FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (FGEIS)
DOLSONTOWN CORRIDOR
Town of Wawayanda, Orange County, New York

Lead Agency: Planning Board, Town of Wawayanda

Lead Agency Contact: John Razzano, Chairperson
80 Ridgebury Hill Road
Slate Hill, NY 10973
(845) 355-5700

APPENDIX D:
SIMON BUSINESS PARK,
RDM #6

FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (FGEIS)
DOLSONTOWN CORRIDOR

APPENDIX D: SIMON BUSINESS PARK, RDM #6

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Section 1

NEW YORK
STATE OF
OPPORTUNITY.

**Parks, Recreation,
and Historic Preservation**

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

January 04, 2021

Patrick Hines
Engineering Consultant
McGoey, Hauser & Edsall D.P.C.
33 Airport Center Drive
New Windsor, NY 12553

Re: DEC
Simon Business Park Site Plan
Town of Wawayanda, Orange County
20PR08106

Dear Patrick Hines:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources.

Cumulatively, the proposed project area has been examined by two previous archaeological surveys - 01SR51892 and 07SR57257 – neither of which identified any archaeological sites.

Therefore, based on the available information, it is the opinion of OPRHP that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via email only

cc: Richard Onorati, Town of Wawayanda Planning Board

Division for Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • parks.ny.gov

Section 2

Threatened and Endangered Species Habitat Suitability Assessment Report

Simon Business Park Site
Dolsontown Road
Town of Wawayanda, New York

November 24, 2021

Prepared by:

Michael Nowicki
Ecological Solutions, LLC
121 Leon Stocker Drive
Stratton, VT 05360
(203) 910-4716

1.0 INTRODUCTION

Ecological Solutions, LLC completed a threatened and endangered species habitat suitability assessment on the Simon Business Park site (6-1-107, 6-1-90.1) located on Dolsontown Road in the Town of Waywayanda, Orange County, New York (*Figure 1*). The site totals 70.93 acres of vacant wooded land, wetlands, and upland meadow. The Applicant is proposing to construct a 282,550 sq. ft. warehouse with associated improvements including access road, parking areas, and stormwater management.

The New York State Department of Environmental Conservation (NYSDEC) Environmental Assessment Form indicates that the Indiana bat (*Myotis sodalis*) may be located in the vicinity of the site. The US Fish and Wildlife Service (USFWS) also lists the Northern long-eared bat (*Myotis septentrionalis*) and small whorled pogonia (*Isotria medeoloides*) as threatened and endangered species potentially located on the site and monarch butterfly (*Danaus plexippus*) as a candidate species that also is potentially located on the site (*Attachments 1 and 2*). This assessment was completed to determine if suitable habitat exists on the site for this species and determine potential impacts to suitable habitat and recommends measures to mitigate the impacts that can not be avoided or minimized. Habitat was observed on the site on November 20, 2021 and is listed in Table 1.

TABLE 1
COVER TYPES IDENTIFIED ON THE SITE

HABITAT COVER TYPES			
NO.	**DESCRIPTION**	**COVERAGE (ACRES)**	**DISTURBANCE (ACRES)**
1	Wetlands	33.0	0.0
2	Upland Forest	7.29	5.79
3	Upland Meadow	30.64	17.16

Upland Hardwood Forest - The site contains upland hardwood forest which is a young forest type with soils that are well drained. The canopy is dominated by a mixture of oaks and maples. The oaks include one or more of the following: black oak (*Quercus velutina*), red oak (*Q. rubra*), and white oak (*Q. alba*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), and black cherry (*Prunus serotina*) are common associates occurring at low densities. Sizes of the trees vary from saplings to mature trees with a wide range of dbh from 3--8 inches and tree conditions including dead wood, crevices, and holes.

Wetlands - Wetlands on the site are Federal regulated wetlands dominated by scrub/shrub and meadow species.

Upland Meadow - The majority of the site is maintained / mowed upland field.

2.0 HABITAT SUITABILITY ASSESSMENT/CONCLUSION

2.0 HABITAT SUITABILITY ASSESSMENT/CONCLUSION

2.1 Small whorled pogonia

The small whorled pogonia is a member of the orchid family. It usually has a single grayish-green stem that grows about 10 inches tall when in flower and about 14 inches when bearing fruit. The plant is named for the whorl of five or six leaves near the top of the stem and beneath the flower. The leaves are grayish-green, somewhat oblong and 1 to 3.5 inches long. The single or paired greenish-yellow flowers are about 0.5 to 1 inch long and appear in May or June. The fruit, an upright ellipsoid capsule, appears later in the year. This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.

Conclusion - There is no potential habitat for this species since there is no older growth forest on the site but rather young woods with a thick dense understory.

2.2 Indiana and Northern long-eared bats

The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches dbh. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

The northern long eared bat requires/occupies practically the same habitat niche as the Indiana bat. Impacts to habitat and mitigation would be consistent with the recommendations for the Indiana bat.

Conclusion - This proposed project will require about 5.79 acres of tree clearing, grubbing, and earth moving in upland forest area. The disturbance activities will not result in adverse effects to this species since will be removed when bats are not on site between October 1 and March 31 or as approved by the NYSDEC (Emergence survey/s) outside this clearing timeframe. Generation of dust and noise, potential for changes to surface water quality, and increased lighting on the site may cause an impact to foraging bats but can be mitigated as per below.

The site owner proposes to avoid, minimize, and mitigate for effects by:

- Site lighting will use approved light fixtures that have tops that direct light down to minimize light pollution and not interfere with potential bat foraging activities;
- Implementing soil conservation and dust control best management practices, such as watering dry disturbed soil areas to keep dust down, and using staked, recessed silt fence and anti tracking pads to prevent erosion and sedimentation in surface waters on the site, and;
- Stormwater pond/s will not be maintained with any chemicals that might adversely affect bats or insect populations on which they may feed.

These measures will result in avoiding adverse effects to Indiana bats.

2.3 Monarch butterfly

Monarchs, like all other butterflies and moths, go through egg, larval (caterpillar), chrysalis (pupa), and adult stages. Monarch caterpillars ingest milkweed that contains a toxic compound. The presence of this toxin is used by the monarch butterfly as a defense against predators.

In late August, masses of monarch butterflies begin an epic migration stretching thousands of miles from areas across the United States and as far north as Canada (east of the Rocky Mountains) to overwinter in mountaintops of Central Mexico.

Conclusion – Milkweed plants occur on the site and the impacts from the project will occur to field habitats and will impact this species directly or through the loss of habitat (i.e milkweed plants). No mitigation measures are proposed.

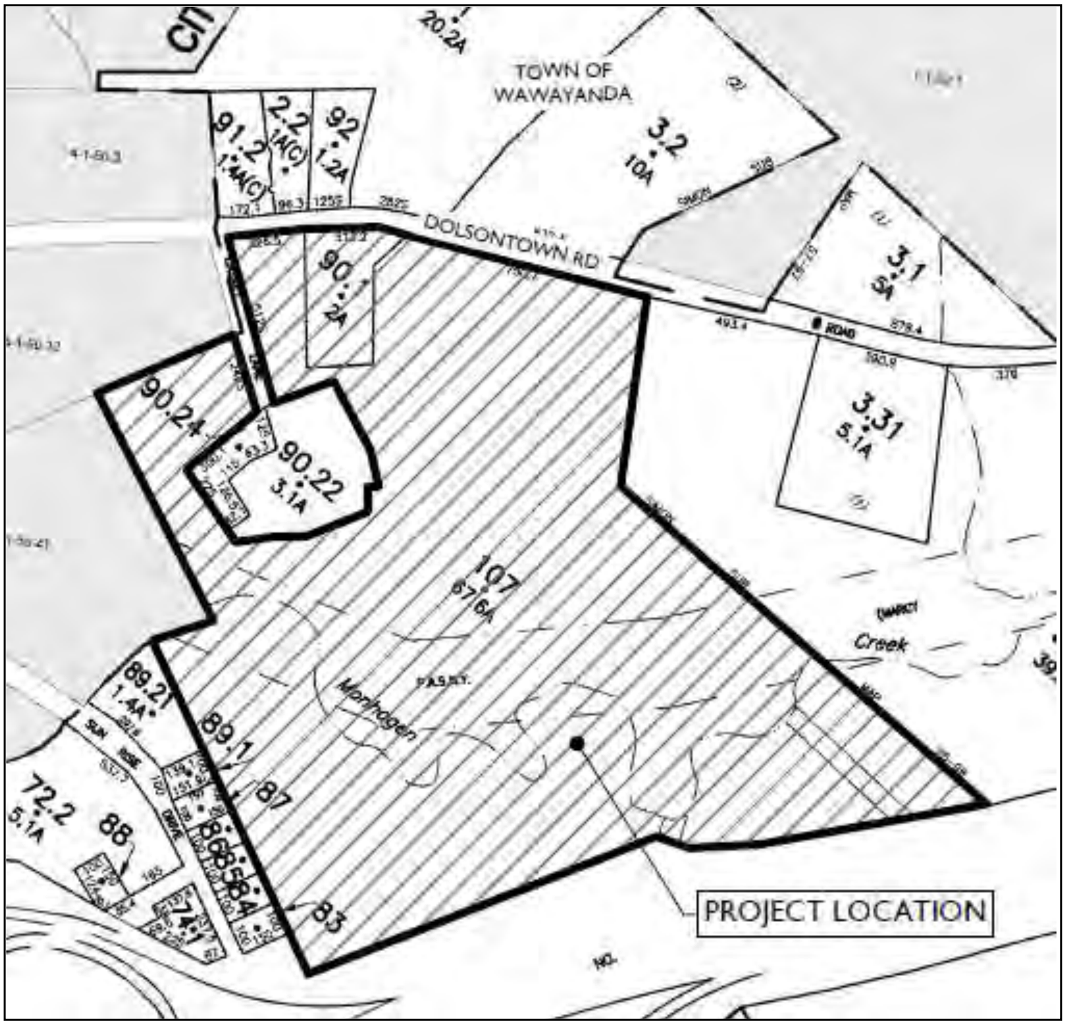
3.0 PHOTOGRAPHS

Existing field/meadow on the site.

Existing field/meadow on the site.

Existing wood line and wetland boundary on the site.

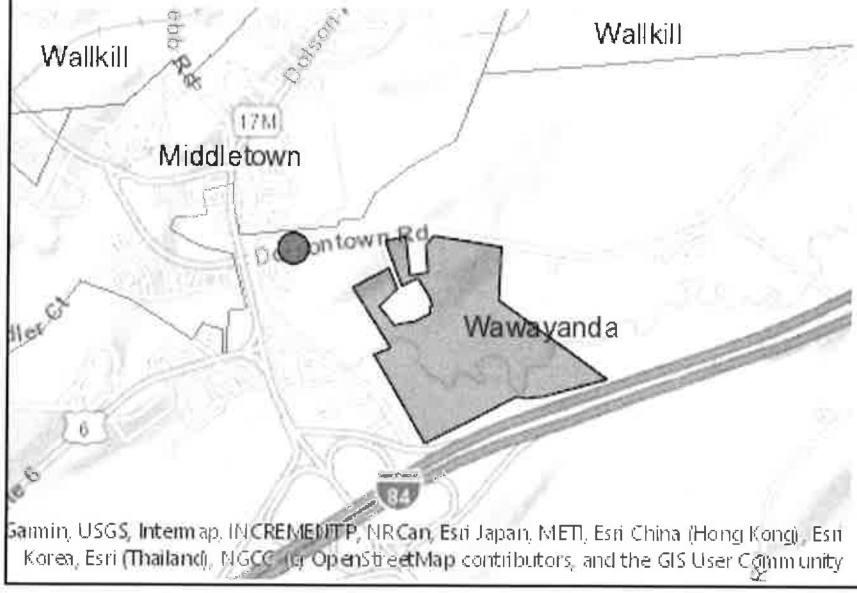
Figure 1 Location Map



Attachment 1 - NYSDEC Mapper

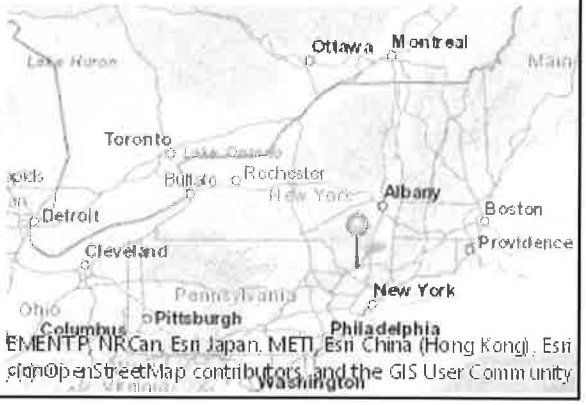
EAF Mapper Summary Report

Monday, September 13, 2021 10:53 AM



Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.



EMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri (c) OpenStreetMap contributors, and the GIS User Community

B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h [DEC Spills or Remediation Site - Potential Contamination History]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Listed]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.i [DEC Spills or Remediation Site - Environmental Site Remediation Database]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.1.h.iii [Within 2,000' of DEC Remediation Site]	Yes
E.1.h.iii [Within 2,000' of DEC Remediation Site - DEC ID]	V00289, 336029
E.2.g [Unique Geologic Features]	No
E.2.h.i [Surface Water Features]	Yes
E.2.h.ii [Surface Water Features]	Yes
E.2.h.iii [Surface Water Features]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
E.2.h.iv [Surface Water Features - Stream Name]	855.5-180
E.2.h.iv [Surface Water Features - Stream Classification]	C
E.2.h.iv [Surface Water Features - Wetlands Name]	Federal Waters
E.2.h.v [Impaired Water Bodies]	Yes
E.2.h.v [Impaired Water Bodies - Name and Basis for Listing]	Name - Pollutants - Uses:Monhagen Brook and tribs – Nutrients;Unknown Toxicity – Recreation;Aquatic Life

E.2.i. [Floodway]	No
E.2.j. [100 Year Floodplain]	No
E.2.k. [500 Year Floodplain]	No
E.2.l. [Aquifers]	No
E.2.n. [Natural Communities]	No
E.2.o. [Endangered or Threatened Species]	Yes
E.2.o. [Endangered or Threatened Species - Name]	Indiana Bat
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	Yes
E.3.a. [Agricultural District]	ORAN002
E.3.c. [National Natural Landmark]	No
E.3.d [Critical Environmental Area]	No
E.3.e. [National or State Register of Historic Places or State Eligible Sites]	Digital mapping data are not available or are incomplete. Refer to EAF Workbook.
E.3.f. [Archeological Sites]	Yes
E.3.i. [Designated River Corridor]	No

Attachment 2 - USFWS List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To:
Project Code: 2022-0023422
Project Name: Simon Business Park

March 23, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Project Code:	2022-0023422
Event Code:	None
Project Name:	Simon Business Park
Project Type:	Commercial Development
Project Description:	Warehouse

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.4204286,-74.42035271143219,14z

Counties: Orange County, New York

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	Ecological Solutions, LLC
Name:	Michael Nowicki
Address:	121 Leon Stocker Drive
City:	Stratton
State:	VT
Zip:	05360
Email	ecolsol@aol.com
Phone:	2039104716

Section 3

Colliers
Engineering
& Design

Stormwater Pollution Prevention Plan

February 2022

Revised February 2023

Simon Warehouse
Tax Lots 6-1-107 & 6-1-90.1
Town of Wawayanda, Orange County, New York

Prepared for:

Mid Dolsontown, LLC
1 International Boulevard, Suite 410
Mahwah, NJ 07430

Prepared by:

Connor P. McCormack, P.E.
New York Professional
Licensed Professional Engineer
License No. 103756

Colliers Engineering & Design
555 Hudson Valley Avenue Suite 101
New Windsor, NY 12553
Main: 845.564.4495
Colliersengineering.com

Project No. 21004268A

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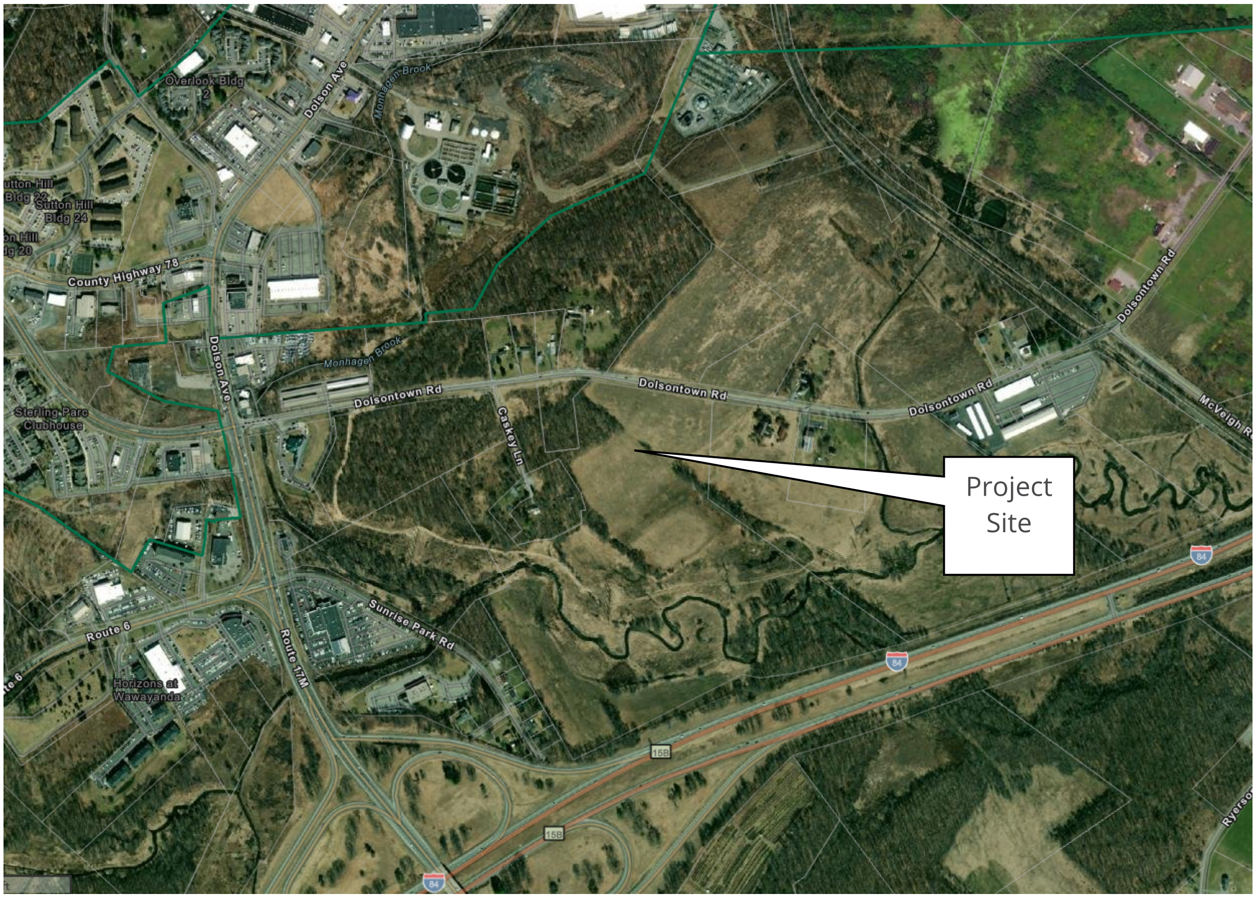
Appendices

EXECUTIVE SUMMARY

Project Name:	**Operator Name and Address:**
Simon Warehouse Town of Wawayanda Orange County, NY	Mid Dolsontown, LLC 1 International Boulevard, Suite 410 Mahwah, NJ 07430
Project Engineer and Firm:	**Contractor Name and Address:**
Andrew B. Fetherston, P.E. Colliers Engineering & Design CT, PC 555 Hudson Valley Avenue, Suite 101 New Windsor, NY 12553 (845) 564-4495	**TBD**
Project Location:	**MS4 Contact:**
Dolsontown Road Town of Wawayanda, Orange County NY, 10940 Tax lots: 6-1-107 & 6-1-90.1	Town of Wawayanda (NYR20A279) 80 Ridgebury Hill Road Slate Hill, NY 10973

Figure 1: Project Location Aerial



INTRODUCTION

The project site is in the Town of Wawayanda, Orange County, New York, on the south side of Dolsontown Road. The property is comprised of tax lots 6-1-107 & 6-1-90.1, located within the Mixed commercial zoning district (MC-1). The Project site totals +/- 71.2 Acres in size, abuts interstate 84 to the South, fronts Dolsontown Road to the north and Caskey Lane on the west. The parcels are currently undeveloped with a mixture of agricultural fields, some woodlands, and wetlands in southern portions of the site. The site is bisected by the Monhagen Brook, a waterbody listed on the NYSDEC general permit 303(d) list.   The site contains approximately 33 acres of wetlands for which an official jurisdiction is being sought.

The applicant proposes to construct one 54,000 SF warehouse building with a 1,500 sf office (building #1); and a second 244,200 SF warehouse with a 7,500 SF office (building #2). Other site improvements associated with the project include a new driveway, off-street parking, trailer loading docks, trailer storage, landscaping lighting and utilities.

To meet the stormwater requirements, a total of five (5) stormwater management practices have been proposed on site. These five Bioretention basins with underdrains were designed in accordance with the 2015 New York State Stormwater Management Design Manual and local municipal requirements.

Due to the size of the project, coverage under the State Pollutant Discharge Elimination System Permit (SPDES GP 0-20-001), administered by New York State Department of Environmental Conservation (NYSDEC), is required.

STORMWATER MANAGEMENT GOALS

The Stormwater Pollution Prevention Plan (SWPPP) has been prepared in compliance with the New York State Department of Environmental Conservation (NYSDEC), State Pollutant Discharge Elimination System (SPDES) and General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-20-001 (See ***Appendix 4***). The SWPPP is a plan for controlling runoff and pollutants from a site during and after construction activities. The principal objective of this document is to comply with the SPDES Permit for construction activities by planning and implementing the following practices:

- Reduction or elimination of erosion and sediment loading to water bodies during and after construction.
- Control of the impact of stormwater runoff on the water quality of the receiving waters.
- Control of the peak rate of runoff during and after construction.
- Maintenance of stormwater controls during and after completion of construction.
- Minimize impacts to the Monhegan Brook, a waterbody listed on the NYSDEC 303(d) list

Classification & Standards

The activities associated with this project are eligible for coverage under this permit. Using the General Permit guidelines for coverage, a summary of classification and requirements is provided below:

Project Type:

- *Industrial facilities, including industrial parks.*
- *Commercial developments.*

Classification: as per the GP-0-20-001, *Appendix B*, Table 2, "Construction activities that require the preparation of a SWPPP that includes Post Construction Stormwater Practices".

The following guidance documents, in addition to various resources located on the NYS Department of Environmental Conservation website, were used in preparation of this SWPPP.

- The New York State Stormwater Management Design Manual, by New York State Department of Environmental Conservation, August 2015.
- New York Standard Specifications for Erosion and Sediment Control, by New York State Department of Environmental Conservation, November 2016.

The SWPPP is intended to be a *'living'* document and should be revised and updated whenever site conditions dictate. Any proposed modifications shall be reviewed by the owner/operator prior to incorporation in the SWPPP and implementation at the project site. The certifying engineer of this SWPPP document shall be notified of any proposed modifications to this document. Modifications shall be in accordance with the NYSDEC technical standards.

METHODOLOGY

1. The watersheds are divided into subareas, by topography, soils, and land use. A summary of the watershed areas, composite curve numbers, and travel times are shown in Table 1.
2. Rainfall depths used for this analysis are those published by the Northeast Regional Climate Center for the project location for the 100, 10, and 1-year frequency storms as directed in the NYSSMDM.
3. Topographical mapping is taken from a survey title "Alta/NSPS Land Title Survey prepared for Dolsontown Road Section 6 Block 1 Lot 107 & 90.1", Prepared by John W. McCord Sr. Dated September 2, 2021, Revised November 16, 2021; and supplemented with best available mapping.
4. The required water quality volume (WQv) was calculated in accordance with the Section 4.2 and chapter 9 of the NYSSMDM. This is also the required RRv as per Section 4.3 of the NYSSMDM.
5. The provided RRv was calculated with the Green Infrastructure (GI) Worksheets, Version 1.6, provided by NYSDEC. The worksheets are included in ***Appendix 3***.
6. As this project is defined as new development (increase in impervious area), the study shows mitigation of the proposed impervious areas as required per the NYSSMDM.

7. The peak flows from the watersheds in the existing condition are computed using the runoff curve numbers taken from TR-55 to determine undeveloped peak runoff and runoff hydrographs at the design points. The existing peak flows are presented in the report.
8. In the post-development condition, the peak flows from the proposed development are computed using the runoff curve numbers taken from TR-55. The watersheds are adjusted for the proposed improvements and grading of the site. The runoff flows are hydraulically routed for updated travel times, diversions, and new storage structures, as necessary. The resulting proposed peak flows at the design point are presented in the report.
9. Erosion and sediment control plans and details have been included with the site plans. A full Erosion & Sediment Control Plan (plans and construction sequencing) designed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (aka the "bluebook") has been included in ***Appendix 15*** of this document.
10. Maps indicating the various drainage conditions are enclosed in this report. Schematic diagrams of the flow models in the existing and proposed conditions are included in the HydroCAD output within the ***Appendix 2***.
11. A draft Notice of Intent (NOI) for GP-0-20-001 has been included within the ***Appendix*** of this report. The final complete NOI will be submitted with the Final SWPPP and site plans.

DISCUSSION

Discussion of Design Points

The Project has one (1) design point, the design point was studied to mitigate for stormwater peak flow and provided the required water quality requirements at the design point. The design point and drainage areas were limited, wherever possible to the area of proposed project site. The design point evaluated in this report is described as follows:

Design Point 1 is located at eastern property line where the Monhagen Brook leaves the site. The Monhagen Brook bisects the site and generally flows in a west to east direction. The Brook received runoff from the north and south sides of the site.

The Design Point locations, the pre- and post-development land use, travel times flow paths, and watersheds are clearly identified on the watershed maps found in the ***Appendix*** of this report. The pre-development (hereafter "existing") and post-development (hereafter "proposed") watershed characteristics can be found in Table 1 below.

Table 1: Watershed Characteristics

Existing Conditions			
WS Name	**Area**	**CN**	**Tc (min)**
WS E1A	25.950	75	24.3
WS E1B	45.243	77	24.9
Totals	71.193	-	-
Proposed Conditions			
WS Name	**Area**	**CN**	**Tc**
WS 1A	25.950	75	24.3
WS 1B	24.606	76	17.1
WS 2	2.203	92	6.0
WS 3	3.543	87	18.4
WS 4	2.778	89	8.9
WS 5	3.902	94	6.0
WS 6	8.211	92	16.7
Totals	71.193		-

Soil Types

Soil data for this project was obtained from the NRCS Web Soil Survey (WSS) as operated by the USDA Natural Resources Conservation Service (NRCS) (See ***Appendix 8***)

Six (6) soil designations are identified within the project site. The project site soils include Erie gravelly silt loam, 0 to 3 percent slopes (ErA), Erie gravelly silt loam, 3 to 8 percent slopes (ErB), Mardin Gravelly Silt Loam 3 to 8 percent slopes (MdB), Mardin Gravelly Silt Loam 8 to 15 percent slopes (MdC), Rhinebeck silt loam, onto 3 precent slopes (RbA), and Wayland soils complex (Wd). A further detailed description of the soil characteristics and properties can be found in ***Appendix 8*** of this report**.**

Hydrologic Soil Group (HSG)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four (4) groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long duration storms. The soils in the United States are assigned to four groups (A, B, C and D) and three dual classes (A/D, B/D and C/D). Conservatively dual class soil groups are considered “D” soils.

Table 2: Hydrologic soil groups

HSG	Soil (abbreviation)
D	ErA
D	ErB
D	MdB
D	MdC
C/D	RbA
B/D	Wd

Soil Boring and Infiltration Testing

Preliminary project specific soil testing has been conducted for the site. During this testing, the site soils were determined to not be suitable for infiltration. Therefore Bioretention basins with under drains have been proposed to provided runoff reduction, water quality treatment, treatment of Hot spot runoff and Peak detention. The full Geotechnical report has been included as an appendix.

HOTSPOT RUNOFF

As defined in section 4.11 of the NYSSWDM, stormwater “hotspots” are land uses and activities that generate higher concentration of hydrocarbons, trace metals or toxicants that are found in typical stormwater runoff. The loading docks and trailer storage/parking areas would fall under the definition of a hotspot.

To meet the design criteria for hot spot runoff, pretreatment is provided using swirl chambers designed to separate floatable and contaminants, and runoff has been treated using bioretention areas approved for hotspot runoff treatment by the DEC.

Zero-Net Increase:

The proposed storm water improvements for the site provide the required channel protection (CPv), overbank flood protection (Qp), and extreme flood protection (Qf). Peak flows have been reduced at the selected design point in the proposed condition for the 100, 10, and 1-year storms. These peak flow reductions can also be found in Table 3 below.

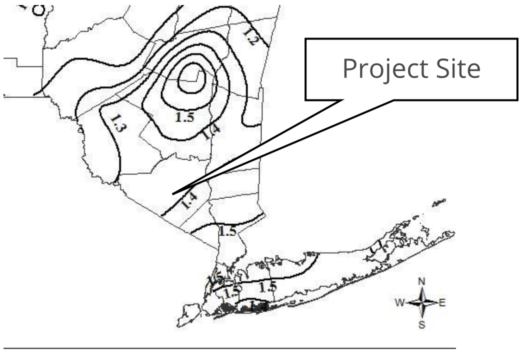
Table 3: Existing and Proposed Peak Flow Summary

	Storm Events	Existing	Proposed	Diff.	Percent
DP 1	1	37.93	30.06	-7.87	-20.75%
	10	117.60	114.66	-2.94	-2.50%
	100	276.10	274.81	-1.29	-0.47%

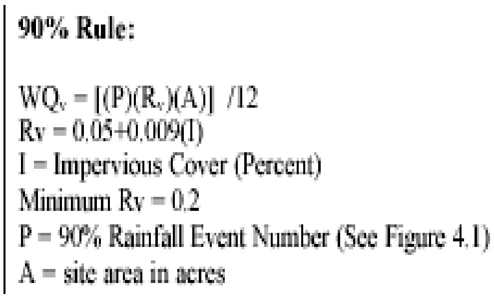
As is evident in the table below, attenuation of the peak flows by diversion, and stylization of SMP's with RRv capacity and site planning have effectively reduced or maintained the peak discharge with providing the required water quality, which will be further discussed below.

Water Quality Volume (WQv):

The Water Quality Volume (WQv) is designed to improve water quality. The design captures and treats 90% of the average annual stormwater runoff volume. The WQv is directly related to the impervious cover created at a site. The 90% rainfall event value (P) used in the calculations (1.40") is shown below in the portion of Figure 4.1 from Section 4.2, page 4-3 in the NYSSMDM.



Project Site



90% Rule:

$WQ_v = [(P)(R_v)(A)]\ /12$
$Rv = 0.05+0.009(I)$
I = Impervious Cover (Percent)
Minimum Rv = 0.2
P = 90% Rainfall Event Number (See Figure 4.1)
A = site area in acres

Colliers Engineering & Design determined the impervious area for each watershed in the proposed condition. The Runoff Coefficient "Rv" in the computation of Water Quality Volume WQv is dependent on the percent impervious cover. As per Section 4.2 of the NYSSMDM, 100% of the water quality volume shall be treated.

Table 4: Required Water Quality Calculation

Watershed	Area (A) Acres	90% Rainfall Event Number (P) Inches	Impervious Area treated Acres	Percent Impervious (I) %	Runoff Coefficient Rv	Required WQv Cf	Provided WQv Cf
WS 2	2.20	1.40	1.44	65%	.64	7,145	7,145
WS 3	3.54	1.40	1.51	43%	.43	7,807	7,807
WS 4	2.78	1.40	1.42	51%	.51	7,201	7,201
WS 5	3.90	1.40	3.08	79%	.76	15,060	15,060
WS 6	8.21	1.40	5.61	68%	.66	27,745	27,745

The total required water quality volume per NYSDEC standards is based on the proposed increase in impervious area of 13.05 acres, is 64,958 or 1.491 Ac-ft. As shown in Table 4 above, the current design provides the required Water quality volume. The above table also has not accounted for the water quality volume provided by the pretreatment practices upstream of the SMPs. Therefore, the proposed design exceeds the water quality requirements.

Runoff Reduction Volume

The runoff reduction volume (RRv) is designed to reduce the stormwater volume leaving the site by capturing an amount equal to the computed water quality volume and infiltrating it onsite. However, for sites that cannot reduce runoff in the amount equal to the water quality volume, a minimum RRv is allowed if the project demonstrates acceptable limitations. The minimum RRv requirement (in acre-feet) was calculated as follows:

$RRv_{min} = [(P)(\overline{R}v)(S)(Aic)]/12$ where,
I = Percent Impervious Cover (must be 100%)
P = 90% rainfall event = 1.4
$\overline{R}v = 0.05 + [(0.009)(I)] = 0.95$
S = Hydrologic Soil Group Reduction Factor = 0.20 (100% HSG D)
Aic = Total Area of new impervious cover (acres) = 13.05

$$RRv_{min} = \frac{[(P)(\overline{R}v)(S)(Aic)]}{12} = \frac{[(1.4)(0.95)(0.20)(13.05)]}{12} = 0.29 \text{ Acre-ft} = 12{,}600 \text{ ft}^3$$

Runoff from the impervious area has been treated by bioretention basins with underdrains. Within these proposed practices, the entire WQv has not been reduced using standard SMPs with RRv capacity. The RRv and for each proposed practice is included in Table 4 below. Calculations are provided in ***Appendix 3***.

Table 5 –RRv Volumes Provided

Watershed	Treatment Practice	RRv Provided (CF.)
WS 2	Bioretention Basin (F-5)	3,161
WS 3	Bioretention Basin (F-5)	3,295
WS 4	Bioretention Basin (F-5)	3,432
WS 5	Bioretention Basin (F-5)	6,039
WS 6	Bioretention Basin (F-5)	11,210

The proposed development requires a minimum runoff reduction of 12,600 cf (0.29 Ac-Ft) be reduced and total water quality be treated for the proposed improvements. The proposed design exceeds the minimum requirement, providing an RRv of 27,137 cf (0.62 Ac-ft) and meets the requirement set forth by the NYSDEC requirements. This aspect of the design has been met.

Runoff Reduction Volume (RRv) through Site Planning:

The application of site planning and green infrastructure to reduce water quality volume with runoff reduction practices can either reduce the required water quality volume to be treated; or can completely account for the required water quality volume. The summary of this analysis can be found below. The combination of practices provided on site exceeds the minimum required water quality and runoff reduction for the proposed development.

The basic premise of runoff reduction is to recognize the water quality benefits of certain practices by allowing for a reduction in the water quality treatment volume. Runoff reduction is first achieved through better site design during the planning stages and has been implemented in the planning and design of this project as described in this report.

In accordance with Section 5.2 "Planning for Green Infrastructure: Reduction of Impervious Cover" of the NYSDEC Stormwater Management Design Manual, the proposed site plan has been designed to meet the planning techniques as follows:

Table 6: Green Infrastructure Site Planning

Preservation of undisturbed Areas	
Delineate and place into permanent conservation undisturbed forests, native vegetated areas, riparian corridors, wetlands, and natural terrain.	Not applicable for this project. Existing onsite easements limit the ability to utilize this practice.
Preservations of Buffers	
Define, delineate and preserve naturally vegetated buffers along perennial streams, rivers, shorelines and wetlands.	The site development was limited to the norther portion of the site, away from the existing wetlands. The proposed limit of disturbance provides a minimum +/-30 ‘ buffer around these wetlands.
Reduction of Clearing & Grading	
Limit clearing and grading to the minimum amount needed for roads, driveways, foundations, utilities and stormwater management facilities.	The clearing limit was minimized using maximum allowable slopes and retaining walls to meet grade where applicable.
Locating Development in Less Sensitive Areas	
Avoid sensitive resource areas such as floodplains, steep slopes, erodible soils,	The project was designed to avoid the most sensitive areas on site such as the wetlands to

wetlands, mature forests and critical habitats by locating development to fit the terrain in areas that will create the least impact.	the south. Most of the development is proposed within a cleared meadow
Open Space Design	
Use clustering, conservation design or open space design to reduce impervious cover, preserve more open space and protect water resources.	Not applicable for this project.
Soil Restoration	
Restore the original properties and porosity of the soil by deep till and amendment with compost to reduce the generation of runoff and enhance the runoff reduction performance of post construction practices.	Compacted soils located in open areas without shallow existing utilities will be tilled in order to restore the original properties of the soil prior to seeding. (*see* ***Appendix 11***)
Roadway Reduction	
Minimize roadway widths and lengths to reduce site impervious area.	Roadway widths were reduced wherever possible to meet the end users needs and for emergency vehicle access. The proposed buildings utilize a combined driveway and access onto Dolsontown Road
Sidewalk Reduction	
Minimize sidewalk lengths and widths to reduce site impervious area.	Sidewalks added where needed to adequately and safely serve the pedestrian needs of the facility.
Driveway Reduction	
Minimize driveway lengths and widths to reduce site impervious area.	The proposed driveways have been minimized wherever possible. A shared driveway is proposed for the 2 warehouse buildings.
Cul-de-Sac Reduction	
Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.	N/A no Cul-de-Sacs are proposed.
Building Footprint Reduction	
Reduce the impervious footprint of residences and commercial buildings by using alternate or taller buildings while maintaining the same floor to area ratio.	The building were designed to meet the potential end user’s needs.
Parking Reduction	

Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.	The parking spaces were limited to what is required by local municipal code and the end users needs.

Green Infrastructure Techniques (GITs):

After considering the reductions through Site Planning mentioned above, RRv remains to be treated through GITs and/or Standard SMPs. Chapter 5 of the NYSSMDM outlines the various Green Infrastructure Techniques which can be implemented on-site to achieve runoff reduction. The GI Worksheets included in the ***Appendix*** of this report provide the calculations for the Green Infrastructure Techniques chosen to treat the Runoff Reduction Volume for this project. Below is a brief description of each Green Infrastructure Technique along with a discussion regarding the feasibility of each technique with respect to this project.

Table 7: Green Infrastructure Feasibility

<table>
<tr><th colspan="2">Conservation of Natural Areas</th></tr>
<tr><td>Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas, stream and wetland buffers by restoring and/or permanently conserving these areas on a site.</td><td>The project was designed to avoid the most sensitive areas on site such as the southern wetlands.</td></tr>
<tr><th colspan="2">Sheetflow to Riparian Buffers or Filter Strips</th></tr>
<tr><td>Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from some areas of a development project.</td><td>The wetland and vegetated areas onsite are located downhill of the proposed development and will act as a buffer although the Water quality benefits have not been quantified.</td></tr>
<tr><th colspan="2">Vegetated Open Swale</th></tr>
<tr><td>The natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration.</td><td>Vegetated open swales were used on the norther side of the buildings to divert runoff around the site, towards the design point.</td></tr>
<tr><th colspan="2">Tree Planting/Tree Box</th></tr>
<tr><td>Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, conservation areas and erosion and sediment control.</td><td>Tree planting has been proposed through the site but has not been quantified as a stormwater mitigation.</td></tr>
<tr><th colspan="2">Disconnection of Rooftop Runoff</th></tr>
<tr><td>Direct runoff from residential rooftop areas and upland overland runoff flow to designated</td><td>Based on the size of the proposed buildings, this practice is not applicable for this project.</td></tr>
</table>

pervious areas to reduce runoff volumes and rates.	Rooftop runoff has been directed to the bioretention basins for treatment.
Stream Daylighting for Redevelopment Projects	
Stream Daylight previously-culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads.	This strategy is not applicable to the project.
Rain Garden	
Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression.	There are a few green locations proposed throughout the development but rain gardens have not been proposed on site.
Green Roof	
Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system.	The structural design of the proposed buildings do not allow for this technique.
Stormwater Planter	
Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve quality.	Landscaping in green areas and planted beds are proposed throughout the development, but planters have not been proposed for treatment. No credit has been taken in the SWPPP.
Rain Tank or Cistern	
Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities.	This practice has not been used for the proposed development.
Porous Pavement	
Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils.	Based on the types of vehicles to be used on the project site after construction and the need to control hot spot runoff, this pratices has not yet been utilized.

The bioretention basins account for the runoff reduction as required. **The site has been designed to meet the required water quality requirements without accounting for the pretreatment volume tributary to the proposed basins.**

Soil restoration efforts, including mechanical decompaction and compost amendment in accordance with Section 5.1.6 and Table 5.3 of the NYSSMDM, are proposed for areas to be disturbed for improvements that will not be impervious at final buildout.

Refer to Tables 6 and 7 above for the decision-making matrices utilized here. The design for the project utilized a standard SMPs with RRv capacity to attain the required minimum runoff reduction volume and water quality for new construction and redevelopment, respectively. NYSDEC Green Infrastructure (GI) worksheets can be found in the ***Appendix 3*** summarizing calculations.

Bioretention Basins with Underdrain (No Infiltration):

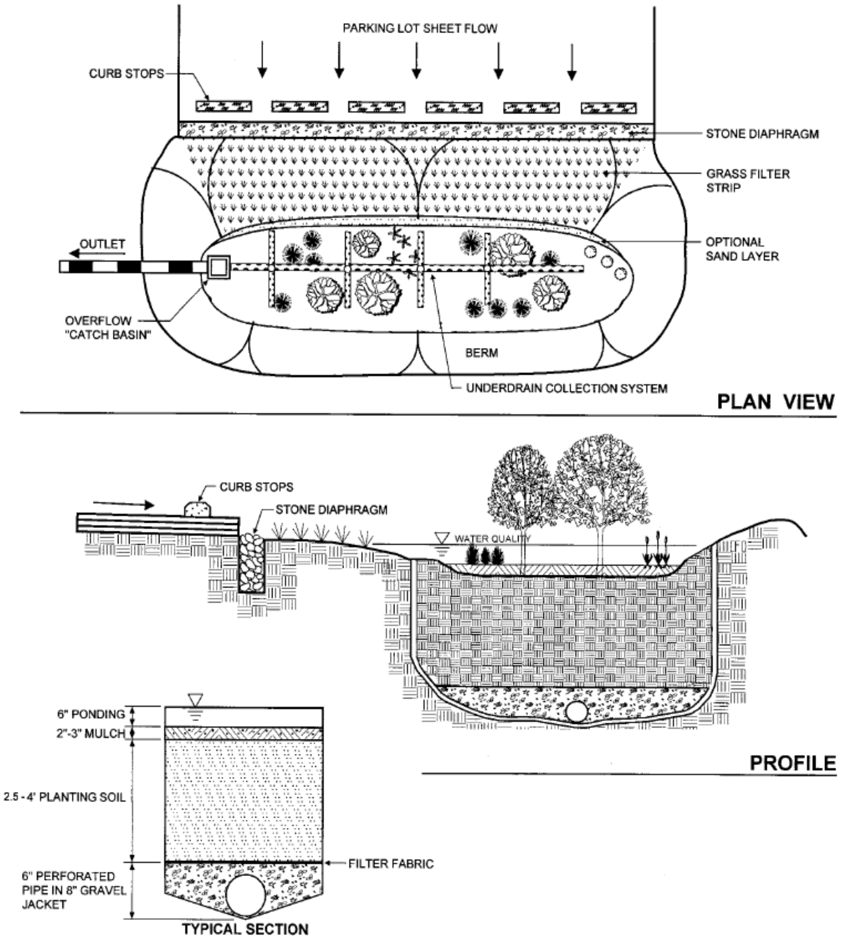
The proposed development causes an increase in impervious cover. As such the runoff must be mitigated for water quality. One of the SMP utilized for the proposed development is the use of bioretention with a proposed underdrain (F-5). Runoff from the development is proposed to be routed to a bioretention basin to provide runoff reduction capacity as well as water quality treatment volume. The basins are proposed with a 3-inch mulch layer, 2.5 feet of soil media, and an 8-inch drainage layer with a 6-inch underdrain which ultimately connects to an outlet control structure and discharges downstream to provide WQv. Bioretention soils shall meet the design criteria outlined in ***Appendix H*** of the NYSSMDM; soil deep ripping and de-compaction shall be in accordance with the NYSDEC guidelines found in the ***Appendix***.

The sizing calculation for the bioretention system was completed in accordance with design requirements set forth in Section 6.4.4 of the NYSSMDM. An exception to the design is that grass filter strips have not been provided in all locations for pre-treatment of the sheet flow from the paved areas. Frequent observance of scour and destruction of existing bioretention areas have led the design to include properly sized riprap inlet protection at all curb cuts and proper scour protection for discharging pipes. Additionally, one of the proposed bioretention areas (P-1A) are designed to treat the “hotspot” portions of the site and are therefore not allowed to infiltrate prior to treatment.

Although the intent of the design requires grass filter strips, Colliers Engineering & Design believes longevity of the system design and maintenance of the mulch layer and vegetation will adequately treat the runoff from the proposed development and this design alteration will meet the long-term goals of the permit.

The stage/storage information of the bioretention areas can be found in the HydroCAD output within the ***Appendix*** of this report. The NYSDEC GI worksheet for runoff reduction and water quality treatment can be found in the ***Appendix*** for RRv capacity calculations (See NYSDEC GI worksheet). A summary of the water quality provided in these facilities can be found in Table 4.

Figure 6.19 Bioretention (F-5)



Hydrodynamic Separator (Swirl Chamber):

The applicant proposes to install a hydrodynamic separator to provide water quality pre-treatment and hotspot treatment as part of the "treatment train" upstream of the standard mitigation practices with Runoff reduction capacity. Hydrodynamic separators are devices that move water in a circular, centrifugal manner to accelerate the separation and deposition of primarily sediment from the water. They are suitable for removal of coarse particles, oils, and fuels over small drainage areas. The NYSDEC refers to the New Jersey Department of Environmental Protection for a list of Stormwater Manufactured Treatment Devices which have received Interim Certification (included in the Appendix). One of the products on the list is the Hydro International First Defense unit.

Sizing of the First Defense system (an alternative stormwater practice) requires the application of a "rate-based" sizing approach for water quality treatment. In the "rate-based" approach, the device should be sized to treat the peak rate of runoff from the WQv storm; utilizing the WQv storm precipitation depth, the peak runoff for each tributary area can then be determined, and the associated devices sized appropriately. HydroCAD was used to determine the water quality flow rate for treatment sizing of the First Defense system. The table below lists the water quality storm event, its associated flowrate for the treatment structure, the tributary catchments, and the appropriately sized First Defense system capacity which provides in excess of the required flow, for the location shown on the plans

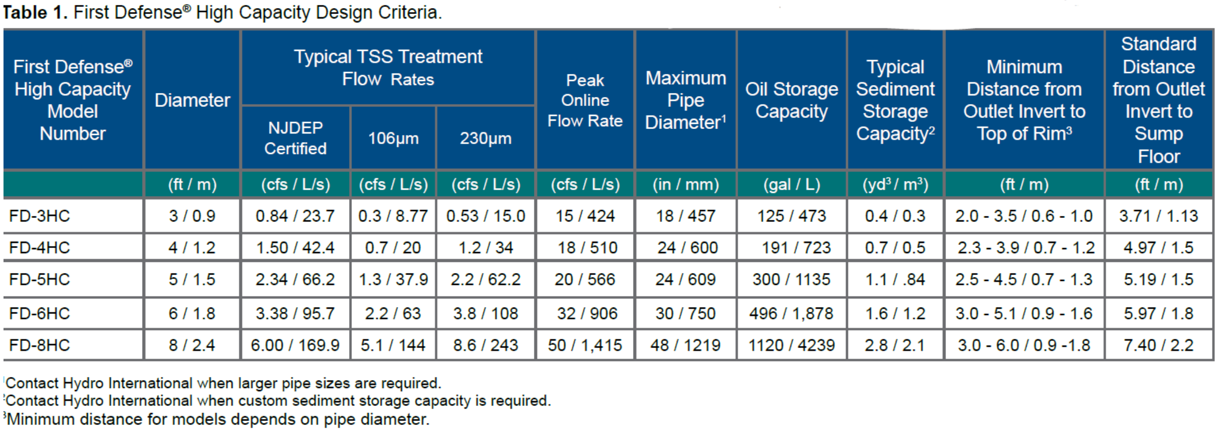


Table 1. First Defense® High Capacity Design Criteria.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates			Peak Online Flow Rate	Maximum Pipe Diameter[1]	Oil Storage Capacity	Typical Sediment Storage Capacity[2]	Minimum Distance from Outlet Invert to Top of Rim[3]	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified	106µm	230µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd^3 / m^3)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	0.3 / 8.77	0.53 / 15.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	0.7 / 20	1.2 / 34	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC	5 / 1.5	2.34 / 66.2	1.3 / 37.9	2.2 / 62.2	20 / 566	24 / 609	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	2.2 / 63	3.8 / 108	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6.00 / 169.9	5.1 / 144	8.6 / 243	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 -1.8	7.40 / 2.2

[1] Contact Hydro International when larger pipe sizes are required.
[2] Contact Hydro International when custom sediment storage capacity is required.
[3] Minimum distance for models depends on pipe diameter.

The First Defense treatment system has the capacity of bypassing high flow rates internally as well as controlling flow through the treatment chamber so as to avoid wash-out of previously captured pollutants. The HydroCAD output can be found in the Appendix of this report. Specifications for the First Defense Systems can also be found in the appendix of this report along with certification from NYSDEC that it is an accepted proprietary device. The NJCAT testing certification is also included within the Appendix.

Table 8: Swirl Chamber Sizing Calculations

Proposed First Defense System	90% Rainfall Event Number (P) Inches	Tributary Catchment Areas (WS-#)	Required Water Quality Flow, cfs	Hydro International First Defense Model	Treatment Capacity, cfs
S-38 (5' DIA)	1.40	WS-2*	1.85*	FD-5HC	2.34
S-88 (5' DIA)		WS-2*	1.85*	FD-5HC	2.34
S-89 (4' DIA)		WS-3	1.28	FD-4HC	1.50
S-91 (5' DIA)		WS-4*	1.60*	FD-5HC	2.34
S-90 (5' DIA)		WS-4*	1.60*	FD-5HC	2.34

Proposed First Defense System	90% Rainfall Event Number (P) Inches	Tributary Catchment Areas (WS-#)	Required Water Quality Flow, cfs	Hydro International First Defense Model	Treatment Capacity, cfs
S-84 (8' DIA)	1.40	WS-5	3.87	FD-8HC	6.0
S-83 (8' DIA)		WS-6	5.01	FD-8HC	6.0

*Watershed discharges into the basin at 2 separate locations, requiring 2 separate pretreatment units. The required water quality flow provided is for the entire watershed. Therefore, the units have been oversized.

Stormwater Conveyance & Pipe Capacity

The storm pipes and structures were designed to convey flows from the 25-year storm event per New York State standards. Drainage areas to each drainage structures were delineated, and the land uses within the drainage area were calculated. The design information, along with the proposed pipe sizes, material, slopes and inlet capacities were entered into the HydroFlow Storm sewer program to analyze the capacity of the storm conveyance system. It should be noted that this program uses the rational method for calculation while the HydroCAD program uses TR-55. The program output and pipe flows can be found within the Appendix of this report.

EROSION & SEDIMENT CONTROL

General Erosion Control Plan:

Construction operations shall be carried out in such a manner that erosion will be controlled and sediment migration minimized. Federal, State, and Local laws concerning pollution reduction will be followed. The control practices indicated on attached Erosion & Sediment Control Plans shall be installed and used on this project.

In the event control practices not contained within the attached Erosion & Sediment Control Plans are required due to unforeseen/unknown existing conditions this SWPPP document contains applicable Erosion and Sediment Control details in ***Appendix 15*** as a reference. Details in ***Appendix 15*** are considered, as needed, and are not part of the construction documents for bidding purposes.

The list of measures and practices below are contained on the attached Erosion and Sediment Control Plans and shall be installed and maintained per the most current edition of the New York Standard Specifications for Erosion and Sediment Control Handbook. All erosion control measures implemented shall be in accordance with the construction sequence schedule as described in later in this section of the report.

303(d) Segments Impaired by Construction related pollutants

As stated earlier in this report, the site design point discharges to a tributary of the Monhagen Brook, a waterbody listed on the 303(d) list within the general permit. As such, the following requirements will need to be met during construction.

- 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 of GP-0-20-001, 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.
- 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 of GP-0-20-001, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days

Five (5) Acres or Greater of Disturbance

Due to the size of the proposed development, construction cannot be staged in such a way to limit soil disturbance below 5-acres at one time. It is understood by the applicant as well as the design engineer that this project will require a waiver of this 5-acre limit. To obtain this waiver, permission must first be granted from the local MS4 and NYSDEC. After these agencies authorize the disturbance, the project must comply with the following requirements:

A. The owner or operator shall have a qualified inspector conduct at least two (2) site inspections in accordance with Part IV.C of the GP-0-020-001 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 2016.

C. The owner, operator or contractor 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.

Temporary Measures

- *Silt Fence* – Silt fence shall be placed at a minimum along the toe of all fill areas or any location where surface sheet flow could be expected in accordance with temporary soil erosion and sediment control plans serving to reduce runoff velocity and effect deposition of transported sediment load. Where silt fence ends, the end shall turn and run perpendicular to contours for a length of ten (10) feet, or for a difference in elevation of two (2) feet, whichever comes first.

- *Mulching* – Mulching of all disturbed surfaces will be mandatory. Hydroseeding with mulch only mixes will be the preferred method.
- *Stabilized Construction Access* - A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction access is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

The access shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately. When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

- *Concrete Washout Station* - A temporary concrete washout station is to be used near the entrance to the site. The station will have a depth of 24 inches and shall be a minimum of 10 feet by 10 feet. Station shall be lined with a 10mil waterproof plastic membrane. Tools or equipment that were used for concrete work will be cleaned here before leaving the site.

Permanent Measures

- *Topsoil, Seed & Mulch* – Final vegetative stabilization shall be used at all locations where the ground has been disturbed and impervious covers are not specified. Mulch shall be applied with, or immediately after seeding.
- *Rock outlet protection*- Stone riprap is to be placed at the outlet end of the culverts beneath the flared end section to slow down the flow of the runoff and reduce erosion.

Maintenance and Inspection of Measures

All temporary and permanent soil erosion and sediment measures shall be maintained by the contractor during the life of the project. The contractor shall have a *trained contractor,* as defined in the GP-0-20-001 (See ***Appendix 4***), on site at all times. The *trained contractor* shall be responsible for the day-to-day construction and maintenance of all erosion and sediment control measures.

All temporary measures (silt fence, inlet protection, etc.) and permanent measures (landscaping) shall be inspected by the *Qualified Inspector* every seven (7) calendar days. The *Qualified Inspector* role and inspection requirements are outlined in Part IV.C of the GP-0-20-001 (See ***Appendix 4***). All inspections are required to be completed within one calendar day. Any comments, suggestions or corrective actions the *Qualified Inspector* notes shall be addressed by the contractor within 24 hours of the inspection.

General Enhanced Erosion and Sediment Control Plan:

- Enlarged sediment ponds or sediment storage traps utilizing the maximum practical area in excess of the minimum amount recommended in the Bluebook
- Apply slope protection measures within 3 days after earthmoving on a particular slope is complete.
- Install reinforced silt fences with hay bale or silt sock backing along wetlands or other sensitive areas.
- Install bonded fiber matrix hydraulically applied mulch as temporary stabilization (hay/straw mulch and unbonded hydraulically applied mulches are not acceptable)
- Install flexible growth medium with seed, soil amendment, and fertilizer to seek final stabilization
- Perform equipment (cat) tracking for bare slopes to be protected. (See page 4.56 of the Bluebook)
- Install slope crest protection (perimeter dike/swale) measures to divert flow from going down the newly graded slope. (See page 3.36 of the Bluebook)
- Install pipe slope drains. (See page 3.37 of the Bluebook) Install reverse slope bench on the long slopes to convey water to a stable outlet. (See page 4.24 of the Bluebook)
- Install Geosynthetic Turf Reinforcement Mats available from Profile Products or equal on the embankments of sediment basins; immediately following construction. (See pages 5.19 to 5.41 of the Bluebook)
- Install Geosynthetic Turf Reinforcement Mats available from Profile Products or equal in temporary diversion ditches within two days of construction to stabilize the ditch.
- Install floating water skimmers connected to the outlet riser pipe in sedimentation ponds (See attached diagrams)
- Install sediment filter bags on the downstream end of the outlet pipe. (See page 5.16 of the Bluebook)
- Design sedimentation pond to maximize the sediment residence time. (See pages 5.19 to 5.41 of the Bluebook)
- Address the disposal or storage of sediment cleaned from sediment control devices, sediment ponds, ditches, and drainage inlets.
- Stabilize construction access roads with crushed stone, item 4, etc.
- Assign a dedicated and trained crew to maintain and repair erosion and sediment control measures daily.
- Install hydroseed & erosion control matting on all disturbed slopes 3H:1V or steeper
- Follow NYSDEC guidelines which limit the maximum soil disturbance area to 18 acres at any given time (or 5 acres max for projects not seeking 5-acre disturbance waiver). Temporary stabilization must be utilized in inactive areas to manage the amount of active open soil disturbance.

Construction Sequence:

The construction sequence for the proposed development will be as follows:

- Install construction entrance.
- Stake limits of disturbance and orange construction fence for wetland protection.
- Install perimeter silt fencing on downhill areas as shown on plan.
- Install sediment ponds. Install temporary swales to direct all open soil area disturbance to sediment ponds, as necessary. Locations and size of the erosions and sediment control practices are noted on the plan. these may vary depending on the contractor's schedule and approach but 3,600 cf of storage must be provided at a minimum per acre of upstream disturbance. Sediment traps shall be installed in accordance with the plans and details. Sediment traps and basins shall be sized in accordance with the New York standards and specifications for erosion and sediment control manual.
- Sediment Pond Restoration: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of. Sediment can be disposed of by exporting it off site for disposal or be used as fill in lawn areas. Sediment ponds in future open space or lawn areas may be pumped dry, graded, and backfilled. Sediment ponds in paved or structural areas must have the basin material and trapped sediments removed, safely disposed of, and backfilled with structural fill. Sediment ponds in locations of future stormwater ponds must have the trapped sediment removed leaving the basin area open for the development of the final stormwater pond.
- Rough grade proposed driveway/road.
- Disturbed soils shall be temporarily stabilized as soon as practical. Materials stored in stockpiles shall be cordoned off with silt fence per the appropriate specifications and details. The operator shall initiate stabilization measures as soon as practical in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than (14) days after the construction activity in that portion of the site has temporarily or permanently ceased.
- Construct roads, drives, buildings, parking areas and install drainage systems.
- Topsoil/hay/seed lawn areas.
- The project site must meet final stabilization criteria prior to removing all erosion and sediment control devices and closing out the project. Litter and construction debris shall be removed as practical throughout the life of the project.

    - *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 riprap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

- Upon final stabilization being met, the Contractor shall clear drainage pipes and structures of any sediment which may have accumulated. Additional erosion control measures shall be installed, as may be necessary, required and/or requested by authorities, to prevent the incidental discharge of silt laden runoff from entering a water course or a drainage system.

The general permit for stormwater discharges from construction activities states that it is unlawful for any person to cause or contribute to a violation of water quality standards.

- Additional erosion control measures shall be installed, as may be necessary, required and/or requested by authorities, to prevent the incidental discharge of silt laden runoff from entering a water course or a drainage system. The general permit for stormwater discharges from construction activities states that it is unlawful for any person to cause or contribute to a violation of water quality standards.

For additional, general Erosion and Sediment Control notes including seeding, please refer to the Erosion and Sediment Control Plans.

Good Housekeeping

Good housekeeping practices are inexpensive, relatively easy to implement and are often effective in preventing stormwater contamination. Specific activities that should be completed by the contractor are listed below:

Spill Inventory

The materials or substances listed below are expected to be present on-site during construction:

- Concrete
- Fertilizers
- Piping
- Paints (enamel & latex)
- Treated and non-treated wood
- Seed
- Tar
- Petroleum-based products
- Reinforcing steel
- Cleaning solvents
- Masonry block
- Paving materials

Material Management Practices

The following are the material management practices that shall be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff:

- Products shall be kept in original containers unless they are not resealable.
- Original labels and material safety data sheets (MSDS) shall be retained; they contain important product information.
- An effort shall be made to store only enough products required to do the job.
- All materials stored onsite shall be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure and/or on non-porous blacktop.

- Products shall be kept in their original containers with the original manufacturer's label.
- Substances shall not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all a product shall be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal shall be followed.
- The contractor's site superintendent shall inspect daily to ensure proper use and disposal of materials on site.

Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices shall be followed for spill prevention and cleanup.

- Spills, of any size, of toxic or hazardous material and/or petroleum products shall be reported to the NYSDEC and Central Hudson's Environmental Affairs division.
- Manufacturer's recommended methods for spill cleanup shall be clearly posted and site personnel shall be made aware of the procedures and the locations of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup shall be kept in the material storage area onsite. Equipment and materials shall include but not be limited to brooms, dust pans, mops, rags, gloves, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills shall be cleaned up immediately after discovery.
- The spill area shall be kept well ventilated, and personnel shall wear appropriate PPE to prevent injury from contact with a hazardous substance.
- The spill prevention plan shall be adjusted to include measures to prevent toxic or hazardous material of spills from recurring and how to clean up the spill. A description of the spill, what caused it, and the cleanup measures shall also be included.

The contractor's site superintendent is responsible for the day-to-day site operations and shall be the spill prevention and cleanup coordinator.

Product Specific Practices

The following product specific practices shall be followed onsite.

- Petroleum Products – All onsite vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products shall be stored in tightly sealed containers that are clearly labeled. Any asphalt substances used on site shall be applied according to manufacturer's recommendations.
- Fertilizers – Fertilizers shall be applied only in the minimum amounts recommended by the manufacturer. Use only fertilizers that have five (5) or less parts phosphorous. Once applied, fertilizers shall be worked into the soil to limit exposure to stormwater. Storage shall be in a covered shed. The contents of any partially used bags of fertilizer shall be transferred to a sealable plastic bin to avoid spills.
- Paints – All containers shall be tightly sealed and stored when not required for use. Excess paint shall not be discharged to the storm sewer system but shall be properly disposed of according to the manufacturer's instructions or state and local regulations.

- Concrete Trucks – Concrete trucks shall not be allowed to wash out or discharge surplus concrete or drum wash water on the site, unless in approved clean-out areas.
- Waste Disposal – All waste materials shall be collected and stored in a securely lidded metal dumpster rented from a licensed solid waste management company. The dumpster shall meet all local and any State solid waste management regulations. All trash and construction debris from the site shall be deposited in the dumpster. The dumpster shall be emptied as necessary, and the trash shall be hauled to a NYSDEC permitted landfill. No construction waste materials shall be buried onsite. All personnel shall be instructed regarding the correct procedure for waste disposal.
- Hazardous Waste – All hazardous waste materials shall be disposed of in a manner specified by local or State regulations or the manufacturer. Site personnel shall be instructed in these practices.
- Sanitary Waste – All sanitary waste shall be collected from the portable units by a licensed sanitary waste management contractor, as required by local regulation and as required to protect public health and safety.
- Recyclable Waste – All recyclable waste (cardboard, wood, etc.) shall be collected and recycled on a weekly schedule.

Responsible Parties

Implementation of SWPPP

The owner/operator is responsible for implementing the provisions of the SWPPP and ensuring that the appropriate contractors and subcontractors on the site provide certification in accordance with the provisions of the GP-0-20-001.

The owner/operator is also responsible to have a *Trained Contractor* and *Qualified Inspector* inspect the active construction site in accordance with section 6.3 of this report and all provisions for inspections defined in the GP-0-20-001, (See ***Appendix 10)*** A *Trained Contractor* cannot conduct *Qualified Inspector* site inspections unless they meet the *Qualified Inspector* qualifications listed in appendices of the GP-0-20-001.

Inspection Requirements

The owner/operator is responsible for implementing inspections of all erosion and sediment control measures. To do so, the owner/operator shall have a *Qualified Inspector* inspect the site in accordance with the guidelines of Part IV of the GP-0-20-001. A sample inspection template is provided in this document (See ***Appendix 9***).

The owner/operator shall maintain a record of all inspection reports in a site logbook. The site logbook shall be kept on site and be made available to the permitting authority upon request. The owner/operator shall also retain a copy of this SWPPP document at the construction site during the life of the project.

End of Project – Termination of Permit

Final Inspection

Prior to filing the Notice of Termination (NOT), or at the end of permit term, the owner/operator shall have a Qualified Inspector perform a final site inspection. The inspector shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods. Final stabilization means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of 80% has been established on all unpaved areas and areas not covered by permanent structures.

Notice of Termination (NOT)

When the site has been finally stabilized, the owner/operator must submit a Notice of Termination (NOT) form to terminate coverage under SPDES General Permit GP-0-20-001. The permittee must identify all the permanent stormwater management structures that have been constructed. In addition, a manual describing the operation and maintenance practices that will be necessary for the structures(s) to function as designed after the site is stabilized must be developed and in place. The permittee must also certify that the permanent structure(s) have been constructed in conformance with this document. A copy of the NOT is provided in this document (see ***Appendix 6***).

Record Keeping

The owner/operator shall retain copies of SWPPP, any reports submitted in conjunction with this permit, and records of all data used to complete the NOI & NOT for a period of at least five (5) years from the date that the site is finally stabilized.

SUMMARY OF PROPOSED STORMWATER IMPROVEMENTS

The proposed project falls under the New York State definition of new development requiring coverage under the General permit. The site runoff has been attenuated for peak flows in the peak design storms. The proposed development has been designed to treat the required water quality through SMP's with RRv capacity. The design utilizes DEC approved practices that help maintain the existing hydrology.

CONCLUSION

As the storm water pollution prevention plan meets the water quality requirements for a new development project and meets peak flow mitigation to the applicable standards, there should be no adverse impacts due to storm water, on-site or off-site, as a result of the proposed site improvements.

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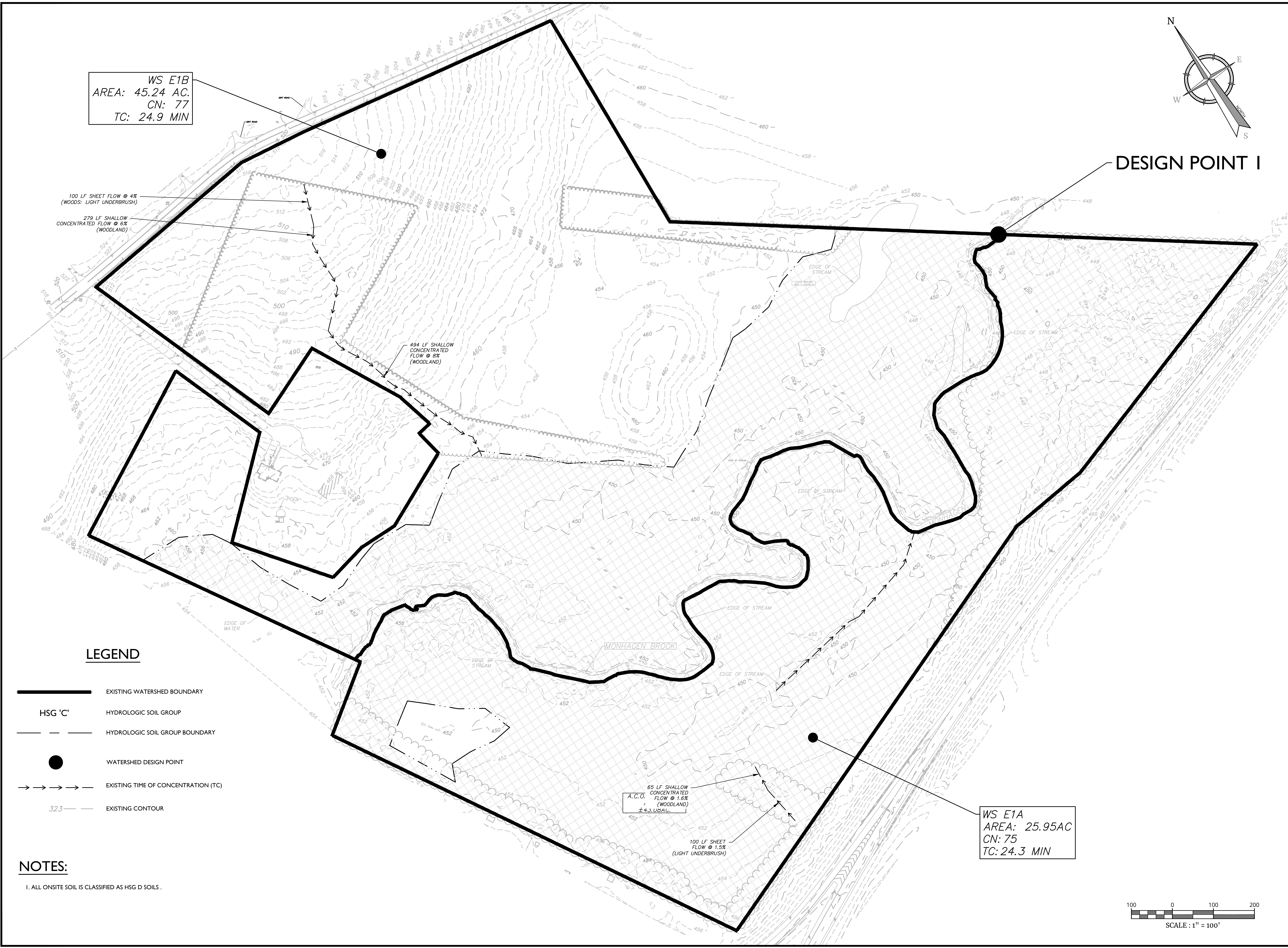
APPENDIX 1

WATERSHED MAPS



LEGEND

▬▬▬	EXISTING WATERSHED BOUNDARY
HSG 'C'	HYDROLOGIC SOIL GROUP
—— — ——	HYDROLOGIC SOIL GROUP BOUNDARY
●	WATERSHED DESIGN POINT
→ → → → —	EXISTING TIME OF CONCENTRATION (TC)
323—— ——	EXISTING CONTOUR

NOTES:

1. ALL ONSITE SOIL IS CLASSIFIED AS HSG D SOILS .

\AcPublish_9884\C-DRNG.dwg\C-01-EXIST. DRAINAGE MAP By: CMCCORMACK

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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-	-	-	-
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-	-	-	-
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-	-	-	-

WATERSHED MAPS

FOR

MID DOLSONTOWN,
LLC

SBL
6-1-107 & 6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

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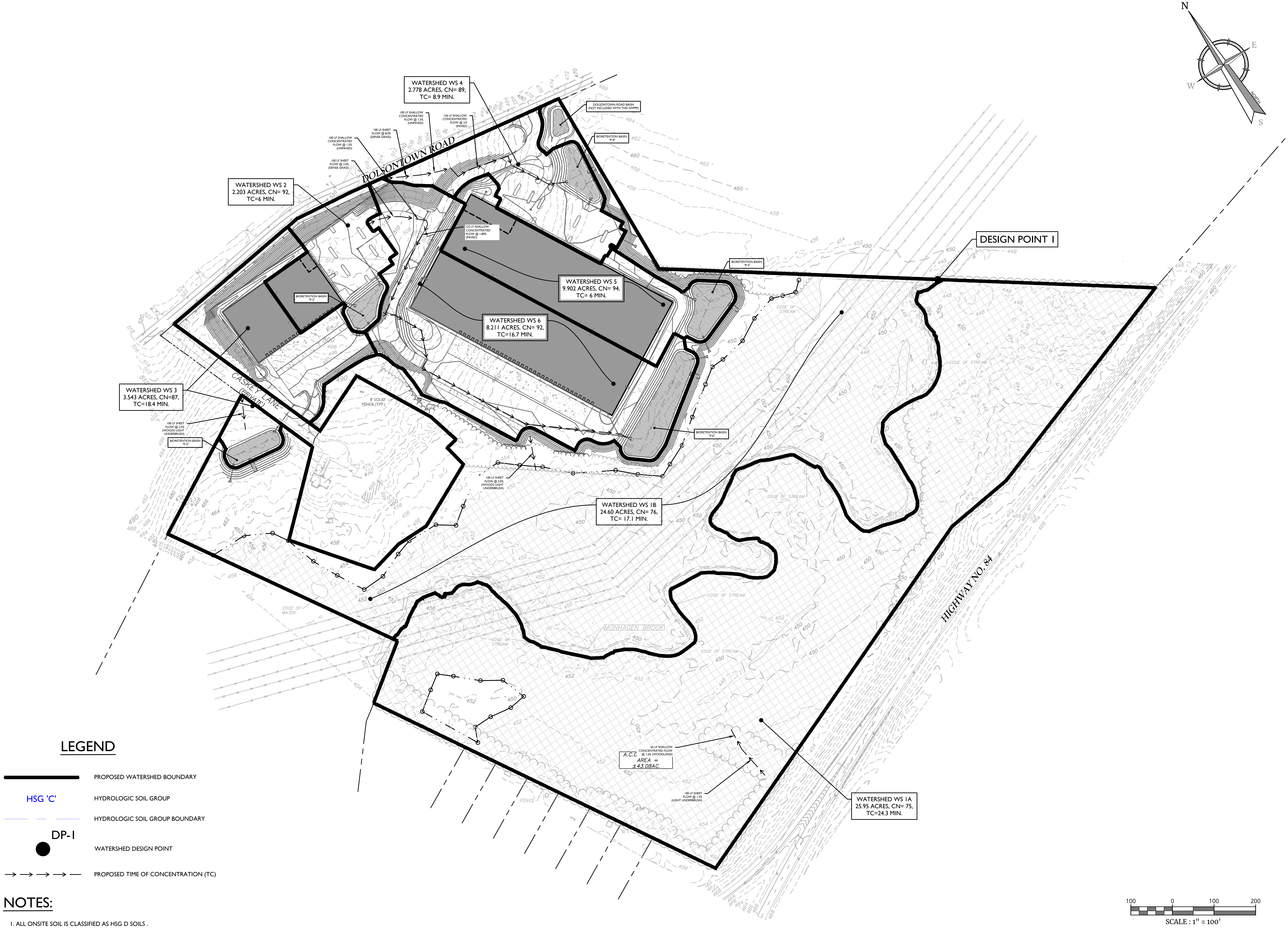
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/1/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DRNG

SHEET TITLE:
EXISTING
DRAINAGE MAP

SHEET NUMBER:
1 of 2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



LEGEND

▬	PROPOSED WATERSHED BOUNDARY
HSG 'C'	HYDROLOGIC SOIL GROUP
— —	HYDROLOGIC SOIL GROUP BOUNDARY
DP-1 ●	WATERSHED DESIGN POINT
→ → → —	PROPOSED TIME OF CONCENTRATION (TC)

NOTES:

1. ALL ONSITE SOIL IS CLASSIFIED AS HSG D SOILS .

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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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WATERSHED MAPS

FOR

MID DOLSONTOWN,
LLC

SBL
6-1-107 & 6-1-90.1

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/1/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DRNG

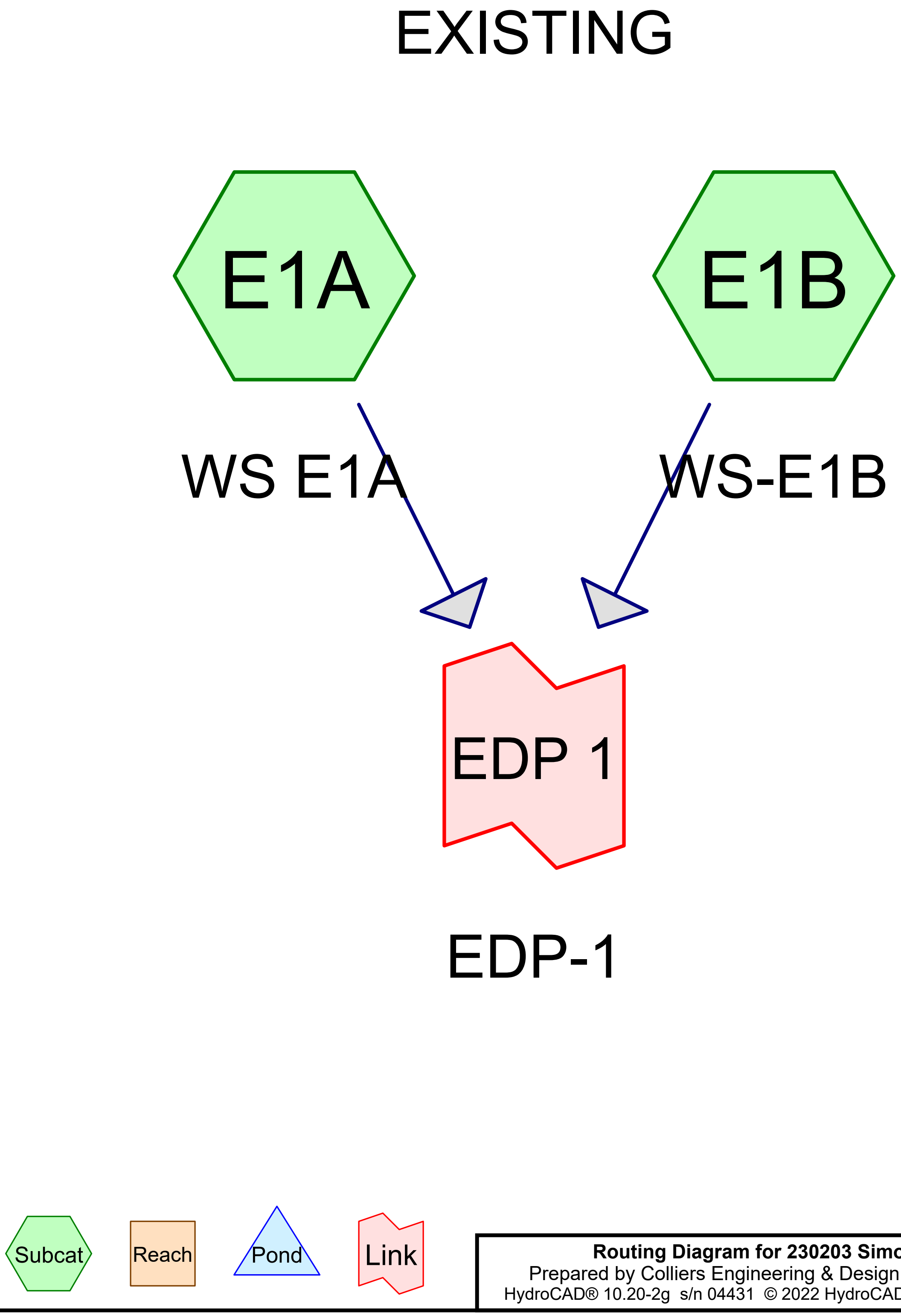
SHEET TITLE:
PROPOSED
DRAINAGE MAP

SHEET NUMBER:
2 of 2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

APPENDIX 2

HYDROCAD MODEL OUTPUT


EXISTING
E1A
WS E1A
E1B
WS-E1B
EDP 1
EDP-1
Subcat
Reach
Pond
Link

Summary for Subcatchment E1A: WS E1A

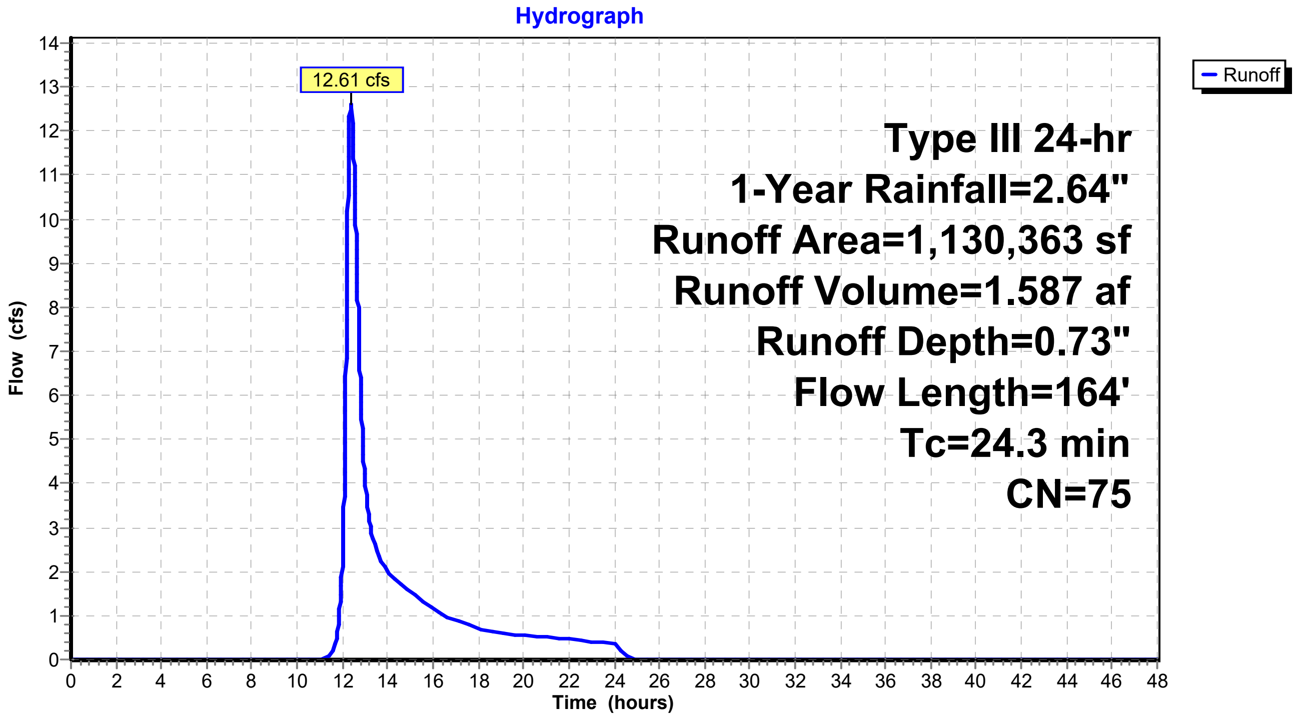
Runoff = 12.61 cfs @ 12.39 hrs, Volume= 1.587 af, Depth= 0.73"
Routed to Link EDP 1 : EDP-1

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=2.64"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment E1A: WS E1A



Summary for Subcatchment E1B: WS-E1B

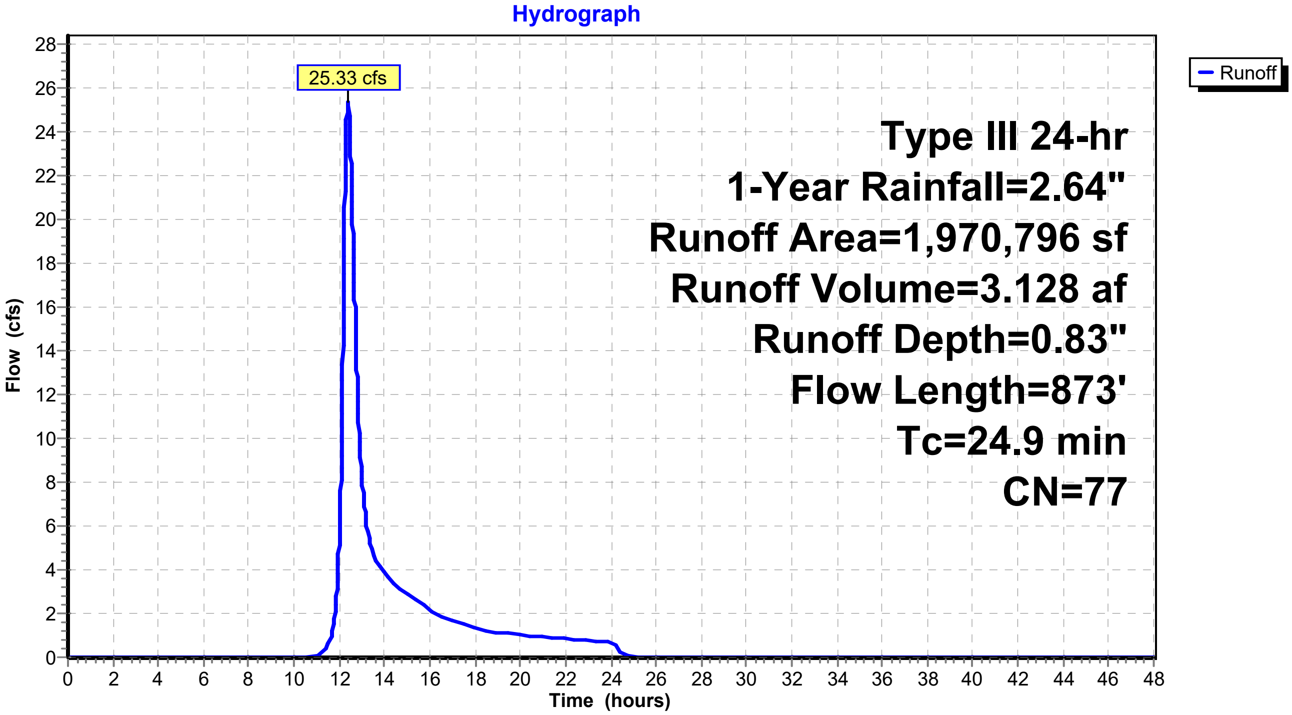
Runoff = 25.33 cfs @ 12.37 hrs, Volume= 3.128 af, Depth= 0.83"
Routed to Link EDP 1 : EDP-1

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=2.64"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	826,328	73	Brush, Good, HSG D
	271,534	79	Woods, Fair, HSG D
*	9,635	98	Trail
	784,944	78	Meadow, non-grazed, HSG D
	1,970,796	77	Weighted Average
	1,882,806		95.54% Pervious Area
	87,990		4.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
3.8	279	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.8	494	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.9	873	Total			

Subcatchment E1B: WS-E1B

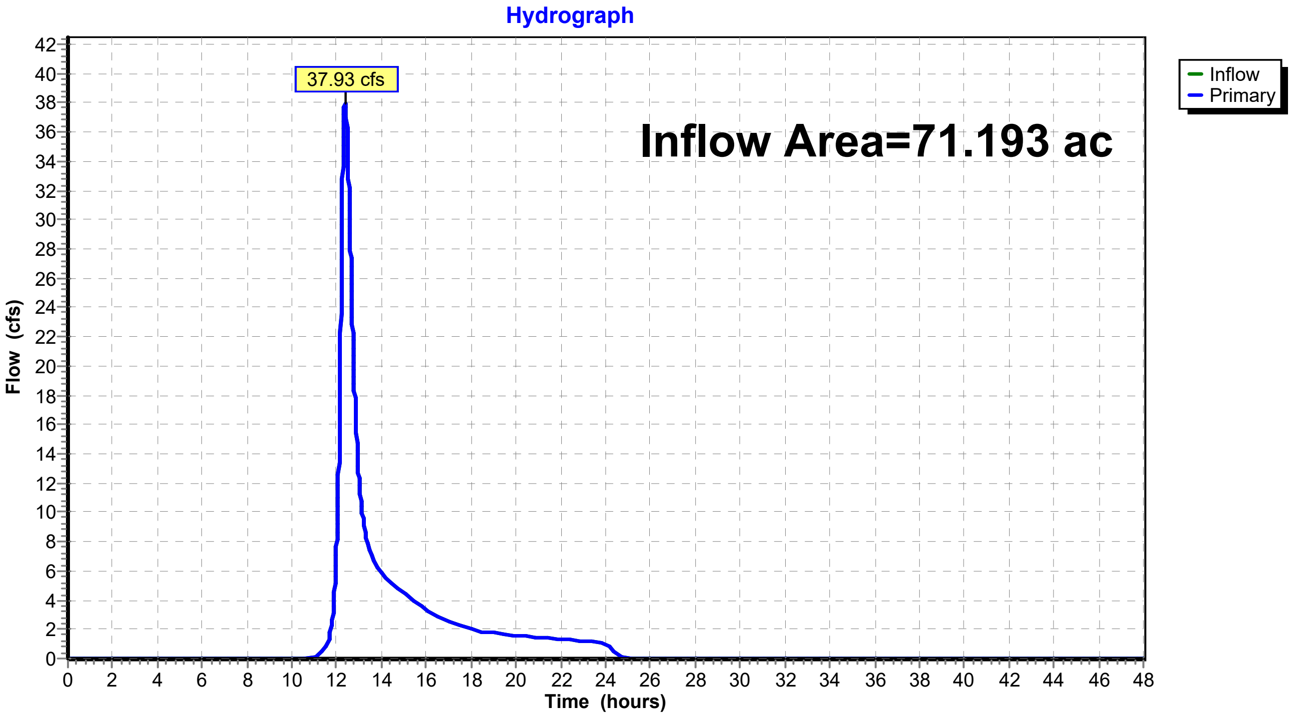


Summary for Link EDP 1: EDP-1

Inflow Area = 71.193 ac, 2.94% Impervious, Inflow Depth = 0.79" for 1-Year event
Inflow = 37.93 cfs @ 12.37 hrs, Volume= 4.714 af
Primary = 37.93 cfs @ 12.37 hrs, Volume= 4.714 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link EDP 1: EDP-1



Summary for Subcatchment E1A: WS E1A

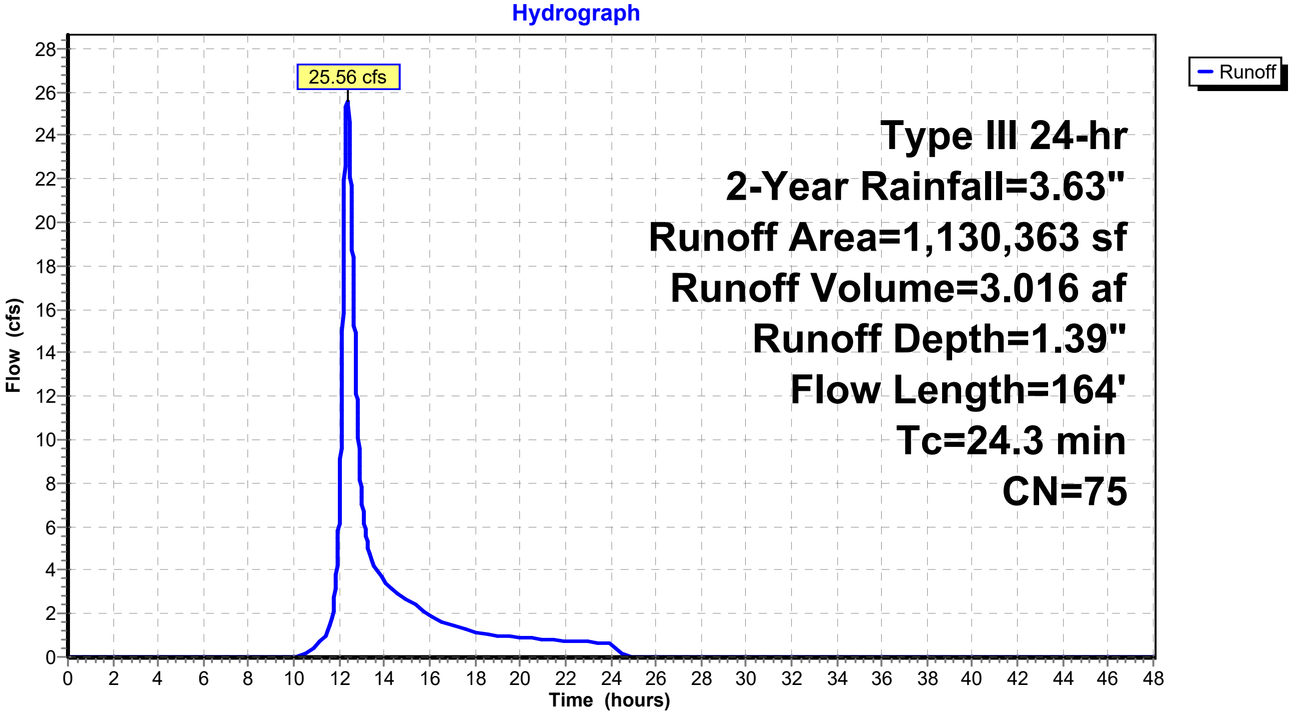
Runoff = 25.56 cfs @ 12.35 hrs, Volume= 3.016 af, Depth= 1.39"
Routed to Link EDP 1 : EDP-1

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 2-Year Rainfall=3.63"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment E1A: WS E1A



Summary for Subcatchment E1B: WS-E1B

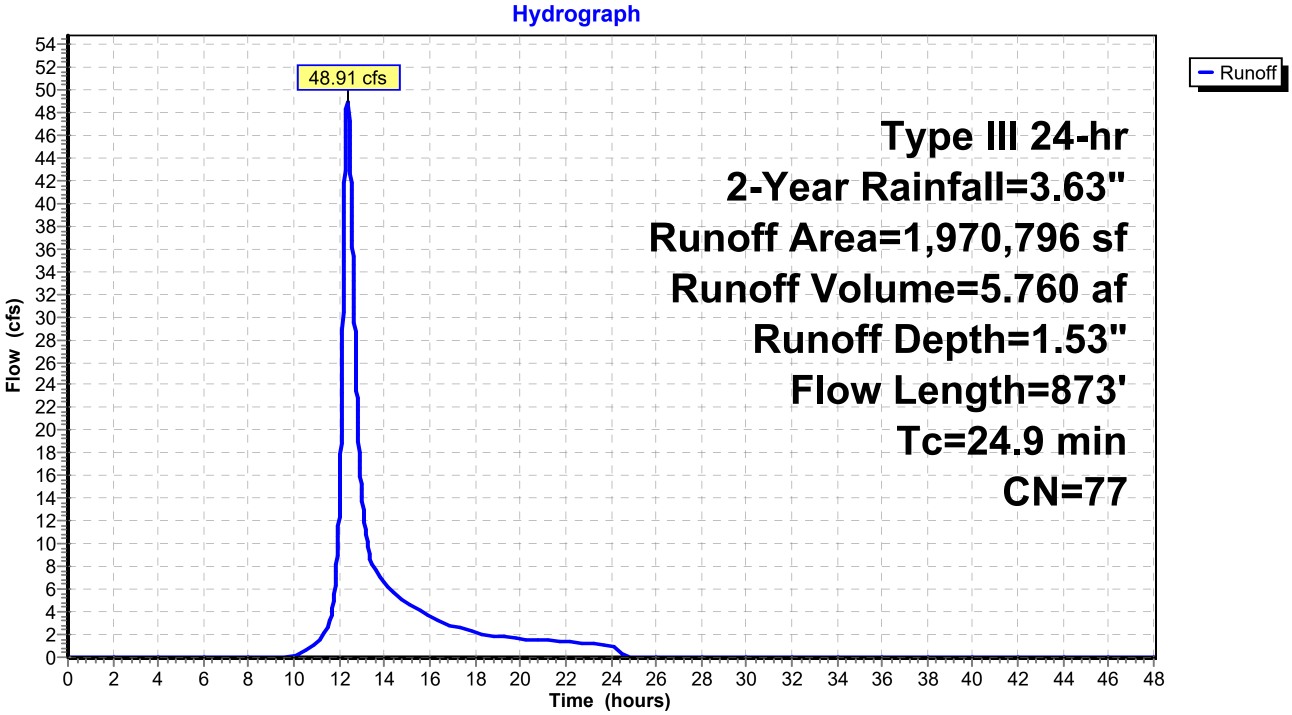
Runoff = 48.91 cfs @ 12.37 hrs, Volume= 5.760 af, Depth= 1.53"
Routed to Link EDP 1 : EDP-1

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 2-Year Rainfall=3.63"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	826,328	73	Brush, Good, HSG D
	271,534	79	Woods, Fair, HSG D
*	9,635	98	Trail
	784,944	78	Meadow, non-grazed, HSG D
	1,970,796	77	Weighted Average
	1,882,806		95.54% Pervious Area
	87,990		4.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
3.8	279	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.8	494	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.9	873	Total			

Subcatchment E1B: WS-E1B

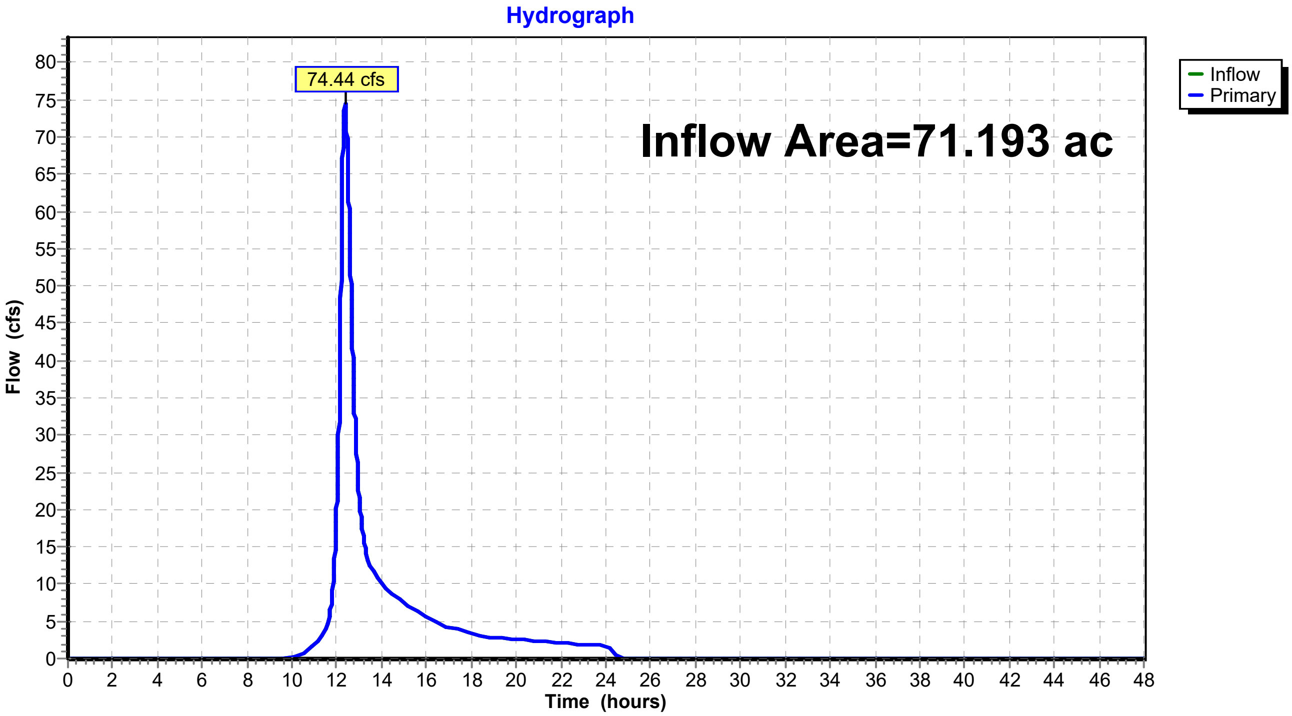


Summary for Link EDP 1: EDP-1

```
Inflow Area =       71.193 ac,   2.94% Impervious,  Inflow Depth =   1.48"    for  2-Year event
Inflow      =      74.44 cfs @   12.36 hrs,  Volume=            8.776 af
Primary     =      74.44 cfs @   12.36 hrs,  Volume=            8.776 af,  Atten= 0%,  Lag= 0.0 min
```

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link EDP 1: EDP-1



Summary for Subcatchment E1A: WS E1A

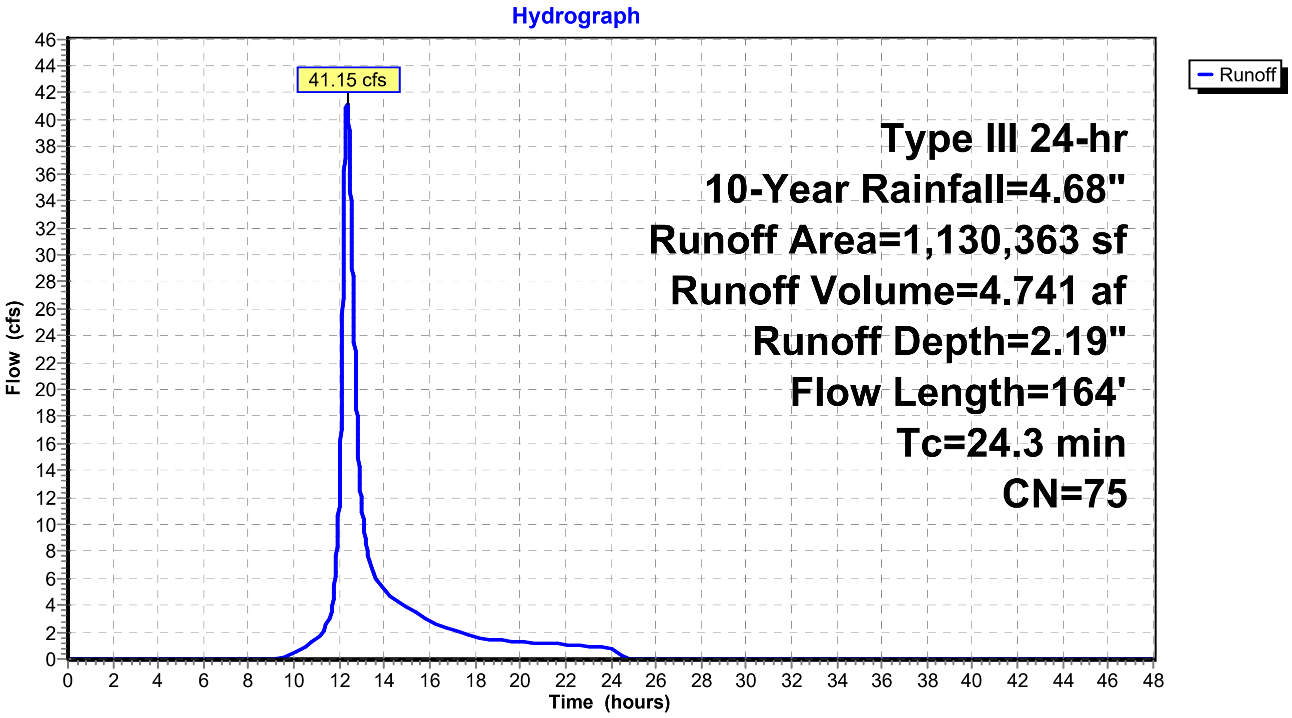
Runoff = 41.15 cfs @ 12.34 hrs, Volume= 4.741 af, Depth= 2.19"
Routed to Link EDP 1 : EDP-1

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=4.68"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment E1A: WS E1A



Summary for Subcatchment E1B: WS-E1B

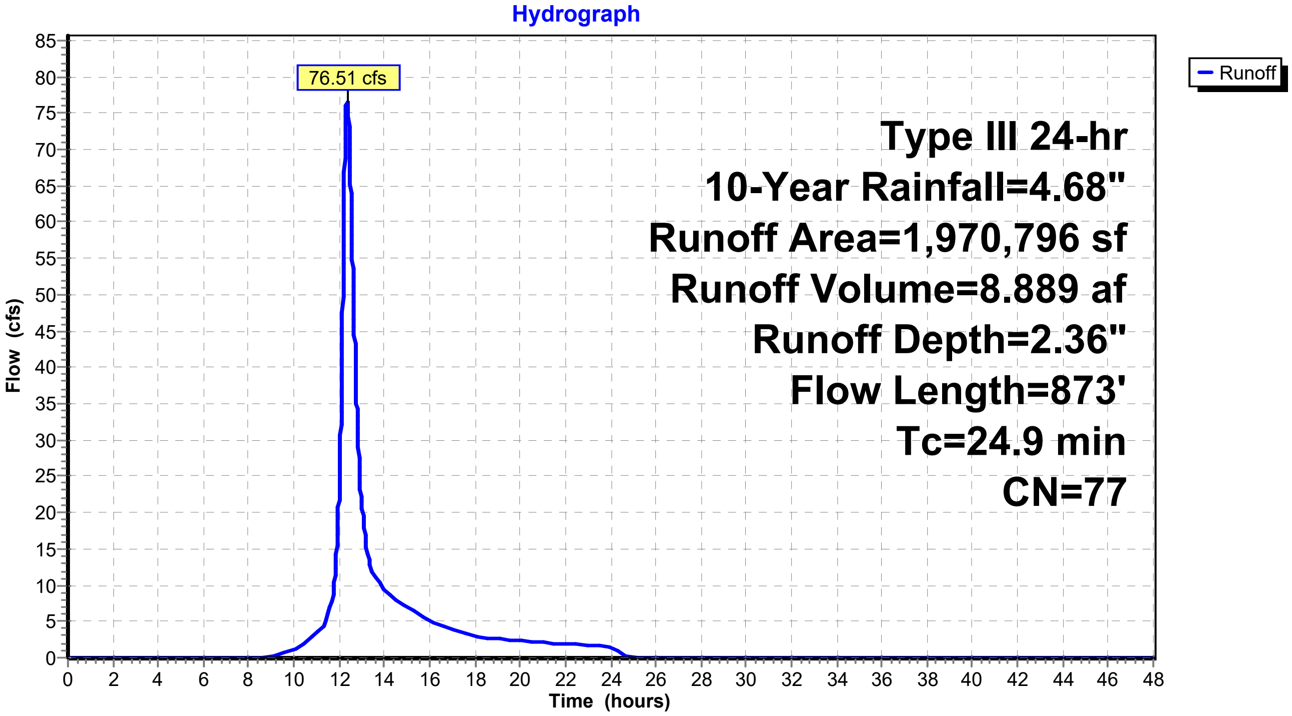
Runoff = 76.51 cfs @ 12.36 hrs, Volume= 8.889 af, Depth= 2.36"
Routed to Link EDP 1 : EDP-1

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=4.68"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	826,328	73	Brush, Good, HSG D
	271,534	79	Woods, Fair, HSG D
*	9,635	98	Trail
	784,944	78	Meadow, non-grazed, HSG D
	1,970,796	77	Weighted Average
	1,882,806		95.54% Pervious Area
	87,990		4.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
3.8	279	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.8	494	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.9	873	Total			

Subcatchment E1B: WS-E1B

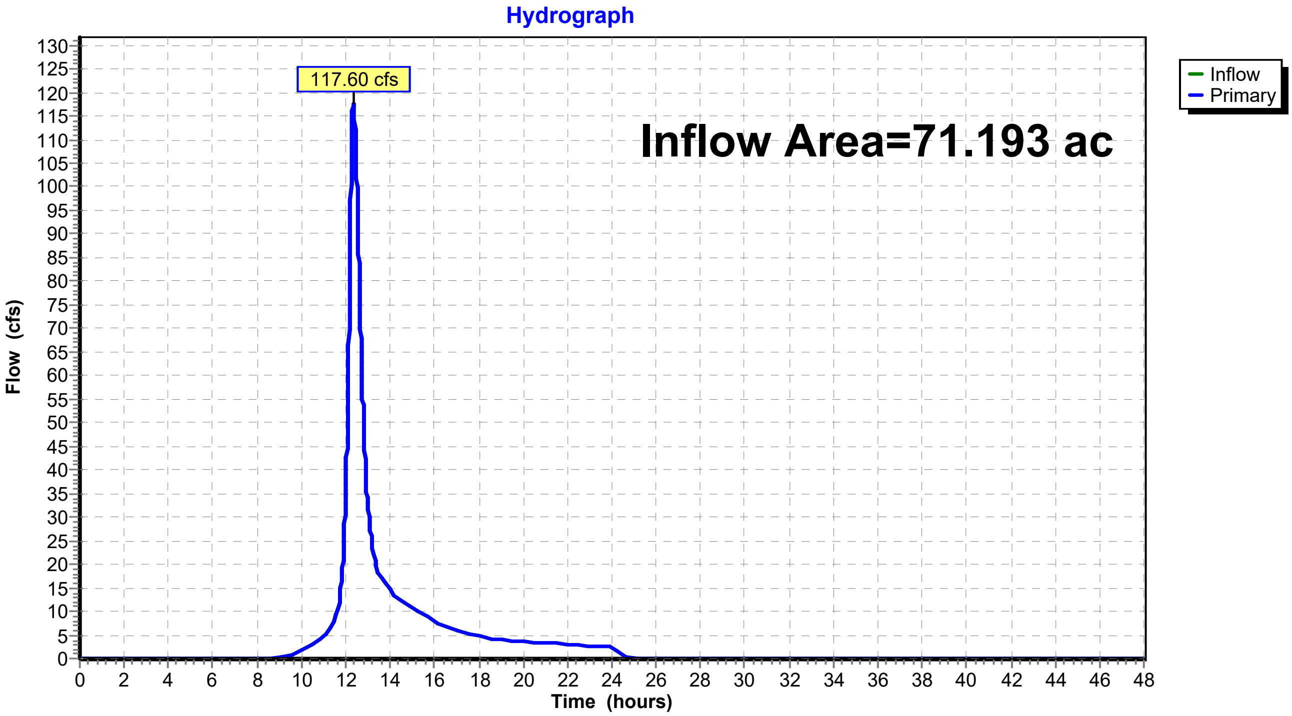


Summary for Link EDP 1: EDP-1

Inflow Area =	71.193 ac,	2.94% Impervious, Inflow Depth = 2.30"	for 10-Year event	
Inflow =	117.60 cfs @	12.34 hrs, Volume=	13.630 af	
Primary =	117.60 cfs @	12.34 hrs, Volume=	13.630 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link EDP 1: EDP-1



Summary for Subcatchment E1A: WS E1A

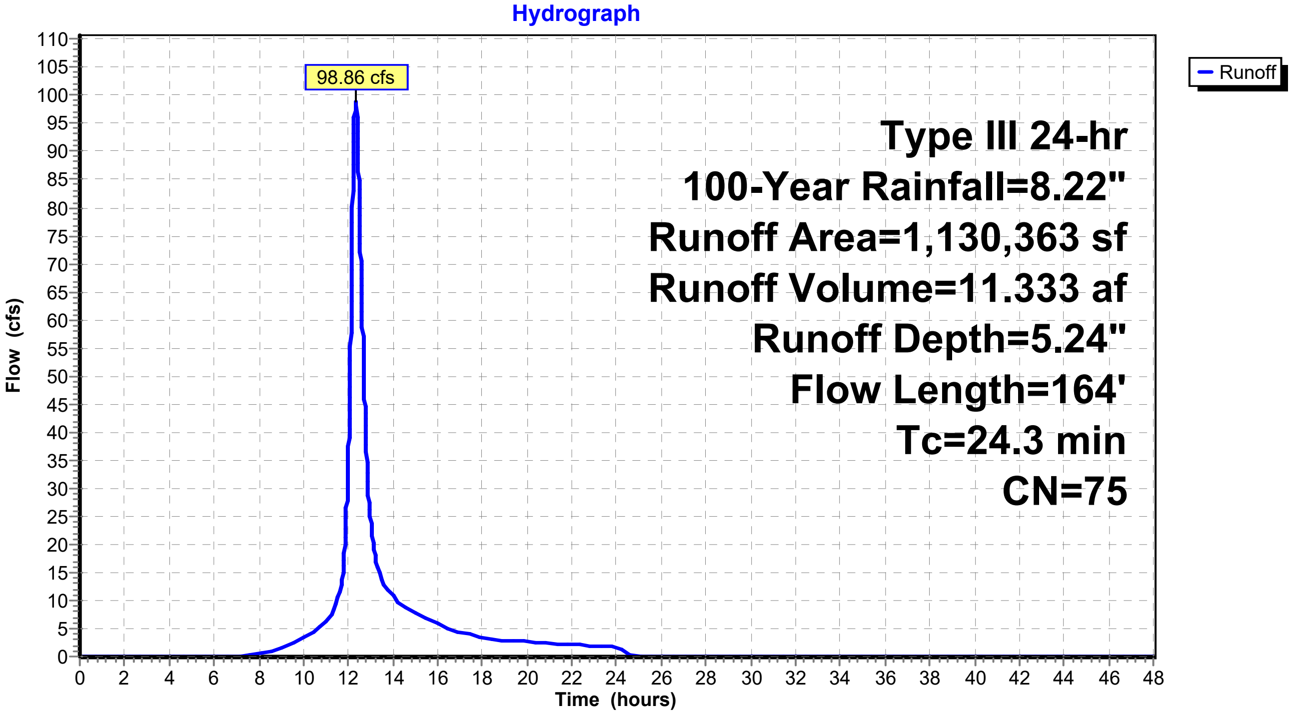
Runoff = 98.86 cfs @ 12.34 hrs, Volume= 11.333 af, Depth= 5.24"
Routed to Link EDP 1 : EDP-1

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=8.22"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment E1A: WS E1A



Summary for Subcatchment E1B: WS-E1B

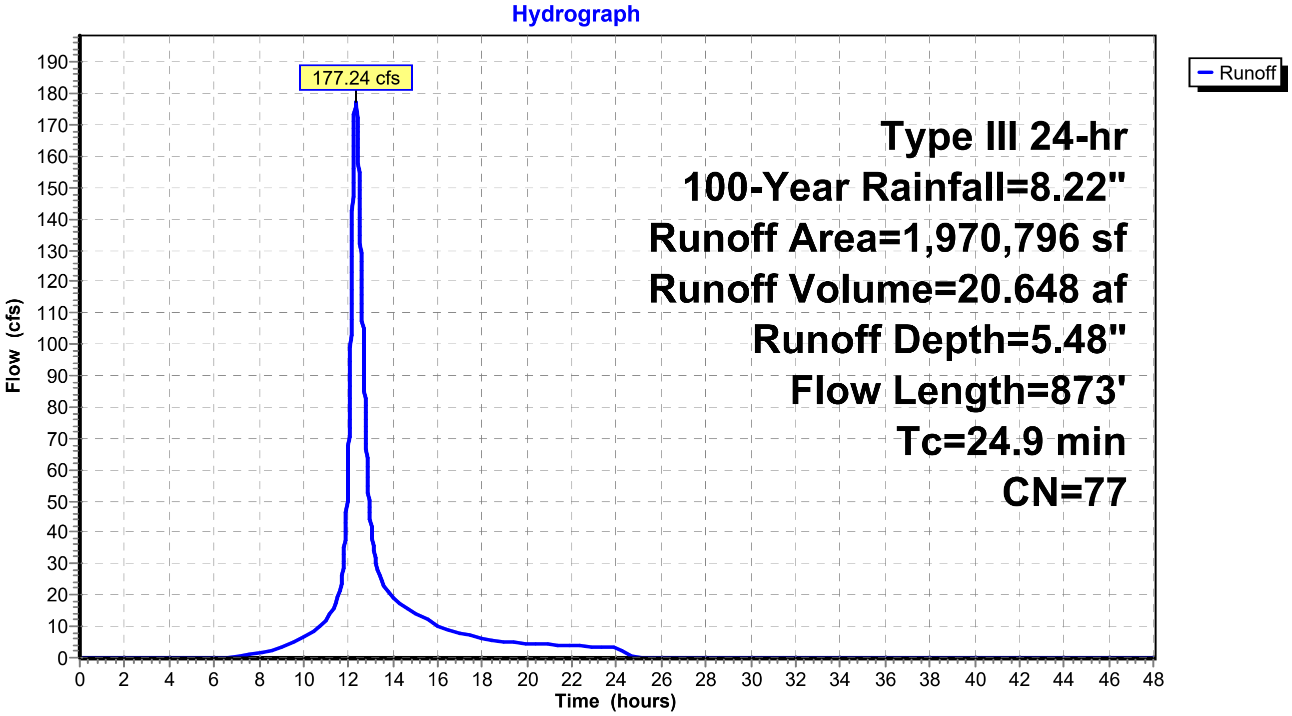
Runoff = 177.24 cfs @ 12.34 hrs, Volume= 20.648 af, Depth= 5.48"
Routed to Link EDP 1 : EDP-1

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=8.22"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	826,328	73	Brush, Good, HSG D
	271,534	79	Woods, Fair, HSG D
*	9,635	98	Trail
	784,944	78	Meadow, non-grazed, HSG D
	1,970,796	77	Weighted Average
	1,882,806		95.54% Pervious Area
	87,990		4.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
3.8	279	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.8	494	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.9	873	Total			

Subcatchment E1B: WS-E1B

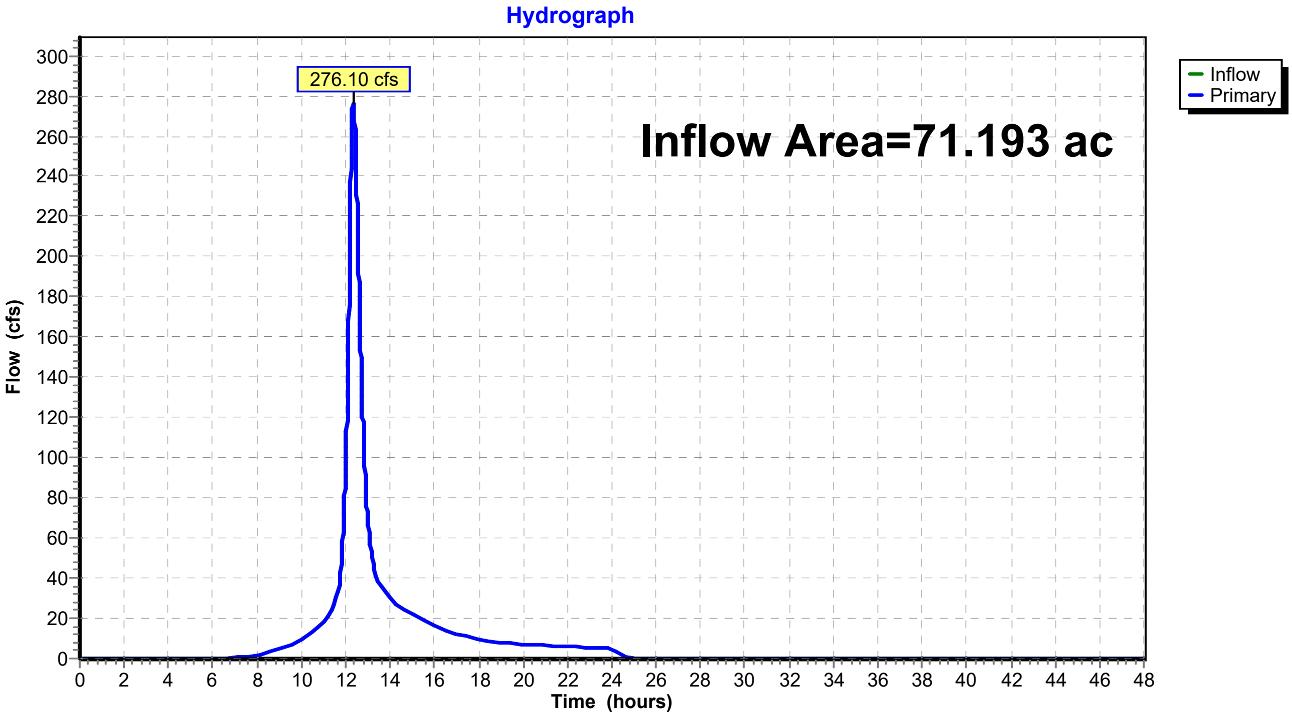


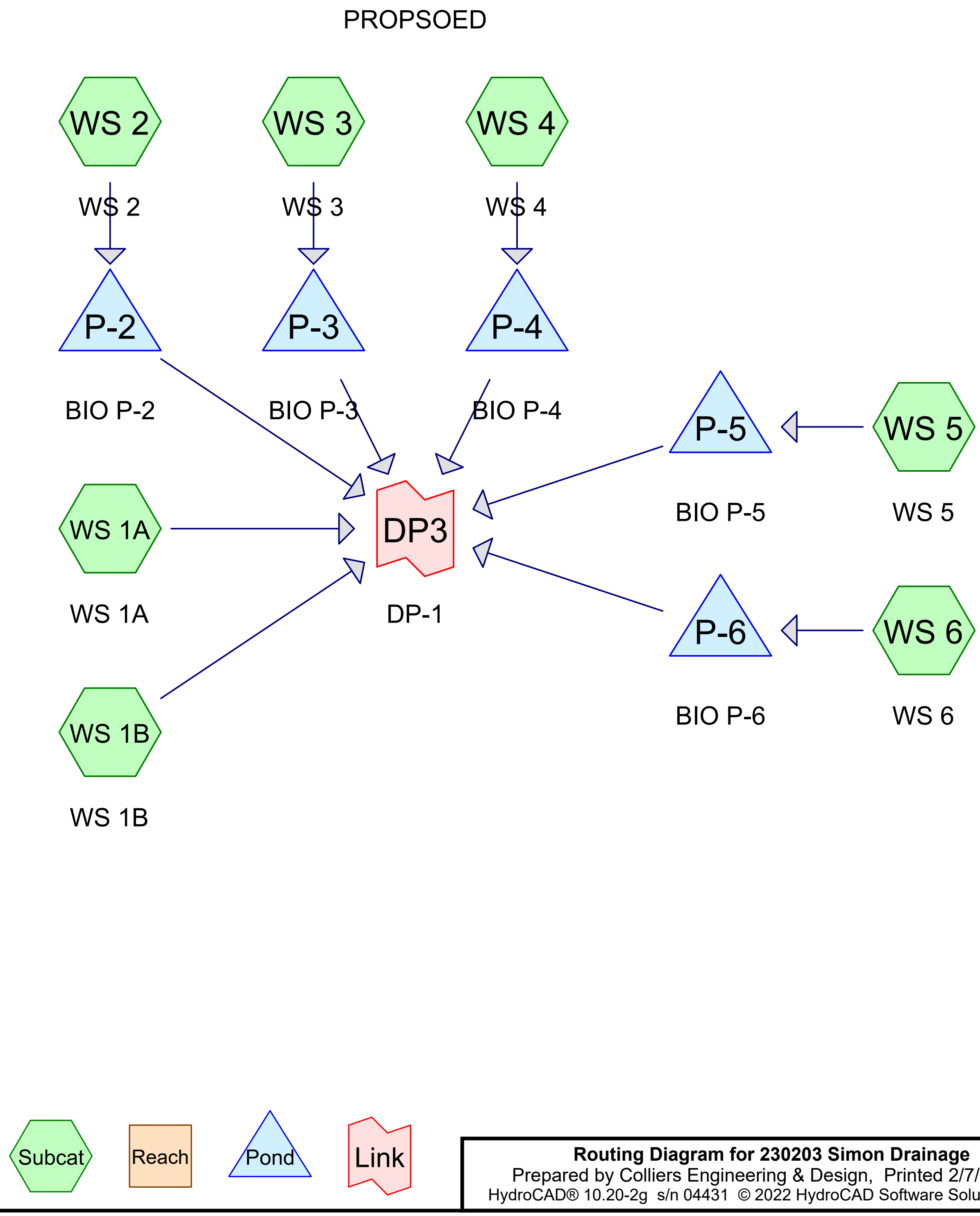
Summary for Link EDP 1: EDP-1

Inflow Area =	71.193 ac,	2.94% Impervious, Inflow Depth =	5.39"	for 100-Year event
Inflow =	276.10 cfs @	12.34 hrs, Volume=	31.981 af	
Primary =	276.10 cfs @	12.34 hrs, Volume=	31.981 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link EDP 1: EDP-1





Routing Diagram for 230203 Simon Drainage
Prepared by Colliers Engineering & Design, Printed 2/7/2023
HydroCAD® 10.20-2g s/n 04431 © 2022 HydroCAD Software Solutions LLC

Summary for Subcatchment WS 1A: WS 1A

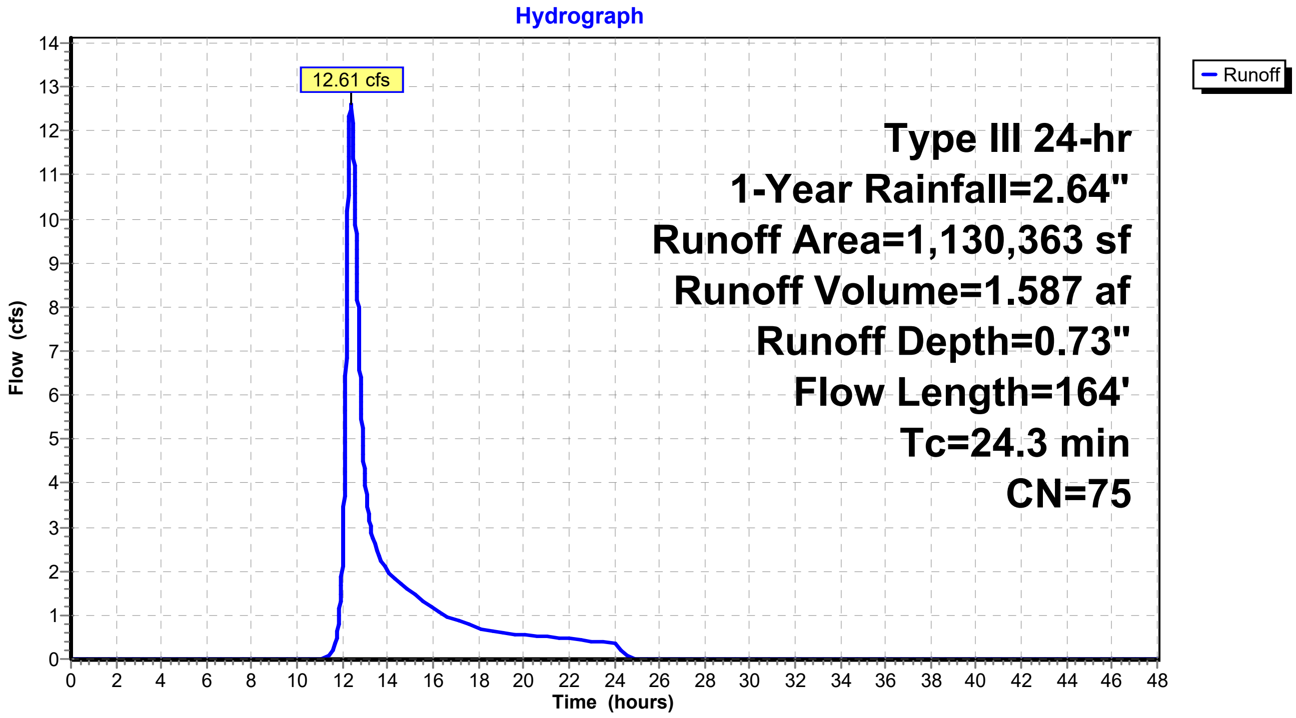
Runoff = 12.61 cfs @ 12.39 hrs, Volume= 1.587 af, Depth= 0.73"
Routed to Link DP3 : DP-1

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=2.64"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment WS 1A: WS 1A



Summary for Subcatchment WS 1B: WS 1B

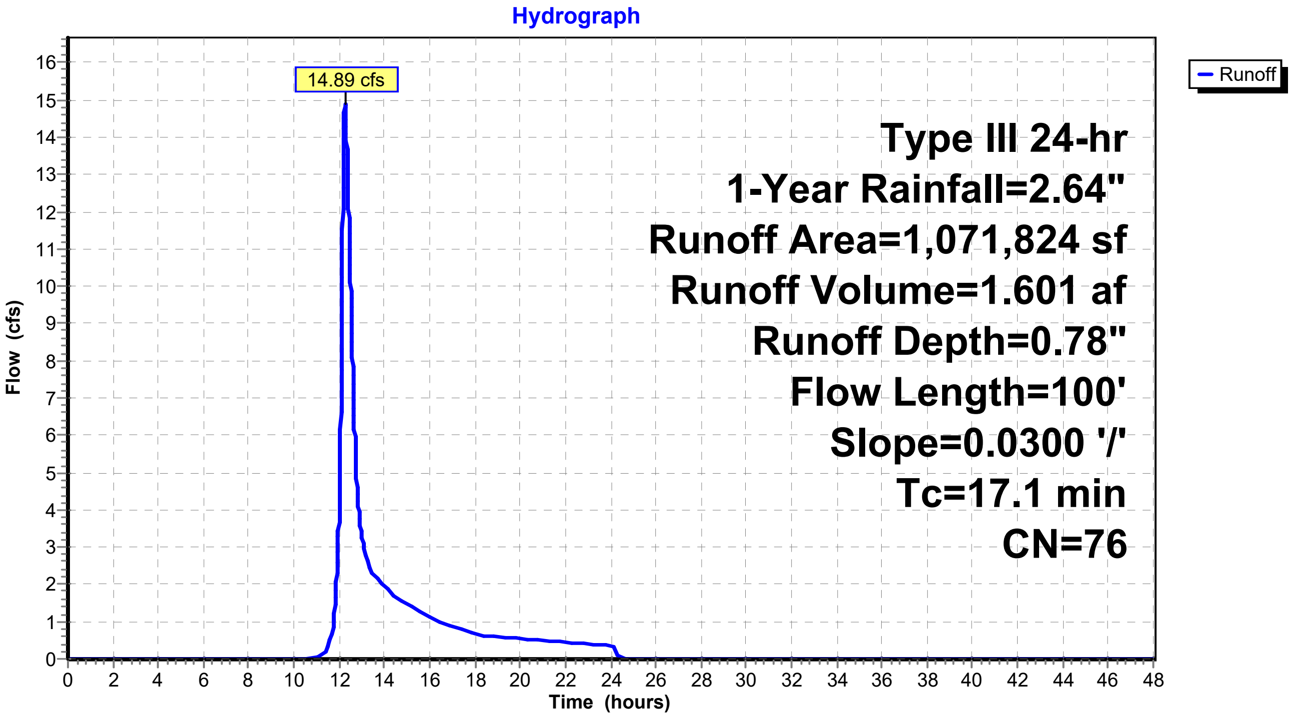
```
Runoff     =      14.89 cfs @   12.26 hrs,  Volume=           1.601 af,  Depth=  0.78"
   Routed to Link DP3 : DP-1
```

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=2.64"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	845,994	73	Brush, Good, HSG D
	15,520	78	Meadow, non-grazed, HSG D
*	9,633	98	Trail
	59,047	79	Woods, Fair, HSG D
	63,275	80	>75% Grass cover, Good, HSG D
	1,071,824	76	Weighted Average
	983,836		91.79% Pervious Area
	87,988		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0300	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 1B: WS 1B



Summary for Subcatchment WS 2: WS 2

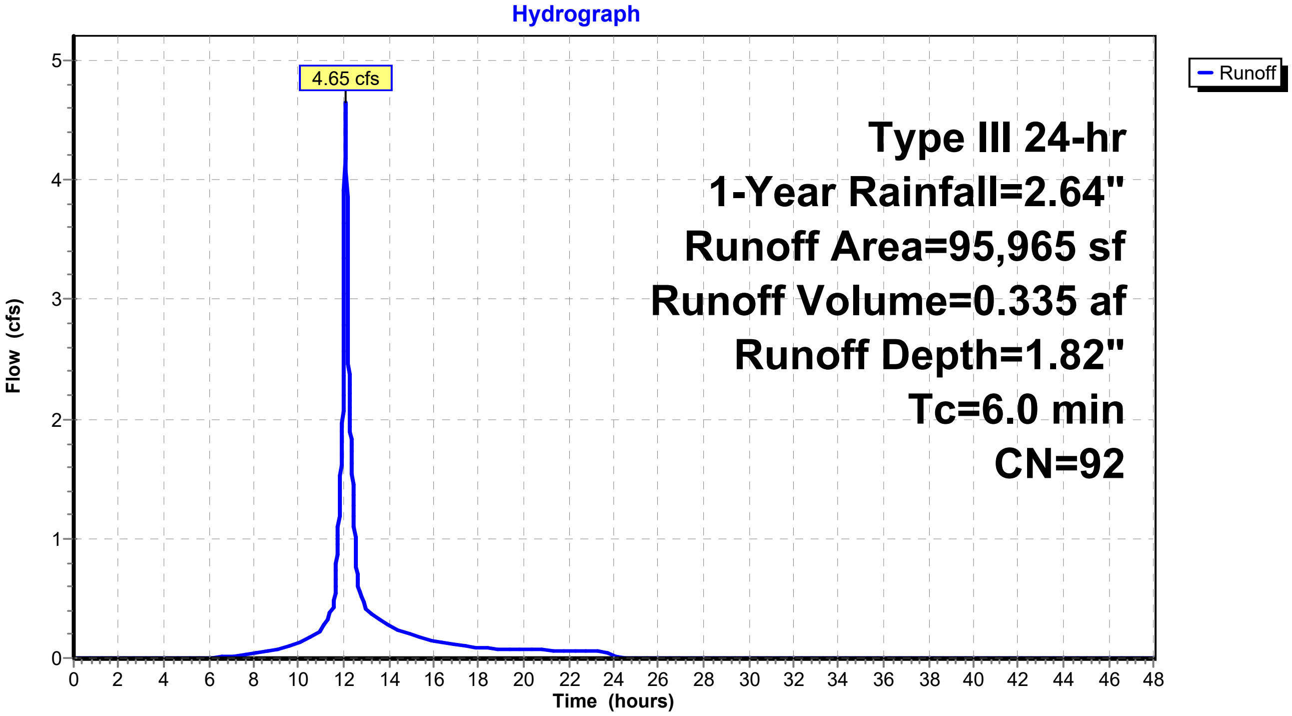
Runoff = 4.65 cfs @ 12.09 hrs, Volume= 0.335 af, Depth= 1.82"
Routed to Pond P-2 : BIO P-2

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=2.64"

Area (sf)	CN	Description
62,776	98	Paved parking, HSG D
33,189	80	>75% Grass cover, Good, HSG D
95,965	92	Weighted Average
33,189		34.58% Pervious Area
62,776		65.42% Impervious Area

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

Subcatchment WS 2: WS 2



Summary for Subcatchment WS 3: WS 3

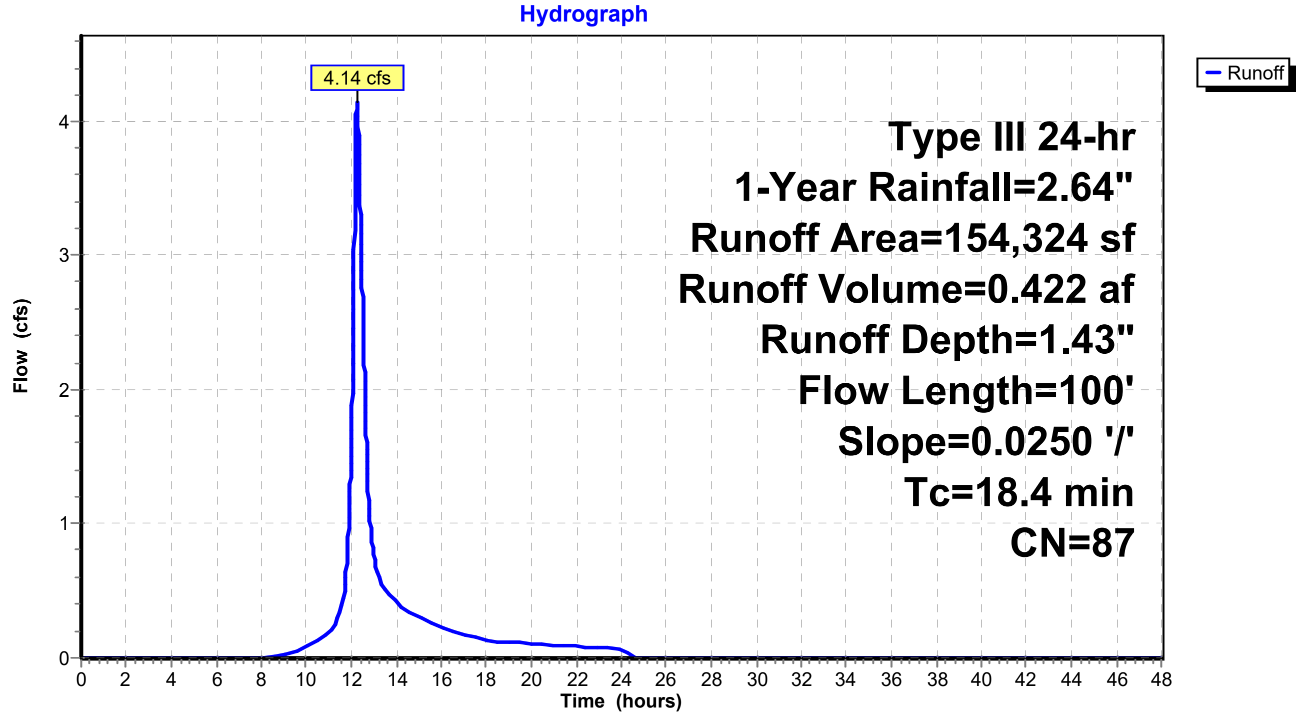
Runoff = 4.14 cfs @ 12.25 hrs, Volume= 0.422 af, Depth= 1.43"
Routed to Pond P-3 : BIO P-3

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=2.64"

Area (sf)	CN	Description
65,736	98	Paved parking, HSG D
69,746	80	>75% Grass cover, Good, HSG D
8,645	73	Brush, Good, HSG D
10,197	78	Meadow, non-grazed, HSG D
154,324	87	Weighted Average
88,588		57.40% Pervious Area
65,736		42.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	100	0.0250	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 3: WS 3



Summary for Subcatchment WS 4: WS 4

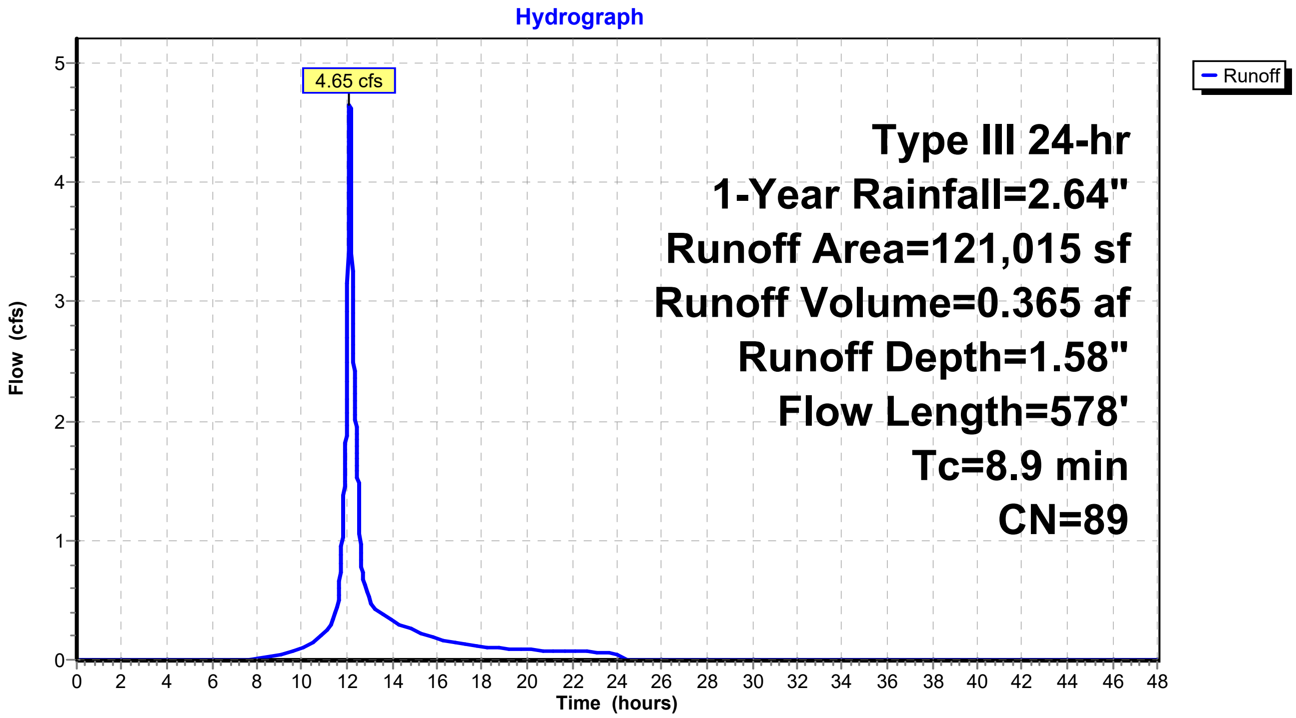
```
Runoff      =      4.65 cfs @   12.13 hrs,  Volume=          0.365 af,  Depth=  1.58"
   Routed to Pond P-4 : BIO P-4
```

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=2.64"

Area (sf)	CN	Description
61,847	98	Paved parking, HSG D
59,168	80	>75% Grass cover, Good, HSG D
121,015	89	Weighted Average
59,168		48.89% Pervious Area
61,847		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.3	124	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	156	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	198	0.0650	17.45	21.41	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
8.9	578	Total			

Subcatchment WS 4: WS 4



Summary for Subcatchment WS 5: WS 5

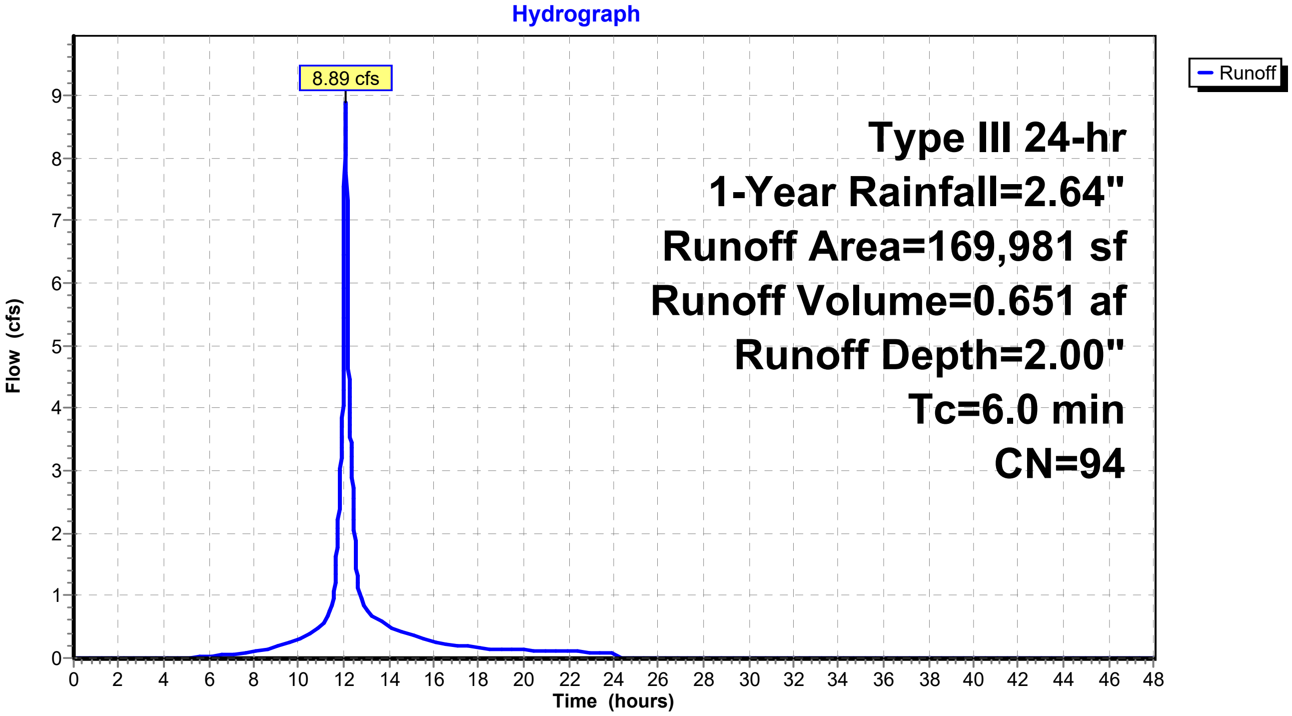
Runoff = 8.89 cfs @ 12.09 hrs, Volume= 0.651 af, Depth= 2.00"
Routed to Pond P-5 : BIO P-5

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=2.64"

Area (sf)	CN	Description
134,005	98	Paved parking, HSG D
35,976	80	>75% Grass cover, Good, HSG D
169,981	94	Weighted Average
35,976		21.16% Pervious Area
134,005		78.84% Impervious Area

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

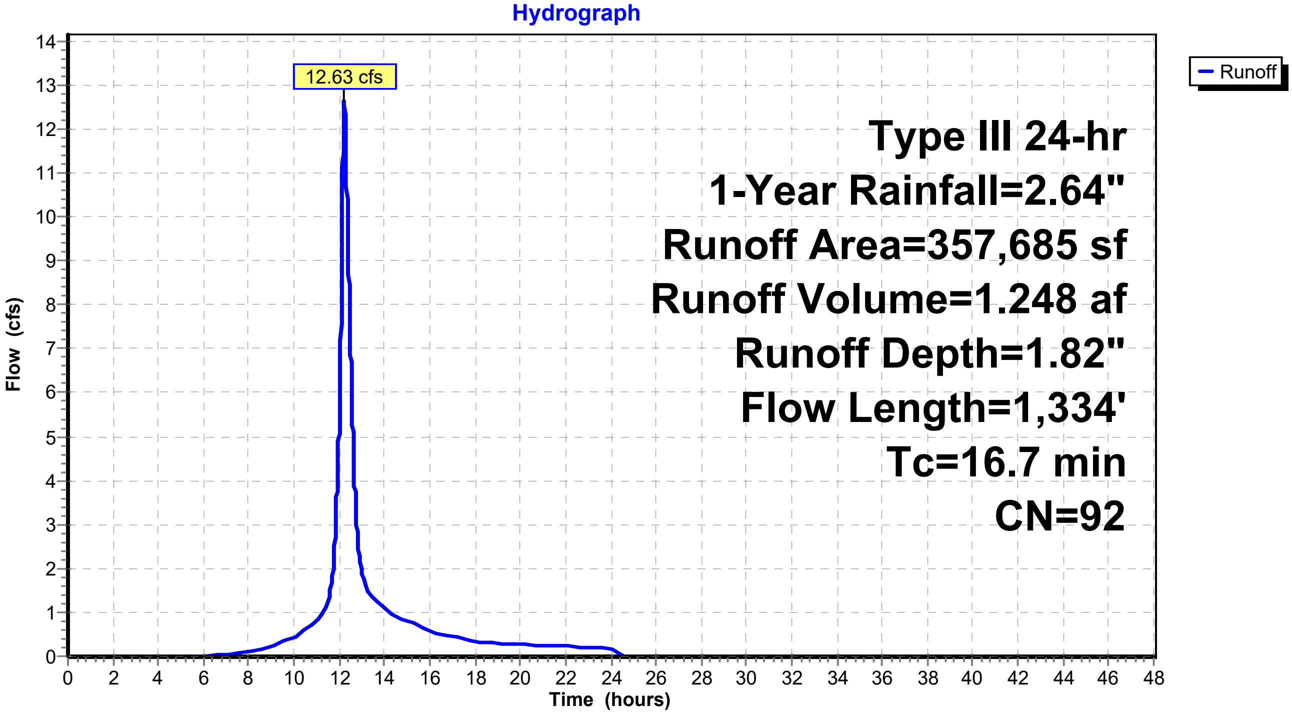
Subcatchment WS 5: WS 5



Summary for Subcatchment WS 6: WS 6

```
Runoff      =       12.63 cfs @   12.23 hrs,  Volume=           1.248 af,  Depth=  1.82"
    Routed to Pond P-6 : BIO P-6

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=2.64"

      Area (sf)   CN   Description
       244,733    98   Paved parking, HSG D
       112,952    80   >75% Grass cover, Good, HSG D
       357,685    92   Weighted Average
       112,952         31.58% Pervious Area
       244,733         68.42% Impervious Area

    Tc  Length   Slope  Velocity  Capacity  Description
 (min)  (feet)  (ft/ft)  (ft/sec)     (cfs)
  13.4     100  0.0200      0.12            Sheet Flow,
                                            Grass: Dense   n= 0.240   P2= 3.63"
   0.6      71  0.0150      1.97            Shallow Concentrated Flow,
                                            Unpaved   Kv= 16.1 fps
   0.7     122  0.0189      2.79            Shallow Concentrated Flow,
                                            Paved   Kv= 20.3 fps
   2.0   1,041  0.0160      8.66     10.62  Pipe Channel,
                                            15.0"  Round  Area= 1.2 sf  Perim= 3.9'  r= 0.31'
                                            n= 0.010  PVC, smooth interior
  16.7   1,334  Total
```

Subcatchment WS 6: WS 6



Summary for Pond P-2: BIO P-2

Inflow Area = 2.203 ac, 65.42% Impervious, Inflow Depth = 1.82" for 1-Year event
Inflow = 4.65 cfs @ 12.09 hrs, Volume= 0.335 af
Outflow = 1.18 cfs @ 12.47 hrs, Volume= 0.327 af, Atten= 75%, Lag= 22.8 min
Primary = 1.18 cfs @ 12.47 hrs, Volume= 0.327 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 480.88' @ 12.47 hrs Surf.Area= 8,204 sf Storage= 6,780 cf

Plug-Flow detention time= 446.4 min calculated for 0.326 af (98% of inflow)
Center-of-Mass det. time= 432.0 min (1,236.9 - 804.9)

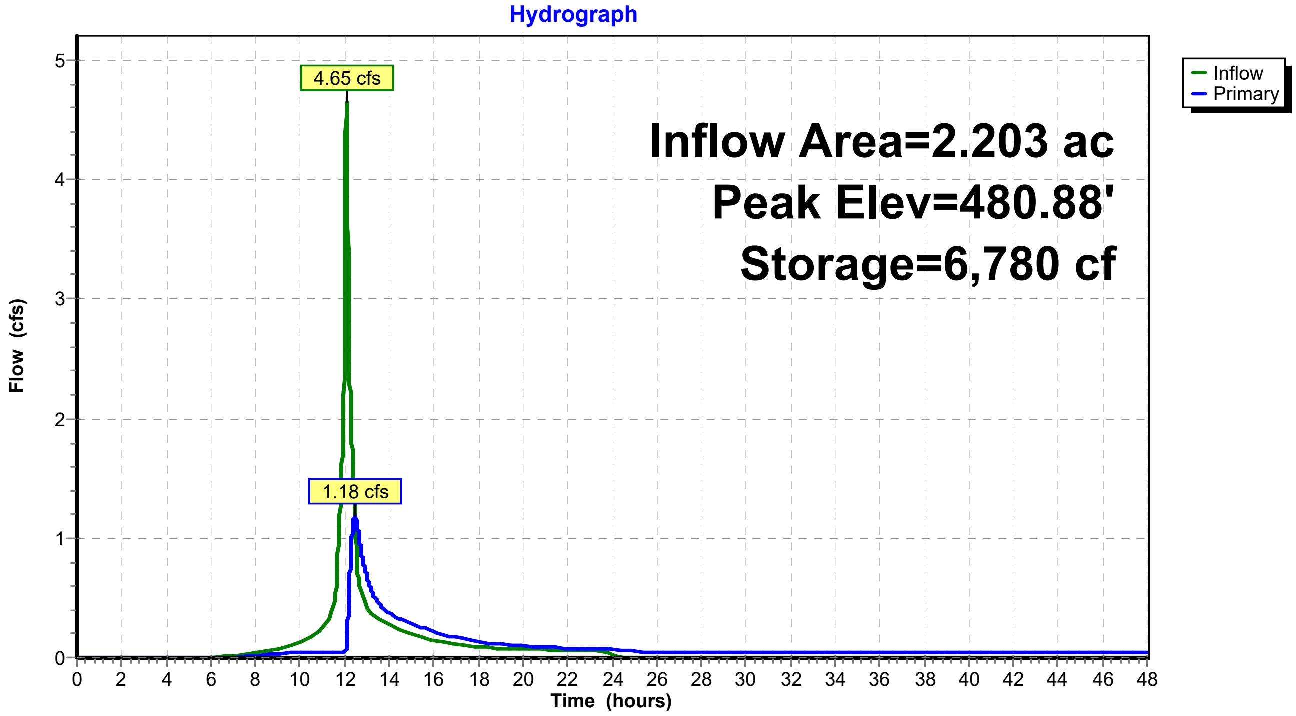
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	26,757 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
480.00	7,185	0	0
483.00	10,653	26,757	26,757

Device	Routing	Invert	Outlet Devices
#1	Primary	476.50'	**18.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 476.50' / 472.00' S= 0.0174 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	480.50'	**6.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	480.75'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	481.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	480.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=1.18 cfs @ 12.47 hrs HW=480.88' (Free Discharge)
└─**1=Culvert** (Passes 1.18 cfs of 16.21 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 2.10 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.46 cfs @ 1.16 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Bio Media** (Exfiltration Controls 0.05 cfs)

Pond P-2: BIO P-2



Summary for Pond P-3: BIO P-3

Inflow Area = 3.543 ac, 42.60% Impervious, Inflow Depth = 1.43" for 1-Year event
Inflow = 4.14 cfs @ 12.25 hrs, Volume= 0.422 af
Outflow = 2.01 cfs @ 12.60 hrs, Volume= 0.418 af, Atten= 51%, Lag= 20.8 min
Primary = 2.01 cfs @ 12.60 hrs, Volume= 0.418 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 474.85' @ 12.60 hrs Surf.Area= 8,536 sf Storage= 6,782 cf

Plug-Flow detention time= 335.4 min calculated for 0.418 af (99% of inflow)
Center-of-Mass det. time= 329.8 min (1,168.6 - 838.8)

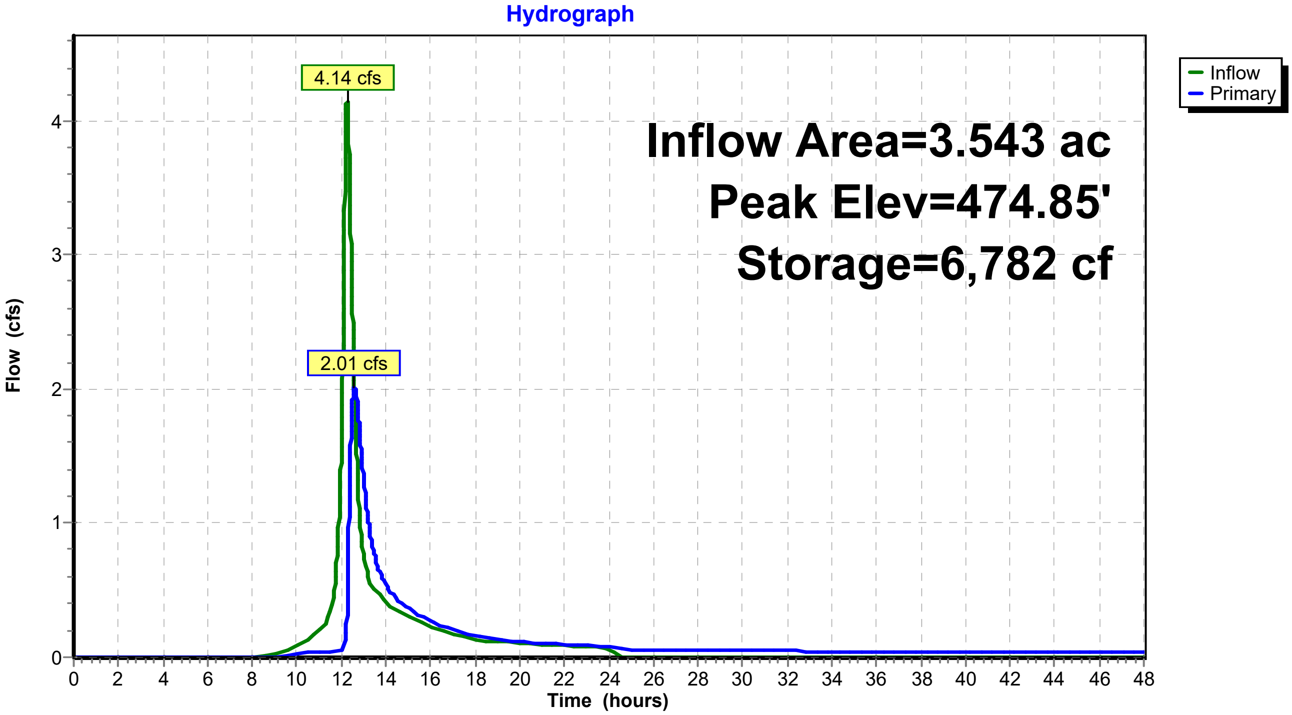
Volume	Invert	Avail.Storage	Storage Description
#1	474.00'	28,034 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
474.00	7,489	0	0
477.00	11,200	28,034	28,034

Device	Routing	Invert	Outlet Devices
#1	Primary	469.00'	**15.0" Round Culvert** L= 38.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 469.00' / 467.00' S= 0.0524 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	474.00'	**0.250 in/hr Bio Media over Surface area**
#3	Device 1	474.50'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	475.50'	**36.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 1	476.00'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.01 cfs @ 12.60 hrs HW=474.85' (Free Discharge)
└─**1=Culvert** (Passes 2.01 cfs of 13.50 cfs potential flow)
  ├─**2=Bio Media** (Exfiltration Controls 0.05 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 1.96 cfs @ 1.89 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: BIO P-3



Summary for Pond P-4: BIO P-4

Inflow Area = 2.778 ac, 51.11% Impervious, Inflow Depth = 1.58" for 1-Year event
Inflow = 4.65 cfs @ 12.13 hrs, Volume= 0.365 af
Outflow = 0.50 cfs @ 13.03 hrs, Volume= 0.348 af, Atten= 89%, Lag= 54.4 min
Primary = 0.50 cfs @ 13.03 hrs, Volume= 0.348 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 463.98' @ 13.03 hrs Surf.Area= 9,063 sf Storage= 8,224 cf

Plug-Flow detention time= 494.4 min calculated for 0.348 af (95% of inflow)
Center-of-Mass det. time= 469.1 min (1,290.8 - 821.7)

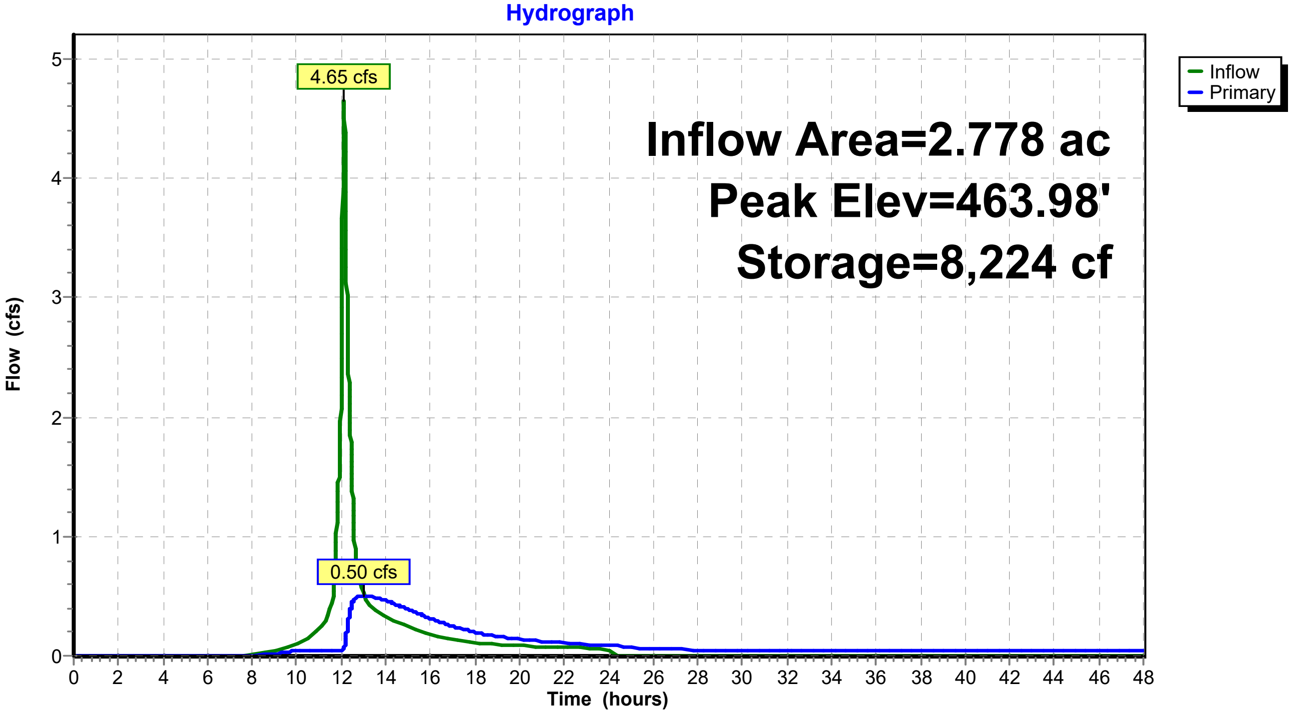
Volume	Invert	Avail.Storage	Storage Description
#1	463.00'	29,228 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
463.00	7,801	0	0
466.00	11,684	29,228	29,228

Device	Routing	Invert	Outlet Devices
#1	Primary	459.50'	**15.0" Round Culvert** L= 221.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 459.50' / 454.00' S= 0.0248 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	463.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	464.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	464.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	463.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=0.50 cfs @ 13.03 hrs HW=463.98' (Free Discharge)
↑—**1=Culvert** (Passes 0.50 cfs of 11.59 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 2.35 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)
—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
—**5=Bio Media** (Exfiltration Controls 0.05 cfs)

Pond P-4: BIO P-4



Summary for Pond P-5: BIO P-5

Inflow Area = 3.902 ac, 78.84% Impervious, Inflow Depth = 2.00" for 1-Year event
Inflow = 8.89 cfs @ 12.09 hrs, Volume= 0.651 af
Outflow = 1.12 cfs @ 12.66 hrs, Volume= 0.587 af, Atten= 87%, Lag= 34.3 min
Primary = 1.12 cfs @ 12.66 hrs, Volume= 0.587 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 461.08' @ 12.66 hrs Surf.Area= 14,962 sf Storage= 15,223 cf

Plug-Flow detention time= 523.8 min calculated for 0.587 af (90% of inflow)
Center-of-Mass det. time= 475.4 min (1,269.0 - 793.6)

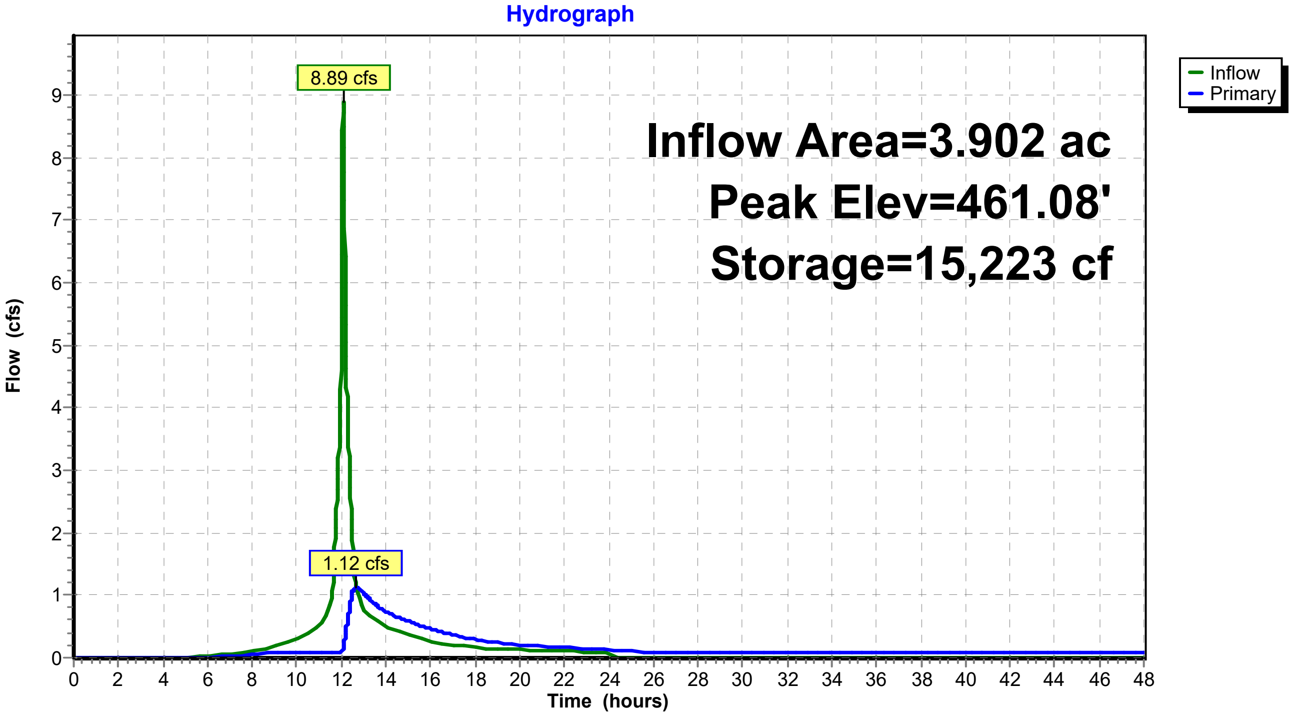
Volume	Invert	Avail.Storage	Storage Description
#1	460.00'	46,806 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
460.00	13,338	0	0
463.00	17,866	46,806	46,806

Device	Routing	Invert	Outlet Devices
#1	Primary	455.00'	**18.0" Round Culvert** L= 34.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.00' / 452.00' S= 0.0860 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	461.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	460.66'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	461.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	460.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=1.12 cfs @ 12.66 hrs HW=461.08' (Free Discharge)
└─**1=Culvert** (Passes 1.12 cfs of 19.64 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 0.86 cfs @ 2.07 fps)
  ├─**4=Orifice/Grate** (Orifice Controls 0.17 cfs @ 0.88 fps)
  └─**5=Bio Media** (Exfiltration Controls 0.09 cfs)

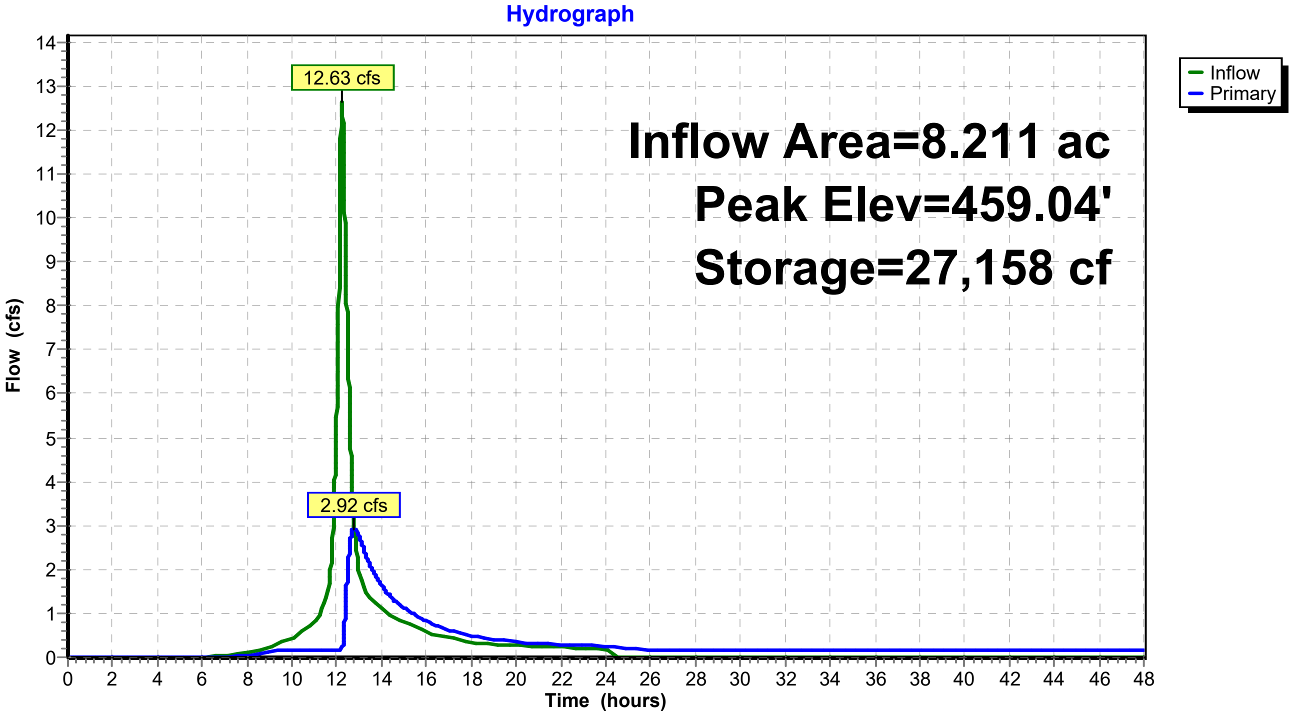
Pond P-5: BIO P-5



Summary for Pond P-6: BIO P-6

```
Inflow Area =        8.211 ac, 68.42% Impervious,  Inflow Depth =  1.82"   for  1-Year event
Inflow      =      12.63 cfs @  12.23 hrs,  Volume=          1.248 af
Outflow     =       2.92 cfs @  12.77 hrs,  Volume=          1.124 af,  Atten= 77%,  Lag= 32.8 min
Primary     =       2.92 cfs @  12.77 hrs,  Volume=          1.124 af
    Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 459.04' @ 12.77 hrs   Surf.Area= 27,290 sf   Storage= 27,158 cf

Plug-Flow detention time= 485.5 min calculated for 1.124 af (90% of inflow)
Center-of-Mass det. time= 437.3 min ( 1,252.1 - 814.8 )

Volume        Invert     Avail.Storage   Storage Description
   #1        458.00'         85,194 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation         Surf.Area          Inc.Store          Cum.Store
    (feet)             (sq-ft)      (cubic-feet)       (cubic-feet)
    458.00             24,756                  0                  0
    461.00             32,040             85,194             85,194

Device   Routing           Invert   Outlet Devices
   #1    Primary          454.00'   18.0"  Round Culvert
                                    L= 30.0'   CPP, square edge headwall,  Ke= 0.500
                                    Inlet / Outlet Invert= 454.00' / 452.00'   S= 0.0667 '/'   Cc= 0.900
                                    n= 0.010  PVC, smooth interior,  Flow Area= 1.77 sf
   #2    Device 1         458.66'   22.0" W x 6.0" H Vert. Orifice/Grate  C= 0.600
                                    Limited to weir flow at low heads
   #3    Device 1         458.75'   32.0" W x 9.0" H Vert. Orifice/Grate  C= 0.600
                                    Limited to weir flow at low heads
   #4    Device 1         459.75'   16.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00
                                    Coef. (English)  2.80  2.92  3.08  3.30  3.32
   #5    Device 1         458.00'   0.250 in/hr Bio Media over Surface area

Primary OutFlow Max=2.92 cfs @ 12.77 hrs  HW=459.04'   (Free Discharge)
└─1=Culvert  (Passes 2.92 cfs of 17.63 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 1.40 cfs @ 1.99 fps)
   ├─3=Orifice/Grate  (Orifice Controls 1.36 cfs @ 1.74 fps)
   ├─4=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
   └─5=Bio Media  (Exfiltration Controls 0.16 cfs)
```

Pond P-6: BIO P-6

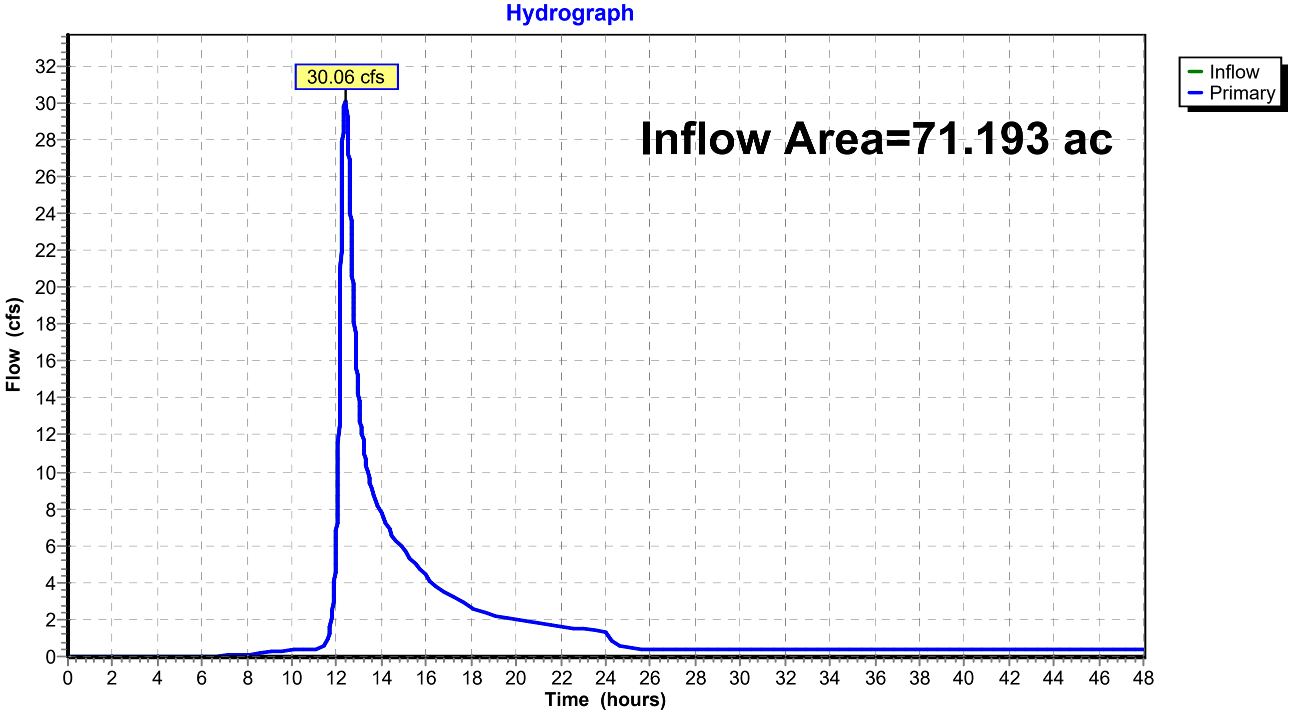


Summary for Link DP3: DP-1

Inflow Area =	71.193 ac,	21.29% Impervious,	Inflow Depth > 1.01"	for 1-Year event
Inflow =	30.06 cfs @	12.37 hrs, Volume=	5.992 af	
Primary =	30.06 cfs @	12.37 hrs, Volume=	5.992 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP3: DP-1



Summary for Subcatchment WS 1A: WS 1A

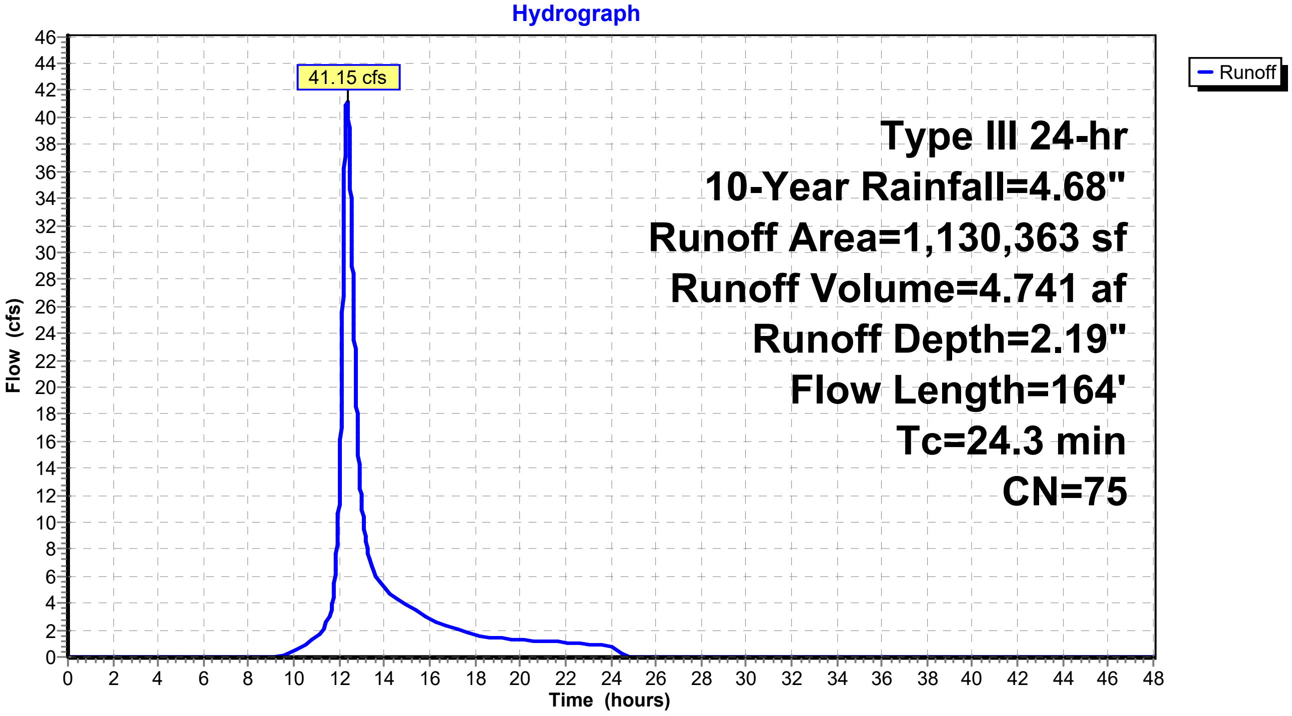
Runoff = 41.15 cfs @ 12.34 hrs, Volume= 4.741 af, Depth= 2.19"
Routed to Link DP3 : DP-1

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=4.68"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment WS 1A: WS 1A



Summary for Subcatchment WS 1B: WS 1B

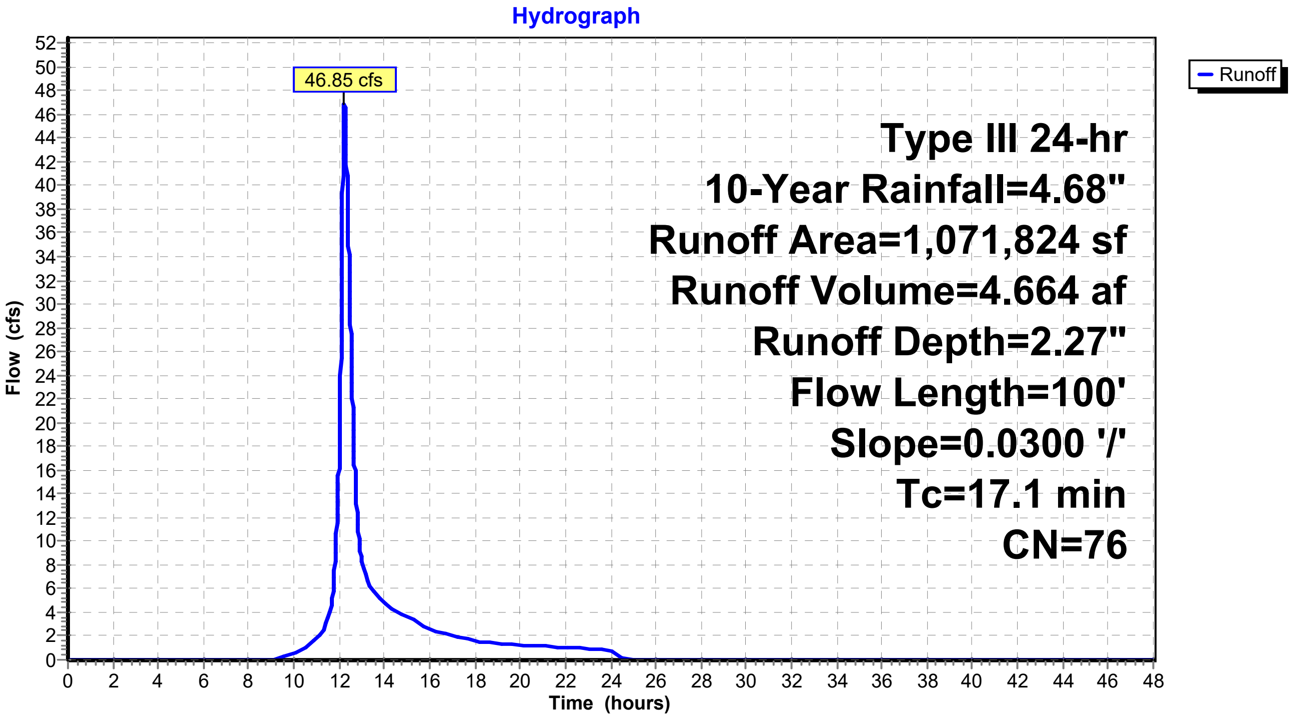
Runoff = 46.85 cfs @ 12.24 hrs, Volume= 4.664 af, Depth= 2.27"
Routed to Link DP3 : DP-1

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=4.68"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	845,994	73	Brush, Good, HSG D
	15,520	78	Meadow, non-grazed, HSG D
*	9,633	98	Trail
	59,047	79	Woods, Fair, HSG D
	63,275	80	>75% Grass cover, Good, HSG D
	1,071,824	76	Weighted Average
	983,836		91.79% Pervious Area
	87,988		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0300	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 1B: WS 1B



Summary for Subcatchment WS 2: WS 2

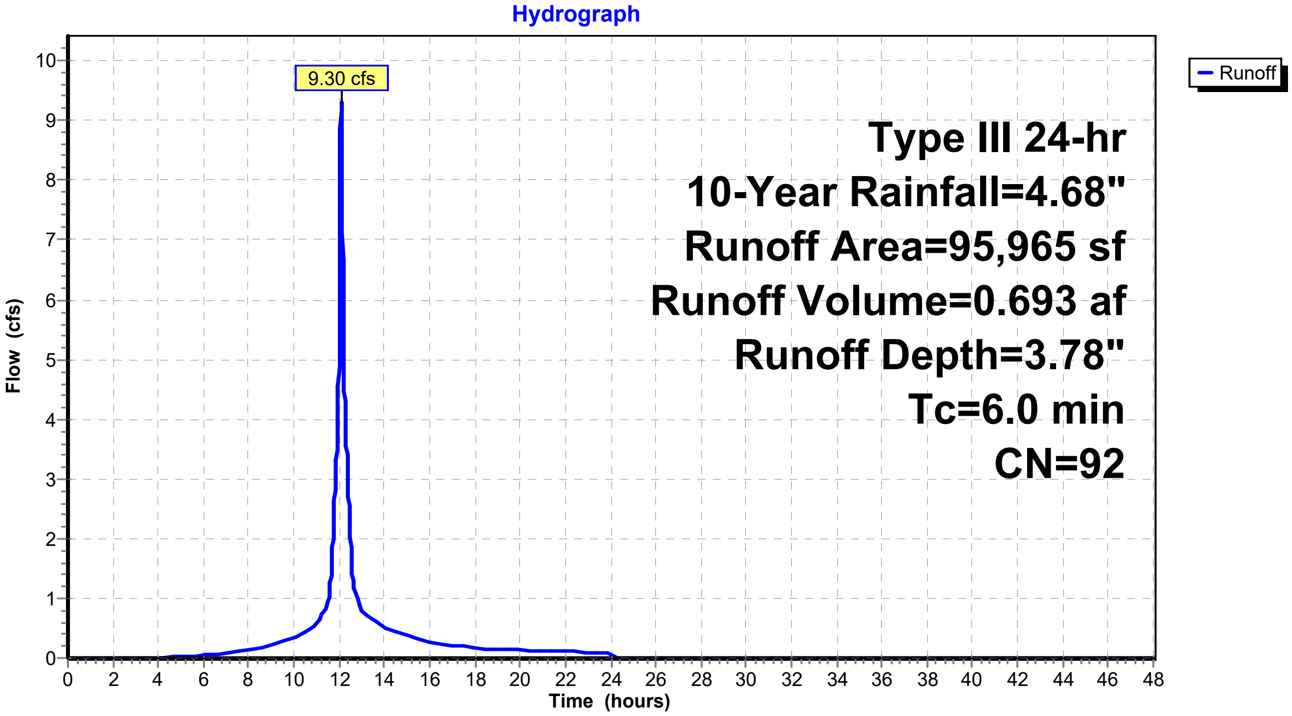
Runoff = 9.30 cfs @ 12.08 hrs, Volume= 0.693 af, Depth= 3.78"
Routed to Pond P-2 : BIO P-2

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=4.68"

Area (sf)	CN	Description
62,776	98	Paved parking, HSG D
33,189	80	>75% Grass cover, Good, HSG D
95,965	92	Weighted Average
33,189		34.58% Pervious Area
62,776		65.42% Impervious Area

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

Subcatchment WS 2: WS 2



Summary for Subcatchment WS 3: WS 3

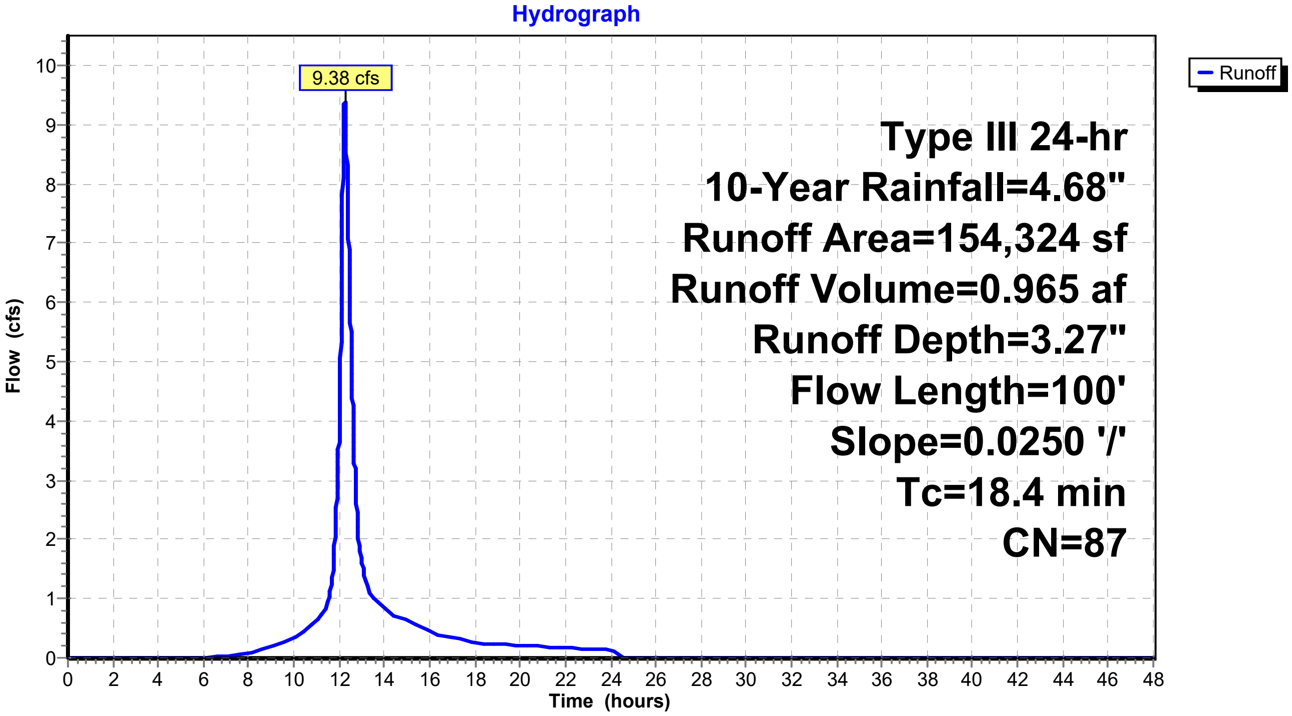
Runoff = 9.38 cfs @ 12.25 hrs, Volume= 0.965 af, Depth= 3.27"
Routed to Pond P-3 : BIO P-3

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=4.68"

Area (sf)	CN	Description
65,736	98	Paved parking, HSG D
69,746	80	>75% Grass cover, Good, HSG D
8,645	73	Brush, Good, HSG D
10,197	78	Meadow, non-grazed, HSG D
154,324	87	Weighted Average
88,588		57.40% Pervious Area
65,736		42.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	100	0.0250	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 3: WS 3



Summary for Subcatchment WS 4: WS 4

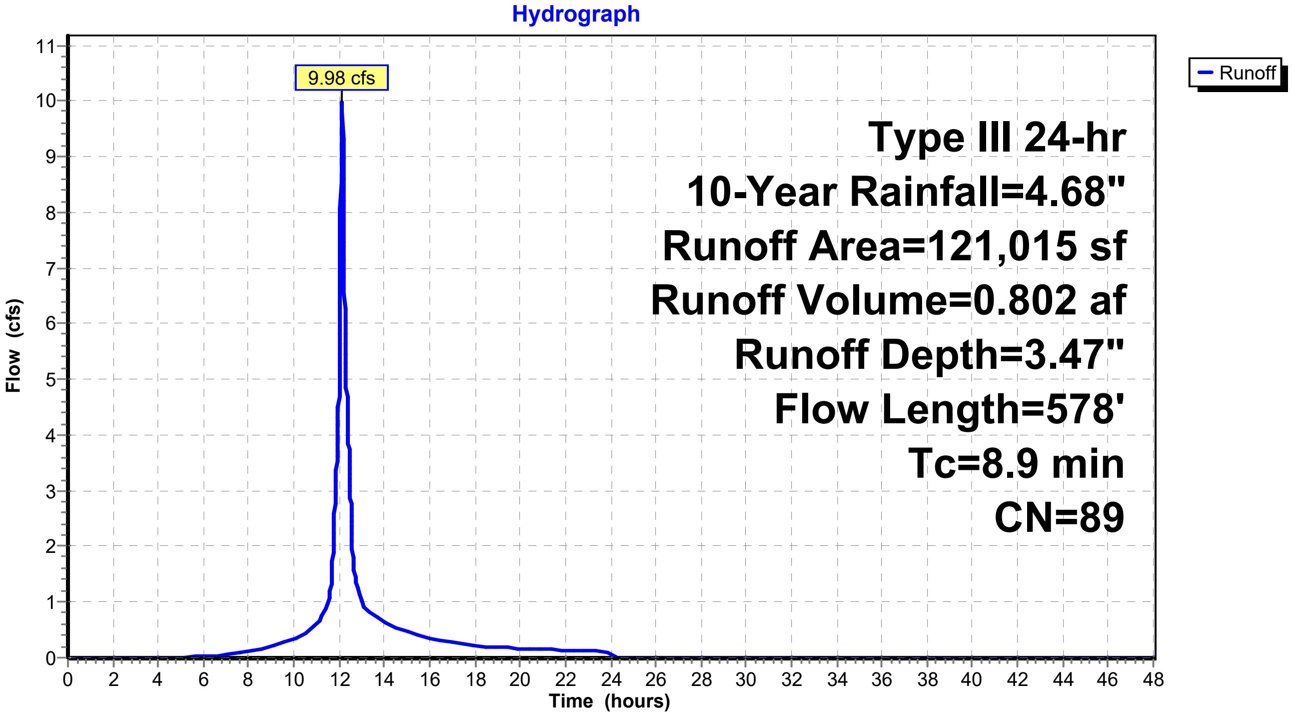
Runoff = 9.98 cfs @ 12.12 hrs, Volume= 0.802 af, Depth= 3.47"
Routed to Pond P-4 : BIO P-4

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=4.68"

Area (sf)	CN	Description
61,847	98	Paved parking, HSG D
59,168	80	>75% Grass cover, Good, HSG D
121,015	89	Weighted Average
59,168		48.89% Pervious Area
61,847		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.3	124	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	156	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	198	0.0650	17.45	21.41	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
8.9	578	Total			

Subcatchment WS 4: WS 4



Summary for Subcatchment WS 5: WS 5

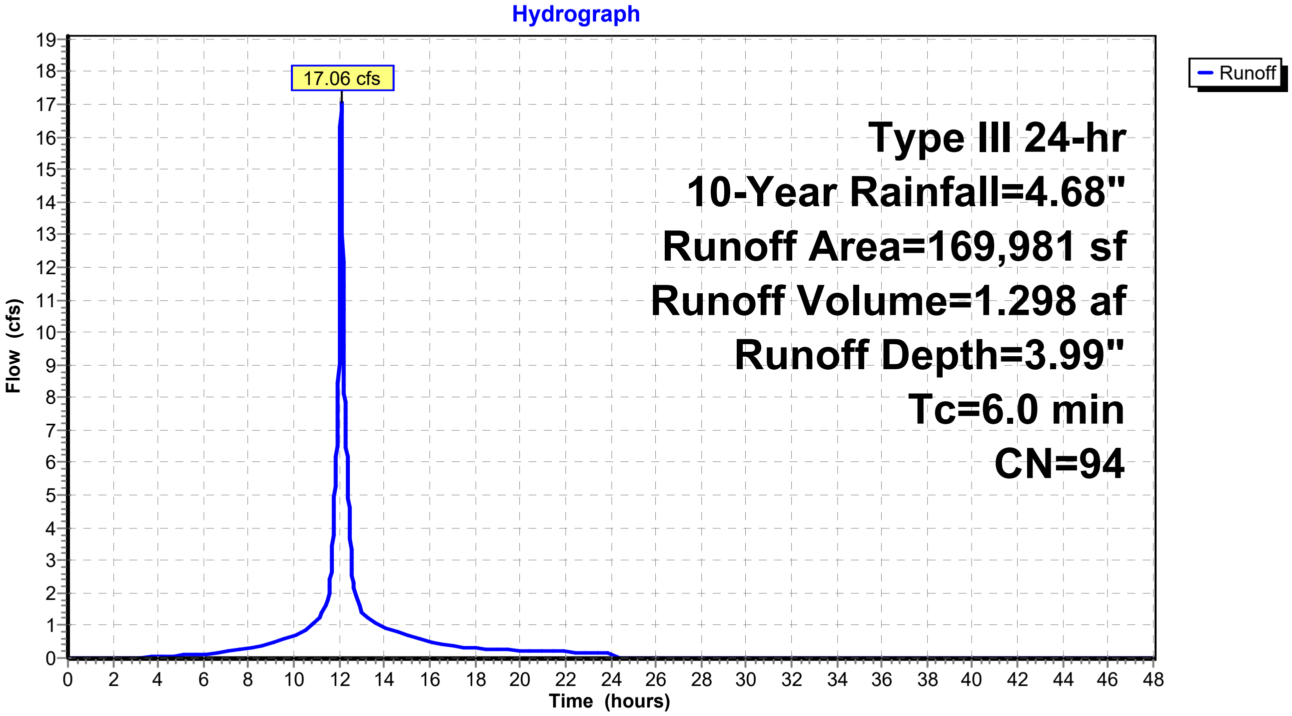
Runoff = 17.06 cfs @ 12.08 hrs, Volume= 1.298 af, Depth= 3.99"
Routed to Pond P-5 : BIO P-5

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=4.68"

Area (sf)	CN	Description
134,005	98	Paved parking, HSG D
35,976	80	>75% Grass cover, Good, HSG D
169,981	94	Weighted Average
35,976		21.16% Pervious Area
134,005		78.84% Impervious Area

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

Subcatchment WS 5: WS 5



Summary for Subcatchment WS 6: WS 6

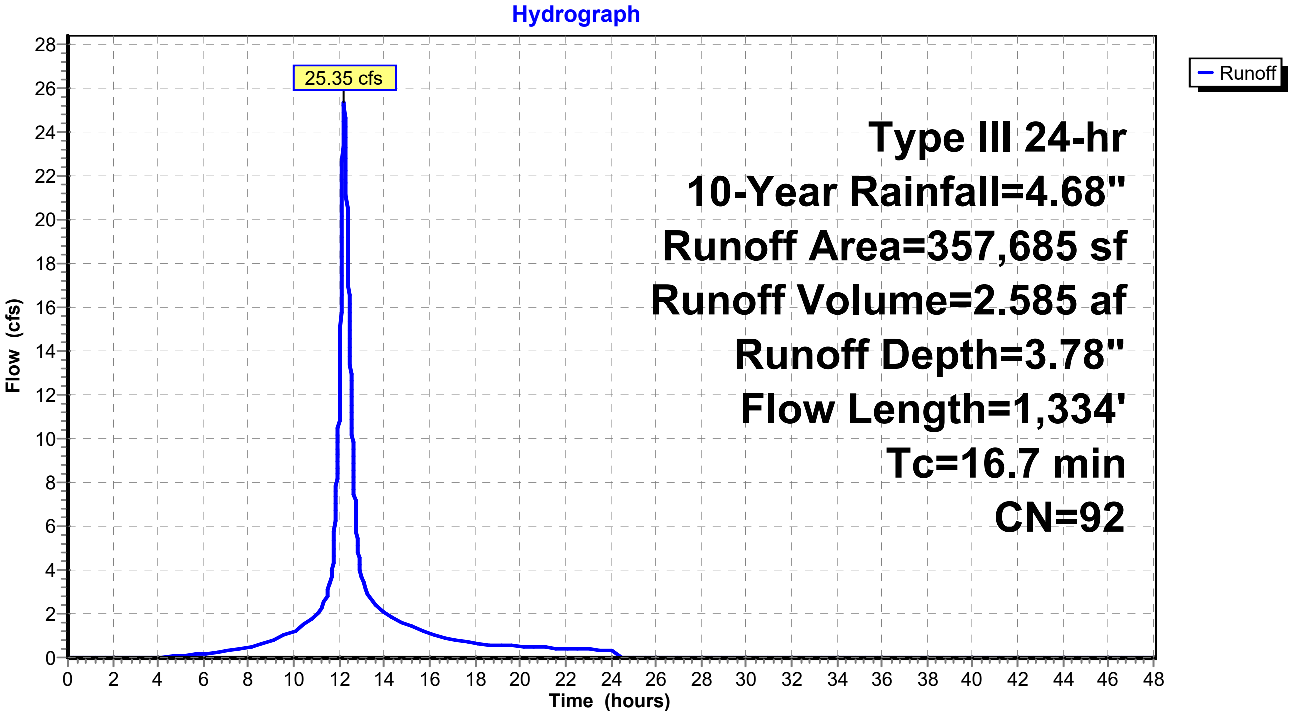
Runoff = 25.35 cfs @ 12.22 hrs, Volume= 2.585 af, Depth= 3.78"
Routed to Pond P-6 : BIO P-6

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=4.68"

Area (sf)	CN	Description
244,733	98	Paved parking, HSG D
112,952	80	>75% Grass cover, Good, HSG D
357,685	92	Weighted Average
112,952		31.58% Pervious Area
244,733		68.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.6	71	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	122	0.0189	2.79		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	1,041	0.0160	8.66	10.62	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
16.7	1,334	Total			

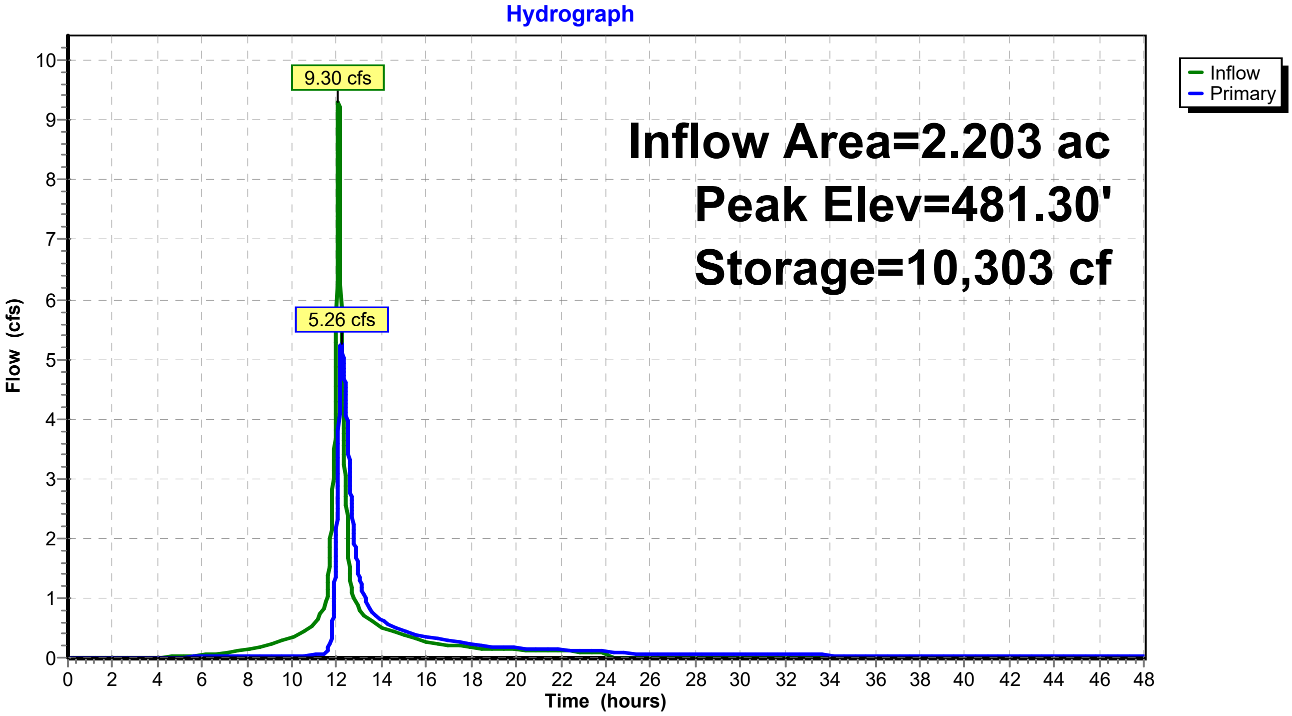
Subcatchment WS 6: WS 6



Summary for Pond P-2: BIO P-2

```
Inflow Area =       2.203 ac,  65.42% Impervious,  Inflow Depth =   3.78"    for  10-Year event
Inflow      =      9.30 cfs @  12.08 hrs,  Volume=          0.693 af
Outflow     =      5.26 cfs @  12.20 hrs,  Volume=          0.681 af,  Atten= 43%,  Lag= 6.9 min
Primary     =      5.26 cfs @  12.20 hrs,  Volume=          0.681 af
    Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 481.30' @ 12.20 hrs   Surf.Area= 8,686 sf   Storage= 10,303 cf

Plug-Flow detention time= 243.6 min calculated for 0.681 af (98% of inflow)
Center-of-Mass det. time= 232.8 min ( 1,017.6 - 784.8 )

Volume      Invert    Avail.Storage   Storage Description
   #1       480.00'       26,757 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation       Surf.Area       Inc.Store       Cum.Store
    (feet)         (sq-ft)     (cubic-feet)    (cubic-feet)
    480.00           7,185               0               0
    483.00          10,653          26,757          26,757

Device   Routing        Invert   Outlet Devices
   #1    Primary       476.50'   18.0"  Round Culvert
                                 L= 258.0'   CPP, square edge headwall,  Ke= 0.500
                                 Inlet / Outlet Invert= 476.50' / 472.00'   S= 0.0174 '/'   Cc= 0.900
                                 n= 0.010  PVC, smooth interior,  Flow Area= 1.77 sf
   #2    Device 1      480.50'   6.0" Vert. Orifice/Grate X 2.00  C= 0.600
                                 Limited to weir flow at low heads
   #3    Device 1      480.75'   36.0" W x 6.0" H Vert. Orifice/Grate  C= 0.600
                                 Limited to weir flow at low heads
   #4    Device 1      481.75'   16.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                 Head (feet)  0.20  0.40  0.60  0.80  1.00
                                 Coef. (English)  2.80  2.92  3.08  3.30  3.32
   #5    Device 1      480.00'   0.250 in/hr Bio Media over Surface area

Primary OutFlow Max=5.26 cfs @ 12.20 hrs  HW=481.30'   (Free Discharge)
↑
└─1=Culvert  (Passes 5.26 cfs of 17.12 cfs potential flow)
  ↑
  ├─2=Orifice/Grate  (Orifice Controls 1.40 cfs @ 3.57 fps)
  ├─3=Orifice/Grate  (Orifice Controls 3.81 cfs @ 2.54 fps)
  ├─4=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
  └─5=Bio Media  (Exfiltration Controls 0.05 cfs)
```

Pond P-2: BIO P-2



Summary for Pond P-3: BIO P-3

Inflow Area = 3.543 ac, 42.60% Impervious, Inflow Depth = 3.27" for 10-Year event
Inflow = 9.38 cfs @ 12.25 hrs, Volume= 0.965 af
Outflow = 5.86 cfs @ 12.49 hrs, Volume= 0.959 af, Atten= 38%, Lag= 14.4 min
Primary = 5.86 cfs @ 12.49 hrs, Volume= 0.959 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 475.40' @ 12.49 hrs Surf.Area= 9,225 sf Storage= 11,731 cf

Plug-Flow detention time= 168.2 min calculated for 0.958 af (99% of inflow)
Center-of-Mass det. time= 164.7 min (979.9 - 815.2)

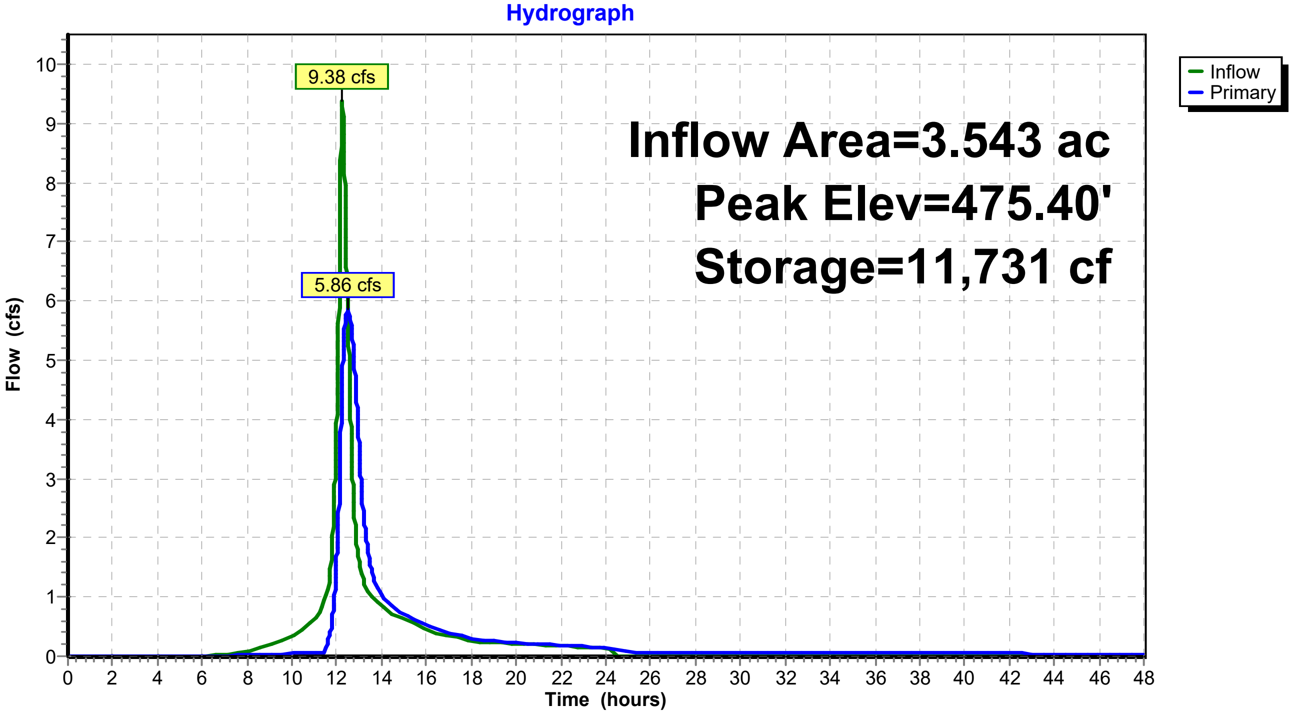
Volume	Invert	Avail.Storage	Storage Description
#1	474.00'	28,034 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
474.00	7,489	0	0
477.00	11,200	28,034	28,034

Device	Routing	Invert	Outlet Devices
#1	Primary	469.00'	**15.0" Round Culvert** L= 38.2' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 469.00' / 467.00' S= 0.0524 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	474.00'	**0.250 in/hr Bio Media over Surface area**
#3	Device 1	474.50'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	475.50'	**36.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Device 1	476.00'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.86 cfs @ 12.49 hrs HW=475.40' (Free Discharge)
└─**1=Culvert** (Passes 5.86 cfs of 14.20 cfs potential flow)
  ├─**2=Bio Media** (Exfiltration Controls 0.05 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 5.80 cfs @ 3.87 fps)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: BIO P-3



Summary for Pond P-4: BIO P-4

```
Inflow Area =         2.778 ac,  51.11% Impervious,  Inflow Depth =   3.47"    for  10-Year event
Inflow      =        9.98 cfs @   12.12 hrs,  Volume=           0.802 af
Outflow     =        4.33 cfs @   12.37 hrs,  Volume=           0.780 af,  Atten= 57%,  Lag= 14.8 min
Primary     =        4.33 cfs @   12.37 hrs,  Volume=           0.780 af
    Routed to Link DP3 : DP-1
```

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 464.59' @ 12.37 hrs Surf.Area= 9,855 sf Storage= 14,012 cf

Plug-Flow detention time= 265.0 min calculated for 0.780 af (97% of inflow)
Center-of-Mass det. time= 248.1 min (1,047.6 - 799.4)

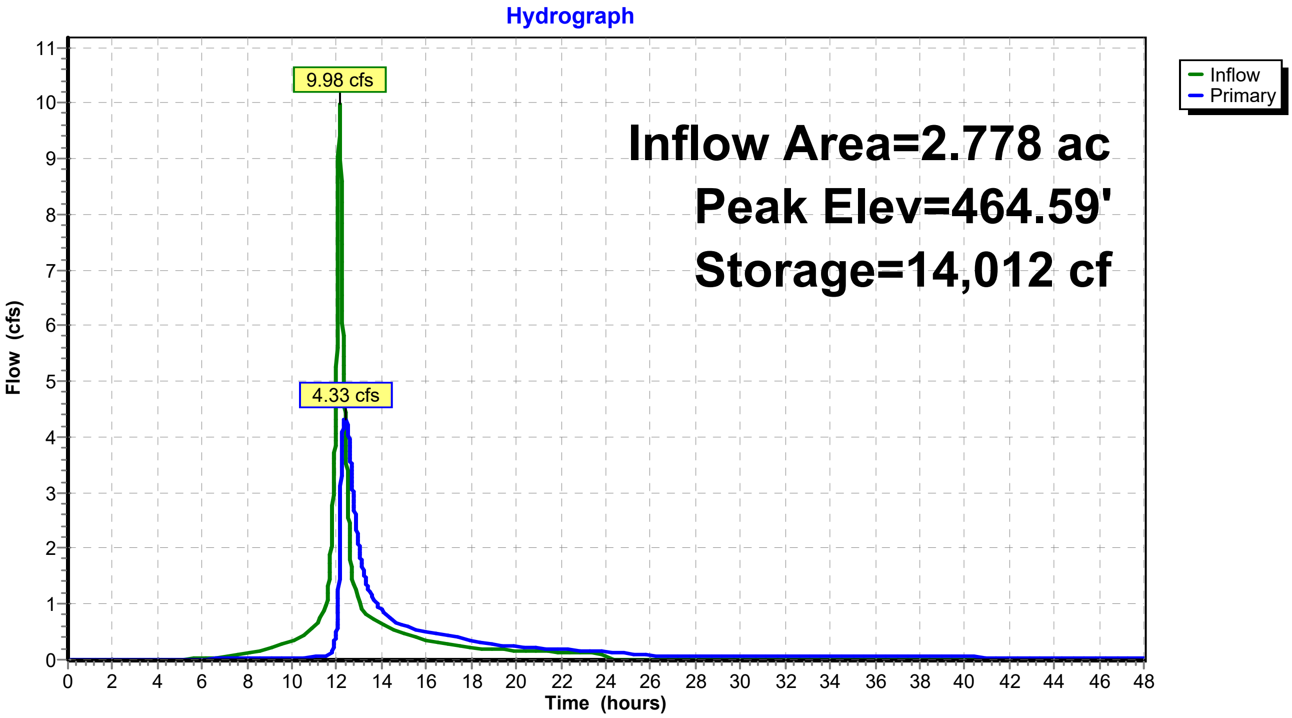
Volume	Invert	Avail.Storage	Storage Description
#1	463.00'	29,228 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
463.00	7,801	0	0
466.00	11,684	29,228	29,228

Device	Routing	Invert	Outlet Devices
#1	Primary	459.50'	**15.0" Round Culvert** L= 221.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 459.50' / 454.00' S= 0.0248 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	463.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	464.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	464.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	463.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=4.33 cfs @ 12.37 hrs HW=464.59' (Free Discharge)
└─**1=Culvert** (Passes 4.33 cfs of 12.48 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.87 cfs @ 4.41 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.40 cfs @ 2.72 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Bio Media** (Exfiltration Controls 0.06 cfs)

Pond P-4: BIO P-4



Summary for Pond P-5: BIO P-5

```
Inflow Area =        3.902 ac, 78.84% Impervious, Inflow Depth =  3.99"   for 10-Year event
Inflow      =      17.06 cfs @  12.08 hrs, Volume=         1.298 af
Outflow     =       6.11 cfs @  12.34 hrs, Volume=         1.224 af, Atten= 64%, Lag= 15.4 min
Primary     =       6.11 cfs @  12.34 hrs, Volume=         1.224 af
   Routed to Link DP3 : DP-1
```

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 461.69' @ 12.34 hrs Surf.Area= 15,882 sf Storage= 24,623 cf

Plug-Flow detention time= 297.0 min calculated for 1.224 af (94% of inflow)
Center-of-Mass det. time= 265.2 min (1,040.6 - 775.4)

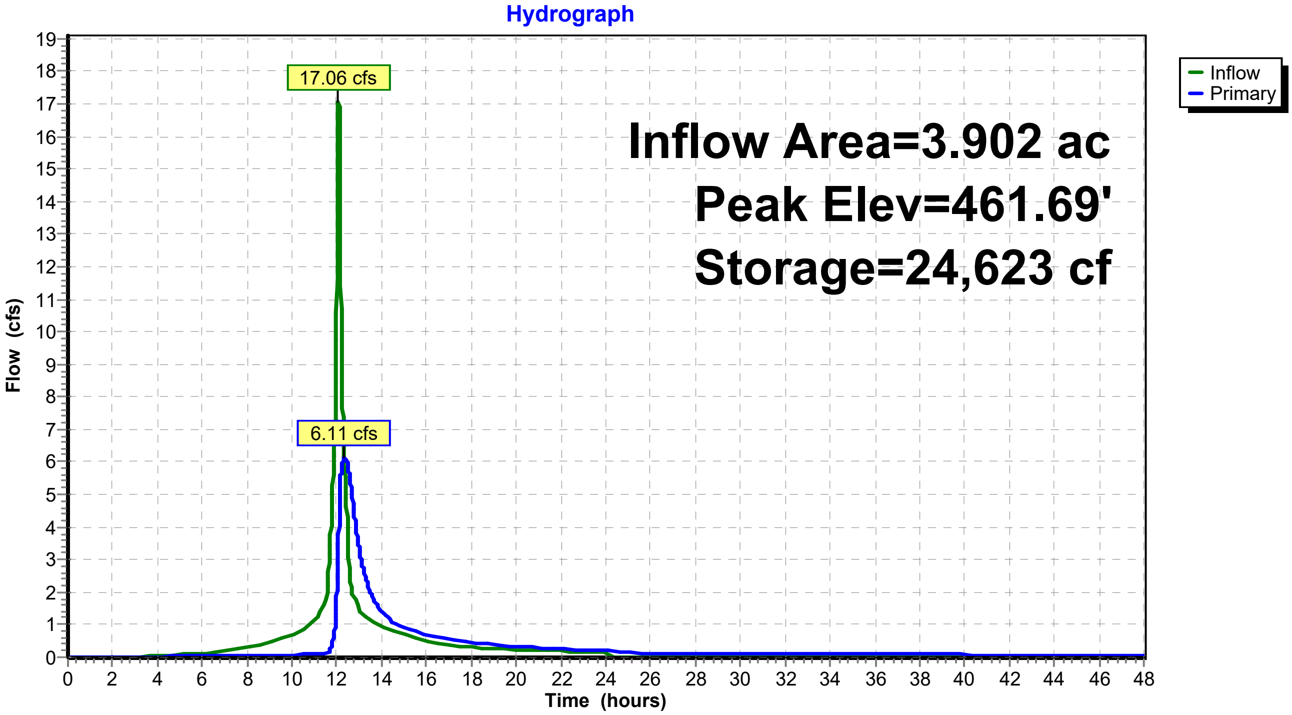
Volume	Invert	Avail.Storage	Storage Description
#1	460.00'	46,806 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
460.00	13,338	0	0
463.00	17,866	46,806	46,806

Device	Routing	Invert	Outlet Devices
#1	Primary	455.00'	**18.0" Round Culvert** L= 34.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.00' / 452.00' S= 0.0860 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	461.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	460.66'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	461.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	460.00'	**0.250 in/hr Bio Media over Surface area**

```
Primary OutFlow Max=6.12 cfs @ 12.34 hrs HW=461.69'   (Free Discharge)
└─1=Culvert (Passes 6.12 cfs of 20.73 cfs potential flow)
   ├─2=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
   ├─3=Orifice/Grate (Orifice Controls 2.11 cfs @ 4.22 fps)
   ├─4=Orifice/Grate (Orifice Controls 3.91 cfs @ 3.13 fps)
   └─5=Bio Media (Exfiltration Controls 0.09 cfs)
```

Pond P-5: BIO P-5



Summary for Pond P-6: BIO P-6

Inflow Area = 8.211 ac, 68.42% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 25.35 cfs @ 12.22 hrs, Volume= 2.585 af
Outflow = 11.41 cfs @ 12.55 hrs, Volume= 2.447 af, Atten= 55%, Lag= 19.8 min
Primary = 11.41 cfs @ 12.55 hrs, Volume= 2.447 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 459.72' @ 12.55 hrs Surf.Area= 28,931 sf Storage= 46,163 cf

Plug-Flow detention time= 264.2 min calculated for 2.447 af (95% of inflow)
Center-of-Mass det. time= 234.5 min (1,029.3 - 794.7)

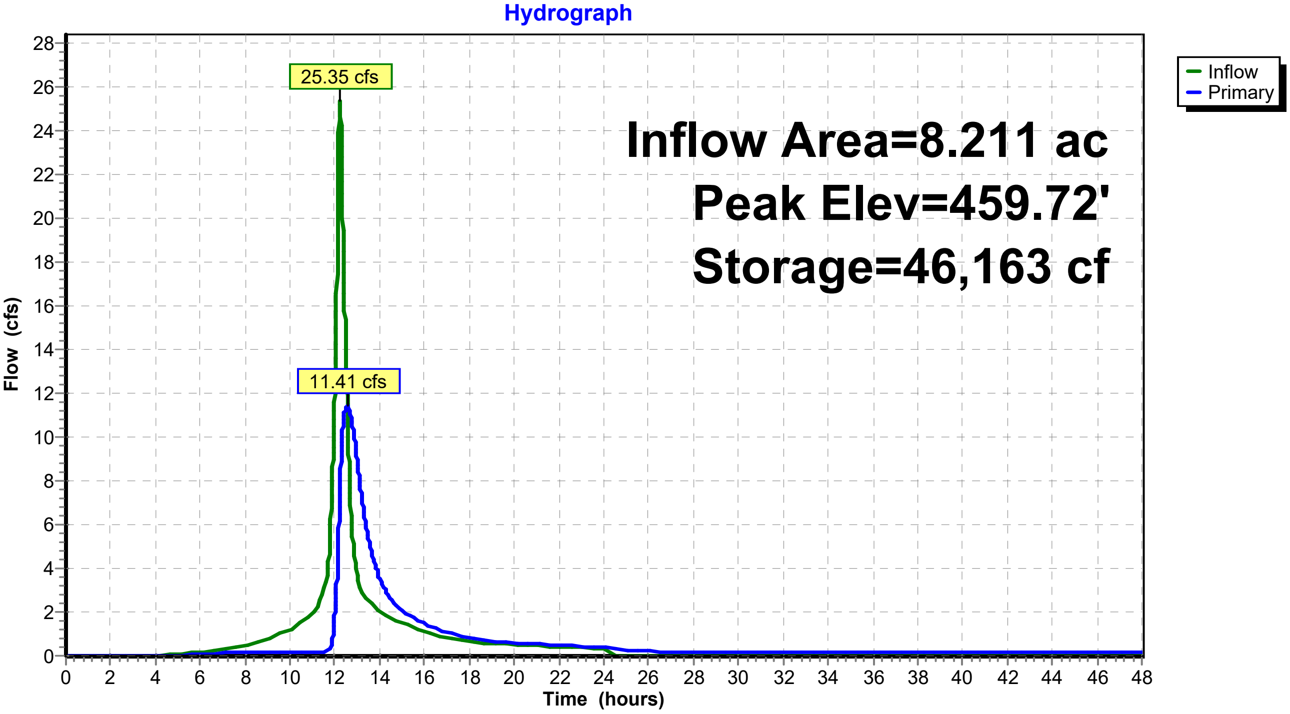
Volume	Invert	Avail.Storage	Storage Description
#1	458.00'	85,194 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
458.00	24,756	0	0
461.00	32,040	85,194	85,194

Device	Routing	Invert	Outlet Devices
#1	Primary	454.00'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 454.00' / 452.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	458.66'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	458.75'	**32.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	459.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	458.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=11.41 cfs @ 12.55 hrs HW=459.72' (Free Discharge)
└**1=Culvert** (Passes 11.41 cfs of 18.97 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 3.96 cfs @ 4.32 fps)
  ├**3=Orifice/Grate** (Orifice Controls 7.29 cfs @ 3.65 fps)
  ├**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**5=Bio Media** (Exfiltration Controls 0.17 cfs)

Pond P-6: BIO P-6

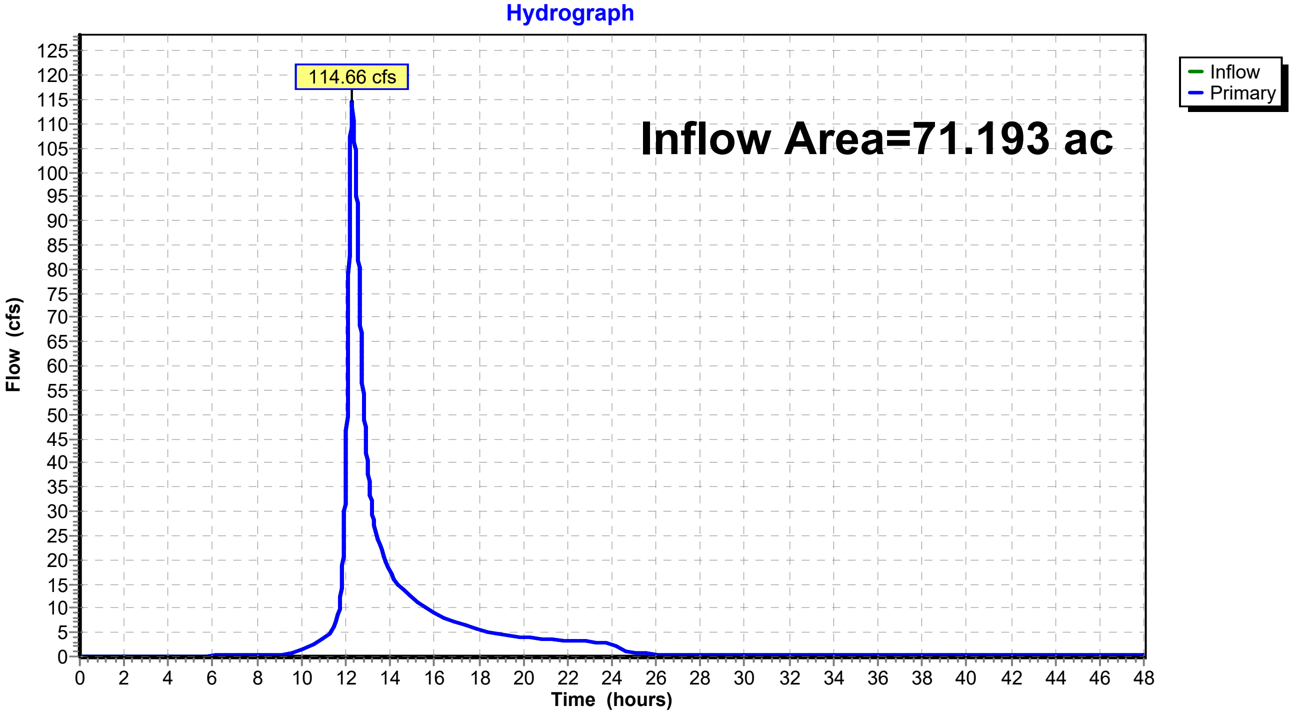


Summary for Link DP3: DP-1

Inflow Area =	71.193 ac,	21.29% Impervious,	Inflow Depth >	2.61"	for 10-Year event
Inflow =	114.66 cfs @	12.29 hrs,	Volume=	15.496 af	
Primary =	114.66 cfs @	12.29 hrs,	Volume=	15.496 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP3: DP-1



Summary for Subcatchment WS 1A: WS 1A

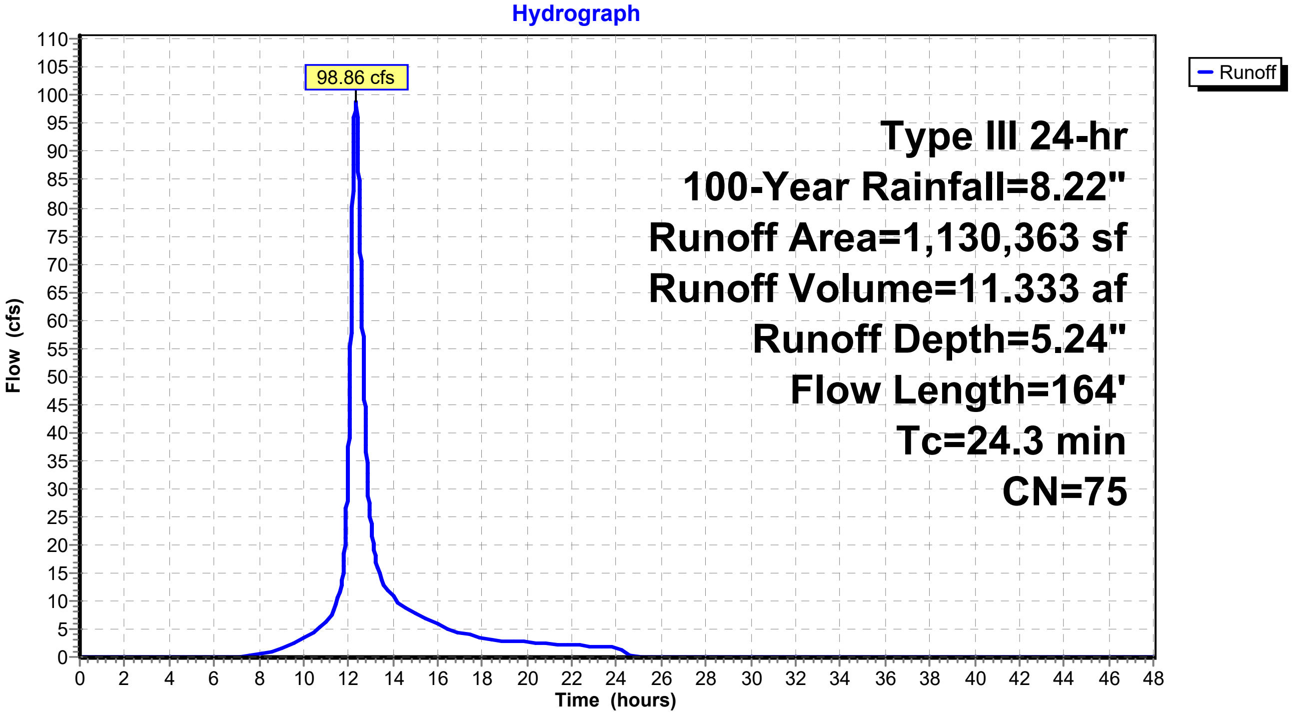
Runoff = 98.86 cfs @ 12.34 hrs, Volume= 11.333 af, Depth= 5.24"
Routed to Link DP3 : DP-1

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=8.22"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment WS 1A: WS 1A



Summary for Subcatchment WS 1B: WS 1B

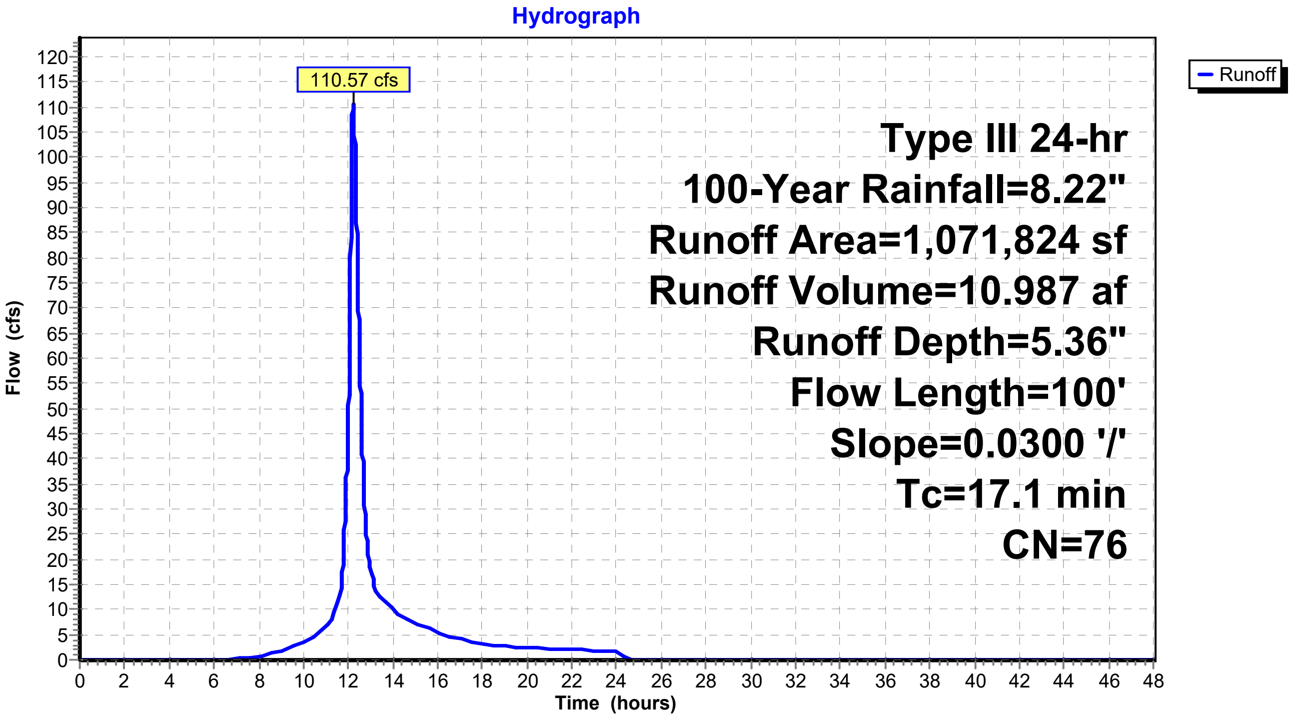
Runoff = 110.57 cfs @ 12.23 hrs, Volume= 10.987 af, Depth= 5.36"
Routed to Link DP3 : DP-1

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=8.22"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	845,994	73	Brush, Good, HSG D
	15,520	78	Meadow, non-grazed, HSG D
*	9,633	98	Trail
	59,047	79	Woods, Fair, HSG D
	63,275	80	>75% Grass cover, Good, HSG D
	1,071,824	76	Weighted Average
	983,836		91.79% Pervious Area
	87,988		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0300	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 1B: WS 1B



Summary for Subcatchment WS 2: WS 2

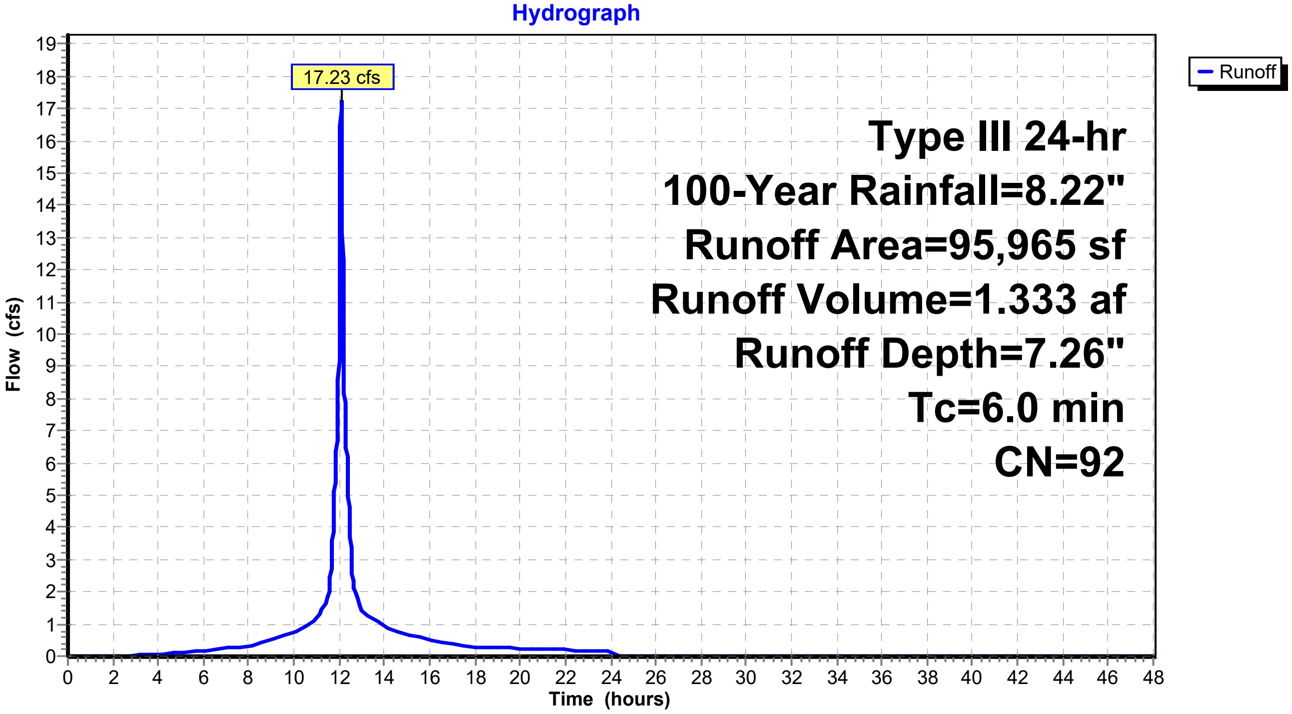
Runoff = 17.23 cfs @ 12.08 hrs, Volume= 1.333 af, Depth= 7.26"
Routed to Pond P-2 : BIO P-2

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=8.22"

Area (sf)	CN	Description
62,776	98	Paved parking, HSG D
33,189	80	>75% Grass cover, Good, HSG D
95,965	92	Weighted Average
33,189		34.58% Pervious Area
62,776		65.42% Impervious Area

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

Subcatchment WS 2: WS 2



Summary for Subcatchment WS 3: WS 3

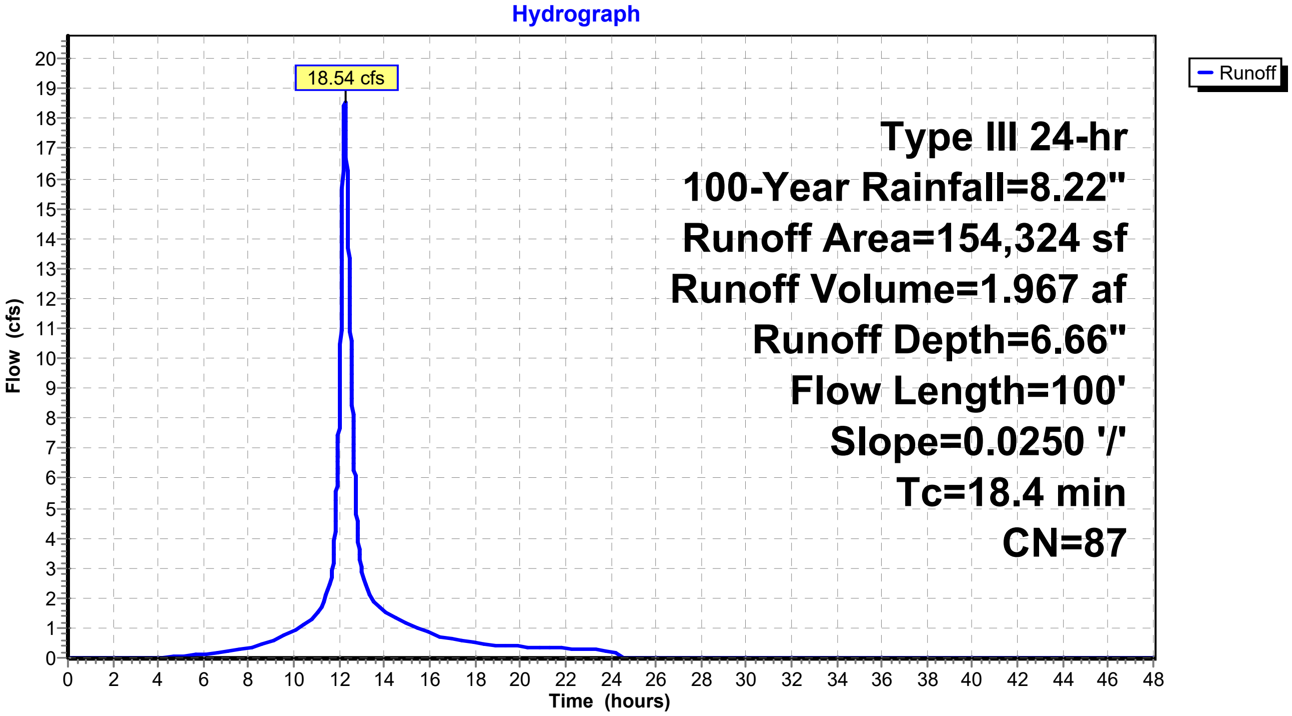
Runoff = 18.54 cfs @ 12.24 hrs, Volume= 1.967 af, Depth= 6.66"
Routed to Pond P-3 : BIO P-3

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=8.22"

Area (sf)	CN	Description
65,736	98	Paved parking, HSG D
69,746	80	>75% Grass cover, Good, HSG D
8,645	73	Brush, Good, HSG D
10,197	78	Meadow, non-grazed, HSG D
154,324	87	Weighted Average
88,588		57.40% Pervious Area
65,736		42.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	100	0.0250	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 3: WS 3



Summary for Subcatchment WS 4: WS 4

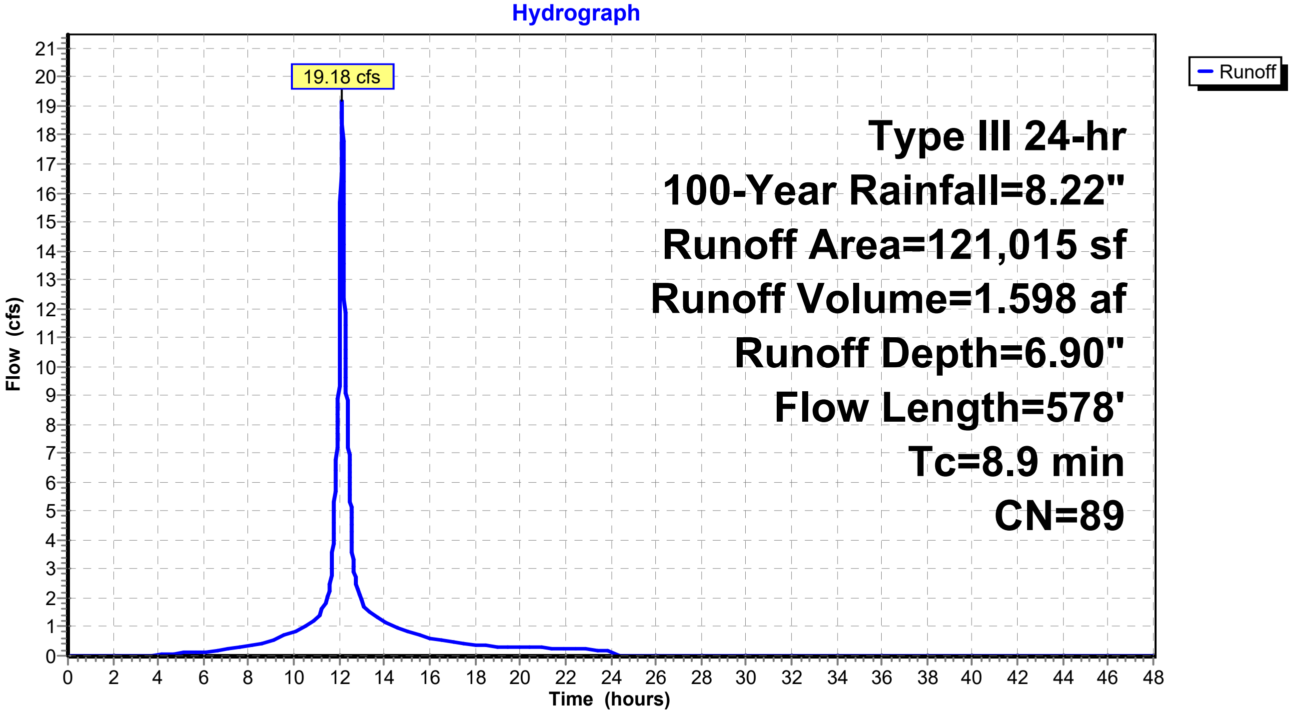
Runoff = 19.18 cfs @ 12.12 hrs, Volume= 1.598 af, Depth= 6.90"
Routed to Pond P-4 : BIO P-4

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=8.22"

Area (sf)	CN	Description
61,847	98	Paved parking, HSG D
59,168	80	>75% Grass cover, Good, HSG D
121,015	89	Weighted Average
59,168		48.89% Pervious Area
61,847		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.3	124	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	156	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	198	0.0650	17.45	21.41	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
8.9	578	Total			

Subcatchment WS 4: WS 4



Summary for Subcatchment WS 5: WS 5

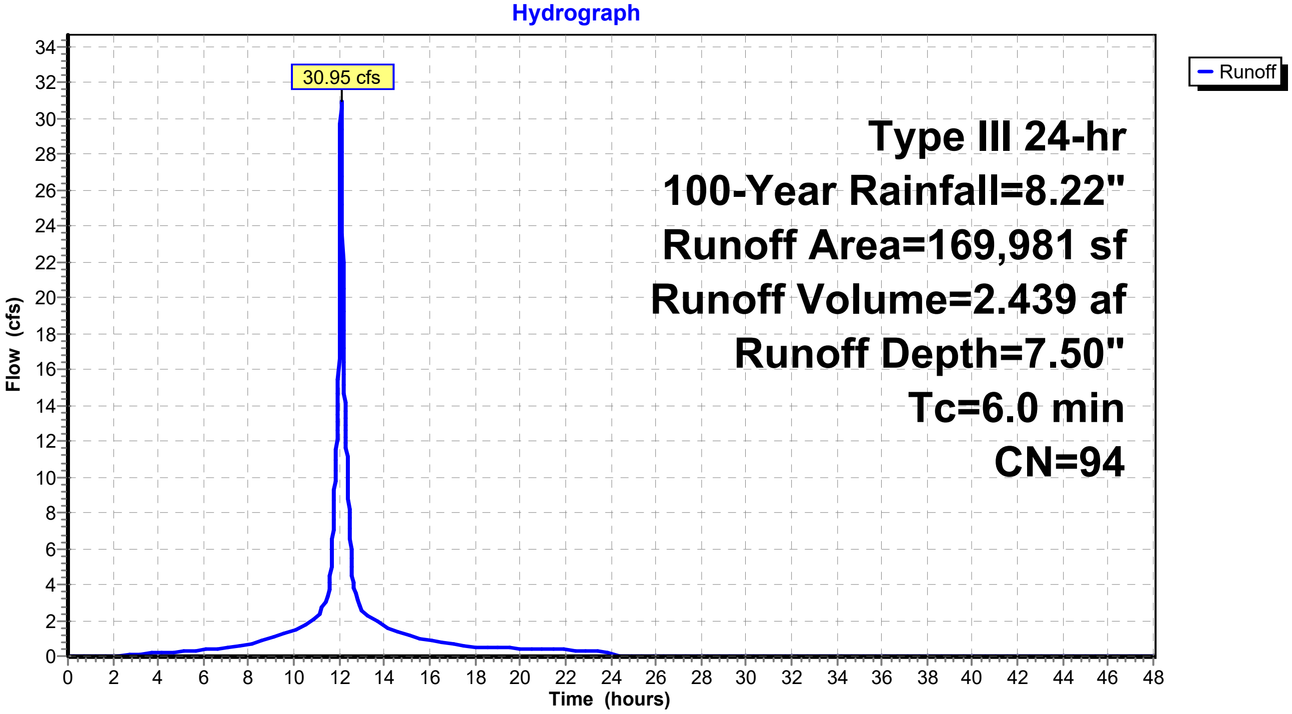
Runoff = 30.95 cfs @ 12.08 hrs, Volume= 2.439 af, Depth= 7.50"
Routed to Pond P-5 : BIO P-5

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=8.22"

Area (sf)	CN	Description
134,005	98	Paved parking, HSG D
35,976	80	>75% Grass cover, Good, HSG D
169,981	94	Weighted Average
35,976		21.16% Pervious Area
134,005		78.84% Impervious Area

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

Subcatchment WS 5: WS 5



Summary for Subcatchment WS 6: WS 6

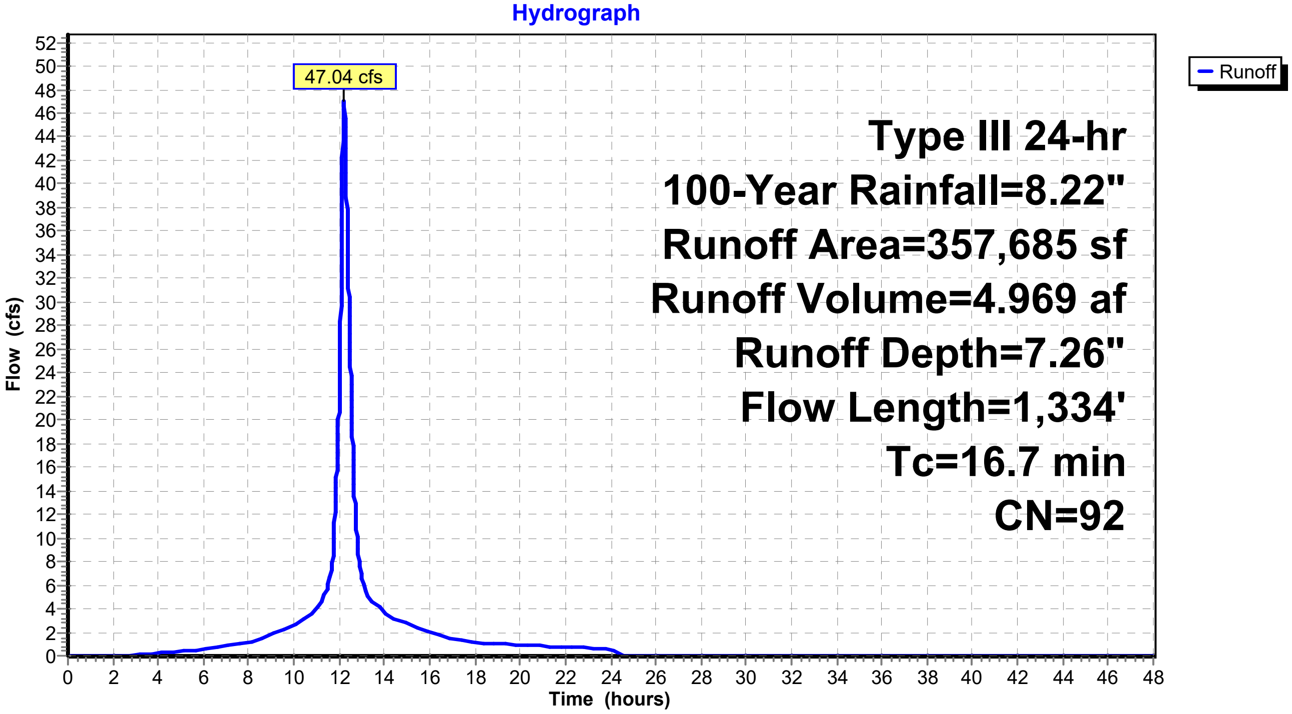
Runoff = 47.04 cfs @ 12.22 hrs, Volume= 4.969 af, Depth= 7.26"
Routed to Pond P-6 : BIO P-6

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=8.22"

Area (sf)	CN	Description
244,733	98	Paved parking, HSG D
112,952	80	>75% Grass cover, Good, HSG D
357,685	92	Weighted Average
112,952		31.58% Pervious Area
244,733		68.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.6	71	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	122	0.0189	2.79		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	1,041	0.0160	8.66	10.62	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
16.7	1,334	Total			

Subcatchment WS 6: WS 6



Summary for Pond P-2: BIO P-2

Inflow Area = 2.203 ac, 65.42% Impervious, Inflow Depth = 7.26" for 100-Year event
Inflow = 17.23 cfs @ 12.08 hrs, Volume= 1.333 af
Outflow = 9.69 cfs @ 12.20 hrs, Volume= 1.318 af, Atten= 44%, Lag= 6.9 min
Primary = 9.69 cfs @ 12.20 hrs, Volume= 1.318 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 481.83' @ 12.20 hrs Surf.Area= 9,305 sf Storage= 15,121 cf

Plug-Flow detention time= 150.2 min calculated for 1.318 af (99% of inflow)
Center-of-Mass det. time= 142.7 min (911.1 - 768.4)

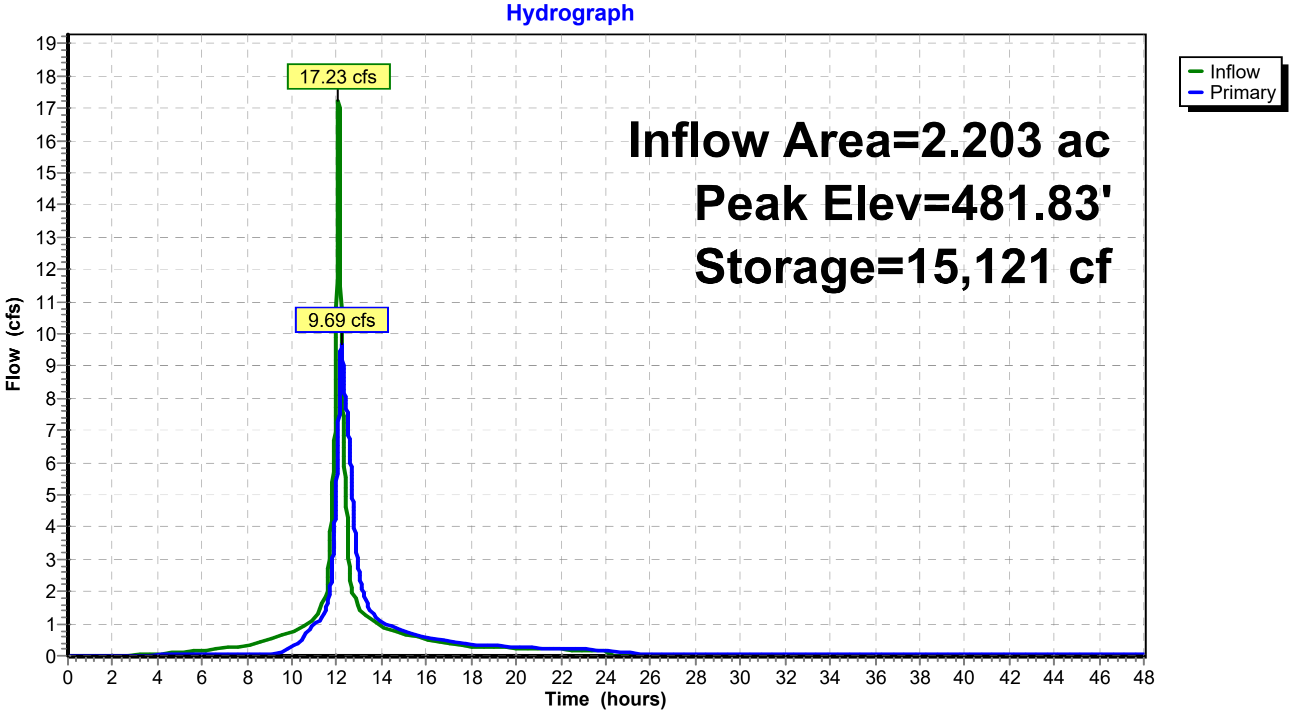
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	26,757 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
480.00	7,185	0	0
483.00	10,653	26,757	26,757

Device	Routing	Invert	Outlet Devices
#1	Primary	476.50'	**18.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 476.50' / 472.00' S= 0.0174 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	480.50'	**6.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	480.75'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	481.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	480.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=9.68 cfs @ 12.20 hrs HW=481.83' (Free Discharge)
└─**1=Culvert** (Passes 9.68 cfs of 18.22 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.97 cfs @ 5.01 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 6.57 cfs @ 4.38 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 1.09 cfs @ 0.81 fps)
  └─**5=Bio Media** (Exfiltration Controls 0.05 cfs)

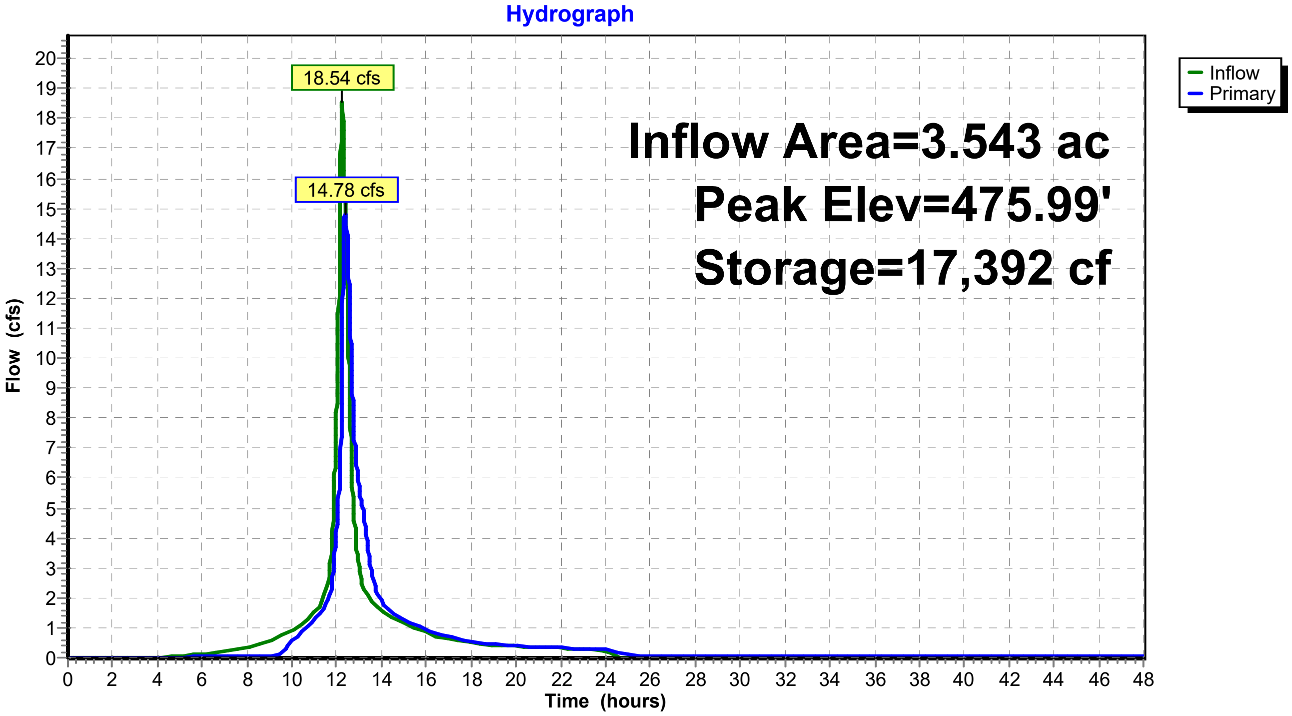
Pond P-2: BIO P-2



Summary for Pond P-3: BIO P-3

```
Inflow Area =        3.543 ac, 42.60% Impervious,  Inflow Depth =   6.66"    for  100-Year event
Inflow      =      18.54 cfs @  12.24 hrs,  Volume=          1.967 af
Outflow     =      14.78 cfs @  12.38 hrs,  Volume=          1.960 af,  Atten= 20%,  Lag= 8.1 min
Primary     =      14.78 cfs @  12.38 hrs,  Volume=          1.960 af
   Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 475.99' @ 12.38 hrs   Surf.Area= 9,956 sf   Storage= 17,392 cf

Plug-Flow detention time= 98.9 min calculated for 1.960 af (100% of inflow)
Center-of-Mass det. time= 96.8 min ( 892.4 - 795.6 )

Volume       Invert     Avail.Storage   Storage Description
   #1        474.00'        28,034 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store        Cum.Store
    (feet)              (sq-ft)       (cubic-feet)      (cubic-feet)
    474.00              7,489                  0                0
    477.00             11,200             28,034           28,034

Device   Routing            Invert   Outlet Devices
   #1    Primary           469.00'   15.0"  Round Culvert
                                     L= 38.2'   CPP, square edge headwall,  Ke= 0.500
                                     Inlet / Outlet Invert= 469.00' / 467.00'   S= 0.0524 '/'   Cc= 0.900
                                     n= 0.010  PVC, smooth interior,  Flow Area= 1.23 sf
   #2    Device 1          474.00'   0.250 in/hr Bio Media over Surface area
   #3    Device 1          474.50'   36.0" W x 6.0" H Vert. Orifice/Grate  C= 0.600
                                     Limited to weir flow at low heads
   #4    Device 1          475.50'   36.0" W x 6.0" H Vert. Orifice/Grate X 2.00  C= 0.600
                                     Limited to weir flow at low heads
   #5    Device 1          476.00'   16.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                     Head (feet)  0.20  0.40  0.60  0.80  1.00
                                     Coef. (English)  2.80  2.92  3.08  3.30  3.32

Primary OutFlow  Max=14.79 cfs @ 12.38 hrs  HW=475.99'   (Free Discharge)
└─1=Culvert  (Passes 14.79 cfs of 14.91 cfs potential flow)
   ├─2=Bio Media  (Exfiltration Controls 0.06 cfs)
   ├─3=Orifice/Grate  (Orifice Controls 8.04 cfs @ 5.36 fps)
   ├─4=Orifice/Grate  (Orifice Controls 6.69 cfs @ 2.26 fps)
   └─5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
```

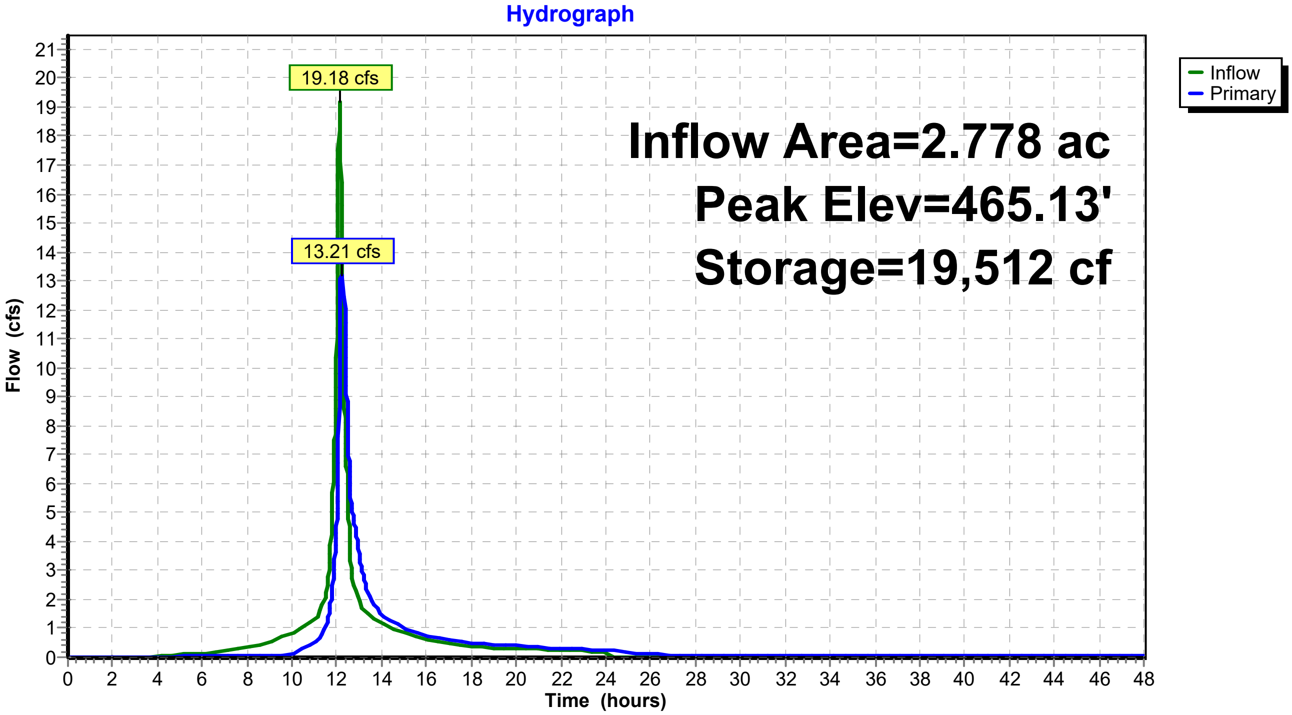
Pond P-3: BIO P-3



Summary for Pond P-4: BIO P-4

```
Inflow Area =        2.778 ac, 51.11% Impervious,  Inflow Depth =  6.90"   for 100-Year event
Inflow      =      19.18 cfs @  12.12 hrs,  Volume=          1.598 af
Outflow     =      13.21 cfs @  12.23 hrs,  Volume=          1.571 af,  Atten= 31%,  Lag= 6.3 min
Primary     =      13.21 cfs @  12.23 hrs,  Volume=          1.571 af
   Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 465.13' @ 12.23 hrs   Surf.Area= 10,553 sf   Storage= 19,512 cf

Plug-Flow detention time= 160.9 min calculated for 1.571 af (98% of inflow)
Center-of-Mass det. time= 150.5 min ( 931.4 - 780.9 )

Volume       Invert    Avail.Storage  Storage Description
   #1        463.00'        29,228 cf  Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation        Surf.Area        Inc.Store      Cum.Store
    (feet)           (sq-ft)     (cubic-feet)    (cubic-feet)
   463.00             7,801              0              0
   466.00            11,684         29,228         29,228

Device  Routing          Invert  Outlet Devices
   #1   Primary         459.50'  15.0"  Round Culvert
                                 L= 221.6'   CPP, square edge headwall,  Ke= 0.500
                                 Inlet / Outlet Invert= 459.50' / 454.00'   S= 0.0248 '/'   Cc= 0.900
                                 n= 0.010  PVC, smooth interior,  Flow Area= 1.23 sf
   #2   Device 1        463.50'  6.0" Vert. Orifice/Grate   C= 0.600   Limited to weir flow at low heads
   #3   Device 1        464.00'  30.0" W x 6.0" H Vert. Orifice/Grate  C= 0.600
                                 Limited to weir flow at low heads
   #4   Device 1        464.75'  16.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                 Head (feet)  0.20  0.40  0.60  0.80  1.00
                                 Coef. (English)  2.80  2.92  3.08  3.30  3.32
   #5   Device 1        463.00'  0.250 in/hr Bio Media over Surface area

Primary OutFlow  Max=13.21 cfs @ 12.23 hrs  HW=465.13'   (Free Discharge)
↑—1=Culvert  (Inlet Controls 13.21 cfs @ 10.77 fps)
   ↑—2=Orifice/Grate  (Passes < 1.11 cfs potential flow)
   ├—3=Orifice/Grate  (Passes < 5.61 cfs potential flow)
   ├—4=Broad-Crested Rectangular Weir(Passes < 10.72 cfs potential flow)
   └—5=Bio Media  (Passes < 0.06 cfs potential flow)
```

Pond P-4: BIO P-4



Summary for Pond P-5: BIO P-5

Inflow Area = 3.902 ac, 78.84% Impervious, Inflow Depth = 7.50" for 100-Year event
Inflow = 30.95 cfs @ 12.08 hrs, Volume= 2.439 af
Outflow = 21.44 cfs @ 12.16 hrs, Volume= 2.358 af, Atten= 31%, Lag= 4.8 min
Primary = 21.44 cfs @ 12.16 hrs, Volume= 2.358 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 462.18' @ 12.16 hrs Surf.Area= 16,635 sf Storage= 32,732 cf

Plug-Flow detention time= 187.5 min calculated for 2.358 af (97% of inflow)
Center-of-Mass det. time= 167.2 min (927.9 - 760.7)

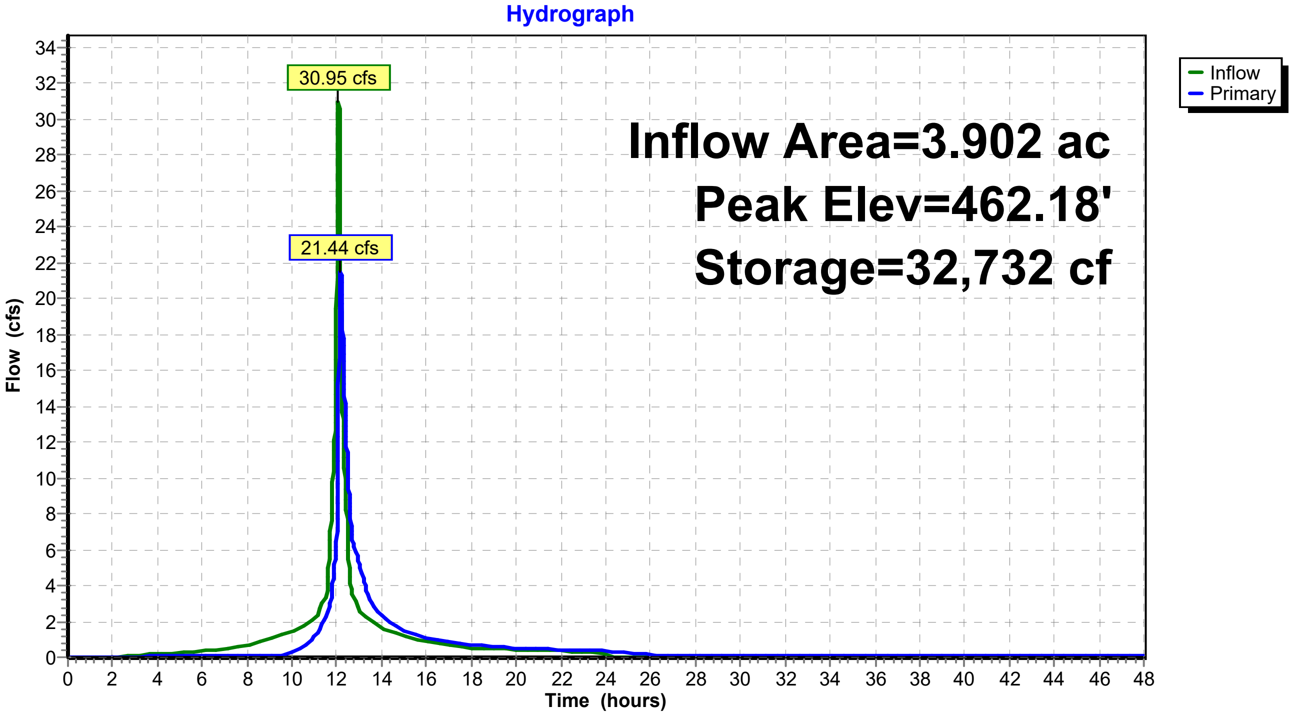
Volume	Invert	Avail.Storage	Storage Description
#1	460.00'	46,806 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
460.00	13,338	0	0
463.00	17,866	46,806	46,806

Device	Routing	Invert	Outlet Devices
#1	Primary	455.00'	**18.0" Round Culvert** L= 34.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.00' / 452.00' S= 0.0860 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	461.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	460.66'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	461.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	460.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=21.58 cfs @ 12.16 hrs HW=462.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 21.58 cfs @ 12.21 fps)
  ├─**2=Broad-Crested Rectangular Weir** (Passes < 13.47 cfs potential flow)
  ├─**3=Orifice/Grate** (Passes < 2.71 cfs potential flow)
  ├─**4=Orifice/Grate** (Passes < 5.80 cfs potential flow)
  └─**5=Bio Media** (Passes < 0.10 cfs potential flow)

Pond P-5: BIO P-5



Summary for Pond P-6: BIO P-6

Inflow Area = 8.211 ac, 68.42% Impervious, Inflow Depth = 7.26" for 100-Year event
Inflow = 47.04 cfs @ 12.22 hrs, Volume= 4.969 af
Outflow = 20.64 cfs @ 12.56 hrs, Volume= 4.823 af, Atten= 56%, Lag= 20.1 min
Primary = 20.64 cfs @ 12.56 hrs, Volume= 4.823 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 460.63' @ 12.56 hrs Surf.Area= 31,147 sf Storage= 73,579 cf

Plug-Flow detention time= 167.4 min calculated for 4.822 af (97% of inflow)
Center-of-Mass det. time= 149.7 min (928.0 - 778.3)

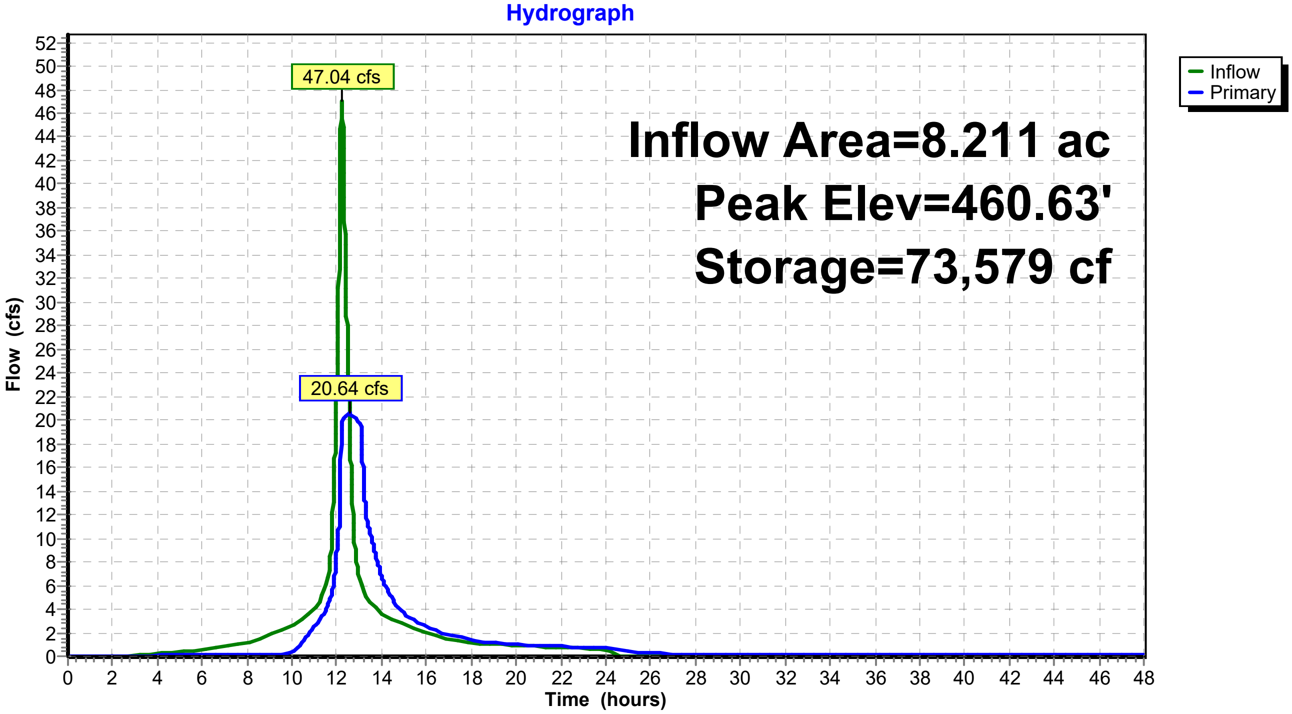
Volume	Invert	Avail.Storage	Storage Description
#1	458.00'	85,194 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
458.00	24,756	0	0
461.00	32,040	85,194	85,194

Device	Routing	Invert	Outlet Devices
#1	Primary	454.00'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 454.00' / 452.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	458.66'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	458.75'	**32.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	459.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	458.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=20.64 cfs @ 12.56 hrs HW=460.63' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 20.64 cfs @ 11.68 fps)
  ↑—**2=Orifice/Grate** (Passes < 5.79 cfs potential flow)
  —**3=Orifice/Grate** (Passes < 11.79 cfs potential flow)
  —**4=Broad-Crested Rectangular Weir** (Passes < 43.87 cfs potential flow)
  └—**5=Bio Media** (Passes < 0.18 cfs potential flow)

Pond P-6: BIO P-6

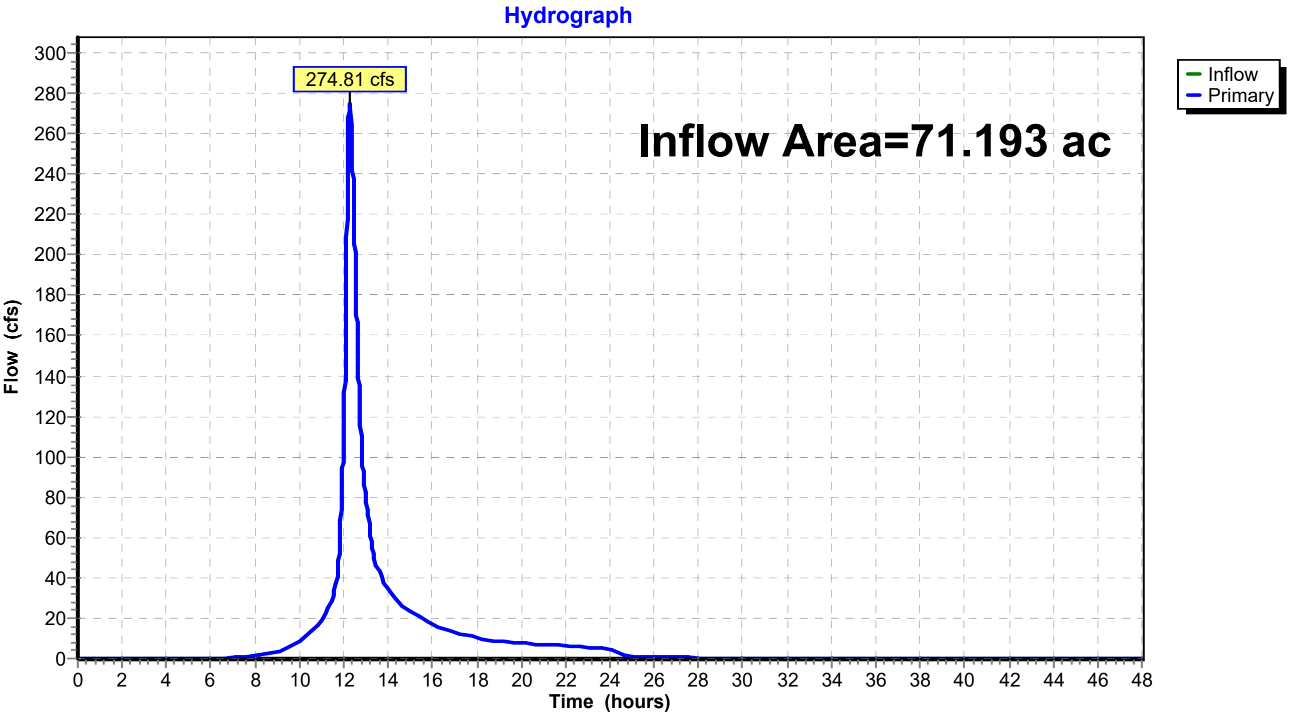


Summary for Link DP3: DP-1

Inflow Area = 71.193 ac, 21.29% Impervious, Inflow Depth > 5.79" for 100-Year event
Inflow = 274.81 cfs @ 12.26 hrs, Volume= 34.350 af
Primary = 274.81 cfs @ 12.26 hrs, Volume= 34.350 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP3: DP-1



Summary for Subcatchment WS 1A: WS 1A

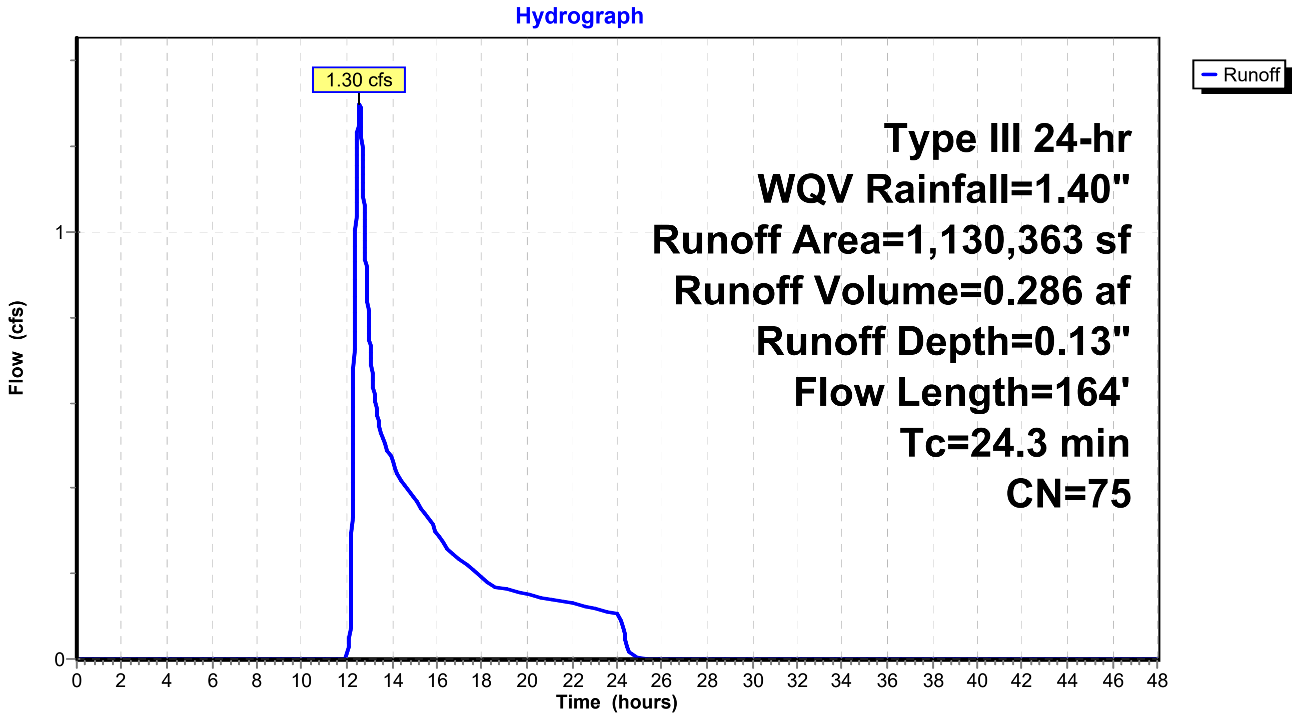
Runoff = 1.30 cfs @ 12.56 hrs, Volume= 0.286 af, Depth= 0.13"
Routed to Link DP3 : DP-1

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
3,073	98	Water Surface, HSG D
751,876	73	Brush, Good, HSG D
375,414	79	Woods, Fair, HSG D
1,130,363	75	Weighted Average
1,127,290		99.73% Pervious Area
3,073		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	100	0.0150	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"
1.7	64	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.3	164	Total			

Subcatchment WS 1A: WS 1A



Summary for Subcatchment WS 1B: WS 1B

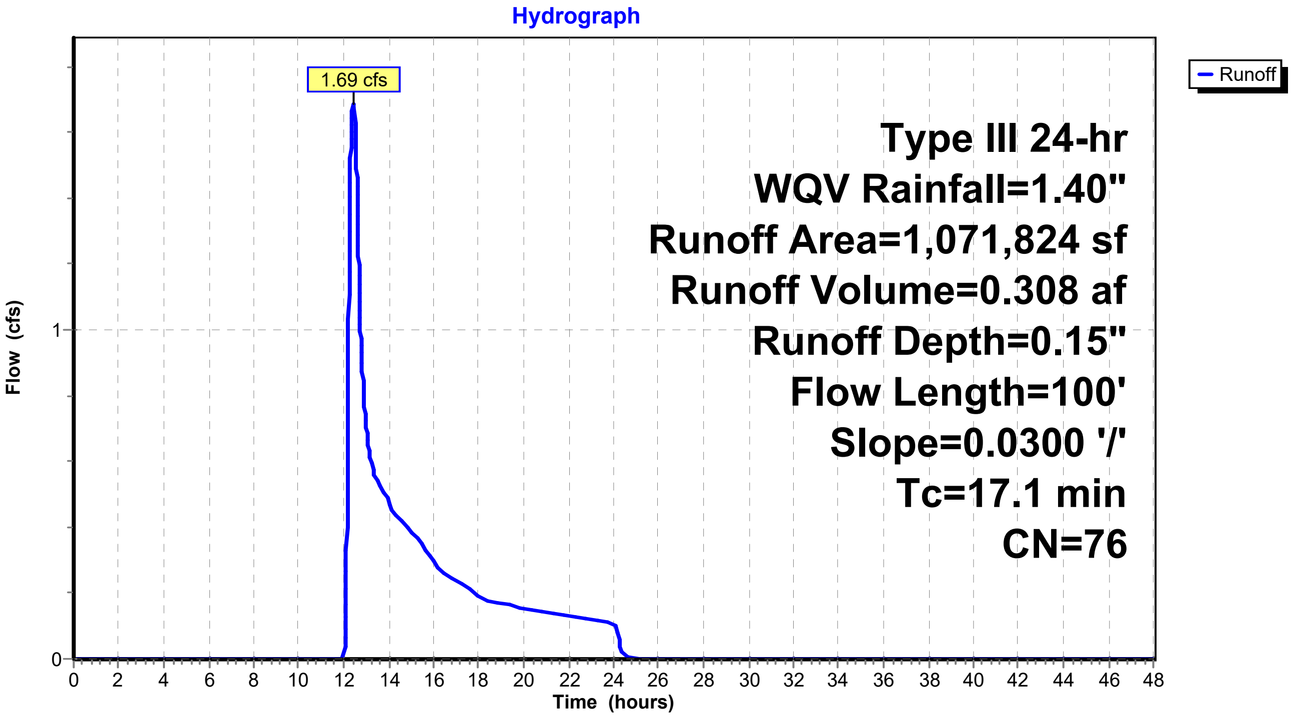
```
Runoff      =        1.69 cfs @   12.44 hrs,  Volume=          0.308 af,  Depth=  0.15"
   Routed to Link DP3 : DP-1
```

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 WQV Rainfall=1.40"

	Area (sf)	CN	Description
	78,355	98	Water Surface, HSG D
	845,994	73	Brush, Good, HSG D
	15,520	78	Meadow, non-grazed, HSG D
*	9,633	98	Trail
	59,047	79	Woods, Fair, HSG D
	63,275	80	>75% Grass cover, Good, HSG D
	1,071,824	76	Weighted Average
	983,836		91.79% Pervious Area
	87,988		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0300	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 1B: WS 1B



Summary for Subcatchment WS 2: WS 2

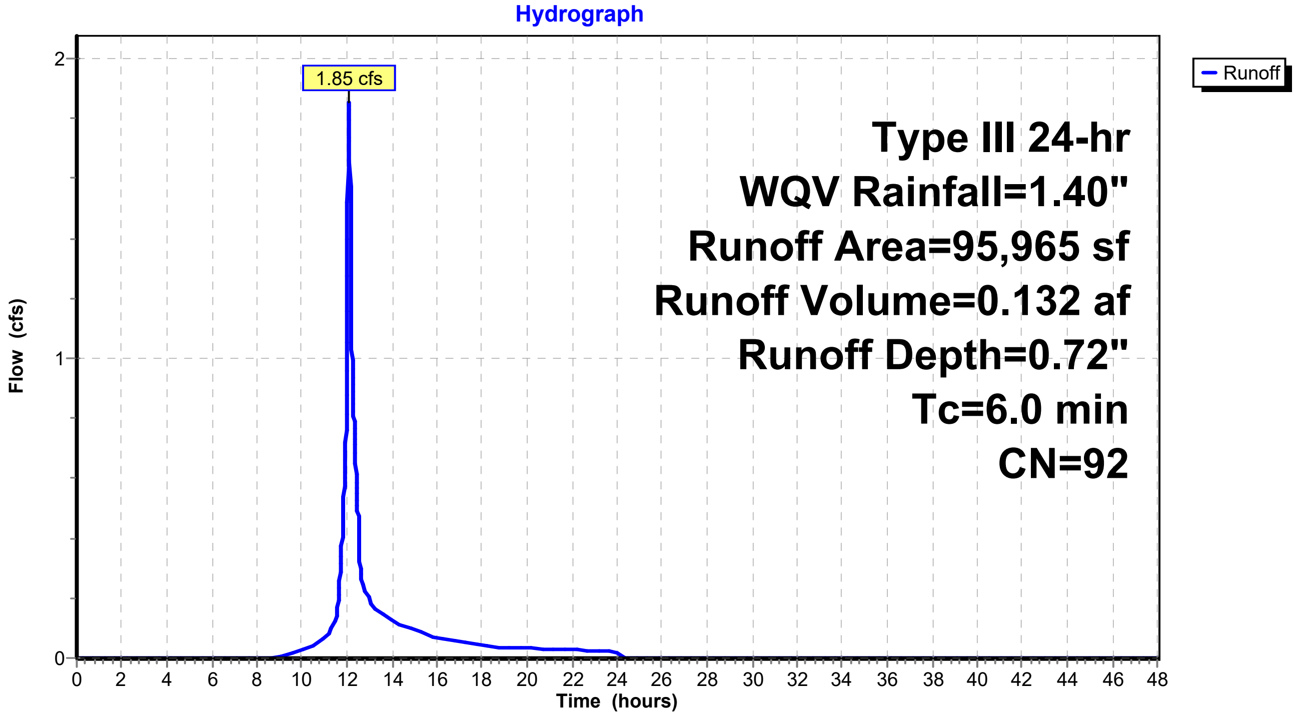
Runoff = 1.85 cfs @ 12.09 hrs, Volume= 0.132 af, Depth= 0.72"
Routed to Pond P-2 : BIO P-2

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
62,776	98	Paved parking, HSG D
33,189	80	>75% Grass cover, Good, HSG D
95,965	92	Weighted Average
33,189		34.58% Pervious Area
62,776		65.42% Impervious Area

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

Subcatchment WS 2: WS 2



Summary for Subcatchment WS 3: WS 3

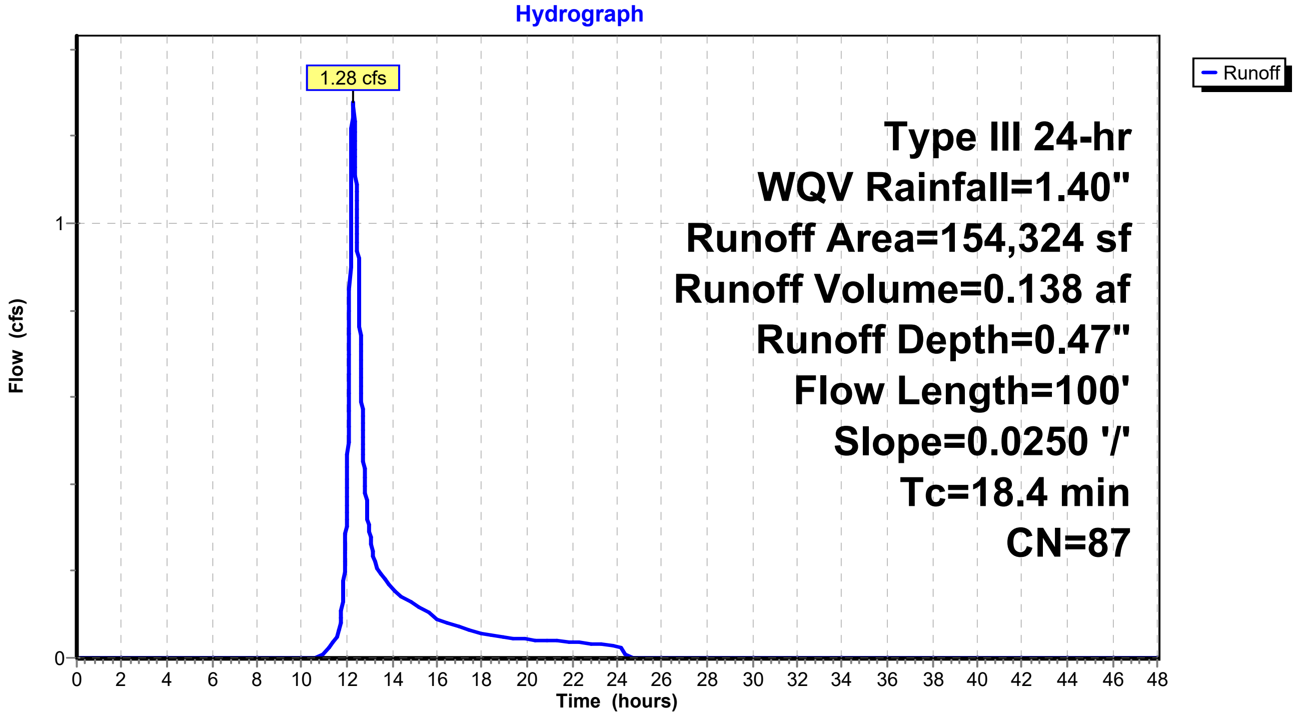
Runoff = 1.28 cfs @ 12.27 hrs, Volume= 0.138 af, Depth= 0.47"
Routed to Pond P-3 : BIO P-3

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
65,736	98	Paved parking, HSG D
69,746	80	>75% Grass cover, Good, HSG D
8,645	73	Brush, Good, HSG D
10,197	78	Meadow, non-grazed, HSG D
154,324	87	Weighted Average
88,588		57.40% Pervious Area
65,736		42.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	100	0.0250	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.63"

Subcatchment WS 3: WS 3



Summary for Subcatchment WS 4: WS 4

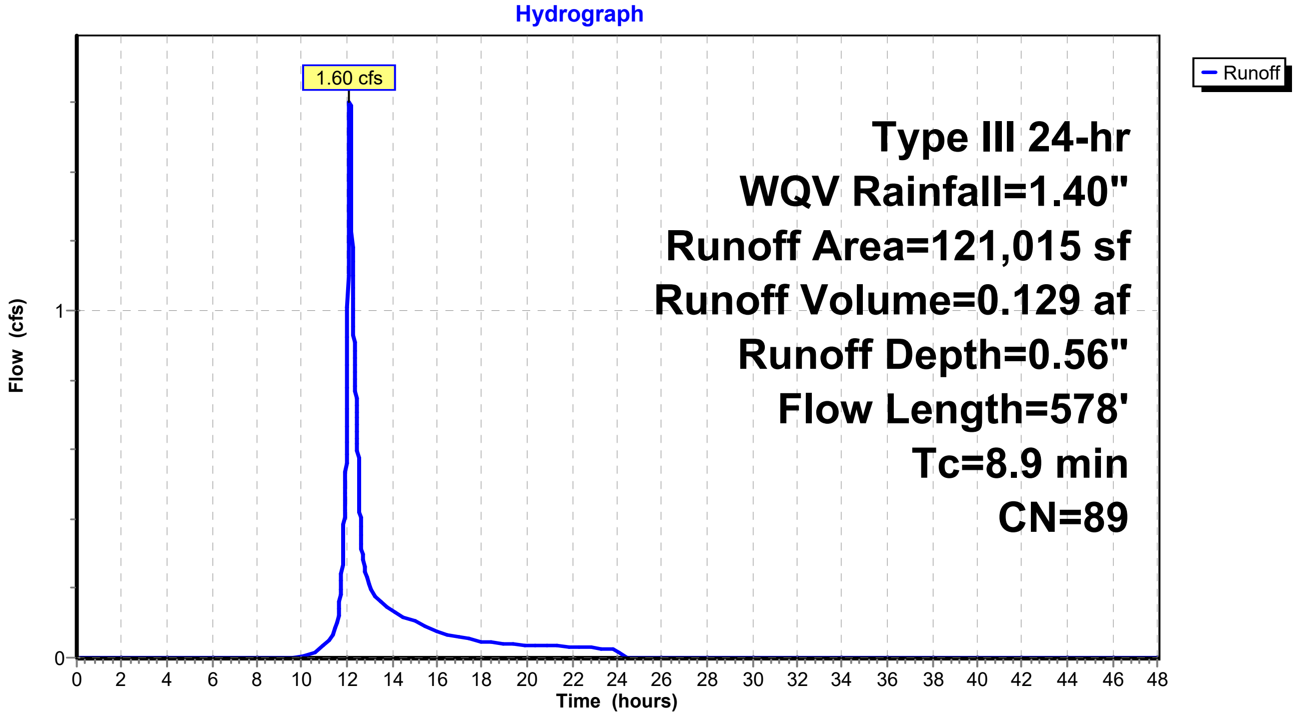
```
Runoff    =      1.60 cfs @  12.13 hrs,  Volume=         0.129 af,  Depth=  0.56"
   Routed to Pond P-4 : BIO P-4
```

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
61,847	98	Paved parking, HSG D
59,168	80	>75% Grass cover, Good, HSG D
121,015	89	Weighted Average
59,168		48.89% Pervious Area
61,847		51.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.3	124	0.1900	7.02		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	156	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	198	0.0650	17.45	21.41	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
8.9	578	Total			

Subcatchment WS 4: WS 4



Summary for Subcatchment WS 5: WS 5

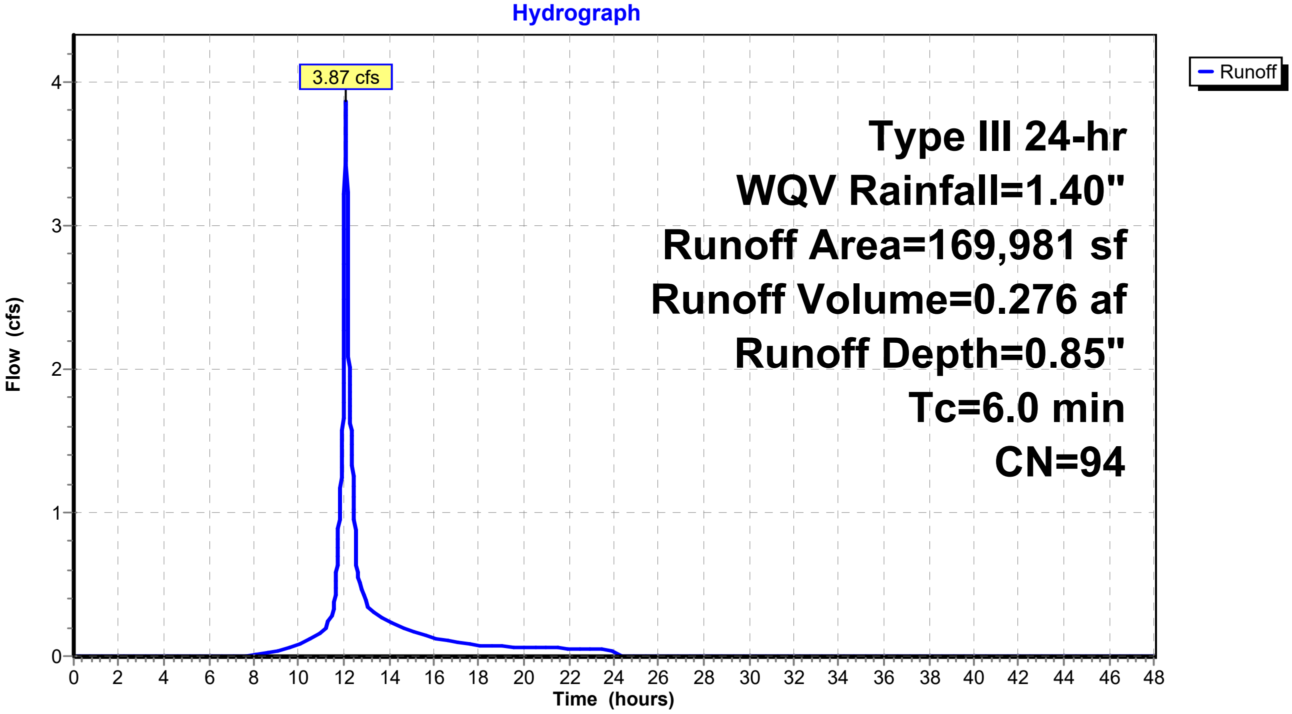
Runoff = 3.87 cfs @ 12.09 hrs, Volume= 0.276 af, Depth= 0.85"
Routed to Pond P-5 : BIO P-5

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
134,005	98	Paved parking, HSG D
35,976	80	>75% Grass cover, Good, HSG D
169,981	94	Weighted Average
35,976		21.16% Pervious Area
134,005		78.84% Impervious Area

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

Subcatchment WS 5: WS 5



Summary for Subcatchment WS 6: WS 6

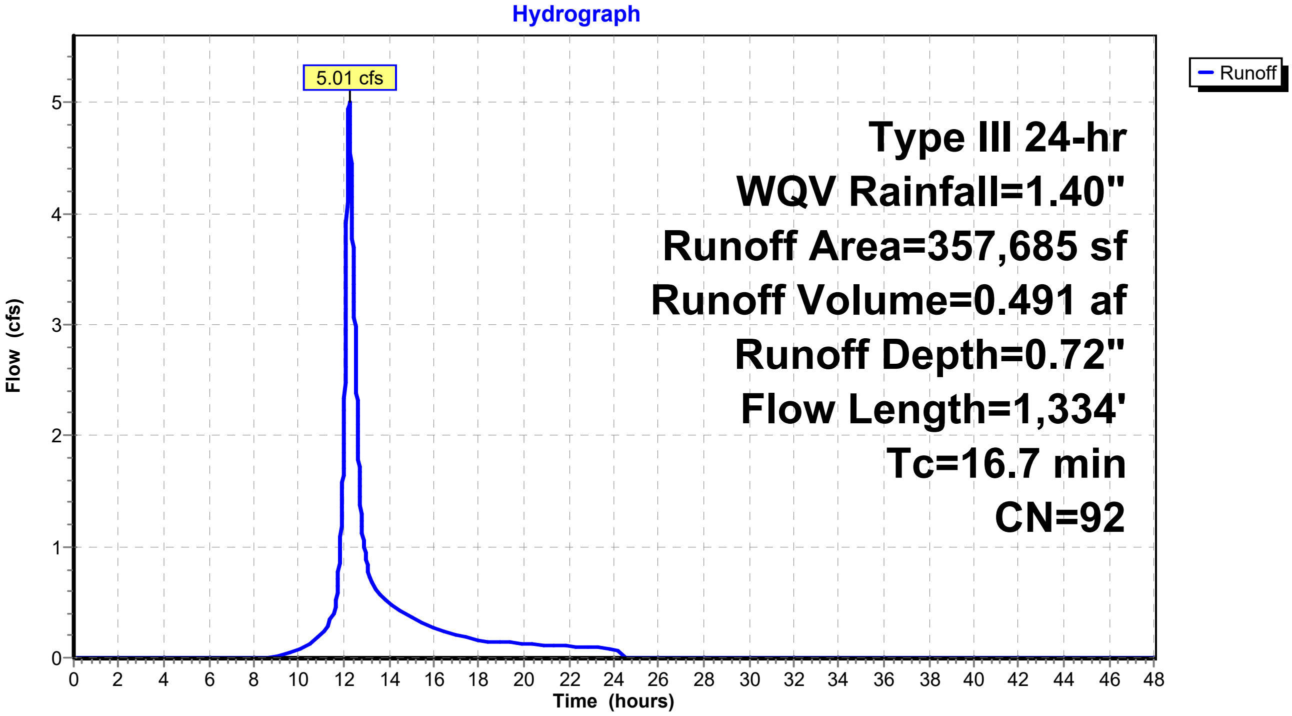
Runoff = 5.01 cfs @ 12.23 hrs, Volume= 0.491 af, Depth= 0.72"
Routed to Pond P-6 : BIO P-6

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 WQV Rainfall=1.40"

Area (sf)	CN	Description
244,733	98	Paved parking, HSG D
112,952	80	>75% Grass cover, Good, HSG D
357,685	92	Weighted Average
112,952		31.58% Pervious Area
244,733		68.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.63"
0.6	71	0.0150	1.97		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.7	122	0.0189	2.79		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	1,041	0.0160	8.66	10.62	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010 PVC, smooth interior
16.7	1,334	Total			

Subcatchment WS 6: WS 6



Summary for Pond P-2: BIO P-2

Inflow Area = 2.203 ac, 65.42% Impervious, Inflow Depth = 0.72" for WQV event
Inflow = 1.85 cfs @ 12.09 hrs, Volume= 0.132 af
Outflow = 0.05 cfs @ 17.47 hrs, Volume= 0.131 af, Atten= 97%, Lag= 322.9 min
Primary = 0.05 cfs @ 17.47 hrs, Volume= 0.131 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 480.52' @ 17.47 hrs Surf.Area= 7,783 sf Storage= 3,871 cf

Plug-Flow detention time= 874.5 min calculated for 0.131 af (99% of inflow)
Center-of-Mass det. time= 870.6 min (1,702.2 - 831.5)

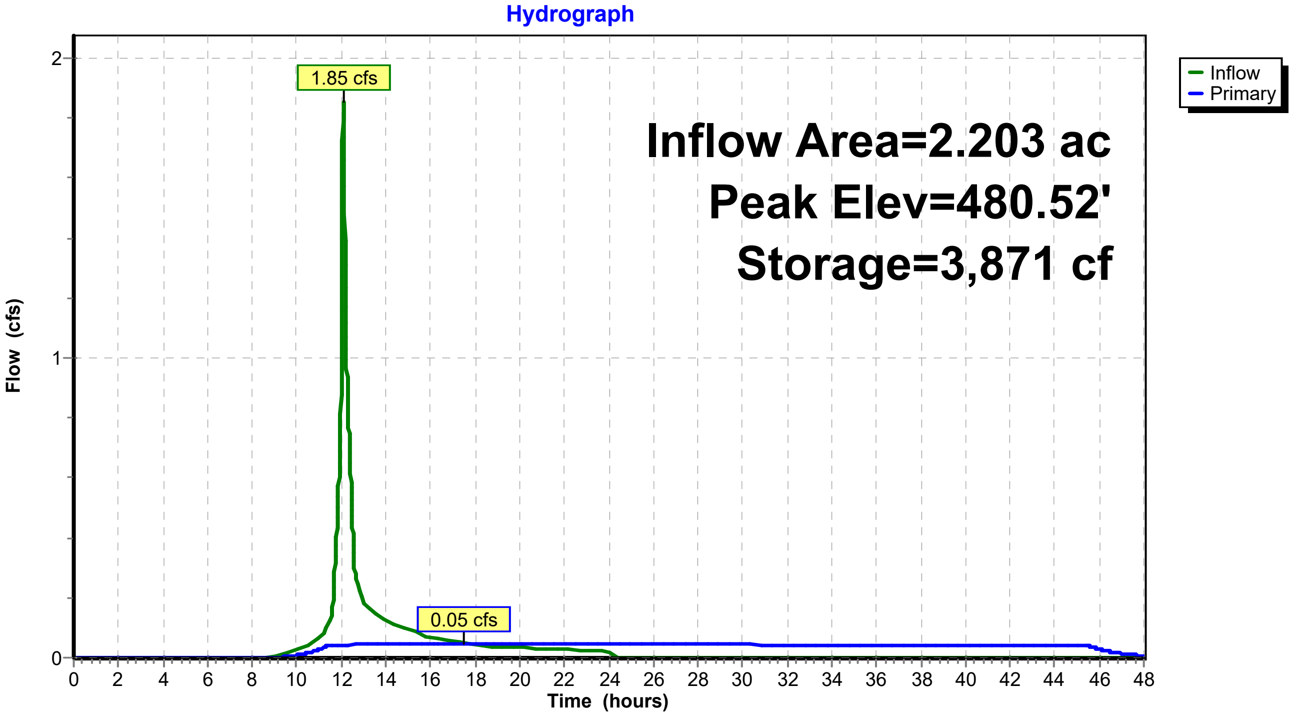
Volume	Invert	Avail.Storage	Storage Description
#1	480.00'	26,757 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
480.00	7,185	0	0
483.00	10,653	26,757	26,757

Device	Routing	Invert	Outlet Devices
#1	Primary	476.50'	**18.0" Round Culvert** L= 258.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 476.50' / 472.00' S= 0.0174 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	480.50'	**6.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#3	Device 1	480.75'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	481.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	480.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=0.05 cfs @ 17.47 hrs HW=480.52' (Free Discharge)
↑—**1=Culvert** (Passes 0.05 cfs of 15.38 cfs potential flow)
  ↑—**2=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.45 fps)
  —**3=Orifice/Grate** (Controls 0.00 cfs)
  —**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └—**5=Bio Media** (Exfiltration Controls 0.05 cfs)

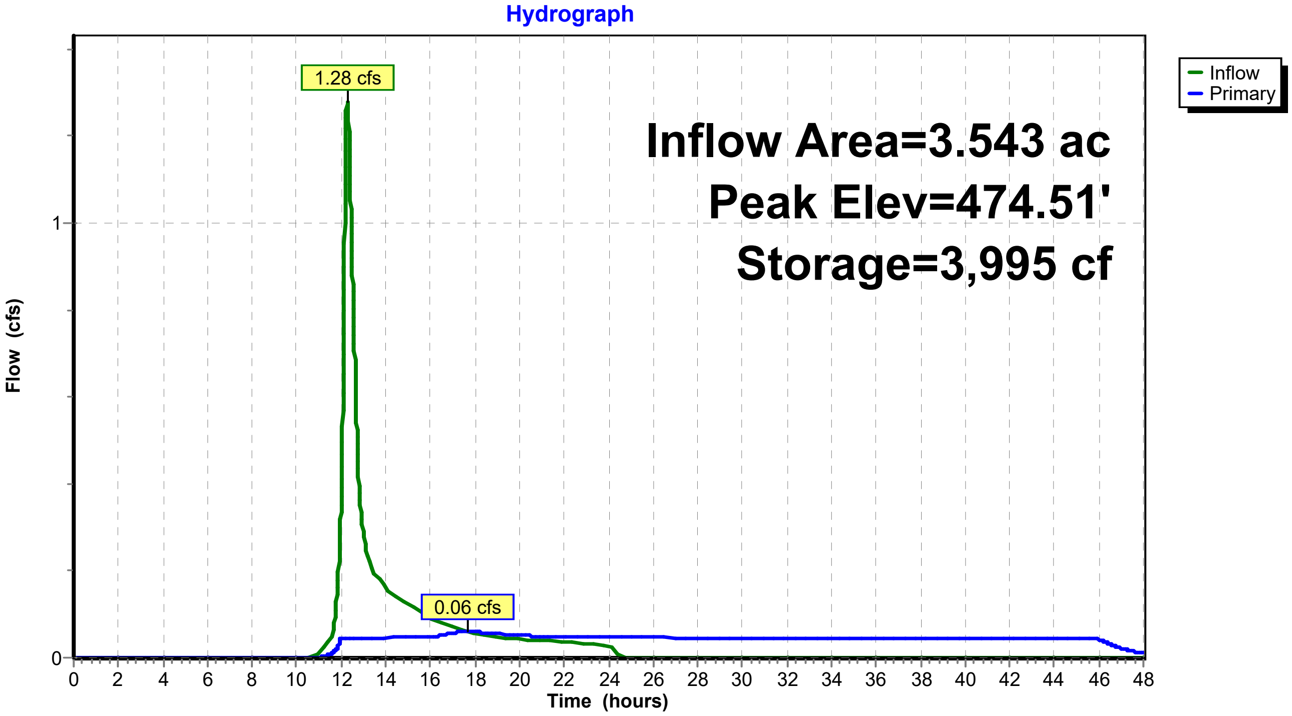
Pond P-2: BIO P-2



Summary for Pond P-3: BIO P-3

```
Inflow Area =        3.543 ac, 42.60% Impervious, Inflow Depth =  0.47"   for WQV event
Inflow      =       1.28 cfs @  12.27 hrs, Volume=          0.138 af
Outflow     =       0.06 cfs @  17.68 hrs, Volume=          0.137 af, Atten= 95%, Lag= 324.1 min
Primary     =       0.06 cfs @  17.68 hrs, Volume=          0.137 af
   Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 474.51' @ 17.68 hrs   Surf.Area= 8,122 sf   Storage= 3,995 cf

Plug-Flow detention time= 870.4 min calculated for 0.137 af (99% of inflow)
Center-of-Mass det. time= 865.1 min ( 1,736.9 - 871.8 )

Volume       Invert    Avail.Storage  Storage Description
  #1        474.00'        28,034 cf  Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation        Surf.Area          Inc.Store        Cum.Store
    (feet)           (sq-ft)       (cubic-feet)     (cubic-feet)
    474.00             7,489                  0                0
    477.00            11,200             28,034           28,034

Device  Routing          Invert  Outlet Devices
  #1    Primary         469.00'  15.0"  Round Culvert
                                 L= 38.2'   CPP, square edge headwall,  Ke= 0.500
                                 Inlet / Outlet Invert= 469.00' / 467.00'   S= 0.0524 '/'   Cc= 0.900
                                 n= 0.010  PVC, smooth interior,  Flow Area= 1.23 sf
  #2    Device 1        474.00'  0.250 in/hr Bio Media over Surface area
  #3    Device 1        474.50'  36.0" W x 6.0" H Vert. Orifice/Grate  C= 0.600
                                 Limited to weir flow at low heads
  #4    Device 1        475.50'  36.0" W x 6.0" H Vert. Orifice/Grate X 2.00  C= 0.600
                                 Limited to weir flow at low heads
  #5    Device 1        476.00'  16.0' long  x 0.5' breadth Broad-Crested Rectangular Weir
                                 Head (feet)  0.20  0.40  0.60  0.80  1.00
                                 Coef. (English)  2.80  2.92  3.08  3.30  3.32

Primary OutFlow  Max=0.06 cfs @ 17.68 hrs  HW=474.51'   (Free Discharge)
└─1=Culvert  (Passes 0.06 cfs of 13.06 cfs potential flow)
   ├─2=Bio Media  (Exfiltration Controls 0.05 cfs)
   ├─3=Orifice/Grate  (Orifice Controls 0.01 cfs @ 0.35 fps)
   ├─4=Orifice/Grate  ( Controls 0.00 cfs)
   └─5=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
```

Pond P-3: BIO P-3



Summary for Pond P-4: BIO P-4

Inflow Area = 2.778 ac, 51.11% Impervious, Inflow Depth = 0.56" for WQV event
Inflow = 1.60 cfs @ 12.13 hrs, Volume= 0.129 af
Outflow = 0.05 cfs @ 17.83 hrs, Volume= 0.129 af, Atten= 97%, Lag= 342.0 min
Primary = 0.05 cfs @ 17.83 hrs, Volume= 0.129 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 463.46' @ 17.83 hrs Surf.Area= 8,394 sf Storage= 3,708 cf

Plug-Flow detention time= 807.7 min calculated for 0.129 af (100% of inflow)
Center-of-Mass det. time= 807.0 min (1,658.9 - 852.0)

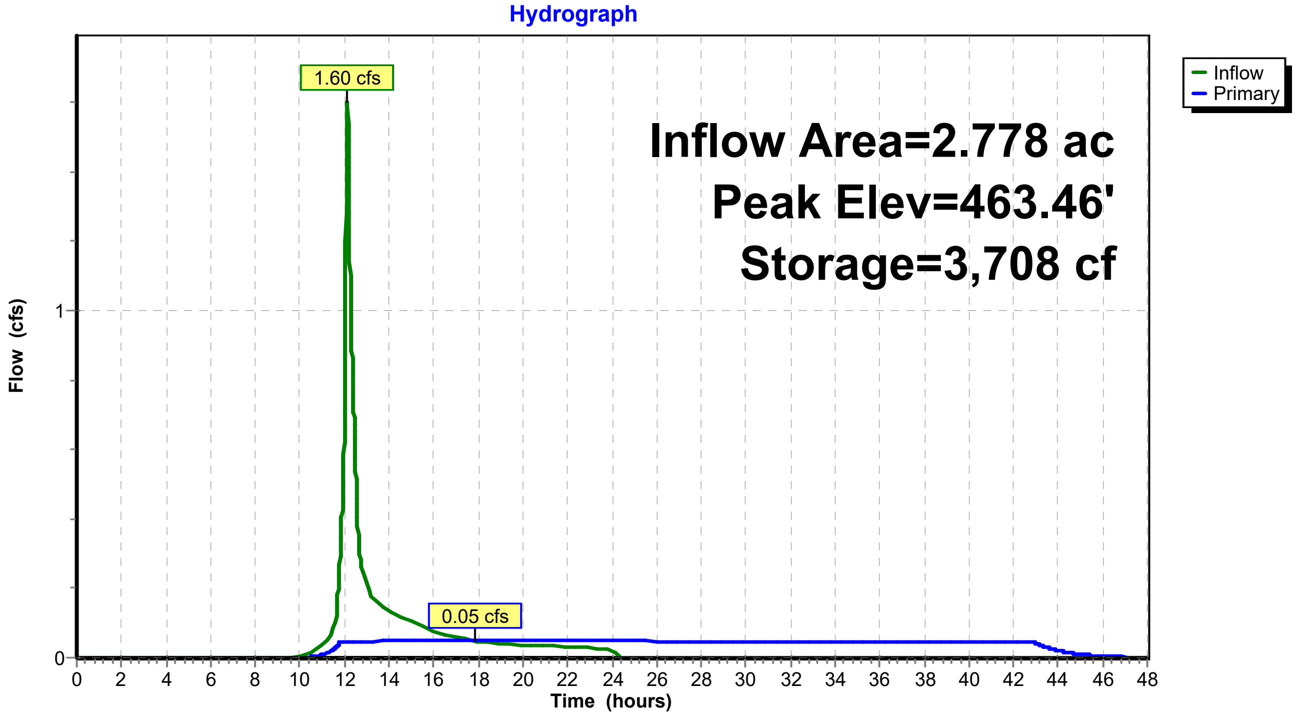
Volume	Invert	Avail.Storage	Storage Description
#1	463.00'	29,228 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
463.00	7,801	0	0
466.00	11,684	29,228	29,228

Device	Routing	Invert	Outlet Devices
#1	Primary	459.50'	**15.0" Round Culvert** L= 221.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 459.50' / 454.00' S= 0.0248 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Device 1	463.50'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	464.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	464.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	463.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=0.05 cfs @ 17.83 hrs HW=463.46' (Free Discharge)
└─**1=Culvert** (Passes 0.05 cfs of 10.79 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**5=Bio Media** (Exfiltration Controls 0.05 cfs)

Pond P-4: BIO P-4



Summary for Pond P-5: BIO P-5

Inflow Area = 3.902 ac, 78.84% Impervious, Inflow Depth = 0.85" for WQV event
Inflow = 3.87 cfs @ 12.09 hrs, Volume= 0.276 af
Outflow = 0.08 cfs @ 17.87 hrs, Volume= 0.254 af, Atten= 98%, Lag= 347.0 min
Primary = 0.08 cfs @ 17.87 hrs, Volume= 0.254 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 460.60' @ 17.87 hrs Surf.Area= 14,251 sf Storage= 8,341 cf

Plug-Flow detention time= 949.1 min calculated for 0.254 af (92% of inflow)
Center-of-Mass det. time= 909.1 min (1,727.0 - 817.9)

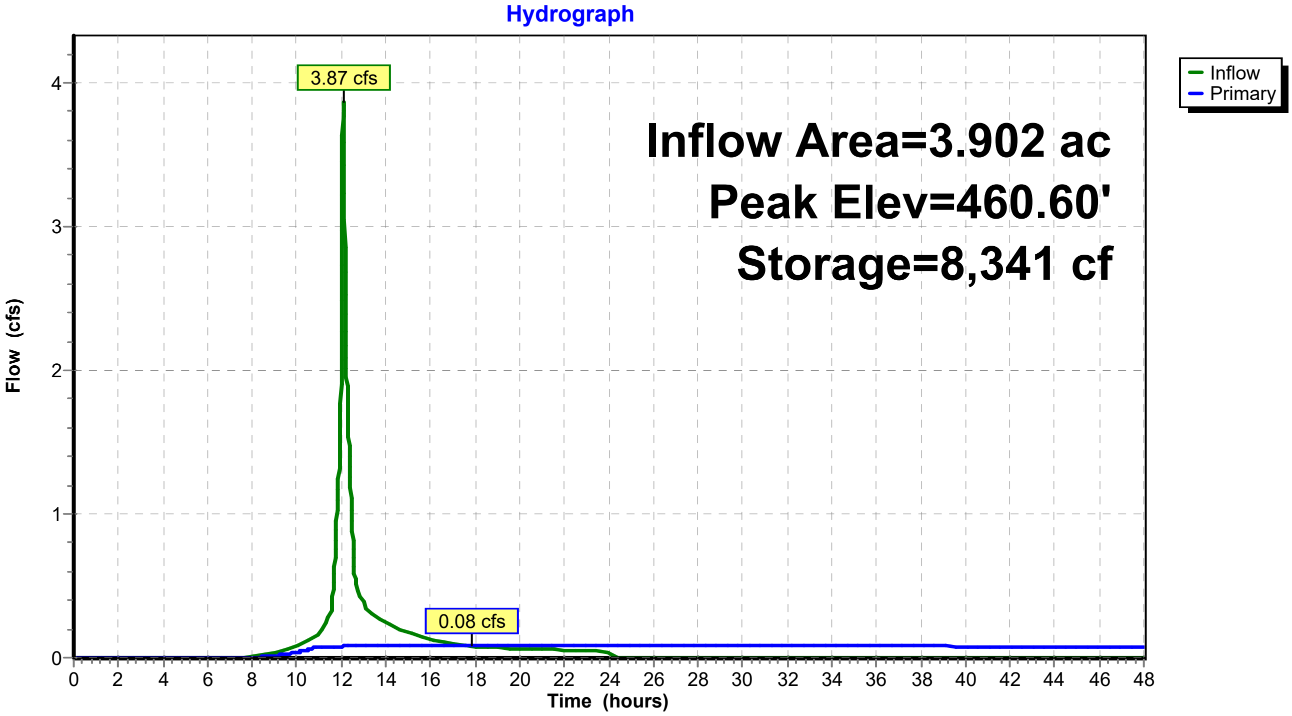
Volume	Invert	Avail.Storage	Storage Description
#1	460.00'	46,806 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
460.00	13,338	0	0
463.00	17,866	46,806	46,806

Device	Routing	Invert	Outlet Devices
#1	Primary	455.00'	**18.0" Round Culvert** L= 34.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 455.00' / 452.00' S= 0.0860 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	461.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	460.66'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	461.00'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	460.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=0.08 cfs @ 17.87 hrs HW=460.60' (Free Discharge)
└─**1=Culvert** (Passes 0.08 cfs of 18.75 cfs potential flow)
  ├─**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Bio Media** (Exfiltration Controls 0.08 cfs)

Pond P-5: BIO P-5



Summary for Pond P-6: BIO P-6

Inflow Area = 8.211 ac, 68.42% Impervious, Inflow Depth = 0.72" for WQV event
Inflow = 5.01 cfs @ 12.23 hrs, Volume= 0.491 af
Outflow = 0.15 cfs @ 18.27 hrs, Volume= 0.458 af, Atten= 97%, Lag= 362.4 min
Primary = 0.15 cfs @ 18.27 hrs, Volume= 0.458 af
Routed to Link DP3 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 458.58' @ 18.27 hrs Surf.Area= 26,171 sf Storage= 14,845 cf

Plug-Flow detention time= 946.3 min calculated for 0.458 af (93% of inflow)
Center-of-Mass det. time= 911.4 min (1,752.9 - 841.4)

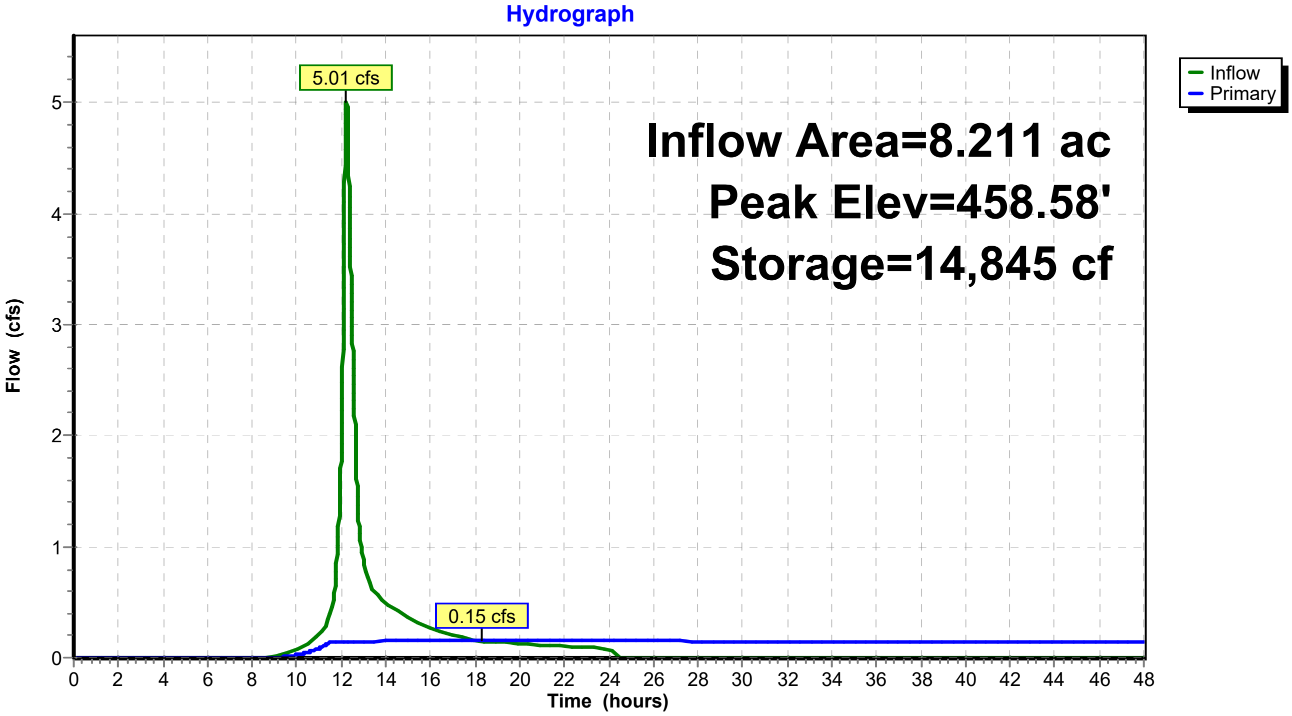
Volume	Invert	Avail.Storage	Storage Description
#1	458.00'	85,194 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
458.00	24,756	0	0
461.00	32,040	85,194	85,194

Device	Routing	Invert	Outlet Devices
#1	Primary	454.00'	**18.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 454.00' / 452.00' S= 0.0667 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	458.66'	**22.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	458.75'	**32.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	459.75'	**16.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	458.00'	**0.250 in/hr Bio Media over Surface area**

Primary OutFlow Max=0.15 cfs @ 18.27 hrs HW=458.58' (Free Discharge)
└—**1=Culvert** (Passes 0.15 cfs of 16.66 cfs potential flow)
  ├—**2=Orifice/Grate** (Controls 0.00 cfs)
  ├—**3=Orifice/Grate** (Controls 0.00 cfs)
  ├—**4=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  └—**5=Bio Media** (Exfiltration Controls 0.15 cfs)

Pond P-6: BIO P-6

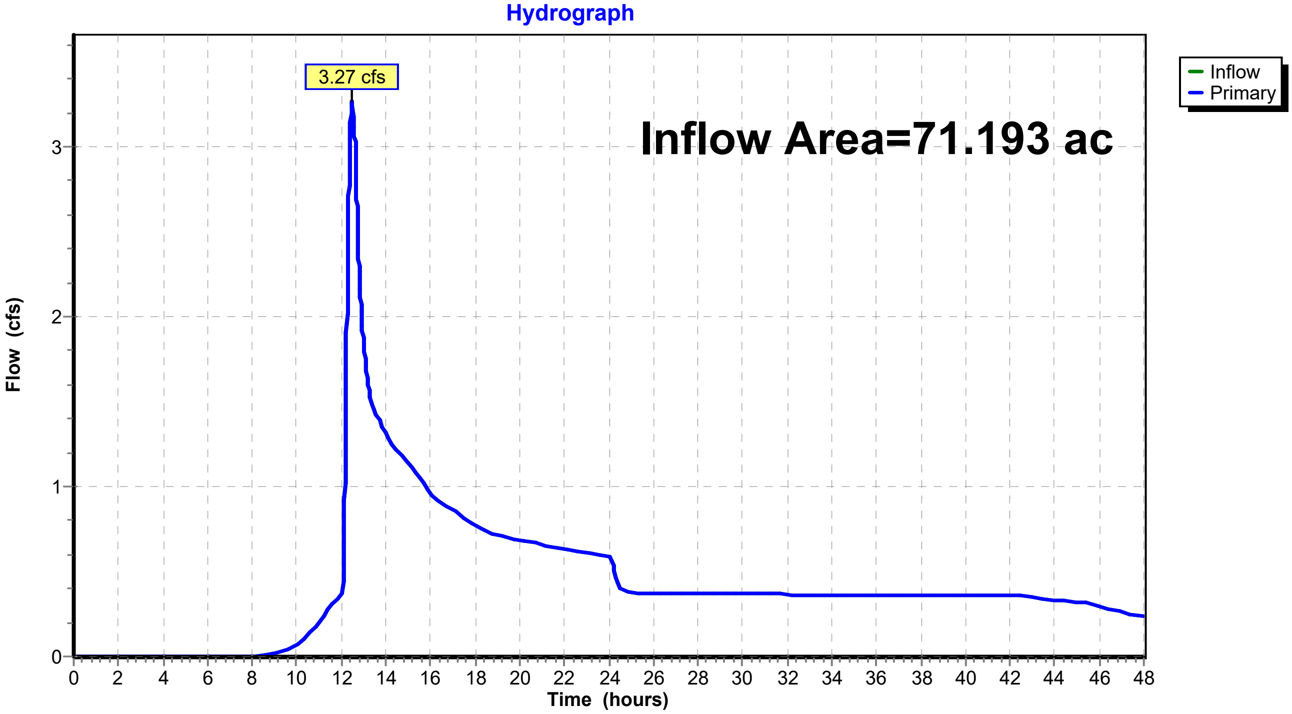


Summary for Link DP3: DP-1

Inflow Area =	71.193 ac,	21.29% Impervious,	Inflow Depth > 0.29"	for WQV event
Inflow =	3.27 cfs @	12.50 hrs, Volume=	1.703 af	
Primary =	3.27 cfs @	12.50 hrs, Volume=	1.703 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link DP3: DP-1



APPENDIX 3

NYSDEC GREEN INFRASTRUCTURE WORKSHEETS

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

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

Design Point:	Lot 1	
P=	1.40	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**		
1								
2	2.20	1.44	65%	0.64	7,145	Bio 2		
3	3.54	1.51	43%	0.43	7,807	Bio 3		
4	2.78	1.42	51%	0.51	7,201	Bio 4		
5	3.90	3.08	79%	0.76	15,060	Bio5		
6	8.21	5.61	68%	0.66	27,745	Bio 6		
7								
8								
9								
10								
Subtotal (1-30)	20.63	13.06			**64,958**	**Subtotal 1**		
Total	20.63	13.06			**64,958**	**Initial WQv**	**1.49**	**af**

Identify Runoff Reduction Techniques By Area

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

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient Rv**	**WQv** *(ft^3)*		
"<<Initial WQv"	20.63	13.06	63%	0.62	64,958		
Subtract Area	0.00	0.00					
WQv adjusted after Area Reductions	**20.63**	**13.06**	63%	0.62	64,958		
Disconnection of Rooftops		0.00					
Adjusted WQv after Area Reduction and Rooftop Disconnect	20.63	13.06	63%	0.62	**64,958**	**1.49**	**af**
WQv reduced by Area Reduction techniques					0	**0.00**	**af**

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

(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:	**Lot 1**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	2.20	1.44	0.65	0.64	7145.29	1.40	Bio 2
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	65%	0.64	7,145	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		7,145	*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*	0.25	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**6496**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	1	*ft*
Filter Length	7185	*ft*
Filter Area	7185	*ft^2*
Actual Volume Provided	7904	*ft^3*

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	3,161		
RRv applied	**3,161**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	3,984	*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*

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

(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 & Schueler, 1996)

Design Point:	**Lot 1**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
3	3.54	1.51	0.43	0.43	7806.71	1.40	Bio 3
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	43%	0.43	7,807	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		7,807	*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*	0.25	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**7097**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	1	*ft*
Filter Length	7489	*ft*
Filter Area	7489	*ft^2*
Actual Volume Provided	8238	*ft^3*

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	3,295		
RRv applied	**3,295**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	4,512	*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*

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

(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:	**Lot 1**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
4	2.78	1.42	0.51	0.51	7201.19	1.40	Bio 4
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	51%	0.51	7,201	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		7,201	*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*	0.25	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**6547**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	1	*ft*
Filter Length	7801	*ft*
Filter Area	7801	*ft^2*
Actual Volume Provided	8581	*ft^3*

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?		No	Select Practice
RRv	3,432		
RRv applied	**3,432**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	3,769	*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*

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

$$WQv(acre\text{-}feet) = [(P)(Rv)(A)] / 12$$

(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:	**Lot 1**						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
5	3.90	3.08	0.79	0.76	15060.00	1.40	Bio5
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	79%	0.76	15,060	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	
Soil Information							
Soil Group		D					
Soil Infiltration Rate		0.00	*in/hour*	*Okay*			
Using Underdrains?		Yes	*Okay*				
Calculate the Minimum Filter Area							
				Value		Units	Notes
WQv				15,060		*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*	0.33		*ft*	*6 inches max.*
Enter Filter Time			*tf*	2		*days*	
Required Filter Area			***Af***	**13304**		***ft^2***	
Determine Actual Bio-Retention Area							
Filter Width		1	*ft*				
Filter Length		13338	*ft*				
Filter Area		13338	*ft^2*				
Actual Volume Provided		15099	*ft^3*				
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?			No	Select Practice			
RRv		6,039					
RRv applied		**6,039**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***			
Volume Treated		9,021	*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*			

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

(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:	**Lot 1**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
6	8.21	5.61	0.68	0.66	27745.18	1.40	Bio 6
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	68%	0.66	27,745	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		27,745	*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*	0.33	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**24510**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	1	*ft*
Filter Length	24756	*ft*
Filter Area	24756	*ft^2*
Actual Volume Provided	28024	*ft^3*

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	11,210		
RRv applied	**11,210**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	16,536	*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*

APPENDIX 4

SPDES GENERAL PERMIT GP 0-20-001

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 not 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 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;

   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

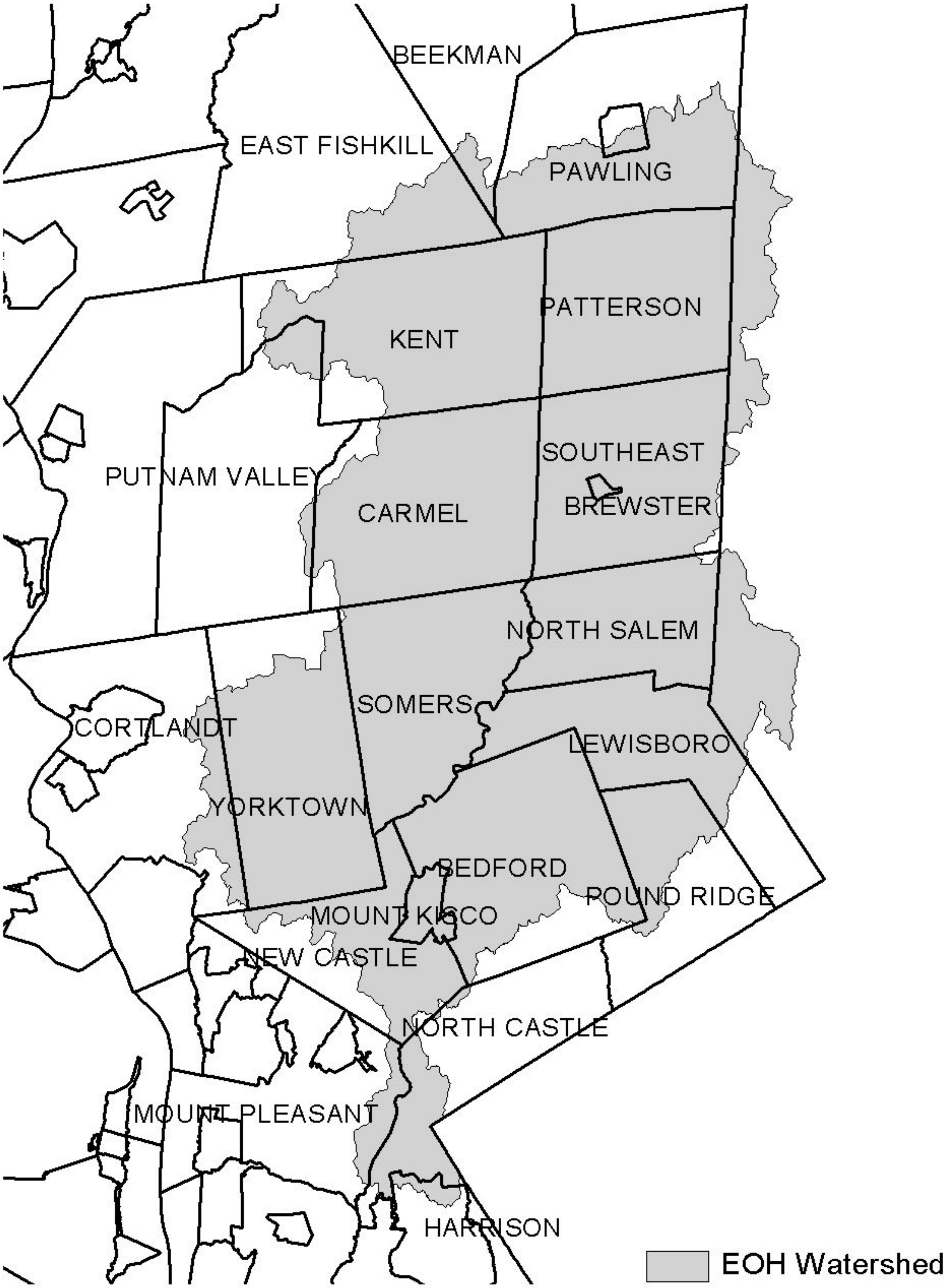


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

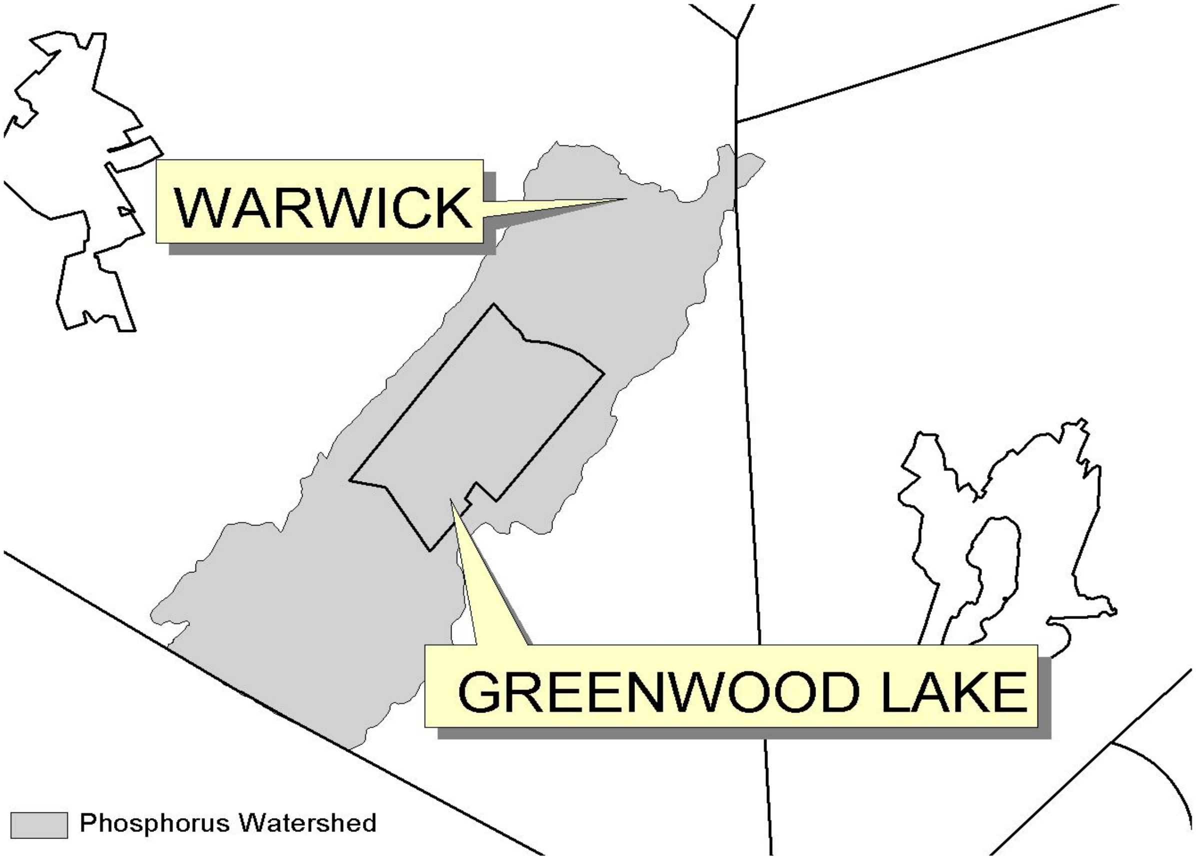


Figure 4 - Oscawana Lake Watershed

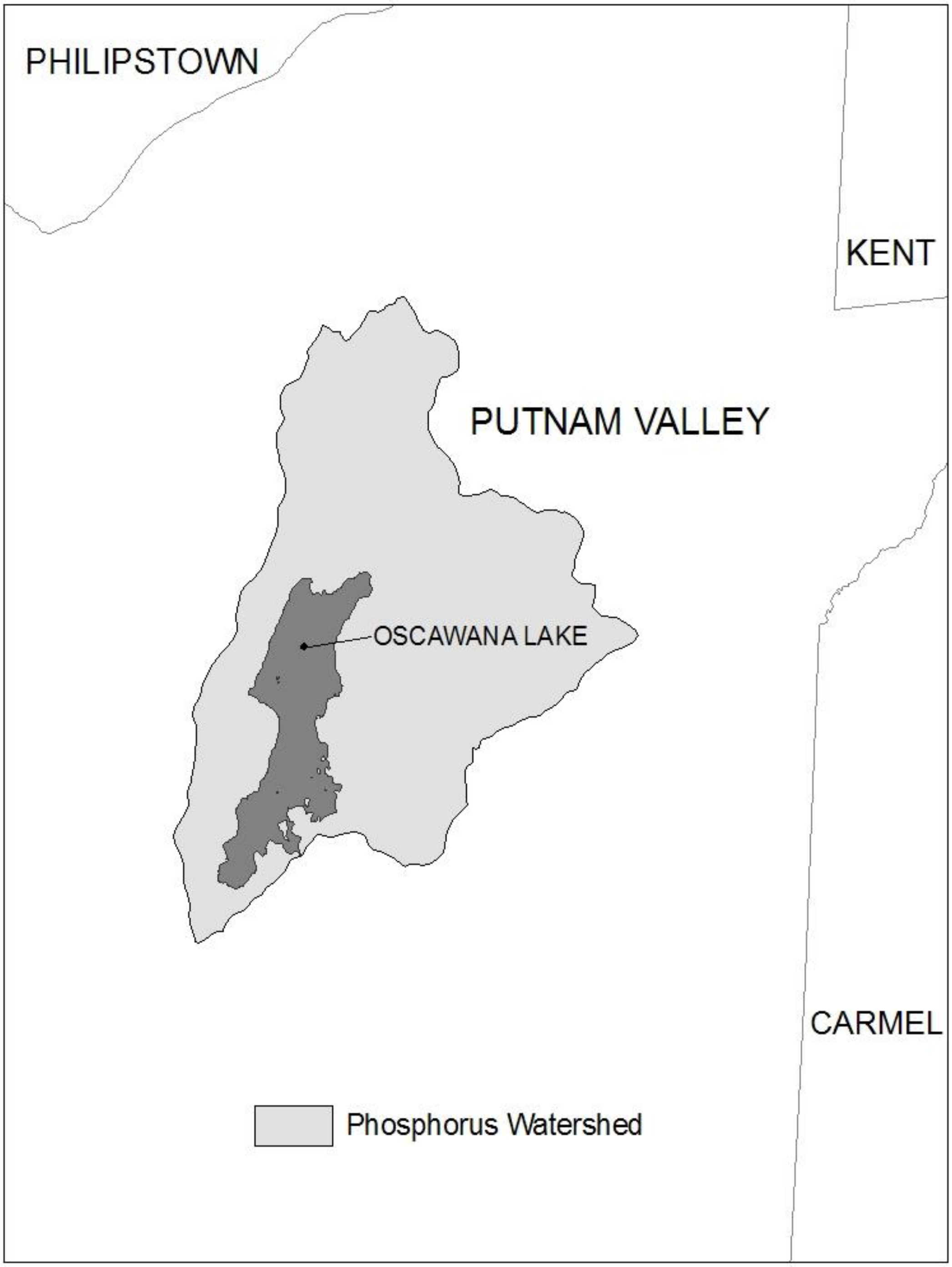
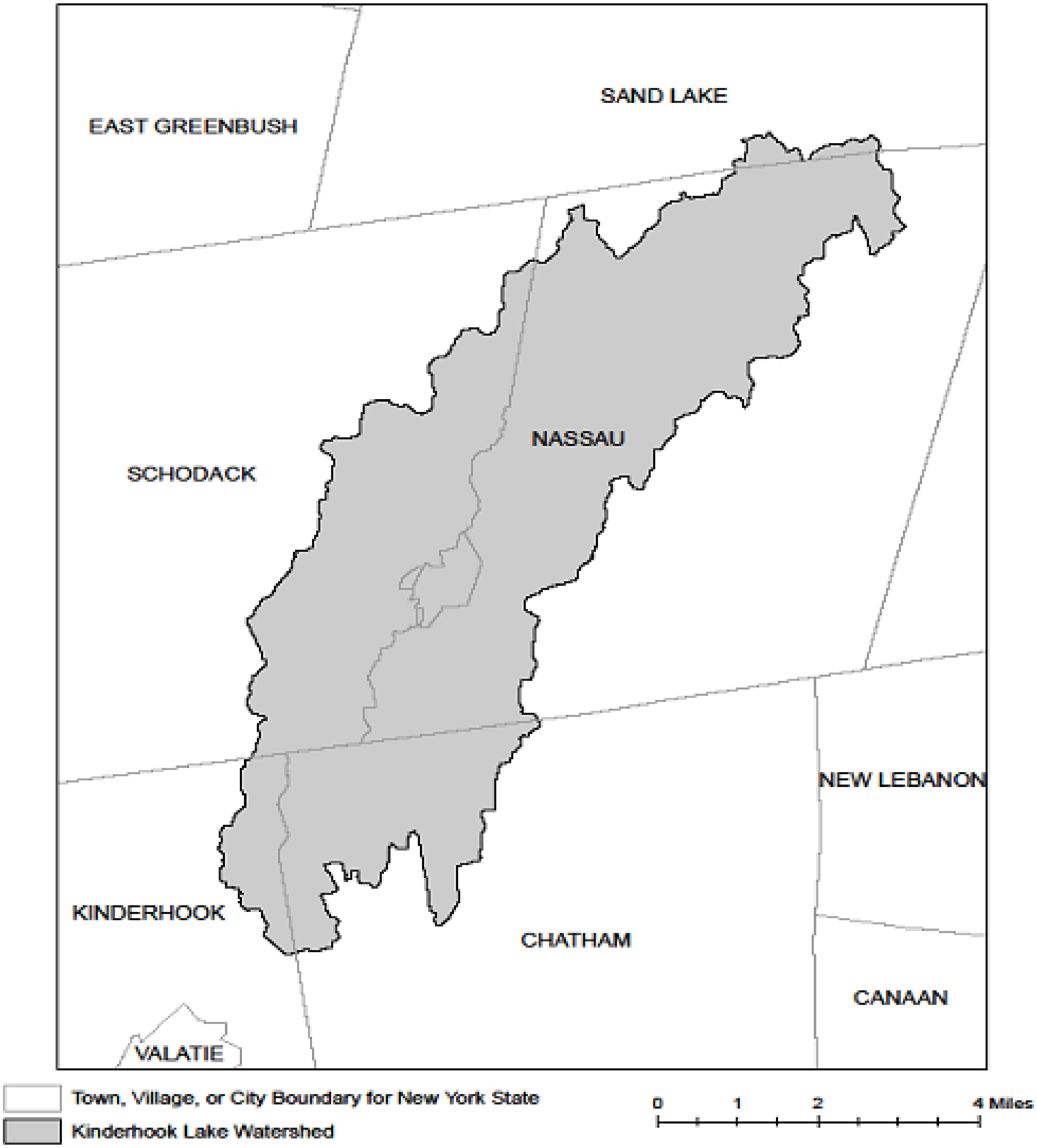


Figure 5 - Kinderhook Lake Watershed



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

APPENDIX 5

DRAFT NOTICE OF INTENT (NOI)

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-0-15-002

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)
Mid Dolsontown, LLC

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

Owner/Operator Contact Person First Name
Isaac

Owner/Operator Mailing Address
1 international boulevard

City
Mahwah

State
NJ

Zip
07430 -

Phone (Owner/Operator)
845 - 202 - 4900

Fax (Owner/Operator)
\- -

Email (Owner/Operator)
isaac@rdmgp.com

FED TAX ID
\- (not required for individuals)

Project Site Information

Project/Site Name
Simon Warehouse

Street Address (NOT P.O. BOX)
Dolsontown Road

Side of Street
○ **North** ○ **South** ● **East** ○ **West**

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

State	Zip	County	DEC Region
NY	10940 -	Orange	3

Name of Nearest Cross Street
Caskey Lane

Distance to Nearest Cross Street (Feet)
0

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

Tax Map Numbers
Section-Block-Parcel
6-1-107 90.1

Tax Map Numbers
6-1-107 90.1

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)	**Y Coordinates (Northing)**
41.424N	74.422W

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**
71.2	21.7	0.	13.1

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 %	0 %	0 %	100 %

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

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

Start Date __ / __ / ____ - **End Date** __ / __ / ____

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

Name

Monhagen Brook & on-site 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-0-15-002? ● **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ **Yes** ● **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?
If no, skip question 13. ○ **Yes** ● **No**

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?

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
Cilliers Engineering & Design CT PC

Contact Name (Last, Space, First)
McConnor, Connor

Mailing Address
555 Hudson Valley Avenue

City
New Windsor NY

State NY Zip 12553-

Phone 845-564-4495 Fax - -

Email
connor.mccormack@colliersen g.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-0-15-002. 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 Connor **MI** P

Last Name McCormack

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

1.491 **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)			13.05
○ 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)			.

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

Alternative SMP	Total Contributing Impervious Area(acres)
● Hydrodynamic	13.05
○ 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 First Defense

Manufacturer Hydro International

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

0.62 **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

0.29 **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

1.491 **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). 1.491

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 117.60 **CFS**

Post-development 114.66 **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development 276.1 **CFS**

Post-development 274.81 **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

Mid Dolsontown, LLC

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.

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
- ○ Other
- ○ None

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

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

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.

Owner/Operator Certification

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.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date

/ /

APPENDIX 6

DRAFT NOTICE OF TERMINATION (NOT)

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: MID DOLSONTOWN, LLC

2. Street Address: 1 International Boulevard, Suite 410

3. City/State/Zip: Mahwah, NJ, 07430

4. Contact Person: Isaac Newman | 4a.Telephone: 917-530-6479

4b. Contact Person E-Mail: isaac@realdealmgt.com

II. Project Site Information

5. Project/Site Name: Simon warehouse

6. Street Address: Dolsontown road

7. City/Zip: Wawayanda, NY, 10973

8. County: orange

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, a mechanism is 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.

☐ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; 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:

Title/Position:

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:

APPENDIX 7

MS4 ACCEPTANCE FORM

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: MID DOLSONTOWN, LLC
2. Contact Person: Isaac Newman
3. Street Address: 1 International Boulevard, Suite 410
4. City/State/Zip: Mahwah, NJ, 07430

II. Project Site Information

5. Project/Site Name: Simon warehouse
6. Street Address: Dolsontown road
7. City/State/Zip: Wawayanda NY 10973

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

8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4:
12. MS4 SPDES Permit Identification Number: NYR20A
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

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:

Title/Position:

Signature:

Date:

VI. Additional Information

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

APPENDIX 8

NRCS HYDROLOGIC SOIL MAPPING

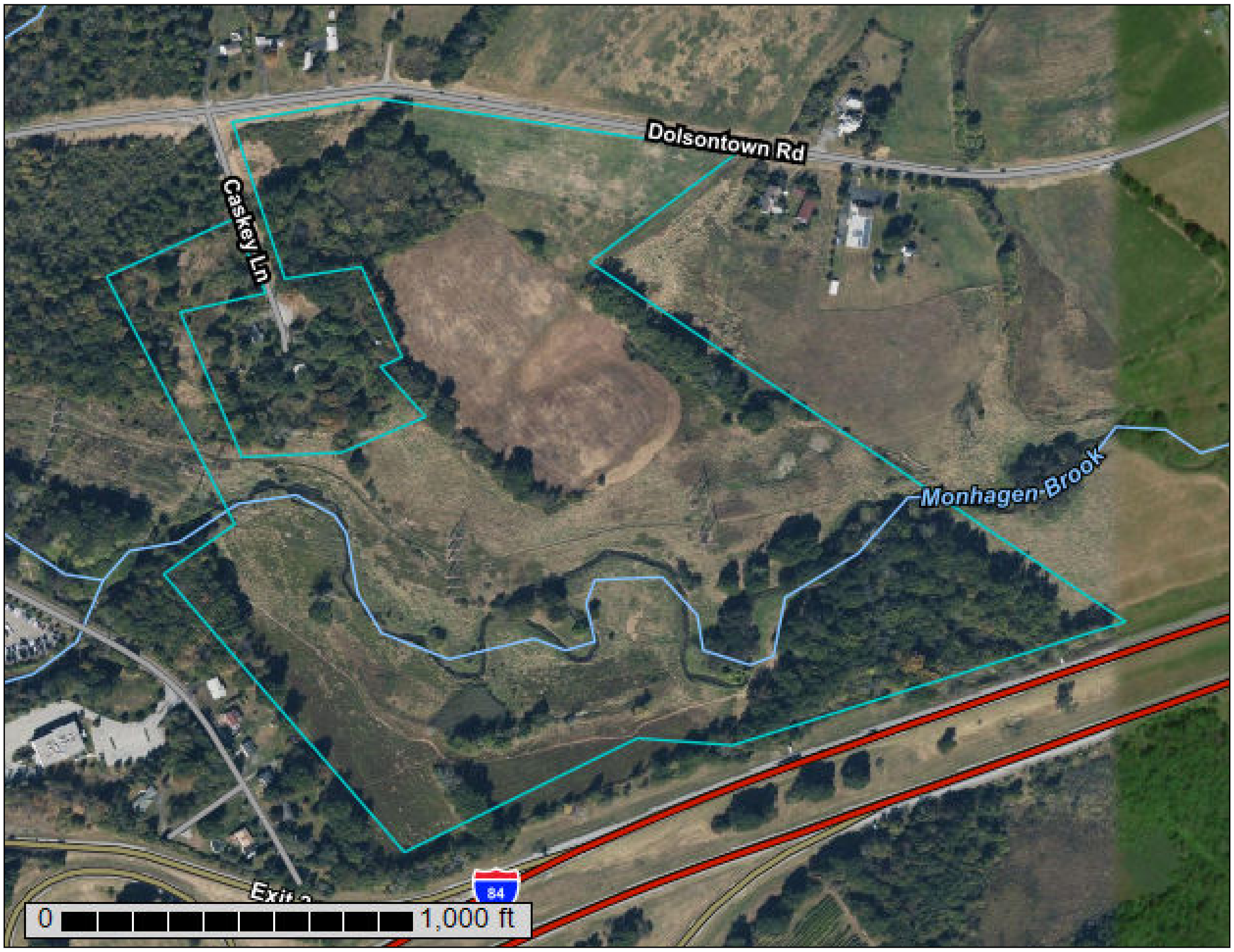
United States
Department of
Agriculture

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
Orange County, New York

Simon



January 10, 2022

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.

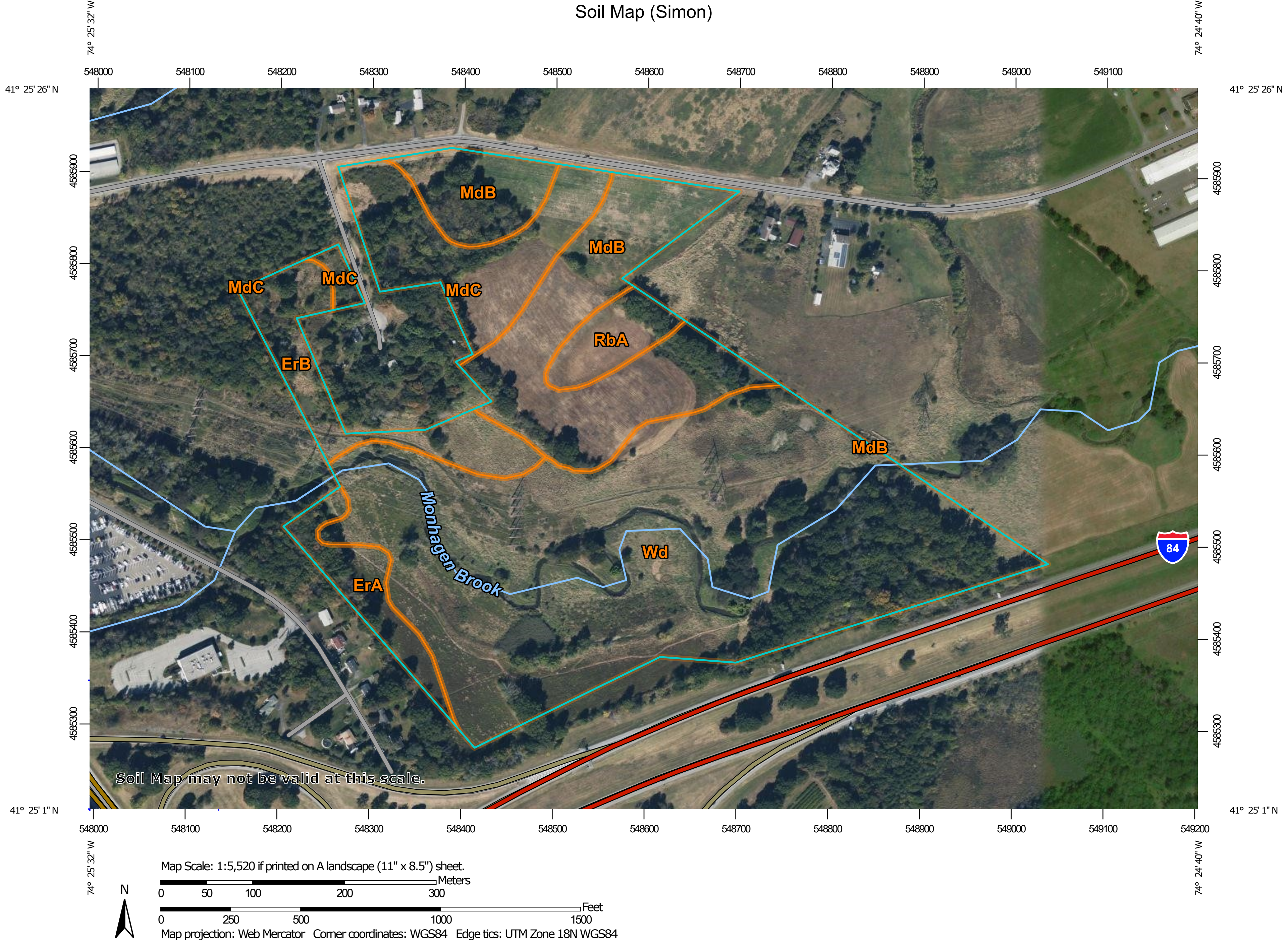
The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political 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

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 (Simon)



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
Λ 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
ꝏ Very Stony Spot
ψ 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 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Orange County, New York
Survey Area Data: Version 22, Aug 29, 2021

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—Oct 5, 2019

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 (Simon)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ErA	Erie gravelly silt loam, 0 to 3 percent slopes	2.6	3.7%
ErB	Erie gravelly silt loam, 3 to 8 percent slopes	4.5	6.5%
MdB	Mardin gravelly silt loam, 3 to 8 percent slopes	14.1	20.3%
MdC	Mardin gravelly silt loam, 8 to 15 percent slopes	6.9	9.9%
RbA	Rhinebeck silt loam, 0 to 3 percent slopes	2.1	3.0%
Wd	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	39.5	56.7%
Totals for Area of Interest		**69.7**	**100.0%**

Map Unit Descriptions (Simon)

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.

Orange County, New York

ErA—Erie gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9vv8
Elevation: 100 to 1,360 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Erie

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from siltstone, sandstone, shale, and limestone

Typical profile

H1 - 0 to 10 inches: gravelly silt loam
H2 - 10 to 18 inches: channery silt loam
H3 - 18 to 56 inches: channery silt loam
H4 - 56 to 70 inches: channery silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Wurtsboro

Percent of map unit: 5 percent

Hydric soil rating: No

Bath

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

Mardin

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

Alden

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

Swartswood

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

ErB—Erie gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9vv9
Elevation: 100 to 1,390 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Erie

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from siltstone, sandstone, shale, and limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 18 inches: channery silt loam
H3 - 18 to 54 inches: channery silt loam
H4 - 54 to 70 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Alden

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

Bath

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

Wurtsboro

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

Mardin

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

MdB—Mardin gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v30j
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Mardin and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
Bw - 8 to 15 inches: gravelly silt loam
E - 15 to 20 inches: gravelly silt loam
Bx - 20 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

MdC—Mardin gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2v30l
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Mardin

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
Bw - 8 to 15 inches: gravelly silt loam
E - 15 to 20 inches: gravelly silt loam
Bx - 20 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

Bath

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

RbA—Rhinebeck silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9vwf
Elevation: 80 to 1,000 feet
Mean annual precipitation: 42 to 52 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 75 percent
Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 45 inches: silty clay loam
H3 - 45 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Unadilla

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

Madalin

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

Hudson

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

Raynham

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

Collamer

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

Wd—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2srgt
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 9 inches: mucky silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Holderton

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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APPENDIX 9

APPENDIX H – CONSTRUCTION SITE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

CONSTRUCTION SITE LOG BOOK

Table of Contents

Properly completing forms such as those contained in Appendix H meet the inspection requirement of NYS-DEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.

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 professional[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.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). 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. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional 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] "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

[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. Operators 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. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Name (please print): ______________________________

Title ______________________ **Date:** __________

Address: ______________________________

Phone: __________ **Email:** ____________________

Signature: ______________________________

c. Qualified Professional's Credentials & Certification

"I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print): ______________________________

Title ______________________ **Date:** __________

Address: ______________________________

Phone: __________ **Email:** ____________________

Signature: ______________________________

d. 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 Entrance

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. Perimeter 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 Professional (print name) **Qualified Professional 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?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] 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 and debris 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.

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.

2. Level 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

CONSTRUCTION DURATION INSPECTIONS

Runoff Control Practices (continued)

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. Stabilized Construction Entrance
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?

2. Silt Fence
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)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated 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.
Sediment accumulation ___% of design capacity.

4. 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 accumulation is ___% of design capacity.

5. 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 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.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

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:

APPENDIX 10

NYSDEC CONSTRUCTION STORMWATER INSPECTION MANUAL

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Construction Stormwater Inspection Manual

Primarily for Government Inspectors Evaluating Compliance with Construction Stormwater Control Requirements

New York State
Department of Environmental Conservation

TABLE OF CONTENTS

Version 1.05 (8/27/07)

ATTACHMENTS

1.0 INTRODUCTION AND PURPOSE

The New York State Department of Environmental Conservation Division of Water (DOW) considers there to be two types of inspections germane to construction stormwater; compliance inspections and self-inspections.

This manual is for use by DOW and other regulatory oversight construction stormwater inspectors in performing compliance inspections, as well as for site operators in performing self inspections. The manual should be used in conjunction with the *New York State Standards and Specifications for Erosion and Sediment Control*, August 2005.

1.1 Compliance Inspections

Regulatory compliance inspections are performed by regulatory oversight authorities such as DOW staff, or representatives of DOW and local municipal construction stormwater inspectors. These inspections are intended to determine compliance with the state or local requirements for control of construction stormwater through erosion and sediment control and post construction practices. Compliance inspections focus on determinations of compliance with legal and water quality standards. Typically, compliance inspections can be further sub-categorized to include comprehensive inspections, and follow-up or reconnaissance inspections.

Compliance inspectors will focus on determining whether:

- the project is causing water quality standard violations;
- the required Stormwater Pollution Prevention Plan (SWPPP) includes appropriate erosion and sediment controls and, to some extent, post construction controls;
- the owner/operator is complying with the SWPPP;
- where required, self-inspections are being properly performed; and
- where self-inspections are required, the owner/operator responds appropriately to the self-inspector’s reports.

1.1.1 Comprehensive Inspection

Comprehensive inspections are designed to verify permittee compliance with all applicable regulatory requirements, effluent controls, and compliance schedules. This inspection involves records reviews, visual observations, and evaluations of management practices, effluents, and receiving waters.

Comprehensive inspections should be conducted according to a neutral or random inspection scheme, or in accordance with established priorities. A neutral monitoring scheme provides some objective basis for scheduling inspections and sampling visits by establishing a system (whether complex factor-based, alphabetic, or geographic) for setting prioritiesto ensure that a particular facility is not unfairly selected for inspection or sampling. The selection of which facility to inspect must be made without bias to ensure that the regulatory oversight authority, if challenged for being arbitrary and capricious manner, can reasonably defend itself.

A neutral inspection scheme should set the criteria the inspector uses to choose which facilities to inspect, but the schedule for the actual inspection should remain confidential, and may be kept separate from the neutral plan.

A routine comprehensive compliance inspection is most effective when it is unannounced or conducted with very little advance warning.

1.1.2 Reconnaissance Inspection

A reconnaissance inspection is performed in lieu of, or following a comprehensive inspection to obtain a preliminary overview of an owner/operator's compliance program, to respond to a citizen complaint, or to assess a non-permitted site. The inspector performs a brief (generally about an hour) visual inspection of the site, discharges and receiving waters. A reconnaissance inspection uses the inspector's experience and judgement to summarize potential compliance problems, without conducting a full comprehensive inspection. The objective of a reconnaissance inspection is to expand inspection coverage without increasing inspection resource expenditures. The reconnaissance inspection is the shortest and least resource intensive of all inspections.

Reconnaissance inspections may be initiated in response to known or suspected violations, a public complaint, a violation of regulatory requirements, or as follow-up to verify that necessary actions were taken in response to a previous inspection.

1.2 Self-inspections

For some projects, the site owner/operator is required by their State Pollutant Discharge Elimination System (SPDES) Permit and/or local requirements to have a qualified professional[1] perform a "self-inspection" at the site. In self-inspections, the qualified professional determines whether the site is being managed in accordance with the SWPPP, and whether the SWPPP's recommended erosion and sediment controls are effective. If activities are not in accordance with the SWPPP, or if the SWPPP erosion and sediment controls are not effective, the qualified professional inspecting the site recommends corrections to the owner/operator.

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[1] A "Qualified professional" is a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed landscape architect or soil scientist.

2.0 PRE-INSPECTION ACTIVITIES

2.1 Regulatory Oversight Authorities

This section is intended for inspectors with regulatory oversight authority such as agents of the DOW or a local municipality, or others acting on their behalf, such as county Soil and Water Conservation District staff. Examples of other regulatory oversight authorities include: the United States Environmental Protection Agency (EPA); New York City Department of Environmental Protection (DEP), Adirondack Park Agency (APA); the Lake George Park Commission (LGPC), and the Skaneateles Lake Watershed Authority (SLWA). Before arriving on-site to conduct the inspection, considerations concerning communication, documentation and equipment must be made.

Regulatory oversight authority is granted by state or local law to government agencies or, depending upon the particular law, an authorized representative of state or local government. SPDES rules 6 NYCRR 750-2.3 and Environmental Conservation Law 17-0303(6) and 17-0829(a) all allow for authorized representatives of the (NYSDEC) commissioner to perform all the duties of an inspector.

2.1.1 Communication

Coordination with Other Entities
Where appropriate, prior to selecting sites for inspection, compliance inspectors should communicate with other regulatory oversight authorities to avoid unnecessary duplication or to coordinate follow-up to inspections performed by other regulatory oversight authorities.

Announced vs. Unannounced Inspection
Inspections may be announced or unannounced. Each method has its own advantages and disadvantages. Unannounced inspections are preferred, however many job sites are not continuously manned, or not always staffed by someone who is familiar with the SWPPP, thus necessitating an announced inspection. As an alternative, when an announced inspection is necessary, inspectors should try to give as little advanced warning as possible (24 hours is suggested).

Itinerary
For obvious safety reasons, inspectors should be sure to inform someone in their office which site or sites they will be visiting prior to leaving the to perform inspections.

2.1.2 Documentation

Data Review
The inspector should review any available information such as:

- Notice of Intent
- Stormwater Pollution Prevention Plan
- Past inspection records
- Phasing plan

- Construction sequence
- Inspection and Maintenance schedules
- Site specific issues
- Consent Orders
- Access agreements

Inspection Form

The inspector should have copies of, and be familiar with, the inspection form used by their regulatory oversight authority (example in Attachment 1) before leaving the office. Static information such as name, location and permit number can be entered onto the inspection form prior to arriving at the inspection site.

Credentials

Inspectors should always carry proper identification to prove that they are employed by an entity with jurisdictional authority. Failure to display proper credentials may be legal grounds for denial of entry to a site.

2.1.3 Equipment

Personal Protective Equipment

DOW employees must conform to the DOW Health and Safety policy as it relates to personal protective equipment. Other regulatory oversight authorities should have their own safety policies or, if not, may wish to consult the OSHA health and safety tool at: www.osha.gov/dep/etools/ehasp/ to develop a health and safety plan.

The following is a list of some of the most common health and safety gear that may be needed:

- Hard hat (Class G, Type1 or better)
- Safety toe shoes
- Reflective vest
- Hearing protection (to achieve 85 dBA - 8 hr TWA)
- Safety glasses with side shields

If the construction is on an industrial site or a hazardous waste site, special training may be required prior to entering the site. The inspector should consult with OSHA or NYSDEC prior to entering such a site.

Monitoring Equipment

The following is a list of some equipment that may be helpful to document facts and verify compliance:

- Digital Camera
- Measuring tape or wheel
- Hand level or clinometer
- Turbidity meter (in limited circumstances)

2.2 Permittee’s Self-inspection

This section is intended for qualified professionals who conduct site self-inspections on behalf of owner/operators. Self-inspectors are responsible for performing inspections in accordance with permit requirements and reporting to site owners and operators the results and any recommendations resulting from the inspection.

Prior to conducting inspections, qualified professionals should ensure familiarity with the Stormwater Pollution Prevention Plan and previous inspection reports.

3.0 ON-SITE INSPECTION PROCESS

3.1 Compliance Inspections

3.1.1 Professionalism

Don’t Pretend to Possess Knowledge

Unless the inspector has experience with a particular management practice, do not pretend to possess knowledge. Inspectors cannot be expert in all areas; their job is to collect information, not to demonstrate superior wisdom. Site operators are often willing to talk to someone who is inquisitive and interested. Within reason, asking questions to obtain new information about a management practice, construction technique or piece of equipment is one of the inspector’s main roles in an inspection.

Don’t Recommend Solutions

The inspector should not recommend solutions or endorse products. The solution to a compliance problem may appear obvious based on the inspector’s experience. However, the responsibility should be placed on the site owner to implement a workable solution to a compliance problem that meets NYSDEC standards. The inspector should refer the site operator to the New York Standards and Specifications for Erosion and Sediment Control (the Blue Book) or the New York State Stormwater Management Design Manual (the Design Manual).

Key advice must be offered carefully. One experienced stormwater inspector suggests saying: “I can’t direct you or make recommendations, but what we’ve seen work in other situations is ...”

The way inspectors present themselves is important to the effectiveness of the inspection. An inspector cannot be overly familiar, but will be more effective if able to establish a minimum level of communication.

3.1.2 Safety

DOW employees must conform to Division health and safety policies when on a construction site. Other regulatory oversight authorities should have their own safety policies or, if not, may wish to consult the OSHA health and safety tool at:

www.osha.gov/dep/etools/ehasp to develop a health and safety plan.

Some general protections for construction sites are:

- Beware of heavy equipment, avoid operator blind spots and make sure of operator eye contact around heavy equipment.
- Avoid walking on rock rip-rap if possible. Loose rock presents a slip hazard.
- Stay out of confined spaces like tanks, trenches and foundation holes.
- Avoid lightning danger. Monitor weather conditions, get out of water, avoid open areas and high points, do not huddle in groups or near trees.
- Protect yourself from sun and heat exposure. Use sun screen or shading clothing. Remain hydrated by drinking water, watching for signs of heat cramps, exhaustion (fatigue, nausea, dizziness, headache, cool or moist skin), or stroke (high body temperature; red, hot and dry skin)
- Protect yourself from cold weather. Wear multiple layers of thin clothing. Wear a warm hat. Drink warm fluids or eat hot foods, and keep dry.
- Avoid scaffolding in excess of 4 feet above grade.
- Beware of ticks, stinging insects, snakes and poison ivy or sumac.

3.1.3 Legal access

DOW has general powers, set forth under ECL 17-0303, subparagraph 6, to enter premises for inspections. In addition, ECL 3-0301.2 conveys general statutory authority granting the DOW the power to access private property to fulfill DOW obligations under the law.

ECL 15-0305 gives the DOW the authority to enter at all times in or upon any property, public or private, for the purpose of inspecting or investigating conditions affecting the construction of improvements to or developments of water resources for the public health, safety or welfare.

ECL 17-0829 allows an authorized DOW representative, upon presentation of their credentials, to enter upon any premises where any effluent source is located, or in which records are required to be maintained. The representative may at reasonable times have access to, and sample discharges/pollutants to the waters or to publicly owned treatment plants where the effluent source is located. This subparagraph provides DOW representatives performing their duties authority to enter a site to pursue administrative violations. Pursuing criminal violations may require a warrant or the owner’s permission to enter the site.

For sites that are permitted, DOW has authority under the permit to enter the site.

If the owner/operator’s representatives onsite deny access, the inspector *should not* physically force entry. Under these circumstances the attorney representing the inspector should be immediately notified and consideration should be given to soliciting the aid of a law officer to obtain entry.

DOW staff have the right to enter at any reasonable time. If no one is available, and the site is fenced or posted, DOW staff should make all reasonable efforts to identify, contact and notify the owner that the DOW is entering the site. If the inspector has made all reasonable efforts to contact site owners, but was unable to do so, the site can then be accessed. All efforts should be taken not to cause any damage to the facility.

Other regulatory oversight authorities should seek advice on their legal authorities to enter a job site. Municipalities that have adopted Article 6 of the New York State Sample Local Law for Stormwater Management and Erosion and Sediment Control (NYSDEC, 2004, updated 2006) will have legal authority to enter sites in accordance with that chapter and any other existing municipal authority .

Agents of DOW have authority similar DOW staff authority to enter sites. However, DOW staff enjoy significant personal liability protections as state employees. That liability protection may not be the same for authorized representatives of DOW. For authorized representatives of DOW (or other regulatory oversight authorities), it is prudent to obtain permission to enter the site. If such permission is denied, the authorized representatives should inform the appropriate DOW contact, usually the regional water manager.

3.1.4 Find the Legally Responsible Party (Construction Manager, Self-inspector)

The first action a compliance inspector should take upon entering a construction site is to find the construction trailer or the construction or project manager if they are available. The inspector should present appropriate identification to the site's responsible party and state the reason for the inspection; construction stormwater complaint response or neutral construction stormwater inspection. If the inspection is initiated as a response to a complaint, frequently the responsible party will ask who made the complaint. DOW keeps private individual complainants confidential. If the complainant is another regulatory oversight authority, DOW tends to make that known to the site's responsible party.

3.1.5 On-site records review (NOI, SWPPP, Self-inspection Reports, Permit)

Generally, the compliance inspector should next review the on-site records. Verify that a copy of the construction stormwater permit and NOI are on-site. Verify that the acreage, site conditions, and receiving water listed on the NOI are accurate. Compare the on-site documentation with documentation already submitted to, or obtained by the compliance inspector.

If the SWPPP has not been reviewed in the office, verify that it exists and contains the minimum required components (16 for a basic plan and 22 for a full plan). On-site review of the SWPPP should determine if: there is an appropriate phasing plan; the acreage disturbed in each phase, construction sequence for each phase; proposed implementation of erosion and sediment control measures; and, where required, post construction controls. For each of the erosion and sediment control practices, the SWPPP must show design details in accordance with the NYS Standards for Erosion and Sediment Controls. The SWPPP must also include provisions for maintenance of practices during construction. On-site review of post construction controls is generally limited to verification that the proposed stormwater management practices are shown on the site plan.

Where self-inspections are required, self-inspection reports are a significant tool for the compliance inspector to determine the performance history of the site. The self-inspection reports should be done with the required frequency . Self-inspection reports must include all the details required by the permit. Generally, it is desirable for permit information to be shown on a site plan. The compliance inspector should become familiar with the report and use that familiarity to judge whether the self-inspections are being performed correctly and that the site operator is correcting deficiencies noted in the report.

3.1.6 Walk the Site

During wet weather conditions, it may be advantageous to observe the receiving waters prior to walking the rest of the site. At some point during the inspection, the receiving water conditions must be observed and noted. It is critical to note if there is a substantial visible contrast to natural conditions, or evidence of deposition, streambank erosion, construction debris or waste materials (e.g. concrete washdown) in the receiving stream.

Each inspector should evaluate actual implementation and maintenance of practices on-site compared to how implementation and maintenance is detailed in the SWPPP. At a minimum, the compliance inspector should observe all areas of active construction. Observing equipment or materials storage, recently stabilized areas, or stockpile areas is also appropriate to evaluate the effectiveness of management practices.

3.1.7 Taking Photographs

Evidence of poor receiving water conditions and poor or ineffective practices should be documented with digital photographs. Those photographs should be logged date stamped and stored on media that cannot be edited (e.g. write only CDs). Photos should also be appended to the site inspector’s report.

It is also beneficial to take photographs of good practices for educational and technology transfer reasons.

3.1.8 Exit Interview

Clearly communicate expectations and consequences. If it is clear from the inspection that the owner/operator must modify the SWPPP, or modify management practices within an assigned period (e.g. 24 hours, 48 hours, one week, two weeks), then that finding should be communicated at the time of the exit interview. The inspector should assign the period based on factors such as how long it would reasonably take to complete such modifications and the level of risk to water quality associated with failure to make such modifications.

The inspector should make clear that NYSDEC reserves rights to future enforcement actions. If the inspector’s supervisor or enforcement coordinator determines additional enforcement actions are necessary, the inspector *should not* reassure the owner/operator that the current situation is acceptable.

3.2 Non-permitted Site Inspections

For sites not authorized in accordance with state or local laws, the process will be abbreviated. First verify the need for authorization and observe receiving waters to detect water quality standard violations. If there is a violation, notify the owner of the violation or other compliance actions in response to their illicit activity. For DOW staff, Attachment 2 or a similar notice can be used to notify the site owner/operator that stormwater authorization is required.

3.3 Self-inspections

The role of the self-inspector is to verify that the site is complying with stormwater requirements. In particular, the self-inspector verifies that the SWPPP is being properly implemented. The self-inspector also documents SWPPP implementation so regulatory agencies can review implementation activities.

It is <u>not</u> the role of the self-inspector to report directly to regulatory authorities.

Appendix H of *The New York Standards and Specifications for Erosion and Sediment Control* - August 2005 (the Blue Book) includes a Construction Duration Inspection checklist that can be used by the owner/operators qualified professional for self-inspections. The Blue Book is available on the NYSDEC website.

3.3.1 Purpose

The self inspector should ensure that the project's SWPPP is being properly implemented. This includes ensuring that the erosion and sediment control practices are properly installed and being maintained in accordance with the SWPPP/Blue Book.

The project must be properly phased to limit the disturbance to less than five acres, and the construction sequence for each phase must be followed. The SWPPP must also be modified to address evolving circumstances. Finally, and most importantly, receiving waters must be protected.

If a soil disturbance will be greater than five acres at any given time, the site operator must obtain written permission from the DOW regional office.

3.3.2 Pre-construction Conference

The parties responsible for various aspects of stormwater compliance should be identified at the pre-construction conference. Responsible parties may include, but are not limited to, owner's engineer, owner/operator/permittee, contractors, and subcontractors.

Typical responsibilities include: installation of erosion and sediment control (E & SC) practices; maintenance of E & SC practices, inspection of E&SC practices, installation of post construction stormwater management practices (SMPs), inspection of post construction SMPs, SWPPP revisions, and contractor direction.

All parties should clearly know what is expected of them. Responsible parties should complete the Pre-construction Site Assessment Checklist provided in Appendix H of the Blue Book.

3.3.3 Inspection Preparation

The inspector should review the project's SWPPP (including the phasing plan, construction sequence and site specific issues) and the last few inspection reports (if the inspector has them available).

3.3.4 Self-inspection Components

Inspect installation, performance and maintenance of all E&SC practices

The self inspector should inspect all areas that are under active construction or disturbance and areas that are vulnerable to erosion. The self-inspector should also inspect areas that will be disturbed prior to the next inspection for measures required prior to construction (e.g. silt barriers, stabilized construction entrance, diversions). Finally, self-inspectors should inspect post-construction controls during and after installation.

Identify site deficiencies and corrective measures

The self-inspector's reports must be maintained in a log book on site and the log book must be made available to the regulatory authorities. Although the legal responsibility for filing a Notice of Termination lies with the owner/operator, the self-inspector may also be called upon to perform a final site inspection, including post construction SMPs, prior to filing the Notice of Termination.

4.0 POST-INSPECTION ACTIVITIES

4.1 Regulatory Oversight Authorities

This section is intended for inspectors with regulatory oversight authority such as agents of the DOW or a local municipality, or others acting on their behalf (such as County Soil and Water Conservation District staff.) Upon completion of an inspection, inspection results should be documented for the record.

4.1.1 Written Notification

The inspector should inform the permittee or the on-site representative of their inspection results in writing by sending the permittee a complete, signed copy of the inspection report. The inspection report should be transmitted under a cover letter which elaborates on any deficiencies noted in the inspection report. It is not a good idea to commend exceptional efforts by the owner/operator in a letter, because such letters tend to undermine enforcement efforts when compliance status at a site degrades.

The inspector should consider providing a copy of the cover letter and inspection report to other parties with including:

- Permittee
- Contractor(s)
- Other regulatory oversight authorities
- Other parties present during the inspection (e.g. SWPPP preparer, permittee's self-inspector, etc.)

For DOW staff, an example of the inspection cover letter is included as Attachment 3.

4.1.2 Inspection Tracking

DOW staff must enter their inspection results into the electronic *Water Compliance System*.

Local municipalities and other regulatory oversight authorities are encouraged to develop an electronic tracking system in which to record their inspections.

4.2 Permittee's Self-inspections

This section is intended for qualified professionals who conduct site inspections for permittees in accordance with a SPDES permit or local requirements.

4.2.1 Written Records

Inspection Reports
The inspector shall prepare a written report summarizing inspection results. The inspection report is then provided to the permittee, or the permittee's duly authorized representative, and to the contractor responsible for implementing stormwater controls on-site in order to correct deficiencies noted in the inspection report. Finally, the inspection report must be added to the site log book that is required to be maintained on-site, and be available to regulatory oversight authorities for review.

4.2.2 Stormwater Pollution Prevention Plan Revisions

The inspector must inform the permittee of his/her duty to amend the Stormwater Pollution Prevention Plan (SWPPP) whenever an inspection proves the SWPPP to be ineffective in:

- Eliminating or significantly minimizing pollutants from on-site sources
- Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity
- Eliminating discharges that cause a substantial visible contrast to natural conditions

ATTACHMENT 1

Construction Stormwater Compliance Inspection Report

Project Name and Location:	Date:	Page 1 of 2
	Permit # (if any): **NYR**	
Municipality: County:	Entry Time:	Exit Time:
On-site Representative(s) and contact information:	Weather Conditions:	
Name and Address of SPDES Permittee/Title/Phone/Fax Numbers: Contacted: Yes ☐ No ☐		

INSPECTION CHECKLIST

SPDES Authority

Yes No N/A **Law, rule or permit citation**

1. ☐ ☐ ☐ Is a copy of the NOI posted at the construction site for public viewing?
2. ☐ ☐ ☐ Is an up-to-date copy of the signed SWPPP retained at the construction site?
3. ☐ ☐ ☐ Is a copy of the SPDES General Permit retained at the construction site?

SWPPP Content

Yes No N/A **Law, rule or permit citation**

4. ☐ ☐ ☐ Does the SWPPP describe and identify the erosion & sediment control measures to be employed?
5. ☐ ☐ ☐ Does the SWPPP provide a maintenance schedule for the erosion & sediment control measures?
6. ☐ ☐ ☐ Does the SWPPP describe and identify the post-construction SW control measures to be employed?
7. ☐ ☐ ☐ Does the SWPPP identify the contractor(s) and subcontractor(s) responsible for each measure?
8. ☐ ☐ ☐ Does the SWPPP include all the necessary ‘CONTRACTOR CERTIFICATION’ statements?
9. ☐ ☐ ☐ Is the SWPPP signed/certified by the permittee?

Recordkeeping

Yes No N/A **Law, rule or permit citation**

10. ☐ ☐ ☐ Are inspections performed as required by the permit (every 7 days and after ½" rain event)?
11. ☐ ☐ ☐ Are the site inspections performed by a qualified professional?
12. ☐ ☐ ☐ Are all required reports properly signed/certified?
13. ☐ ☐ ☐ Does the SWPPP include copies of the monthly/quarterly written summaries of compliance status?

Visual Observations

Yes No N/A **Law, rule or permit citation**

14. ☐ ☐ ☐ Are all erosion and sediment control measures installed/constructed?
15. ☐ ☐ ☐ Are all erosion and sediment control measures maintained properly?
16. ☐ ☐ ☐ Have all disturbances of 5 acres or more been approved prior to the disturbance?
17. ☐ ☐ ☐ Are stabilization measures initiated in inactive areas?
18. ☐ ☐ ☐ Are permanent stormwater control measures implemented?
19. ☐ ☐ ☐ Was there a discharge into the receiving water on the day of inspection?
20. ☐ ☐ ☐ Are receiving waters free of there evidence of turbidity, sedimentation, or oil ? (If no , complete Page 2)

Overall Inspection Rating: ☐ Satisfactory ☐ Marginal ☐ Unsatisfactory	
Name/Agency of Lead Inspector:	**Signature of Lead Inspector:**
Names/Agencies of Other Inspectors:	

Water Quality Observations

Describe the discharge(s) [source(s), impact on receiving water(s), etc.] ____________________

Describe the quality of the receiving water(s) both upstream and downstream of the discharge____________________

Describe any other water quality standards or permit violations ____________________

Additional Comments:____________________

☐ Photographs attached

ATTACHMENT 2

**** NOTICE ****

On March 10, 2003, provisions of the Federal Clean Water Act went into effect that apply to many construction operations.

If your construction operations result in the disturbance of one acre or greater and stormwater runoff from your site reaches surface waters (i.e., lake, stream, road side ditch, swale, storm sewer system, etc.), the stormwater runoff from your site must be covered by a State Pollutant Discharge Elimination System (SPDES) Permit issued by the New York State Department of Environmental Conservation (NYSDEC).

To facilitate your compliance with the law, NYSDEC has issued a General Permit which may be applicable to your project. To obtain coverage under this General Permit, you need to prepare a Stormwater Pollution Prevention Plan (SWPPP) and then file a Notice of Intent (NOI) to the NYSDEC headquarters in Albany. The NOI form is available on the DEC website. You may also obtain a copy of the NOI form at the nearest NYSDEC regional offices.

When you file your NOI you are certifying that you have developed a SWPPP and that it will be implemented prior to commencing construction. When you submit the NOI you need to indicate if your SWPPP is in conformance with published NYSDEC technical standards; if it is, your SPDES permit coverage will be effective in as few as five business days. If your SWPPP does not conform to the DEC technical standards, coverage will not be available for at least 60 business days.

Failure to have the required permit can result in legal actions which include Stop Work Orders and/or monetary penalties of up to $37,500/day

If your construction operations are already in progress and you are not covered by an appropriate NYSDEC permit contact the NYSDEC Regional Water Engineer as soon as possible. If your construction field operations have not yet commenced, review the NOI and the General Permit on the DEC's website or at the DEC regional office for your area. When you are comfortable that you understand and comply with the requirements, file your NOI.

The requirement to file an NOI does not replace any local requirements. Developers/Contractors are directed to contact the Local Code Enforcement Officer or Stormwater Management Officer for local requirements.

ATTACHMENT 3

<< Date >>

Mr. John Smith
123 Main Street
Ferracane, NY 12345

Re: **Stormwater Inspection**
SPDES Permit Identification No. NYR10Z000 (through SPDES No. GP-02-01)
Blowing Leaves Subdivision
Gasper (T), Eaton (Co.)

Dear Mr. Smith:

On the afternoon of << date >> I conducted an inspection of the construction activities associated with the Blowing Leaves Subdivision located on County Route 1 in the town of Gasper, Eaton County. The inspection was conducted in the presence of you and Mr. Samuel Siltfence of Acme Excavating Co., Inc. The purpose of the inspection was to verify compliance with the *State Pollutant Discharge Elimination System (SPDES) General Permit for Storm Water Discharges from Construction Activity* ("the general permit").

The overall rating for the project at the time of the inspection was ***unsatisfactory***. A copy of my inspection report is attached for your information. In addition to the report, I would like to elaborate on the following:

SPDES Authority

- In accordance with subdivision 750-2.1 (a) of Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR), a copy of your permit must be retained at the construction site. You did not have a copy of the general permit at the site. **Your failure to retain a copy of the general permit at the construction site is a violation of 6 NYCRR Part 750-2.1 (a).** Please retain a copy of the general permit at the site from this point forward.

SWPPP Content

- In accordance with Part III.E.2. of the general permit, contractors and subcontractors must certify that they understand the terms and conditions of the general permit and the SWPPP before undertaking any construction activity at the site. Your SWPPP does not include a certification statement from Acme Excavating Co., Inc. **The failure of your contractor to sign this certification before undertaking construction activity at the site is a violation of Part III.E.2. of the general permit.** Please obtain copies of all necessary certifications and provide copies of them to each party who holds a copy of your SWPPP.

- In accordance with Part V.H.2. of the general permit, SWPPP's must be certified by the permittee. Your SWPPP was not certified by you. **Your failure to certify your SWPPP is a**

violation of Part V.H.2. of the general permit. Please certify your SWPPP.

Recordkeeping

- In accordance with Parts III.D.3.a. and III.D.3.b. of the general permit, permittees must have a qualified professional conduct site inspections within 24 hours of the end of 0.5" or greater rain events and at least once per week. A review of your records revealed that your "self-inspections" are only being conducted about two or three times per month. **Your failure to have a qualified professional conduct inspections at the required frequency is a violation of Part III.D.3.b. of the general permit.** Please immediately direct your qualified professional to conduct your site inspections at the required frequency.

- Although the frequency of self-inspections does not meet rquirements, the quality of them is very good. Your qualified professional has accurately noted the same SWPPP deficiencies and necessary maintenance activities that I also observed, and prepared thorough sketches on the self-inspection site maps.

- In accordance with Part V.H.2. of the general permit, the permittee must certify all reports required by the permit. A review of your records showed that your self-inspection reports were not certified. **Your failure to certify your self-inspection reports is a violation of Part V.H.2. of the general permit.** Please sign and certify any and all existing and future self-inspection reports.

Visual Observations

- In accordance with Parts III.A.2. and III.A.3. of the general permit, all erosion and sediment controls (E&SC) measures must be installed (as detailed in the SWPPP) prior to the initiation of construction. During the inspection, I noted all of your E&SC measures have been correctly installed at the right times and locations.

- In accordance with Part V.L. of the general permit, all of the E&SC measures at your site must be maintained properly. While on site I observed that, among other things, the section of silt fence in place parallel to County Route 1 is in various stages of disrepair. **The failure of your contractor to adequately maintain the E&SC measures currently in place at your site is a violation of Part V.L of the general permit.** Please direct your contractor to repair this silt fence immediately and to diligently maintain all of the other required E&SC measures as they are brought to his attention by your qualified professional.

- This inspection was conducted during a rain event which resulted in a stormwater discharge to the municipal separate storm sewer system (MS4) being operated by the Eaton County Department of Public Works. Your discharge was visibly turbid whereas upstream water MS4 was clear. As a result, the discharge from the MS4 outfall into Karimipour Creek was causing slight turbidity. Please be advised that the narrative water quality standard for turbidity in Karimipour Creek is “no increase that will cause a substantial visible contrast to natural conditions.” I attribute the lack of maintenance of your E&SC measures to be the primary cause of the turbid discharge. Please be reminded that the general permit does not authorize you cause or contribute to a condition in contravention of any water quality standards.

If you have any questions or comments, please feel free to contact me at (999) 456-5432.

Sincerely,

Hector D. Inspector, CPESC
Environmental Program Specialist 2

HDI:ms
Attachment

cc w/att.: Chester Checkdam, (T) Gasper Code Enforcement Officer
Samuel Siltfence, Acme Excavating Co., Inc.

APPENDIX 11

CONTRACTOR CERTIFICATION FORM

CONTRACTOR'S CERTIFICATION
Pursuant to
NYS DEC GENERAL PERMIT GP-0-20-001

Pursuant to the SPDES General Permit for Stormwater Discharges from Construction Activity (Permit GP-0-20-001) Part III.a.6, all contractors and subcontractors implementing all, or a portion of the Stormwater Pollution Prevention Plan (SWPPP) shall sign a copy of the following certification statement before undertaking any construction activity at the site identification in the SWPPP:

> *"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 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 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"*

____________________________	____________________________	______________
Signature	Print Name	Date

Contracting Firm Information:

Contracting Firm Name:

Address:

Telephone Number:

Address of Site: ____

Name of trained individual responsible for SWPPP implementation, and who shall be on site on a daily basis when soil disturbance activities are being performed:

Name: ____________________________

Title: ____________________________

APPENDIX 12

NYSDEC DEEP-RIPPING & DECOMPACTION MANUAL

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

Deep-Ripping and Decompaction

April 2008

New York State
Department of Environmental Conservation

Document Prepared by:

John E. Lacey,
Land Resource Consultant and Environmental Compliance Monitor
(Formerly with the Division of Agricultural Protection and Development Services,
NYS Dept. of Agriculture & Markets)

Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

The two-phase practice of 1) “Deep Ripping;” and 2) “Decompaction” (deep subsoiling), of the soil material as a step in the cleanup and restoration/landscaping of a construction site, helps mitigate the physically induced impacts of soil compression; i.e.: soil compaction or the substantial increase in the bulk density of the soil material.

Deep Ripping and Decompaction are key factors which help in restoring soil pore space and permeability for water infiltration. Conversely, the physical actions of cut-and-fill work, land grading, the ongoing movement of construction equipment and the transport of building materials throughout a site alter the architecture and structure of the soil, resulting in: the mixing of layers (horizons) of soil materials, compression of those materials and diminished soil porosity which, if left unchecked, severely impairs the soil’s water holding capacity and vertical drainage (rainfall infiltration), from the surface downward.

In a humid climate region, compaction damage on a site is virtually guaranteed over the duration of a project. Soil in very moist to wet condition when compacted, will have severely reduced permeability. Figure 1 displays the early stage of the deep-ripping phase (Note that all topsoil was stripped prior to construction access, and it remains stockpiled until the next phase – decompaction – is complete). A heavy-duty tractor is pulling a three-shank ripper on the first of several series of incrementally deepening passes through the construction access corridor's densely compressed subsoil material. Figure 2 illustrates the approximate volumetric composition of a loam surface soil when conditions are good for plant growth, with adequate natural pore space for fluctuating moisture conditions.

Fig. 1. A typical deep ripping phase of this practice, during the first in a series of progressively deeper “rips” through severely compressed subsoil.

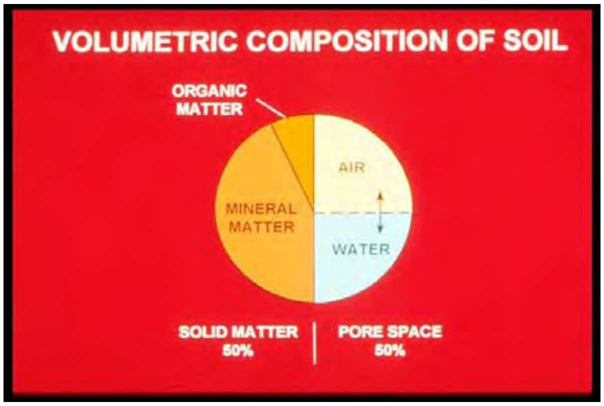

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

Fig. 3. Construction site with significant compaction of the deep basal till subsoil extends 24 inches below this exposed cut-and-fill work surface.

The objective of Deep Ripping and Decompaction is to effectively fracture (vertically and laterallly) through the thickness of the physically compressed subsoil material (see Figure 3), restoring soil porosity and permeability and aiding infiltration to help reduce runoff. Together with topsoil stripping, the "two-phase" practice of Deep Ripping and Decompaction first became established as a "best management practice" through ongoing success on commercial farmlands affected by heavy utility construction right-of-way projects (transmission pipelines and large power lines).

Soil permeability, soil drainage and cropland productivity were restored. For broader construction application, the two-phase practice of Deep Ripping and Decompaction is best adapted to areas impacted with significant soil compaction, on contiguous open portions of large construction sites and inside long, open construction corridors used as temporary access over the duration of construction. Each mitigation area should have minimal above-and-below-ground obstructions for the easy avoidance and maneuvering of a large tractor and ripping/decompacting implements. Conversely, the complete two-phase practice is not recommended in congested or obstructed areas due to the limitations on tractor and implement movement.

Benefits

Aggressive "deep ripping" through the compressed thickness of exposed subsoil before the replacement/respreading of the topsoil layer, followed by "decompaction," i.e.: "sub-soiling," through the restored topsoil layer down into the subsoil, offers the following benefits:

- Increases the project (larger size) area's direct surface infiltration of rainfall by providing the open site's mitigated soil condition and lowers the demand on concentrated runoff control structures
- Enhances direct groundwater recharge through greater dispersion across and through a broader surface than afforded by some runoff-control structural measures
- Decreases runoff volume generated and provides hydrologic source control
- May be planned for application in feasible open locations either alone or in

conjunction with plans for structural practices (e.g., subsurface drain line or infiltration basin) serving the same or contiguous areas

- Promotes successful long-term revegetation by restoring soil permeability, drainage and water holding capacity for healthy (rather than restricted) root-system development of trees, shrubs and deep rooted ground cover, minimizing plant drowning during wet periods and burnout during dry periods.

Feasibility / Limitations

The effectiveness of Deep Ripping and Decompaction is governed mostly by site factors such as: the original (undisturbed) soil's hydrologic characteristics; the general slope; local weather/timing (soil moisture) for implementation; the space-related freedom of equipment/implement maneuverability (noted above in **Recommended Application of Practice**), and by the proper selection and operation of tractor and implements (explained below in **Design Guidance**). The more notable site-related factors include:

Soil

In the undisturbed condition, each identified soil type comprising a site is grouped into one of four categories of soil hydrology, Hydrologic Soil Group A, B, C or D, determined primarily by a range of characteristics including soil texture, drainage capability when thoroughly wet, and depth to water table. The natural rates of infiltration and transmission of soil-water through the undisturbed soil layers for Group A is "high" with a low runoff potential while soils in Group B are moderate in infiltration and the transmission of soil-water with a moderate runoff potential, depending somewhat on slope. Soils in Group C have slow rates of infiltration and transmission of soil-water and a moderately high runoff potential influenced by soil texture and slope; while soils in Group D have exceptionally slow rates of infiltration and transmission of soil-water, and high runoff potential.

In Figure 4, the profile displays the undisturbed horizons of a soil in Hydrologic Soil Group C and the naturally slow rate of infiltration through the subsoil. The slow rate of infiltration begins immediately below the topsoil horizon (30 cm), due to the limited amount of macro pores, e.g.: natural subsoil fractures, worm holes and root channels. Infiltration after the construction-induced mixing and compression of such subsoil material is virtually absent; but can be restored back to this natural level with the two-phase practice of deep ripping and decompaction, followed by the permanent establishment of an appropriate, deep taproot

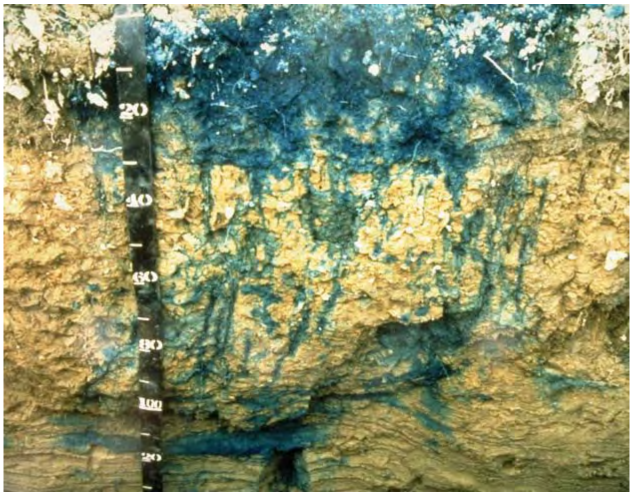

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

lawn/ground cover to help maintain the restored subsoil structure. Infiltration after construction-induced mixing and compression of such subsoil material can be notably rehabilitated with the Deep Ripping and Decompaction practice, which prepares the site for the appropriate long-term lawn/ground cover mix including deep taproot plants such as clover, fescue or trefoil, etc. needed for all rehabilitated soils.

Generally, soils in Hydrologic Soil Groups A and B, which respectively may include deep, well-drained, sandy-gravelly materials or deep, moderately well-drained basal till materials, are among the easier ones to restore permeability and infiltration, by deep ripping and decompaction. Among the many different soils in Hydrologic Soil Group C are those unique glacial tills having a natural fragipan zone, beginning about 12 to 18 inches (30 – 45cm), below surface. Although soils in Hydrologic Soil Group C do require a somewhat more carefully applied level of the Deep Ripping and Decompaction practice, it can greatly benefit such affected areas by reducing the runoff and fostering infiltration to a level equal to that of pre-disturbance.

Soils in Hydrologic Soil Group D typically have a permanent high water table close to the surface, influenced by a clay or other highly impervious layer of material. In many locations with clay subsoil material, the bulk density is so naturally high that heavy trafficking has little or no added impact on infiltration; and structural runoff control practices rather than Deep Ripping and Decompaction should be considered.

The information about Hydrologic Soil Groups is merely a general guideline. Site-specific data such as limited depths of cut-and-fill grading with minimal removal or translocation of the inherent subsoil materials (as analyzed in the county soil survey) or, conversely, the excavation and translocation of deeper, unconsolidated substratum or consolidated bedrock materials (unlike the analyzed subsoil horizons’ materials referred to in the county soil survey) should always be taken into account.

Sites made up with significant quantities of large rocks, or having a very shallow depth to bedrock, are not conducive to deep ripping and decompation (subsoiling); and other measures may be more practical.

Slope

The two-phase application of 1) deep ripping and 2) decompaction (deep subsoiling), is most practical on flat, gentle and moderate slopes. In some situations, such as but not limited to temporary construction access corridors, inclusion areas that are moderately steep along a project’s otherwise gentle or moderate slope may also be deep ripped and decompacted. For limited instances of moderate steepness on other projects, however, the post-construction land use and the relative alignment of the potential ripping and decompaction work in relation to the lay of the slope should be reviewed for safety and practicality. In broad construction areas predominated by moderately steep or steep slopes, the practice is generally not used.

Local Weather/Timing/Soil Moisture

Effective fracturing of compressed subsoil material from the exposed work surface, laterally and vertically down through the affected zone is achieved only when the soil material is moderately dry to moderately moist. Neither one of the two-phases, deep ripping nor decompaction (deep subsoiling), can be effectively conducted when the soil material (subsoil or replaced topsoil) is in either a “plastic” or “liquid” state of soil consistency. Pulling the respective implements legs through the soil when it is overly moist only results in the “slicing and smearing” of the material or added “squeezing and compression” instead of the necessary fracturing. Ample drying time is needed for a “rippable” soil condition not merely in the material close to the surface, but throughout the material located down to the bottom of the physically compressed zone of the subsoil.

The “poor man’s Atterberg field test” for soil plasticity is a simple “hand-roll” method used for quick, on-site determination of whether or not the moisture level of the affected soil material is low enough for: effective deep ripping of subsoil; respreading of topsoil in a friable state; and final decompaction (deep subsoiling). Using a sample of soil material obtained from the planned bottom depth of ripping, e.g.: 20 - 24 inches below exposed subsoil surface, the sample is hand rolled between the palms down to a 1/8-inch diameter thread. (Use the same test for stored topsoil material before respreading on the site.) If the respective soil sample crumbles apart in segments no greater than 3/8 of an inch long, by the time it is rolled down to 1/8 inch diameter, it is low enough in moisture for deep ripping (or topsoil replacement), and decompaction. Conversely, as shown in Figure 5, if the rolled sample stretches out in increments greater than 3/8 of an inch long before crumbling, it is in a “plastic” state of soil consistency and is too wet for subsoil ripping (as well as topsoil replacement) and final decompaction.

Fig. 5. Augered from a depth of 19 inches below the surface of the replaced topsoil, this subsoil sample was hand rolled to a 1/8-inch diameter. The test shows the soil at this site stretches out too far without crumbling; it indicates the material is in a plastic state of consistence, too wet for final decompaction (deep subsoiling) at this time.

Design Guidance

Beyond the above-noted site factors, a vital requirement for the effective Deep Ripping and Decompaction (deep subsoiling), is implementing the practice in its distinct, two-phase process:

1) Deep rip the affected thickness of exposed subsoil material (see Figure 10 and 11), aggressively fracturing it before the protected topsoil is reapplied on the site (see Figure 12); and

2) Decompact (deep subsoil), simultaneously through the restored topsoil layer and the upper half of the affected subsoil (Figure 13). The second phase, “decompaction,” mitigates the partial recompaction which occurs during the heavy process of topsoil spreading/grading. Prior to deep ripping and decompacting the site, all construction activity, including construction equipment and material storage, site cleanup and trafficking (Figure 14), should be finished; and the site closed off to further disturbance. Likewise, once the practice is underway and the area’s soil permeability and

rainfall infiltration are being restored, a policy limiting all further traffic to permanent travel lanes is maintained.

The other critical elements, outlined below, are: using the proper implements (deep, heavy-duty rippers and subsoilers), and ample pulling-power equipment (tractors); and conducting the practice at the appropriate speed, depth and pattern(s) of movement.

Note that an appropriate plan for the separate practice of establishing a healthy perennial ground cover, with deep rooting to help maintain the restored soil structure, should be developed in advance. This may require the assistance of an agronomist or landscape horticulturist.

Implements

Avoid the use of all undersize implements. The small-to-medium, light-duty tool will, at best, only "scarify" the uppermost surface portion of the mass of compacted subsoil material. The term "chisel plow" is commonly but incorrectly applied to a broad range of implements. While a few may be adapted for the moderate subsoiling of non-impacted soils, the majority are less durable and used for only lighter land-fitting (see Figure 6).

Fig. 6. A light duty chisel implement, not adequate for either the deep ripping or decompaction (deep subsoiling) phase.

Fig. 7. One of several variations of an agricultural ripper. This unit has long, rugged shanks mounted on a steel V-frame for deep, aggressive fracturing through Phase 1.

Use a "heavy duty" agricultural-grade, deep ripper (see Figures 7,9,10 and 11) for the first phase: the lateral and vertical fracturing of the mass of exposed and compressed subsoil, down and through, to the bottom of impact, prior to the replacement of the topsoil layer. (Any oversize rocks which are uplifted to the subsoil surface during the deep ripping phase are picked and removed.) Like the heavy-duty class of implement for the first phase, the decompaction (deep subsoiling) of Phase 2 is conducted with the heavy-duty version of the deep subsoiler. More preferable is the angled-leg variety of deep subsoiler (shown in Figures 8 and 13). It minimizes the inversion of the subsoil and topsoil layers while laterally and vertically fracturing the upper half of the previously ripped subsoil layer and all of the topsoil layer by delivering a momentary, wave-like "lifting and shattering" action up through the soil layers as it is pulled.

Pulling-Power of Equipment

Use the following rule of thumb for tractor horsepower (hp) whenever deep ripping and decompacting a significantly impacted site: For both types of implement, have at least 40 hp of tractor pull available for each mounted shank/ leg.

Using the examples of a 3-shank and a 5-shank implement, the respective tractors should have 120 and 200 hp available for fracturing down to the final depth of 20-to-24 inches per phase. Final depth for the deep ripping in Phase 1 is achieved incrementally by a progressive series of passes (see Depth and Patterns of Movement, below); while for Phase 2, the full operating depth of the deep subsoiler is applied from the beginning.

The operating speed for pulling both types of implement should not exceed 2 to 3 mph. At this slow and managed rate of operating speed, maximum functional performance is sustained by the tractor and the implement performing the soil fracturing. Referring to Figure 8, the implement is the 6-leg version of the deep angled-leg subsoiler. Its two outside legs are "chained up" so that only four legs will be engaged (at the maximum depth), requiring no less than 160 hp, (rather than 240 hp) of pull. The 4-wheel drive, articulated-frame tractor in Figure 8 is 174 hp. It will be decompacting this unobstructed, former construction access area simultaneously through 11 inches of replaced topsoil and the upper 12 inches of the previously deep-ripped subsoil. In constricted areas of Phase 1) Deep Ripping, a medium-size tractor with adequate hp, such as the one in Figure 9 pulling a 3-shank deep ripper, may be more maneuverable.

Fig. 8. A deep, angled-leg subsoiler, ideal for Phase 2 decompaction of after the topsoil layer is graded on top of the ripped subsoil.

Fig. 9. This medium tractor is pulling a 3-shank deep ripper. The severely compacted construction access corridor is narrow, and the 120 hp tractor is more maneuverable for Phase 1 deep ripping (subsoil fracturing), here.

Some industrial-grade variations of ripping implements are attached to power graders and bulldozers. Although highly durable, they are generally not recommended. Typically, the shanks or "teeth" of these rippers are too short and stout; and they are mounted too far apart to achieve the well-distributed type of lateral and vertical fracturing of the soil materials necessary to restore soil permeability and infiltration. In addition, the power graders and bulldozers, as pullers, are far less maneuverable for turns and patterns than the tractor.

Depth and Patterns of Movement

As previously noted both Phase 1 Deep Ripping through significantly compressed, exposed subsoil and Phase 2 Decompaction (deep subsoiling) through the replaced topsoil and upper subsoil need to be performed at maximum capable depth of each implement. With an implement's guide wheels attached, some have a "normal" maximum operating depth of 18 inches, while others may go deeper. In many situations, however, the tractor/implement operator must first remove the guide wheels and other non essential elements from the implement. This adapts the ripper or the deep subsoiler for skillful pulling with its frame only a few inches above surface, while the shanks or legs, fracture the soil material 20-to-24 inches deep.

There may be construction sites where the depth of the exposed subsoil's compression is moderate, e.g.: 12 inches, rather than deep. This can be verified by using a ¾ inch cone penetrometer and a shovel to test the subsoil for its level of compaction, incrementally, every three inches of increasing depth. Once the full thickness of the subsoil's compacted zone is finally "pieced" and there is a significant drop in the psi measurements of the soil penetrometer, the depth/thickness of compaction is determined. This is repeated at several representative locations of the construction site. If the thickness of the site's subsoil compaction is verified as, for example, ten inches, then the Phase 1 Deep Ripping can be correspondingly reduced to the implement's minimum operable depth of 12 inches. However, the Phase 2 simultaneous Decompation (subsoiling) of an 11 inch thick layer of replaced topsoil and the upper subsoil should run at the subsoiling implements full operating depth.

Fig. 10. An early pass with a 3-shank deep ripper penetrating only 8 inches into this worksite's severely compressed subsoil.

Fig. 11. A repeat run of the 3-shank ripper along the same patterned pass area as Fig. 9; here, incrementally reaching 18 of the needed 22 inches of subsoil fracture.

Typically, three separate series (patterns) are used for both the Phase 1 Deep Ripping and the Phase 2 Decompaction on significantly compacted sites. For Phase 1, each series begins with a moderate depth of rip and, by repeat-pass, continues until full depth is reached. Phase 2 applies the full depth of Decompation (subsoiling), from the beginning.

Every separate series (pattern) consists of parallel, forward-and-return runs, with each progressive pass of the implement's legs or shanks evenly staggered between those from the previous pass. This compensates for the shank or leg-spacing on the implement, e.g., with 24-to-30 inches between each shank or leg. The staggered return pass ensures lateral and vertical fracturing actuated every 12 to 15 inches across the densely compressed soil mass.

Large, Unobstructed Areas

For larger easy areas, use the standard patterns of movement:

- The first series (pattern) of passes is applied lengthwise, parallel with the longest spread of the site; gradually progressing across the site's width, with each successive pass.

- The second series runs obliquely, crossing the first series at an angle of about 45 degrees.

- The third series runs at right angle (or 90 degrees), to the first series to complete the fracturing and shattering on severely compacted sites, and avoid leaving large unbroken blocks of compressed soil material. (In certain instances, the third series may be optional, depending on how thoroughly the first two series loosen the material and eliminate large chunks/blocks of material as verified by tests with a ¾-inch cone penetrometer.)

Fig. 12. Moderately dry topsoil is being replaced on the affected site now that Phase 1 deep ripping of the compressed subsoil is complete.

Fig. 13. The same deep, angled-leg subsoiler shown in Fig. 7 is engaged at maximum depth for Phase 2, decompaction (deep soiling), of the replaced topsoil and the upper subsoil materials.

Corridors

In long corridors of limited width and less maneuverability than larger sites, e.g.: along compacted areas used as temporary construction access, a modified series of pattern passes are used.

- First, apply the same initial lengthwise, parallel series of passes described above.

- A second series of passes makes a broad “S” shaped pattern of rips, continually and gradually alternating the “S” curves between opposite edges inside the compacted corridor.

- The third and final series again uses the broad, alternating S pattern, but it is “flip-flopped” to continually cross the previous S pattern along the corridor’s centerline. This final series of the S pattern curves back along the edge areas skipped by the second series.

Maintenance and Cost

Once the two-phase practice of Deep Ripping and Decompation is completed, two items are essential for maintaining a site’s soil porosity and permeability for infiltration. They are: planting and maintaining the appropriate ground cover with deep roots to maintain the soil structure (see Figure 15); and keeping the site free of traffic or other weight loads.

Note that site-specific choice of an appropriate vegetative ground-cover seed mix, including the proper seeding ratio of one or more perennial species with a deep taproot system and the proper amount of lime and soil nutrients (fertilizer mix) adapted to the soil-needs, are basic to the final practice of landscaping, i.e: surface tillage, seeding/planting/fertilizing and culti-packing or mulching is applied. The "maintenance" of an effectively deep-ripped and decompacted area is generally limited to the successful perennial (long-term) landscape ground cover; as long as no weight-bearing force of soil compaction is applied.


Fig. 14. The severely compacted soil of a temporary construction yard used daily by heavy equipment for four months; shown before deep ripping, topsoil replacement, and decompaction.


Fig. 15. The same site as Fig. 14 after deep ripping of the exposed subsoil, topsoil replacement, decompaction through the topsoil and upper subsoil and final surface tillage and revegetation to maintain soil permeability and infiltration.

The Deep Ripping and Decompaction practice is, by necessity, more extensive than periodic subsoiling of farmland.The cost of deep ripping and decompacting (deep subsoiling), will vary according to the depth and severity of soil-material compression and the relative amount of tractor and implement time that is required. In some instances, depending on open maneuverability, two-to-three acres of compacted project area may be deep-ripped in one day. In other situations of more severe compaction and - or less maneuverability, as little as one acre may be fully ripped in a day. Generally, if the Phase 1) Deep Ripping is fully effective, the Phase 2) Decompaction should be completed in 2/3 to 3/4 of the time required for Phase 1.

Using the example of two acres of Phase 1) Deep Ripping in one day, at $1800 per day, the net cost is $900 per acre. If the Phase 2) Decompacting or deep subsoiling takes 3/4 the time as Phase 1, it costs $675 per acre for a combined total of $1575 per acre to complete the practice (these figures do not include the cost of the separate practice of topsoil stripping and replacement). Due to the many variables, it must be recognized that cost will be determined by the specific conditions or constraints of the site and the availability of proper equipment.

Resources

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- US Department of Agriculture in cooperation with Cornell University Agricultural Experiment Station. Various years. *Soil Survey of* _(various names)_ *County, New York.* USDA.

Internet Access:

- Examples of implements:

V-Rippers. Access by internet search of *John Deere Ag -New Equipment for 915* (larger-frame model) *V-Rippe*; and, *for 913* (smaller-frame model) *V-Ripper*. Deep, angled-leg subsoiler. Access by internet search of: B*igham Brothers Shear Bolt Paratill-Subsoiler.* http://salesmanual.deere.com/sales/salesmanual/en_NA/primary_tillage/2008/feature/rippers/915v_pattern_frame.html?sbu=ag&link=prodcat Last visited March 08.

- Soils data of USDA Natural Resources Conservation Service. *NRCS Web Soil Survey.* http://websoilsurvey.nrcs.usda.gov/app/ and *USDA-NRCS Official Soil Series Descriptions; View by Name.* http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi . *Last visited Jan. 08.*
- Soil penetrometer information. Access by internet searches of: *Diagnosing Soil Compaction using a Penetrometer (soil compaction tester), PSU Extension;* as well as *Dickey-john Soil Compaction Tester.* http://www.dickey-johnproducts.com/pdf/SoilCompactionTest.pdf and http://cropsoil.psu.edu/Extension/Facts/uc178pdf Last visited Sept. 07

APPENDIX 13

NRCC PRECIPITATION TABLES

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New York
Location	
Longitude	74.420 degrees West
Latitude	41.422 degrees North
Elevation	0 feet
Date/Time	Wed, 02 Feb 2022 07:36:41 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.50	0.62	0.82	1.02	1.26	**1yr**	0.88	1.18	1.45	1.77	2.17	2.64	3.07	**1yr**	2.33	2.95	3.38	4.08	4.71	**1yr**
2yr	0.39	0.60	0.75	0.98	1.24	1.54	**2yr**	1.07	1.43	1.76	2.15	2.62	3.17	3.63	**2yr**	2.80	3.49	4.00	4.71	5.37	**2yr**
5yr	0.46	0.71	0.89	1.19	1.53	1.92	**5yr**	1.32	1.77	2.20	2.70	3.28	3.96	4.57	**5yr**	3.50	4.40	5.01	5.80	6.57	**5yr**
10yr	0.51	0.81	1.02	1.38	1.80	2.27	**10yr**	1.55	2.08	2.62	3.21	3.89	4.68	5.45	**10yr**	4.14	5.24	5.96	6.79	7.66	**10yr**
25yr	0.60	0.95	1.21	1.67	2.23	2.85	**25yr**	1.92	2.57	3.29	4.05	4.90	5.85	6.87	**25yr**	5.18	6.61	7.49	8.38	9.40	**25yr**
50yr	0.68	1.09	1.39	1.95	2.62	3.38	**50yr**	2.26	3.01	3.91	4.81	5.81	6.94	8.20	**50yr**	6.14	7.89	8.90	9.82	10.98	**50yr**
100yr	0.77	1.24	1.60	2.27	3.09	4.01	**100yr**	2.67	3.54	4.66	5.73	6.91	8.22	9.79	**100yr**	7.28	9.42	10.59	11.52	12.82	**100yr**
200yr	0.87	1.42	1.84	2.64	3.65	4.76	**200yr**	3.15	4.17	5.54	6.82	8.22	9.75	11.70	**200yr**	8.63	11.25	12.61	13.52	14.99	**200yr**
500yr	1.04	1.71	2.24	3.25	4.55	5.97	**500yr**	3.93	5.17	6.96	8.57	10.32	12.23	14.81	**500yr**	10.82	14.24	15.90	16.72	18.44	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.73	0.89	1.11	**1yr**	0.77	1.09	1.26	1.61	1.98	2.41	2.61	**1yr**	2.14	2.51	2.86	3.36	3.93	**1yr**
2yr	0.37	0.58	0.71	0.96	1.19	1.43	**2yr**	1.03	1.40	1.62	2.07	2.56	3.09	3.52	**2yr**	2.73	3.39	3.90	4.58	5.23	**2yr**
5yr	0.42	0.65	0.81	1.11	1.41	1.66	**5yr**	1.22	1.62	1.88	2.42	3.01	3.69	4.26	**5yr**	3.27	4.10	4.70	5.40	6.16	**5yr**
10yr	0.46	0.71	0.88	1.24	1.60	1.86	**10yr**	1.38	1.82	2.10	2.66	3.38	4.23	4.92	**10yr**	3.74	4.73	5.39	6.05	6.87	**10yr**
25yr	0.53	0.80	1.00	1.42	1.87	2.13	**25yr**	1.62	2.09	2.47	3.19	3.91	5.06	5.96	**25yr**	4.48	5.73	6.49	6.93	7.93	**25yr**
50yr	0.58	0.88	1.10	1.58	2.12	2.40	**50yr**	1.83	2.35	2.77	3.61	4.38	5.82	6.90	**50yr**	5.15	6.63	7.48	7.68	8.85	**50yr**
100yr	0.64	0.97	1.21	1.75	2.40	2.69	**100yr**	2.07	2.63	3.12	4.09	4.92	6.72	8.02	**100yr**	5.95	7.71	8.62	9.08	9.84	**100yr**
200yr	0.71	1.07	1.36	1.97	2.74	3.01	**200yr**	2.37	2.94	3.51	4.66	5.53	7.77	9.32	**200yr**	6.88	8.96	9.97	10.26	10.93	**200yr**
500yr	0.83	1.23	1.58	2.30	3.27	3.50	**500yr**	2.82	3.42	4.11	5.55	6.50	9.44	11.40	**500yr**	8.36	10.96	12.11	12.05	12.57	**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**	0.97	1.32	1.53	1.95	2.40	2.83	3.31	**1yr**	2.50	3.18	3.65	4.37	5.11	**1yr**
2yr	0.41	0.63	0.78	1.05	1.30	1.54	**2yr**	1.12	1.51	1.76	2.23	2.78	3.29	3.75	**2yr**	2.91	3.61	4.17	4.96	5.61	**2yr**
5yr	0.50	0.77	0.95	1.31	1.66	1.98	**5yr**	1.43	1.93	2.25	2.88	3.58	4.27	4.88	**5yr**	3.78	4.69	5.32	6.20	6.95	**5yr**
10yr	0.59	0.91	1.13	1.58	2.04	2.44	**10yr**	1.76	2.39	2.74	3.54	4.38	5.22	5.99	**10yr**	4.62	5.76	6.44	7.45	8.40	**10yr**
25yr	0.75	1.14	1.41	2.02	2.66	3.25	**25yr**	2.29	3.18	3.64	4.64	5.73	6.79	7.82	**25yr**	6.01	7.52	8.31	9.50	10.69	**25yr**
50yr	0.89	1.35	1.68	2.42	3.26	3.73	**50yr**	2.81	3.64	4.46	5.68	7.00	8.27	9.57	**50yr**	7.32	9.20	10.09	11.44	12.85	**50yr**
100yr	1.06	1.60	2.01	2.90	3.98	4.54	**100yr**	3.44	4.43	5.47	6.94	8.57	10.08	11.73	**100yr**	8.92	11.28	12.23	13.99	15.46	**100yr**
200yr	1.27	1.91	2.42	3.50	4.88	5.53	**200yr**	4.21	5.40	6.72	8.50	10.49	12.29	14.38	**200yr**	10.88	13.82	14.84	16.89	18.61	**200yr**
500yr	1.61	2.40	3.08	4.48	6.37	7.16	**500yr**	5.49	7.00	8.83	11.11	13.70	15.94	18.78	**500yr**	14.11	18.06	19.15	21.67	23.82	**500yr**

APPENDIX 14

OPERATION & MAINTENANCE PLAN

Colliers
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Stormwater Operation & Maintenance Plan

Site Drainage

A State Pollutant Discharge Elimination System Permit (SPDES GP 0-20-001) is required from the New York State Department of Environmental Conservation (NYSDEC) and a Storm Water Pollution Prevention Plan (SWPPP) has been prepared for review/approval by the Town of Wawayanda (an MS4 community). The site improvements made to the parcel are new construction and will increase the impervious area on the site. The study provides the proposed improvements and provides measures that will be used to control potential impacts due to stormwater runoff.

Constructed Stormwater Control Practices

Catch Basins:

Catch basins on-site are utilized to collect stormwater run-off and melting snow from the paved parking areas, driveway and sidewalks. These are located along the centerline of roadside swales.

Roof leaders:

Roof leaders are utilized to collect stormwater run-off from the roof and discharge it into the subsurface chamber system.

Bio-retention Areas:

These are shallow stormwater depressions which capture run-off from a surrounding drainage area (six inch deep surface ponding area) and then utilize an engineered soil strata and vegetation for treatment.

See Design Plans and Details for these improvements.

Typical Maintenance for Stormwater Practices

As a consequence of its function, the stormwater conveyance system collects and transports runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and the basins on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly to avoid flooding.

Catch Basins:

Catch basins should be inspected monthly and after heavy rain fall to ensure they are functioning properly. Typical maintenance of catch basins includes removal of debris from the grate and sump. This can be done manually or using a vehicle equipped with a vacuum pump. Catch basins should be cleaned out at least one (1) time per year. A good time to clean out catch basins is in the spring to remove the build-up of leaves, sand used for traction, dirt, and other debris that accumulates during winter months.

Roof leaders:

Roof leaders, similar to the catch basins, require typical maintenance which includes removal of debris manually. Inspections of the leaders should occur monthly and after heavy rain fall to ensure they are still functioning properly. These should be cleaned out at least one (1) time per year.

Bio-retention Areas:

These areas should be inspected monthly and after heavy rain fall to ensure they are functioning properly. Typical maintenance of the bio-retention areas include removal of debris, weeding (especially in the first couple of years while the plants are establishing their root systems) and mulching. Any areas devoid of mulch shall be re-mulched on an annual basis. Dead or diseased plant material shall be replaced immediately.

Silt/Sediment removal from the filter bed shall be conducted when the accumulation exceeds one inch or every five to six years. If the filter bed ponds water at the surface for more than 48 hours, the top 4-6 inches (below the mulch) of material shall be removed and replaced with fresh material. Any plant material removed during clean-out shall be replaced in-kind.

See Design Plans and Details for the components of the soil mixture for the filter bed.

Stormwater Basins:

These basins should be inspected monthly (this includes the inlets pipes, rip-rap, embankments, outlet control structure, emergency spillway and fencing) and after heavy rain fall to ensure proper functionality.

Long-term Stormwater Basin maintenance requires the following:

- Mowing grass, at least twice yearly. Grass clippings and other debris must be removed from the basin area after each cutting. Removal of woody brush and trees. Reestablish good grass cover in areas where woody material has been removed.
- Leaves shall be removed as needed from the basin and outlet control structure.
- Restore and reseed eroded any areas and gullies along embankment areas. Reoccurring erosion should be inspected by a licensed professional engineer to determine probable cause and remedial action that may be necessary.
- General maintenance and repairs of the stormwater outlet and inlet structures.
- Sediment removal from forebay and micropool every five to six years or when 50% full.
- The emergency spillway must remain free of debris and maintain the design elevation in order to convey stormwater during a catastrophic storm event.

In general, any deficiencies identified during the regular inspections or otherwise for all the stormwater management facilities should be corrected immediately. See appendices for forms to record inspection and maintenance work for the stormwater facilities.

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Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project ______________________________
Location: ______________________________
Site Status: ______________________________

Date: ______________________________
Time: ______________________________

Inspector: ______________________________

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

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

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

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

Comments:

____

____

____

____

Actions to be Taken:

________________ Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

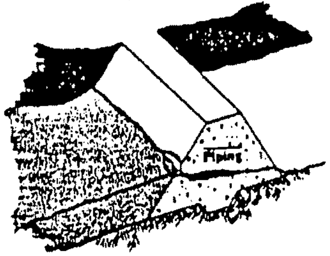
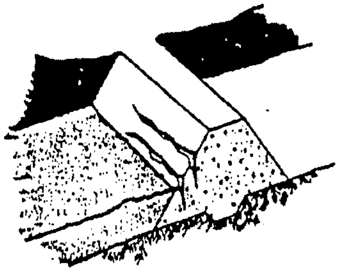
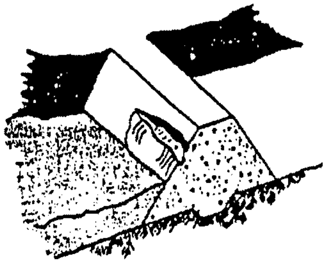
MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater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

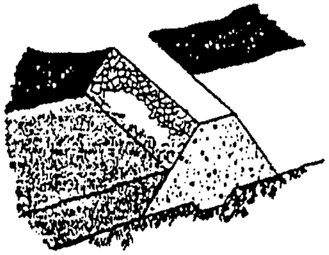
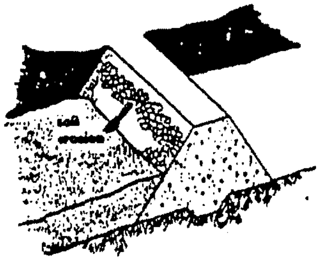
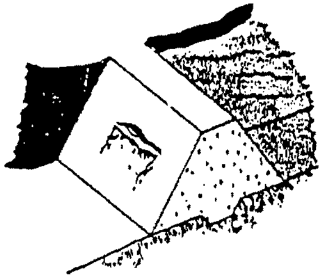
MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

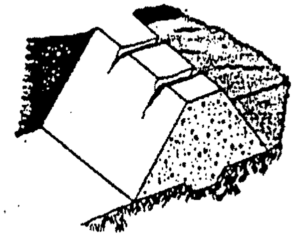
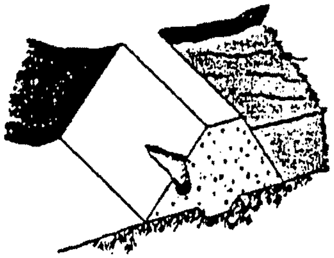
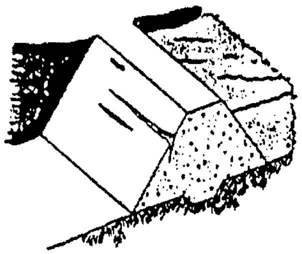
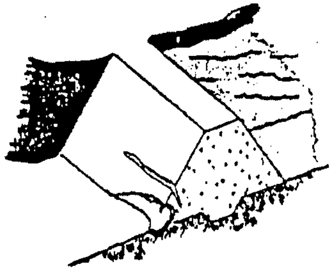
Actions to be Taken:

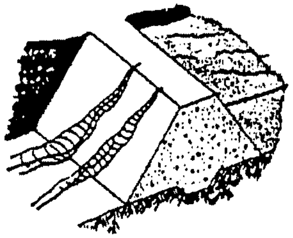
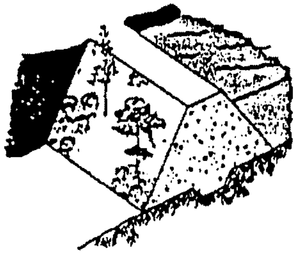
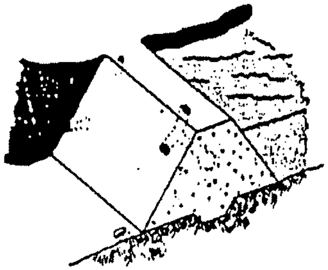
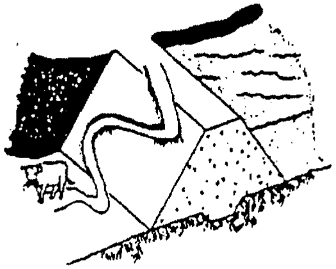
FIGURES 5.3.1
INSPECTION GUIDELINES - EMBANKMENT UPSTREAM SLOPE

PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
SINKHOLE  	Piping or internal erosion of embankment materials or foundation causes a sinkhole. The cave-in of an eroded cavern can result in a sink hole. A small hole in the wall of an outlet pipe can develop a sink hole. Dirty water at the exit indicates erosion of the dam.	HAZARDOUS Piping can empty a reservoir through a small hole in the wall or can lead to failure of a dam as soil pipes erode through the foundation or a pervious part of the dam.	Inspect other parts of the dam for seepage or more sink holes. Identify exact cause of sink holes. Check seepage and leakage outflows for dirty water. A qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
LARGE CRACKS 	A portion of the embankment has moved because of loss of strength, or the foundation may have moved, causing embankment movement.	HAZARDOUS Indicates onset of massive slide or settlement caused by foundation failure.	Depending on embankment involved, draw reservoir level down. A qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
SLIDE, SLUMP OR SLIP 	Earth or rocks move down the slope along a slippage surface because of too steep a slope, or the foundation moves. Also, look for slides movement in reservoir basin.	HAZARDOUS A series of slides can lead to obstruction of the outlet or failure of the dam.	Evaluate extent of the slide. Monitor slide. (See Chapter 6.) Draw the reservoir level down if safety of dam is threatened. A qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
SCARPS, BENCHES, OVERSTEEP AREAS	Wave action, local settlement, or ice action cause soil and rock to erode and slide to the lower part of the slope forming a bench.	Erosion lessens the width and possible height of the embankment and could lead to increased seepage or overtopping of the dam.	Determine exact cause of scarps. Do necessary earthwork, restore embankment to original slope and provide adequate protection (bedding and riprap). See Chapter 7.

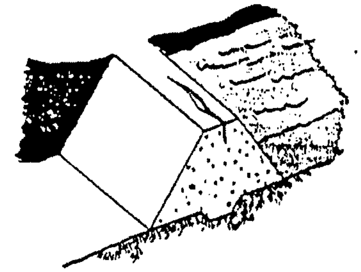
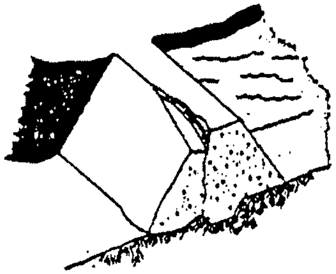
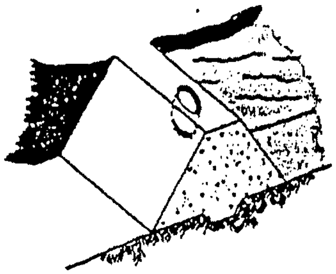
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMEND ACTIONS
BROKEN DOWN MISSING RIPRAP . 	Poor quality riprap has deteriorated. Wave action or ice action has displaced riprap. Round and similar-sized rocks have rolled downhill.	Wave action against these unprotected areas decreases embankment width.	Re-establish normal slope. Place bedding and competent riprap. (See Chapter 7.)
EROSION BEHIND POORLY GRADED RIPRAP  	Similar-sized rocks allow waves to pass between them and erode small gravel particles and soil.	Soil is eroded away from behind the riprap. This allows riprap to settle, providing less protection and decreased embankment width.	Re-establish effective slope protection. Place bedding material. ENGINEER REQUIRED for design for gradation and size for rock for bedding and riprap. A qualified engineer should inspect the conditions and recommend further actions to be taken.
SLIDE/SLOUGH 	1. Lack of or loss of strength of embankment material. 2. Loss of strength can be attributed to infiltration of water into the embankment or loss of support by the foundation.	HAZARDOUS Massive slide cuts through crest or upstream slope reducing freeboard and cross section. Structural collapse or overtopping can result.	1. Measure extent and displacement of slide. 2. If continued movement is seen, begin lowering water level until movement stops. 3. Have a qualified engineer inspect the condition and recommend further action. ENGINEER REQUIRED

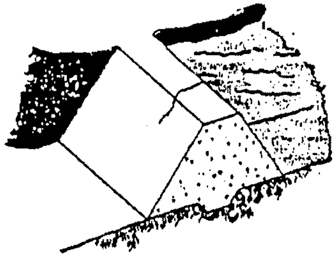
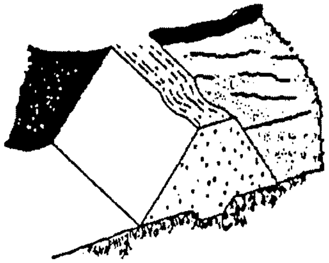
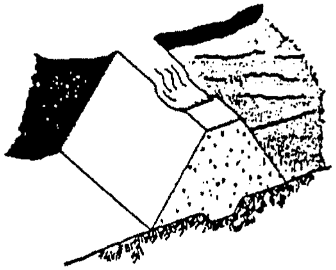
Figures 5.3.2
Inspection Guidelines - Downstream Slope

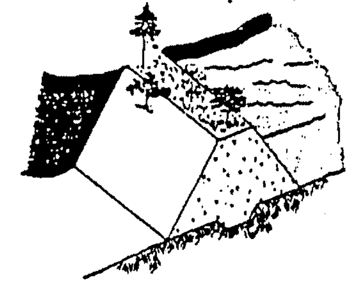
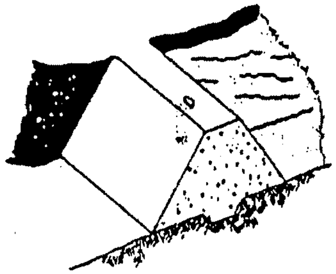
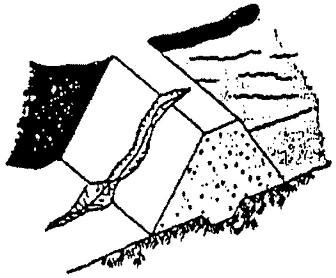
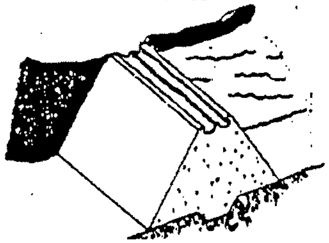
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
TRANSVERSE CRACKING 	Differential settlement of the embankment also leads to tranverse cracking (e.g., center settles more than abutments).	HAZARDOUS Settlement or shrinkage cracks can lead to seepage of reservoir water through the dam. Shrinkage cracks allow water to enter the embankment. This promotes saturation and increases freeze-thaw action.	1. If necessary, plug upstream end of crack to prevent flows from the reservoir. 2. A qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
CAVE IN/COLLAPSE 	1. Lack of adequate compaction. 2. Rodent hole below. 3. Piping through embankment or foundation.	HAZARDOUS Indicates possible wash out of embankment.	1. Inspect for and immediately repair rodent holes. Control rodents to prevent future damage. 2. Have a qualified engineer inspect the condition and recommend further action. ENGINEER REQUIRED
LONGITUDINAL CRACKING 	1. Drying and shrinkage of surface material. 2. Downstream movement of settlement of embankment.	1. Can be an early warning of a potential slide. 2. Shrinkage cracks allow water to enter the embankment and freezing will further crack the embankment. 3. Settlement or slide showing loss of strength in embankment can lead to failure.	1. If cracks are from drying, dress area with well-compacted material to keep surface water out and natural moisture in. 2. If cracks are extensive, a qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
SLUMP (LOCALIZED CONDITION) 	Preceded by erosion undercutting a portion of the slope. Can also be found on steep slopes.	Can expose impervious zone to erosion and lead to further slumps.	1. Inspect area for seepage. 2. Monitor for progressive failure. 3. Have a qualified engineer inspect the condition and recommend further action. ENGINEER REQUIRED

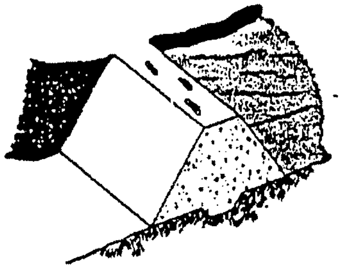
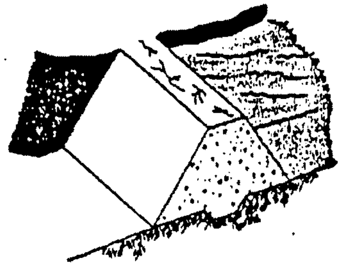
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
EROSION 	Water from intense rainstorms or snow-melt carries surface material down the slope, resulting in continuous troughs.	Can be hazardous if allowed to continue. Erosion can lead to eventual deterioration of the downstream slope and failure of the structure.	1. The preferred method to protect eroded areas is rock or riprap. 2. Re-establishing protective grasses can be adequate if the problem is detected early.
TREES/OBSCURING BRUSH 	Natural vegetation in area.	Large tree roots can create seepage paths. Bushes can obscure visual inspection and harbor rodents.	1. Remove all large, deep-rooted trees and shrubs on or near the embankment. Properly backfill void. (See Chapter 7.) 2. Control vegetation on the embankment that obscures visual inspection. (See Chapter 7.)
RODENT ACTIVITY 	Over-abundance of rodents. Holes, tunnels and caverns are caused by animal burrowings. Certain habitats like cattail type plants and trees close to the reservoir encourage these animals.	Can reduce length of seepage path, and lead to piping failure. If tunnel exists through most of the dam, it can lead to failure of the dam.	1. Control rodents to prevent more damage. 2. Backfill existing rodent holes. 3. Remove rodents. Determine exact location of digging and extent of tunneling. Remove habitat and repair damages. (See Chapter 7.)
LIVESTOCK/CATTLE TRAFFIC 	Excessive travel by livestock especially harmful to slope when wet.	Creates areas bare of erosion protection and causes erosion channels. Allows water to stand. Area susceptible to drying cracks.	1. Fence livestock outside embankment area. 2. Repair erosion protection, i.e., riprap, grass.

Figures 5.3.3
Inspection Guidelines - Embankment Crest

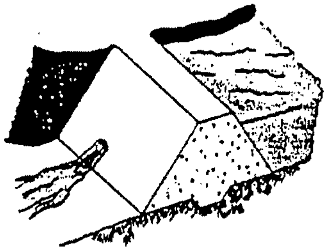
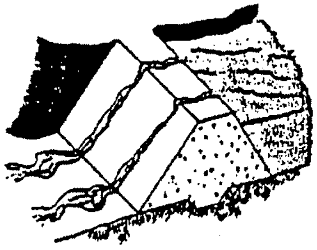
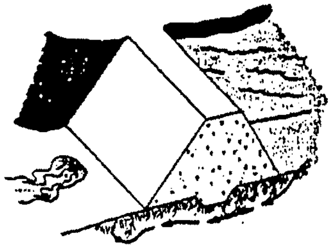
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
LONGITUDINAL CRACK 	1. Uneven settlement between adjacent sections or zones within the embankment. 2. Foundation failure causing loss of support to embankment. 3. Initial stages of embankment slide.	HAZARDOUS 1. Creates local area of low strength within embankment. Could be the point of initiation of future structural movement, deformation, or failure. 2. Provides entrance point for surface run-off into embankment, allowing saturation of adjacent embankment area, and possible lubrication which could lead to localized failure.	1. Inspect crack and carefully record location, length, depth, width, alignment, and other pertinent physical features. Immediately stake out limits of cracking. Monitor frequently. 2. Engineer should determine cause of cracking and supervise steps necessary to reduce danger to dam and correct condition. 3. Effectively seal the cracks at the crest's surface to prevent infiltration by surface water. 4. Continue to routinely monitor crest for evidence of further cracking. ENGINEER REQUIRED
VERTICAL DISPLACEMENT 	1. Vertical movement between adjacent sections of the embankment. 2. Structural deformation or failure caused by structural stress or instability, or by failure of the foundation.	HAZARDOUS 1. Provides local area of low strength within embankment which could cause future movement. 2. Leads to structural instability or failure. 3. Provides entrance point for surface water that could further lubricate failure plane. 4. Reduces available embankment cross section.	1. Carefully inspect displacement and record its location, vertical and horizontal displacement, length, and other physical features. Immediately stake out limits of cracking. 2. Engineer should determine cause of displacement and supervise all steps necessary to reduce danger to dam and correct condition. 3. Excavate area to the bottom of the displacement. Backfill excavation using competent material and correct construction techniques, and under supervision of engineer. 4. Continue to monitor areas routinely for evidence of future cracking or movement. (See Chapter 6.) ENGINEER REQUIRED
CAVE-IN ON CREST 	1. Rodent activity. 2. Hole in outlet conduit is causing erosion of embankment material. 3. Internal erosion or piping of embankment material by seepage. 4. Breakdown of dispersive clays within embankment by seepage waters.	HAZARDOUS 1. Void within dam could cause localized caving, sloughing, instability, or reduced embankment cross section. 2. Entrance point for surface water.	1. Carefully inspect and record location and physical characteristics (depth, width, length) of cave in. 2. Engineer should determine cause of cave in and supervise all steps necessary to reduce threat to dam and correct condition. 3. Excavate cave in, slope sides of excavation, and backfill hole with competent material using proper construction techniques. (See Chapter 7.) This should be supervised by engineer. ENGINEER REQUIRED

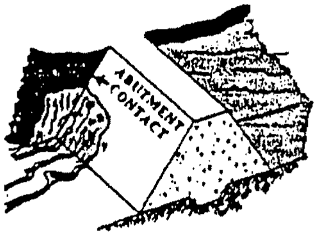
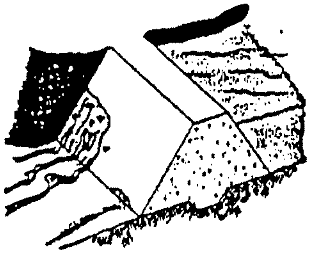
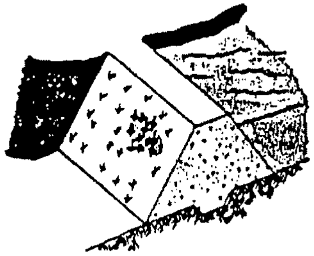
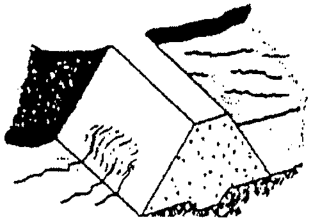
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
TRANSVERSE CRACKING 	1. Uneven movement between adjacent segments of the embankment. 2. Deformation caused by structural stress or instability.	HAZARDOUS 1. Can provide a path for seepage through the embankment cross section. 2. Provides local area of low strength within embankment. Future structural movement, deformation or failure could begin. 3. Provides entrance point for surface runoff to enter embankment.	1. Inspect crack and carefully record crack location, length, depth, width, and other pertinent physical features. Stake out limits of cracking. 2. Engineer should determine cause of cracking and supervise all steps necessary to reduce danger to dam and correct condition. 3. Excavate crest along crack to a point below the bottom of the crack. Then backfilling excavation using competent material and correct construction techniques. This will seal the crack against seepage and surface runoff. (See Chapter 7.) This should be supervised by engineer. 4. Continue to monitor crest routinely for evidence of future cracking. (See Chapter 6.) ENGINEER REQUIRED
CREST MISALIGNMENT 	1. Movement between adjacent parts of the structure. 2. Uneven deflection of dam under loading by reservoir. 3. Structural deformation or failure near area of misalignment.	1. Area of misalignment is usually accompanied by low area in crest which reduces freeboard. 2. Can produce local areas of low embankment strength which may lead to failure.	1. Establish monuments across crest to determine exact amount, location, and extent of misalignment. 2. Engineer should determine cause of misalignment and supervise all steps necessary to reduce threat to dam and correct condition. 3. Monitor crest monuments on a scheduled basis following remedial action to detect possible future movement. (See Chapter 6.) ENGINEER REQUIRED
LOW AREA IN CREST OF DAM 	1. Excessive settlement in the embankment or foundation directly beneath the low area in the crest. 2. Internal erosion of embankment material. 3. Foundation spreading to upstream and/or downstream direction. 4. Prolonged wind erosion of crest area. 5. Improper final grading following construction.	Reduces freeboard available to pass flood flows safely through spillway.	1. Establish monuments along length of crest to determine exact amount, location, and extent of settlement in crest. 2. Engineer should determine cause of low area and supervise all steps necessary to reduce possible threat of the dam and correct condition. 3. Re-establish uniform crest elevation over crest length by placing fill in low area using proper construction techniques. This should be supervised by engineer. 4. Re-establish monuments across crest of dam and monitor monuments on a routine basis to detect possible future settlement. ENGINEER REQUIRED

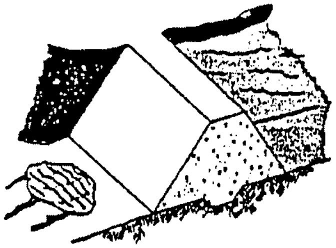
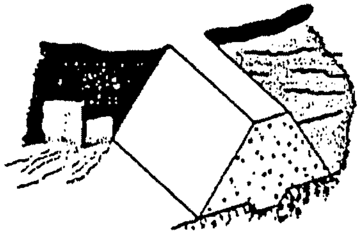
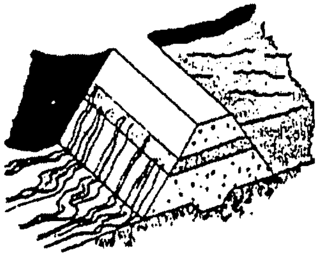
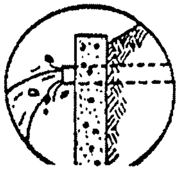
PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
OBSCURING VEGETATION 	Neglect of dam and lack of proper maintenance procedures.	1. Obscures large parts of the dam, preventing adequate, accurate visual inspection of all parts of the dam. Problems which threaten the integrity of the dam can develop and remain undetected until they progress to a point that threatens the dam's safety. 2. Associated root systems develop and penetrate into the dam's cross section. When the vegetation dies, the decaying root systems can provide paths for seepage. This reduces the effective seepage path through the embankment and could lead to possible piping situations. 3. Prevents easy access to all parts of the dam for operation, maintenance, and inspection. 4. Provides habitat for rodents.	1. Remove all damaging growth from the dam. This would include removal of trees, bushes, brush, conifers, and growth other than grass. Grass should be encouraged on all segments of the dam to prevent erosion by surface runoff. Root systems should also be removed to the maximum practical extent. The void which results from removing the root system should be backfilled with wellcompetent, well-compacted material. 2. Future undesirable growth should be removed by cutting or spraying, as part of an annual maintenance program. (See Chapter 7.) 3. All cutting or debris resulting from the vegetative removal should be immediately taken from the dam and properly disposed of outside the reservoir basin.
RODENT ACTIVITY 	Burrowing animals.	1. Entrance point for surface runoff to enter dam. Could saturate adjacent portions of the dam. 2. Especially dangerous if hole penetrates dam below phreatic line. During periods of high storage, seepage path through the dam would be greatly reduced and a piping situation could develop.	1. Completely backfill the hole with competent, well-compacted material. 2. Initate a rodent control program to reduce the burrowing animal population and to prevent future damage to the dam. (See Chapter 7.)
GULLY ON CREST 	1. Poor grading Xand improper drainage of crest. Improper drainage causes surface runoff to collect and drain of crest at low point in upstream or downstream shoulder. 2. Inadequate spillway capacity which has caused dam to overtop.	1. Can reduce available freeboard. 2. Reduces cross-sectional area of dam. 3. Inhibits access to all parts of the crest and dam. 4. Can result in a hazardous condition if due to overtopping.	1. Restore freeboard to dam by adding fill material in low area, using proper construction techniques. (See Chapter 7.) 2. Regrading crest to provide proper drainage of surface runoff. 3. If gully was caused by overtopping, provide adequate spillway which meets current design standards. This should be done by engineer. 4. Re-establish protective cover.
RUTS ALONG CREST 	Heavy vehicle traffic without adequate or proper maintenance or proper crest surfacing.	1. Inhibits easy access to all parts of crest. 2. Allows continued development of rutting. 3. Allows standing water to collect and saturate crest of dam. 4. Operating and maintenance vehicles can get stuck.	1. Drain standing water from ruts. 2. Regrade and recompact crest to restore integrity and provide proper drainage to upstream slope. (See Chapter 7.) 3. Provide gravel or roadbase material to accommodate traffic. 4. Do periodic maintenance and regrading to prevent reformation of ruts.

PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
PUDDLING ON CREST-POOR DRAINAGE 	1. Poor grading and improper drainage of crest. 2. Localized consolidation or settlement on crest allows puddles to develop.	1. Cause localized saturation of the crest. 2. Inhibits access to all parts of the dam and crest. 3. Becomes progressively worse if not corrected.	1. Drain standing water from puddles. 2. Regrade and recompact crest to restore integrity and provide proper drainage to upstream slope. (See Chapter 7.) 3. Provide gravel or roadbase material to accommodate traffic. 4. Do periodic maintenance and regrading to prevent reformation of low areas.
DRYING CRACKS 	Material on the crest of dam expands and contracts with alternate wetting and drying of weather cycles. Drying cracks are usually short, shallow, narrow, and many.	Provides point of entrance for surface runoff and surface moisture, causing staturation of adjacent embankment areas. This staturation, and later drying of the dam, could cause further cracking.	1. Seal surface of cracks with a tight, impervious material. (See Chapter 7.) 2. Routinely grade crest to provide proper drainage and fill cracks. -OR 3. Cover crest with non-plastic (not clay) material to prevent large moisture content variations.

Figures 5.3.4
Inspection Guidelines - Embankment Seepage Areas

PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
EXCESSIVE QUANTITY AND/OR MUDDY WATER EXITING FROM A POINT 	1. Water has created an open pathway, channel, or pipe through the dam. The water is eroding and carrying embankment material. 2. Large amounts of water have accumulated in the downstream slope. Water and embankment materials are exiting at one point. Surface agitation may be causing the muddy water. 3. Rodents, frost action or poor construction have allowed water to create an open pathway or pipe through the embankment.	HAZARDOUS 1. Continued flows can saturate parts of the embankment and lead to slides in the area. 2. Continued flows can further erode embankment materials and lead to failure of the dam.	1. Begin measuring outflow quantity and establishing whether water is getting muddier, staying the same, or clearing up. 2. If quantity of flow is increasing the water level in the reservoir should be lowered until the flow stabilizes or stops. 3. Search for opening on upstream side and plug if possible. 4. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED
STREAM OF WATER EXITING THROUGH CRACKS NEAR THE CREST 	1. Severe drying has caused shrinkage of embankment material. 2. Settlement in the embankment or foundation is causing the transverse cracks.	HAZARDOUS Flow through the crack can cause failure of the dam.	1. Plug the upstream side of the crack to stop the flow. 2. The water level in he reservoir should be lowered until it is below the level of the cracks. 3. A qualified engineer should inspect the condition and recommend further actions to be taken.
SEEPAGE WATER EXITING AS A BOIL IN THE FOUNDATION 	Some part of the foundation material is supplying a flow path. This could be caused by a sand or gravel layer in the foundation.	HAZARDOUS Increased flows can lead to erosion of the foundation and failure of the dam.	1. Examine the boil for transportation of foundation materials. 2. If soil particles are moving downstream, sandbags or earth should be used to create a dike around the boil. The pressures created by the water level within the dike may control flow velocities and temporarily prevent further erosion. 3. If erosion is becoming greater, the reservoir level should be lowered. 4. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED

PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
SEEPAGE EXITING AT ABUTMENT CONTACT 	1. Water flowing through pathways in the abutment. 2. Water flowing through the embankment.	HAZARDOUS Can lead to erosion of embankment materials and failure of the dam.	1. Study leakage area to determine quantity of flow and extent of saturation. 2. Inspect daily for developing slides. 3. Water level in reservoir may need to be lowered to assure the safety of the embankment. 4. A qualified engineer should inspect the conditions and recommend further actions to be taken. ENGINEER REQUIRED
LARGE AREA WET OR PRODUCING FLOW 	A seepage path has developed through the abutment or embankment materials and failure of the dam can occur.	HAZARDOUS 1. Increased flows could lead to erosion of embankment material and failure of the dam. 2. Saturation of the embankment can lead to local slides which could cause failure of the dam.	1. Stake out the saturated area and monitor for growth or shrinking. 2. Measure any outflows as accurately as possible. 3. Reservoir level may need to be lowered if saturated areas increase in size at a fixed storage level or if flow increases. 4. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED
MARKED CHANGE IN VEGETATION 	1. Embankment material are supplying flows paths. 2. Natural seeding by wind. 3. Change in seed type during early post construction seeding.	Can show a saturated area.	1. Use probe and shovel to establish if the materials in this area are wetter than surrounding areas. 2. If areas shows wetness, when surrounding areas do not, a qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED
BULGE IN LARGE WET AREA 	Downstream embankment materials have begun to move.	HAZARDOUS Failure of the embankment result from massive sliding can follow these early movements.	1. Compare embankment cross section to the end of construction condition to see if observed condition may reflect end of construction. 2. Stake out affected area and accurately measure outflow. 3. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED

PROBLEM	PROBABLE CAUSE	POSSIBLE CONSEQUENCES	RECOMMENDED ACTIONS
TRAMPOLINE EFFECT IN LARGE SOGGY AREA 	1. Water moving rapidly through the embankment or foundation is being controlled or contained by a well-established turf root system.	Condition shows excessive seepage in the area. If control layer of turf is destroyed, rapid erosion of foundation materials could result in failure of the dam.	1. Carefully inspect the area for outflow quantity and any transported material. 2. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED
LEAKAGE FROM ABUTMENTS BEYOND THE DAM 	Water moving through cracks and fissures in the abutment materials.	Can lead to rapid erosion of abutment and evacuation of the reservoir. Can lead to massive slides near or downstream from the dam.	1. Carefully inspect the area to determine quantity of flow and amount of transported material. 2. A qualified engineer or geologist should inspect the condition and recommend further actions to be taken.
WET AREA IN HORIZONTAL BAND 	Frost layer or layer of sandy material in original construction.	HAZARDOUS 1. Wetting of areas below the area of excessive seepage can led to localized instability of the embankment. (SLIDES) 2. Excessive flows can lead to accelerated erosion of embankment materials and failure of the dam.	1. Determine as closely as possible the flow being produced. 2. If flow increases, reservoir level should be reduced until flow stabilizes or stops. 3. Stake out the exact area involved. 4. Using hand tools, try to identify the material allowing the flow. 5. A qualified engineer should inspect the condition and recommend further actions to be taken. ENGINEER REQUIRED
LARGE INCREASE IN FLOW OR SEDIMENT IN DRAIN OUTFALL 	A shortened seepage path or increased storage levels.	HAZARDOUS 1. Higher velocity flows can cause erosion of drain then embankment materials. 2. Can lead to piping failure.	1. Accurately measures outflow quantity and determine amount of increase over previous flow. 2. Collect jar samples to compare turbidity. 3. If either quantity or turbidity has increased by 25%, a qualified engineer should evaluate the condition and; recommend further actions. ENGINEER REQUIRED

APPENDIX 15

EROSION AND SEDIMENT CONTROL PLAN & DETAILS

GENERAL SOIL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN FOURTEEN (14) DAYS FOR DISTURBANCES LESS THAN FIVE (5) ACRES AND SEVEN (7) DAYS FOR DISTURBANCES GREATER THAN FIVE (5) ACRES, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
3. PERMANENT VEGETATION TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN FIVE (5) DAYS AFTER FINAL GRADING. MULCHING IS REQUIRED ON ALL SEEDING. WHEN HYDROSEEDING, MULCH SHALL NOT BE INCLUDED IN THE TANK WITH THE SEED.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE 2016 NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL OR AS AMENDED.
5. A SUBBASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUBBASE SHALL BE INSTALLED WITHIN FIVE (5) DAYS OF THE PRELIMINARY GRADING.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION CONTINUES (I.E. SLOPES GREATER THAN 3:1).
8. THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A STONE PAD, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
9. IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE COVERED WITH A MINIMUM OF TWELVE (12) INCHES OF SOIL HAVING A PH OF 5 OR MORE PRIOR TO SEEDBED PREPARATION. AREAS WHERE TREES OR SHRUBS ARE TO BE PLANTED SHALL BE COVERED WITH A MINIMUM OF TWENTY-FOUR (24) INCHES OF SOIL HAVING A PH OF 5 OR MORE.
10. AT THE TIME THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER, SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
11. CONDUIT OUTLET PROTECTION MUST BE REVIEWED & SUPPLEMENTED AT ALL OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
12. UNFILTERED DEWATERING IS NOT PERMITTED. TAKE ALL NECESSARY PRECAUTIONS DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH STATE STANDARDS.
13. SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED IN ACCORDANCE WITH STATE STANDARDS FOR EROSION CONTROL.
14. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHT-OF-WAY WILL BE REMOVED IMMEDIATELY.
15. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION AND SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.
16. STOCKPILE AND STAGING LOCATIONS DETERMINED IN THE FIELD, SHALL BE PLACED WITHIN THE LIMITS OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN.
17. CONCRETE WASHOUT, DUMPSTER, & STAGING AREA LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED AT THE PRE-CONSTRUCITON MEETING. THEY SHALL BE PLACED IN THE PROXIMITY OF THE CONSTRUCTION ENTRANCE AND STAGING AREAS AND SHALL BE USED PRIOR TO EXITING THE PROJECT SITE. THE LOCATION SHALL BE IN A PRACTICAL, CLEARLY DELINEATED, AREA AND BE MAINTAINED THROUGHOUT CONSTRUCTION.
18. ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
19. ALL PERMANENT SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED BY THE PROPERTY OWNER, AND SHALL BECOME THEIR RESPONSIBILITY.
20. PAVEMENT AREAS ARE TO BE KEPT CLEAN AT ALL TIMES.
21. DURING CONSTRUCTION, ANY ADDITIONAL CONTROL MEASURES AS DEEMED NECESSARY TO PREVENT EROSION OR CONTROL SEDIMENT BEYOND THOSE MEASURES SHOWN ON THE APPROVED PLAN SHALL BE INSTALLED OR EMPLOYED AT THE DIRECTION OF THE MUNICIPAL ENGINEER.
22. ALL TEMPORARY, STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED, WHEN ALL CONSTRUCTION ACTIVITY IDENTIFIED IN THE SWPPP HAS BEEN COMPLETED, ALL AREAS OF DISTURBANCE HAVE ACHIEVED FINAL STABILIZATION** AND ALL POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH THE SWPPP AND ARE OPERATIONAL.
23. BOTTOM AND BERM ELEVATIONS OF TEMPORARY SEDIMENT BASINS TO BE REVIEWED WITH THE CONTRACTOR BASED ON THEIR PROPOSED CONSTRUCTION SEQUENCE FOR THE PROJECT.

**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.

MAINTENANCE PLAN DURING CONSTRUCTION:

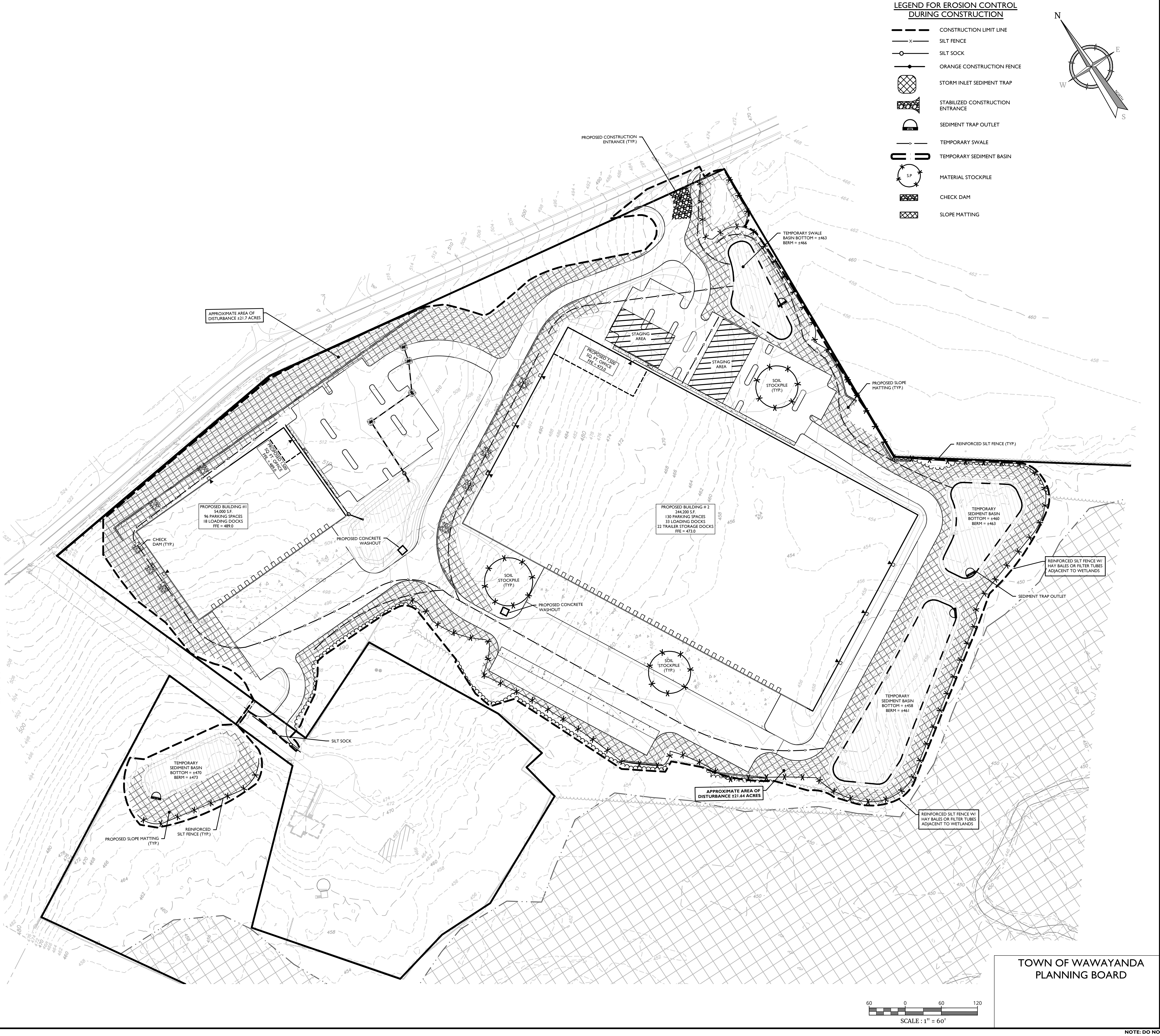
INSPECTION AND MAINTENANCE SHALL BE PERFORMED IN CONFORMANCE WITH GP-0-20-001 OR AS AMENDED. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED AND INSTALLED FOR THE PROJECT. THE SEDIMENT TRAPS WILL BE CLEANED OUT WHEN THE LEVEL OF SEDIMENT REACHES 25% OF ITS' CAPACITY. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES APPROXIMATELY 6" DEEP AT THE FENCE. THE SILT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. ALL SEEDED AREAS WILL BE FERTILIZED, RE-SEEDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS IN THE LANDSCAPE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

MAINTENANCE AGREEMENT NOTE:

THE OWNER/APPLICANT SHALL ENTER INTO AN ENFORCEABLE MAINTENANCE AGREEMENT WITH THE MUNICIPALITY (IF AN MS4. COMMUNITY) RELATED TO MAINTENANCE OF STORMWATER FACILITIES. THE OWNER/APPLICANT IS RESPONSIBLE TO PERFORM ALL REQUIRED MAINTENANCE BOTH DURING CONSTRUCTION AND LONG-TERM. THE NATURE OF THE AGREEMENT IS TO ALLOW THE MUNICIPALITY TO PERFORM MAINTENANCE AT THEIR OPTION SHOULD THE OWNER/APPLICANT FAIL TO ADEQUATELY MAINTAIN THE SYSTEM AS DETERMINED BY THE MUNICIPAL ENGINEER. MAINTENANCE OF THE STORMWATER SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED SWPPP AND DETAIL SHEETS.

303 (D) - SEGMENTS IMPAIRED BY CONSTRUCTION RELATED POLLUTANTS

1. FOR CONSTRUCTION SITE THAT DIRECTLY DISCHARGE TO ONE OF THE 303(D) SEGMENTS LISTED IN APPENDIX E OF THE GP-0-20-001 OR IS LOCATED IN ONE OF THE WATERSHEDS LISTED IN APPENDIX GP-0-20-001, 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.
2. FOR CONSTRUCTION SITES THAT DIRECTLY DISCHARGE TO ONE OF THE 303(D) SEGMENTS LISTED IN APPENDIX E OF THE GP-0-20-001 OR IS LOCATED IN ONE OF THE WATERSHEDS LISTED IN APPENDIX C OF THE GP-0-20-001, THE APPLICATION OF SOIL STABILIZATION MEASURES MUST BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN SEVEN (7) DAYS.
3. THE PROJECT SITE DISCHARGES TO THE MONHAGEN BROOK LISTED IN APPENDIX E OF THE GP-0-20-001.



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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
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COLLIERS ENGINEERING & DESIGN CT, P.C.
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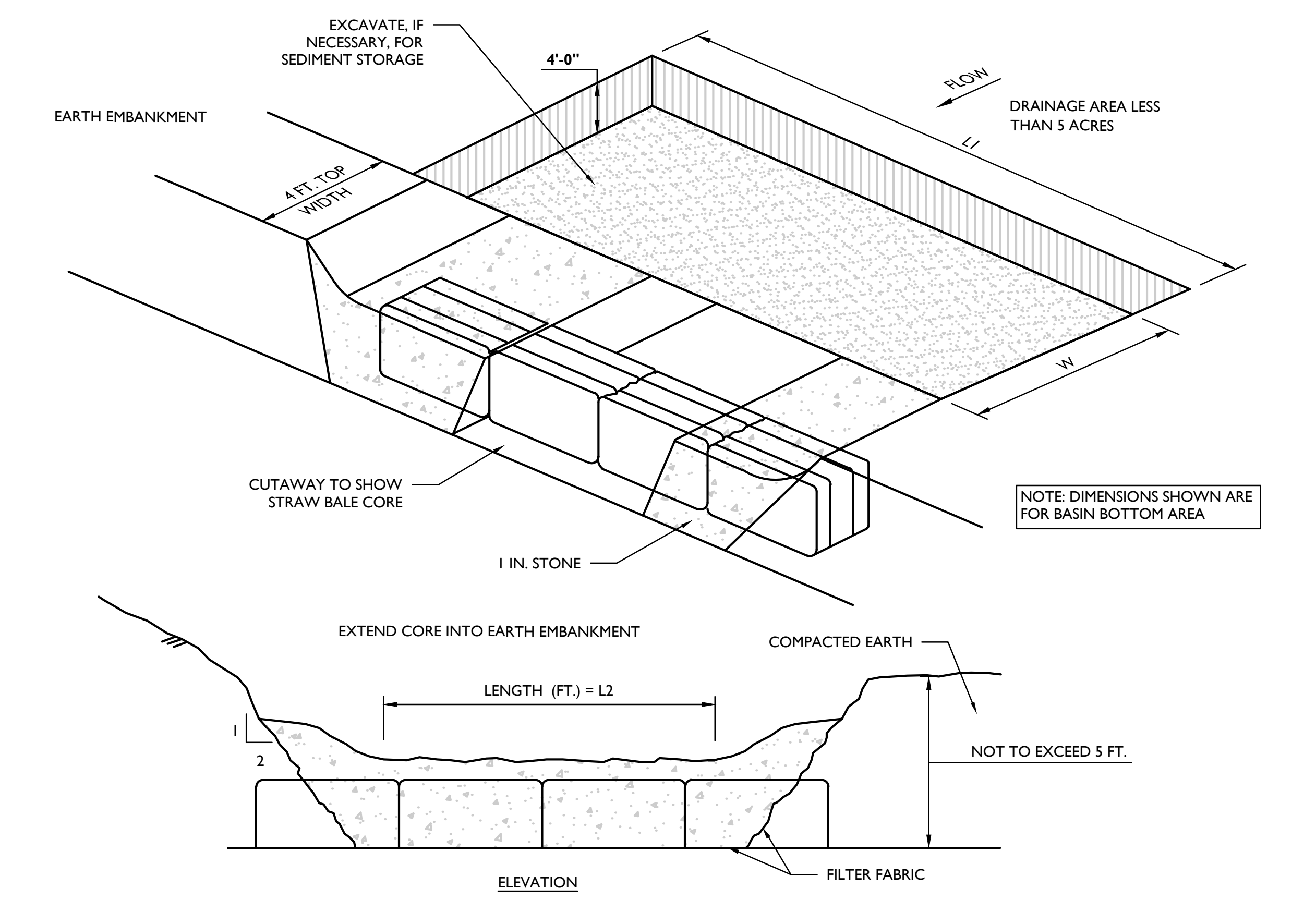
PROJECT NUMBER: 21004268A
DRAWING NAME: C-SESC

SHEET TITLE:
SOIL EROSION & SEDIMENT CONTROL PLAN

SHEET NUMBER:
10 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



TO BE INSTALLED PRIOR TO GRADING OR FILLING IN THE DRAINAGE AREA THEY ARE TO PROTECT. TRAPS THAT ARE TO FUNCTION DURING BUILDING CONSTRUCTION MUST NOT BE LOCATED WITHIN 20 FEET OF A PROPOSED BUILDING FOUNDATION. WHILE TRAPS SHOULD BE SITED TO MAXIMIZE STORAGE BENEFIT, THEY SHOULD NOT BE LOCATED IN WETLANDS OR WETLAND BUFFER AREAS, OR IN EXISTING WATERCOURSES.

SEE EROSION AND SEDIMENT CONTROL PLAN FOR LOCATIONS.

INSTALLATION NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED AS WELL.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER SIZED STONES, ROCKS, ORGANIC MATERIAL AND OTHER QUESTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
6. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT AND FILL SLOPES SHALL BE 1 : 2 OR FLATTER.
8. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.

SIZING CALCULATIONS

NOTE:

1. 3,600 CUBIC FEET OF STORAGE REQUIRED PER ACRE OF DISTURBANCE.

*THIS IS THE MINIMUM AMOUNT OF SEDIMENT TRAPS, ADDITIONAL MAY BE REQUIRED BASED UPON OTHER ON-SITE CONDITIONS AND CONTRACTOR SCHEDULE AND PHASING ACTIVITIES.

STONE OUTLET SEDIMENT TRAP DETAIL

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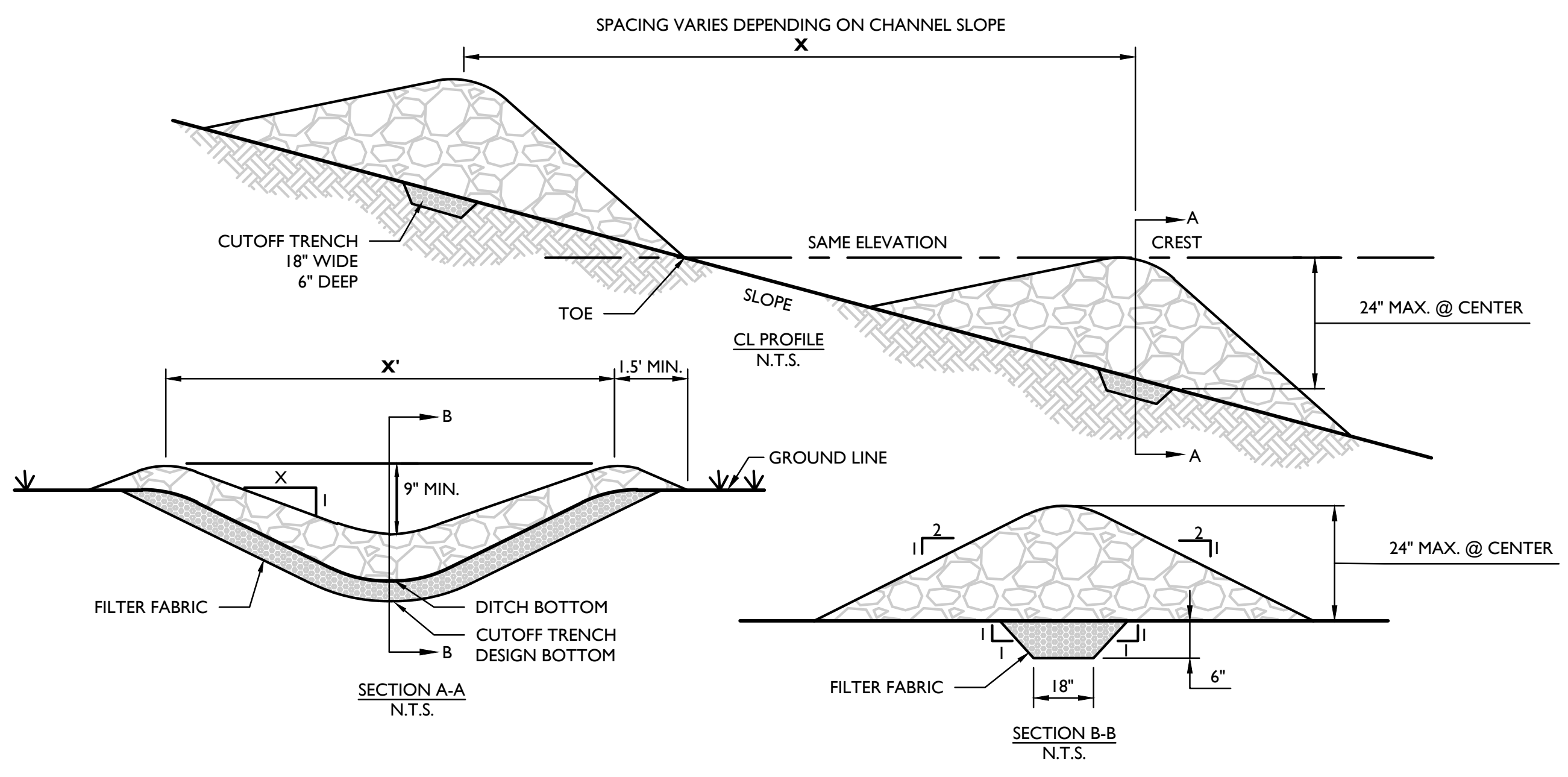

CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN ON THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA: 2 ACRES

3

STONE CHECK DAM DETAIL

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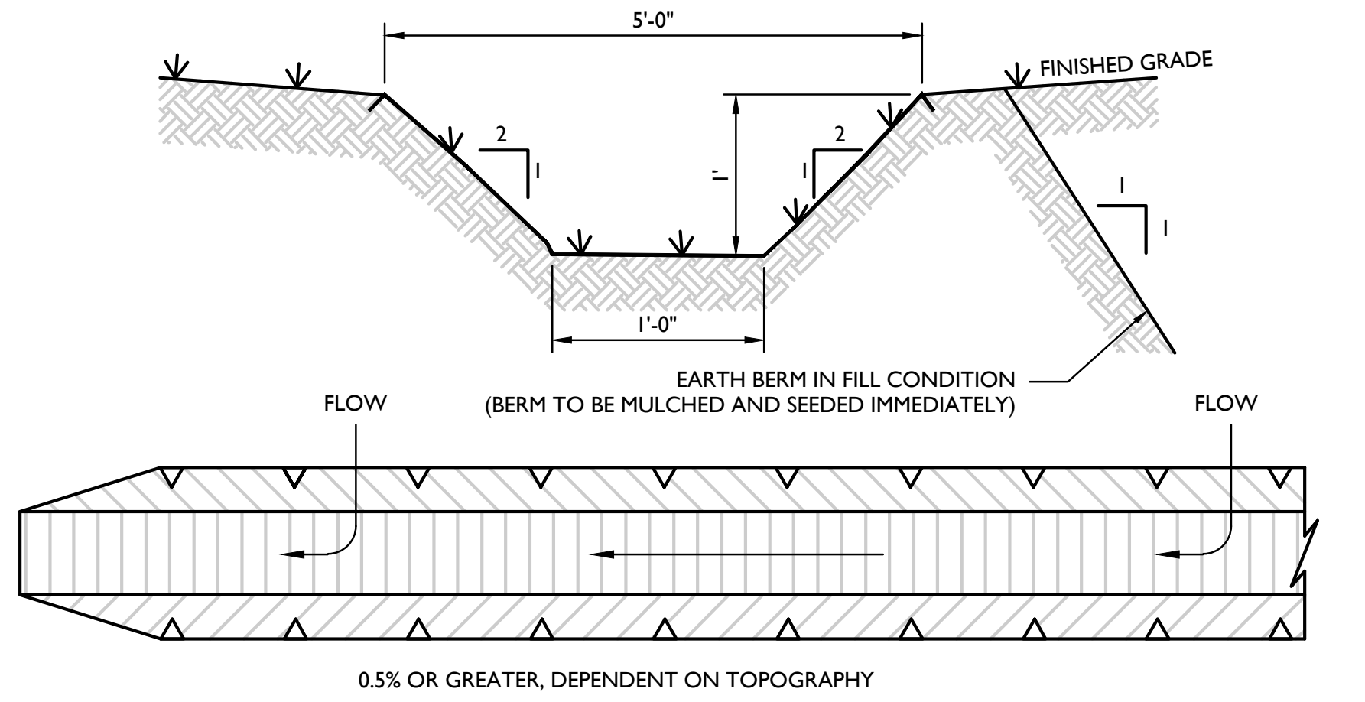

PLAN

TO BE INSTALLED ABOVE DISTURBED AREAS, TO DIVERT RUNOFF OFF-SITE WITHOUT INCREASING EROSION; INTERMITTENTLY ACROSS DISTURBED AREAS, TO SHORTEN OVERLAND FLOW DISTANCES; BELOW DISTURBED AREAS, TO DIVERT SEDIMENT-LADEN WATER TO A SEDIMENT TRAPPING DEVICE; AND TO SAFELY TRANSPORT RUNOFF ALONG ROADWAYS.

* WHERE SWALE TRAVERSES CONSTRUCTION VEHICLE PATH, DEPTH TO BE 6". SEE PLAN FOR LOCATION

INSTALLATION NOTES:

1. ALL SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED BY THE CONTRACTOR AS REQUIRED
9. STABILIZATION SHALL BE SEED AND STRAW MULCH.

1

TEMPORARY SWALE & EARTH BERM DETAIL

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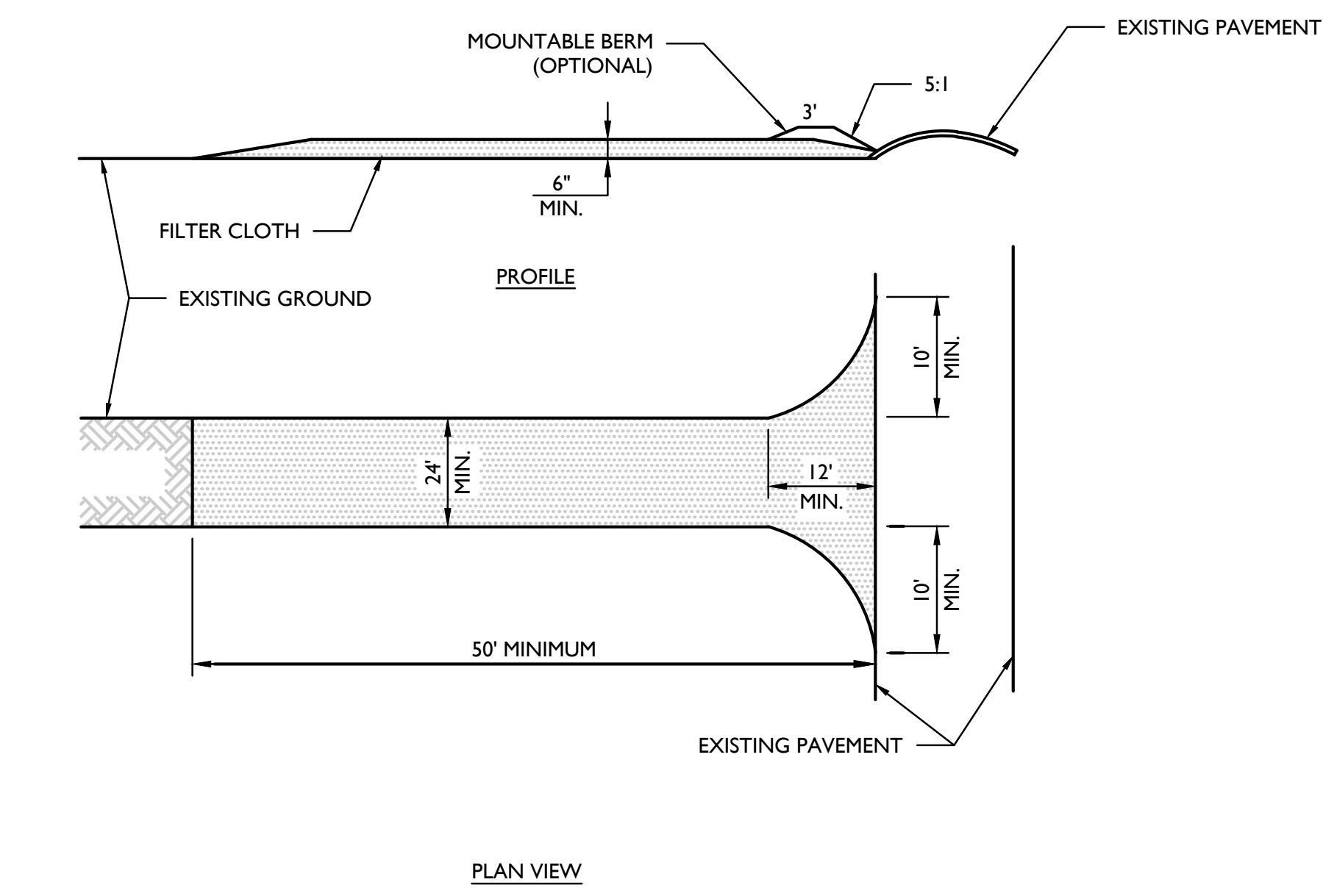

NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT. LENGTH: NOT LESS THAN 50 FEET. THICKNESS: NOT LESS THAN (6) INCHES.
2. WIDTH - 24'
3. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
4. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTING BERM WITH 5:1 SLOPES WILL BE PERMITTED.
5. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
6. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

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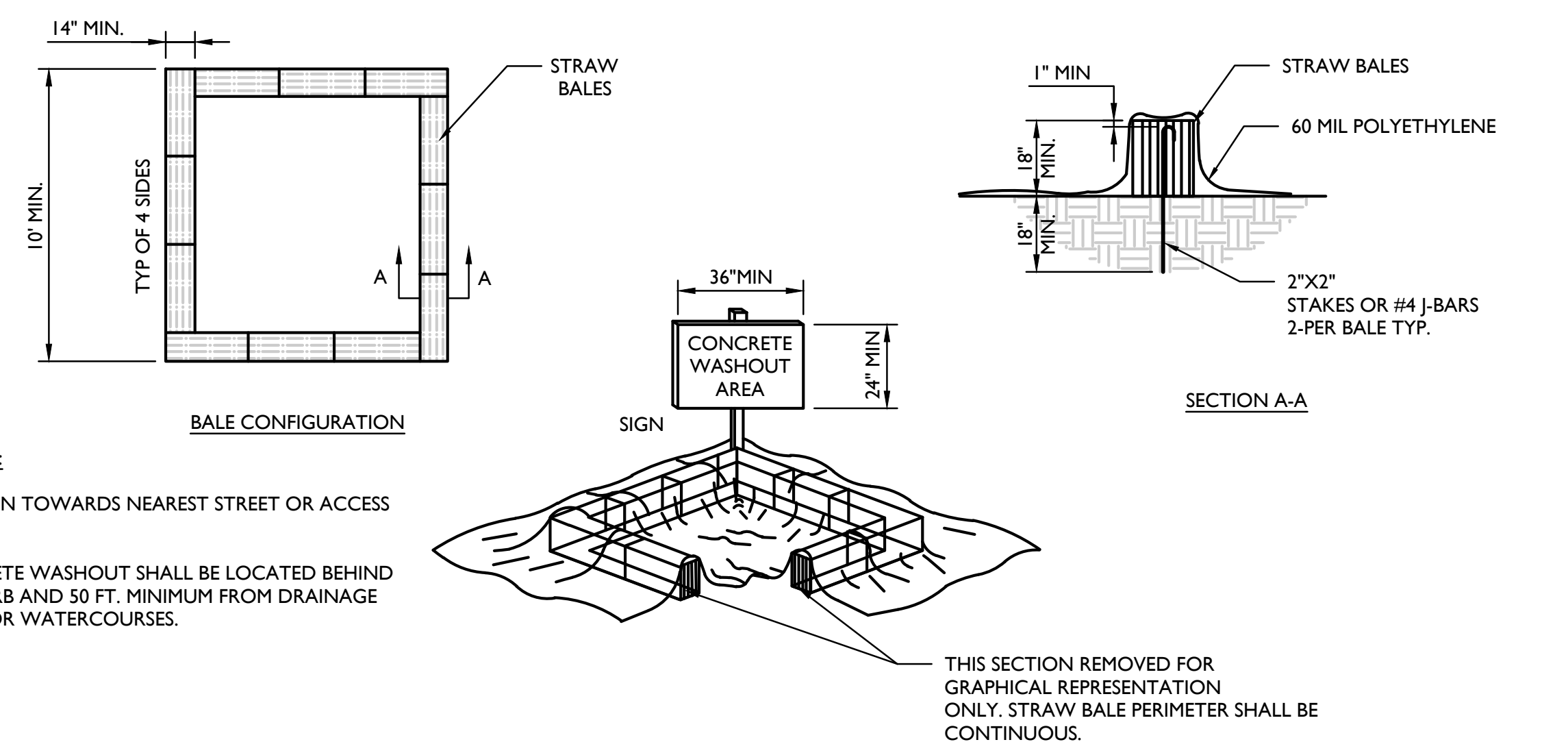

DETAIL NOTES:

1. FACE SIGN TOWARDS NEAREST STREET OR ACCESS POINT.
2. CONCRETE WASHOUT SHALL BE LOCATED BEHIND THE CURB AND 50 FT. MINIMUM FROM DRAINAGE INLETS OR WATERCOURSES.

NOTES:

1. CONCRETE WASHOUTS ARE REQUIRED ON ALL CONSTRUCTION SITES INVOLVING CONCRETE AND STUCCO USE.
2. THE CONTRACTOR SHALL REQUIRE ALL CONCRETE DRIVERS TO UTILIZE THE CONCRETE WASHOUTS ONSITE.
3. WASHOUT FACILITIES SHALL BE LOCATED AT LEAST 50 FEET AWAY FROM STORM SEWER DRAIN INLETS, GUTTERS, OPEN DITCHES, AND WATER COURSES.
4. APPROPRIATE STONE SHOULD COVER PATHS TO CONCRETE WASHOUT.
5. THE NUMBER OF CONCRETE WASHOUTS DEPENDS ON THE EXPECTED DEMAND FOR STORAGE CAPACITY. LARGE SITES WITH EXTENSIVE CONCRETE WORK SHALL BE PLACED AT MULTIPLE LOCATIONS FOR USE BY CONCRETE TRUCK DRIVERS.
6. CONCRETE WASHOUT AREAS SHALL BE IDENTIFIED BY POSTING SIGNS ONSITE.
7. CONCRETE WASHOUTS ARE TO BE INSPECTED DAILY BY THE CONTRACTOR FOR LEAKS OR TEARS IN PLASTIC LINER.
8. REMOVE AND DISPOSE OF ALL MATERIAL WHEN THE WASHOUT HAS BEEN FILLED TO 75% CAPACITY.
9. PRIOR TO ANY RAINFALL, ALL CONCRETE WASHOUTS ARE TO BE CLEANED OUT OR COVERED.
10. ONCE THE MATERIAL HAS BEEN CLEANED OUT OF THE CONCRETE WASHOUT FACILITY, THE FACILITY MUST BE INSPECTED FOR REPAIR, RECONSTRUCTION OR REPLACEMENT. ALL PLASTIC LINING SHALL BE REMOVED AND REPLACED.
11. PRE-FABRICATED OR ONSITE FABRICATED CONCRETE WASHOUTS MAY BE USED.
12. OPTIONS FOR ONSITE CONCRETE WASHOUTS:
    A. DIG A PIT AND LINE WITH 10 MIL PLASTIC SHEETING.
    B. CREATE AN ABOVE-GROUND STRUCTURE FROM STRAW BALES OR SANDBAGS WITH 10 MIL PLASTIC LINING.

CONCRETE WASHOUT DETAIL

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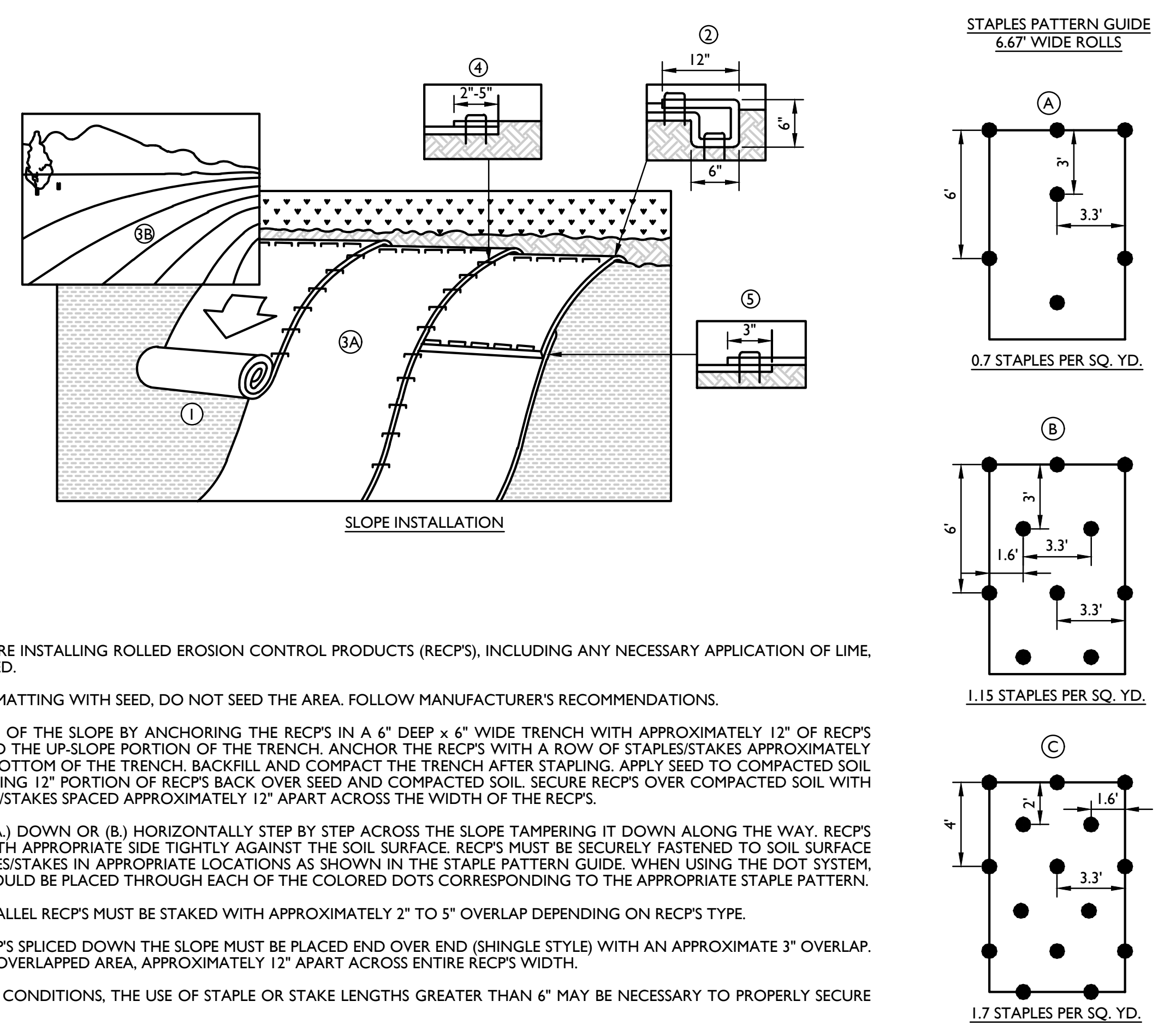
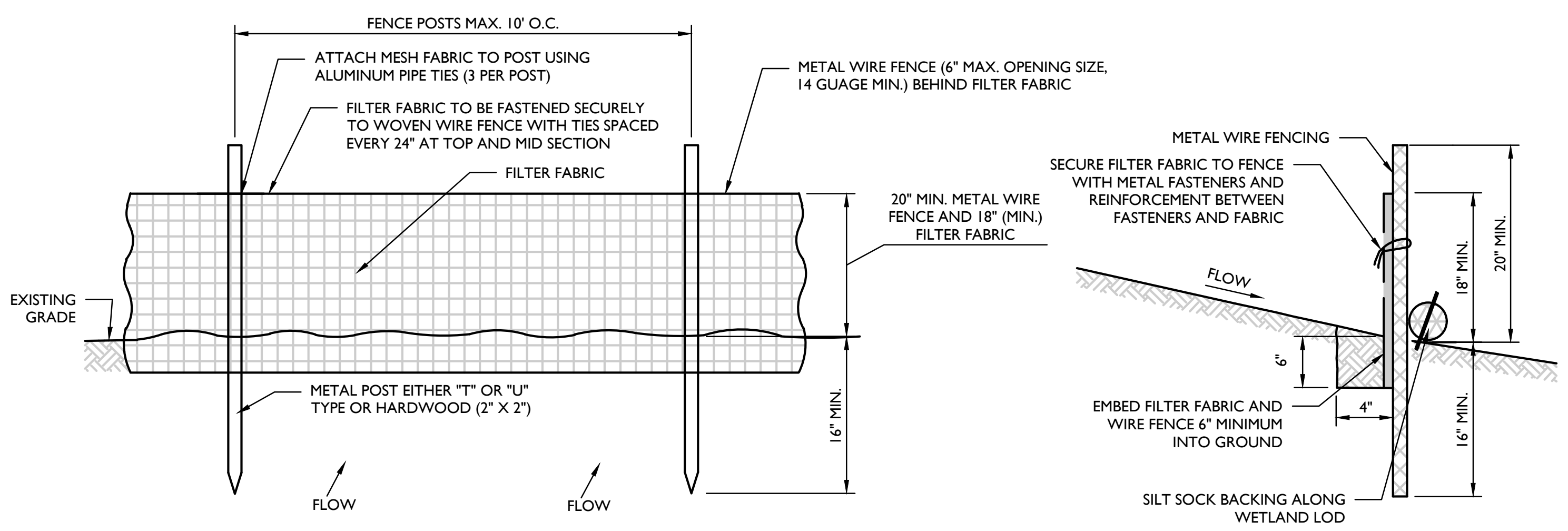


NOTES:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP'S), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
   * WHEN USING MATTING WITH SEED, DO NOT SEED THE AREA. FOLLOW MANUFACTURER'S RECOMMENDATIONS.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S IN A 6" DEEP x 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A.) DOWN OR (B.) HORIZONTALLY STEP BY STEP ACROSS THE SLOPE TAMPERING IT DOWN ALONG THE WAY. RECP'S SHALL UNROLL WITH APPROPRIATE SIDE TIGHTLY AGAINST THE SOIL SURFACE. RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKESSHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAKED WITH APPROXIMATELY 2" TO 5" OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WIDTH.
   * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

EROSION MATTING (CURLEX ENFORCER I) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-2200 07/01/19

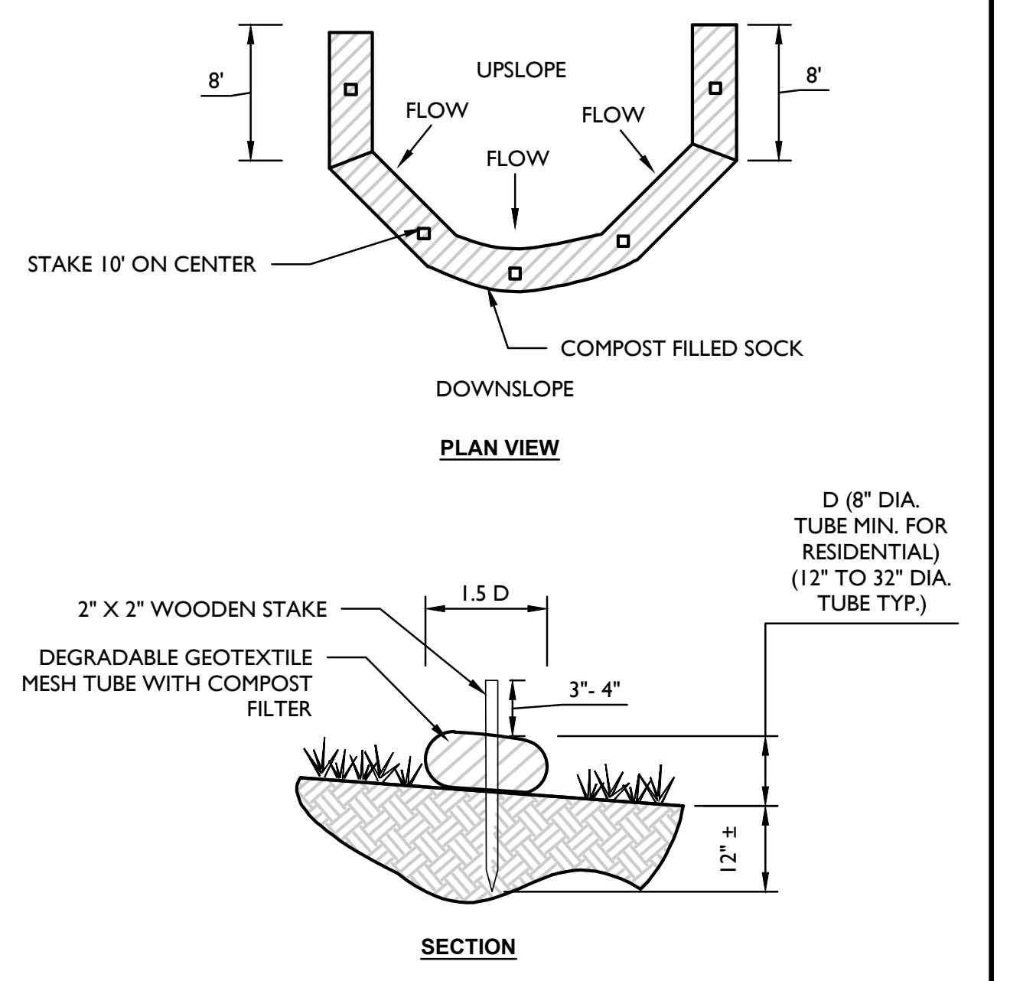


NOTES:

1. GEOTEXTILE TO BE FASTENED SECURELY TO FENCE POST BY USING WIRE TIES OR HOG RINGS. USE 3 FASTENERS PER POST.
2. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
3. ALL SILT FENCE TO BE INSPECTED AND REMEDIAL MAINTENANCE PERFORMED BY THE CONTRACTOR AS REQUIRED. MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
4. WHEN TWO SECTIONS OF FILTER FABRIC ARE JOINED, THEY SHALL BE OVER-WRAPPED BY SIX INCHES AND FOLDED.
5. FILTER FABRIC TO BE EITHER FILTER X, MIRAFI 100X, STABILINKA T14ON, OR APPROVED EQUIVALENT.
6. PREFABRICATED UNITS SHALL MEET THE MINIMUM REQUIREMENTS SHOWN.
7. IF SPACE PERMITTED, LOCATE SILT FENCE 10' AWAY FROM TOE OF SLOPE IF THE SLOPE IS STEEPER THAN 1:1.

REINFORCED SILT FENCE (WITH WIRE FENCE) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1101 07/01/19



DIA. (in.)	SLOPE%						
	2	5	10	20	25	33	50
8	225*	200	100	50	20	-	-
12	250	225	125	65	50	40	25
18	275	250	150	70	55	45	30
24	350	275	200	130	100	60	35
32	450	325	275	150	120	75	50

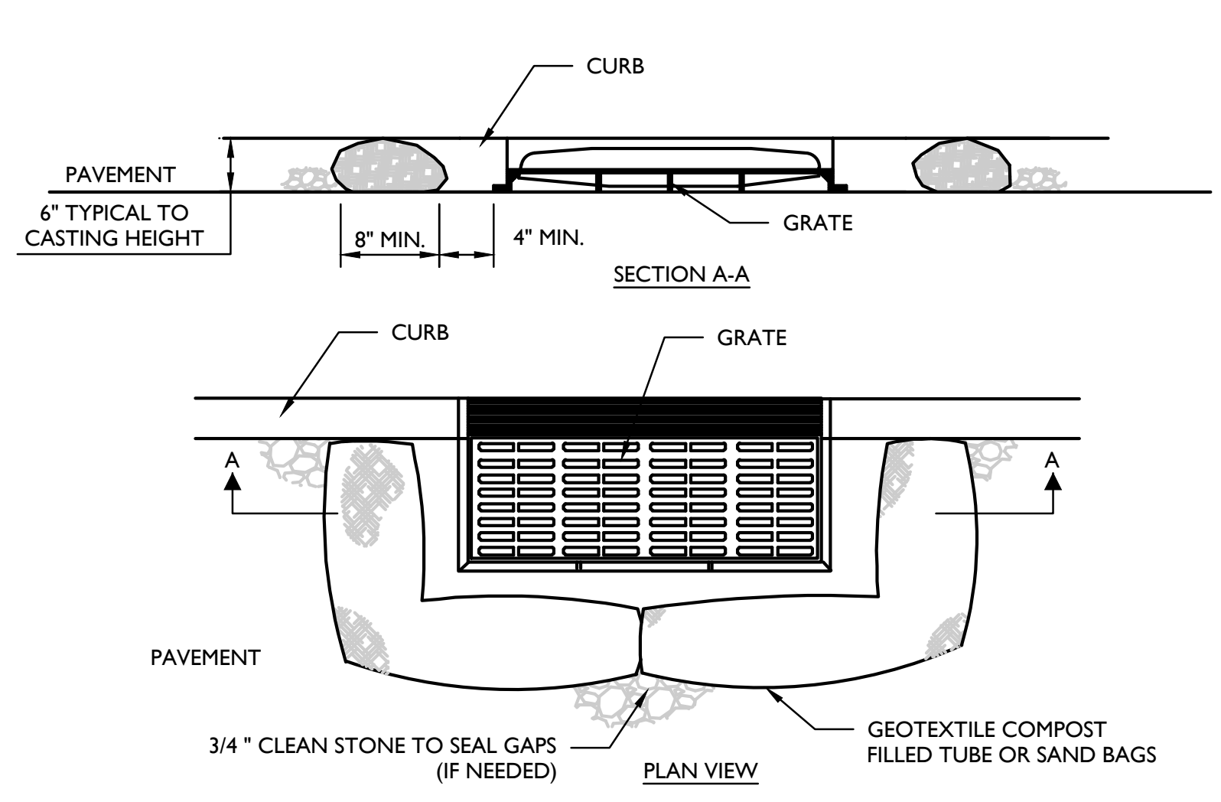
*Length in feet

NOTES:

1. ALL MATERIAL TO MEET **FILTREXX SILTSOX** SPECIFICATIONS OR APPROVED EQUAL.
2. COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST FILTER SOCK DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1200 05/01/17

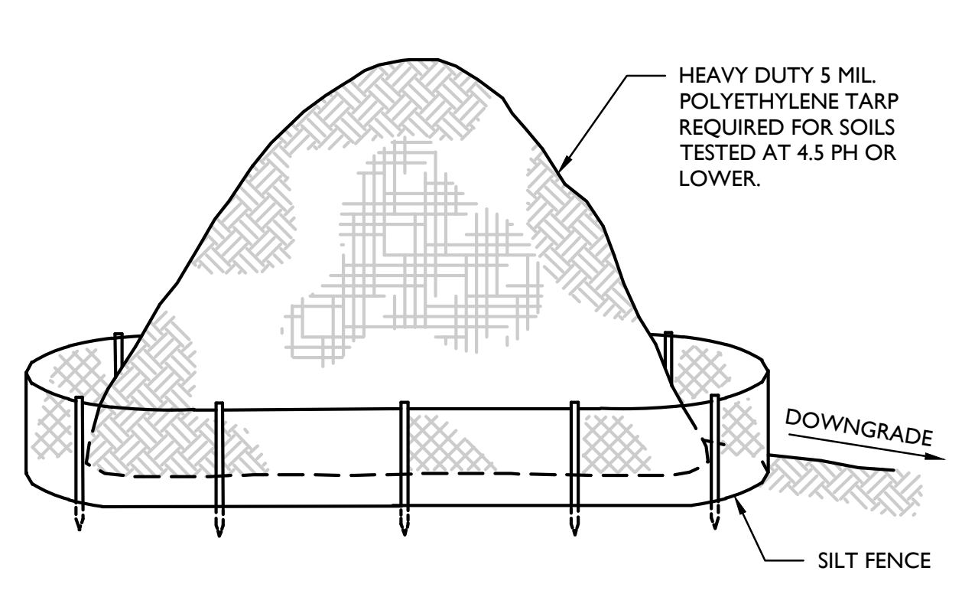


NOTES:

1. GEOTEXTILE TO BE WOVEN POLYPROPYLENE PRODUCT, OR APPROVED EQUAL.
2. FILLER CORE MAY BE SAND, COMPOST, OR PEA GRAVEL COMPLETELY CONTAINED WITHIN GEOTEXTILE. SEAMS, CLOSED BY SUITABLE MECHANICAL MEANS TO PREVENT LEAKAGE OF FILLER.
3. WHERE NO CURB IS PRESENT, BARRIER SHALL COMPLETELY ENCIRCLE THE DRAIN INLET.
4. INLET GRATE OPENING IS TO BE KEPT CLEAR OF OBSTRUCTIONS AT ALL TIMES.
5. THE PROTECTION DEVICE WILL BE DESIGNED TO CAPTURE OR FILTER RUNOFF FROM THE 1 YEAR/ 24 HOUR STORM EVENT AND SHALL SAFELY CONVEY HIGHER FLOWS DIRECTLY INTO THE STORM SEWER SYSTEM.
6. OTHER METHODS THAT ACCOMPLISH THE PURPOSE OF STORM SEWER INLET PROTECTION MAY BE USED IF APPROVED BY THE PROJECT ENGINEER.
7. INSPECTIONS SHALL BE FREQUENT. MAINTENANCE, REPAIR, AND REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED. THE BARRIER SHALL BE REMOVED WHEN THE AREA DRAINING TOWARDS THE INLET HAS REACHED FINAL STABILIZATION.

INLET PROTECTION (FILTER BARRIER) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1500 07/01/19

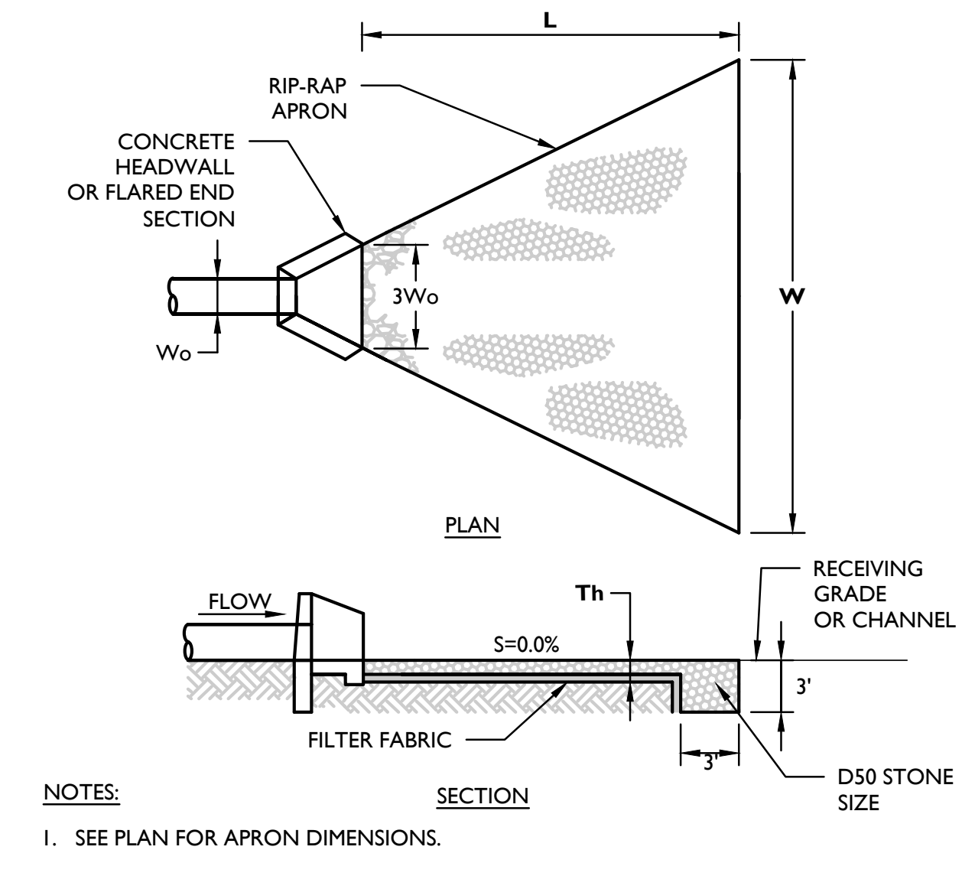


NOTES:

1. ALL STOCKPILES SHALL NOT TO BE LOCATED WITHIN 50 FEET OF A FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITY.

TOPSOIL STOCKPILE DETAIL

NOT TO SCALE MCNY-SOIL-EROS-2500 07/01/19



NOTES:

1. SEE PLAN FOR APRON DIMENSIONS.
2. SIDE SLOPE SHALL BE 2:1 OR FLATTER. THE BOTTOM GRADE SHALL BE LEVEL (0% SLOPE). THERE SHALL BE NO FALL AT THE END OF APRON TO THE RECEIVING SURFACE.

CONDUIT OUTLET PROTECTION DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1600 07/01/19

TOWN OF WAWAYANDA
PLANNING BOARD

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

PRELIMINARY
SITE PLAN

FOR

MID DOLSONTOWN,
LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers
Engineering
& Design

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New Windsor, NY 12553
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COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING
ENGINEERING & LAND SURVEYING

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-SESC

SHEET TITLE:
SOIL EROSION &
SEDIMENT CONTROL PLAN

SHEET NUMBER:
11 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

APPENDIX 16

GEOTECHNICAL EXPLORATION REPORT

Colliers
Engineering
& Design

GEOTECHNICAL EXPLORATION REPORT

March 30, 2022

RDM Simon
Town of Wawayanda, Orange County, New York

Prepared for:

Real Deal Management, Inc.
One International Boulevard, Suite 410
Mahwah, NJ 07430

Prepared by:

Ahmed Elmekati
New York Professional Engineer
License No. 094599

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Project No. 20004268A

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Introduction

In accordance with our proposal dated December 13, 2021, Colliers Engineering & Design CT, PC, (CED), performed a geotechnical exploration program for the proposed industrial development located at SBL 6-1-107 & 6-1-90.1, Town of Wawayanda, Orange County, New York to explore the subsurface conditions below the proposed development and develop related geotechnical design recommendations and construction considerations.

This report summarizes our findings and provides our geotechnical design recommendations and construction considerations for this project. Results and findings of the subsurface stormwater exploration and in-situ infiltration testing for the proposed stormwater management facilities are presented in our separate geotechnical data report dated March 14, 2022 and referenced below.

Available Information

1. Drawing Set titled, "Preliminary Site Plans" by Colliers Engineering & Design, dated February 04, 2022.
2. Report titled, "Geotechnical Data Report" by Colliers Engineering & Design, dated March 14, 2022

Site and Project Description

The project site is located along Dolsontown Road, Town of Wawayanda, Orange County, New York, as shown on Figure 1 and is identified as Section 6, Block 1, Lot 107, & 90.1 within the Town of Wawayanda. The site is bounded by Interstate I-84 towards south. Vegetated and wooded areas bound the west, north, and east sides of the site. The site is undeveloped and is mostly open fields. Surface grades generally slope downward from El. 520± towards northwest to El. 450± towards southeast.

We understand the proposed development comprises the construction of two new buildings and new stormwater management facilities along with typical appurtenant site improvements such as parking, lighting, and landscaping. The first building (Building 1) will be located at the northwest corner of the site and will occupy an approximate footprint of 54,000 sq. ft. The second building (Building 2) will be located near the northeast corner of the site and will occupy an approximate footprint of 244,200 sq. ft. Information pertaining to the structural loads were not provided at this time of the report.

Subsurface Explorations

CED performed a subsurface exploration program consisting of 15 test borings, TB-01 through TB-15 to explore the subsurface conditions below the proposed buildings. Test Borings TB-01 through TB-04 were performed within the footprint of Building 1. Test Borings TB-05 through TB-15 were performed within the footprint of Building 2. The test borings extended up to 46 ft below ground surface. Drawing B-01-ELP presents the location of the corresponding test borings.

CED performed an additional subsurface exploration program for the proposed stormwater management facilities that consisted of nine infiltration test borings, TB-I03 through TB-I11 and in-situ infiltration testing. Results of this exploration program are presented in our Geotechnical Data Report dated March 14, 2022 (Reference 2 of the Available Information).

The test borings were performed by SoilTesting, Inc of Oxford, CT, during the period from February 18, 2022 through February 24, 2022 using a Dietrich D50T Mounted Track Rig under the continuous observation of CED representative, Mr. Mohamed Rady. Our field representative located test borings based on existing site features and information available at the time of our field exploration. The test borings were backfilled upon completion.

The test borings were advanced using hollow-stem auger drilling techniques using track-mounted equipment. Split spoon sampling was performed in accordance with ASTM D1586 (Standard Method for Penetration Test and Split-Barrel Sampling of Soils) by means of a 2-inch OD split barrel sampler. The number of blows required to drive the split spoon every 6 inches into the soil were recorded and are shown on the logs. The sum of blows for the 6 to 18-inch interval is the SPT N-value expressed in terms of blows per foot (bpf). The SPT N-value indicates the soil resistance encountered at that respective layer. Blow counts exceeding 50 blows per 6 inches of penetration were considered split spoon refusal. Sampling was performed continuously from the ground surface to a depth of 12 ft, then at 5-ft intervals to the termination depths of the test borings.

Soils encountered in the field were classified in accordance with the Burmister Soil Classification System, a summary of which is included in Appendix A. Details pertaining to the subsurface conditions encountered are presented on the Test Boring Logs (Appendix A). Recovered soil samples were transported to our in-house Testing Laboratory in Totowa, New Jersey, where the samples were re-evaluated and select samples were chosen for lab testing.

Subsurface Conditions

Geologic Setting

The geology of the area is presented within the Lower Hudson Area. A review of the geologic information (Figure 2) indicates that bedrock underlying the site mainly consists of sedimentary, clastic rock. Bedrock is overlain by glacial till sediments (Figure 3), consisting of silt, mostly thin.

Subsurface Description

The test borings were first advanced through up to 24 inches of surface materials consisting of topsoil material. Descriptions of the subsurface soil strata encountered below the surface materials are summarized below in order of their general occurrence with depth:

Stratum T – Till

A stratum of glacial till was encountered below the surface materials within the test borings. Test Borings TB-01 through TB-05, TB-07 through TB-09, and TB-11 through TB-14 were terminated within this stratum at depths exceeding 40 ft at some locations. Where fully penetrated, this stratum extended up to 7 ft in thickness within the remaining test borings. Stratum T consists of medium stiff to hard brown, orange-brown, brown-gray, gray clay and silt/clayey silt, little to and coarse to fine sand, various amounts of coarse to fine gravel. Frequent boulders were encountered within this stratum. Hard augering conditions and auger refusal were encountered in some locations within this stratum. The SPT-N values for this stratum ranged between 5 bpf and split-spoon refusal.

Stratum DR – Decomposed Rock

A stratum of decomposed bedrock was encountered below Stratum T within Test Borings TB-06, TB-10, and TB-15. This stratum extended until auger refusal was encountered within the corresponding test borings. Stratum DR consists of dense to very dense brown, orange-brown, brown-gray, gray coarse to fine gravel (rock fragments), various amounts of coarse to fine sand, various amounts of silt. Auger refusal. Frequent boulders were encountered within this stratum. The SPT-N values for this stratum ranged between 38 bpf and split-spoon refusal.

Groundwater Conditions

Groundwater was encountered at elevations varying between El. 500± and El 504± within the test borings located within the footprint of Building 1, and between El 454± and El 486± within the test borings located within Building 2. Note that existing site grades slope upward within the footprint of Building 1 from El. 492± towards southwest to El. 512± towards northeast and within the footprint of Building 2 from El. 454 towards south to El. 494 towards north indicating that the groundwater tables encountered within the test borings likely represent perched conditions due to presence of fine grained soils and the presence of property at lower elevations within the southern portion of the site.

It should be noted that groundwater levels can fluctuate with locations, seasonal changes, precipitation, nearby construction activities, leakage into and out of utilities, and other factors

Soil Laboratory Testing

Soil laboratory testing was performed on select soil samples at our in-house Testing Laboratory in Totowa, NJ. The corresponding test results are presented in Appendix B.

- **Atterberg Limits**: Two Atterberg Limits tests were conducted in accordance with ASTM D-4318.
- **Grainsize Analysis**: Two grain size tests were conducted in accordance with ASTM D-6913.

Seismicity

Based on the subsurface conditions encountered at the site, the seismic site class is Site Class D.

Foundation Design Recommendations

Specific information pertaining to the building loads were not available at the time of this report. As such, we assumed columns loads will be on the order of 100 kips. We can refine our recommendations once building loads are available and further engineering evaluations can be performed to evaluate potential differential settlement.

General

Reference 1 of the Available Information indicates Building 1 is proposed to have FFE at El. 498 while Building 2 has a FFE at El. 473. As such, re-grading will be required to achieve the proposed finished floor elevation (FFE) for each building. Excavations extending up to 25 ft below existing grades along with placement of up to 20 ft of fill will be required in various areas to achieve the proposed grades.

Foundations

Foundation Type and Depths

We recommend a system of shallow foundations consisting of isolated footings to support the building columns, and strip footings to support exterior and/or interior walls. Foundations shall bear at a minimum foundation depth of 48 inches below the surrounding finished grades to provide protection from frost action. The minimum horizontal foundation dimensions of the footings should be 36 inches for column footings and 24 inches for wall footings regardless of the actual applied bearing pressure to limit the risk of a punching-type shear failure.

The proposed excavations are anticipated to extend into Stratum T or Stratum DR based on the findings of the performed explorations. These strata should be over-excavated a minimum of 1 ft and replaced with Structural Fill to foundations bearing elevation. Foundations shall be supported on Structural Fill in areas where fill will be placed. The Structural Fill shall be placed in accordance with Structural Fill/Backfill section of this report.

Allowable Bearing Pressure

The allowable net bearing pressure is 2 TSF (4 KSF), provided that all foundations bear on Structural Fill after over-excavating the underlying soils as described above.

Settlement

We anticipate the foundation settlement under the allowable bearing pressure indicated above to be on the order of 1- inch total, with differential settlements on the order of 0.5 inches.

Global Stability

The design of foundation elements constructed at or near adjacent slopes should consider global stability. The following represents the minimum recommended factors of safety (FS) against global stability:

- Minimum factor of safety during construction: FS ≥ 1.3
- Minimum factor of safety after construction: FS ≥ 1.5
- Minimum factor of safety for seismic loadings: FS ≥ 1.1

Floor Slab

The design of the floor slab for regular building loads should be developed as conventional slab-on-grade. The modulus of subgrade reaction for a 1-square foot plate (k_{v1}) should be 140 tons per cubic foot (TCF). For slabs up to 20 ft wide, this modulus should be adjusted for the width of the slab in accordance with the following expression:

$$k_{slab} = k_{v1} \frac{(B+1)^2}{(2B)^2}$$

where B is width of the slab, k_{slab} is modulus of subgrade reaction of a slab of width B, and k_{vl} is modulus of subgrade reaction for a 1-foot square plate.

Proposed mesh-reinforced concrete floor slabs can be uniformly supported on-grade and simply supported at the wall to allow unrestricted rotation or vertical movement of slab edges. Saw joints or construction joints should isolate each bay to control shrinkage cracks. A minimum of 6 inches of ¾-inch clean crushed stone or a 12-inch-thick layer (minimum) of well-graded sand and gravel with no more than 12% non-plastic fines, is recommended below the slab to provide uniform curing conditions. A minimum 10-mil vapor retarder may be placed between the slab and base course, as directed by the Architect, to minimize moisture migration to the surface. All structural fill supporting the floor slab should be compacted to 95% of its maximum dry density (ASTM D 1557).

Inasmuch as the floor slab in the vehicle traffic areas will be supporting live loads in the form of moving equipment, it is recommended that all construction joints in the floor slab be provided with a key or dowels to permit the proper transfer of loads. Large floor areas should be provided with joints at frequent intervals.

Groundwater

Groundwater levels can fluctuate with locations, seasonal changes, precipitation, nearby construction activities, leakage into and out of utilities, and other factors. As such, groundwater encountered during construction may vary from those observed during the subsurface exploration. Foundation design should consider groundwater at a depth of 5 ft or shallower to account for seasonal variations. It should be noted that perched groundwater conditions may develop in various locations due to the presence of fine-grained soils below the site.

Seismic Design

Based on the subsurface conditions encountered at the site and considering foundation level will be bearing on Stratum T or Structural Fill, the seismic design shall consider Site Class D. The following represents the seismic design parameters (see also Appendix C):

Seismic Site Class: D
Mapped Spectral Acceleration S_s (period =0.2 S): 0.211
Mapped Spectral Acceleration S_1 (period =1.0 S): 0.054
Site Coefficient F_a: 1.6
Site Coefficient F_v: 2.4
Spectral Response Accelerations:
  S_{MS} (g): 0.338
  S_{M1} (g): 0.130
Design Spectral Accelerations:
  S_{DS} (g): 0.225
  S_{D1} (g): 0.087

Based on the encountered SPT N-values encountered during sampling and the nature of the underlying soils, the site soils are not susceptible to liquefaction.

Lateral Earth Pressures

Lateral earth pressures acting on exterior walls should be designed considering the following:

- Compute lateral earth pressures using a total unit weight for soils of 120 pounds per cubic foot and drained internal friction angle of 30 degrees. Foundation elements restrained from movement should be designed considering at-rest earth pressures. Consider the buoyant unit weight for zones below the groundwater table.

- Surcharge loads from streets, construction equipment, and nearby structures should be added to the lateral earth pressures. We recommend using a coefficient of 0.5 times the vertical surcharge loads to determine the horizontal surcharge load.

Lateral Resistance

Lateral loads on shallow foundations will be resisted by passive pressures on the vertical sides of the foundations, and by frictional sliding resistance on the bases of foundations:

- *Passive Resistance to Lateral Loads:*
  - Compute ultimate passive resistance using a total unit weight for soils of 120 pounds per cubic foot and an internal friction angle of 30 degrees. Consider the buoyant unit weight for zones below the groundwater table.
  - Use a factor of safety of 1.5 on the ultimate passive resistance when working loads are used.
  - Spacing between adjacent footings needs to be considered to verify that a full passive "wedge" can be developed.

- *Frictional Resistance to Lateral Loads:*
  - Compute ultimate frictional resistance using a coefficient of friction of 0.50 on the horizontal base of foundations.

- Use a factor of safety of 1.5 on the ultimate frictional resistance when working loads are used.

Site Preparation

Stripping of Topsoil

Existing topsoil within the footprints of the proposed buildings, plus a 5-foot perimeter zone, should be stripped and stockpiled for re-use. Topsoil is not suitable for re-use as controlled compacted fill or backfill. The topsoil can be stockpiled on-site for future re-use as general fill within landscaped areas or legally be disposed of off-site. If the topsoil is to be re-used, it should be screened to eliminate oversize particles and deleterious material. An agronomist should examine the material for its ability to support new vegetation.

Existing Utilities

We recommend that a subsurface utility exploration be performed to locate subsurface utilities prior to commencement of construction. The contractor should be prepared to relocate utilities prior to construction if needed.

Underground utilities that are to be reused should be evaluated by the Civil Engineer, and utility trench backfill should be evaluated by the geotechnical engineer, to determine their suitability for support of the planned construction. If any existing utilities are to be preserved, grading operations must be carefully performed so as not to disturb or damage the existing utility.

Construction Considerations

Excavation

We anticipate excavations for the proposed development to extend up to 25 ft below existing grades, in some areas. The explorations revealed that excavations will extend through very stiff soils of Stratum T to the underlying decomposed rock (Stratum DR).

The contractor should be prepared to handle zones of hard excavation within Stratum T and Stratum DR as reflected within the high SPT-N blow counts encountered within this stratum.

Excavation Support

Construction excavations should be sloped and/or shored in accordance with OSHA excavation regulations or stricter local governing safety codes. Our opinion is that the existing site soils and new structural fill will generally be classified as “Type C” soils under OSHA excavation regulations.

All excavation support systems and earth slopes must be designed by a qualified engineer, licensed in the State of New York. Lateral pressures presented in the Lateral Earth Pressures section of this report shall be employed in the design of such systems. Appropriate live loads, building loads, and surcharges for sidewalk, vehicular and construction loads, impacts of groundwater seepage, if encountered, shall also be considered in the design.

Structural Fill/Backfill

All fill/backfill proposed to support building and site features that will be adversely affected by settlement is considered structural fill. Materials used as structural fill should consist of visually stable, inorganic, readily compactable materials that are free of trash, debris, organic inclusions, frozen material, or excess moisture. On-site materials with an organic content of less than 5 percent may be included in structural fill, provided they are well blended with other inorganic fill materials.

The existing on-site materials may be difficult for direct re-use as structural fill due to the high fines content. However, it can be used at proper moisture contents while utilizing appropriate compaction equipment. On site cohesive soils can be dried utilizing lime and or by mixing with dry granular materials. The mixing with lime and or granular materials shall be designed by the special inspection geotechnical engineer. Additional materials are required to establish the proposed site grades, we recommend using imported fill consisting of granular soils with no more than 15 % fines.

Structural fill should be placed in essentially horizontal lifts with a maximum loose thickness of 8 inches. The optimum loose lift thickness of the structural fill material shall be established by the contractor in the field via an earthwork test pad. In addition to meeting the compaction criteria, the compacted material shall maintain visual stability beneath the compaction equipment and be observed and documented by the Geotechnical Engineer.

Each lift should be compacted to at least 95 percent of the maximum dry density for building or floor slab support, and 95 percent of the maximum dry density for pavement construction and utility trench backfill, as determined by the modified Proctor test (ASTM D 1557). Compaction of granular materials can be achieved using as large a vibratory compactor as practical. Moisture contents shall be maintained within 2 to 3 percent of the optimum moisture content during compaction procedures.

Subgrade Preparation

Building Foundations

Building foundations should be constructed on undisturbed soils of Stratum T or Structural Fill. This will require careful excavation during construction such that subgrade is not disturbed. Any over-excavation below the foundations shall be backfilled to the bearing elevation with Structural Fill.

Subgrade soils exposed in foundation excavations should be evaluated by a Geotechnical Engineer prior to placement of structural fill, reinforcing steel, or concrete, to confirm stability of the subgrade soils. The evaluation should consist of proof-rolling and compacting the subgrade soils with the largest practical equipment and observation or testing as deemed necessary by the Geotechnical Engineer.

Floor Slabs

The floor slab subgrade soils should be compacted and proof-rolled under the direction of the Geotechnical Engineer to evaluate stability. We recommend a minimum 6-inch-thick bedding of clean stone to be placed below the floor slab to interrupt the rise of capillary moisture through the slab and allow for proper curing of the concrete. The floor slab may bear on footing projections; however, control joints should be provided at the slab and wall/column interfaces to reduce the potential for slab cracking, should the building settle differentially from the floor slab.

Subsurface Utilities

The natural soils and new structural fill materials will be suitable for support of subsurface utilities. However, should cobbles, boulders, loose and/or unstable soils be encountered at the utility invert levels, the subgrade should be over-excavated a minimum depth of 6 inches and backfilled with granular material, such as AASHTO No. 57 aggregate, to provide uniform support. Utility excavations should be backfilled using structural fill in accordance with the *Structural Fill* section of this report.

General Subgrade Considerations

Any natural subgrade soils that are determined to be soft, loose, wet, or otherwise unstable should be selectively excavated and replaced with structural fill, placed, and compacted in accordance with the recommendations mentioned above.

Unless foundation construction proceeds within 24 hours of foundation subgrade preparation, including approval by the Geotechnical Engineer, subgrades should be protected from the elements to reduce exposure and potential weakening of the subgrade materials, particularly if precipitation or freezing temperatures are expected prior to foundation construction. Preventative measures such as placing a minimum 2-inch-thick lean concrete “mud mat” on the subgrade, or providing suitable cover for the excavations, may be considered appropriate, depending on the prevailing weather conditions. Foundation excavations should be protected from frost and water infiltration until the foundations have been constructed and backfilled.

Surface Water Control and Perched Conditions

The contractor should be prepared to address ponding of water that may accumulate due to seasonal variations. Surface water should be controlled using gravity drainage and local sump pumping to prevent ponding of water following periods of precipitation or snowmelt. Surface grading should be maintained on a continual basis during construction to direct surface water runoff away from open excavations and prevent water from pooling on subgrade soils. The sump pits should be filled with minimum ¾-inch clean stone and lined with geotextile filter fabric to prevent soil migration. Pumped water should be discharged away from the building pad and open excavations.

Perched groundwater conditions may be encountered at some locations. The contractor should be prepared to address these conditions during construction which may require a level of dewatering to maintain perched water at a minimum of 2 ft below subgrade. Should the actual conditions vary from those encountered within the borings, such conditions should be brought to the Geotechnical Engineer for further evaluation of the recommendations presented in this report.

The foundation subgrade should be visually confirmed by a qualified Geotechnical Engineer and reviewed prior to foundation placement.

Special Inspections

Special Inspections shall be required for the following construction:

- Subgrade Inspection – Inspection is required periodically and immediately prior to placement of footings and foundations.
- Backfill – Continuous inspection is required.
- Evaluation of in-place density – In accordance with technical specifications for earthwork.

Closing

The conclusions and recommendations presented in this report are based, in part, on the explorations accomplished for this evaluation. The number, location, and depth of the explorations were completed within the constraints of budget and site access to yield the information to formulate the recommendations. We recommend that CED be provided the opportunity for general review of the project plans and specifications when they become available, to confirm that the recommendations and design considerations presented in this report have been properly interpreted and implemented into the project design package.

The design recommendations and construction considerations presented in this report were developed based on the subsurface information interpreted from the referenced explorations. Should the information not be adequate for the Contractor's purposes, the Contractor may make, prior to bidding, their own explorations, tests, and analyses.

Limitations

This data report and all supporting documentation have been prepared exclusively for the use of **Real Deal Management, Inc.** pursuant to the Agreement between Colliers Engineering & Design CT, PC (DBA Maser Consulting CT) and **Real Deal Management, Inc**. All provisions set forth in the Agreement and the General Terms and Conditions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein.

The findings, conclusions, and recommendations contained in this report are based on limited exploration and testing of the subsurface at the referenced project site. The explorations indicate subsurface conditions at the specific locations, depths, and times explored. Should deviations from the described subsurface conditions be encountered at any time prior to or during construction, CED should be notified to determine whether the findings necessitate modification of our recommendations.

This report is applicable only to the contemplated site design described herein; any changes in the design should be brought to our attention so that we may evaluate whether our recommendations will be affected. CED is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Colliers. As such, the conclusions and recommendations contained in this report are pending our review of final plans and specifications, and verification of subsurface conditions by direct observation at the time of construction.

This report and supporting documentation are instruments of service. The subject matter of this report is limited to the facts and matters stated herein.

The scope of this geotechnical exploration program did not include investigation or evaluation of any environmental issues, such as wetlands, or hazardous or toxic materials on, below, or in the vicinity of the subject site. Any statements in this report or supporting documentation regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

Figures

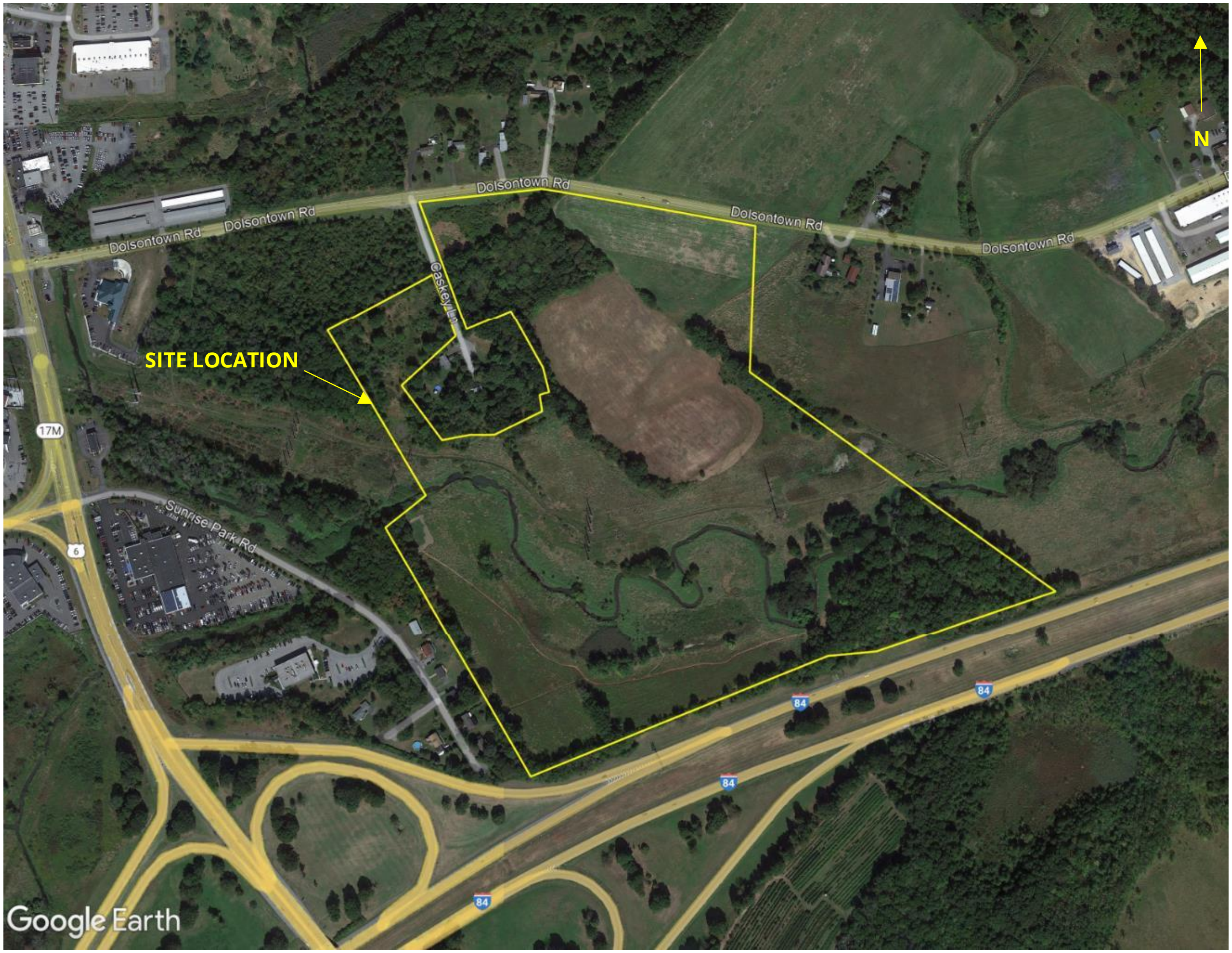
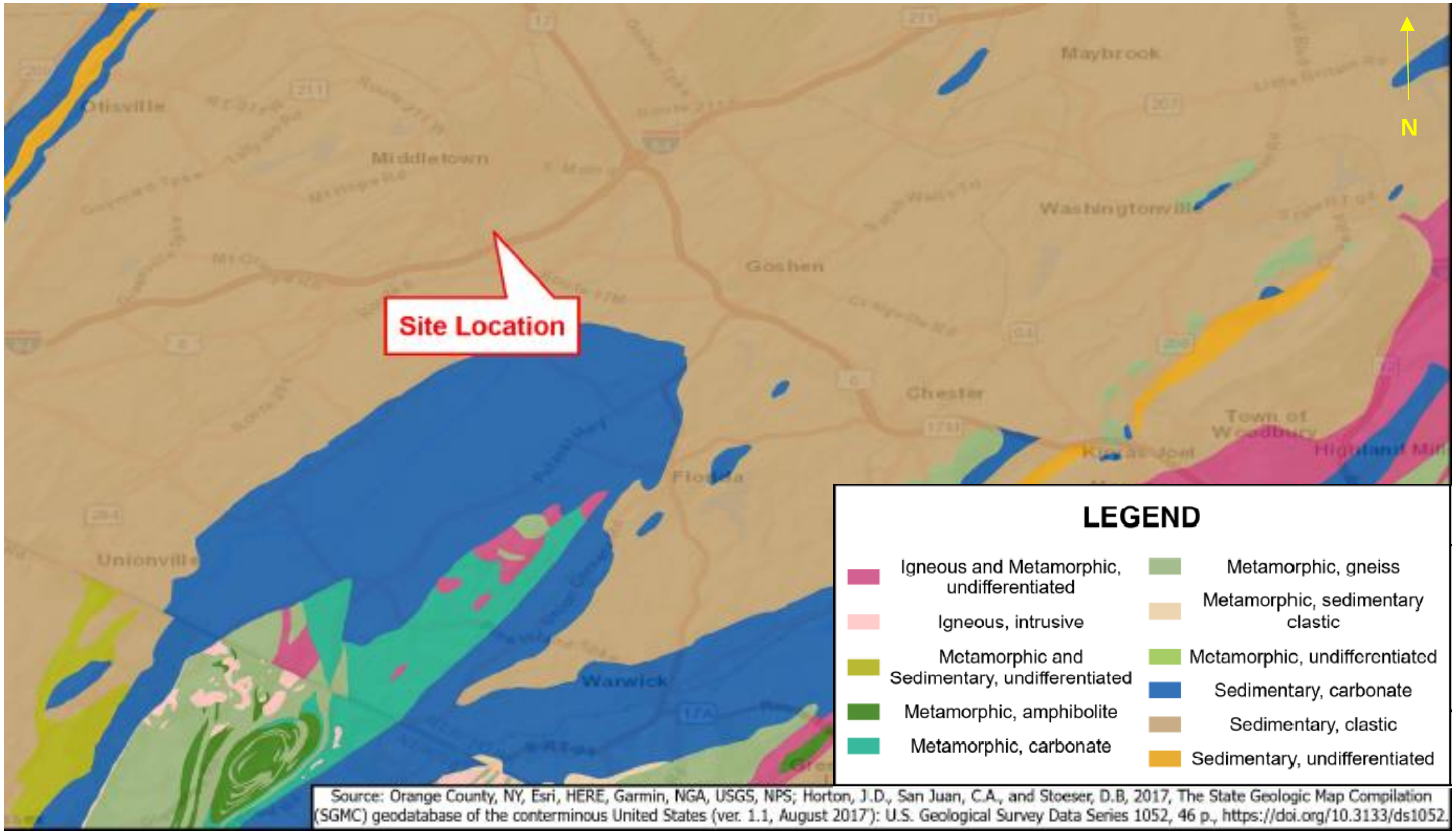
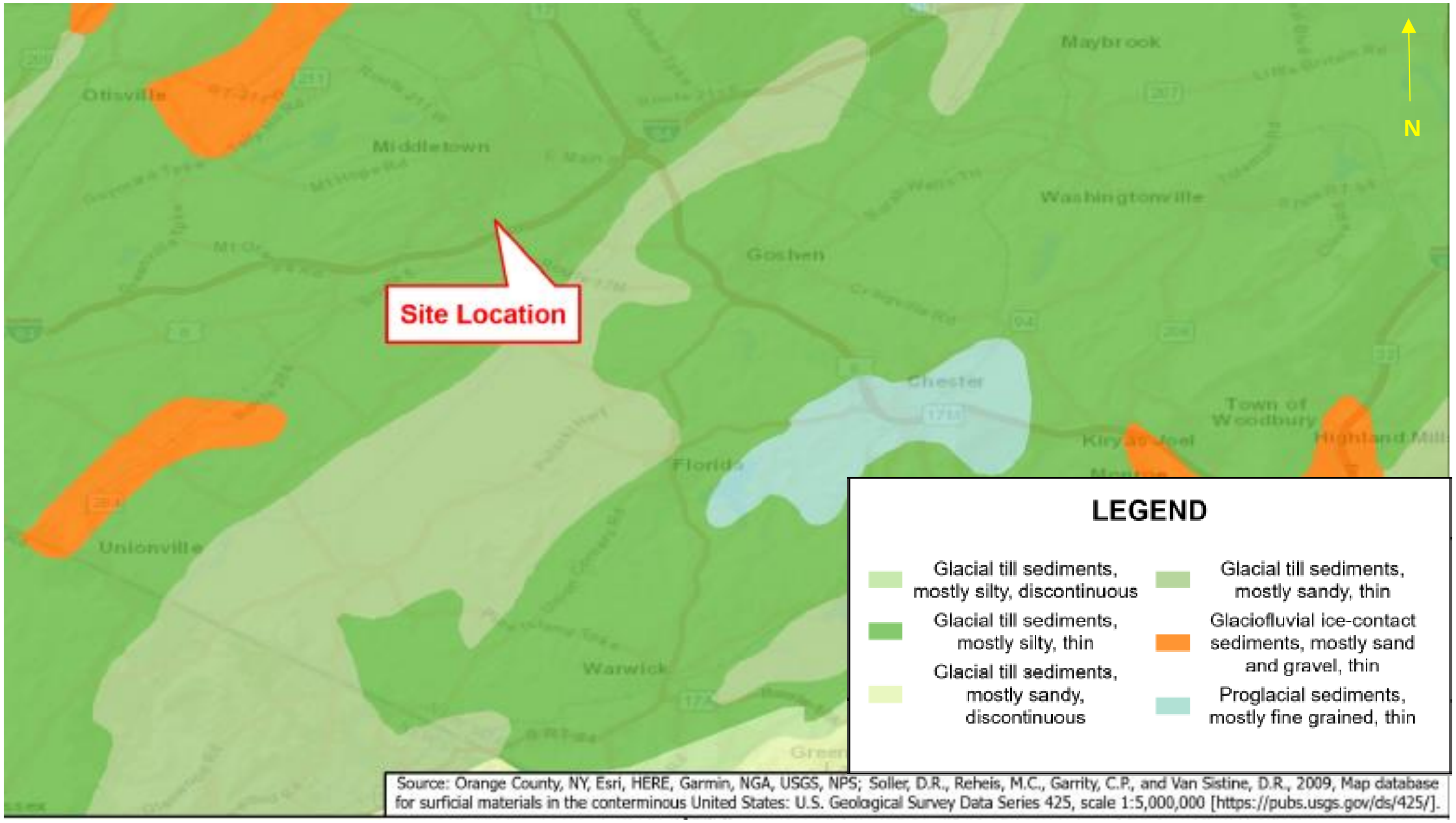


Figure 1: Site Location



Source: Orange County, NY, Esri, HERE, Garmin, NGA, USGS, NPS; Horton, J.D., San Juan, C.A., and Stoeser, D.B, 2017, The State Geologic Map Compilation (SGMC) geodatabase of the conterminous United States (ver. 1.1, August 2017): U.S. Geological Survey Data Series 1052, 46 p., https://doi.org/10.3133/ds1052.

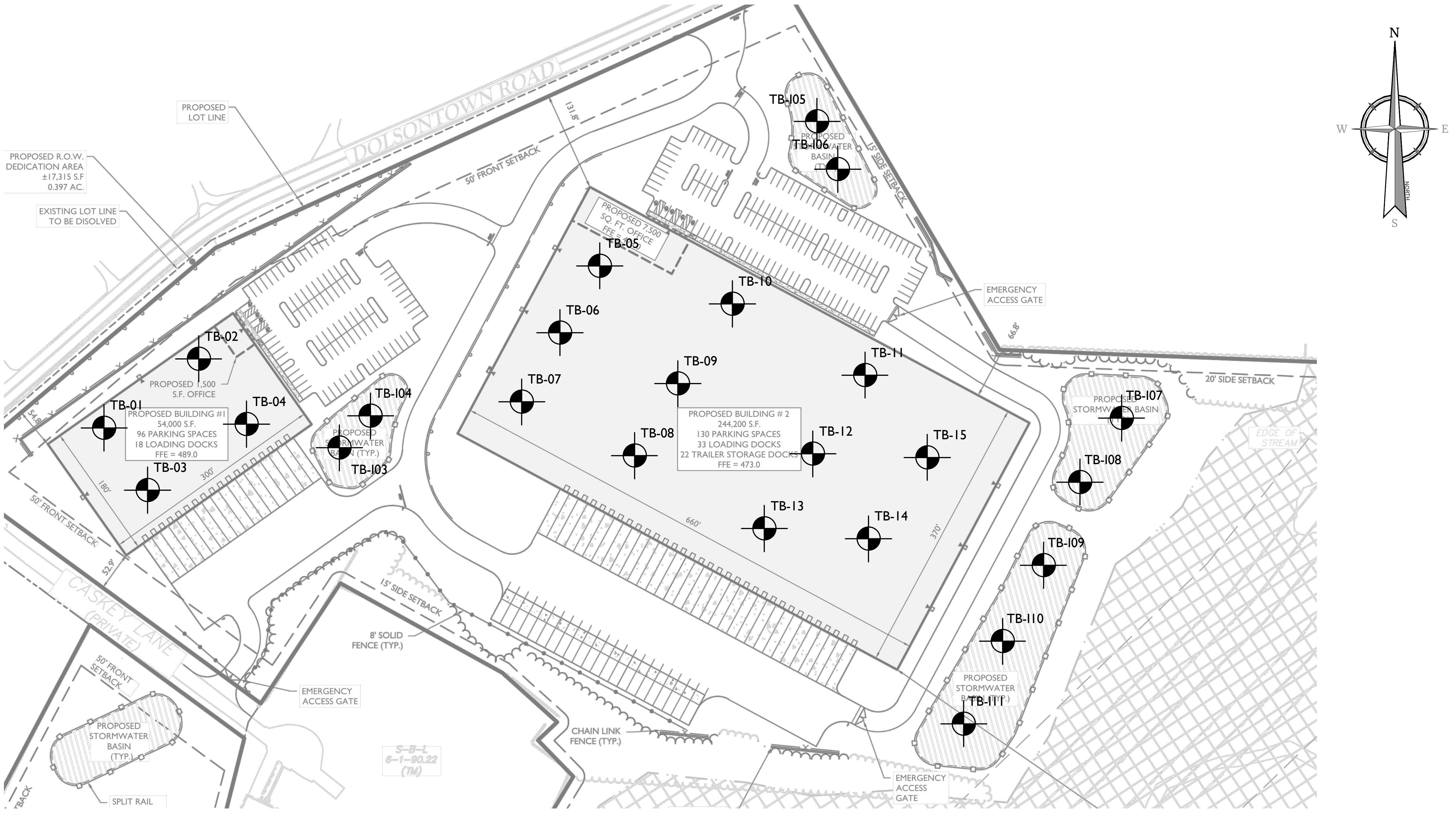
Figure 2: Bedrock Geology



Source: Orange County, NY, Esri, HERE, Garmin, NGA, USGS, NPS; Soller, D.R., Reheis, M.C., Garrity, C.P., and Van Sistine, D.R., 2009, Map database for surficial materials in the conterminous United States: U.S. Geological Survey Data Series 425, scale 1:5,000,000 [https://pubs.usgs.gov/ds/425/].

Figure 3: Surficial Geology

Drawings



GENERAL NOTES:

1. LAYOUT BASED ON DRAWING TITLED "OVERALL DIMENSION PLAN" BY COLLIERS ENGINEERING & DESIGN, DATED FEBRUARY 4, 2022.
2. THIS DRAWING IS PART OF COLLIERS ENGINEERING & DESIGN'S REPORT (PROJECT NO. 21004268A) AND SHOULD ONLY BE USED IN CONJUNCTION WITH THE REPORT.
3. SOIL EXPLORATION LOCATIONS ARE APPROXIMATE BASED ON EXISTING SITE FEATURES AND INFORMATION AVAILABLE AT THE TIME OF OUR FIELD EXPLORATION..
4. TEST BORINGS SERIES TB-XX PERFORMED BY SOILTESTING, INC. DURING THE PERIOD FROM FEBRUARY 10, 2022 THROUGH FEBRUARY 18, 2022 AND FEBRUARY 24, 2022 UNDER CONTINUOUS OBSERVATION OF CED.
5. INFILTRATION TEST BORINGS TB-IXX PERFORMED SOILTESTING, INC. DURING THE PERIOD FROM FEBRUARY 21, 2022 THROUGH FEBRUARY 23, 2022 UNDER CONTINUOUS OBSERVATION OF CED.
6. TEST BORINGS BACKFILLED UPON COMPLETION.

LEGEND:

⊕ TB-XX	TEST BORING LOCATION
⊕ TB-IXX	INFILTRATION TEST BORING LOCATION

150 0 150

SCALE : 1" = 150'

Colliers
Engineering & Design

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REV	DATE	DRAWN BY	DESCRIPTION

EXPLORATION LOCATION PLAN
FOR
REAL DEAL MANAGEMENT

SBL 6-0-107, 6-1-90.1
TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers
Engineering & Design

NEWBURGH
555 Hudson Valley Avenue
Suite 101
New Windsor, NY 12553
Phone: 845.564.4495
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING
ENGINEERING & LAND SURVEYING

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	03/14/2022	PA	AHE

PROJECT NUMBER: 21004268A
DRAWING NAME: B-EXPL

SHEET TITLE: EXPLORATION PLAN

SHEET NUMBER: B-01-ELP

2021\21004268A\Geotechnical\Explorations\B-EXPL.dwg\B-XX-EXPLORATION By: PAYOUB

Appendix A

Structural Test Boring Logs

Burmister Soil Classification System

I. Soil and Fraction Definitions

Material	Symbol	Fraction	Sieve Size	Definition
Boulders	Bldr	-----	9" +	Material retained on 9" sieve.
Cobbles	Cbl	-----	3" to 9"	Material passing 9" sieve and retained on the 3" sieve.
Gravel	G	Coarse (c) Medium (m) Fine (f)	1" to 3" 3/8" to 1" No. 10 to 3/8"	Material passing the 3" sieve and retained on the No. 10 sieve.
Sand	S	Coarse (c) Medium (m) Fine (f)	No. 30 to No. 10 No. 60 to No. 30 No. 200 to No. 60	Material passing No. 10 sieve and retained on the No. 200 sieve.

Material	Symbol	Plasticity	Plasticity Index	Definition
Silt	$	-----	Passing No. 200 (0.075 mm) PI<1	Material passing the No. 200 sieve that is non-plastic in character and exhibits little or no strength when air-dried.
Clayey Silt	c$	Slight (SL)	1 to 5	Clay – Soil. Material passing the No. 200 sieve which can be made to exhibit plasticity and clay qualities within a certain range of moisture content, and which exhibits considerable strength when air-dried.
Silt & Clay	$ & C	Low (L)	5 to 10	
Clay & Silt	C & $	Medium (M)	10 to 20	
Silty Clay	$C	High (H)	20 to 40	
Clay	C	Very High (VH)	40 Plus	
Organic Silt	(O$)	-----	-----	Material passing the No. 200 sieve which exhibits plastic properties within a certain range of moisture content and exhibits fine granular and organic characteristics.

II. Proportion Definition

Component	Written	Proportions	Symbol	Percentage by Weight*
Principal	CAPITALS	---	---	50 or more
Minor	Lower Case	And	a.	35 to 50
		Some	s.	20 to 35
		Little	l.	10 to 20
		Trace	t.	0 to 10

*Minus sign (-) lower limit, plus sign (+) upper limit, no sign middle range.

III. Terminology for Stratified Soils

Terminology	Definition
Parting	0 to 1/16" thickness
Seam	1/16" to ½" thickness
Layer	½" to 12" thickness
Occasional	One or less per foot of thickness
Frequent	More than one per foot of thickness
Alternating	Stratification descriptor (non-varved)

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-01

PAGE 1 OF 2

GROUND ELEVATION (ft): 508 +/-

ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 500.50

CONTRACTOR: Soil Testing (Inc.)

DRILLER: Sam DeAngelis

DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig

METHOD: HSA X Mud Rotary ____ Other ____

HAMMER: CH X Safety ____ Automatic ____

RODS: AW ____ NW X Other ____

GROUNDWATER:	DEPTH (ft)	DATE
FIRST ENCOUNTERED ▽	12	02/10/2022
END OF DRILLING (0 hrs.) ▽	7.5	02/10/2022

ASTM D-1586

DATE STARTED 02/10/2022

DATE FINISHED 02/10/2022

FIELD OBSERVER: M. Greer

CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	2	2	3	4	6				Topsoil	S-1: S-1: Dk. Brown Clay & Silt, and mf Gravel. (Topsoil, Wet)
	0.0'-2.0'									2.0	
	S-2	5	9	10	8	15				506.0 Stratum T	S-2: S-2: Brown Clay & Silt, cmf Gravel, little cmf Sand. (Moist)
	2.0'-4.0'										
5	S-3	11	20	18	14	12	1.0				S-3: Brown Clay & Silt, and cmf Gravel, little cmf Sand (Moist)
	4.0'-6.0'										
	S-4	13	19	18	19	6	1.25				S-4: Brown Clay & Silt, and cmf Gravel, little cmf Sand. (Moist)
	6.0'-8.0'								▽		
	S-5	12	16	14	13	0					S-5: No Recovery.
10	8.0'-10.0'										
	S-6	15	22	12	12	18	1.5				S-6: Brown-Gray Silt & Clay, little mf Gravel, little cmf Sand (Wet)
	10.0'-12.0'								▽		
15											
	S-7	38	50/3"			6					S-7: Brown cmf GRAVEL, some cmf Sand, some Clay & Silt. (Wet)
	15.0'-15.8'										
20											
	S-8	25	45	50/4"		16	4.5				S-8: Gray CLAY & SILT, little mf Gravel, little cmf Sand. (Wet)
	20.0'-21.3'										
25											
	S-9	41	35	50/4"		16					S-9: Brown-Gray cmf GRAVEL, some Clay & Silt, some cmf Sand. (Wet)
	25.0'-26.3'										
30											
	S-10	50/1"				0					S-10: No Recovery.
	30.0'-30.1'										
35											
	S-11	48	50/3"			6					S-11: Brown-Gray CLAY & SILT, some mf Gravel, little cmf Sand. (Wet)
	35.0'-35.8'										
40											
	S-12	47	50/3"			6	3.5				S-12: Same as S-11.
	40.0'-40.8'										

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-01

PAGE 2 OF 2

GROUND ELEVATION (ft): 508 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 500.50

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Sam DeAngelis
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	12	02/10/2022
END OF DRILLING (0 hrs.)	▽	7.5	02/10/2022

ASTM D-1586

DATE STARTED 02/10/2022
DATE FINISHED 02/10/2022
FIELD OBSERVER: M. Greer
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-13	50/3"				3				46.0	S-13: Brown-Gray SILT & CLAY, little cmf Sand, little cmf Gravel. (Wet)
	45.0'-45.3'									462	END OF TEST BORING AT 46.0 FEET AUGER REFUSAL AT 46 FT BGS
50											
55											
60											
65											
70											
75											
80											
85											

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-03

PAGE 1 OF 1

GROUND ELEVATION (ft): 500 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 496.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Sam DeAngelis
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	10	02/10/2022
END OF DRILLING (0 hrs.)	▽	4	02/10/2022

ASTM D-1586

DATE STARTED 02/10/2022
DATE FINISHED 02/10/2022
FIELD OBSERVER: M. Greer
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	2	2	3	4	12	0.75			0.5 499.5 Topsoil	S-1: Top 6": Topsoil
	0.0'-2.0'									Stratum T	S-1: Orange-Brown CLAY & SILT, some cmf Gravel, little cmf Sand. (Moist)
	S-2	4	6	8	9	20	1.75				S-2: Same as S-1.
	2.0'-4.0'										
5	S-3	11	17	30	29	12			▽		S-3: Orange-Brown cmf Sand, and cmf Gravel, some Clay & Silt. (Moist)
	4.0'-6.0'										
	S-4	38	22	16	13	14	2				S-4: Same as S-3.
	6.0'-8.0'										
	S-5	8	6	9	11	18	2				S-5: Brown SILT & CLAY, some mf Gravel, little cmf Sand. (Wet)
10	8.0'-10.0'										
	S-6	15	50/2"			6	2		▽		S-6: Same as S-5.
	10.0'-10.7'										
15											
	S-7	26	50/3"			5					S-7: Same as S-5.
	15.0'-15.8'										
	S-8	90				2				17.5 482.5	S-8: Coarse Gravel at tip. * Possible Boulder.
	17.0'-17.5'										END OF TEST BORING AT 17.5 FEET AUGER REFUSAL AT 17.5 FT BGS
20											
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-03
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-02

PAGE 1 OF 1

GROUND ELEVATION (ft): 510 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 502.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Sam DeAngelis
DRILLING EQUIPMENT: a
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	8	02/11/2022
END OF DRILLING (0 hrs.)	▽	8	02/14/2022

ASTM D-1586

DATE STARTED 02/11/2022
DATE FINISHED 02/14/2022
FIELD OBSERVER: M. Greer/M.Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1									Topsoil	
	0.0'-2.0'									2.0	
	S-2									508.0 Stratum T	
	2.0'-4.0'										
5	S-3										
	4.0'-6.0'										
	S-4										
	6.0'-8.0'										
	S-5	11	10	18	23	18			▽		S-5: Brown Clayey Silt, and f Sand, trace f Gravel. (Wet)
10	8.0'-10.0'										
	S-6	48	31	48	79	18					S-6: Same as S-5.
	10.0'-12.0'										
15											
	S-7	78	50/2"			6					S-7: Brown mf Gravel, and cmf Sand, some Silt & Clay. (Wet)
	15.0'-15.7'										
20											
	S-8	50/5"				5					S-8: Gray Silt & Clay, and cmf Sand, some mf Gravel. (Wet)
	20.0'-20.4'										
25											
	S-9	47	50/4"			8					S-9: Gray Clayey SILT, little(+) cmf Sand, little mf Gravel. (Wet)
	25.0'-25.8'										
30											
	S-10	77	50/2"			0					S-10: Gray cmf SAND, some Silt & Clay, little f Gravel. (Wet)
	30.0'-30.7'										
35											
	S-11	100/5"				3					S-11: Gray cmf SAND, little Silt & Clay, little f Gravel. (Wet)
	35.0'-35.4'										
40											
	S-12	100/5"				4					S-12: Same as S-11.
	40.0'-40.4'									42.0	
										468	END OF TEST BORING AT 42.0 FEET AUGER REFUSAL AT 42 FT BGS

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-02
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-04

PAGE 1 OF 1

GROUND ELEVATION (ft): 506 +/-
ELEV. FROM: Interpolated
GROUNDWATER ELEV. (ft): 504.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	2	02/15/2022
END OF DRILLING (0 hrs.)	▽	2	02/16/2022

ASTM D-1586

DATE STARTED 02/15/2022
DATE FINISHED 02/16/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER	BLOWS PER 6 INCHES				RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE	IDENTIFICATION OF SOILS / REMARKS
	DEPTH (ft.)	0-6"	6-12"	12-18"	18-24"					DEPTH ELEV.	
	S-1	2	12	2	4	4				0.5 505.5 Topsoil	S-1: Top 4": Topsoil
	0.0'-2.0'								▽	Stratum T	S-1: Brown Silt & Clay, and mf Sand, some f Gravel. (Moist)
	S-2	18	22	12	14	12					S-2: Brown Clayey SILT, some mf Sand, little mf Gravel. (Wet)
	2.0'-4.0'										
5	S-3	70	35	30	32	12					S-3: Brown Silt & Clay, and f Sand, little mf Gravel. (Wet)
	4.0'-6.0'										
	S-4	20	17	9	9	15					S-4: Brown SILT & CLAY, some f Sand. (Wet)
	6.0'-8.0'										
	S-5	14	20	22	39	12					S-5: Brown Clayey Silt, and f Sand, little f Gravel. (Wet)
10	8.0'-10.0'										
	S-6	38	50/5"			8					S-6: Brown Clayey SILT, some f Gravel, little f Sand. (Wet)
	10.0'-10.8'										
15											
	S-7	38	50/2"			8					S-7: Brown Clayey SILT, little f Sand, trace f Gravel. (Wet)
	15.0'-15.7'										
20											
	S-8	50/3"				3					S-8: Same as S-7.
	20.0'-20.3'									22.0	
										484	END OF TEST BORING AT 22.0 FEET AUGER REFUSAL AT 22 FT BGS
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-08

PAGE 1 OF 1

GROUND ELEVATION (ft): 470 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 470.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Truck Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/18/2022
END OF DRILLING (0 hrs.)	▽	0	02/18/2022

ASTM D-1586

DATE STARTED 02/18/2022
DATE FINISHED 02/18/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	 6-12"	 12-18"	 18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.		IDENTIFICATION OF SOILS / REMARKS
	S-1	6	7	5	5	8			▽		Topsoil	S-1: S-1: Brown Clayey SILT, little f Sand, trace f Gravel. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	5	7	8	10	15				468.0	Stratum T	S-2: Brown Clayey SILT, little f Sand, trace f Gravel. (Wet)
	2.0'-4.0'											
5	S-3	7	19	30	19	12						S-3: Brown Silt & Clay, and cf Gravel, little f Sand. (Wet)
	4.0'-6.0'											
	S-4	25	44	31	29	18						S-4: Same as S-3.
	6.0'-8.0'											
	S-5	12	26	53	53	10						S-5: Same as S-3.
10	8.0'-10.0'											
	S-6	35	50	27	50/3"	12						S-6: Gray Silt & Clay, and cf Gravel, little f Sand. (Wet)
	10.0'-11.8'									12.0		
										458		END OF TEST BORING AT 12.0 FEET
15												
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-05

PAGE 1 OF 1

GROUND ELEVATION (ft): 484 +/-
ELEV. FROM: Interpolated
GROUNDWATER ELEV. (ft): 484.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/17/2022
END OF DRILLING (0 hrs.)	▽	0	02/17/2022

ASTM D-1586

DATE STARTED 02/17/2022
DATE FINISHED 02/17/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH / ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	4	5	4	3	0			▽	Topsoil	S-1: No Recovery.
	0.0'-2.0'									2.0	
	S-2	12	16	15	15	12				482.0 Stratum T	S-2: Brown mf SAND, little Clayey Silt, little mf Gravel. (Wet)
	2.0'-4.0'										
5	S-3	32	21	25	35	15					S-3: Brown cmf SAND, little clayey Silt, little cmf Gravel. (Wet)
	4.0'-6.0'										
	S-4	40	20	23	23	18					S-4: Same as S-3.
	6.0'-8.0'										
	S-5	17	22	50/3"		12					S-5: Brown-Gray cmf SAND, little clayey Silt, little cmf Gravel. (Wet)
10	8.0'-10.0'										
	S-6	10	13	28	38	12					S-6: Same as S-5.
	10.0'-11.8'										
15										14.5	
										469.5	END OF TEST BORING AT 14.5 FEET AUGER REFUSAL AT 14.5 FT BGS
20											
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-05
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-06

PAGE 1 OF 1

GROUND ELEVATION (ft): 486 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 482.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	4	02/17/2022
END OF DRILLING (0 hrs.)	▽	4	02/17/2022

ASTM D-1586

DATE STARTED 02/17/2022
DATE FINISHED 02/17/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	PROFILE	IDENTIFICATION OF SOILS / REMARKS
	S-1	3	3	3	3	15				1.0 485.0	Topsoil Stratum T	S-1: Top 12": Topsoil S-1: Brown Silty CLAY, little mf Sand, little f Gravel. (Moist)
	0.0'-2.0'											
	S-2	5	11	50/2"		15						S-2: Brown SILT, little mf Sand, little f Gravel. (Moist)
	2.0'-3.2'								▽			
5	S-3	18	13	13	20	12						S-3: Brown Clay & Silt, and cmf Sand, some mf Gravel. (Wet)
	4.0'-6.0'											
	S-4	50/5"				5						S-4: Brown Silty CLAY, little f Sand, trace f Gravel. (Wet)
	6.0'-6.4'									8.0		
	S-5	50				2				478.0 9.0	Stratum DR	S-5: Brown-Gray Rock fragments.
10	8.0'-8.5'									477		END OF TEST BORING AT 9.0 FEET AUGER REFUSAL AT 9 FT BGS
15												
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-06
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-07

PAGE 1 OF 1

GROUND ELEVATION (ft): 484 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 480.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	4	02/17/2022
END OF DRILLING (0 hrs.)	▽	4	02/18/2022

ASTM D-1586

DATE STARTED 02/17/2022
DATE FINISHED 02/18/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	 6-12"	 12-18"	 18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	2	3	3	8	15				0.5 483.5 Topsoil	S-1: Top 6": Topsoil S-1: Brown Silty CLAY, little cf Sand, trace f Gravel. Moist)
	0.0'-2.0'									Stratum T	
	S-2	12	14	12	11	0					S-2: No Recovery.
	2.0'-4.0'								▽		
5	S-3	12	10	17	22	12					S-3: Brown Clayey SILT, little cmf Sand, little mf Gravel. (Wet)
	4.0'-6.0'										
	S-4	26	21	20	36	15					S-4: Brown Clayey SILT, little cmf Sand, little f Gravel. (Wet)
	6.0'-8.0'										
	S-5	35	45	21	25	10					S-5: Brown SILT & CLAY, some cf Gravel, little cf Sand. (Wet)
10	8.0'-10.0'										
	S-6	27	37	25	29	12					S-6: Brown SILT & CLAY, little cmf Sand, little f Gravel. (Wet)
	10.0'-11.8'									12.0	
										472	END OF TEST BORING AT 12.0 FEET AUGER REFUSAL AT 12 FT BGS
15											
20											
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-07
PAGE 1 OF 1

Colliers
Engineering
& Design
50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-09

PAGE 1 OF 1

GROUND ELEVATION (ft): 468 +/-
ELEV. FROM: Interpolated
GROUNDWATER ELEV. (ft): 468.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/18/2022
END OF DRILLING (0 hrs.)	▽	0	02/18/2022

ASTM D-1586

DATE STARTED 02/18/2022
DATE FINISHED 02/18/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER	BLOWS PER 6 INCHES				RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE		IDENTIFICATION OF SOILS / REMARKS
	DEPTH (ft.)	0-6"	6-12"	12-18"	18-24"					DEPTH ELEV.		
	S-1	5	6	8	5	18			▽		Topsoil	S-1: S-1: Brown Silt, and cmf Sand. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	5	7	8	9	5				466.0	Stratum T	S-2: Brown Silty CLAY, some cmf Sand, trace f Gravel. (Wet)
	2.0'-4.0'											
5	S-3	3	10	14	16	18						S-3: Brown Clayey SILT, some cmf Sand, little f Gravel. (Wet)
	4.0'-6.0'											
	S-4	13	15	13	11	18						S-4: Brown Clayey SILT, some f Sand, little f Gravel. (Wet)
	6.0'-8.0'											
	S-5	9	12	24	19	10						S-5: Brown Clayey Silt, and cmf Sand, little f Gravel. (Wet)
10	8.0'-10.0'											
	S-6	12	12	18	23	18						S-6: Brown Silt & Clay, and f Sand, little f Gravel. (Wet)
	10.0'-11.8'											
										14.0		
15										454		END OF TEST BORING AT 14.0 FEET AUGER REFUSAL AT 14 FT BGS
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-10

PAGE 1 OF 1

GROUND ELEVATION (ft): 466 +/-

ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 466.00

CONTRACTOR: Soil Testing (Inc.)

DRILLER: Andy

DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig

METHOD: HSA X Mud Rotary ____ Other ____

HAMMER: CH X Safety ____ Automatic ____

RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/18/2022
END OF DRILLING (0 hrs.)	▽	0	02/18/2022

ASTM D-1586

DATE STARTED 02/18/2022

DATE FINISHED 02/18/2022

FIELD OBSERVER: M. Rady

CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	 6-12"	 12-18"	 18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	2	3	4	5	5			▽	Topsoil	S-1: S-1: Brown Silt, and f Sand. (Topsoil, Wet)
	0.0'-2.0'									2.0	
	S-2	9	10	11	11	12				464.0 Stratum T	S-2: Brown Clayey SILT, little mf Sand, little f Gravel. (Wet)
	2.0'-4.0'										
5	S-3	9	13	15	18	15					S-3: Brown SILT & CLAY, some mf Sand, little f Gravel. (Wet)
	4.0'-6.0'										
	S-4	20	22	25	15	15					S-4: Brown mf Gravel, and cmf Sand, little Silt. (Wet)
	6.0'-8.0'										
	S-5	19	17	17	23	15					S-5: Brown cmf SAND, some f Gravel, little Silt. (Wet)
10	8.0'-10.0'									10.0	
	S-6	33	50/2"			18				456.0 Stratum DR 10.5	S-6: Gray cmf Gravel (Rock Fragments), little cmf Sand. (Wet).
	10.0'-10.7'									455.5	END OF TEST BORING AT 10.5 FEET AUGER REFUSAL AT 10.5 FT BGS
15											
20											
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-11

PAGE 1 OF 1

GROUND ELEVATION (ft): 454 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 454.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/18/2022
END OF DRILLING (0 hrs.)	▽	0	02/24/2022

ASTM D-1586

DATE STARTED 02/18/2022
DATE FINISHED 02/24/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	 6-12"	 12-18"	 18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.		IDENTIFICATION OF SOILS / REMARKS
	S-1	2	1	2	5	10			▽		Topsoil	S-1: S-1: Brown SILT, little f Sand. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	6	11	11	13	12				452.0	Stratum T	S-2: Brown Clayey SILT, trace f Sand. (Wet)
	2.0'-4.0'											
5	S-3	8	11	12	19	14						S-3: Brown Clayey SILT, trace f Sand. (Wet)
	4.0'-6.0'											
	S-4	6	8	11	13	10						S-4: Brown-Gray SILT & CLAY, little f Sand. (Wet)
	6.0'-8.0'											
	S-5	5	7	11	18	18						S-5: Gray cmf Gravel, and cmf Sand, little Silt. (Wet)
10	8.0'-10.0'											
	S-6	18	14	11	10	18						S-6: Gray cf GRAVEL, little cmf Sand, trace Clayey Silt. (Wet)
	10.0'-12.0'											
15												
	S-7	11	18	22	20	15						S-7: Gray cf SAND, little mf Gravel, trace Silt. (Wet)
	15.0'-17.0'											
20												
	S-8	19	30	35	50	6						S-8: Gray Silty CLAY, trace f Sand. (Wet)
	20.0'-22.0'											
										23.0		
										431		END OF TEST BORING AT 23.0 FEET AUGER REFUSAL AT 23 FT BGS
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-11
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-12

PAGE 1 OF 1

GROUND ELEVATION (ft): 455 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 455.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ______ Other ______
HAMMER: CH X Safety ______ Automatic ______
RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/24/2022
END OF DRILLING (0 hrs.)	▽	0	02/24/2022

ASTM D-1586

DATE STARTED 02/24/2022
DATE FINISHED 02/24/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	 6-12"	 12-18"	 18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	IDENTIFICATION OF SOILS / REMARKS
	S-1	1	1	2	6	12			▽	Topsoil	S-1: S-1: Brown Silty CLAY, little mf Sand, trace f Gravel. (Topsoil, Wet)
	0.0'-2.0'									2.0	
	S-2	11	12	13	14	12				453.0 Stratum T	S-2: Brown-Gray SILT, little f Sand, trace f Gravel. (Wet)
	2.0'-4.0'										
5	S-3	7	8	9	10	12					S-3: Brown-Gray Silt, and f Sand. (Wet)
	4.0'-6.0'										
	S-4	10	12	19	20	18					S-4: Same as S-3.
	6.0'-8.0'										
	S-5	12	10	13	16	18					S-5: Gray SILT, little f Sand. (Wet)
10	8.0'-10.0'										
	S-6	12	14	17	16	12					S-6: Brown Silt, and f Sand. (Wet)
	10.0'-12.0'										
15											
	S-7	37	14	17	18	12					S-7: Gray Clayey Silt, and f Sand, little mf Gravel. (Wet)
	15.0'-17.0'										
20											
	S-8	11	39	19	23	18					S-8: Brown Clayey SILT, some mf Sand. (Wet)
	20.0'-22.0'										
										23.0	
										432	END OF TEST BORING AT 23.0 FEET AUGER REFUSAL AT 23 FT BGS
25											
30											
35											
40											

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-13

PAGE 1 OF 1

GROUND ELEVATION (ft): 455 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 455.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Andy
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:	DEPTH (ft)	DATE
FIRST ENCOUNTERED ▽	0	02/24/2022
END OF DRILLING (0 hrs.) ▽	0	02/24/2022

ASTM D-1586

DATE STARTED 02/24/2022
DATE FINISHED 02/24/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.	PROFILE	IDENTIFICATION OF SOILS / REMARKS
	S-1	1	6	6	7	12			▽		Topsoil	S-1: S-1: Brown cf SAND, some Silt, little cmf Gravel. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	2	2	3	4	10				453.0	Stratum T	S-2: Gray Clayey SILT, little f Sand. (Wet)
	2.0'-4.0'											
5	S-3	1	1	12	50/3"	0						S-3: No Recovery. Wood stuck in spoon tip.
	4.0'-5.8'											
	S-4	50/0"				18						S-4: No Recovery.
	6.0'-6.0'											
	S-5	8	9	10	16	12						S-5: Brown f SAND, little Silt. (Wet)
10	8.0'-10.0'											
	S-6	11	12	18	40	14						S-6: Same as S-5.
	10.0'-12.0'											
15												
	S-7	21	24	25	25	14						S-7: Brown-Gray cmf SAND, little f Gravel, trace Clayey Silt. (Wet)
	15.0'-17.0'									17.0		
										438		END OF TEST BORING AT 17.0 FEET
												AUGER REFUSAL AT 17 FT BGS
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

TEST BORING: TB-13
PAGE 1 OF 1

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-14

PAGE 1 OF 1

GROUND ELEVATION (ft): 455 +/-
ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 455.00

CONTRACTOR: Soil Testing (Inc.)
DRILLER: Danny
DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig
METHOD: HSA X Mud Rotary ____ Other ____
HAMMER: CH X Safety ____ Automatic ____
RODS: AW ____ NW X Other ____

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/24/2022
END OF DRILLING (0 hrs.)	▽	0	02/24/2022

ASTM D-1586

DATE STARTED 02/24/2022
DATE FINISHED 02/24/2022
FIELD OBSERVER: M. Rady
CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES 0-6"	6-12"	12-18"	18-24"	RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.		IDENTIFICATION OF SOILS / REMARKS
	S-1	1	3	4	7	14			▽		Topsoil	S-1: S-1: Brown Silt, and cf Sand. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	8	12	14	15	19				453.0	Stratum T	S-2: Brown-Gray cf SAND, some Silt, little f Gravel. (Wet)
	2.0'-4.0'											
5	S-3	9	12	9	7	0						S-3: Brown-Gray cmf SAND, little Silt. (Wet)
	4.0'-5.8'											
	S-4	17	50/3"			18				7.0		S-4: Gray-Brown Silt, and f Sand, some c Gravel. (Wet)
	6.0'-6.8'									448		END OF TEST BORING AT 7.0 FEET AUGER REFUSAL AT 7 FT BGS
10												
15												
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

Colliers Engineering & Design

50 Chestnut Ridge Road, Suite 101, Montvale, NJ 07645

PROJECT: RDM Simon

LOCATION: Town of Wawayanda, Orange County, NY

PROJECT NO. 21004268A

TEST BORING: TB-15

PAGE 1 OF 1

GROUND ELEVATION (ft): 454 +/-

ELEV. FROM: Interpolated

GROUNDWATER ELEV. (ft): 454.00

CONTRACTOR: Soil Testing (Inc.)

DRILLER: Andy

DRILLING EQUIPMENT: Diedrich D50T Track Mounted Rig

METHOD: HSA X Mud Rotary ______ Other ______

HAMMER: CH X Safety ______ Automatic ______

RODS: AW ______ NW X Other ______

GROUNDWATER:		DEPTH (ft)	DATE
FIRST ENCOUNTERED	▽	0	02/24/2022
END OF DRILLING (0 hrs.)	▽	0	02/24/2022

ASTM D-1586

DATE STARTED 02/24/2022

DATE FINISHED 02/24/2022

FIELD OBSERVER: M. Rady

CHECKED BY: A. Elmekati

DEPTH BELOW SURFACE (ft.)	SAMPLE NUMBER DEPTH (ft.)	BLOWS PER 6 INCHES				RECOVERY (in)	POCKET PENETROM. (tsf)	MOISTURE (%)	WATER SYMBOL	PROFILE DEPTH ELEV.		IDENTIFICATION OF SOILS / REMARKS
		0-6"	6-12"	12-18"	18-24"							
	S-1	1	3	3	7	3			▽		Topsoil	S-1: S-1: Brown SILT, little f Sand. (Topsoil, Wet)
	0.0'-2.0'									2.0		
	S-2	11	15	9	14	12				452.0	Stratum T	S-2: Brown Clayey SILT, little f Sand. (Wet)
	2.0'-4.0'											
5	S-3	5	5	6	10	18						S-3: Brown Clayey SILT, little f Sand. (Wet)
	4.0'-5.8'											
	S-4	6	15	17	19	15						S-4: Brown cmf SAND, little Clayey Silt, little f Gravel. (Wet)
	6.0'-8.0'									8.0		
	S-5	5	12	26	11	15				446.0	Stratum DR	S-5: Gray cmf Gravel (Rock Fragments), and Silt, little cf Sand. (Wet)
10	8.0'-10.0'											
	S-6	10	50/3"			6						S-6: Same as S-6.
	10.0'-10.8'									12.0		
										442		END OF TEST BORING AT 12.0 FEET AUGER REFUSAL AT 12 FT BGS
15												
20												
25												
30												
35												
40												

NOTES: Test boring backfilled upon completion.

Appendix B

Soil Laboratory Testing

Colliers Engineering & Design #21004268A
RDM Simon
LABORATORY TESTING DATA SUMMARY

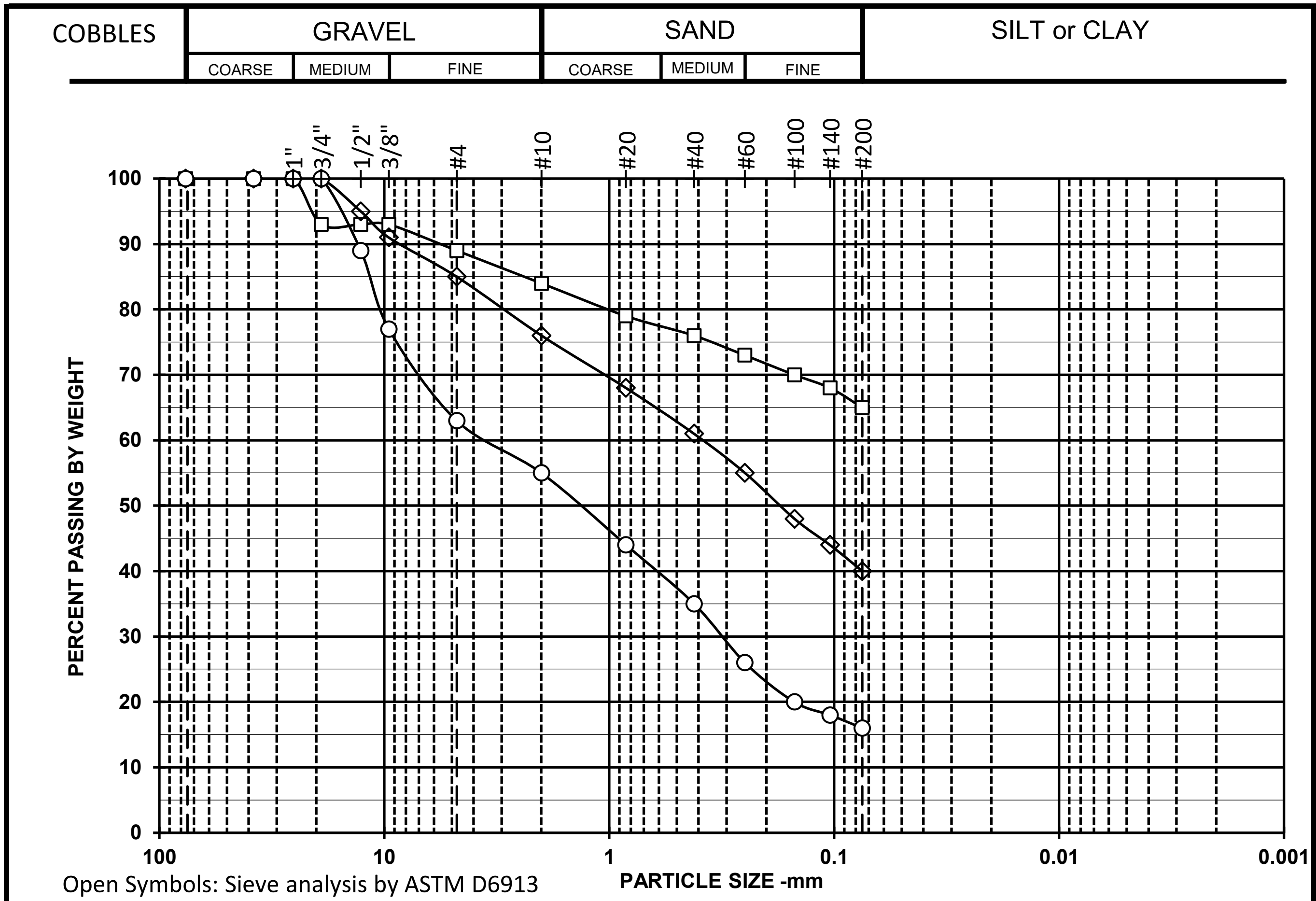
BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS						REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	
TB-01	S-6	10-12	15.3	23	15	8	CL		
TB-02	S-9	25-27	10.8				ML	65	
TB-06	S-3	4-6	12.8				SC	40	
TB-10	S-4	6-8	11.4				SM	16	

Note: (1) USCS symbol based on visual observation and Sieve and Atterberg limits reported.

Prepared by: NG
Reviewed by: CMJ
Date: 3/24/2022

TerraSense
45H Commerce Way
Totowa, NJ 07512

Project No.: 21004268A
File: Indx1.xlsx



Open Symbols: Sieve analysis by ASTM D6913

Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

Symbol	□	◇	○
Boring	TB-02	TB-06	TB-10
Sample	S-9	S-3	S-4
Depth	25-27	4-6	6-8
% +3"	0	0	0
% Gravel	16	24	45
% SAND	19	36	39
%C SAND	6	11	15
%M SAND	5	10	14
%F SAND	8	15	10
% FINES	65	40	16
D_{100} (mm)	25.4	19.1	19.1
D_{60} (mm)		0.384	3.43
D_{30} (mm)			0.31
D_{10} (mm)			
Cc			
Cu			

Size/ID #	Percent Finer Data		
6"	100	100	100
4"	100	100	100
3"	100	100	100
1 1/2"	100	100	100
1"	100	100	100
3/4"	93	100	100
1/2"	93	95	89
3/8"	93	91	77
#4	89	85	63
#10	84	76	55
#20	79	68	44
#40	76	61	35
#60	73	55	26
#100	70	48	20
#140	68	44	18
#200	65	40	16
5µ m			
2µ m			
1µ m			

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	MODIFIED BURMISTER DESCRIPTION AND REMARKS	DATE
□	10.8				ML		Gray Clayey SILT, little coarse medium to fine Sand, little medium to fine Gravel.	03/15/22
◇	12.8				SC		Brown Clay & Silt, and coarse medium to fine Sand, some medium to fine Gravel.	03/15/22
○	11.4				SM		Brown medium to fine Gravel, and coarse medium to fine Sand, little Silt.	03/15/22

Colliers Engineering & Design #21004268A

TerraSense #21004268A

RDM Simon

PARTICLE SIZE DISTRIBUTION

TerraSense Analysis File: GrainSizeTSLV2

Siev1a.xlsx 3/24/2022

Appendix C

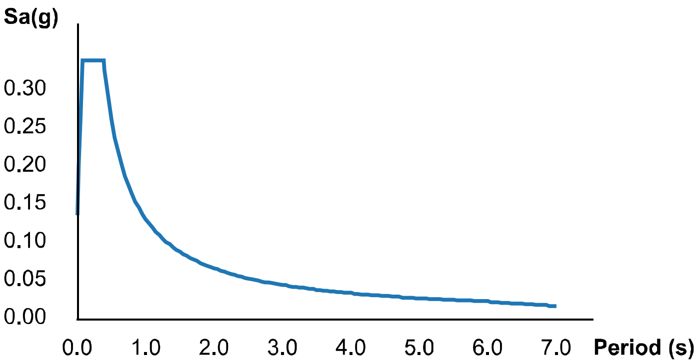
Seismic Design Report

Hazards by Location

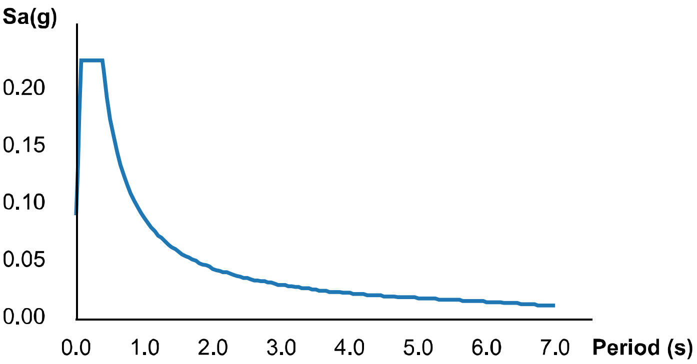
Search Information

Coordinates:	41.422900679936724, -74.42062976776734
Elevation:	512 ft
Timestamp:	2022-03-15T12:29:22.238Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.211	MCE_R ground motion (period=0.2s)
S_1	0.054	MCE_R ground motion (period=1.0s)
S_{MS}	0.338	Site-modified spectral acceleration value
S_{M1}	0.13	Site-modified spectral acceleration value
S_{DS}	0.225	Numeric seismic design value at 0.2s SA
S_{D1}	0.087	Numeric seismic design value at 1.0s SA

▾Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s
CR_S	0.942	Coefficient of risk (0.2s)
CR_1	0.93	Coefficient of risk (1.0s)
PGA	0.12	MCE_G peak ground acceleration
F_{PGA}	1.559	Site amplification factor at PGA
PGA_M	0.188	Site modified peak ground acceleration

T_L	6	Long-period transition period (s)
SsRT	0.211	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.224	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.054	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.058	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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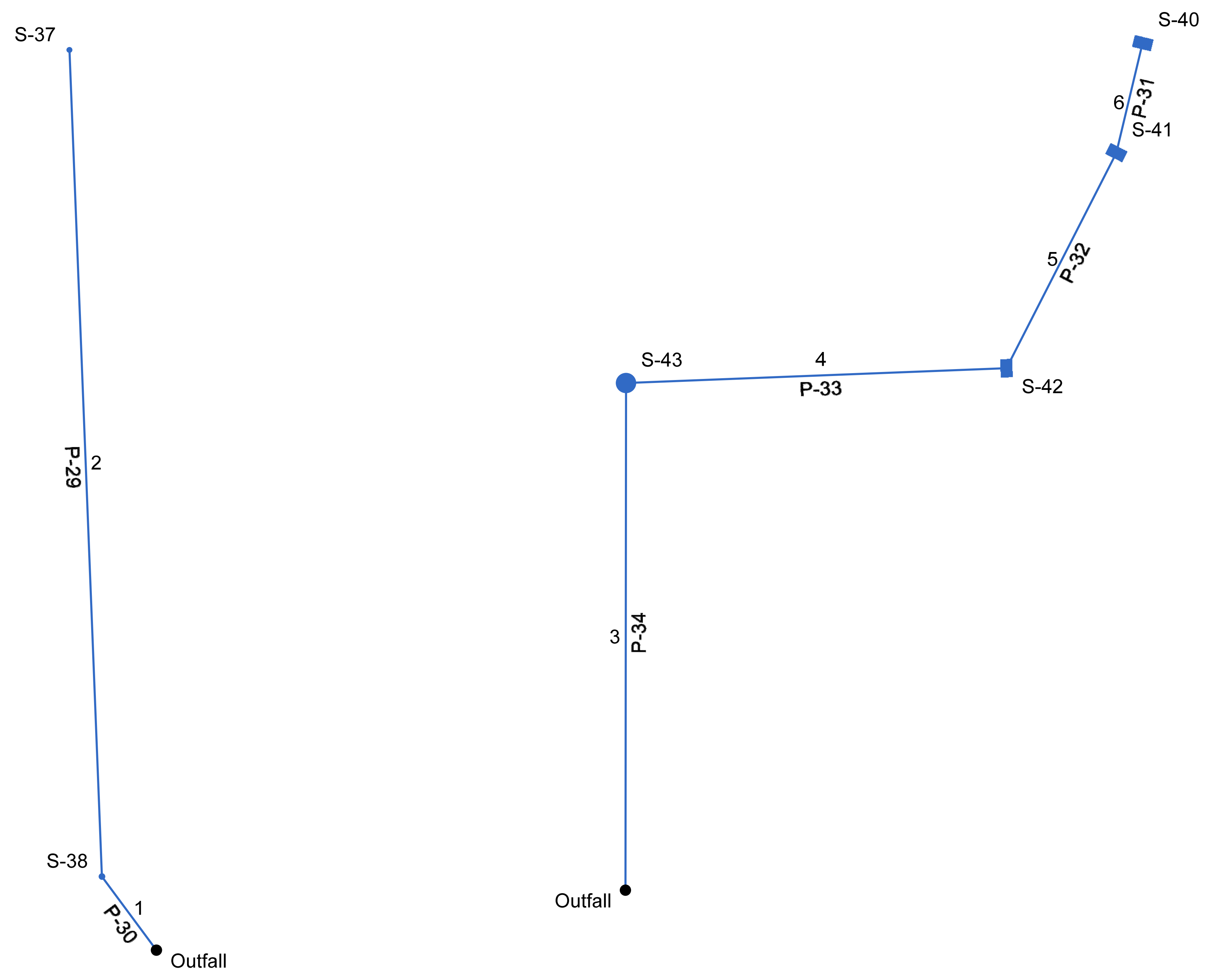
Accelerating success.

APPENDIX 17

HYDROFLOW PIPE CAPACITY REPORT

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



Project File: Simon Stormwater BLDG_1_PARK.stm	Number of lines: 6	Date: 8/10/2022

Storm Sewers v2020.00

MC Report

Line No.	Line ID	Inlet ID	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	i Sys (in/hr)	Q Capt (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Type	n-val Pipe	Line Size (in)	Line Slope (%)	Line Length (ft)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)
1	P-30	S-38	0.31	0.90	6.7	7.58	....	4.23	29.52	10.96	Cir	0.012	15	17.80	20	483.58	480.00	487.87	480.12	484.41	480.32
2	P-29	S-37	0.31	0.90	6.0	7.98	....	2.23	2.49	4.96	Cir	0.012	10	1.10	182	486.00	484.00	488.86	487.87	486.67	484.62
3	P-34	S-43	0.22	0.90	7.5	7.20	1.58	5.92	8.06	4.99	Cir	0.012	18	0.50	112	480.56	480.00	485.58	481.30	481.53	480.94
4	P-33	S-42	0.52	0.90	7.2	7.37	3.74	4.60	4.96	3.75	Cir	0.012	15	0.50	83	481.00	480.58	483.91	485.58	482.60	482.24
5	P-32	S-41	0.04	0.39	6.3	7.82	0.12	1.22	4.99	1.00	Cir	0.012	15	0.51	53	481.38	481.11	483.71	483.91	483.12	483.10
6	P-31	S-40	0.44	0.32	6.0	7.98	1.12	1.12	2.79	1.43	Cir	0.012	12	0.52	25	481.51	481.38	483.69	483.71	483.15	483.12

Project File: Simon Stormwater BLDG_1_PARK.stm

Number of lines: 6

Date: 8/10/2022

NOTES: Intensity = 39.57 / (Inlet time + 3.70) ^ 0.70 -- Return period = 25 Yrs. ; ** Critical depth

MC Report

Cover Up (ft)	Cover Dn (ft)	Line No.	
3.04	-1.13	1	
2.03	3.04	2	
3.52	-0.20	3	
1.66	3.75	4	
1.08	1.55	5	
1.18	1.33	6	

Project File: Simon Stormwater BLDG_1_PARK.stm	Number of lines: 6	Date: 8/10/2022

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	15	4.23	480.00	480.32	0.32	0.25	17.05	0.37	480.69	0.000	20	483.58	484.41	0.83**	0.87	4.87	0.37	484.78	0.000	0.000	n/a	0.62	0.23
2	10	2.23	484.00	484.62	0.62*	0.43	5.16	0.35	484.97	0.000	182	486.00	486.67	0.67**	0.47	4.76	0.35	487.02	0.000	0.000	n/a	1.00	0.35
3	18	5.92	480.00	480.94	0.94	1.17	5.08	0.40	481.34	0.527	112	480.56	481.53	0.97	1.21	4.89	0.37	481.90	0.479	0.503	0.561	1.50	0.56
4	15	4.60	480.58	482.24	1.25	1.23	3.75	0.22	482.46	0.433	83	481.00	482.60	1.25	1.23	3.75	0.22	482.82	0.433	0.433	0.361	1.34	0.29
5	15	1.22	481.11	483.10	1.25	1.23	1.00	0.02	483.12	0.031	53	481.38	483.12	1.25	1.23	1.00	0.02	483.13	0.031	0.031	0.016	0.50	0.01
6	12	1.12	481.38	483.12	1.00	0.79	1.43	0.03	483.16	0.085	25	481.51	483.15	1.00	0.79	1.43	0.03	483.18	0.085	0.085	0.021	1.00	0.03

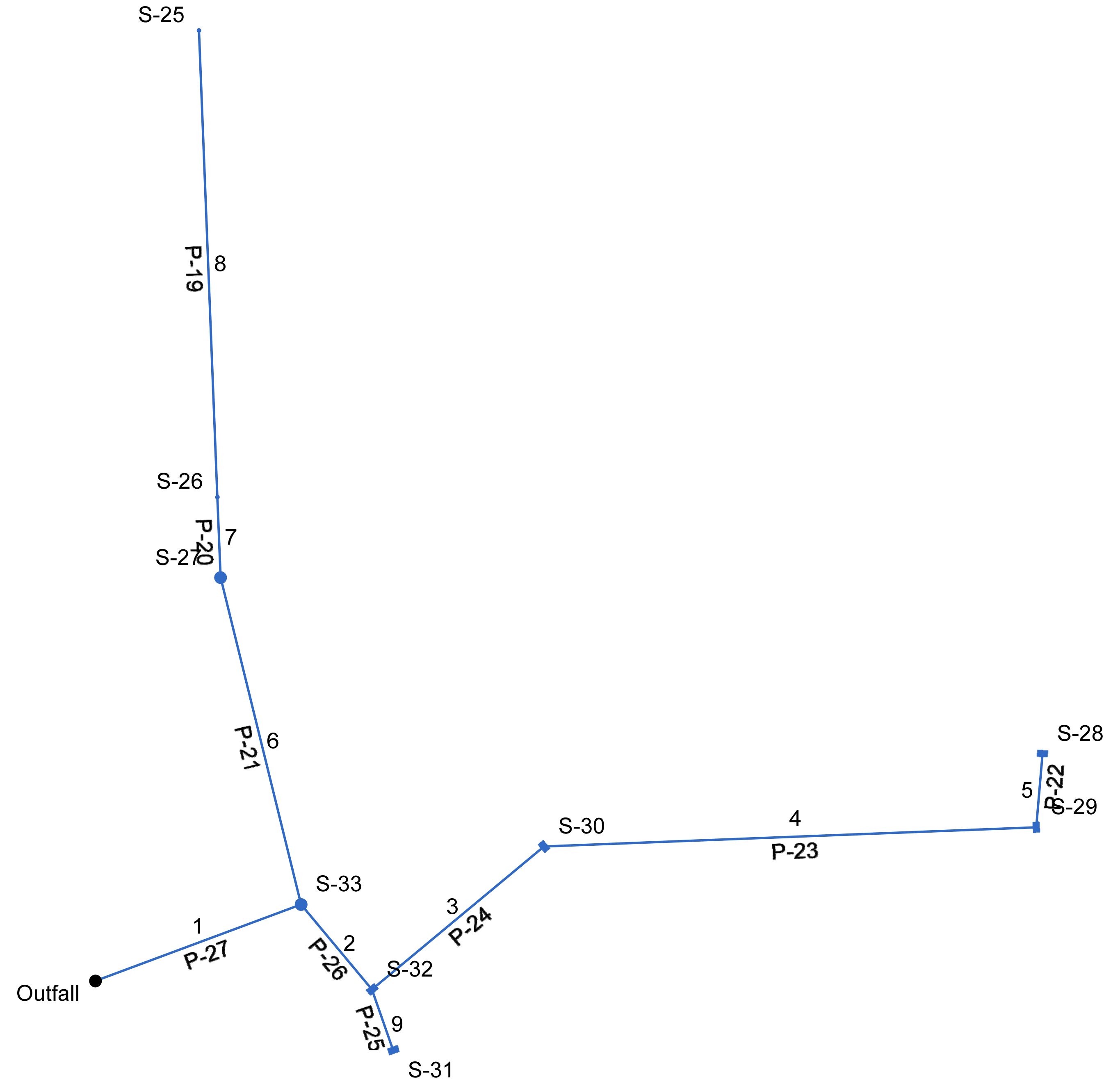
Project File: Simon Stormwater BLDG_1_PARK.stm

Number of lines: 6

Run Date: 8/10/2022

Notes: * Normal depth assumed; ** Critical depth. ; c = cir e = ellip b = box

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



Project File: Simon Stormwater BLDG_1_TRAILER.stm	Number of lines: 9	Date: 8/10/2022

Storm Sewers v2020.00

MC Report

Line No.	Line ID	Inlet ID	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	i Sys (in/hr)	Q Capt (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Type	n-val Pipe	Line Size (in)	Line Slope (%)	Line Length (ft)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)
1	P-27	S-33	0.17	0.60	11.4	5.85	....	8.53	13.86	5.97	Cir	0.012	18	1.48	84	475.25	474.00	484.00	474.63	476.38	475.13
2	P-26	S-32	0.17	0.60	11.2	5.90	0.81	4.14	6.70	3.79	Cir	0.012	15	0.92	43	475.89	475.50	478.42	484.00	476.82	476.76
3	P-24	S-30	0.41	0.81	10.8	6.02	2.65	3.47	0.00	3.53	Cir	0.012	15	1.00	86	476.75	475.89	481.02	478.42	477.54	477.39
4	P-23	S-29	0.32	0.68	8.8	6.69	1.74	1.63	0.00	2.13	Cir	0.012	15	0.50	189	477.70	476.76	479.79	481.02	478.28	478.07
5	P-22	S-28	0.22	0.12	6.0	7.98	0.21	0.21	0.00	1.10	Cir	0.012	15	1.05	29	478.00	477.70	480.60	479.79	478.18	478.60
6	P-21	S-27	0.80	0.12	7.2	7.37	0.77	4.82	0.00	4.58	Cir	0.012	15	0.77	130	476.50	475.50	478.76	484.00	477.39	476.69
7	P-20	S-26	0.31	0.90	7.1	7.42	....	4.14	0.00	5.27	Cir	0.012	12	0.81	31	476.75	476.50	478.76	478.76	477.86	477.50
8	P-19	S-25	0.31	0.90	6.0	7.98	....	2.23	0.00	3.53	Cir	0.012	12	1.94	180	480.25	476.75	482.36	478.76	480.89	478.23
9	P-25	S-31	0.05	0.47	6.0	7.98	0.19	0.19	0.00	0.15	Cir	0.012	15	0.80	25	476.00	475.80	478.42	478.42	477.51	477.51

Project File: Simon Stormwater BLDG_1_TRAILER.stm

Number of lines: 9

Date: 8/10/2022

NOTES: Intensity = 39.57 / (Inlet time + 3.70) ^ 0.70 -- Return period = 25 Yrs. ; ** Critical depth

MC Report

Cover Up (ft)	Cover Dn (ft)	Line No.
7.25	-0.87	1
1.28	7.25	2
3.02	1.28	3
0.84	3.01	4
1.35	0.84	5
1.01	7.25	6
1.01	1.26	7
1.11	1.01	8
1.17	1.37	9

Project File: Simon Stormwater BLDG_1_TRAILER.stm	Number of lines: 9	Date: 8/10/2022

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	18	8.53	474.00	475.13	1.13	1.43	5.98	0.55	475.68	0.000	84	475.25	476.38	1.13**	1.43	5.97	0.55	476.94	0.000	0.000	n/a	0.99	0.55
2	15	4.14	475.50	476.76	1.25	1.23	3.38	0.18	476.94	0.351	43	475.89	476.82	0.93	0.98	4.21	0.28	477.10	0.425	0.388	0.165	1.50	0.41
3	15	3.47	475.89	477.39	0.00	0.00	2.83	0.00	477.39	0.000	86	476.75	477.54	0.00**	0.00	4.24	0.00	477.54	0.000	0.000	0.000	0.99	n/a
4	15	1.63	476.76	478.07	0.00	0.00	1.33	0.00	478.07	0.000	189	477.70	478.28	0.00**	0.00	2.92	0.00	478.28	0.000	0.000	0.000	1.49	n/a
5	15	0.21	477.70	478.60	0.00	0.00	0.22	0.00	478.60	0.000	29	478.00	478.18	0.00**	0.00	1.98	0.00	478.18	0.000	0.000	0.000	1.00	n/a
6	15	4.82	475.50	476.69	0.00	0.00	3.99	0.00	476.69	0.000	130	476.50	477.39	0.00**	0.00	5.16	0.00	477.39	0.000	0.000	0.000	0.50	n/a
7	12	4.14	476.50	477.50	0.00*	0.00	5.27	0.00	477.50	0.000	31	476.75	477.86	0.00**	0.00	5.27	0.00	477.86	0.000	0.000	0.000	0.15	n/a
8	12	2.23	476.75	478.23	0.00	0.00	2.84	0.00	478.23	0.000	180	480.25	480.89	0.00**	0.00	4.21	0.00	480.89	0.000	0.000	0.000	1.00	n/a
9	15	0.19	475.80	477.51	0.00	0.00	0.15	0.00	477.51	0.000	25	476.00	477.51	0.00**	0.00	0.15	0.00	477.51	0.000	0.000	0.000	1.00	n/a

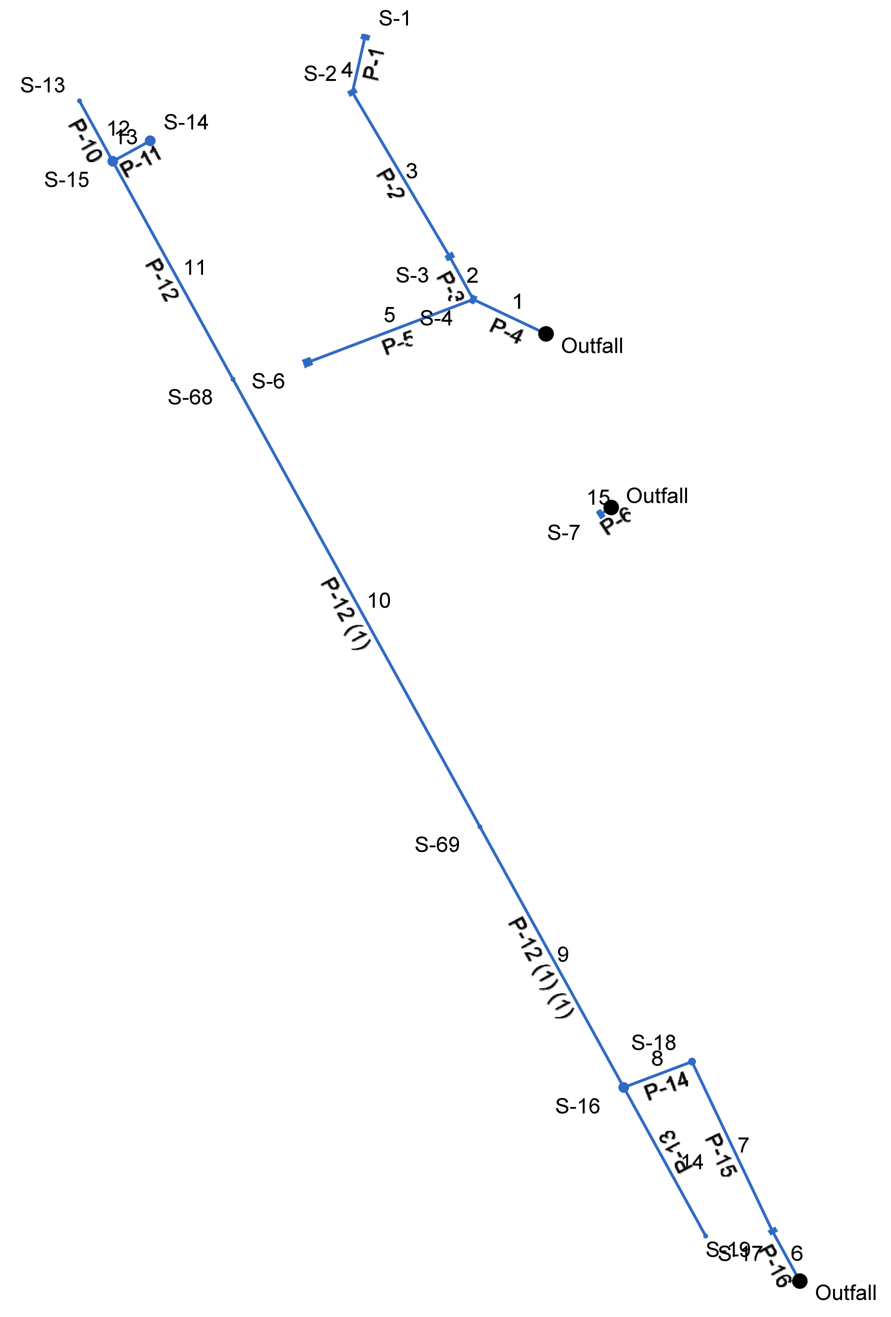
Project File: Simon Stormwater BLDG_1_TRAILER.stm

Number of lines: 9

Run Date: 8/10/2022

Notes: * Normal depth assumed; ** Critical depth. ; c = cir e = ellip b = box

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



Project File: Simon Stormwater BLDG_2_PARK.stm	Number of lines: 15	Date: 8/10/2022

Storm Sewers v2020.00

MC Report

Line No.	Line ID	Inlet ID	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	i Sys (in/hr)	Q Capt (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Type	n-val Pipe	Line Size (in)	Line Slope (%)	Line Length (ft)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)	HGL Dn (ft)
1	P-4	S-4	0.09	0.90	7.9	7.02	0.65	3.67	21.88	8.58	Cir	0.012	15	9.78	41	467.50	463.50	473.78	464.28	468.27	463.86
2	P-3	S-3	0.08	0.73	7.7	7.12	0.47	1.43	5.47	4.73	Cir	0.012	12	2.01	25	473.00	472.50	474.53	473.78	473.51	472.85
3	P-2	S-2	0.07	0.90	6.6	7.66	0.50	1.09	5.87	3.36	Cir	0.012	12	2.32	97	475.50	473.25	479.42	474.53	475.94	473.68
4	P-1	S-1	0.21	0.38	6.0	7.98	0.64	0.64	5.08	2.05	Cir	0.012	12	1.73	29	476.00	475.50	479.42	479.42	476.33 j	476.10
5	P-5	S-6	0.33	0.73	6.0	7.98	1.92	1.92	5.21	2.71	Cir	0.012	15	0.55	90	468.00	467.50	471.53	473.78	468.55	468.57
6	P-16	S-19	0.28	0.60	10.4	6.14	1.34	18.57	42.43	10.08	Cir	0.012	24	3.00	29	460.87	460.00	467.23	462.38	462.42	460.93
7	P-15	S-18	0.17	0.54	10.1	6.22	0.73	17.78	26.05	7.46	Cir	0.012	24	1.13	96	462.45	461.37	466.02	467.23	463.97	462.71
8	P-14	S-16	0.79	0.90	10.0	6.24	....	17.26	22.89	12.06	Cir	0.012	18	4.05	37	464.50	463.00	471.81	466.02	465.94	463.97
9	P-12 (1) (1)	S-69	1.10	0.90	9.7	6.36	....	11.86	8.52	6.71	Cir	0.012	18	0.56	152	466.50	465.65	472.25	471.81	468.80	467.15
10	P-12 (1)	S-68	0.49	0.90	8.5	6.78	....	5.93	8.49	3.36	Cir	0.012	18	0.56	260	468.00	466.55	472.89	472.25	470.13	469.43
11	P-12	S-15	0.25	0.90	7.8	7.09	....	3.08	5.38	2.51	Cir	0.012	15	0.59	127	468.75	468.00	472.86	472.89	470.48	470.24
12	P-10	S-13	0.21	0.90	6.0	7.98	....	1.51	3.25	1.92	Cir	0.012	12	0.71	35	469.00	468.75	472.51	472.86	470.68	470.62
13	P-11	S-14	0.20	0.10	6.0	7.98	0.16	0.16	4.15	0.20	Cir	0.012	12	1.16	22	469.00	468.75	471.16	472.86	470.68	470.68
14	P-13	S-17	0.21	0.90	6.0	7.98	....	1.51	6.56	2.79	Cir	0.012	12	2.89	86	467.50	465.00	471.34	471.81	468.02 j	467.41
15	P-6	S-7	0.85	0.85	6.0	7.98	5.77	5.77	38.62	13.95	Cir	0.012	15	30.47	6	464.00	462.07	469.89	464.35	464.97	462.40

Project File: Simon Stormwater BLDG_2_PARK.stm

Number of lines: 15

Date: 8/10/2022

NOTES: Intensity = 39.57 / (Inlet time + 3.70) ^ 0.70 -- Return period = 25 Yrs. ; ** Critical depth

MC Report

Cover Up (ft)	Cover Dn (ft)	Line No.	
5.03	-0.47	1	
0.53	0.28	2	
2.92	0.28	3	
2.42	2.92	4	
2.28	5.03	5	
4.36	0.38	6	
1.57	3.86	7	
5.81	1.52	8	
4.25	4.66	9	
3.39	4.20	10	
2.86	3.64	11	
2.51	3.11	12	
1.16	3.11	13	
2.84	5.81	14	
4.64	1.03	15	

Project File: Simon Stormwater BLDG_2_PARK.stm	Number of lines: 15	Date: 8/10/2022

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	15	3.67	463.50	463.86	0.36	0.29	12.56	0.33	464.19	0.000	41	467.50	468.27	0.77**	0.80	4.61	0.33	468.60	0.000	0.000	n/a	1.15	n/a
2	12	1.43	472.50	472.85	0.35*	0.24	5.86	0.20	473.05	0.000	25	473.00	473.51	0.51**	0.40	3.59	0.20	473.71	0.000	0.000	n/a	0.50	0.10
3	12	1.09	473.25	473.68	0.43	0.32	3.42	0.17	473.84	0.000	97	475.50	475.94	0.44**	0.33	3.29	0.17	476.11	0.000	0.000	n/a	1.09	n/a
4	12	0.64	475.50	476.10	0.60	0.23	1.30	0.12	476.22	0.000	29	476.00	476.33 j	0.33**	0.23	2.80	0.12	476.45	0.000	0.000	n/a	1.00	n/a
5	15	1.92	467.50	468.57	1.07	0.52	1.73	0.21	468.78	0.000	90	468.00	468.55	0.55**	0.52	3.68	0.21	468.76	0.000	0.000	n/a	1.00	0.21
6	24	18.57	460.00	460.93	0.93*	1.42	13.05	0.79	461.71	0.000	29	460.87	462.42	1.55**	2.61	7.11	0.79	463.21	0.000	0.000	n/a	0.50	0.39
7	24	17.78	461.37	462.71	1.34	2.23	7.96	0.75	463.46	0.000	96	462.45	463.97	1.52**	2.56	6.95	0.75	464.72	0.000	0.000	n/a	1.50	n/a
8	18	17.26	463.00	463.97	0.97*	1.21	14.23	1.52	465.50	0.000	37	464.50	465.94	1.44**	1.74	9.89	1.52	467.46	0.000	0.000	n/a	1.00	1.52
9	18	11.86	465.65	467.15	1.50*	1.77	6.71	0.70	467.85	1.087	152	466.50	468.80	1.50	1.77	6.71	0.70	469.50	1.086	1.087	1.647	0.15	0.10
10	18	5.93	466.55	469.43	1.50	1.77	3.36	0.18	469.60	0.272	260	468.00	470.13	1.50	1.77	3.36	0.18	470.31	0.272	0.272	0.708	0.15	0.03
11	15	3.08	468.00	470.24	1.25	1.23	2.51	0.10	470.34	0.194	127	468.75	470.48	1.25	1.23	2.51	0.10	470.58	0.194	0.194	0.246	1.00	0.10
12	12	1.51	468.75	470.62	1.00	0.79	1.92	0.06	470.68	0.153	35	469.00	470.68	1.00	0.79	1.92	0.06	470.73	0.153	0.153	0.054	1.00	0.06
13	12	0.16	468.75	470.68	1.00	0.79	0.20	0.00	470.68	0.002	22	469.00	470.68	1.00	0.79	0.20	0.00	470.68	0.002	0.002	0.000	1.00	0.00
14	12	1.51	465.00	467.41	1.00	0.41	1.92	0.06	467.46	0.153	86	467.50	468.02 j	0.52**	0.41	3.65	0.21	468.23	0.535	0.344	n/a	1.00	n/a
15	15	5.77	462.07	462.40	0.33	0.26	22.27	0.49	462.89	0.000	6	464.00	464.97	0.97**	1.02	5.64	0.49	465.47	0.000	0.000	n/a	1.00	n/a

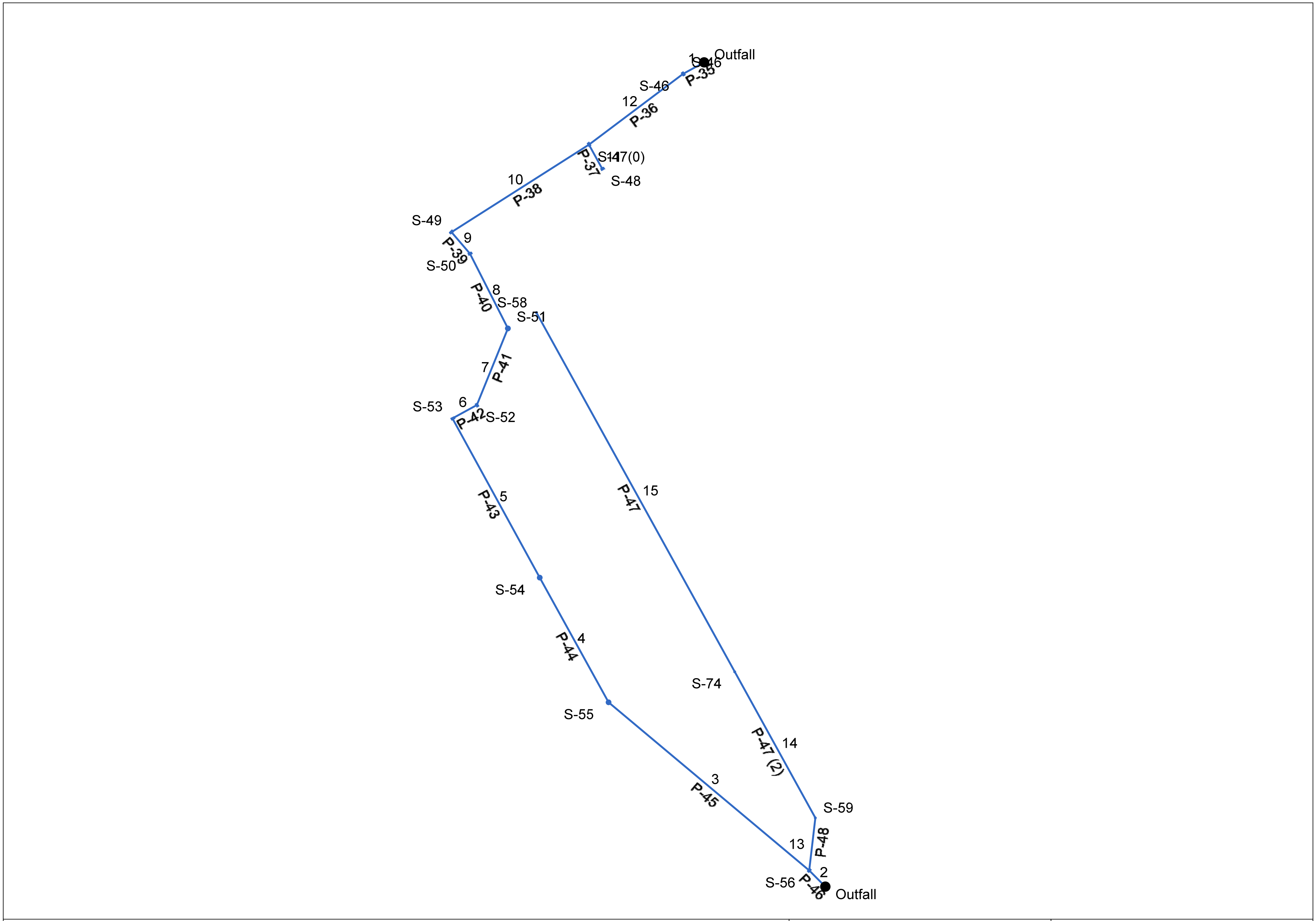
Project File: Simon Stormwater BLDG_2_PARK.stm

Number of lines: 15

Run Date: 8/10/2022

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

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



Project File: Simon Stormwater BLDG_2_Trailer.stm	Number of lines: 15	Date: 8/10/2022

MC Report

Line No.	Line ID	Inlet ID	Drng Area (ac)	Runoff Coeff (C)	Tc (min)	i Sys (in/hr)	Q Capt (cfs)	Total Runoff (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Type	n-val Pipe	Line Size (in)	Line Slope (%)	Line Length (ft)	Invert Up (ft)	Invert Dn (ft)	Gnd/Rim El Up (ft)	Gnd/Rim El Dn (ft)	HGL Up (ft)
1	P-35	S-46	0.15	0.67	6.0	7.98	0.80	0.80	7.02	3.28	Cir	0.012	15	1.01	25	478.25	478.00	481.25	481.25	478.60
2	P-46	S-56	0.42	0.51	13.8	5.27	1.71	27.12	31.02	9.73	Cir	0.012	24	1.60	24	458.38	458.00	466.68	460.16	460.19
3	P-45	S-55	1.22	0.90	12.8	5.49	8.77	13.24	17.39	4.21	Cir	0.012	24	0.50	272	459.75	458.38	464.63	466.68	461.99
4	P-44	S-54	0.80	0.78	11.9	5.72	4.98	7.51	17.43	2.39	Cir	0.012	24	0.51	148	460.50	459.75	466.12	464.63	462.48
5	P-43	S-53	0.21	0.44	10.6	6.06	0.74	4.18	8.02	2.81	Cir	0.012	18	0.50	189	461.75	460.81	469.68	466.12	462.77
6	P-42	S-52	0.05	0.90	10.4	6.13	0.36	3.65	7.92	3.35	Cir	0.012	18	0.49	29	462.00	461.86	469.68	469.68	462.73
7	P-41	S-51	0.72	0.10	9.8	6.34	0.57	3.49	8.04	3.72	Cir	0.012	18	0.50	86	462.50	462.07	465.00	469.68	463.21 j
8	P-40	S-50	0.07	0.90	9.2	6.52	0.50	3.13	19.09	3.84	Cir	0.012	15	7.45	87	469.00	462.50	476.75	465.00	469.71 j
9	P-39	S-49	0.54	0.25	9.0	6.59	1.08	2.74	9.11	5.32	Cir	0.012	15	1.70	29	472.00	471.50	475.62	476.75	472.66
10	P-38	S-47(0)	0.33	0.33	8.0	7.00	0.87	1.97	4.92	4.08	Cir	0.012	12	1.63	169	475.00	472.25	478.18	475.62	475.60
11	P-37	S-48	0.08	0.90	6.0	7.98	0.57	0.57	3.59	1.78	Cir	0.012	12	0.87	29	475.25	475.00	478.18	478.18	475.56
12	P-36	S-46	0.15	0.67	6.0	7.98	0.80	0.80	6.04	2.07	Cir	0.012	12	2.45	122	478.00	475.00	481.25	478.18	478.37 j
13	P-48	S-59	0.70	0.90	8.9	6.64	....	16.74	13.53	9.47	Cir	0.012	18	1.41	55	460.00	459.22	471.97	466.68	461.91
14	P-47 (2)	S-74	1.40	0.90	8.5	6.79	....	12.84	8.05	7.26	Cir	0.012	18	0.50	174	460.87	460.00	468.99	471.97	465.58
15	P-47	S-58	0.70	0.90	6.0	7.98	....	5.03	8.11	2.85	Cir	0.012	18	0.51	427	463.04	460.87	466.66	468.99	467.23

Project File: Simon Stormwater BLDG_2_Trailer.stm

Number of lines: 15

Date: 8/10/2022

NOTES: Intensity = 39.57 / (Inlet time + 3.70) ^ 0.70 -- Return period = 25 Yrs. ; ** Critical depth

MC Report

HGL Dn (ft)	Cover Up (ft)	Cover Dn (ft)	Line No.
478.29	1.75	2.00	1
459.55	6.30	0.16	2
461.19	2.88	6.30	3
462.35	3.62	2.88	4
462.53	6.43	3.81	5
463.06	6.18	6.32	6
462.95	1.00	6.11	7
463.39	6.50	1.25	8
471.97	2.37	4.00	9
472.83	2.18	2.37	10
475.82	1.93	2.18	11
475.83	2.25	2.18	12
460.72	10.47	5.96	13
463.37	6.62	10.47	14
466.40	2.12	6.62	15

Project File: Simon Stormwater BLDG_2_Trailer.stm

Number of lines: 15

Date: 8/10/2022

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	15	0.80	478.00	478.29	0.29	0.22	3.72	0.13	478.42	0.000	25	478.25	478.60	0.35**	0.28	2.85	0.13	478.73	0.000	0.000	n/a	1.00	0.13
2	24	27.12	458.00	459.55	1.55	2.61	10.38	1.28	460.83	0.000	24	458.38	460.19	1.81**	2.99	9.07	1.28	461.47	0.000	0.000	n/a	1.22	1.56
3	24	13.24	458.38	461.19	2.00	3.14	4.21	0.28	461.47	0.292	272	459.75	461.99	2.00	3.14	4.21	0.28	462.26	0.292	0.292	0.794	0.62	0.17
4	24	7.51	459.75	462.35	2.00	3.14	2.39	0.09	462.44	0.094	148	460.50	462.48	1.98	3.14	2.40	0.09	462.57	0.087	0.090	0.134	0.50	0.04
5	18	4.18	460.81	462.53	1.50	1.77	2.36	0.09	462.61	0.135	189	461.75	462.77	1.02	1.28	3.26	0.17	462.94	0.208	0.171	0.324	1.50	0.25
6	18	3.65	461.86	463.06	1.20	0.85	2.42	0.29	463.34	0.000	29	462.00	462.73	0.73**	0.85	4.28	0.29	463.01	0.000	0.000	n/a	1.02	0.29
7	18	3.49	462.07	462.95	0.88	0.83	3.23	0.28	463.23	0.000	86	462.50	463.21 j	0.71**	0.83	4.22	0.28	463.49	0.000	0.000	n/a	1.18	n/a
8	15	3.13	462.50	463.39	0.89	0.72	3.35	0.29	463.68	0.000	87	469.00	469.71 j	0.71**	0.72	4.34	0.29	470.00	0.000	0.000	n/a	0.50	0.15
9	15	2.74	471.50	471.97	0.47*	0.42	6.49	0.27	472.24	0.000	29	472.00	472.66	0.66**	0.66	4.14	0.27	472.93	0.000	0.000	n/a	1.50	0.40
10	12	1.97	472.25	472.83	0.58	0.48	4.14	0.25	473.08	0.000	169	475.00	475.60	0.60**	0.49	4.02	0.25	475.85	0.000	0.000	n/a	1.50	n/a
11	12	0.57	475.00	475.82	0.82	0.21	0.84	0.11	475.93	0.000	29	475.25	475.56	0.31**	0.21	2.71	0.11	475.68	0.000	0.000	n/a	1.00	0.11
12	12	0.80	475.00	475.83	0.83	0.27	1.15	0.14	475.97	0.000	122	478.00	478.37 j	0.37**	0.27	2.99	0.14	478.51	0.000	0.000	n/a	1.00	n/a
13	18	16.74	459.22	460.72	1.50*	1.77	9.47	1.39	462.12	2.165	55	460.00	461.91	1.50	1.77	9.47	1.39	463.31	2.164	2.165	1.194	0.63	0.88
14	18	12.84	460.00	463.37	1.50	1.77	7.27	0.82	464.19	1.274	174	460.87	465.58	1.50	1.77	7.26	0.82	466.40	1.273	1.274	2.211	0.15	0.12
15	18	5.03	460.87	466.40	1.50	1.77	2.85	0.13	466.52	0.196	427	463.04	467.23	1.50	1.77	2.85	0.13	467.36	0.195	0.195	0.835	1.00	0.13

Project File: Simon Stormwater BLDG_2_Trailer.stm

Number of lines: 15

Run Date: 8/10/2022

Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Section 4

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Colliers
Engineering
& Design

Memorandum

To: Justin Dates, R.L.A., LEED AP

From: Philip Grealy, Ph.D., P.E.

Date: February 8, 2022

Subject: RDM Simon - Noise Evaluation

Project No.: 21004268A

We have completed our sound level measurements and analysis for the above project site located at Tax Lots #6-1-107 & 6-1-90.1, located on Dolsontown Road in the Town of Wawayanda, New York. The sound level readings were collected following standard procedures as described in more detail below. We have also compared these levels to the future sound levels associated with the typical activities expected on the site and as they relate to the adjacent proposed warehouse development on Dolsontown Road. We have also compared these to the Town of Wawayanda Code requirements and NYSDEC guidelines.

Typical Noise Parameters

The Equivalent Sound Level or L_{eq} is related to the average of the sound energy over time. The L_{eq} integrates fluctuating sound levels over a period of time to express them as a steady state sound level. As an example, if two sounds are measured and one sound has twice the energy but lasts half as long, the two sounds would be characterized as having the same equivalent sound level. Equivalent Sound Level is considered to be directly related to the effects of sound on people since it expresses the equivalent magnitude of the sound as a function of frequency of occurrence and time. It is also useful in establishing the ambient sound levels at a potential noise source.

Designations for sound levels also include those as L_{10} or L_{90}. These designations refer to the sound pressure level (SPL) that is exceeded for 10% of the time over which the sound is measured, in the case of L_{10}, and 90% of the time, in the case of L_{90}. For example, an L_{90} of 70 dBA means that 70 dBA is exceeded for 90% of the time for which the measurement was taken. L_{max} represents the maximum observed sound level during the measurement period.

Existing Ambient Noise Levels (*Figure No. 1 and Tables No. 1 and 2*)

The predominant area background noise source is from traffic along the I-84 corridor as well as local traffic along the NYS Route 17M and Dolsontown Road corridors.

Existing noise measurement surveys were conducted at three locations (receptors) around the site, including at the adjacent and nearby residential property boundaries, to provide a representative sampling of ambient noise levels in the area (see Figure No. 1 for receptor locations). The noise measurements were collected by representatives of Colliers Engineering & Design. The noise measurements were taken with a Brüel and Kjaer Type 1-Precision integrating Sound Level Meter –

Type 2236. The meter was calibrated prior to actual measurements using a Brüel and Kjaer Acoustical Calibrator Model No. 4231. The actual measurements and calibration procedures followed were completed in conformance with American National Standards Institute (ANSI) criteria as well as those outlined in the NYSDEC guidelines for "Assessing and Mitigating Noise Impacts" dated February 2, 2001.

The microphones used in the measurements were located, without obstruction from stationary objects, at a height of approximately five feet above the ground surface. Measurements taken included a L_{eq} level, $L_{10,}$ L_{50}, L_{90}, L_{min} and L_{max} for each location. The measurements were collected at 15-minute intervals to identify the noise character at each receptor. The existing sound level measurements were taken on January 25, 2022 and January 26, 2022.

The primary receptors in the area include the private residences along the east side of Sunrise Park Road, the residences located on the north side of Dolsontown Road, i.e., 1065, 1069, and 1073, and the residences located on Caskey Lane.

The receptors evaluated are identified on Figure No. 1 and described below:

R1 – On the east side of the cul-de-sac at the end of Caskey Lane

R2 – On the north side of Dolsontown Road near 1081 Dolsontown Road for representation of the existing residences at 1073, 1069, and 1065

R3 – On the northeast side of Sunrise Park Road adjacent to the property line of the 55 Sunrise Park Road single family residential home

Appendix A contains a figure identifying the receptor locations and photographs of these measurement locations are also attached.

The measurements were taken at these three locations along the perimeter of the property to identify background ambient sound levels at these residential receptors. They are summarized on the Noise Data Summary tables, which summarize various noise characteristics measured including L_{eq}, L_{10}, $L_{90,}$ L_{max} and L_{min} for each receptor. The Noise Data Summary Tables also summarize other critical information include temperature, wind conditions, coordinates and the factors influencing noise levels. Note that the L_{eq} is the typical standard used for evaluating potential noise impacts.

For reference, Table No. 1 is also attached and summarizes the range of typical environmental scenarios, while Table No. 2 summarizes the Federal Highway Administration's Design Noise Levels.

The existing background levels are the result of general background traffic noise from traffic on I-84 as well as Dolsontown Road, nature noises, airplane flyovers and other local background sources. As can be seen from a review of the tables, the typical L_{eq} levels ranging from the low 40's to the mid/high 50's dBA range at the different receptors along the perimeter of the site. Appendix B contains the various tables. Appendix C contains a summary of the noise receptor location descriptions and field measurement conditions.

The NYSDEC guidelines for “Assessing and Mitigating Noise Impacts” dated February 2, 2001 summarizes several parameters related to sound pressure levels. Some of the key items are provided herein.

- Sound Level Reduction Over Distance – It is important to have an understanding of the way noise decreases with distance. The decrease in sound level from any single noise source normally follows the “inverse square law.” That is, sound pressure level (SPL) changes in inverse proportion to the square of the distance from the sound source. At distances greater than 50 feet from a sound source, every doubling of the distance produces a 6 dB reduction in the sound. Therefore, a sound level of 70 dB at 50 feet would have a sound level of approximately 64 dB at 100 feet. At 200 feet sound from the same source would be perceived at a level of approximately 58 dB.

- Most humans find a sound level of 60-70 dBA as beginning to create a condition of significant noise effect (EPA 550/9-79-100, November 1978).

- Sound pressure level increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Table B below from the DEC policy provides some more detail on this.

Table A

HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL

Increase in Sound Pressure (dB)	**Human Reaction**
Under 5	Unnoticed to tolerable
5 – 10	Intrusive
10 – 15	Very noticeable
15 – 20	Objectionable
Over 20	Very objectionable to intolerable

Source: NYSDEC “Assessing and Mitigating Noise Impacts” revised February 2, 2001 (Table B, Page 15)

Comparison of Future Noise Levels with Ambient Levels (*Tables No. 3 and 4)*

Table No. 3 provides a summary of the computed L_{eq} sound pressure levels (dBA) for the Existing, No-Build, and Build conditions based on expected traffic volumes and onsite vehicle movements at the facility.

In addition to the NYSDEC guidance, the Town of Wawayanda Code in Chapter 195, “Zoning,” Article IV General Supplementary Regulations at §195-23 “ General Commercial and Industrial Standards” Item D states “Noise shall not exceed an intensity of 65 decibels as measured 100 feet from the boundaries of the lot where such use is situated.”

Recommendations

As can be seen from a review of the sound level tables, the increases in noise levels at the receptors as a result of the project traffic movements and other onsite activities are expected to be typically less than 5 dbA at all receptors. The position of the building on the site provides a physical barrier, which will attenuate sound emanating at the south side of the building from the residences to the northeast along Dolsontown Road. In order to reduce future noise levels to the greatest extent reasonably possible, the following is a summary of recommendations to be implemented as mitigation:

1. The construction equipment used on-site will have to be inspected periodically to ensure that properly functioning muffler systems are used on all equipment.

2. All equipment should not idle unnecessarily while on site.

3. The HVAC equipment should also be positioned to face away from the adjacent residences as part of the final building design/HVAC equipment layout.

4. Installation of a berm or solid fencing along the western portion of the property in between the proposed parking areas and the property lines, as well as along the east side of Caskey Lane, providing a buffer to separate the residential property on Caskey Lane from the Site.

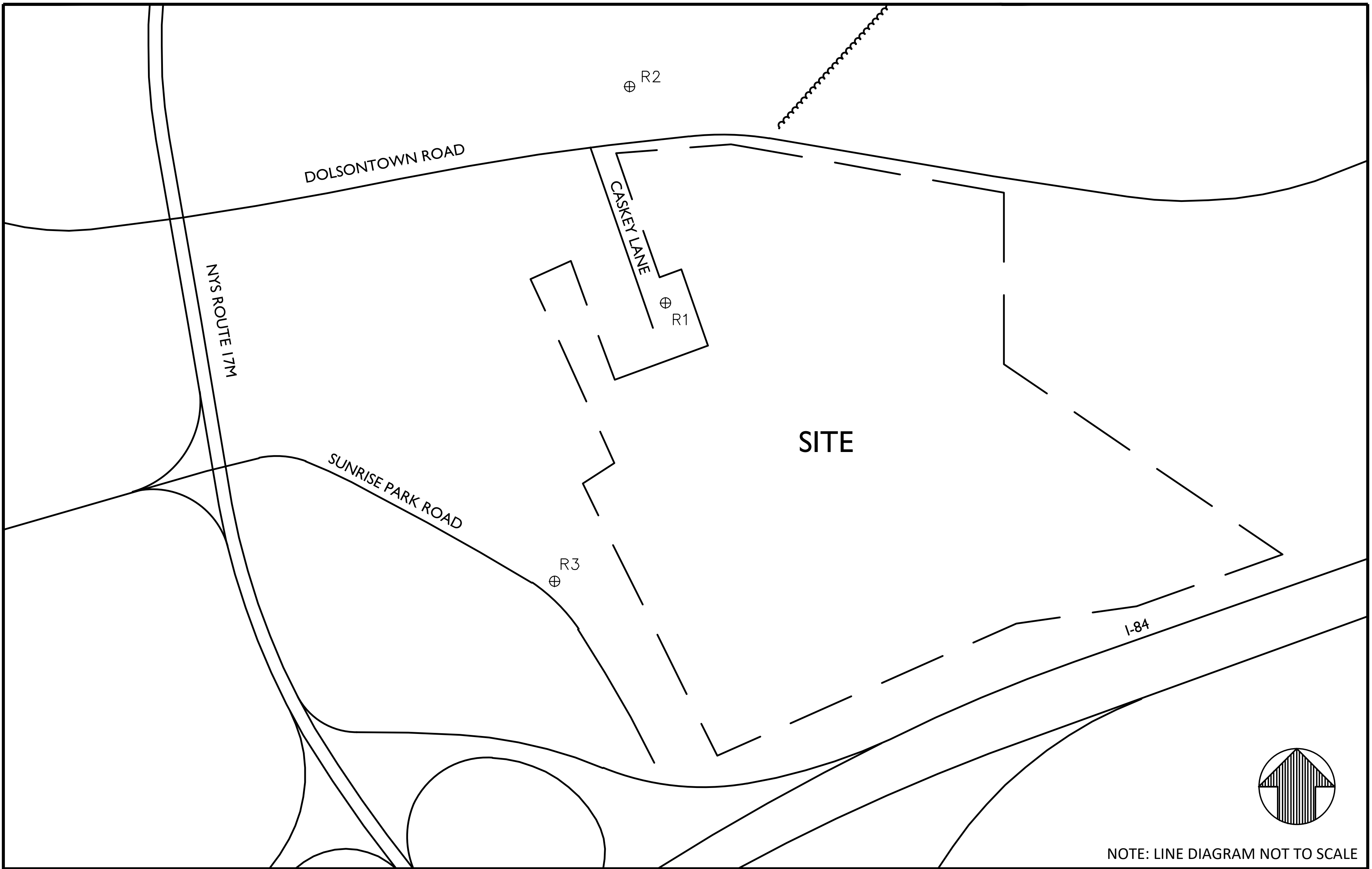
5. Any onsite equipment should be equipped with alternate backup safety alarms such as “white noise” alarms, alternate radar, or infrared alarm systems.

Engineering
& Design

RDM Simon

Appendix A | Figures

4268A\Reports\Noise\Figures\220124JFM_Noise Reading Map.dwg\Figure 1   By: JMUCCIN



NOTE: LINE DIAGRAM NOT TO SCALE

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NOISE IMPACT EVALUATION

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	1/24/2022	J.F.M.	P.J.G.

PROJECT NUMBER: 21004268A
DRAWING NAME: 220124JFM_NOISE READING MAP

SHEET TITLE:
NOISE RECEPTOR LOCATIONS

SHEET NUMBER:
FIGURE 1

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Appendix B | Tables

TABLE NO 1.
RANGE OF TYPICAL ENVIRONMENTAL A-WEIGHTED NOISE LEVELS

SITUATION	NOISE LEVEL (dBA) (1,2)
Discotheque/Rock Band at 5m	110
Jet Flyover at 1,000 feet	105
Gas Lawn Mower at 3 feet	98
Inside Subway Train	95
Shouting at 3 feet	78
Gas Lawn Mower at 100 feet	70
Normal Speech at 3 feet	65
Background Office Noise	50
Library	34 -40
Optimum Sleeping Level	35 or less
Threshold of Hearing	5

1) *The Audible Landscape: Manual for Highway Noise and Land Use* , Table A-16, Page 91, USDOT, 1974

2) *Transportation Planning Handbook* , Institute of Transporation Engineers, Figure 8-2, Edition , 1999

TABLE NO. 2
FHWA DESIGN LEVELS

ACTIVITY CATEGORY	DESIGN NOISE LEVEL (dBA)		DESCRIPTION OF ACTIVITY CATEGORY (2)
	L_{eq}	L_{10}	
A	57 (EXTERIOR	60 (EXTERIOR)	Tracts where serentiy and quiet are expecially important.
B	67 (EXTERIOR)	70 (EXTERIOR)	Residences, motels, schools, churches, hospitals, etc.
C	72 (EXTERIOR)	75 (EXTERIOR)	Developed lands other than thos above.
E	52 (EXTERIOR)	55 (EXTERIOR)	Buidling interiors.

1) Source: Federal Highway Adminstration, *Procedures for the Abatement of Highway Traffic Noise and Construction Noise* , Federal Register 41 (80), Washington, D.C.

2) Either L_{eq} or L_{10} can be used - not both - and an hourly measure applies. The land-use descriptions are further qualified in the reference and a category D is also reserved for undeveloped land. The interior noise levels may be established by subtracting from outdoor levels the attentuation expected of the particular wall and window constructions involved.

Table No. 3

(AM)

Summary of Existing and Projected Noise Levels (Leq-dBA)

Receptor	**Existing**	**No-Build**	**Build**	**Build Comb**	**Δ NB -> BD**	**Δ NB -> BD COMB**
R1	53.4	54.0	56.9	57.3	2.9	3.3
R2	57.9	58.5	58.7	58.7	0.2	0.2
R3	53.2	53.7	53.8	53.8	0.1	0.1

(PM)

Summary of Existing and Projected Noise Levels (Leq-dBA)

Receptor	**Existing**	**No-Build**	**Build**	**Build Comb**	**Δ NB -> BD**	**Δ NB -> BD COMB**
R1	52.0	52.5	55.2	56.6	2.7	4.1
R2	57.7	58.2	58.5	58.5	0.3	0.3
R3	56.6	56.8	57.0	57.0	0.2	0.2

Notes:

1) The Build Combined scenario includes both the RDM Simon and Dewpoint South developments.

TABLE NO. 4
HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL

INCREASE IN SOUND PRESSURE (dBA)	HUMAN REACTION
2-3	BARELY PRECEPTIBLE
3-5	NOTICEABLE
10	SOMEWHAT INTRUSIVE-DOUBLING OF LOUDNESS
10-15	VERY NOTICEABLE
15-20	OBJECTIONABLE
OVER 20	VERY OBJECTIONABLE TO INTOLERABLE

Source: *Fundamentals and Abatement of Highway Traffic Noise* , FHWA, 1973.

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Appendix C | Noise Receptor Locations & Field Measurement Characteristics

Receptor-R1 - Located on the east side of the cul-de-sac at the end of Caskey Lane

Receptor-R1 – Located on the east side of the cul-de-sac at the end of Caskey Lane

Receptor-R2 – Located on the north side of Dolsontown Road directly east of 1081 Dolsontown Road

Receptor-R2 – Located on the north side of Dolsontown Road directly east of 1081 Dolsontown Road

Receptor-R3 – Located on the north side of Sunrise Park Road directly northwest of the 55 Sunrise Park Road Single Family Residential Home.

Receptor-R3 – Located on the north side of Sunrise Park Road directly northwest of the 55 Sunrise Park Road Single Family Residential Home.

Receptor Location #1 Description

Receptor Location #1 is located on the east side of the cul-de-sac at the end of Caskey Lane.

Field Measurement Conditions

Weekday (AM)

1/25/2022 – Start time: 7:18 AM, Wind Max: 0.4 MPH, Wind Average: 0.2 MPH, 25°F

1/25/2022 – Start time: 8:37 AM, Wind Max: 1.2 MPH, Wind Average: 0.6 MPH, 27°F

1/25/2022 – Start time: 10:01 AM, Wind Max: 1.4 MPH, Wind Average: 1.0 MPH, 32°F

Weekday (PM)

1/25/2022 – Start time: 1:05 PM, Wind Max: 1.2 MPH, Wind Average: 0.8 MPH, 34°F

1/25/2022 – Start time: 2:15 PM, Wind Max: 0.8 MPH, Wind Average: 0.5 MPH, 34°F

1/26/2022 – Start time: 3:26 PM, Wind Max: 5.5 MPH, Wind Average: 3.0 MPH, 23°F

1/26/2022 – Start time: 4:35 PM, Wind Max: 1.5 MPH, Wind Average: 0.7 MPH, 21°F

Receptor Location #2 Description

Receptor Location #2 is located on the north side of Dolsontown Road directly east of 1081 Dolsontown Road

Field Measurement Conditions

Weekday (AM)

1/25/2022 – Start time: 7:47 AM, Wind Max: 0.5 MPH, Wind Average: 0.3 MPH, 25°F

1/25/2022 – Start time: 9:05 AM, Wind Max: 0.6 MPH, Wind Average: 0.5 MPH, 28°F

1/25/2022 – Start time: 10:23 AM, Wind Max: 1.1 MPH, Wind Average: 0.7 MPH, 34°F

Weekday (PM)

1/25/2022 – Start time: 1:28 PM, Wind Max: 0.6 MPH, Wind Average: 0.3 MPH, 36°F

1/26/2022 – Start time: 3:51 PM, Wind Max: 1.0 MPH, Wind Average: 0.4 MPH, 23°F

1/26/2022 – Start time: 4:57 PM, Wind Max: 1.1 MPH, Wind Average: 0.5 MPH, 19°F

Receptor Location #3 Description

Receptor Location #3 is located on the north side of Sunrise Park Road directly northwest of the 55 Sunrise Park Road Single Family Residential Home.

Field Measurement Conditions

Weekday (AM)

1/25/2022 – Start time: 8:14 AM, Wind Max: 0.3 MPH, Wind Average: 0.2 MPH, 27°F

1/25/2022 – Start time: 9:30 AM, Wind Max: 0.7 MPH, Wind Average: 0.5 MPH, 30°F

1/25/2022 – Start time: 10:48 AM, Wind Max: 1.6 MPH, Wind Average: 1.2 MPH, 34°F

Weekday (PM)

1/25/2022 – Start time: 1:54 PM, Wind Max: 2.0 MPH, Wind Average: 1.3 MPH, 34°F

1/26/2022 – Start time: 4:15 PM, Wind Max: 1.1 MPH, Wind Average: 0.6 MPH, 23°F

1/26/2022 – Start time: 5:32 PM, Wind Max: 1.3 MPH, Wind Average: 0.7 MPH, 19°F

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Appendix D | Noise Modeling Summary Worksheets

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 10:51:49 AM
CASE:	AMEX	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency	
PAVEMENT TYPE(S) USED:	Average	substantiates the use of a different type with approval of FHWA.	

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc.
			Existing		Absolute		Relative	Type	Calc.			Minus
			LAeq	Calc.	Criterion	Calc.	Criterion	of	LAeq	Calc.	Goal	Goal
Name	No.	DUs	dBA	dBA	dBA	dBA	dBA	Impact	dBA	dBA	dBA	dBA
Receiver-1	1	1	53.4	51.0	0.0	-2.4	10.0	Sound Level	51.0	0.0	8.0	-8.0
Receiver-2	2	1	57.9	57.0	0.0	-0.9	10.0	Sound Level	57.0	0.0	8.0	-8.0
Receiver-3	3	1	53.2	53.3	0.0	0.1	10.0	Sound Level	53.3	0.0	8.0	-8.0

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 10:56:48 AM
CASE:	AMNB	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.	
PAVEMENT TYPE(S) USED:	Average		

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc. Minus Goal
Name	No.	DUs	Existing LAeq dBA	Calc. dBA	Absolute Criterion dBA	Calc. dBA	Relative Criterion dBA	Type of Impact	Calc. LAeq dBA	Calc. dBA	Goal dBA	dBA
Receiver-1	1	1	54.0	51.4	0.0	-2.6	10.0	Sound Level	51.4	0.0	8.0	-8.0
Receiver-2	2	1	58.5	57.5	0.0	-1.0	10.0	Sound Level	57.5	0.0	8.0	-8.0
Receiver-3	3	1	53.7	53.6	0.0	-0.1	10.0	Sound Level	53.6	0.0	8.0	-8.0

REPORT: **Results: Sound Levels - Input Heights**
TNM VERSION: 3.1.7970.37608
REPORT DATE: 8 February 2022
CALCULATED WITH: 3.1.7970.37608
CALCULATION DATE: 2/8/2022 11:10:03 AM
CASE: AMBD
ORGANIZATION: Colliers Engineering & Design
ANALYSIS BY: J.F.M.
PROJECT/CONTRACT: 21004268A
DEFAULT GROUND TYPE: FieldGrass
ATMOSPHERICS: 68°F, 50%
PAVEMENT TYPE(S) USED: Average

Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc. Minus Goal
			Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact	Calc. LAeq	Calc.	Goal	
Name	No.	DUs	dBA	dBA	dBA	dBA	dBA		dBA	dBA	dBA	dBA
Receiver-1	1	1	54.2	56.9	0.0	2.7	10.0	Sound Level	56.9	0.0	8.0	-8.0
Receiver-2	2	1	58.7	58.0	0.0	-0.7	10.0	Sound Level	58.0	0.0	8.0	-8.0
Receiver-3	3	1	53.9	53.8	0.0	-0.1	10.0	Sound Level	53.8	0.0	8.0	-8.0

REPORT: **Results: Sound Levels - Input Heights**

TNM VERSION: 3.1.7970.37608
REPORT DATE: 8 February 2022
CALCULATED WITH: 3.1.7970.37608
CALCULATION DATE: 2/8/2022 11:33:15 AM
CASE: AMBD COMB
ORGANIZATION: Colliers Engineering & Design
ANALYSIS BY: J.F.M.
PROJECT/CONTRACT: 21004268A
DEFAULT GROUND TYPE: FieldGrass
ATMOSPHERICS: 68°F, 50%
PAVEMENT TYPE(S) USED: Average

Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc. Minus Goal
			Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact	Calc. LAeq	Calc.	Goal	
Name	No.	DUs	dBA	dBA	dBA	dBA	dBA		dBA	dBA	dBA	dBA
Receiver-1	1	1	54.2	57.3	0.0	3.1	10.0	Sound Level	57.3	0.0	8.0	-8.0
Receiver-2	2	1	58.7	58.0	0.0	-0.7	10.0	Sound Level	58.0	0.0	8.0	-8.0
Receiver-3	3	1	53.9	53.8	0.0	-0.1	10.0	Sound Level	53.8	0.0	8.0	-8.0

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 12:02:32 PM
CASE:	PMEX	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.	
PAVEMENT TYPE(S) USED:	Average		

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		
			Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of	Calc. LAeq	Calc.	Goal	Calc. Minus Goal
Name	No.	DUs	dBA	dBA	dBA	dBA	dBA	Impact	dBA	dBA	dBA	dBA
Receiver-1	1	1	52.0	51.0	0.0	-1.0	10.0	Sound Level	51.0	0.0	8.0	-8.0
Receiver-2	2	1	57.7	58.1	0.0	0.4	10.0	Sound Level	58.1	0.0	8.0	-8.0
Receiver-3	3	1	56.6	52.8	0.0	-3.8	10.0	Sound Level	52.8	0.0	8.0	-8.0

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 1:08:33 PM
CASE:	PMNB	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency	
PAVEMENT TYPE(S) USED:	Average	substantiates the use of a different type with approval of FHWA.	

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		
Name	No.	DUs	Existing LAeq dBA	Calc. dBA	Absolute Criterion dBA	Calc. dBA	Relative Criterion dBA	Type of Impact	Calc. LAeq dBA	Calc. dBA	Goal dBA	Calc. Minus Goal dBA
Receiver-1	1	1	52.5	51.5	0.0	-1.0	10.0	Sound Level	51.5	0.0	8.0	-8.0
Receiver-2	2	1	58.2	58.6	0.0	0.4	10.0	Sound Level	58.6	0.0	8.0	-8.0
Receiver-3	3	1	56.8	53.1	0.0	-3.7	10.0	Sound Level	53.1	0.0	8.0	-8.0

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 1:28:03 PM
CASE:	PMBD	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.	
PAVEMENT TYPE(S) USED:	Average		

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc. Minus Goal
			Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of	Calc. LAeq	Calc.	Goal	
Name	No.	DUs	dBA	dBA	dBA	dBA	dBA	Impact	dBA	dBA	dBA	dBA
Receiver-1	1	1	52.8	55.2	0.0	2.4	10.0	Sound Level	55.2	0.0	8.0	-8.0
Receiver-2	2	1	58.5	58.0	0.0	-0.5	10.0	Sound Level	58.0	0.0	8.0	-8.0
Receiver-3	3	1	57.0	53.2	0.0	-3.8	10.0	Sound Level	53.2	0.0	8.0	-8.0

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.1.7970.37608	REPORT DATE:	8 February 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	2/8/2022 1:34:01 PM
CASE:	PMBD COMB	ORGANIZATION:	Colliers Engineering & Design
ANALYSIS BY:	J.F.M.	PROJECT/CONTRACT:	21004268A
DEFAULT GROUND TYPE:	FieldGrass		
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval of FHWA.	
PAVEMENT TYPE(S) USED:	Average		

Results for:		DUs	Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
			dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	3	0.0	0.0	0.0	0	0	0	0
	All Impacted	3	0.0	0.0	0.0	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc. Minus Goal
Name	No.	DUs	Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact	Calc. LAeq	Calc.	Goal	
			dBA	dBA	dBA	dBA	dBA		dBA	dBA	dBA	dBA
Receiver-1	1	1	52.8	56.6	0.0	3.8	10.0	Sound Level	56.6	0.0	8.0	-8.0
Receiver-2	2	1	58.5	58.0	0.0	-0.5	10.0	Sound Level	58.0	0.0	8.0	-8.0
Receiver-3	3	1	57.0	53.2	0.0	-3.8	10.0	Sound Level	53.2	0.0	8.0	-8.0

Section 5

AR - NY SHPO Archaeological Report

DIGITAL ARCHIVE DOCUMENTATION

NY SHPO SHELVING REFERENCE

ID # 7257

County ORANGE

Report Number 533

PR Number 07PR3315

ELECTRONIC VERSION ☐

STATUS Scan On-Site

Page Count

Report Title

Phase I Archaeological Investigation for the Simon Business Park, New Hampton, Town of Wawayanda, Orange County, New York

Report Type IA/B

Author TRACKER ARCHAEOLOGY

Month 3

Year 2007

Date

Survey Sponsor SEQRA (FED/STATE/SEQRA/CEQRA/CLG SUBGRANT/OTHE

Survey Acreage (IB ONLY) 24

Survey Square Footage 0

Underwater Survey Area - Acres

Stripped Area - SqFt (II and III ONLY)

Surface Exam Area(Acres)

MULTIPLE COUNTIES CROSS REFERENCE:

County 1		**Report 1**		**County 3**		**Report 3**	
County 2		**Report 2**		**County 4**		**Report 4**	

MINOR CIVIL DIVISION

County	Town 1	Town 2	Town 3	Town 4
ORANGE	/T/ Wawayanda			

REVIEW

Number of Archaeological Sites Identified 0

Number of Architectural Sites Identified

Log Month	Log Year	Log Date	Date Reviewed
			7/25/2007

UNIQUE SITE NUMBER(S) REPORTED : IA, IB, II AND III SURVEY

Site 1 #	Site Type 1	Quad 1	Site 8 #	Site Type 8	Quad 8
Site 2 #	Site Type 2	Quad 2	Site 9 #	Site Type 9	Quad 9
Site 3 #	Site Type 3	Quad 3	Site 10 #	Site Type 10	Quad 10
Site 4 #	Site Type 4	Quad 4	Site 11 #	Site Type 11	Quad 11
Site 5 #	Site Type 5	Quad 5	Site 12 #	Site Type 12	Quad 12
Site 6 #	Site Type 6	Quad 6	Site 13 #	Site Type 13	Quad 13
Site 7 #	Site Type 7	Quad 7	Site 14 #	Site Type 14	Quad 14

DIGITAL FILE NAME

BOX

LOCATION

BAR CODE

533

ORANGE

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors

REPORTS OF INVESTIGATIONS

Phase I Archaeological Investigation
for the Simon Business Park
New Hampton, Town of Wawayanda
Orange County, New York

March 2007

Prepared for:

Kirk Rother, P.E., Warwick, New York

Prepared by:

Alfred G. Cammisa, RPA
Felicia Cammisa, Alexander Padilla

Report #: 491

TRACKER ARCHAEOLOGY SERVICES, INC.
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07|3315

MANAGEMENT SUMMARY

PR#:
not known

Involved agencies:
Town of Wawayanda

Phase:
Phase IA & IB

Location:
New Hampton
Town of Wawayanda
Orange County

Survey Area:
Length: about 812 feet (248 meters) east-west
Width: about 1187 feet (362 m) north-south.
Acres Surveyed: about 24 acre (9.7 hectares)

USGS:
Middletown, NY

Survey overview:
ST no. & interval: 370 ST's at 50 ft (15m) intervals.

Results:
No prehistoric or historic archaeological sites.

Results of Architectural Survey:
No. Of buildings/structures/cemeteries in project area: 0
No. Of buildings/structures/cemeteries adjacent to project area: 5
No. Of previously determined NR listed or eligible buildings/structures/cemeteries/districts: 0
No. Of identified eligible buildings/structures/cemeteries/districts: 0

Authors:
Alfred G. Cammisa, M.A./RPA
Felicia Cammisa, B.A.
Alexander Padilla, B.A.

Date of Report:
Report completed March, 2007

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INTRODUCTION

Between November 7, 2006 and January 15, 2007, TRACKER-Archaeology Services, Inc. conducted a Phase IA documentary study and a Phase IB field testing for the proposed Eason property in New Hampton, Town of Wawayanda, Orange County, New York.

The purpose of the Phase IA documentary study was to determine the prehistoric and historic potential of the project area for the recovery of archaeological remains. This was implemented by a review of the original and current environmental data, archaeological site files, other archival literature, maps, and documents.

The prehistoric and historic site file search was conducted utilizing the resources of the New York State Historic Preservation Office in Waterford, New York. Various historic and/or archaeological web sites were visited to review any pertinent site information.

The purpose of the Phase IB survey was to recover physical evidence for the presence or absence of archaeological sites on the property. This was accomplished through subsurface testing and ground surface reconnaissance.

These investigations have been conducted in accordance with the standards set forth by the New York Archaeological Council and the New York State Historic Preservation Office.

The project area (APE) consists of approximately 24 acres from a larger property. The project area is bounded to the north by Dolsontown Road, to the west by Caskey Lane and on the remaining sides by the rest of the Simon property.

The investigation was completed by TRACKER-Archaeology Services, Inc. of Monroe, New York. Field work was conducted by field director, Alexander Padilla, B.A. and field technician, Gregory martino, M.A. Report preparation was by Alfred Cammisa, Felicia Cammisa and Alexander Padilla.

The work was performed for Kirk Rother, P.E. of Warwick, New York.

ENVIRONMENT

Geology

The study area is located in the southeast portion of New York State in the south part of Orange County. This region of New York lies within the Ridge and Valley Physiographic Province. This province, also known as the Newer Appalachians, extends from Lake Champlain to Alabama. It passes as a narrow lowland belt between the New England Uplands (Taconic Mountains and Hudson Highlands) to the east and the Appalachian Plateau (Catskill and Shawangunk Mountains) and Adirondack Mountains to the west. The characteristic topography is a succession of parallel valleys and ridges trending roughly in a northeasterly direction. This is a region of sedimentary rocks which were easily eroded and subjected to folding or bedding of the rock layers (Schuberth 1968: cover map, 16-18; Isachsen et al 2000: 4, 53-54; New York-New Jersey Trail Conference 1998: cover map).

Soils and Topography

Soils on the project area consist of:

Name	**Soil Horizon Depth in(cm)**	**Color**	**Texture** **Inclusion**	**Slope %**	**Drainage**	**Landform**
Mardin	Ap=0-8(-20) B=8-15(-38)	10YR4/3 10YR5/6	GrSiLo	3-8 & 8-15	well	glacial lake deposits
Rhinebeck	Ap=0-7(0-18) B=7-11(-28)	10YR3/2 10YR5/4	SiLo	0-3	poor	glacial lake deposits

(Olsson 1981: Map 59 pgs. 37-38, 48, 95, 99, 100-101).

KEY:

Shade: Lt=Light, Dk=Dark, V=Very
Color: Br=Brown, Blk=Black, Gry=Gray, Gbr=Gray Brown, StBr=Strong Brown, Rbr=Red Brown, Ybr= Yellow Brown
Soils: Si=Silt, Lo=Loam, Sa=Sand, Cl=Clay
Other: Sh=shale, M=Mottle, Gr=Gravelly, Cb=cobbles, /=or

The elevation on the project area ranges from approximately 450 to 510 feet above mean sea level.

Hydrology

The project area is approximately 370 north of the Monhagen Brook. The Monhagen drains east into the Wallkill River. The Wallkill drains north into the Hudson River.

Vegetation

The predominant forest community in this area was probably the Oak Hickory Forest. This forest is a nut producing forest with acorns and hickory nuts usually an obvious part of the leaf litter on the forest floor. The Oak Hickory Forest intermingles with virtually all other forest types. The northern extension of this forest community was also originally called the Oak-Chestnut forest, before the historic Chestnut blight (Kricher 1988:38, 57-60).

At the time of the Phase IB survey, the property consisted predominately of open meadows with some wooded portions containing maples, oak, thorn bushes, and poison ivy.

PREHISTORIC POTENTIAL

A prehistoric site file search was conducted at the New York State Historic Preservation Office. The search included a 1 mile radius around the study area. The following sites were recorded:

NYSM Sites	**NYSHPO Sites**	**Distance from APE ft(m)**	**Site Description**
	07119.000021	370	No info.
6169		740	Cemetery
6170		1110+	Bates: No info.
	07119.000016	1300	No info.
	07119.000083	1500	Simon Site: Transitional/Late Archaic
	07119.000017	1850	No info.
	07119.000015	1850	No info.
	07119.000008	2590	No info.
	07119.000018	4440	No info.

Assessing the known environmental and prehistoric data, we can summarize the following points:

-The project area is approximately 370 north of the Monhagen Brook.

-The study parcel consists of level to steeply sloping terrain, with mostly well drained, and some poorly drained, soils.

-Many prehistoric sites are in the vicinity, several of which are along the Monhagen, and 1 of which is recorded as only 370 feet away.

In our opinion, the study area has a higher than average potential for the recovery of prehistoric sites. The type of site encountered could be from either Woodland or Archaic Periods and likely encountered in the A or upper B soil horizons.

HISTORIC POTENTIAL

Seventeenth Century

At the time of European contact and settlement, the study area was probably occupied by the Waoranecks who lived between Stony Point and Danns Kammer (near Newburgh Bay). Their western boundary was unknown. These peoples were likely a sub-branch and/or clan related to the large Munsee (Minsi) tribe belonging to the Delawarean linguistic family. The term "Minsi" (or "Munsee") means people of the stony country" or abbreviated as "mountaineers" (Ruttenber 1992A:35, 44-45, 49-50, 93; Ruttenber 1992B:221; Becker 1993:16-22; Hearne Brothers nd:wall map; Weslager 1991:45; Synder 1969:2).

Population estimates for the Munsee are 600 to 800 individuals. The Munsee are described by Becker (1993:18) as possibly horticultural. Hull (1996:10) mentions that they were hunters, gatherers, and horticulturalists. They fished in the fast running waters of the Wawayanda and Pochuck creeks.

An Indian trail known as the Wawayanda Trail started at the tribal meeting grounds at Danns Kammer, then passed through Washingtonville, Warwick and Vernon villages, and eventually on to Philadelphia. This road, or the close approximation, is currently known as Kings Highway (Hull 1996:127; Figure 5).

Eighteenth Century

New York State Military Museum mentions Fort Gardner as being constructed in 1756 in Gardnerville by Captain Richard Gardner of the Frontier Guard. The fort had a 100 foot square palisade and contained multiple dwellings (www.dmna.state.ny.us.forts).

The DeWitt map of Land Patents show the approximate location of the project area. The study area is lands possibly on the Clowes parcel(Figure 3).

The 1779 Sauthier map shows the study property between the Wallkill River and the Shawangunk Kill on lands possibly within the Minisink Angle (Figure 4).

Early business in town included farming, potash, and milling (Ruttenber 1881:676-684).

Nineteenth Century

The 1840 Burr map shows the study property possibly near or along Route 6 and/or Dolonstown Road. In the hamlet of Dolsontown. Land here appears to have been in lands of Clowes (Figure 5).

In 1849 the Town of Wawayanda was formed when it separated from the Town of Minisink. The population in 1850 in Wawayanda was 2,069 inhabitants (Stickney 1903:454).

The 1850 Sydney map depicts no structures on or adjacent to, the project area. W.M.. Dolsen has a dwelling across the road (Figure 6).

The 1859 map of Orange County depicts Caskey Lane bordering the project area. Structures are depicted at the end of Caskey Lane belonging to O' Sweezy. This may have been part of the Clowes Patent (Figure 7).

By 1860 the town's population *decreased* 163 people (Stickney 1903:454).

The 1875 Beers atlas depicts Caskey Lane very vaguely with C. Caskey's residence at the end of the road possibly adjacent to the project area (Figure 8).

Twentieth Century

The 1908 U.S.G.S. shows a structure at the end of Caskey Lane which extends closer to the Monhagen Brook. The structure is nearby but not immediately adjacent to the project area (Figure 9).

An historic site file search was conducted at the New York State Historic Preservation Office. The search included a 1 mile radius around the study area. The following sites were recorded:

-No sites were recorded.

Assessing the known environmental and historic data, we can summarize the following points:

-The project area is approximately 370 north of the Monhagen Brook.

-The study parcel consists of level to steeply sloping terrain, with mostly well drained, and some poorly drained, soils.

-An historic map documented structure (MDS) appears to have been adjacent to the project area.

In our opinion, the study area has a higher than average potential for encountering nineteenth century European American sites, likely encountered in the A soil horizon or on the surface.

FIELD METHODS

Walkover
Exposed ground surfaces were subjected to a close quarters walk- over, when possible, at 3 to 5 meter intervals to observe for artifacts. Covered ground terrain was reconnoitered at about 15 meter intervals, or less, to observe for any above ground features, such as berms, depression, or rock configurations, which could be evidence for a prehistoric or historic site. Photographs were taken of the project area.

Shovel Testing
Shovel test pits (ST's) were excavated at about 15 meter intervals across the project area.

Each ST measured about 30 to 40 cm. in diameter and was dug into the underlying subsoil (B horizon) 10 to 20 cm. when possible. All soils were screened through 1/4 inch wire mesh and observed for artifacts. Shovel tests were flagged in the field. All ST's were mapped on the project area map at this time.

Soil stratigraphy was recorded according to texture and color. Soil color was matched against the Munsell color chart for soils. Notes were transcribed in a notebook and on pre-printed field forms.

FIELD RESULTS

Field testing of the project area included the excavation of 370 shovel tests (ST's) across the project area. No prehistoric artifacts or features were encountered. No historic artifacts or features were encountered on the project area.

Twentieth century buildings were adjacent to the project area, including 2 barns one on either side of the project area.

Stratigraphy
Stratigraphy across the project area included the following:

-O horizon - 0 to 7 cm. thick of root mat, leaf litter, and humus. Much of the times this layer was absent.

-Ap horizon - 10 to 40 cm. thick of 10YR4/3 brown gravelly silt loam.

-B horizon - 10 to 20 cm. thick of 10YR5/6, yellow brown gravelly silt loam.

CONCLUSIONS AND RECOMMENDATIONS

Based on distance to prehistoric sites in the vicinity, well drained soils, level terrain, and distance to a water source, the property was seen as having an above average potential for encountering prehistoric native American sites.

Based upon similar soils, terrain, and water source as well as an MDS on or adjacent to the property, the property was assessed as having a higher than average potential for historic sites.

During the course of the field testing, 370 ST's were excavated. No prehistoric artifacts or features were encountered. No historic artifacts or features were encountered. No further archaeological work is recommended.

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APPENDIX 1

Phase I Archaeological Investigation for the proposed Simon Business Park
Town of Wawayanda, Orange County, New York

October 2020

Prepared for:
Kirk Rother, P.E., Warwick, New York

Alfred G. Cammisa, M.A.
with Alexander Padilla, B.A. (CAD)

1031

MANAGEMENT SUMMARY

PR#:
None known

Involved agencies:
Town of Wawayanda

Phase:
Phase IA & IB

Location:
Town of Wawayanda
Orange County

Survey Area:
Length: about 360 feet (110 meters) north-south
Width: about 180 feet (55 m) east-west
Acres Surveyed: about 2 ares (.8h)

USGS:
Middeltown, NY

Survey overview:
ST no. & interval: 32 ST’s at 50 ft (15m) intervals

Results:
No prehistoric or historic sites

Structures:
No. Of buildings/structures/cemeteries in project area: none
No. Of buildings/structures/cemeteries adjacent to project area:1
No. Of previously determined NR listed or eligible buildings/structures/cemeteries/districts: none
No. Of identified eligible buildings/structures/cemeteries/districts: none

Authors:
Alfred G. Cammisa, M.A.
Alexander Padilla, B.A. (CAD)

Date of Report:
Report completed October, 2020

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INTRODUCTION

Between September 21 and October 8, 2020 and TRACKER Archaeology, Inc. conducted a Phase IA documentary study and a Phase IB field testing for the proposed Simon Business Park, Town of Wawayanda, Orange County, New York.

The purpose of the Phase IA documentary study was to determine the prehistoric and historic potential of the project area for the recovery of archaeological remains. This was implemented by a review of the original and current environmental data, archaeological site files, other archival literature, maps, and documents.

The prehistoric and historic site file search was conducted utilizing the CRIS resources of the New York State Historic Preservation Office in Waterford, New York. Various historic and/or archaeological web sites may have been visited to review any pertinent site information.

The purpose of the Phase IB survey was to recover physical evidence for the presence or absence of archaeological sites on the property. This was accomplished through subsurface testing and ground surface reconnaissance.

These investigations have been conducted in accordance with the standards set forth by the New York Archaeological Council and the New York State Historic Preservation Office.

The project area consists of a proposed commercial development on about 2 acres near the southeast intersection of Dolsontown Road and Caskey Lane.

The investigation was completed by TRACKER-Archaeology, Inc. of Monroe, New York. Historic & prehistoric research by P.I., Alfred G. Cammisa, M.A. Field work was conducted by Alfred G. Cammisa, and crew chief, Alfred T. Cammisa. Report preparation was by Alfred G. Cammisa with Alexander Padilla, B.A. (CAD).

The work was performed for Kirk Rother, P.E., Warwick, New York.

ENVIRONMENT

Geology

The study area is located in the southeast portion of New York State in the center part of Orange County. This region of New York lies within the Ridge and Valley Physiographic Province. This province, also known as the Newer Appalachians, extends from Lake Champlain to Alabama. It passes as a narrow lowland belt between the New England Uplands (Taconic Mountains and Hudson Highlands) to the east and the Appalachian Plateau (Catskill and Shawangunk Mountains) and Adirondack Mountains to the west. The characteristic topography is a succession of parallel valleys and ridges trending roughly in a northeasterly direction. This is a region of sedimentary rocks which were easily eroded and subjected to folding or bedding of the rock layers (Schuberth 1968: cover map, 16-18; Isachsen et al 2000: 4, 53-54; New York-New Jersey Trail Conference 1998: cover map).

Soils and Topography

Soils on the project area consist of:

Name	Soil Horizon Depth in(cm)	Color	Texture Inclusion	Slope %	Drainage	Landform
Mardin	Ap=0-8(-20) B=8-15(-38)	10YR4/2 10YR5/6	GrSiLo	3-8, 8-15	well	glacial lake deposits

(Olsson 1981: Map 48 pgs., 37-38, 95).

KEY:

Shade: Lt=Light, Dk=Dark, V=Very
Color: Br=Brown, Blk=Black, Gry=Gray, Gbr=Gray Brown, StBr=Strong Brown, Rbr=Red Brown, Ybr= Yellow Brown
Soils: Si=Silt, Lo=Loam, Sa=Sand, Cl=Clay
Other: Sh=shale, M=Mottle, Gr=Gravelly, Cb=cobbles, /=or

The elevation on the project area is approximately 500 feet above mean sea level.

Hydrology
Freshwater wetlands associated with the Monhagen Brook are on the property close to the project area. The project area is about 700 feet northwest of Monhagen Brook which drains into the Wallkill River. The Wallkill drains north into the Hudson River.

Vegetation
The predominant forest community in this area was probably the Oak Hickory Forest. This forest is a nut producing forest with acorns and hickory nuts usually an obvious part of the leaf litter on the forest floor. The Oak Hickory Forest intermingles with virtually all other forest types. The northern extension of this forest community was also originally called the Oak-Chestnut forest, before the historic Chestnut blight (Kricher 1988:38, 57-60).

At the time of the Phase IB survey, the property consisted of an overgrown field near the the road with goldenrod and other wild flowers and sapling, and a forested section for the remainder of the property with oak and some maple and other trees.

PREHISTORIC POTENTIAL

A prehistoric site file search was conducted at the New York State Historic Preservation Office. The search included a 1 mile radius around the study area. The following sites were recorded:

NYSM Sites	NYSHPO Sites	Distance from APE ft(m)	Site Description
6169		1709(521)	Cemetery: no info.
6170		1549+(472+)	Bates: no info.
	7119.000016	1614(492)	Unknown

NYSM Sites	NYSHPO Sites	Distance from APE ft(m)	Site Description
	7119.000083	2461(750)	Simon:Late Archaic/Early Woodland point, bifaces, cores, flakes, scraper
	7119.000017	1669(509)	Unknown
	7119.000021	1564(477)	Unknown
	7119.000008	2610(796)	Unknown
	7119.000205	2484(757)	4 lithic scatters, 1 with Late Archaic Brewerton Eared
	7119.000206	2463(751)	Isolated find: Brewerton Eared
	7119.000186	2735(834)	Late Archaic.2 Lamoka point, 2 biface, 2 utilized flakes, 1 retouched flake, 1 core, 107 flakes, shatter 2 FCRs
	7119.000187	3011(918)	Lake Archaic with 1 Lamoka point, 1 Normanskill point, 2 utilized flakes, 32 flakes, 3 shatter 1 FCR
	7119.000018	3957(1206)	Cemetery expansion
	7119.000202	5099(1554)	Shatter
	7119.000199	4698(1402)	Arguillte point, 2 flakes, shatter
	7119.000197	5234(1596)	6 flakes, shatter
	7119.0001021	1528(466)	Unknown
	7119.000015	2313(705)	Unknown

-Freshwater wetlands associated with the Monhagen Brook are on the property close to the project area. The project area is about 700 feet northwest of Monhagen Brook which drains into the Wallkill River

-The study parcel consists of level to moderately sloped, well drained terrain.

-Numerous prehistoric sites are in the vicinity.

In our opinion, the study area has a higher than average potential for the recovery of prehistoric sites on the more level, well drained terrain. The type of site encountered could be from either Woodland or Archaic Periods and likely encountered in the A or upper B soil horizons.

HISTORIC POTENTIAL

Seventeenth Century

At the time of European contact and settlement, the study area was probably occupied by the Waoranecks who lived between Stony Point and Danns Kammer (near Newburgh Bay). Their western boundary was unknown. These peoples were likely a sub-branch and/or clan related to the large Munsee (Minsi) tribe belonging to the Delawarean linguistic family. The term “Minsi” (or “Munsee”) means people of the stony country” or abbreviated as “mountaineers” (Ruttenber 1992A:35, 44-45, 49-50, 93; Ruttenber 1992B:221; Becker 1993:16-22; Hearne Brothers nd:wall map; Weslager 1991:45; Synder 1969:2).

Population estimates for the Munsee are 600 to 800 individuals. The Munsee are described by Becker (1993:18) as possibly horticultural. Hull (1996:10) mentions that they were hunters, gatherers, and horticulturalists. They fished in the fast running waters of the Wawayanda and Pochuck creeks.

An Indian trail known as the Wawayanda Trail started at the tribal meeting grounds at Danns Kammer, then passed through Washingtonville, Warwick and Vernon villages, and eventually on to Philadelphia. This road, or the close approximation, is currently known as Kings Highway (Hull 1996:127; Figure 5).

Eighteenth Century

New York State Military Museum mentions Fort Gardner as being constructed in 1756 in Gardnerville by Captain Richard Gardner of the Frontier Guard. The fort had a 100 foot square palisade and contained multiple dwellings (www.dmna.state.ny.us.forts).

The 1779 Sauthier map shows the study property just west of the Wallkill River on lands possibly within or near the Minisink Angle (Figure 3).

Early business in town included farming, potash, and milling (Ruttenber 1881:676-684).

Nineteenth Century

The 1840 Burr map shows the study property possibly near Dolllenstown. Land here appears to have been on land belonging to Ten Eyck or L. Clowes (Figure 4).

In 1849 the Town of Wawayanda was formed when it separated from the Town of Minisink. The population in 1850 in Wawayanda was 2,069 inhabitants (Stickney 1903:454).

The 1850 Sydney map depicts a structures nearby or adjacent to the project area belonging to G. Hull (Figure 5).

The 1859 map of Orange County depicts the project area adjacent or close to the O. Sweezy house (Figure 6).

By 1860 the town's population *decreased* by 163 people (Stickney 1903:454).

The 1875 Beers atlas the Caskey house adjacent or close to to the project area. There is a saw mill on the Monhagen River (Figure 7).

Twentieth Century

The 1908 U.S.G.S. shows a structure adjacent to the project area (Figure 8).

An historic site file search was conducted at the New York State Historic Preservation Office. The search included a 1 mile radius around the study area. The following sites were recorded:

-No reported historic sites.

Assessing the known environmental and historic data, we can summarize the following points:

-Freshwater wetlands associated with the Monhagen Brook are on the property close to the project area. The project area is about 700 feet northwest of Monhagen Brook which drains into the Wallkill River

-The study parcel consists of level to moderately sloped, well drained terrain.

-An historic map documented structure (MDS) was noted adjacent to the project area.

-No historic sites were recorded in the area.

In our opinion, the study area has a higher than average potential for encountering nineteenth to early twentieth century European-American sites relating to O'Sweezy/Caskey.

FIELD METHODS

Walkover

Exposed ground surfaces were subjected to a close quarters walk-over, when possible, at 3 to 5 meter intervals to observe for artifacts. Covered ground terrain was reconnoitered at about 15 meter intervals, or less, to observe for any above ground features, such as berms, depression, or rock configurations, which could be evidence for a prehistoric or historic site. Photographs were taken of the project area.

Shovel Testing

Shovel tests (ST's) were excavated at about 15 meter intervals across the project area. Each ST measured about 30 to 40 cm. in diameter and was dug into the underlying subsoil (B horizon) 10 to 20 cm. when possible. All soils were screened through 1/4 inch wire mesh and observed for artifacts. Shovel tests were flagged in the field. All ST's were mapped on the project area map at this time.

Soil stratigraphy was recorded according to texture and color. Soil color was matched against the Munsell color chart for soils. Notes were transcribed in a notebook and on pre-printed field forms.

FIELD RESULTS

Field testing of the project area included the excavation of 32 shovel tests (ST's) across the project area. No prehistoric artifacts were encountered. No historic artifacts or features were encountered. The wooded terrain was stoney.

Stratigraphy

Stratigraphy across the project area was generally:

-O horizon - 4 to 6 cm. thick of root mat, leaf litter, and humus.

-A horizon - 22 to 26 cm. thick of 10YR4/2 dark grey brown gravely loam in the wooded areas and 10YR4/3 brown gravelly loam in the field.

-B horizon - 10 to 20 cm. dug into where possible of 10YR5/4, yellow brown gravelly loam.

CONCLUSIONS AND RECOMMENDATIONS

Based on distance to prehistoric sites in the vicinity, well drained soils, level terrain, and distance to a water sources, the property was seen as having an above average potential for encountering prehistoric native American sites.

Based upon similar soils, terrain, and water sources as well as proximity to historic MDS's and/or historic sites, Indian foot trails, or roads, the property was assessed as having a higher than average potential for historic sites.

During the course of the field testing, 32 ST's were excavated. No prehistoric or historic artifacts or features were encountered. No further archaeological work is recommended.

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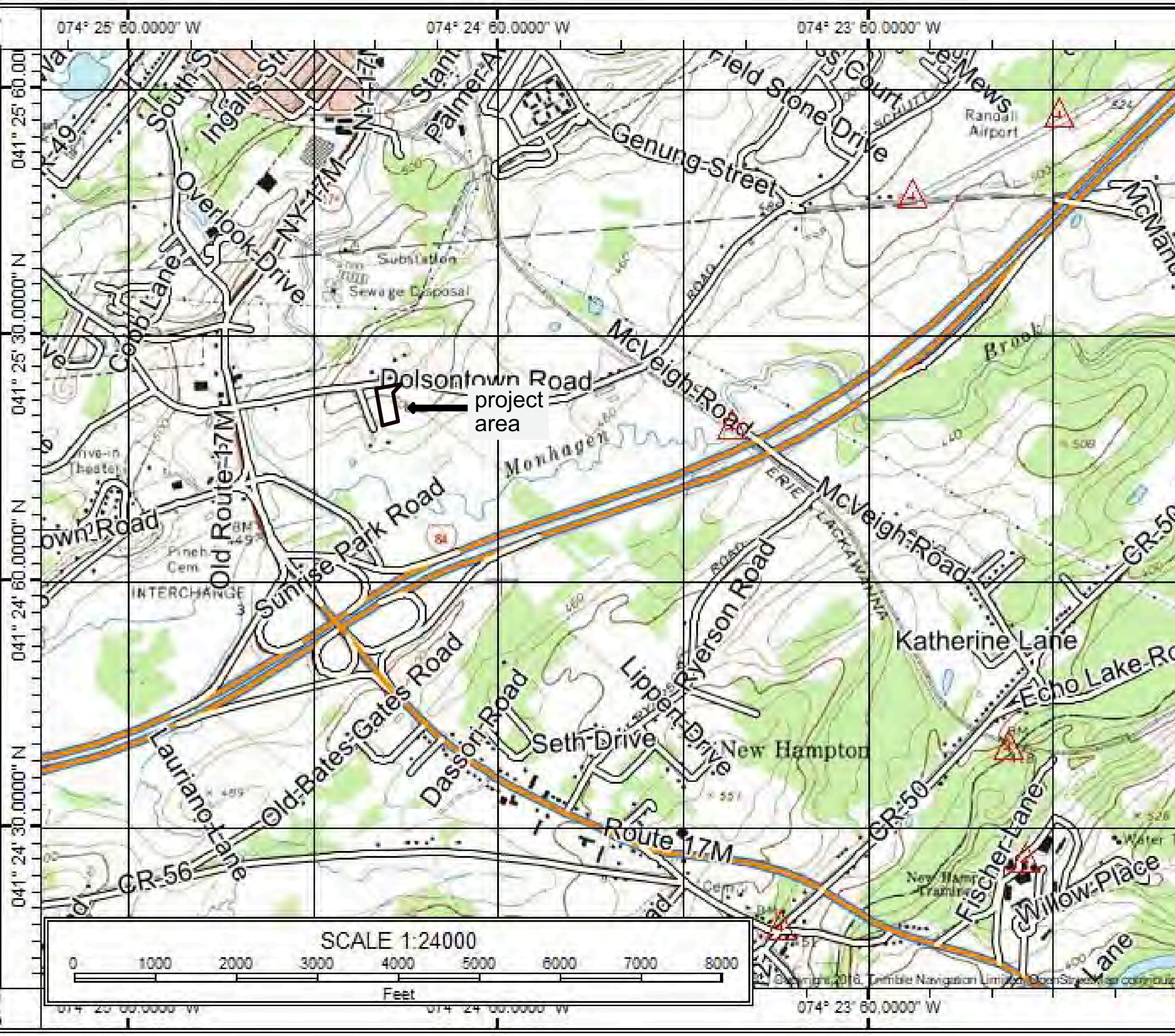
APPENDIX 1

Figure 1

N

Middletown, NY USGS



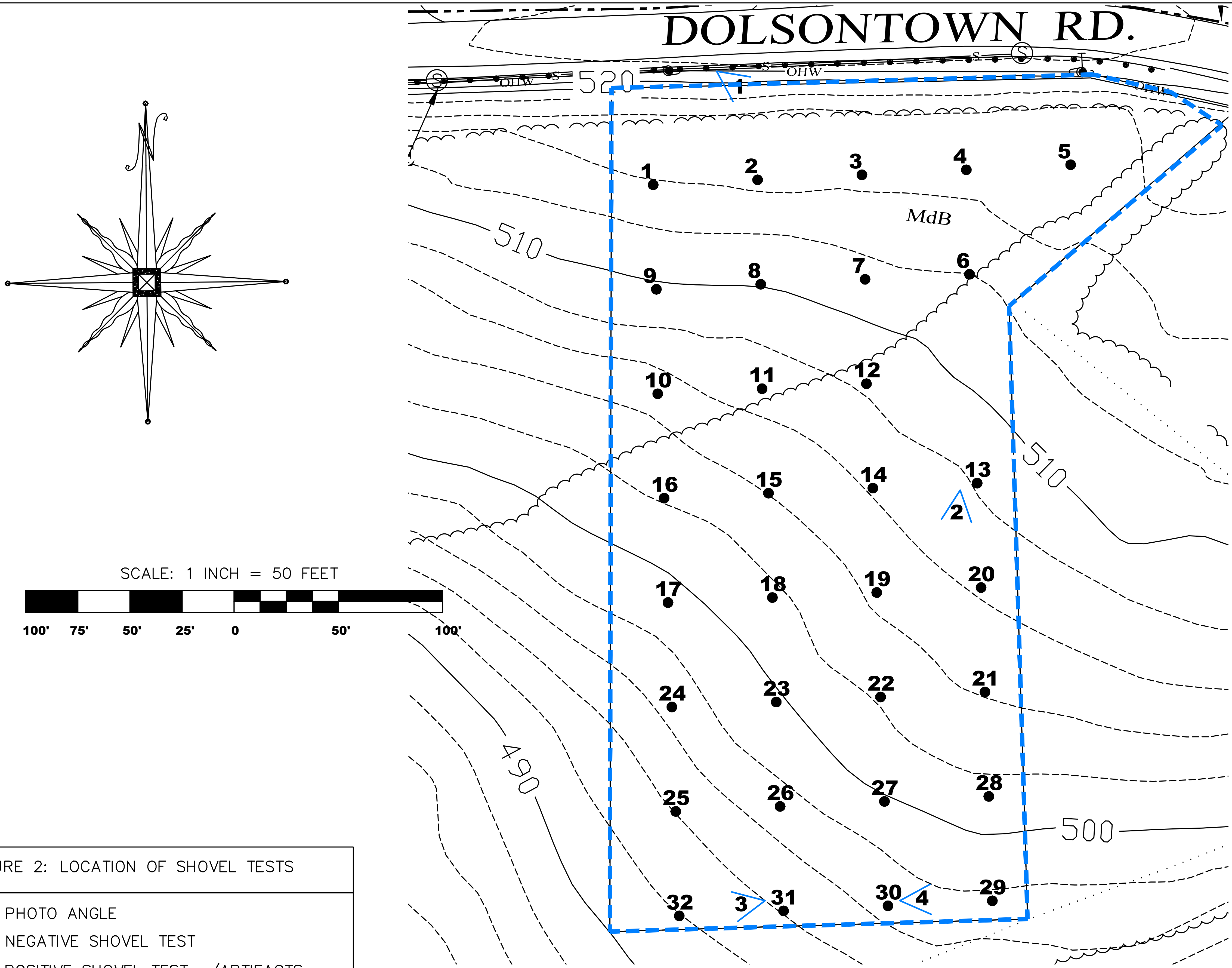


FIGURE 2: LOCATION OF SHOVEL TESTS

V PHOTO ANGLE
● NEGATIVE SHOVEL TEST
☒ POSITIVE SHOVEL TEST w/ARTIFACTS
- - - PROJECT BOUNDARY(A.P.E.)

PROJECT NAME: SIMON BUSINESS PARK

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors

Figure 3

1779 Sauthier map

Figure 4

1840 Burr map

Figure 5

1850 Sydney map

Figure 6

1859 County map

Figure 7

1875 Beers atlas

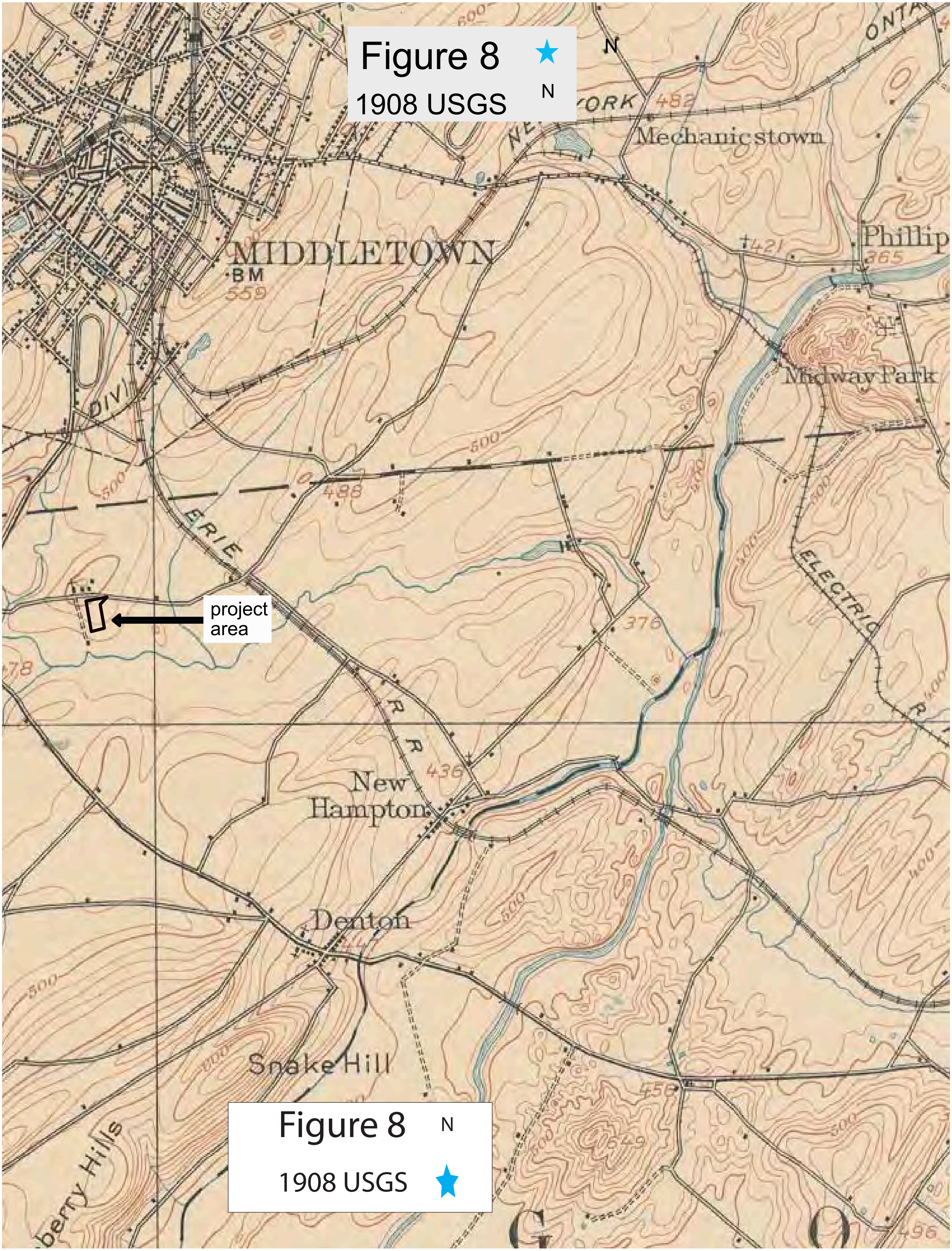


Figure 8 N

1908 USGS N

Figure 8 N

1908 USGS

Figure 9

County Soil Survey

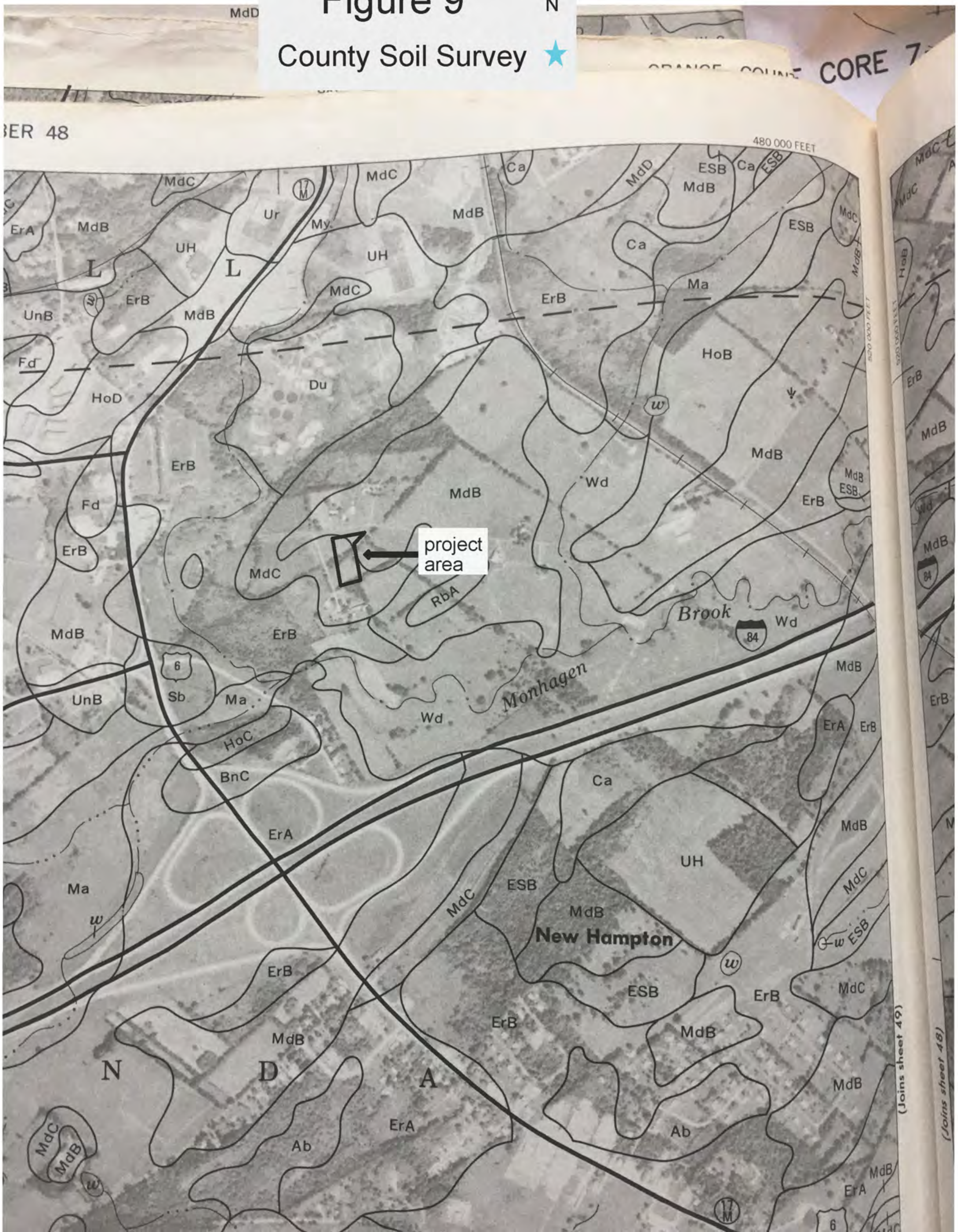


Photo 1
Project area from road

Photo 2

Forested area from near ST 13

Photo 3

Looking toward Caskey Lane

Photo 4

East along stone boundary wall

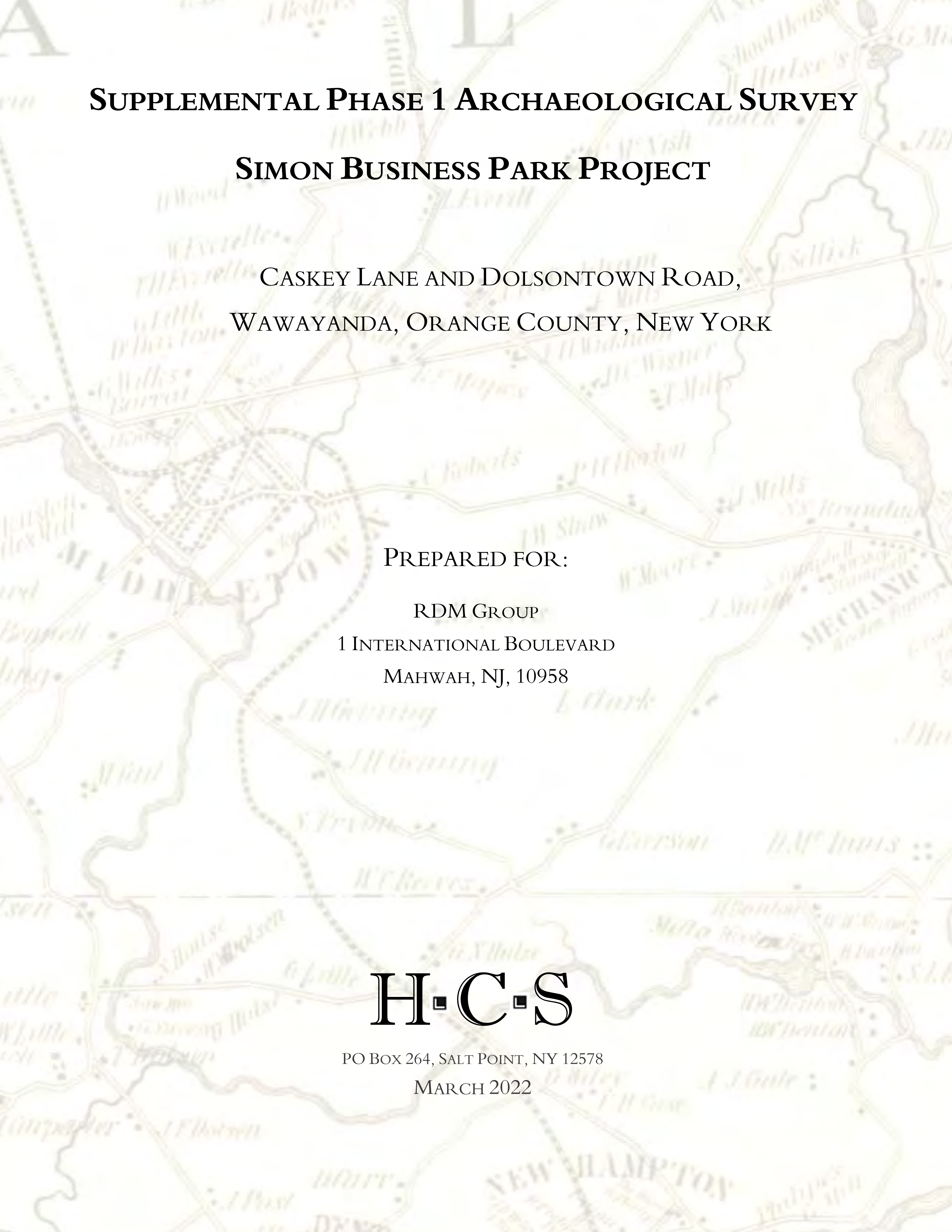
APPENDIX 2

Shovel Tests

STP	LV	DEPTH(CM)	TEXTURE	COLOR	HOR	COMMENT
1	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/3	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
2	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/3	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
3	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-29	GrLo	10YR4/3	A	NCM
	3	29-39	GrLo	10YR5/4	B	NCM
4	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-28	GrLo	10YR4/3	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
5	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-28	GrLo	10YR4/3	A	beer bottle glass
	3	28-28	GrLo	10YR5/4	B	NCM
6	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/3	A	beer bottle glass
	3	27-37	GrLo	10YR5/4	B	NCM
7	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/3	A	NCM
	3	27-37	GrLo	10YR5/4	B	NCM
8	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/3	A	NCM
	3	27-37	GrLo	10YR5/64	B	NCM
9	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/3	A	NCM
	3	27-37	GrLo	10YR5/4	B	NCM
10	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/3	A	NCM
	3	27-37	GrLo	10YR5/4	B	NCM
11	1	0-6	Rootmat,humus,leaves		A/O	NCM
	2	6-25	GrLo	10YR4/2	A	NCM
	3	25-35	GrLo	10YR5/4	B	NCM
12	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/2	A	NCM
	3	27-39	GrLo	10YR5/4	B	NCM

13	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo	10YR4/2	A	NCM
	3	27-39	GrLo	10YR5/4	B	NCM
14	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-27	GrLo mottle	10YR4/2-5/4	A	NCM
	3	27-39	GrLo	10YR5/4	B	NCM
15	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
16	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
17	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
18	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
19	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
20	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-25	GrLo	10YR4/2	A	NCM
	3	25-35	GrLo	10YR5/4	B	NCM
21	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
22	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
23	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-20	GrLo	10YR4/2	A	NCM
	3	20-root				
24	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
25	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM

26	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
27	1	0-5	Rootmat,humus,leaves		A/O	NCM
	2	5-30	GrLo	10YR4/2	A	NCM
	3	30-40	GrLo	10YR5/4	B	NCM
28	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-18	GrLo	10YR4/2	A	NCM
	3	18-rock				
29	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
30	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
31	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM
32	1	0-4	Rootmat,humus,leaves		A/O	NCM
	2	4-28	GrLo	10YR4/2	A	NCM
	3	28-38	GrLo	10YR5/4	B	NCM



SUPPLEMENTAL PHASE 1 ARCHAEOLOGICAL SURVEY

SIMON BUSINESS PARK PROJECT

CASKEY LANE AND DOLSONTOWN ROAD,
WAWAYANDA, ORANGE COUNTY, NEW YORK

PREPARED FOR:

RDM GROUP
1 INTERNATIONAL BOULEVARD
MAHWAH, NJ, 10958

H·C·S

PO BOX 264, SALT POINT, NY 12578
MARCH 2022

MANAGEMENT SUMMARY

SHPO Project Review Number (if available): **20PR08106**

Involved State and Federal Agencies: **NYS DEC**

Phase of Survey: **Supplemental Phase 1 Archaeological Survey**

Location Information:

Location: **Dolsontown Road**, **Caskey Lane**

Minor Civil Division: **Wawayanda**

County: **Orange County**

Survey Area (Metric & English)

Length:

Width:

Number of Project Acres (Project Parcel): **70.93** (**28.7h**)

Number of Acres Surveyed: **5.29 acres** (**.922 h**)

Number of Square Meters & Feet Excavated (Phase II, Phase III only): **N/A**

Percentage of the Site Excavated (Phase II, Phase III only):

USGS 7.5 Minute Quadrangle Map: **2019 Middletown**, **NY**

Archaeological Survey Overview

Number & Interval of Shovel Tests: **26 STs at 50' Interval**

Number & Size of Units: N/A

Width of Plowed Strips: N/A

Surface Survey Transect Interval: N/A

Results of Archaeological Survey

Number & name of prehistoric sites identified: **0**

Number & name of historic sites identified: **0**

Number & name of sites recommended for Phase II/Avoidance: N/A

Recommendations: **No further archaeological investigations**.

Report Author (s): **Beth Selig**, **MA**, **RPA**.

Date of Report: **March 24**, **2022**

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PHOTOGRAPHS

I. SUPPLEMENTAL PHASE 1 ARCHAEOLOGICAL SURVEY

On March 21, 2022 Hudson Cultural Services (HCS) completed a Supplemental Phase 1 Archaeological Survey of the proposed Simon Business Park Project. In March of 2007 Tracker Archaeology completed a Phase 1 Archaeological Investigation for the proposed Simon Business Park Project on the eastern side of Caskey Lane, south of Dolsontown Road in the town of Wawayanda, Orange County New York. In September of 2021, the RDM Group redesigned the proposed plan for the property, expanding the area of impact by ±5.29 acres (2.14 h), including areas that were not previously examined. The Supplemental Phase 1 survey examined these ±5.29 acre areas in the western, eastern and northern portions of the property.

HCS was retained by RDM Group to complete a survey for the areas that fall within the boundaries of the Simon Business Park Project Area of Potential Effect (APE) but were outside the boundaries of the Simon Business Park APE and were not included in the 2007 Tracker Archaeology Survey.

The Simon Business Park Project was reviewed by the New York State Office of Parks Recreation and Historic Preservation in 2020. The review concurred with the recommendations in the Tracker Survey report that no further archaeological investigations were needed for the Project APE. As the project APE has changed, additional review of the previously untested areas is warranted.

Archaeological fieldwork was completed by Franco Zani Jr, and Sarah Gilleland, MA, RPA and supervised by Beth Selig MA, RPA, and Principal Investigator of HCS, who also completed the final report. Archaeological investigations were completed on March 21, 2022.

A. PHASE 1A REPORT INFORMATION

The, environmental information and archaeological sensitivity assessment are included in the Phase 1 report completed in November 2007 by Tracker Archaeology. The research completed for the Phase 1 report reviewed the existing environmental and geological setting of the site, and provided a historic overview of the property within the Town of Wawayanda. A review of the historic maps included in the 2007 Tracker Archaeological Report, and a series of additional historical maps were reviewed to determine if the areas added to the Project APE contained historic structure or identified the potential for cultural resources.

In November of 2020 the Office of Parks, Recreation and Historic Preservation (OPRHP) completed its review of the Simon Business Park project and stated that there were no further concerns regarding archaeological resources.

Since 2020, HCS (as Hudson Valley Cultural Resource Consultants (HVCRC)) has completed several Phase 1 Archaeological surveys along Dolsontown Road, adjacent to the boundaries of the Simon Business Park Project. These surveys did not identify any significant cultural resources.

B. PROJECT INFORMATION

The Simon Business Park Project consists of constructing two warehouse facilities on the ±71.1 acres Project Parcel. The proposed plan includes two warehouse structures, surrounded by parking areas and loading docks. Access to the warehouse facility will be from Dolsontown Road. The project includes stormwater drainage basins which will be located within the eastern and western portions of the Project APE.

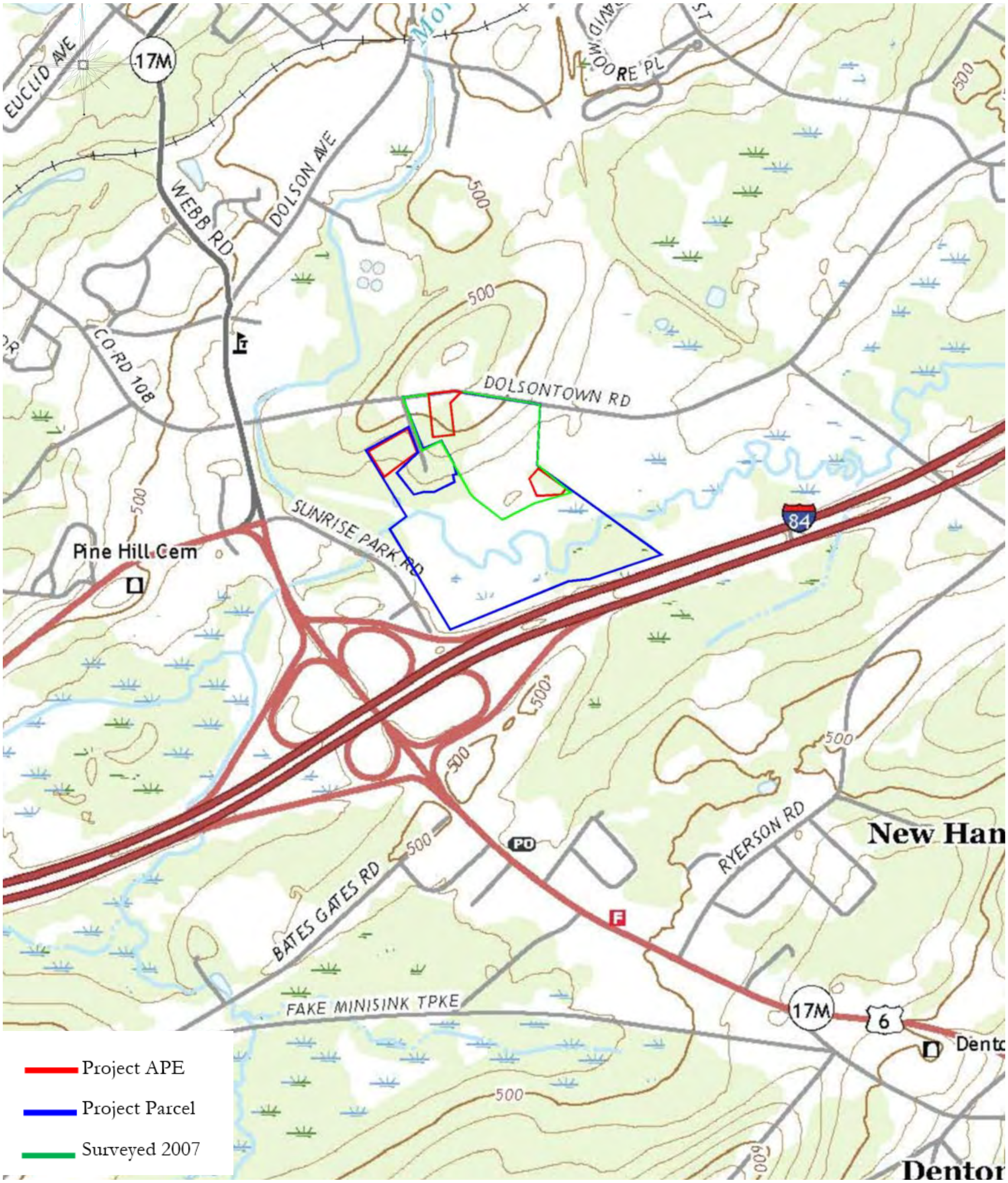


Figure 1: 2019 USGS Topographical Map. Middletown, NY Quadrangle. 7.5 Minute Series. (Source: USGS.gov.) Scale: 1" =1460'.

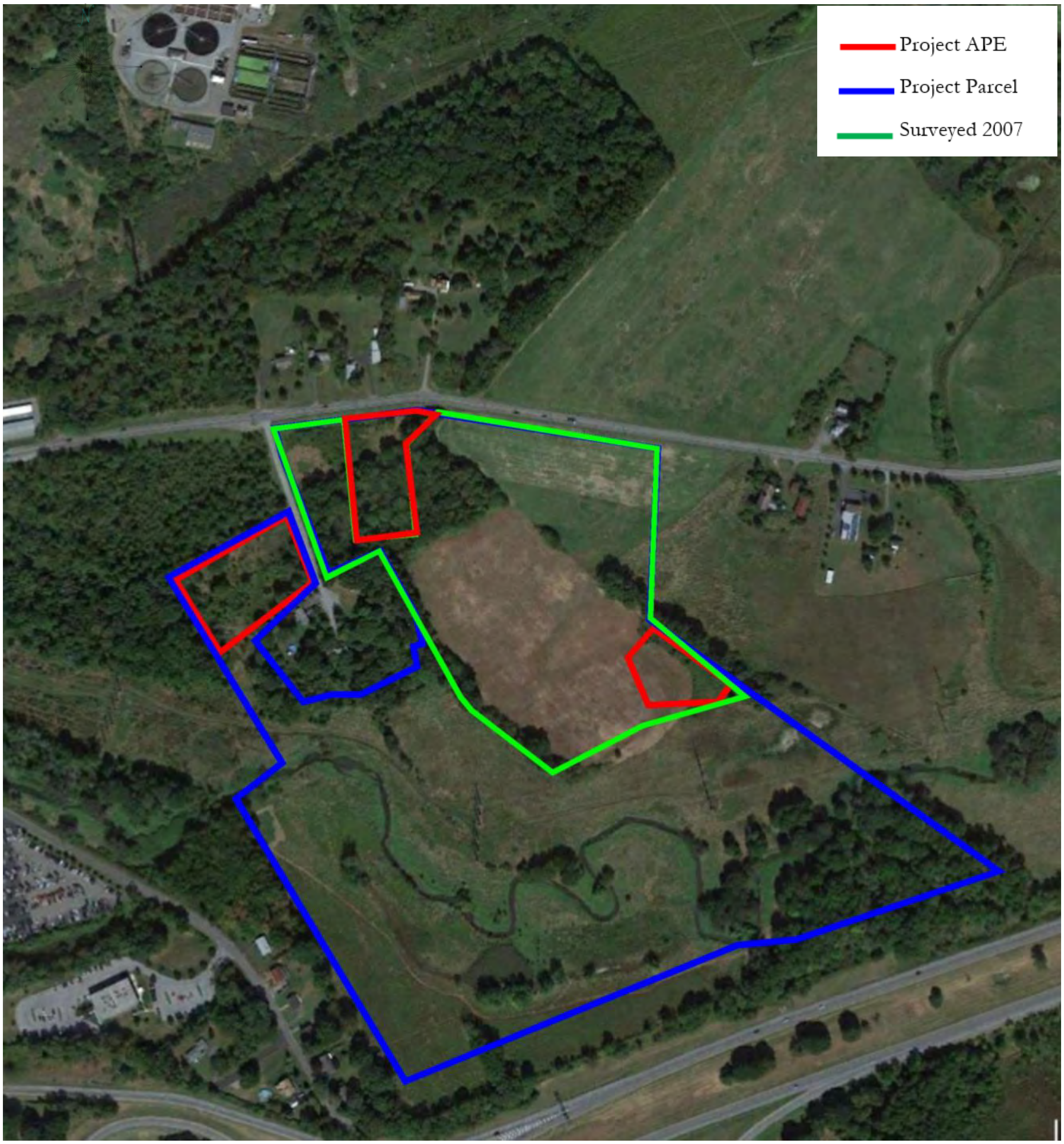


Figure 2: 2019 aerial image showing the location of the Project APE. (Source: Google Earth.) Scale: 1" =540'.

The parcel is generally comprised of wooded areas and mown fields. Dolsontown Road is raised above the level of the ground surface within the Project APE. The Project Parcel includes 70 acres. The southern portion of the Project Parcel contains Monhagen Brook, which is bordered by large wetland areas. Of the 70 acres within the Project Parcel, 33 acres is classified as wetland.

C. ARCHAEOLOGICAL METHODOLOGY

Areas selected for subsurface testing were identified during a walkover inspection which evaluated the landscape to determine areas of prior disturbance, slopes in excess of 12% grade, saturated or wet soils and document evidence of former land usage. The locations of the shovel tests and disturbed areas were recorded on a scaled map that shows surveyed borders and has the locations of the various structures or features identified (Field Reconnaissance Map).

Shovel tests (STs) approximately 50 cm in diameter, were spaced 50 feet apart and excavated at least 10 cm into sterile subsoil, unless impeded by pooling water and rocks or other obstructions. All soils excavated from shovel tests were screened through 0.25-inch hardware cloth. Shovel test profiles were recorded on standard field forms which included stratigraphic depths, Munsell soil color, texture and inclusions, disturbances and artifacts (Appendix A). The presence of clearly modern materials, if recovered would be noted on field forms, but HCS does not generally collect these materials for analysis or inclusion in the artifact assemblage. If any precontact period or potentially significant historic-period artifacts had been recovered from shovel tests, then these finds would have been bagged, labeled with standard project provenience information. Following completion of the archaeological fieldwork, all recovered materials would be washed, identified, inventoried and placed in labeled archival quality plastic bags. All artifacts recovered would then be identified and described based on material type and standard descriptive characteristics and included in an artifact inventory.

D. ARCHAEOLOGICAL SURVEY RESULTS

Field investigations began with an initial walkover of the surface of the areas added to the Project APE. The additional areas include a portion of land in the western part of the Project Parcel that is included in the boundaries of a wetland. This area was overgrown and contained large stands of phragmites. The work proposed in this location is that of a stormwater drainage basin. The ground surface in this area was saturated, limiting field testing to the area adjacent to Caskey Lane. The soils encountered in the shovel tests consisted of very dark gray silty clay loam with cobbles and gravel and light brownish gray silty clay loam. No cultural material was identified in the three shovel tests completed in this area.

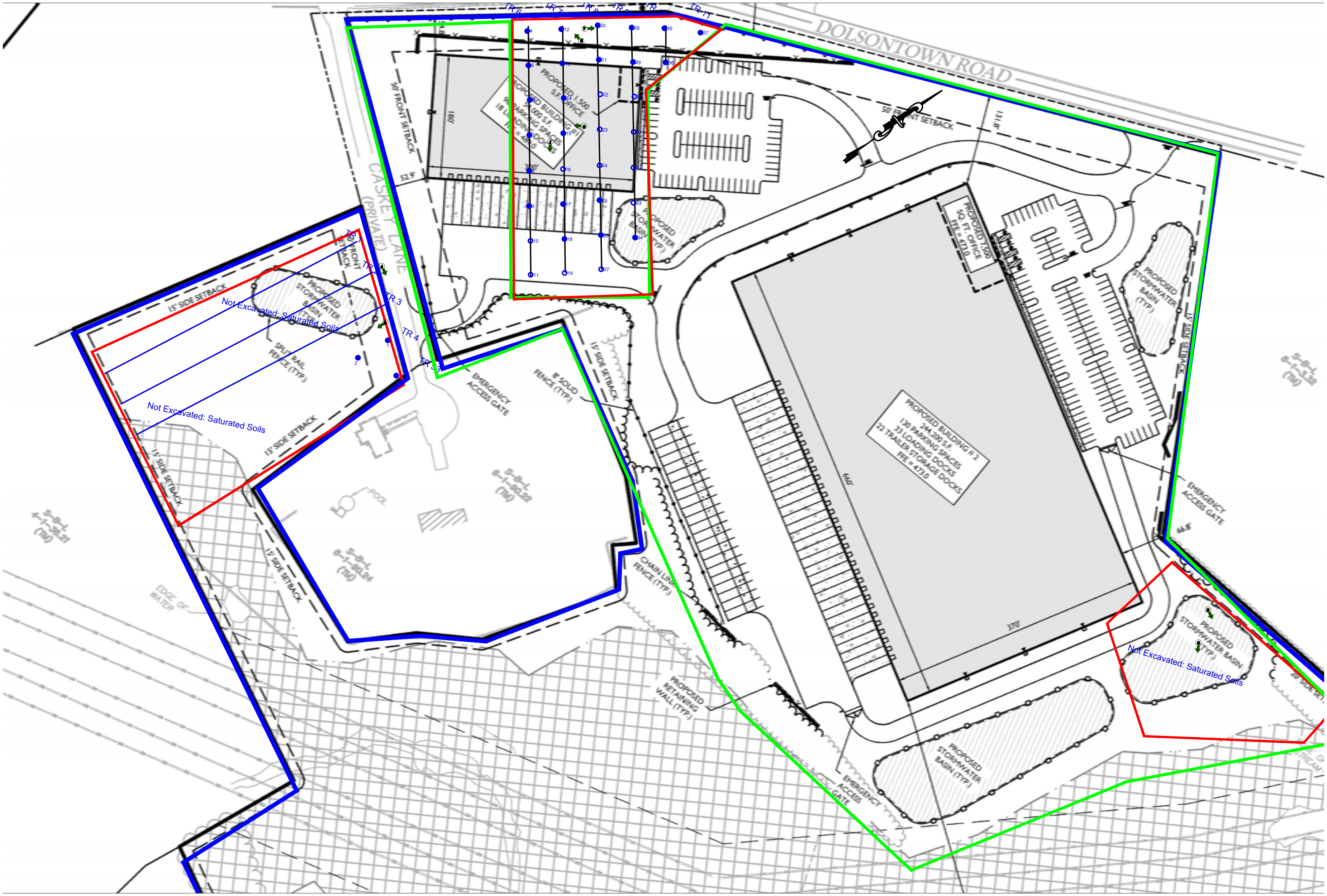
Along the southern side of Dolsontown Road, in the northern portion of the Project APE, is a 2 acre parcel, that was located outside the boundaries of the previous Project APE. This area consisted of meadow grasses and small shrubs with wooded areas located to the south of the mown fields. At the time of the field investigations, large areas contained surface water and were saturated. The soil classification for this portion of the Project APE is identified as Mardin Gravelly loam, which is a well-drained soil classification. The shovel tests completed in this area were off set as needed to avoid the surface water. The soils identified consisted of dark yellowish brown silty clay loam with cobbles and gravel and yellowish-brown silty clay loam with cobbles and gravel. A total of thirty- seven (37) shovel tests were planned in this portion of the APE. Due to saturated soils and rock, eleven tests could not be completed.

The third area added to the Project APE includes a small portion of land in the eastern portion of the Project APE. This area was identified by Tracker Archeology in 2007 as being saturated. The walkover completed by HCS confirmed that the soils were saturated. Due to the extent of the surface water, no shovel tests were completed in this portion of the project APE.

E. CONCLUSIONS AND RECOMMENDATIONS

In December of 2021, HCS completed a Supplemental Phase 1 Archaeological Survey of the Simon Business Park Project Site. The Project APE is located within the boundaries of the Town of Wawayanda, Orange County New York. Based on the cultural and environmental assessment completed, it was determined that the site met the ecological criteria for the potential to contain precontact cultural resources. A total of twenty-six (26) shovel tests were completed within the expanded proposed Project APE, however no significant cultural materials were recovered.

It is the recommendation of Hudson Cultural Services that no further archaeological investigation be required for the proposed Project location.



Hudson Cultural Services

Figure 3: Simon Business Park Project Supplemental Phase 1B Field Reconnaissance Map
Scale 1" = 200'

0 100 200

(IN FEET)
1 inch = 200 ft.

LEGEND

● ST	Sterile Shovel Test Location
○ ST	Planned Shovel Test, Not Excavated
① ➜	Photographic View
🟥	Project APE Boundaries
🟦	Parcel Boundaries
🟩	Tested by Tracker Archeology 20

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G. PHOTOGRAPHS

Photo 1: Wooded areas were located in the central portion of the Project APE. View to the south.

Photo 2: The fields in the northern portion of the eastern portion of the Project APE, were saturated at the time of the field investigations. View to the southeast.

Photo 3: Extensive surface water was noted in the eastern portion of the Project Parcel. View to the east.

Photo 4: Surface water was noted along Caskey Lane in the western portion of the Project APE. View to the southeast.

Photo 5: Dolsontown Road is raised above the ground surface within the Project Parcel. View to the northwest.

Photo 6: The northern portion of the Project APE includes mown lawn, fields and wooded areas. View to the west.

Photo 7: View to the east along the baseline in the northern portion of the Project APE.

Photo 8: Stands of phragmites mark the western portion of the Project APE. View to the southeast.

APPENDIX A: SHOVEL TEST RECORDS

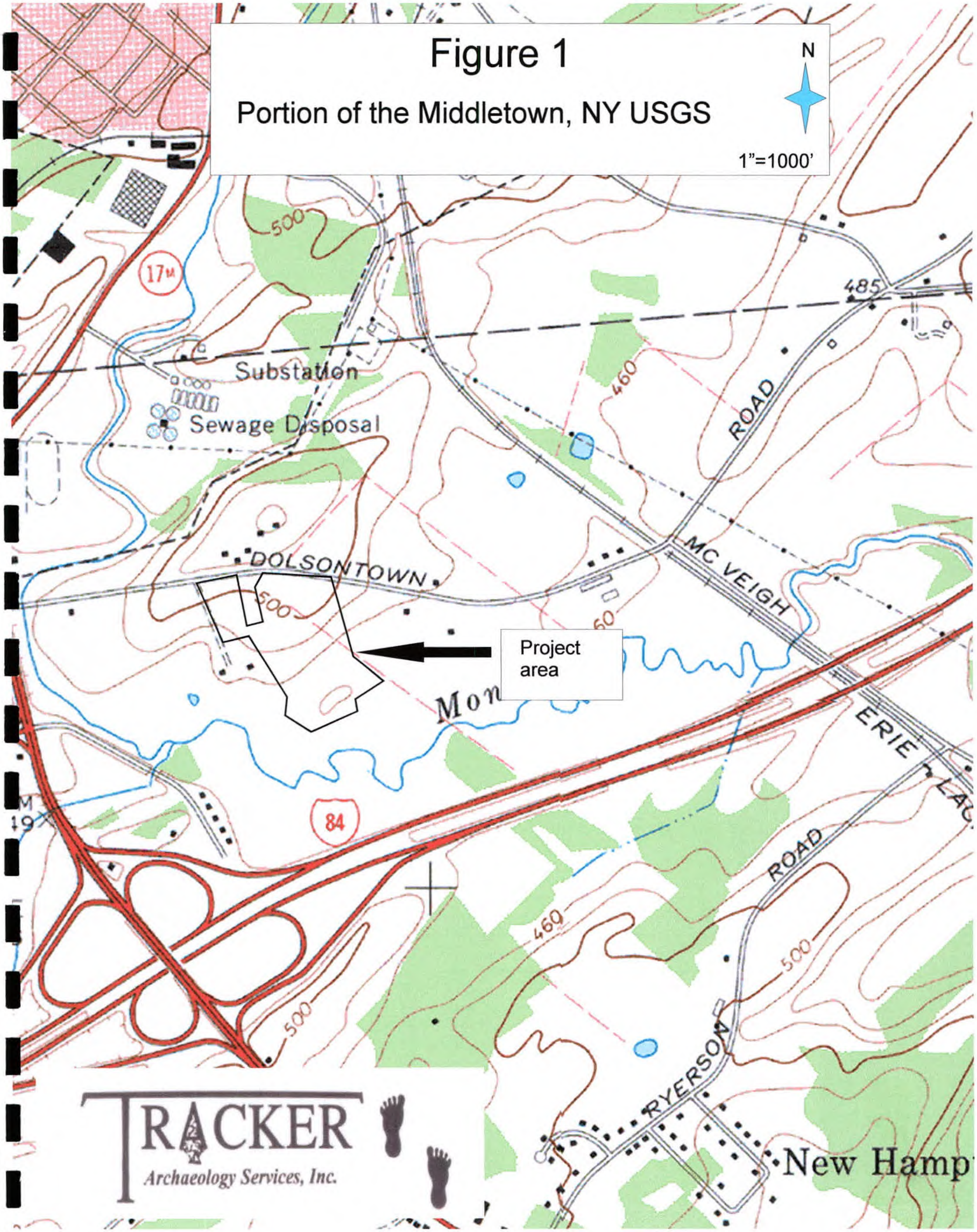
TR	ST	Level	Depth (in)	Depth (cm)	Munsell	Soil Description	Cultural Material
TR 1						Not excavated: Saturated	
TR 2						Not excavated: Saturated	
TR 3						Not excavated: Saturated	
TR 4	1	1		0-18	10YR 3/1	Very dark gray silty clay loam with cobbles and gravel	NCM
		2		18-30	10YR 6/2	Light brownish gray silty clay loam	NCM
	2	1		0-23	10YR 3/1	Very dark gray silty clay loam with cobbles and gravel	NCM
		2		23-35	10YR 6/2	Light brownish gray silty clay loam	NCM
TR 5	3	1		0-19	10YR 3/1	Very dark gray silty clay loam with cobbles and gravel	NCM
		2		19-25	10YR 6/2	Light brownish gray silty clay loam	NCM
TR 6	4	1		0-28	10YR 3/4	Dark yellowish brown silty clay	NCM
		2		28-40	10YR 4/6	Dark yellowish brown silty clay	NCM
	5	1		0-26	10YR 4/3	Brown silty clay	NCM
		2		26-38	10YR 5/6	Yellowish brown silty clay	NCM
	6	1		0-30	10YR 4/3	Brown silty clay	NCM
		2		30-40	10YR 5/6	Yellowish brown silty clay	NCM
	7	1		0-28	10YR 4/3	Brown silty clay	NCM
		2		28-39	10YR 5/6	Yellowish brown silty clay	NCM
	8	1		0-22	10YR 3/2	Very dark grayish brown silty clay	NCM
		2		22-35	10YR 5/4	Yellowish brown silty clay	NCM
	9	1		0-20	10YR 3/2	Very dark grayish brown silty clay	NCM
		2		20-30	10YR 5/4	Yellowish brown silty clay	NCM
	10					Not excavated: Standing water	
	11					Not excavated: Standing water	

TR	ST	Level	Depth (in)	Depth (cm)	Munsell	Soil Description	Cultural Material
TR 7	12	1		0-19	10YR 5/3	Brown silty clay with cobbles and gravel	NCM
		2		19-29	10YR 5/6	Yellowish brown clay with cobbles and gravel	NCM
	13	1		0-23	10YR 4/4	Dark yellowish brown silty clay loam with cobbles and gravel	NCM
		2		23-28	10YR 5/6	Yellowish brown silty clay loam with cobbles and gravel	NCM
	14	1		0-29	10YR 4/4	Dark yellowish brown silty clay loam with cobbles and gravel	NCM
		2		29-39	10YR 5/6	Yellowish brown silty clay loam with cobbles and gravel	NCM
	15	1		0-26	10YR 4/4	Dark yellowish brown silty clay loam with cobbles and gravel	NCM
		2		26-36	10YR 5/6	Yellowish brown silty clay loam with cobbles and gravel	NCM
	16					Not excavated: Standing water and bedrock	
	17	1		0-20	10YR 3/2	Very dark grayish brown silty clay, terminated at rock.	NCM
	18	1		0-8	10YR 3/2	Very dark grayish brown silty clay, terminated at rock.	NCM
	19					Not excavated: Standing water	
TR 8	20	1		0-21	10YR 5/3	Brown silty clay with cobbles and gravel	NCM
		2		21-32	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel	NCM
	21	1		0-28	10YR 5/3	Brown silty clay with cobbles and gravel	NCM
		2		28-38	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel	NCM
	22					Not excavated: saturated	
	23					Not excavated: surface bedrock	
	24					Not excavated: saturated	
	25	1		0-16	10YR 5/3	Brown silty clay loam with cobbles and gravel. Stopped by water.	NCM
	26	1		0-27	10YR 5/3	Brown silty clay loam with cobbles and gravel. Stopped by water.	NCM
	27					Not excavated: saturated, exposed roots, surface bedrock	

TR	ST	Level	Depth (in)	Depth (cm)	Munsell	Soil Description	Cultural Material
TR 9	28	1		0-20	10YR 5/2	Grayish brown silty clay with cobbles and gravel	NCM
		2		20-28	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel, terminated at rock.	NCM
	29	1		0-22	10YR 5/2	Grayish brown silty clay with cobbles and gravel.	NCM
		2		22-34	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel	NCM
	30					Not excavated: saturated	
	31					Not excavated: standing water	
	32					Not excavated: saturated	
	33					Not excavated: saturated	
	34	1		0-25	10YR 5/2	Grayish brown silty clay with cobbles and gravel, terminated at rock.	NCM
TR 10	35	1		0-28	10YR 5/2	Grayish brown silty clay with cobbles and gravel	NCM
		2		28-35	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel.	NCM
	36	1		0-24	10YR 5/2	Grayish brown silty clay with cobbles and gravel.	NCM
		2		24-37	2.5Y 6/4	Light yellowish brown silty clay with cobbles and gravel.	NCM
TR 11	37	1		0-12	10YR 5/2	Grayish brown silty clay with cobbles and gravel, terminated at rock.	NCM

Figure 1

Portion of the Middletown, NY USGS



TRACKER
Archaeology Services, Inc.

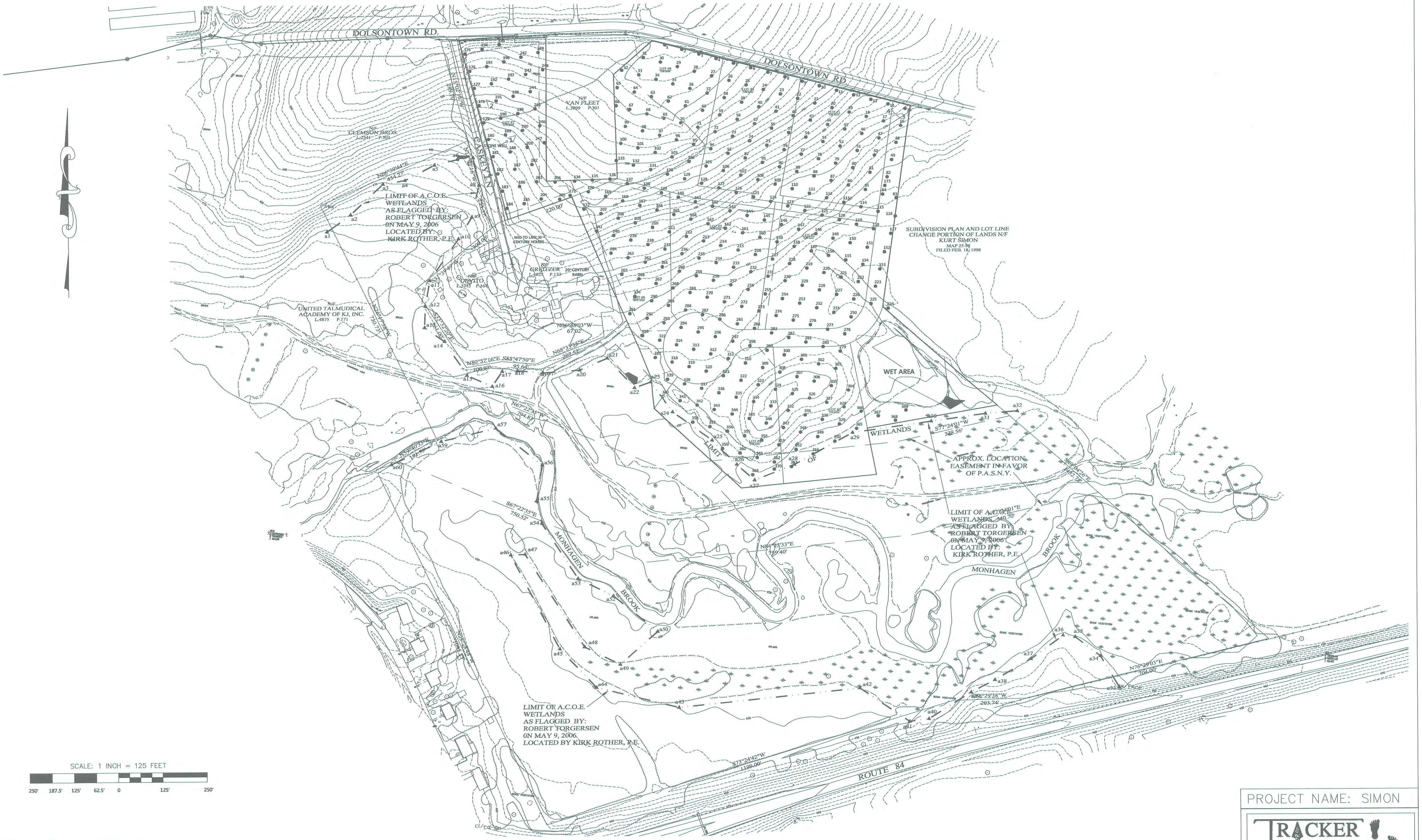


FIGURE 2: LOCATION OF SHOVEL TESTS

● NEGATIVE SHOVEL TEST

V PHOTO ANGLE

PROJECT NAME: SIMON

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors

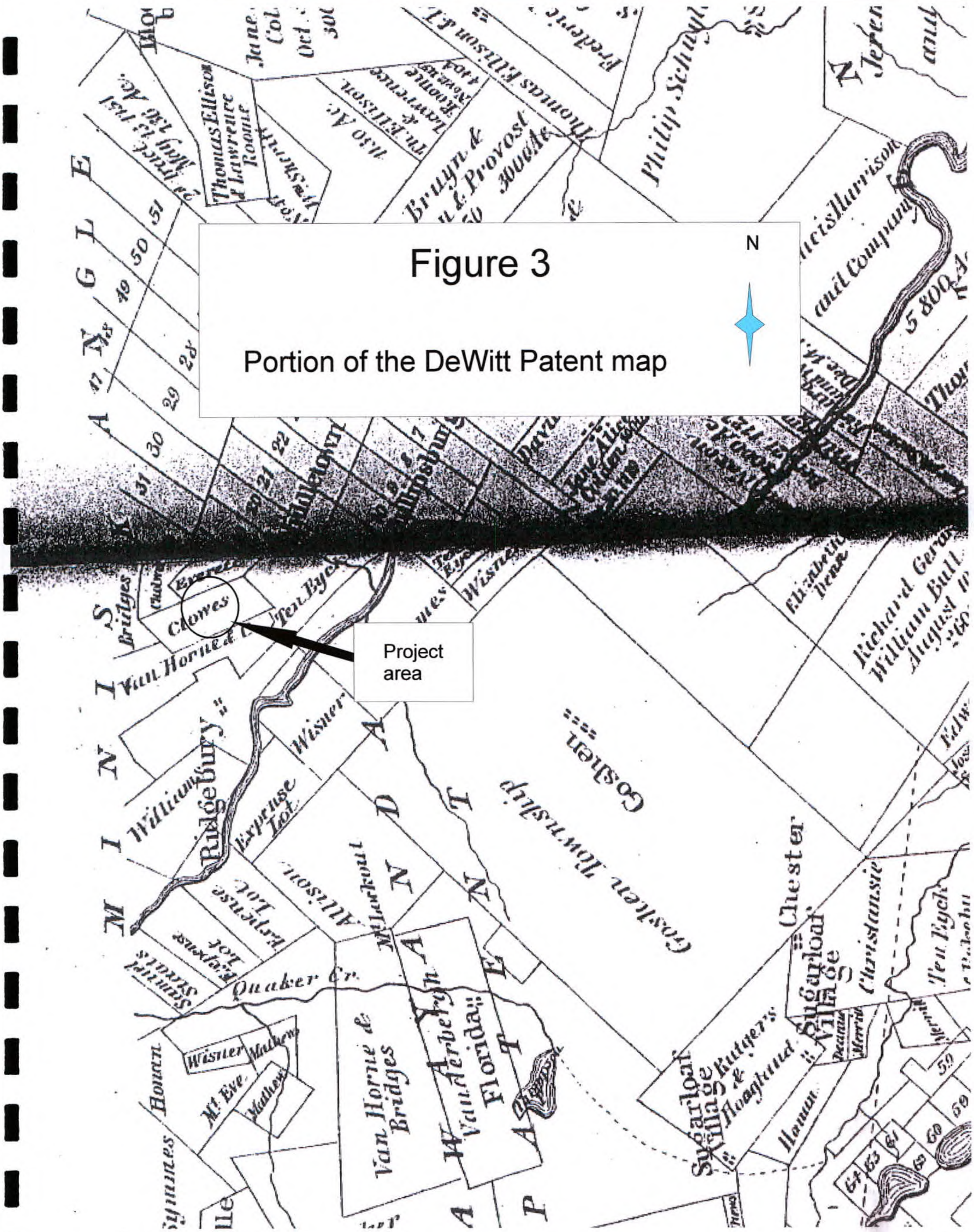
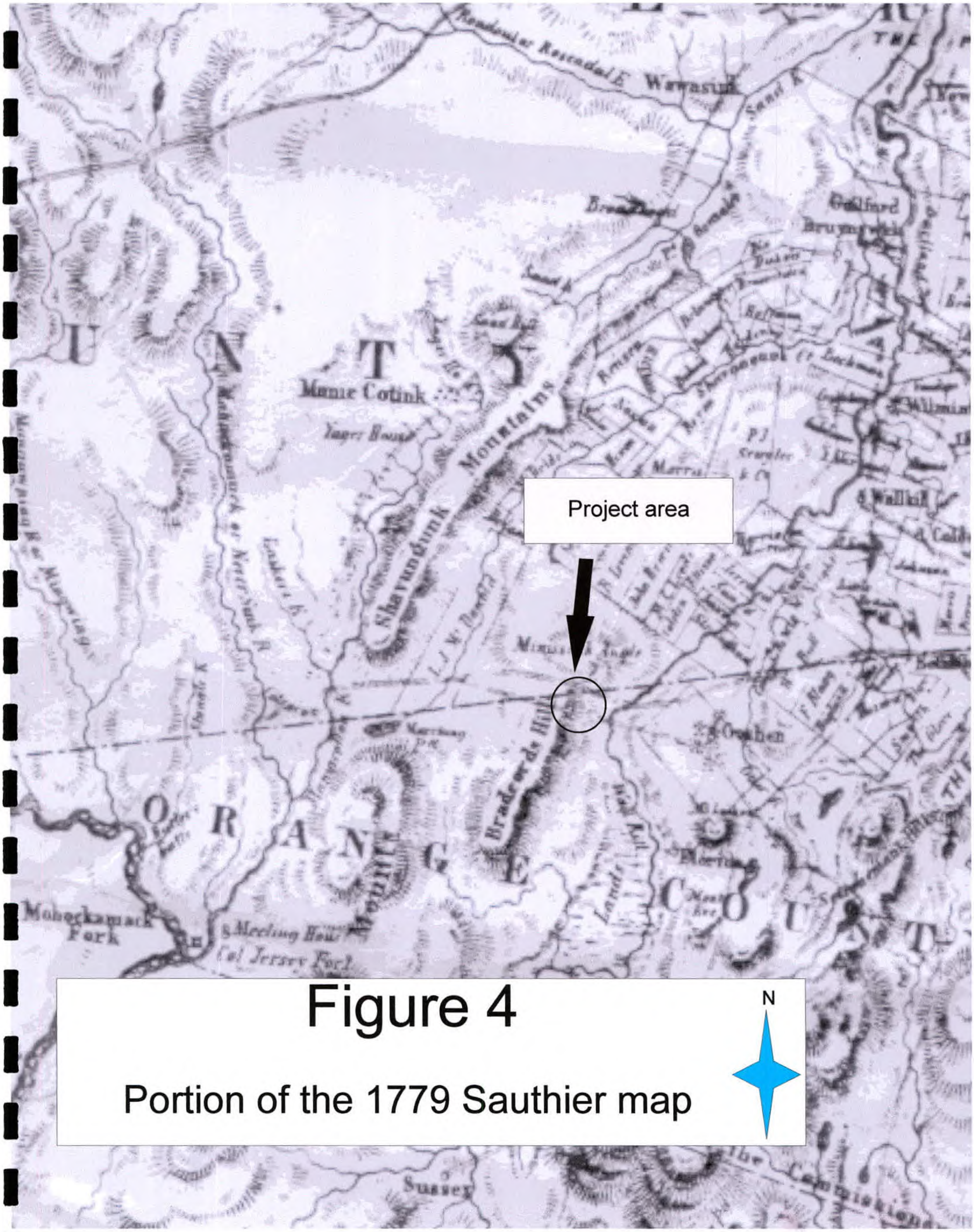


Figure 3

Portion of the DeWitt Patent map



Project area

Figure 4

Portion of the 1779 Sauthier map

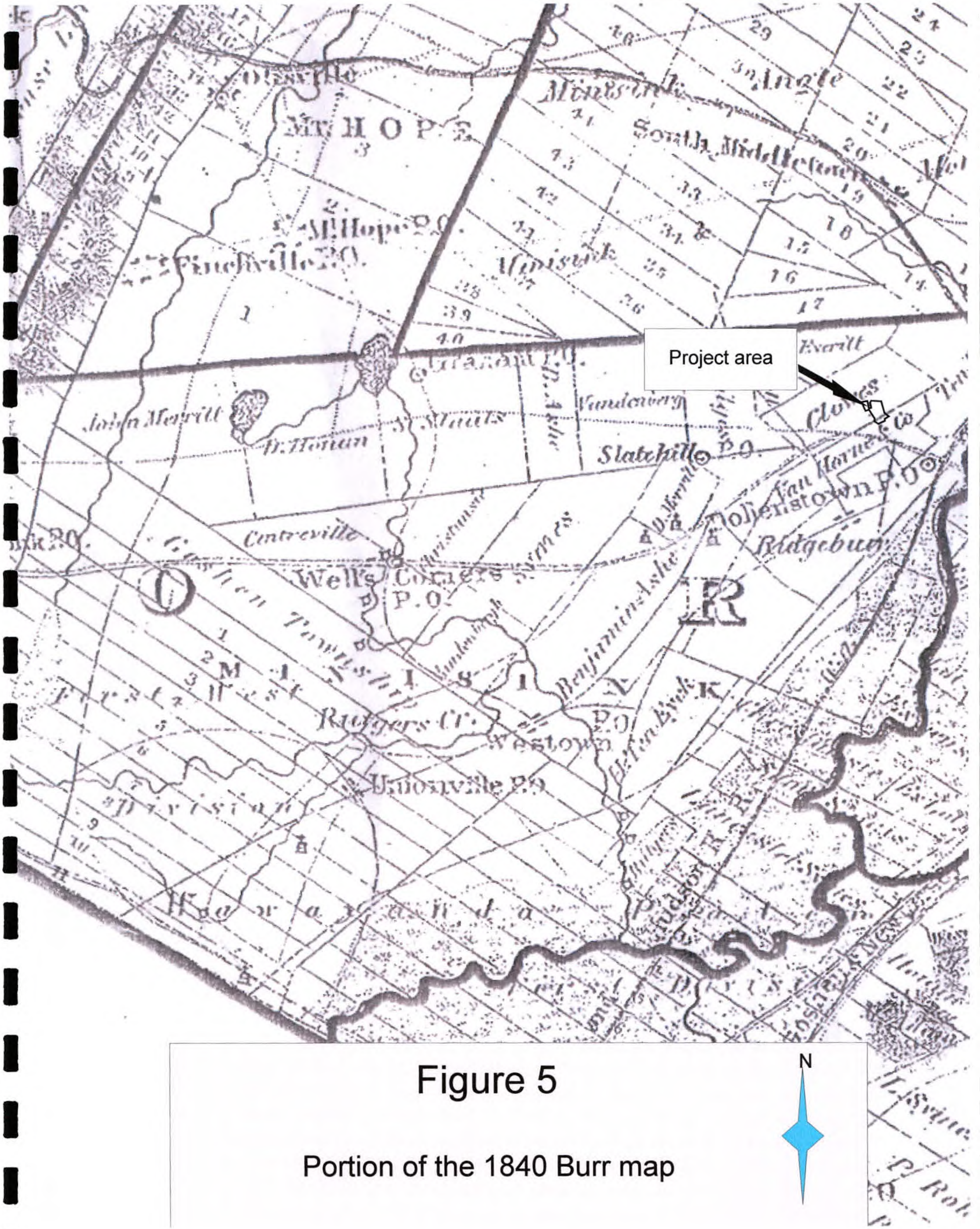
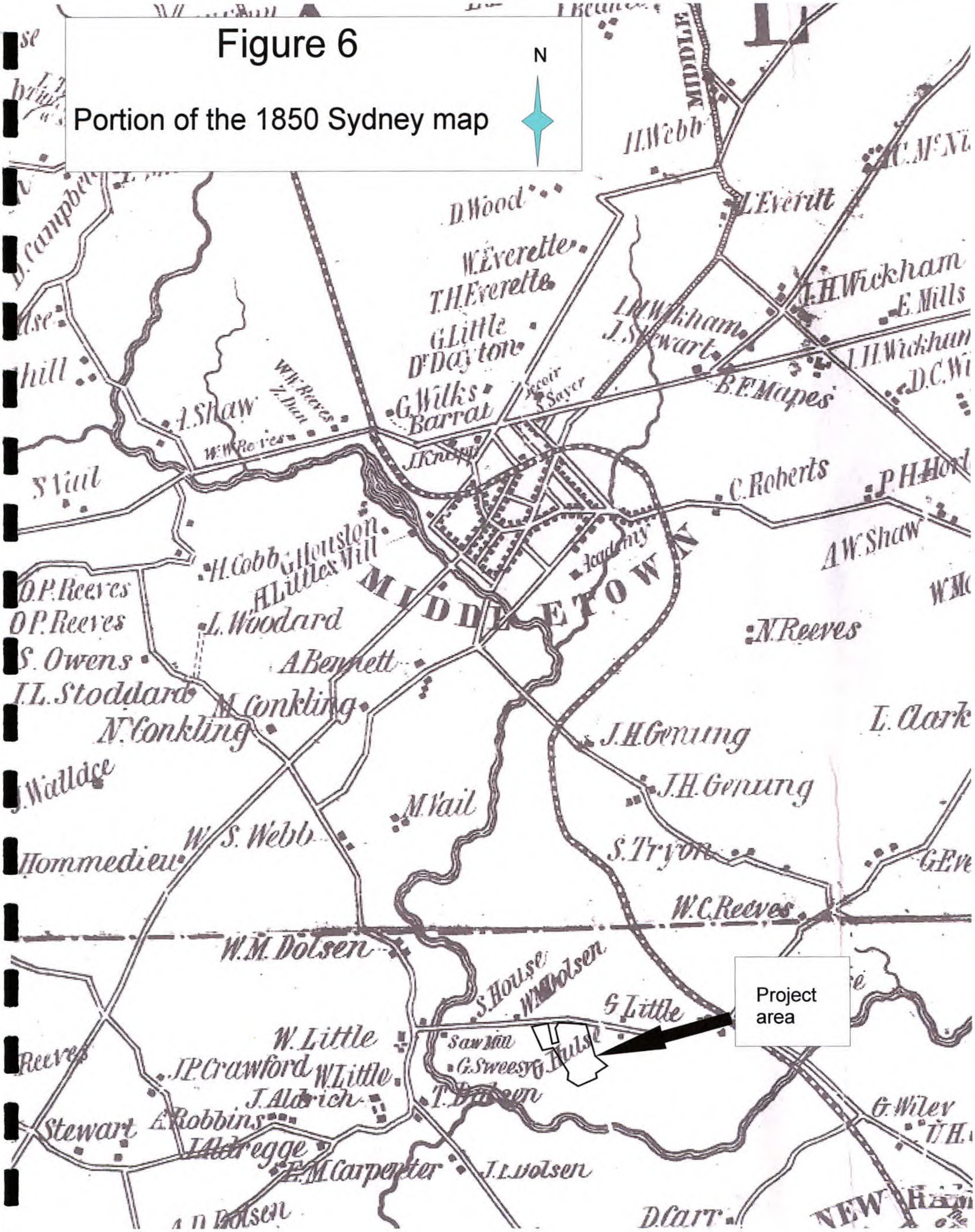


Figure 5

Portion of the 1840 Burr map

Figure 6

Portion of the 1850 Sydney map



Project area

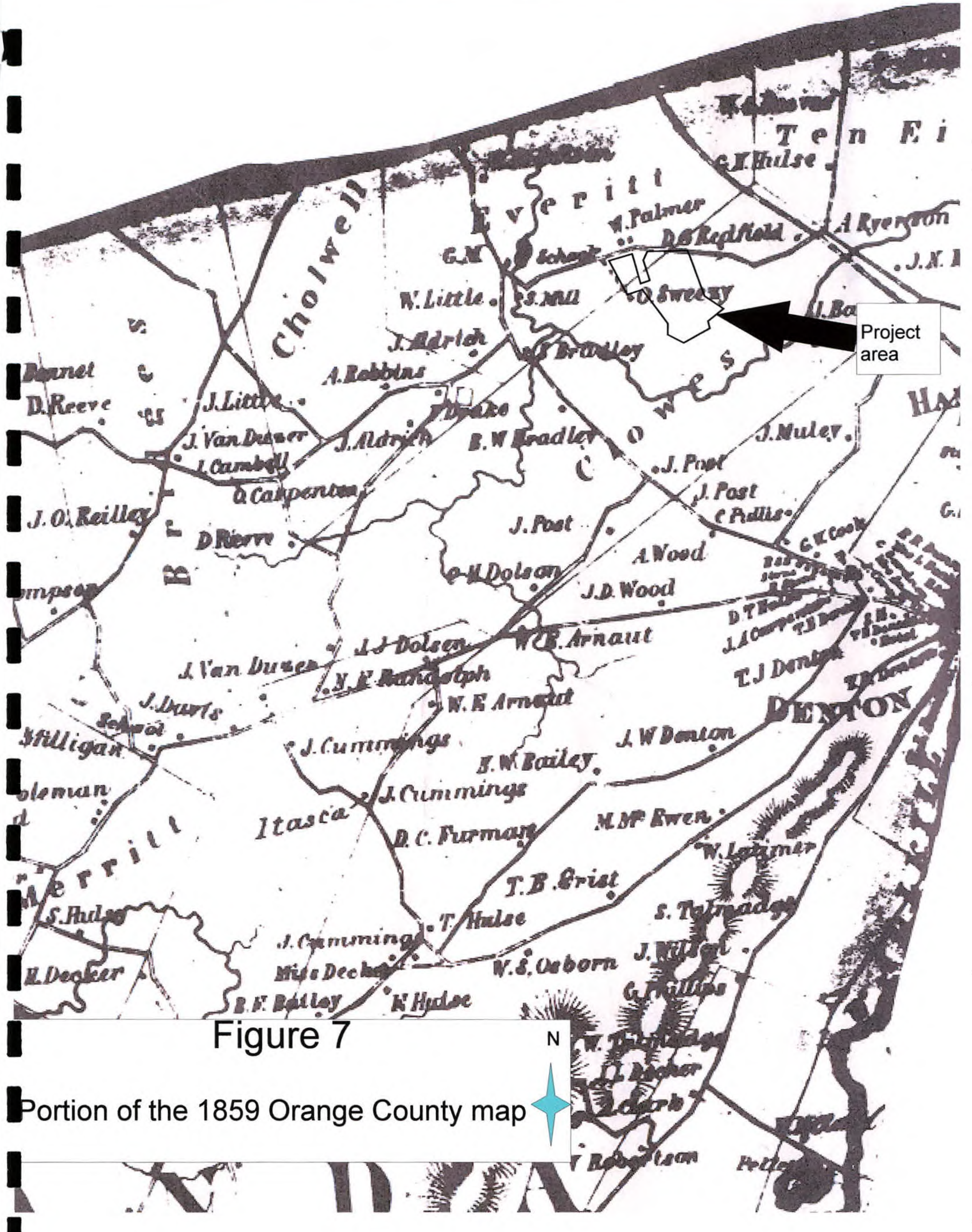


Figure 7

Portion of the 1859 Orange County map

Figure 8

Portion of the 1875 Beers atlas

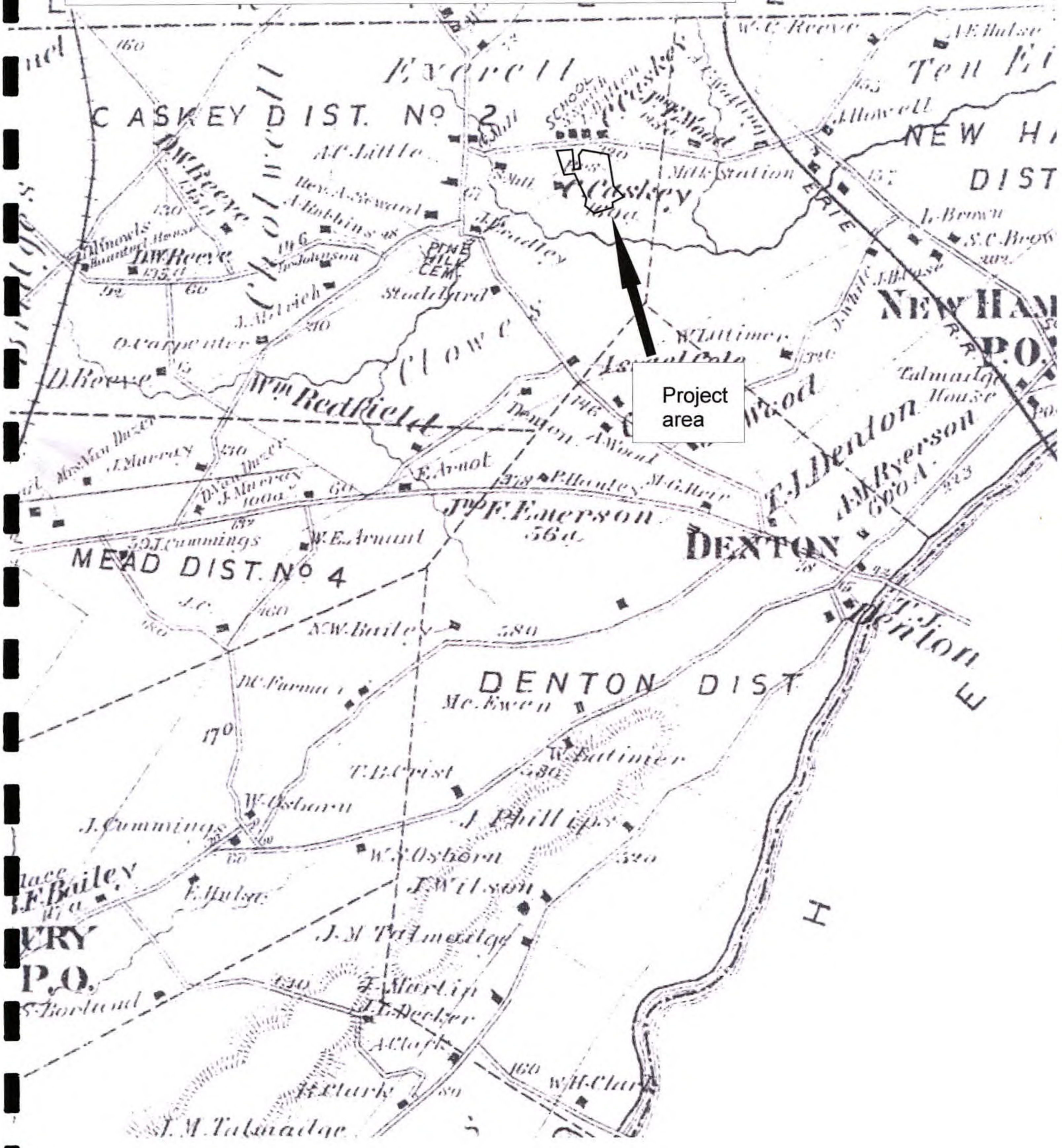
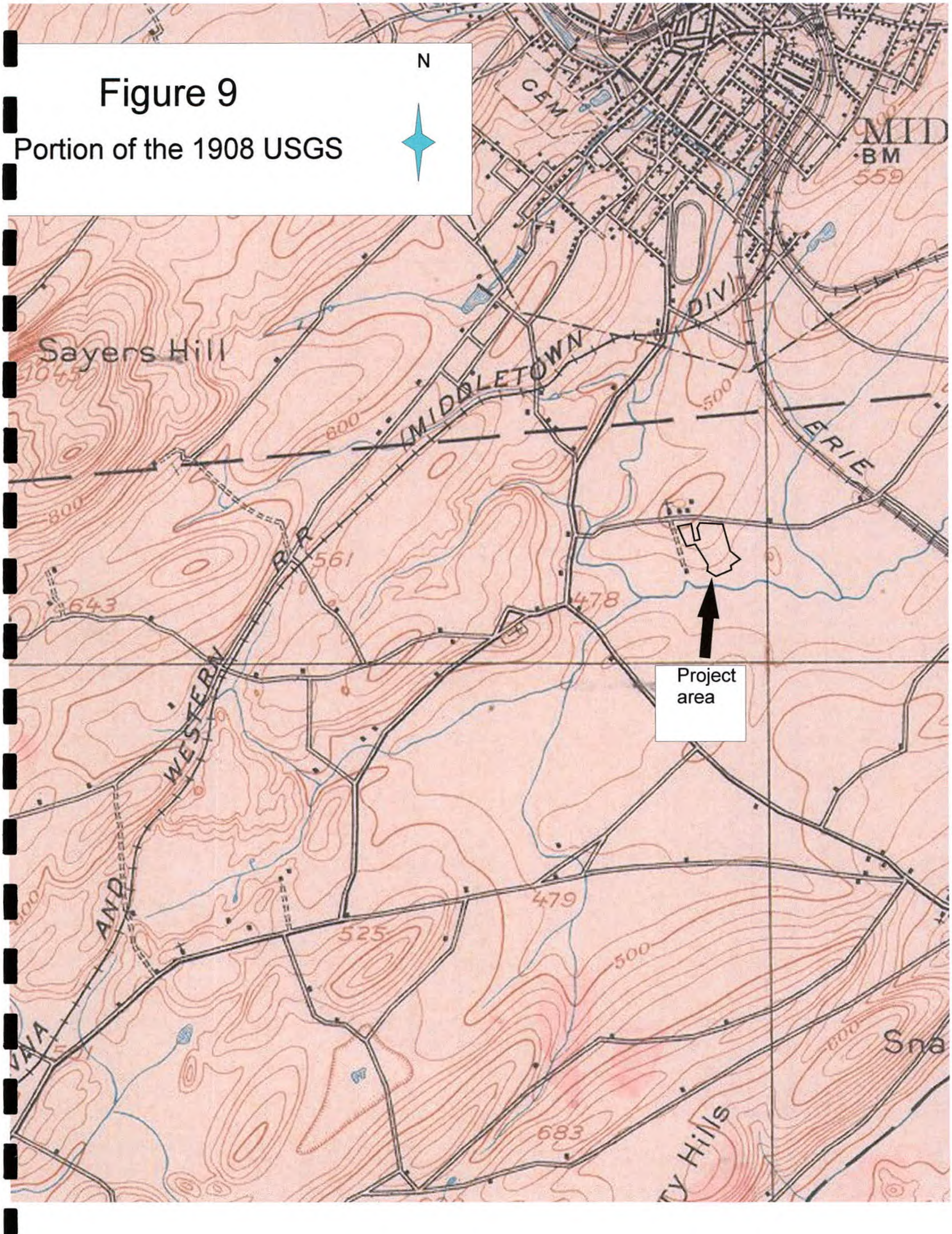


Figure 9

Portion of the 1908 USGS



Project area

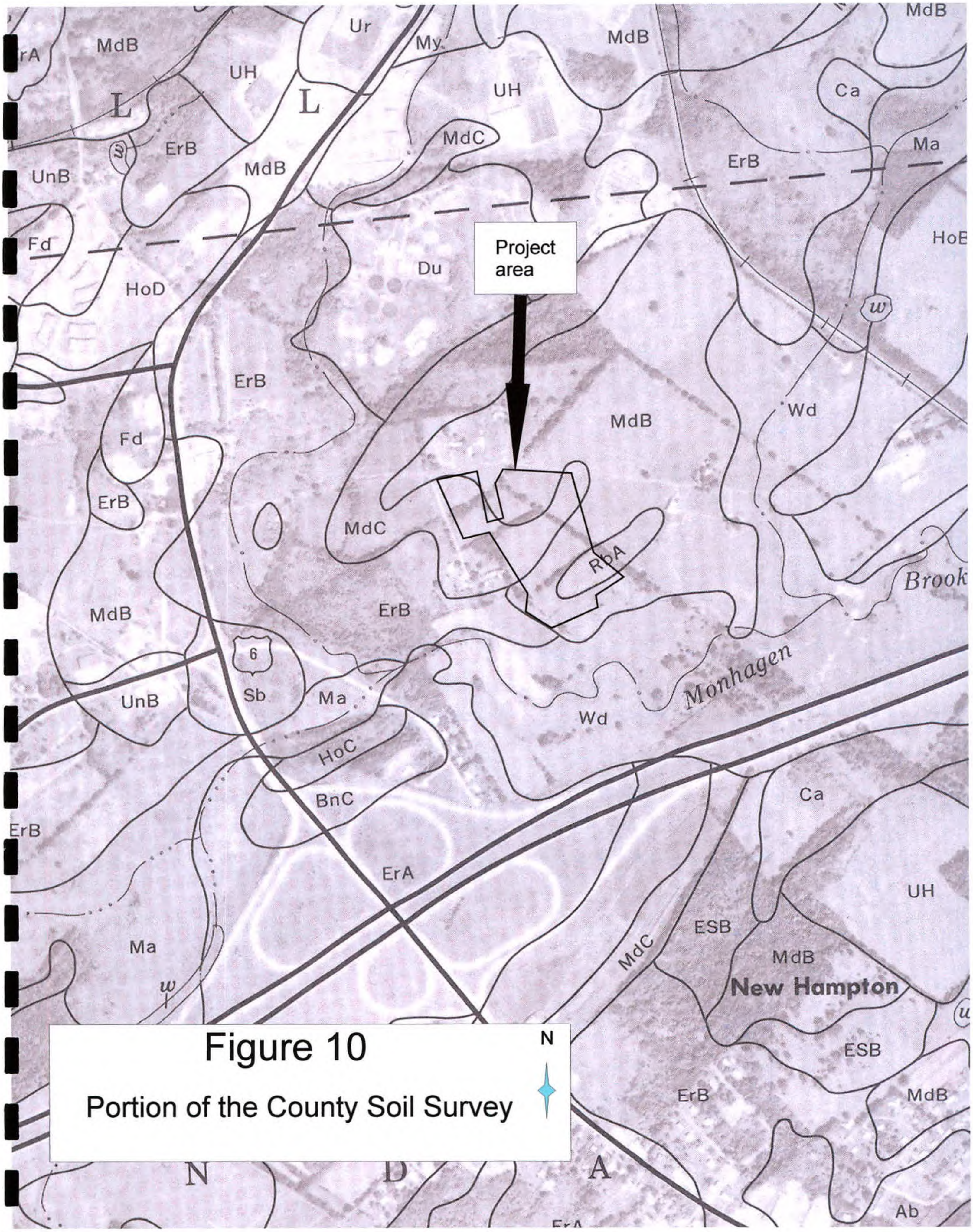


Figure 10

Portion of the County Soil Survey

Photo 1
Looking at open stone well near ST 189

Photo 2

Looking southwest from ST 178

Photo 3

Looking east from ST 16 off project area at old barn

Photo 4

Looking west from
ST 14 along
Dolsontown Road

APPENDIX 2

SHOVEL TEST PITS

STP	LV	DEPTH (CM)	TEXTURE	COLOR	HOR	COMMENT
1	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-37	GrSiLo	10YR4/3	A	NCM
	3	37-50	GrSiLo	10YR5/6	B	NCM
2	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
3	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
4	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
5	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
6	1	0-7	rootmat, leaves, humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
7	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
8	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
9	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
10	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
11	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
12	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
13	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
14	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM

15	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
16	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
17	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
18	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
19	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
20	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
21	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
22	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
23	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
24	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
25	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
26	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
27	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
28	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
29	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM

30	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
31	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
32	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
33	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
34	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
35	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
36	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
37	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
38	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-45	GrSiLo	10YR4/3	Ap	NCM
	3	45-55	GrSiLo	10YR5/6	B	NCM
39	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
40	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-46	GrSiLo	10YR4/3	Ap	NCM
	3	46-56	GrSiLo	10YR5/6	B	NCM
41	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-43	GrSiLo	10YR4/3	Ap	NCM
	3	43-53	GrSiLo	10YR5/6	B	NCM
42	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
43	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
44	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM

45	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-42	GrSiLo	10YR4/3	Ap	NCM
	3	42-53	GrSiLo	10YR5/6	B	NCM
46	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
47	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
48	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
49	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
50	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
51	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
52	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
53	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
54	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
55	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by water.				
56	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
57	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
58	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
59	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM

60	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
61	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
62	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
63	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-44	GrSiLo	10YR5/6	B	NCM
64	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-35	GrSiLo	10YR4/3	A	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
65	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
66	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	A	NCM
	3	35-48	GrSiLo	10YR5/6	B	NCM
67	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
68	1	0-7	rootmat, leaves, humus		A/O	NCM
	2	7-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
69	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
70	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
71	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
72	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
73	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
74	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM

75	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
76	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
77	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-39	GrSiLo	10YR4/3	Ap	NCM
	3	39-50	GrSiLo	10YR5/6	B	NCM
78	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-41	GrSiLo	10YR4/3	Ap	NCM
	3	41-51	GrSiLo	10YR5/6	B	NCM
79	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
80	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
81	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
82	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
83	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
84	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
85	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
86	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
87	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
88	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
89	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				

90	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
91	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
92	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
93	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-43	GrSiLo	10YR5/6	B	NCM
94	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
95	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
96	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
97	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
98	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
99	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
100	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
101	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
102	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
103	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
104	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM

105	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-18	GrSiLo	10YR4/3	Ap	NCM
	3	18-impeded by rocks.				
106	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
107	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
108	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-38	GrSiLo	10YR4/3	Ap	NCM
	3	38-48	GrSiLo	10YR5/6	B	NCM
109	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
110	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
111	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
112	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
113	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
114	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
115	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
116	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
117	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-42	GrSiLo	10YR4/3	Ap	NCM
	3	42-52	GrSiLo	10YR5/6	B	NCM
118	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
119	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-39	GrSiLo	10YR4/3	Ap	NCM
	3	39-49	GrSiLo	10YR5/6	B	NCM

120	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
121	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
122	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
123	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-49	GrSiLo	10YR5/6	B	NCM
124	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
125	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
126	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
127	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-18	GrSiLo	10YR4/3	A	NCM
	3	18-36	GrSiLo	10YR5/6	B	NCM
128	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
129	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-15	GrSiLo	10YR4/3	A	NCM
	3	15-30	GrSiLo	10YR5/6	B	NCM
130	1	0-7	rootmat, leaves, humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
131	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
132	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
133	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
134	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM

135	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
136	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-36	GrSiLo	10YR5/6	B	NCM
137	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
138	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
139	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-34	GrSiLo	10YR5/6	B	NCM
140	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
141	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
142	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-35	GrSiLo	10YR5/6	B	NCM
143	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
144	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
145	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
146	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
147	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-impeded by rocks.				
148	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-21	GrSiLo	10YR4/3	Ap	NCM
	3	21-31	GrSiLo	10YR5/6	B	NCM
149	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM

150	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
151	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
152	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
153	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
154	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-impeded by rocks.				
155	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
156	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
157	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
158	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
159	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-37	GrSiLo	10YR4/3	A	NCM
	3	37-49	GrSiLo	10YR5/6	B	NCM
160	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
161	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
162	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
163	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
164	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM

165	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
166	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
167	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-18	GrSiLo	10YR4/3	Ap	NCM
	3	18-impeded by rocks.				
168	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-15	GrSiLo	10YR4/3	Ap	NCM
	3	15-30	GrSiLo	10YR5/6	B	NCM
169	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-15	GrSiLo	10YR4/3	Ap	NCM
	3	15-28	GrSiLo	10YR5/6	B	NCM
170	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-19	GrSiLo	10YR4/3	Ap	NCM
	3	19-30	GrSiLo	10YR5/6	B	NCM
171	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
172	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
173	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-18	GrSiLo	10YR4/3	Ap	NCM
	3	18-34	GrSiLo	10YR5/6	B	NCM
174	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
175	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-impeded by rocks.				
176	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
177	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
178	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-19	GrSiLo	10YR4/3	Ap	NCM
	3	19-29	GrSiLo	10YR5/6	B	NCM
179	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM

180	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
181	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
182	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
183	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-impeded by water.				
184	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
185	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
186	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
187	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
188	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-impeded by water.				
189	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	GrSiLo	10YR4/3	A	NCM
	3	23-impeded by water.				
190	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
191	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
192	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
193	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
194	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM

195	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
196	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
197	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	7-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-impeded by water.				
198	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
199	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
200	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
201	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
202	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
203	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
204	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-34	GrSiLo	10YR5/6	B	NCM
205	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
206	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
207	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-20	GrSiLo	10YR4/3	Ap	NCM
	3	20-31	GrSiLo	10YR5/6	B	NCM
208	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
209	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				

210	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
211	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-impeded by rocks.				
212	2	0-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
213	2	0-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
214	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
215	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
216	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
217	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
218	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-impeded by water.				
219	2	0-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
220	2	0-13	GrSiLo	10YR4/3	A	NCM
	3	13-impeded by water.				
221	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
222	2	0-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
223	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
224	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
225	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
226	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
227	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-impeded by water.				

228	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
229	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-43	GrSiLo	10YR5/6	B	NCM
230	2	0-12	GrSiLo	10YR4/3	Ap	NCM
	3	12-impeded by rocks.				
231	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
232	2	0-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
233	2	0-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-43	GrSiLo	10YR5/6	B	NCM
234	2	0-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
235	2	0-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
236	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-33	GrSiLo	10YR5/6	B	NCM
237	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
238	2	0-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
239	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
240	2	0-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
241	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
242	1	0-4	rootmat, leaves, humus		A/O	NCM
	2	4-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-39	GrSiLo	10YR5/6	B	NCM
243	1	0-5	rootmat, leaves, humus		A/O	NCM
	2	5-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-40	GrSiLo	10YR5/6	B	NCM
244	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
245	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
246	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM

247	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-19	GrSiLo	10YR4/3	Ap	NCM
	3	19-impeded by rocks.				
248	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
249	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
250	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
251	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-14	GrSiLo	10YR4/3	A	NCM
	3	14-36	GrSiLo	10YR5/6	B	NCM
252	2	0-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
253	2	0-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
254	2	0-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-48	GrSiLo	10YR5/6	B	NCM
255	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
256	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
257	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-38	GrSiLo	10YR5/6	B	NCM
258	2	0-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
259	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
260	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-43	GrSiLo	10YR5/6	B	NCM
261	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
262	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
263	2	0-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
264	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM

265	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-38	GrSiLo	10YR5/6	B	NCM
266	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
267	2	0-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-44	GrSiLo	10YR5/6	B	NCM
268	2	0-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-impeded by rocks.				
269	2	0-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
270	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
271	2	0-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-impeded by rocks.				
272	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
273	2	0-10	GrSiLo	10YR4/3	Ap	NCM
	3	10-impeded by water.				
274	2	0-15	GrSiLo	10YR4/3	Ap	NCM
	3	15-impeded by water.				
275	2	0-8	GrSiLo	10YR4/3	Ap	NCM
	3	8-impeded by water.				
276	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
277	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
278	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				
279	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
280	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
281	2	0-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
282	2	0-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
283	2	0-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
284	2	0-26	GrSiLo	10YR4/3	A	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
285	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM

286	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
287	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-37	GrSiLo	10YR5/6	B	NCM
288	2	0-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
289	2	0-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
290	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
291	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-35	GrSiLo	10YR5/6	B	NCM
292	2	0-15	GrSiLo	10YR4/3	Ap	NCM
	3	15-37	GrSiLo	10YR5/6	B	NCM
293	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
294	2	0-13	GrSiLo	10YR4/3	Ap	NCM
	3	13-impeded by water.				
295	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
296	2	0-17	GrSiLo	10YR4/3	Ap	NCM
	3	17-impeded by water.				
297	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-39	GrSiLo	10YR5/6	B	NCM
298	2	0-14	GrSiLo	10YR4/3	Ap	NCM
	3	14-impeded by water.				
299	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
300	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-38	GrSiLo	10YR5/6	B	NCM
301	2	0-17	GrSiLo	10YR4/3	Ap	NCM
	3	17-30	GrSiLo	10YR5/6	B	NCM
302	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-impeded by rocks.				
303	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
304	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-39	GrSiLo	10YR5/6	B	NCM
305	2	0-18	GrSiLo	10YR4/3	Ap	NCM
	3	18-30	GrSiLo	10YR5/6	B	NCM

306	1	0-6	rootmat, leaves, humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
307	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
308	1	0-3	rootmat, leaves, humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
309	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
310	1	0-2	rootmat, leaves, humus		A/O	NCM
	2	2-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-32	GrSiLo	10YR5/6	B	NCM
311	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-28	GrSiLo	10YR5/6	B	NCM
312	2	0-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
313	2	0-22	GrSiLo	10YR4/3	A	NCM
	3	22-37	GrSiLo	10YR5/6	B	NCM
314	2	0-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
315	2	0-20	GrSiLo	10YR4/3	A	NCM
	3	20-30	GrSiLo	10YR5/6	B	NCM
316	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-37	GrSiLo	10YR5/6	B	NCM
317	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
318	2	0-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-48	GrSiLo	10YR5/6	B	NCM
319	2	0-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-43	GrSiLo	10YR5/6	B	NCM
320	2	0-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
321	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
322	2	0-40	GrSiLo	10YR4/3	Ap	NCM
	3	40-50	GrSiLo	10YR5/6	B	NCM
323	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
324	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM

325	2	0-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
326	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
327	2	0-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
328	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
329	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM
330	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
331	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	GrSiLo	10YR4/3	Ap	NCM
	3	34-45	GrSiLo	10YR5/6	B	NCM
332	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
333	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-47	GrSiLo	10YR4/3	Ap	NCM
	3	47-57	GrSiLo	10YR5/6	B	NCM
334	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
335	2	0-21	GrSiLo	10YR4/3	Ap	NCM
	3	21-31	GrSiLo	10YR5/6	B	NCM
336	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
337	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
338	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
339	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
340	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-impeded by rocks.				

341	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-41	GrSiLo	10YR4/3	Ap	NCM
	3	41-52	GrSiLo	10YR5/6	B	NCM
342	2	0-43	GrSiLo	10YR4/3	Ap	NCM
	3	43-impeded by rocks.				
343	2	0-27	GrSiLo	10YR4/3	A	NCM
	3	27-37	GrSiLo	10YR5/6	B	NCM
344	2	0-30	GrSiLo	10YR4/3	A	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
345	2	0-28	GrSiLo	10YR4/3	A	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
346	2	0-31	GrSiLo	10YR4/3	A	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
347	2	0-41	GrSiLo	10YR4/3	Ap	NCM
	3	41-53	GrSiLo	10YR5/6	B	NCM
348	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM
349	2	0-19	GrSiLo	10YR4/3	Ap	NCM
	3	19-40	GrSiLo	10YR5/6	B	NCM
350	2	0-37	GrSiLo	10YR4/3	Ap	NCM
	3	37-47	GrSiLo	10YR5/6	B	NCM
351	2	0-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-33	GrSiLo	10YR5/6	B	NCM
352	2	0-25	GrSiLo	10YR4/3	Ap	NCM
	3	25-35	GrSiLo	10YR5/6	B	NCM
353	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
354	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
355	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-40	GrSiLo	10YR5/6	B	NCM
356	2	0-32	GrSiLo	10YR4/3	Ap	NCM
	3	32-42	GrSiLo	10YR5/6	B	NCM
357	2	0-27	GrSiLo	10YR4/3	Ap	NCM
	3	27-40	GrSiLo	10YR5/6	B	NCM
358	2	0-35	GrSiLo	10YR4/3	Ap	NCM
	3	35-45	GrSiLo	10YR5/6	B	NCM
359	2	0-24	GrSiLo	10YR4/3	Ap	NCM
	3	24-35	GrSiLo	10YR5/6	B	NCM
360	2	0-33	GrSiLo	10YR4/3	Ap	NCM
	3	33-45	GrSiLo	10YR5/6	B	NCM

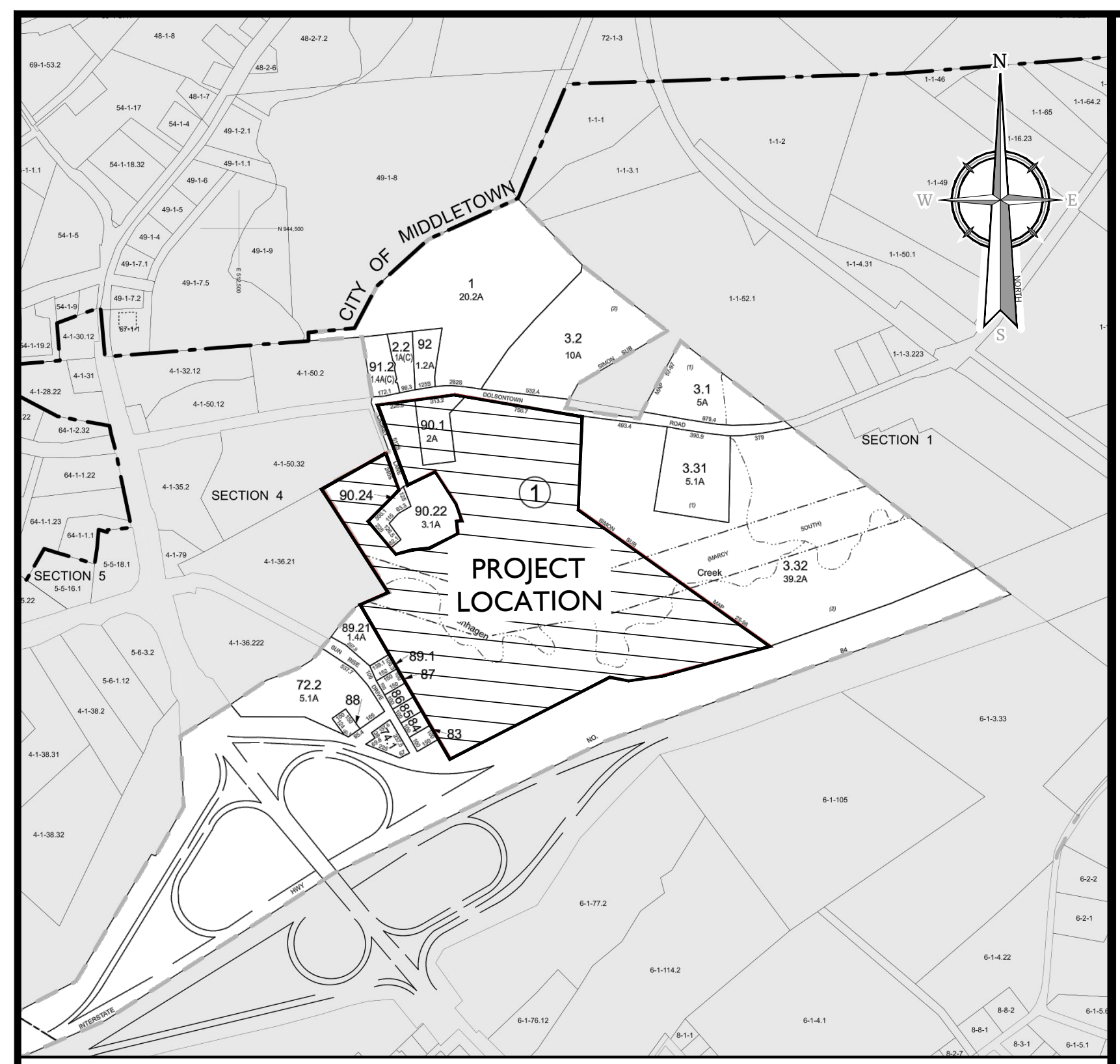
361	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-impeded by rocks.				
362	2	0-22	GrSiLo	10YR4/3	Ap	NCM
	3	22-33	GrSiLo	10YR5/6	B	NCM
363	2	0-23	GrSiLo	10YR4/3	Ap	NCM
	3	23-35	GrSiLo	10YR5/6	B	NCM
364	2	0-17	GrSiLo	10YR4/3	Ap	NCM
	3	17-impeded by rocks.				
365	2	0-28	GrSiLo	10YR4/3	Ap	NCM
	3	28-38	GrSiLo	10YR5/6	B	NCM
366	2	0-36	GrSiLo	10YR4/3	Ap	NCM
	3	36-46	GrSiLo	10YR5/6	B	NCM
367	2	0-31	GrSiLo	10YR4/3	Ap	NCM
	3	31-41	GrSiLo	10YR5/6	B	NCM
368	2	0-29	GrSiLo	10YR4/3	Ap	NCM
	3	29- impeded by root				
369	2	0-30	GrSiLo	10YR4/3	Ap	NCM
	3	30-40	GrSiLo	10YR5/6	B	NCM
370	2	0-26	GrSiLo	10YR4/3	Ap	NCM
	3	26-36	GrSiLo	10YR5/6	B	NCM

APPENDIX 3

Map Documented Structures

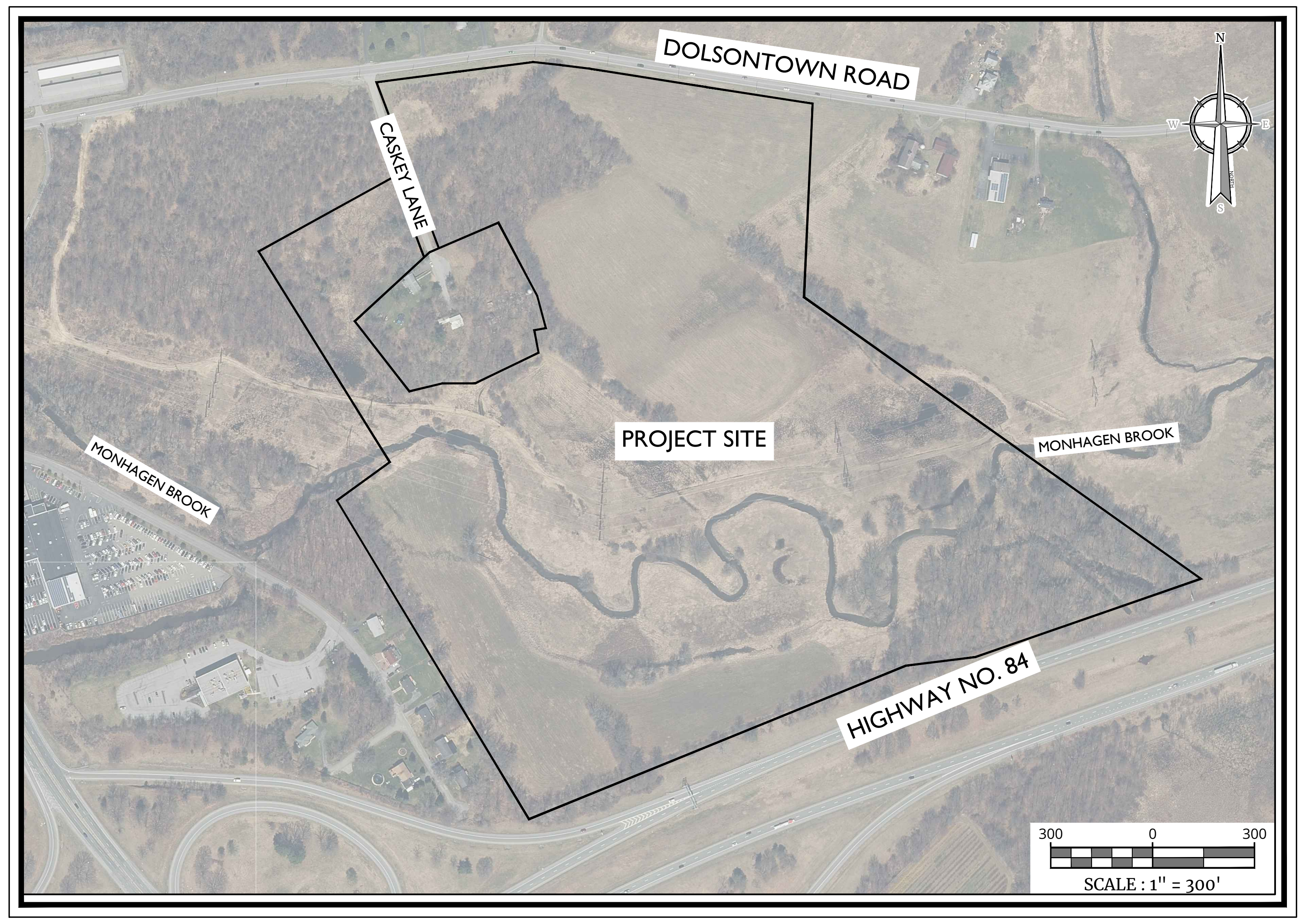
Location	**Map**	**On, or Adjacent to Study Area**	**Owner**	**Eco-niche**	**Comment**
at end of Caskey Lane	1850	no	na	farming community	Fig. 6
same as above	1859	adjacent	O'Sweezy	farming community	Fig. 7
same as above	1875	possibly adjacent	C. Caskey	farming community	Fig. 8
same as above	1908	nearby but not immediately adjacent	na	farming community	Fig. 9

Section 6



TOWN OF WAWAYANDA TAX MAP
SCALE: 1" = 1000'
SOURCE: ORANGE COUNTY NY.
TOWN OF WAWAYANDA
SECTION 6N TAX YEAR 2021

SITE PLANS
FOR
MID DOLSONTOWN, LLC.
SIMON WAREHOUSE
SBL: 6-1-107 & 6-1-90.1
TOWN OF WAWAYANDA
ORANGE COUNTY, NEW YORK



KEY & ZONING MAP

SOURCE: NYS GIS CLEARING HOUSE

INDEX OF SHEETS

SHT. No.	DESCRIPTION	LATEST REVISION
1	COVER SHEET	2/6/2023
2	EXISTING CONDITIONS & DEMOLITION PLAN	2/6/2023
3	OVERALL DIMENSION PLAN	2/6/2023
4-5	DIMENSION PLANS	2/6/2023
6-7	GRADING & DRAINAGE PLANS	2/6/2023
8-9	UTILITY PLANS	2/6/2023
10	SOIL EROSION & SEDIMENT CONTROL PLAN	2/6/2023
11	SOIL EROSION & SEDIMENT CONTROL PLAN DETAILS	2/6/2023
12-13	LANDSCAPE PLAN	2/6/2023
14-15	LIGHTING PLAN	2/6/2023
16 - 20	CONSTRUCTION DETAILS	2/6/2023

GENERAL INFORMATION

1. THE SUBJECT PROPERTY IS KNOWN AS SECTION 6, BLOCK 1, LOT 107 & SECTION 6, BLOCK 1, LOT 90.1 IN THE TOWN OF WAWAYANDA, ORANGE COUNTY, NEW YORK.
2. THE PROPERTY IS LOCATED IN THE MC-1 (MIXED COMMERCIAL) ZONING DISTRICT & COUNTY AGRICULTURE DISTRICT AND CONTAINS A COMBINED TRACT AREA OF ±3,101,161 SQ FT, ±71.19 ACRES.

OWNER1:
SAMUEL G. SIMON & GAIL SIMON
7 LOCKERMAN AVE.
POUGHKEEPSIE, NY 12601
SBL: 6-1-107

OWNER 2:
DOLSONTOWN PARK, LLC.
P.O. BOX 696
NEWHAMPTON, NY 10958
SBL: 6-1-90.1

APPLICANT:
MID DOLSONTOWN LLC,
ONE INTERNATIONAL BOULEVARD, SUITE 410
MAHWAH, NJ 04730

3. BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS TAKEN FROM A PLAN ENTITLED "ALTA/NSPS LAND TITLE SURVEY PREPARED FOR DOLSONTOWN ROAD SECTION 6 BLOCK 1 LOT 107, & 90.1 AND PREPARED BY JOHN W. McCCORD, SR. DATED SEPTEMBER 20, 2021 REV: NOVEMBER 16, 2021.
4. THE HORIZONTAL DATUM IS RELATIVE TO NAD83. THE VERTICAL DATUM IS RELATIVE TO N.A.V.D. 1988. .
5. THE LIMITS OF FRESHWATER WETLANDS SHOWN HEREON WERE FIELD DELINEATED BY ECOLOGICAL SOLUTIONS, LLC ON 9/28/2021.
6. NO 100 YEAR FLOOD PLAINS ARE KNOWN TO EXIST ON THE SITE PER THE FLOOD INSURANCE RATE MAPS 36071C0266E DATED 08/03/2009 PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
7. THIS SET OF PLANS IS NOT DEPICTING ENVIRONMENTAL CONDITIONS OR A CERTIFICATION/WARRANTY REGARDING THE PRESENCE OR ABSENCE OF ENVIRONMENTALLY IMPACTED SITE CONDITIONS. COLLIERS ENGINEERING & DESIGN HAS PERFORMED NO EXPLORATORY OR TESTING SERVICES, INTERPRETATIONS, CONCLUSIONS OR OTHER SITE ENVIRONMENTAL SERVICES RELATED TO THE DETERMINATION OF THE POTENTIAL FOR CHEMICAL, TOXIC, RADIOACTIVE OR OTHER TYPE OF CONTAMINANTS AFFECTING THE PROPERTY AND THE UNDERSIGNED PROFESSIONAL IS NOT QUALIFIED TO DETERMINE THE EXISTENCE OF SAME. SHOULD ENVIRONMENTAL CONTAMINATION OR WASTE BE DISCOVERED, THE OWNER AND CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LAWS AND REGULATIONS.
8. THIS IS A SITE DEVELOPMENT PLAN AND UNLESS SPECIFICALLY NOTED ELSEWHERE HEREON, IS NOT A SURVEY.
9. DO NOT SCALE DRAWINGS AS THEY PERTAIN TO ADJACENT AND SURROUNDING PHYSICAL CONDITIONS, BUILDINGS, STRUCTURES, ETC. THEY ARE SCHEMATIC ONLY, EXCEPT WHERE DIMENSIONS ARE SHOWN THERETO.
10. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL APPROVALS REQUIRED HAVE BEEN OBTAINED, ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND THE DRAWINGS HAVE BEEN STAMPED "ISSUED FOR CONSTRUCTION". THIS SHALL INCLUDE APPROVAL OF ALL CATALOG CUTS, SHOP DRAWINGS AND/OR DESIGN CALCULATIONS AS REQUIRED BY THE PROJECT OWNER AND/OR MUNICIPAL ENGINEER.
11. THE CONTRACTOR IS RESPONSIBLE FOR PROJECT SAFETY, INCLUDING PROVISION OF ALL APPROPRIATE SAFETY DEVICES AND TRAINING REQUIRED.
12. PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CALL 811 TO REQUEST A UTILITY MARKOUT.
13. INFORMATION HEREON INCORPORATES THE CONTENT IN THE FOLLOWING REPORTS:
   A. "STORMWATER POLLUTION PREVENTION PLAN (SWPPP)" PREPARED FOR MID DOLSONTOWN LLC, PREPARED BY COLLIERS ENGINEERING & DESIGN; DATED 2/6/2023.

SITE NOTES

1. BUILDING FOOTPRINT DIMENSIONS SHOWN HEREON ARE APPROXIMATE. FINAL BUILDING FOOTPRINT DIMENSIONS FOR THE BUILDING SHALL BE FURNISHED ON THE INDIVIDUAL ARCHITECTURAL PLANS AT THE TIME OF APPLICATION FOR A BUILDING PERMIT. ALL STRUCTURES SHALL CONFORM TO THE APPROVED BULK ZONING REQUIREMENTS.
2. CURBS SHALL BE DEPRESSED FLUSH WITH PAVEMENT, AND ADA ACCESSIBLE CURB RAMPS INSTALLED WHERE SIDEWALKS AND CROSSWALKS INTERSECT SAME. DETECTABLE WARNINGS SHALL BE INCLUDED ON ADA ACCESSIBLE CURB RAMPS.
3. TRAFFIC SIGNAGE AND STRIPING SHALL CORRESPOND TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL WASTE MATERIALS IN ACCORDANCE WITH GOVERNING REGULATIONS AND AGENCIES.
5. REFUSE AND RECYCLABLES SHALL BE STORED WITHIN OUTSIDE SCREENED TRASH ENCLOSURES AS NOTED ON THE PLANS AND PICED UP BY A PRIVATE WASTE DISPOSAL HAULER.
6. THERE SHALL BE NO ON-SITE BURIAL OF CONSTRUCTION MATERIALS, TREE BRANCHES, STUMPS, OR OTHER DELETERIOUS MATERIALS.
7. MATERIALS, WORKMANSHIP, AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH:

A. NEW YORK STATE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", 2020; AS SUPPLEMENTED.
B. CURRENT PREVAILING MUNICIPAL, COUNTY, AND/OR STATE AGENCY SPECIFICATIONS, STANDARDS, CONDITIONS, AND REQUIREMENTS.
C. CURRENT PREVAILING UTILITY COMPANY/AUTHORITY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.
D. CURRENT MANUFACTURER SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.

UTILITY NOTES

1. EXISTING UTILITY INFORMATION SHOWN HEREON HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY OR COMPLETENESS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO HIS SATISFACTION PRIOR TO EXCAVATION. WHERE EXISTING UTILITIES ARE TO BE CROSSED BY PROPOSED CONSTRUCTIONS, TEST PITS SHALL BE DUG BY THE CONTRACTOR PRIOR TO CONSTRUCTION TO ASCERTAIN EXISTING INVERTS, MATERIALS, AND SIZES. TEST PIT INFORMATION SHALL BE GIVEN TO THE ENGINEER PRIOR TO CONSTRUCTION TO PERMIT ADJUSTMENTS AS REQUIRED TO AVOID CONFLICTS. THE CONTRACTOR SHALL NOTIFY THE UNDER SIGNED PROFESSIONAL IMMEDIATELY IF ANY FIELD CONDITIONS ENCOUNTERED DIFFER MATERIALLY FROM THOSE REPRESENTED HEREON. SUCH CONDITIONS COULD RENDER THE DESIGNS HEREON INAPPROPRIATE OR INEFFECTIVE.
2. UTILITY RELOCATIONS SHOWN HEREON, IF ANY, ARE FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REPRESENT ALL REQUIRED UTILITY RELOCATIONS. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING AND/OR COORDINATING ALL REQUIRED UTILITY RELOCATIONS IN COOPERATION WITH THE RESPECTIVE UTILITY COMPANY/AUTHORITIES.
3. STORM SEWERS SHALL BE CLASS III (OR HIGHER IF NOTED) REINFORCED CONCRETE PIPE (RCP) WITH "O" RING GASKETS OR INTERNALLY PRELUBRICATED GASKET (TYLOX SUPERSEAL OR EQUIVALENT, ADS N-12 HIGH DENSITY POLYETHYLENE PIPE (HDPE), AS NOTED ON THE PLAN, OR APPROVED EQUAL. PROPER PIPE COVERAGE SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION. PIPE LENGTHS SHOWN HEREON ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
4. WATER SERVICE TO BE PROVIDED FROM THE EXISTING WATER MAIN LINE WITHIN DOLSONTOWN ROAD, OWNED AND OPERATED BY THE TOWN OF WAWAYANDA WATER DEPARTMENT. PROPOSED WATER MAIN EXTENSIONS AND FIRE HYDRANT LOCATIONS ARE SUBJECT TO MUNICIPAL REVIEW AND APPROVAL. PIPE MATERIALS SHALL BE CEMENT LINED DUCTILE IRON PIPE, CLASS 52 AS NOTED ON THE PLANS. WATER MAINS SHALL BE INSTALLED TO PROVIDE A MINIMUM 4'-6" FEET OF COVER FROM THE TOP OF PIPE TO THE PROPOSED GRADE.
5. SANITARY SEWER SERVICE SHALL BE PROVIDED BY PUMP STATION & FORCE MAIN CONNECTION TO EXISTING SEWER MANHOLE WITHIN DOLSONTOWN ROAD, OWNED AN OPERATED BY THE TOWN OF WAWAYANDA SEWER DEPARTMENT. ON-SITE GRAVITY PIPE MATERIALS SHALL BE PVC SDR-35, EXCEPT AS NOTED OTHERWISE ON THE PLANS. EXCEPT WHERE SHALLOWER DEPTHS ARE PERMITTED BY THE MUNICIPALITY OR UTILITY AUTHORITY, SEWER LINES, INCLUDING FORCE MAINS AND LATERALS, SHALL BE INSTALLED TO PROVIDE A MINIMUM 4-6 FEET OF COVER FROM THE TOP OF PIPE TO PROPOSED GRADE.
6. ALL WATER PIPES SHOULD BE SEPARATED FROM SANITARY SEWER AND INDUSTRIAL DISCHARGE LINES BY A MINIMUM HORIZONTAL DISTANCE OF 10 FEET. IF SUCH HORIZONTAL SEPARATION IS NOT POSSIBLE, THE WATER AND SEWER LINES SHALL BE IN SEPARATE TRENCHES (STEP TRENCHES ARE PROHIBITED) WITH THE TOP OF THE SEWER LINE AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN ENCASED IN CONCRETE OR WITH SUCH SEPARATION EXPRESSLY APPROVED BY THE DEPARTMENT OF HEALTH.
7. AT THE CROSSINGS OF ALL SEWER LINES AND WATER MAINS, THE TOP OF THE SEWER LINES SHALL BE AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. IF SUCH VERTICAL SEPARATION IS NOT POSSIBLE, THE WATER LINE SHALL BE ENCASED IN CONCRETE SUBJECT TO THE APPROVAL OF THE PROJECT ENGINEER.
8. GAS, ELECTRIC, LIGHTING, CABLE TELEVISION, AND ELECTRICAL SERVICE PLANS, IF REQUIRED, SHALL BE PREPARED BY THE RESPECTIVE UTILITY COMPANIES THAT SERVICE THE AREA PRIOR TO SITE CONSTRUCTION AND SHALL BE INSTALLED PER ORDINANCE OR LOCAL UTILITY COMPANIES REQUIREMENTS.
9. TELEPHONE, ELECTRIC, AND GAS LINES WILL BE INSTALLED UNDERGROUND. CROSSINGS OF PROPOSED PAVEMENTS WILL BE INSTALLED PRIOR TO THE CONSTRUCTION OF PAVEMENT BASE COURSE.

THESE GENERAL NOTES SHALL APPLY TO ALL SHEETS IN THIS SET

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers
Engineering
& Design

NEWBURGH
555 Hudson Valley Avenue
Suite 101
New Windsor, NY 12553
Phone: 845.564.4495
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING
ENGINEERING & LAND SURVEYING

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-CVER

SHEET TITLE:
COVER SHEET

SHEET NUMBER:
01 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

SURVEY NOTES:

1. BOUNDARY & TOPOGRAPHIC INFORMATION SHOWN HEREON IS TAKEN FROM PLAN TITLED"ALTA/NSPS LAND TITLE SURVEY PREPARED FOR DOLSONTOWN ROAD SECTION 6 BLOCK 1 LOT 107, & 90.1. PREPARED BY JOHN W. MCCORD, SR. DATED SEPTEMBER 2, 2021 REV NOVEMBER 16, 2021.
2. INTERNAL LOT LINE TAKEN FROM BEST AVAILABLE MAPPING.

EXISTING WETLANDS:

±1,876,685 SQ.FT. / 43.08 ACRES

DEMOLITION NOTES:

1. IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR SHALL BE REQUIRED TO CALL THE BOARD OF PUBLIC UTILITIES ONE CALL DAMAGE PROTECTION SYSTEM FOR UTILITY MARK OUT IN ADVANCE OF ANY EXCAVATION. DIG SAFELY, NEW YORK, 1-800-962-7962 OR 811. A PRE-DEMOLITION CONFERENCE WILL NEED TO BE ARRANGED WITH DIG SAFELY, NEW YORK AND MUST BE HELD A MINIMUM OF 7 DAYS BEFORE THE START OF ANY DEMOLITION.
2. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING SITE IMPROVEMENTS AND UTILITIES. ALL DISCREPANCIES SHALL BE IDENTIFIED TO THE ENGINEER IN WRITING.
3. ALL DEMOLITION DEBRIS TO BE REMOVED BY CONTRACTOR IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
4. ALL DEMOLITION ACTIVITIES ARE TO BE PERFORMED IN ACCORDANCE WITH THESE PLANS, AS WELL AS ALL FEDERAL, STATE AND LOCAL REGULATIONS. ANY DISCREPANCIES OR DEVIATIONS SHALL BE IDENTIFIED BY THE CONTRACTOR TO COLLIERS ENGINEERING IN WRITING FOR RESOLUTION PRIOR TO INITIATION OF SITE ACTIVITY.
5. PRIOR TO STARTING ANY DEMOLITION CONTRACTOR IS RESPONSIBLE FOR/TO:
   A. ENSURING COPIES OF ALL PERMITS AND APPROVALS MUST BE MAINTAINED ON SITE AND AVAILABLE FOR REVIEW (SEE "EROSION AND SEDIMENT CONTROL PLAN," THIS DRAWING SET).
   B. INSTALLING THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO SITE DISTURBANCE.
   C. ALL UTILITIES AND SERVICES, INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE. THE CONTRACTOR SHALL USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL THE UNDERGROUND UTILITIES.
   D. PROTECTING AND MAINTAINING IN OPERATION, ALL ACTIVE SYSTEMS THAT ARE NOT BEING REMOVED DURING ALL DEMOLITION ACTIVITIES.
   E. FAMILIARIZING THEMSELVES WITH THE APPLICABLE UTILITY SERVICE PROVIDER AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING PROVIDER AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION REQUIRED FOR THE PROJECT. THE CONTRACTOR SHALL PROVIDE THE OWNER WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTION AND UTILITY COMPANY REQUIREMENTS.
   F. CLEAN THE EXISTING UTILITY STRUCTURES ON-SITE PRIOR TO CONSTRUCTION AND VERIFY THE INVERTS FOR CONNECTION.
6. COLLIERS ENGINEERING IS NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. CONTRACTOR IS TO PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, FOLLOWING ALL THE O.S.H.A. REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY.
7. THE CONTRACTOR SHALL PROVIDE ALL THE "MEANS AND METHODS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE DEMOLITION CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS OF DAMAGE TO ALL ITEMS THAT ARE TO REMAIN AS A RESULT OF HIS ACTIVITIES. ALL REPAIRS SHALL USE NEW MATERIAL. THE REPAIRS SHALL RESTORE THE ITEM TO THE PRE-DEMOLITION CONDITION.
8. ROCK EXCAVATIONS (AS APPLICABLE) WILL BE PERFORMED BY MECHANICAL MEANS ONLY. USE OF EXPLOSIVES IS PROHIBITED. ALL THE REQUIRED PERMITS AND CONTROL MEASURES THAT ARE REQUIRED BY THE FEDERAL, STATE, AND LOCAL GOVERNMENTS SHALL BE IN PLACE PRIOR TO STARTING. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ALL INSPECTION AND SEISMIC VIBRATION TESTING THAT IS REQUIRED TO MONITOR THE EFFECTS ON ALL LOCAL STRUCTURES, AS APPLICABLE.
9. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH: THE "MANUAL ON UNIFORM TRAFFIC CONTROL", AS WELL AS FEDERAL, STATE, AND LOCAL REGULATIONS WHEN DEMOLITION RELATED ACTIVITIES IMPACT ROADWAYS OR ROADWAY RIGHTS-OF-WAY.
10. CONDUCT DEMOLITION ACTIVITIES IN SUCH A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND OTHER ADJACENT FACILITIES. STREET CLOSURE PERMITS MUST BE RECEIVED FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY (AS APPLICABLE).
11. DEMOLITION ACTIVITIES AND EQUIPMENT SHALL NOT USE AREAS OUTSIDE THE DEFINED PROPERTY LINE WITHOUT WRITTEN PERMISSION OF THE OWNER, AND/OR APPROPRIATE GOVERNMENT AGENCY.
12. THIS DEMOLITION PLAN IS INTENDED TO IDENTIFY THOSE EXISTING ITEMS/CONDITIONS WHICH ARE TO BE REMOVED. IT IS NOT INTENDED TO PROVIDE DIRECTION OTHER THAN THAT ALL METHODS AND MEANS ARE TO BE IN ACCORDANCE WITH STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL O.S.H.A. AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE.
13. DEBRIS SHALL NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION WASTES AND DEBRIS (SOLID WASTE) SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL TOWN, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES.
14. DEMOLITION SHALL NOT PROCEED UNTIL THE APPROXIMATE LOCATION OF THE EXISTING UTILITIES ARE MARKED IN THE FIELD AND ALL UTILITY CONNECTIONS ARE SUITABLY SHUT OFF AND DISCONNECTED AND PROPER DEMOLITION PERMITS ARE IN PLACE WITH THE APPROPRIATE JURISDICTION.
15. CONTRACTOR IS RESPONSIBLE TO RESTORE ALL DISTURBED SITE AREAS TO ORIGINAL CONDITION AS DIRECTED BY THE OWNER.
16. PROTECT ALL EXISTING UTILITIES TO REMAIN (INCLUDING DRAINAGE STRUCTURES, HYDRANTS, VALVES, SEWER MANHOLES, ETC.) DURING DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIMSELF OR SUB-CONTRACTORS.
17. THIS SET OF PLANS IS NOT DEPICTING ENVIRONMENTAL CONDITIONS OR A CERTIFICATION/WARRANTY REGARDING THE PRESENCE OR ABSENCE OF ENVIRONMENTALLY IMPACTED SITE CONDITIONS. COLLIERS ENGINEERING & DESIGN HAS PERFORMED NO EXPLORATORY OR TESTING SERVICE, INTERPRETATIONS, CONCLUSIONS OR OTHER SITE ENVIRONMENTAL SERVICES RELATED TO THE DETERMINATION OF POTENTIAL FOR CHEMICAL, TOXIC, OR RADIOACTIVE OR OTHER TYPE OF CONTAMINANTS AFFECTING THE PROPERTY AND THE UNDERSIGNED PROFESSIONAL IS NOT QUALIFIED TO DETERMINE THE EXISTENCE OF SAME. SHOULD ENVIRONMENTAL CONTAMINATION OR WASTE BE DISCOVERED, THE OWNER AND CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LAW AND REGULATIONS.

2021\21004268A\Engineering\Site Plans\C-DEMO.dwg\C-02-DEMO By: TYLER.SCOGNAMIGLIO

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REV	DATE	DRAWN BY	DESCRIPTION
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SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

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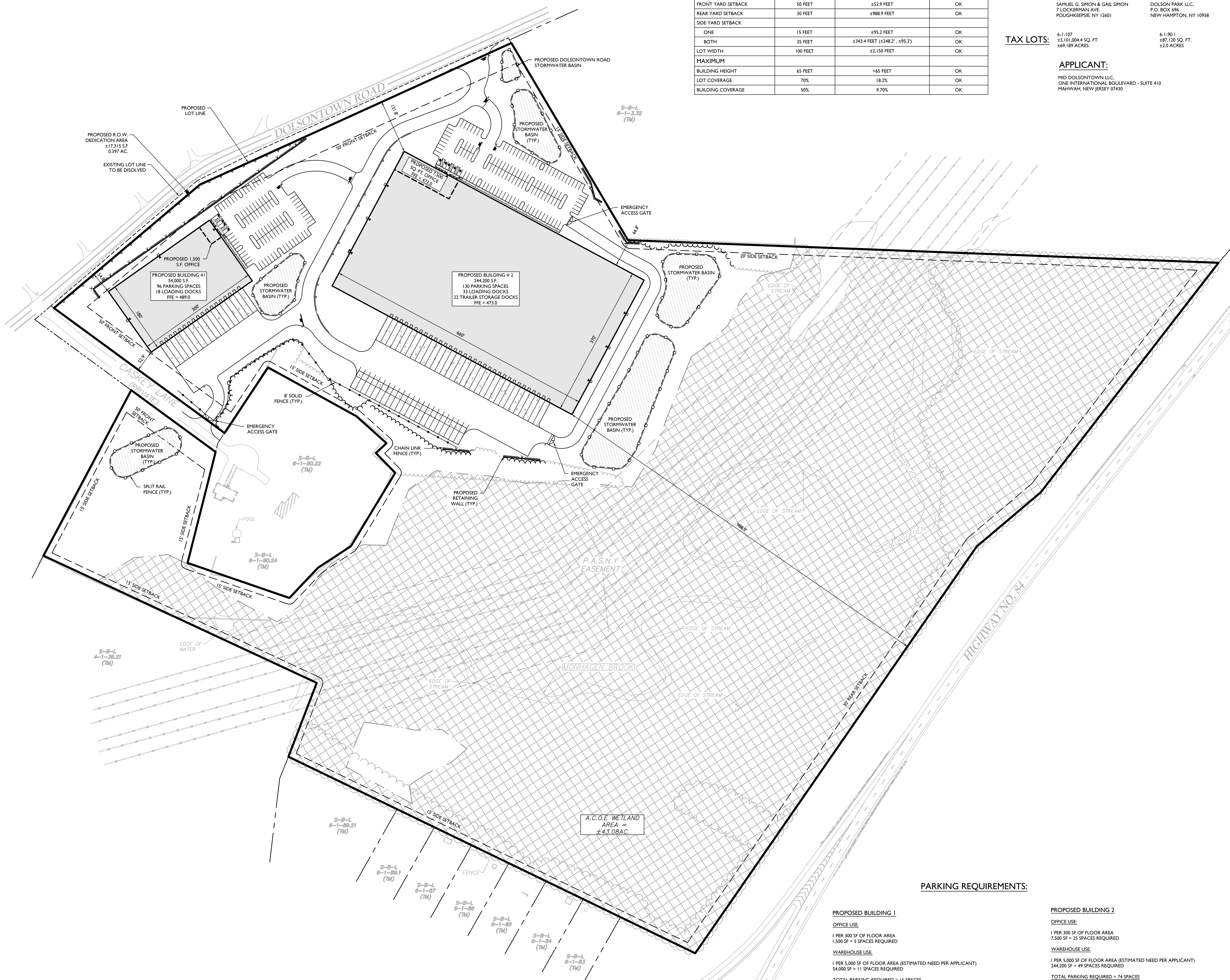
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER:	DRAWING NAME:
21004268A	C-DEMO

SHEET TITLE:
DEMO PLAN

SHEET NUMBER:
02 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



BULK TABLE

ZONING DISTRICT: MC-1 ; (MIXED COMMERCIAL)
SPECIAL USE SUBJECT TO SITE PLAN APPROVAL ; WAREHOUSE

MINIMUM	REQUIRED	PROPOSED LOT	REMARKS
LOT AREA	2 ACRES	±70.79 ACRES	OK
FRONT YARD SETBACK	50 FEET	±52.9 FEET	OK
REAR YARD SETBACK	30 FEET	±988.9 FEET	OK
SIDE YARD SETBACK			
ONE	15 FEET	±95.2 FEET	OK
BOTH	35 FEET	±343.4 FEET (±248.2' , ±95.2')	OK
LOT WIDTH	100 FEET	±2,150 FEET	OK
MAXIMUM			
BUILDING HEIGHT	65 FEET	<65 FEET	OK
LOT COVERAGE	70%	18.2%	OK
BUILDING COVERAGE	50%	9.70%	OK

EXISTING WETLANDS:

± 1,876685 SQ.FT. / 43.08 ACRES

PROPOSED WETLAND DISTURBANCE = NONE

OWNER 1:

SAMUEL G. SIMON & GAIL SIMON
7 LOCKERMAN AVE.
POUGHKEEPSIE, NY 12601

OWNER 2:

DOLSON PARK LLC,
P.O. BOX 696
NEW HAMPTON, NY 10958

TAX LOTS:

6-1-107
±3,101,004.4 SQ. FT.
±69.189 ACRES

6-1-90.1
±87,120 SQ. FT.
±2.0 ACRES

APPLICANT:

MID DOLSONTOWN LLC,
ONE INTERNATIONAL BOULEVARD - SUITE 410
MAHWAH, NEW JERSEY 07430

PARKING REQUIREMENTS:

PROPOSED BUILDING 1

OFFICE USE:

1 PER 300 SF OF FLOOR AREA
1,500 SF = 5 SPACES REQUIRED

WAREHOUSE USE:

1 PER 5,000 SF OF FLOOR AREA (ESTIMATED NEED PER APPLICANT)
54,000 SF = 11 SPACES REQUIRED

TOTAL PARKING REQUIRED = 16 SPACES
TOTAL PARKING PROVIDED = 95 SPACES

NOTE:
1. ITE PARKING GENERATION MANUAL:
WAREHOUSING USE - AVERAGE RATE OF 0.39 SPACES PER 1,000 S.F.
GROSS FLOOR AREA
54,000 GROSS SQ. FT. / 1,000 X 0.39 = 22 SPACES

ISLAND SPACE REQUIREMENT CALCULATION

10 SQ. FT PER PARKING SPACE

BUILDING ONE REQUIRED = 95 X 10 = 950 SQ. FT.
BUILDING ONE PROVIDED = 1,576 SQ. FT.

PROPOSED BUILDING 2

OFFICE USE:

1 PER 300 SF OF FLOOR AREA
7,500 SF = 25 SPACES REQUIRED

WAREHOUSE USE:

1 PER 5,000 SF OF FLOOR AREA (ESTIMATED NEED PER APPLICANT)
244,200 SF = 49 SPACES REQUIRED

TOTAL PARKING REQUIRED = 74 SPACES
TOTAL PARKING PROVIDED = 130 SPACES

NOTE:
1. ITE PARKING GENERATION MANUAL:
WAREHOUSING USE - AVERAGE RATE OF 0.39 SPACES PER 1,000 S.F.
GROSS FLOOR AREA
244,200 GROSS SQ. FT. / 1,000 X 0.39 = 96 SPACES

ISLAND SPACE REQUIREMENT CALCULATION

10 SQ. FT PER PARKING SPACE

REQUIRED = 130 X 10 = 1,300 SQ. FT.
PROVIDED = 2,362 SQ. FT.

100 0 100 200
SCALE : 1" = 100'

LEGEND

EXISTING		PROPOSED
12+00 TL PI 13+00	TRAVERSE LINE, CENTER LINE OR BASELINE (LABEL AS SUCH)	12+00 13+00
— — —	RIGHT OF WAY LINE	— — —
━━━	PROPERTY LINE	━━━
– – – –	EDGE OF PAVEMENT	———
FACE BACK	CURB	FACE BACK
	DEPRESSED CURB	
	SIDEWALK	
—x—x—	FENCES	—X—X—
	TREELINE	
	ROADWAY SIGNS	
━ • • ━	WETLAND LINE	━ • • ━
■ ¦ ¦ ■	MUNICIPAL BOUNDARY LINE	■ ¦ ¦ ■
	STALL COUNT	(10)
	ADA ACCESSIBLE STALL	♿ ♿
	DEPRESSED CURB AND ADA RAMP	HC
	DIRECTION OF TRAFFIC FLOW	→

TOWN OF WAWAYANDA PLANNING BOARD

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
RHODE ISLAND REGISTERED PROFESSIONAL ENGINEER (DISCIPLINE)
LICENSE NUMBER: PE.0011407
COLLIERS ENGINEERING & DESIGN, INC.
R.I. C.O.A. #: 8102

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers
Engineering & Design

NEWBURGH
555 Hudson Valley Avenue
Suite 101
New Windsor, NY 12553
Phone: 845.564.4495
COLLIERS ENGINEERING & DESIGN CT, P.C. DOING BUSINESS AS MASER CONSULTING ENGINEERING & LAND SURVEYING

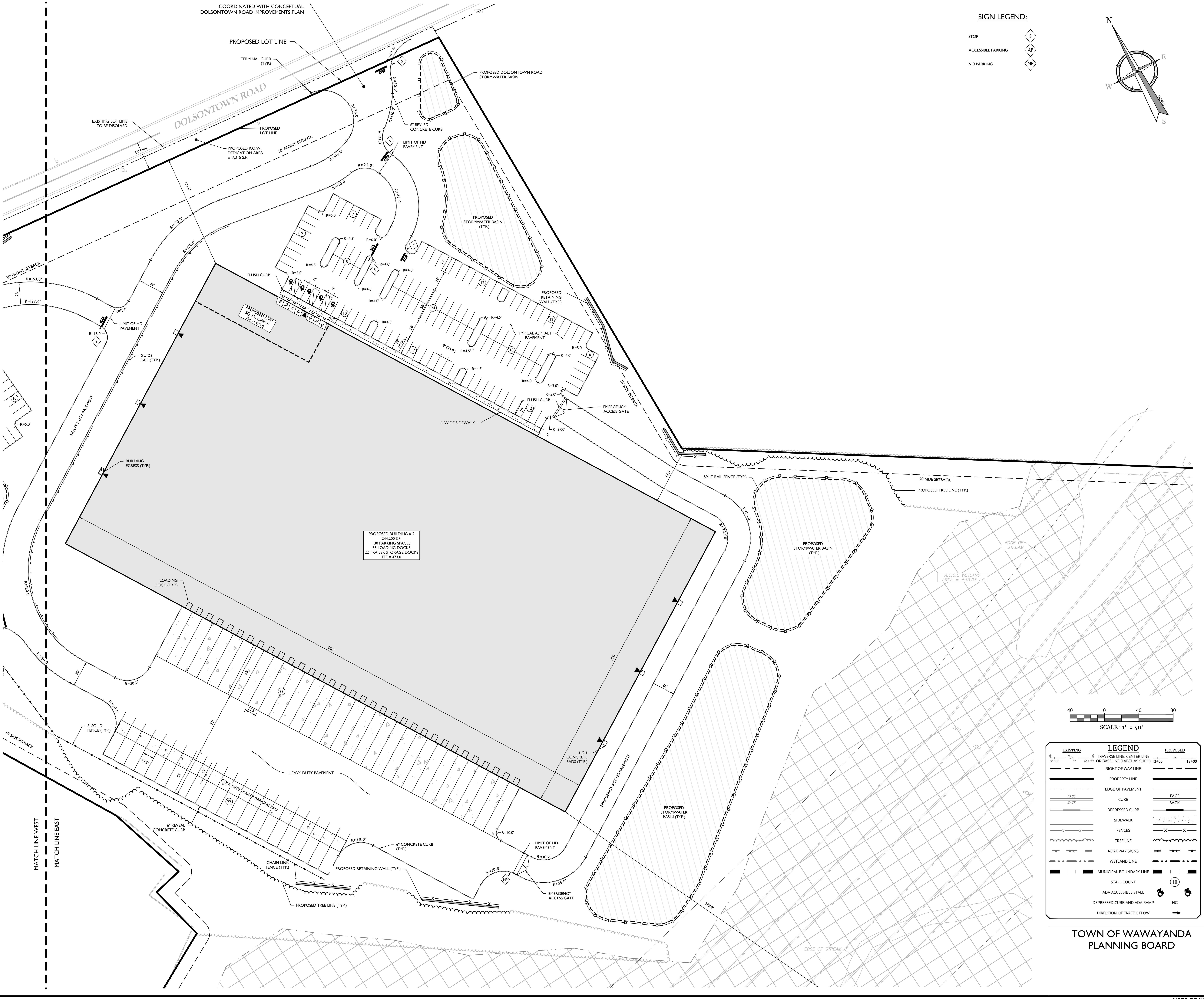
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER:	DRAWING NAME:
21004268A	C-LAYT

SHEET TITLE:
OVERALL DIMENSION PLAN

SHEET NUMBER:
03 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



SCALE : 1" = 40'

SIGN LEGEND:

STOP	S
ACCESSIBLE PARKING	AP
NO PARKING	NP

LEGEND

EXISTING		PROPOSED
12+00 PI 13+00	TRAVERSE LINE, CENTER LINE OR BASELINE (LABEL AS SUCH)	12+00 13+00
	RIGHT OF WAY LINE	
	PROPERTY LINE	
	EDGE OF PAVEMENT	
FACE BACK	CURB	FACE BACK
	DEPRESSED CURB	
	SIDEWALK	
x x	FENCES	x x
	TREELINE	
	ROADWAY SIGNS	
	WETLAND LINE	
	MUNICIPAL BOUNDARY LINE	
	STALL COUNT	(10)
	ADA ACCESSIBLE STALL	♿ ♿
	DEPRESSED CURB AND ADA RAMP	HC
	DIRECTION OF TRAFFIC FLOW	→

TOWN OF WAWAYANDA PLANNING BOARD

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

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ENGINEERING & LAND SURVEYING

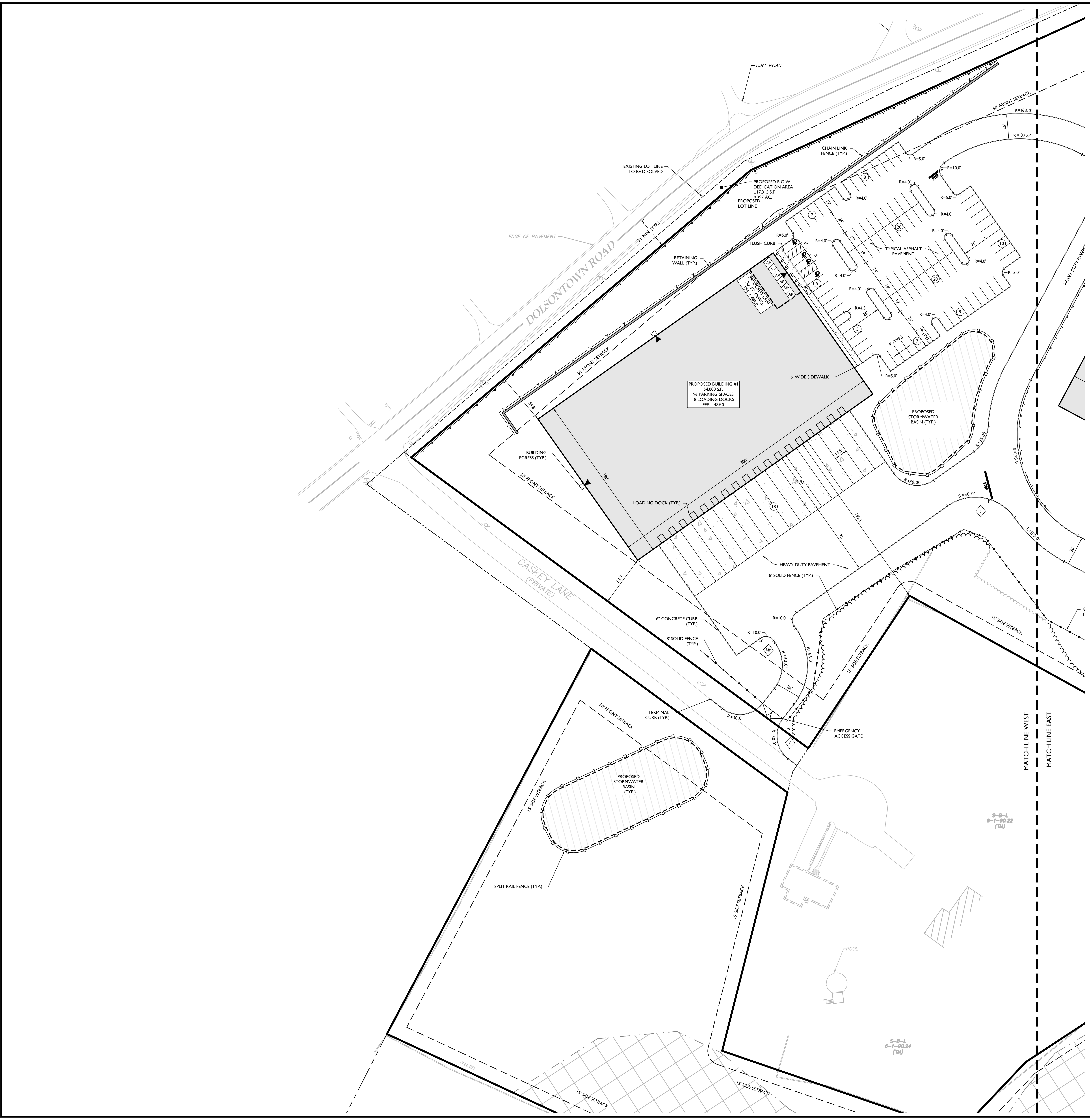
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

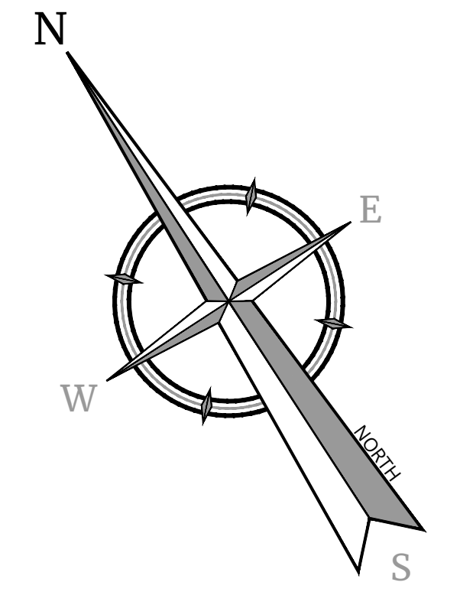
PROJECT NUMBER: 21004268A
DRAWING NAME: C-LAYT

SHEET TITLE:
DIMENSION PLAN EAST

SHEET NUMBER:
04 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.





SIGN LEGEND:

STOP	S
ACCESSIBLE PARKING	AP
NO PARKING	NP
EMERGENCY ACCESS WAY	E

40 0 40 80

SCALE : 1" = 40'

LEGEND

EXISTING		PROPOSED
12+00 PI 13+00	TRAVERSE LINE, CENTER LINE OR BASELINE (LABEL AS SUCH)	12+00 13+00
	RIGHT OF WAY LINE	
	PROPERTY LINE	
	EDGE OF PAVEMENT	
FACE BACK	CURB	FACE BACK
	DEPRESSED CURB	
	SIDEWALK	
X X	FENCES	X X
	TREELINE	
	ROADWAY SIGNS	
	WETLAND LINE	
	MUNICIPAL BOUNDARY LINE	
	STALL COUNT	10
	ADA ACCESSIBLE STALL	
	DEPRESSED CURB AND ADA RAMP	HC
	DIRECTION OF TRAFFIC FLOW	→

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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

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R.I. C.O.A. #: 8102

SITE PLANS

FOR

MID DOLSONTOWN,
LLC

SBL 6-1-107
&
6-1-90.1

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

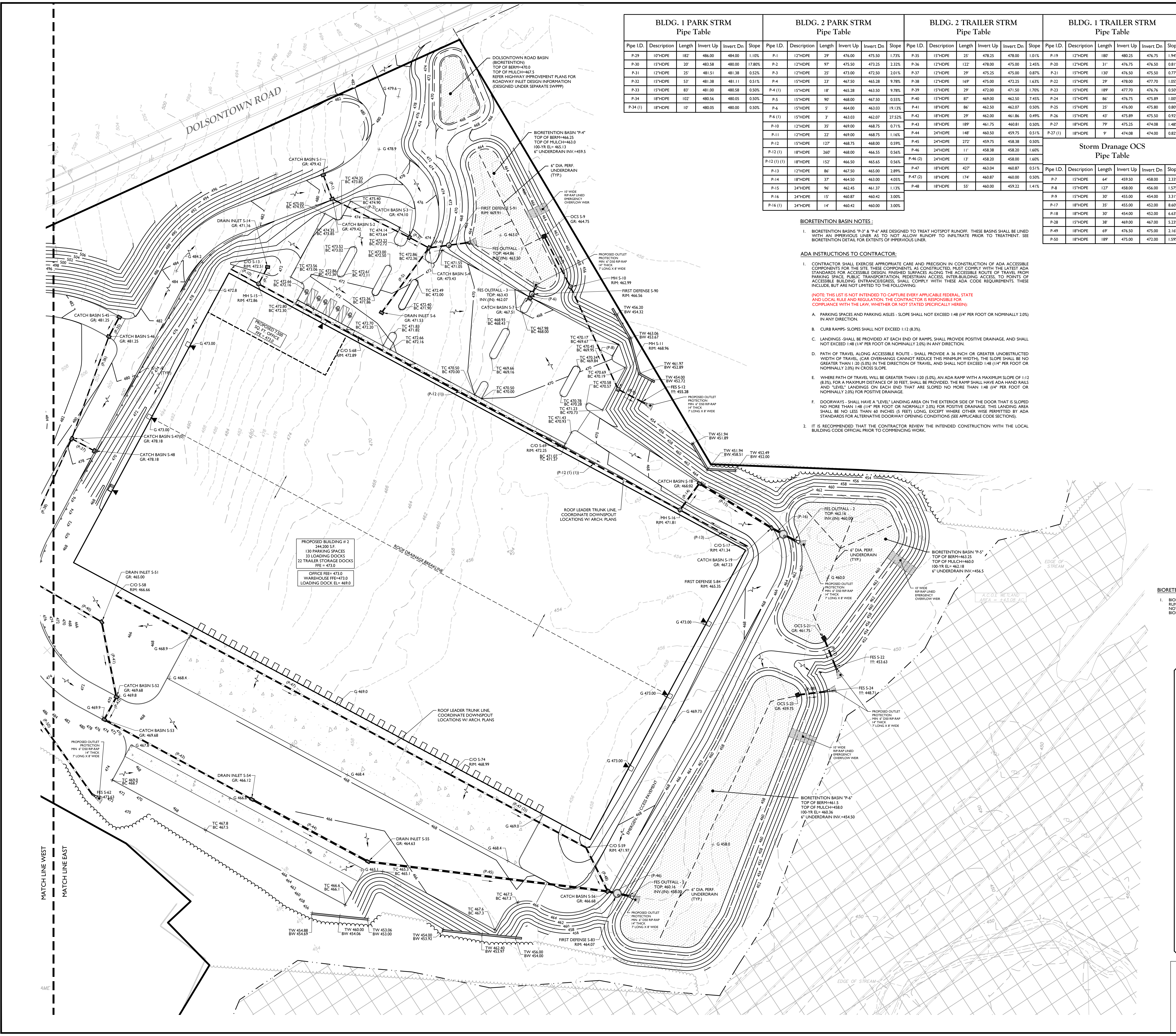
PROJECT NUMBER:	DRAWING NAME:
21004268A	C-LAYT

SHEET TITLE:
DIMENSION PLAN WEST

SHEET NUMBER:
05 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

2021\21004268A\Engineering\Site Plans\C-LAYT.dwg\C-05-LAYOUT-W By: TYLER.SCOGNAMIGLIO



BLDG. 1 PARK STRM Pipe Table					
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-29	10"HDPE	182'	486.00	484.00	1.10%
P-30	15"HDPE	20'	483.58	480.00	17.80%
P-31	12"HDPE	25'	481.51	481.38	0.52%
P-32	15"HDPE	53'	481.38	481.11	0.51%
P-33	15"HDPE	83'	481.00	480.58	0.50%
P-34	18"HDPE	102'	480.56	480.05	0.50%
P-34 (1)	18"HDPE	10'	480.05	480.00	0.50%

BLDG. 2 PARK STRM Pipe Table					
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-1	12"HDPE	29'	476.00	475.50	1.73%
P-2	12"HDPE	97'	475.50	473.25	2.32%
P-3	12"HDPE	25'	473.00	472.50	2.01%
P-4	15"HDPE	23'	467.50	465.28	9.78%
P-4 (1)	15"HDPE	18'	465.28	463.50	9.78%
P-5	15"HDPE	90'	468.00	467.50	0.55%
P-6	15"HDPE	5'	464.00	463.03	19.13%
P-6 (1)	15"HDPE	3'	463.03	462.07	27.52%
P-10	12"HDPE	35'	469.00	468.75	0.71%
P-11	12"HDPE	22'	469.00	468.75	1.16%
P-12	15"HDPE	127'	468.75	468.00	0.59%
P-12 (1)	18"HDPE	260'	468.00	466.55	0.56%
P-12 (1) (1)	18"HDPE	152'	466.50	465.65	0.56%
P-13	12"HDPE	86'	467.50	465.00	2.89%
P-14	18"HDPE	37'	464.50	463.00	4.05%
P-15	24"HDPE	96'	462.45	461.37	1.13%
P-16	24"HDPE	15'	460.87	460.42	3.00%
P-16 (1)	24"HDPE	14'	460.42	460.00	3.00%

BLDG. 2 TRAILER STRM Pipe Table					
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-35	15"HDPE	25'	478.25	478.00	1.01%
P-36	12"HDPE	122'	478.00	475.00	2.45%
P-37	12"HDPE	29'	475.25	475.00	0.87%
P-38	12"HDPE	169'	475.00	472.25	1.63%
P-39	15"HDPE	29'	472.00	471.50	1.70%
P-40	15"HDPE	87'	469.00	462.50	7.45%
P-41	18"HDPE	86'	462.50	462.07	0.50%
P-42	18"HDPE	29'	462.00	461.86	0.49%
P-43	18"HDPE	189'	461.75	460.81	0.50%
P-44	24"HDPE	148'	460.50	459.75	0.51%
P-45	24"HDPE	272'	459.75	458.38	0.50%
P-46	24"HDPE	11'	458.38	458.20	1.60%
P-46 (2)	24"HDPE	13'	458.20	458.00	1.60%
P-47	18"HDPE	427'	463.04	460.87	0.51%
P-47 (2)	18"HDPE	174'	460.87	460.00	0.50%
P-48	18"HDPE	55'	460.00	459.22	1.41%

BLDG. 1 TRAILER STRM Pipe Table					
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-19	12"HDPE	180'	480.25	476.75	1.94%
P-20	12"HDPE	31'	476.75	476.50	0.81%
P-21	15"HDPE	130'	476.50	475.50	0.77%
P-22	15"HDPE	29'	478.00	477.70	1.05%
P-23	15"HDPE	189'	477.70	476.76	0.50%
P-24	15"HDPE	86'	476.75	475.89	1.00%
P-25	15"HDPE	25'	476.00	475.80	0.80%
P-26	15"HDPE	43'	475.89	475.50	0.92%
P-27	18"HDPE	79'	475.25	474.08	1.48%
P-27 (1)	18"HDPE	9'	474.08	474.00	0.82%

Storm Dranage OCS Pipe Table					
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-7	15"HDPE	64'	459.50	458.00	2.33%
P-8	15"HDPE	127'	458.00	456.00	1.57%
P-9	15"HDPE	30'	455.00	454.00	3.31%
P-17	18"HDPE	35'	455.00	452.00	8.60%
P-18	18"HDPE	30'	454.00	452.00	6.63%
P-28	15"HDPE	38'	469.00	467.00	5.23%
P-49	18"HDPE	69'	476.50	475.00	2.16%
P-50	18"HDPE	189'	475.00	472.00	1.59%

BIORETENTION BASIN NOTES :

1. BIORETENTION BASINS "P-3" & "P-6" ARE DESIGNED TO TREAT HOTSPOT RUNOFF. THESE BASINS SHALL BE LINED WITH AN IMPERVIOUS LINER AS TO NOT ALLOW RUNOFF TO INFILTRATE PRIOR TO TREATMENT. SEE BIORETENTION DETAIL FOR EXTENTS OF IMPERVIOUS LINER.

ADA INSTRUCTIONS TO CONTRACTOR:

1. CONTRACTOR SHALL EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ADA ACCESSIBLE COMPONENTS FOR THE SITE. THESE COMPONENTS, AS CONSTRUCTED, MUST COMPLY WITH THE LATEST ADA STANDARDS FOR ACCESSIBLE DESIGN. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACE, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EGRESS, SHALL COMPLY WITH THESE ADA CODE REQUIREMENTS. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

   (NOTE: THIS LIST IS NOT INTENDED TO CAPTURE EVERY APPLICABLE FEDERAL, STATE AND LOCAL RULE AND REGULATION. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE LAW, WHETHER OR NOT STATED SPECIFICALLY HEREIN):

   A. PARKING SPACES AND PARKING AISLES - SLOPE SHALL NOT EXCEED 1:48 (l/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.

   B. CURB RAMPS- SLOPES SHALL NOT EXCEED 1:12 (8.3%).

   C. LANDINGS -SHALL BE PROVIDED AT EACH END OF RAMPS, SHALL PROVIDE POSITIVE DRAINAGE, AND SHALL NOT EXCEED 1:48 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.

   D. PATH OF TRAVEL ALONG ACCESSIBLE ROUTE - SHALL PROVIDE A 36 INCH OR GREATER UNOBSTRUCTED WIDTH OF TRAVEL, (CAR OVERHANGS CANNOT REDUCE THIS MINIMUM WIDTH), THE SLOPE SHALL BE NO GREATER THAN 1 :20 (5.0%) IN THE DIRECTION OF TRAVEL, AND SHALL NOT EXCEED 1:48 (1/4" PER FOOT OR NOMINALLY 2.0%) IN CROSS SLOPE.

   E. WHERE PATH OF TRAVEL WILL BE GREATER THAN 1:20 (5.0%), AN ADA RAMP WITH A MAXIMUM SLOPE OF 1:12 (8.3%), FOR A MAXIMUM DISTANCE OF 30 FEET, SHALL BE PROVIDED. THE RAMP SHALL HAVE ADA HAND RAILS AND "LEVEL" LANDINGS ON EACH END THAT ARE SLOPED NO MORE THAN 1:48 (l/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE.

   F. DOORWAYS - SHALL HAVE A "LEVEL" LANDING AREA ON THE EXTERIOR SIDE OF THE DOOR THAT IS SLOPED NO MORE THAN 1:48 (1/4" PER FOOT OR NORMALLY 2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA SHALL BE NO LESS THAN 60 INCHES (5 FEET) LONG, EXCEPT WHERE OTHER WISE PERMITTED BY ADA STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS (SEE APPLICABLE CODE SECTIONS).

2. IT IS RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION WITH THE LOCAL BUILDING CODE OFFICIAL PRIOR TO COMMENCING WORK.

BIORETENTION BASIN NOTES :

1. BIORETENTION BASINS "P-3" & "P-6" ARE DESIGNED TO TREAT HOTSPOT RUNOFF. THESE BASINS SHALL BE LINED WITH AN IMPERVIOUS LINER AS TO NOT ALLOW RUNOFF TO INFILTRATE PRIOR TO TREATMENT. SEE BIORETENTION DETAIL FOR EXTENTS OF IMPERVIOUS LINER.

40 0 40 80
SCALE : 1" = 40'

LEGEND

EXISTING		PROPOSED
12+00 PI 13+00	TRAVERSE LINE, CENTER LINE OR BASELINE (LABEL AS SUCH)	12+00 13+00
	RIGHT OF WAY LINE	
	PROPERTY LINE	
	EDGE OF PAVEMENT	
FACE BACK	CURB	FACE BACK
	DEPRESSED CURB	
	SIDEWALK	
—x—x—	FENCES	—x—x—
	TREELINE	
	ROADWAY SIGNS	
	WETLAND LINE	
	MUNICIPAL BOUNDARY LINE	
	'B' INLET	
	'E' INLET	
Ⓓ	STORM MANHOLE	Ⓓ
Ⓢ	SANITARY MANHOLE	Ⓢ
	FLARED END SECTION	
	HEADWALL	
	HYDRANT	
	POLE MOUNTED LIGHT	
75 74	CONTOURS	75 74
× G 29.0	SPOT ELEVATION	× G 29.0
	DIRECTION OF OVERLAND FLOW	
× TC 29.0	TOP OF CURB ELEVATION	× TC 29.0
× BC 29.0	BOTTOM OF CURB ELEVATION	× BC 29.0
	TOP OF DEPRESSED CURB ELEVATION	× TDC 29.0

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-GRAD

SHEET TITLE:
GRADING AND DRAINAGE PLAN - EAST

SHEET NUMBER:
06 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

BLDG. 1 PARK STRM
Pipe Table

Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-29	10"HDPE	182'	486.00	484.00	1.10%
P-30	15"HDPE	20'	483.58	480.00	17.80%
P-31	12"HDPE	25'	481.51	481.38	0.52%
P-32	15"HDPE	53'	481.38	481.11	0.51%
P-33	15"HDPE	83'	481.00	480.58	0.50%
P-34	18"HDPE	102'	480.56	480.05	0.50%
P-34 (1)	18"HDPE	10'	480.05	480.00	0.50%

BLDG. 2 PARK STRM
Pipe Table

Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-1	12"HDPE	29'	476.00	475.50	1.73%
P-2	12"HDPE	97'	475.50	473.25	2.32%
P-3	12"HDPE	25'	473.00	472.50	2.01%
P-4	15"HDPE	23'	467.50	465.28	9.78%
P-4 (1)	15"HDPE	18'	465.28	463.50	9.78%
P-5	15"HDPE	90'	468.00	467.50	0.55%
P-6	15"HDPE	5'	464.00	463.03	19.13%
P-6 (1)	15"HDPE	3'	463.03	462.07	27.52%
P-10	12"HDPE	35'	469.00	468.75	0.71%
P-11	12"HDPE	22'	469.00	468.75	1.16%
P-12	15"HDPE	127'	468.75	468.00	0.59%
P-12 (1)	18"HDPE	260'	468.00	466.55	0.56%
P-12 (1) (1)	18"HDPE	152'	466.50	465.65	0.56%
P-13	12"HDPE	86'	467.50	465.00	2.89%
P-14	18"HDPE	37'	464.50	463.00	4.05%
P-15	24"HDPE	96'	462.45	461.37	1.13%
P-16	24"HDPE	15'	460.87	460.42	3.00%
P-16 (1)	24"HDPE	14'	460.42	460.00	3.00%

BLDG. 2 TRAILER STRM
Pipe Table

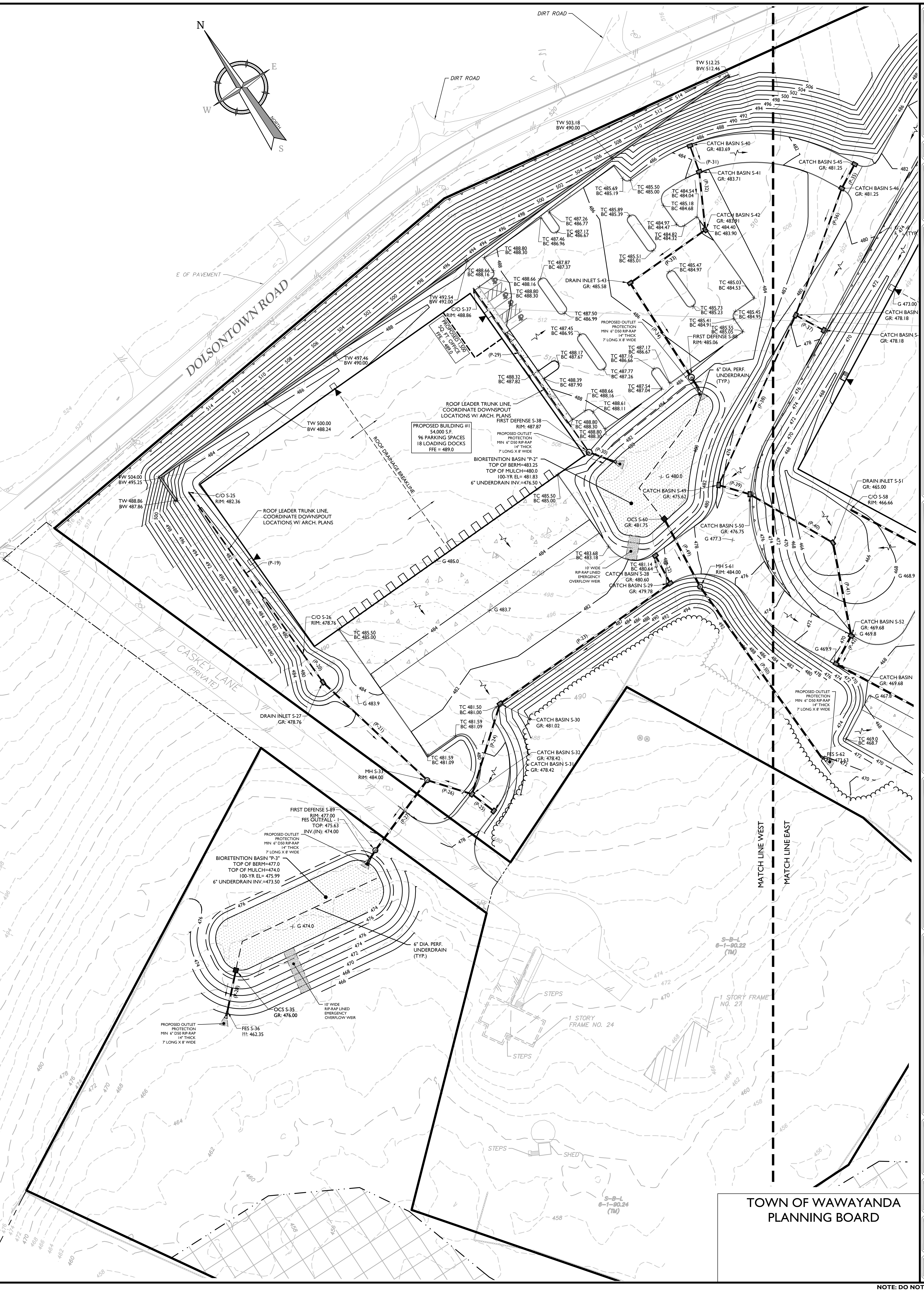
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-35	15"HDPE	25'	478.25	478.00	1.01%
P-36	12"HDPE	122'	478.00	475.00	2.45%
P-37	12"HDPE	29'	475.25	475.00	0.87%
P-38	12"HDPE	169'	475.00	472.25	1.63%
P-39	15"HDPE	29'	472.00	471.50	1.70%
P-40	15"HDPE	87'	469.00	462.50	7.45%
P-41	18"HDPE	86'	462.50	462.07	0.50%
P-42	18"HDPE	29'	462.00	461.86	0.49%
P-43	18"HDPE	189'	461.75	460.81	0.50%
P-44	24"HDPE	148'	460.50	459.75	0.51%
P-45	24"HDPE	272'	459.75	458.38	0.50%
P-46	24"HDPE	11'	458.38	458.20	1.60%
P-46 (2)	24"HDPE	13'	458.20	458.00	1.60%
P-47	18"HDPE	427'	463.04	460.87	0.51%
P-47 (2)	18"HDPE	174'	460.87	460.00	0.50%
P-48	18"HDPE	55'	460.00	459.22	1.41%

BLDG. 1 TRAILER STRM
Pipe Table

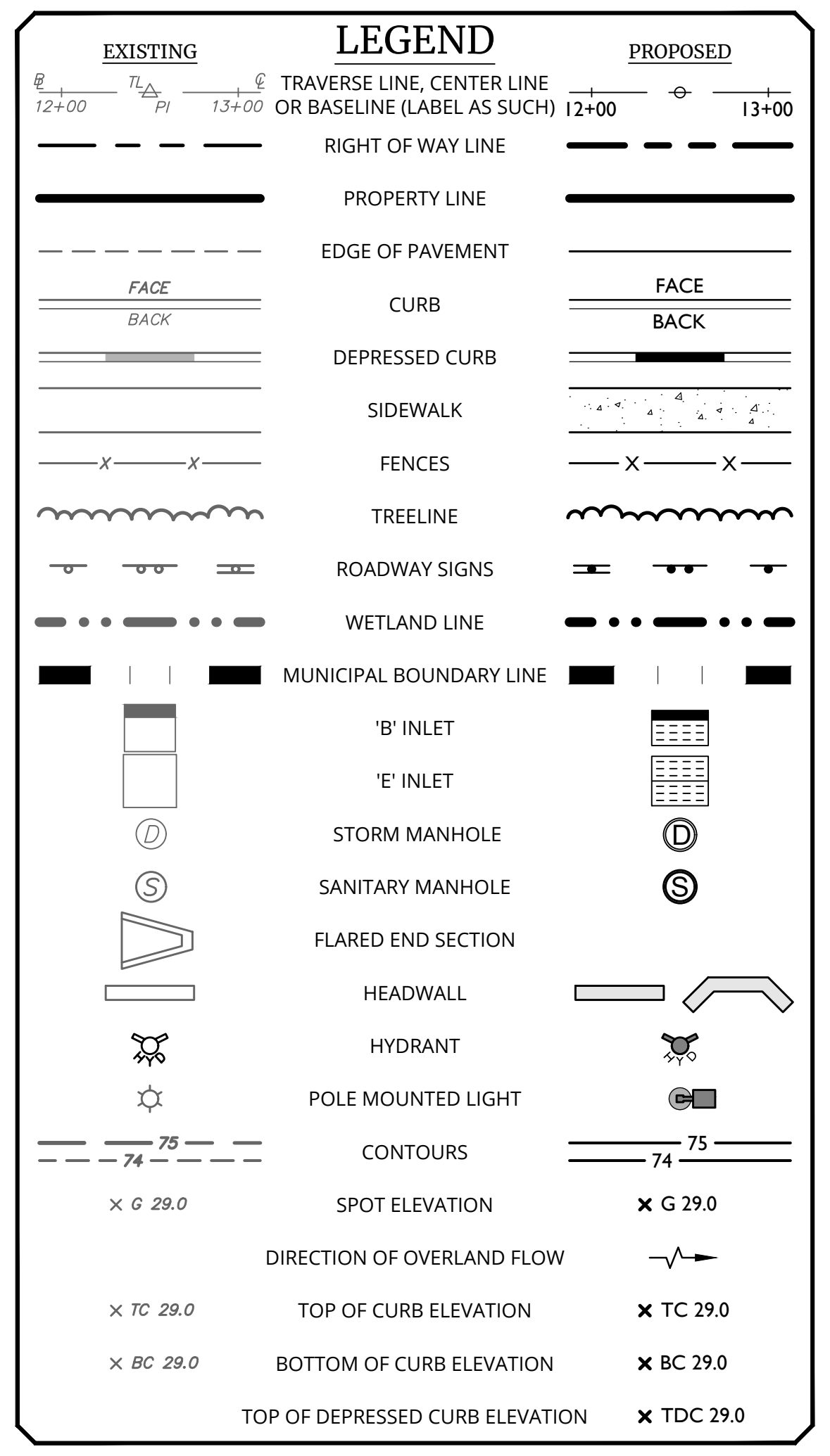
Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-19	12"HDPE	180'	480.25	476.75	1.94%
P-20	12"HDPE	31'	476.75	476.50	0.81%
P-21	15"HDPE	130'	476.50	475.50	0.77%
P-22	15"HDPE	29'	478.00	477.70	1.05%
P-23	15"HDPE	189'	477.70	476.76	0.50%
P-24	15"HDPE	86'	476.75	475.89	1.00%
P-25	15"HDPE	25'	476.00	475.80	0.80%
P-26	15"HDPE	43'	475.89	475.50	0.92%
P-27	18"HDPE	79'	475.25	474.08	1.48%
P-27 (1)	18"HDPE	9'	474.08	474.00	0.82%

Storm Dranage OCS
Pipe Table

Pipe I.D.	Description	Length	Invert Up	Invert Dn	Slope
P-7	15"HDPE	64'	459.50	458.00	2.33%
P-8	15"HDPE	127'	458.00	456.00	1.57%
P-9	15"HDPE	30'	455.00	454.00	3.31%
P-17	18"HDPE	35'	455.00	452.00	8.60%
P-18	18"HDPE	30'	454.00	452.00	6.63%
P-28	15"HDPE	38'	469.00	467.00	5.23%
P-49	18"HDPE	69'	476.50	475.00	2.16%
P-50	18"HDPE	189'	475.00	472.00	1.59%



TOWN OF WAWAYANDA PLANNING BOARD



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SCALE : 1" = 40'

BIORETENTION BASIN NOTES :

1. BIORETENTION BASINS "P-3" & "P-6" ARE DESIGNED TO TREAT HOTSPOT RUNOFF. THESE BASINS SHALL BE LINED WITH AN IMPERVIOUS LINER AS TO NOT ALLOW RUNOFF TO INFILTRATE PRIOR TO TREATMENT. SEE BIORETENTION DETAIL FOR EXTENTS OF IMPERVIOUS LINER.

ADA INSTRUCTIONS TO CONTRACTOR:

1. CONTRACTOR SHALL EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ADA ACCESSIBLE COMPONENTS FOR THE SITE. THESE COMPONENTS, AS CONSTRUCTED, MUST COMPLY WITH THE LATEST ADA STANDARDS FOR ACCESSIBLE DESIGN. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACE, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EGRESS, SHALL COMPLY WITH THESE ADA CODE REQUIREMENTS. THESE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

   (NOTE: THIS LIST IS NOT INTENDED TO CAPTURE EVERY APPLICABLE FEDERAL, STATE AND LOCAL RULE AND REGULATION. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE LAW, WHETHER OR NOT STATED SPECIFICALLY HEREIN):

   A. PARKING SPACES AND PARKING AISLES - SLOPE SHALL NOT EXCEED 1:48 (l/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.

   B. CURB RAMPS- SLOPES SHALL NOT EXCEED 1:12 (8.3%).

   C. LANDINGS -SHALL BE PROVIDED AT EACH END OF RAMPS, SHALL PROVIDE POSITIVE DRAINAGE, AND SHALL NOT EXCEED 1:48 (1/4" PER FOOT OR NOMINALLY 2.0%) IN ANY DIRECTION.

   D. PATH OF TRAVEL ALONG ACCESSIBLE ROUTE - SHALL PROVIDE A 36 INCH OR GREATER UNOBSTRUCTED WIDTH OF TRAVEL, (CAR OVERHANGS CANNOT REDUCE THIS MINIMUM WIDTH), THE SLOPE SHALL BE NO GREATER THAN 1 :20 (5.0%) IN THE DIRECTION OF TRAVEL, AND SHALL NOT EXCEED 1:48 (1/4" PER FOOT OR NOMINALLY 2.0%) IN CROSS SLOPE.

   E. WHERE PATH OF TRAVEL WILL BE GREATER THAN 1:20 (5.0%), AN ADA RAMP WITH A MAXIMUM SLOPE OF 1:12 (8.3%), FOR A MAXIMUM DISTANCE OF 30 FEET, SHALL BE PROVIDED. THE RAMP SHALL HAVE ADA HAND RAILS AND "LEVEL" LANDINGS ON EACH END THAT ARE SLOPED NO MORE THAN 1:48 (l/4" PER FOOT OR NOMINALLY 2.0%) FOR POSITIVE DRAINAGE.

   F. DOORWAYS - SHALL HAVE A "LEVEL" LANDING AREA ON THE EXTERIOR SIDE OF THE DOOR THAT IS SLOPED NO MORE THAN 1:48 (1/4" PER FOOT OR NORMALLY 2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA SHALL BE NO LESS THAN 60 INCHES (5 FEET) LONG, EXCEPT WHERE OTHER WISE PERMITTED BY ADA STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS (SEE APPLICABLE CODE SECTIONS).

2. IT IS RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION WITH THE LOCAL BUILDING CODE OFFICIAL PRIOR TO COMMENCING WORK.

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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN,
LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
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PROJECT NUMBER:	DRAWING NAME:
21004268A	C-GRAD

SHEET TITLE:
GRADING AND DRAINAGE
PLAN - WEST

SHEET NUMBER:
07 of 20

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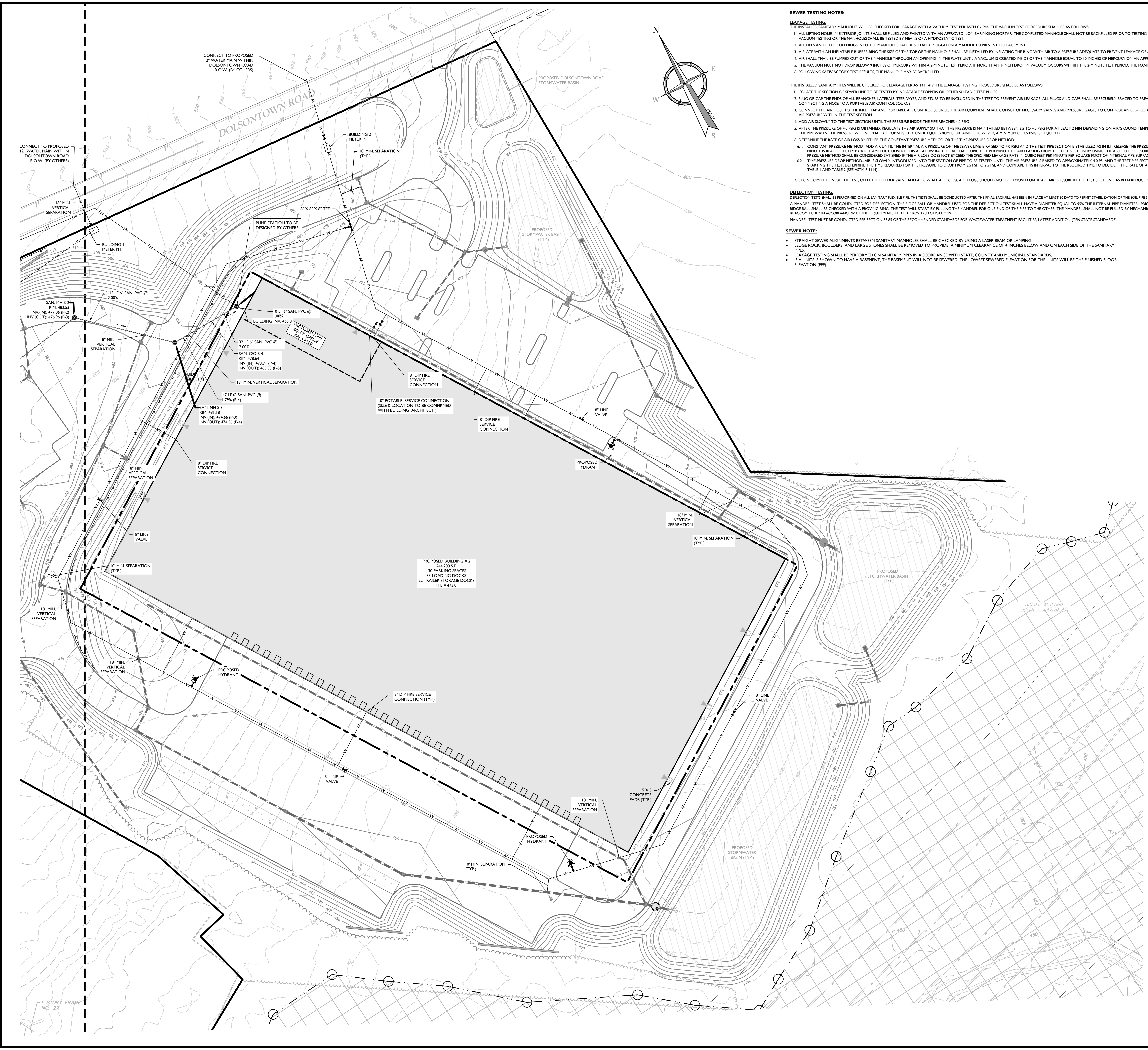


SEWER TESTING NOTES:

LEAKAGE TESTING:
THE INSTALLED SANITARY MANHOLES WILL BE CHECKED FOR LEAKAGE WITH A VACUUM TEST PER ASTM C-1244. THE VACUUM TEST PROCEDURE SHALL BE AS FOLLOWS:

1. ALL LIFTING HOLES IN EXTERIOR JOINTS SHALL BE FILLED AND PAINTED WITH AN APPROVED NON-SHRINKING MORTAR. THE COMPLETED MANHOLE SHALL NOT BE BACKFILLED PRIOR TO TESTING. MANHOLES WHICH HAVE BEEN BACKFILLED SHALL BE EXCAVATED TO EXPOSE THE ENTIRE EXTERIOR PRIOR TO VACUUM TESTING OR THE MANHOLES SHALL BE TESTED BY MEANS OF A HYDROSTATIC TEST.
2. ALL PIPES AND OTHER OPENINGS INTO THE MANHOLE SHALL BE SUITABLY PLUGGED IN A MANNER TO PREVENT DISPLACEMENT.
3. A PLATE WITH AN INFLATABLE RUBBER RING THE SIZE OF THE TOP OF THE MANHOLE SHALL BE INSTALLED BY INFLATING THE RING WITH AIR TO A PRESSURE ADEQUATE TO PREVENT LEAKAGE OF AIR BETWEEN THE RUBBER RING AND MANHOLE WALL.
4. AIR SHALL THAN BE PUMPED OUT OF THE MANHOLE THROUGH AN OPENING IN THE PLATE UNTIL A VACUUM IS CREATED INSIDE OF THE MANHOLE EQUAL TO 10 INCHES OF MERCURY ON AN APPROVED VACUUM GAUGE. THE REMOVAL OF AIR SHALL THEN BE STOPPED, AND THE TEST TIME BEGUN.
5. THE VACUUM MUST NOT DROP BELOW 9 INCHES OF MERCURY WITHIN A 2-MINUTE TEST PERIOD. IF MORE THAN 1-INCH DROP IN VACUUM OCCURS WITHIN THE 2-MINUTE TEST PERIOD, THE MANHOLE HAS FAILED THE TEST AND SHALL BE REPAIRED OR RECONSTRUCTED AND RE-TESTED.
6. FOLLOWING SATISFACTORY TEST RESULTS, THE MANHOLE MAY BE BACKFILLED.

THE INSTALLED SANITARY PIPES WILL BE CHECKED FOR LEAKAGE PER ASTM F1417. THE LEAKAGE TESTING PROCEDURE SHALL BE AS FOLLOWS:

1. ISOLATE THE SECTION OF SEWER LINE TO BE TESTED BY INFLATABLE STOPPERS OR OTHER SUITABLE TEST PLUGS
2. PLUG OR CAP THE ENDS OF ALL BRANCHES, LATERALS, TEES, WYES, AND STUBS TO BE INCLUDED IN THE TEST TO PREVENT AIR LEAKAGE. ALL PLUGS AND CAPS SHALL BE SECURELY BRACED TO PREVENT BLOW-OUT. ONE OF THE PLUGS OR CAPS SHOULD HAVE AN INLET TAP, OR OTHER PROVISION FOR CONNECTING A HOSE TO A PORTABLE AIR CONTROL SOURCE.
3. CONNECT THE AIR HOSE TO THE INLET TAP AND PORTABLE AIR CONTROL SOURCE. THE AIR EQUIPMENT SHALL CONSIST OF NECESSARY VALVES AND PRESSURE GAGES TO CONTROL AN OIL-FREE AIR SOURCE AND THE RATE AT WHICH AIR FLOWS INTO THE TEST SECTION TO ENABLE MONITORING OF THE AIR PRESSURE WITHIN THE TEST SECTION.
4. ADD AIR SLOWLY TO THE TEST SECTION UNTIL THE PRESSURE INSIDE THE PIPE REACHES 4.0 PSIG
5. AFTER THE PRESSURE OF 4.0 PSIG IS OBTAINED, REGULATE THE AIR SUPPLY SO THAT THE PRESSURE IS MAINTAINED BETWEEN 3.5 TO 4.0 PSIG FOR AT LEAST 2 MIN DEPENDING ON AIR/GROUND TEMPERATURE CONDITIONS. THE AIR TEMPERATURE SHOULD STABILIZE IN EQUILIBRIUM WITH THE TEMPERATURE OF THE PIPE WALLS. THE PRESSURE WILL NORMALLY DROP SLIGHTLY UNTIL EQUILIBRIUM IS OBTAINED; HOWEVER, A MINIMUM OF 3.5 PSIG IS REQUIRED.
6. DETERMINE THE RATE OF AIR LOSS BY EITHER THE CONSTANT PRESSURE METHOD OR THE TIME-PRESSURE DROP METHOD.
   - 6.1. CONSTANT PRESSURE METHOD--ADD AIR UNTIL THE INTERNAL AIR PRESSURE OF THE SEWER LINE IS RAISED TO 4.0 PSIG AND THE TEST PIPE SECTION IS STABILIZED AS IN 8.1. RELEASE THE PRESSURE TO 3.5 PSIG TO RUN THE CONSTANT PRESSURE TEST. THE AIR-FLOW RATE IN STANDARD CUBIC FEET PER MINUTE IS READ DIRECTLY BY A ROTAMETER. CONVERT THIS AIR-FLOW RATE TO ACTUAL CUBIC FEET PER MINUTE OF AIR LEAKING FROM THE TEST SECTION BY USING THE ABSOLUTE PRESSURE AND TEMPERATURE IN THE TEST SECTION. THE REQUIREMENTS FOR AIR LOSS UNDER THE CONSTANT PRESSURE METHOD SHALL BE CONSIDERED SATISFIED IF THE AIR LOSS DOES NOT EXCEED THE SPECIFIED LEAKAGE RATE IN CUBIC FEET PER MINUTE PER SQUARE FOOT OF INTERNAL PIPE SURFACE AREA.
   - 6.2. TIME-PRESSURE DROP METHOD--AIR IS SLOWLY INTRODUCED INTO THE SECTION OF PIPE TO BE TESTED, UNTIL THE AIR PRESSURE IS RAISED TO APPROXIMATELY 4.0 PSI AND THE TEST PIPE SECTION IS STABILIZED AS IN 8.1. DISCONNECT THE AIR SUPPLY AND DECREASE THE PRESSURE TO 3.5 PSI BEFORE STARTING THE TEST. DETERMINE THE TIME REQUIRED FOR THE PRESSURE TO DROP FROM 3.5 PSI TO 2.5 PSI, AND COMPARE THIS INTERVAL TO THE REQUIRED TIME TO DECIDE IF THE RATE OF AIR LOSS IS WITHIN THE ALLOWABLE. MINIMUM HOLDING TIMES REQUIRED BY PIPE DIAMETER ARE SHOWN IN TABLE 1 AND TABLE 2 (SEE ASTM F-1414).
7. UPON COMPLETION OF THE TEST, OPEN THE BLEEDER VALVE AND ALLOW ALL AIR TO ESCAPE. PLUGS SHOULD NOT BE REMOVED UNTIL ALL AIR PRESSURE IN THE TEST SECTION HAS BEEN REDUCED TO ATMOSPHERIC PRESSURE.

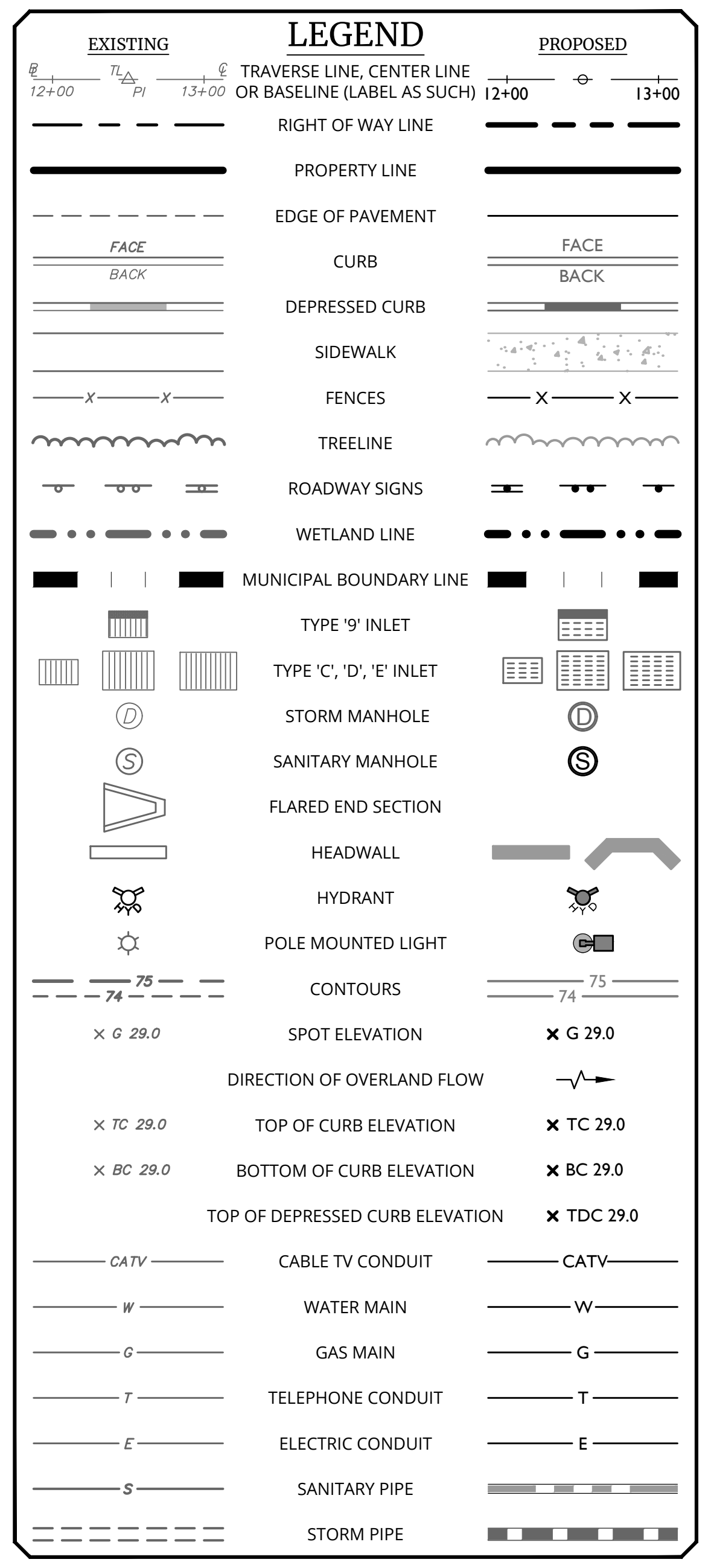
DEFLECTION TESTING:
DEFLECTION TESTS SHALL BE PERFORMED ON ALL SANITARY FLEXIBLE PIPE. THE TESTS SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL-PIPE SYSTEM. NO PIPE SHALL EXCEED A DEFLECTION OF 5 PERCENT OF THE INSIDE DIAMETER.

A MANDREL TEST SHALL BE CONDUCTED FOR DEFLECTION. THE RIDGE BALL OR MANDREL USED FOR THE DEFLECTION TEST SHALL HAVE A DIAMETER EQUAL TO 95% THE INTERNAL PIPE DIAMETER. PRIOR TO CONDUCTING THE TEST, THE PIPE SHALL BE CLEAN OF SEDIMENTS AND DEBRIS AND THE MANDREL OR RIDGE BALL SHALL BE CHECKED WITH A PROVING RING. THE TEST WILL START BY PULLING THE MANDREL FOR ONE END OF THE PIPE TO THE OTHER. THE MANDREL SHALL NOT BE PULLED BY MECHANICAL MEANS. IF DEFLECTION EXCEEDS 5 PERCENT, THE PIPE SHALL BE EXCAVATED. REPLACEMENT OR CORRECTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE REQUIREMENTS IN THE APPROVED SPECIFICATIONS.

MANDREL TEST MUST BE CONDUCTED PER SECTION 33.85 OF THE RECOMMENDED STANDARDS FOR WASTEWATER TREATMENT FACILITIES, LATEST ADDITION (TEN STATE STANDARDS).

SEWER NOTE:

- STRAIGHT SEWER ALIGNMENTS BETWEEN SANITARY MANHOLES SHALL BE CHECKED BY USING A LASER BEAM OR LAMPING.
- LEDGE ROCK, BOULDERS AND LARGE STONES SHALL BE REMOVED TO PROVIDE A MINIMUM CLEARANCE OF 4 INCHES BELOW AND ON EACH SIDE OF THE SANITARY PIPES.
- LEAKAGE TESTING SHALL BE PERFORMED ON SANITARY PIPES IN ACCORDANCE WITH STATE, COUNTY AND MUNICIPAL STANDARDS.
- IF A UNITS IS SHOWN TO HAVE A BASEMENT, THE BASEMENT WILL NOT BE SEWERED. THE LOWEST SEWERED ELEVATION FOR THE UNITS WILL BE THE FINISHED FLOOR ELEVATION (FFE).



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N.Y. C.O.A #: 0017609

SITE PLANS

FOR

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&
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21004268A	C-UTIL

SHEET TITLE:
UTILITIES PLAN
EAST

SHEET NUMBER:
08 of 20

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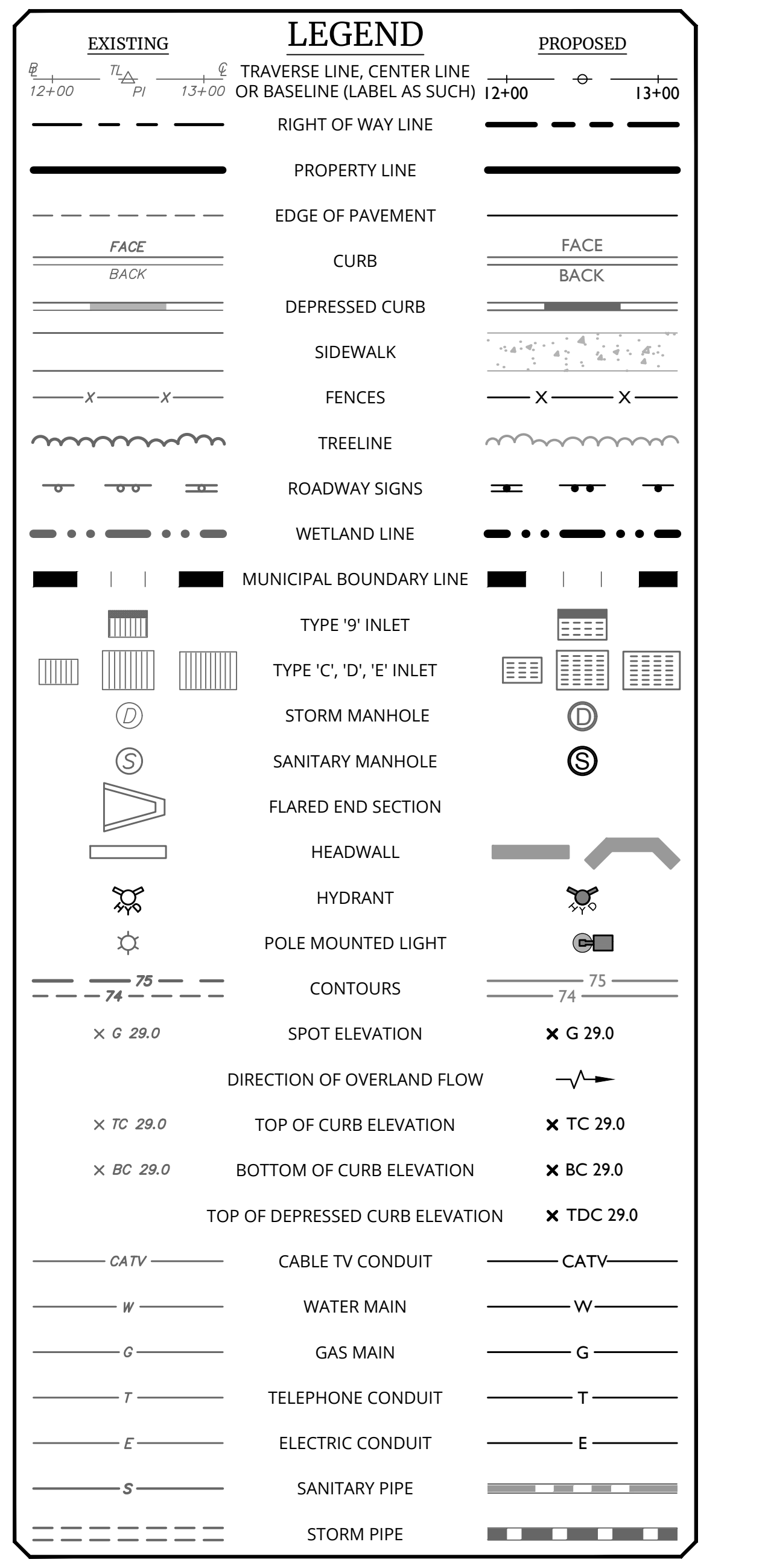


TOWN OF WAWAYANDA WATER NOTES

1. ALL METHODS, MATERIALS, FITTINGS, DEVICES, DIMENSIONAL REQUIREMENTS AND PROCEDURES NECESSARY TO COMPLETE THE WORK SHOWN HEREON SHALL MEET THE APPROPRIATE CURRENT AWWA SPECIFICATIONS IN EFFECT AS WELL AS ALL REQUIREMENTS DEEMED APPLICABLE BY THE MUNICIPALITY OR ANY OTHER GOVERNMENTAL BODY HAVING JURISDICTION OVER SAID WORK.

2. ALL WATER MAIN PIPE SHALL BE AWWA C151/A21.51-02 THICKNESS CLASS FIFTY-TWO (52) CEMENT LINED DUCTILE IRON PUSH-ON (RUBBER GASKET) TYPE; AND INSTALLED WITH THREE (3) BRONZE WEDGES PER JOINT. JOINT INSTALLATION SHALL BE "TYPE 2" AS PRESCRIBED IN THE LATEST REVISION OF AWWA C600. MECHANICAL JOINTS SHALL HAVE RETAINER GLANDS.

3. ALL PIPE FITTINGS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE AWWA SPECIFICATION C153/A21.53-00.

4. ALL GATE VALVES SHALL BE "MUELLER" OR APPROVED EQUAL, RESILIANT-SEATED GATE VALVES WITH MECHANICAL JOINT CONNECTIONS. OPENING SHALL BE LEFT (CCW) AND OPERATION SHALL BE BY 2" SQUARE WRENCH NUT. MINIMUM WORKING PRESSURE SHALL BE 250 PSI. GATE VALVES ARE TO BE IN ACCORDANCE WITH LATEST REVISION OF AWWA SPECIFICATION C509.

5. ALL VALVE BOXES SHALL BE EXTENSION TYPE BY MUELLER SET ON BRICKS AND POSITIONED PERPENDICULAR TO THE PIPE AND ON COMPACTED BACKFILL.

6. ALL CHANGES IN PIPE LINE DIRECTION, BOTH HORIZONTAL AND VERTICAL SHALL BE TIE-RODDED AND THRUST BLOCKED WITH CONCRETE AGAINST UNDISTURBED EARTH AS DIRECTED BY THE ENGINEER.

7. FLUSH OUT ALL WATER MAINS AND APPURTENANCES AS DIRECTED BY THE MUNICIPALITY UNTIL THE WATER RUNS CLEAN AND FREE OF RUST AND DIRT. PRESSURIZE ALL LINES AND APPURTENANCES FOR FORTY-EIGHT (48) HOURS, OR AS DIRECTED BY THE MUNICIPALITY, TO REVEAL ANY LEAKS OR BROKEN PIPE. THIS SHALL ALL BE DONE EITHER AS A TOTAL PROJECT OR BETWEEN VALVED SECTIONS AS DIRECTED BY THE TOWN. IF PRESSURE TESTING REVEALS ANY LEAKS OR DIFFICULTIES THE CONTRACTOR SHALL PROMPTLY UNCOVER THE LEAK OR BROKEN PIPE AND IMMEDIATELY REPAIR AND RETEST SAME. THIS SHALL BE REPEATED AS MANY TIMES AS MAY BE REQUIRED TO DEMONSTRATE A TIGHT LINE TO THE SATISFACTION OF THE TOWN. THE NEW WATER MAIN AND APPURTENANCES SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C-600. RESULTS OF TESTS ARE TO BE SUBMITTED AND ACCEPTED BY THE MUNICIPALITY.

8. THE MUNICIPAL ENGINEER MUST BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO PRESSURE TESTING.

9. ALL WATER LINES AND APPURTENANCES SHALL BE DISINFECTED TO THE SATISFACTION OF THE MUNICIPALITY, AND IN ACCORDANCE WITH THE STANDARDS OF THE DEPT. OF HEALTH. THIS SHALL ALSO BE DONE IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C651. A MINIMUM OF TWO (2) BACTERIAL TESTS TAKEN TWENTY-FOUR (24) HOURS APART ARE REQUIRED. RESULTS OF TESTS ARE TO BE SUBMITTED AND ACCEPTED BY THE MUNICIPALITY.
   AS PER AWWA C651, LATEST REVISION, WATER MAIN DISINFECTION PROCEDURE SHALL, GENERALLY, BE AS FOLLOWS:
   A. INSPECTING MATERIALS TO BE USED TO ENSURE THEIR INTEGRITY.
   B. PREVENTING CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR AND NOTING POTENTIAL CONTAMINATION AT THE CONSTRUCTION SITE.
   C. REMOVING, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAIN.
   D. CHLORINATING ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSHING THE CHLORINATED WATER FROM THE MAIN.
   E. PROTECTING THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW CAUSED BY HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
   F. DOCUMENTING THAT AN ADEQUATE LEVEL OF CHLORINE CONTACTED EACH PIPE TO PROVIDE DISINFECTION.
   G. DETERMINING THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
   H. FINAL CONNECTION OF THE APPROVED NEW WATER SERVICE TO THE ACTIVE DISTRIBUTION SYSTEM.

   THE CONTINUOUS-FEED METHOD SHALL BE IMPLEMENTED FOR CHLORINATION, AS DESCRIBED IN AWWA C651, LATEST REVISION. AFTER CHLORINATION, THE CONTRACTOR SHALL FLUSH THE MAINS AS PER FINAL FLUSHING REQUIREMENTS OF AWWA C651, LATEST REVISION. WHEN CUTTING INTO OR REPAIRING AN EXISTING MAIN, DISINFECTION PROCEDURES SHALL BE OBSERVED AS DETAILED IN DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS OF AWWA C651, LATEST REVISION.

   VERIFICATION SHALL BE ACCOMPLISHED VIA BACTERIOLOGICAL TESTS. AFTER FINAL FLUSHING AND BEFORE THE NEW WATER MAIN IS CONNECTED TO THE DISTRIBUTION SYSTEM, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES, TAKEN AT LEAST 24 HR APART, SHALL BE COLLECTED FROM THE NEW MAIN. AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED FROM EVERY 1,200 FT OF THE NEW WATER MAIN, PLUS ONE SET FROM THE END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH. SAMPLES SHALL BE TESTED FOR BACTERIOLOGICAL (CHEMICAL AND PHYSICAL) QUALITY IN ACCORDANCE WITH STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, AND SHALL SHOW THE ABSENCE OF COLIFORM ORGANISMS AND THE PRESENCE OF A CHLORINE RESIDUAL. SAMPLES FOR BACTERIOLOGICAL ANALYSIS SHALL BE COLLECTED IN STERILE BOTTLES TREATED WITH SODIUM THIOSULFATE, AS REQUIRED BY STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER. NO HOSE OR FIRE HYDRANT SHALL BE USED IN THE COLLECTION OF SAMPLES. THERE SHOULD BE NO WATER IN THE TRENCH UP TO THE CONNECTION FOR SAMPLING. THE SAMPLING PIPE MUST BE DEDICATED AND CLEAN AND DISINFECTED AND FLUSHED PRIOR TO SAMPLING. A CORPORATION COCK MAY BE INSTALLED IN THE MAIN WITH A COPPER-TUBE GOOSENECK ASSEMBLY. AFTER SAMPLES HAVE BEEN COLLECTED, THE GOOSENECK ASSEMBLY MAY BE REMOVED AND RETAINED FOR FUTURE USE. IF SAMPLES RESULTS FROM THE LAB INDICATE A MEASURED HPC GREATER THAN 500 COLONY-FORMING UNITS (CFU) PER ML, FLUSHING SHOULD BE RESUMED AND ANOTHER COLIFORM AND HPC SET OF SAMPLES SHOULD BE TAKEN UNTIL NO COLIFORMS ARE PRESENT AND THE HPC IS LESS THAN 500 CFU/ML THE RECORD OF COMPLIANCE SHALL BE THE BACTERIOLOGICAL TEST RESULTS CERTIFYING THAT THE WATER SAMPLED FROM THE NEW WATER MAIN IS FREE OF COLIFORM BACTERIA CONTAMINATION AND IS EQUAL TO OR BETTER THAN THE BACTERIOLOGIC WATER QUALITY IN THE DISTRIBUTION SYSTEM.

   ALL OTHER REQUIREMENTS OF AWWA C651, LATEST REVISION, SHALL BE OBSERVED.

10. WATER SERVICE CROSSING SEWER OR STORM SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER OR STORM. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER OR STORM AS POSSIBLE. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SEWER MAY BE REQUIRED.

11. WATER SERVICE SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWER MAIN OR SERVICE.

12. WATER TIGHT PLUGS ARE TO BE INSTALLED IN THE ENDS OF PIPES WHEN WORK IS NOT IN PROGRESS.

13. LEAKAGE AND HYDROSTATIC PRESSURE TESTING SHALL BE PERFORMED AT 1.5 TIMES THE WORKING PRESSURE.

14. THE MAXIMUM DEFLECTION ALLOWED ALLOWED AT PIPE JOINTS SHALL BE LIMITED TO 80% OF THAT ALLOWED BY AWWA OR IN ACCORDANCE WITH THE MUNICIPALITY. FOR AWWA ALLOWABLE JOINT DEFLECTIONS SEE LATEST REVISION OF AWWA SPECIFICATION C600.

15. CONSTRUCTION MUST CONFORM TO ALL ORDINANCES.

16. CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING WATER AND OTHER UTILITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

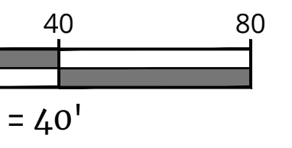
17. CONTRACTOR TO CALL UNDERGROUND MARK-OUT PRIOR TO COMMENCEMENT OF CONSTRUCTION AT 1-800-962-7962 FOR COMPLETE UTILITIES MARK-OUT.

18. CONTRACTOR TO CONTACT WATER DEPARTMENT AT LEAST 2 DAYS PRIOR TO CONSTRUCTION.

19. ALL IMPROVEMENTS SHALL BE INSPECTED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK AND CERTIFICATION SHALL BE PROVIDED TO THE MUNICIPALITY THAT THE SUBJECT IMPROVEMENTS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS.

20. CONTRACTOR TO NOTIFY ENGINEER OF ANY DEVIATION FROM THE HORIZONTAL OR VERTICAL ALIGNMENTS WITH REGARDS TO EXISTING UTILITIES.

21. A CERTIFIED AS BUILT MAP OF THE WATER SYSTEM IMPROVEMENTS SHALL BE PROVIDED TO THE MUNICIPALITY'S WATER DEPARTMENT BY A LICENSED DESIGN PROFESSIONAL.



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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER:	DRAWING NAME:
21004268A	C-UTIL

SHEET TITLE:
UTILITIES PLAN
WEST

SHEET NUMBER:
09 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

GENERAL SOIL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
2. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN FOURTEEN (14) DAYS FOR DISTURBANCES LESS THAN FIVE (5) ACRES AND SEVEN (7) DAYS FOR DISTURBANCES GREATER THAN FIVE (5) ACRES, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
3. PERMANENT VEGETATION TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN FIVE (5) DAYS AFTER FINAL GRADING. MULCHING IS REQUIRED ON ALL SEEDING. WHEN HYDROSEEDING, MULCH SHALL NOT BE INCLUDED IN THE TANK WITH THE SEED.
4. ALL WORK TO BE DONE IN ACCORDANCE WITH THE 2016 NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL OR AS AMENDED.
5. A SUBBASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUBBASE SHALL BE INSTALLED WITHIN FIVE (5) DAYS OF THE PRELIMINARY GRADING.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AT A RATE OF TWO (2) TONS PER ACRE, ACCORDING TO STATE STANDARDS.
7. ANY STEEP SLOPES RECEIVING PIPELINE INSTALLATION WILL BE BACKFILLED AND STABILIZED DAILY, AS THE INSTALLATION CONTINUES (I.E. SLOPES GREATER THAN 3:1).
8. THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A STONE PAD, AT ALL CONSTRUCTION DRIVEWAYS, IMMEDIATELY AFTER INITIAL SITE DISTURBANCE.
9. IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE COVERED WITH A MINIMUM OF TWELVE (12) INCHES OF SOIL HAVING A PH OF 5 OR MORE PRIOR TO SEEDBED PREPARATION. AREAS WHERE TREES OR SHRUBS ARE TO BE PLANTED SHALL BE COVERED WITH A MINIMUM OF TWENTY-FOUR (24) INCHES OF SOIL HAVING A PH OF 5 OR MORE.
10. AT THE TIME THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER, SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
11. CONDUIT OUTLET PROTECTION MUST BE REVIEWED & SUPPLEMENTED AT ALL OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
12. UNFILTERED DEWATERING IS NOT PERMITTED. TAKE ALL NECESSARY PRECAUTIONS DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH STATE STANDARDS.
13. SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED IN ACCORDANCE WITH STATE STANDARDS FOR EROSION CONTROL.
14. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHT-OF-WAY WILL BE REMOVED IMMEDIATELY.
15. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION AND SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.
16. STOCKPILE AND STAGING LOCATIONS DETERMINED IN THE FIELD, SHALL BE PLACED WITHIN THE LIMITS OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN.
17. CONCRETE WASHOUT, DUMPSTER, & STAGING AREA LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED AT THE PRE-CONSTRUCITON MEETING. THEY SHALL BE PLACED IN THE PROXIMITY OF THE CONSTRUCTION ENTRANCE AND STAGING AREAS AND SHALL BE USED PRIOR TO EXITING THE PROJECT SITE. THE LOCATION SHALL BE IN A PRACTICAL, CLEARLY DELINEATED, AREA AND BE MAINTAINED THROUGHOUT CONSTRUCTION.
18. ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
19. ALL PERMANENT SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED BY THE PROPERTY OWNER, AND SHALL BECOME THEIR RESPONSIBILITY.
20. PAVEMENT AREAS ARE TO BE KEPT CLEAN AT ALL TIMES.
21. DURING CONSTRUCTION, ANY ADDITIONAL CONTROL MEASURES AS DEEMED NECESSARY TO PREVENT EROSION OR CONTROL SEDIMENT BEYOND THOSE MEASURES SHOWN ON THE APPROVED PLAN SHALL BE INSTALLED OR EMPLOYED AT THE DIRECTION OF THE MUNICIPAL ENGINEER.
22. ALL TEMPORARY, STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED, WHEN ALL CONSTRUCTION ACTIVITY IDENTIFIED IN THE SWPPP HAS BEEN COMPLETED, ALL AREAS OF DISTURBANCE HAVE ACHIEVED FINAL STABILIZATION** AND ALL POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH THE SWPPP AND ARE OPERATIONAL.
23. BOTTOM AND BERM ELEVATIONS OF TEMPORARY SEDIMENT BASINS TO BE REVIEWED WITH THE CONTRACTOR BASED ON THEIR PROPOSED CONSTRUCTION SEQUENCE FOR THE PROJECT.

**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.

MAINTENANCE PLAN DURING CONSTRUCTION:

INSPECTION AND MAINTENANCE SHALL BE PERFORMED IN CONFORMANCE WITH GP-0-20-001 OR AS AMENDED. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED AND INSTALLED FOR THE PROJECT. THE SEDIMENT TRAPS WILL BE CLEANED OUT WHEN THE LEVEL OF SEDIMENT REACHES 25% OF ITS' CAPACITY. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES APPROXIMATELY 6" DEEP AT THE FENCE. THE SILT FENCE WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER. ALL SEEDED AREAS WILL BE FERTILIZED, RE-SEEDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS IN THE LANDSCAPE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.

MAINTENANCE AGREEMENT NOTE:

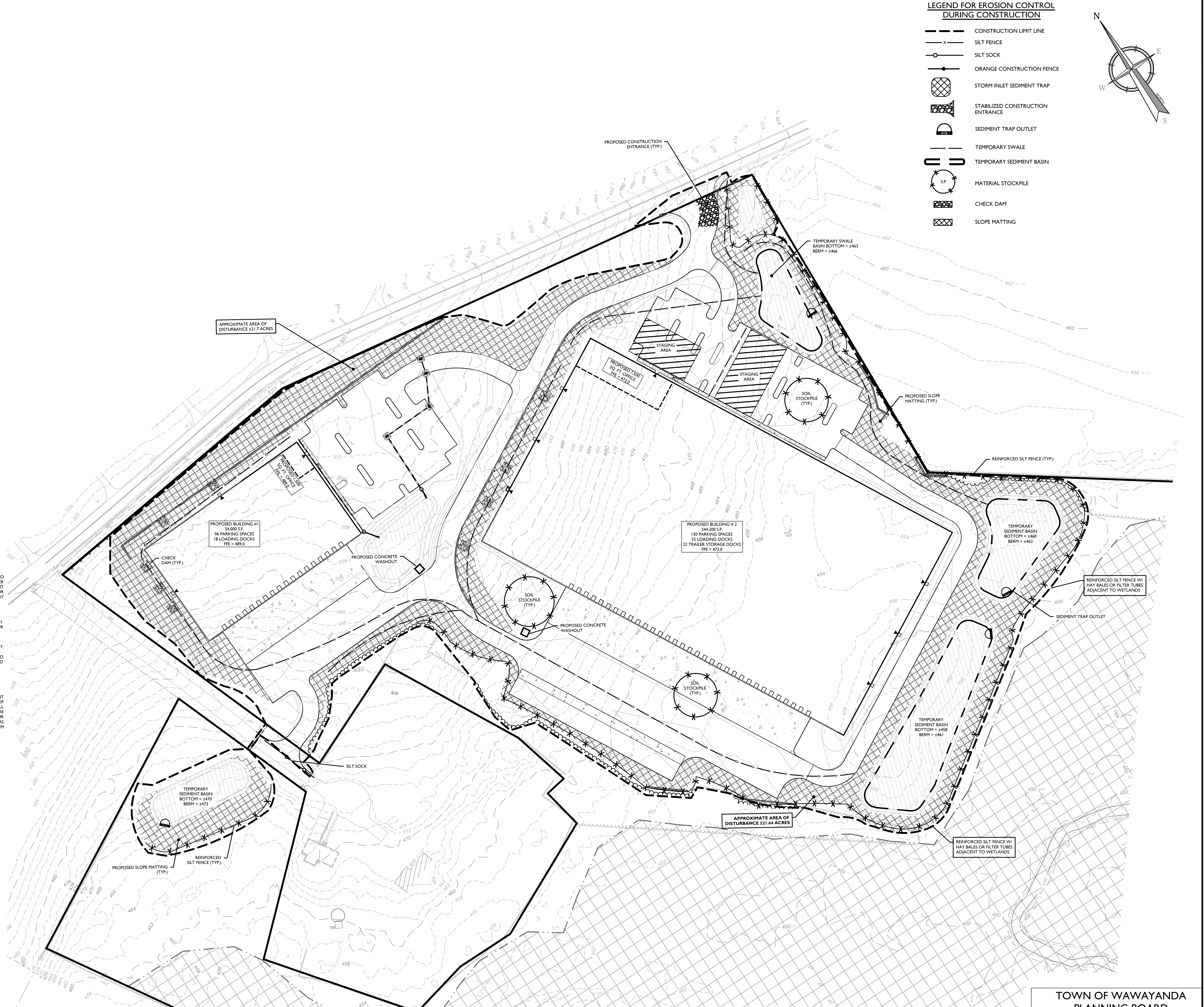
THE OWNER/APPLICANT SHALL ENTER INTO AN ENFORCEABLE MAINTENANCE AGREEMENT WITH THE MUNICIPALITY (IF AN MS4. COMMUNITY) RELATED TO MAINTENANCE OF STORMWATER FACILITIES. THE OWNER/APPLICANT IS RESPONSIBLE TO PERFORM ALL REQUIRED MAINTENANCE BOTH DURING CONSTRUCTION AND LONG-TERM. THE NATURE OF THE AGREEMENT IS TO ALLOW THE MUNICIPALITY TO PERFORM MAINTENANCE AT THEIR OPTION SHOULD THE OWNER/APPLICANT FAIL TO ADEQUATELY MAINTAIN THE SYSTEM AS DETERMINED BY THE MUNICIPAL ENGINEER. MAINTENANCE OF THE STORMWATER SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED SWPPP AND DETAIL SHEETS.

303 (D) - SEGMENTS IMPAIRED BY CONSTRUCTION RELATED POLLUTANTS

1. FOR CONSTRUCTION SITE THAT DIRECTLY DISCHARGE TO ONE OF THE 303(D) SEGMENTS LISTED IN APPENDIX E OF THE GP-0-20-001 OR IS LOCATED IN ONE OF THE WATERSHEDS LISTED IN APPENDIX GP-0-20-001, 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.
2. FOR CONSTRUCTION SITES THAT DIRECTLY DISCHARGE TO ONE OF THE 303(D) SEGMENTS LISTED IN APPENDIX E OF THE GP-0-20-001 OR IS LOCATED IN ONE OF THE WATERSHEDS LISTED IN APPENDIX C OF THE GP-0-20-001, THE APPLICATION OF SOIL STABILIZATION MEASURES MUST BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN SEVEN (7) DAYS.
3. THE PROJECT SITE DISCHARGES TO THE MONHAGEN BROOK LISTED IN APPENDIX E OF THE GP-0-20-001.

LEGEND FOR EROSION CONTROL DURING CONSTRUCTION

▬ ▬ ▬	CONSTRUCTION LIMIT LINE
—x—	SILT FENCE
—o—	SILT SOCK
—◆—	ORANGE CONSTRUCTION FENCE
▨	STORM INLET SEDIMENT TRAP
▨	STABILIZED CONSTRUCTION ENTRANCE
◓	SEDIMENT TRAP OUTLET
—> —	TEMPORARY SWALE
⊂⊃	TEMPORARY SEDIMENT BASIN
S.P	MATERIAL STOCKPILE
▨	CHECK DAM
▨	SLOPE MATTING



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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS
FOR
MID DOLSONTOWN, LLC

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TOWN OF WAWAYANDA
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PROJECT NUMBER: 21004268A
DRAWING NAME: C-SESC

SHEET TITLE:
SOIL EROSION & SEDIMENT CONTROL PLAN

SHEET NUMBER:
10 of 20

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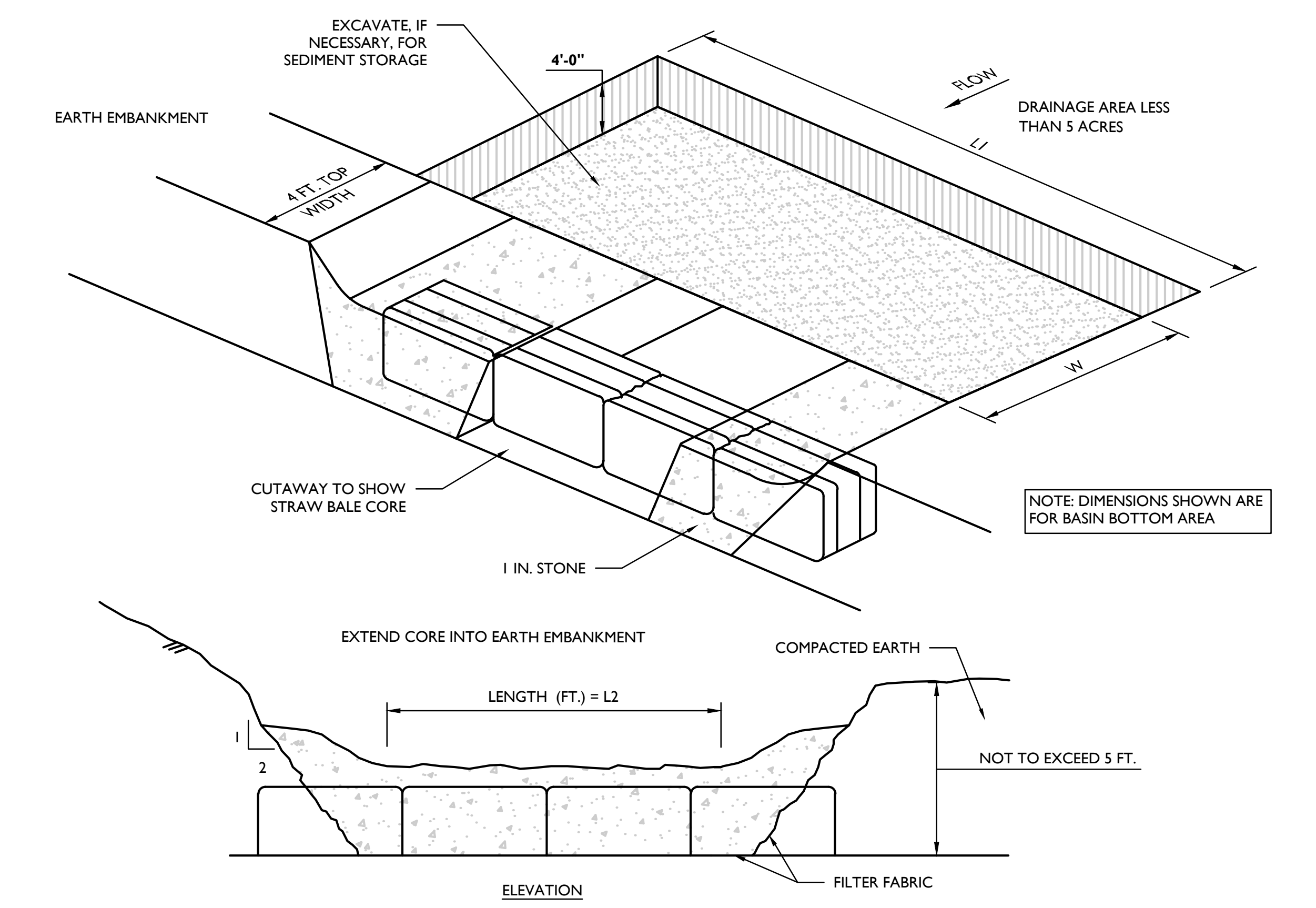

TO BE INSTALLED PRIOR TO GRADING OR FILLING IN THE DRAINAGE AREA THEY ARE TO PROTECT. TRAPS THAT ARE TO FUNCTION DURING BUILDING CONSTRUCTION MUST NOT BE LOCATED WITHIN 20 FEET OF A PROPOSED BUILDING FOUNDATION. WHILE TRAPS SHOULD BE SITED TO MAXIMIZE STORAGE BENEFIT, THEY SHOULD NOT BE LOCATED IN WETLANDS OR WETLAND BUFFER AREAS, OR IN EXISTING WATERCOURSES.

SEE EROSION AND SEDIMENT CONTROL PLAN FOR LOCATIONS.

INSTALLATION NOTES:

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED AS WELL.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER SIZED STONES, ROCKS, ORGANIC MATERIAL AND OTHER QUESTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
6. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT AND FILL SLOPES SHALL BE 1 : 2 OR FLATTER.
8. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.

SIZING CALCULATIONS

NOTE:

1. 3,600 CUBIC FEET OF STORAGE REQUIRED PER ACRE OF DISTURBANCE.

*THIS IS THE MINIMUM AMOUNT OF SEDIMENT TRAPS, ADDITIONAL MAY BE REQUIRED BASED UPON OTHER ON-SITE CONDITIONS AND CONTRACTOR SCHEDULE AND PHASING ACTIVITIES.

STONE OUTLET SEDIMENT TRAP DETAIL

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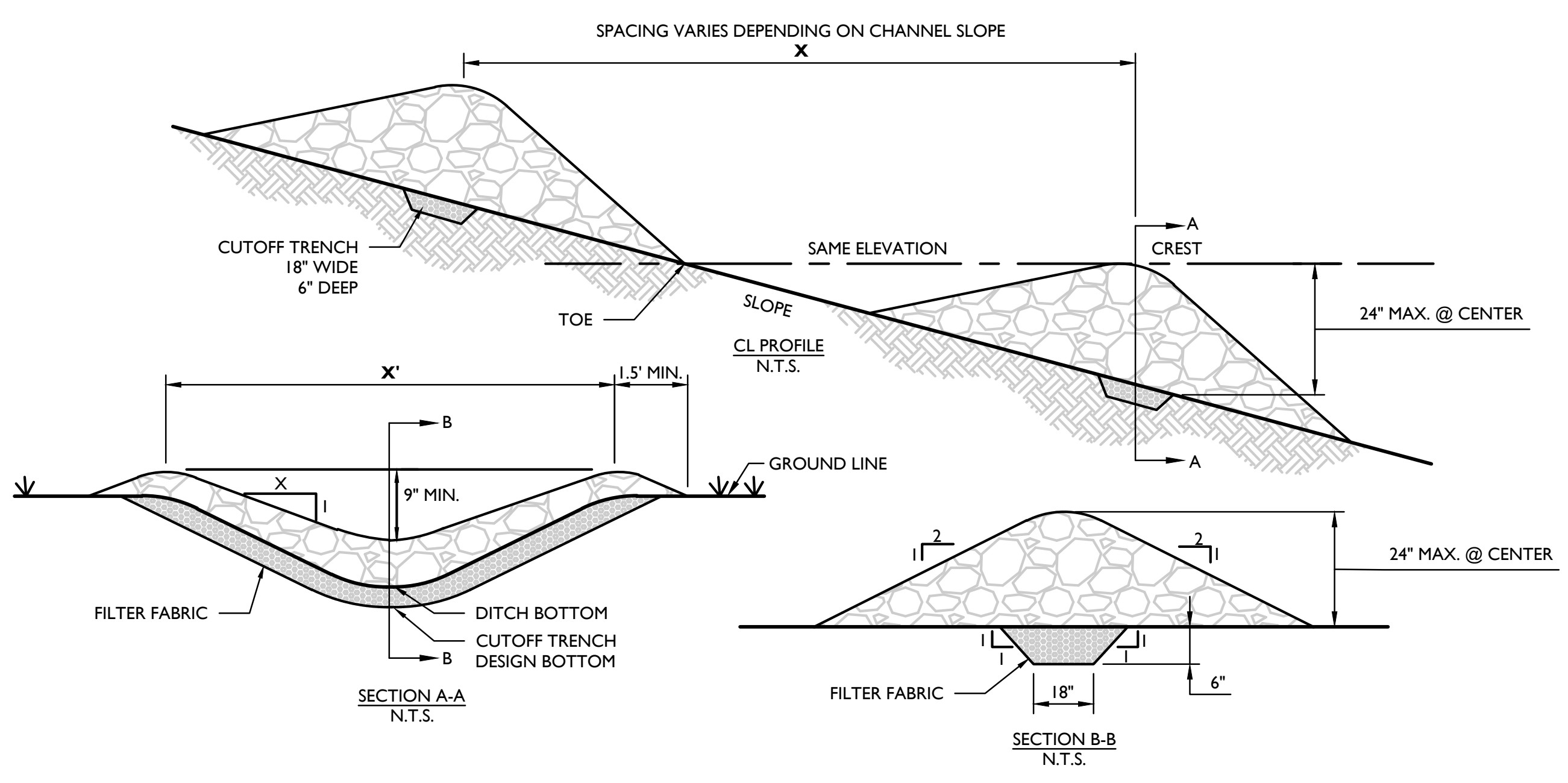

CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN ON THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA: 2 ACRES

3

STONE CHECK DAM DETAIL

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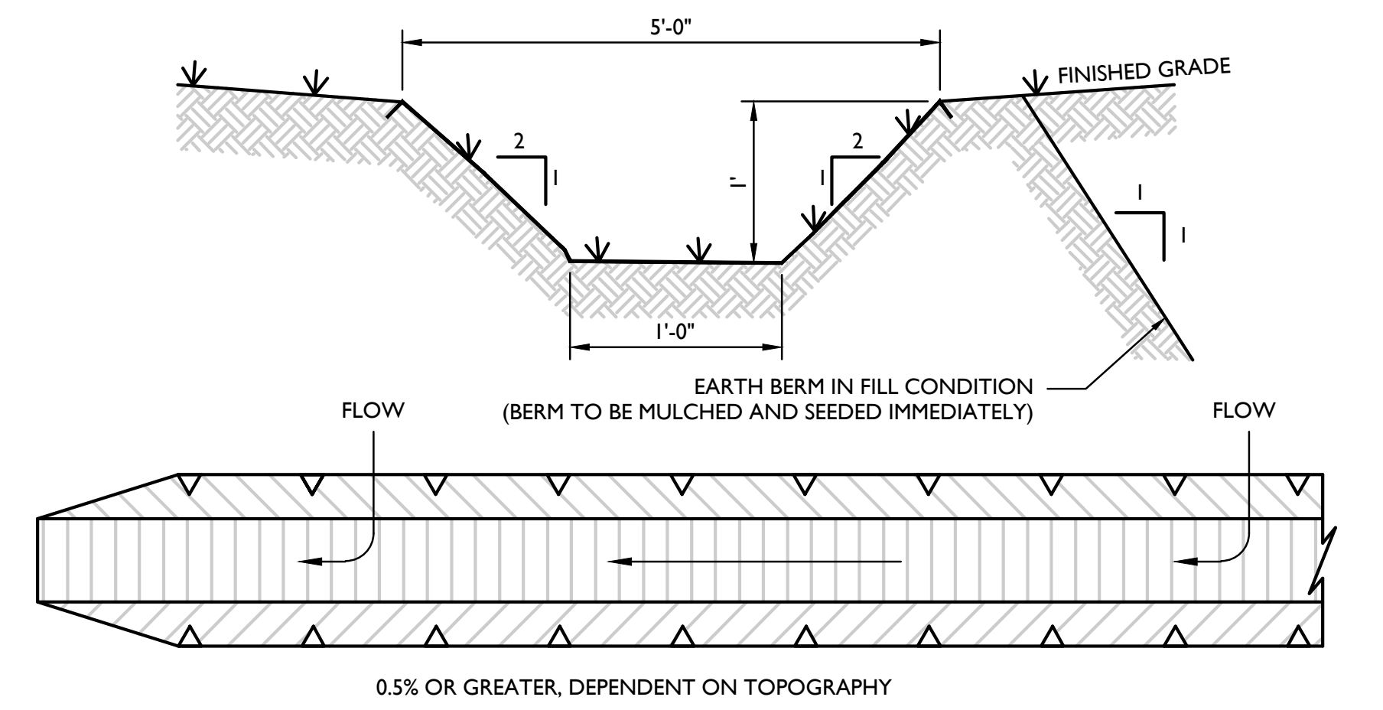

TO BE INSTALLED ABOVE DISTURBED AREAS, TO DIVERT RUNOFF OFF-SITE WITHOUT INCREASING EROSION; INTERMITTENTLY ACROSS DISTURBED AREAS, TO SHORTEN OVERLAND FLOW DISTANCES; BELOW DISTURBED AREAS, TO DIVERT SEDIMENT-LADEN WATER TO A SEDIMENT TRAPPING DEVICE; AND TO SAFELY TRANSPORT RUNOFF ALONG ROADWAYS.

* WHERE SWALE TRAVERSES CONSTRUCTION VEHICLE PATH, DEPTH TO BE 6". SEE PLAN FOR LOCATION

INSTALLATION NOTES:

1. ALL SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO AS NOT TO INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED BY THE CONTRACTOR AS REQUIRED
9. STABILIZATION SHALL BE SEED AND STRAW MULCH.

1

TEMPORARY SWALE & EARTH BERM DETAIL

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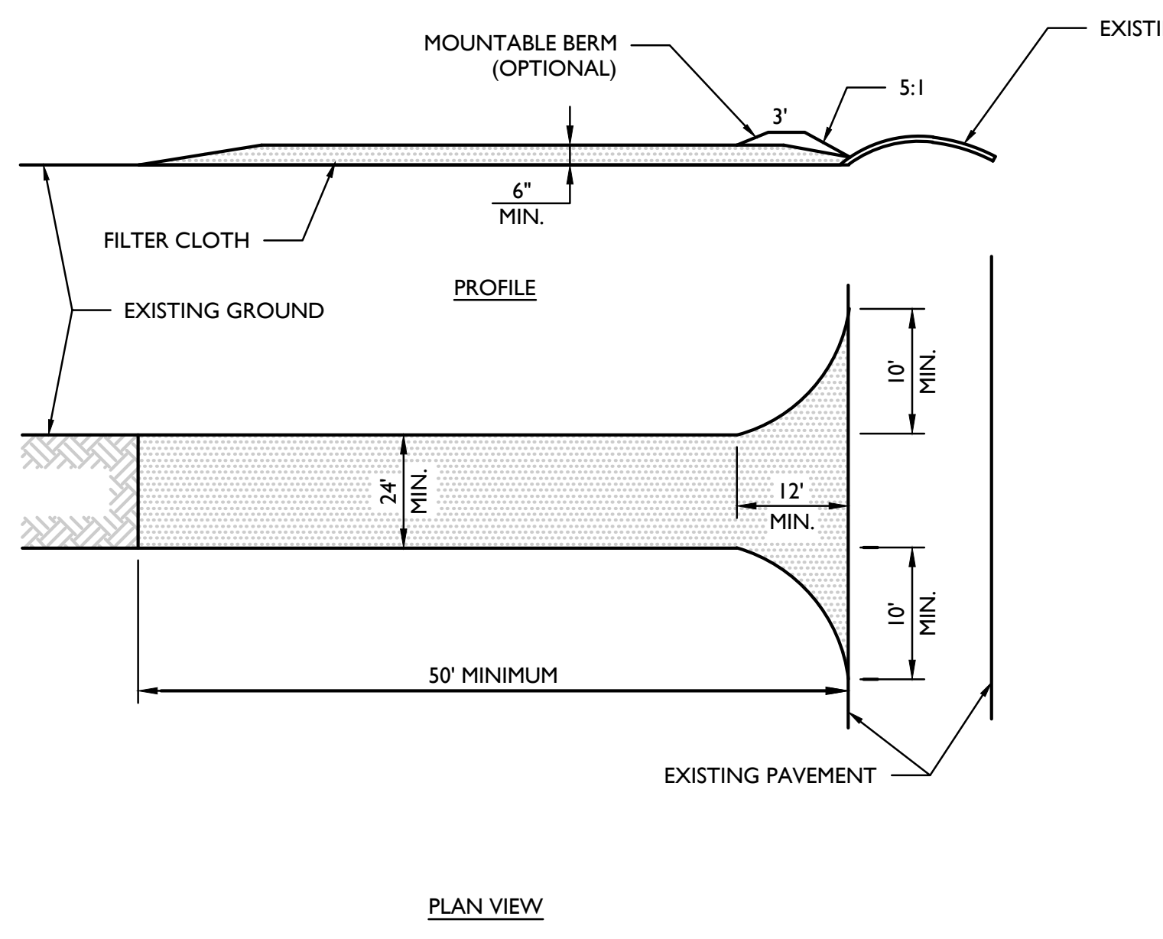

NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT. LENGTH: NOT LESS THAN 50 FEET. THICKNESS: NOT LESS THAN (6) INCHES.
2. WIDTH - 24'
3. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
4. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTING BERM WITH 5:1 SLOPES WILL BE PERMITTED.
5. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
6. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

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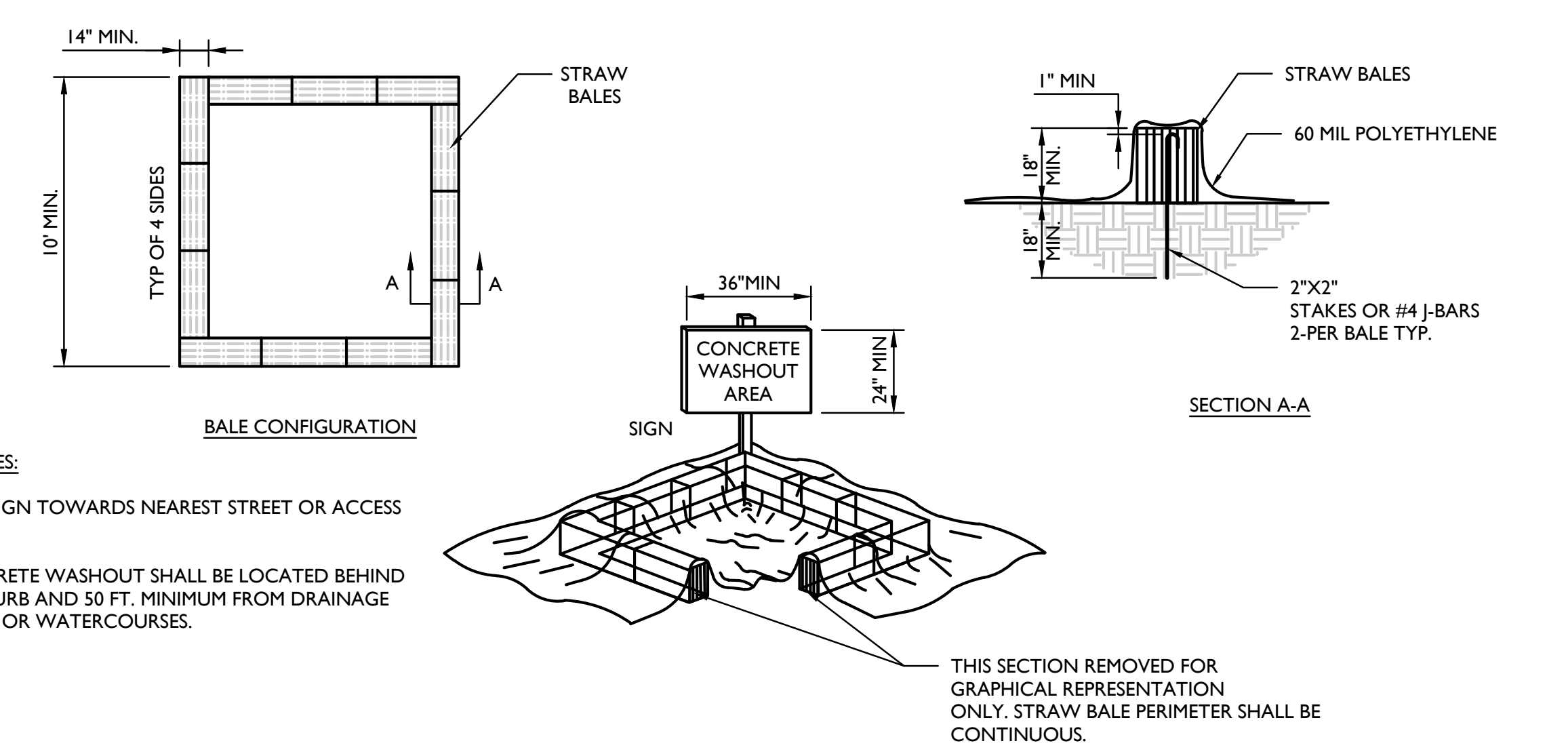

DETAIL NOTES:

1. FACE SIGN TOWARDS NEAREST STREET OR ACCESS POINT.
2. CONCRETE WASHOUT SHALL BE LOCATED BEHIND THE CURB AND 50 FT. MINIMUM FROM DRAINAGE INLETS OR WATERCOURSES.

NOTES:

1. CONCRETE WASHOUTS ARE REQUIRED ON ALL CONSTRUCTION SITES INVOLVING CONCRETE AND STUCCO USE.
2. THE CONTRACTOR SHALL REQUIRE ALL CONCRETE DRIVERS TO UTILIZE THE CONCRETE WASHOUTS ONSITE.
3. WASHOUT FACILITIES SHALL BE LOCATED AT LEAST 50 FEET AWAY FROM STORM SEWER DRAIN INLETS, GUTTERS, OPEN DITCHES, AND WATER COURSES.
4. APPROPRIATE STONE SHOULD COVER PATHS TO CONCRETE WASHOUT.
5. THE NUMBER OF CONCRETE WASHOUTS DEPENDS ON THE EXPECTED DEMAND FOR STORAGE CAPACITY. LARGE SITES WITH EXTENSIVE CONCRETE WORK SHALL BE PLACED AT MULTIPLE LOCATIONS FOR USE BY CONCRETE TRUCK DRIVERS.
6. CONCRETE WASHOUT AREAS SHALL BE IDENTIFIED BY POSTING SIGNS ONSITE.
7. CONCRETE WASHOUTS ARE TO BE INSPECTED DAILY BY THE CONTRACTOR FOR LEAKS OR TEARS IN PLASTIC LINER.
8. REMOVE AND DISPOSE OF ALL MATERIAL WHEN THE WASHOUT HAS BEEN FILLED TO 75% CAPACITY.
9. PRIOR TO ANY RAINFALL, ALL CONCRETE WASHOUTS ARE TO BE CLEANED OUT OR COVERED.
10. ONCE THE MATERIAL HAS BEEN CLEANED OUT OF THE CONCRETE WASHOUT FACILITY, THE FACILITY MUST BE INSPECTED FOR REPAIR, RECONSTRUCTION OR REPLACEMENT. ALL PLASTIC LINING SHALL BE REMOVED AND REPLACED.
11. PRE-FABRICATED OR ONSITE FABRICATED CONCRETE WASHOUTS MAY BE USED.
12. OPTIONS FOR ONSITE CONCRETE WASHOUTS:
    - A. DIG A PIT AND LINE WITH 10 MIL PLASTIC SHEETING.
    - B. CREATE AN ABOVE-GROUND STRUCTURE FROM STRAW BALES OR SANDBAGS WITH 10 MIL PLASTIC LINING.

CONCRETE WASHOUT DETAIL

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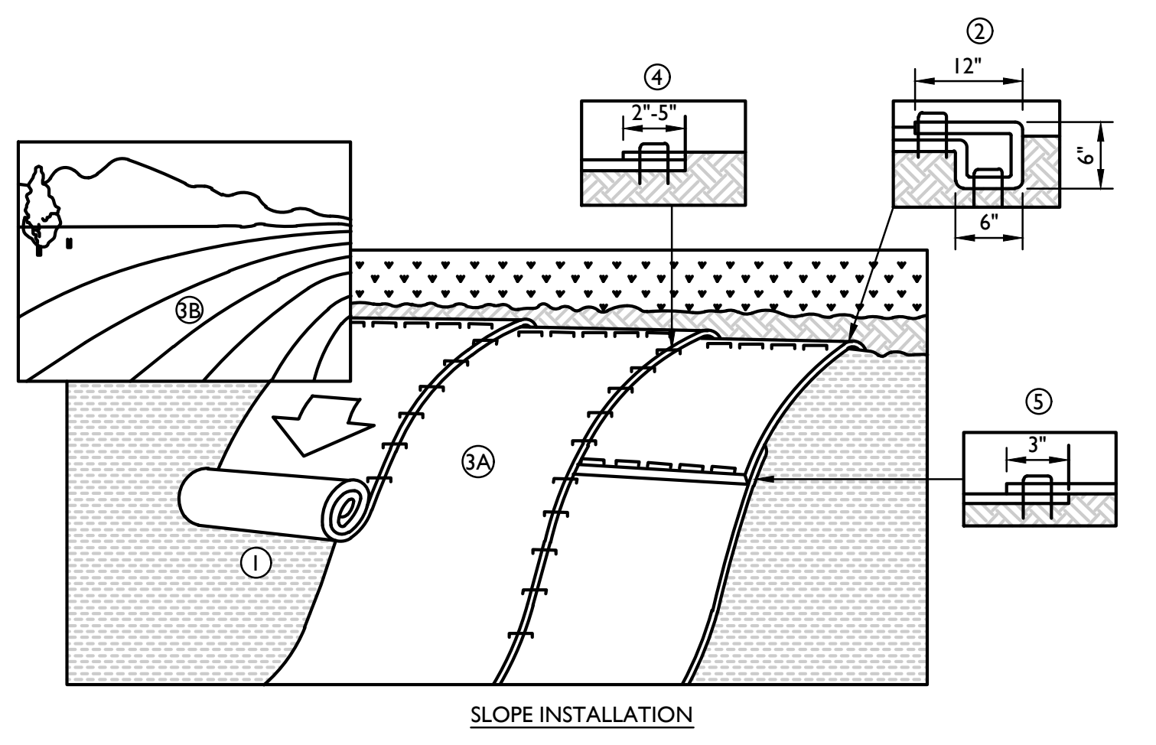
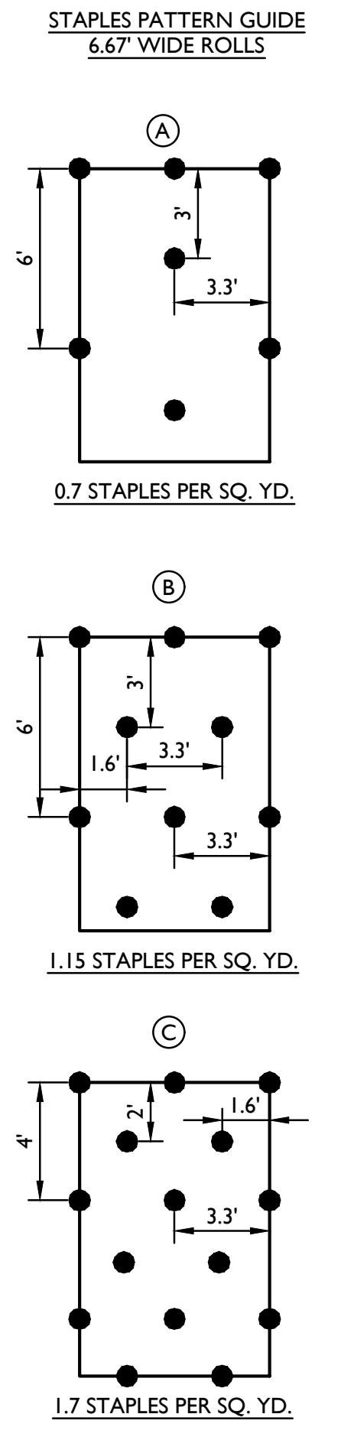


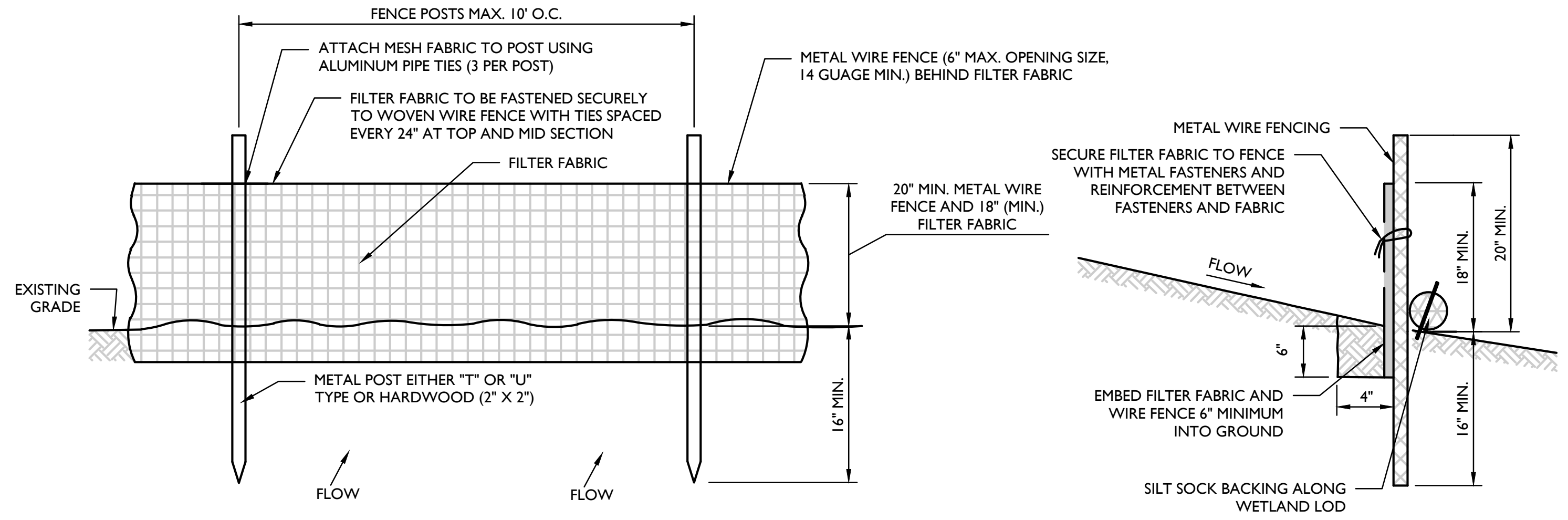


NOTES:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP'S), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
   - * WHEN USING MATTING WITH SEED, DO NOT SEED THE AREA. FOLLOW MANUFACTURER'S RECOMMENDATIONS.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S IN A 6" DEEP x 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A.) DOWN OR (B.) HORIZONTALLY STEP BY STEP ACROSS THE SLOPE TAMPERING IT DOWN ALONG THE WAY. RECP'S SHALL UNROLL WITH APPROPRIATE SIDE TIGHTLY AGAINST THE SOIL SURFACE. RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKESSHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAKED WITH APPROXIMATELY 2" TO 5" OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WIDTH.
   - * IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

EROSION MATTING (CURLEX ENFORCER I) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-2200 07/01/19

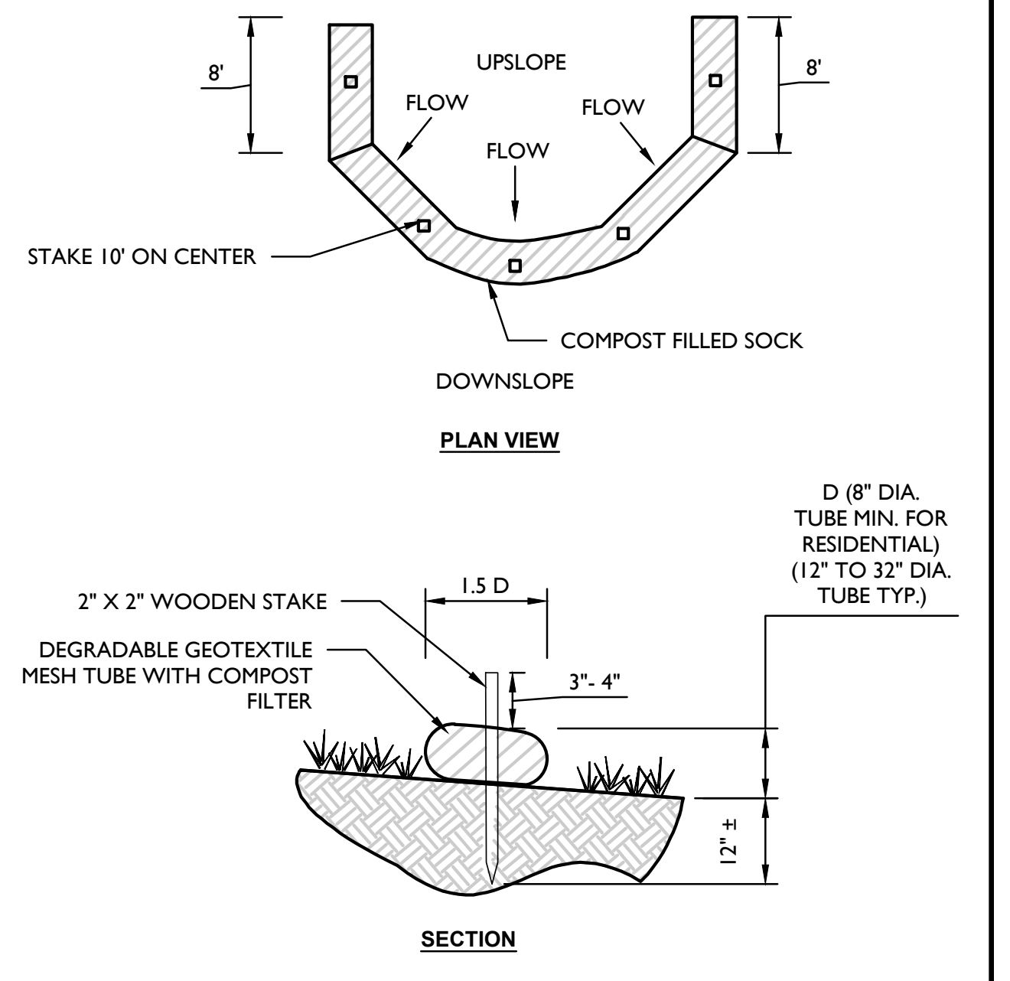


NOTES:

1. GEOTEXTILE TO BE FASTENED SECURELY TO FENCE POST BY USING WIRE TIES OR HOG RINGS. USE 3 FASTENERS PER POST.
2. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
3. ALL SILT FENCE TO BE INSPECTED AND REMEDIAL MAINTENANCE PERFORMED BY THE CONTRACTOR AS REQUIRED. MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
4. WHEN TWO SECTIONS OF FILTER FABRIC ARE JOINED, THEY SHALL BE OVER-WRAPPED BY SIX INCHES AND FOLDED.
5. FILTER FABRIC TO BE EITHER FILTER X, MIRAFI 100X, STABILINKA T14ON, OR APPROVED EQUIVALENT.
6. PREFABRICATED UNITS SHALL MEET THE MINIMUM REQUIREMENTS SHOWN.
7. IF SPACE PERMITTED, LOCATE SILT FENCE 10' AWAY FROM TOE OF SLOPE IF THE SLOPE IS STEEPER THAN 1:1.

REINFORCED SILT FENCE (WITH WIRE FENCE) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1101 07/01/19



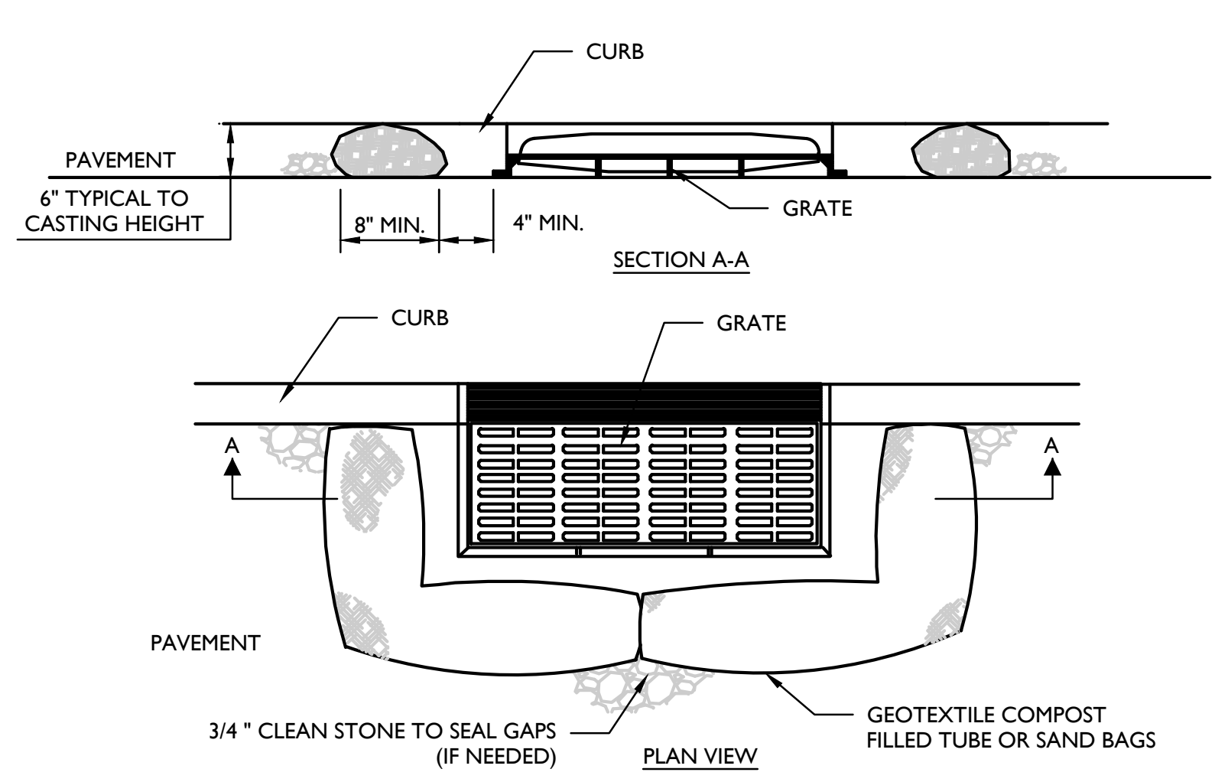
DIA. (in.)	SLOPE%						
	2	5	10	20	25	33	50
8	225*	200	100	50	20	-	-
12	250	225	125	65	50	40	25
18	275	250	150	70	55	45	30
24	350	275	200	130	100	60	35
32	450	325	275	150	120	75	50
*Length in feet							

NOTES:

1. ALL MATERIAL TO MEET **FILTREXX SILTSOX** SPECIFICATIONS OR APPROVED EQUAL.
2. COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST FILTER SOCK DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1200 05/01/17

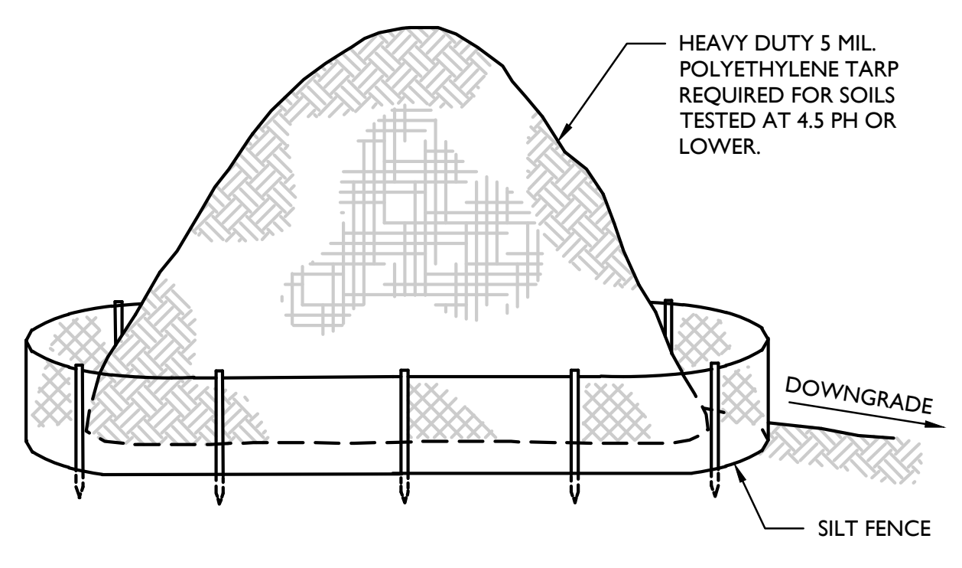


NOTES:

1. GEOTEXTILE TO BE WOVEN POLYPROPYLENE PRODUCT, OR APPROVED EQUAL.
2. FILLER CORE MAY BE SAND, COMPOST, OR PEA GRAVEL COMPLETELY CONTAINED WITHIN GEOTEXTILE. SEAMS, CLOSED BY SUITABLE MECHANICAL MEANS TO PREVENT LEAKAGE OF FILLER.
3. WHERE NO CURB IS PRESENT, BARRIER SHALL COMPLETELY ENCIRCLE THE DRAIN INLET.
4. INLET GRATE OPENING IS TO BE KEPT CLEAR OF OBSTRUCTIONS AT ALL TIMES.
5. THE PROTECTION DEVICE WILL BE DESIGNED TO CAPTURE OR FILTER RUNOFF FROM THE 1 YEAR/ 24 HOUR STORM EVENT AND SHALL SAFELY CONVEY HIGHER FLOWS DIRECTLY INTO THE STORM SEWER SYSTEM.
6. OTHER METHODS THAT ACCOMPLISH THE PURPOSE OF STORM SEWER INLET PROTECTION MAY BE USED IF APPROVED BY THE PROJECT ENGINEER.
7. INSPECTIONS SHALL BE FREQUENT. MAINTENANCE, REPAIR, AND REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED. THE BARRIER SHALL BE REMOVED WHEN THE AREA DRAINING TOWARDS THE INLET HAS REACHED FINAL STABILIZATION.

INLET PROTECTION (FILTER BARRIER) DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1500 07/01/19

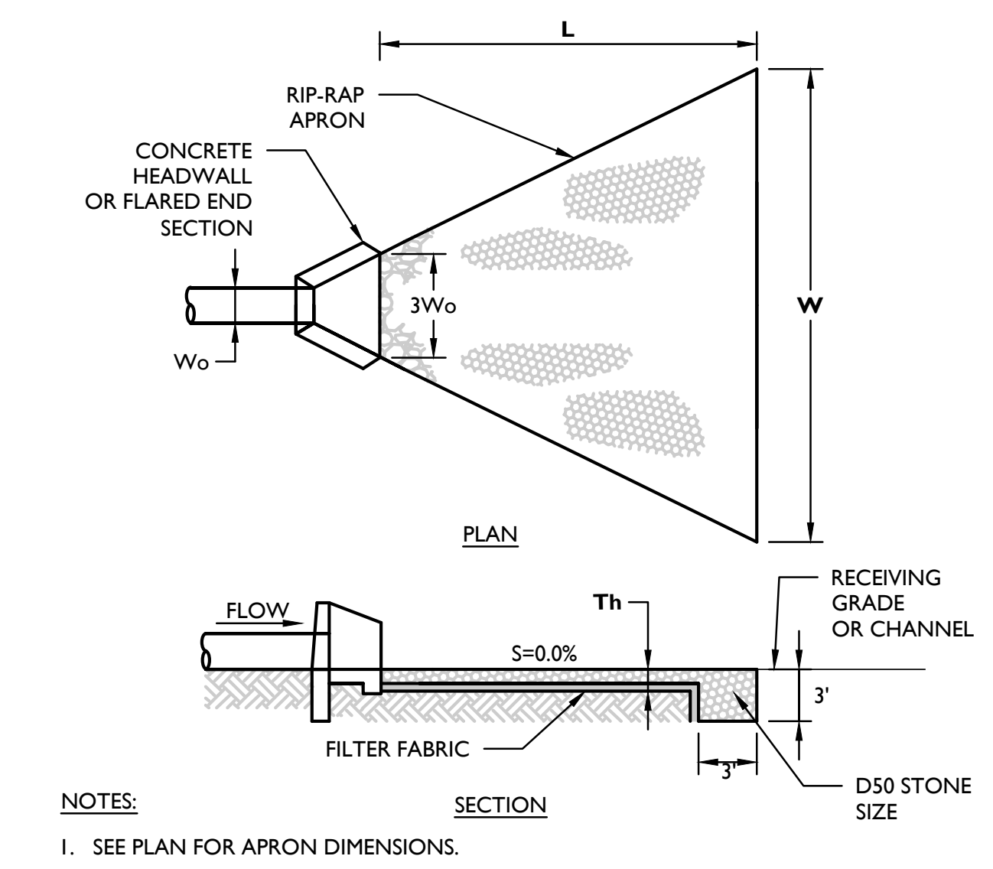


NOTES:

1. ALL STOCKPILES SHALL NOT TO BE LOCATED WITHIN 50 FEET OF A FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITY.

TOPSOIL STOCKPILE DETAIL

NOT TO SCALE MCNY-SOIL-EROS-2500 07/01/19



NOTES:

1. SEE PLAN FOR APRON DIMENSIONS.
2. SIDE SLOPE SHALL BE 2:1 OR FLATTER. THE BOTTOM GRADE SHALL BE LEVEL (0% SLOPE). THERE SHALL BE NO FALL AT THE END OF APRON TO THE RECEIVING SURFACE.

CONDUIT OUTLET PROTECTION DETAIL

NOT TO SCALE MCNY-SOIL-EROS-1600 07/01/19

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS

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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
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COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

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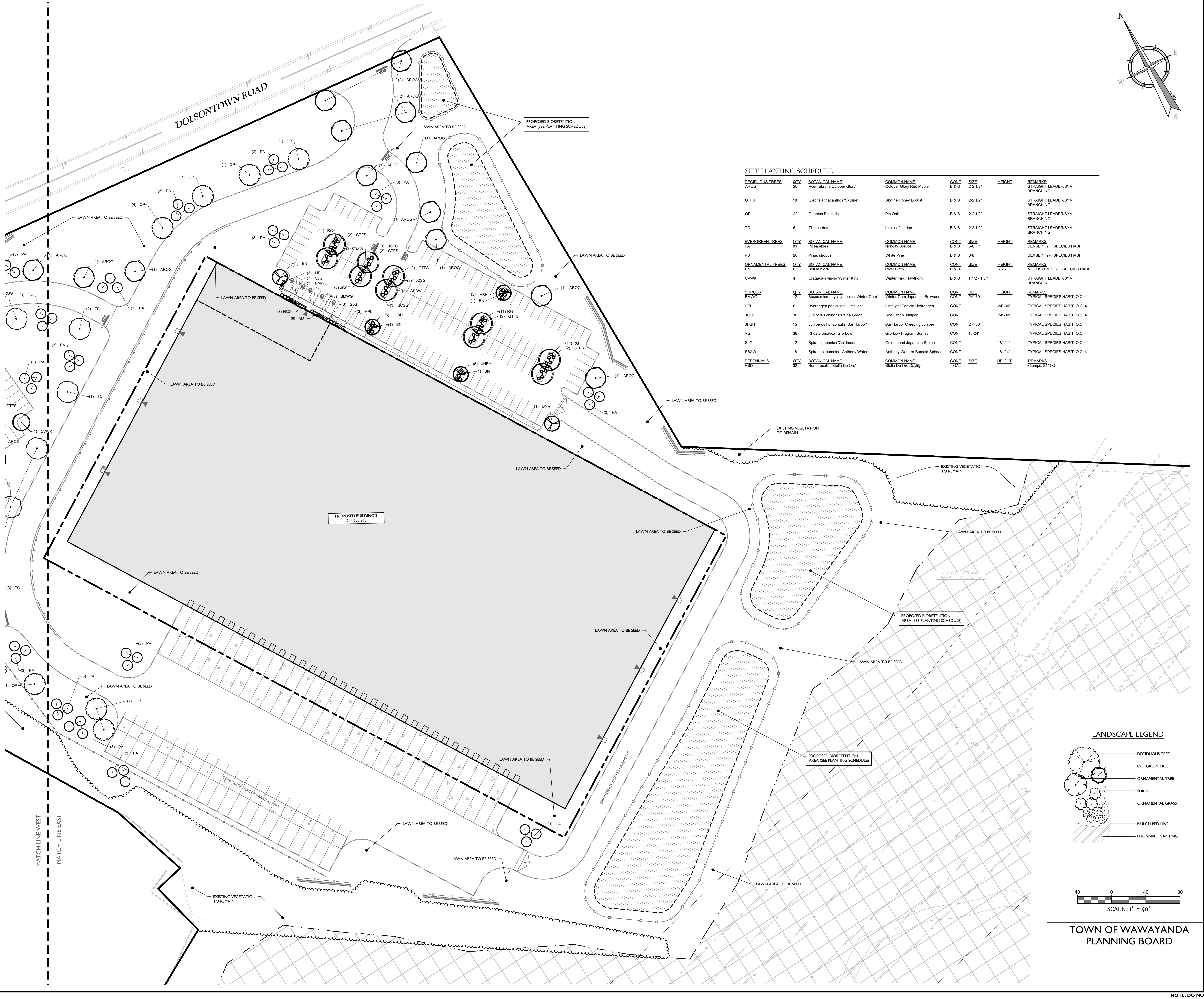
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-SESC

SHEET TITLE:
SOIL EROSION &
SEDIMENT CONTROL PLAN

SHEET NUMBER:
11 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



SITE PLANTING SCHEDULE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	SIZE	HEIGHT	REMARKS
AROG	26	Acer rubrum 'October Glory'	October Glory Red Maple	B & B	2-2 1/2"		STRAIGHT LEADER/SYM. BRANCHING
GTFS	18	Gleditsia triacanthos 'Skyline'	Skyline Honey Locust	B & B	2-2 1/2"		STRAIGHT LEADER/SYM. BRANCHING
QP	22	Quercus Palustris	Pin Oak	B & B	2-2 1/2"		STRAIGHT LEADER/SYM. BRANCHING
TC	6	Tilia cordata	Littleleaf Linden	B & B	2-2 1/2"		STRAIGHT LEADER/SYM. BRANCHING
EVERGREEN TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**	**HEIGHT**	**REMARKS**
PA	81	Picea abies	Norway Spruce	B & B	6-8` Ht.		DENSE / TYP. SPECIES HABIT
PS	20	Pinus strobus	White Pine	B & B	6-8` Ht.		DENSE / TYP. SPECIES HABIT
ORNAMENTAL TREES	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**	**HEIGHT**	**REMARKS**
BN	6	Betula nigra	River Birch	B & B		6` - 7`	MULTISTEM / TYP. SPECIES HABIT
CVWK	4	Crataegus viridis 'Winter King'	Winter King Hawthorn	B & B	1 1/2 - 1 3/4"		STRAIGHT LEADER/SYM. BRANCHING
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**	**HEIGHT**	**REMARKS**
BMWG	12	Buxus microphylla japonica 'Winter Gem'	Winter Gem Japanese Boxwood	CONT	24"-30"		TYPICAL SPECIES HABIT, O.C. 4'
HPL	6	Hydrangea paniculata 'Limelight'	Limelight Panicle Hydrangea	CONT		24"-30"	TYPICAL SPECIES HABIT, O.C. 4'
JCSG	36	Juniperus chinensis 'Sea Green'	Sea Green Juniper	CONT		24"-30"	TYPICAL SPECIES HABIT, O.C. 4'
JHBH	15	Juniperus horizontalis 'Bar Harbor'	Bar Harbor Creeping Juniper	CONT	24"-30"		TYPICAL SPECIES HABIT, O.C. 4'
RG	38	Rhus aromatica `Gro-Low`	Gro-Low Fragrant Sumac	CONT	18-24"		TYPICAL SPECIES HABIT, O.C. 4'
SJG	12	Spiraea japonica 'Goldmound'	Goldmound Japanese Spirea	CONT		18"-24"	TYPICAL SPECIES HABIT, O.C. 4'
SBAW	18	Spiraea x bumalda 'Anthony Waterer'	Anthony Waterer Bumald Spiraea	CONT		18"-24"	TYPICAL SPECIES HABIT, O.C. 4'
PERENNIALS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**	**HEIGHT**	**REMARKS**
HSD	32	Hemerocallis 'Stella De Oro'	Stella De Oro Daylily	1 GAL.			Clumps, 24" O.C.

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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

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Justin Eric Dates
NEW YORK REGISTERED LANDSCAPE ARCHITECT
LICENSE NUMBER: 001964-01
COLLIERS ENGINEERING & DESIGN CT, P.C.

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-LAND

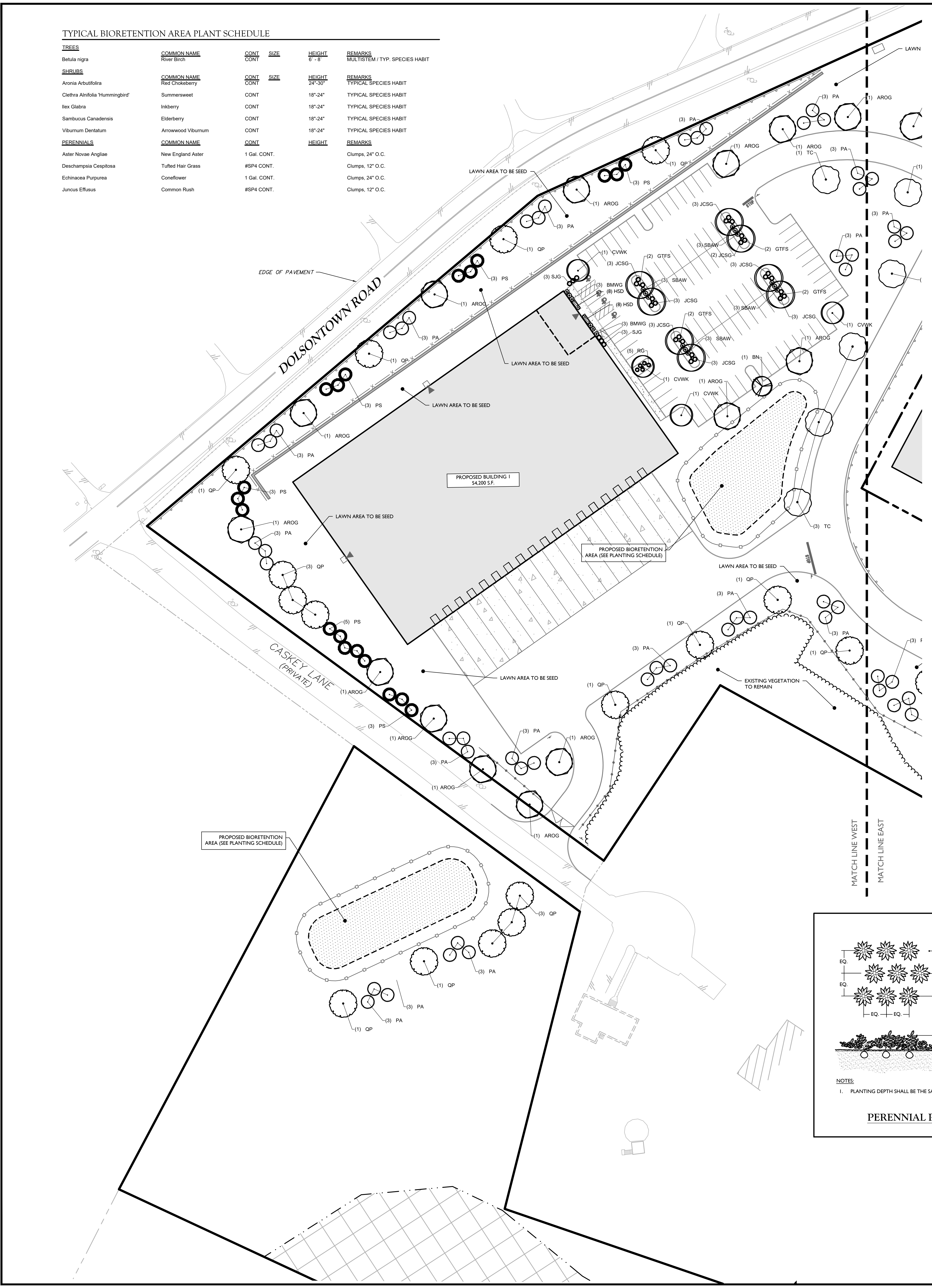
SHEET TITLE:
LANDSCAPE PLAN
EAST

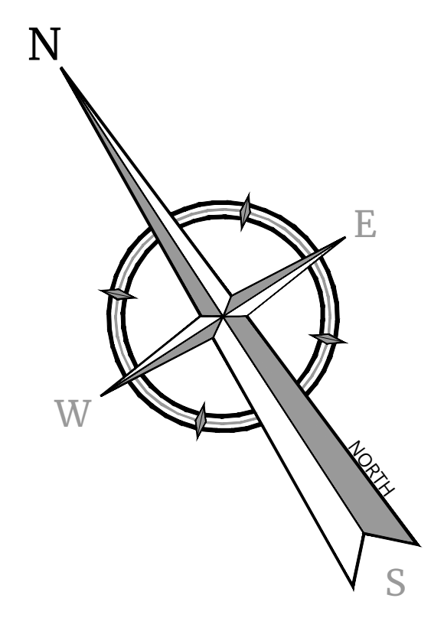
SHEET NUMBER:
12 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TYPICAL BIORETENTION AREA PLANT SCHEDULE

TREES	COMMON NAME	CONT	SIZE	HEIGHT	REMARKS
Betula nigra	River Birch	CONT		6` - 8`	MULTISTEM / TYP. SPECIES HABIT
SHRUBS	COMMON NAME	CONT	SIZE	HEIGHT	REMARKS
Aronia Arbutifolira	Red Chokeberry	CONT		24"-30"	TYPICAL SPECIES HABIT
Clethra Alnifolia 'Hummingbird'	Summersweet	CONT		18"-24"	TYPICAL SPECIES HABIT
Ilex Glabra	Inkberry	CONT		18"-24"	TYPICAL SPECIES HABIT
Sambucus Canadensis	Elderberry	CONT		18"-24"	TYPICAL SPECIES HABIT
Viburnum Dentatum	Arrowwood Viburnum	CONT		18"-24"	TYPICAL SPECIES HABIT
PERENNIALS	COMMON NAME	CONT		HEIGHT	REMARKS
Aster Novae Angliae	New England Aster	1 Gal. CONT.			Clumps, 24" O.C.
Deschampsia Cespitosa	Tufted Hair Grass	#SP4 CONT.			Clumps, 12" O.C.
Echinacea Purpurea	Coneflower	1 Gal. CONT.			Clumps, 24" O.C.
Juncus Effusus	Common Rush	#SP4 CONT.			Clumps, 12" O.C.





GENERAL SEEDING NOTES

1. TEMPORARY SEEDING: REFER TO SOIL EROSION AND SEDIMENT CONTROL PLANS.
2. PERMANENT SEEDING SHALL CONSIST OF THE FOLLOWING MIXTURE OR APPROVED EQUAL: OPTIMUM SEEDING DATES ARE BETWEEN APRIL 1 AND MAY 31: AND AUGUST 16 AND OCTOBER 15.

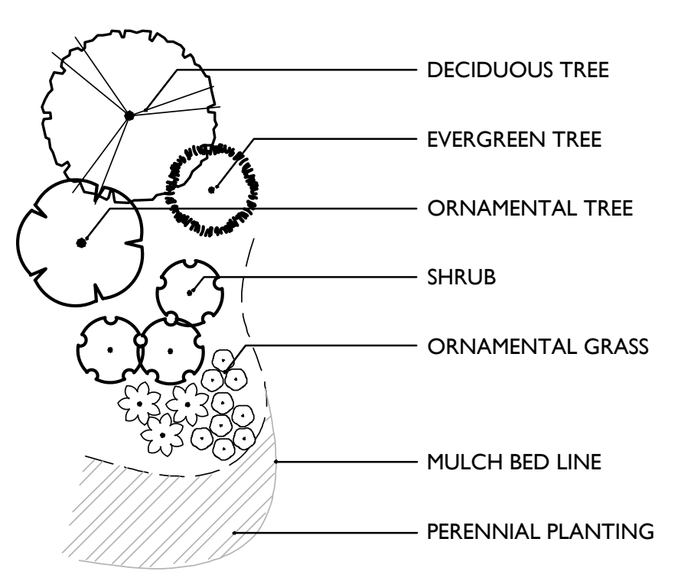
   TURF MIX (7-10 LBS./1,000 S.F. MINIMUM)
   TALL FESCUE, 'STINGRAY' (34%)
   TALL FESCUE, RAPTOR III (33%)
   HARD FESCUE, 'RIDU' (33%)

   SEEDING OUTSIDE OF THE OPTIMUM DATES SHALL NOT BE CONDUCTED WITH OUT PRIOR APPROVAL.

3. PERMANENT SEEDING TO BE APPLIED BY RAKING OR DRILLING INTO THE SOILS AT THE RATE GIVEN ABOVE.
4. FERTILIZER FOR THE ESTABLISHMENT OF TEMPORARY AND PERMANENT VEGETATIVE COVER SHALL BE IN COMPLIANCE WITH THE LATEST NYSDEC REGULATIONS. THIS INCLUDES, BUT LIMITED TO:
   1. NO FERTILIZER SHALL BE APPLIED BETWEEN DEC. 1 AND APRIL 1 IN ANY YEAR.
   2. SHALL NOT BE APPLIED WITHIN 20 FEET OF A WATER BODY.
   3. ONLY LAWN FERTILIZER WITH LESS THAN 0.67% BY WEIGHT PHOSPHATE CONTENT MAY BE APPLIED.

   (A SOIL TEST PRIOR TO FERTILIZER APPLICATION IS RECOMMENDED.)
5. IF SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY OR PERMANENT SEEDING, EXPOSED AREA TO BE STABILIZED WITH MULCH AS INDICATED IN NOTE 6.
6. MULCH TO CONSIST OF SMALL GRAIN STRAW OR SALT HAY ANCHORED WITH A WOOD AND FIBER MULCH BINDER OR AN APPROVED EQUAL. MULCH WILL BE SPREAD AT RATES PER NYSDEC STANDARDS AND ANCHORED WITH A MULCH ANCHORING TOOL OR LIQUID MULCH BINDER, AND SHALL BE PROVIDED ON ALL SEEDINGS. HYDROMULCH SHALL ONLY BE USED DURING OPTIMUM GROWING SEASONS.
7. AS NEEDED, WORK LIME AND FERTILIZER INTO SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW, OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
8. REMOVE FROM THE SURFACE ALL STONES TWO INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, PIECES OF CONCRETE, CLODS, LUMPS, OR OTHER UNSUITABLE MATERIAL.
9. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED, THE AREA MUST BE RETILLED AND FIRMED AS ABOVE.

LANDSCAPE LEGEND



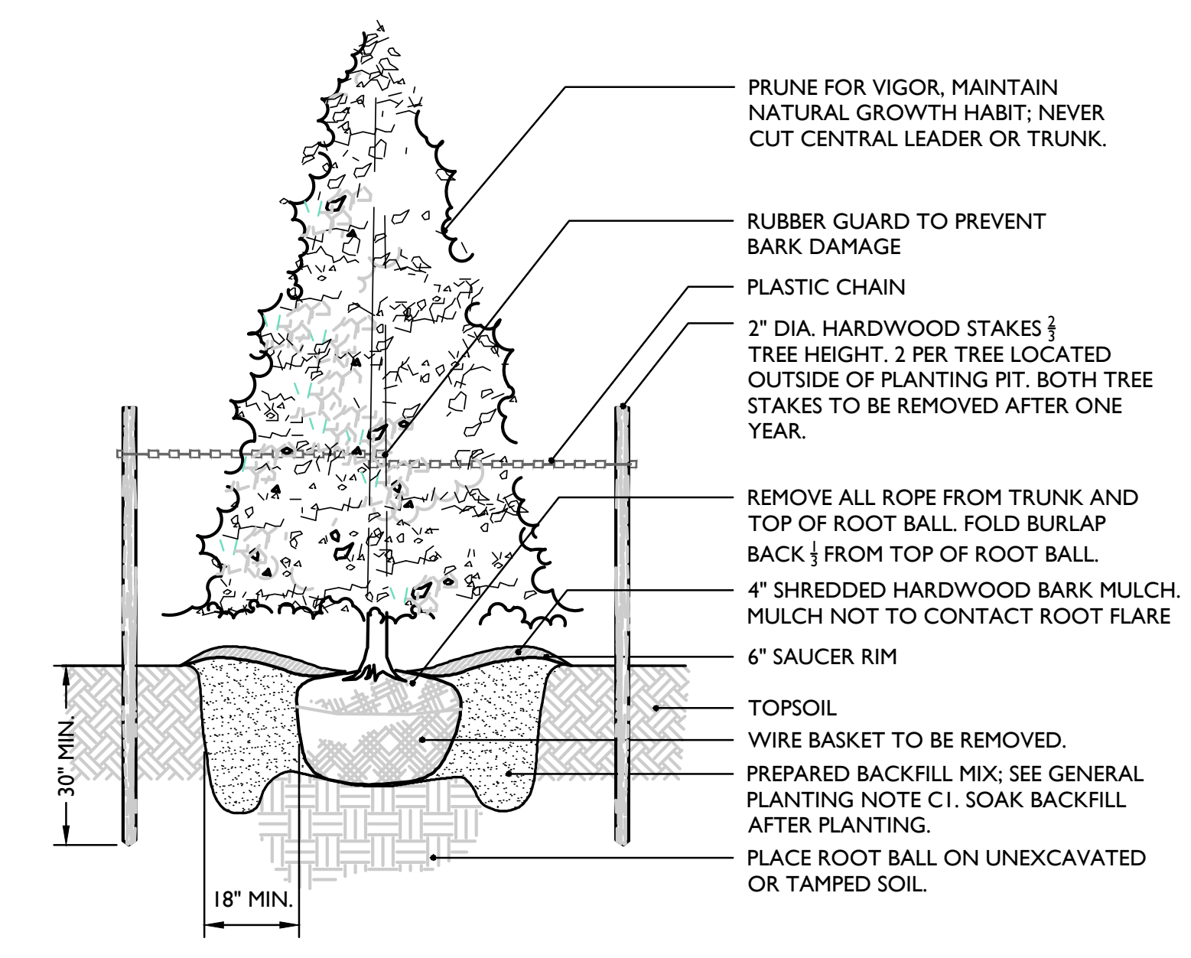
PLANT DETAIL NOTES

1. NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT. MULCH SHALL NOT TOUCH THE TREE TRUNK.
2. PLANTING DEPTH SHALL BE THE SAME OR HIGHER AS GROWN IN NURSERY.
3. WIRE BASKETS AND NON-JUTE BURLAP MUST BE ENTIRELY REMOVED FROM THE ROOT BALL. JUTE BURLAP MUST BE REMOVED FROM THE TOP 1/3 OF THE ROOT BALL.
4. DEPTH OF PLANT PIT SHALL BE INCREASED BY 12" WHEREVER POOR SOIL CONDITIONS OCCUR, WITH THE ADDITION OF LOOSE AGGREGATE.
5. CONTRACTOR SHALL PARTIALLY FILL WITH WATER A REPRESENTATIVE NUMBER OF PITS IN EACH AREA OF THE PROJECT PRIOR TO PLANTING TO DETERMINE IF THERE IS ADEQUATE PERCOLATION. IF PIT DOESN'T PERCOLATE, MEASURES MUST BE TAKEN TO ASSURE PROPER DRAINAGE BEFORE PLANTING.
6. PLANTING MUST BE GUARANTEED FOR TWO FULL GROWING SEASONS FROM THE TIME OF FINAL ACCEPTANCE BY THE LANDSCAPE CONSULTANT. CONTRACTOR SHALL REMOVE ALL WRAPPING AT THE END OF GUARANTEE PERIOD OR SOONER PER PROJECT LANDSCAPE ARCHITECT.
7. BACKFILL MIXTURE TO BE SPECIFIED BASED UPON SOIL TEST AND CULTURAL REQUIREMENTS OF PLANT.
8. PRUNE DAMAGED AND CONFLICTING BRANCHES MAINTAINING NORMAL TREE SHAPE, NEVER CUT CENTRAL TRUNK OR LEADER.

GENERAL PLANTING NOTES:

1. THIS PLAN SHALL BE USED FOR LANDSCAPE PLANTING PURPOSES ONLY. EXAMINE ALL ENGINEERING DRAWINGS AND FIELD CONDITIONS FOR SPECIFIC LOCATIONS OF UTILITIES AND STRUCTURES AND NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES OR LOCATION CONFLICTS PRIOR TO PLANTING INSTALLATION.
2. THE CONTRACTOR IS RESPONSIBLE TO LOCATE AND VERIFY LOCATION OF ALL UTILITIES ON SITE PRIOR TO CONSTRUCTION.
3. ALL PLANT MATERIAL SHALL CONFORM TO GUIDELINES AS SET FORTH IN THE LATEST EDITION OF THE AMERICAN ASSOCIATION OF NURSERYMEN'S STANDARD FOR NURSERY STOCK OR THE PLANT MATERIAL WILL BE UNACCEPTABLE. ALL PLANT MATERIAL SHALL BE TRUE TO SPECIES, VARIETY, SIZE AND BE CERTIFIED DISEASE AND INSECT FREE. THE OWNER AND/OR THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO APPROVE ALL PLANT MATERIAL ON SITE PRIOR TO INSTALLATION.
4. NO PLANT SUBSTITUTIONS SHALL BE PERMITTED WITH REGARD TO SIZE, SPECIES, OR VARIETY WITHOUT WRITTEN PERMISSION OF THE LANDSCAPE CONSULTANT. WRITTEN PROOF OF PLANT MATERIAL UNAVAILABILITY MUST BE DOCUMENTED.
5. THE LOCATION OF ALL PLANT MATERIAL INDICATED ON THE LANDSCAPE PLANS ARE APPROXIMATE. THE FINAL LOCATION OF ALL PLANT MATERIAL AND PLANTING BED LINES SHALL BE DETERMINED IN THE FIELD UNDER THE DIRECTION OF THE LANDSCAPE ARCHITECT.
6. ALL STREET TREES AND SHADE TREES PLANTED NEAR PEDESTRIAN OR VEHICULAR ACCESS SHOULD NOT BE BRANCHED LOWER THAN 7'-0" ABOVE GRADE. ALL PLANT MATERIAL LOCATED WITHIN SIGHT TRIANGLE EASEMENTS SHALL NOT EXCEED A MATURE HEIGHT OF 30" ABOVE THE ELEVATION OF THE ADJACENT CURB. ALL STREET TREES PLANTED IN SIGHT TRIANGLE EASEMENTS SHALL BE PRUNED TO NOT HAVE BRANCHES BELOW 10'-0".
7. THE PLANTING PLAN SHALL TAKE PRECEDENCE OVER THE PLANT SCHEDULE SHOULD ANY PLANT QUANTITY DISCREPANCIES OCCUR.
8. ALL PLANT MATERIAL SHALL BE PROPERLY INSTALLED IN CONFORMANCE WITH THE TYPICAL PLANTING DETAILS. INSTALL ALL PLANT MATERIAL ON UNDISTURBED GRADE. CUT AND REMOVE JUTE BURLAP FROM TOP ONE-THIRD OF THE ROOT BALL. WIRE BASKETS AND NOT JUTE BURLAP SHALL BE COMPLETELY REMOVED PRIOR TO BACKFILLING THE PLANT PIT.
9. BRANCHES OF DECIDUOUS TREES SHALL BE PRUNED BACK BY NO MORE THAN ONE QUARTER (1/4) TO BALANCE THE TOP GROWTH WITH ROOTS AND TO PRESERVE THEIR CHARACTER AND SHAPE. THE CENTRAL LEADER OF TREE SHALL NOT BE PRUNED.
10. PROVIDE PLANTING PITS AS INDICATED ON PLANTING DETAILS. BACKFILL PLANTING PITS WITH ONE PART EACH OF TOPSOIL, PEAT MOSS AND PARENT MATERIAL. IF WET SOIL CONDITIONS EXIST THEN PLANTING PITS SHALL BE EXCAVATED AN ADDITIONAL 12" AND FILLED WITH CRUSHED STONE OR UNTIL FREE DRAINING.
11. ALL PLANT MATERIAL SHALL BEAR THE SAME RELATION TO FINISHED GRADE AS IT BORE TO EXISTING GRADE AT NURSERY.
12. OPTIMUM PLANTING TIME:
    DECIDUOUS - APRIL 1 TO JUNE 1 & OCTOBER 15 TO NOVEMBER 30.
    CONIFEROUS - APRIL 1 TO JUNE 1 & SEPTEMBER 1 TO NOVEMBER 1.

    PLANTING OUTSIDE OF THE OPTIMUM DATES SHALL NOT BE CONDUCTED WITH OUT PRIOR APPROVAL FROM THE LANDSCAPE CONSULTANT.
13. NEWLY INSTALLED PLANT MATERIAL SHALL BE WATERED AT THE TIME OF INSTALLATION. REGULAR WATERING SHALL BE PROVIDED TO ENSURE THE ESTABLISHMENT, GROWTH AND SURVIVAL OF ALL PLANTS. WATERING AMOUNTS SHOULD BE ADJUSTED AS RAIN EVENTS OCCUR. WATERING AFTER THE INITIAL 4 WEEKS SHALL BE ADJUSTED BASED ON SEASONAL CONDITIONS. WATERING SHALL NOT TAKE PLACE DURING THE HOTTEST POINT OF THE DAY.
14. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR TWO YEARS AFTER THE DATE OF FINAL ACCEPTANCE. ANY PLANT MATERIAL THAT DIES WITHIN THAT TIME PERIOD SHALL BE REMOVED, INCLUDING THE STUMP, AND REPLACED BY A TREE OF SIMILAR SIZE AND SPECIES AT NO EXPENSE TO THE OWNER.
15. THE LANDSCAPE CONTRACTOR SHALL PROVIDE A MINIMUM 4" LAYER OF TOPSOIL IN ALL LAWN AREAS AND A MINIMUM OF 12" OF TOPSOIL IN ALL PLANTING AREAS. A FULL SOIL ANALYSIS SHALL BE CONDUCTED AFTER CONSTRUCTION AND PRIOR TO PLANTING TO DETERMINE THE EXTENT OF SOIL AMENDMENT REQUIRED. SOIL PH SHOULD BE 5.5-6.5.
16. ALL DISTURBED LAWN AREAS SHALL BE STABILIZED WITH SEED AS INDICATED ON THE LANDSCAPE PLANS. TEMPORARY SEEDING SHALL BE IN ACCORDANCE WITH THE GENERAL SEEDING NOTES ON THIS SHEET. ALL DISTURBED LAWN AREAS SHALL BE TOPSOILED, LIMED, FERTILIZED AND FINE GRADED PRIOR TO LAWN INSTALLATION.
17. ALL PLANTING BEDS SHALL RECEIVE 3" OF SHREDDED HARDWOOD BARK MULCH.
18. ALL SHRUB MASSES SHALL BE PLANTED IN CONTINUOUS MULCHED BEDS.
19. ALL PLANTING DEBRIS (WIRE, TWINE, RUBBER HOSE, BACKFILL ETC.) SHALL BE REMOVED FROM THE SITE AFTER PLANTING IS COMPLETE. PROPERTY IS TO BE LEFT IN A NEAT ORDERLY CONDITION IN ACCORDANCE WITH ACCEPTED PLANTING PRACTICES.

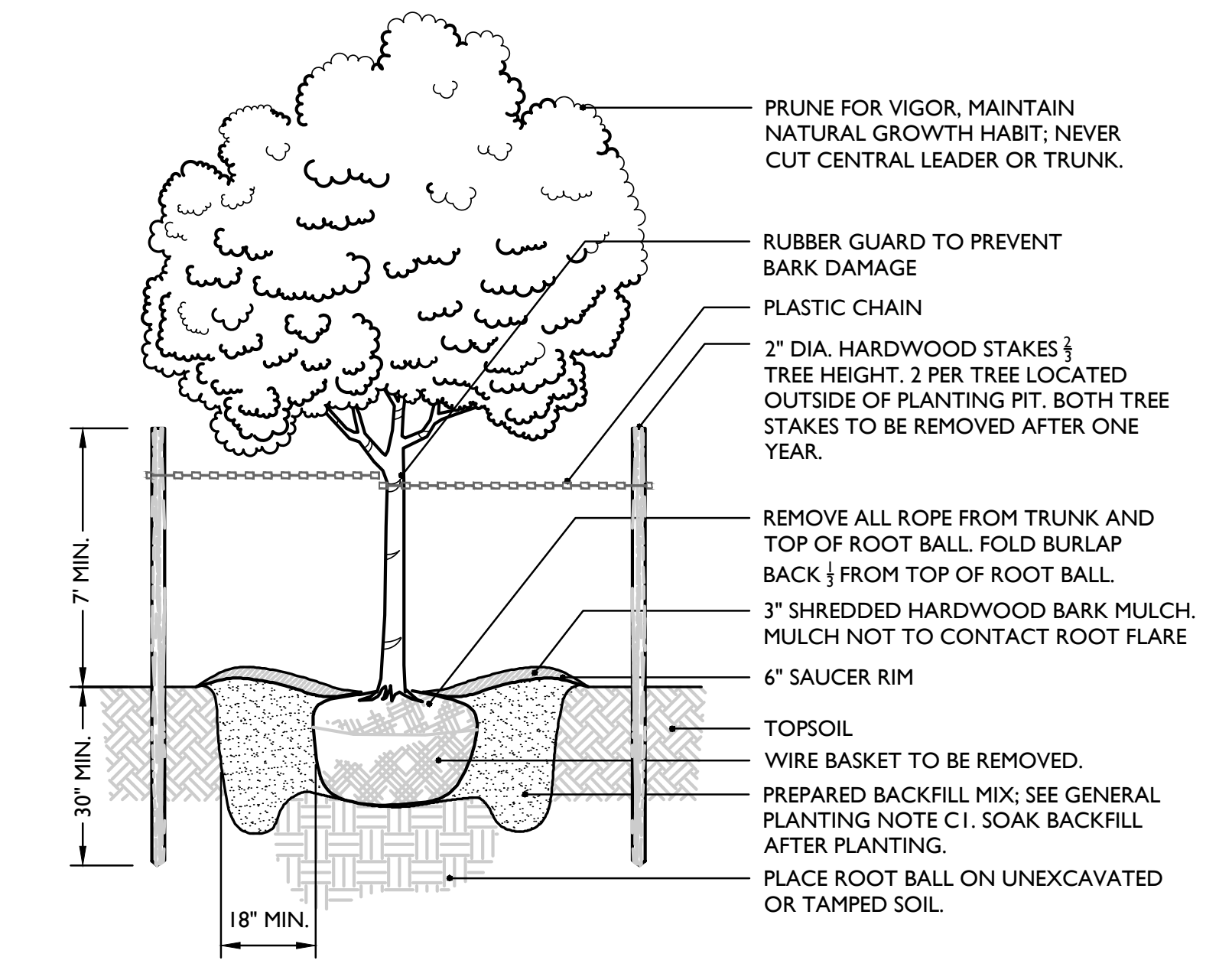


NOTES:

1. NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2. PLANTING DEPTH SHALL BE THE SAME OR HIGHER AS GROWN IN NURSERY.

EVERGREEN TREE PLANTING DETAIL

07/01/19

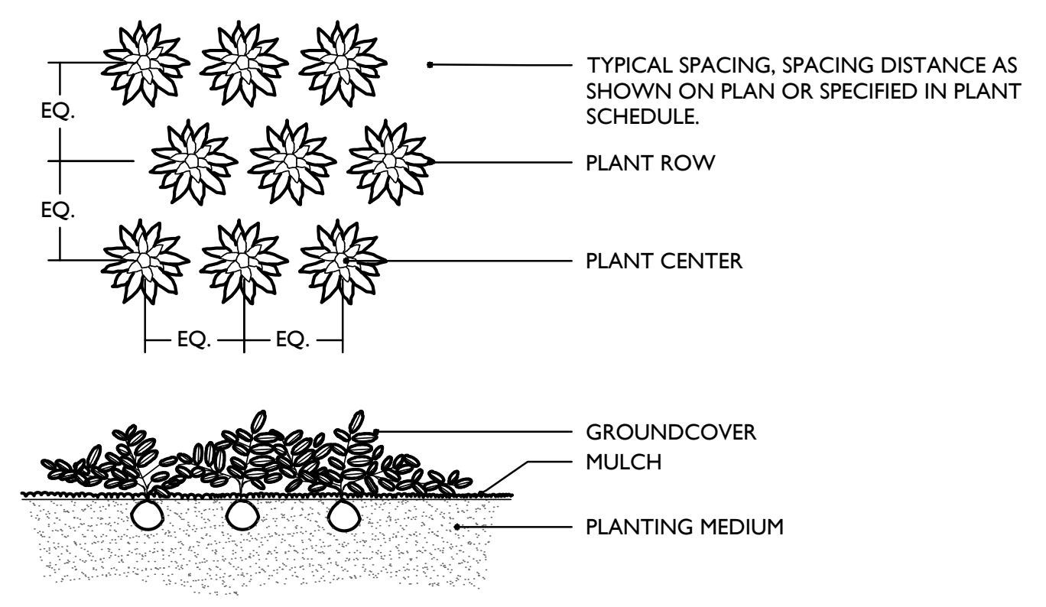


NOTES:

1. NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2. PLANTING DEPTH SHALL BE THE SAME OR HIGHER AS GROWN IN NURSERY.

TREE PLANTING DETAIL

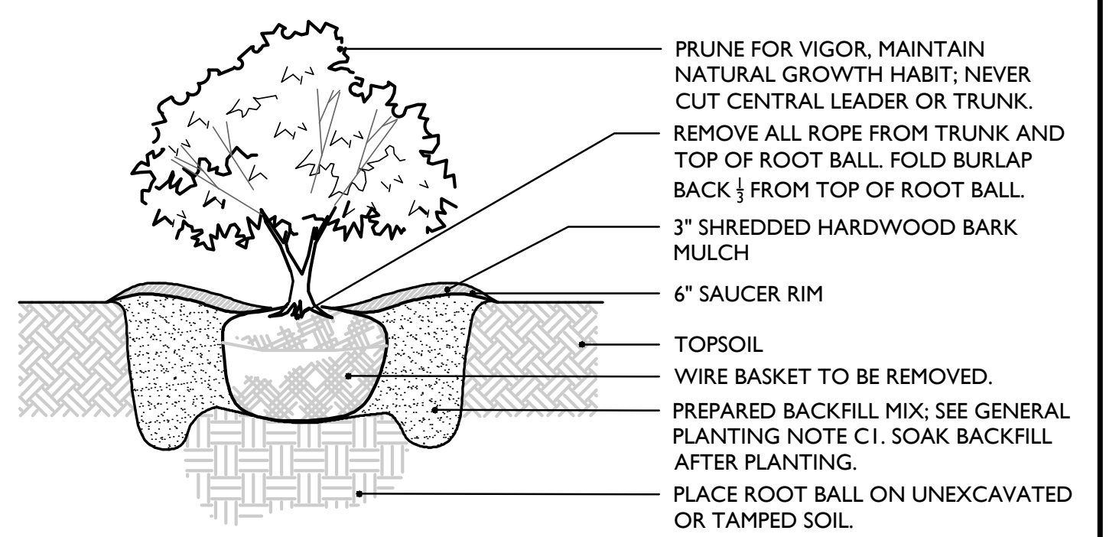
07/01/19



NOTES:

1. PLANTING DEPTH SHALL BE THE SAME OR HIGHER AS GROWN IN NURSERY.

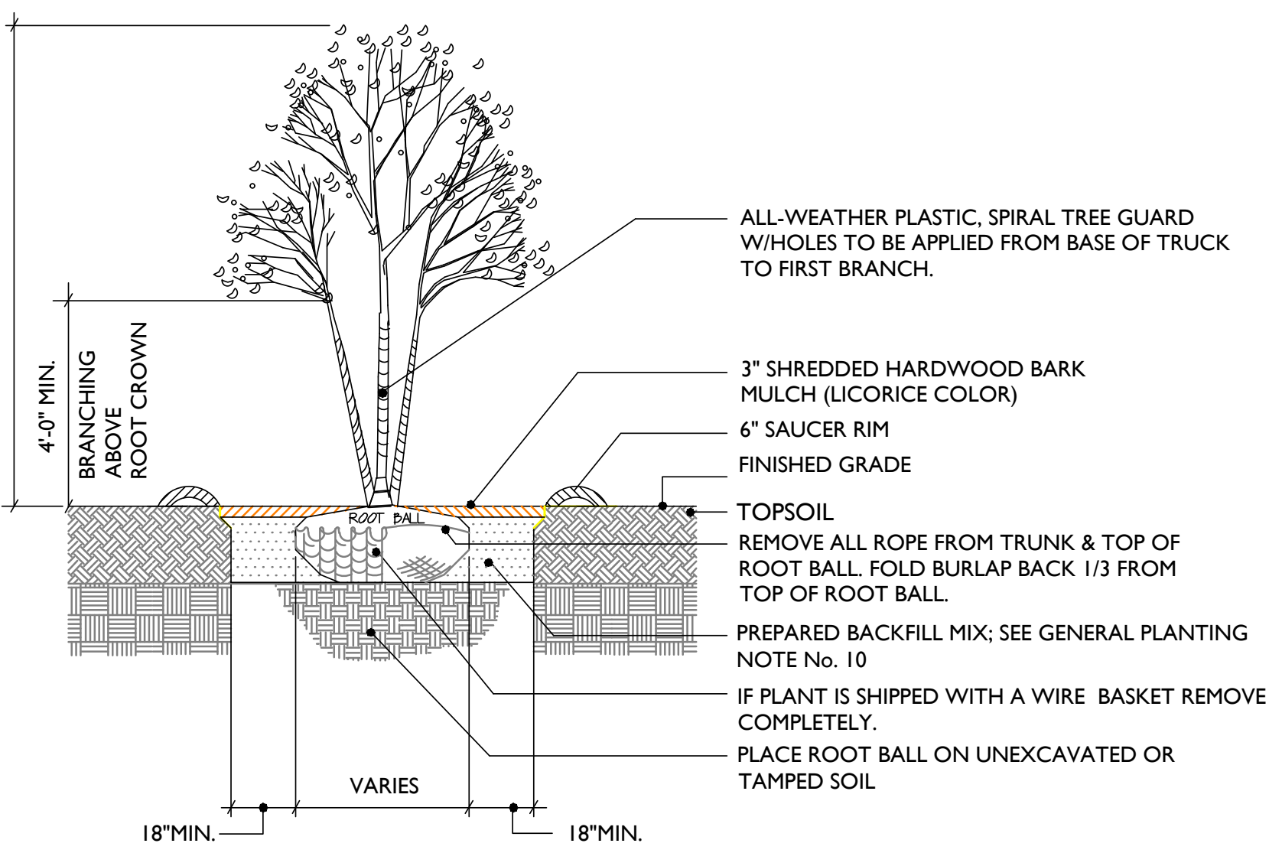
PERENNIAL PLANTING DETAIL



NOTES:

1. NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2. PLANTING DEPTH SHALL BE THE SAME OR HIGHER AS GROWN IN NURSERY.

SHRUB PLANTING DETAIL



MULTI-STEM TREE PLANTING DETAIL

07/01/19

TOWN OF WAWAYANDA
PLANNING BOARD

40 0 40 80
SCALE : 1" = 40'

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

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Justin Eric Dates
NEW YORK REGISTERED LANDSCAPE ARCHITECT
LICENSE NUMBER: 001964-01
COLLIERS ENGINEERING & DESIGN CT, P.C.

SITE PLANS
FOR
MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers Engineering & Design
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Suite 101
New Windsor, NY 12553
Phone: 845.564.4495
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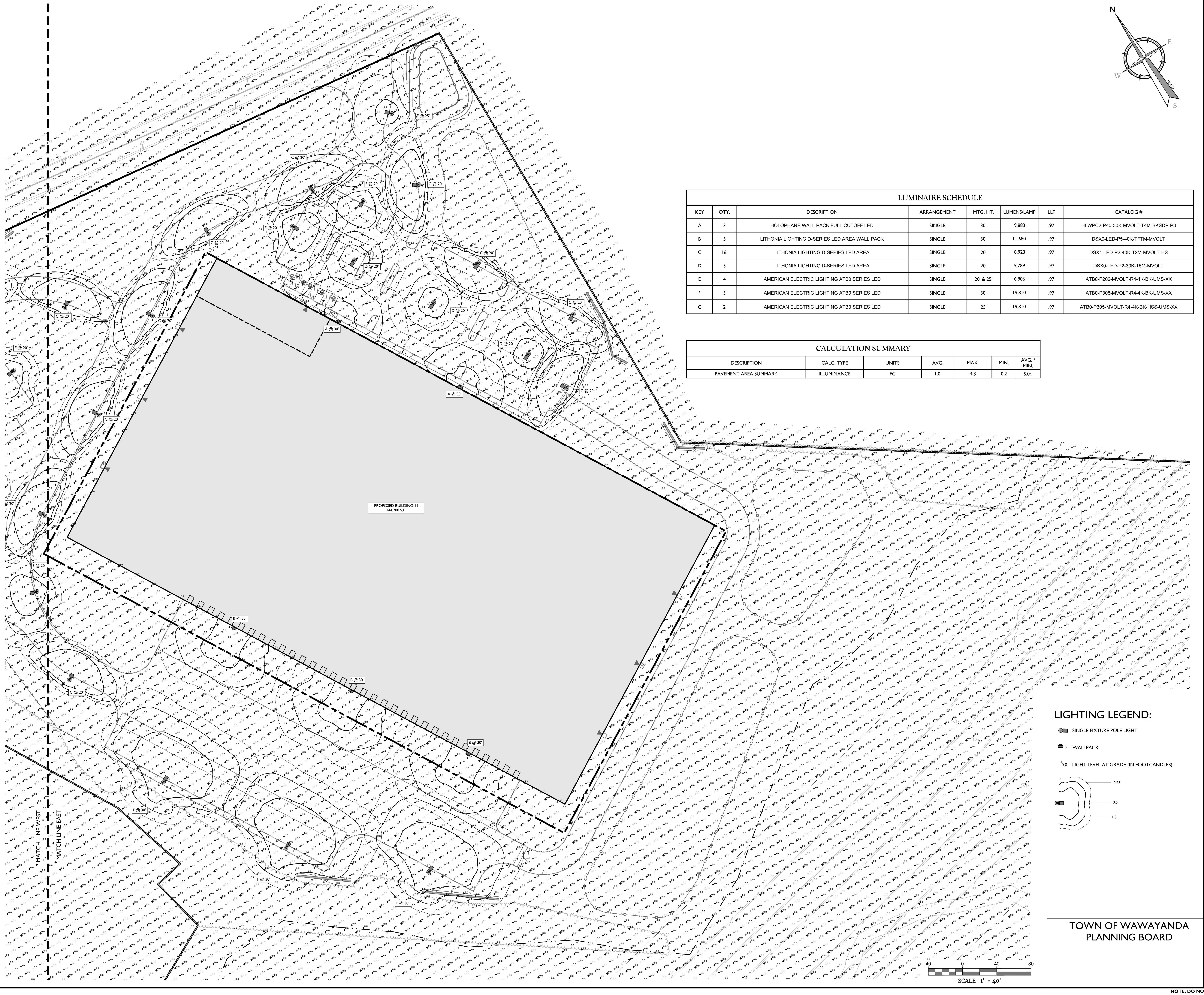
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-LAND

SHEET TITLE:
LANDSCAPE PLAN
WEST

SHEET NUMBER:
13 of 20



LUMINAIRE SCHEDULE

KEY	QTY.	DESCRIPTION	ARRANGEMENT	MTG. HT.	LUMENS/LAMP	LLF	CATALOG #
A	3	HOLOPHANE WALL PACK FULL CUTOFF LED	SINGLE	30'	9,883	.97	HLWPC2-P40-30K-MVOLT-T4M-BKSDP-P3
B	5	LITHONIA LIGHTING D-SERIES LED AREA WALL PACK	SINGLE	30'	11,680	.97	DSX0-LED-P5-40K-TFTM-MVOLT
C	16	LITHONIA LIGHTING D-SERIES LED AREA	SINGLE	20'	8,923	.97	DSX1-LED-P2-40K-T2M-MVOLT-HS
D	5	LITHONIA LIGHTING D-SERIES LED AREA	SINGLE	20'	5,789	.97	DSX0-LED-P2-30K-T5M-MVOLT
E	4	AMERICAN ELECTRIC LIGHTING ATB0 SERIES LED	SINGLE	20' & 25'	6,906	.97	ATB0-P202-MVOLT-R4-4K-BK-UMS-XX
F	3	AMERICAN ELECTRIC LIGHTING ATB0 SERIES LED	SINGLE	30'	19,810	.97	ATB0-P305-MVOLT-R4-4K-BK-UMS-XX
G	2	AMERICAN ELECTRIC LIGHTING ATB0 SERIES LED	SINGLE	25'	19,810	.97	ATB0-P305-MVOLT-R4-4K-BK-HSS-UMS-XX

CALCULATION SUMMARY

DESCRIPTION	CALC. TYPE	UNITS	AVG.	MAX.	MIN.	AVG. / MIN.
PAVEMENT AREA SUMMARY	ILLUMINANCE	FC	1.0	4.3	0.2	5.0:1

LIGHTING LEGEND:

⊏●	SINGLE FIXTURE POLE LIGHT
⌓	WALLPACK
+0.0	LIGHT LEVEL AT GRADE (IN FOOTCANDLES)

0.25
0.5
1.0

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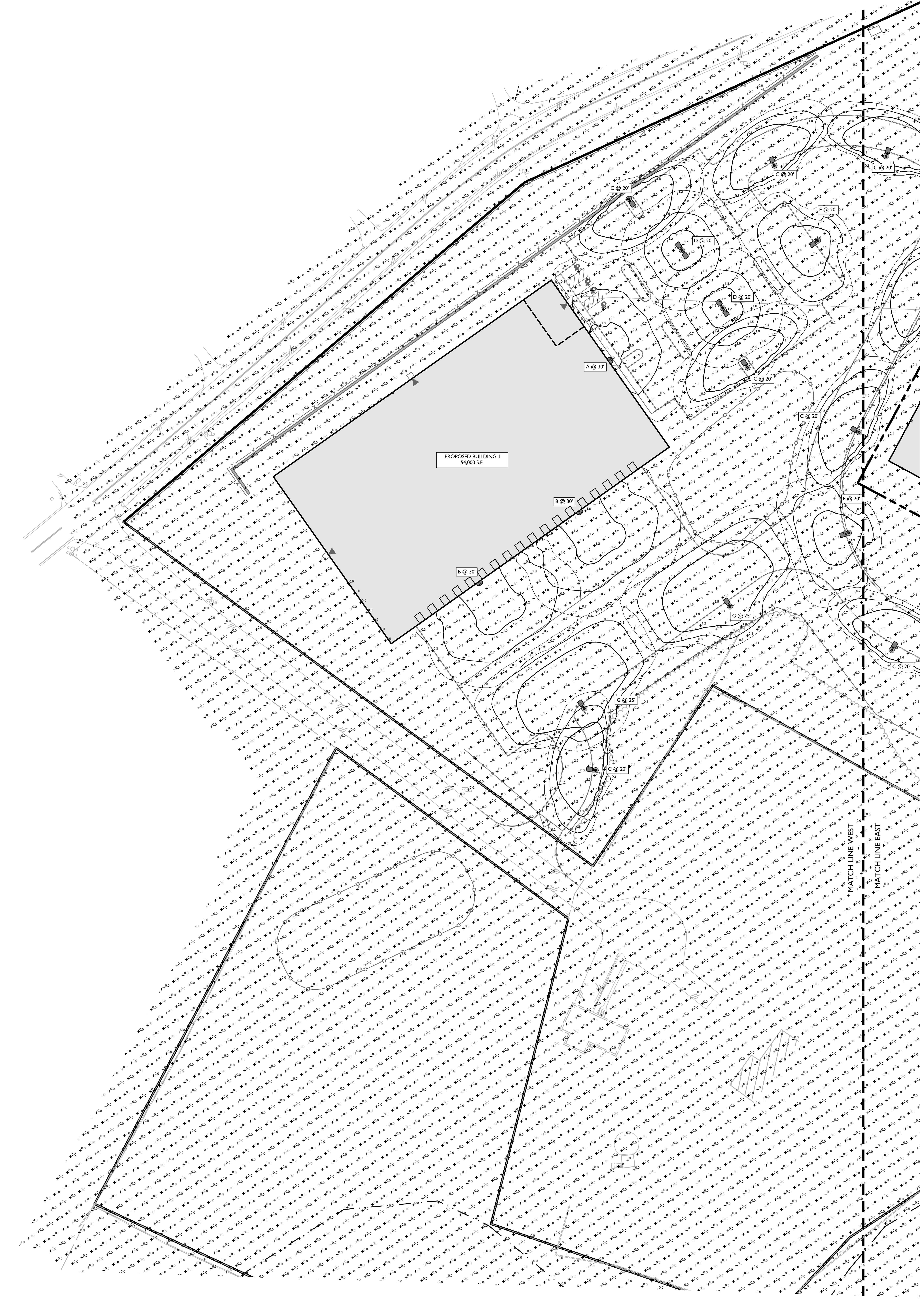
AS SHOWN	2/4/2022	MAS	CPM

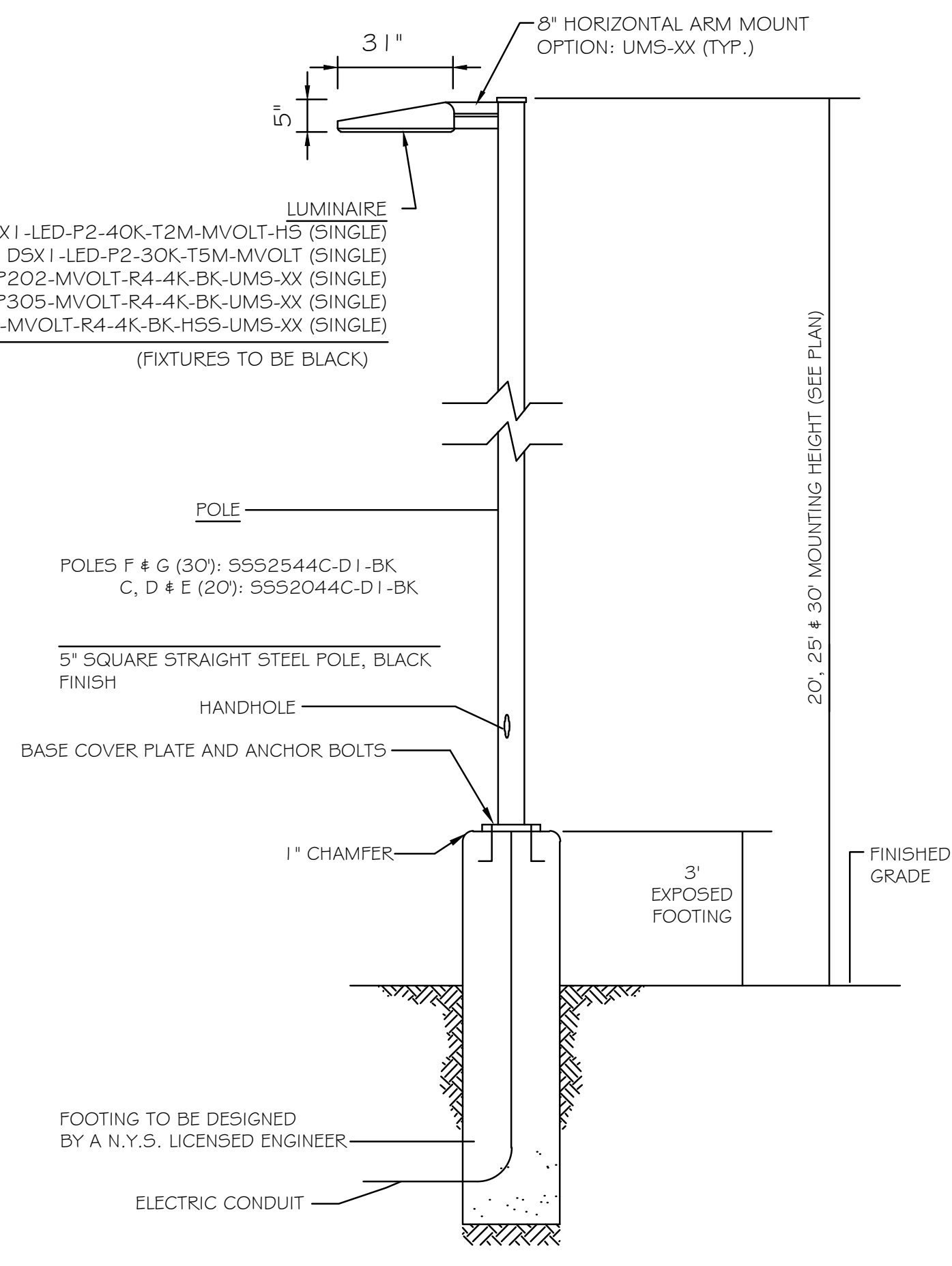
PROJECT NUMBER: 21004268A
DRAWING NAME: C-LGHT

SHEET TITLE:
LIGHTING PLAN
EAST

SHEET NUMBER:
12 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.





LUMINAIRE
MODEL: FIXTURE (C) - DSX1-LED-P2-40K-T2M-MVOLT-HS (SINGLE)
FIXTURE (D) - DSX1-LED-P2-30K-T5M-MVOLT (SINGLE)
FIXTURE (E) - ATB0-P202-MVOLT-R4-4K-BK-UMS-XX (SINGLE)
FIXTURE (F) - ATB0-P305-MVOLT-R4-4K-BK-UMS-XX (SINGLE)
FIXTURE (G) - ATB0-P305-MVOLT-R4-4K-BK-HSS-UMS-XX (SINGLE)
(FIXTURES TO BE BLACK)

POLES F & G (30'): SSS2544C-D1-BK
C, D & E (20'): SSS2044C-D1-BK

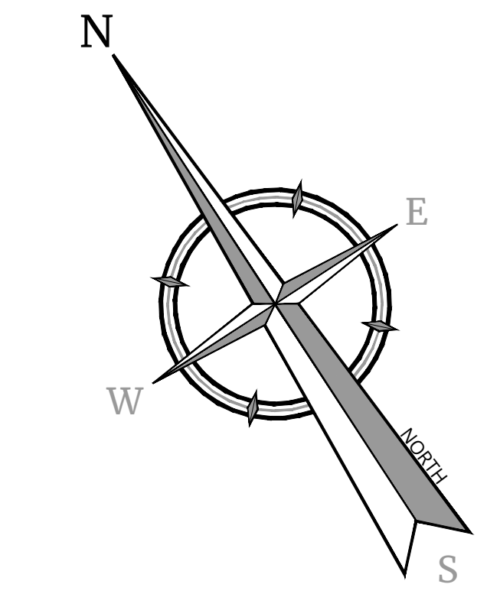
5" SQUARE STRAIGHT STEEL POLE, BLACK FINISH

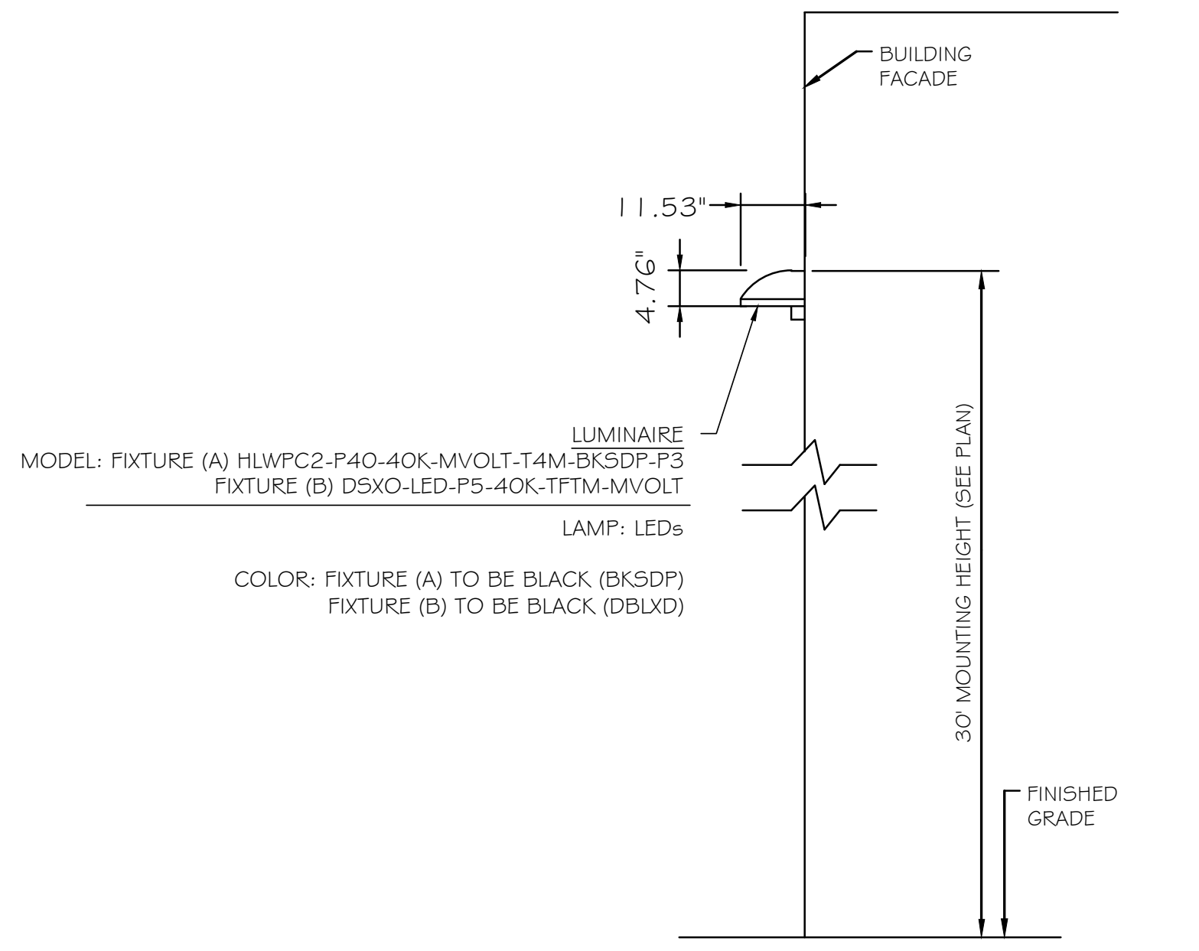
POLE MOUNTED FIXTURE DETAIL

NOT TO SCALE

NOTES:

1. LUMINAIRES TO BE MANUFACTURED BY AMERICAN ELECTRIC LIGHTING / LITHONIA LIGHTING AND POLES BY HOLOPHANE (MANUFACTURER TO CONFIRM POLE SIZE) OR APPROVED EQUAL.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF LIGHT FIXTURES FOR REVIEW AND APPROVAL BY THE OWNER OR PROJECT LANDSCAPE ARCHITECT.
3. FOOTING TO BE DESIGNED, SIGNED, AND SEALED BY A N.Y.S. LICENSED ENGINEER.
4. *VOLTAGE TO BE CONFIRMED BY ELECTRICIAN CONTRACTOR.
5. PROPOSED POLES HEIGHT TO BE MODIFIED IN FIELD TO MEET DESIGN.





LUMINAIRE
MODEL: FIXTURE (A) HLWPC2-P40-40K-MVOLT-T4M-BKSDP-P3
FIXTURE (B) DSXO-LED-P5-40K-TFTM-MVOLT
LAMP: LEDs

COLOR: FIXTURE (A) TO BE BLACK (BKSDP)
FIXTURE (B) TO BE BLACK (DBLXD)

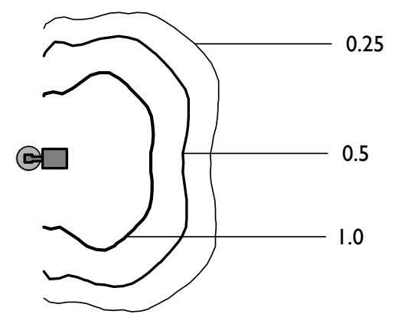
WALL MOUNTED FIXTURE DETAIL

NOTES:

1. LUMINAIRES TO BE MANUFACTURED BY HOLOPHANE LIGHTING / LITHONIA LIGHTING OR APPROVED EQUAL.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF LIGHT FIXTURES FOR REVIEW AND APPROVAL BY THE OWNER OR PROJECT LANDSCAPE ARCHITECT.
3. *VOLTAGE TO BE CONFIRMED BY ELECTRICIAN CONTRACTOR.

LIGHTING LEGEND:

- SINGLE FIXTURE POLE LIGHT
- WALLPACK
- 0.0 LIGHT LEVEL AT GRADE (IN FOOTCANDLES)



LIGHTING NOTES:

1. THIS PLAN IS TO BE USED FOR LIGHTING PURPOSES ONLY.
2. POLES AND FIXTURES AS SUPPLIED BY:
   POLES & WALL FIXTURES - HOLOPHANE
   POLE FIXTURES - AMERICAN ELECTRIC LIGHTING & LITHONIA LIGHTING
3. LAMPS ARE TO BE LEDs. A LIGHT LOSS FACTOR (LLF) WAS USED AS SHOWN IN THE LUMINARIES SCHEDULE.
4. FIXTURES AND POLES ARE TO BE BLACK.
5. POLE MOUNTED FIXTURES SHALL BE PLACED A MINIMUM OF TWO (2) FEET BEHIND CURBS, EDGE OF PAVEMENT OR RETAINING WALLS IN CAR PARKING AREAS.
6. PROPOSED LIGHT FIXTURE LOCATIONS ARE CRITICAL TO PROVIDE THE LIGHTING LEVELS DEPICTED ON THIS PLAN. THE LIGHTING CONTRACTOR SHALL FIELD VERIFY FIXTURE LOCATIONS PRIOR TO INSTALLATION. IF ADJUSTMENT TO ANY LIGHT FIXTURE LOCATION IS REQUIRED DUE TO FINAL CONSTRUCTION OF UTILITIES AND SITE IMPROVEMENTS, THE LIGHTING CONTRACTOR SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT OF ANY DISCREPANCIES PRIOR TO INSTALLATION.
7. LIGHTING SHOWN ON PLAN DEPICTS AVERAGE MAINTAINED FOOTCANDLE LEVELS AT GRADE.
8. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF LIGHT FIXTURES FOR REVIEW AND APPROVAL BY THE OWNER OR PROJECT LANDSCAPE ARCHITECT.
9. ELECTRICAL PLANS FOR WIRING LAYOUT BY OTHERS.
10. POLE BASE INSTALLATION SHALL INCLUDE A SUPPLEMENTARY GROUND ROD AND WIRE LEAD TO BASE FOR POWER CONNECTION. DETAILS PER PROJECT ELECTRICAL ENGINEER.
11. ALL LIGHTING FIXTURES WILL BE DARK SKY COMPLIANT.

40 0 40 80
SCALE : 1" = 40'

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SITE PLANS

FOR

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LLC

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&
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AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-LGHT

SHEET TITLE:
LIGHTING PLAN
WEST

SHEET NUMBER:
15 of 20

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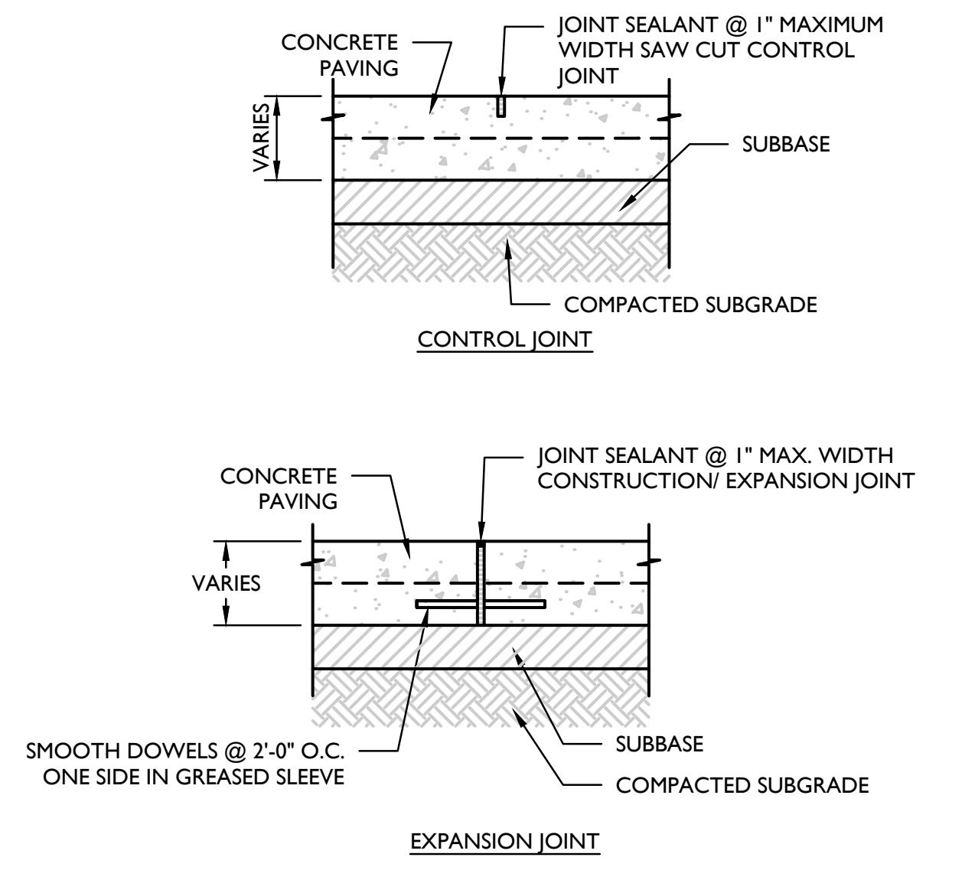
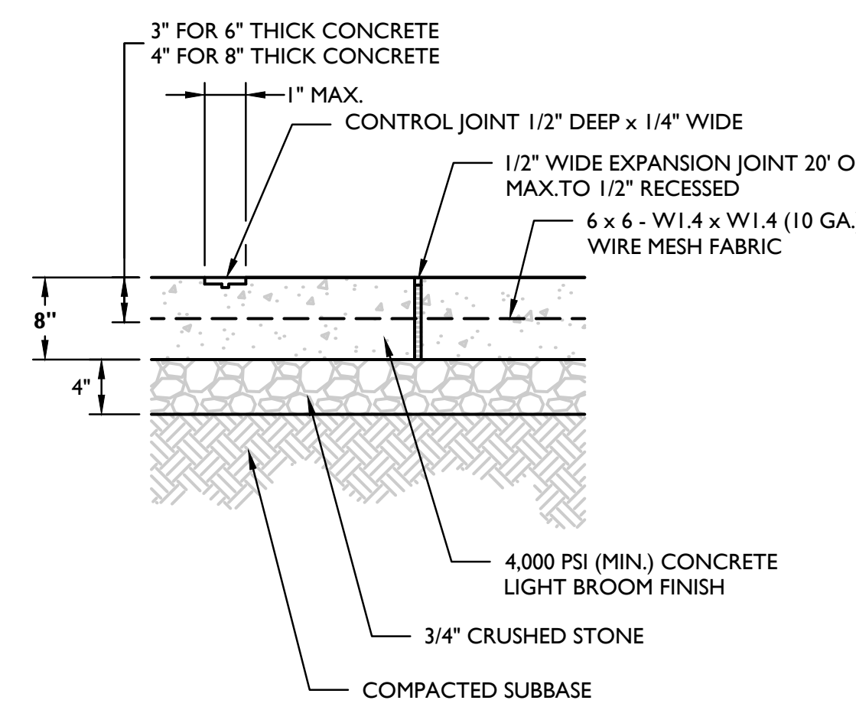


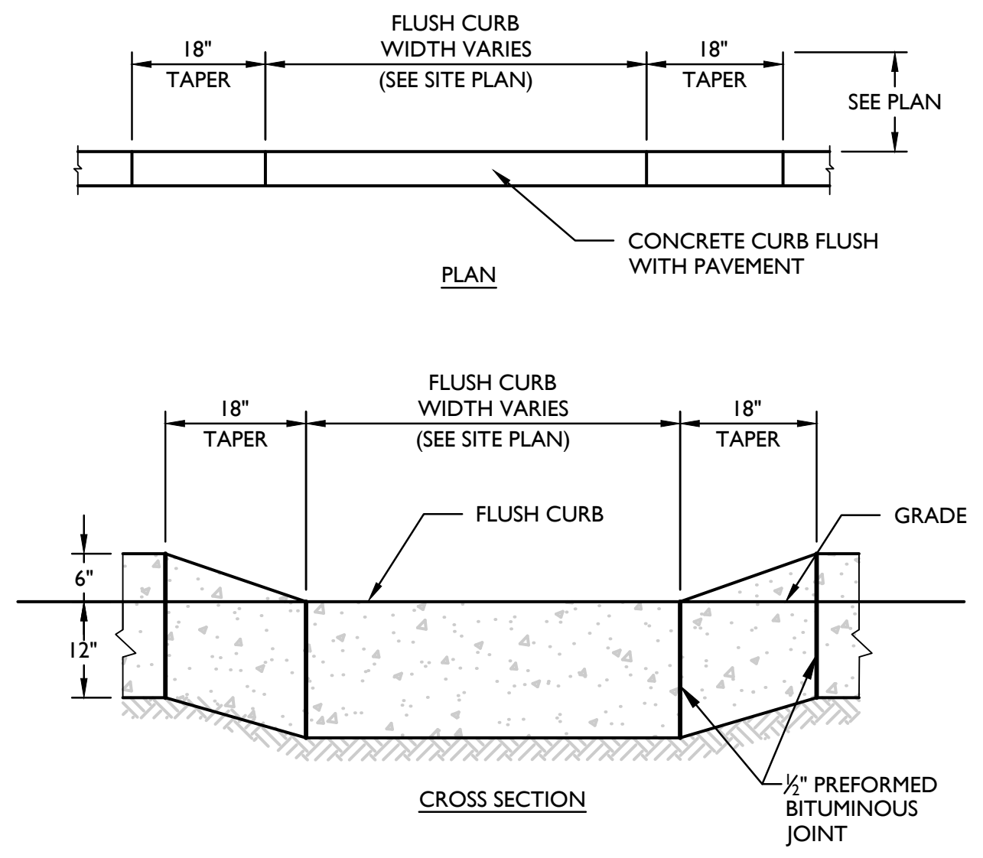
CONCRETE PAVING JOINTS DETAIL

NOT TO SCALE 07/01/19



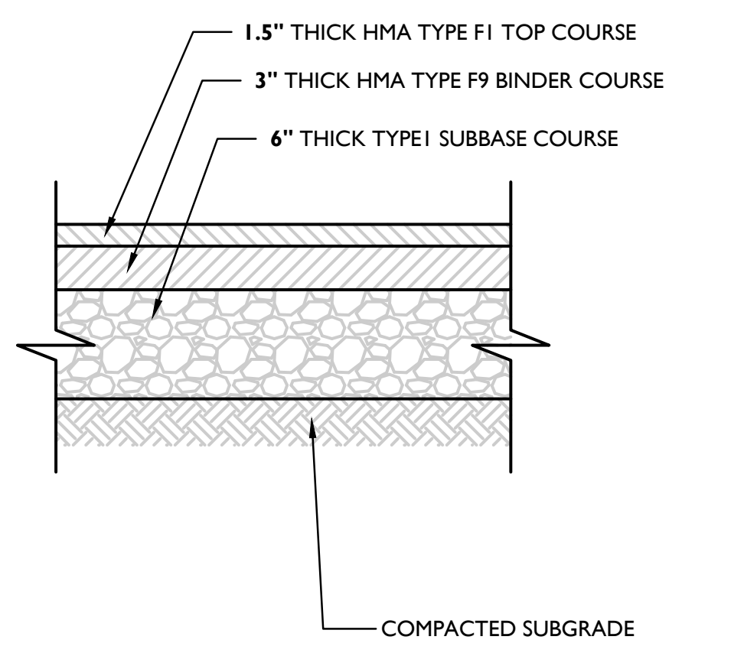
CONCRETE PAVEMENT DETAIL

NOT TO SCALE 07/01/19



CONCRETE FLUSH CURB DETAIL

NOT TO SCALE 07/01/19

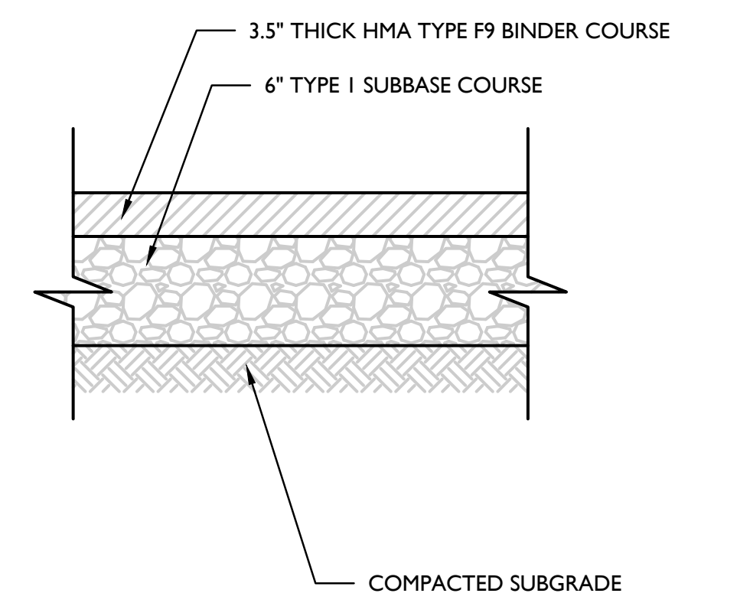


NOTES:

1. PAVEMENT TYPES TO BE IN ACCORDANCE WITH CURRENT NYSDOT STANDARDS AND SPECIFICATIONS.

STANDARD ASPHALT PAVEMENT DETAIL

NOT TO SCALE 07/01/19

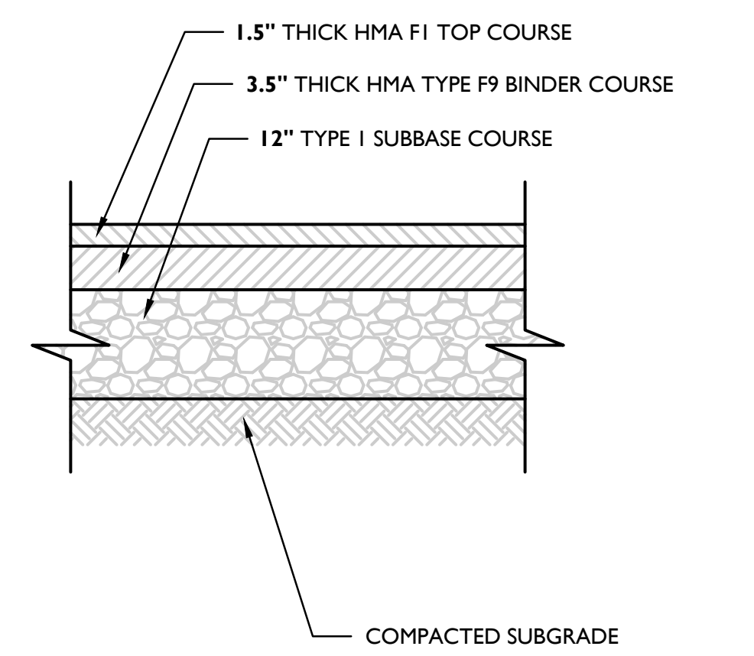


NOTES:

1. PAVEMENT TYPES TO BE IN ACCORDANCE WITH CURRENT NYSDOT STANDARDS AND SPECIFICATIONS.

EMERGENCY ACCESS PAVEMENT DETAIL

NOT TO SCALE

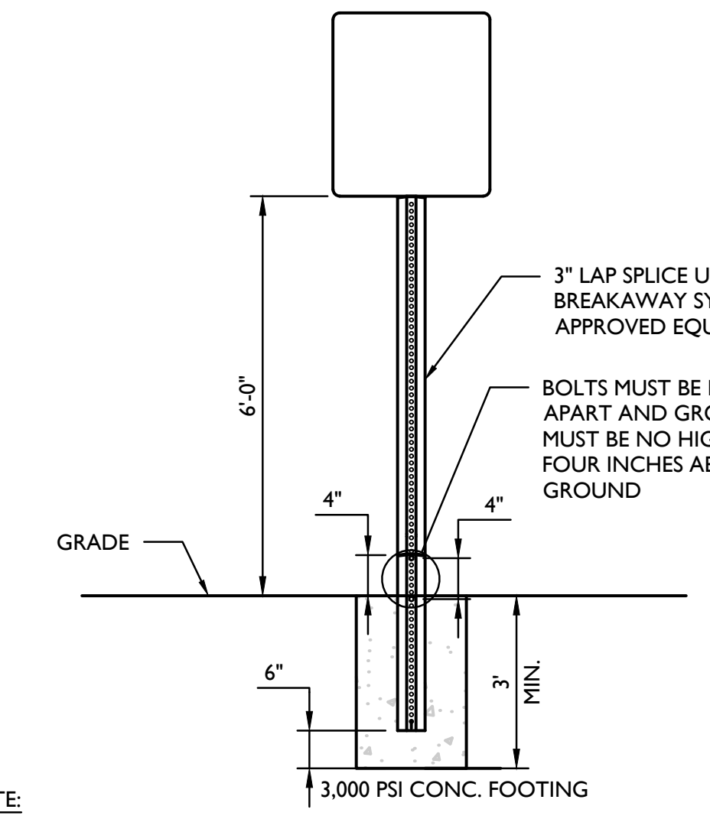


NOTES:

1. PAVEMENT TYPES TO BE IN ACCORDANCE WITH CURRENT NYSDOT STANDARDS AND SPECIFICATIONS.

HEAVY-DUTY ASPHALT PAVEMENT DETAIL

NOT TO SCALE 07/01/19

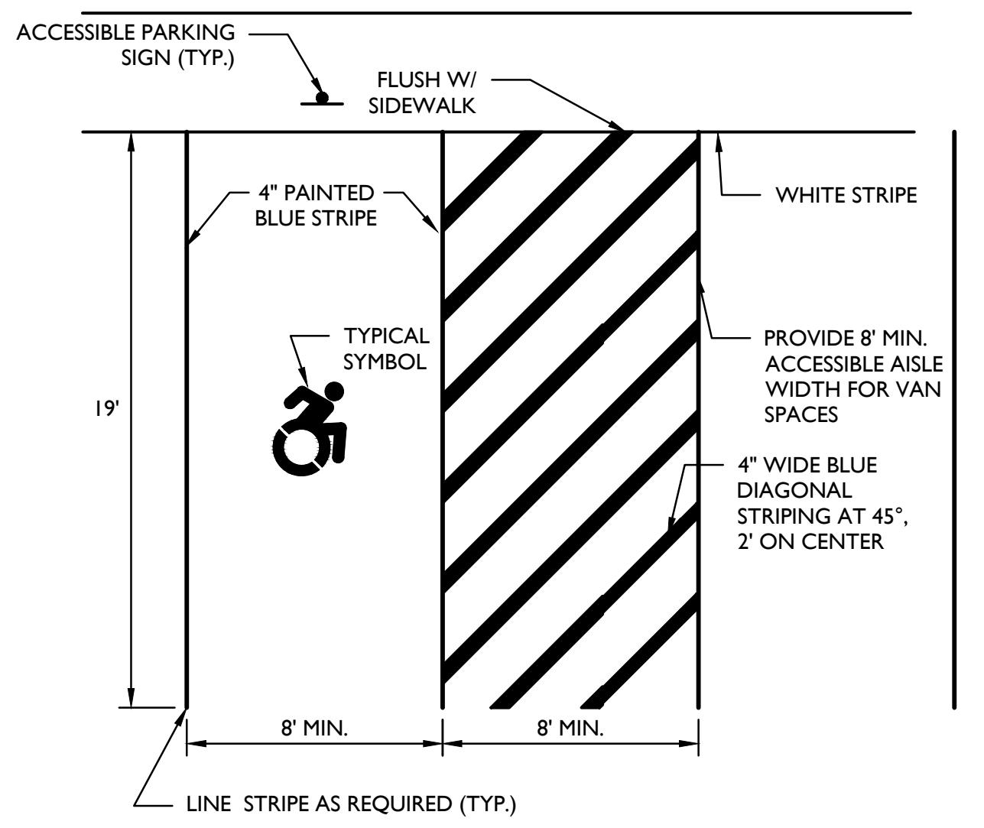


NOTE:

1. ALL SIGNS SHALL CONFORM TO THE CURRENT MANUAL ON "UNIFORM TRAFFIC CONTROL DEVICES" FOR STREETS AND HIGHWAYS AND CURRENT MUNICIPAL SPECIFICATIONS FOR COLOR, DESIGN AND EXACT WORDING.
2. ALL POSTS SHALL BE OF ADEQUATE LENGTH TO MEET THE REQUIREMENTS FOR ERECTION AS STATED IN THE CURRENT MANUAL IN "UNIFORM TRAFFIC CENTRAL DEVICES" FOR STREET & HIGHWAYS.
3. ALL POSTS SHALL BE EMBEDDED 4' MINIMUM.
4. ALL POSTS TO BE BREAKAWAY STEEL U-POSTS IN CONFORMANCE WITH CURRENT NYSDOT STANDARDS.
5. IN AREAS WITHOUT CURBING, THE OUTER EDGE OF SIGN TO BE 2'-0" MINIMUM TO 12'-0" MAXIMUM FROM EDGE OF CURB AS DIRECTED.

BREAKAWAY SIGN POST DETAIL

NOT TO SCALE 07/01/19



ACCESSIBLE PARKING LINE STRIPE STALL DETAIL

MOD: 11/17/20

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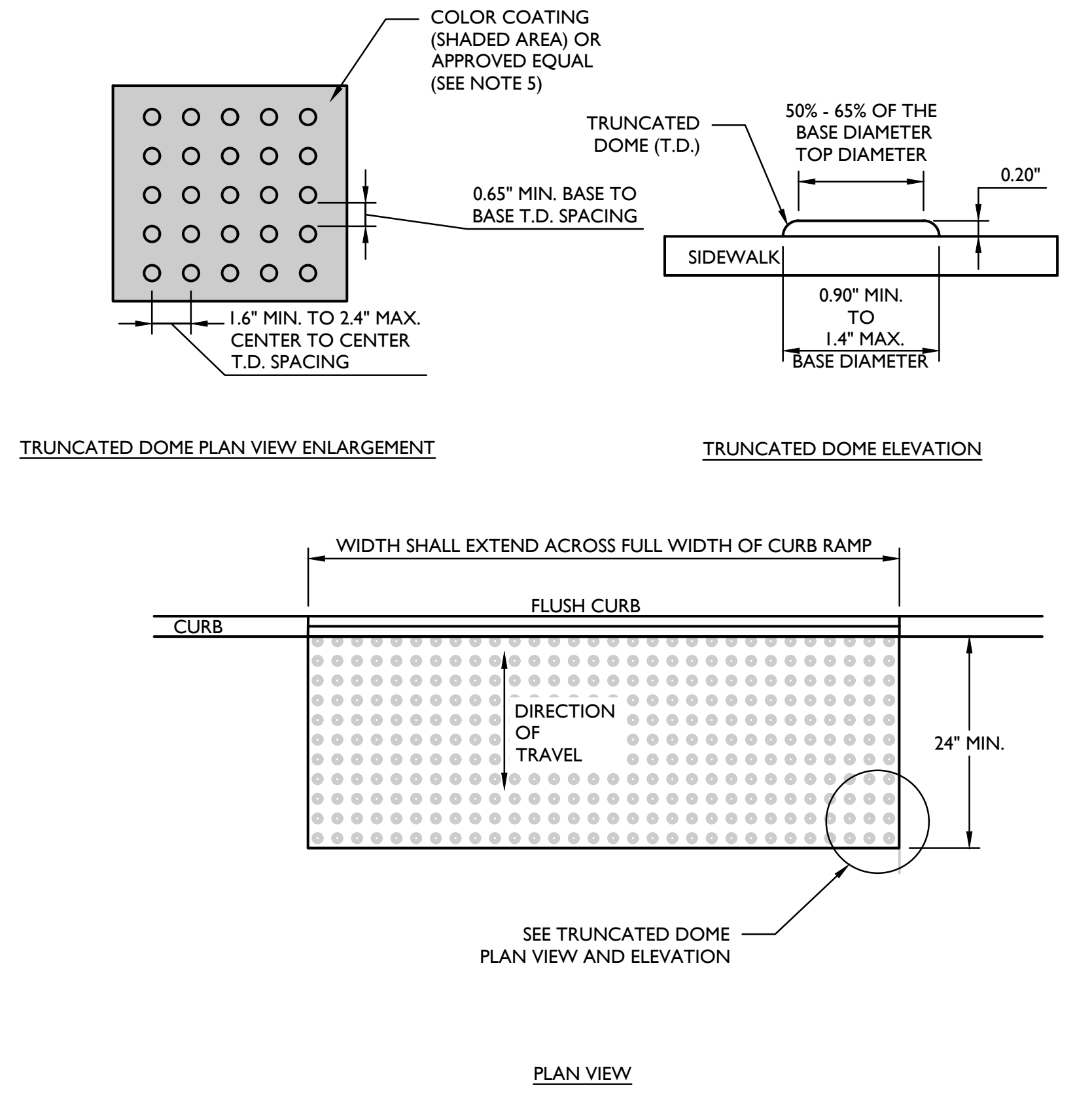
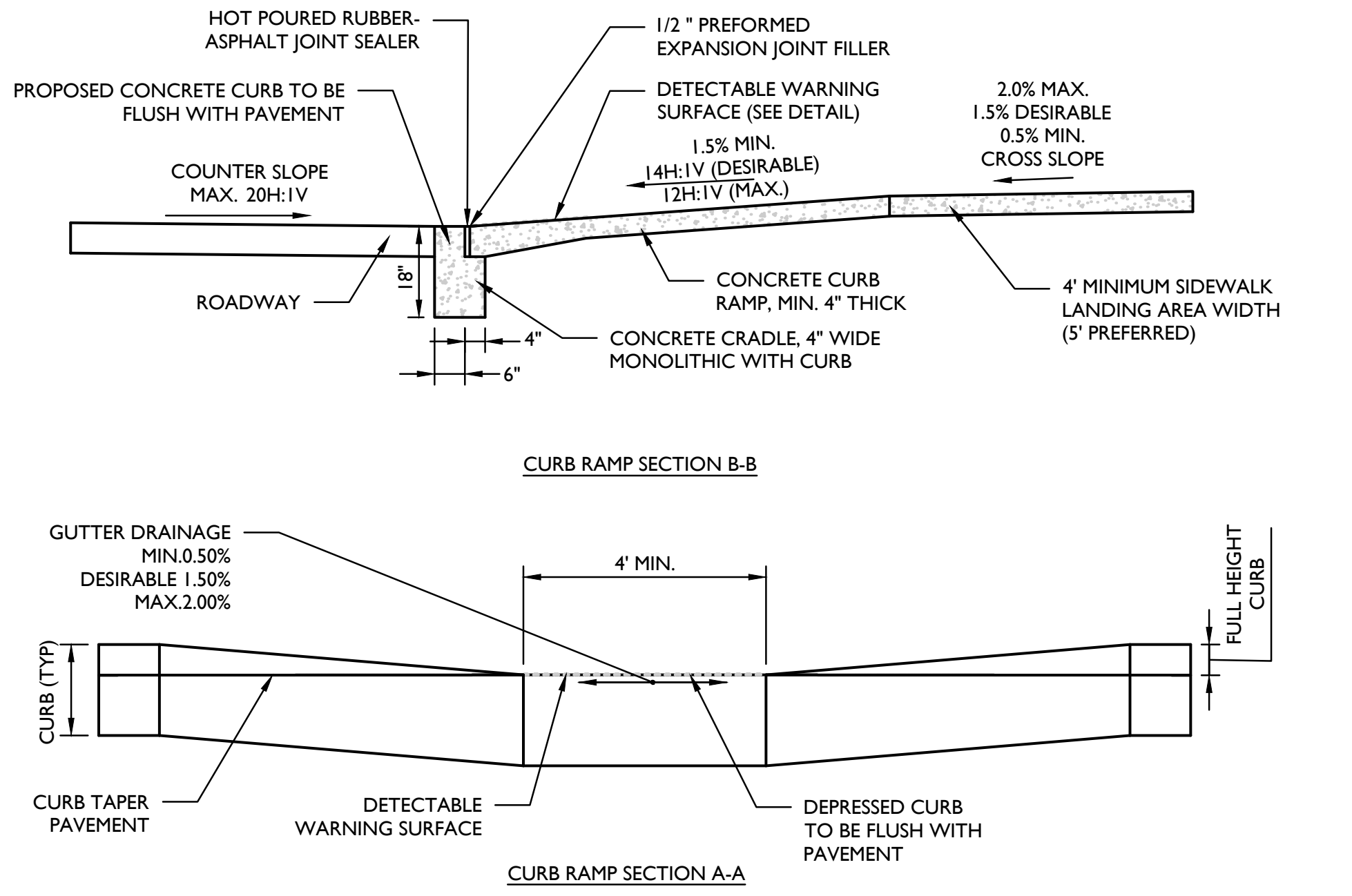


NOTES:

1. THE DETECTABLE WARNING SURFACE SHALL BE MANUFACTURED MATS THAT ARE EMBEDDED AND CAST-IN-PLACE IN THE CONCRETE.
2. IN LIEU OF A CAST IN PLACE DETECTABLE WARNING SURFACE, THE CONTRACTOR MAY UTILIZE A SURFACE APPLIED DETECTABLE WARNING SURFACE WITH PRIOR APPROVAL OF THE UNDERSIGNED ENGINEER AND PRIOR TO POURING OF THE CONCRETE RAMP.
3. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A SHOP DRAWING OF THE DETECTABLE WARNING SURFACE PRIOR TO CONSTRUCTION FOR APPROVAL.
4. THE CONTRACTOR SHALL PROVIDE A MANUFACTURER CERTIFICATION THAT THE DETECTABLE WARNING SURFACE COMPLIES WITH THE CURRENT ADA STANDARDS FOR ACCESSIBLE DESIGN AS PUBLISHED BY THE DEPARTMENT OF JUSTICE AND THE ADA STANDARDS AS SUPPORTED BY THE UNITED STATES ACCESS BOARD, AND THE STATE AND/OR LOCAL ADA STANDARDS.
5. **SAFETY RED** SHALL BE APPROVED BY THE LOCAL JURISDICTION PRIOR TO INSTALLATION. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. ALTERNATIVE COLOR MAY BE USED PROVIDED SUCH COLOR COMPLIES WITH CURRENT ADA STANDARDS.
6. DETECTABLE WARNINGS SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES.
7. TRUNCATED DOMES IN A DETECTABLE WARNING SURFACE SHALL HAVE A BASE DIAMETER OF 0.9 INCH (23 mm) MINIMUM AND 1.4 INCHES (36 mm) MAXIMUM, A TOP DIAMETER OF 50 PERCENT OF THE BASE DIAMETER MINIMUM TO 65 PERCENT OF THE BASE DIAMETER MAXIMUM, AND A HEIGHT OF 0.2 INCH (5.1 mm).
8. TRUNCATED DOMES IN DETECTABLE WARNING SURFACE SHALL HAVE A CENTER-TO-CENTER SPACING OF 1.6 INCHES (41 mm) MINIMUM AND 2.4 INCHES (61 mm) MAXIMUM, AND A BASE-TO-BASE SPACING OF 0.65 INCH (17 mm) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
9. SOME DETECTABLE WARNING PRODUCTS REQUIRE A CONCRETE BORDER FOR PROPER INSTALLATION. WHERE REQUIRED BY THE MANUFACTURER, THE CONCRETE BORDER SHALL NOT EXCEED 2 INCHES (51 mm).
10. DETECTABLE WARNING SURFACES SHOULD NOT BE PLACED ON PAVING OR EXPANSION JOINTS AT CURB RAMPS. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET SO PEDESTRIANS WHO USE WHEELCHAIRS CAN "TRACK" BETWEEN THE DOMES.
11. ON PERPENDICULAR CURB RAMPS, DETECTABLE WARNING SURFACES SHALL BE PLACED AS FOLLOWS:
    a. WHERE THE ENDS OF THE BOTTOM GRADE BREAK ARE IN FRONT OF THE BACK OF CURB, DETECTABLE WARNING SURFACES SHALL BE PLACED AT THE BACK OF CURB.
    b. WHERE THE ENDS OF THE BOTTOM GRADE BREAK ARE BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS 5.0 FT OR LESS, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE RAMP RUN WITHIN ONE DOME SPACING OF THE BOTTOM GRADE BREAK.
    c. WHERE THE ENDS OF THE BOTTOM GRADE BREAK ARE BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS MORE THAN 5.0 FT, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE LOWER LANDING AT THE BACK OF CURB.
12. ON PARALLEL CURB RAMPS, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE TURNING SPACE AT THE FLUSH TRANSITION BETWEEN THE STREET AND SIDEWALKS.
13. ON BLENDED TRANSITIONS, DETECTABLE WARNING SURFACES SHALL BE PLACED AT THE BACK OF CURB.

DETECTABLE WARNING SURFACE DETAIL

NOT TO SCALE 07/01/19



NOTES:

1. DEPRESSED CURB AT DETECTABLE WARNING SHALL BE A SMOOTH LEVEL SURFACE THAT IS FLUSH WITH THE ADJOINING PAVEMENT. NO BUMPS OR ROUGH SURFACE ARE ALLOWED. SUCH UNEVENNESS SHALL BE MILLED OR GRINDED SMOOTH.
2. POSITIVE DRAINAGE SHALL BE MAINTAINED AT RAMP. RAMP SHALL SLOPE TOWARDS PAVEMENT NO PONDING OF WATER IS PERMITTED AT CURB RAMP. PAVEMENT GRADES TO BE ADJUSTED AS NECESSARY TO PROVIDE POSITIVE GUTTER DRAINAGE.
3. CURB (DROPPED CURB) GUTTER-LINE TO BE FLUSH WITH ROADWAY PAVEMENT.
4. MAXIMUM GUTTER DRAINAGE GRADE MAY BE INCREASED TO 2.00% UPON THE WRITTEN APPROVAL OF THE UNDERSIGNED PROFESSIONAL.
5. DEVIATION FROM THIS DETAIL REQUIRES THE WRITTEN APPROVAL OF THE UNDERSIGNED PROFESSIONAL.

CURB RAMP SECTIONS DETAIL

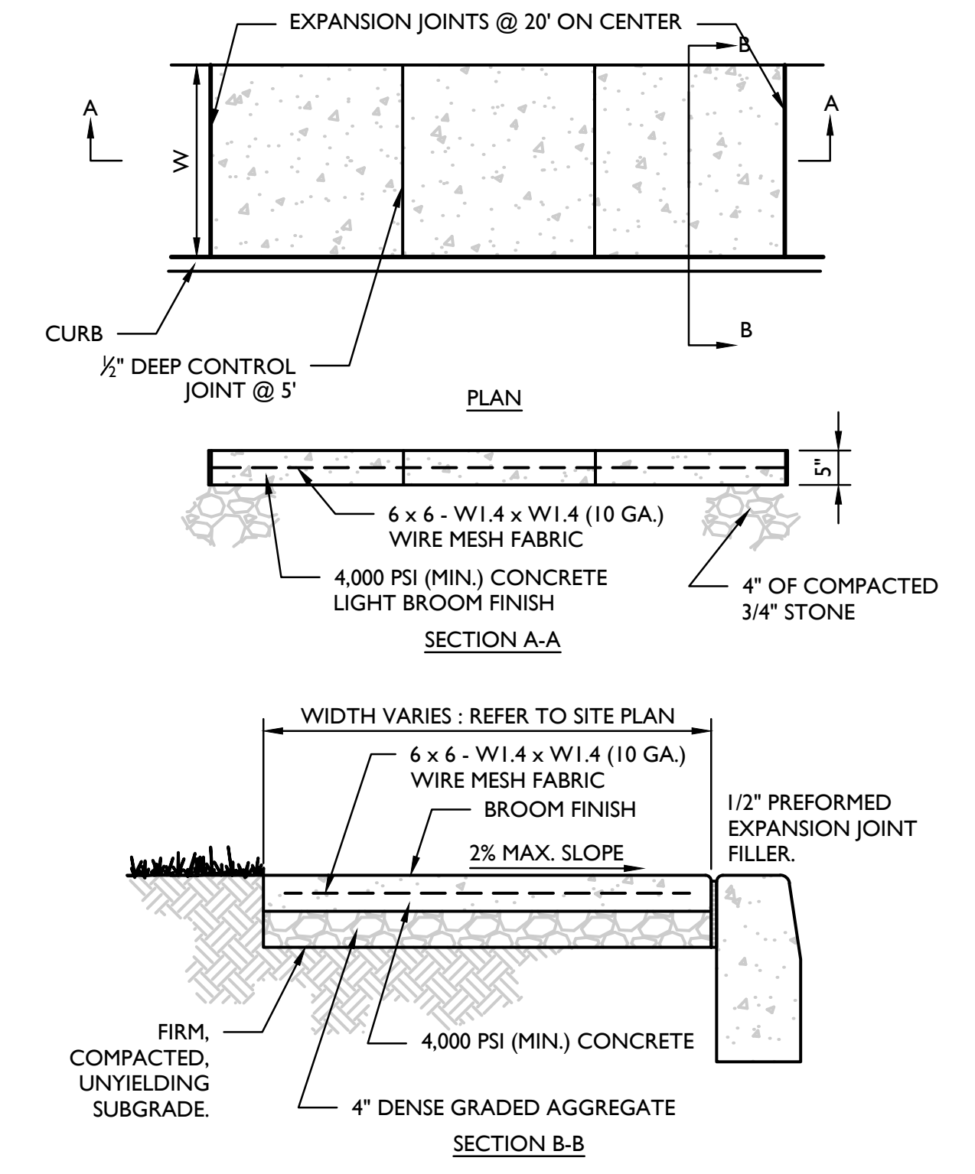
NOT TO SCALE CURB RAMP 07/01/19

NOTES:

1. CONTRACTOR SHALL PREPARE SHOP DRAWINGS OF EACH CURB RAMP FOR SUBMISSION AND APPROVAL OF THE UNDERSIGNED PROFESSIONAL AND THE MUNICIPAL, COUNTY, STATE OR OTHER AGENCY'S ENGINEER HAVING JURISDICTION.
2. LANDING AREA, APPROACH SIDEWALK TRANSITIONS AND CURB RAMP SHALL BE KEPT CLEAR OF OBSTRUCTIONS.
3. CURB AT RAMP OPENING (FLUSH CURB) TO BE FLUSH WITH ROADWAY PAVEMENT.
4. CROSSWALKS AND PAVEMENT MARKINGS TO BE INSTALLED AS DENOTED ON SITE PLAN.
5. MAXIMUM RAMP SLOPE MAY BE 12H:1V UPON APPROVAL OF ENGINEER. RAMP SLOPES SHOWN ARE THE PREFERRED SLOPE. SIDE FLARE SLOPES MAY BE 10H:1V UPON APPROVAL OF THE ENGINEER.
6. MINIMUM RAMP CROSS-SLOPE SHALL BE 0.50%. THE MAXIMUM RAMP CROSS-SLOPE MAY BE 2.00% UPON APPROVAL OF THE ENGINEER. CROSS-SLOPES SHOWN IN THE DETAILS ARE THE PREFERRED SLOPES TO MAINTAIN A LEVEL OF CONSTRUCTION TOLERANCE.
7. ACCESSIBLE RAMPS SHALL BE INSTALLED PURSUANT WITH THE CURRENT UNITED STATES ACCESS BOARD ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES AND THE ADA STANDARDS FOR ACCESSIBLE DESIGN AS PUBLISHED BY THE UNITED STATES DEPARTMENT OF JUSTICE AND OTHER APPLICABLE LOCAL AND STATE STANDARDS IN EFFECT AT THE DATE OF CONSTRUCTION.
8. DEVIATIONS FROM THE CURB RAMP DETAILS REQUIRE WRITTEN APPROVAL OF THE UNDERSIGNED PROFESSIONAL AND THE MUNICIPAL, COUNTY, STATE OR OTHER AGENCY'S ENGINEER HAVING JURISDICTION.
9. THE RAMP SURFACE SHALL HAVE A NON-SLIP, HAND BROOMED FINISH.
10. CONCRETE EXPANSION JOINTS SHALL HAVE A FIRM SURFACE WITH 1/4" BEVELED CONCRETE EDGES. THE JOINT SURFACE SHALL NOT BE MORE THAN 1/4" BELOW THE ADJOINING CONCRETE SURFACE.
11. CURB RAMP MUST BE WHOLLY CONTAINED WITHIN THE CROSSWALK CROSSING.
12. THE CLEAR SPACE SHALL BE INCREASED TO 5 FEET WHERE THE TURNING SPACE IS CONSTRAINED AT THE BACK OF THE SIDEWALK.
13. THE MAXIMUM SEPARATION BETWEEN THE BACK OF CURB AND DETECTABLE WARNING SURFACE SHALL NOT EXCEED 5 FEET. THE MAXIMUM SEPARATION AREA MAY BE WITHIN THE 4' X 4' CLEAR SPACE.
14. SEE SEPARATE DETAILS FOR "DETECTABLE WARNING SURFACE" AND "CURB RAMP SECTIONS".
15. WHERE SIDE FLARES ARE NOT REQUIRED, PROVIDE AN 18" CURB TAPER TO THE FLUSH CURB.
16. ALL CURB RAMP FLUSH CURB SHALL BE MADE WITH CONCRETE CURB CRADLE, REGARDLESS OF THE CURB MATERIAL USED THROUGHOUT THE SITE.

CURB RAMP NOTES

07/01/19

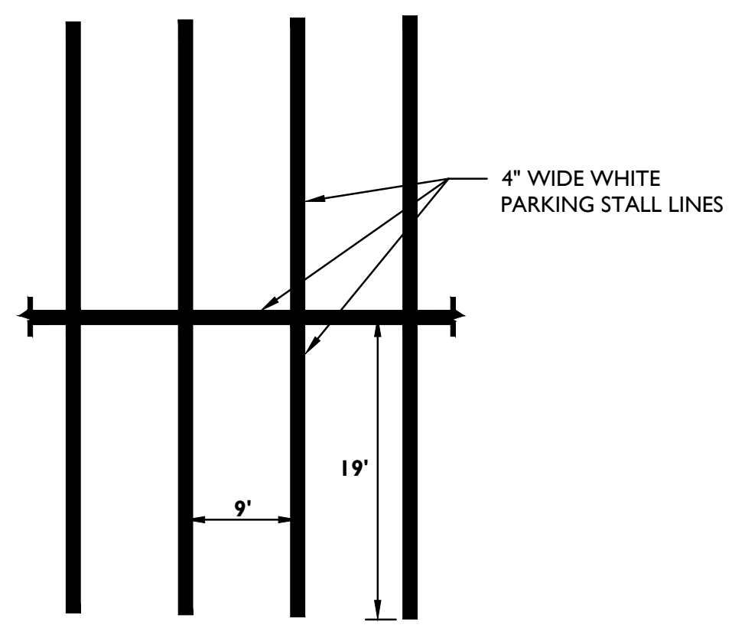


NOTES:

1. A PREFORMED, BITUMINOUS EXPANSION JOINT 1/2" THICK, 4" WIDE AND EXTENDING THE FULL WIDTH OF THE SIDEWALK (UNBROKEN) SHALL BE INSTALLED.
2. ½" DEEP CONTROL JOINTS INSTALLED AT AN INTERVAL OF EVERY 5'.
3. JOINT FILLER SHALL CONFORM TO AASHTO M-33. SURFACE OF CONCRETE SHALL BE BROOM FINISH. ROUND EDGES USING AN EDGING TOOL WITH A 1/4" RADIUS.
4. CONCRETE SIDEWALK SHALL BE CONSTRUCTED PER THE LATEST ADA REQUIREMENTS.

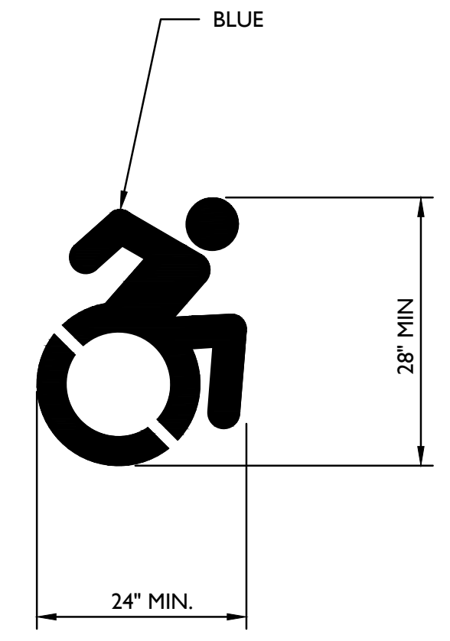
REINFORCED CONCRETE SIDEWALK (NEXT TO CURB) DETAIL

NOT TO SCALE REINFORCED CONCRETE 07/01/19



TYPICAL PARKING STALL STRIPING DETAIL

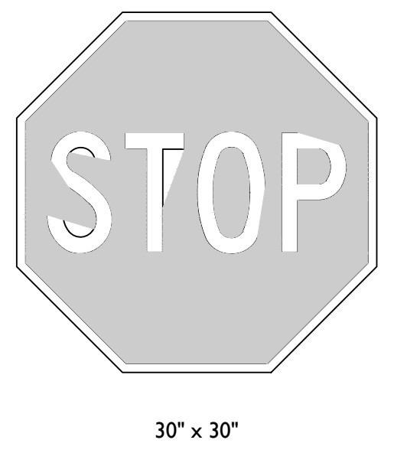
NOT TO SCALE 07/01/19



STROKE WIDTH: MINIMUM/STANDARD = 3"

ACCESSIBLE SYMBOL DETAIL

NOT TO SCALE 07/01/19

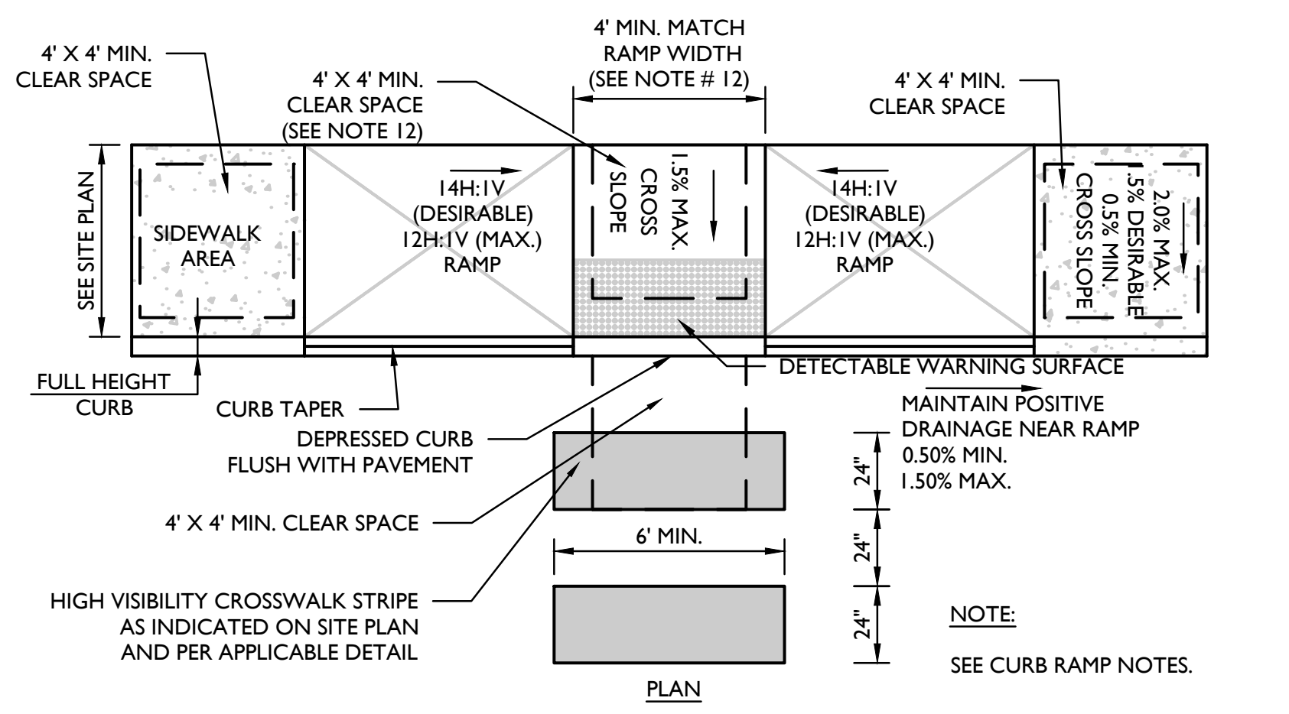


30" x 30"

COLORS:
LEGEND = WHITE (RETROREFLECTIVE)
BACKGROUND = RED (RETROREFLECTIVE)

R1-1 SIGN DETAIL

NOT TO SCALE 12/01/20

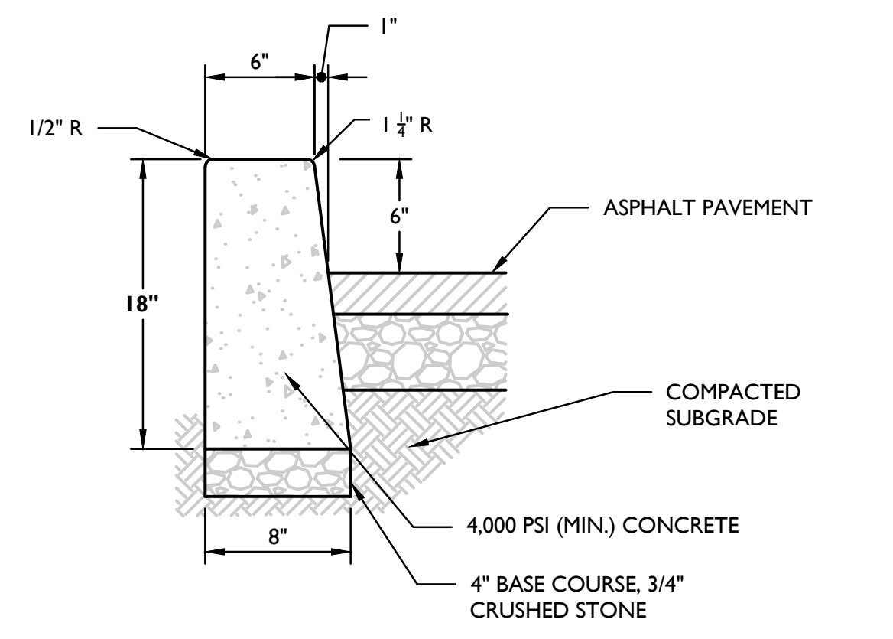


NOTE:

SEE CURB RAMP NOTES.

CURB RAMP TYPE 7 DETAIL

NOT TO SCALE type 7 07/01/19

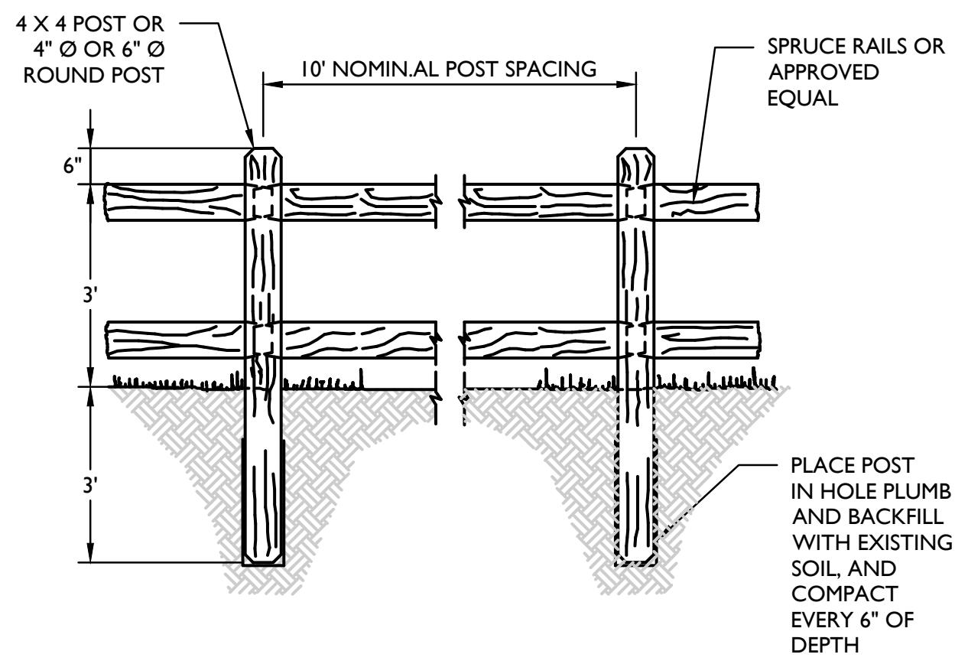


NOTES:

1. PREFORMED BITUMINOUS FIBER EXPANSION JOINTS, 1/2" THICK AT 20' MAX. INTERVALS ALONG THE CURB. PROVIDE CONTROL JOINTS @ 10 FEET MAX. BETWEEN EXPANSION JOINTS.

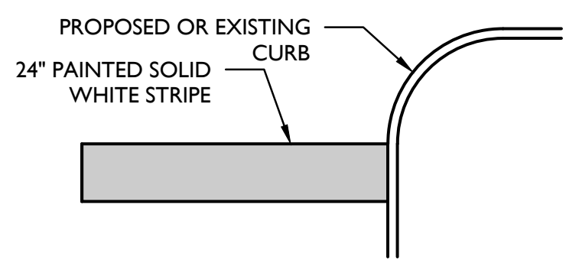
CONCRETE CURB (ASPHALT PAVEMENT) DETAIL

NOT TO SCALE



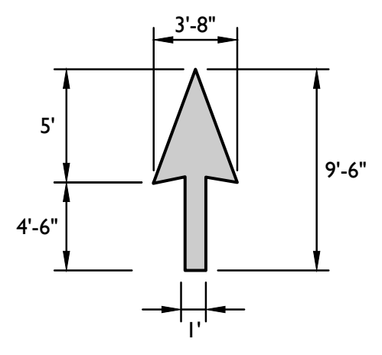
SPLIT RAIL FENCE (2 - RAIL) DETAIL

NOT TO SCALE 07/01/19



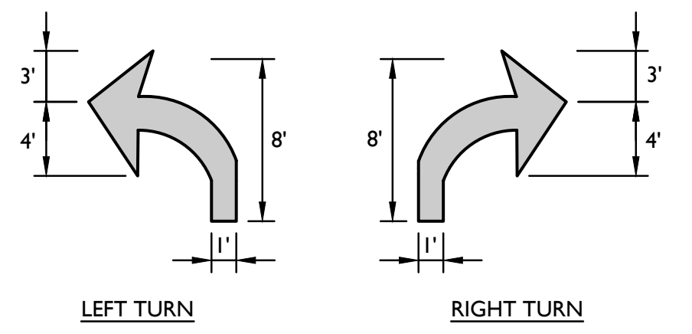
TYPICAL STOP BAR DETAIL

NOT TO SCALE 07/01/19



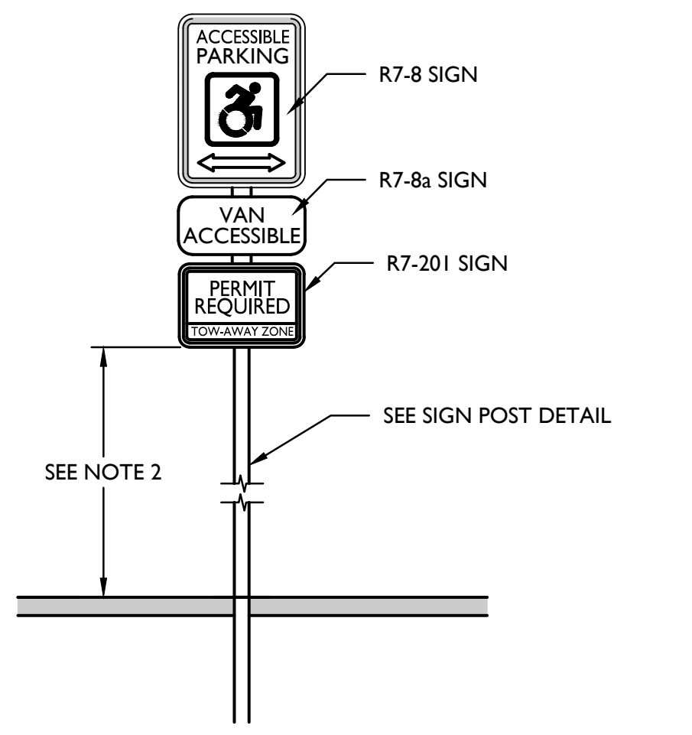
STRAIGHT PAVEMENT ARROW DETAIL

NOT TO SCALE 07/01/19



"LEFT OR RIGHT" PAVEMENT ARROW DETAIL

NOT TO SCALE 07/01/19

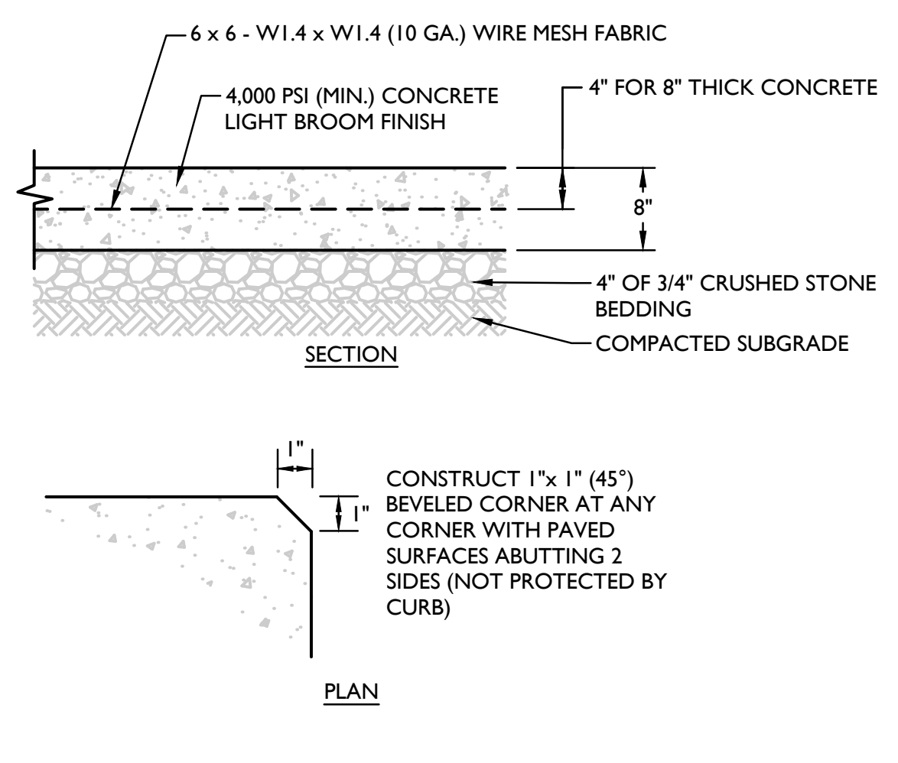


NOTES:

1. INSTALL SIGN WHERE NOTED ON PLAN.
2. THE BOTTOM OF THE LOWEST SIGN SHALL BE MOUNTED 60" ABOVE THE PARKING LOT OR SIDEWALK SURFACE WHEN THE SIGN IS PARALLEL TO THE SIDEWALK AND 72" ABOVE THE PARKING LOT OR SIDEWALK WHEN THE SIGN IS PERPENDICULAR TO THE SIDEWALK.

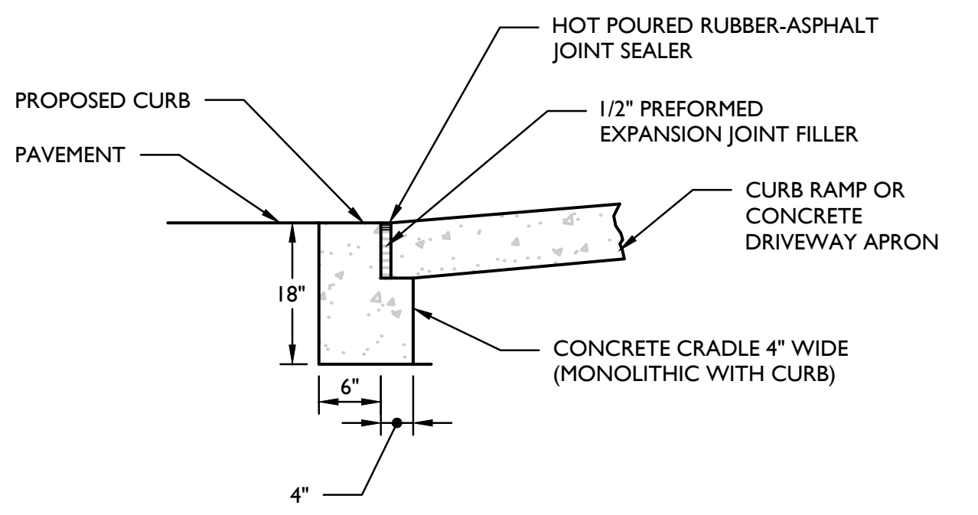
ACCESSIBLE PARKING SIGN DETAIL

NOT TO SCALE 07/01/19



CONCRETE LOADING & DOLLY PAD DETAIL

NOT TO SCALE 07/01/19



DROPPED CURB AND CRADLE DETAIL

NOT TO SCALE 07/01/19

TOWN OF WAWAYANDA
PLANNING BOARD

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REV	DATE	DRAWN BY	DESCRIPTION
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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.
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UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers
Engineering & Design
NEWBURGH
555 Hudson Valley Avenue
Suite 101
New Windsor, NY 12553
Phone: 845.564.4495
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ENGINEERING & LAND SURVEYING

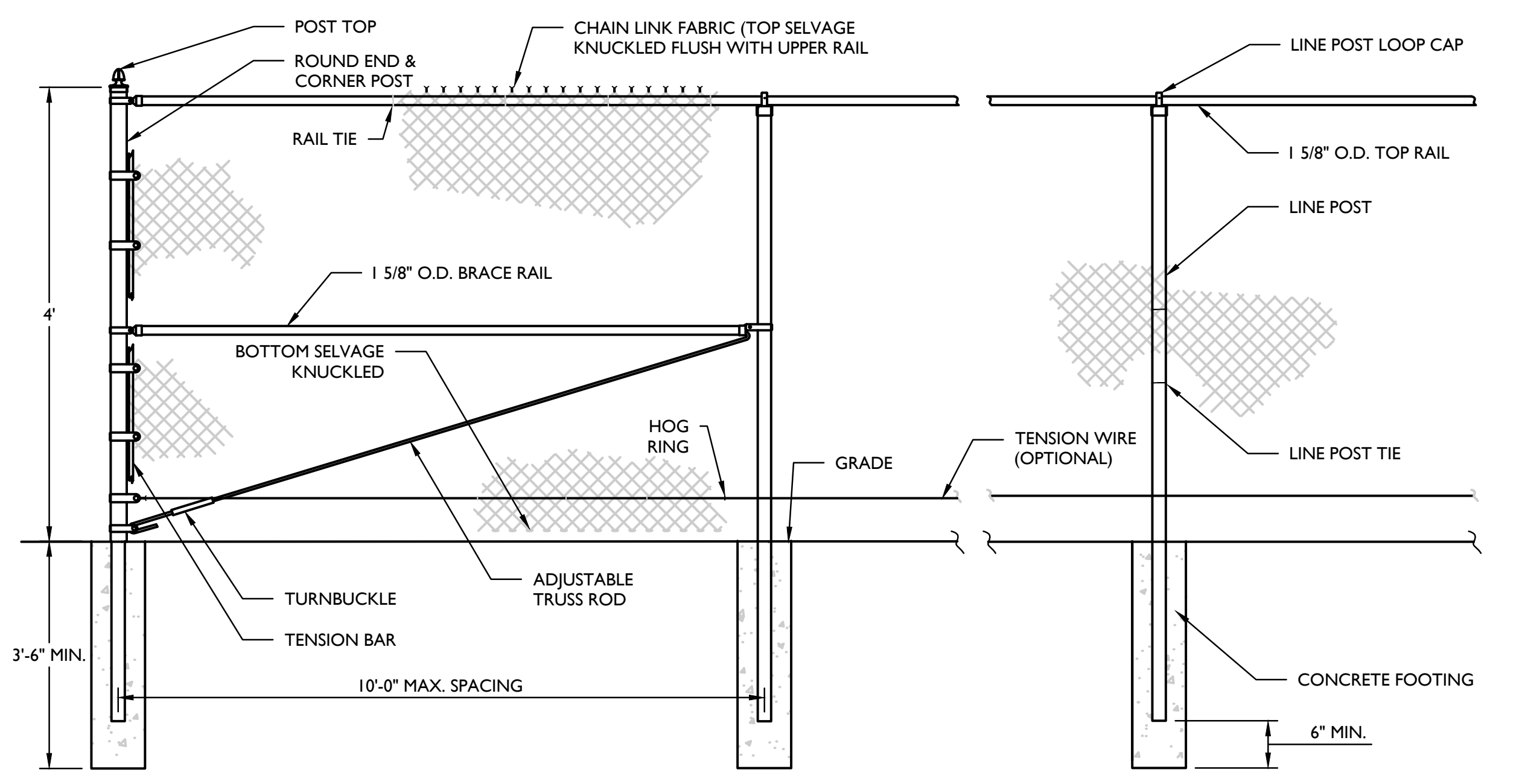
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DTLS

SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
16 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

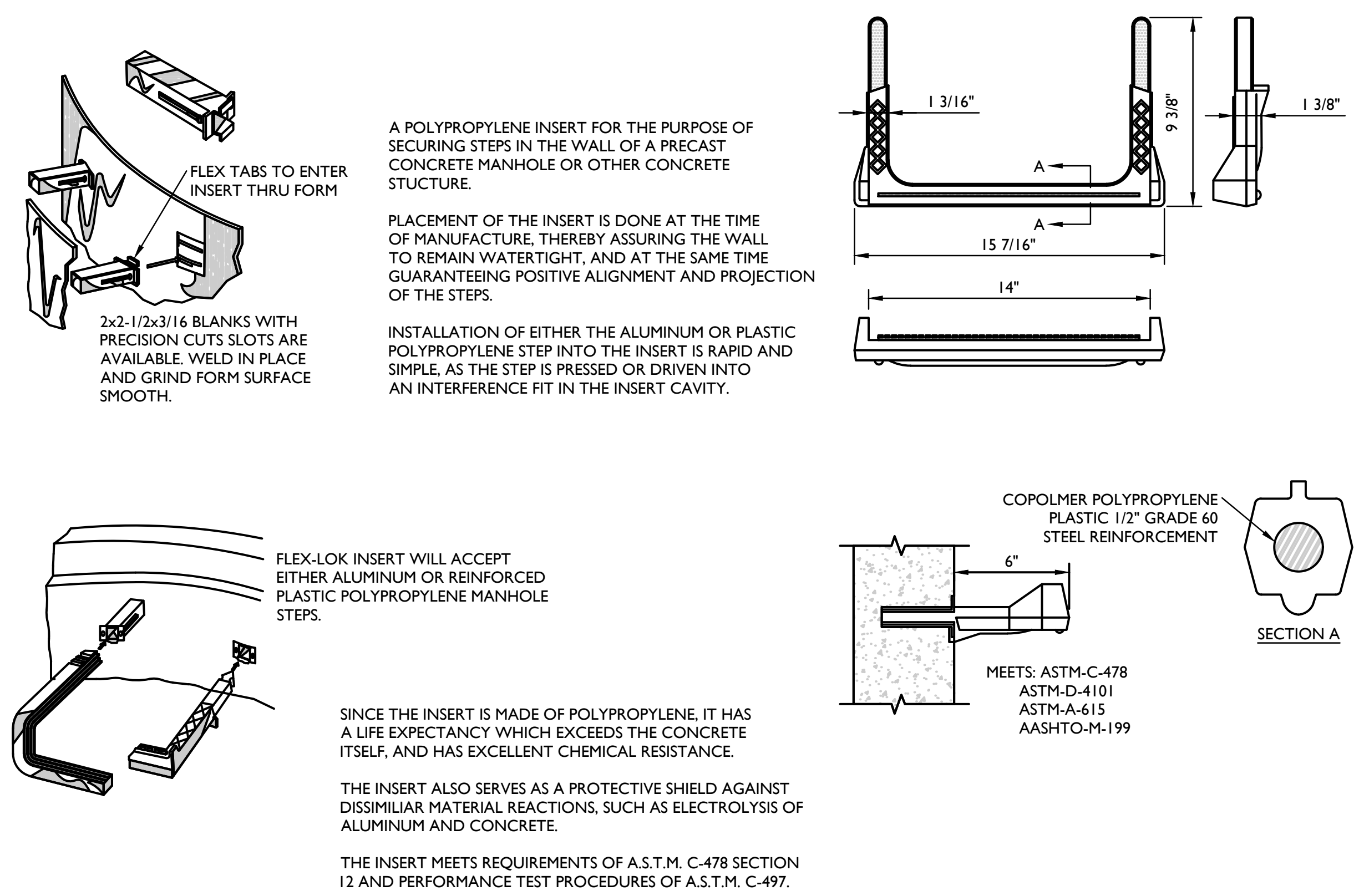


NOTES:

1. WIRE MESH SHALL BE 2" MESH 9 GAUGE GALVANIZED (ZINC) COATED STEEL CHAIN LINK FABRIC, WITH KNUCKLED SELVAGE (KK) ON BOTH TOP AND BOTTOM.
2. FENCE FRAMEWORK RAIL AND POSTS SHALL BE HOT DIP GALVANIZED STEEL PIPE, 16 GAUGE, CLASS 1 ZINC COATED PER ASTM 1043 GORUP 1A FOR SCHEDULE 40 ROUND PIPE, WITH REGULAR STEEL YIELD STRENGTH OF 30,000 PSI PER ASTM F1083.
3. BAR LENGTH AND POST HEIGHT ABOVE GRADE PER FENCE HEIGHT AND MANUFACTURER'S SPECIFICATIONS. FENCE HEIGHT AS SPECIFIED ON THE PLAN.
4. COLOR OF WIRE MESH AS SPECIFIED ON THE PLANS.
5. END AND CORNER POST TOP SHALL BE DOME SHAPE.
6. FOOTING WIDTH TO BE (4) X POST WIDTH, MINIMUM DEPTH 3'-6", 3,000 PSI (MIN.) CONCRETE.

GALVANIZED STEEL CHAIN LINK FENCE DETAIL

NOT TO SCALE 07/01/19



A POLYPROPYLENE INSERT FOR THE PURPOSE OF SECURING STEPS IN THE WALL OF A PRECAST CONCRETE MANHOLE OR OTHER CONCRETE STUCTURE.

PLACEMENT OF THE INSERT IS DONE AT THE TIME OF MANUFACTURE, THEREBY ASSURING THE WALL TO REMAIN WATERTIGHT, AND AT THE SAME TIME GUARANTEEING POSITIVE ALIGNMENT AND PROJECTION OF THE STEPS.

INSTALLATION OF EITHER THE ALUMINUM OR PLASTIC POLYPROPYLENE STEP INTO THE INSERT IS RAPID AND SIMPLE, AS THE STEP IS PRESSED OR DRIVEN INTO AN INTERFERENCE FIT IN THE INSERT CAVITY.

SINCE THE INSERT IS MADE OF POLYPROPYLENE, IT HAS A LIFE EXPECTANCY WHICH EXCEEDS THE CONCRETE ITSELF, AND HAS EXCELLENT CHEMICAL RESISTANCE.

THE INSERT ALSO SERVES AS A PROTECTIVE SHIELD AGAINST DISSIMILIAR MATERIAL REACTIONS, SUCH AS ELECTROLYSIS OF ALUMINUM AND CONCRETE.

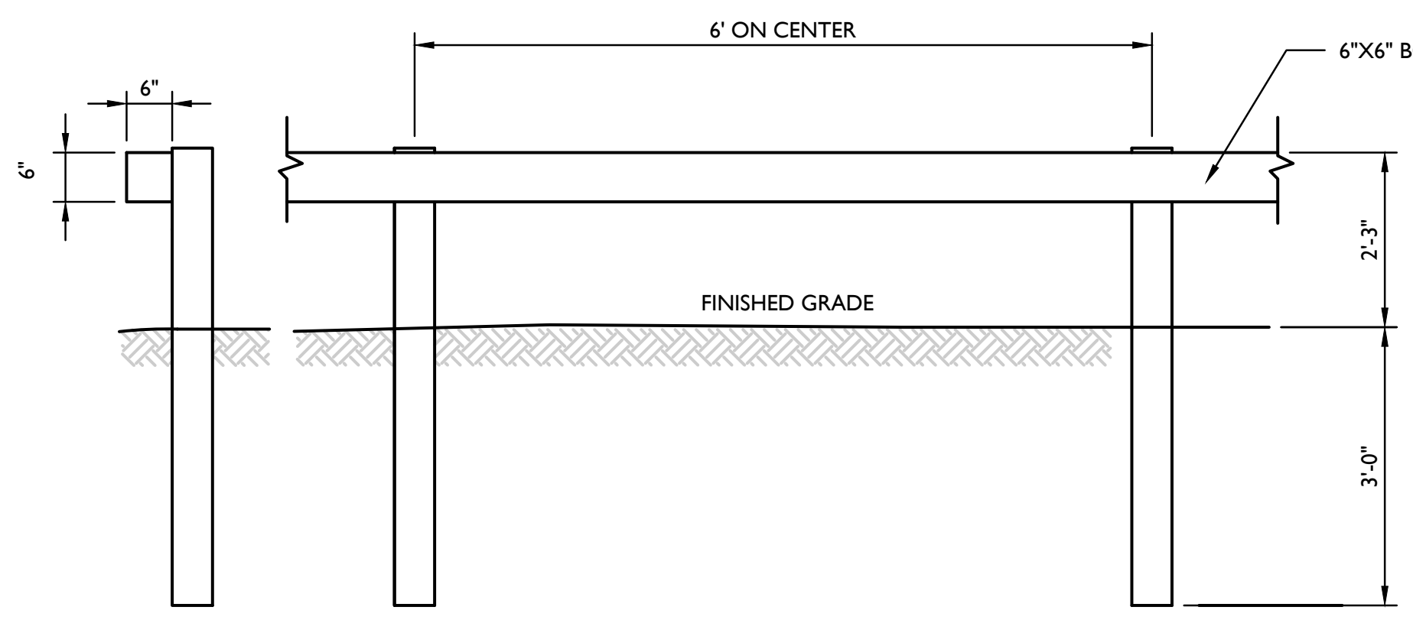
THE INSERT MEETS REQUIREMENTS OF A.S.T.M. C-478 SECTION 12 AND PERFORMANCE TEST PROCEDURES OF A.S.T.M. C-497.

NOTES:

1. STEP INSERTS TO BE AS MANUFACTURED BY A-LOK PRODUCTS OR APPROVED EQUAL.

LADDER RUNG (COPOLYMER) DETAIL

NOT TO SCALE 07/01/19

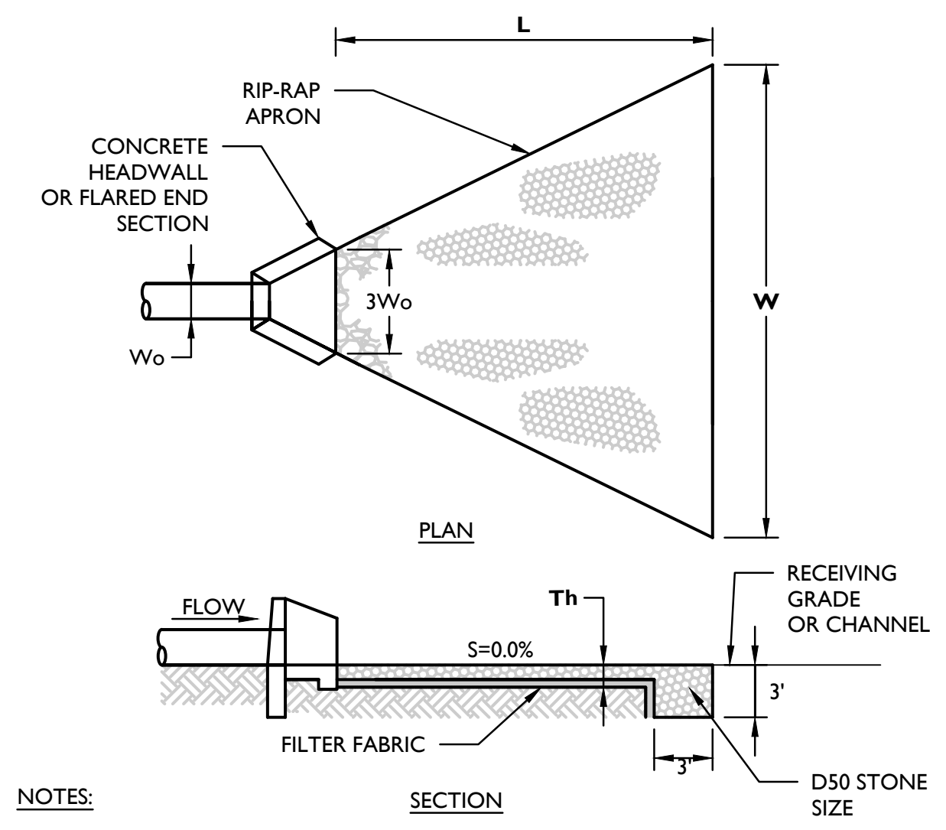


NOTES:

1. INSTALLATION OF PROPOSED GUIDE RAIL TO BE IN ACCORDANCE WITH NYSDOT STANDARD SPECIFICATIONS.

BOX BEAM GUIDE RAIL DETAIL

NOT TO SCALE 07/01/19

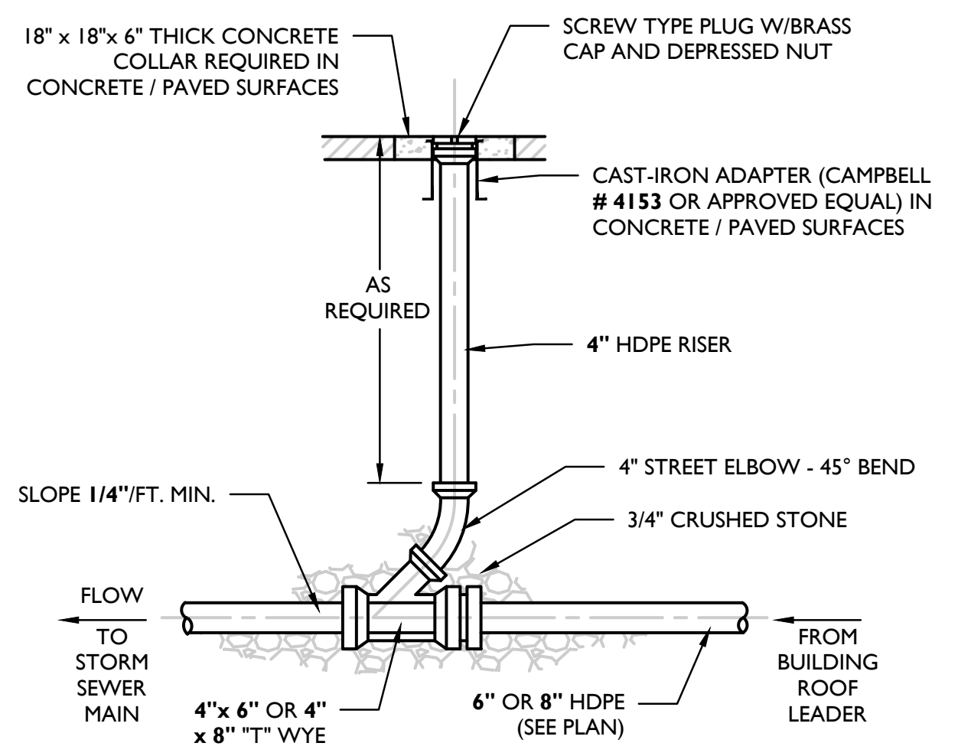


NOTES:

1. SEE PLAN FOR APRON DIMENSIONS.
2. SIDE SLOPE SHALL BE 2:1 OR FLATTER. THE BOTTOM GRADE SHALL BE LEVEL (0% SLOPE). THERE SHALL BE NO FALL AT THE END OF APRON TO THE RECEIVING SURFACE.

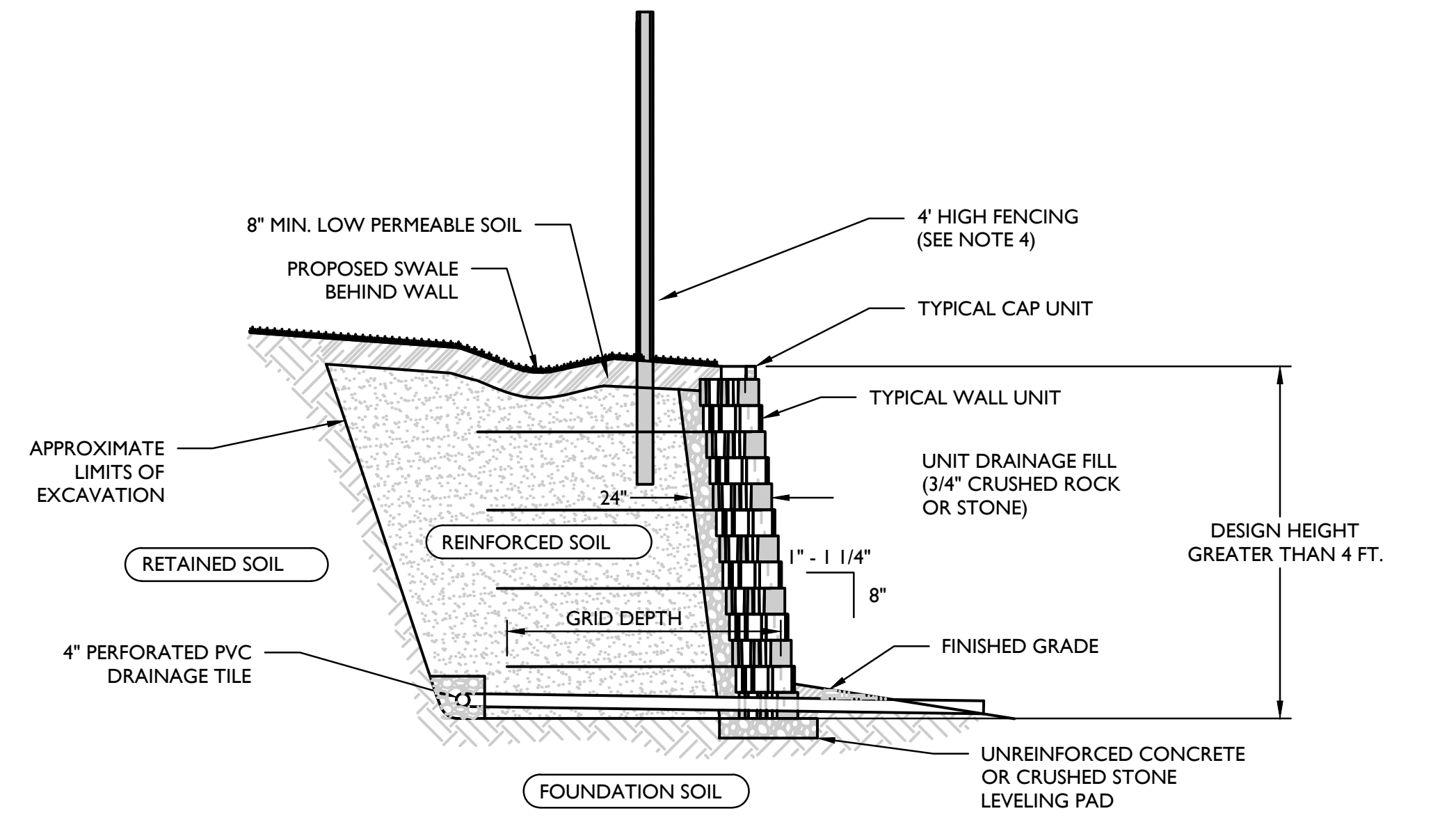
CONDUIT OUTLET PROTECTION DETAIL

MOD: 01/05/22
05/01/17



ROOF LEADER CLEANOUT DETAIL

NOT TO SCALE 07/01/19

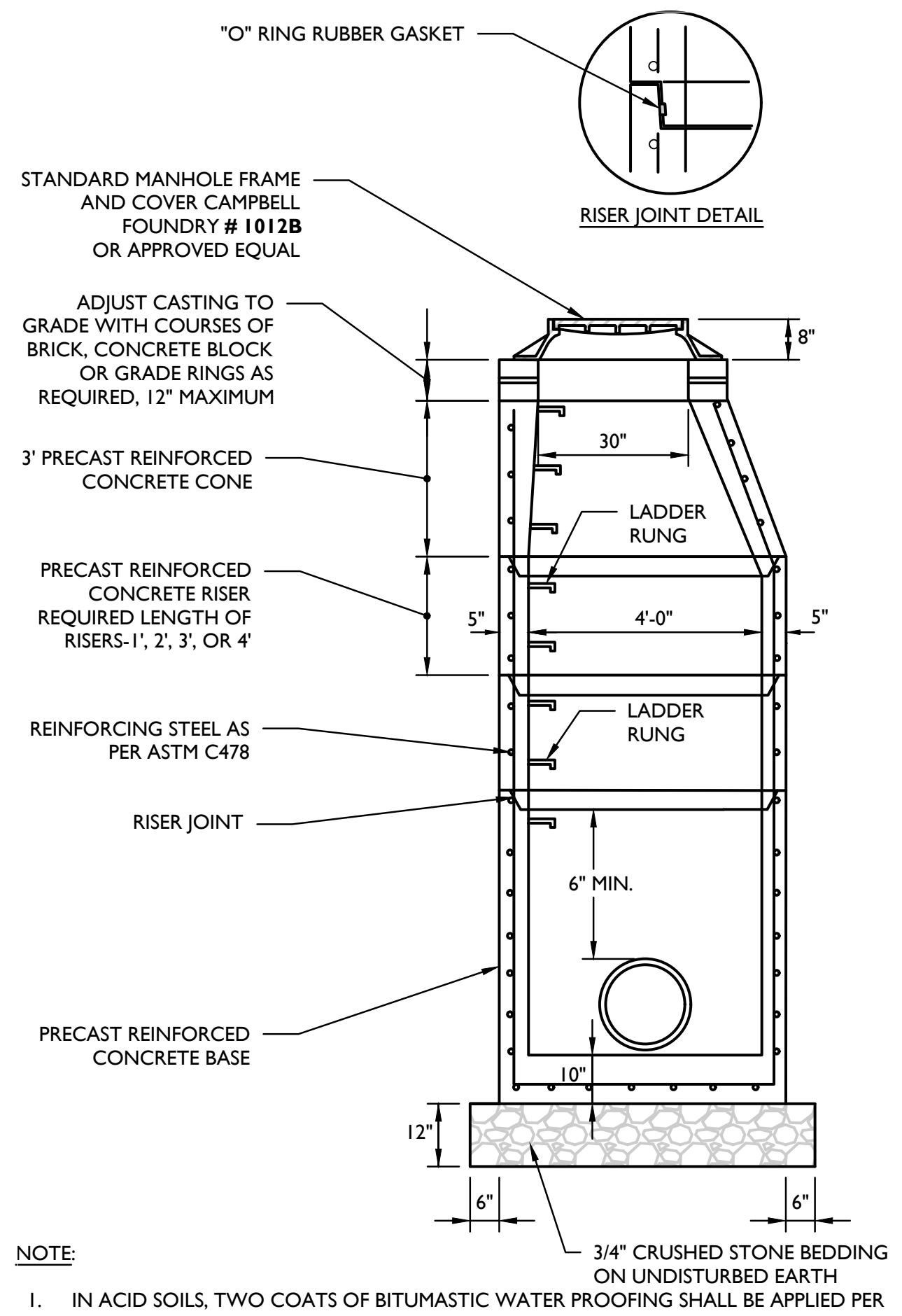


NOTES:

1. THIS DETAIL IS A SCHEMATIC REPRESENTATION FOR MUNICIPAL AND/OR AGENCY APPROVALS AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.
2. CONTRACTOR TO PROVIDE SITE-SPECIFIC SHOP DRAWINGS AND STRUCTURAL DESIGN CALCULATIONS FOR EACH RETAINING WALL PREPARED BY A STATE LICENSED PROFESSIONAL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
3. MODULAR CONCRETE BLOCK WALL TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
4. A SAFETY BARRIER (FENCING) IS REQUIRED ON ALL WALLS WHERE THE WALL HEIGHT EXCEEDS 30". PLACEMENT AND INSTALLATION METHOD OF THE PROPOSED FENCING TO BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

TYPICAL REINFORCED WALL SECTION (1" TO 1-1/4" SETBACK) DETAIL

NOT TO SCALE 10/01/19

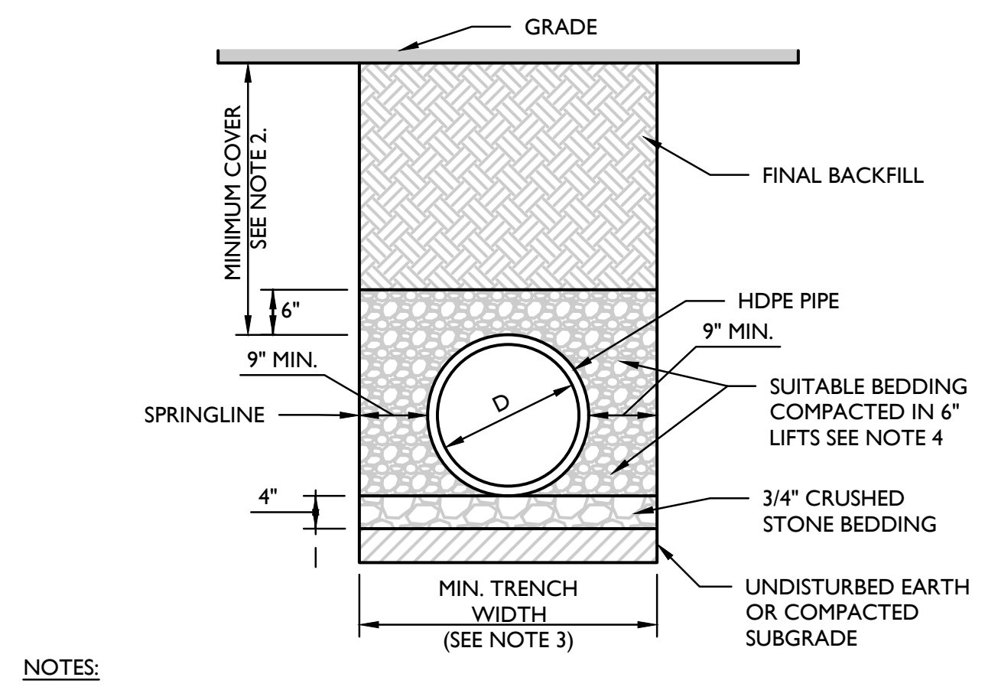


NOTE:

1. IN ACID SOILS, TWO COATS OF BITUMASTIC WATER PROOFING SHALL BE APPLIED PER MANUFACTURER'S SPECIFICATION.
2. ALL CONCRETE TO BE 4,000 PSI.

PRECAST CONCRETE STORM MANHOLE 4' DIA. DETAIL

NOT TO SCALE 07/01/19

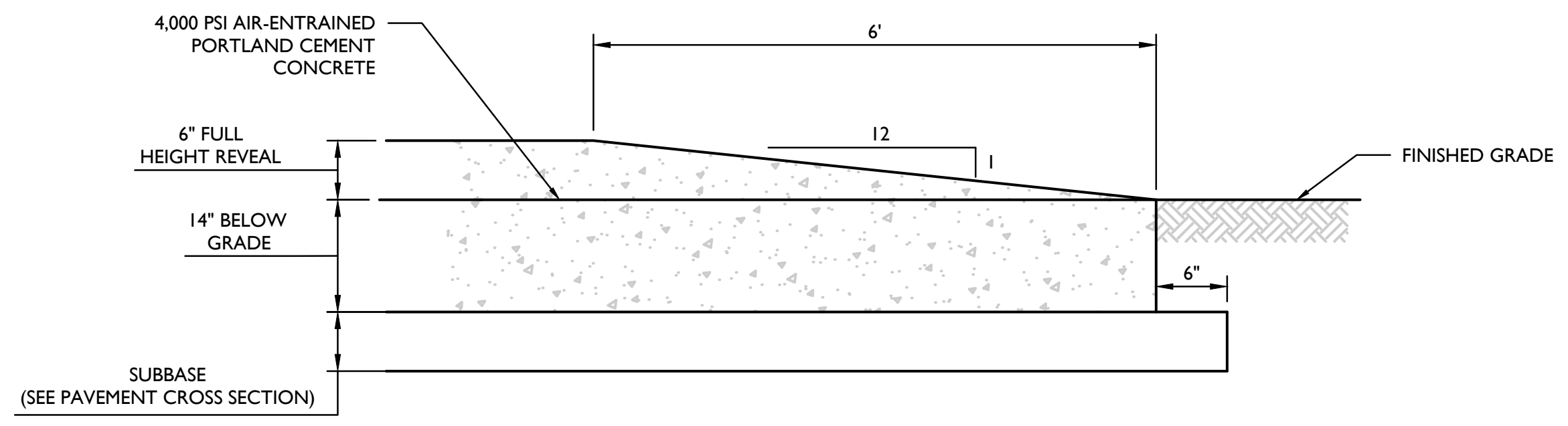


NOTES:

1. ALL PIPE SYSTEMS AND BACKFILL SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
2. MINIMUM COVER FOR HDPE PIPES IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR UP TO 60" DIAMETER PIPE. PIPE COVER IS MEASURED FROM TOP OF PIPE TO THE BOTTOM OF FLEXIBLE PAVEMENT, OR TO THE TOP OF RIGID PAVEMENT, OR TO THE GROUND SURFACE.
3. MINIMUM TRENCH WIDTH PER MANUFACTURER'S RECOMMENDATIONS.
4. SUITABLE BEDDING MATERIAL SHALL BE SAND, WELL GRADED GRAVEL < 2", OR 3/4" CRUSHED STONE.
5. SUITABLE FINAL BACKFILL MATERIAL SHALL BE SITE SOILS, CLEAN FILL, OR ITEM 4 STONE COMPACTED IN MAX. 9" LIFTS.
6. STONES LARGER THAN 2" FOUND IN THE TRENCH SHALL BE REMOVED FOR A DEPTH OF AT LEAST 4" BELOW THE PIPE.
7. FOR INSTALLATION IN PAVEMENT, REFER TO THE APPLICABLE PAVEMENT DETAIL TO ESTABLISH FINAL GRADE. BACKFILL REQUIREMENTS BEYOND THE DEPTH OF THE PAVEMENT DETAIL SHALL BE IN ACCORDANCE WITH THIS DETAIL.

HDPE STORM PIPE BEDDING DETAIL

NOT TO SCALE 07/01/19



TERMINAL CURB DETAIL

NOT TO SCALE 07/01/19

TOWN OF WAWAYANDA
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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers Engineering & Design
NEWBURGH
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COLLIERS ENGINEERING & DESIGN CT, P.C.
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DTLS

SHEET TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: 17 of 20

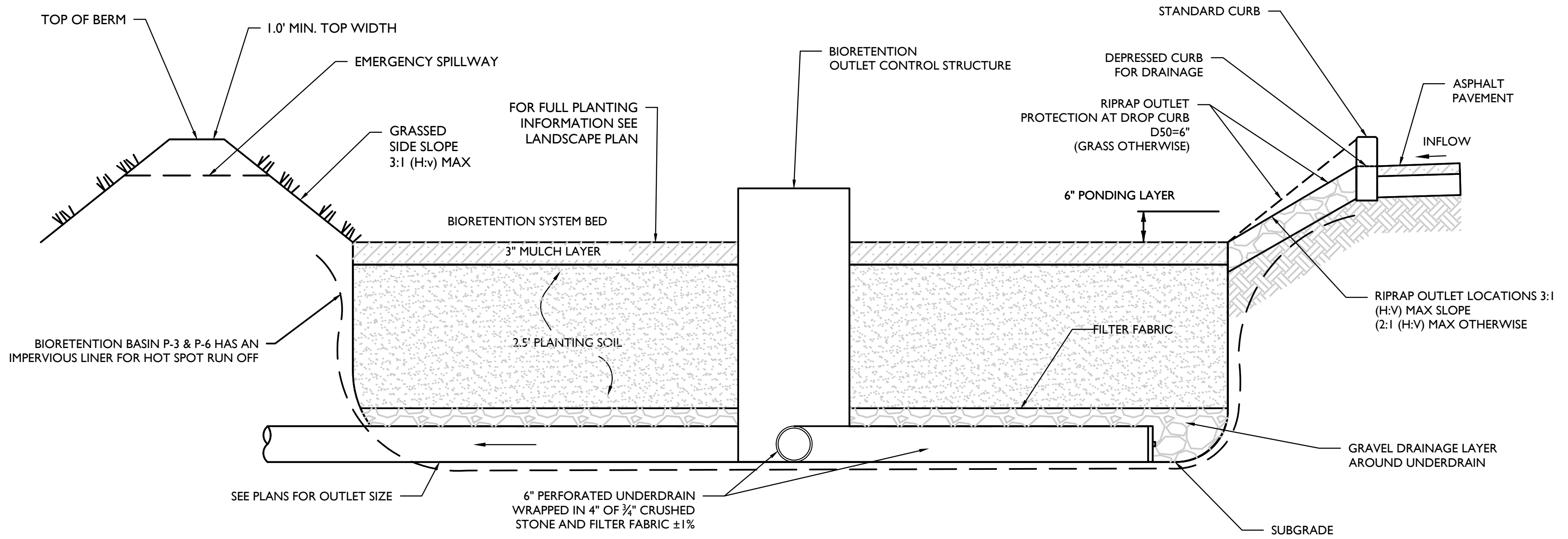
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

BIORETENTION ELEVATIONS					
SYSTEM	OUTLET NAME	OUTLET SIZE	BED ELEVATION	TOP OF BERM ELEVATION	EMERGENCY SPILLWAY EL.
BIORETENTION BASIN "P-2"	OCS S-60	4' X 4'	480.0	483.25	481.5
BIORETENTION BASIN "P-3"	OCS S-35	4' X 4'	474.0	477.25	475.5
BIORETENTION BASIN "P-4"	OCS S-9	4' X 4'	463.0	466.25	465.5
BIORETENTION BASIN "P-5"	OCS S-21	4' X 4'	460.0	463.25	461.5
BIORETENTION BASIN "P-6"	OCS S-23	4' X 4'	458.0	461.25	459.5

PLANTING SOIL NOTE:

THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (SHOULD CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 25% BY VOLUME. SOILS SHOULD FALL WITHIN THE SM, OR ML CLASSIFICATIONS OD THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.5"/HR) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER, AND BRUSH OR SEED FROM NOXIOUS WEEDS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN LIFTS OF 12" TO 18", LOOSELY COMPACTED (TAMPED LIGHTLY WITH A DOZER OR BACKHOE BUCKET). THE SPECIFIC CHARACTERISTICS ARE AS FOLLOWS:

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0%
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (P_2O_5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (K_2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 ppm
CLAY	10 TO 25%
SILT	30 TO 55%
SAND	35 TO 60%

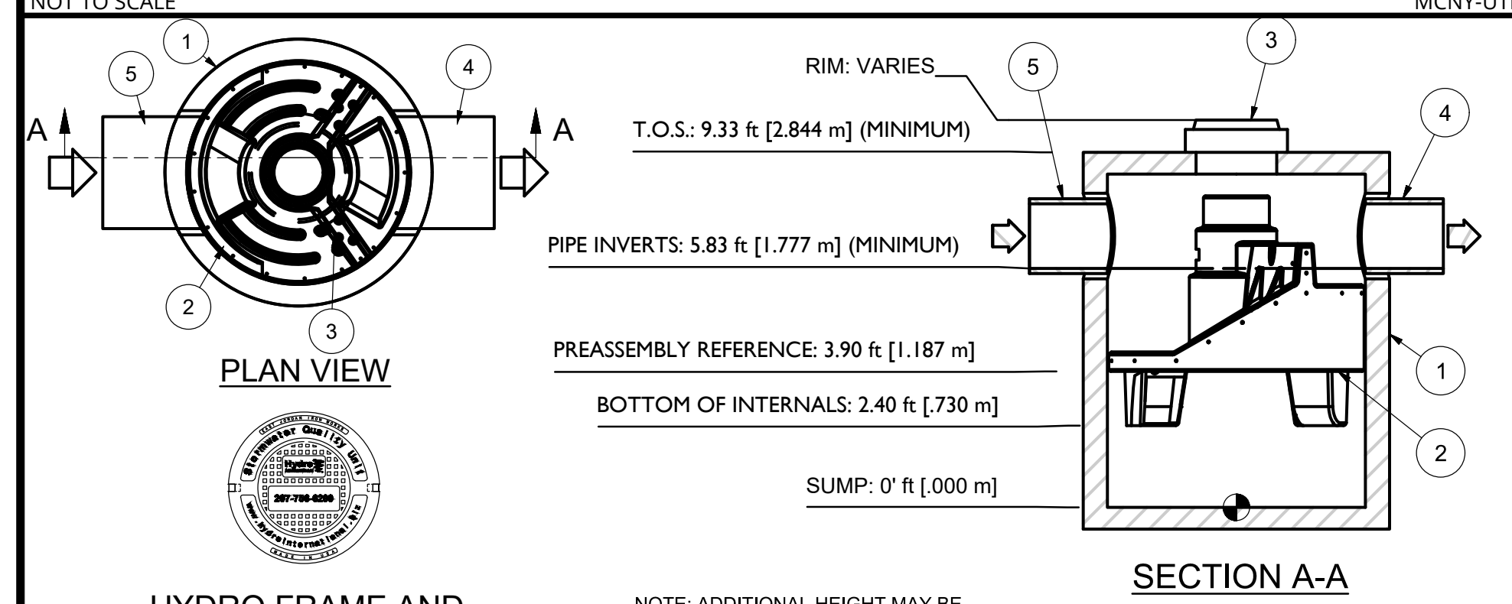


NOTES:

1. SEE PLAN FOR DROP CURB LOCATIONS AND BIORETENTION AREA CONFIGURATION.
2. PLANTING SOIL TO BE IN ACCORDANCE WITH NEW YORK STATE STANDARDS AND SPECIFICATIONS FOUND WITHIN THE PROJECT SWPPP.
3. CONTRACTOR MUST PROVIDE SUBMITTAL OF PROPOSED BIORETENTION SOIL FOR APPROVAL.

BIORETENTION SYSTEM CROSS SECTION DETAIL

NOT TO SCALE
MCNY-UTIL-STMW-2400
07/01/19



NOTE: ADDITIONAL HEIGHT MAY BE REQUIRED DEPENDING ON PIPE SIZE

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

PRODUCT SPECIFICATION:

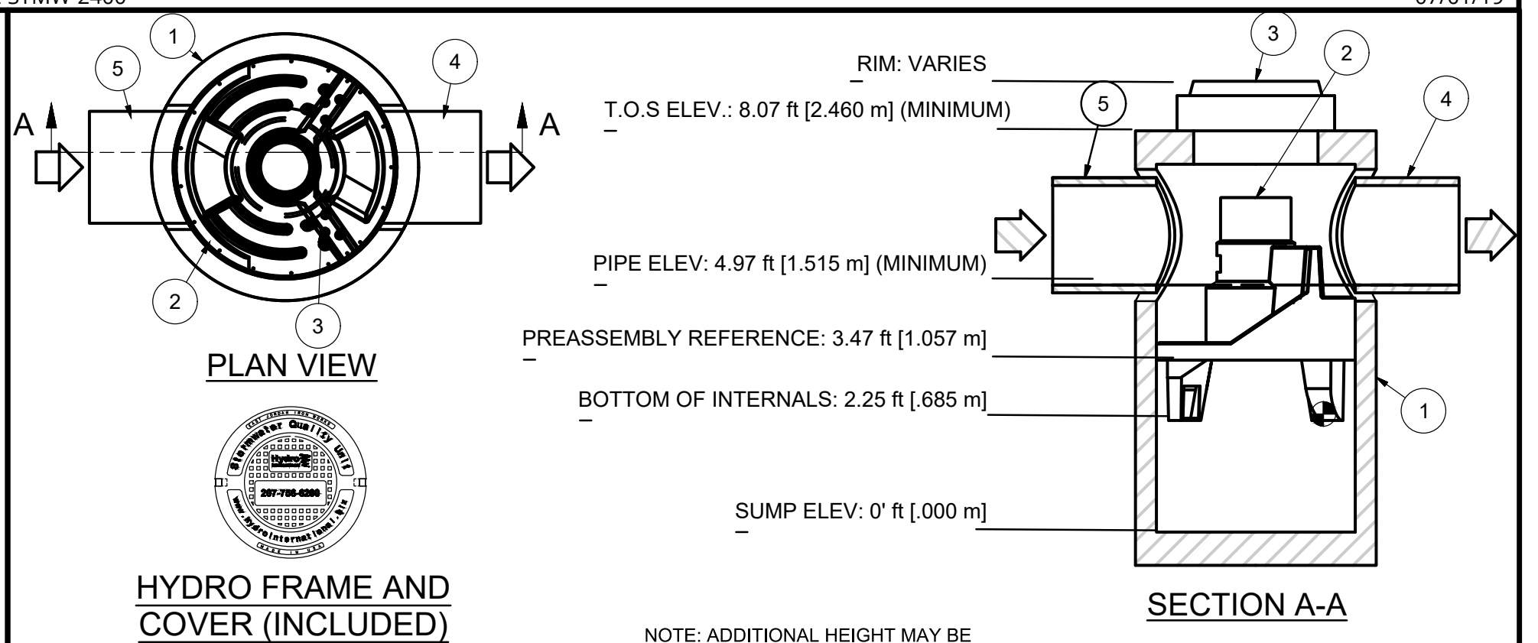
1. Peak Hydraulic Flow: 20.0 cfs (566 l/s)
2. Min Sediment Storage Capacity: 1.1 cu. yd. (0.8 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 24 in. (600 mm)
4. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
5. For more product information including regulatory acceptances, please visit https://hydro-int.com/en/products/first-defense

GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 24".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST			
ITEM	QTY	SIZE (in)	DESCRIPTION
1	1	60	I.D. PRECAST MANHOLE
2	1		INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	FRAME AND COVER (ROUND)
4	1	24 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	24 (MAX)	INLET PIPE (BY OTHERS)

5' DIAMETER STORMWATER SEPARATOR

MOD: 09/25/20
07/01/19



PRODUCT SPECIFICATION:

1. Peak Hydraulic Flow: 18.0 cfs (510 l/s)
2. Min Sediment Storage Capacity: 0.7 cu. yd. (0.5 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 24 in. (600 mm)
4. The Treatment System Shall Use An Induced Vortex To Separate Pollutants From Stormwater Runoff.
5. For More Product Information Including Regulatory Acceptances, Please Visit https://hydro-int.com/en/products/first-defense

NOTE: ADDITIONAL HEIGHT MAY BE REQUIRED DEPENDING ON PIPE SIZE

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

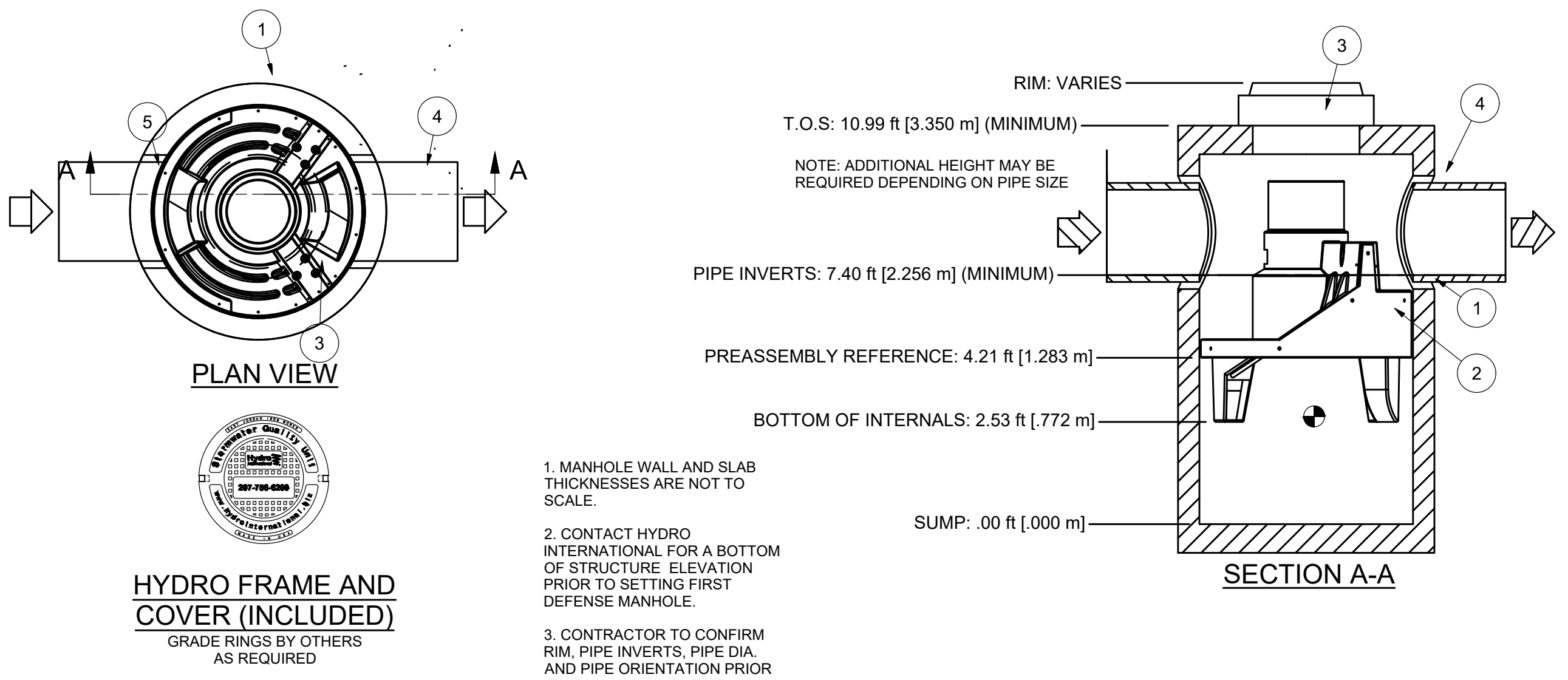
3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 24".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST				
ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	48	1200	I.D. PRECAST MANHOLE
2	1			INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	750	FRAME AND COVER (ROUND)
4	1	24 (MAX)	600 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	24 (MAX)	600 (MAX)	INLET PIPE (BY OTHERS)

4' DIAMETER FIRST DEFENSE STORMWATER SEPARATOR

MOD: 09/25/20
07/01/19



NOTE: ADDITIONAL HEIGHT MAY BE REQUIRED DEPENDING ON PIPE SIZE

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

PRODUCT SPECIFICATION:

1. Peak Hydraulic Flow: 20.0 cfs (566 l/s)
2. Min Sediment Storage Capacity: 1.1 cu. yd. (0.8 cu. m.)
3. Maximum Inlet/Outlet Pipe Diameters: 24 in. (600 mm)
4. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
5. For more product information including regulatory acceptances, please visit https://hydro-int.com/en/products/first-defense

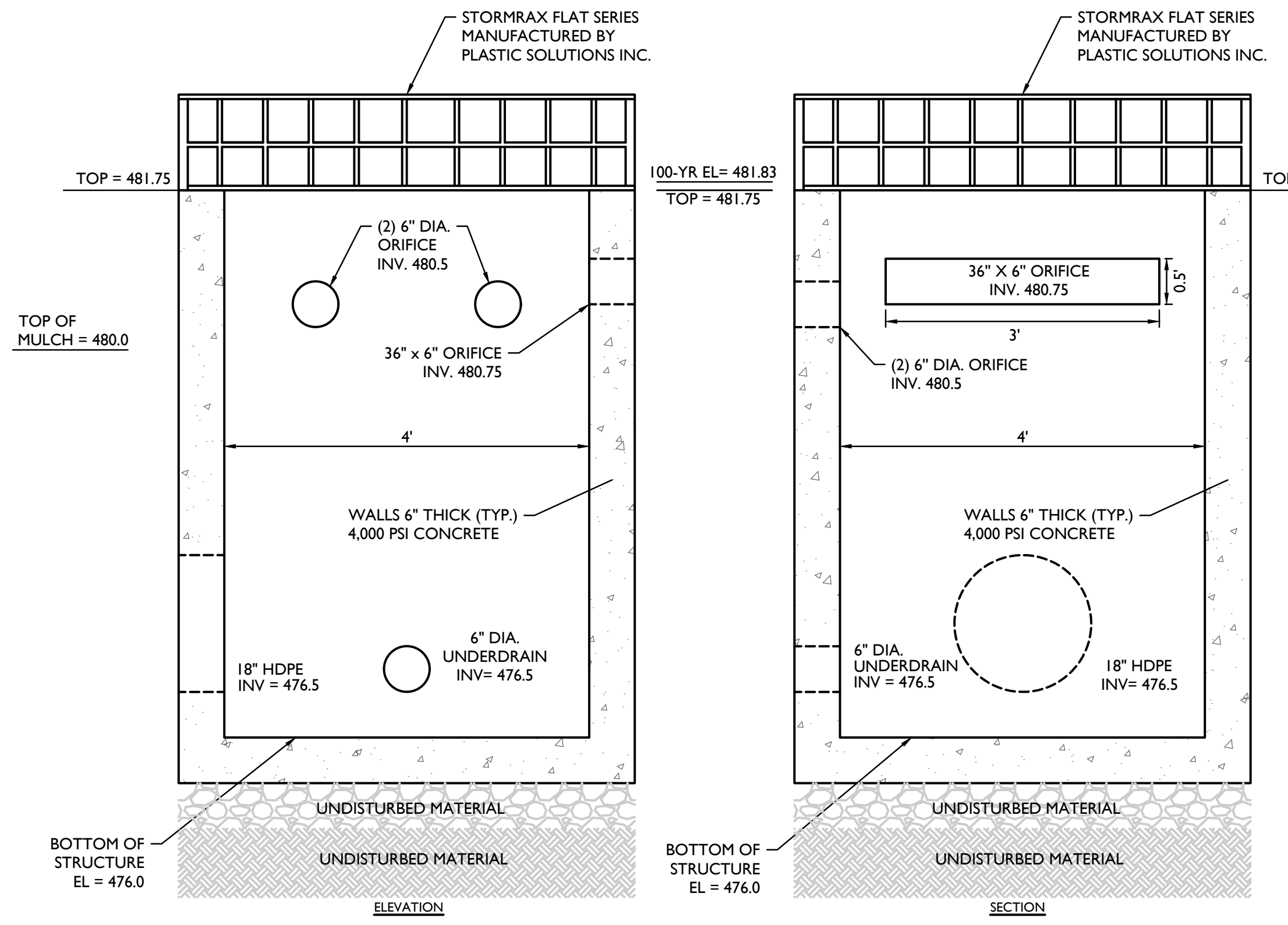
GENERAL NOTES:
1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 24".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plans).
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

PARTS LIST			
ITEM	QTY	SIZE (in)	DESCRIPTION
1	1	96	I.D. PRECAST MANHOLE
2	1		INTERNAL COMPONENTS (PRE-INSTALLED)
3	1	30	FRAME AND COVER (ROUND)
4	1	48 (MAX)	OUTLET PIPE (BY OTHERS)
5	1	48 (MAX)	INLET PIPE (BY OTHERS)

8' DIAMETER FIRST DEFENSE STORMWATER SEPARATOR

MOD: 09/25/20
07/01/19

Site Plans\C-DTLS.dwg\C-18-STRM-DTLS By: TYLER.SCOGNAMIGLIO



BIO-RETENTION BASIN POND-P-2 OUTLET CONTROL STRUCTURE (OCS-S60) DETAIL

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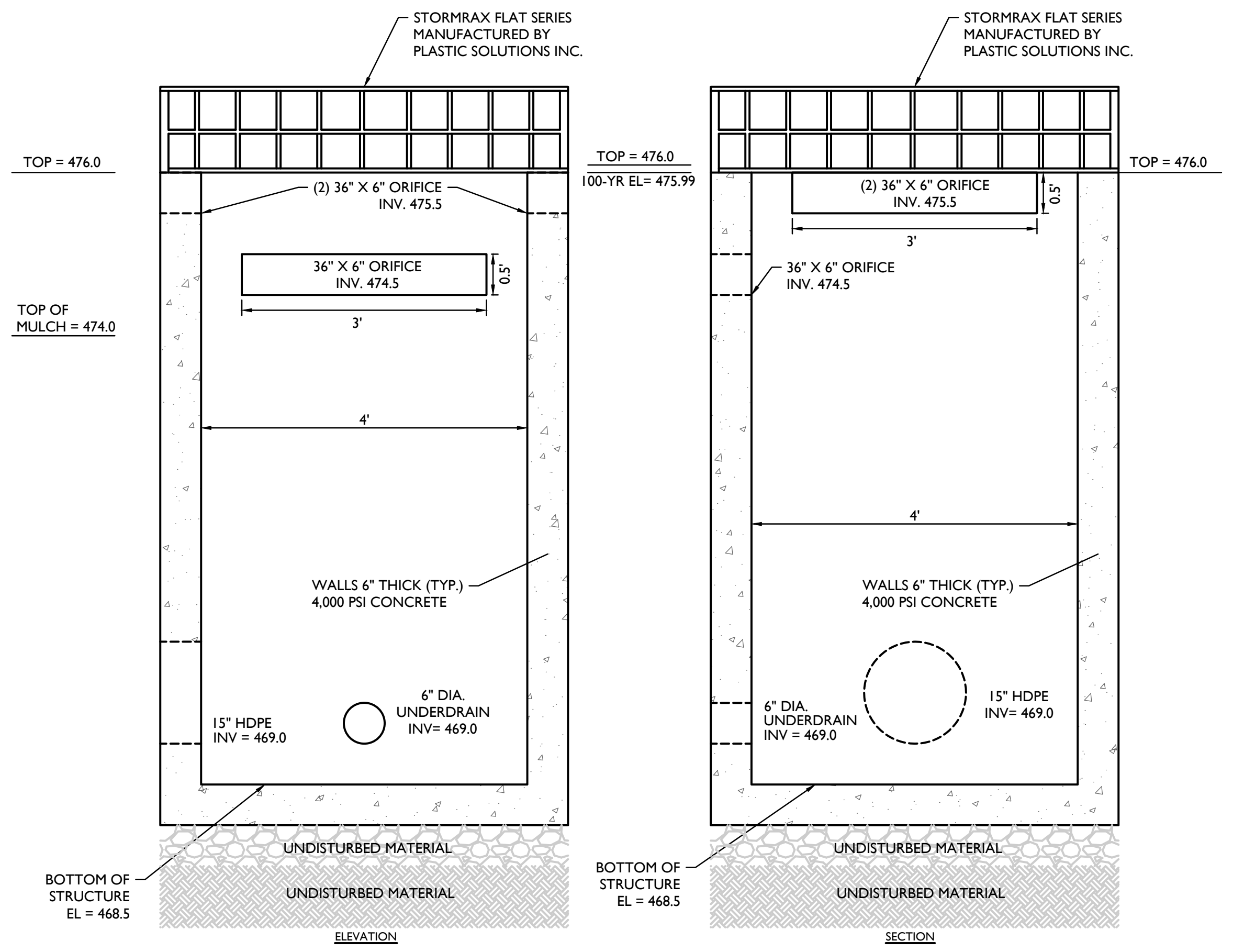
MOD: 02/06/23
07/01/19



BIO-RETENTION BASIN POND-P-3 OUTLET CONTROL STRUCTURE (OCS-S35) DETAIL

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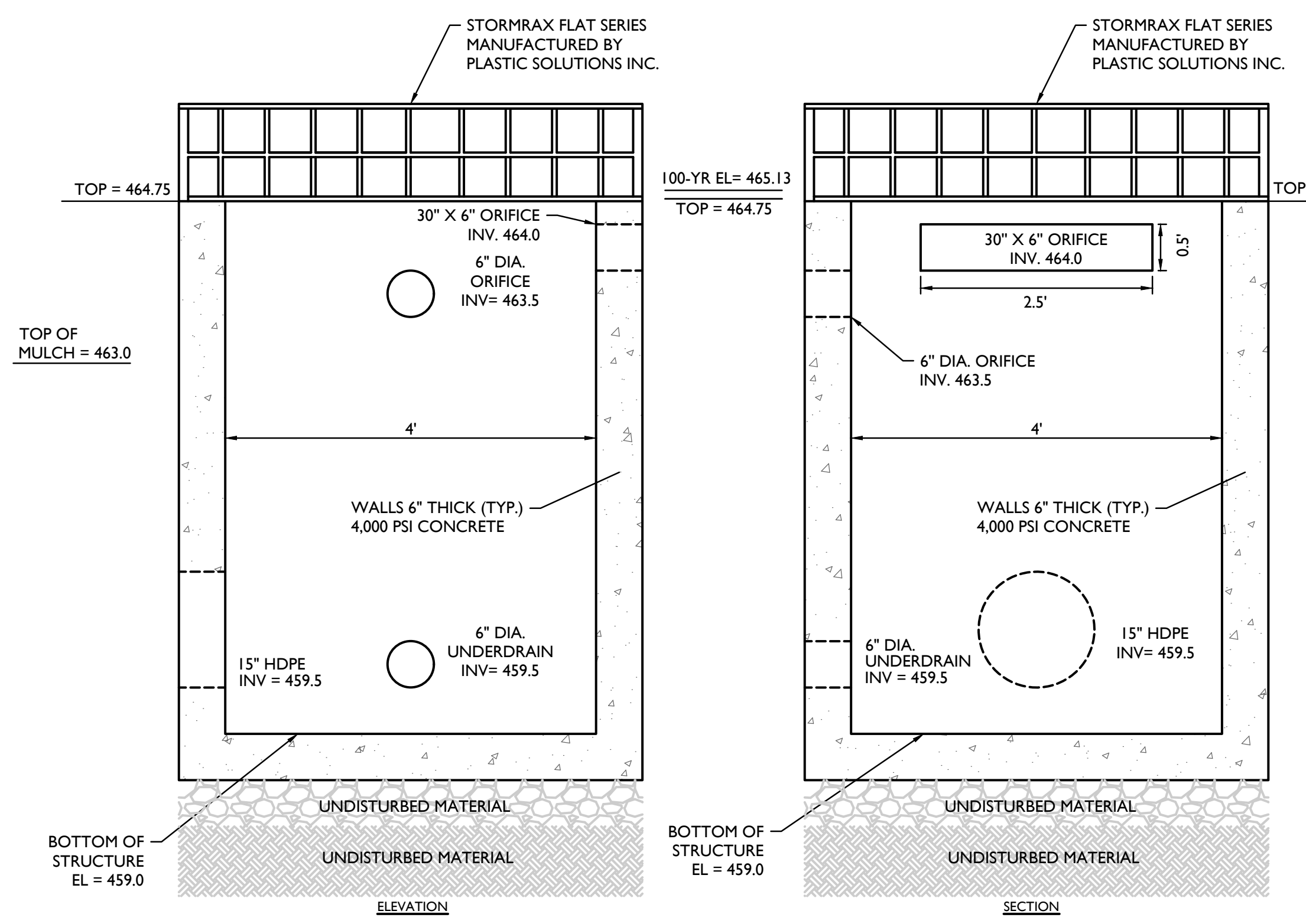
07/01/19



BIO-RETENTION BASIN POND-P-4 OUTLET CONTROL STRUCTURE (OCS-S9) DETAIL

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MOD: 02/06/23
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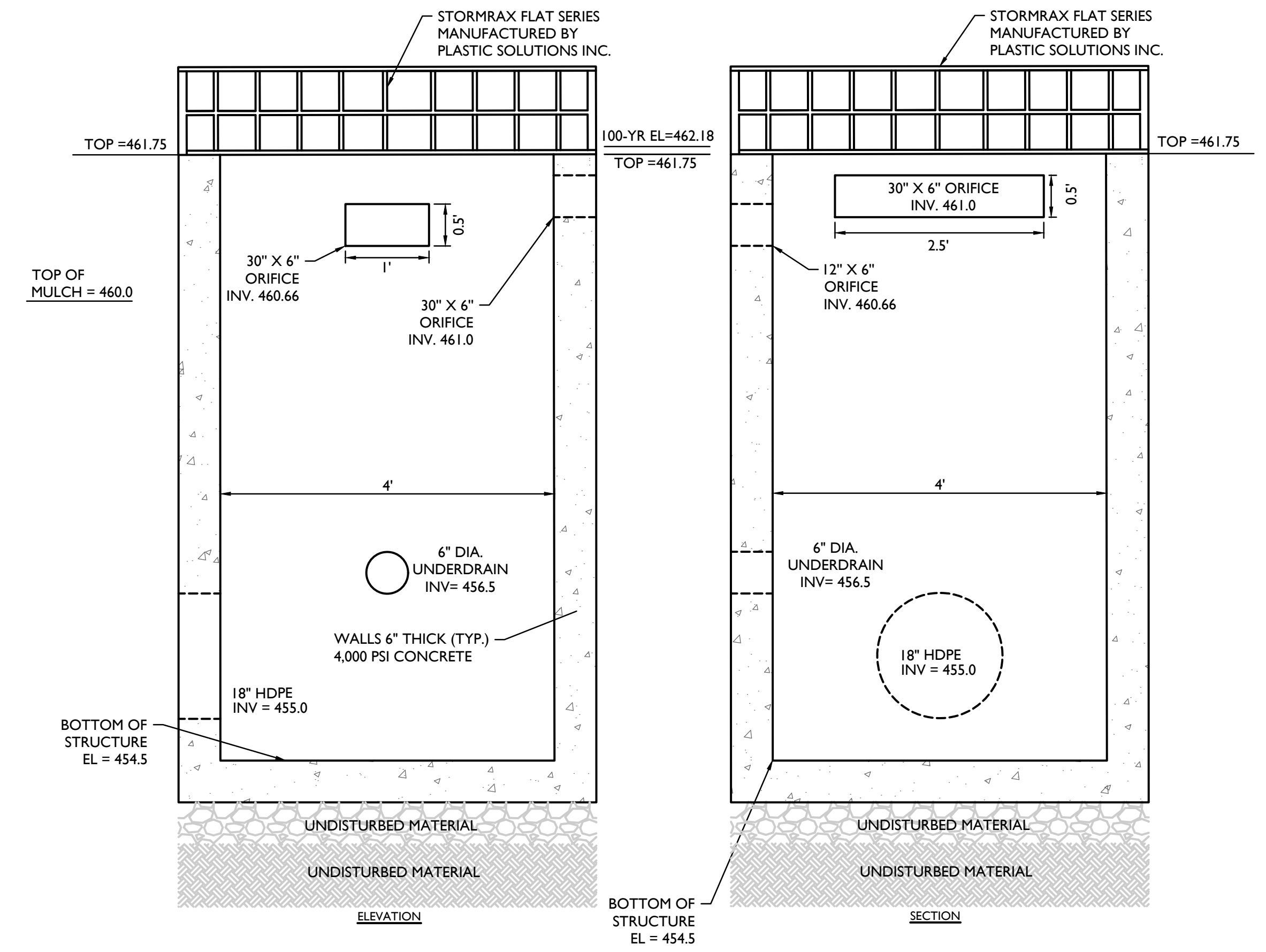

BIO-RETENTION BASIN POND-P-5 OUTLET CONTROL STRUCTURE (OCS-S21) DETAIL

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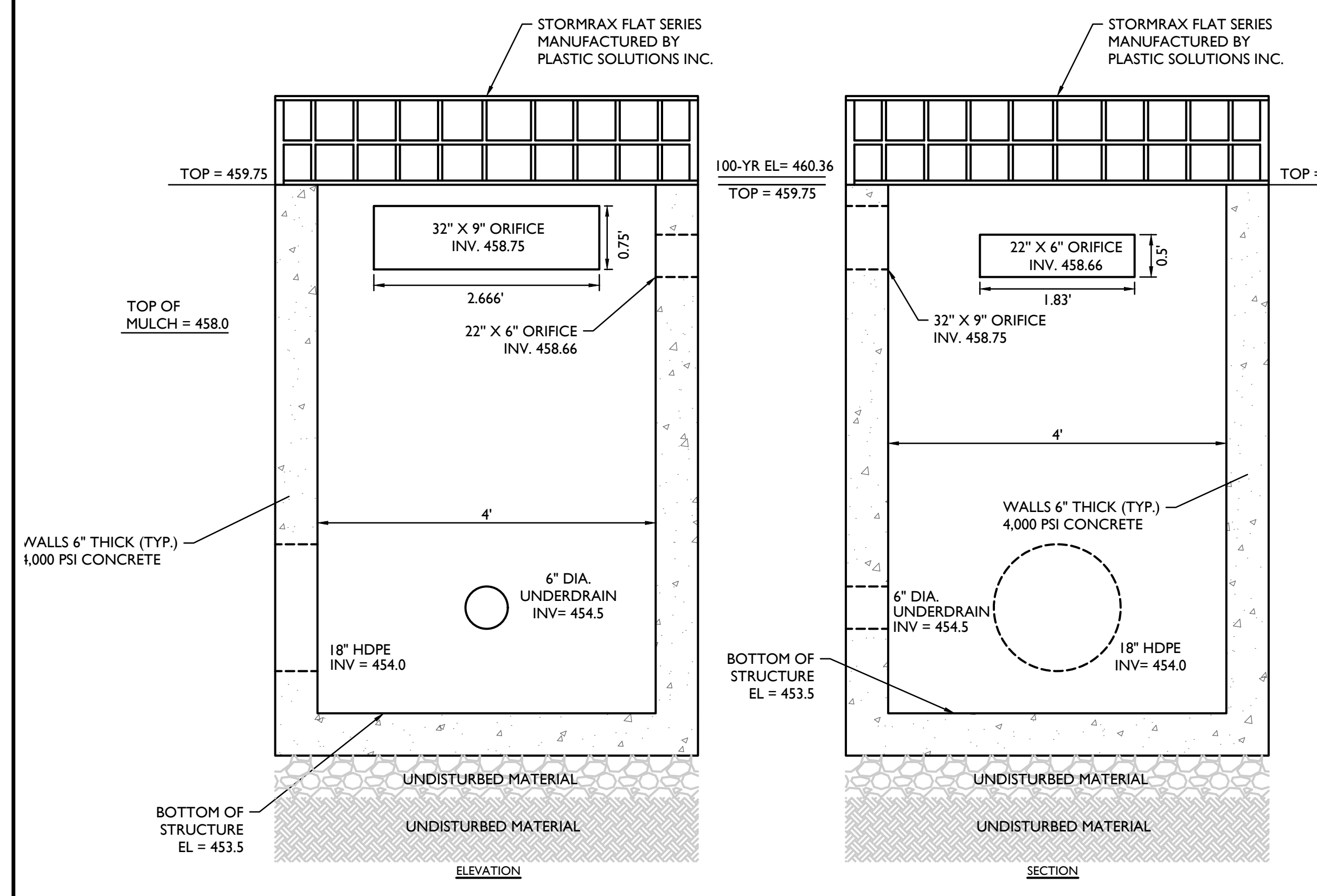
MOD: 02/06/23
07/01/19



BIO-RETENTION BASIN POND-P-6 OUTLET CONTROL STRUCTURE (OCS-S23) DETAIL

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1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS.

UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
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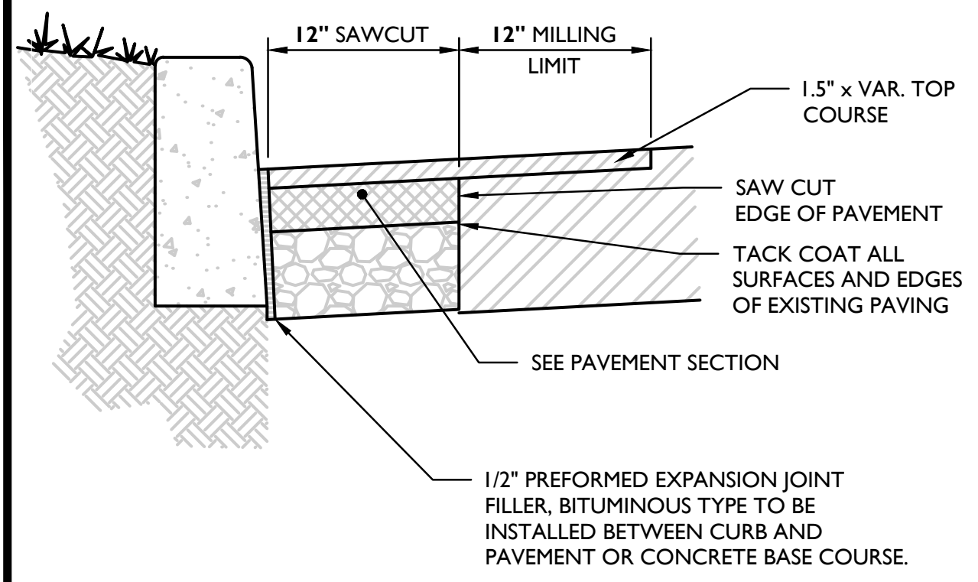
SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER:	DRAWING NAME:
21004268A	C-DTLS

SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
18 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



SAWCUT AND PAVEMENT RESTORATION DETAIL

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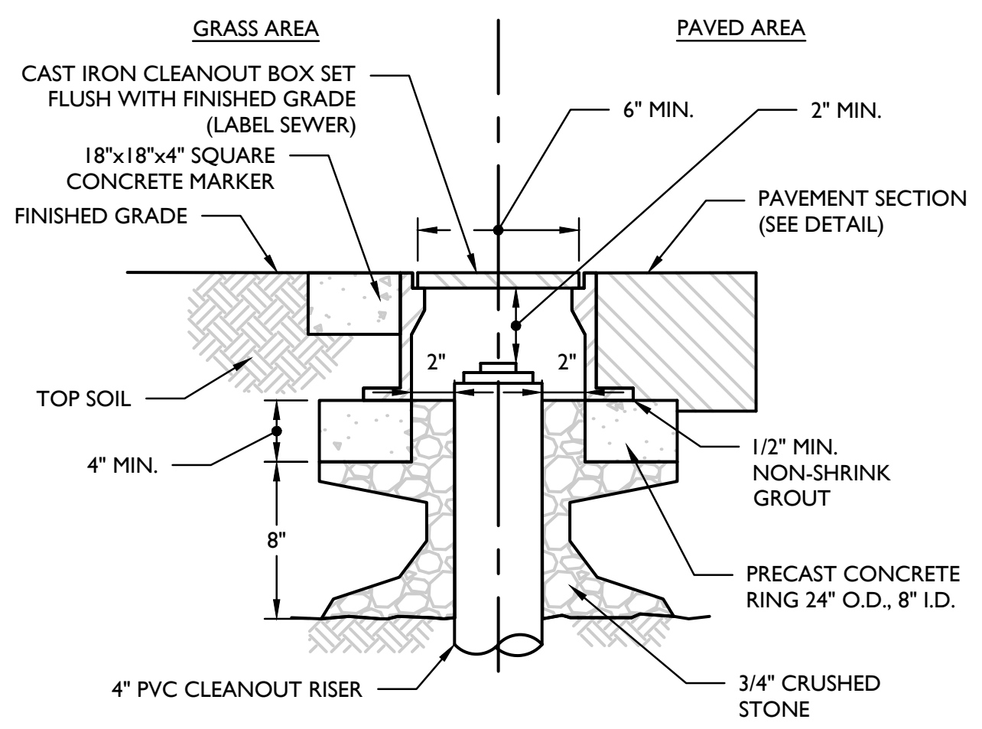
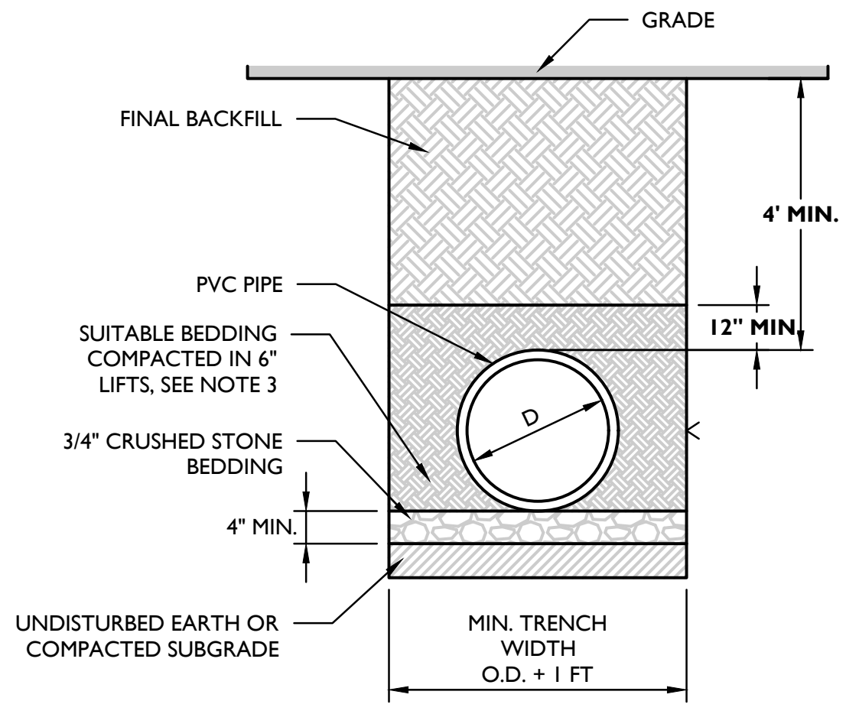


NOTES

1. ALL PVC CLEANOUTS TO HAVE CAST IRON FRAME AND COVER PROTECTION BOX. DESIGN FOR H20 LOADING.

CLEANOUT PROTECTION BOX DETAIL

NOT TO SCALE 07/01/19

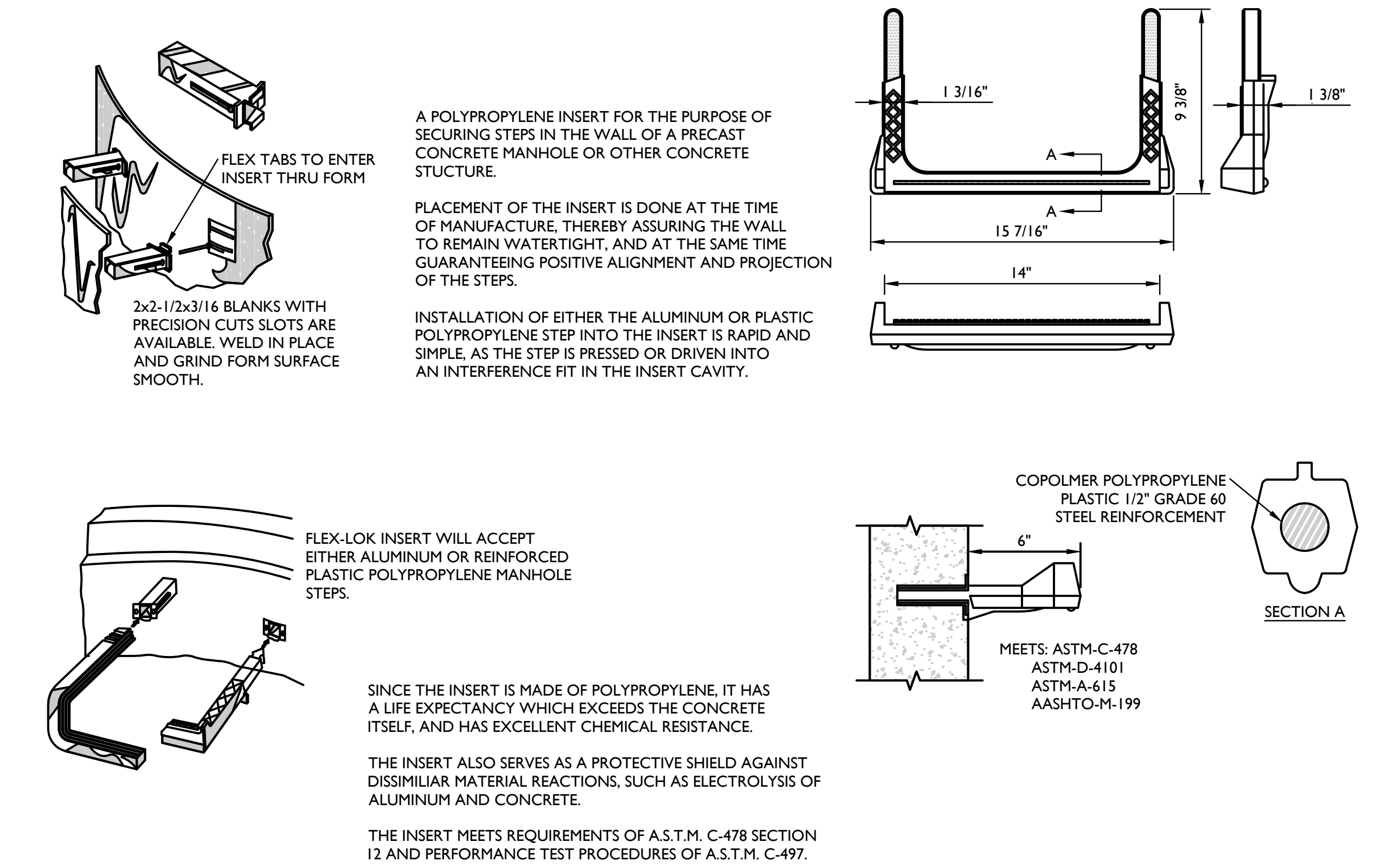


NOTES:

1. ALL PVC GRAVITY PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
2. GRAVITY SANITARY PIPE SHALL BE PVC SDR 35 PER ASTM D3034 OR AS REQUIRED BY THE GOVERNING AUTHORITY.
3. SUITABLE BEDDING MATERIAL SHALL BE COARSE SAND OR $\frac{3}{4}$" CRUSHED STONE.
4. SUITABLE FINAL BACKFILL MATERIAL SHALL BE SITE SOILS, CLEAN FILL, OR ITEM 4 STONE COMPACTED IN MAX. 9" LIFTS. BACKFILL MATERIAL WITHIN 2' OF THE PIPE MUST BE FREE AND CLEAR OF DEBRIS, FROZEN MATERIAL, LARGE CLODS OR STONES, ORGANIC MATTER, OR OTHER UNSUITABLE MATERIALS.
5. STONES LARGER THAN 2" FOUND IN THE TRENCH SHALL BE REMOVED FOR A DEPTH OF AT LEAST 4" BELOW THE PIPE.
6. FOR INSTALLATION IN PAVEMENT, REFER TO THE APPLICABLE PAVEMENT DETAIL TO ESTABLISH FINAL GRADE. BACKFILL REQUIREMENTS BEYOND THE DEPTH OF THE PAVEMENT DETAIL SHALL BE IN ACCORDANCE WITH THIS DETAIL.

PVC SANITARY PIPE BEDDING (GRAVITY) DETAIL

NOT TO SCALE 07/01/19



A POLYPROPYLENE INSERT FOR THE PURPOSE OF SECURING STEPS IN THE WALL OF A PRECAST CONCRETE MANHOLE OR OTHER CONCRETE STUCTURE.

PLACEMENT OF THE INSERT IS DONE AT THE TIME OF MANUFACTURE, THEREBY ASSURING THE WALL TO REMAIN WATERTIGHT, AND AT THE SAME TIME GUARANTEEING POSITIVE ALIGNMENT AND PROJECTION OF THE STEPS.

INSTALLATION OF EITHER THE ALUMINUM OR PLASTIC POLYPROPYLENE STEP INTO THE INSERT IS RAPID AND SIMPLE, AS THE STEP IS PRESSED OR DRIVEN INTO AN INTERFERENCE FIT IN THE INSERT CAVITY.

SINCE THE INSERT IS MADE OF POLYPROPYLENE, IT HAS A LIFE EXPECTANCY WHICH EXCEEDS THE CONCRETE ITSELF, AND HAS EXCELLENT CHEMICAL RESISTANCE.

THE INSERT ALSO SERVES AS A PROTECTIVE SHIELD AGAINST DISSIMILIAR MATERIAL REACTIONS, SUCH AS ELECTROLYSIS OF ALUMINUM AND CONCRETE.

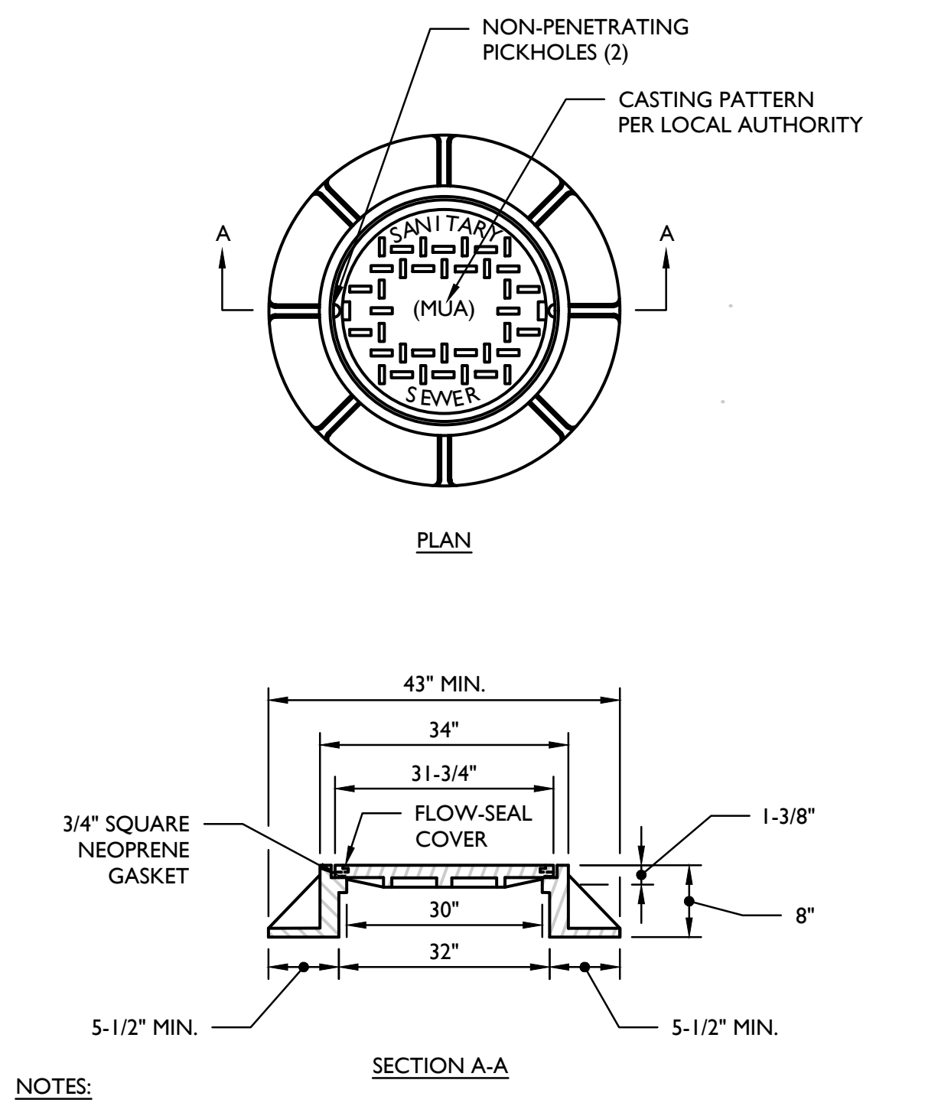
THE INSERT MEETS REQUIREMENTS OF A.S.T.M. C-478 SECTION 12 AND PERFORMANCE TEST PROCEDURES OF A.S.T.M. C-497.

NOTES:

1. STEP INSERTS TO BE AS MANUFACTURED BY A-LOK PRODUCTS OR APPROVED EQUAL.

LADDER RUNG (COPOLYMER) DETAIL

NOT TO SCALE 07/01/19



NOTES:

1. MANHOLE FRAME AND COVER SHALL BE CAMPBELL FOUNDRY PATTERN # **1012B** WITH FLOW-SEAL COVER OR APPROVED EQUAL OR AS OTHERWISE REQUIRED BY JURISDICTIONAL AUTHORITY.
2. MANHOLE FRAME AND COVER TO BE HEAVY DUTY, CONFORMING TO ASTM SPECIFICATION A-48 CLASS 30-B WITH SHOP COAT OF ASPHALTIC PITCH.
3. IN EASEMENTS AND REMOTE AREAS, COVER LOCKING DEVICES OF BRONZE AND KEY SHALL BE PROVIDED.
4. WATERTIGHT MANHOLE FRAME AND COVER SHALL BE PATTERN # **6548** AS MANUFACTURED BY CAMPBELL FOUNDRY COMPANY OR APPROVED EQUAL.

SANITARY MANHOLE FRAME AND COVER DETAIL

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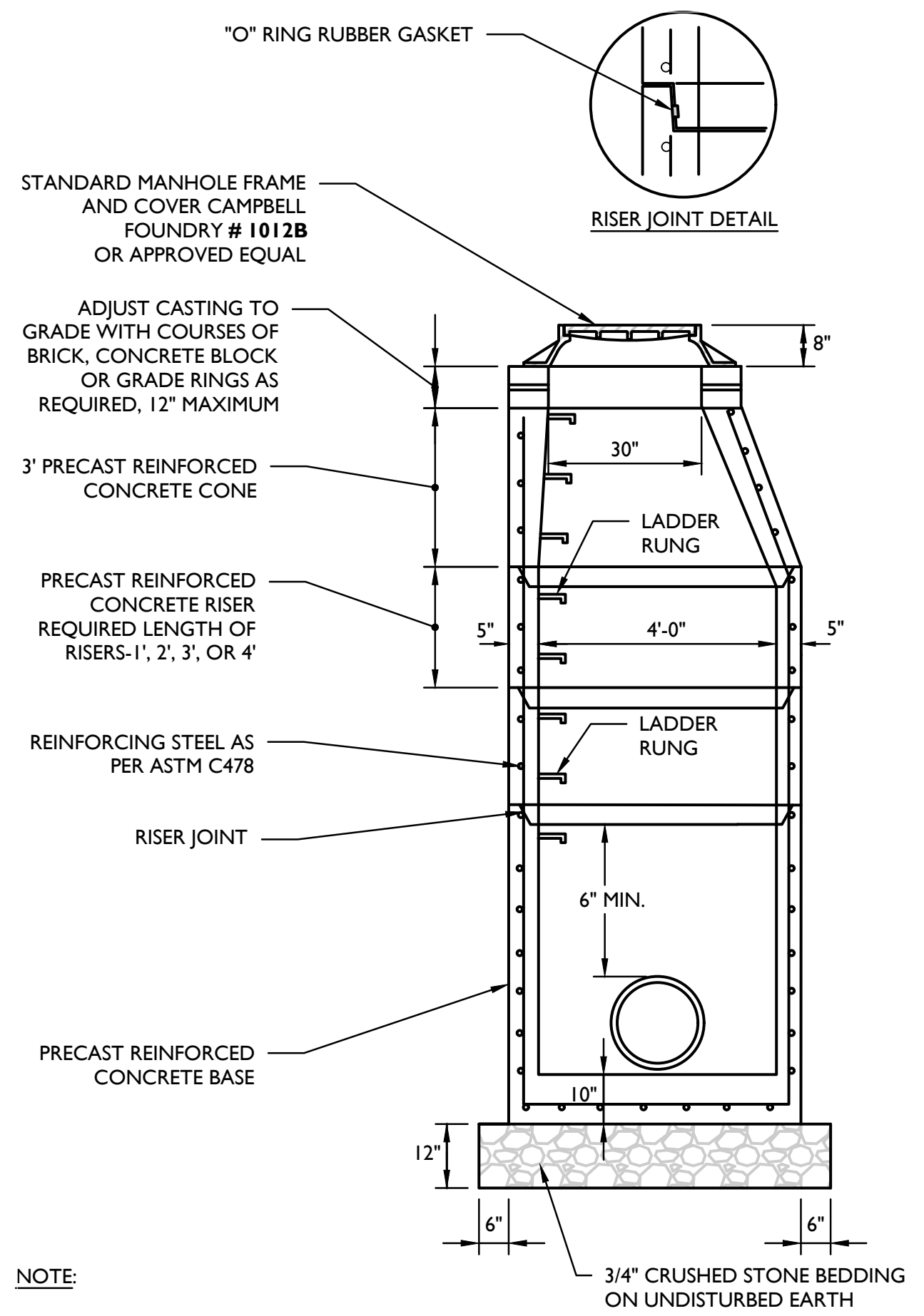
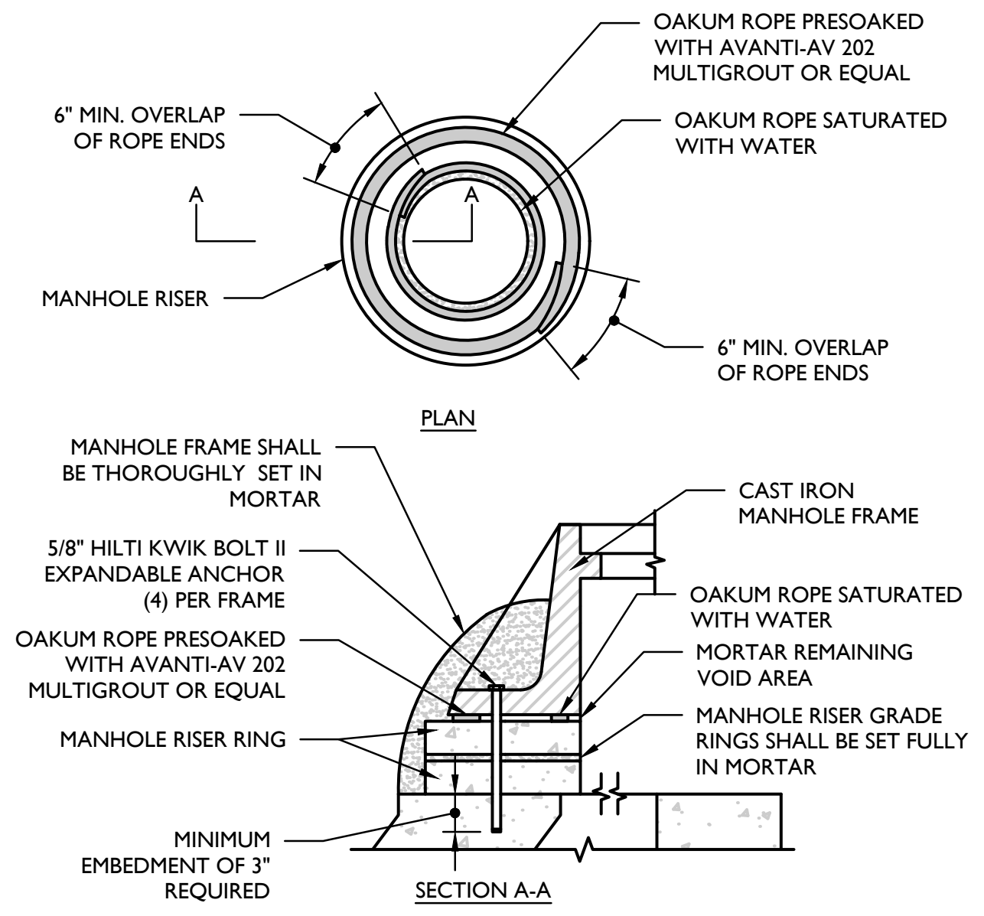


NOTE:

1. IN ACID SOILS, TWO COATS OF BITUMASTIC WATER PROOFING SHALL BE APPLIED PER MANUFACTURER'S SPECIFICATION.
2. ALL CONCRETE TO BE 4,000 PSI.

PRECAST CONCRETE STORM MANHOLE 4' DIA. DETAIL

NOT TO SCALE



SANITARY SEWER MANHOLE FRAME INSTALLATION DETAIL

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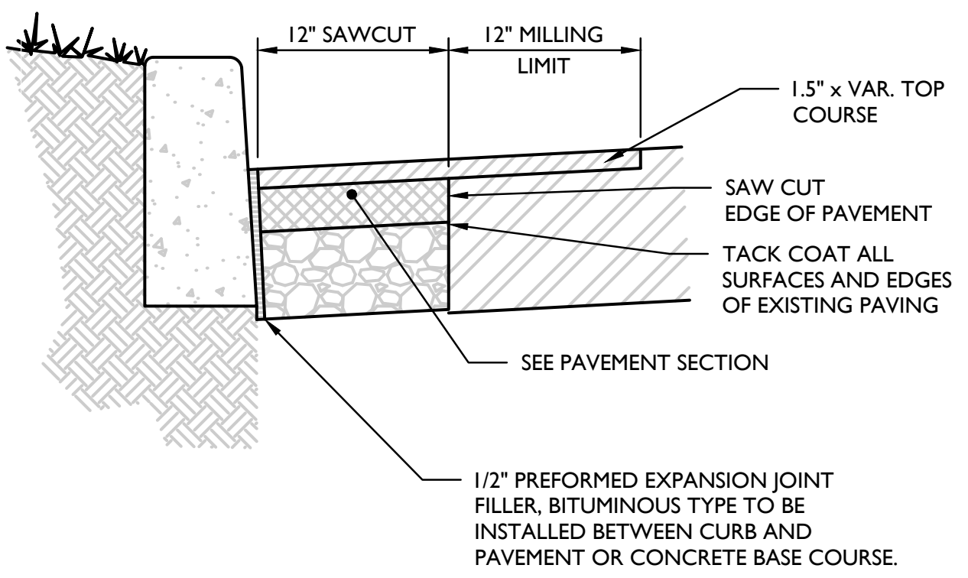

SAWCUT AND PAVEMENT RESTORATION DETAIL

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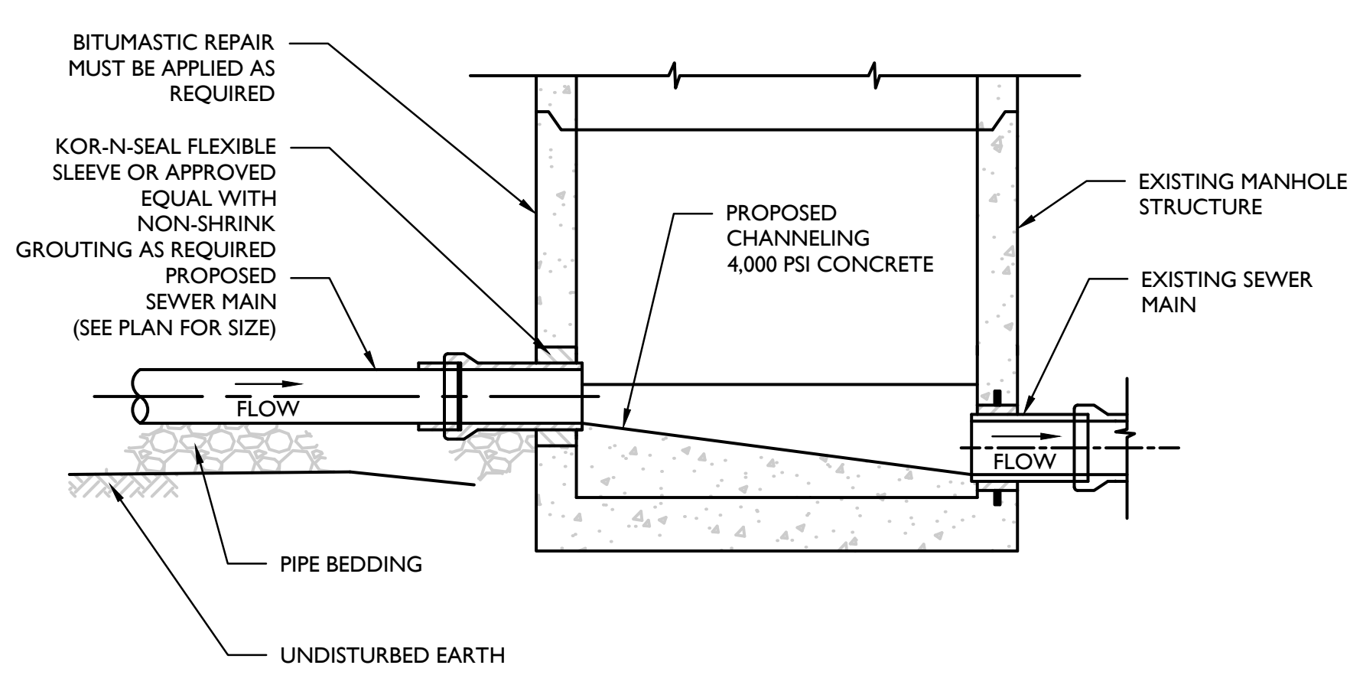

NOTES:

1. CONSTRUCTION OF THE NEW SEWER MAIN SHALL NOT IMPEDE THE OPERATION OF THE EXISTING SEWER.
2. WHERE NEW PIPE IS TO BE CONNECTED INTO AN EXISTING MANHOLE, THE CONTRACTOR SHALL CORE DRILL ALL HOLES INTO MANHOLE AND SHALL PERFORM ALL CUTTING AND PATCHING NECESSARY FOR CHANNEL AND BENCH RECONSTRUCTION TO CHANNEL FLOW INTO EXISTING SEWER.
3. PIPE SHALL BE SEALED USING KOR-N-SEAL MANHOLE ADAPTERS OR APPROVED EQUAL, AND NON-SHRINK GROUT.
4. EXISTING BENCH SHALL BE CHIPPED AND CUT AWAY TO ALLOW FOR NEW CHANNEL TO BE CONSTRUCTED AND TO PROVIDE GOOD, SOUND SURFACE FOR BONDING WITH NEW CONCRETE CHANNEL AND BENCH. REMOVE ALL LOOSE MATERIALS AND CLEAN INSIDE OF THE STRUCTURE.
5. THE CONCRETE USED TO CONSTRUCT BENCHES AND CHANNELS SHALL BE 4,000 PSI CONCRETE APPLY EPOXY BONDING AGENT PRIOR TO POURING CONCRETE.
6. ANY DAMAGE TO THE EXISTING MANHOLE CAUSED BY THE CONSTRUCTION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR.

CONNECTION TO EXISTING MANHOLE DETAIL

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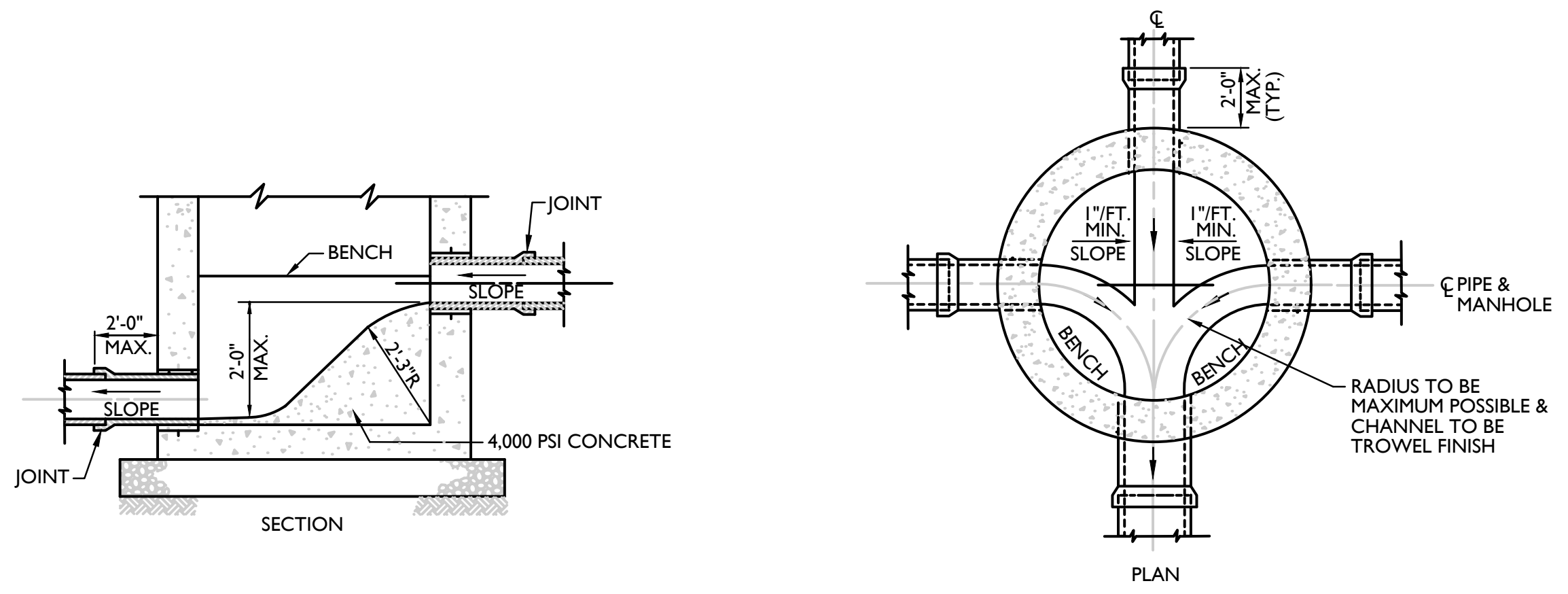

NOTE:

1. MANHOLE CHUTE IS TO BE USED WHERE DIFFERENCE IN INVERT ELEVATIONS BETWEEN INCOMING PIPE AND OUTGOING PIPE IS LESS THAN 2'-0".
2. IF THE DIFFERENCE 2'-0" OR GREATER, THEN EXTERNAL DROP CONNECTION SHALL BE MADE. CHANNELING SHALL BE AS SHOWN ABOVE.

MANHOLE CHUTE DETAIL

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Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DTLS

SHEET TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: 19 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

WATER NOTES:

1. ALL METHODS, MATERIALS, FITTINGS, DEVICES, DIMENSIONAL REQUIREMENTS AND PROCEDURES NECESSARY TO COMPLETE THE WORK SHOWN HEREON SHALL MEET THE APPROPRIATE CURRENT AWWA SPECIFICATIONS IN EFFECT AS WELL AS ALL REQUIREMENTS DEEMED APPLICABLE BY THE MUNICIPALITY OR ANY OTHER GOVERNMENTAL BODY HAVING JURISDICTION OVER SAID WORK.
2. ALL WATER MAIN PIPE SHALL BE AWWA C151/A21.51-02 THICKNESS CLASS FIFTY-TWO (52) CEMENT LINED DUCTILE IRON PUSH-ON (RUBBER GASKET) TYPE; AND INSTALLED WITH THREE (3) BRONZE WEDGES PER JOINT. JOINT INSTALLATION SHALL BE "TYPE 2" AS PRESCRIBED IN THE LATEST REVISION OF AWWA C600. MECHANICAL JOINTS SHALL HAVE RETAINER GLANDS.
3. ALL PIPE FITTINGS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE AWWA SPECIFICATION C153/A21.53-00.
4. ALL GATE VALVES SHALL BE "MUELLER" OR APPROVED EQUAL, RESILIANT-SEATED GATE VALVES WITH MECHANICAL JOINT CONNECTIONS. OPENING SHALL BE LEFT (CCW) AND OPERATION SHALL BE BY 2" SQUARE WRENCH NUT. MINIMUM WORKING PRESSURE SHALL BE 250 PSI. GATE VALVES ARE TO BE IN ACCORDANCE WITH LATEST REVISION OF AWWA SPECIFICATION C509.
5. ALL VALVE BOXES SHALL BE EXTENSION TYPE BY MUELLER SET ON BRICKS AND POSITIONED PERPENDICULAR TO THE PIPE AND ON COMPACTED BACKFILL.
6. ALL CHANGES IN PIPE LINE DIRECTION, BOTH HORIZONTAL AND VERTICAL SHALL BE TIE-RODDED AND MECHANICALLY RESTRAINED AS DIRECTED BY THE ENGINEER.
7. FLUSH OUT ALL WATER MAINS AND APPURTENANCES AS DIRECTED BY THE MUNICIPALITY UNTIL THE WATER RUNS CLEAN AND FREE OF RUST AND DIRT. PRESSURIZE ALL LINES AND APPURTENANCES FOR FORTY-EIGHT (48) HOURS, OR AS DIRECTED BY THE MUNICIPALITY, TO REVEAL ANY LEAKS OR BROKEN PIPE. THIS SHALL ALL BE DONE EITHER AS A TOTAL PROJECT OR BETWEEN VALVED SECTIONS AS DIRECTED BY THE TOWN. IF PRESSURE TESTING REVEALS ANY LEAKS OR DIFFICULTIES THE CONTRACTOR SHALL PROMPTLY UNCOVER THE LEAK OR BROKEN PIPE AND IMMEDIATELY REPAIR AND RETEST SAME. THIS SHALL BE REPEATED AS MANY TIMES AS MAY BE REQUIRED TO DEMONSTRATE A TIGHT LINE TO THE SATISFACTION OF THE TOWN & PROJECT ENGINEER. THE NEW WATER MAIN AND APPURTENANCES SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C-600. RESULTS OF TESTS ARE TO BE SUBMITTED AND ACCEPTED BY THE MUNICIPALITY & PROJECT ENGINEER.
8. THE MUNICIPAL ENGINEER MUST BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO PRESSURE TESTING.
9. ALL WATER LINES AND APPURTENANCES SHALL BE DISINFECTED TO THE SATISFACTION OF THE MUNICIPALITY, PROJECT ENGINEER, AND IN ACCORDANCE WITH THE STANDARDS OF THE DEPT. OF HEALTH. THIS SHALL ALSO BE DONE IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C651. A MINIMUM OF TWO (2) BACTERIAL TESTS TAKEN TWENTY-FOUR (24) HOURS APART ARE REQUIRED. RESULTS OF TESTS ARE TO BE SUBMITTED AND ACCEPTED BY THE MUNICIPALITY & PROJECT ENGINEER. DISINFECTION PROCEDURE, FEED LOCATIONS, AND SAMPLE LOCATIONS MUST BE REVIEWED AND APPROVED BY THE MUNICIPALITY & PROJECT ENGINEER PRIOR TO TESTING.
   AS PER AWWA C651, LATEST REVISION, WATER MAIN DISINFECTION PROCEDURE SHALL, GENERALLY, BE AS FOLLOWS:
   - A. INSPECTING MATERIALS TO BE USED TO ENSURE THEIR INTEGRITY.
   - B. PREVENTING CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR AND NOTING POTENTIAL CONTAMINATION AT THE CONSTRUCTION SITE.
   - C. REMOVING, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAIN.
   - D. CHLORINATING ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSHING THE CHLORINATED WATER FROM THE MAIN.
   - E. PROTECTING THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW CAUSED BY HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
   - F. DOCUMENTING THAT AN ADEQUATE LEVEL OF CHLORINE CONTACTED EACH PIPE TO PROVIDE DISINFECTION.
   - G. DETERMINING THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
   - H. FINAL CONNECTION OF THE APPROVED NEW WATER SERVICE TO THE ACTIVE DISTRIBUTION SYSTEM.

   THE CONTINUOUS-FEED METHOD SHALL BE IMPLEMENTED FOR CHLORINATION, AS DESCRIBED IN AWWA C651, LATEST REVISION. AFTER CHLORINATION, THE CONTRACTOR SHALL FLUSH THE MAINS AS PER FINAL FLUSHING REQUIREMENTS OF AWWA C651, LATEST REVISION. WHEN CUTTING INTO OR REPAIRING AN EXISTING MAIN, DISINFECTION PROCEDURES SHALL BE OBSERVED AS DETAILED IN DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS OF AWWA C651, LATEST REVISION. THE TABLET METHOD FOR INTRODUCING CHLORINE TO THE SYSTEM SHALL NOT BE PERMITTED.

   VERIFICATION SHALL BE ACCOMPLISHED VIA BACTERIOLOGICAL TESTS. AFTER FINAL FLUSHING AND BEFORE THE NEW WATER MAIN IS CONNECTED TO THE DISTRIBUTION SYSTEM, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES, TAKEN AT LEAST 24 HR APART, SHALL BE COLLECTED FROM THE NEW MAIN. AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED FROM EVERY 1,200 FT OF THE NEW WATER MAIN, PLUS ONE SET FROM THE END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH. SAMPLES SHALL BE TESTED FOR BACTERIOLOGICAL (CHEMICAL AND PHYSICAL) QUALITY IN ACCORDANCE WITH STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, AND SHALL SHOW THE ABSENCE OF COLIFORM ORGANISMS AND THE PRESENCE OF A CHLORINE RESIDUAL. SAMPLES FOR BACTERIOLOGICAL ANALYSIS SHALL BE COLLECTED IN STERILE BOTTLES TREATED WITH SODIUM THIOSULFATE, AS REQUIRED BY STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER. NO HOSE OR FIRE HYDRANT SHALL BE USED IN THE COLLECTION OF SAMPLES. THERE SHOULD BE NO WATER IN THE TRENCH UP TO THE CONNECTION FOR SAMPLING. THE SAMPLING PIPE MUST BE DEDICATED AND CLEAN AND DISINFECTED AND FLUSHED PRIOR TO SAMPLING. A CORPORATION COCK MAY BE INSTALLED IN THE MAIN WITH A COPPER-TUBE GOOSENECK ASSEMBLY. AFTER SAMPLES HAVE BEEN COLLECTED, THE GOOSENECK ASSEMBLY MAY BE REMOVED AND RETAINED FOR FUTURE USE. IF SAMPLES RESULTS FROM THE LAB INDICATE A MEASURED HPC GREATER THAN 500 COLONY-FORMING UNITS (CFU) PER ML, FLUSHING SHOULD BE RESUMED AND ANOTHER COLIFORM AND HPC SET OF SAMPLES SHOULD BE TAKEN UNTIL NO COLIFORMS ARE PRESENT AND THE HPC IS LESS THAN 500 CFU/ML THE RECORD OF COMPLIANCE SHALL BE THE BACTERIOLOGICAL TEST RESULTS CERTIFYING THAT THE WATER SAMPLED FROM THE NEW WATER MAIN IS FREE OF COLIFORM BACTERIA CONTAMINATION AND IS EQUAL TO OR BETTER THAN THE BACTERIOLOGIC WATER QUALITY IN THE DISTRIBUTION SYSTEM.

   ALL OTHER REQUIREMENTS OF AWWA C651, LATEST REVISION, SHALL BE OBSERVED.
10. WATER SERVICE CROSSING SEWER OR STORM SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER OR STORM. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER OR STORM AS POSSIBLE. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SEWER MAY BE REQUIRED.
11. WATER SERVICE SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWER MAIN OR SERVICE.
12. WATER TIGHT PLUGS ARE TO BE INSTALLED IN THE ENDS OF PIPES WHEN WORK IS NOT IN PROGRESS.
13. LEAKAGE AND HYDROSTATIC PRESSURE TESTING SHALL BE PERFORMED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICHEVER IS GREATER.
14. THE MAXIMUM DEFLECTION ALLOWED ALLOWED AT PIPE JOINTS SHALL BE LIMITED TO 80% OF THAT ALLOWED BY AWWA OR IN ACCORDANCE WITH THE MUNICIPALITY. FOR AWWA ALLOWABLE JOINT DEFLECTIONS SEE LATEST REVISION OF AWWA SPECIFICATION C600.
15. CONSTRUCTION MUST CONFORM TO ALL ORDINANCES.
16. CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING WATER AND OTHER UTILITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
17. CONTRACTOR TO CALL UNDERGROUND MARK-OUT PRIOR TO COMMENCEMENT OF CONSTRUCTION AT 1-800-962-7962 FOR COMPLETE UTILITIES MARK-OUT.
18. CONTRACTOR TO CONTACT WATER DEPARTMENT AT LEAST 2 DAYS PRIOR TO CONSTRUCTION.
19. ALL IMPROVEMENTS SHALL BE INSPECTED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK AND CERTIFICATION SHALL BE PROVIDED TO THE MUNICIPALITY THAT THE SUBJECT IMPROVEMENTS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS.
20. CONTRACTOR TO NOTIFY ENGINEER OF ANY DEVIATION FROM THE HORIZONTAL OR VERTICAL ALIGNMENTS WITH REGARDS TO EXISTING UTILITIES.
21. A CERTIFIED AS BUILT MAP OF THE WATER SYSTEM IMPROVEMENTS SHALL BE PROVIDED TO THE MUNICIPALITY'S WATER DEPARTMENT BY A LICENSED DESIGN PROFESSIONAL.

NUMBER AND SIZE OF RODS REQUIRED AND PIPE LENGTH IN FEET TO BE RESTRAINED

PIPE SIZE IN INCHES	90° TEE OR DEAD END PLUG			45° BEND			22½° BEND		
	No.	SIZE	L*	No.	SIZE	L*	No.	SIZE	L*
4	2	¾"	30'	2	¾"	10'	2	¾"	5'
6	2	¾"	40'	2	¾"	10'	2	¾"	5'
8	4 or 2	¾" or ⅞"	50'	2	¾"	15'	2	¾"	5'
10	4 or 2	¾" or 1"	60'	2	¾"	20'	2	¾"	5'
12	4	⅞"	70'	2	¾"	20'	2	¾"	5'
14	4	1"	80'	2	¾"	25'	2	¾"	5'
16	4	1"	80'	2	¾"	25'	2	¾"	5'

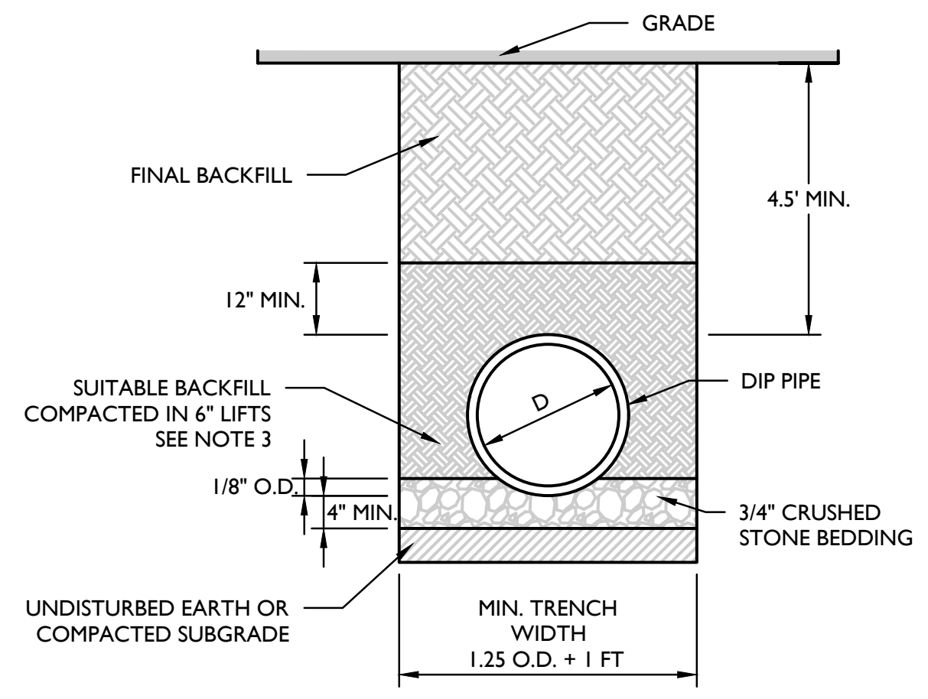
L* = LENGTH OF PIPE TO BE RESTRAINED IS FOR EACH SIDE OF BEND

NOTES:

1. USE OF MECHANICAL JOINT RETAINER GLANDS SHALL PROVIDE A THRUST RESTRAINT SYSTEM EQUIVALENT TO THAT LISTED IN THE TABLE FOR CLAMPS AND RODS.
2. LENGTHS ARE BASED ON THE FOLLOWING CRITERIA: 150 PSI MAXIMUM PRESSURE AND 3'-6" 0F COVER, THEREFORE THE CALCULATION IS CONSERVATIVE FOR THE PROPOSED MIN. 4'-6" COVER. TABLE IS FOR USE WITH CAST IRON PIPE OR DUCTILE IRON PIPE ONLY. IF TEST CONDITIONS ARE MORE SEVERE OR LARGER PIPES ARE PROPOSED, THEN SPECIAL COMPUTATIONS MUST BE PROVIDED BY LICENSED PROFESSIONAL ENGINEER.

JOINT RESTRAINT SCHEDULE DETAIL

NOT TO SCALE 07/01/19



NOTES:

1. ALL PIPE SYSTEMS AND BACKFILL SHALL BE INSTALLED IN ACCORDANCE WITH ANSI/AWWA C600.
2. WATER MAIN PIPE SHALL BE CEMENT LINED DUCTILE IRON PIPE (DIP) PRESSURE CLASS 150, THICKNESS CLASS 52 WITH ASPHALTIC EPOXY TYPE COATING, INSTALLED W/ THREE (3) BRONZE WEDGES PER JOINT FOR CONDUCTIVITY.
3. SUITABLE BACKFILL MATERIAL SHALL BE SAND, WELL GRADED GRAVEL < 2", OR 3/4" CRUSHED STONE.
4. SUITABLE FINAL BACKFILL MATERIAL SHALL BE SITE SOILS, CLEAN FILL, 3/4" CRUSHED STONE, OR ITEM 4 STONE - COMPACTED IN MAX. 9" LIFTS.
5. STONES LARGER THAN 2" FOUND IN THE TRENCH SHALL BE REMOVED FOR A DEPTH OF AT LEAST 4" BELOW THE PIPE.
6. FOR INSTALLATION IN PAVEMENT, REFER TO THE APPLICABLE PAVEMENT DETAIL TO ESTABLISH FINAL GRADE. BACKFILL REQUIREMENTS BEYOND THE DEPTH OF THE PAVEMENT DETAIL SHALL BE IN ACCORDANCE WITH THIS DETAIL.
7. MAXIMUM ALLOWABLE DEFLECTION AT PIPE JOINTS SHALL BE LIMITED TO 80% OF THE VALUES PUBLISHED IN AWWA C600, LATEST REVISION.

DIP WATER PIPE BEDDING DETAIL

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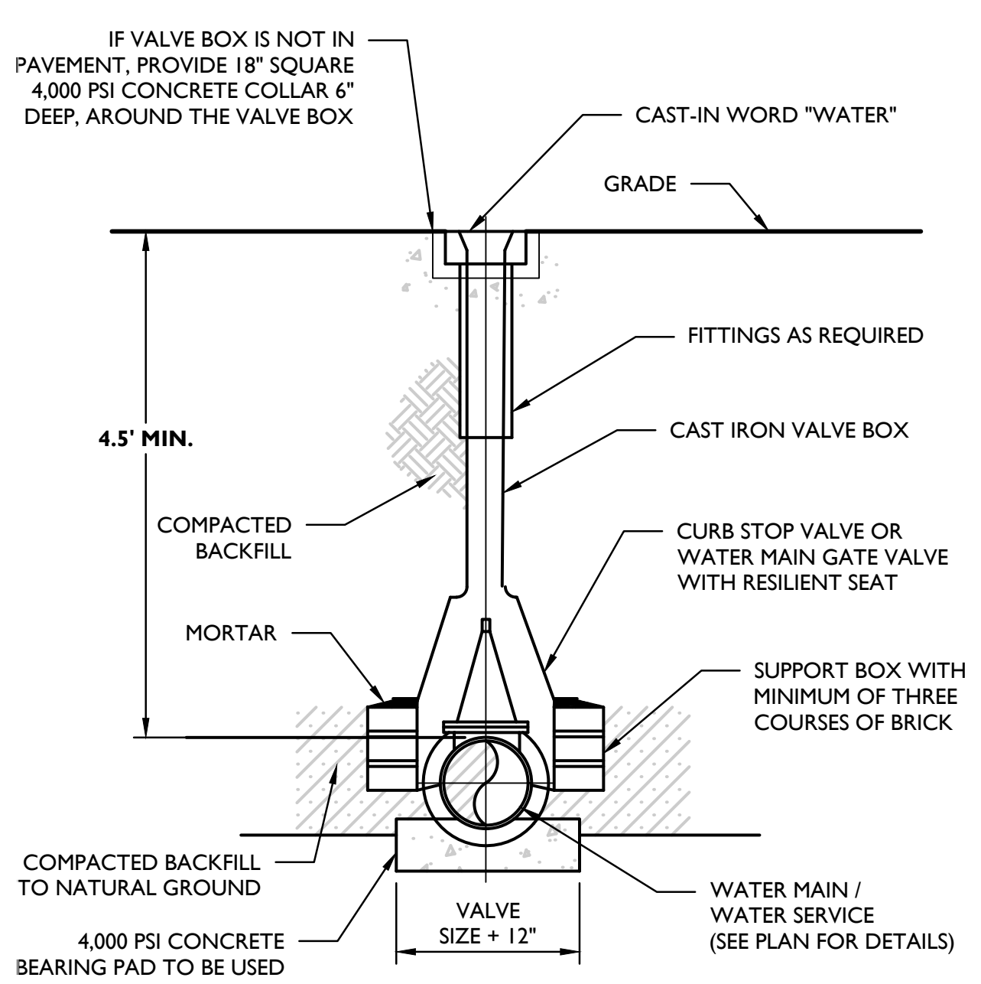

NOTES:

1. VALVE BOX SHOULD HAVE EXTENSION IF WATER MAIN OR SERVICE IS PLACED DEEPER THAN 5 FEET.
2. VALVE BOX SHALL BE MUELLER SLIP/EXTENSION TYPE WITH ARCH PATTERN BASE, OR APPROVED EQUAL.
3. VALVES TO BE RESILIENT-SEATED GATE VALVES CONFORMING TO THE LATEST EDITION OF AWWA C509 STANDARD SPECIFICATIONS, MODEL MUELLER #2360 OR APPROVED EQUAL.

WATER VALVE BOX DETAIL

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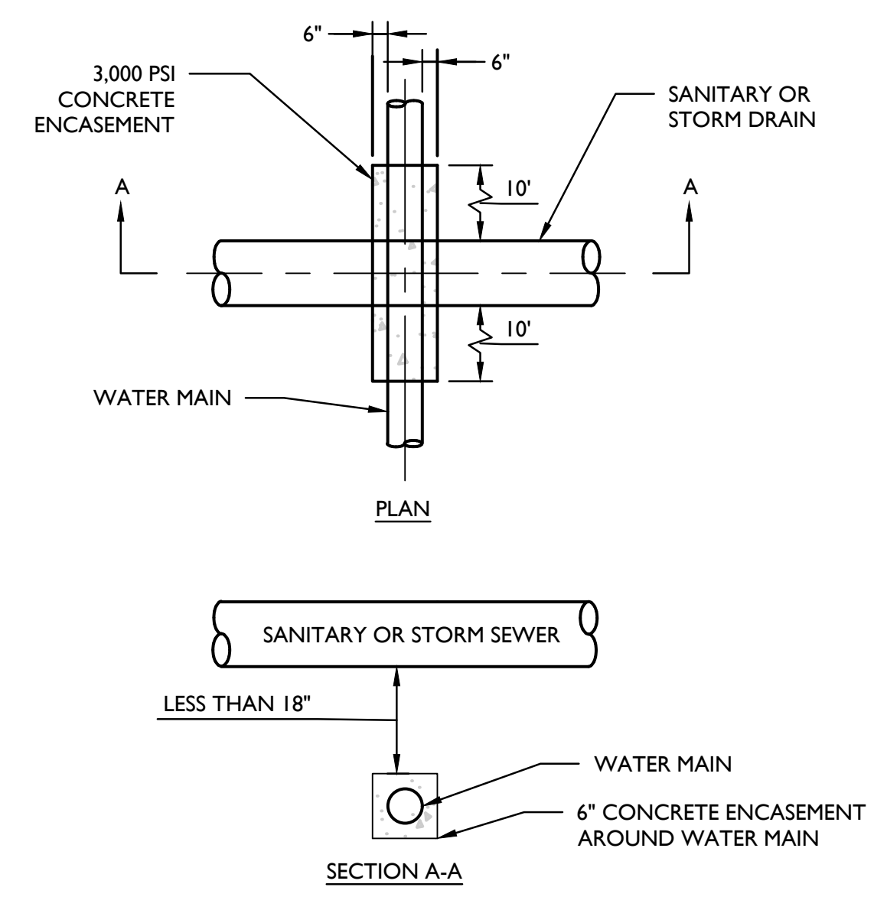

WATER MAIN ENCASEMENT DETAIL

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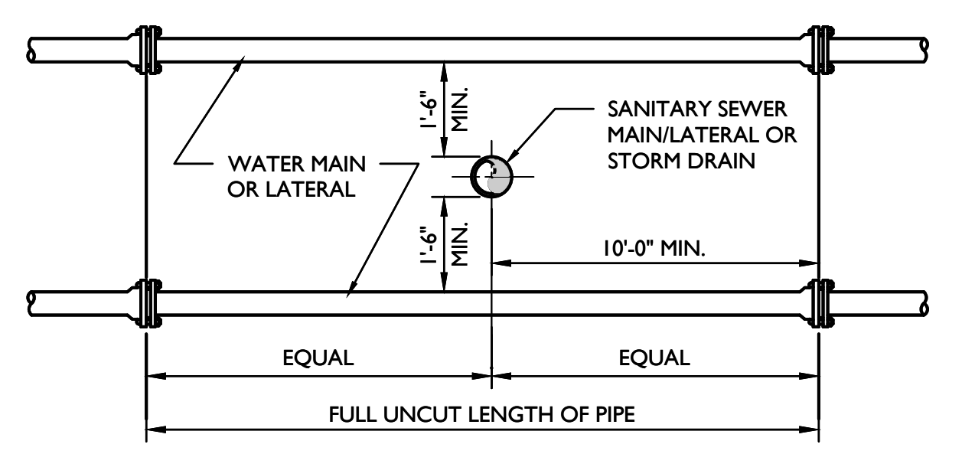
LIST OF STANDARD WATER SUPPLY MATERIALS

MOD: 04/23/21
07/01/19

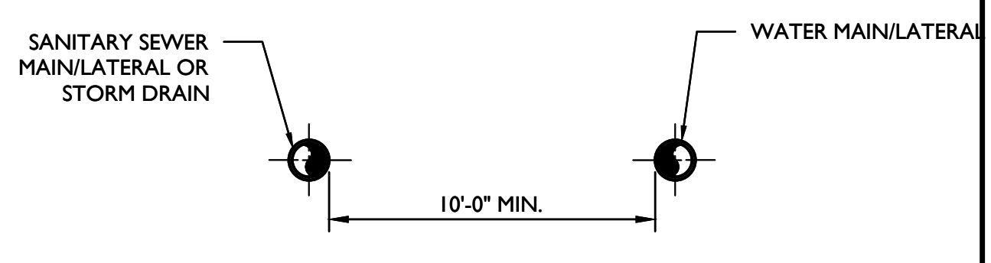
ANY EXCEPTIONS TO THE MATERIALS LISTED BELOW SHALL BE APPROVED IN WRITING BY THE ENGINEER.

HYDRANTS	MUELLER SUPER CENTURION 250 #A-421, 2 HOSE NOZZLES AND 1 PUMPER NOZZLE
VALVES	MUELLER TYPE A-2630 RESILIENT WEDGE GATE VALVES, NRS-AWWA C509
VALVE BOXES	CAST IRON, SLIP/EXTENSION TYPE, ARCH PATTER BASE, AND AT LEAST 5 ¼" IN DIAMETER
PIPE	CLASS 52 DUCTILE IRON PIPE CEMENT LINED & SEALED W/ MECHANICAL OR PUSH-ON JOINT CONNECTIONS
TAPPING SLEEVE	MUELLER #H-615, DUCTILE IRON CLASS 250 OR MUELLER #H-304SS STAINLESS STEEL
TAPPING VALVE	MUELLER #T-2361 CLASS 250
MECHANICAL JOINT RESTRAINTS	EBAA's IRON MEGALUG SERIES 1100
FITTINGS	DUCTILE IRON MECHANICAL JOINT FITTINGS

NOTE:
ALL UTILITY WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARDS AND DETAILS OF THE MUNICIPALITY.



VERTICAL SEPARATION



HORIZONTAL SEPARATION

NOTE :
1. NO DEVIATION IN THE SEPARATION REQUIREMENTS WILL BE PERMITTED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER.

SANITARY/STORM SEWER-WATER MAIN SEPARATION DETAIL

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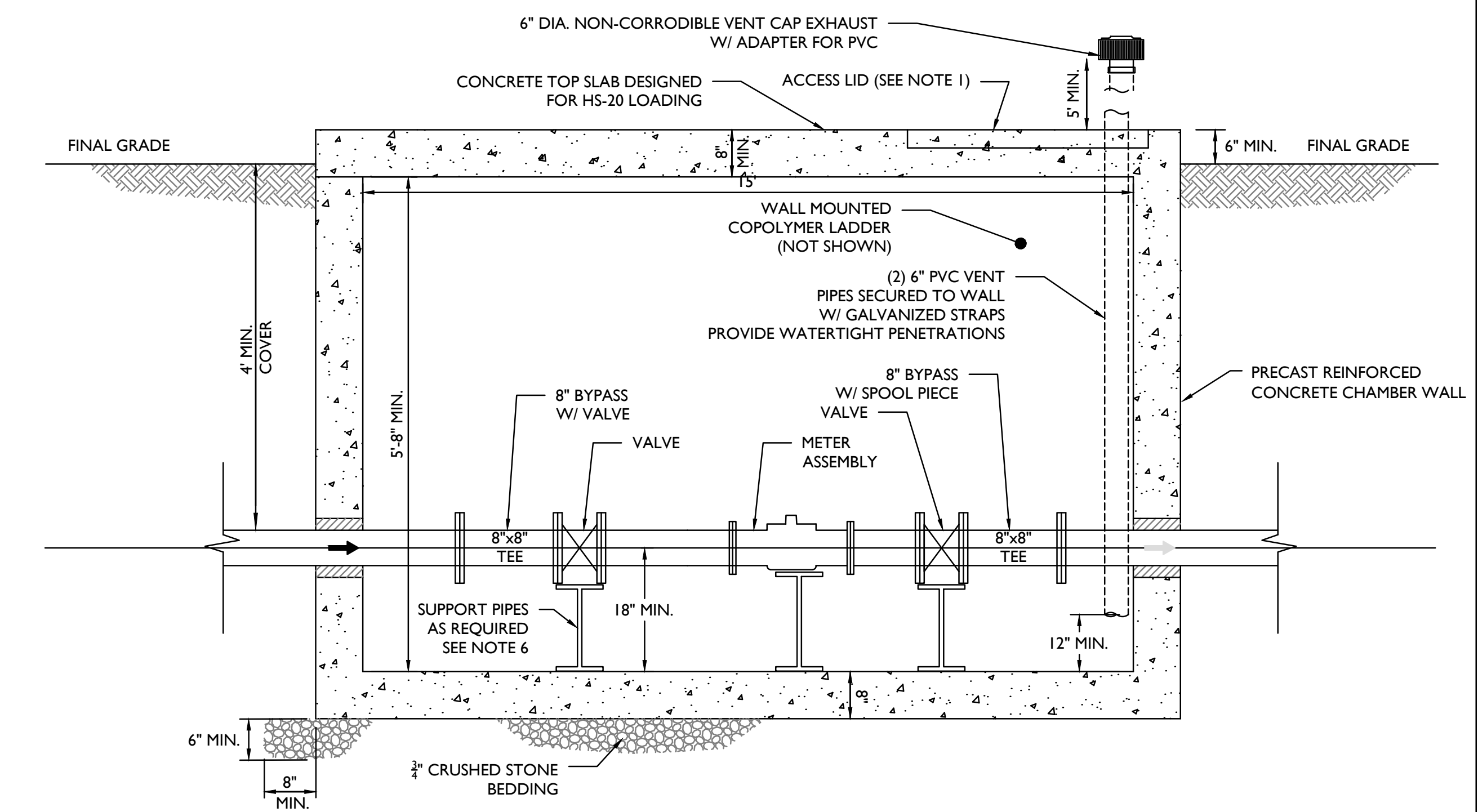
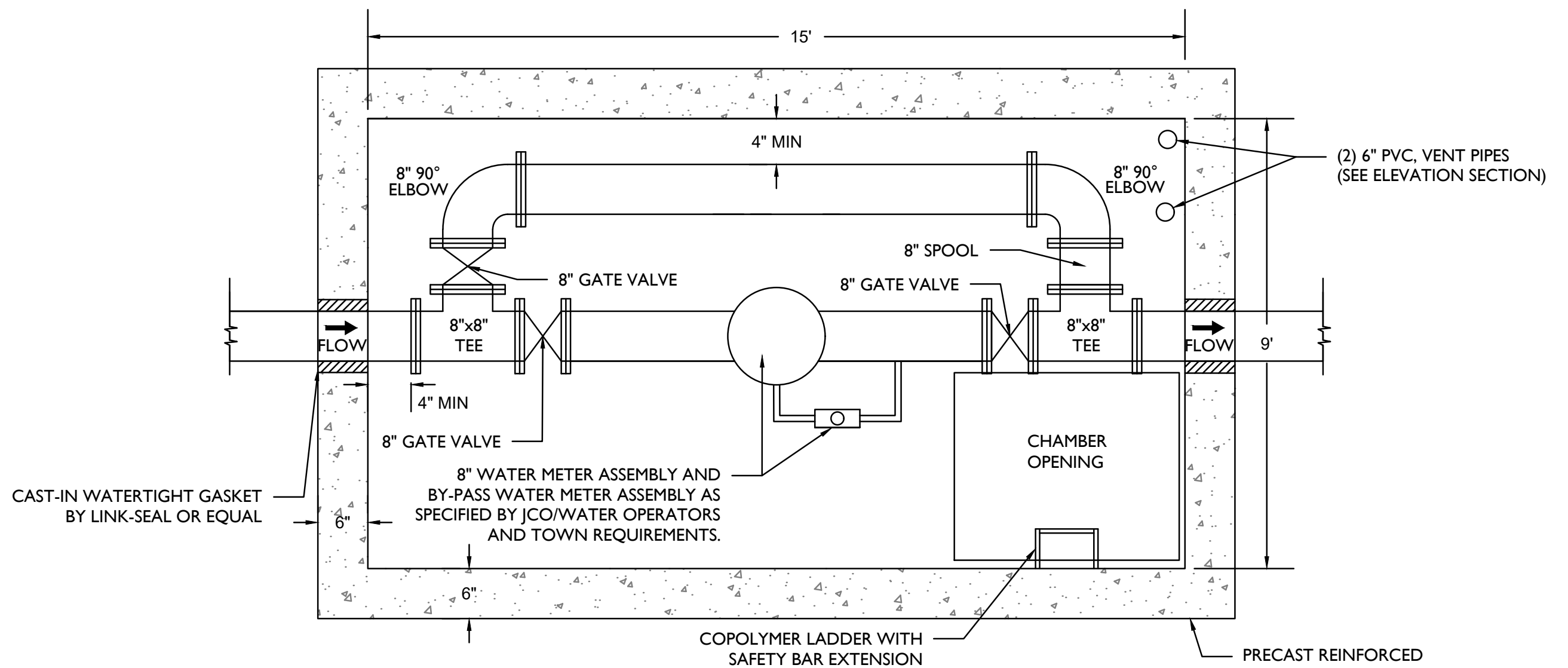


ELEVATION VIEW



PLAN VIEW

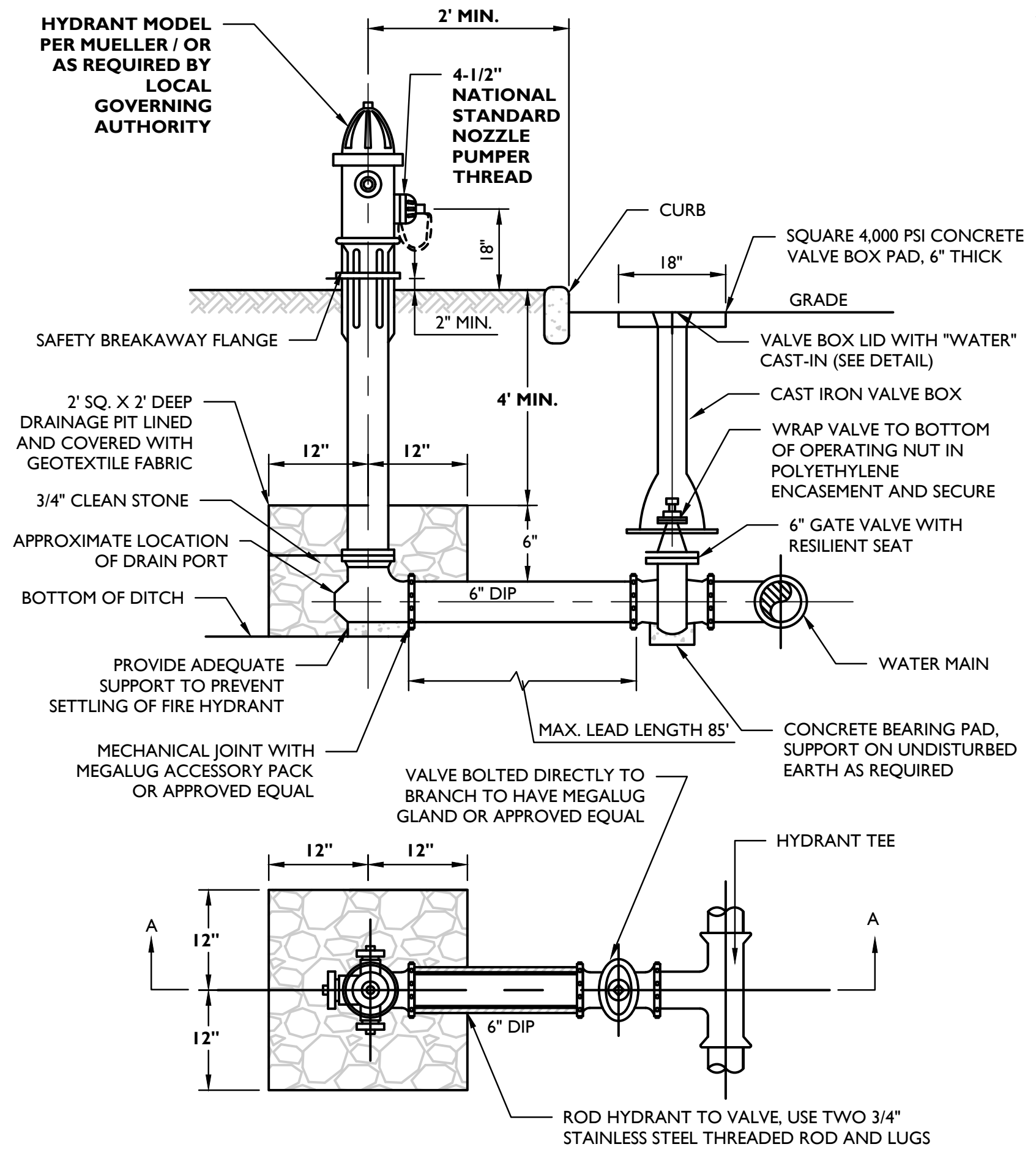
NOTES:

1. ACCESS TO CHAMBER BY 36"X30" TYPE PCM-3 FLUSH WATERTIGHT SIDEWALK DOOR AS MANUFACTURED BY BILCO, OR APPROVED EQUAL.
   - LADDER SHALL BE POLYPROPYLENE VAULT LADDER W/ SAFETY BAR EXTENSION BY LANE INTERNATIONAL, OR APPROVED EQUAL. LADDER MUST BE ANCHORED TO WALL PER MANUFACTURER SPECIFICATIONS.
   - ENTIRE CHAMBER INSIDE AND OUTSIDE MUST BE COMPLETELY WATERPROOFED.
   - GRADE AROUND CHAMBER MUST BE PITCHED TO DRAIN WATER AWAY FROM CHAMBER TOP.
   - "LADDER-UP" SAFETY POST BY BILCO OR APPROVED EQUAL SHALL BE PROVIDED.
   - ACCESS TO HAVE LOCKABLE DOOR.
2. ALL CHAMBER AND PIPING CONSTRUCTION SUBJECT TO WATER DEPARTMENT APPROVAL PRIOR TO SERVICE CONNECTION.
3. ALL 3" AND LARGER CONNECTIONS WITHIN THE METER CHAMBER SHALL BE FLANGED TYPE CONNECTIONS, UNLESS OTHERWISE NOTED.
4. ALL CONNECTIONS OUTSIDE THE METER CHAMBER SHALL BE AS SPECIFIED FOR BURIED WATER LINES.
5. ALL GATE VALVES TO OPEN LEFT (COUNTERCLOCKWISE).
6. PIPE/EQUIPMENT SYSTEM TO BE ADEQUATELY SUPPORTED WITHIN THE CHAMBER TO THE SATISFACTION OF THE MUNICIPALITY.
7. MINIMUM STRENGTH 4,000 PSI CONCRETE WITH ADEQUATE STEEL REINFORCEMENT TO WITHSTAND H20 HIGHWAY LOAD AND SOIL LOADS.
8. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR PRECAST AND ALL APPURTENANCES FOR REVIEW AND APPROVAL.
9. PROPER SIGNAGE SHALL BE DISPLAYED TO INDICATE THAT THIS VAULT IS A CONFINED SPACE AND ALL APPLICABLE ENTRY RULES APPLY.
10. WATER METER AND READING EQUIPMENT AS SPECIFIED BY JCO/WATER OPERATORS AND TOWN REQUIREMENTS.
11. BACKFLOW PREVENTION DEVICES TO BE INSTALLED INSIDE OF THE PROPOSED BUILDINGS (DESIGN BY OTHERS).

WATER METER PIT DETAIL

MCNY-UTIL-WATR-1100

MOD: 07/29/20
07/01/19



NOTES:

1. HYDRANT SHALL BE **MUELLER SUPER CENTURION 250 #A-421** TRAFFIC MODEL DESIGN WITH THE FOLLOWING SPECIFICATION.
   - A. SAFETY COUPLED STANDPIPE.
   - B. 6" MECHANICAL JOINT INLET CONNECTION
   - C. TWO 2-1/2" NATIONAL STANDARD THREAD HOSE NOZZLES.
   - D. ONE 4-1/2" NATIONAL STANDARD THREAD STEAMER NOZZLE, FACING THE ROAD.
   - E. HYDRANT OPERATORS AND HYDRANT NOZZLE CAP NUTS SHALL BE IN ACCORDANCE WITH AWWA/ANSI STANDARD C502.
   - F. HYDRANT HOSE CAPS SHALL BE ATTACHED BY MEANS OF CHAINS.
   - G. HYDRANT BARRELS SHALL BE PAINTED - **RED**, BONNETS - **YELLOW**, AND NOZZLE CAPS - **BLACK** TO INDICATE THE AVAILABLE FIRE FLOW OR AS IN ACCORDANCE WITH THE LOCAL REQUIREMENTS.
   - H. HYDRANTS SHALL OPEN COUNTER-CLOCKWISE.
2. STANDPIPE (BREAK-AWAY) COUPLING SHALL NOT EXCEED A MAXIMUM OF 5 INCHES FROM THE TOP OF THE CURB TO THE BOTTOM OF COUPLING.
3. THE DRAIN VALVE SHALL BE CLEAR OF ANY OBSTRUCTIONS, AND 3/4" CLEAN GRAVEL BE PLACED FROM THE BOTTOM OF THE HYDRANT TO A POINT 6" ABOVE THE HYDRANT LATERAL PIPE. HYDRANT DRAINS SHALL NOT BE CONNECTED TO OR LOCATED WITHIN 10' OF ANY SANITARY SEWERS OR STORM DRAINS. IF HYDRANT DRAIN IS LOCATED WITHIN 2 FEET OF HIGH GROUNDWATER, DRAIN SHALL BE PLUGGED. IF PLUGGED, PROPER SIGNAGE MUST BE INSTALLED TO INDICATE THAT THE BARRELS MUST BE PUMPED DRY AFTER EACH USE.
4. BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE LOCAL JURISDICTION.
5. GATE VALVE SHALL BE **6" U.S. PIPE METROSEAL 250 R/S** (RESILIENT SEALED) MECHANICAL JOINT END (RIGHT HAND) OR APPROVED EQUAL.
6. WATER LATERAL SHALL BE 6" DUCTILE IRON CEMENT LINED CLASS 52 PIPE.
7. TIE ROD SHALL BE 3/4" DIAMETER TIE ROD WITH EYE BOLTS - TWO REQUIRED (SIDE VIEW SHOWN). RESTRAIN ALL JOINTS ON HYDRANT TEE, VALVE, AND HYDRANT LEAD.
8. HYDRANT TEE SHALL BE U.S. PIPE CATALOG #U-592 TRIM-TYTE DUCTILE IRON, MECHANICAL JOINT OR AN APPROVED EQUAL SUBSTITUTE.

FIRE HYDRANT (VALVE IN PAVEMENT) DETAIL

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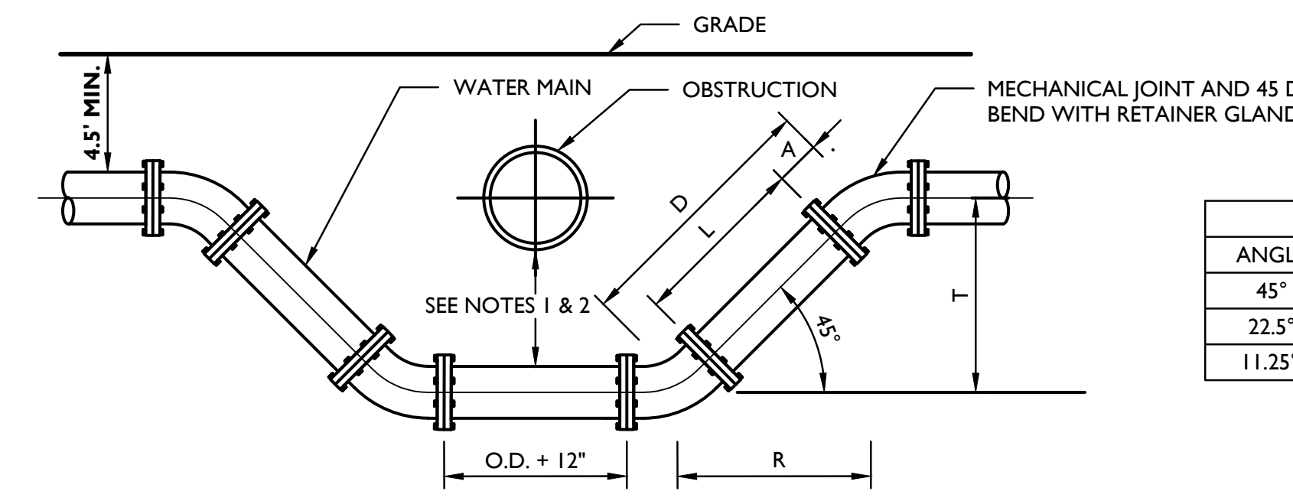

MECHANICAL JOINTS			
ANGLE	D =	R =	L =
45°	T x 1.414	T x 1.000	D-2A
22.5°	T x 2.613	T x 2.414	D-2A
11.25°	T x 5.126	T x 5.027	D-2A

NOTES:

1. WATER MAIN MAY CROSS ABOVE OBSTRUCTION IF **4.5'** MINIMUM COVER IS MAINTAINED ABOVE THE WATER MAIN AND FINISH GRADE.
2. MINIMUM VERTICAL SEPARATION BETWEEN SANITARY OR STORM SEWER TO WATER MAIN SHALL BE 18" IF THE HORIZONTAL SEPARATION IS LESS THAN 10'. BETWEEN WATER MAIN AND OTHER UTILITIES, THE MINIMUM VERTICAL SEPARATION SHALL BE 12".
3. WATER MAIN SHALL BE SIZE AND MATERIAL SPECIFIED ON THE PLAN, WITH MECHANICAL JOINT OR PUSH-ON AND ALL FITTINGS BE CAST IRON MECHANICAL JOINT.
4. OFFSETS MAY BE SUBSTITUTED FOR A "T" OF UP TO 24" IF APPROVED BY THE ENGINEER.
5. THRUST RESTRAINT SHALL BE PROVIDED AT ALL BENDS OR OTHER POINTS OF PIPE DIRECTION CHANGE.

WATER CROSSING UNDER UTILITY DETAIL

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TOWN OF WAWAYANDA
PLANNING BOARD

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REV	DATE	DRAWN BY	DESCRIPTION
1	2/6/2023	CPM	REVISED PER PLANNING BOARD COMMENTS

UNAUTHORIZED ALTERATION OR ADDITION TO A PLAN BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER IS A VIOLATION OF ARTICLE 145, SECTION 7209, SUB-DIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Andrew B. Fetherston
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 073555-01
COLLIERS ENGINEERING & DESIGN CT, P.C.
N.Y. C.O.A #: 0017609

SITE PLANS

FOR

MID DOLSONTOWN, LLC

SBL 6-1-107
&
6-1-90.1

TOWN OF WAWAYANDA
ORANGE COUNTY
NEW YORK

Colliers Engineering & Design

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	2/4/2022	MAS	CPM

PROJECT NUMBER: 21004268A
DRAWING NAME: C-DTLS

SHEET TITLE:
CONSTRUCTION DETAILS

SHEET NUMBER:
20 of 20

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Section 7

TOWN OF WAWAYANDA PLANNING BOARD

ENVIRONMENTAL ASSESSMENT FORM NARRATIVE
MID DOLSONTOWN, LLC (“Applicant”)

TOWN OF WAWAYANDA, ORANGE COUNTY
MC-1 (Mixed Commercial) zoning district

TAX LOTS: 6-1-107 and 6-1-90.1 (the “Site”)
February 9, 2022

PROPOSED ACTION

The proposed project will consist of the construction of two warehouse/distribution facilities on two existing parcels, which will be combined via a lot line change to be approximately 44.3 acres in size. The Site has frontage along Dolsontown Road to the north and borders Interstate 84 to the south. The Site is proposed to host one 54,000 square foot warehouse/distribution facility with 1,500 square feet of office space and one 244,400 square foot warehouse/distribution facility with 7,500 square feet of office space. The warehouses are located on Dolsontown Road, tax lots 6-1-107 and 6-1-90.1 (the “Project”). The Project is consistent with the Town of Wawayanda Comprehensive Plan and complies with Wawayanda’s Zoning Law.

The Project is within the Town of Wawayanda MC-1 (Mixed Commercial) zoning district. Within the MC-1 zoning district, a “Warehouse, storage and distribution facilities” use requires a special use permit subject to site plan approval by the Planning Board. Other associated site improvements proposed for the Site include 96 vehicle parking spaces and 18 truck loading docks for the first warehouse and 130 vehicle parking spaces, 33 truck loading docks, and 22 trailer storage spaces for the second warehouse. The Site has a proposed driveway to Dolsontown Road that will provide vehicular and truck access to the facilities, and an gated emergency access driveway connecting to Caskey Lane.

The warehouse facilities propose water (potable & fire protection) and sanitary sewer services to service the buildings. These services will be provided by extended service connections to the adjacent town mains within Dolsontown Road. The sewer service will require a pump station and force main connection to the existing sewer manhole on Dolsontown Road. The Project is anticipated to generate a water and sewer demand of approximately 5,016 GPD.

The Site is currently undeveloped with a mixture of agricultural fields, some woodlands, and wetlands in the southern portion of the site. The Site contains 43.08 acres of federally regulated wetlands; however, no wetland disturbance is necessary to accommodate the project.

The Project is estimated to require approximately 18.39 acres of site disturbance and requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP). A SWPPP has been prepared in accordance with the Town and NYSDEC requirements to provide stormwater management/mitigation for water quantity and water quality and will be provided to the Planning Board with this submission as part of Appendix D.

SEQRA COMPLIANCE AND INVOLVED AND INTERESTED AGENCIES

The Project's potential environmental impacts must be reviewed pursuant to the State Environmental Quality Review Act and its implementing regulations in 6 NYCRR Part 617 (collectively, "SEQRA"). Pursuant to 6 NYCRR § 617.6(a)(1)(iv), "as soon as an agency receives an application for…approval of an action, it must" make a preliminary classification of the action as Type 1, Type 2 or Unlisted. This "preliminary classification will assist in determining whether a full EAF and coordinated review is necessary."

In this Project, the SEQRA "action" is the Planning Board's decision on the Applicant's applications for site plan and special use permit approvals for the Project. Because the Project entails the proposed construction of a facility with more than 100,000 square feet of gross floor area in a town having a population of 150,000 persons or less, it is properly classified as a Type 1 action pursuant to 6 NYCRR §§ 617.4(b)(6)(v). As a result, a full EAF ("FEAF") and coordinated environmental review of the Project has been conducted.

Accordingly, Applicant completed Part 1 of the FEAF as required by 6 NYCRR § 617.6(a)(2) and provided it to the Planning Board in its September 29, 2021 amended submission. As further required by SEQRA, Applicant identified the following other agencies that may be involved or interested in the review of the Project:

- Town of Wawayanda Town Board;
- Town of Wawayanda Planning Board;
- Orange County Department of Planning;
- Orange County Department of Health;
- NYS Department of Environmental Conservation;
- NYS Department of Parks, Recreation and Historic Preservation;
- New York State Department of Transportation;

At its November 18, 2020 meeting, the Planning Board declared itself "lead agency" in a coordinated SEQRA review and circulated a Notice to Designate SEQRA Lead Agency to the identified involved and interested agencies on or about December 23, 2020. No objection was received to the Planning Board serving as lead agency.

EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS

The lead agency must consider the criteria for determining the significance of potential environmental impacts from the Project as set forth in the SEQRA regulations at 6 NYCRR § 617.7(c). To do this, the lead agency reviews all relevant information and completes Parts 2 and 3 of the FEAF to provide the basis for its SEQRA determination.

For the Project, the identification of potential impacts and assessment of potential environmental impacts based on FEAF Part 2 is discussed below. Based on the following discussion, the Project includes the potential for at least one significant adverse environmental impact. A draft Generic Environmental Impact Statement (GEIS) was prepared to assess such potential significant adverse environmental impacts.

1. Impact on Land

The Project will have minimal impacts on land. Blasting is not anticipated to be required in connection with Project construction.

Consistent with Section 5.2 "Planning for Green Infrastructure: Reduction of Impervious Cover" of the NYSDEC Stormwater Management Design Manual, the proposed site plan has been designed to include the following Green Infrastructure site planning techniques, among others: the extent of the clearing will be limited to meet the user's needs; compacted soils located in open areas without shallow utilities will be tilled in order to restore the original properties of the soil prior to seeding; roadway widths were reduced wherever possible while still maintaining the necessary access; sidewalks added where needed to adequately and safely serve the pedestrian needs of the facilities; the proposed driveways have been minimized wherever possible; building footprints have been designed to meet the end user's needs.

Existing federally regulated wetland areas exist on site but will not be disturbed by the Project. Additionally, erosion control measures will be implemented during construction to minimize the erosion of land. Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts to wetlands and surface water.

Based on the foregoing, the Project is not anticipated to have any significant adverse impacts on land.

2. Impact of Geological Features

There are no unique landforms on the Site that will be impacted by the Project. No geological feature registered as a National Natural Landmark is present on or next to the Site. Accordingly, the Project is not anticipated to have any significant adverse impact on geological features.

3. Impact on Surface Water

Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts to wetlands and surface water. Based on the findings set forth in the draft GEIS, the Project is not anticipated to have any significant adverse impact on surface water.

4. Impact on Groundwater

The SWPPP provides for "good housekeeping" and material management practices to minimize the risk of spills. These practices include: keeping products in original containers unless they are not re-sealable, (retaining original labels and material safety data sheets (MSDS), storing only enough products required to do the job, storing materials in a neat, orderly manner in their appropriate containers (and if possible, under a roof or other enclosure and/or on non-porous blacktop), not mixing substances unless recommended by the manufacturer, using all of a product before disposing of the container, following manufacturer's recommendations for proper use and disposal of materials and daily inspections by the contractor’s site superintendent to ensure proper use and disposal of materials on site.

Additionally, the contractor’s Site superintendent shall serve as a spill prevention and cleanup coordinator, and the following practices, outlined in the SWPPP, shall be followed: spills, of any size, of toxic or hazardous material and/or petroleum products shall be reported to the NYSDEC and Central Hudson’s Environmental Affairs division; manufacturer’s recommended methods for spill cleanup shall be clearly posted and site personnel shall be made aware of the procedures and the locations of the information and cleanup supplies; materials and equipment necessary for spill cleanup shall be kept in the material storage area onsite (equipment and materials shall include but not be limited to brooms, dust pans, mops, rags, gloves, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose); all spills shall be cleaned up immediately after discovery and the spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance. The spill prevention plan shall be adjusted to include measures to prevent toxic or hazardous material of spills from recurring and how to clean up the spill. A description of the spill, what caused it, and the cleanup measures shall also be included.

The proposed facilities are anticipated to generate approximately 5,016 gallons per day of water and sewer usage. The facilities are proposed to have water (potable & fire protection) and sanitary sewer services through connections to the existing town mains within Dolsontown Road. Please refer to the draft GEIS for a full discussion of the Project’s potential significant adverse environmental impacts to groundwater.

Based on the foregoing, the Project will not create any significant adverse impacts to groundwater.

5. Impact on Flooding

All storm water from the Site will be collected, managed and treated by a stormwater management system in accordance with the NYSDEC General SPDES permit for stormwater discharges and SWPPP. Furthermore, as noted on the Federal Emergency Management Administration Flood Insurance Rate Maps (“FIRM”) covering the Town of Wawayanda, the Site is located outside any designated flood hazard area in an area where there is a minimal flood hazard during 100-year and 500-year storm events. There is no known flooding on the Site.

Please refer to the draft GEIS for a full discussion of the Project’s potential significant adverse environmental impacts to flooding.

Based on the foregoing, the Project will not create any adverse impacts to flooding.

6. Impacts on Air

The Project will not result in any significant adverse impacts on air quality. The Project does not include a State regulated air emission source or involve any activity that will have more than a minimal impact on air quality.

Several energy conservation methods will be incorporated into building construction. Energy Star approved building materials will be used that help reduce the amount of heat lost during the wintertime and cool air during the summertime. Other items such as reduced flow water fixtures that limit the amount of water flowing through the tap, thereby diminishing the amount of water used throughout the day will be used. Energy efficient light bulbs will reduce the amount of energy required for building and site light while extending the "life" of the lightbulb.

Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts on air associated with traffic.

Based on the foregoing, the Project will not create any significant adverse impacts to air quality.

7. Impact on Plants and Animals

Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts on plants and animals.

Based on the findings set forth in the draft GEIS, the Project will not create any significant adverse impacts to plants and animals.

8. Impact on Agricultural Resources

The Project is consistent with the Town's Comprehensive Plan and the requirements of the MC-1 Zoning District. The Town's Comprehensive Plan provides that "the MC mixed commercial zone is a district intended to provide a principal area for intensive nonresidential development such as office, retail, service businesses, manufacturing and industrial uses". The Comprehensive Plan further indicates that the zone is intended to be developed with commercial enterprises and specifically excludes residential uses and observes that recently attracted uses include small contractor yards, offices, retail, large warehousing and industrial uses. The Comprehensive Plan recommends that the Town continue to allow commercial/industrial uses on a minimum 2-acre lot size. The Project is consistent with the letter and intent of the MC-1 Zone as set forth in the Town of Wawayanda Zoning Law and Comprehensive plan, as it is a permitted use on a 71.189-acre lot, far greater than the minimum lot size requirement.

Based on the foregoing, no significant adverse environmental impacts to agricultural resources are anticipated from the Project.

9. Impact on Aesthetic Resources

The Project will not be visible from any officially designated federal, state, or local scenic or aesthetic resource, nor will it impact any officially designated scenic views. The Project is located in the MC-1 zone and is consistent with the Town's Comprehensive Plan. It is consistent with existing land uses in the vicinity of the Site, with the exception of certain pre-existing nonconforming residential uses which will be screened from the Project. The Site is bounded on the south by Interstate 84. Building height is proposed to be less than the 65 feet allowed by the Town's Zoning Code.

The landscaping plan adheres to Chapter 195-24 of the Town Code, and in accordance with Section 195-24 A. has a goal of enhancing the appearance and natural beauty of the Town and protecting property values through the preservation and planting of vegetation, screening, and landscaping material. The plan includes a variety of native deciduous and evergreen trees and shrubs, as well as non-invasive ornamental species. To further break-up the building mass along the roadway, trees are proposed near the right-of-way line.

Based on the foregoing, the Project will not result in any significant adverse impacts to aesthetic resources.

10. Impact on Historic and Archeological Resources

Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts on historic and archaeological resources.

Based on the findings set forth in the draft GEIS, the Project will not create any significant adverse impacts on historic and archaeological resources.

11. Impact on Open Space and Recreation

The Project will not result in any loss of recreational opportunities or any reduction of an open space resource designated in a governmental open space plan. The Site is not designated open space. The Site is largely wooded and located in a zoning district intended for commercial development such as the Project. The Site is privately owned and is not used for public recreation.

Based on the foregoing, the Project will not have any significant adverse impact on open space and recreational resources.

12. Impact on Critical Environmental Areas

The Site is not located within a Critical Environmental Area. As summarized in the draft GEIS, stormwater will be managed, treated and discharged in accordance with the requirements set forth in the NYSDEC SPDES and the Project's SWPPP, which is designed to conform to applicable requirements in the NYSDEC general stormwater permit and the standards provided by the New York State Stormwater Management Design Manual (dated January 2015).

Based on the foregoing, the Project will not have any significant adverse impact on Critical Environmental Areas.

13. Impact on Transportation

Please refer to the draft GEIS for a full discussion of the Project's potential significant adverse environmental impacts on traffic/transportation.

Based on the findings set forth in the draft GEIS, the Project will not create any significant adverse impacts on traffic/transportation.

14. Impact on Energy

Several energy conservation methods will be incorporated into building construction. Energy Star approved building materials will be used that help reduce the amount of heat lost during the wintertime and cool air during the summertime. Other items such as reduced flow water fixtures that limit the amount of water flowing through the tap, thereby diminishing the amount of water used throughout the day will be used. Energy efficient light bulbs will reduce the amount of energy required for building and site light while extending the "life" of the lightbulb.

Based on the foregoing, the Project will not have any significant adverse impact on Energy.

15. Impact on Noise, Odor and Light

Noise

The Project Site is located in the MC-1 Zoning District. As stated above, The Project is consistent with the District Intent set forth in Attachment 8 to the Town's Zoning Law, which provides that the MC District "is intended to provide the Town with a principal area for intensive nonresidential development such as office, retail, service businesses and manufacturing". Indeed, the Project is anticipated to be less intensive than a variety of other uses that are permitted by Site Plan approval or Special Use Permit, including contractor yards, motor vehicle sales and services, high traffic retail and service businesses, industrial uses, manufacturing uses and mining operations, including major mining operations.

The Project will generate noise during its construction phase. Once constructed, the Project will produce small to moderate amounts of noise, mostly due to Site generated traffic and building HVAC mechanical units.

There is typically a minimal amount of time that trucks will be idling and waiting to drop off or pick up a trailer. In the event that they are waiting for a period of more than five (5) minutes, they are required to turn off their engine in accordance with the New York State Heavy Duty Vehicle Idling Law (6 NYCRR Subpart 217-3).

Also note that a sound level measurement and analysis was completed and a February 8, 2022 memorandum summarizing the same (the “Noise Evaluation”) and will be provided to the Planning Board with this submission as part of Appendix D. The Noise Evaluation evaluated existing and projected noise levels associated with the Project at certain receptors, and found that in all instances, noise increases associated with the Project are anticipated to be less than 5dbA at all receptors. Increases of sound pressure of less than 5dB are anticipated to result in unnoticed to tolerable human reactions, pursuant to NYSDEC’s Assessing and Mitigating Noise Impacts, revised as of February 2, 2001.

Notwithstanding the foregoing, in an order to reduce future noise levels to the greatest extent reasonably possible, the Noise Evaluation recommended the following mitigation measures, which have been incorporated into Project Plans:

- The construction equipment used on-site will have to be inspected periodically to ensure that properly functioning muffler systems are used on all equipment.
- All equipment should not idle unnecessarily while one site.
- The HVAC equipment should also be positioned to face away from the adjacent residence as part of the final building design/HVAC equipment layout.
- Installation of a berm or solid fencing along the western portion of the Property in between the proposed parking areas and the property lines, as well as along the east side of Caskey Lane, providing a buffer to separate the residential property on Caskey Lane from the Site.
- Any onsite equipment should be equipped with alternate backup safety alarms such as “white noise” alarms, alternate radar, or infrared alarm systems.

Based on the foregoing, the Project will not have any significant adverse impacts with regard to noise.

Light

Project Site lighting will be provided for the parking lot areas surrounding the buildings and along the driveways into the Project Site. All lighting will be dark sky compliant. The exterior site lighting proposed for the Project utilizes night sky friendly fixtures which will be down directed and has been designed with fixture locations that do not present any light trespass onto neighboring properties.

The lighting will consist of energy efficient LED light fixtures. The lights will have edges that extend below the level of the fixture to reduce the potential for source glare and light spillage. The light fixtures will be mounted on poles and on the building.

Based on the foregoing, the Project will not have any significant adverse impacts with regard to light.

Odor

Regarding odor, the Project Site is not expected to produce appreciable odors. Refuse and recycling will be contained an enclosed dumpster or compactor until pickup for disposal on a regular basis by a private carting company. In addition, the Project does not include any fixed-point source of air emissions that would cause any odor.

Based on the foregoing, the Project will not have any significant adverse impacts with regard to odor.

16. Impact on Human Health

No significant impacts to human health are anticipated from the Project because all construction and operational activities will be undertaken in accordance with and in compliance with all pertinent environmental and land development regulations and related permit and approval procedures and requirements. As indicated above, water service to the facilities will be provided from an existing water main line, owned and operated by the Town of Wawayanda Water Department and sanitary sewer service will be provided from an existing sewer main on, owned and operated by the Town of Wawayanda Sewer Department. As further indicated above, spill prevention and cleanup protocols are proposed to be in place.

Based on the foregoing, the Project will not have any significant adverse impacts on human health.

17. Consistency with Community Plans

The Project is consistent with the Town of Wawayanda's Comprehensive Plan and complies with Wawayanda's Zoning Law that was enacted in furtherance of the Comprehensive Plan's goals.

Specifically, the Project is consistent with the requirements of the MC-1 Zoning District. The Town's Comprehensive Plan provides that "the MC mixed commercial zone is a district intended to provide a principal area for intensive nonresidential development such as office, retail, service businesses, manufacturing and industrial uses". The Comprehensive Plan further indicates that the zone is intended to be developed with commercial enterprises and specifically excludes residential uses and observes that recently attracted uses include small contractor yards, offices, retail, large warehousing and industrial uses. The Comprehensive Plan recommends that the Town continue to allow commercial/industrial uses on a minimum 2 acre lot size. The Project is consistent with the letter and intent of the MC-1 Zone as set forth in the Town of Wawayanda Zoning Law and Comprehensive plan, as it is a permitted use on a 71.189-acre lot, far greater than the minimum lot size requirement.

The Project will increase tax revenues to the Town and other taxing jurisdictions including the local school district (without generating any school age children).

For the foregoing reasons, the Project will not have a significant adverse impact on the Town of Wawayanda's community plans.

18. Consistency with Community Character

The Project is a permitted use in accordance with the Town of Wawayanda Zoning Code and located in the MC-1 zoning district. The Project is consistent with existing land uses in the vicinity of the Site, with the exception of certain pre-existing nonconforming residential uses which will be screened from the Project. The Site is bounded on the south by Interstate 84.

The Project is consistent with the District Intent set forth in Attachment 8 to the Town's Zoning Law, which provides that the MC District "is intended to provide the Town with a principal area for intensive nonresidential development such as office, retail, service businesses and manufacturing". Indeed, the Project is anticipated to be less intensive than a variety of other uses that are permitted by Site Plan approval or Special Use Permit, including contractor yards, motor vehicle sales and services, high traffic retail and service businesses, industrial uses, manufacturing uses and mining operations, including major mining operations.

In addition to the above, the Project is consistent with the surrounding community character based on the Project's design incorporating measures to limit noise and to protect adjoining properties, among other such mitigation measures discussed above and in the various reports.

Accordingly, the Project will not have a significant adverse impact on the community character of the Town of Wawayanda.