

Fill and/or backfill material for the project should be a well-graded granular or non-expansive (Liquid Limit (LL) <40 and Plasticity Index (PI) <15) soil free of organic debris. The first layer of fill material should be placed in a relatively uniform horizontal lift and adequately keyed into the subgrade soils. All fill materials should have a modified Proctor maximum dry density greater than one-hundred ten (110) pounds per cubic foot (pcf); be essentially free of organic or other deleterious materials and have a maximum particle size of 2 inches. Soils classified as CL, CL-ML, SM, SC-SM, SW, GW, GP and SP will generally be suitable for use as structural fill. Soils classified as OL, OH, MH, CH and PT should be considered unsuitable. However, silt (ML) soils with PI≤4, are considered very unstable at or above optimum moisture limits; therefore, extra attention should be paid during site grading operations of these silt (ML) soils.

Fills and backfills should be placed in maximum lifts of eight (8) inches of loose material. Suitable soil fills should be compacted to a minimum dry density of 95% of the maximum, as determined by ASTM D1557 (Modified Proctor Test). The material should be compacted within the range of -2 and +3 percentage points of the optimum moisture content value as determined by the standard Proctor test. If a fine-grained silt or clay (cohesive) soil is used for fill, close moisture content control will be essential to achieve the recommended degree of compaction. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of compacted-structural fill should be tested by a representative of PSI prior to placement of subsequent lifts. The following tables summaries the recommended compaction effort for various types of structural fills.

RECOMMENDED COMPACTIVE EFFORT

(FOR VARIOUS TYPES OF STRUCTURAL FILL/BACKFILL)

MATERIAL TESTED	PROCTOR TYPE	MIN % DRY DENSITY	MOISTURE CONTENT RANGE	RECOMMENDED FREQUENCY OF TESTING
Structural Fill (Cohesive)	Modified	95%	-2 to +3%	1 per 2,500 sf of fill placed
Structural Fill (Granular)	Modified	95%	-2 to +3%	1 per 2,500 sf of fill placed
Base Under Slab (Cohesive)	Modified	95%	-2 to +3%	1 per 2,500 sf of fill placed
Base Under Slab (Granular)	Modified	95%	-2 to +3%	1 per 2,500 sf of fill placed
Landscape Fill (non-load bearing)	Modified	90%	-2 to +3%	1 per 5,000 sf of fill placed
Utility Trench / Wall Backfill	Modified	95%	-2 to +3%	1 per 200 lf of backfill placed

Whenever new fill placement meets existing natural slopes, the structural fill is to be tied into the existing slopes by means of benches and keys. The limits of compacted structural fill should extend at least ten (10) feet beyond the edges of foundations or five (5) feet beyond the outside edge of pavement before sloping. PSI recommends that all permanent fill slopes be constructed and maintained at 3 horizontal to 1 vertical (3H:1V) or flatter. Care should be taken to apply compactive effort throughout the fill and fill slope areas.

If over-excavation of the foundations is required to remove soft or unsuitable soils, the excavation should extend outward horizontally from the edge of the footing for a distance equal to ½ the depth of the undercut thickness below design footing bottom. A representative of PSIE, PLLC should be present on site to check that approximate proper excavation depths have been achieved. Backfilling and compaction procedures, as described above, could then be implemented to the bottom of footing elevation.

Based on the boring information, the underlying natural soils typically appear suitable for use as structural fill. However, based on the in-situ moisture contents of these materials, drying of the on-site soils should be anticipated to facilitate compaction. Drying is typically achieved by spreading the material in a relatively thin lift and aerating the soil by continuous disking. This process works best during periods of warm, dry weather. If earthwork activities are carried out during wetter months, when drying conditions are not optimal, it may be beneficial to incorporate a hydrated lime, or similar additive, into the soil to promote drying if cohesive soils are used. Off-site soils used as fill should be evaluated by adequate laboratory testing prior to their use as fill. A crushed aggregate (NYSDOT 304 Type 2 crushed stone) would be a suitable "select" granular fill/backfill.

4.5 FOUNDATION RECOMMENDATIONS

Considering the results from test borings, laboratory test results, and engineering evaluation and analysis, Professional Service Industries Engineering, PLLC believes that the proposed building structure, trash enclosure, security gate, and WIP masonry wall can be founded on shallow bearing isolated or continuous footing foundations designed for maximum net allowable soil bearing pressure of **2,500 pounds per square feet (psf)**. The bottom of the footing excavations should be observed, and the surface compacted with either a vibratory or an impact compactor weighing at least two hundred (200) pounds and imparting a minimum of four (4) kips of force to the subgrade. In the vicinity of boring locations B-23 (assumed WIP masonry wall location) and B-24 ("Carwash" building), the bottom of footing excavation will potentially bear at the level of existing native materials interbedded with organics. This native material interbedded with organics must be removed entirely and replaced with compacted and tested/documented crushed stone, such as NYSDOT 304. When the footing excavation is undercut, a line drawn outward and downward at 1H:2V, where H=Horizontal and V=Vertical, from the perimeter of the foundation bearing area should define the lateral limits of over-excavation. Field conditions will dictate the extent of the undercut and replacement.

Continuous wall and isolated column footings should be at least twenty-four (24) and thirty (30) inches in width, respectively. Column and wall footings should extend to a minimum depth of forty-two (42) inches beneath the lowest adjacent exterior grade to provide adequate frost protection. In heated areas, interior footings can be located at a minimum depth of eighteen (18) inches below finished floor elevations. The size of the foundation, the bearing pressure and the embedment depth has a direct impact on the anticipated settlement. If the design varies from the above recommendations, Professional Service Industries Engineering, PLLC should review the design to check for the potential for excessive settlement.

The foundation walls may not be free standing in the overburden soils; therefore the sides of the cut excavation for the footings may need to be sloped and the footings formed and backfilled in order to maintain a vertical concrete face.

Rock excavation will be necessary to establish some foundation bearing elevations. Based on past project experience and review of geologic maps, it is anticipated that the weathered bedrock (shale) will be rippable. However, the underlying competent bedrock (shale) may require the use of mechanical excavation equipment consisting of hoe-rams attached to hydraulic excavators.

After opening, footing bearing surfaces evaluations should be performed by a representative of the geotechnical engineer prior to placement of reinforcing steel and concrete. The foundation areas should be observed and tested by a Professional Service Industries Engineering, PLLC representative to assess that the foundation materials are consistent with the materials discussed in this report. Foundation concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. If it is required that footing excavations be left open for more than one day, they should be protected to reduce evaporation or entry of soil moisture. If concrete will not be placed the same day a foundation excavation is cut to grade, the contractor should be required to place three (3) to five (5) inches of compacted crushed aggregate or a concrete "mud mat" within the footing excavation. Any unsuitable, excessively soft/loose or wet soils encountered during foundation excavation and construction should be removed and replaced with compacted structural fill, or the foundations can be extended to bear on the underlying higher strength soils.

Once the footing concrete is placed, the foundations should be backfilled with structural fill as soon as it is safe to do so without causing damage to them. The backfill serves to protect the footing, is a component of overturning resistance and prevents accumulation of water around the foundations which can soften and weaken the bearing soils. The ground surface near the completed foundations should be sloped to drain away from the foundations throughout construction to avoid accumulation of moisture in the subgrade soils.

Based on the soil index properties, Professional Service Industries Engineering, PLLC's knowledge of the local soils and standard of care to the similar structures, Professional Service Industries Engineering, PLLC estimated the consolidation characteristics of the foundation bearing soils based on the empirical relationships. Based on the explored subsurface conditions and site geology, laboratory testing and past experience, Professional Service Industries Engineering, PLLC anticipates that properly designed and constructed footings supported on the recommended materials should experience total and differential settlements between adjacent (40-foot distance) columns of less than 1-inch and ½-inch, respectively. However, actual settlements will be dependent upon the depth of the foundations, column spacing, structural loads and other related factors. The structural and architectural design should include provisions for liberally spaced, vertical control joints to minimize the effects of potential settlement.

If a larger allowable bearing pressure is required to accommodate the anticipated design loads and the potential for settlement to exceed 1-inch, under the additional load, is not satisfactory to the client, other construction methods or foundation types may be considered.

Light Pole Foundation

It is Professional Service Industries Engineering, PLLC's understanding from reviewing the information within the RFP that the typical light pole foundation for CarMax is a 30-inch drilled pier embedded to depths of approximately seven (7) to nine (9) feet below the existing grade. The following parameters can be used for design of light pole foundations.

LIGHT POLE DESIGN PARAMETERS	
Allowable Bearing Capacity	2,000 psf
Lateral Bearing Capacity (1/2-in deflection)	150 psf/ft
Lateral Sliding Coefficient of Friction	0.25

Based on IBC 2018 and granular soil types (Table 1806.2)

For transient loading, the values provided can be increased by 33%. In general, the portion of the passive pressure within the potential frost depth or 1.5*D should be ignored in design due to potential disturbance.

4.6 EARTHQUAKE AND SEISMIC DESIGN CONSIDERATIONS

The 2020 New York State Building Code is an adaptation/incorporates the 2018 International Building Code (IBC). As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site.

Part of the IBC code procedure to evaluate seismic forces, requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper one hundred (100) feet BGS. To define the Seismic Site Class for this project, Professional Service Industries

Engineering, PLLC has interpreted the results of the soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of one (100) feet, as permitted by Section 1615.1.1 of the code. The estimated soil properties were based upon data available in published regional geologic reports as well as Professional Service Industries Engineering, PLLC's experience with subsurface conditions in the general site area. Professional Service Industries Engineering, PLLC anticipates that the subsurface conditions below the explored depth may generally consist of graywacke, shale. Based on the review of the available data, knowledge of regional geology and the Standard Penetration Test (SPT) N values, we have assigned a **Soil Site Class "C"** as defined in Section 1615.1.1. The recommended seismic vales are presented in Table 2, Recommended Seismic Values.

The USGS-NEHRP probabilistic ground motion values for the site which were obtained from the USGS geohazards web page (http://eqdesign.cr.usgs.gov/html/design-lookup.html) and are as follows:

Table 2 – Recommended Seismic Values

Parameter	NY Building Code Reference	Value	
Site Class	Table 20.3-1 of ASCE 7-16	C	
Mapped spectral accelerations for short periods (S_S)	Figure 1613.2.1(1)	0.222	g
Mapped spectral accelerations for a 1-second period (S_1)	Figure 1613.2.1(2)	0.056	g
Site coefficient F_a	Table 1613.2.3(1)	1.3	
Site coefficient F_V	Table 1613.2.3(2)	1.5	
Maximum considered earthquake spectral response for short periods (S_{MS}) adjusted for site class effects	Equation 16-36	0.289	g
Maximum considered earthquake spectral response for 1-second period (S_{M1}), adjusted for site class effects	Equation 16-37	0.085	g
Design Spectral Response acceleration at short periods (S_{DS})	Equation 16-38	0.193	g
Design Spectral Response acceleration at 1-second periods (S_{D1})	Equation 16-39	0.057	g

NOTES: *Based upon a 2% Probability of Exceedance in 50 years
MCE = Maximum Considered Earthquake
g = acceleration due to gravity

The Site Coefficients, Fa and Fv presented in the above table were interpolated from IBC Tables 1613.5.3(1) and 1613.5.3(2) as a function of the site classification and mapped spectral response acceleration at the short (S_s) and 1 second (S_1) periods.

A **Seismic Design Category B** was assigned as determined for the intended building use (Type II) and the IBC Tables 1613.5.6(1) and 1613.5.6(2). For the assigned Design Category, Section 1802 of the Code does not require an assessment of slope stability, liquefaction potential, and surface rupture due to faulting or lateral spreading.

4.7 FLOOR SLAB SUBGRADE RECOMMENDATIONS

The proposed building slab-on-grade may be supported on natural soils and/or compacted engineered fill placed over a suitable natural soil subgrade, provided the upper soils have been proof-compacted with a minimum fifteen (15) ton smooth drum, vibratory roller, operating in the vibratory mode in order to confirm their suitability. It is Professional Service Industries Engineering, PLLC's understanding that the typical floor slab for the proposed dealership will support loads up to two hundred (200) psf. Professional Service Industries Engineering, PLLC recommends that if the proposed building will include heavily loaded floor slab sections, Professional Service Industries Engineering, PLLC should be provided the opportunity to review the final design plans and specifications to determine if the underlying subsurface soils can adequately support the heavily loaded floor slab sections.

Preparation of floor slab subgrades should be in accordance with recommendations outlined in the Site Preparation and Structural fill sections of the report. If the materials at the finished subgrade elevations exhibit excessive moisture contents and unstable subgrade conditions, then undercutting and replacement of the objectionable soils should be performed to achieve firm subgrade support. Alternatively, the unstable soils can be stabilized by choking the exposed bearing surface with coarse aggregate.

It is recommended that the floor slab be grade supported on a densely-graded crushed stone similar to NYSDOT 304 Type 2 crushed stone. Base course thickness of six (6) inches is recommended. Where additional drainage capabilities are desired, a more open-graded material may be used. If the floor slab is to be supported on an open-graded material, Professional Service Industries Engineering, PLLC recommends utilizing a geo-textile fabric between the subgrade soils and base material to prevent the migration of the subgrade soil into the voids of the open graded "clean" crushed aggregate.

Professional Service Industries Engineering, PLLC recommends that the soil surface be graded to drain away from the buildings without low spots during and after construction, and before the placement of the granular base material. Polyethylene sheeting should be placed to act as a vapor retarder where the floor will be in contact with moisture sensitive equipment or product such as tile, wood, carpet, etc., as directed by the design engineer. The decision to locate the vapor retarder in direct contact with the slab or beneath the layer of granular fill should be made by the design engineer after considering the moisture sensitivity of subsequent floor finishes, anticipated project conditions and the potential effects of slab curling and cracking. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage.

For subgrade prepared as recommended with properly compacted fill and base thickness of six (6) inches, a composite modulus of subgrade reaction, *k* value, of one-hundred twenty (120) pounds per cubic inch (pci) may be used on top of the aggregate base in the grade slab design based on a 1 ft. x 1 ft. plate load test. However, if the subgrade is chemically treated (lime, cement etc.), a higher modulus of subgrade reaction, *k* value, may be possible depending on the incorporated weight percent of lime/cement. Additional sampling and testing should be performed if soil modification/stabilization is pursued.
Depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soil:

Modulus of Subgrade Reaction, k_s = $(\frac{k}{B})$ for cohesive soil and

$$k_s = k\left(\frac{B+1}{2B}\right)^2 \text{ for cohesionless soil}$$

Where: k_s= coefficient of vertical subgrade reaction for loaded area (pci)
k = coefficient of vertical subgrade reaction for 1x1 square foot area (pci)
B = width of area loaded (feet)

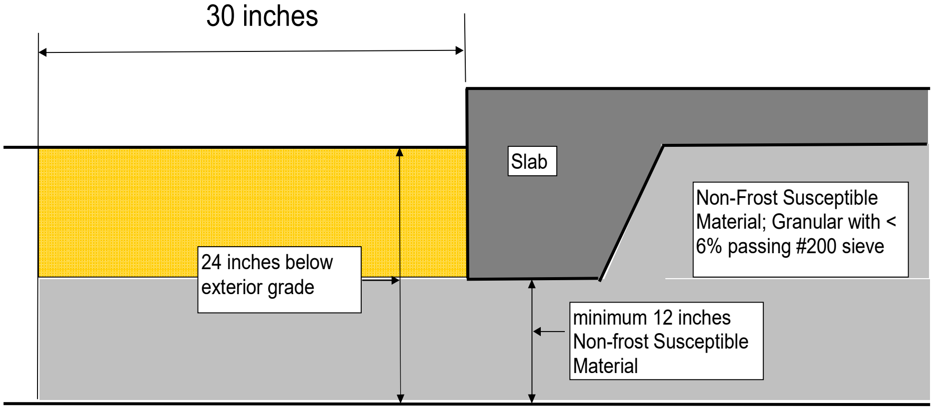
The precautions listed below should be followed for construction of slab-on-grade pads. These details will not reduce the amount of movement, but are intended to reduce potential damage should some settlement of the supporting subgrade take place. Some increase in moisture content is inevitable as a result of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices.

- Cracking of slab-on-grade concrete is normal and should be expected. Cracking can occur not only as a result of heaving or compression of the supporting soil and/or bedrock material, but also as a result of concrete curing stresses. The occurrence of concrete shrinkage cracking, and problems associated with concrete curing may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement, finishing, and curing, and by the placement of crack control joints at frequent intervals, particularly where re-entrant slab corners occur. The American Concrete Institute (ACI) recommends a maximum panel size (in feet) equal to approximately three times the thickness of the slab (in inches) in both directions.
- Areas supporting slabs should be properly moisture conditioned and compacted. Backfill in all interior and exterior water and sewer line trenches should be carefully compacted to reduce the shear stress in the concrete extending over these areas.

Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

Unheated Slab Recommendations

Grade supported slab structures in unheated areas shall have a minimum of twelve (12) inches of non-frost susceptible materials to a depth of twenty-four (24) inches below the exterior grade with at least twelve (12) inches below the bottom of the slab or perimeter footings. These materials shall extend at least thirty (30) inches from the outside limits of the grade supported slab. The thirty (30) inch dimension can be reduced by 1.25 inches for every additional inch below twenty-four (24) inches that the non-frost susceptible material is extended below grade. Non-frost susceptible soil is defined as drained, granular material with less than 6% passing the #200 sieve. The non-frost susceptible soils shall be graded and gravity drained such that it will not impound or trap water within the frost protected area.



4.8 BELOW GRADE/RETAINING WALLS RECOMMENDATIONS

Retaining walls should be designed to resist lateral earth pressures. Lateral earth pressure is developed from the soils present within a wedge formed by the vertical retaining wall and an imaginary line extending up and away from the bottom of the wall footing at an approximate 45° angle. The lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient K. If the wall is not permitted to rotate or deflect at the top, Professional Service Industries Engineering, PLLC recommends designing the wall for the "at-rest" lateral earth pressure condition using K_o. Wall that is permitted to rotate and deflect at the top can be designed for the active lateral earth pressure condition using K_a. Passive pressure can be determined using K_p with a factor of safety of 2.0. Recommended parameters for use in retaining wall are as follows:

Table 3 – Soil Parameters and Lateral Earth Pressures

Recommended Parameters for use in Retaining Wall Design					
Material Type	Angle of Internal Friction (ϕ)				
1) Lean Clay (in-situ)	20°				
2) Silty Sand (SM)	28°				
3) Silt (ML)	22°				
4) Poorly Graded Sand (SP)	32°				
5) Clean Crushed Limestone	35°				
Total Soil Density (pcf)	125				
Cohesion for Clay Soils (psf) (undrained, ϕ = 0)	ϕ = 0, C = 500 psf				
Groundwater Elevation	At bottom of the wall				
Parameters specific to soil type	**1***	**2***	**3***	**4***	**5***
Friction Factor for Base	0.30	0.27	0.25	0.32	0.47
Coefficient of Active Pressure (K_a) **	0.49	0.36	0.45	0.31	0.27
Coefficient of Passive Pressure (K_p) **	2.04	2.77	2.20	3.24	3.69
Coefficient of At-Rest Pressure (K_o) **	0.66	0.53	0.63	0.47	0.43

** These values may be used for design only if the aggregate backfill extends back from the wall certain distances. These are a horizontal distance approximately equal to or greater than the total height of the wall at the surface, and at least one-foot beyond the heel of the wall footing.*

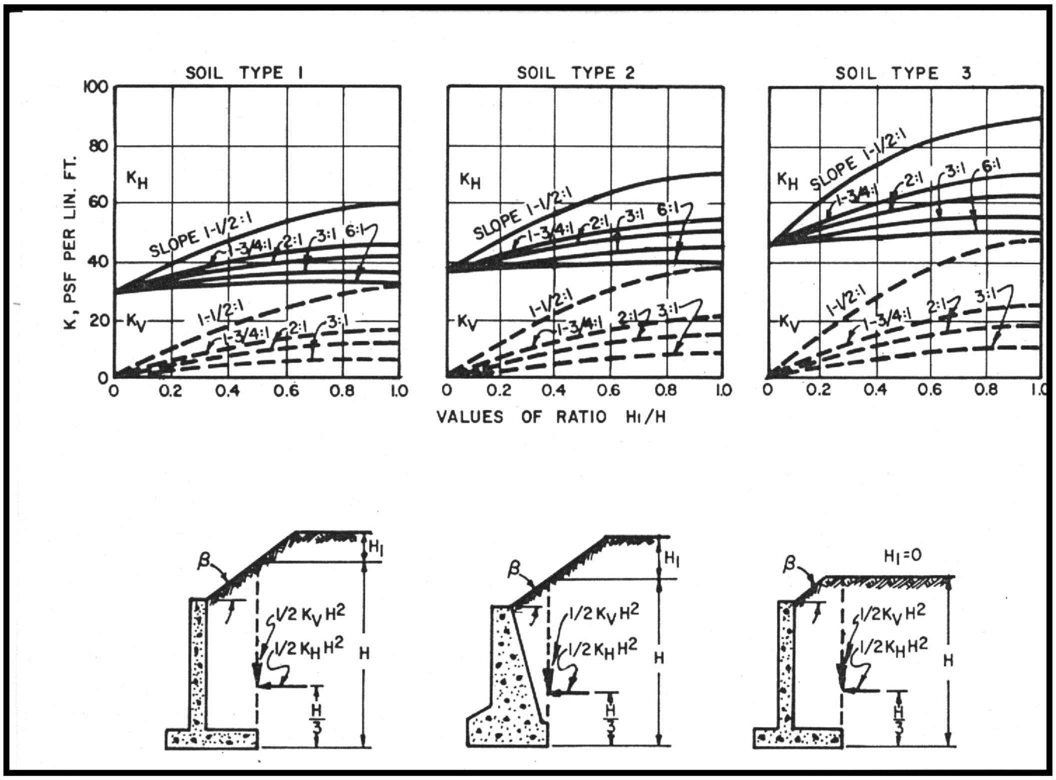
*** Earth pressure coefficients valid for level backfill conditions with no surcharge.*

The values presented above were calculated based on positive foundation drainage being provided to prevent the buildup of hydrostatic pressure. If surface loads are placed near the walls, such as traffic loads, they should be designed to resist an additional uniform lateral load of one-half of the vertical surface loads. An “equivalent fluid” pressure can be obtained from the above chart by multiplying the appropriate K-factor times the total unit weight of the soil. This applies to unsaturated conditions only. If a saturated “equivalent fluid” pressure is needed, the effective unit weight (total unit weight minus unit weight of water) should be multiplied times the appropriate K-factor and the unit weight of water added to that resultant. However, PSIE, PLLC does not recommend that earth retaining walls be designed with a hydrostatic load and PSIE, PLLC does recommend that drainage should be provided to relieve the pressure.

Professional Service Industries Engineering, PLLC recommends that retaining walls be provided with drainage. One possible drainage system would include:

1) A 4 or 6-inch diameter perforated drain tile at the bottom of the backfill to collect seepage water with the tile connected to a suitable means of disposal.
2) Clean 1/2-inch or 1-inch gravel classified as "GP" and containing less than 5% passing a #200 sieve surrounding the drain tile.
3) Non-woven 4 ounce per square yard geotextile between the drainage material and the on-site soils to prevent infiltration of fine grained soils into the drain tile, granular drainage blanket, or granular backfill.

The designs of retaining walls need to take into account the effects of geometry and loading conditions. The following charts have been included from NAVFAC 7.02 concerning slopes in the grade at the top of retaining wall. Depending on the geometry of the site, the lateral loading on the retaining wall should be modified according to these charts.



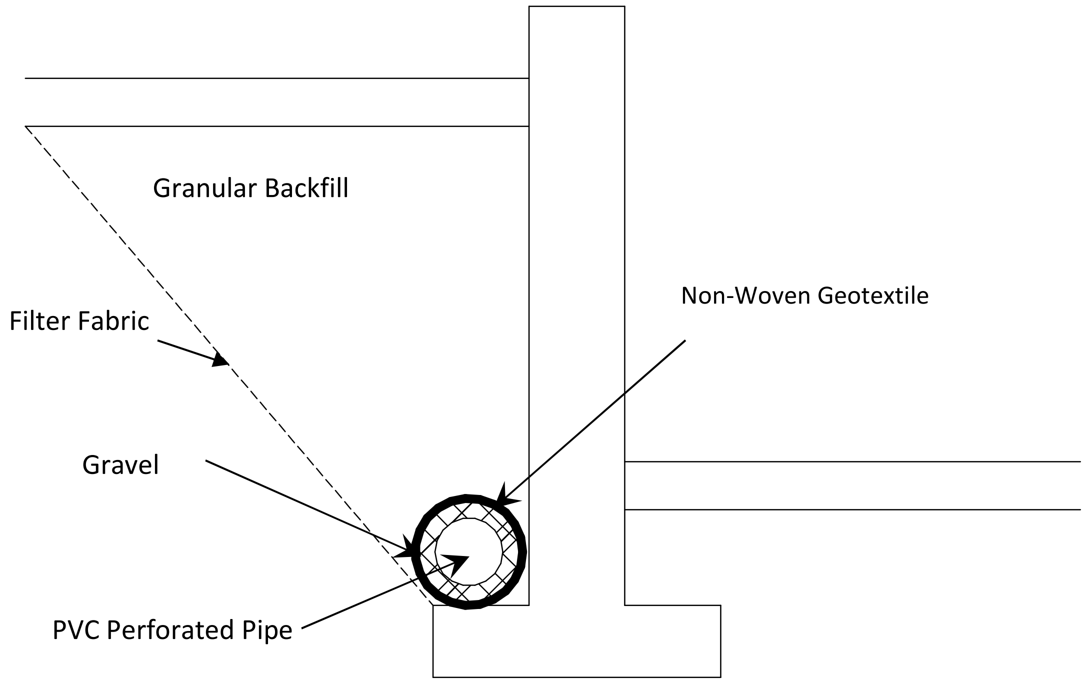
Soil Type

1 – Clean Sand and Gravel, GW, GP, SW, SP
Soil Type 2 – Dirty Sand and Gravel of Restricted Permeability, GM, GM-GP, SM-SP, SM
Soil Type 3 – Stiff Residual Silts and Clays, Silty Fine Sands, Clayey Sands and Gravels: CL, ML, CH, MH, SM, SC, GC

Internal and external stability analysis of the wall was not part of Professional Service Industries Engineering, PLLC's scope. However, if required, Professional Service Industries Engineering, PLLC can provide the external stability analysis upon request under separate scope of work. It is general industry practice that the project structural engineer provides the internal stability of the retaining wall structure.

4.9 RETAINING WALL BACKFILL AND COMPACTION

Backfill of retaining walls shall consist of granular materials with soil fines that have low plasticity. The backfill materials should be placed in lifts that do not exceed 4 to 6-inches loose. The lift thickness may need to be reduced to thinner lifts immediately behind the walls to achieve the desired compaction without overstressing the wall with the compaction process. The backfill materials should be compacted to at least 95% of the Modified Proctor maximum dry density (ASTM D1557). Granular material with less than 10% passing the #200 sieve should be placed in uniform lifts. Granular material shall be compacted to a minimum dry density of at least 95% Modified Proctor or 70% relative density. Backfill that is placed within 4-feet or 4-feet + the height of the wall (minus 4-feet)/2 for wall over 4 feet high, should be placed in thinner lifts with hand compaction equipment to achieve the specified density. Heavy compactors and grading equipment should not be allowed to operate within these limits during the backfilling of the retaining wall to reduce the developing of excessive temporary or long-term lateral soil pressures from the installation process. Professional Service Industries Engineering, PLLC recommends that a representative of the geotechnical engineer be present to monitor the retaining wall excavation, construction and backfilling processes. Care should be exercised during the backfilling operation to prevent overstressing and damaging the wall. A typical wall cross-section is as follows:



The placement of a limited amount of granular material behind a retaining wall does not appreciably change the coefficient of lateral earth pressure acting on that wall. The lateral earth pressure acting on a retaining structure is a function of the weight of the soil that exist above the theoretical plane projecting up from the base of the wall. The soil above this plane is held in place by two forces, the strength of the soil itself and the lateral resistance of the retaining wall. Therefore, a thin layer of granular material behind the wall is of little consequence on the forces acting on the wall.

4.10 PAVEMENT SECTION RECOMMENDATIONS

Professional Service Industries Engineering, PLLC's scope of services did not include CBR testing of existing subgrade or potential sources of imported fill for the specific purpose of detailed pavement section analysis. Instead, Professional Service Industries Engineering, PLLC has based this report on pavement-related design parameters that are considered to be typical for the area soil types.

In large areas of pavement, or where pavements are subject to significant traffic, a more detailed analysis of the subgrade and traffic conditions should be made. The results of such a study will provide information necessary to design an economical and serviceable pavement.

The existing subgrade soils and subbase material encountered at soil boring locations B-1, B-2, B-3, B-4, B-7, B-9, B-10, B-11, B-12, B-13, B-15, B-16, B-17, B-18, B-21, and B-26 are considered suitable for support of the proposed pavement provided the soils and subbase material have been proof-compacted with a minimum fifteen (15) ton smooth drum vibratory roller, operating in the vibratory mode making a minimum of four (4) passes, in order to confirm stability/suitability. Proof-compaction should also be performed immediately prior to the placement of any aggregate base stone. Unstable soils which are revealed by proof-compaction and which cannot be adequately densified in place should be removed and replaced with crushed limestone (NYSDOT 304) or similar material under the recommendations of the geotechnical engineer of record or his representative. Additionally, depending on weather conditions and precipitation at the time of construction, the use of additional stabilization techniques such as choking the subgrade with coarse aggregate may be required.

Native soils interbedded with organic material were encountered at boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30, extends to approximate depths ranging from one-half (1/2) to six (6) feet below existing site grades. The organic material is considered to be highly compressible even when subjected to very small loadings and is NOT considered suitable for supporting any structural elements, including pavements. Therefore, the following steps are suggested in order to support the pavements within these areas, however Professional Service Industries Engineering, PLLC recommends you contact representatives of Tensar to review this option further:

1) Where organic materials were encountered, the subgrades should be undercut to allow for the placement of a 4-inch lift of NYSDOT 304 aggregate beneath the bottom of the pavement section (i.e. asphalt and aggregate base).

2) Tensar Geogrid TX 140 should be placed on undercut/existing soil subgrades with installation and overlaps per manufacturer's specifications.

3) An aggregate material meeting NYSDOT 304 specifications should be placed upon the geogrid reinforced undercut subgrade. The initial lift should be 4-inches and compacted to a firm and

unyielding condition. Afterwards, subsequent fill should be in accordance with section 4.4 – Fill/Backfill Requirements.

4) If unstable conditions persist as determined by a proofroll, then another layer of Tensar Geogrid TX 140 may be required beneath or within pavement aggregate base layer.

Professional Service Industries Engineering, PLLC should observe the soil stabilization operations including undercutting, geogrid placement and fill placement or any test strip sections. Additional or supplemental recommendations may become necessary during the course of the soil stabilization work.

The following pavement recommendations are presented as preliminary for your consideration. The civil engineer for the project may have more traffic and project design data available than is presently known, and may wish to modify and refine these pavement sections. Professional Service Industries Engineering, PLLC will, upon request, be pleased to provide detailed pavement design recommendations when definite traffic and building plans are available.

Prior to placing the base or leveling course, the subgrade should be proof-compacted with a smooth steel drum vibratory roller weighing at least fifteen (15) tons and operating in the vibratory mode, in order to detect areas or pockets of unusually soft material. These areas, if encountered, should be over-excavated and replaced with structural fill.

Should the subgrade be wet and/or earthwork is anticipated during the wet seasons, a woven geotextile such as a Mirafi 500x (Grab Tear Strength, 200-300 lbs; Trapezoid Tear Strength, 75-120 lbs; Apparent Opening Size, US Sieve size 40 to 50 or 0.30 to 0.45 mm) or equivalent can be placed upon subgrades requiring additional stabilization prior to placing the subbase course materials.

Rigid concrete pavement is recommended where semi-trailers are to be parked on the pavement or where a considerable load is transferred from relatively small steel wheels. This should provide better distribution of surface loads to the subgrade without causing deformation of the surface.

Drainage of Pavement Structures

Design for drainage is of the utmost importance to minimize detrimental effects that may shorten the service life of the pavements. Inclusion of adequate surface and subsurface drainage systems within the pavement areas is considered imperative in order to maintain the compacted subgrades as close to optimum moisture conditions as possible. The pavement should be crowned or sloped in order to promote effective surface drainage and reduce the risk of water ponding. We recommend a minimum slope of one and one-half percent for the pavement surfaces. In addition, the subgrade should be similarly sloped to promote effective subgrade drainage. Professional Service Industries Engineering, PLLC recommends “stub” or “finger” drains be provided around catch basins, and in other low areas of the proposed pavements to limit the accumulation of water on the frost susceptible subgrade soils. Overall surface grades should be such that no pavement sectors are allowed to impound water. Surface water should be directed to a system of catch basins.

Subsurface drainage systems should be installed at least forty-two (42) inches below the design subgrade elevations at regular intervals including landscape areas, sidewalk areas and along the perimeter of the pavement areas. Subsurface drainage system consisting of perforated drain pipes bedded in and backfilled over with suitable filter materials (No. 57 coarse aggregate per AASHTO M-43) should be installed. The filter around the drainage members is to terminate in direct contact with the aggregate base course for the pavements. Also, all unpaved areas should be isolated from the paved sectors by including additional subsurface drainage lines following the above-outlined recommendations. Final grading plans should be reviewed to determine necessity and location of subsurface drains.

Pavement Design

AASHTO design methodology could be used to design the pavements. According to AASHTO design methodology, the pavement design thickness primarily depends on strength of the subgrade soils and type of traffic. Traffic includes several types of vehicles with various magnitudes of axle loads that may be subjected to the pavement during its service life. The design involves a traffic analyses that converts various types of vehicles with various magnitudes axle loads to a number of 18-kip equivalent single axle load repetitions.

Based on the anticipated traffic, the design engineer should perform the traffic analyses to compute the number of ESALs repetitions that would be subjected to the pavement during its service life or design life. Based on the computed ESALs, the pavements should be designed accordingly.

Based on previous experience, we have provided pavement thickness for both flexible pavement and rigid pavement systems in the tables below. The tables below include thickness design corresponding to two levels of traffic (light duty and heavy duty). The required life expectancy in ESALs for each design is also presented. Professional Service Industries Engineering, PLLC recommends that the pavement design thicknesses correspond to light duty traffic condition be used for parking areas. Professional Service Industries Engineering, PLLC recommends that the thickness design corresponding to heavy duty condition be used for driveways, exit and entry lanes and frequently used areas. Where repeated high axle loading and heavy traffic is anticipated, such as the drive lanes for refuse trucks, rigid pavement is recommended or the equivalent flexible pavement ESAL design capacity be provided.

Pavement Design Traffic	
Traffic Category	**Design ESALS**
Light Duty Section	7,500
Heavy Duty Section	75,000

In addition, specific design parameters considered in the pavement analysis are as follows:

Table 4 – Pavement Analysis Specific Design Parameters

CBR (Estimated)	3.5
Modulus of subgrade Reaction, K	120 psi/in
Soil Resilient Modulus	5,200 psi
Reliability	95%
Deviation	0.45 Asphalt
Deviation	0.35 Rigid
Combined Standard Error (S_0)	0.5
Initial Serviceability	4.5
Terminal Serviceability	2.5
Modulus of Rupture	650 psi
Load Transfer	3.2 Dowels or Keys
Drainage Coefficient	1.0
Layer Coefficients	0.44 Asphalt
	0.14 Crushed Aggregate Base

Flexible Pavement Section

Based on a design California Bearing Ratio (CBR) value of three and one-half (3.5) for the subgrade soils, and design ESALs for the various traffic types, Tables 5 and 6 presents required structural numbers and typical flexible pavement sections.

Table 5 – Flexible Pavement Minimum Sections (20-Year Design Life)
Boring locations B-1, B-2, B-3, B-4, B-7, B-9, B-10, B-11, B-12, B-13, B-15, B-16, B-17, B-18, B-21, & B-26

Pavement Materials	Recommended Pavement Thickness (inches)	
	Light Duty Section	Heavy Duty Section
Required Structural Number, SN	1.90	2.80
Asphalt Top Course 9.5 mm F2 HMA	1.5	1.5
Asphalt Binder Course 19 mm F9 HMA	2.5	2.5
Aggregate Base Course (NYSDOT 304 Type 2)	8.0	8.0

Table 6 – Flexible Pavement Minimum Sections (20-Year Design Life)
Boring locations B-5, B-6, B-8, B-19, B-22, B-23, B-24, B-27, B-28, B-29, and B-30

Pavement Materials	Recommended Pavement Thickness (inches)	
	Light Duty Section	Heavy Duty Section
Required Structural Number, SN	1.90	2.80
Asphalt Top Course 9.5 mm F2 HMA	1.5	1.5
Asphalt Binder Course 19 mm F9 HMA	2.5	2.5
Aggregate Base Course (NYSDOT 304 Type 2)	8.0	8.0
Reinforced Subgrade (NYSDOT 304 Type 2 with Tensar TX-4 GeoGrid)	4.0	4.0

A light-duty section is recommended in typical parking areas where cars and lightly loaded trucks are anticipated. A heavy-duty pavement section should be utilized in paved areas where traffic flow is channelized and/or delivery trucks will travel.

The following materials are recommended for the previously mentioned asphalt pavement structure components:

- Asphaltic Concrete Top Course-NYSDOT Standard Specification, Item No. 402.097202 – 9.5 mm F2 Hot Mix Asphalt.
- Asphaltic Concrete Binder Course-NYSDOT Standard Specification, Item No. 402.197902 – 19 mm F9 Hot Mix Asphalt.
- Crushed Aggregate Base (Subbase) Course-NYSDOT Standard Specification, Item No. 304.12 – Crushed Aggregate Base, Type 2.

If the anticipated traffic exceeds these values, Professional Service Industries Engineering, PLLC should be informed so that a specific pavement design can be made for the project, or the site Civil Engineer can modify the design.

In general, pavement construction should be performed in accordance with the New York State Department of Transportation specifications unless otherwise noted.

Base course material should be moisture conditioned to within two (2) percent of optimum moisture content and compacted by mechanical means to a minimum of ninety-five (95) percent of the material's maximum dry density as determined in accordance with ASTM D 1557 (Modified Proctor). Fill materials should be placed in layers that, when compacted, do not exceed about eight (8) inches. The granular base course should be built at least two (2) feet wider than the pavement on each side to support the tracks of the slipform paver. This extra width is structurally beneficial for wheel loads applied at pavement edge. The asphaltic concrete material should be compacted to at least ninety-two (92) percent of the material’s theoretical maximum density as determined in accordance ASTM D 2041 (Rice Specific Gravity).

Periodic maintenance of the pavement should be anticipated. This should include sealing of cracks and joints and by maintaining proper surface drainage to avoid ponding of water on or near the pavement area.

Rigid Concrete Pavement

Rigid concrete pavement is recommended where trash dumpsters are to be parked on the pavement or where a considerable load is transferred from relatively small steel wheels and for semi-tractor trailer traffic. This should provide better distribution of surface loads to subgrade without causing deformation of the surface.

Assuming a concrete strength of 4,000 psi and a corresponding modulus of rupture of 650 psi calculated minimum pavement sections for a 20-year design life of using the AASHTO design method and a modulus of subgrade reaction of one-hundred twenty (120) pci.

Table 7 – Typical Rigid Pavement Section

Rigid (Concrete) Pavement	Light-Duty	Heavy-Duty
Portland Cement Concrete (4,000 psi)	5 inches	8 inches
Aggregate Base Course (NYSDOT 304 Type 2) NYSDOT Item 304.11 or 304.12	6 inches	6 inches

The following materials are recommended for the previously mentioned rigid pavement structure components:

- Portland Cement Concrete Slabs - 4,000 psi minimum compressive strength and the Portland Cement Concrete meeting the requirements of NYSDOT Standard Specifications 501.

- Crushed Aggregate Base (Subbase) Course-NYSDOT Standard Specification, Item No. 304.12 – Crushed Aggregate Base, Type 2.

Civil Design Considerations Pavements

Related civil design factors such as drainage, cross-sectional configurations, surface elevations and environmental factors that will significantly affect the service life of the pavement must be included in the preparation of the construction drawings and specifications. Concrete pavement slabs should be provided with adequate steel reinforcement. Proper finishing of concrete pavements requires the use of sawed and sealed joints, which should be designed in accordance with current Portland Cement Association guidelines. Joint spacing intervals for plain concrete shall be in accordance with PCA guidelines according to pavement thickness. Dowel bars should be used to transfer loads at the transverse joints. Normal periodic maintenance will be required.

Surface water infiltration to the pavement subgrade layers may soften the subgrade soils. Considering several factors in the pavement design can reduce surface infiltration. To summarize, the following are some of the factors that need to be emphasized in order to maintain proper drainage.

1) Appropriate slopes should be provided.

2) Joints should be properly sealed and maintained.

3) Side drains or sub drains along a pavement section may be provided.

4) Proper pavement maintenance programs such as sealing surface cracks, and immediate repair of distressed pavement areas should be adopted.

5) During and after the construction, site grading should be kept in such a way that the water drains freely off the site and off any prepared or unprepared subgrade soils. Excavations should not be kept open for a long period of time.

4.11 UTILITIES TRENCHING

Excavation for utility trenches shall be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. It should be noted that utility trench excavations have the potential to degrade the properties of the adjacent fill materials. Utility trench walls that are allowed to move laterally can lead to reduced bearing capacity and increased settlement of adjacent structural elements and overlying slabs.

Backfill for utility trenches is as important as the original subgrade preparation or structural fill placed to support either a foundation or slab. Therefore, it is imperative that the backfill for utility trenches be placed to meet the project specifications for the structural fill of this project. PSI recommends that flowable fill or controlled low strength material (CLSM) be utilized for utility trench backfill to lessen potential of settlement. Up to four (4) inches of bedding material placed directly under the pipes or conduits placed in the utility trench can be compacted to the 90% compaction criteria with respect to the standard Proctor. As soon as the condition of the pipe permits, the entire width of the trench shall be backfilled with aggregate to a height of at least to the center of the pipe; however when using flexible pipe, the aggregate backfill shall be continued to a minimum height of 1 foot above the top of the pipe in general accordance with NYSDOT specifications. If on-site soils are placed as trench backfill above the aggregate, the backfill for the utility trenches should be placed in four (4) to six (6) inch loose lifts and compacted to a minimum of 95% of the maximum dry density achieved by the Modified Proctor Test. Compaction testing should be performed for every 200 linear feet of backfill placed.

Backfill of utility trenches should not be performed with water standing in the trench. If granular material is used for the backfill of the utility trench, the granular material should have a gradation that will filter protect the backfill material from the adjacent soils. If this gradation is not available, a geosynthetic non-woven filter fabric should be used to reduce the potential for the migration of fines into the backfill material. Granular backfill material shall be compacted to meet the above compaction criteria. The clean granular backfill material should be compacted to achieve a relative density greater than 75% or as specified by the geotechnical engineer for the specific material used.

4.12 SILTATION CONTROL

The upper soils at the site are generally fine-grained and are susceptible to erosion. Appropriate erosion control measures such as proper site contouring during general grading and siltation fences should be used during construction so that eroded materials remain onsite. Depending on the length of time the subgrade is exposed and the amount of the siltation which occurs, it may be necessary to periodically remove materials collected by the silt fences.

4.13 CORROSIVE POTENTIAL OF SOIL

Steel/metal and concrete elements in contact with soil are subject to corrosion or degradation due to soil chemical activity. Buried metal/steel and concrete elements should be designed to resist this soil chemical activity. Table 8 below presents general corrosive potential ratings as a function of electrical resistivity:

Table 8 – Corrosive Ratings Based on Soil Resistivity

Electrical Resistivity Ohm-cm	Corrosivity Rating
Greater than 20, 000	Essentially Non-Corrosive
10,000 to 20,000	Mildly Corrosive
5000 to 10,000	Moderately Corrosive
3000 to 5000	Corrosive
1000 to 3000	Highly Corrosive
Less than 1000	Extremely Corrosive

Based on the limited analysis and data collected, PSIE, PLLC anticipates that the soils in this area will be corrosive to ductile iron pipe due to low soil resistivity. However, additional testing would be required based on the depth and location of any ductile pipes. Analytical testing was performed on soil samples obtained from test boring B-14 (one [1] to four [4] feet). The following table summarizes the results:

TEST	LAB VALUES
	B-14 (1 - 4 FEET)
Resistivity (ohm-cm)	2,390
pH	7.4

Based on the electrical soil resistivity tests performed, the test results indicate that the near surface soils at this site are rated as corrosive to highly corrosive.

It should be realized that limited testing alone might not provide a reliable indication of corrosion potential. Based on experience in this area and for long-term purposes, PSI considers it necessary to provide appropriate wrappings or cathodic protection for buried metal utility pipelines or other structures.

4.14 CHEMICAL ATTACK POTENTIAL FOR DEGRADATION OF CONCRETE

The concentration of water-soluble sulfates is considered to be a good indicator of the potential for chemical attack on concrete. Based on the ACI Manual of Concrete Practice (ACI 201.2R-10) or (ACI 318/318R-33), the amount of water-soluble sulfates in soil can be used to evaluate the need for protection of concrete based on the following table:

Requirements for Concrete Exposed to Sulfate		
Water Soluble Sulfate in soil (percent by weight)	**Sulfate Exposure**	**Cement Requirements**
0.00 to 0.10	Negligible or Class 0 Exposure	None
0.10 to 0.20	Moderate or Class 1 Exposure	C150 Type II
0.20 to 2.00	Severe or Class 2 Exposure	C150 Type V
Over 2.0	Very Severe or Class 3 Exposure	C150 Type V plus pozzolan or slag

TEST	**LAB VALUES**
	B-14 (1 - 4 FEET)
Sulfate (ppm)	32
Chloride (ppm)	51

Based on the ACI Manual of Concrete Practice, soils containing less than 0.10 percent by weight (or less than 1,000 ppm) of water soluble sulfate are typically considered non-corrosive to concrete. The tested sample was less than 1,000 ppm. Therefore, the use of Type I cement appears appropriate at this site

5. CONSTRUCTION CONSIDERATIONS

It is recommended that PSI be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. PSI cannot accept any responsibility for any conditions, which deviate from those, described in this report, nor for the performance of the foundation if not engaged to also provide construction observation and testing for this project.

5.1 WEATHER RELATED CONCERNS

The upper fine-grained soils encountered at this site may be sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

5.2 DRAINAGE AND GROUNDWATER CONSIDERATIONS

Based on the Professional Service Industries Engineering, PLLC's observations at the time of our soil exploration (March 9, 10, 11, and 12, 2021), groundwater was encountered within twenty-three (23) of the thirty (30) boring locations (B-2, B-4, B-5, B-7, B-8, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-18, B-19, B-22, B-23, B-24, B-25, B-26, B-27, B-28, B-29, and B-30) at depths between one-half (1/2) and eleven (11) feet below existing site grades. Fluctuations in the groundwater level should be anticipated throughout the year depending on variations in climatological conditions and other factors not apparent at the time the borings were performed. Additionally, discontinuous zones of perched water may exist within the soils. The possibility of groundwater level fluctuation should be considered when developing the design and construction plans for the project.

Groundwater was encountered at depths between one-half (1/2) and eleven (11) feet below existing site grades during Professional Service Industries Engineering, PLLC's exploration, therefore a temporary dewatering system may be required during construction. The temporary dewatering system should be designed and installed by a contractor experienced in the project area. Monitoring wells should be installed within the excavation so that the water levels can be monitored, the effectiveness of the dewatering system evaluated and appropriate adjustments to the system made, if necessary.

Furthermore, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slab. Grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

5.3 FEDERAL EXCAVATION REGULATIONS

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better enhance the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that all excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person," as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Professional Service Industries Engineering, PLLC is providing this information solely as a service to our client. Professional Service Industries Engineering, PLLC is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Materials removed from the excavation should not be stockpiled immediately adjacent to the excavation, inasmuch as this load may cause a sudden collapse of the embankment and side slopes.

6. CONSTRUCTION OBSERVATION AND TESTING

Professional Service Industries Engineering, PLLC should be retained to examine and identify soil exposures created during project excavations in order to verify that soil conditions are as anticipated. Professional Service Industries Engineering, PLLC further recommends that compacted engineered fill be continuously observed and tested during placement by our representative in order to document the compaction effort. Samples of fill materials should be submitted to Professional Service Industries Engineering, PLLC's laboratory for testing prior to placement of fills on site and should include a moisture-density relationship (Proctor) and sieve analysis including a minus 200 sieve test. Density testing should be performed at a rate of one per 2,500 square feet per six (6)-inch lift in building areas, one test per 10,000-square feet per six (6)-inch lift in pavement areas and one per one hundred linear feet per six (6)-inch lift in utility trench backfill.

Professional Service Industries Engineering, PLLC should also be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related vertical construction activities of this project. Professional Service Industries Engineering, PLLC cannot accept any responsibility for any conditions that deviated from those described in this report, nor for the performance of the foundation, if not engaged to also provide construction observation and testing for this project.

Costs for the recommended observations during construction are beyond the scope of this current consultation. Such future services would be at an additional charge.

7. GEOTECHNICAL RISK & REPORT LIMITATIONS

Geotechnical Risk

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding section constitutes PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and reference during this evaluation, and PSI's experience in working with these conditions.

Report Limitations

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by CenterPoint Integrated Solutions, LLC, for the proposed CarMax Auto Superstore, in the Town of Wappinger, Dutchess County, New York. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, Professional Service Industries Engineering, PLLC should be notified immediately to determine if changes in the foundation recommendations are required. If Professional Service Industries Engineering, PLLC is not retained to perform these functions, Professional Service Industries Engineering, PLLC will not be responsible for the impact of those conditions on the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area at the time of this report. No other warranties are implied or expressed.

The scope of investigation was intended to evaluate soil conditions within the influence of the proposed foundations. The analyses and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed structure.

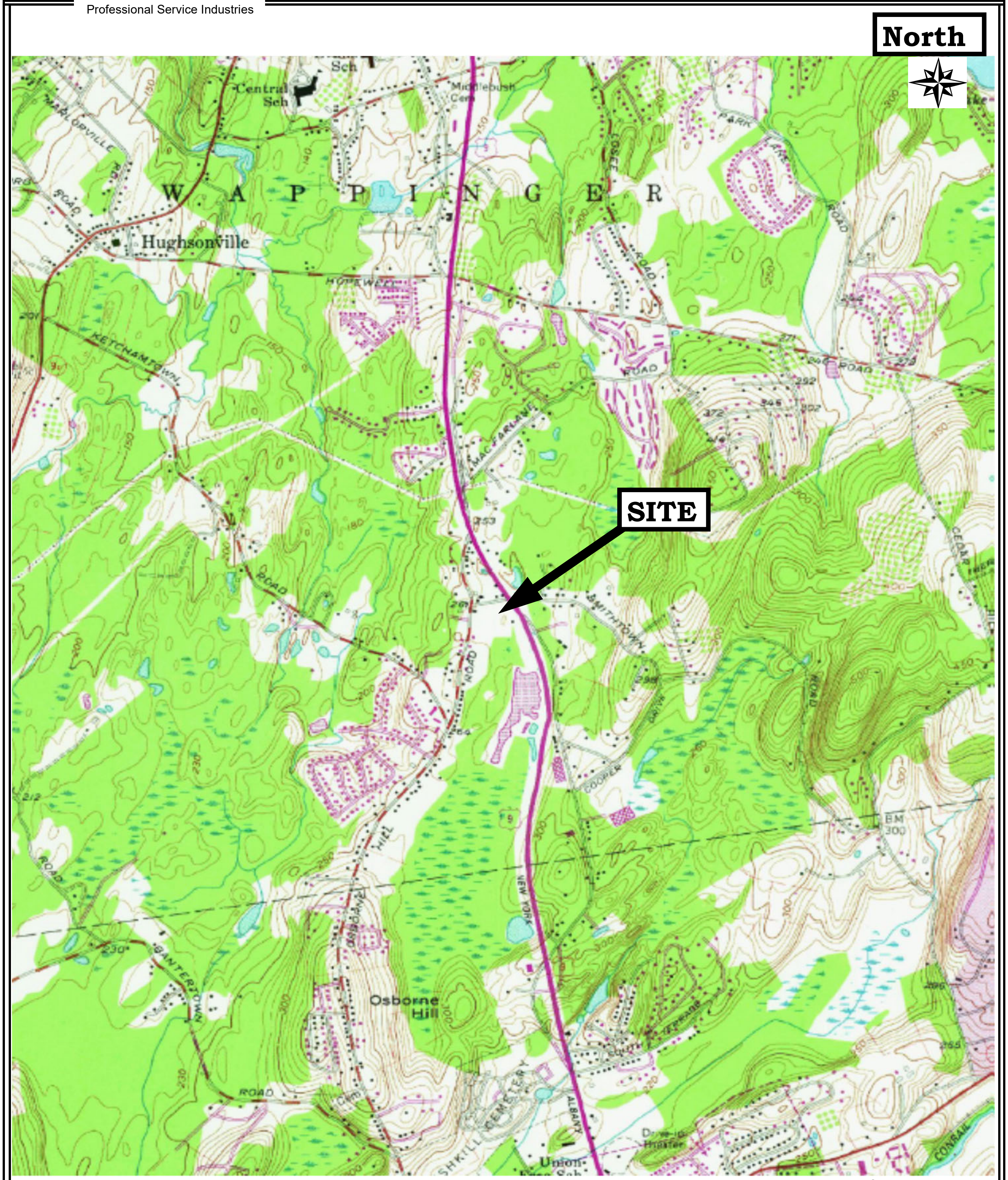
After the plans and specifications are more complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At this time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of CenterPoint Integrated Solutions, LLC for the specific application to the proposed CarMax, located at 1115 Route 9 in the Town of Wappinger, Dutchess County, New York.

This report has been prepared for the exclusive use of CenterPoint Integrated Solutions, LLC and their intermediaries, consultants for the specific application to this project at this site. Professional Service

Industries Engineering, PLLC warrants that the evaluations and recommendations contained in this report are based on generally accepted professional engineering practices in the field of geotechnical engineering in the local area at the time of this report. No other warranties are implied or expressed.

FIGURES

Professional Service Industries



Base map provided by Microsoft Research Maps

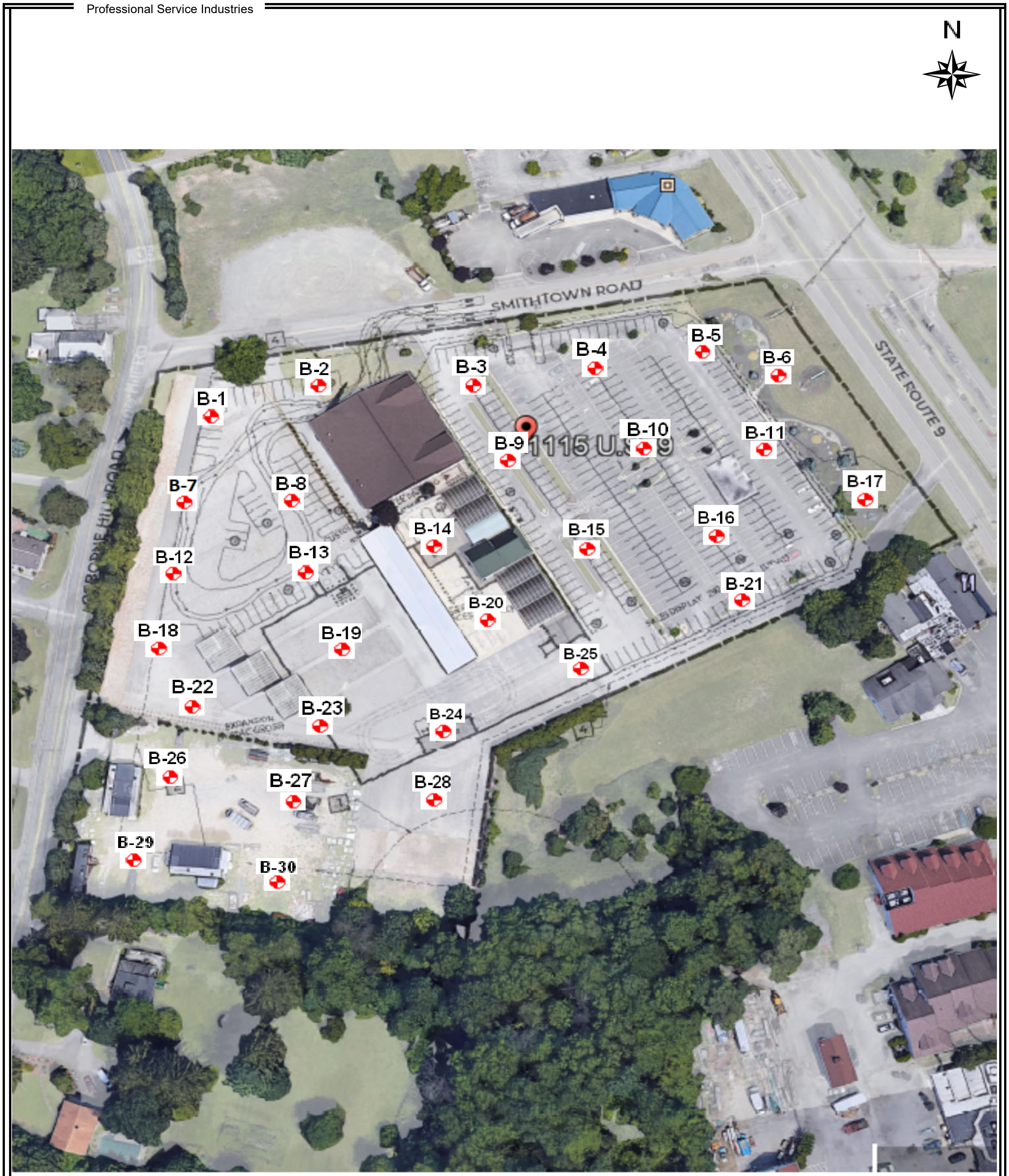
Project Name:
Proposed CarMax Auto Superstore
1115 Route 9
Town of Wappinger, Dutchess County, New York 12524

General Site Location Plan

Project No.: 08061265

Date: April 27, 2021

Professional Service Industries



NOT TO SCALE

Project Name: Proposed CarMax Auto Superstore 1115 Route 9 Town of Wappinger, Dutchess County, New York 12524	**Boring Location Plan**
	Project No.: 08061265
	Date: April 27, 2021

LIST OF APPENDICES

BORING B-1

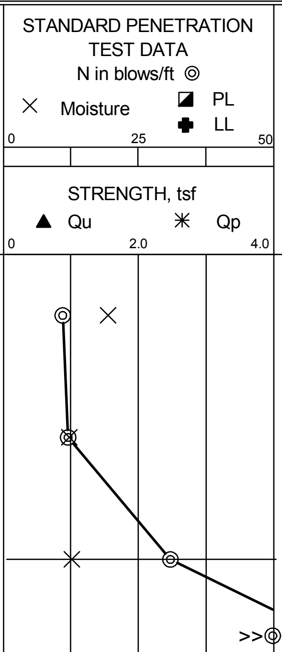
DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 7.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					2" ASPHALT				
				1	10	CLAYEY SILT (ML), little medium to fine sand, trace medium to fine gravel, brown, medium dense, moist	ML	3-5-6-7 N=11	19	
				2	8	SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, trace clay, brown, medium dense, moist	SM	4-4-8-7 N=12	12	
	5			3	10	CLAYEY SILT (ML), little coarse to fine sand and shale fragments, brown, dense, wet	ML	12-15-16-14 N=31	13	
				4	3	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown and gray, very dense, wet		50/5"		
						Auger Refusal at 7.5'				



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Professional Service Industries, Inc.
3784 Commerce Court, Suite 300
North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 7.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

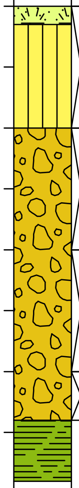
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

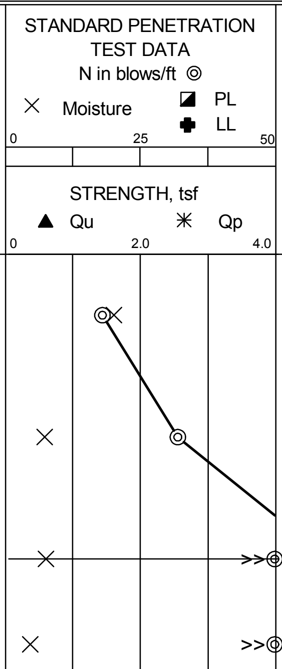
BORING B-2

Water		
∇ While Drilling	4 feet
▼ Upon Completion	None feet
⊻ Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0				3" TOPSOIL				
			1	10	SILT (ML), some coarse to fine sand and medium to fine gravel, brown, medium dense, moist	ML	6-8-10-9 N=18	20	
			2	11	POORLY GRADED GRAVEL (GP), coarse to fine gravel, little coarse to fine sand and silt, brown, dense to very dense, moist	GP	12-14-18-20 N=32	7	
					∇ ** Cobbles and Boulders noted				
	5		3	2			50/4"	8	
			4	6			33-50/4"	5	
					SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown and gray, very dense, moist				
					Auger Refusal at 7.8'				





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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 11.7 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

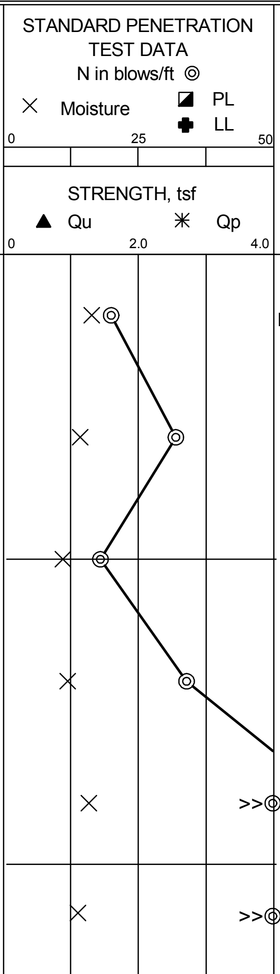
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-3

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3.5" ASPHALT				
		1	10	SILT (ML), some coarse to fine sand, trace fine gravel and clay, brown, medium dense, moist	ML	20-12-8-6 N=20	16	Fines=62.5%
		2	12	SANDY SILT (ML), coarse to fine sand, little medium to fine gravel and clay, brown, dense, moist	ML	11-14-18-22 N=32	14	
	5	3	12	CLAYEY SILT (ML), some shale fragments, little coarse to fine sand, brown, medium dense to dense, moist	ML	4-8-10-11 N=18	11	
		4	16			12-16-18-18 N=34	12	
		5	10	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, gray, very dense, saturated		22-28-34-48 N=62	16	
	10	6	1			50/1"	14	
				Auger Refusal at 11.7'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-4

DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 9.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

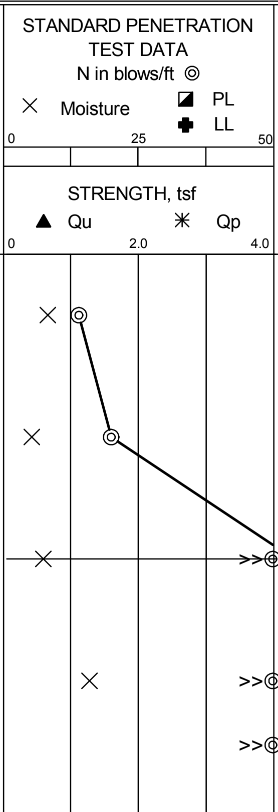
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	6 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					3.5" ASPHALT				
				1	2	POORLY GRADED SAND (SP), coarse to fine sand, little medium to fine gravel, trace silt, brown, medium dense, moist	SP	12-8-6-5 N=14	8	
				2	4	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, brown and gray, medium dense to very dense, moist	SM	7-9-11-20 N=20	5	
	5			3	12			22-26-28-26 N=54	7	
				4	14	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel (shale fragments), little clay, trace silt, brown and gray, very dense, saturated	SP	24-27-30-36 N=57	16	
				5	1	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, gray, very dense, wet		100/1"		

Auger Refusal at 9'



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PROJECT: Proposed CarMax Auto Superstore
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Wappinger, Dutchess County, NY 12524

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DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 18.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

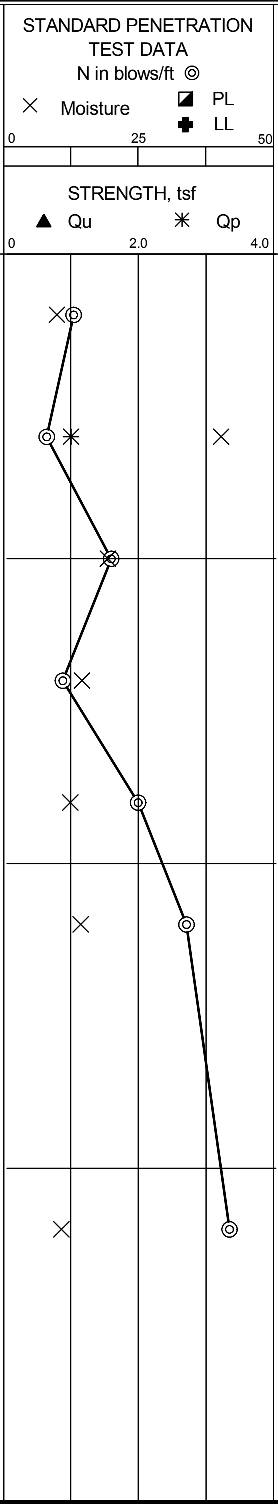
BORING B-5

Water

▽	While Drilling	6 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					3.5" ASPHALT				
				1	5	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, trace silt, brown, medium dense, moist	SP	12-9-4-4 N=13	10	
				2	6	SILTY CLAY (CL-ML), trace fine sand and organics, black, medium stiff, moist LOI = 9.5%	CL-ML	3-4-4-6 N=8	40	
	5			3	8	SANDY SILT (ML), fine sand, little clay, gray, medium dense, moist	ML	6-11-9-7 N=20	19	
				4	12	SANDY SILT (ML), fine sand, little medium to fine gravel, trace clay, gray, medium dense, saturated	ML	4-6-5-3 N=11	15	
				5	12	POORLY GRADED SAND (SP), coarse to fine sand, some weathered shale fragments, little silt, brown and gray, medium dense to dense, saturated		8-11-14-18 N=25	12	
	10									
				6	5		SP	12-16-18-25 N=34	14	
	15									
				7	13	SANDY SILT (ML), coarse to fine sand, some weathered shale fragments, trace clay, brown and gray, dense, moist	ML	16-18-24-18 N=42	11	
						Auger Refusal at 18'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 9.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

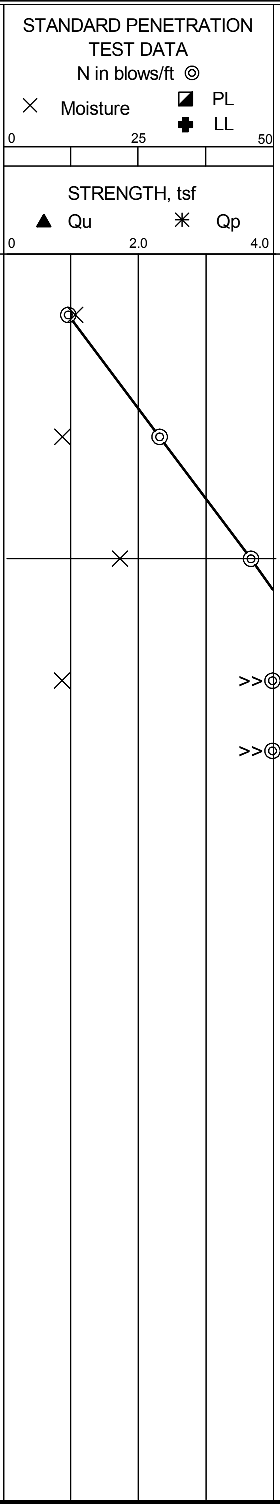
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-6

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					4" TOPSOIL				
				1	10	POORLY GRADED SAND (SP), coarse to fine sand, little silt and medium to fine gravel, trace organics, brown, medium dense, moist	SP	3-6-6-8 N=12	13	
				2	14	SANDY SILT (ML), coarse to fine sand, some weathered shale fragments, trace clay, brown, medium dense to very dense, moist to wet		12-14-15-18 N=29	11	
	5			3	15		ML	18-22-24-25 N=46	22	
				4	8			28-29-33-35 N=62	11	
				5	2	SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown and gray, very dense, moist		50/3"		
						Auger Refusal at 9.8'				



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Professional Service Industries, Inc.
3784 Commerce Court, Suite 300
North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 11.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

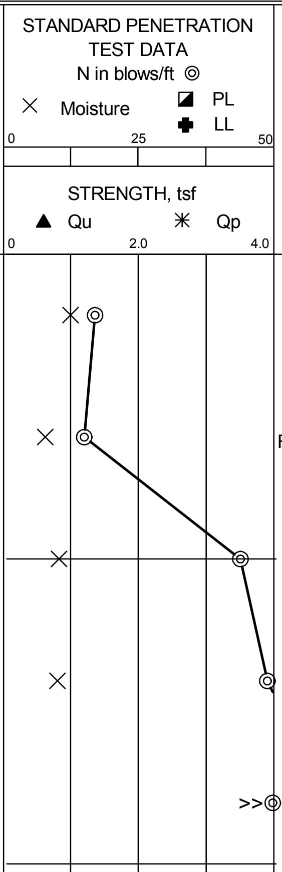
BORING B-7

Water

▽	While Drilling	6 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	4	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, medium dense, moist	SP	6-8-9-11 N=17	12	
		2	6	POORLY GRADED SAND (SP), coarse to fine sand, some fine gravel, little silt, brown, medium dense to dense, moist	SP	5-8-7-5 N=15	8	Fines=16.4%
	5	3	10			16-20-24-28 N=44	10	
		4	6	▽ SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, brown, dense, moist	SM	21-23-26-27 N=49	10	
		5	2	SEVERELY WEATHERED SHALE, little medium to fine sand and silt, brown and gray, very dense, wet		29-50/4"		
	10							
				Auger Refusal at 11'				



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North Tonawanda, NY 14120
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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 11.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

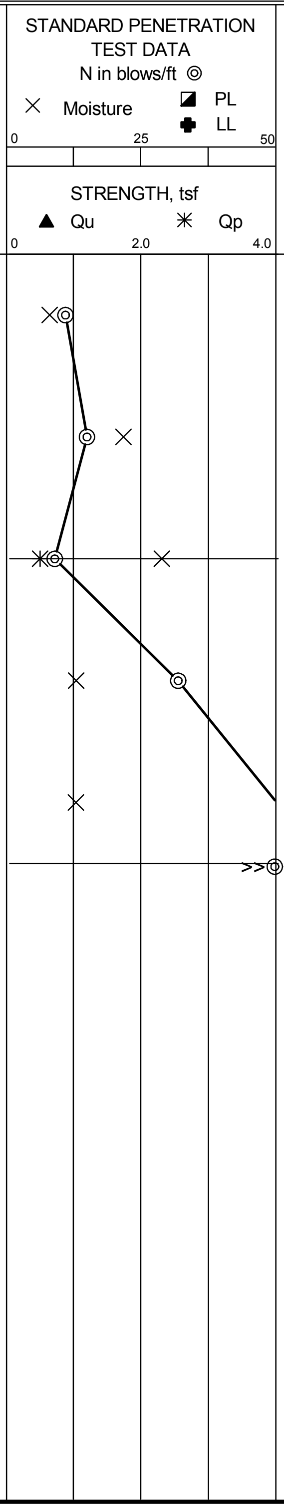
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-8

Water		
▽	While Drilling	2 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					3.5" ASPHALT				
				1	2	POORLY GRADED SAND (SP), coarse to fine sand, some fine gravel, little silt, gray and brown, medium dense, moist	SP	3-4-7-8 N=11	8	
	▽			2	5	SILT (ML), little fine sand and medium to fine gravel, trace clay and organics, gray and black, medium dense, wet LOI = 4.9%	ML	6-8-7-5 N=15	22	
	5			3	9	SILTY CLAY (CL-ML), trace medium to fine sand and medium to fine gravel, gray, medium stiff, moist	CL-ML	3-3-6-7 N=9	29	
				4	16	SANDY SILT (ML), coarse to fine sand, little medium to fine gravel, trace clay, brown, dense to very dense, wet to saturated	ML	12-14-18-21 N=32	13	
				5	10			16-24-50/3"	13	
	10			6	0	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown and gray, very dense, wet		50/1"		
						Auger Refusal at 11.5'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

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BORING B-9

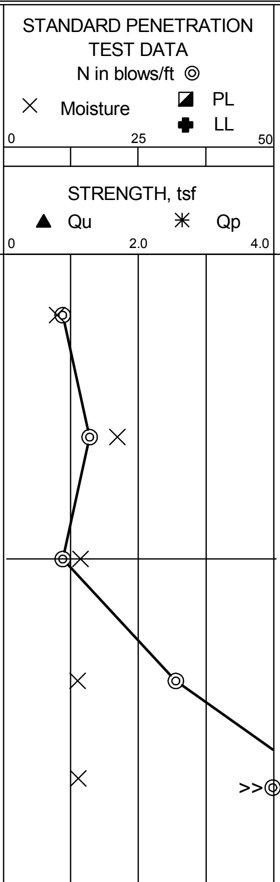
DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 9.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					3.5" ASPHALT				
				1	10	SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, trace clay, brown, medium dense, moist	SM	4-6-5-3 N=11	10	
				2	11	SILT (ML), little medium to fine gravel and coarse to fine sand, trace clay, brown, medium dense, moist	ML	5-7-9-21 N=16	21	
	5			3	12	SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, trace clay, brown, medium dense, wet	SM	7-3-8-11 N=11	14	
				4	8	POORLY GRADED SAND (SP), coarse to fine sand, little silt and medium to fine gravel, brown, dense, moist	SP	12-14-18-22 N=32	14	
				5	3			26-50/4"	14	
						SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown and gray, very dense, moist				
						Auger Refusal at 9.5'				



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BORING B-10

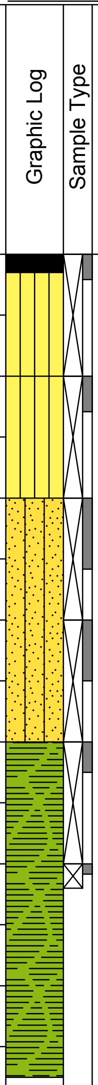
DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 13.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

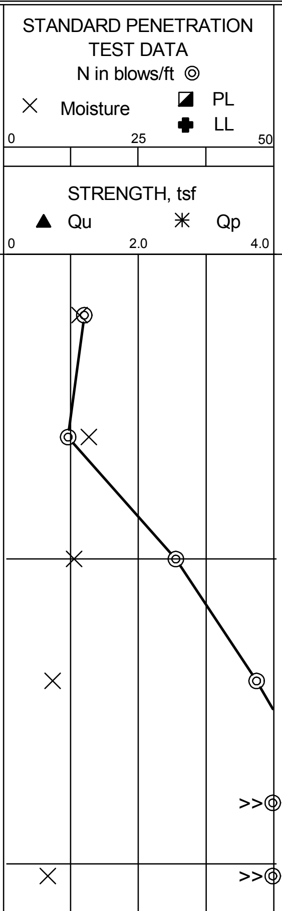
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	0.5 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3.5" ASPHALT				
		1	5	SILT (ML), little coarse to fine sand and medium to fine gravel, trace clay, brown, medium dense, moist	ML	4-6-9-7 N=15	14	
		2	7	CLAYEY SILT (ML), little coarse to fine sand, trace medium to fine gravel, brown and gray, medium dense, wet	ML	8-4-8-11 N=12	16	
	5	3	14	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, brown and gray, dense, wet to saturated	SM	12-15-17-21 N=32	13	
		4	12			20-24-23-20 N=47	9	
		5	6	SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown, very dense, saturated		24-28-32-35 N=60		
	10	6	2			50/5"	8	
				Auger Refusal at 13.5'				





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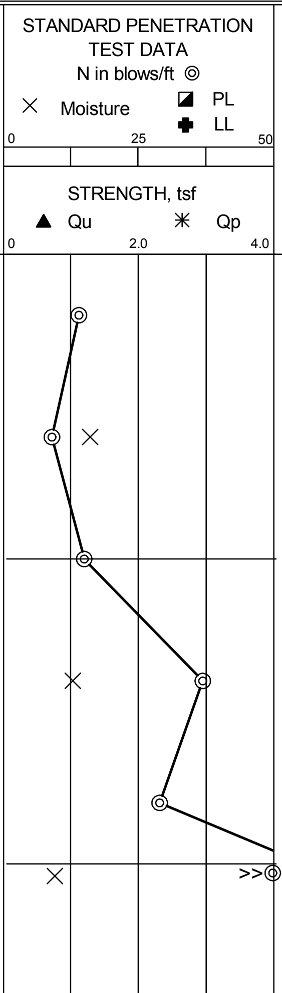
BORING B-11

DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 12.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	8 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan



Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	0	SILT (ML), little clay and coarse to fine sand, trace fine gravel, brown and gray, medium dense to loose, moist	ML	5-9-5-3 N=14		
		2	4			3-4-5-4 N=9	16	
	5	3	16	SANDY SILT (ML), coarse to fine sand, little fine gravel, trace clay, brown, medium dense to dense, moist	ML	4-6-9-11 N=15		
		4	4			21-19-18-16 N=37	13	
		5	10	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, trace silt, brown, medium dense, saturated	SP	6-11-18-26 N=29		
	10	6	4	SEVERELY WEATHERED SHALE, some coarse to fine sand, trace silt, brown, very dense, saturated		50/4"	10	
				Auger Refusal at 12'				

Professional Service Industries, Inc.
3784 Commerce Court, Suite 300
North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 9.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

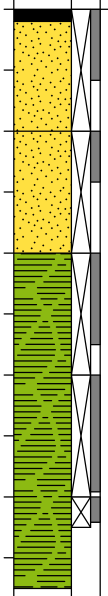
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

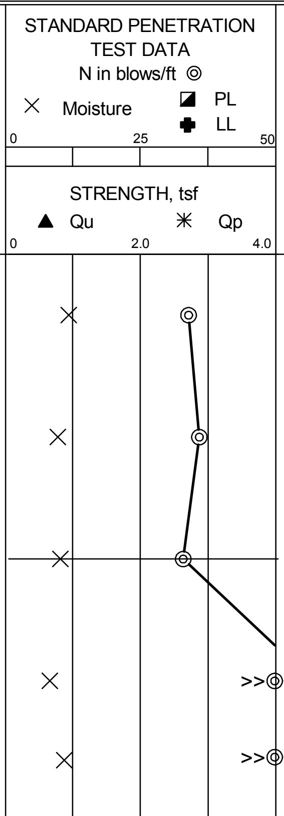
BORING B-12

Water		
∇	While Drilling	3 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	14	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, dense, moist	SP	11-16-18-22 N=34	12	
		2	10 ∇	POORLY GRADED SAND (SP), coarse to fine sand, some coarse to fine gravel, trace silt, brown, dense, saturated	SP	18-20-16-12 N=36	10	
	5	3	18	SEVERELY WEATHERED SHALE, some coarse to fine sand, trace silt, brown and gray, dense to very dense, moist to saturated		14-15-18-13 N=33	10	
		4	23			21-26-31-38 N=57	8	
		5	5			100/6"	11	
				Auger Refusal at 9.5'				





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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

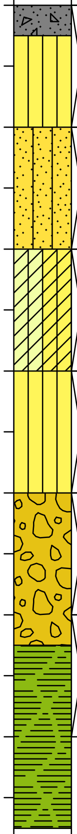
DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 13.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

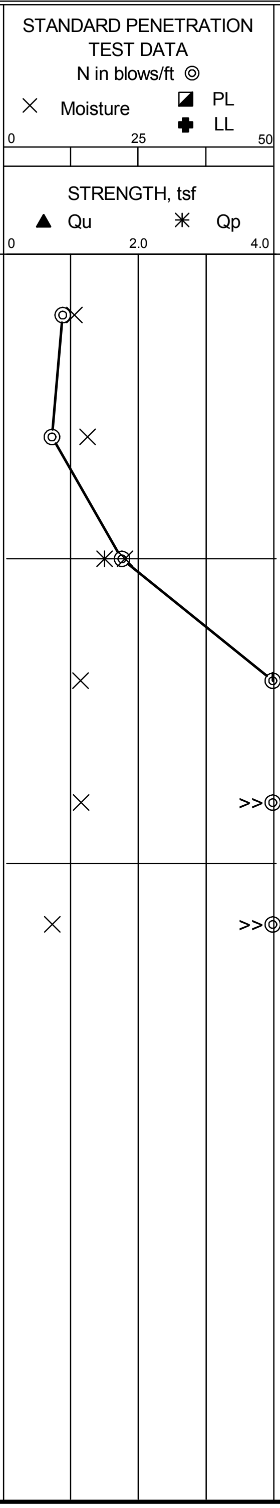
BORING B-13

Water		
∇	While Drilling	2 feet
▼	Upon Completion	None feet
∇	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan



Elevation (feet)	Depth, (feet)	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0				6" CONCRETE				
			1	12	CLAYEY SILT (ML), little coarse to fine sand and medium to fine gravel, brown, medium dense, moist	ML	3-5-6-5 N=11	13	
			2	3	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, trace clay, brown, loose, saturated	SM	6-4-5-2 N=9	16	
	5		3	14	SILTY CLAY (CL-ML), little fine sand, gray and brown, very stiff, moist	CL-ML	7-9-13-16 N=22	23	
			4	12	CLAYEY SILT (ML), little coarse to fine sand and medium to fine gravel, brown, dense, wet	ML	16-22-28-31 N=50	14	
	10		5	14	POORLY GRADED SAND (SP), medium to fine gravel, some coarse to fine sand, trace silt and clay, brown, very dense, saturated	GP	23-28-34-42 N=62	14	
			6	4	SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown and gray, very dense, saturated		36-50/3"	9	
					Auger Refusal at 13.5'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-14

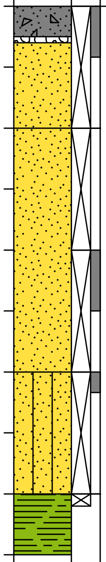
DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 9.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

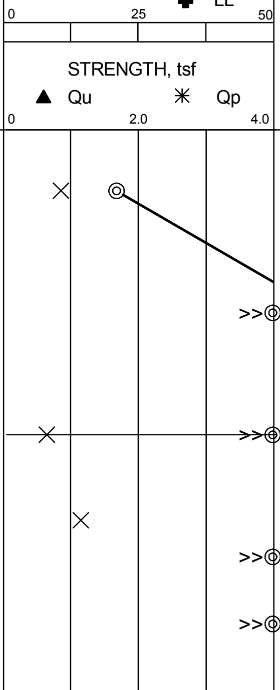
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	5 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / × Moisture ◪ PL ✚ LL / STRENGTH, tsf ▲ Qu ✳ Qp	Additional Remarks
	0					6" CONCRETE					
						1" AGGREGATE BASE					
				1	10	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, medium dense, moist	SP	8-11-10-9 N=21	11		
				2	0	POORLY GRADED SAND (SP), coarse to fine sand with weathered shale fragments, little silt, brown, very dense, moist ** Cobbles and Boulders noted	SP	50/3"		>>	
	5			3	12 ▽			25-28-32-34 N=60	8	>>	
						SILTY SAND (SM), coarse to fine sand, some weathered shale fragments, trace clay, brown, very dense, moist			14		
				4	4		SM	39-50/2"		>>	
				5	0	SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown and gray, very dense, wet		100/2"		>>	
						Auger Refusal at 9'					





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North Tonawanda, NY 14120
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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

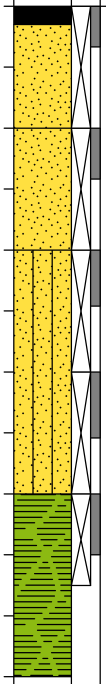
DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 11.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

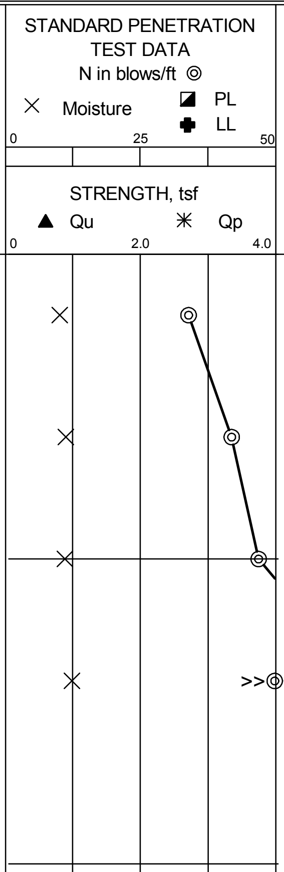
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-15

Water		
▽	While Drilling	8 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan





Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3.5" ASPHALT				
		1	8	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, trace silt, brown, dense, moist	SP	12-16-18-22 N=34	10	
		2	10	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, dense, moist	SP	18-20-22-23 N=42	11	
	5	3	11	SILTY SAND (SM), coarse to fine sand, some weathered shale fragments, trace clay, brown, dense to very dense, moist to wet	SM	21-23-24-26 N=47	11	
		4	13			28-32-34-38 N=66	12	
		5	12	▽ SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown and gray, very dense, saturated		26-29-50/5"		
	10							
				Auger Refusal at 11'				

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North Tonawanda, NY 14120
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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 6.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

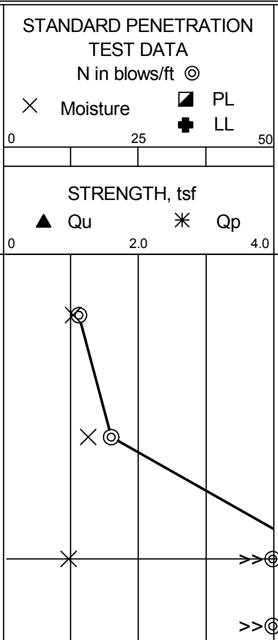
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-16

Water		
▽	While Drilling	4 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3.5" ASPHALT				
		1	14	POORLY GRADED SAND (SP), coarse to fine sand, some silt, little medium to fine gravel, trace clay, brown, medium dense, wet	SP	4-6-8-9 N=14	13	Fines=35.5%
		2	17	POORLY GRADED SAND (SP), coarse to fine sand, little silt and fine gravel, brown, medium dense, wet	SP	14-12-8-13 N=20	16	
	5	3	4	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, very dense, saturated	SP	50/5"	12	
		4	1			50/2"		
				Auger Refusal at 6.8'				



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North Tonawanda, NY 14120
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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 9.7 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

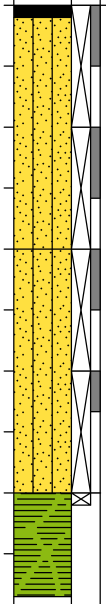
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

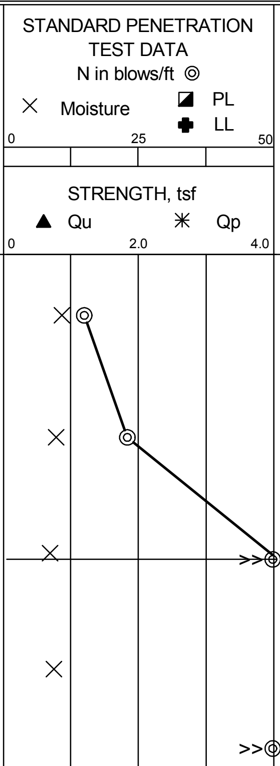
BORING B-17

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
⊻	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3" TOPSOIL				
		1	12	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel (weathered shale fragments), brown, medium dense, moist	SM	4-7-8-9 N=15	11	
		2	14			10-11-12-15 N=23	10	
	5	3	12	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel (weathered shale fragments), trace clay, brown and gray, very dense, moist	SM	21-23-28-50/3" N=51	9	
		4	8			26-32-50/4"	9	
		5	0	SEVERELY WEATHERED SHALE, little coarse to fine sand, trace clay and silt, brown and gray, very dense, moist		50/2"		
				Auger Refusal at 9.7'				





The stratification lines represent approximate boundaries. The transition may be gradual.

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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

BORING B-18

DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 7.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water
∇ While Drilling 4 feet
▼ Upon Completion None feet
▼ Delay N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL 0 25 50 STRENGTH, tsf ▲ Qu ✳ Qp 0 2.0 4.0	Additional Remarks
	0					2" ASPHALT					
				1	4	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, trace silt, brown, very dense, moist ** Cobbles and Boulders noted	SP	16-50/1"	5	× >>◎	
				2	0			50/0"		>>◎	
						∇ SEVERELY WEATHERED SHALE, trace coarse to fine sand and silt, brown and gray, very dense, saturated					
	5			3	11			22-29-24-50/3" N=53	10	× >>◎	
				4	0			50/4"		>>◎	
						Auger Refusal at 7.5'					

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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 13.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

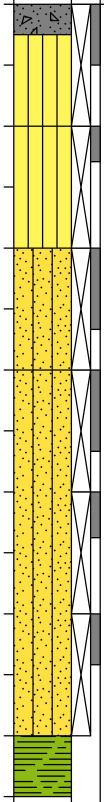
BORING B-19

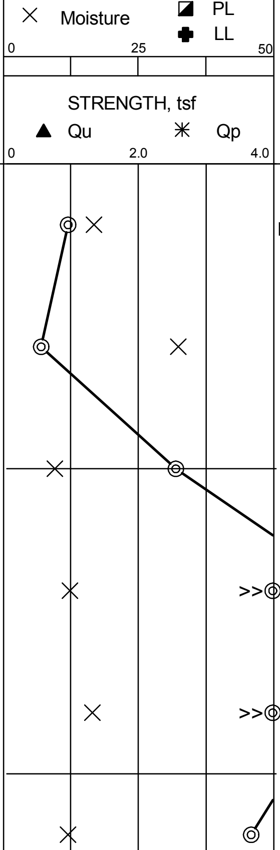
Water

▽	While Drilling	5 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL STRENGTH, tsf ▲ Qu ✳ Qp	Additional Remarks
	0					6" CONCRETE					
				1	12	SILT (ML), some coarse to fine sand, little medium to fine gravel, trace clay, brown, medium dense, moist	ML	4-5-7-9 N=12	17		Fines=66.3%
				2	7	CLAYEY SILT (ML), little fine sand, trace fine gravel and organics, brown and gray, loose, saturated	ML	3-4-3-3 N=7	32		
	5			3	16 ▽	SILTY SAND (SM), coarse to fine sand, some weathered shale fragments, brown and gray, dense, moist	SM	11-15-17-18 N=32	10		
				4	16	SILTY SAND (SM), coarse to fine sand, some weathered shale fragments, trace clay, brown and gray, very dense to dense, wet to saturated		22-26-39-28 N=65	12		
				5	9		SM	26-50/3"	16		
	10										
				6	10			18-22-24-20 N=46	12		
						SEVERELY WEATHERED SHALE, little coarse to fine sand, trace silt and clay, brown and gray, saturated					
						Auger Refusal at 13'					





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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 9.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

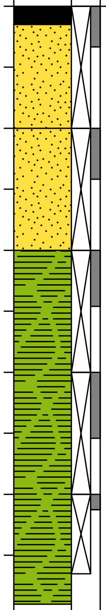
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

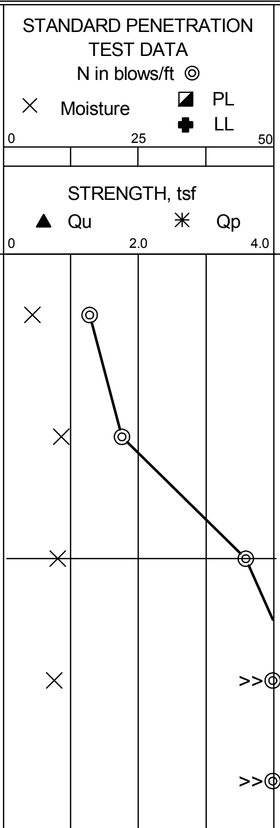
BORING B-20

Water		
▽ While Drilling	None feet	
▼ Upon Completion	None feet	
▽ Delay	N/A	

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3.5" ASPHALT				
		1	8	POORLY GRADED SAND (SP), coarse to fine sand, little medium to fine gravel, trace silt, brown, medium dense, moist ** Cobbles noted	SP	8-9-7-5 N=16	5	
		2	10	POORLY GRADED SAND (SP), coarse to fine sand, little medium to fine gravel, trace silt and clay, brown, medium dense, moist	SP	10-10-12-13 N=22	11	
	5	3	11	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown, dense to very dense, moist		18-21-24-17 N=45	10	
		4	13			24-26-29-35 N=55	9	
		5	3			50/4"		
				Auger Refusal at 9.8'				





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Professional Service Industries, Inc.
3784 Commerce Court, Suite 300
North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-21

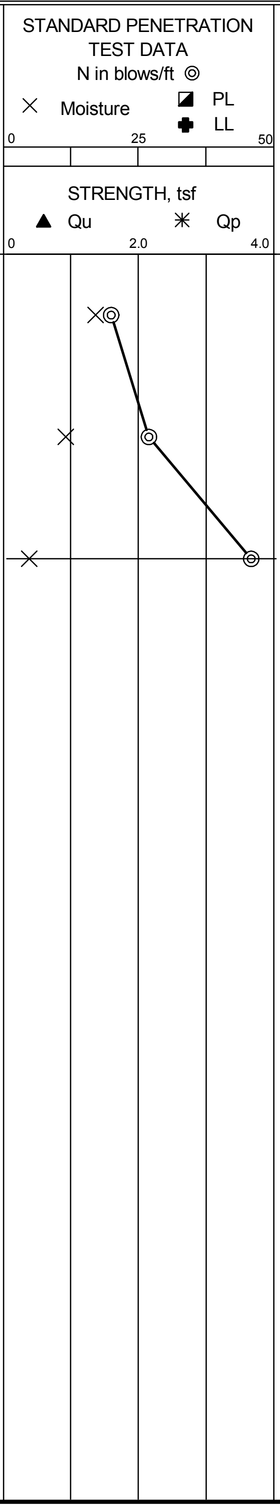
DATE STARTED: 3/11/21
DATE COMPLETED: 3/11/21
COMPLETION DEPTH 7.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	None feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					2" ASPHALT				
				1	12	SANDY SILT (ML), fine sand, trace fine gravel and clay, brown, medium dense, moist	ML	8-9-11-14 N=20	17	
				2	8			10-12-15-17 N=27	12	
	5			3	5	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, dense, moist	SP	18-22-24-22 N=46	5	
						SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown, moist				
						Auger Refusal at 7.8'				



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Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

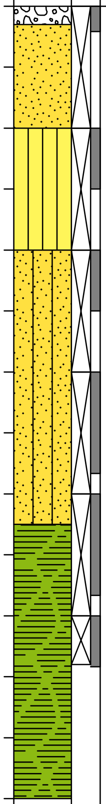
BORING B-22

DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 13.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

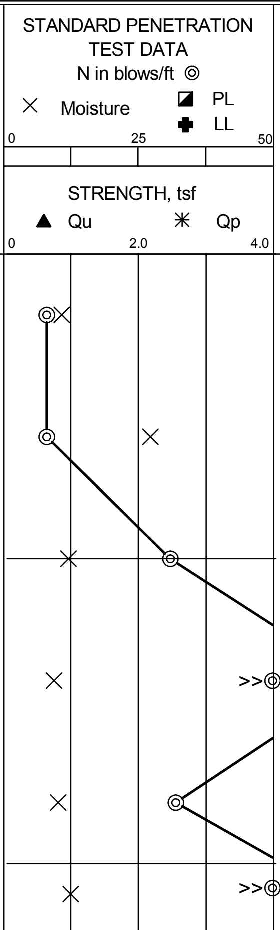
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	8 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan



Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
0			3" AGGREGATE FILL				
	1	5	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, trace clay, brown, loose, wet	SP	4-4-4-2 N=8	11	
	2	12	CLAYEY SILT (ML), little fine sand, trace fine gravel and organics, brown and gray, loose, moist LOI = 3.1%	ML	3-3-5-6 N=8	27	
5	3	12	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, trace clay, gray to brown, medium dense to very dense, moist	SM	9-15-16-23 N=31	12	
	4	20	▽		26-31-35-35 N=66	9	
	5	20	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown, dense to very dense, wet to saturated		9-14-18-24 N=32	10	
10	6	10			28-50/4"	12	
			Auger Refusal at 13'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

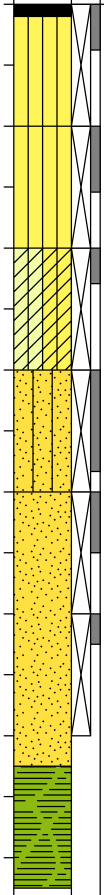
DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 14.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

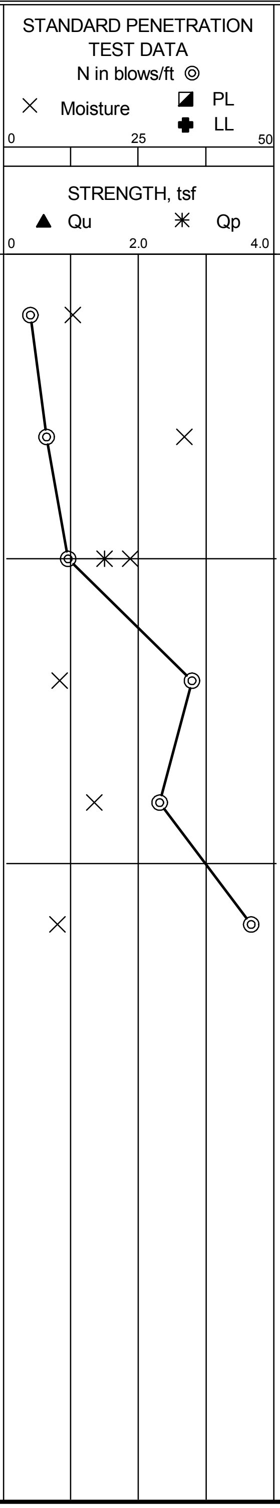
BORING B-23

Water		
∇	While Drilling	2 feet
▼	Upon Completion	None feet
⊻	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan



Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	9	SANDY SILT (ML), coarse to fine sand, some medium to fine gravel, trace clay and organics, brown, very loose, wet	ML	4-3-2-3 N=5	13	
		2	13	SILT (ML), little fine sand, trace medium to fine gravel and organics, brown, loose, wet	ML	3-5-3-2 N=8	34	
	5	3	7	SILTY CLAY (CL-ML), little fine sand, trace medium to fine gravel, gray, stiff, moist	CL-ML	4-5-7-14 N=12	24	
		4	20	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, brown, dense, moist	SM	14-17-18-22 N=35	10	
		5	12	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, brown, medium dense to dense, saturated	SP	12-13-16-19 N=29	17	
	10	6	6			18-22-24-25 N=46	10	
				SEVERELY WEATHERED SHALE, little silt and coarse to fine sand, brown, saturated				
				Auger Refusal at 14.5'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 8.1 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

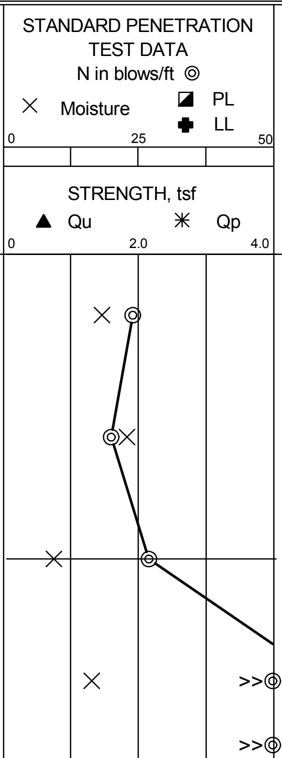
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-24

Water		
∇	While Drilling	2 feet
▼	Upon Completion	None feet
∇	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	7	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, little silt, trace wood/organics, brown and gray, medium dense, moist	SP	6-11-13-6 N=24	18	
		2	6	LOI = 3.8% SILT (ML), little clay, coarse to fine sand and medium to fine gravel, trace organics, gray, medium dense, wet	ML	7-9-11-14 N=20	23	
	5	3	10	LOI = 4.2% CLAYEY SILT (ML), little coarse to fine sand and medium to fine gravel, gray, medium dense, moist	ML	11-13-14-17 N=27	9	
		4	6	SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, gray, very dense, saturated		28-50/3"	16	
		5	1			50/1"		
				Auger Refusal at 8.1'				



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BORING B-25

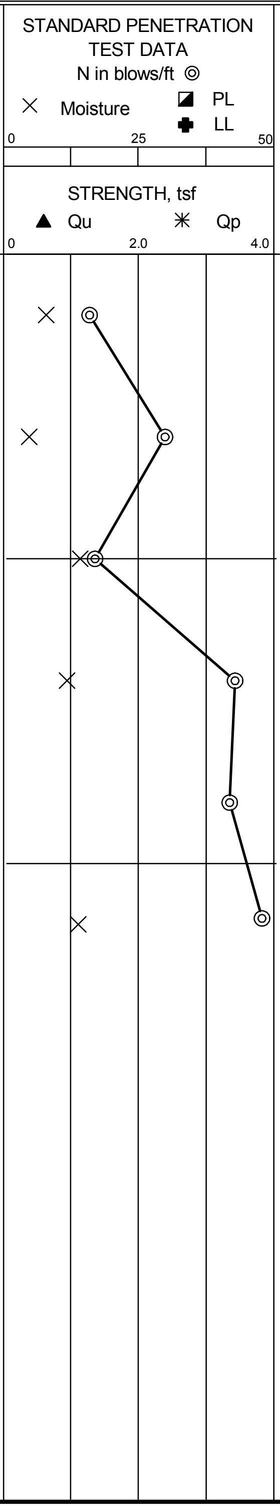
DATE STARTED: 3/9/21
DATE COMPLETED: 3/9/21
COMPLETION DEPTH 14.7 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	11 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			3" ASPHALT				
				POORLY GRADED SAND (SP), coarse to fine sand, little silt and medium to fine gravel, brown and gray, medium dense, moist	SP			
		1	10			6-7-9-10 N=16	8	
		2	4			11-12-18-12 N=30	5	
				SANDY SILT (ML), coarse to fine sand, little fine gravel, brown, medium dense, moist				
	5	3	12		ML	2-6-11-21 N=17	14	
				SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, trace clay, brown and gray, dense, moist				
		4	16		SM	17-18-25-29 N=43	12	
				POORLY GRADED SAND (SP), coarse to fine sand, some weathered shale fragments, little silt, brown, dense, moist	SP			
		5	20			16-19-23-28 N=42		
	10							
		6	12 ▽			24-26-22-50/3" N=48	14	
				SEVERELY WEATHERED SHALE, little coarse to fine sand and silt, brown and gray, moist				
				Auger Refusal at 14.7'				



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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING B-26

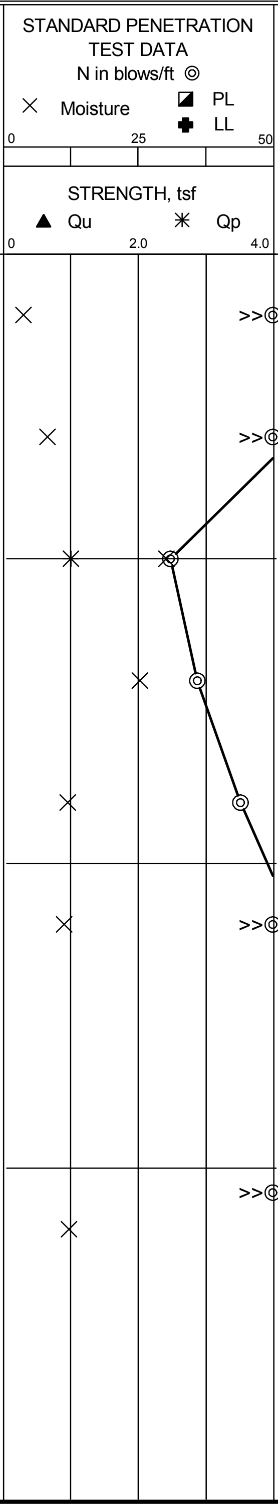
DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 16.8 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
▽	While Drilling	4 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			4" AGGREGATE FILL				
		1	5	POORLY GRADED SAND (SP), coarse to fine sand, some coarse to fine gravel, trace silt, brown, very dense, moist	SP	14-50/2"	4	
		2	12	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, gray, very dense, moist	SM	22-26-28-29 N=54	8	
	5	3	10	SILTY CLAY (CL-ML), little medium to fine gravel, trace fine sand, gray, hard, moist	CL-ML	11-15-16-16 N=31	30	
		4	8	CLAYEY SILT (ML), little fine sand, trace fine gravel, brown and gray, dense, moist	ML	15-17-19-22 N=36	25	
		5	11	SEVERELY WEATHERED SHALE, some coarse to fine sand, trace silt, brown and gray, dense to very dense, saturated		18-21-23-26 N=44	12	
	10	6	12			23-26-28-30 N=54	11	
	15	7	8			28-50/4"	12	
				Auger Refusal at 16.8'				



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North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 18.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

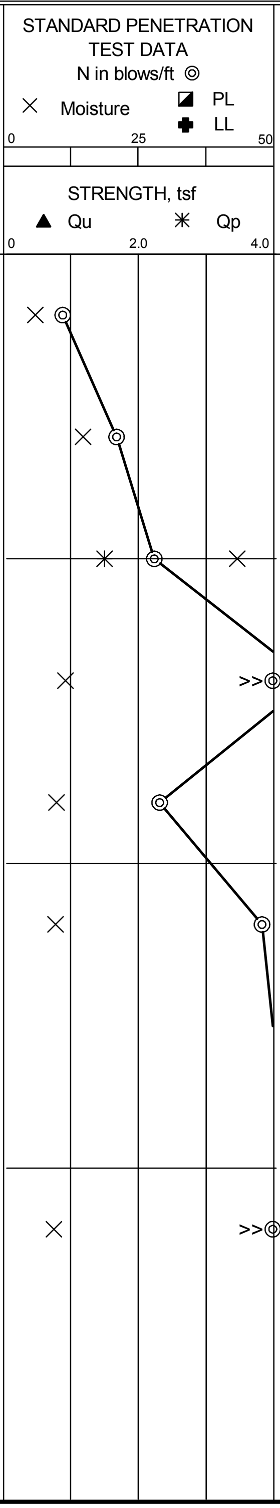
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

BORING B-27

Water		
▽	While Drilling	7 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	4	POORLY GRADED SAND (SP), coarse to fine sand, some medim to fine gravel, trace silt, brown, medium dense, moist	SP	4-6-5-7 N=11	6	
		2	10	SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, brown and gray, medium dense, moist	SM	8-10-11-13 N=21	15	
	5	3	12	SILTY CLAY (CL-ML), trace fine sand and organics, gray and black, very stiff, moist LOI = 5.5%	CL-ML	12-13-15-19 N=28	43	
		4	16 ▽	SANDY SILT (ML), coarse to fine sand, little medium to fine gravel, brown, very dense, moist	ML	22-26-31-38 N=57	11	
		5	11	POORLY GRADED SAND (SP), coarse to fine sand with weathered shale fragments, trace silt and clay, brown and gray, medium dense, saturated	SP	11-13-16-18 N=29	10	
	10	6	14	SEVERELY WEATHERED SHALE, some coarse to fine sand, trace silt, brown and gray, dense to very dense, saturated		21-23-25-27 N=48	10	
	15	7	20			23-26-28-32 N=54	9	
				Auger Refusal at 18'				



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North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/10/21
DATE COMPLETED: 3/10/21
COMPLETION DEPTH 7.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

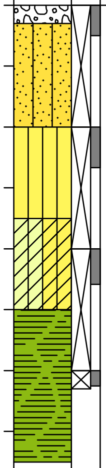
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

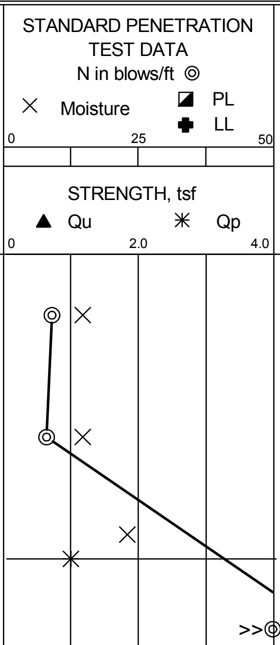
BORING B-28

Water		
▽	While Drilling	2 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			4" AGGREGATE FILL				
		1	6	SILTY SAND (SM), coarse to fine sand, little medium to fine gravel, trace clay, brown, loose, moist	SM	4-6-3-2 N=9	15	
		2	8	SANDY SILT (ML), coarse to fine sand, little medium to fine gravel, trace clay, brown, loose, wet	ML	3-5-3-3 N=8	15	
				SILTY CLAY (CL-ML), trace fine sand and organics, gray and brown, very stiff, moist	CL-ML		23	
	5	3	7	SEVERELY WEATHERED SHALE, little coarse to fine sand, trace silt, brown and gray, very dense, wet		11-14-50/3"		
		4	3			50/2"		
				Auger Refusal at 7.5'				





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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
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BORING B-29

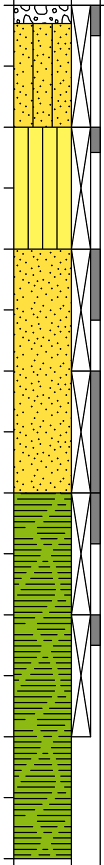
DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 14.0 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

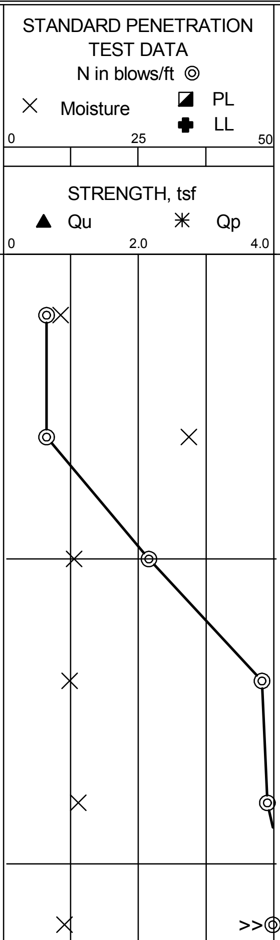
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

Water		
∇	While Drilling	3 feet
▼	Upon Completion	None feet
▼	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			4" AGGREGATE FILL				
		1	6	SILTY SAND (SM), coarse to fine sand, some medium to fine gravel, trace clay, brown, loose, moist	SM	3-4-4-4 N=8	11	
		2	5 ∇	CLAYEY SILT (ML), little coarse to fine sand and wood/organics, trace medium to fine gravel, gray and black, wet	ML	3-4-4-3 N=8	34	
	5	3	14	POORLY GRADED SAND (SP), coarse to fine sand and weathered shale fragments, trace silt, brown and gray, medium dense to dense, saturated	SP	11-12-15-19 N=27	13	
		4	24			18-23-25-28 N=48	12	
		5	10	SEVERELY WEATHERED SHALE, some coarse to fine sand, little silt, trace clay, brown and gray, dense to very dense, saturated		20-24-25-24 N=49	14	
	10	6	6			23-26-28-32 N=54	11	
				Auger Refusal at 14'				





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PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.

DATE STARTED: 3/12/21
DATE COMPLETED: 3/12/21
COMPLETION DEPTH 15.5 ft
BENCHMARK: N/A
ELEVATION: N/A
LATITUDE:
LONGITUDE:
STATION: N/A **OFFSET:** N/A
REMARKS:

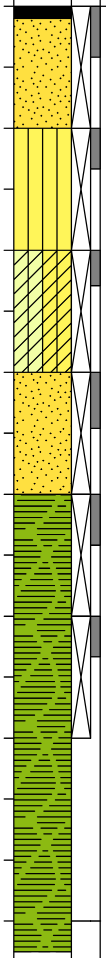
DRILL COMPANY: SoilTesting, Inc.
DRILLER: JK **LOGGED BY:** Steven Pump
DRILL RIG: Diedrich D-50 Truck Mount
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY N/A
REVIEWED BY: DBS

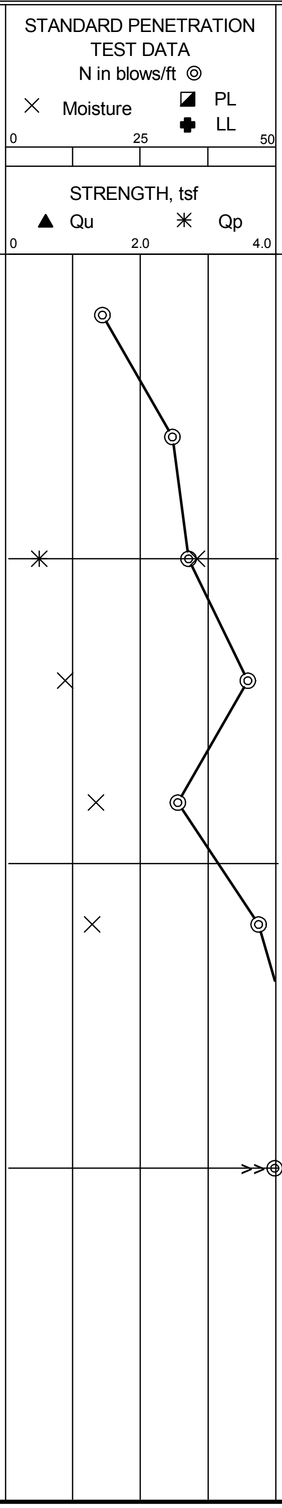
BORING B-30

Water		
▽	While Drilling	4 feet
▼	Upon Completion	None feet
▽	Delay	N/A

BORING LOCATION:
See Attached Boring Location Plan

Elevation (feet)	Depth, (feet)	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0			2" ASPHALT				
		1	10	POORLY GRADED SAND (SP), coarse to fine sand, some medium to fine gravel, trace silt, brown, medium dense, moist	SP	12-10-8-10 N=18		
		2	8	CLAYEY SILT (ML), little fine sand, trace fine gravel and organics, gray, dense, moist	ML	14-17-14-22 N=31		
	5	3	7	SILTY CLAY (CL-ML), trace fine sand, medium to fine gravel, and organics, gray, hard, moist LOI = 4.3%	CL-ML	13-16-18-19 N=34	36	
		4	11	POORLY GRADED SAND (SP), coarse to fine sand, some weathered shale fragments, little silt, trace clay, brown and gray, dense, saturated	SP	18-21-24-28 N=45	11	
		5	10	SEVERELY WEATHERED SHALE, some coarse to fine sand, trace silt, gray to brown, dense to very dense, saturated		16-17-15-12 N=32	17	
	10							
		6	8			21-23-24-25 N=47	16	
	15	7	0			100/0"		
				Auger Refusal at 15.5'				

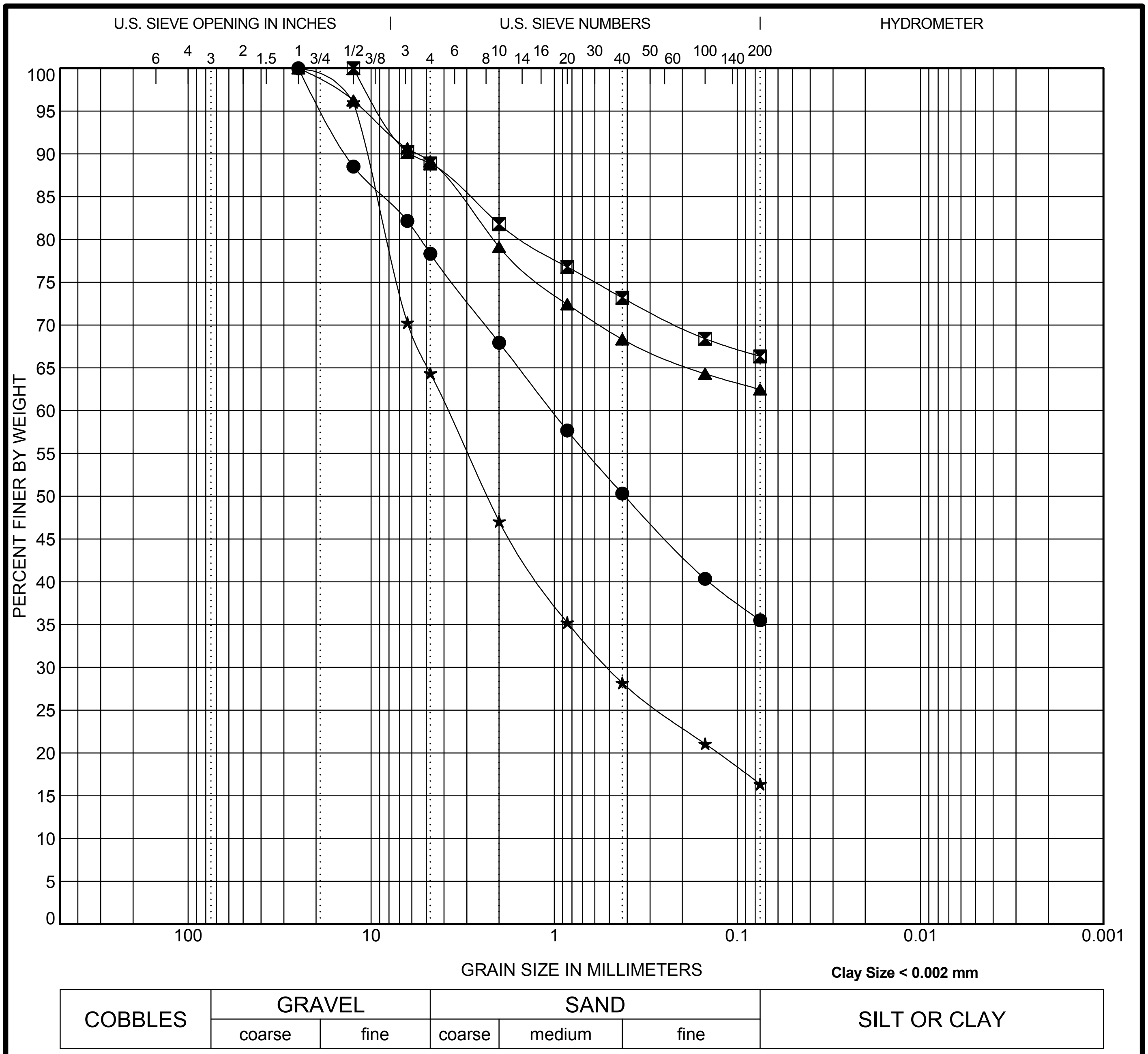




Professional Service Industries, Inc.
3784 Commerce Court, Suite 300
North Tonawanda, NY 14120
Telephone: (716) 694-8657

PROJECT NO.: 08061265
PROJECT: Proposed CarMax Auto Superstore
LOCATION: 1115 US 9
Wappinger, Dutchess County, NY 12524

The stratification lines represent approximate boundaries. The transition may be gradual.



Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	**B-16**	**1.0**	**Poorly Graded Sand (SP), some silt, little mf gravel, trace clay**	**NP**	**NP**	**NP**		
☒	**B-19**	**1.0**	**Silt (ML), some coarse to fine sand, little fine gravel, trace clay**	**NP**	**NP**	**NP**		
▲	**B-3**	**1.0**	**Silt (ML), some coarse to fine sand, trace fine gravel and clay**	**NP**	**NP**	**NP**		
★	**B-7**	**3.0**	**Poorly Graded Sand (SP), some fine gravel, little silt**	**NP**	**NP**	**NP**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-16**	**1.0**	**25**	**1.032**			**21.7**	**42.8**	**35.5**	
☒	**B-19**	**1.0**	**12.5**				**11.1**	**22.5**	**66.3**	
▲	**B-3**	**1.0**	**25**				**10.9**	**26.7**	**62.5**	
★	**B-7**	**3.0**	**25**	**3.819**	**0.508**		**35.6**	**48.0**	**16.4**	

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Telephone: (716) 694-8657
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GRAIN SIZE DISTRIBUTION

Project:	Proposed CarMax Auto Superstore
PSI Job No.:	08061265
Location:	1115 US 9 Wappinger, Dutchess County, NY 12524

intertek psi

Intertek-PSI
850 Poplar Street
Pittsburgh, PA 15220

Tel +1 412-922-4000
Fax +1 412-922-4043
intertek.com/building

REPORT TO:	Intertek PSI 3784 Commerce Court Suite 300 N. Tonawanda, NY 14120	**PROJECT:**	Proposed CarMax Superstore
ATTENTION:	Mr. Steven Pump	**PSI PROJECT NO.:**	08061265
DATE:	April 23, 2021	**PSI LAB NO.:**	SPT-10028

Professional Service Industries, Inc. (PSI) has performed testing on the referenced project. The results of our tests are presented in the accompanying report.

The results contained in this report are related only to the item(s) tested. The pages of this report (including attachments) shall not be reproduced, except in full, without written approval of PSI. All testing was conducted by and under the continuous, direct supervision of Professional Service Industries, Inc.

Please contact us should you have any questions concerning this report.

Respectfully submitted,
Professional Service Industries, Inc.

Denis J. Columbare
Technician, Special Test

Larry W. Troutman, Jr., CIE
Director/Principal Consultant

SCOPE OF SERVICES

General

On April 15, 2021, the Special Test Department of Professional Service Industries, Inc. (PSI) received one (1) soil sample, identified below, for Minimum Laboratory Soil Resistivity testing in general accordance with AASHTO T 288-12 (2016). Testing was performed on April 22, 2021.

Sample Identification

- Boring B-14 (1' – 4' below grade)

Test Procedure and Equipment

Test Method:	AASHTO T 288-12 (2016)
Test Equipment:	Biddle DET 2/2 Soil Meter
Test Cell:	Miller Soil Box
Requirement:	None specified

RESULTS

Boring No.	Minimum Resistivity (ohm cm)
B-14 (1' 1 4' below grade)	2,390

MATERIALS RESEARCH DIVISION

Modern Industries, Inc.
850 POPLAR STREET
PITTSBURGH, PENNSYLVANIA 15220
TEL. (412) 922-9226 FAX (412) 922-7674
www.modernind.com

Complete Material Testing and Research Services

ANALYTICAL REPORT

TESTED FOR: Intertek PSI
3784 Commerce Ct., Suite 300
North Tonawanda, NY 14120

LABORATORY NO: INO114349

ATTENTION: Steven Pump

DATE RECEIVED: 4/15/21

PSI PROJECT NO: 08061265

REPORT DATE: 4/26/21

REMARKS:

Sample Description : One (1) Soil Sample
Project : Centerpoint Integrated Solutions

Sample	Chlorides, ppm	Sulfates, ppm
B-14 (1'-4')	51	32

Respectfully Submitted,
MODERN INDUSTRIES, INC.

James R. Yarris
James R. Yarris
Manager, MRD Pittsburgh

1-Client
JRY/dla

FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

COHESIONLESS SOILS

(Silt, Sand, Gravel and Combinations)

Density

Very Loose	5 blows per foot or less
Loose	6 - 10 blows per foot
Medium Dense	11 - 30 blows per foot
Dense	31 - 50 blows per foot
Very Dense	51 blows per foot or more

Relative Properties

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

Particle Size Indentification

Boulders	8 inch diameter or more	
Cobbles	3 - 8 inch diameter	
Gravel	Coarse	1 - 3 inches
	Medium	1/2 - 1 inch
	Fine	1/4 - 1/2 inch
Sand	Coarse	0.6 mm - 1/4 inch (diameter of pencil lead)
	Medium	0.2 mm - 0.6 mm (diameter of broom straw)
	Fine	0.05 mm - 0.2 mm (diameter of human hair)
Silt		0.002 mm - 0.05 mm (cannot see particles)

COHESIVE SOILS

(Clay, Silt and Combinations)

Consistency

Very soft	3 blows per foot or less
Soft	4 - 5 blows per foot
Medim Stiff	6 - 10 blows per foot
Stiff	11 - 15 blows per foot
Very Stiff	16 - 30 blows per foot
Hard	31 blows per foot or more

Plasticity

Degree of Plasticity	Plasticity Index
None to slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to very high	over 22

CLASSIFICATION ON LOGS ARE MADE BY VISUAL EXAMINATION OF SAMPLES.

Standard Penetration Test Driving a 2.0" O.D., 1 3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30 inches. It is customary for ITL to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The quantity of hammer blows for seating the sampler and performing the test are recorded for each 6.0 inches of penetration on the Field Exploration Log (example: 6-10-13). The standard penetration test result can be obtained by adding the last two figures (i.e. 10 + 13 = 23). The reader is referenced to ASTM D1586.

Strata Changes Boundaries between soil layers are considered approximate based upon observed changes during the drilling operations or noted changes within representative samples.

Groundwater Observations were made to determine either the depth or elevation of water at the times indicated on the Soil Exploration Logs. The water so encountered may be groundwater or perched water. The depth or elevations indicated for water may fluctuate due to seasonal changes or other unknown factors.

psi Information To Build On

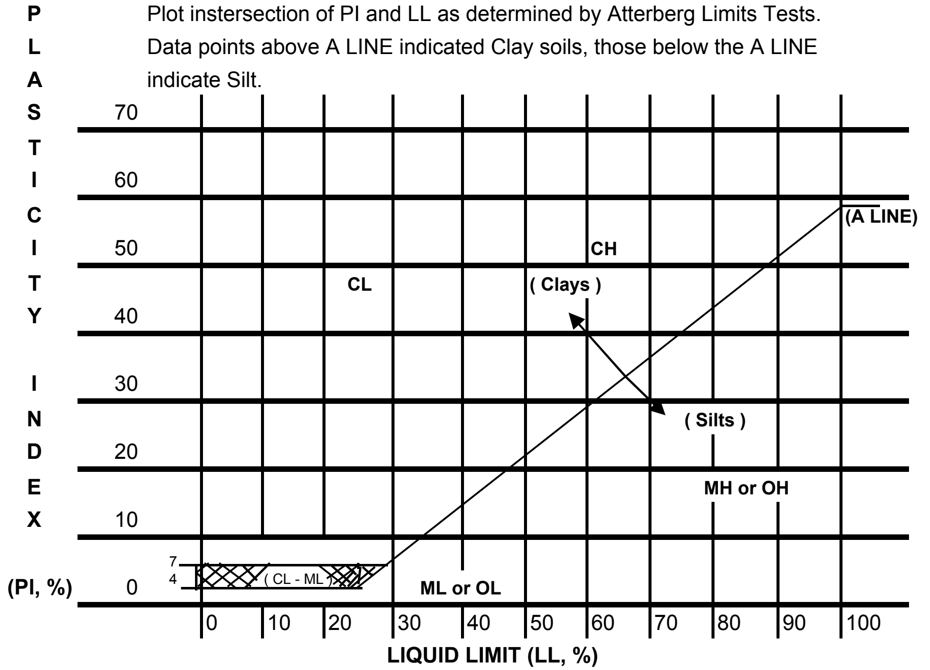
Engineering • Consulting • Testing

United Soil Classification System
ASTM Designation D - 2487

Information To Build On
Engineering • Consulting • Testing

Based upon percentage of material passing No. 200 sieve classify as:

Less than 5%	GW, GP, SW, SP
More than 12%	GM, GC, SM, SC
5% to 12%	Borderline, use dual symbols



Plot intersection of PI and LL as determined by Atterberg Limits Tests. Data points above A LINE indicated Clay soils, those below the A LINE indicate Silt.

Coarse Grained Soils (More than half of is larger than No. 200 sieve)	Gravels (More than 50% retained on No.4 sieve)	GW	Well graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}} > 4$	$1 < C_c = \frac{[D_{30}]^2}{D_{10} * D_{60}} < 3$
		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Does not meet all requirements for GW	
		GM	Silty gravels, gravel-sand-silt mixtures	below A Line, PI < 4	in shaded area 4 < PI < 7 Dual Symbols
		GC	Clayey gravels, gravel-sand-clay mixtures	above A Line, PI > 7	
	Sands (More than 50% passing a No. 4 sieve)	SW	Well graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}} > 6$	$1 < C_c = \frac{[D_{30}]^2}{D_{10} * D_{60}} < 3$
		SP	Poorly graded sands, gravelly sands, little or no fines	Does not meet all requirements for SW	
		SM	Silty sands, sand-silt mixtures	below A Line, PI < 4	in shaded area 4 < PI < 7 Dual Symbols
		SC	Clayey sands, sand-clay mixtures	above A Line, PI > 7	
Fine Grained Soils (More than half of material is smaller than No. 200 sieve)	Silts & Clays (LL less than 50)	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity		
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
		OL	Organic silts and organic silty clays of low plasticity		
	Silts & Clays (LL greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, plastic silts		
		CH	Inorganic clays of high plasticity fat clays		
		OH	Organic clays of medium to high plasticity		
	Highly Organic Soil	Pt	Peat and other highly organic soils		

G. CONSTRUCTION DRAWINGS