Site Plan and Special Use Permit Application
MarDon Community Solar Project

10516 Western Turnpike
Delanson, NY 12053

Submitted December 8, 2023

Prepared for:

C-TEC Solar, LLC
1 Griffin Road South, Suite 200
Bloomfield, CT 06002

Prepared by:

Tetra Tech, Inc.
3136 South Winton Road, Suite 303
Rochester, NY 14623

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1.0 PROJECT OVERVIEW

C-TEC Solar, LLC (C-TEC, the "Applicant") is seeking Site Plan and Special Use Permit approval for the construction of the MarDon Community Solar facility, a 1.875-megawatt (MW) alternating current (AC) photovoltaic (PV) array to be located at 10516 Western Turnpike, in the Town of Duanesburg, Schenectady County, New York (hereafter referred to as the "Site" or "Facility"). The Applicant proposes the development of up to approximately 8.9 acres of a larger 84.4-acre parcel of private land into a ground-mounted PV solar energy generating facility.

The basic components of the Site include:

- PV panels;
- Solar panel racking system;
- Access road to the PV array;
- Power conversion equipment pad consisting of a direct current (DC) to AC inverter, medium-voltage transformer, and switchgear in an electronics control cabinet;
- Underground 13.2-kilovolt (kV) electrical collector lines connecting the array to the collection substation;
- Perimeter (wildlife friendly) fencing; and
- Temporary laydown area, including parking and office trailer (construction phase only).

The following sections provide information regarding the proposed solar facility in addition to considerations and review criteria noted in Town of Duanesburg Solar Energy Facilities Law of 2023 that repealed and replace Local Law No. 1 of 2016.

1.1 Contact Information

1.1.1 Applicant

C-TEC will be the Project Owner and Operator and will construct, own, and operate the Facility. C-TEC Solar is focused on bringing low-cost clean energy and meaningful economic development to communities across the Northeast and other regions of the United States. Since 2010 the company has developed and built more than 100 Megawatts (MW) of utility-scale and or commercial solar projects, while being trusted to operate and maintain entire portfolios of assets totaling close to 200 separate locations.

C-TEC will provide the name and contact information for the on-site construction supervisor prior to construction. When the Facility is operational, the name and contact information for the on-site supervisor of operations will be provided.

The Applicant will be the sole owner of the Project. More information about C-TEC can be found at https://www.C-TECsolar.com/. The primary contact for the Project is:

Name: Michael Morrison
Title: Commercial Project Coordinator
Company: C-TEC Solar, LLC
Address: 1 Griffin Road South, Suite 200, Bloomfield, CT 06002

1.1.2 Environmental and Engineering Consultant

C-TEC has contracted Tetra Tech, Inc. (Tetra Tech) to be the lead consultant to assist in the preparation of the Site Plan and Special Use Permit (SUP) application in compliance with the requirements set forth by the Town of Duanesburg Zoning Ordinance and Solar Energy Facilities Law. Tetra Tech is a leading provider of consulting and engineering services with expertise in science, research, engineering, construction, and information technology. Tetra Tech's office location and Project contact is:

Name: Sonja Torpey
Title: Project Manager/Permitting Specialist
Company: Tetra Tech, Inc.
Address: 3136 South Winton Road, Suite 303, Rochester, NY 14623

2.0 SITE DESCRIPTION

The Facility is located approximately one mile east of the Village of Esperance and two to three miles west of the Village of Delanson, at 10516 Western Turnpike on an 84.4-acre parcel assigned Tax Map Parcel Number 64.00-2-8. According to the Town of Duanesburg Zoning Map, the parcel lies partially in the Commercial-1 (C-1; along Route 20 / Western Turnpike) and partially in the Agricultural-Residential (AR) zoning districts, in an area characterized by agricultural, residential and commercial development.

The parcel consists of undeveloped vacant fields and wooded/brush land. To the north and east, the parcel is bound by agricultural properties with a couple of residences. To the south it is bound by State Route 20 (Western Turnpike) followed by a mix of residential and commercial properties on both the south and west sides of the parcel. A map showing the location of the proposed Facility is presented in Attachment A.

2.1 Preliminary 30% Civil Design Set and Site Plan

A preliminary 30% civil design set including a site plan with key features identified as required per the Town of Duanesburg Zoning Ordinance, Section 14.6.1.4 and the Solar Energy Facilities Law of 2023 is provided in Attachment B. Equipment specification sheets for solar modules are provided in Attachment C.

2.2 Potential Authorizations Required

The federal, state, and local permits, approvals, and agency consultations that have been identified as potentially being required for the construction and operation of the Project are shown in Table 1 below.

Table 1: Potential Permits, Approvals and Agency Consultations

Agency	Approval/Coordination	Application Timeline
New York State Department of Environmental Conservation (NYSDEC)	State Environmental Quality Review Act (SEQR)	Concurrent with Site Plan / SUP Permitting
	State Pollutant Discharge Elimination System (SPDES) General Permit for Construction Discharges	Prior to commencement of construction activity.
New York State Department of Agriculture and Markets (NYS Ag & Markets)	Submit a Notice of Intent to ensure Compliance with Agricultural District Laws	Concurrent with Site Plan/SUP Permitting

Agency	Approval/Coordination	Application Timeline
New York State Office of Parks, Recreation, and Historic Preservation (OPRHP)	Involvement in SEQR for potential impacts to historic or archeological resources	Concurrent with Site Plan/SUP Permitting
New York State Department of Transportation (NYSDOT)	Divisible Load Overweight Permits or Highway Work Permits	Prior to commencement of construction activity.
Town of Duanesburg Planning Board	Site Plan Review/Special Use Permit	Prior to submitting Application for Building Permit
Town of Duanesburg Building Department	Building Permit	Prior to commencement of construction activity.

3.0 COMMUNITY CHARACTER AND LAND USE CONSIDERATIONS

The general area around the Facility consists of forested land, agricultural land, commercial and residential properties. The Site is located on a major State route within a commercial and agricultural area in the Town of Duanesburg, New York. Table 1 provides a listing of the types of properties that surround the Site.

Table 1. Adjacent Property Types and Addresses

Direction from the Site	Street Address	Parcel	Description
West	10666 Western Tpk State Highway 30 4274 State Hwy 30 4318 State Hwy 30 State Hwy 30	64.00-2-7 64.00-2-5 64.00-2-4 64.00-2-3.1 64.00-2-3.2	Residence Forested / Residential Residential Residential Vacant / Wooded
North	State Hwy 30 5204 State Hwy 30	52.00-1-14.1 52.00-1-13	Vacant / Agricultural Agricultural / Residential
East	10244 Western Tpk Western Tpk	64.00-2-10 64.00-2-9	Residential Vacant
South	Western Tpk 10355-57 Western Tpk 10413 Western Tpk 10431 Western Tpk 10497 Western Tpk 10521 Western Tpk 10585 Western Tpk Western Tpk 10723 Western Tpk	64.00-2-35 64.00-2-36 64.00-2-37 64.00-2-32 64.00-2-11.11 64.00-2-13.1 64.00-2-31 64.00-2-30 64.00-2-23.1	Vacant Commercial Commercial Residential Commercial Residential Vacant Vacant Residential

The proposed Facility is harmonious with the existing undeveloped, commercial, agricultural, and residential use of the parcels adjoining the property and will not depreciate or alter those properties' essential character. Utilization of the Site for a solar farm will allow for the future continued use of the land for agricultural purposes. The proposed Facility would be located in the AR zoning district. According to the Town Solar Energy Facilities law, large scale solar energy systems are permitted in AR zoning districts with the issuance of a SUP.

3.1 Town Zoning Code & Commercial Solar Considerations

As outlined in Duanesburg's Solar Energy Facilities Law of 2023, Section Seven. Requirements for Utility-Scale Solar Energy Systems, Subsection F, C-TEC has prepared the following items as part of this permitting and application process.

- 30% Civil Design, stamped by a professional engineer registered in New York State (See Attachment B)
- Electrical Diagram (See Attachment D)
- Stormwater Pollution Prevention Plan (See Attachment E)
- Documentation of Utility Notification. Electric Service Order Number: **30567445**
- Visual Simulations and Viewshed Analysis (See Attachment K)
- Equipment Specifications (See Attachment C)
- Full Environmental Assessment Form – Part I (See Attachment H)
- Sound Study (See Attachment M)
- Wetland Delineation (See Attachment F)
- Habitat Survey (See Attachment I)
- Decommissioning Plan (See Attachment N)

4.0 NATURAL AND CULTURAL RESOURCES

4.1 Prime Soils

Solar facilities are a reversible land-use. At the end of the Facility life, the land will be fully decommissioned and restored and will be available to return to its original use. During Facility operation the vegetation management practices (e.g., no-tillage, deep-rooted perennial vegetative cover) will also contribute to improving soil health throughout the Project Area. Therefore, at the end of the Facility's operating life the soil will be higher quality, as it will have increased soil organic matter, improved aggregate stability and water holding capacity, and increased drought and flood resistance.

Following construction, the final fenced area will be approximately 8.91 acres. Within the fence the actual ground coverage including the solar panel racking system, access road, and equipment pads will be approximately one acre, and the remaining 7.91 acres of disturbance is considered temporary. The Applicant will follow the NYS Department of Agriculture and Markets (NYSAGM) *"Guidelines for Solar Energy Projects-Construction Mitigation for Agricultural* Lands" (2019) (the Guidelines) during construction of the Facility in order to ensure the soil health is maintained in these temporary disturbance areas. As a result of following the NYSAGM Guidelines for soil preservation and establishing vegetation in the space between the solar panel rows and between the panel rows and the fence that will provide pollinator habitat during operation, construction activities for the Facility are considered a temporary disturbance. The soil health in these temporary disturbance areas will also improve over the operating life of the Facility and will be available for agricultural use post-decommissioning.

Approximately 3.9 of the 8.9 acres in the project area are classified as "Prime farmland if drained" and approximately 5 acres are classified as "Farmland of statewide importance." (Attachment G).

Based on field observations made by Tetra Tech in December 2022, the parcel is former agricultural land. The 2021 Cropscape Cropland Layer Data indicates that the parcel was mostly "grass/pasture" and "other hay/non alfalfa." The parcel is not currently receiving an "agricultural value" or exemption for tax purposes.

NYS Agricultural and Markets Law requires the submission of an agricultural data statement by an applicant to the municipality for a rezoning, special use permit, site plan approval, use variance, or subdivision of parcel(s) occurring on property within an agricultural district containing a farm operation or on property within 500 feet of an active farm operation located in an agricultural district. The Site is not located in an Agricultural District; however, it is located within 500 feet of a farm operation that is in an Agricultural District. The Agricultural Data Statement is included Attachment G. No prime agricultural soil will be removed from the Site and displacement of prime soils on-site will be minimized. Thus, an agricultural data statement is not required.

4.2 Tree and Brush Removal

The Town of Duanesburg Solar Law states:

> *Previously cleared or disturbed areas are preferred locations for solar projects. Forested sites shall not be deforested to construct solar energy facilities. Brush and isolated trees or stands of trees in otherwise open fields or scrubland may be cut, however clear cutting of trees more than three inches in diameter at breast height in a single contiguous area exceeding 20,000 square feet is prohibited. This clearing restriction shall not apply to trees cleared for the access road.*

The Project has been sited on previously cleared fields and will not result in any clearing of forested areas. Some isolated trees will be removed for the north section of the array and for the access road. Applicant will strive to minimize tree-clearing and will work with the Town of Duanesburg to ensure the civil design and construction comply with Town law.

4.3 Threatened and Endangered Species and Wetlands

Tetra Tech, on behalf of C-TEC, consulted with the New York State Department of Environmental Conservation (NYSDEC) EAF Mapper on December 8, 2023. The NYSDEC review concluded that there are no records of unique geological features or critical environmental areas on the project Site. One State-listed endangered species may have a presence on the Site: the northern long-eared bat. The NYSDEC Full EAF Form is included as Attachment H.

Tetra Tech consulted with the United States Department of the Interior Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) official species list for the proposed project area on December 8, 2023 (see Attachment I). The official species list indicated the potential presence of the endangered northern long-eared bat. The potential presence of the Monarch butterfly, a candidate species, was also listed. Tetra Tech completed an ecological survey for potential bat habitat on May 23, 2023 (see Attachment I). Due to observations of potential roosting habitat consisting of mainly dead tree snags within forested areas, and the riparian feature that runs west from the man-made pond into the forested area, the habitat to the west of the Project Area is considered to contain suitable habitat for northern long-eared bat. The Project Area is not considered to contain suitable habitat for northern long-eared bat but recommend avoidance of the boundary forest area, and if tree clearing is necessary for shading of solar arrays, then performing seasonal clearings between November 1 through March 31. In addition, it is recommended that snags and cavity trees are left uncut.

The online NYSDEC Environmental Resource Mapper (ERM) did not identify any State-listed rare, threatened, or endangered species, or significant natural communities as present within the Site.

4.4 Cultural Resources

Tetra Tech consulted with the New York State Office of Parks, Recreation, and Historic Preservation's (OPRHP) Cultural Resource Information System (CRIS) database on June 1, 2023, to identify properties listed on the State and National Register of Historic Places (NRHP) on or in the vicinity of the Project Site. The Site is located within a New York State Heritage Area: Mohawk Valley Heritage Corridor. The State Historic Preservation Office (SHPO) responded to the consultation noting that the Project Site is located within the listed William R. Wing Farm Complex and is continuous with the listed Avery Farmhouse property. SHPO found that the solar array appears to be appropriately sited to minimize visual impacts to the State and National Register listed resources. In addition, there are no archaeological concerns associated with the Project. The response letter from the OPRHP State Historic Preservation Office (SHPO) is provided in Attachment J.

5.0 CONSTRUCTION AND MAINTENANCE CONSIDERATIONS

PV Solar facilities of this size are typically considered to be low maintenance. However, routine operation and maintenance services will be done per industry codes and manufacturer specifications, ensuring the equipment is operating safely and efficiently. The system will be continuously monitored remotely such that unexpected problems can be addressed in a timely manner.

5.1 Noninterference

The project will not produce an electromagnetic interference in the operation of existing microwave communications in the region.

5.2 Proximity to radio, television, and telephone systems

The project will not interfere with existing fixed broadcast, retransmission, or reception antennae for radio, television, or wireless phone.

5.3 Fencing and Security

The Site and all mechanical equipment will be enclosed by a seven-foot-high security fence, 24-foot double swing locking gates, and will be in compliance with all Federal, State, and Municipal codes. The Site will remain locked during operation, with access restricted to trained personnel. During operation, the Site does not require any on-site personnel except for planned maintenance inspections, vegetative maintenance visits, and potential repair visits.

5.4 Lighting

No artificial lighting will be needed for the normal operations at the Site.

5.5 Traffic Impacts

Traffic impacts are generally limited to the project construction period, which is estimated to last approximately four to six months. Once the facility is operational, traffic is typically limited to less than 10 visits per year to monitor operation, provide maintenance/repair, and maintain vegetation, as necessary.

5.6 Signage

A clearly visible warning sign with the owner's contact information will be installed on the entrance and perimeter of the fence. No advertising will be placed on the solar equipment. No signs, flags, streamers or similar items, either temporary or permanent, will be placed on solar equipment except the following: (a) manufacturers or installers identification; (b) appropriate warning signs and placards; (c) signs that may be required by a federal agency; and (d) signs that provide a 24-hours emergency contact phone number, electrical shut-off instructions and warnings of any danger.

5.8 Solid Waste

Some minor amount of solid waste generation (wooden pallets, cardboard, etc.) may occur during the construction process, but it will be disposed of off-site at an appropriate location. Once operational, the facility will not generate an appreciable amount of solid waste.

5.9 Construction Stormwater Controls

Stormwater management erosion and sediment controls, in compliance with New York State requirements, will be installed prior to construction. These controls include silt fence, stabilized construction access, concrete washout area, as well as other stormwater features. Stormwater is expected to flow off the array panels and infiltrate into surface soils on the Site, not affecting the storm water runoff patterns of the surrounding properties. The proposed Erosion and Sediment Control Plan is shown on Sheet C-401 of the Engineering Design Plans and the Preliminary Stormwater Pollution Prevention Plan (SWPPP) is included as Attachment E.

5.10 Fire Protection and Emergency Access

Coordination with emergency services is an important part of any Site development process and this coordination will be conducted as part of the Building Permit application process. Local emergency services, including the Delanson Volunteer Fire Department, will be provided with notification that the Site is undergoing review and invited to visit the Site property. Equipment specifications will be provided to responders during the Building Permit application and implementation process.

The following measures will be taken regarding response to potential emergencies at the proposed facility:

- Local emergency responders will be invited to tour the Site during construction and after construction is completed. The site tour agenda will include descriptions of the system components, emergency shut-down, system isolation, etc.;
- The facility will be provided with a ‘Knox-Box” or other similar locking mechanism to provide Site access to emergency responders;
- Emergency telephone numbers will be posted on the perimeter fence;
- System components will be marked in order to provide emergency responders with appropriate warning and guidance with respect to isolating the electrical systems;
- All means of shutting down the PV solar energy system will be clearly marked on the construction drawings and building permit application.
- Facility access road will be constructed in a way that allows for the passage of emergency vehicles in the event of an emergency; and
- Site access road will be maintained to allow emergency vehicle access to the Site.

5.11 Water and Sewer

No buildings will be developed on-site. Operation of the Site will not require the use of public utilities such as water or sewer.

6.0 VISUAL IMPACTS ANALYSES

6.1 Screening and Landscaping

The Site is located within a commercial and agricultural area. The nearest public road is the Western Turnpike which is located approximately a quarter mile south of the proposed solar array. The Facility perimeter fence line has been sited 200 feet away from property lines and behind a 20-foot-wide vegetative screening buffer to minimize potential views from adjoining parcels. (Visual simulations and Viewshed Analysis are included in Attachment K.) The use of existing natural forest along eastern and northern sides of the Site will be maintained and will provide substantial natural vegetative buffering between the project and non-participating property lines, which appear to be mainly undeveloped and vacant. In addition to maintaining existing vegetative buffering, the planted screening buffer will be comprised of an offset, double row of evergreens that are native, non-invasive, deer resistant species, such as Eastern red cedar and white spruce. Tree specimens will be a minimum of 8’ tall and 3" in diameter at breast height at time of planting, and some smaller trees and shrubs, such as red osier dogwood and varietals of viburnum will be planted in front to create a naturalized hedgerow habitat, as required by the Town of Duanesburg.

6.2 Glint and Glare Analysis & Federal Aviation Administration Screening

The Federal Aviation Administration (FAA) developed *Technical Guidance for Evaluating Selected Solar Technologies on Airports* in 2010 (FAA Guidance). The FAA Guidance recommends that glare analyses should be performed on a site-specific basis using the Sandia Laboratories Solar Glare Hazard Analysis Tool (SGHAT). This guidance applies to solar facilities located on/near airport property but is also considered to be an industry best practice for solar facilities in general.

> *Sandia developed SGHAT v. 3.0, a web-based tool and methodology to evaluate potential glint/glare associated with solar energy installations. The validated tool provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g. anti-reflective coating, texturing), and models developed over several years at Sandia. The results are presented in a simple easy-to-interpret plot that specifies when glare will occur throughout the year, with color indicating the potential ocular hazard (Sandia Laboratories, 2016).*

Based on this background, Tetra Tech has utilized the SGHAT tool as licensed for use in the ForgeSolar GlareGauge cloud software application for modeling and analysis. ForgeSolar GlareGauge with SGHAT modeling provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g., anti-reflective coating, texturing), and models developed over several years at Sandia National

Laboratory. The results are presented in a simple easy-to-interpret plot that specifies when glare will occur throughout the year, with color indicating the potential ocular hazard.

The panels to be used on the proposed Project will not exceed 12 feet in height and are smooth glass surface material with an anti-reflection coating (ARC). Two analyses were performed in the glare analysis:

Analyses 1 – 1st Story Receptors

Analysis 1 analyzed three PV Array Areas for 13 first-story receptors (OP-1 through OP-13) and five proximal route receptors along segments of McGuire School Road, State Route 30 North, State Route 30 South, Wendy Lane, and Western Turnpike from the height of a standard commuter vehicle. The SGHAT GlareGauge modeled the results for the Project. No glare is predicted for any OP or route segments.

Analyses 2 – 2nd Story Receptors

Analysis 2 analyzed three PV Array Areas for 13 first-story receptors (OP-1 through OP-13) and five proximal route receptors along segments of McGuire School Road, State Route 30 North, State Route 30 South, Wendy Lane, and Western Turnpike from the height of a typical tractor trailer. The SGHAT GlareGauge modeled the results for the Project. No glare is predicted for any OP or route

The GlareGauge model does not account for varying ambient conditions (i.e., cloudy days, precipitation), atmospheric attenuation, screening due to existing topography not located within the defined array layouts, or existing vegetation or structures (including fences or walls), nor does the tool allow proposed landscaping to be included. As such, the predicted results are considered to be conservative. The Glint and Glare Analysis Memo, dated August 8, 2023, is provided in Attachment L.

The Federal Aviation Administration (FAA) Notice Criteria Tool allows the user to determine if a proposed structure would require a formal submission to the FAA under CFR Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace). This online tool was utilized to determine if the proposed solar facility would require formal filing to the FAA. Based on the results of the FAA Notice Criteria Tool, the Project does not exceed notice criteria. Therefore, it is not recommended that the Project formally file with the FAA OEG. The FAA Notice Criteria Tool Report is included as an attachment to the Glint and Glare Analysis Memo (Attachment L).

7.0 REFERENCES

Adolf Goetzberger and Volker Hoffman (2005). "Photovoltaic Solar Energy Generation." Springer, New York.

The Federal Aviation Administration (FAA) developed *Technical Guidance for Evaluating Selected Solar Technologies on Airports* in 2010

Fthenakis, V.M. (2003). Practical Handbook of Photovoltaics: Fundamentals and Applications: Overview of Potential Hazards. Available at http://www.bnl.gov/pv/files/pdf/art_170.pdf .

U.S. Dept. of Energy (2010). "Photovoltaic Basics." Available at http://www1.eere.energy.gov/solar/pv_basics.html .

Vasilis Fthenakis, Hyung Chul Kim and Erik Alsema (2008). "Emissions from Photovoltaic Life-Cycles." *Environmental Science and Technology* 2008 42 (6):2168-2174. Available at: http://pubs.acs.org/doi/full/10.1021/es071763q .

8.0 ATTACHMENTS

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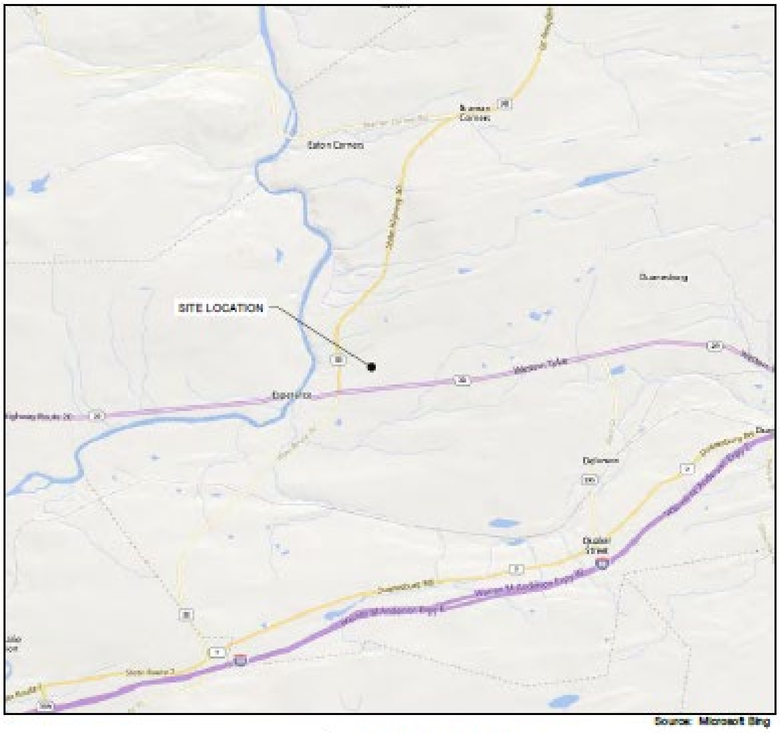
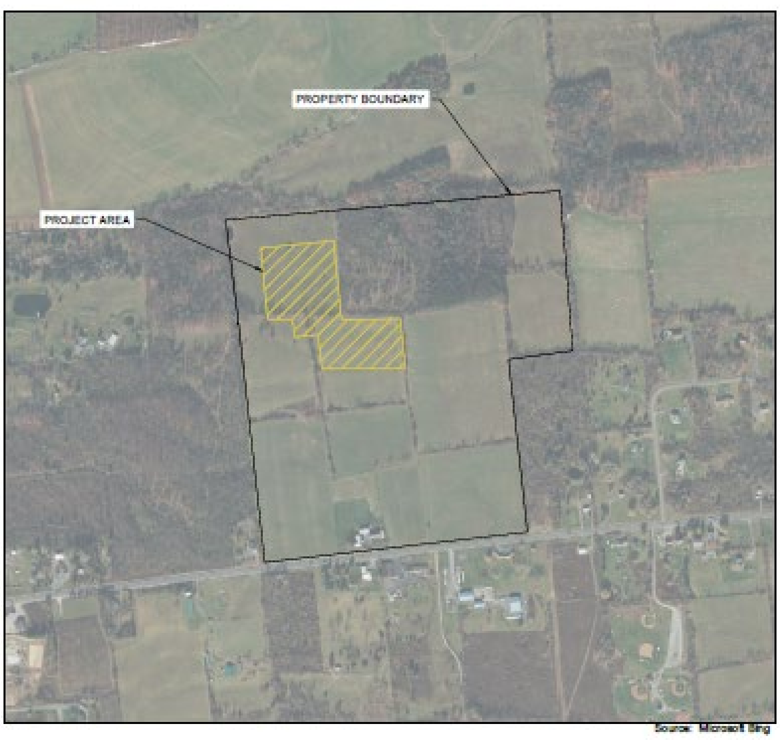
ATTACHMENT A

SITE LOCATION MAP

MarDon Community Solar – Site Location Map



REGIONAL MAP
SCALE 1" = 5,000'



AERIAL MAP
SCALE 1" = 500'

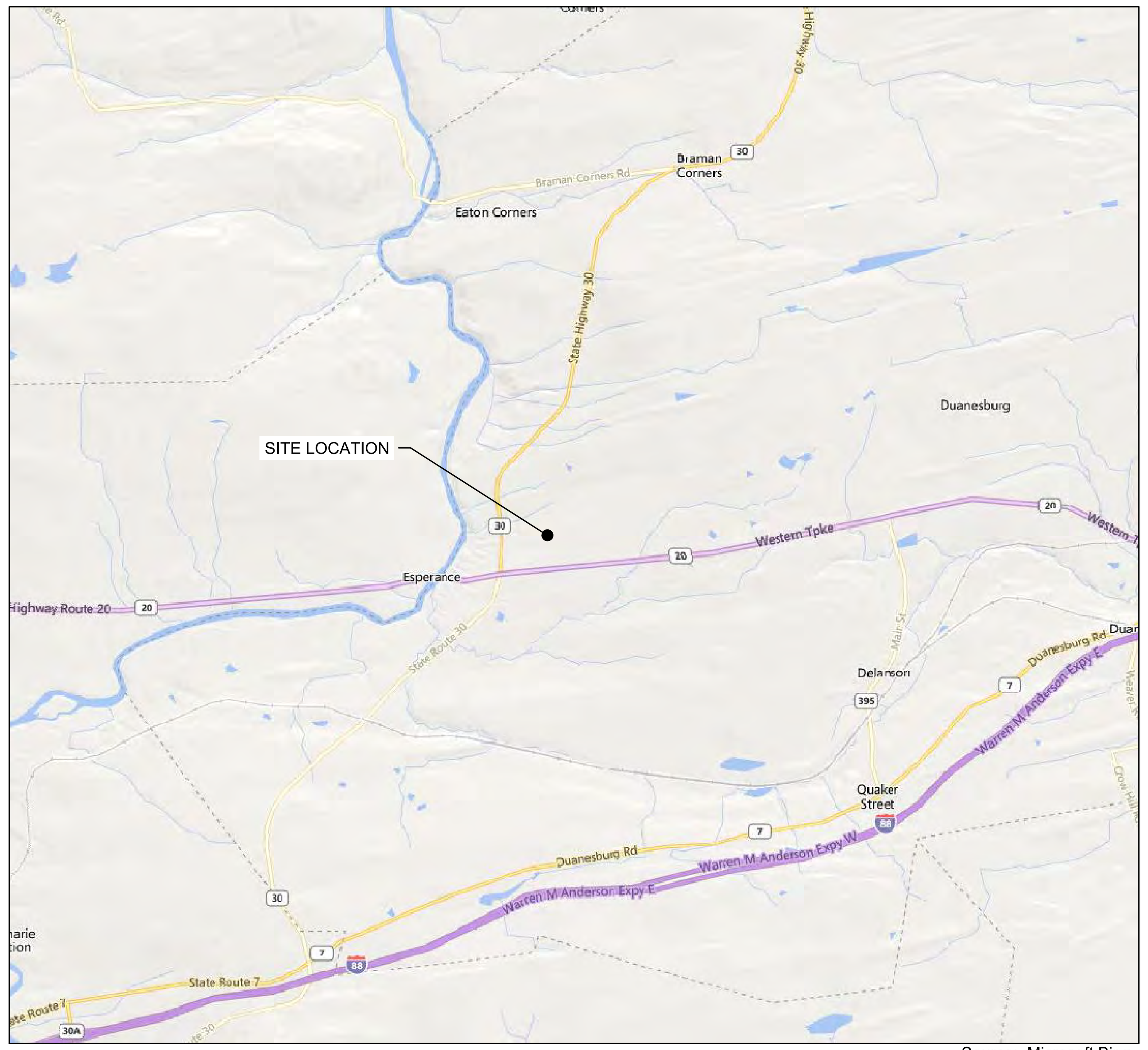
ATTACHMENT B

CIVIL DESIGN SET (BOUND SEPARATELY)

MARDON COMMUNITY SOLAR

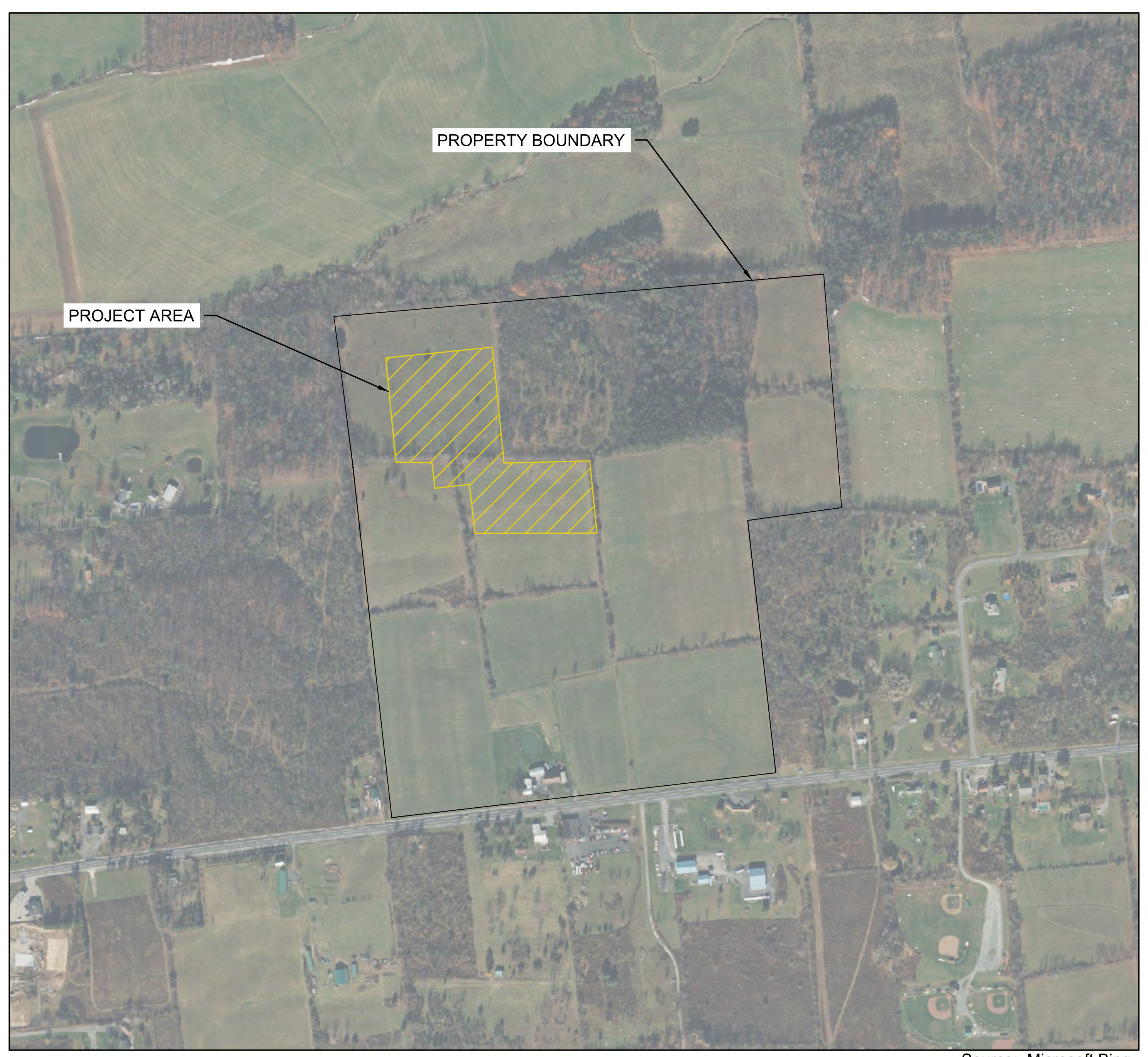
10516 WESTERN TURNPIKE
DUANESBURG, NY 12056

30% CIVIL DESIGN DRAWINGS



Source: Microsoft Bing

REGIONAL MAP
SCALE 1" = 5,000'



Source: Microsoft Bing

AERIAL MAP
SCALE 1" = 500'

CONTACT INFORMATION	
PROJECT OWNER	CTEC SOLAR 1 GRIFFIN ROAD SOUTH, SUITE 200 BLOOMFIELD, CT 06002
PROJECT DEVELOPER	CTEC SOLAR 1 GRIFFIN ROAD SOUTH, SUITE 200 BLOOMFIELD, CT 06002
PROPERTY OWNER	MARTIN & DONNA HEBERT
CIVIL ENGINEER	TETRA TECH ENGINEERING CORPORATION, P.C. CERT #0018815 3136 SOUTH WINTON ROAD ROCHESTER, NY 14623 (585) 417-4009
ELECTRICAL ENGINEER	CTEC SOLAR 1 GRIFFIN ROAD SOUTH, SUITE 200 BLOOMFIELD, CT 06002

PROJECT SCOPE

THIS DESIGN PACKAGE PROVIDES DRAWINGS AND DETAILS FOR THE CIVIL AND STORMWATER COMPONENTS OF A SOLAR PHOTOVOLTAIC SYSTEM IN THE STATE OF NEW YORK. THIS WORK PRODUCT IS PRELIMINARY AND NOT FOR CONSTRUCTION.

PROPERTY SUMMARY	
PARCEL NUMBER	64.00-2-8
PARCEL ACREAGE	± 84.4 ACRES
ZONING CLASSIFICATION	COMMERCIAL-1, AGRICULTURAL & RESIDENTIAL (R-2)
FRONT SETBACK	200 FEET
REAR/ SIDE SETBACKS	200 FEET; FENCING, COLLECTION LINES, ACCESS ROADS AND LANDSCAPING MAY OCCUR WITHIN THE SETBACKS.
PRIMARY SITE ACCESS	WESTERN TURNPIKE
LATITUDE/LONGITUDE AT ENTRANCE	N42°45'43" / W74°14'12"

PROJECT SUMMARY	
AHJ	TOWN OF DUANESBURG
INTERCONNECTION UTILITY	NATIONAL GRID
ZONING CLASSIFICATION	COMMERCIAL-1, AGRICULTURAL & RESIDENTIAL (R-2)
DC SYSTEM SIZE	2.343 MW
AC SYSTEM SIZE	1.875 MW
FENCED AREA	8.91 ACRES
FENCE LENGTH	3,211 LINEAR FEET
ROAD LENGTH	1,850 LINEAR FEET
CUT VOLUME	TBD
FILL VOLUME	TBD
NET CUT/ FILL	TBD

DRAWING INDEX

SHEET NUMBER	SHEET TITLE	REV NO.	DATE
C-001	CIVIL TITLE SHEET	A	11/30/2023
C-002	CIVIL NOTES	A	11/30/2023
C-100	EXISTING CONDITIONS PLAN	A	11/30/2023
CD-200	DEMOLITION PLAN	A	11/30/2023
C-200	OVERALL SITE LAYOUT & LOCATION PLAN	A	11/30/2023
C-201	SITE PLAN SOUTH	A	11/30/2023
C-202	SITE PLAN NORTH	A	11/30/2023
C-301	GRADING PLAN SOUTH	A	11/30/2023
C-302	GRADING PLAN NORTH	A	11/30/2023
C-401	EROSION & SEDIMENT CONTROL PLAN SOUTH	A	11/30/2023
C-402	EROSION & SEDIMENT CONTROL PLAN NORTH	A	11/30/2023
C-501	RESTORATION PLAN	A	11/30/2023
D-200	SITE DETAILS	A	11/30/2023
D-300	EROSION & SEDIMENT CONTROL DETAILS	A	11/30/2023
D-301	EROSION & SEDIMENT CONTROL DETAILS	A	11/30/2023
D-400	LANDSCAPING DETAILS	A	11/30/2023
D-500	FENCE & GATE DETAILS	A	11/30/2023

NOT FOR CONSTRUCTION

CTEC SOLAR
1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:
STATE OF NEW YORK RAKAM LAMA TAMANG 103954 LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT
WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
CIVIL TITLE SHEET

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
N/A

SHEET NO.:
C-001

GENERAL NOTES:

1. THE EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE, AND UTILITY LINES MAY EXIST WHERE NONE ARE SHOWN. SOME INFORMATION MAY HAVE BEEN DERIVED FROM INFORMATION PROVIDED TO THE ENGINEER BY OTHERS. SUCH INFORMATION MAY BE INCOMPLETE OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES.
2. CONTACT DIG SAFELY NEW YORK AT (800) 962-7962 AND ANY NON-PARTICIPATING UTILITY COMPANIES AT LEAST 2 WORKING DAYS BEFORE CONSTRUCTION. EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF PERTINENT UTILITIES, AND OTHER EXISTING FEATURES IN OR NEAR THE AREA OF WORK, WHETHER INDICATED ON THESE DRAWINGS OR NOT. SHOULD A CONFLICT EXIST, NOTIFY THE ENGINEER AS SOON AS POSSIBLE. EXERCISE DUE CARE TO AVOID DISTURBING ANY UNDERGROUND UTILITIES. COORDINATE ANY POTENTIAL DISRUPTION IN UTILITY SERVICE WITH THE UTILITY COMPANIES AFFECTED AT LEAST 24 HOURS PRIOR TO DISRUPTION. REPAIR DAMAGE TO EXISTING UTILITIES AT CONTRACTOR'S EXPENSE.
3. DO NOT ERECT ANY IMPROVEMENTS, FENCES, PLANTINGS, ETC., WITHIN ANY PUBLIC RIGHT OF WAY.
4. PERFORM ALL WORK IN ACCORDANCE WITH SECTION 202-H OF THE PROPOSED NEW YORK STATE LABOR LAW (CODE RULE 57) KNOWN AS THE "HIGH-VOLTAGE PROXIMITY ACT". "HIGH-VOLTAGE LINES" MEANS ELECTRICAL CONDUCTORS INSTALLED ABOVE GROUND AND HAVING A VOLTAGE DIFFERENTIAL IN EXCESS OF 600 VOLTS BETWEEN ANY PAIR OF CONDUCTORS OR BETWEEN ANY CONDUCTOR AND GROUND. IN THE CASE OF ALTERNATING CURRENT, THE VOLTAGE SHALL BE MEASURED IN R.M.S. VALUE. THIS DEFINITION SHALL NOT INCLUDE APPROVED ARMORED CABLE USED TO SUPPLY POWER TO PORTABLE EQUIPMENT AND INSULATED POWER CABLES ENCLOSED IN APPROVED METALLIC RACEWAYS.
5. POST WARNING SIGNS IN ACCORDANCE WITH THE HIGH-VOLTAGE PROXIMITY ACT.
6. BE RESPONSIBLE FOR ALL PERMITS AND APPROVALS FOR CONSTRUCTION ACTIVITIES THAT OCCUR OFF-SITE OR OCCUR WITHIN EXISTING EASEMENT OR RIGHT-OF-WAY AREAS.
7. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATION TO CONSTRUCTION DETAILS AND WORK QUANTITIES. VERIFY ALL EXISTING CONDITIONS, DIMENSIONS, ELEVATIONS, ETC., IN FIELD AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION OR SUBMISSION OF SHOP DRAWINGS.
8. COORDINATE WORK OF ALL DISCIPLINES (SITE WORK, STRUCTURAL, ELECTRICAL, ETC.), EXISTING CONDITIONS, SPECIAL REQUIREMENTS, CONSTRUCTION SCHEDULE AND OTHER CONTRACTORS PERFORMING WORK AT THE SITE.
9. EXCAVATED MATERIAL MAY BE REUSED UPON APPROVAL BY THE OWNER'S REPRESENTATIVE.
10. OBSERVE ALL OSHA AND OTHER APPLICABLE SAFETY REQUIREMENTS INCLUDING THE USE OF SAFETY GLASSES, HARD HATS, AND PROTECTION OF AREA WHEN WORKING OVERHEAD. BE RESPONSIBLE FOR CONSTRUCTION SAFETY AT ALL TIMES.
11. DESIGN AND PROVIDE ANY TEMPORARY SHORING, BRACING, ETC., AS NEEDED FOR THE WORK SO AS NOT TO ENDANGER OR DAMAGE ANY EXISTING STRUCTURAL COMPONENTS, EXISTING APPURTENANCES, OR INSTALLED STRUCTURES OR SYSTEMS.
12. BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, AND CARRY OUT THE WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS. OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, THEIR AGENTS OR EMPLOYEES, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK.
13. FOLLOW GUIDANCE AND RECOMMENDATIONS PROVIDED IN THE STORMWATER POLLUTION PREVENTION PLAN. BRING TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION IF CONFLICT OCCURS BETWEEN CONSTRUCTION DOCUMENTS.
14. GEOTECHNICAL REPORT PREPARER: TBD
15. PROVIDE APPROPRIATE FLAGGING AND/OR SIGNAGE DURING CONSTRUCTION AND LONG TERM MAINTENANCE PER NYSDOT REQUIREMENTS.
16. FINAL PLANT TYPE, HEIGHT AND LOCATION OF PROPOSED VISUAL SCREENING IS SUBJECT TO FINAL LANDSCAPING DESIGN AND MUNICIPAL APPROVAL.
17. THE COMPONENTS NOTED IN THESE PLANS WERE DESIGNED WITHOUT A GEOTECHNICAL INVESTIGATION. ALL COMPONENTS OF THE CIVIL DESIGN ARE CONSIDERED PRELIMINARY AND ARE SUBJECT TO CHANGE THROUGHOUT THE DESIGN STAGES.

EXISTING CONDITIONS & SURVEY NOTES

1. ALL PROPOSED AND EXISTING FEATURES HEREIN SHALL BE CONSIDERED APPROXIMATE. THIS DESIGN PACKAGE WAS COMPLETED WITHOUT A GEOTECHNICAL INVESTIGATION, BOUNDARY, AND TOPOGRAPHIC SURVEY. TETRA TECH IS NOT LIABLE FOR INCONSISTENCIES OR CHANGES NEEDED IN THE FUTURE DESIGN DUE TO UNEXPECTED FINDINGS OR INFORMATION.

GENERAL DRAINAGE & GRADING NOTES:

1. DEWATER THE EXCAVATIONS AS REQUIRED TO MAINTAIN A STABILIZED SLOPE.
2. PROTECT AT ALL TIMES ALL EXISTING SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHERE ENCOUNTERED IN THE WORK, AND, WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, RELOCATE AS DIRECTED BY THE ENGINEER.
3. DO NOT PLACE FILL, EMBANKMENT, OR BACKFILL MATERIAL ON FROZEN GROUND. FROZEN MATERIALS, SNOW, OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT UNLESS APPROVED IN WRITING BY THE ENGINEER.
4. WHERE TREE AND STUMP REMOVAL OCCURRED, GRADE AREA TO LEVEL SURFACE SO THAT SLOPES DO NOT EXCEED 5%.
5. PROVIDE POSITIVE DRAINAGE AWAY FROM EQUIPMENT PADS.
6. ALL SEDIMENT LADEN WATER SHALL BE PUMPED TO A SEDIMENT TRAPPING DEVICE.
7. EARTHWORK QUANTITIES ARE APPROXIMATE AND BASED ON FINAL GRADES (NO TEMPORARY GRADING INCLUDED). CONTRACTOR TO VERIFY FINAL VOLUMES BASED ON SPECIFIC EQUIPMENT AND PROCEDURES USED IN THE FIELD.

PROJECT CONSTRUCTION SEQUENCING NOTES:

1. PRIOR TO COMMENCING ANY CLEARING, GRUBBING, EARTHWORK ACTIVITIES, ETC. AT THE SITE, FLAG THE WORK LIMITS AND INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (I.E., SILT FENCES, TREE PROTECTION/BARRIER FENCES, STABILIZED CONSTRUCTION ENTRANCES, STORM DRAIN SEDIMENT FILTERS, DRAINAGE DITCH SEDIMENT FILTERS, ETC.) INDICATED ON THE PROJECT DRAWINGS. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THEIR TRIBUTARY AREAS.
2. PRIOR TO COMMENCING CLEARING, GRUBBING AND/OR EARTHWORK ACTIVITIES IN ANY OTHER AREA OF THE SITE, INSTALL INLET AND OUTLET PROTECTION MEASURES (RIPRAP OVERFLOW WEIR(S), CULVERT INLET/OUTLET PROTECTION, ETC.) AND STABILIZE THE AREAS DISTURBED DURING THE CONSTRUCTION OF SEDIMENT CONTROL FEATURES.
3. INSTALL TEMPORARY DIVERSION MEASURES WITH ASSOCIATED STABILIZATION MEASURES (I.E., VEGETATIVE COVER, DRAINAGE DITCH SEDIMENT FILTERS, STORM DRAIN SEDIMENT FILTERS, ETC.) PRIOR TO CONSTRUCTION.
4. LOCATE TEMPORARY DIVERSION MEASURES IN A MANNER THAT WILL ASSURE THAT THE AREA TRIBUTARY TO EACH DIVERSION DOES NOT EXCEED FIVE (5) ACRES. INSPECT THESE TEMPORARY DIVERSION MEASURES DAILY AND REPAIR/STABILIZE AS NECESSARY TO MINIMIZE EROSION.
5. COMMENCE SITE CONSTRUCTION ACTIVITIES AS REQUIRED.
6. IMMEDIATELY FOLLOWING COMPLETION OR SUSPENSION OF CONSTRUCTION ACTIVITIES IN ANY PORTION OF THE SITE, ESTABLISH PERMANENT VEGETATION ON ALL EXPOSED SOILS.
7. RESTORE SOILS THAT HAVE BEEN DISTURBED AND COMPACTED DUE TO CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE PROJECT SWPPP (WHICH INCLUDES DE-COMPACTION, COMPOST ADDITION AND TOPSOIL PLACEMENT).
8. UPON ESTABLISHMENT OF PERMANENT VEGETATIVE COVER ON ALL DISTURBED AREAS OF THE SITE, REMOVE THE CONSTRUCTION FABRIC FROM THE PRIMARY INLET OF THE OUTLET CONTROL STRUCTURE. THIS SHALL ONLY BE DONE WHEN THE PRIMARY OUTLET IS NO LONGER SUBMERGED.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND IMMEDIATELY ESTABLISH PERMANENT VEGETATION ON THE AREAS DISTURBED DURING THEIR REMOVAL.
10. REFER TO THE SWPPP FOR ADDITIONAL SEQUENCING INFORMATION.

WINTER STABILIZATION:

1. WINTER STABILIZATION SHALL APPLY TO ALL CONSTRUCTION ACTIVITIES INVOLVED WITH ONGOING LAND DISTURBANCE AND EXPOSURE BETWEEN NOVEMBER 15TH TO THE FOLLOWING APRIL 1ST.
2. MAINTAIN AN AREA FOR ADEQUATE STORAGE FOR SNOW AND CONTROL OF MELT WATER. STORE CLEARED SNOW IN A MANNER NOT AFFECTING ONGOING CONSTRUCTION ACTIVITIES.
3. MAINTAIN A MINIMUM 25 FOOT BUFFER FROM ALL PERIMETER CONTROLS. MARK SILT FENCE WITH TALL STAKES THAT ARE VISIBLE ABOVE THE SNOW PACK.
4. EDGES OF DISTURBED AREAS THAT DRAIN TO A WATERBODY WITHIN 100 FEET SHALL HAVE 2 ROWS OF SILT FENCE, INSTALLED 5 FEET APART ALONG THE CONTOUR.
5. KEEP DRAINAGE STRUCTURES OPEN AND FREE OF SNOW AND ICE DAMS. REMOVE ALL DEBRIS, ICE DAMS, OR DEBRIS FROM PLOWING OPERATIONS THAT RESTRICT THE FLOW OF RUNOFF AND MELTWATER.
6. IN AREAS WHERE SOIL DISTURBANCE ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED, SOIL STABILIZATION MEASURES SHALL BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN 3 DAYS. ROLLED EROSION CONTROL BLANKETS MUST BE USED ON ALL SLOPES 3 HORIZONTAL TO 1 VERTICAL OR STEEPER.
7. STABILIZE AREAS OF DISTURBED SOIL AT THE END OF EACH DAY UNLESS WORK WILL RESUME WITHIN 24 HOURS IN THE SAME AREA AND NO PRECIPITATION IS FORECASTED OR THE WORK IS IN DISTURBED AREAS THAT COLLECT AND RETAIN RUNOFF.

SEDIMENT & EROSION CONTROL NOTES:

1. CONDUCT SOIL DISTURBANCE IN SUCH A MANNER AS TO MINIMIZE EROSION. CONSIDER THE TIME OF YEAR, SITE CONDITIONS, AND THE TEMPORARY OR PERMANENT MEASURES FOR SOIL STABILIZATION.
2. CONSTRUCT SOIL EROSION AND SEDIMENT CONTROL FEATURES PRIOR TO THE COMMENCEMENT OF HYDROLOGIC DISTURBANCE OF UPLAND AREAS.
3. STABILIZE DISTURBED AREAS WITH TEMPORARY OR PERMANENT MEASURES WITHIN 7 CALENDAR DAYS OF THE END OF ACTIVE HYDROLOGIC DISTURBANCE OR REDISTURBANCE.
4. STABILIZE AREAS OR EMBANKMENTS HAVING SLOPES GREATER THAN OR EQUAL TO 3 HORIZONTAL: 1 VERTICAL WITH EROSION CONTROL BLANKET IN COMBINATION WITH SEEDING. STABILIZE CONSTRUCTION DITCHES WITH EROSION CONTROL BLANKET IN COMBINATION WITH SEEDING.
5. LOCATE A STABILIZED CONSTRUCTION ENTRANCE AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET, OR PARKING AREA. REMOVE SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, OR PARKING AREA BY SCRAPING, OR STREET CLEANING, AS ACCUMULATIONS WARRANT AND TRANSPORT TO A CONTROLLED SEDIMENT DISPOSAL AREA. TEMPORARY ROADWAYS ARE TO BE CONSTRUCTED AT 24' WIDTH.
6. ERECT SILT FENCE AROUND TEMPORARY SOIL STOCKPILES, REGARDLESS OF EXPOSURE TIME.
7. DO NOT LOCATE SOIL STOCKPILES IN A FLOOD PRONE AREA OR A DESIGNATED BUFFER PROTECTING WATERS OF THE UNITED STATES.
8. IF DEWATERING SERVICES ARE USED, PROTECT ADJOINING PROPERTIES AND DISCHARGE LOCATIONS FROM EROSION. ROUTE DISCHARGES THROUGH AN EFFECTIVE SEDIMENT CONTROL MEASURE SUCH AS A SEDIMENT TRAP, SEDIMENT BASIN, OR OTHER APPROPRIATE MEASURE.
9. THE EROSION CONTROL MEASURES INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER OR GOVERNING AGENCY.
10. INSPECT AND MAINTAIN ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROL MEASURES AS NEEDED AND IN ACCORDANCE WITH THE NYSDEC SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITY, PERMIT NO. GP-0-20-001 OR LATEST VERSION APPLICABLE, AND AS SPECIFIED IN THE STORMWATER POLLUTION PREVENTION PLAN.

VEGETATIVE COVER SPECIFICATIONS:

SITE PREPARATION:

1. INSTALL NEEDED WATER AND EROSION CONTROL MEASURES.
2. PREPARE SEEDBED BY LOOSENING SOIL TO A DEPTH OF 4 TO 6 INCHES.
3. WHERE GRADING HAS OCCURRED, BRING AREAS TO BE SEEDED TO DESIRED GRADES USING A MINIMUM OF 4 IN. TOPSOIL.
4. LIME TO PH OF 6.5.
5. FERTILIZE AS PER SOIL TEST, OR, IF FERTILIZER MUST BE APPLIED BEFORE SOIL TEST RESULTS ARE RECEIVED, APPLY 850 LBS. OF 5-10-10 OR EQUIVALENT PER ACRE (20 LBS PER 1,000 SQ. FT.).
6. INCORPORATE LIME AND FERTILIZER IN TOP 2-4 INCHES OF TOPSOIL.
7. REMOVE LARGE STONES, STICKS AND FOREIGN MATTER FROM THE SURFACE.

TEMPORARY VEGETATIVE COVER (DURING CONSTRUCTION):

1. SEED MIX:
   SPRING OR SUMMER OR EARLY FALL, SEED WITH ANNUAL OR PERENNIAL RYEGRASS AT A RATE OF 30 LBS. PER ACRE (APPROX. 1 LB./1,000 SQ. FT).

   LATE FALL OR EARLY WINTER, SEED WITH "AROOSTOOK" WINTER RYE (CEREAL RYE) AT A RATE OF 100 LBS PER ACRE (APPROX. 2.5 LBS/1,000 SQ. FT.)

PERMANENT VEGETATIVE COVER (AFTER CONSTRUCTION):

1. SEED MIXES:
   PROVIDE FRESH, CLEAN, NEW-CROP SEED MIXED IN THE PROPORTIONS SPECIFIED FOR SPECIES AND VARIETY, AND CONFORMING TO FEDERAL AND STATE STANDARDS. PROVIDE THE FOLLOWING MIXTURES:

   ARRAY AREA/ FILTER STRIP SEED MIX: ERNMX-610 NORTHEAST SOLAR POLLINATOR BUFFER MIX

AMOUNT BY: WEIGHT	SPECIES OR VARIETY
37.0%	LITTLE BLUESTEM, 'CAMPER'
36.3%	SIDEOATS GRAMA, BUTTE
4.0%	PARTRIDGE PEA, PA ECOTYPE
4.0%	LANCELEAF COREOPSIS
4.0%	PURPLE CONEFLOWER
3.3%	BLACKEYED SUSAN
2.3%	OXEYE SUNFLOWER, PA ECOTYPE
1.6%	TALL WHITE BEARDTONGUE
1.5%	BUTTERFLY MILKWEED
0.8%	MARCH BLAZING STAR
0.7%	WILD SENNA, VA & WV ECOTYPE
0.6%	GOLDEN ALEXANDERS
0.5%	SWAMP MILKWEED, PA ECOTYPE
0.5%	WHITE AVENS, PA ECOTYPE
0.5%	WILD BERGAMOT, FORT INDIANTOWN GAP-PA ECOTYPE
0.5%	NARROWLEAF MOUNTAINMINT
0.4%	SMOOTH BLUE ASTER, NY ECOTYPE
0.4%	NEW ENGLAND ASTER, PA ECOTYPE
0.3%	BLUE FALSE INDIGO, SOUTHERN WV ECOTYPE
0.3%	NARROWLEAF BLUE EYED GRASS
0.2%	SUNDROPS
0.2%	GRAY GOLDENROD, PA ECOTYPE
0.1%	ZIGZAG ASTER, PA ECOTYPE
100%	

   SEEDING RATE: SEED AT 15 LBS/ ACRE WITH 30 LBS/ ACRE OF A COVER CROP. FOR A COVER CROP, USE EITHER GRAIN OATS (1 JAN TO 31 JUL) OR GRAIN RYE (1 AUG TO 31 DEC).

   NON-ARRAY AREA SEED MIX

AMOUNT BY: WEIGHT	SPECIES OR VARIETY	LBS/1,000 SQ.FT.	LBS/ACRE
50%	CREEPING RED FESCUE	0.5	20
50%	PERENNIAL RYEGRASS	0.5	20
100%	TOTAL	1.0	40

2. TIME OF SEEDING: OPTIMUM TIMING OF SEEDING IS EARLY SPRING. LATE JUNE THROUGH EARLY AUGUST IS NOT A GOOD TIME TO SEED, BUT MAY FACILITATE COVERING THE LAND WITHOUT ADDITIONAL DISTURBANCE IF CONSTRUCTION IS COMPLETE. PORTIONS OF THE SEEDING MAY FAIL DUE TO DROUGHT AND HEAT. RESEED THESE AREAS IN LATE SUMMER OR FALL OR THE FOLLOWING SPRING TO SATISFACTION OF OWNER AND ENGINEER.

EARTHWORK

SUBMITTALS:

- NAME OF MATERIAL SUPPLIERS
- MANUFACTURER'S CERTIFICATE: CERTIFY PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS

PRODUCTS/ MATERIALS:

1. SOIL MATERIALS: PROVIDE BORROW SOIL MATERIALS WHEN SUFFICIENT SATISFACTORY SOIL MATERIALS ARE NOT AVAILABLE FROM EXCAVATIONS.
2. SATISFACTORY SOILS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, AND SM, OR A COMBINATION OF THESE GROUP SYMBOLS; FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.
3. UNSATISFACTORY SOILS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT, OR A COMBINATION OF THESE GROUP SYMBOLS.

STRUCTURAL FILL: REFER TO EXCAVATION, BACKFILL AND COMPACTION SPECIFICATIONS IN THE STRUCTURAL SHEETS (WHEN AVAILABLE).

UNCLASSIFIED FILL: SATISFACTORY SOIL MATERIALS.

BACKFILL AND FILL: SATISFACTORY SOIL MATERIALS.

GEOTEXTILE: PRODUCTS AS NOTED ON THE DETAILS.

SUBBASE MATERIAL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; WITH AT LEAST 95 PERCENT PASSING A 1-1/2-INCH SIEVE AND NOT MORE THAN 12 PERCENT PASSING A NO. 200 SIEVE.

INSTALLATION:

PREPARATION:

PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT, AND OTHER HAZARDS CREATED BY EARTHWORK OPERATIONS.

PROOF ROLL SUBGRADES, BEFORE FILLING OR PLACING AGGREGATE COURSES, WITH HEAVY PNEUMATIC-TIRED EQUIPMENT TO IDENTIFY SOFT POCKETS AND AREAS OF EXCESS YIELDING. DO NOT PROOF ROLL WET OR SATURATED SUBGRADES. ALL TOPSOIL AND/OR ORGANIC MATERIAL SHALL BE REMOVED FROM AREAS TO RECEIVE FILL.

EXCAVATE FOR STRUCTURES, PAVEMENTS, AND WALKS TO INDICATED ELEVATIONS AND DIMENSIONS. EXTEND EXCAVATIONS FOR PLACING AND REMOVING CONCRETE FORMWORK, FOR INSTALLING SERVICES AND OTHER CONSTRUCTION, AND FOR INSPECTIONS. TRIM BOTTOMS TO REQUIRED LINES AND GRADES TO LEAVE SOLID BASE TO RECEIVE OTHER WORK.

EXCAVATE UTILITY TRENCHES TO INDICATED GRADIENTS, LINES, DEPTHS, AND INVERT ELEVATIONS OF UNIFORM WIDTHS TO PROVIDE A WORKING CLEARANCE ON EACH SIDE OF PIPE OR CONDUIT. EXCAVATE TRENCH WALLS VERTICALLY FROM TRENCH BOTTOM TO 12 INCHES HIGHER THAN TOP OF PIPE OR CONDUIT. EXCAVATE TRENCHES DEEPER THAN BOTTOM OF PIPE ELEVATION, 6 INCHES DEEPER IN ROCK, 4 INCHES DEEPER ELSEWHERE, TO ALLOW FOR BEDDING COURSE. HAND EXCAVATE FOR BELL OF PIPE. TRENCH WALLS SHALL BE SHORED OR SLOPED IN ACCORDANCE WITH OSHA REGULATIONS.

RECONSTRUCT SUBGRADES DAMAGED BY FREEZING TEMPERATURES, FROST, RAIN, ACCUMULATED WATER, OR CONSTRUCTION ACTIVITIES. BACKFILL AND FILL SHALL NOT BE PLACED ON FROZEN MATERIAL.

FILL UNAUTHORIZED EXCAVATION UNDER FOUNDATIONS OR WALL FOOTINGS BY EXTENDING BOTTOM ELEVATION OF CONCRETE FOUNDATION OR FOOTING TO EXCAVATION BOTTOM, WITHOUT ALTERING TOP ELEVATION. LEAN CONCRETE FILL MAY BE USED WHEN APPROVED BY ENGINEER. FILL UNAUTHORIZED EXCAVATIONS UNDER OTHER CONSTRUCTION OR UTILITY PIPE AS DIRECTED BY THE ENGINEER.

BACKFILL

PLACE AND COMPACT FILL MATERIAL IN LAYERS TO REQUIRED ELEVATIONS.

STRUCTURAL FILL: ALL FILL PLACED AROUND THE FOUNDATIONS SHALL BE COMPACTED IN ACCORDANCE WITH THE EXCAVATION, BACKFILL AND COMPACTION SPECIFICATIONS OUTLINED IN THE STRUCTURAL SHEETS.

STANDARD FILL: SCARIFY AND RECOMPACT THE TOP 12 INCHES OF EXISTING SUBGRADE AND EACH LAYER OF FILL MATERIAL AT 95% MAXIMUM DRY DENSITY.

UNCLASSIFIED FILL: SCARIFY AND RECOMPACT THE TOP 12 INCHES OF EXISTING SUBGRADE AND EACH LAYER OF FILL MATERIAL AT 90% MAXIMUM DRY DENSITY.

UTILITY TRENCH BACKFILL: PLACE, COMPACT, AND SHAPE BEDDING COURSE TO PROVIDE CONTINUOUS SUPPORT FOR PIPES AND CONDUITS OVER ROCK AND OTHER UNYIELDING BEARING SURFACES AND TO FILL UNAUTHORIZED EXCAVATIONS.

PLACE AND COMPACT INITIAL BACKFILL OF SATISFACTORY SOIL MATERIAL OR SUBBASE MATERIAL, FREE OF PARTICLES LARGER THAN 1.5 INCH, TO A HEIGHT OF 12 INCHES OVER THE UTILITY PIPE OR CONDUIT. PLACE AND COMPACT FINAL BACKFILL OF SATISFACTORY SOIL MATERIAL TO FINAL SUBGRADE.

COMPACTION

SUBGRADE UNDER EQUIPMENT FOUNDATIONS: SUBGRADE SHALL BE COMPACTED IN ACCORDANCE WITH EXCAVATION, BACKFILL AND COMPACTION SPECIFICATIONS IN THE STRUCTURAL SHEETS.

PLACE BACKFILL, SUBBASE MATERIAL AND UNCLASSIFIED FILL MATERIALS IN LAYERS NOT MORE THAN 12 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS. COMPACT SOIL TO NOT LESS THAN THE FOLLOWING PERCENTAGE OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 1557, OR AS SPECIFIED.

SUBBASE COMPACTION: COMPACT TYPE CRUSHED STONE FOR THE FULL WIDTH OF FILL LAYER TO A CONDITION OF NON-MOVEMENT UNDER THE COMPACTION EQUIPMENT. COMPACTION ACCEPTANCE WILL BE DETERMINED BY THE FIELD REPRESENTATIVE. NON-MOVEMENT UNDER COMPACTION EQUIPMENT IS DEFINED AS CREATING A STABLE CONDITION OF THE COMPACTED MATERIAL. A STABLE CONDITION OCCURS WHEN THERE IS NO RUTTING, DISPLACEMENT, OR SHEAR WAVE UNDER COMPACTION EQUIPMENT. A SHEAR WAVE IS BULGING OF THE MATERIAL SURFACE IN FRONT OF AND BEHIND THE COMPACTION EQUIPMENT. MAINTAIN TYPE CRUSHED STONE IN A SURFACE DAMP CONDITION, BUT NOT WET (NO EXCESS MOISTURE) AT THE TIME OF COMPACTION.

MULCHING

INSTALLATION:

1. MULCHING SHALL BE REQUIRED ON ALL SEEDING. MULCH WILL REDUCE EROSION BEFORE GRASS IS ESTABLISHED AND WILL PROMOTE FASTER AND EARLIER ESTABLISHMENT. THE EXISTENCE OF VEGETATION SUFFICIENT TO CONTROL SOIL EROSION SHALL BE DEEMED IN COMPLIANCE WITH THIS MULCHING REQUIREMENT.
2. SPREAD STRAW OR HAY MULCH UNIFORMLY BY HAND OR MECHANICALLY SO THAT APPROXIMATELY 75% TO 95% OF THE SOIL SURFACE WILL BE COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO 1,000 SQUARE FOOT SECTIONS AND DISTRIBUTE AT LEAST 90 POUNDS WITHIN EACH SECTION.
3. STRAW OR HAY MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER. APPLICATIONS SHALL BE HEAVIER AT EDGES WHERE WIND CATCHES THE MULCH, IN VALLEYS, AND AT CRESTS OF BANKS. REMAINDER OF AREA SHALL BE UNIFORM IN APPEARANCE.

PRODUCTS:

MULCH MATERIALS SHALL BE WOOD FIBER APPLIED WITH A HYDROMULCH AT 2000 POUNDS PER ACRE, OR IF DRILLING, UNROTTED SMALL GRAIN STRAW OR HAY FREE OF SEEDS, OR SALT HAY APPLIED AT THE RATE OF 2 TONS PER ACRE (90 TO 100 POUNDS PER 1,000 SQUARE FEET).

ACRONYMS/ABBREVIATIONS:

AC	ALTERNATING CURRENT
APPROX.	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CMP	CORRUGATED METAL
DIA	DIAMETER
ETC	ET CETERA
FES	FLARED END SECTION
FT	FOOT
GTD	GRADE TO DRAIN
HDPE	HIGH-DENSITY POLYETHYLENE
IN	INCH
INC	INCORPORATED
INV	INVERT ELEVATION
LBS	POUNDS
LOD	LIMITS OF DISTURBANCE
N/F	NOW OR FORMALLY
NO.	NUMBER
N.T.S.	NOT TO SCALE
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
O.C	ON CENTER
OHE	OVERHEAD ELECTRIC
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PV	PHOTOVOLTAIC
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT-OF-WAY
SPDES	STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM
SQ FT	SQUARE FEET
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
TA#	TAX MAP NUMBER
TBD	TO BE DETERMINED
TYP.	TYPICAL
UGE	UNDERGROUND ELECTRIC

NOT FOR CONSTRUCTION

CTEC SOLAR
1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:
STATE OF NEW YORK
RAKAM LAMA TAMANG
103954
LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS: 194-1409-0003

SHEET TITLE: CIVIL NOTES

SHEET SIZE: ARCH "D" 24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE: 30% CIVIL DESIGN

SCALE: N/A

SHEET NO.: C-002

LEGEND

- PROPERTY BOUNDARY
- PROPERTY LINE SETBACK
- EXISTING PAVEMENT EDGE
- OHE — EXISTING OVERHEAD ELECTRIC
- EXISTING TREE LINE
- EXISTING WETLAND

NOTES:

1. SITE IS LOCATED IN AN AREA OF MINIMAL FLOOD HAZARD ACCORDING TO FEMA FIRM MAPS OF THE AREA. THE 100-YEAR FLOOD PLAIN DOES NOT INTRUDE INTO THE PROPERTY.
2. ALL EXISTING SITE FEATURES TO BE VERIFIED BY ALTA SURVEY.

NOT FOR CONSTRUCTION

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STAMP:

STATE OF NEW YORK
RAKAM LAMA TAMANG
103954
LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

EXISTING CONDITIONS

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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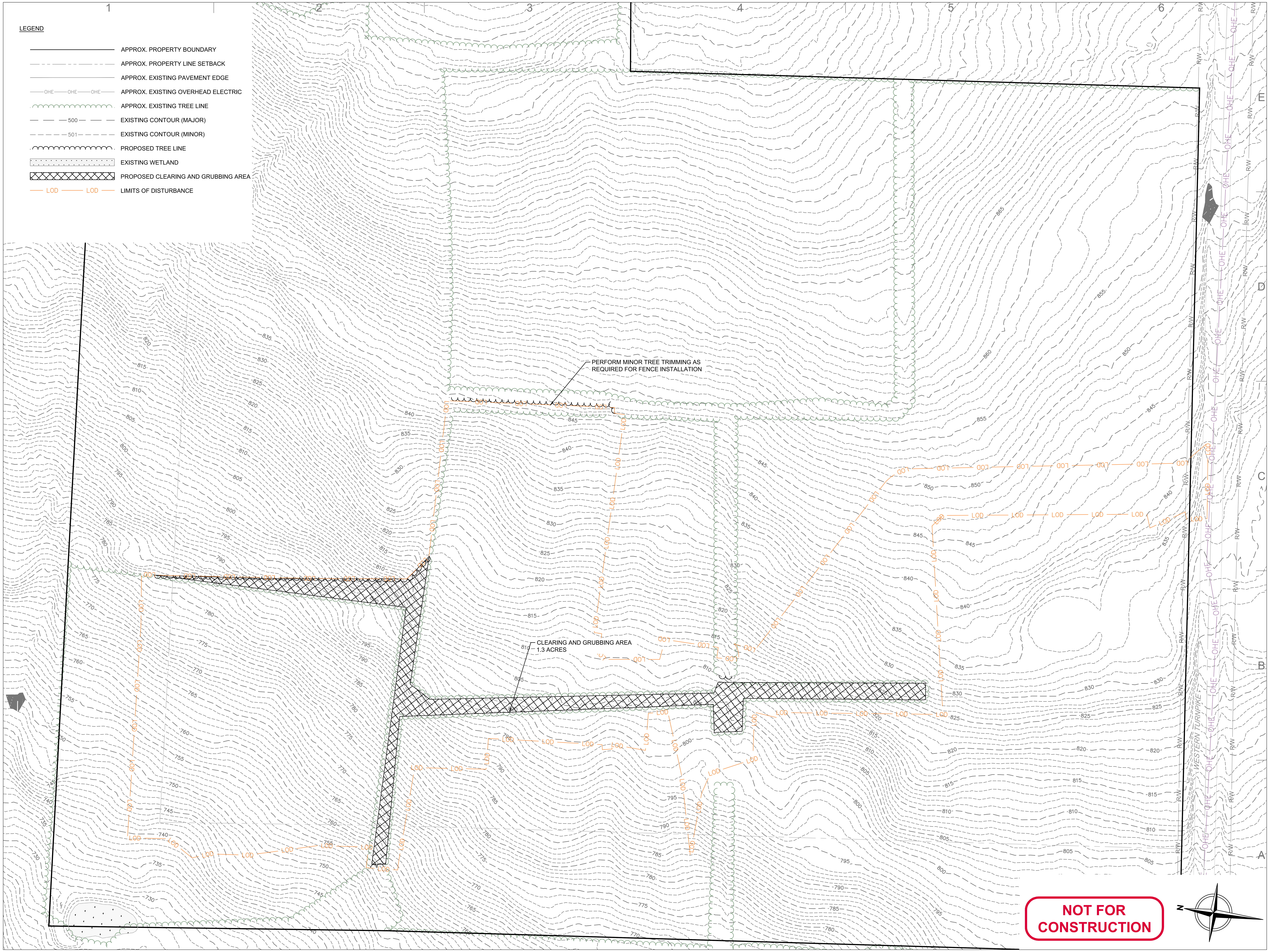
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 50' 100' 200'
SCALE: 1" = 100'

SHEET NO.:
C-100



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STAMP:

STATE OF NEW YORK
RAKAM LAMA TAMANG
103954
LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
DEMOLITION PLAN

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

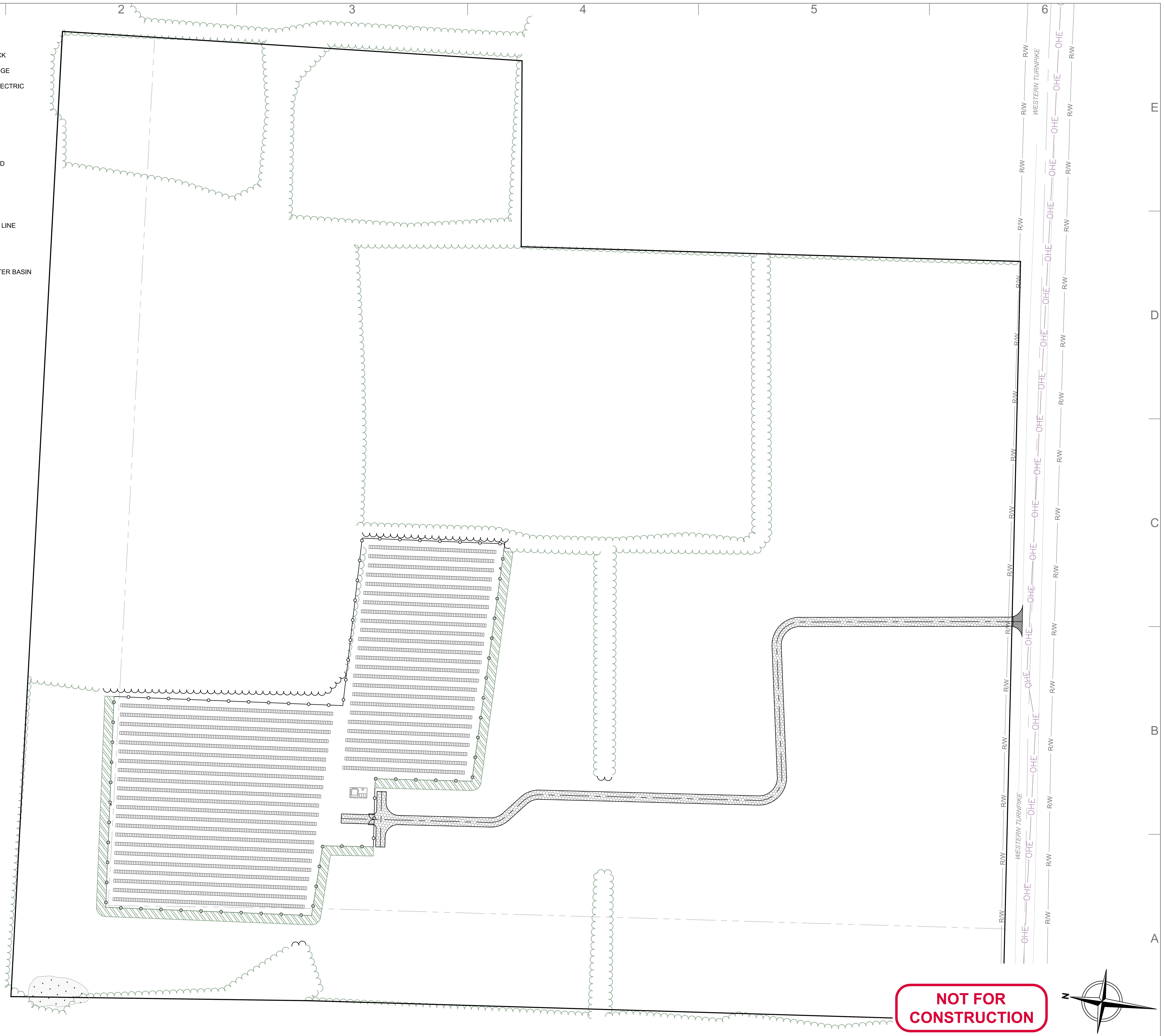
PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 50' 100' 200'
SCALE: 1" = 100'

SHEET NO.:
CD-200

LEGEND

- APPROX. PROPERTY BOUNDARY
- APPROX. PROPERTY LINE SETBACK
- APPROX. EXISTING PAVEMENT EDGE
- OHE — APPROX. EXISTING OVERHEAD ELECTRIC
- APPROX. EXISTING TREE LINE
- PROPOSED TREE LINE
- EXISTING WETLAND
- PROPOSED CHAIN LINK FENCE
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED FILTER STRIP
- PROPOSED CULVERT
- UGE — PROPOSED ELECTRIC TRENCH
- OHE — PROPOSED OVERHEAD ELECTRIC LINE
- PROPOSED DITCH CENTERLINE
- PROPOSED SCREENING BUFFER
- POTENTIAL AREA FOR STORMWATER BASIN



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BLOOMFIELD, CT 06002

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STAMP:

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
OVERALL SITE LAYOUT & LOCATION PLAN

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

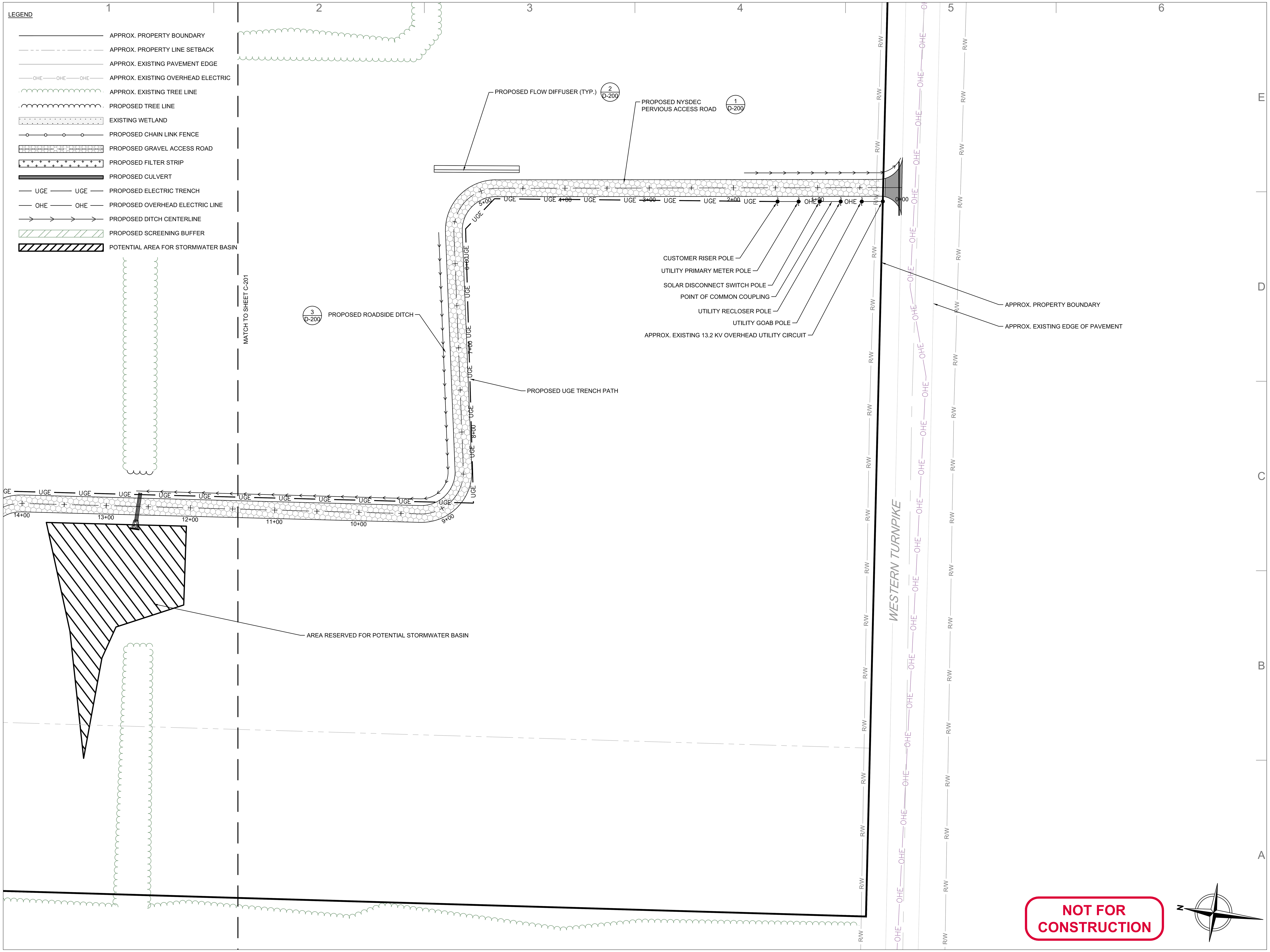
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 50' 100' 200'
SCALE: 1" = 100'

SHEET NO.:
C-200



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STAMP:

STATE OF NEW YORK · RAKAM LAMA TAMANG · 103954 · LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

SITE PLAN SOUTH

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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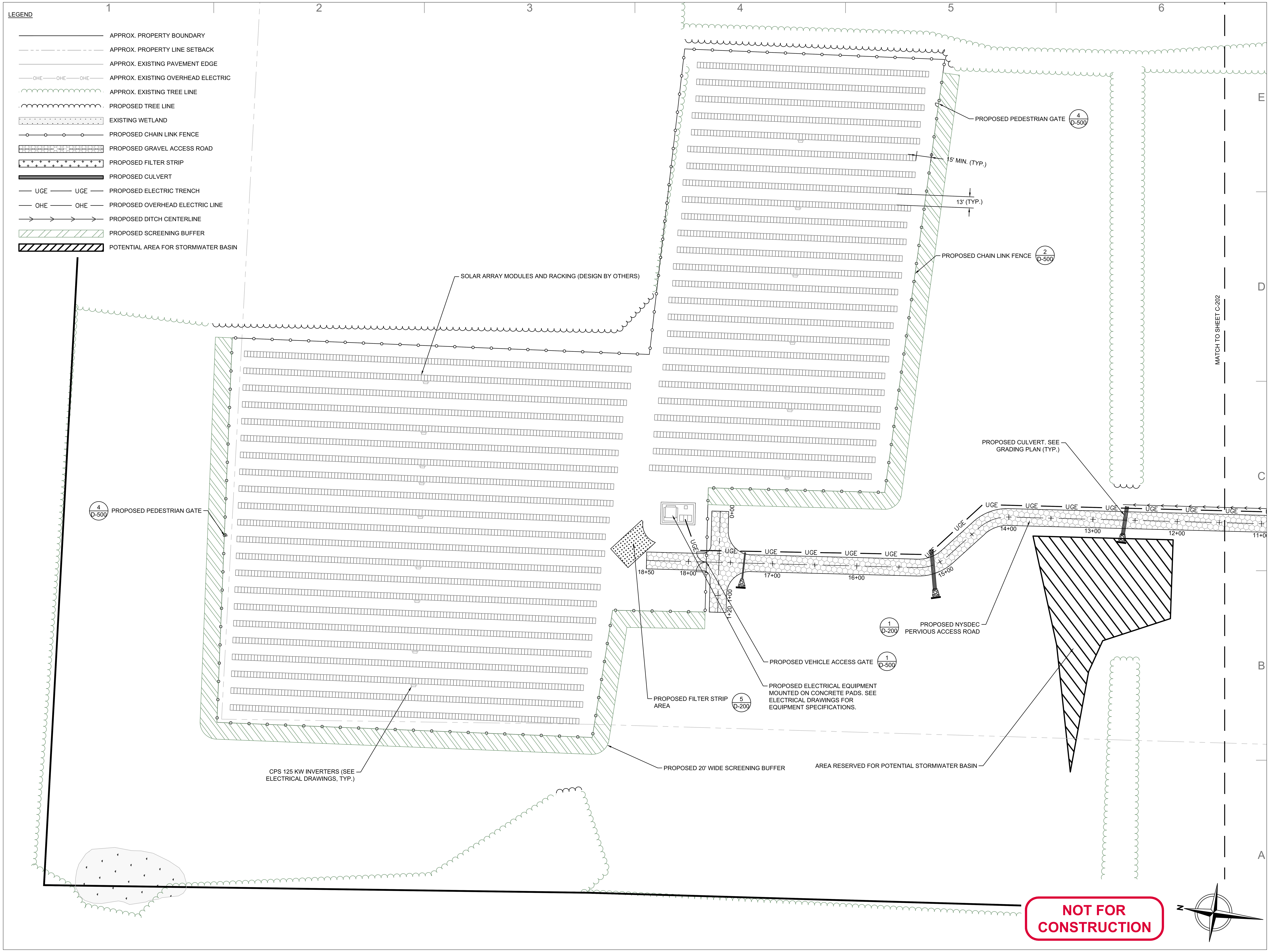
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 25' 50' 100'
SCALE: 1" = 50'

SHEET NO.:
C-201



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STAMP:

STATE OF NEW YORK
RAKAM LAMA TAMANG
103954
LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
SITE PLAN NORTH

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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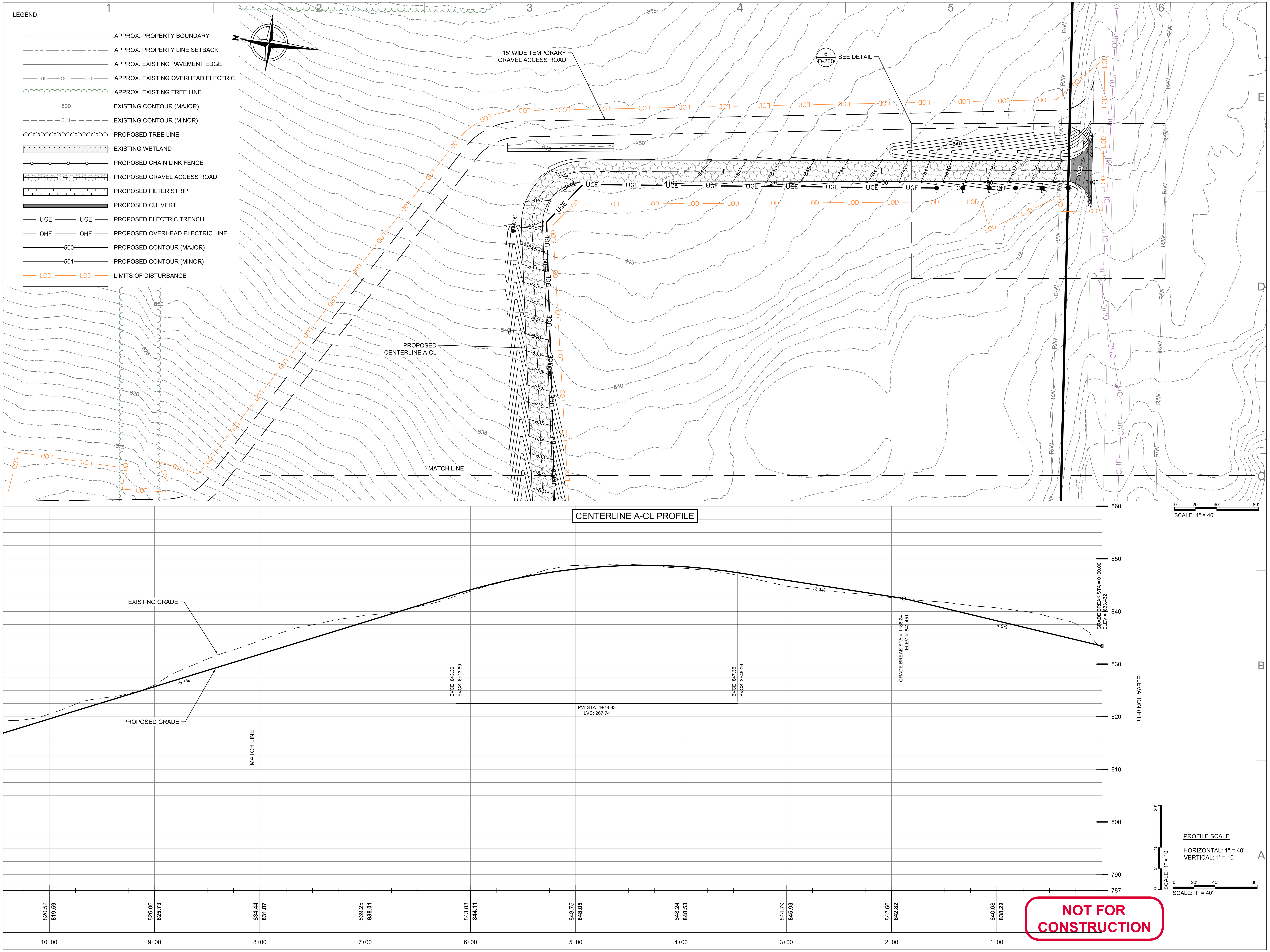
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 25' 50' 100'
SCALE: 1" = 50'

SHEET NO.:
C-202



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STAMP:

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
GRADING PLAN SOUTH

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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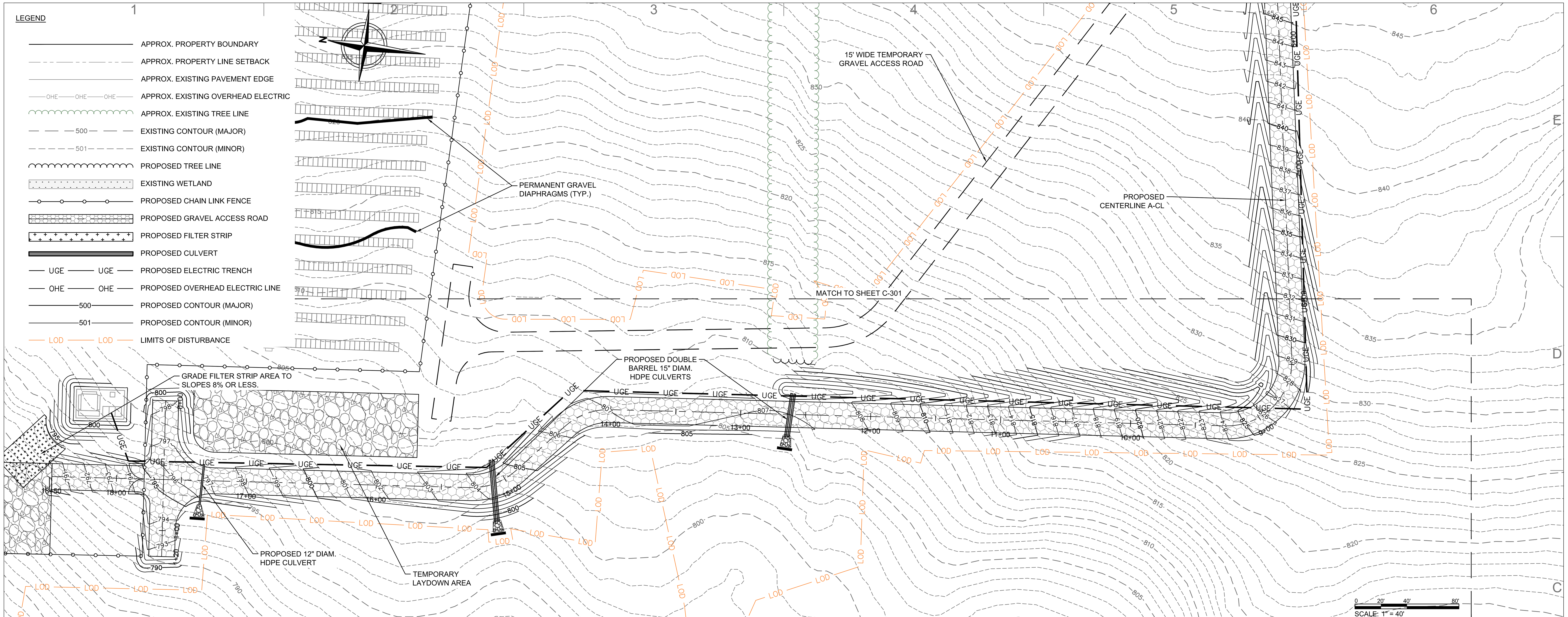
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

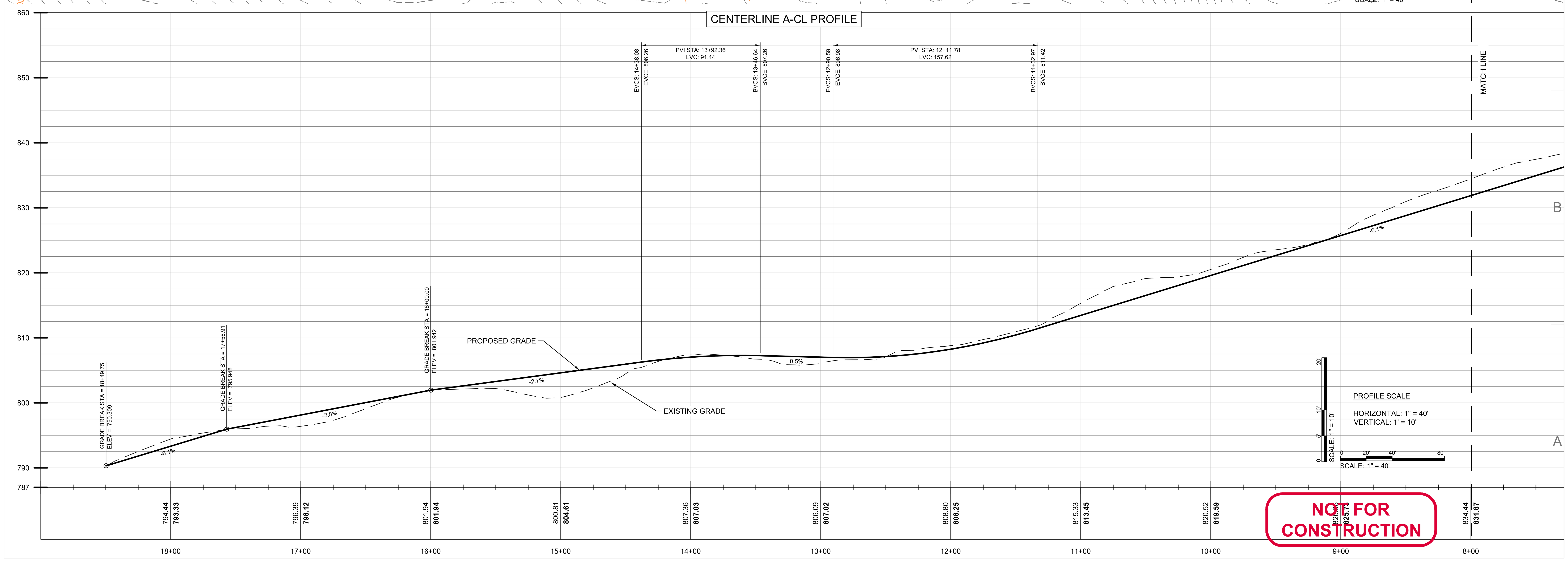
PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
AS SHOWN

SHEET NO.:
C-301



CENTERLINE A-CL PROFILE



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STAMP:

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

GRADING PLAN NORTH

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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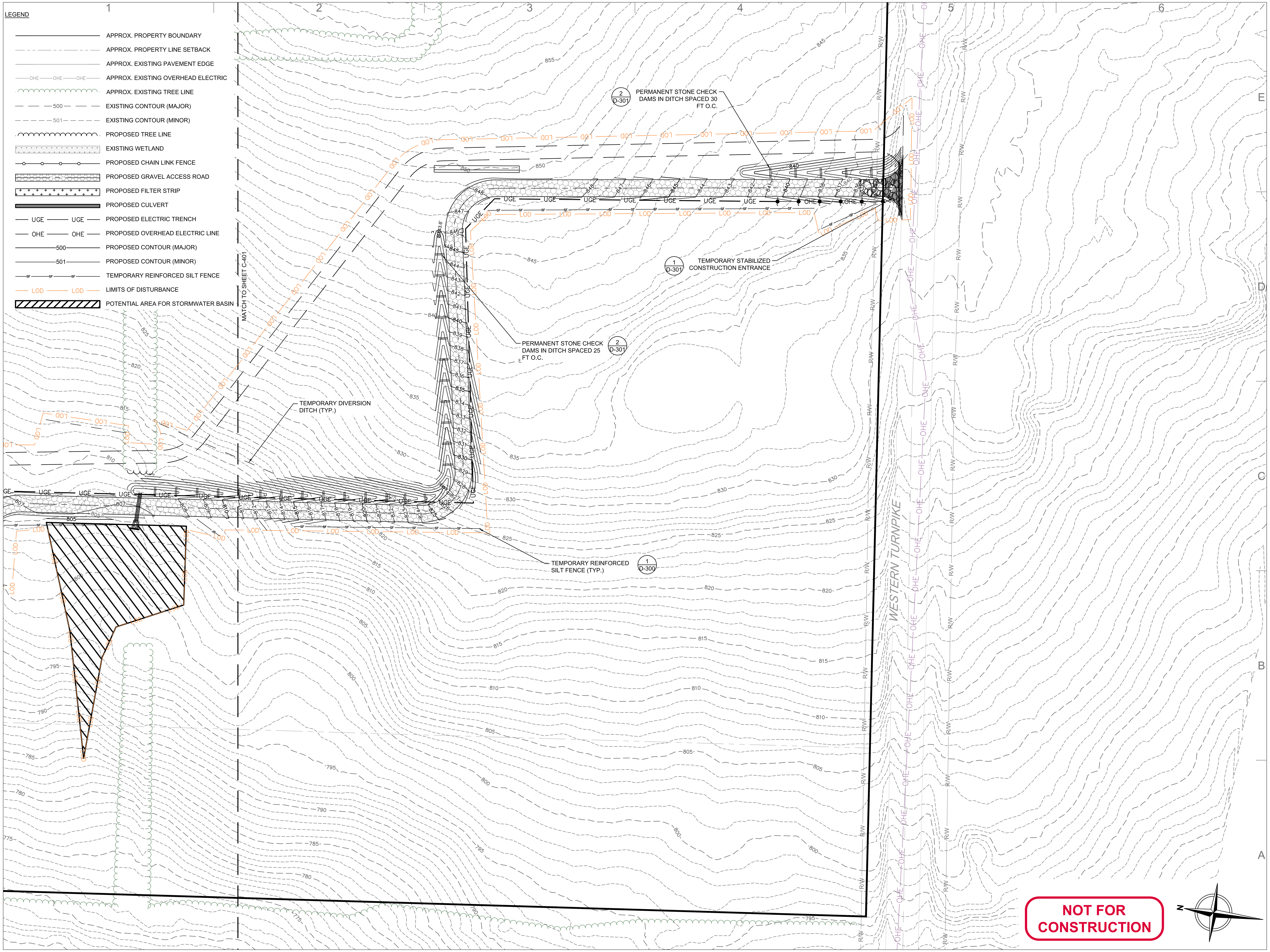
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
AS SHOWN

SHEET NO.:
C-302



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MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
EROSION & SEDIMENT CONTROL PLAN SOUTH

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

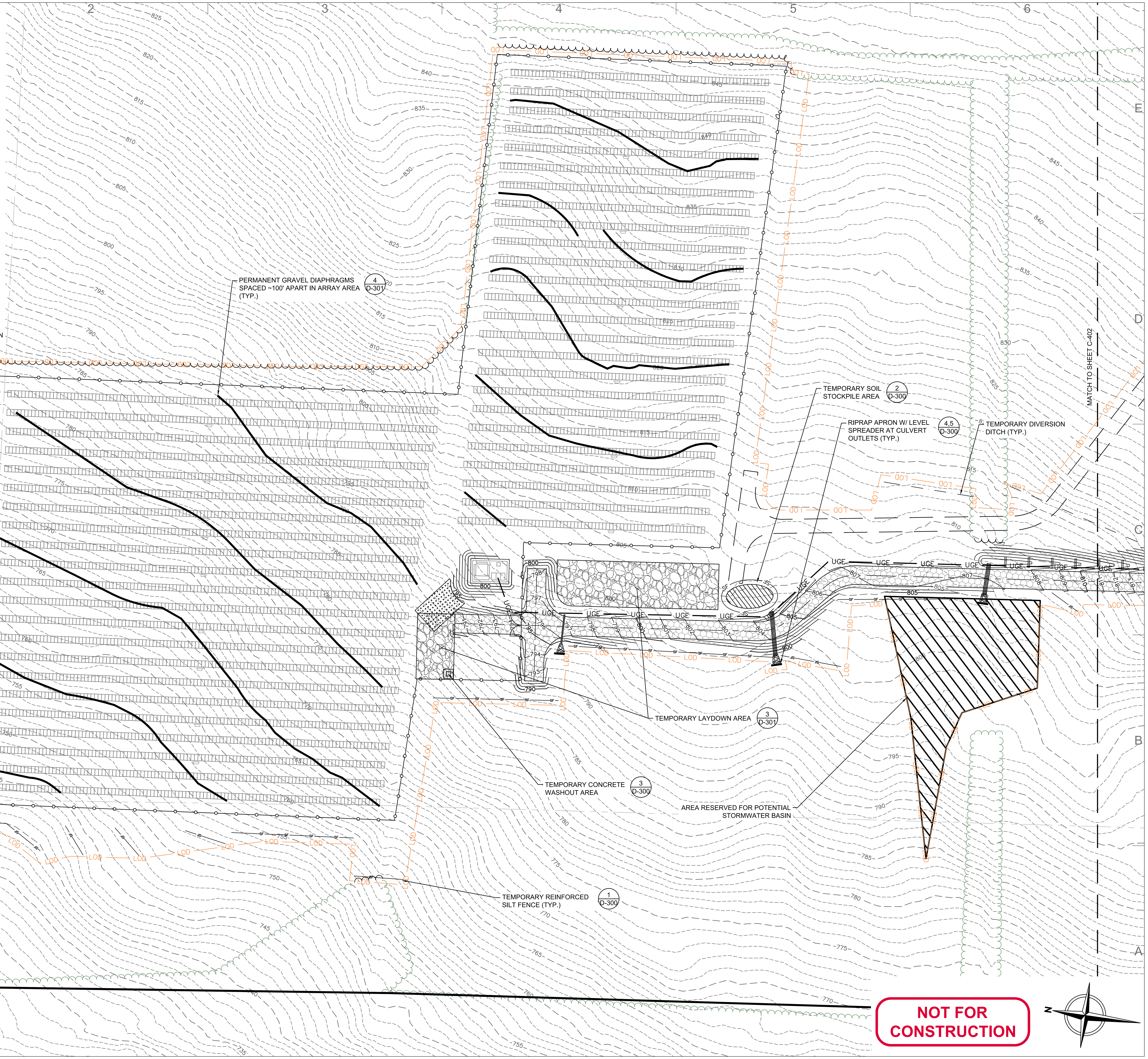
PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 25' 50' 100'
SCALE: 1" = 50'

SHEET NO.:
C-401

LEGEND

- APPROX. PROPERTY BOUNDARY
- APPROX. PROPERTY LINE SETBACK
- APPROX. EXISTING PAVEMENT EDGE
- OHE — APPROX. EXISTING OVERHEAD ELECTRIC
- APPROX. EXISTING TREE LINE
- 500 — EXISTING CONTOUR (MAJOR)
- 501 — EXISTING CONTOUR (MINOR)
- PROPOSED TREE LINE
- EXISTING WETLAND
- PROPOSED CHAIN LINK FENCE
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED FILTER STRIP
- PROPOSED CULVERT
- UGE — PROPOSED ELECTRIC TRENCH
- OHE — PROPOSED OVERHEAD ELECTRIC LINE
- 500 — PROPOSED CONTOUR (MAJOR)
- 501 — PROPOSED CONTOUR (MINOR)
- TEMPORARY REINFORCED SILT FENCE
- LOD — LIMITS OF DISTURBANCE
- POTENTIAL AREA FOR STORMWATER BASIN



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TETRA TECH

STAMP:

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS: 194-1409-0003

SHEET TITLE:
EROSION & SEDIMENT CONTROL PLAN NORTH

SHEET SIZE: ARCH "D" 24" X 36" (610 x 914)

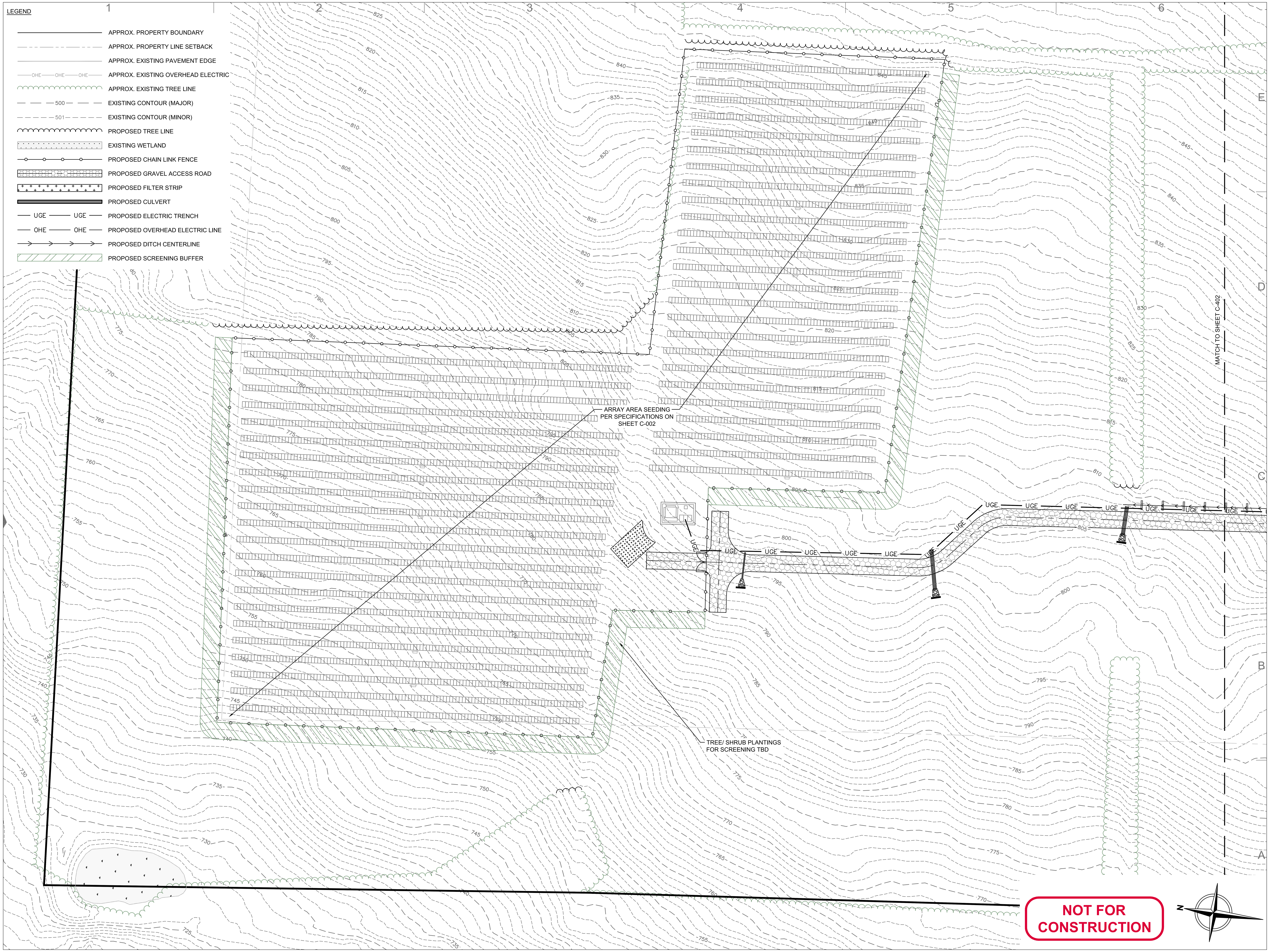
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE: 30% CIVIL DESIGN

SCALE: 1" = 50'

SHEET NO.: C-402



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RAKAM LAMA TAMANG
103954
LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

RESTORATION PLAN

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE: 11/30/2023
DRAWN BY: R. DEMILIO
ENGINEER: R. DEMILIO
APPROVED BY: R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE: 0 25' 50' 100'
SCALE: 1" = 50'

SHEET NO.:
C-501

1 2 3 4 5 6

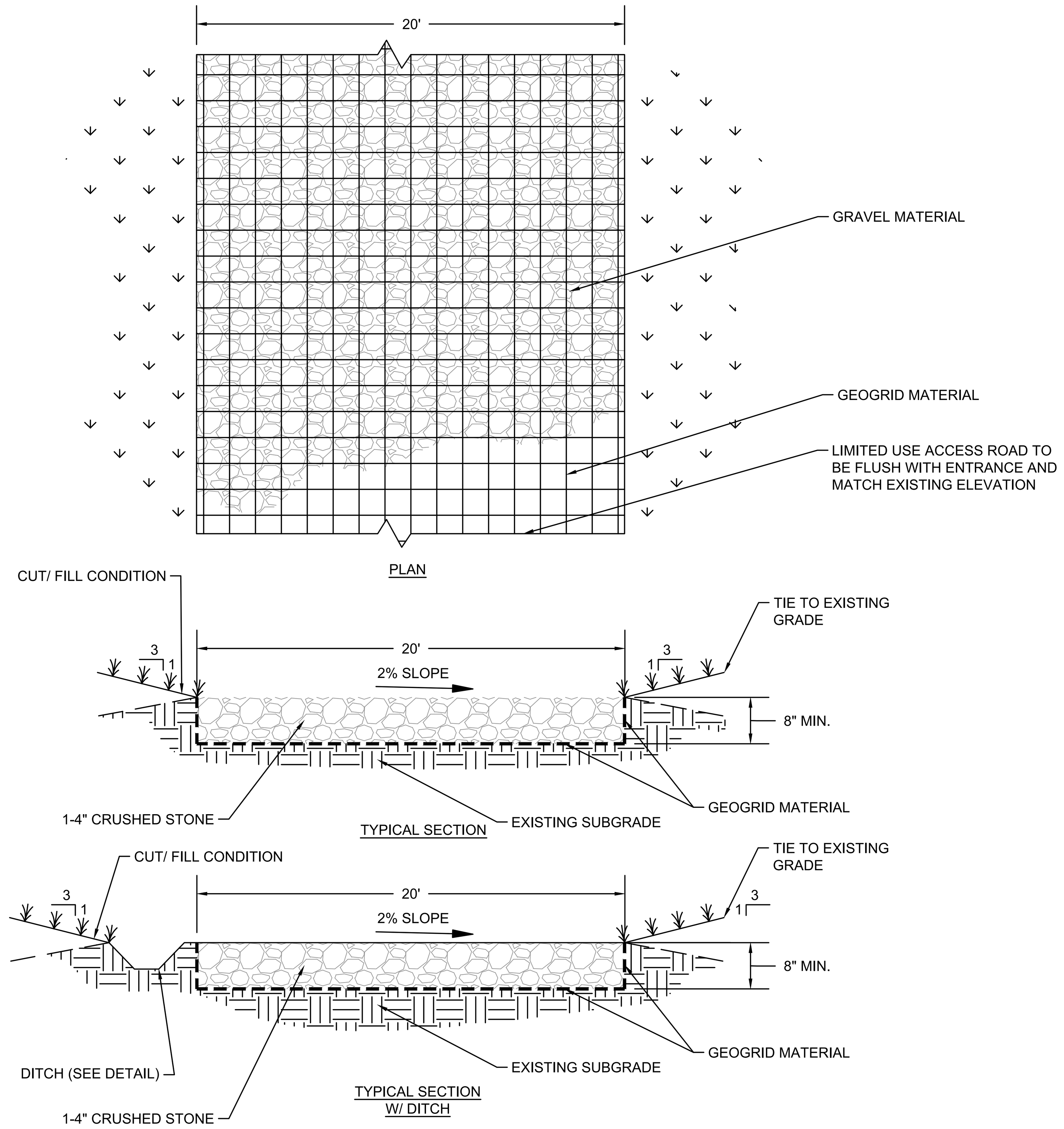
GENERAL NOTES FOR LIMITED USE PERVIOUS ACCESS ROAD:

1. BE RESPONSIBLE FOR AND DESIGN HAUL ROAD FOR CONSTRUCTION USE.
2. PERVIOUS ACCESS ROAD IS LIMITED TO MINIMAL USE ONLY (I.E., MAINTENANCE AND EMERGENCY RESPONSE.)
3. LIMITED TO LOW TRAFFIC LOW IMPACT MAINTENANCE ACCESS ASSOCIATED WITH RENEWABLE ENERGY PROJECTS IN NEW YORK STATE.
4. WHERE NECESSARY, GRADE ROADWAY TO DESIRED ELEVATION. MINOR GRADING FOR CROSS SLOPE MAY BE REQUIRED.
5. REMOVE REFUSE SOILS AS DIRECTED BY PROJECT ENGINEER. DO NOT PLACE IN AN AREA THAT IMPEDES STORMWATER DRAINAGE.
6. CROSS SLOPE SHALL BE 2% IN MOST CASES AND SHOULD NOT EXCEED 6%. THE LONGITUDINAL SLOPE OF THE ACCESS ROAD SHOULD NOT EXCEED 13%.
7. ROAD IS NOT INTENDED TO BE UTILIZED FOR CONSTRUCTION. ROAD IS TO BE DEVELOPED FOR POST-CONSTRUCTION USE ONLY. SOIL RESTORATION PRACTICES MAY BE APPLICABLE TO RESTORE CONSTRUCTION RELATED COMPACTION TO PRE-EXISTING CONDITIONS AND SHOULD BE VERIFIED BY SOIL PENETROMETER READINGS.
8. COMPARE PENETROMETER READINGS TO THE RESPECTIVE RECORDED READINGS TAKEN PRIOR TO CONSTRUCTION. COLLECT PENETROMETER READINGS EVERY 100 L.F. ALONG THE PROPOSED ROADWAY. COLLECT POST PENETROMETER READINGS BIASED FROM LOCATIONS THAT ARE VISUALLY IMPACTED BY VEHICLE TRAFFIC AND COMPACTION. PROVIDE READINGS AND LOCATIONS TO ENGINEER OF RECORD.
9. DO NOT USE CONSTRUCTION VEHICLES TRANSPORTING SOIL, FILL MATERIAL, ETC. ON ACCESS ROAD TO PREVENT SOIL FROM BEING TRACKED ONTO ACCESS ROAD. IF THE LIMITED USE PERVIOUS ACCESS ROAD IS COMPLETED DURING THE INITIAL PHASES OF CONSTRUCTION, CONSTRUCT AND UTILIZE A STANDARD NEW YORK STATE STABILIZED CONSTRUCTION ACCESS TO REMOVE SEDIMENT FROM CONSTRUCTION VEHICLES AND EQUIPMENT PRIOR TO ENTERING THE LIMITED USE PERVIOUS ACCESS ROAD FROM ANY LOCATION ON OR OFF SITE. MAINTAIN ACCESS ROAD IF SEDIMENT IS OBSERVED WITHIN THE CLEAN STONE. CONSTRUCTION USE OF THE ACCESS ROAD MAY REQUIRE DECOMPACTION OF THE SUBSURFACE OF THE ACCESS ROAD.
10. DO NOT CONSTRUCT OR USE UNTIL ALL AREAS SUBJECT TO RUNOFF ONTO THE ACCESS ROAD HAVE ACHIEVED FINAL STABILIZATION.
11. SUBGRADE COMPACTION IS NOT REQUIRED.
12. UTILIZE WOVEN GEOTEXTILE MATERIAL IN AREAS OF POOR DRAINAGE, AS DETAILED IN THE FOLLOWING NOTES.
13. ESTABLISH A PERENNIAL VEGETATIVE COVER, CONSISTING OF UNIFORM VEGETATION 20 FEET WIDE AND PARALLEL TO THE DOWN GRADIENT SIDE OF THE ACCESS ROAD. POST-CONSTRUCTION OPERATION AND MAINTENANCE PRACTICES WILL MAINTAIN THIS VEGETATIVE COVER TO ENSURE FINAL STABILIZATION FOR THE LIFE OF THE ACCESS ROAD.

GEOGRID MATERIAL NOTES:

1. THE GEOGRID IS INTENDED FOR USE FOR ALL CONDITIONS, TO ASSIST IN MATERIAL SEPARATION FROM NATIVE SOILS AND PRESERVE ACCESS LOADS.
2. USE GRAVEL FILL MATERIAL CONSISTING OF 1-4" CLEAN, CURABLE, SHARP-ANGLED CRUSHED STONE OF UNIFORM QUALITY, MEETING THE SPECIFICATIONS OF NYSDOT ITEM 703-02, SIZE DESIGNATION 3-5 OF TABLE 7803-4. STONE MAY BE PLACED IN FRONT OF, AND SPREAD WITH, A TRACKED VEHICLE. DO NOT COMPACT GRAVEL.
3. USE MIRAFI BXG110 OR APPROVED EQUAL. DESIGN GEOGRID BASED ON EXISTING SOIL CONDITIONS.
4. IF MORE THAN ONE ROLL WIDTH IS REQUIRED, ROLLS SHOULD OVERLAP A MINIMUM OF 6".
5. REFER TO MANUFACTURER'S SPECIFICATION FOR PROPER TYING AND CONNECTIONS.
6. LIMITED USE PERVIOUS ACCESS ROAD SHALL BE TOP DRESSED AS REQUIRED WITH ONLY 1-4" CRUSHED STONE MEETING NYSDOT ITEM 703-02 SPECIFICATIONS.

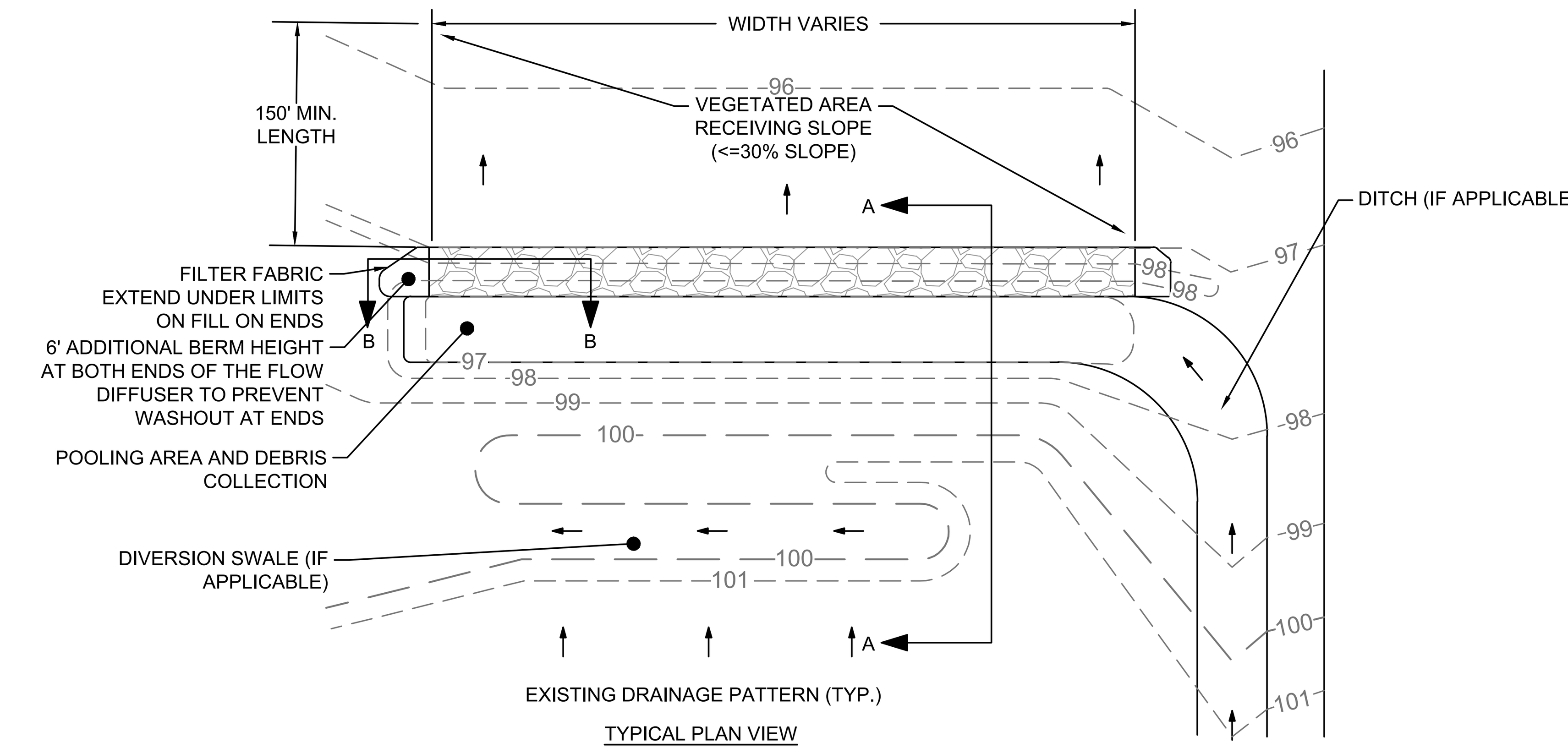
BASIS OF DESIGN: TENCATE MIRAFI BXG110 GEOGRIDS;
365 SOUTH HOLLAND DRIVE, PENDERGRASS, GA;
800-685-9990 OR 706-693-2226; WWW.MIRAFI.COM



NYSDEC PERVIOUS ACCESS ROAD (GEOGRID) 5% - 10% SLOPES

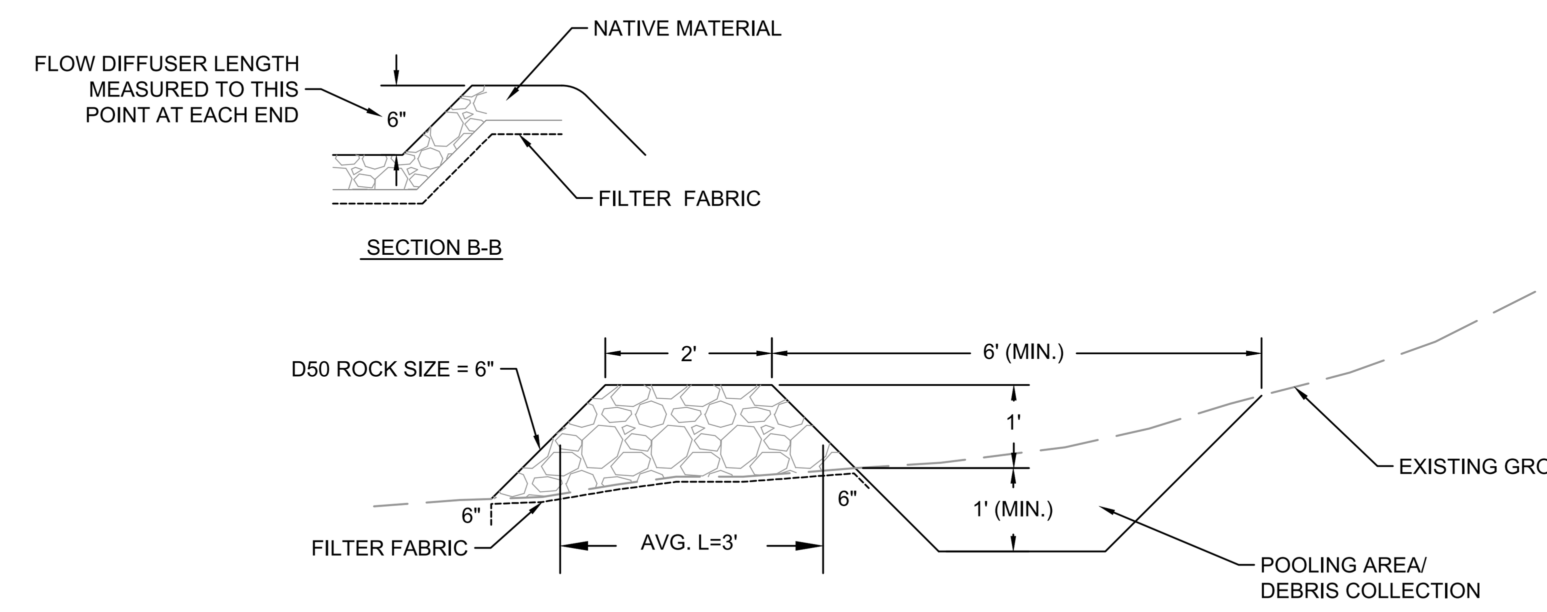
DETAILS 1 D-200

SCALE: N.T.S.



FLOW DIFFUSER NOTES:

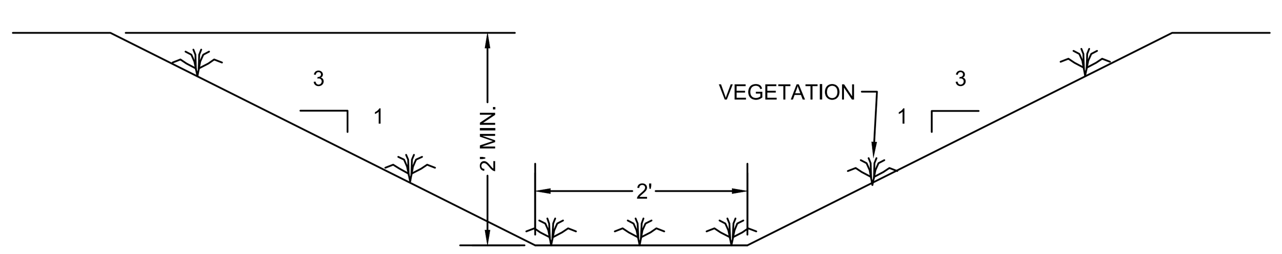
1. TYPICAL ELEVATIONS SHOWN HERE ARE TO ILLUSTRATE THE OPERATION OF THE FLOW DIFFUSER.



FLOW DIFFUSER

DETAIL 2 D-200

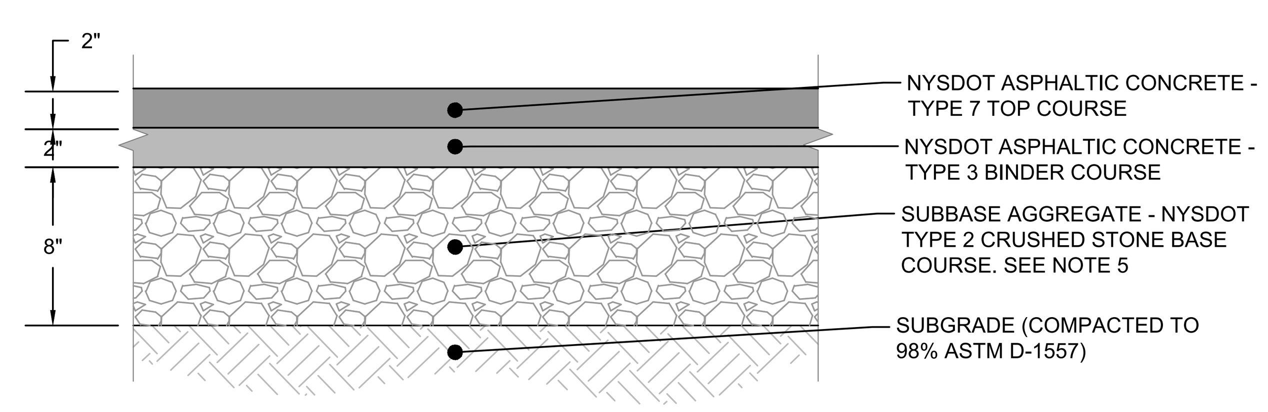
SCALE: N.T.S.



TYPICAL DITCH

DETAIL 3 D-200

SCALE: N.T.S.



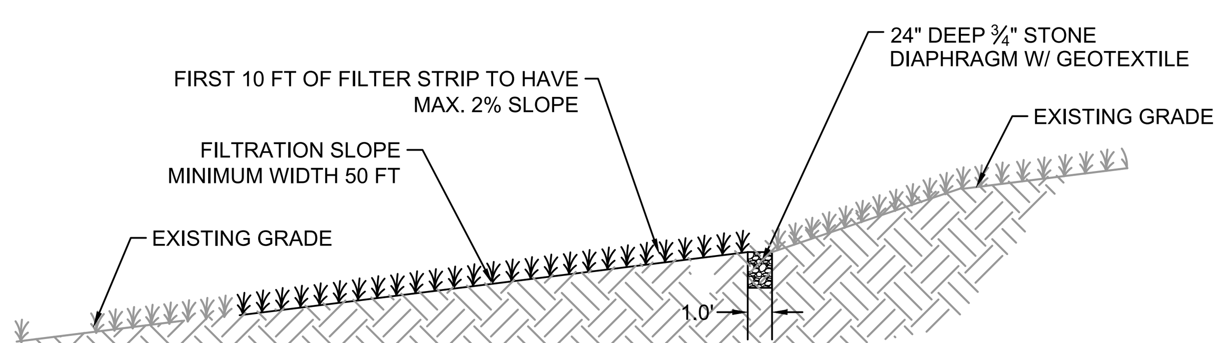
NOTES:

1. ALL MATERIALS PERMANENTLY INCORPORATED INTO THE RIGHT-OF-WAY ARE BY REFERENCE LISTED AS NYSDOT PAY ITEMS PER HTTPS://WWW.DOT.NY.GOV/PIC
2. SAWCUT EDGE OF ASPHALT TO ALLOW FOR A CLEAN BUTT JOINT WITH THE NEW ASPHALT.
3. PROVIDE ASPHALT JOINT SEALANT (PAY ITEM NO. 418.603) BETWEEN EXISTING AND PROPOSED ASPHALT JOINT.
4. TACK COAT SHALL BE APPLIED BETWEEN EACH LIFT OF ASPHALT AND ALL VERTICAL FACES.
5. COMPACT TYPE 2 CRUSHED STONE FOR THE FULL WIDTH OF FILL LAYER TO A CONDITION OF NON-MOVEMENT UNDER THE COMPACTION EQUIPMENT. COMPACTION ACCEPTANCE WILL BE DETERMINED BY THE FIELD REPRESENTATIVE. NON-MOVEMENT UNDER COMPACTION EQUIPMENT IS DEFINED AS CREATING A STABLE CONDITION OF THE COMPACTED MATERIAL. A STABLE CONDITION OCCURS WHEN THERE IS NO RUTTING, DISPLACEMENT, OR SHEAR WAVE UNDER COMPACTION EQUIPMENT. A SHEAR WAVE IS BULGING OF THE MATERIAL SURFACE IN FRONT OF AND BEHIND THE COMPACTION EQUIPMENT. MAINTAIN TYPE 2 CRUSHED STONE IN A SURFACE DAMP CONDITION, BUT NOT WET (NO EXCESS MOISTURE) AT THE TIME OF COMPACTION.

TYPICAL ASPHALT APRON

DETAIL 4 D-200

SCALE: N.T.S.



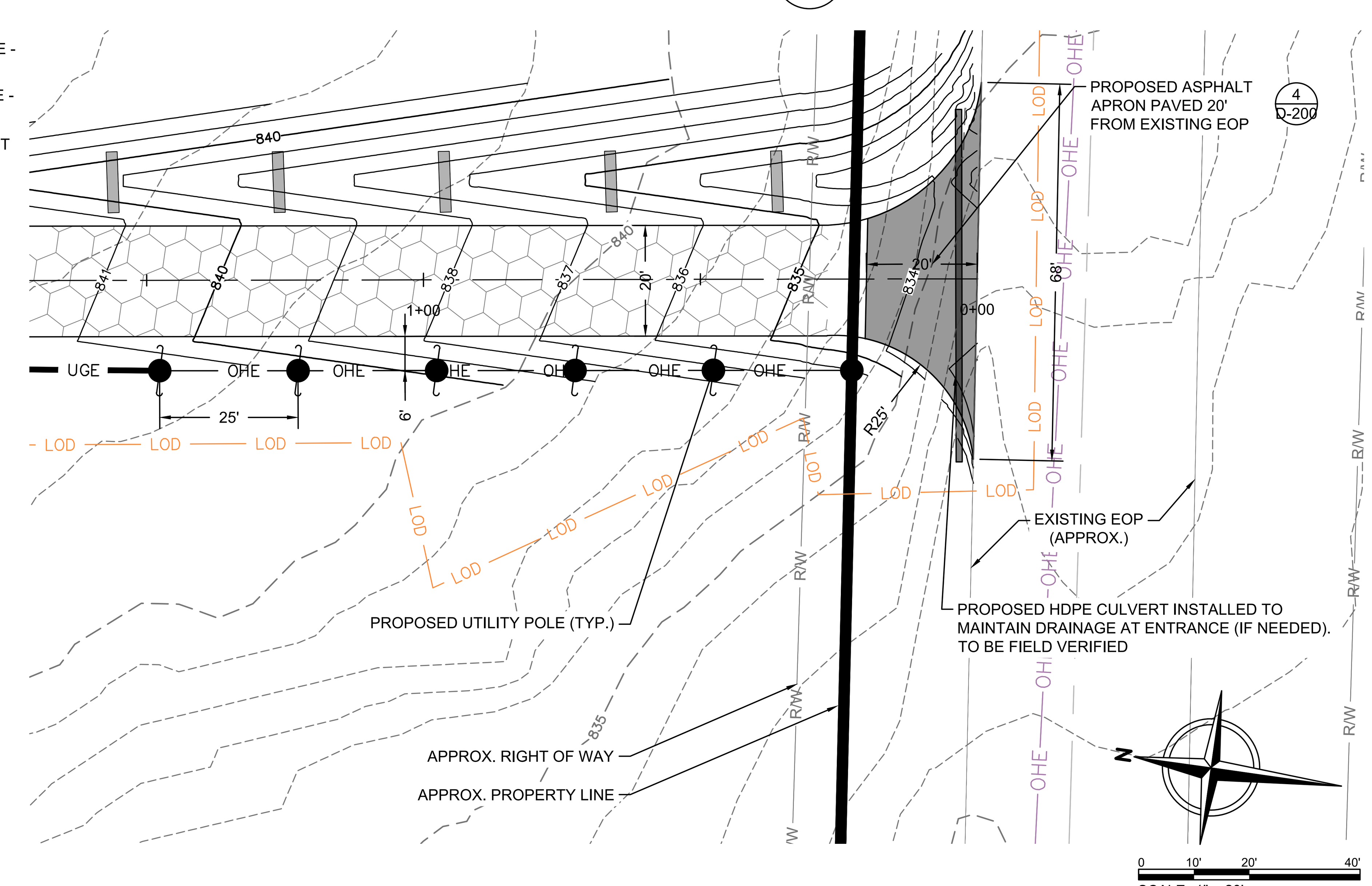
FILTER STRIP NOTES:

1. REFER TO PLANS FOR LENGTH AND WIDTH OF FILTER STRIP.
2. FILTRATION SLOPE SHALL BE FULLY VEGETATED.
3. DECOMPACT SOIL FOR FILTRATION SLOPE AS REQUIRED. REPLACE WITH TOPSOIL NEEDED FOR VEGETATION ESTABLISHMENT IN POORLY DRAINED SOILS TO A MIN DEPTH OF 12 IN.

FILTER STRIP

DETAIL 5 D-200

SCALE: N.T.S.



SITE ENTRANCE

DETAIL 6 D-200

SCALE: 1" = 20'

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CTEC SOLAR

CTEC SOLAR
1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002
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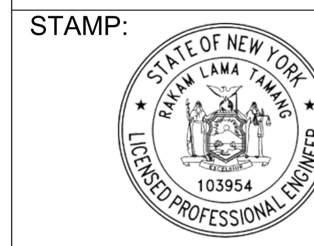
TETRA TECH

STAMP:



MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

SITE DETAILS

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

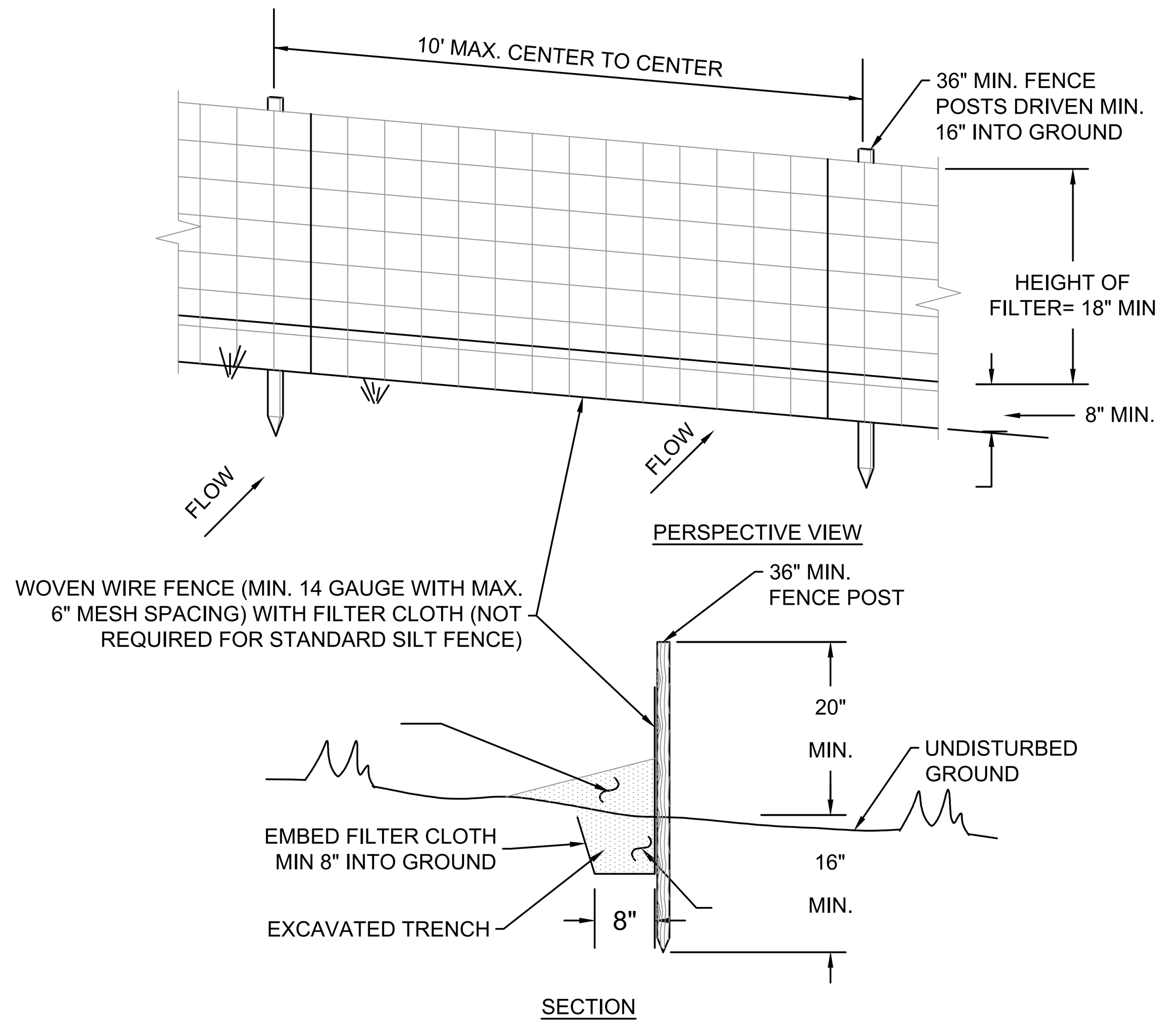
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
N/A

SHEET NO.:
D-200



SILT FENCE NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL.
4. PERFORM MAINTENANCE AS NEEDED AND REMOVE MATERIALS WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. USE SILT FENCE WHERE EROSION COULD OCCUR IN THE FORM OF SHEET EROSION.
6. DO NOT USE SILT FENCE WHEN A CONCENTRATION OF WATER IS FLOWING TO THE BARRIER AND SOIL CONDITIONS DO NOT ALLOW FOR PROPER KEYING OF FABRIC, OR OTHER ANCHORAGE, TO PREVENT BLOWOUTS.
7. THE TYPE OF SILT FENCE SHALL NOT EXCEED THE MAXIMUM SLOPE LENGTH AND MAXIMUM FENCE LENGTH REQUIREMENTS SHOWN IN THE FOLLOWING TABLE.

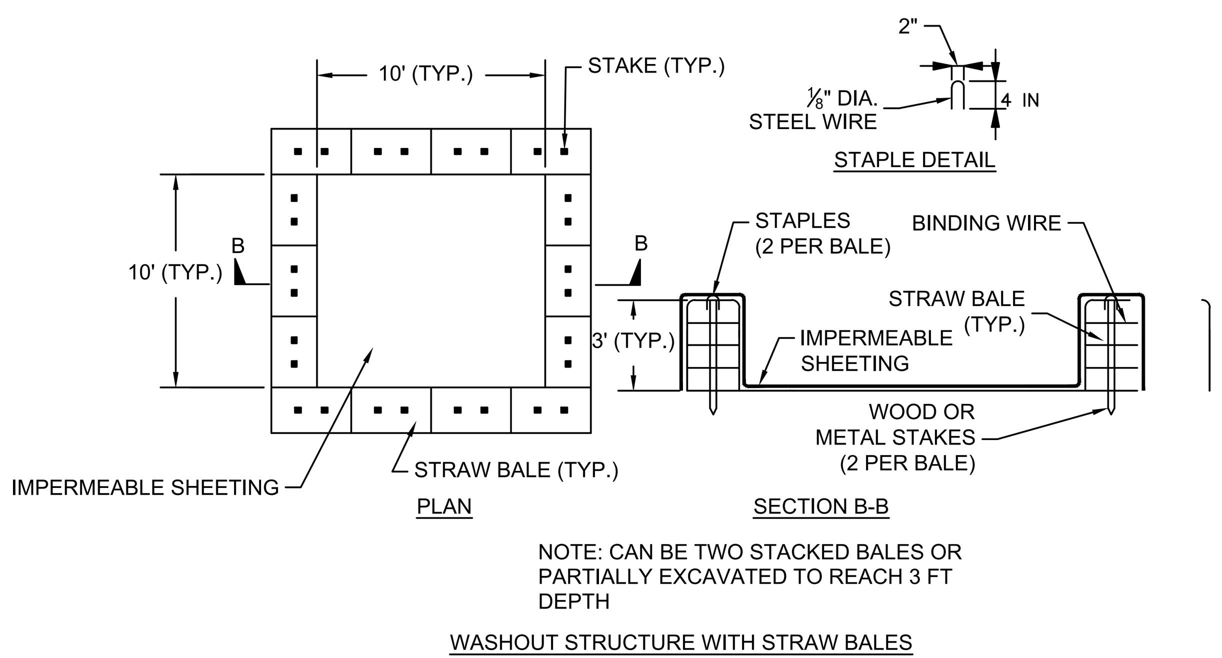
SLOPE	STEEPNESS	SLOPE LENGTH/FENCE LENGTH (FT)		
<2%	<50:1	300/1500	N/A	N/A
2-10%	50:1 TO 10:1	125/1000	250/2000	300/2500
10-20%	10:1 TO 5:1	100/750	150/1000	200/1000
20-33%	5:1 TO 3:1	60/500	80/750	100/1000
33-50%	3:1 TO 2:1	40/250	70/350	100/500
>50%	>2:1	20/125	30/175	50/250

8. STANDARD SILT FENCE DOES NOT REQUIRE WOVEN WIRE FENCE.
SUPER SILT FENCE REQUIRES CHAIN LINK FENCE IN-LIEU OF WOVEN WIRE FENCE AND THE POSTS MUST BE STANDARD CHAIN LINK FENCE POSTS AND BE DRIVEN 3 FEET INTO THE GROUND.

TEMPORARY REINFORCED SILT FENCE

DETAIL 1 D-300

SCALE: N.T.S.



CONCRETE TRUCK WASHOUT AREA NOTES:

1. LOCATE THE FACILITY A MINIMUM OF 100 FEET FROM DRAINAGE SWALES, STORM DRAIN INLETS, WETLANDS, STREAMS AND OTHER SURFACE WATER.
2. PREVENT SURFACE WATER FROM ENTERING THE STRUCTURE EXCEPT FOR THE ACCESS ROAD.
3. PROVIDE A GRAVEL ACCESS ROAD TO FACILITY THAT IS SLOPED DOWN TO FACILITY.
4. PLACE SIGNS TO DIRECT DRIVERS TO THE FACILITY AFTER THEIR LOAD IS DISCHARGED.
5. LINE ALL WASHOUT FACILITIES TO PREVENT LEACHING OF LIQUIDS INTO THE GROUND. USE PLASTIC SHEETING HAVING A MINIMUM THICKNESS OF 10 MILS WITH NO HOLES OR TEARS, AND ANCHORED BEYOND THE TOP OF THE PIT WITH AN EARTHEN BERM, SAND BAGS, STONE, OR OTHER STRUCTURAL APPURTENANCES EXCEPT AT THE ACCESS POINT.
6. PREFABRICATED WASHOUT FACILITIES CAN BE USED BUT THEY MUST CAPTURE AND CONTAIN CONCRETE WASH AND BE SIMILARLY SIZED AS SHOWN ABOVE AND LOCATED AS NOTED ABOVE.
7. WASH WATER IS ESTIMATED TO BE 7 GALLONS PER CHUTE AND 50 GALLONS PER HOPPER OF A PUMP TRUCK AND/OR DISCHARGING DRUM.

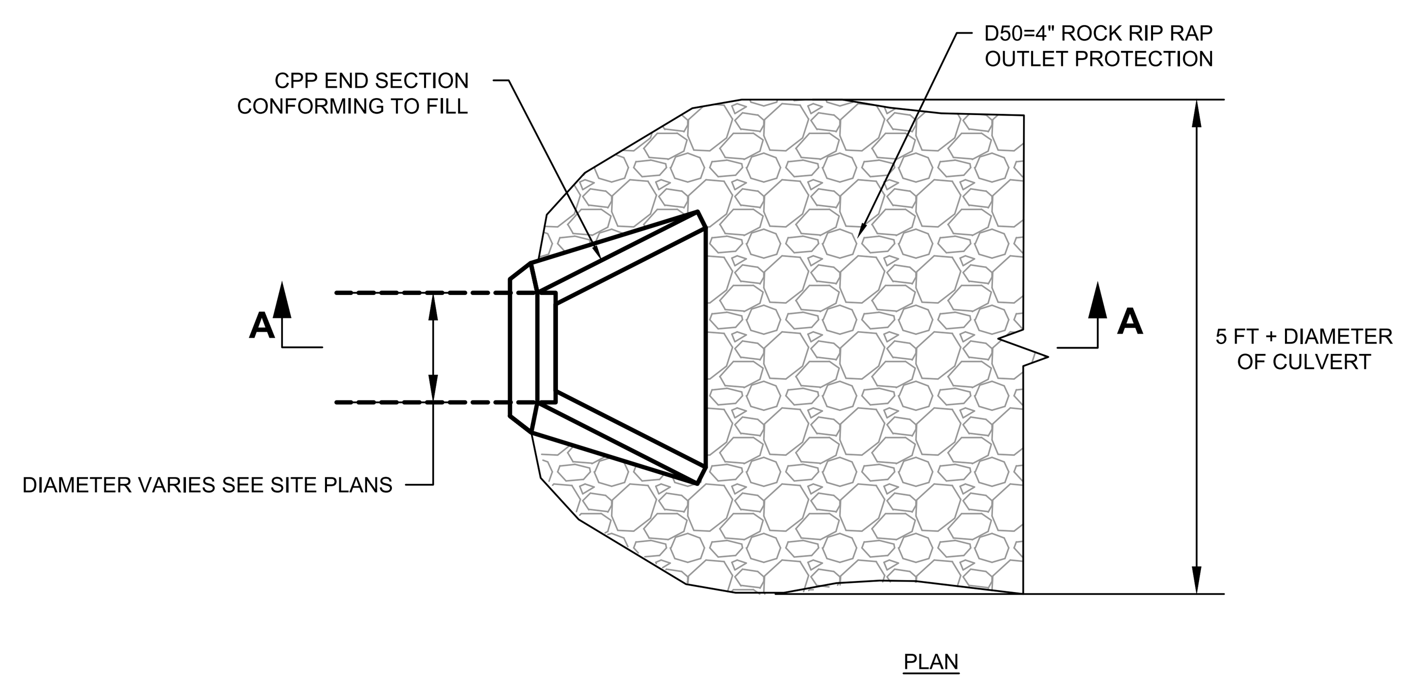
MAINTENANCE:

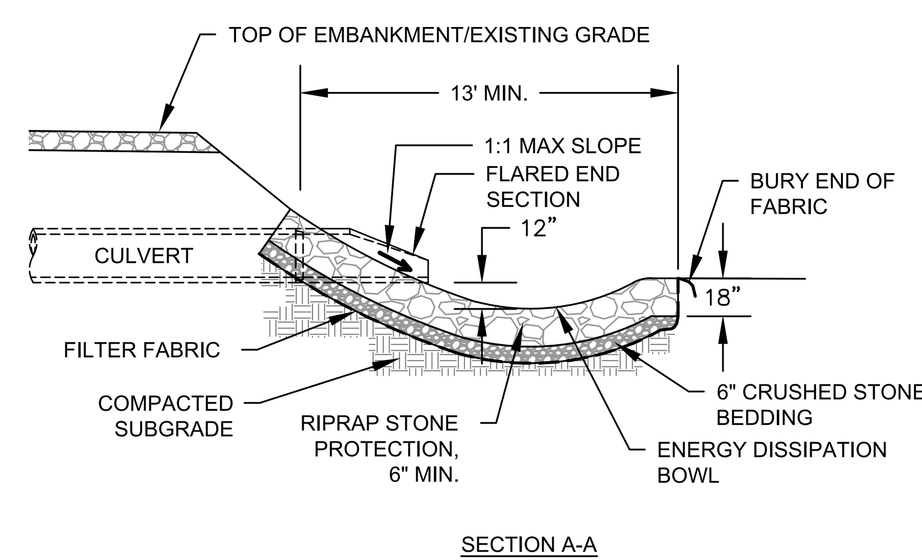
1. ALL FACILITIES MUST BE INSPECTED DAILY.
2. DEACTIVATE DAMAGED OR LEAKING FACILITIES AND REPAIR OR REPLACE IMMEDIATELY.
3. PUMP EXCESS ACCUMULATED RAINWATER OVER HARDENED CONCRETE TO A STABILIZED AREA, SUCH AS A GRASS FILTER STRIP.
4. REMOVE ACCUMULATED HARDENED MATERIAL WHEN 75% OF THE STORAGE CAPACITY OF THE FACILITY IS FILLED. PUMP ANY EXCESS WASH WATER INTO A CONTAINMENT VESSEL AND PROPERLY DISPOSE OF OFF-SITE AT A PERMITTED C&D LANDFILL. NO ONSITE DISPOSAL WILL BE ALLOWED.
5. REPLACE THE PLASTIC LINER WITH EACH CLEANING OF THE FACILITY.
6. INSPECT PROJECT SITE FREQUENTLY TO ENSURE THAT NO CONCRETE DISCHARGES ARE TAKING PLACE IN NON-DESIGNATED AREAS.

TEMPORARY CONCRETE WASHOUT AREA

DETAIL 3 D-300

SCALE: N.T.S.





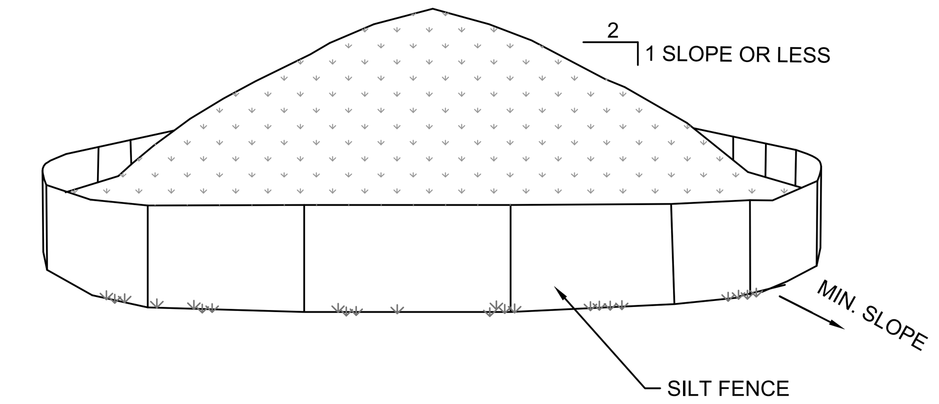
NOTES:

1. FILTER FABRIC SHALL BE MIRAFI 180-N OR OTHER CLASS "C" CRITERIA FILTER FABRIC EQUIVALENT.

RIPRAP APRON

DETAIL 4 D-300

SCALE: N.T.S.



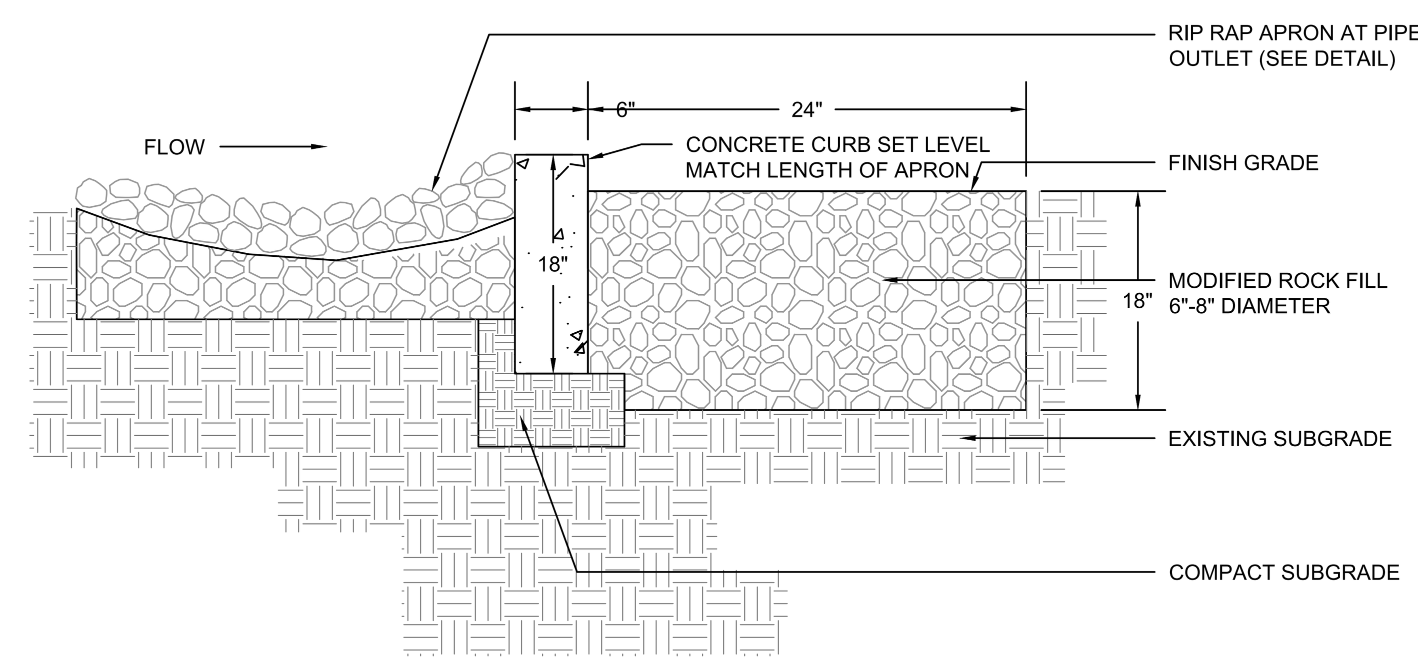
SOIL STOCKPILE NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1V:2H.
3. UPON COMPLETION OF SOIL STOCKPILING, SURROUND EACH PILE WITH SILT FENCING, THEN STABILIZE WITH SEED AND MULCH IN ACCORDANCE WITH SITE SPECIFIC SWPPP.
4. SEE DETAILS FOR INSTALLATION OF SILT FENCE.
5. STOCKPILE HEIGHT SHOULD GENERALLY NOT EXCEED 20 FEET.

TEMPORARY SOIL STOCKPILE

DETAIL 2 D-300

SCALE: N.T.S.



LEVEL SPREADER

DETAIL 5 D-300

SCALE: N.T.S.

NOT FOR CONSTRUCTION

CTEC SOLAR

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1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
EROSION & SEDIMENT CONTROL DETAILS

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

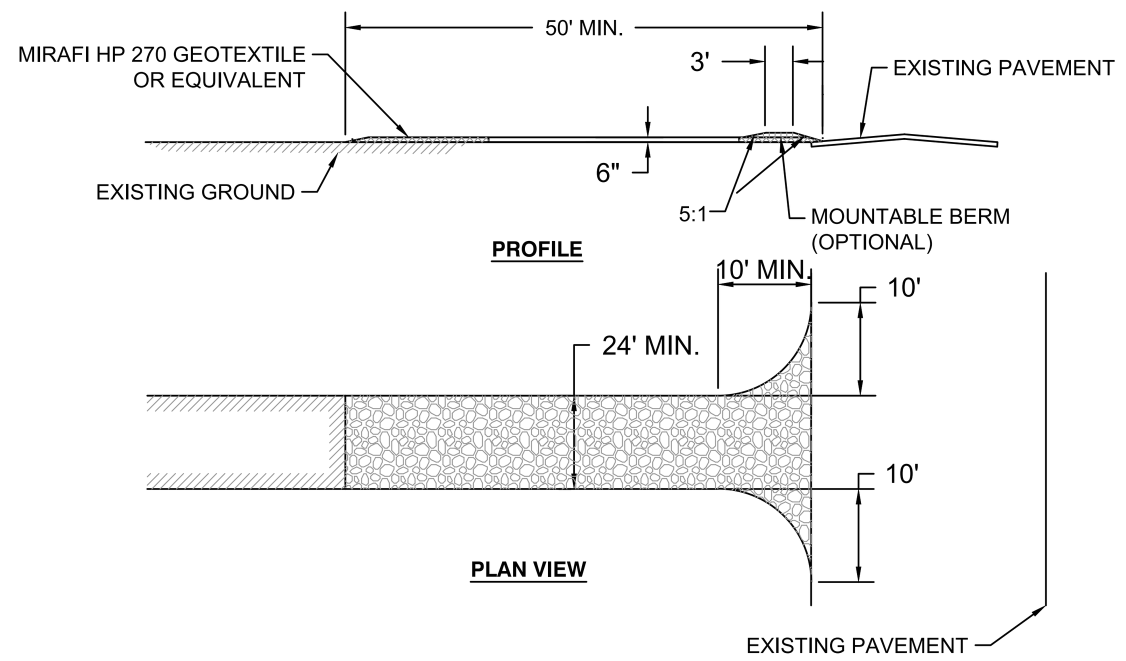
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE: 11/30/2023
DRAWN BY: R. DEMILIO
ENGINEER: R. DEMILIO
APPROVED BY: R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
N/A

SHEET NO.:
D-300



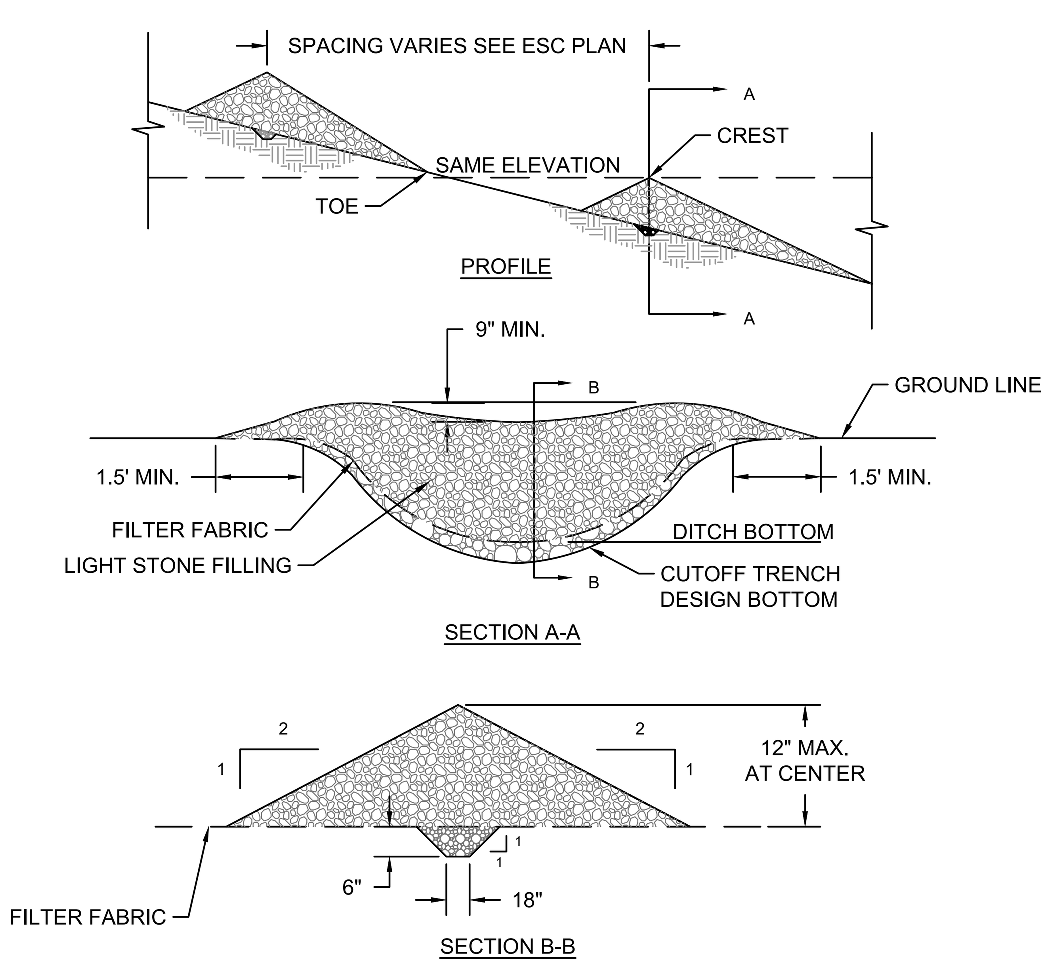
STABILIZED CONSTRUCTION ENTRANCE NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. THICKNESS - NOT LESS THAN 6".
3. WIDTH -TWENTY (20) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
4. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50'.
5. GEOTEXTILE - PLACE OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - MAINTAIN THE ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - CLEAN WHEELS TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PROVIDE WEEKLY INSPECTION AND NEEDED MAINTENANCE.

STABILIZED CONSTRUCTION ENTRANCE

DETAIL 1 D-301

SCALE: N.T.S.



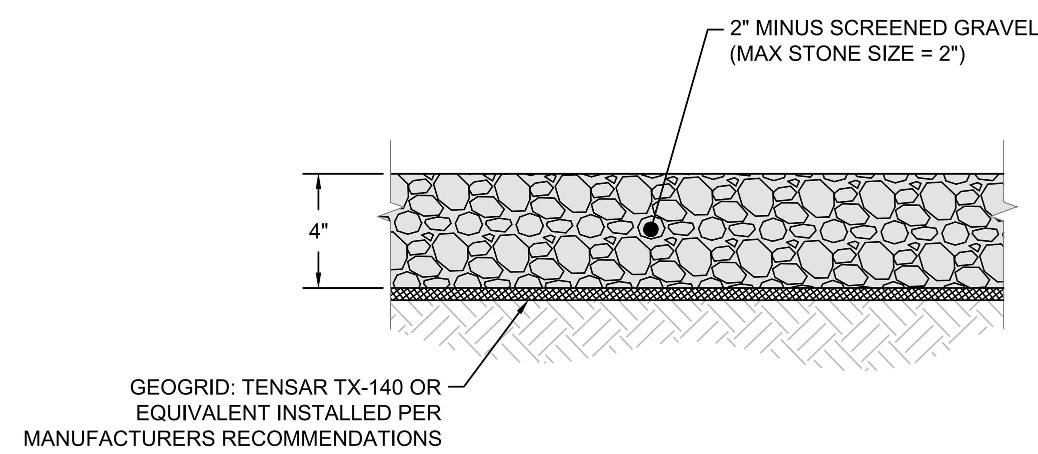
STONE CHECK DAM NOTES:

1. PLACE STONE ON A FILTER FABRIC FOUNDATION SUCH AS MIRAFI 140 N OR EQUIVALENT.
2. SET SPACING OF CHECK DAMS SUCH THAT THE ELEVATIONS OF THE DOWNSTREAM DAM ARE AT THE SAME ELEVATION AS 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 DAM ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

PERMANENT STONE CHECK DAM

DETAIL 2 D-301

SCALE: N.T.S.



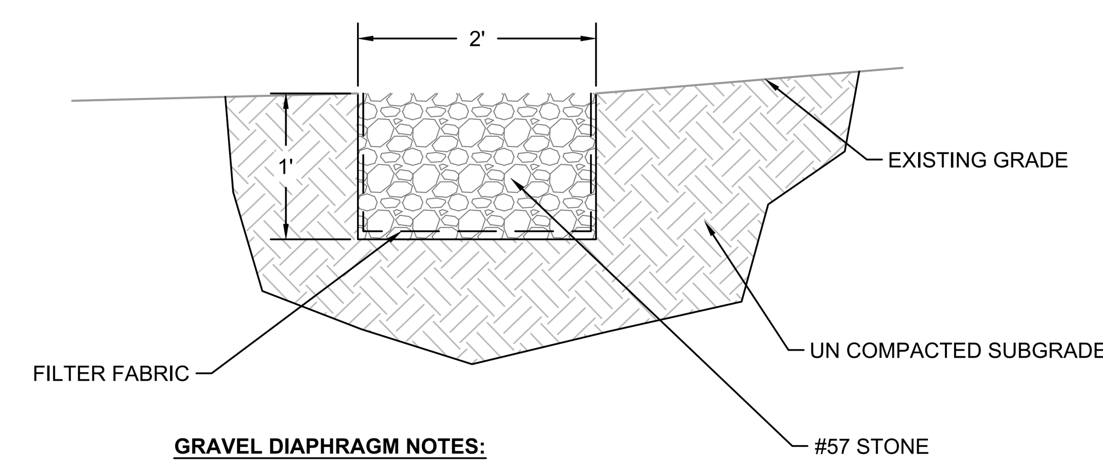
GRAVEL STAGING/ LAYDOWN NOTES:

1. GRAVEL STAGING / LAYOUT AREA IS A TEMPORARY FEATURE AND WILL BE REMOVED AFTER THE CONSTRUCTION PERIOD AND VEGETATED WITH THE SAME INTERNAL SEED MIXES.

TEMPORARY GRAVEL STAGING/ LAYDOWN AREA

DETAIL 3 D-301

SCALE: N.T.S.



GRAVEL DIAPHRAGM NOTES:

1. FILTER FABRIC SHALL BE MIRAFI 180-N OR OTHER CLASS "C" CRITERIA FILTER FABRIC EQUIVALENT.
2. AVOID DRIVING EQUIPMENT OVER DIAPHRAGM DURING CONSTRUCTION.

GRAVEL DIAPHRAGM

DETAIL 4 D-301

SCALE: N.T.S.

NOT FOR CONSTRUCTION

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1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:
STATE OF NEW YORK · RAKAM LAMA TAMANG · 103954 · LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
EROSION & SEDIMENT CONTROL DETAILS

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

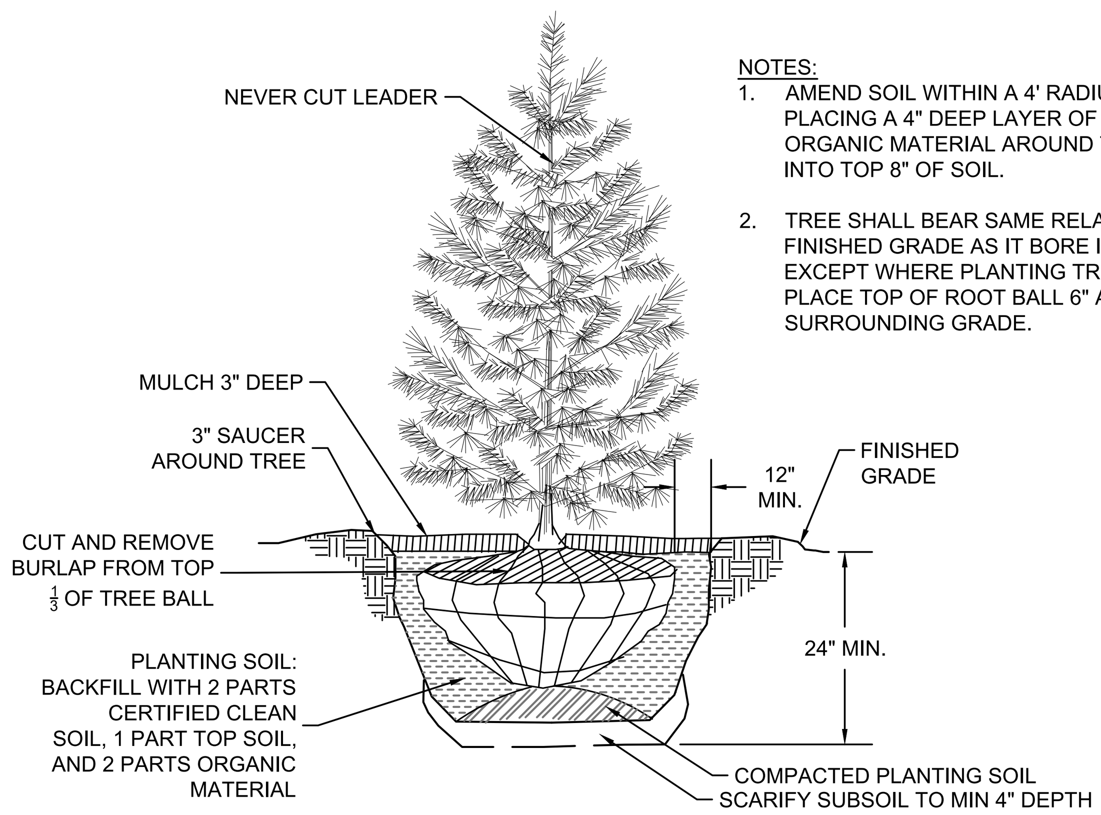
DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
N/A

SHEET NO.:
D-301

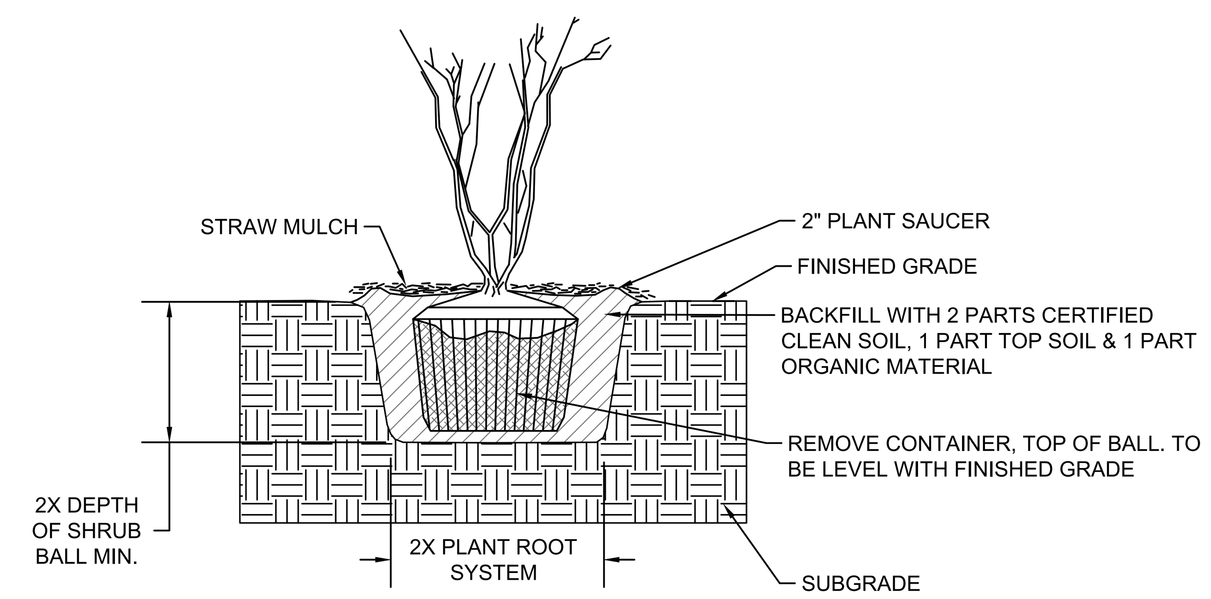
NOTES:
1. AMEND SOIL WITHIN A 4' RADIUS OF TRUNK BY PLACING A 4" DEEP LAYER OF ACCEPTABLE ORGANIC MATERIAL AROUND TREE AND TILL INTO TOP 8" OF SOIL.
2. TREE SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT BORE IN THE NURSERY, EXCEPT WHERE PLANTING TREE IN CLAY SOIL, PLACE TOP OF ROOT BALL 6" ABOVE SURROUNDING GRADE.



TYPICAL TREE PLANTING

DETAIL 1 / D-400

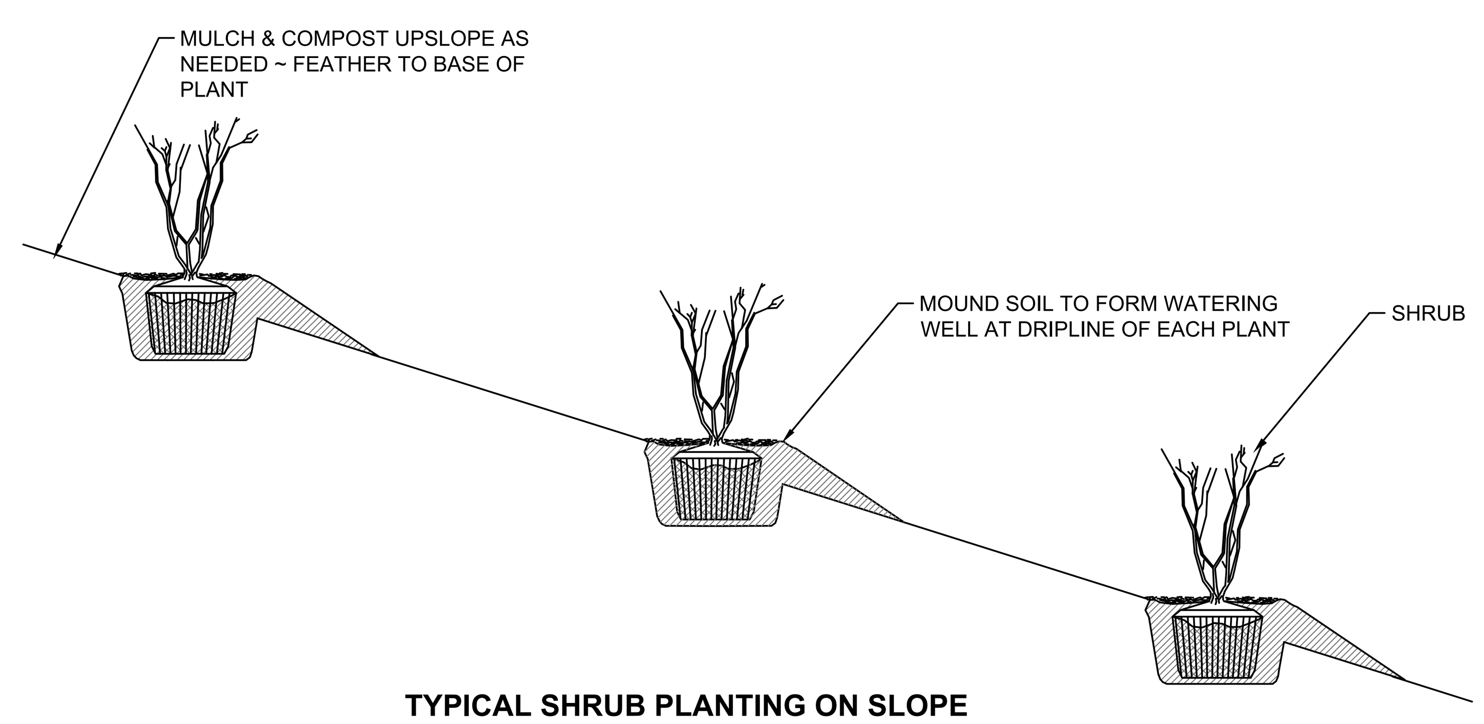
SCALE: N.T.S.



TYPICAL SHRUB PLANTING

DETAIL 2 / D-400

SCALE: N.T.S.



TYPICAL SHRUB PLANTING ON SLOPE

DETAIL 3 / D-400

SCALE: N.T.S.

NOT FOR CONSTRUCTION

CTEC SOLAR

CTEC SOLAR
1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:

STATE OF NEW YORK · RAKAM LAMA TAMANG · 103954 · LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:

LANDSCAPING DETAILS

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

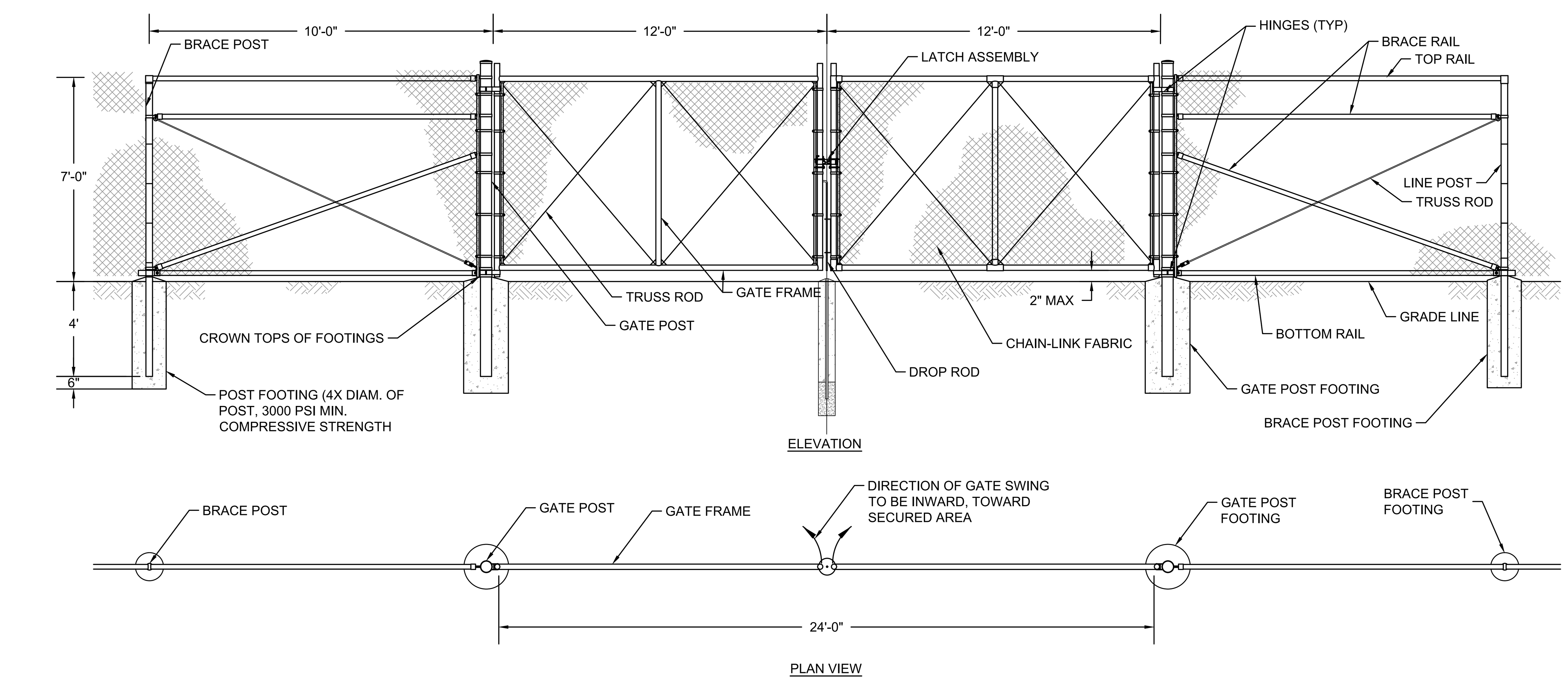
NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE:	11/30/2023
DRAWN BY:	R. DEMILIO
ENGINEER:	R. DEMILIO
APPROVED BY:	R. TAMANG

PROJECT PHASE:
30% CIVIL DESIGN

SCALE:
N/A

SHEET NO.:
D-400



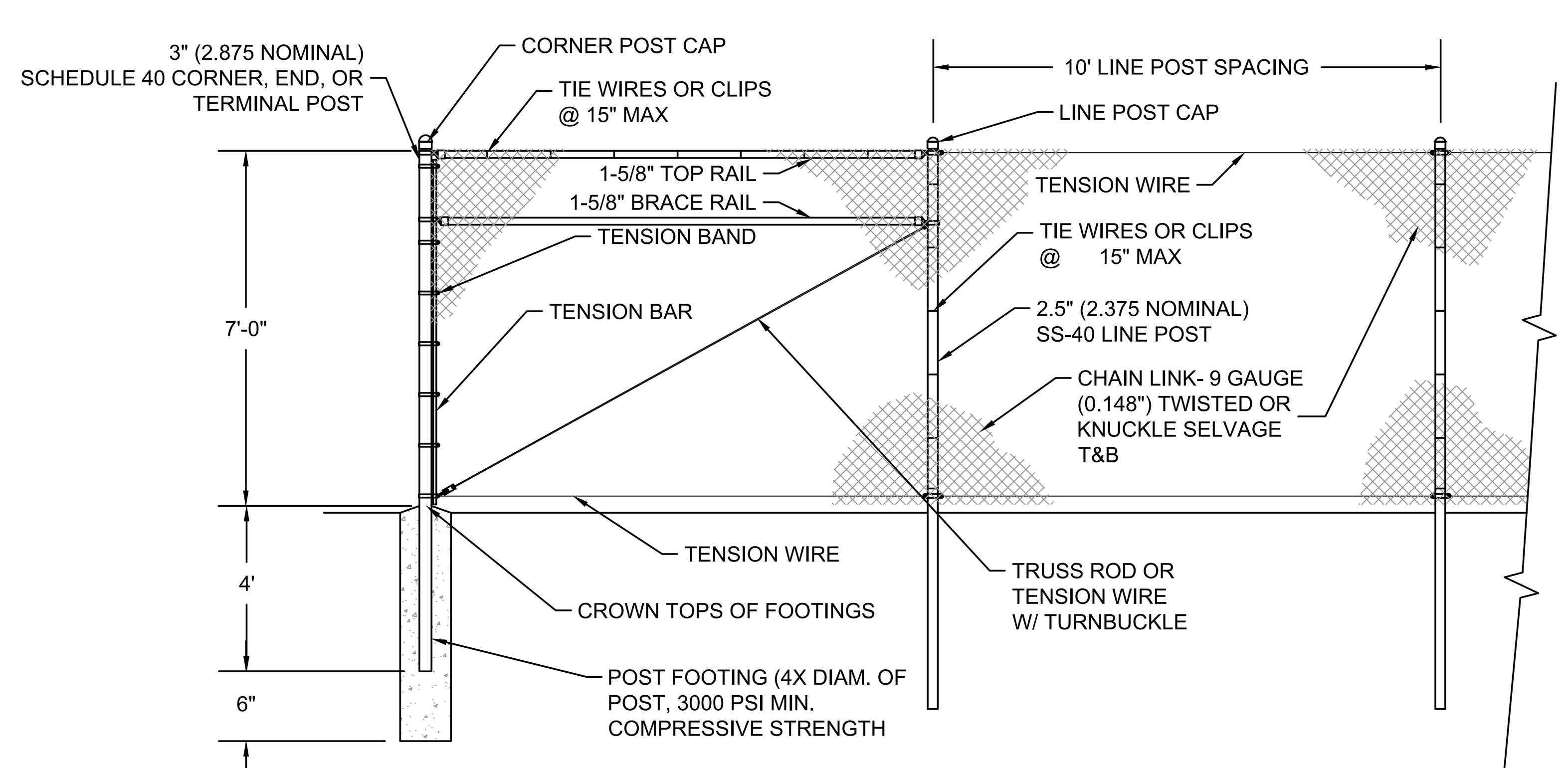
VEHICLE ACCESS GATE - CHAIN LINK

DETAIL 1 / D-500

SCALE: N.T.S.

FENCE & GATE NOTES:

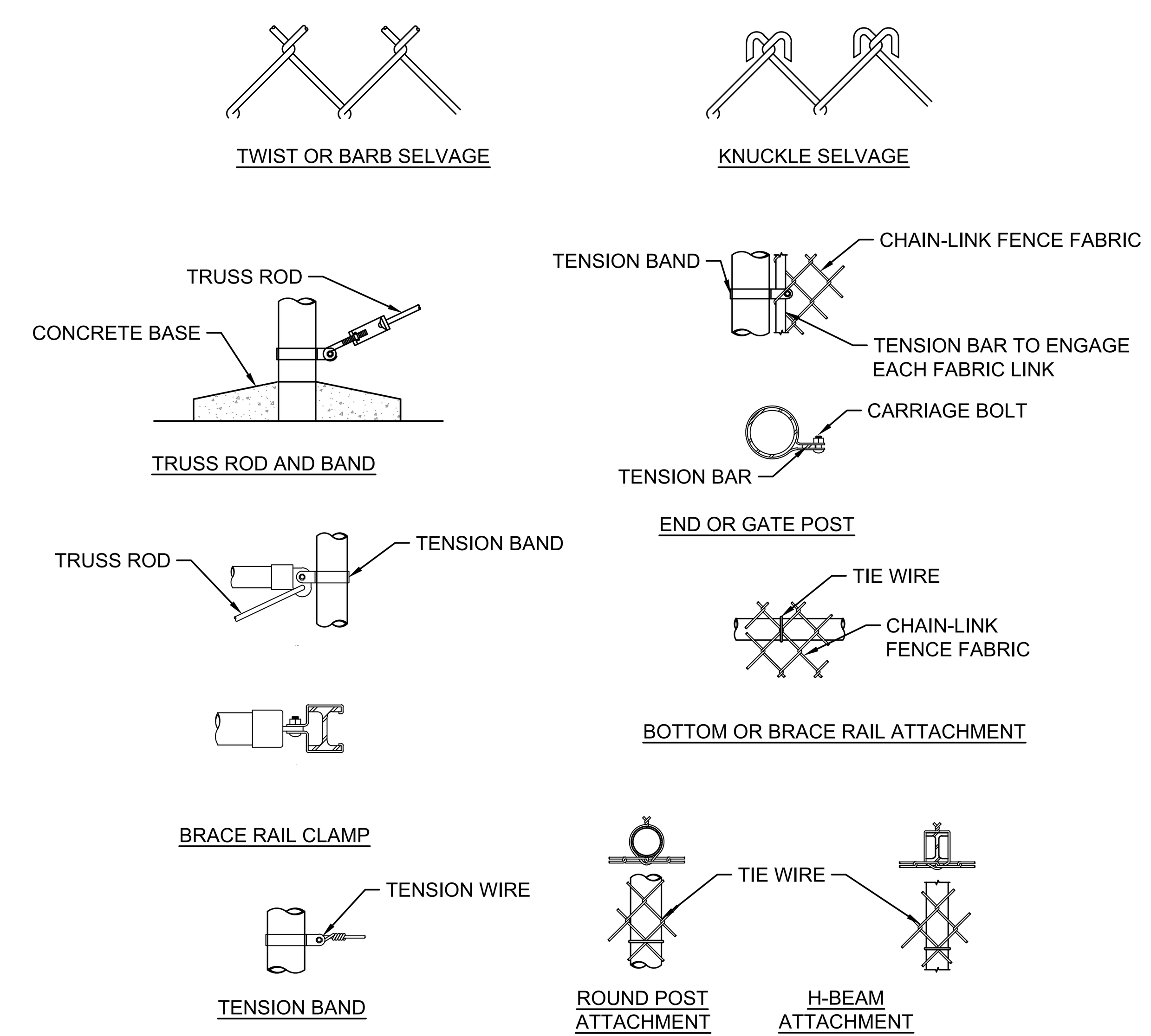
1. SIZE AND DIMENSIONS OF THE FENCE AND GATE COMPONENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH THE CHAIN-LINK FENCE MANUFACTURER SPECIFICATIONS UNLESS OTHERWISE NOTED ON THIS DRAWING.
2. GROUNDING AND BONDING OF THE SECURITY FENCE SYSTEM SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), AND ALL OTHER APPLICABLE STATE AND LOCAL CODE REQUIREMENTS.
3. DOUBLE SWING GATE TO OPEN INWARD, TOWARD SECURED AREA AS SHOWN ON THE SITE PLAN.
4. INSTALL WIRE TIES, RAILS, POSTS, AND BRACES ON THE SECURE SIDE OF THE FENCE ALIGNMENT. PLACE CHAIN-LINK FABRIC ON THE OPPOSITE SIDE OF THE SECURE AREA.
5. DESIGN AND INSTALL GATE, LINE, CORNER, END, AND PULL POST CONCRETE FOOTINGS, AS REQUIRED, PER APPLICABLE CODES AND CHAIN-LINK FENCE MANUFACTURER SPECIFICATIONS AND ASTM F567.
6. TOP SELVAGES TO BE TWISTED, BOTTOM SELVAGES TO BE KNUCKLED.
7. SIGNAGE SHALL BE AS REQUIRED BY CODE WITH DETAILS INCLUDING FACILITY NAME, OWNER, AND CONTACT PHONE NUMBER. WARNING SIGNAGE TO BE PLACED AT BASE OF ALL PAD-MOUNTED TRANSFORMERS AND SUBSTATIONS.
8. INSTALL PERIMETER FENCE WARNING SIGNS 5' ABOVE GRADE IN ACCORDANCE WITH NEC 110.21(B).
9. LATCH ASSEMBLIES AND LOCKING MECHANISMS TO COMPLY WITH ALL STATE AND LOCAL CODES.



CHAIN LINK FENCE

DETAIL 2 / D-500

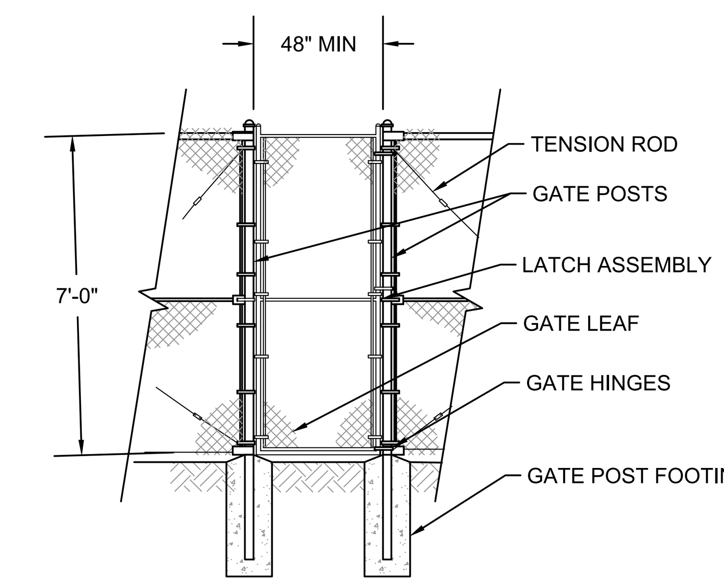
SCALE: N.T.S.



CHAIN LINK CONNECTION

DETAILS 3 / D-500

SCALE: N.T.S.



PEDESTRIAN GATE - CHAIN LINK

DETAIL 4 / D-500

SCALE: N.T.S.

NOT FOR CONSTRUCTION

CTEC SOLAR

CTEC SOLAR
1 GRIFFIN RD SOUTH, SUITE 200
BLOOMFIELD, CT 06002

TETRA TECH

STAMP:

STATE OF NEW YORK · BAKAM LAMA TAMANG · 103954 · LICENSED PROFESSIONAL ENGINEER

MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS: 194-1409-0003

SHEET TITLE: FENCE & GATE DETAILS

SHEET SIZE: ARCH "D" 24" X 36" (610 x 914)

NO.	REVISION	DATE	INIT.
A	30% DESIGN	11/30/23	RCD

DATE: 11/30/2023
DRAWN BY: R. DEMILIO
ENGINEER: R. DEMILIO
APPROVED BY: R. TAMANG

PROJECT PHASE: 30% CIVIL DESIGN

SCALE: N/A

SHEET NO.: D-500

ATTACHMENT C

EQUIPMENT SPECIFICATION SHEETS

PROPOSED SOLAR POWER SITE:

PROJECT NAME
PROJECT STREET ADDRESS
CITY, STATE ZIP

SITE MAP – AERIAL

NORTH

PROJECT SITE

SHEET INDEX: TDP 2.0 TRACKER

S1	1X81 RACK PLAN VIEW, ELEVATION, & NOTES	●			
S2	1X54 RACK PLAN VIEW, ELEVATION, & NOTES	●			
S3	1X27 RACK PLAN VIEW, ELEVATION, & NOTES	●			
S4	ISO VIEW, BILL OF MATERIAL, & HARDWARE DETAILS	●			
S5	TRACKER CONNECTIONS – DRIVE POST & SPLICE CONNECTION DETAILS	●			
S6	TRACKER CONNECTIONS – IDLER POST & VERTICAL RAIL CONNECTION DETAILS	●			
S7	TRACKER CONNECTIONS – DAMPENER & PANEL CONNECTION DETAILS	●			
		SAMPLE DRAWING MONTH DAY, YEAR			
		ISSUANCE/REVISION			

LEGEND:
● ISSUED
○ REVISED, BUT NOT ISSUED

PREPARED FOR:

CUSTOMER NAME
CUSTOMER STREET ADDRESS
CITY, STATE ZIP

GENERAL NOTES:

1. CODES AND STANDARDS:

IBC 2012
NEC 2011
AISC 360–10
AISI S100–10
ASCE 7–10

2. WIND DESIGN PARAMETERS:

ULTIMATE DESIGN WIND SPEED, V – 105 MPH
RISK CATEGORY – I
WIND EXPOSURE CATEGORY C, K_z – 0.85
TOPOGRAPHICAL FACTOR, K_{zt} – 1.00
WIND DIRECTIONALITY FACTOR, K_d – 0.85
GUST FACTOR & NET PRESSURE COEFFICIENT, GCN
–GCN COEFFICIENTS DETERMINED BASED ON CPP WIND TUNNEL TESTING (CPP PROJECT NO. 14093)
–SEE SFR STRUCTURAL REPORT FOR PROJECT SPECIFIC GCN COEFFICIENTS

3. SNOW DESIGN PARAMETERS:

GROUND SNOW LOAD – 15 PSF
EXPOSURE CATEGORY, Ce – 0.90
SNOW THERMAL FACTOR, Ct – 1.20
SNOW IMPORTANCE FACTOR, I – 0.80
SNOW REDUCTION FACTOR SLIPPERY SURFACES, Cs

TILT ANGLE	Cs VALUE
0°–15°	1.00
20°	0.91
25°	0.82
30°	0.73
35°	0.64
40°	0.55
45°	0.46
50°	0.37
55°	0.28

4. EARTHQUAKE DESIGN PARAMETERS – EQUIVALENT LATERAL FORCE:

RISK CATEGORY – I
SITE CLASS – D
SEISMIC IMPORTANCE FACTOR, Ie – 1.0
RESPONSE MODIFICATION COEFFICIENT, R – 2
SPECTRAL RESPONSE ACCELERATION PARAMETERS

MAPPED	DESIGN
S_S – 0.824g	S_{DS} – 0.643g
S_1 – 0.282g	S_{D1} – 0.345g

SEISMIC DESIGN CATEGORY – D
SEISMIC RESPONSE COEFFICIENT, Cs – 0.321

5. FOUNDATION DESIGN PARAMETERS:

FOUNDATION DESIGN DERIVED FROM SUBSURFACE INVESTIGATION AND LABORATORY TESTING INFORMATION CONTAINED WITHIN GEOTECHNICAL REPORT PROVIDED BY:

6. APPLICABLE INSTALLATION TOLERANCES (PER SINGLE TRACKER):

N–S POST SPACING: ±1 ½"
N–S SLOPE OF A STRING–LINE BETWEEN POSTS: 5%
E–W POST ALIGNMENT: ±¾"
IDLER POST HEIGHT OUT OF STRING–LINE: ±1"
POST PLUMB: ±1°
POST TWIST: ±3°
IDLER POST EMBEDMENT: +/–6" *
TUBE TWIST: ±2°

POST TOLERANCES ARE REFERENCED AT TOP–OF–POST LOCATION.
DRIVE POST HEIGHT ABOVE GRADE IS 3'' ABOVE IDLER POSTS

MINIMUM RECOMMENDED CLEARANCE BETWEEN TRACKERS NO LESS THAN 12".
*TOLERANCE GIVEN TO ASSIST WITH VARIATIONS (SLUMPS/HILLS) IN THE GRADE.

PREPARED BY:

SOLAR FLEXRACK
A DIVISION OF NORTHERN STATES METALS
3207 INNOVATION PLACE
YOUNGSTOWN, OHIO 44509
PHONE: 1–888–380–8138

7. GROUND CLEARANCE REQUIREMENTS:

SNOW BANKING AND STORM SURGE AT THE FRONT OF RACK WAS NOT ACCOUNTED FOR IN RACK DESIGN. ANY ADVERSE EFFECTS DUE TO SNOW BANKING, SUCH AS SHADING OR STRUCTURAL CONSIDERATIONS, ARE BEYOND SOLAR FLEXRACK'S SCOPE.

8. CONNECTIONS:

A. SNUG TIGHT: ALL CONNECTIONS TO BE SNUG TIGHT PER THE RESEARCH COUNCIL OF STRUCTURAL CONNECTIONS (AISC RCSC) UNLESS OTHERWISE NOTED PERFORM VISUAL INSPECTION TO ENSURE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT.

B. TURN–OF–NUT: SOME 1/2"–13 ASTM A325T BOLTS MUST BE FASTENED BY TURN OF THE NUT METHOD PER THE RESEARCH COUNCIL OF STRUCTURAL CONNECTIONS (AISC RCSC). FIRST ENSURE FASTENER IS SNUG TIGHT. THEN TURN NUT TO ANGLE BEYOND INITIAL TORQUE MARK AS CALLED OUT IN RESPECTIVE CONNECTION DETAIL(S).

DESIGN ACCOUNTS FOR COMPLETE INSTALLATION PRIOR TO A CLIMATIC OR DESIGN EVENT PER CONTRACT DOCUMENTS. MEANS AND METHODS FALL UNDER THE RESPONSIBILITY OF THE CONTRACTOR.

9. PV MODULE INFORMATION:

NAME/MODEL: SERAPHIM SEG–395–BMA–BG 395W
VERSION: SEG–DS–EN–2020V1.0
DIMENSIONS: 80.512" LONG X 39.685" WIDE X 1.181" TALL
WEIGHT: 58.42 LBS

10. MATERIALS AND COATINGS:

A. PILES:
I. W–SECTIONS: A992 STEEL HOT DIPPED GALVANIZED PER ASTM A123.
B. HARDWARE:
I. ¾"ø TO BE A307 OR BETTER HOT DIPPED GALVANIZED PER ASTM A153.
II. ⅝"ø TO BE A325 HOT DIPPED GALVANIZED PER ASTM A153.
III. ½"ø TO BE A325 HOT DIPPED GALVANIZED PER ASTM A153.
IV. ⅜"ø TO BE A449 MECHANICAL GALVANIZED PER MAGNI 560.
V. 5/16"ø TO BE A449 MECHANICAL GALVANIZED PER MAGNI 560 OR STAINLESS STEEL.
VI. ¼"ø TO BE A449 MECHANICAL GALVANIZED PER MAGNI 560 OR STAINLESS STEEL.
C. COLD FORMED STEEL:
I. ALL COLD FORM STEEL TO BE PRE GALVANIZED PER A653 UNLESS OTHERWISE NOTED. SEE S4 FOR THE GRADE OF STEEL FOR EACH MEMBER.

11. SPECIAL INSPECTIONS:

THE FOLLOWING SPECIAL INSPECTIONS MAY BE REQUIRED PER IBC CHAPTER 17. CHECK WITH LOCAL BUILDING OFFICIAL FOR APPLICABILITY.
DRIVEN PILES..(CONTINUOUS)
–SEE IBC 2012, TABLE 1705.7, ITEMS 1–5
ASTM A325 BOLTS AND FASTENERS..........................(PERIODIC)
–SEE AISC 360–10, SECTION N5.6
ASTM A307 BOLTS AND FASTENERS
–NOT REQUIRED

ABBREVIATIONS

MIN	MINIMUM	BC	BEARING CRADLE
MAX	MAXIMUM	C–C	CENTER TO CENTER
OH	OVERHANG	CD	CRITICAL DIMENSION
PAG	POST ABOVE GRADE	CTA	CENTRAL TUBE AXIS
REF	REFERENCE	DIM	DIMENSION
DIA	DIAMETER	EOP	END OF PANEL
TYP	TYPICAL	HORIZ	HORIZONTAL
VERT	VERTICAL	HDG	HOT DIPPED GALVANIZED
STD	STANDARD	PLN	PLAIN
RV	RECEIVER	SWG	SWAGED
CP	CLAMP	EOT	END OF TUBE
S/C	STOCK CODE		

CUSTOMER:
COMPANY NAME
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S0

COVER SHEET

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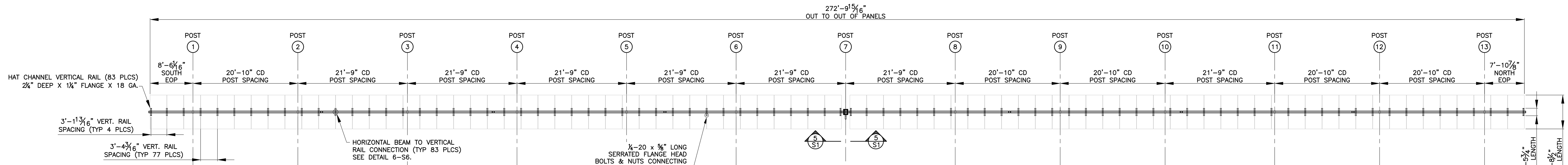
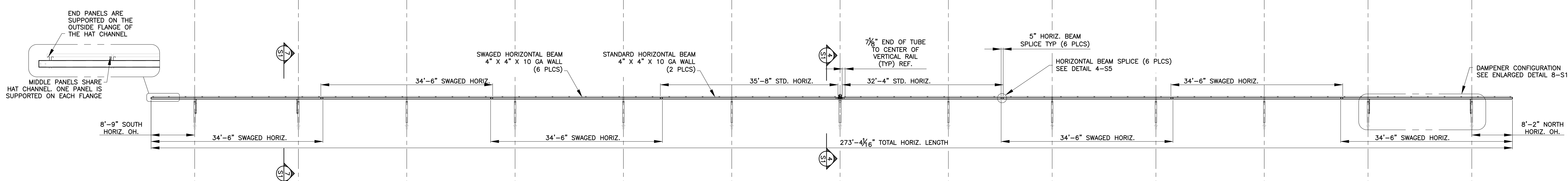
A Division of Northern States Metals

3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

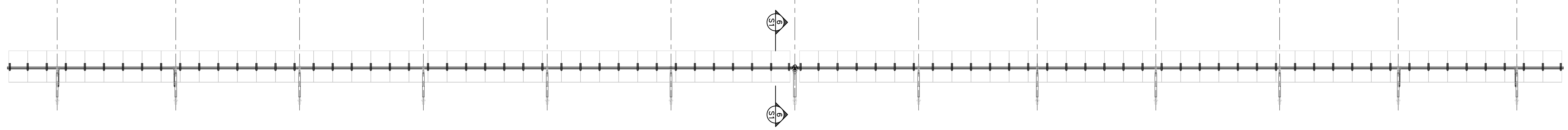
REV	DESCRIPTION	CHG. BY	DATE



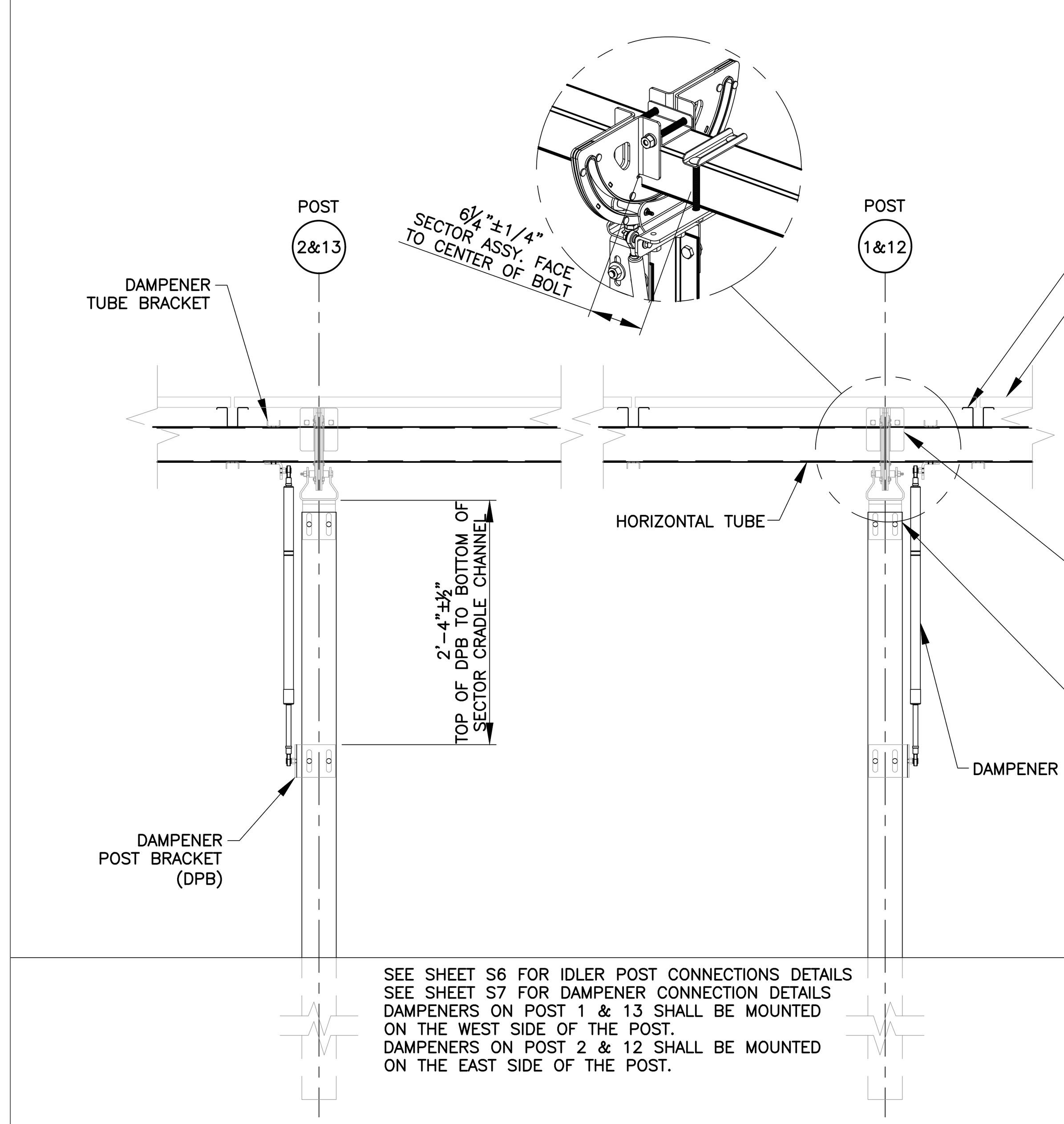
1 S1 PLAN VIEW
SCALE: 3/32" = 1'-0"



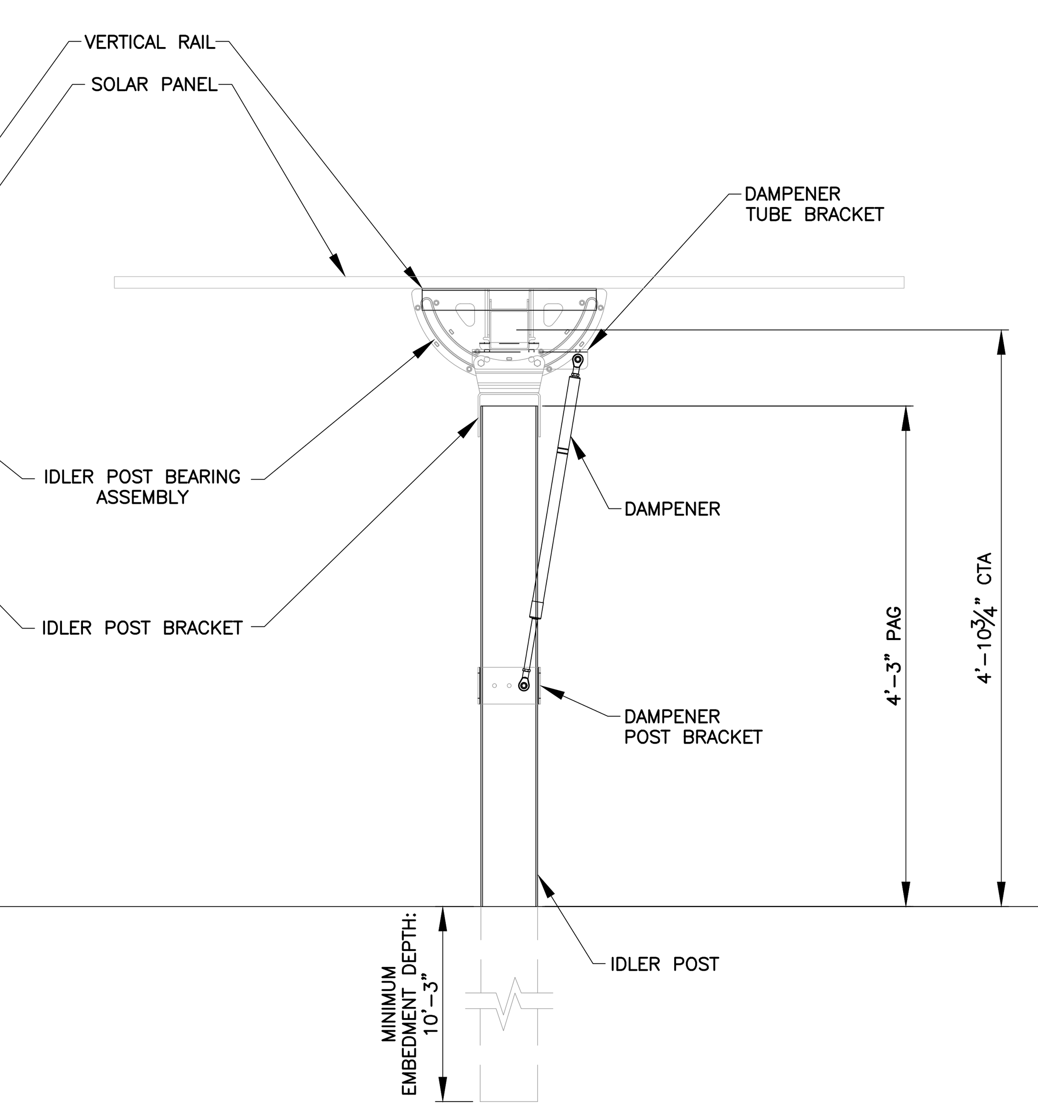
2 S1 FRONT ELEVATION
SCALE: 3/32" = 1'-0"



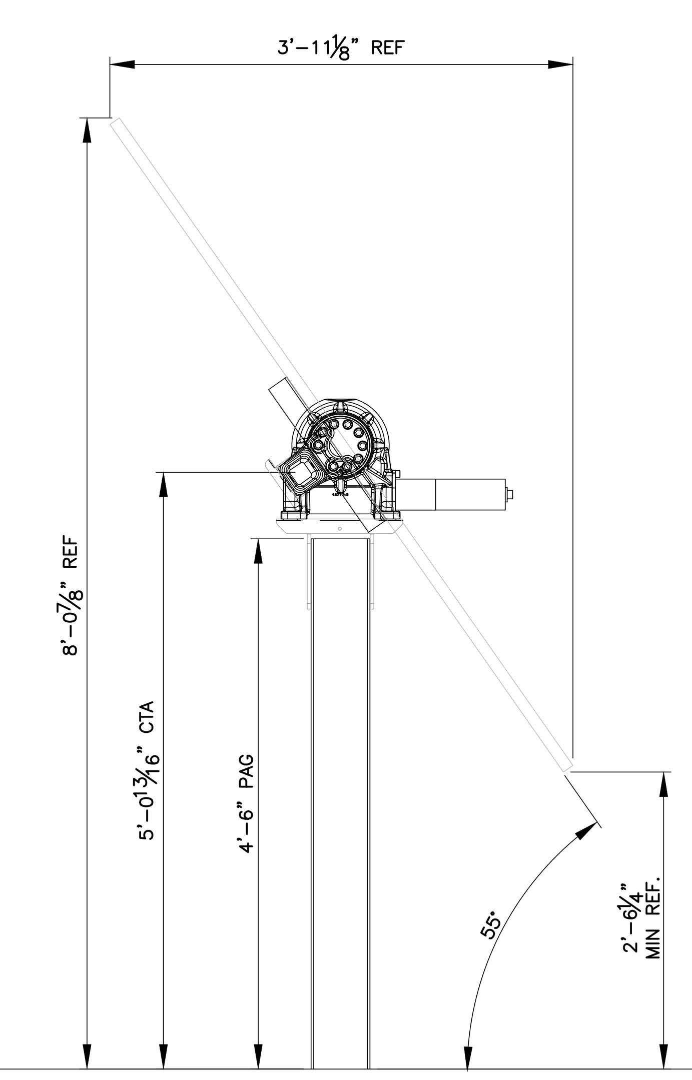
3 S1 FRONT ELEVATION - 55°
SCALE: 3/32" = 1'-0"



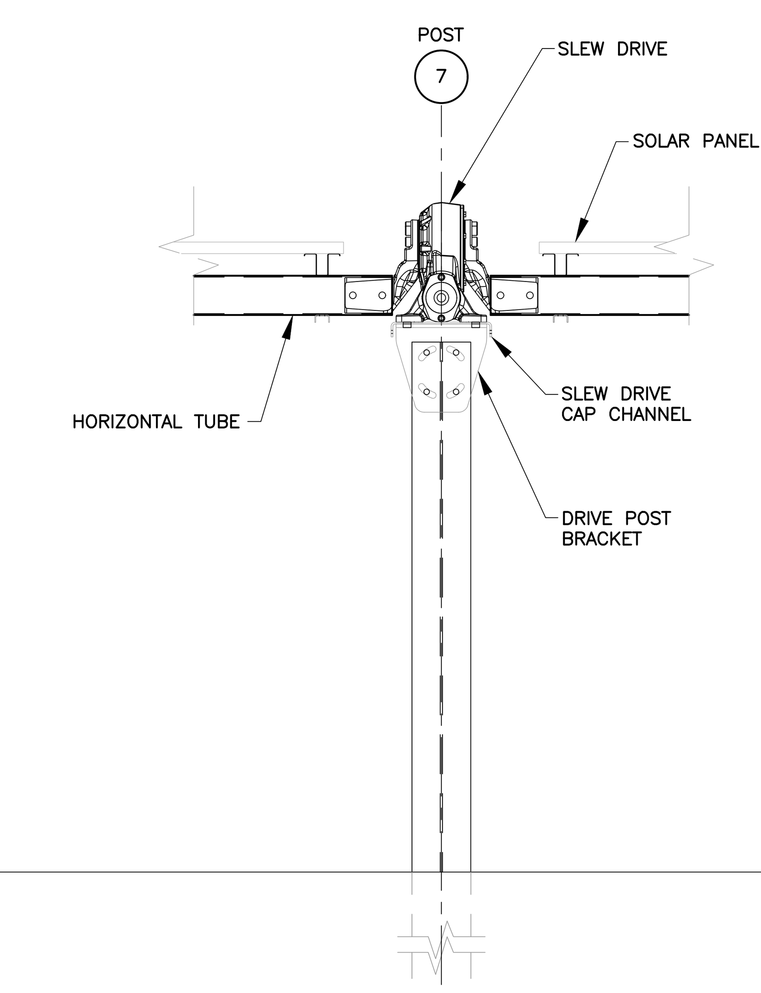
8 S1 DAMPENER FRONT ELEVATION DETAIL
SCALE: 3/4" = 1'-0"



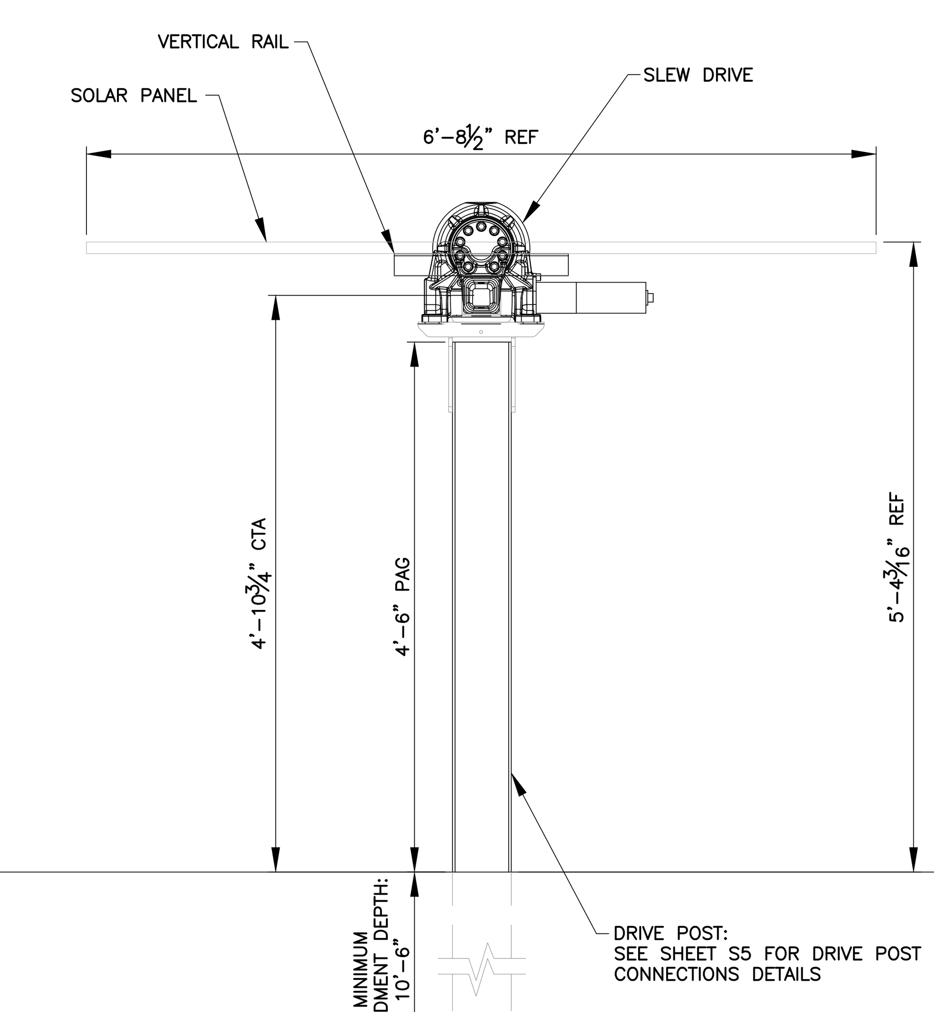
7 S1 IDLER POST DAMPENER SECTION VIEW - 0°
SCALE: 3/4" = 1'-0"



6 S1 DRIVE POST SECTION VIEW - 55°
SCALE: 3/4" = 1'-0"



5 S1 DRIVE POST FRONT ELEVATION VIEW
SCALE: 3/4" = 1'-0"



4 S1 DRIVE POST SECTION VIEW - 0°
SCALE: 3/4" = 1'-0"

COMPANY NAME
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JOB #: XXXX
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SERAPHIM SEG-395-BMA-BG 395W
1X81 SOLAR FLEXRACK TDP2.0

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Phone (888) 380-8138

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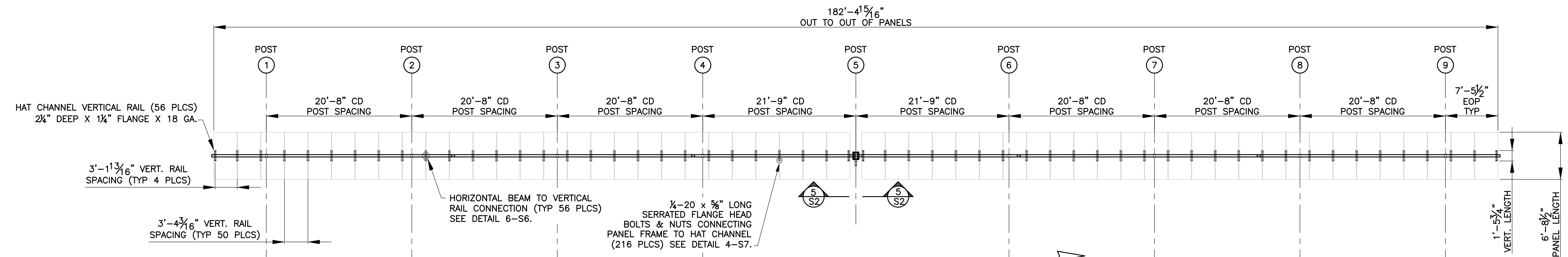
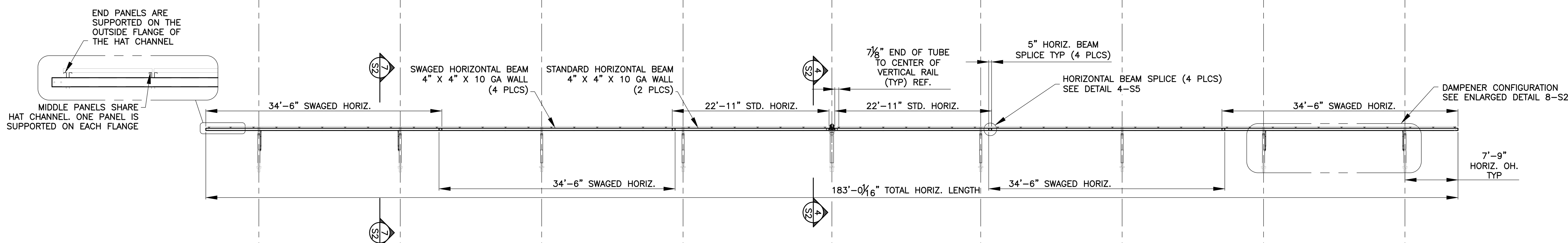
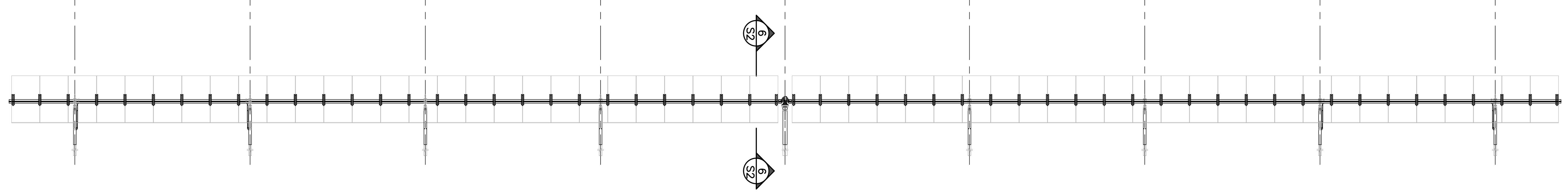


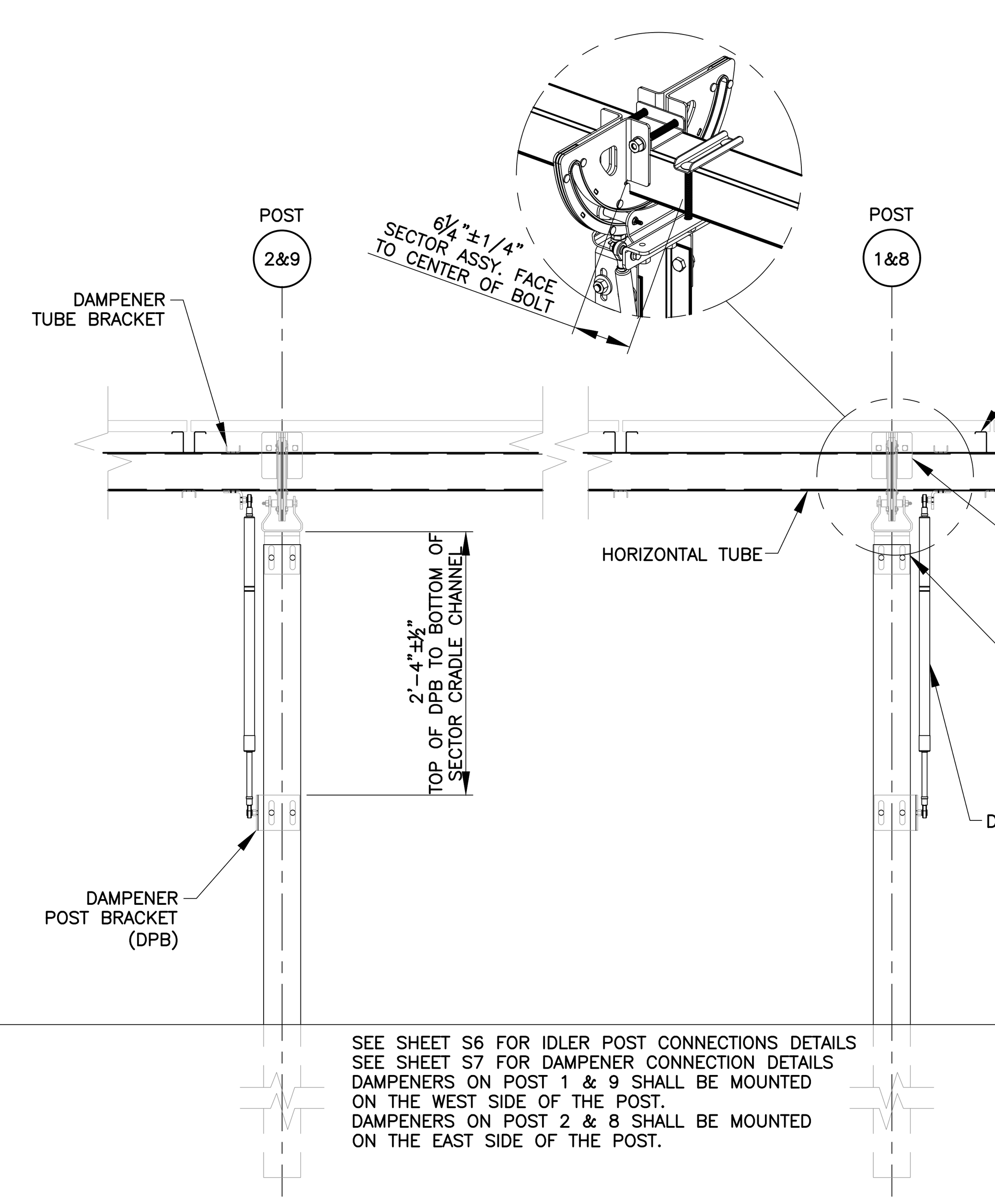
1 S2 PLAN VIEW
SCALE: 3/32" = 1'-0"



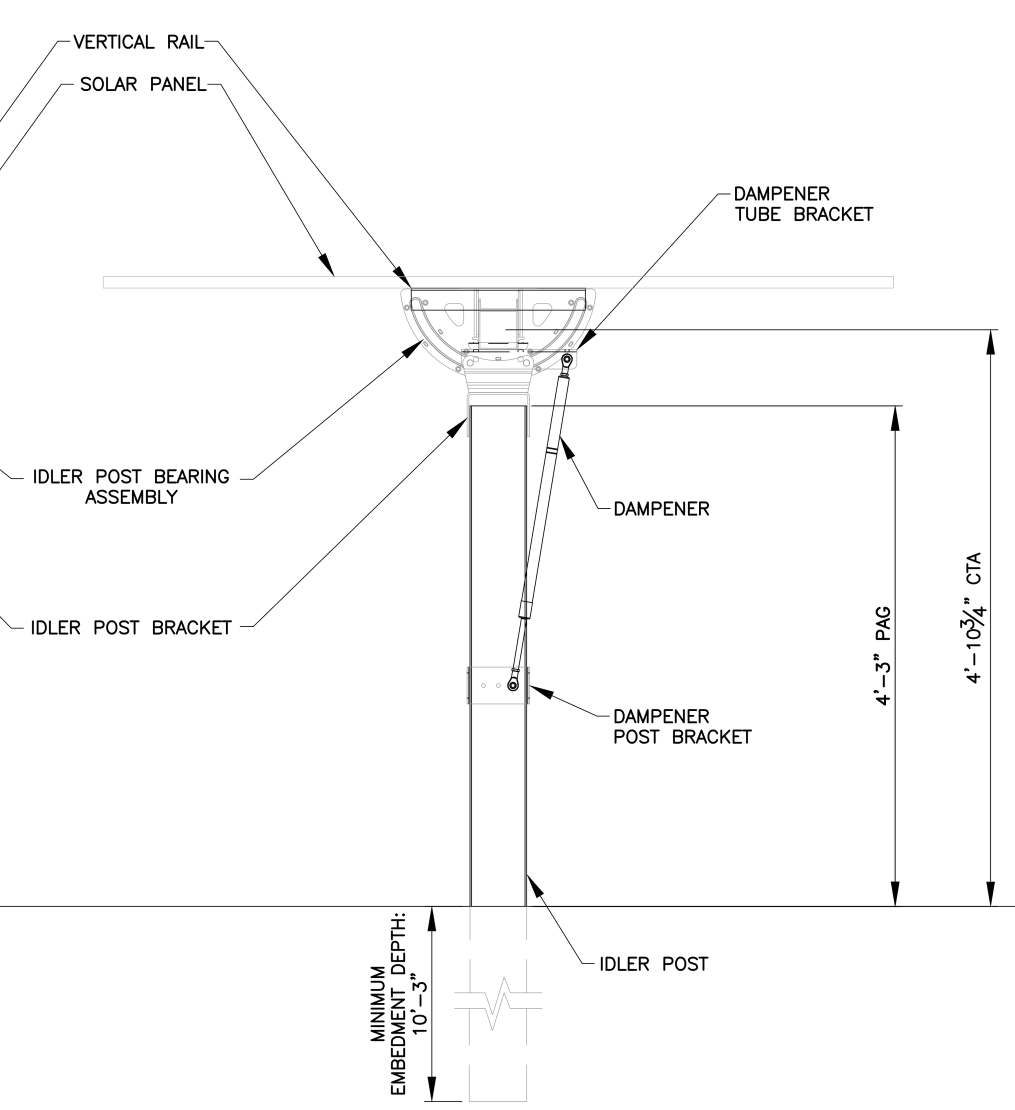
2 S2 FRONT ELEVATION
SCALE: 3/32" = 1'-0"



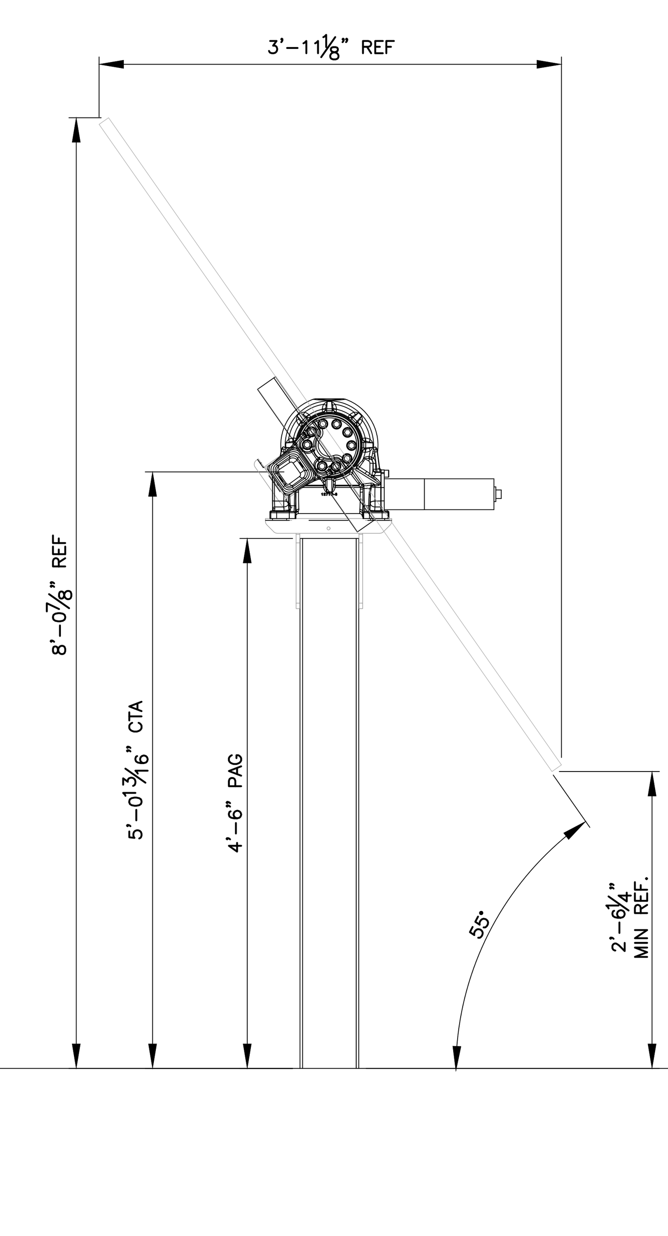
3 S2 FRONT ELEVATION – 55°
SCALE: 3/32" = 1'-0"



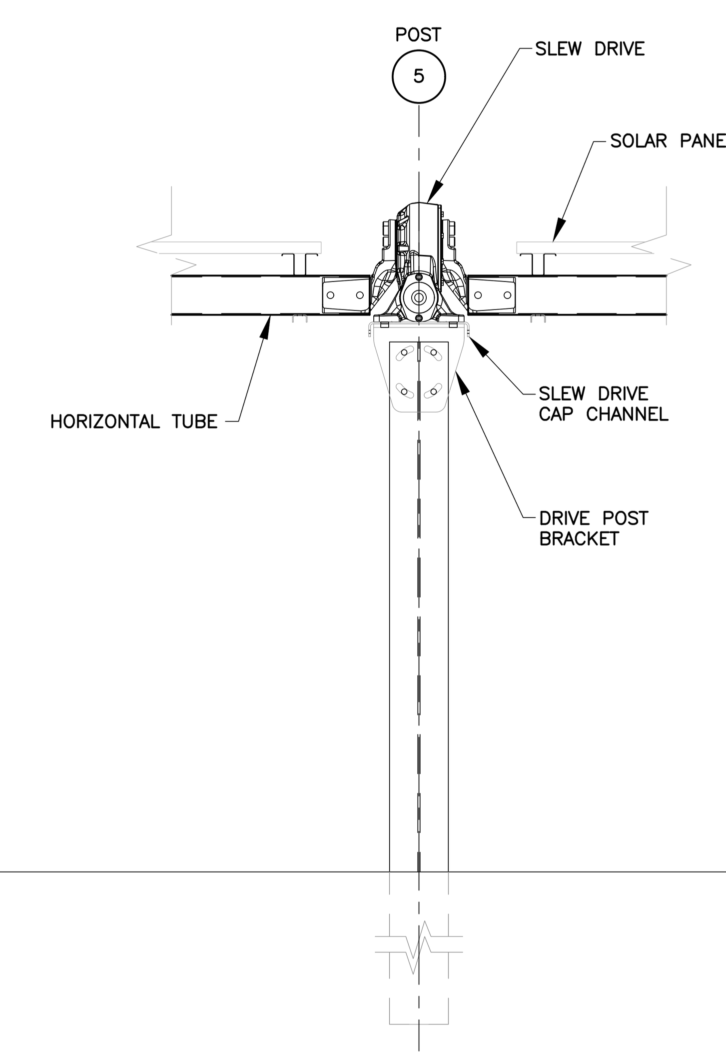
8 S2 DAMPENER FRONT ELEVATION DETAIL
SCALE: 3/4" = 1'-0"



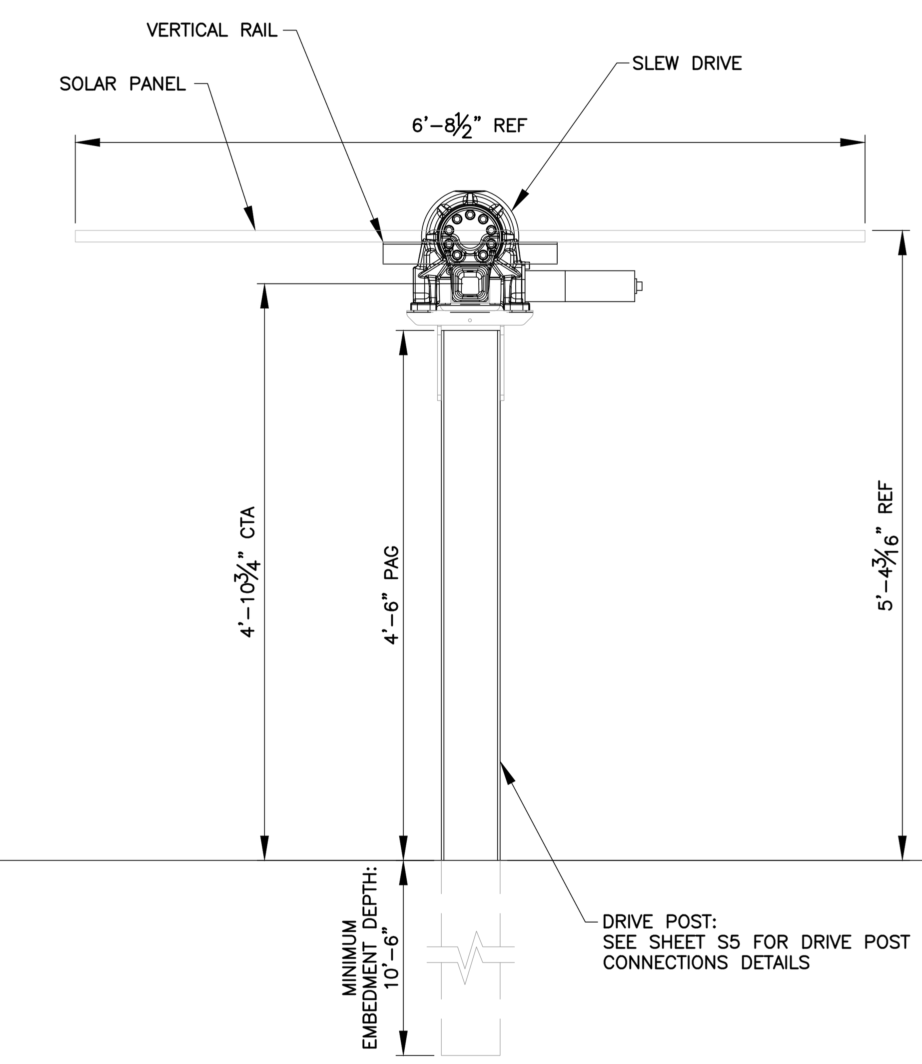
7 S2 IDLER POST DAMPENER SECTION VIEW – 0°
SCALE: 3/4" = 1'-0"



6 S2 DRIVE POST SECTION VIEW – 55°
SCALE: 3/4" = 1'-0"



5 S2 DRIVE POST FRONT ELEVATION VIEW
SCALE: 3/4" = 1'-0"



4 S2 DRIVE POST SECTION VIEW – 0°
SCALE: 3/4" = 1'-0"

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PROJECT NAME
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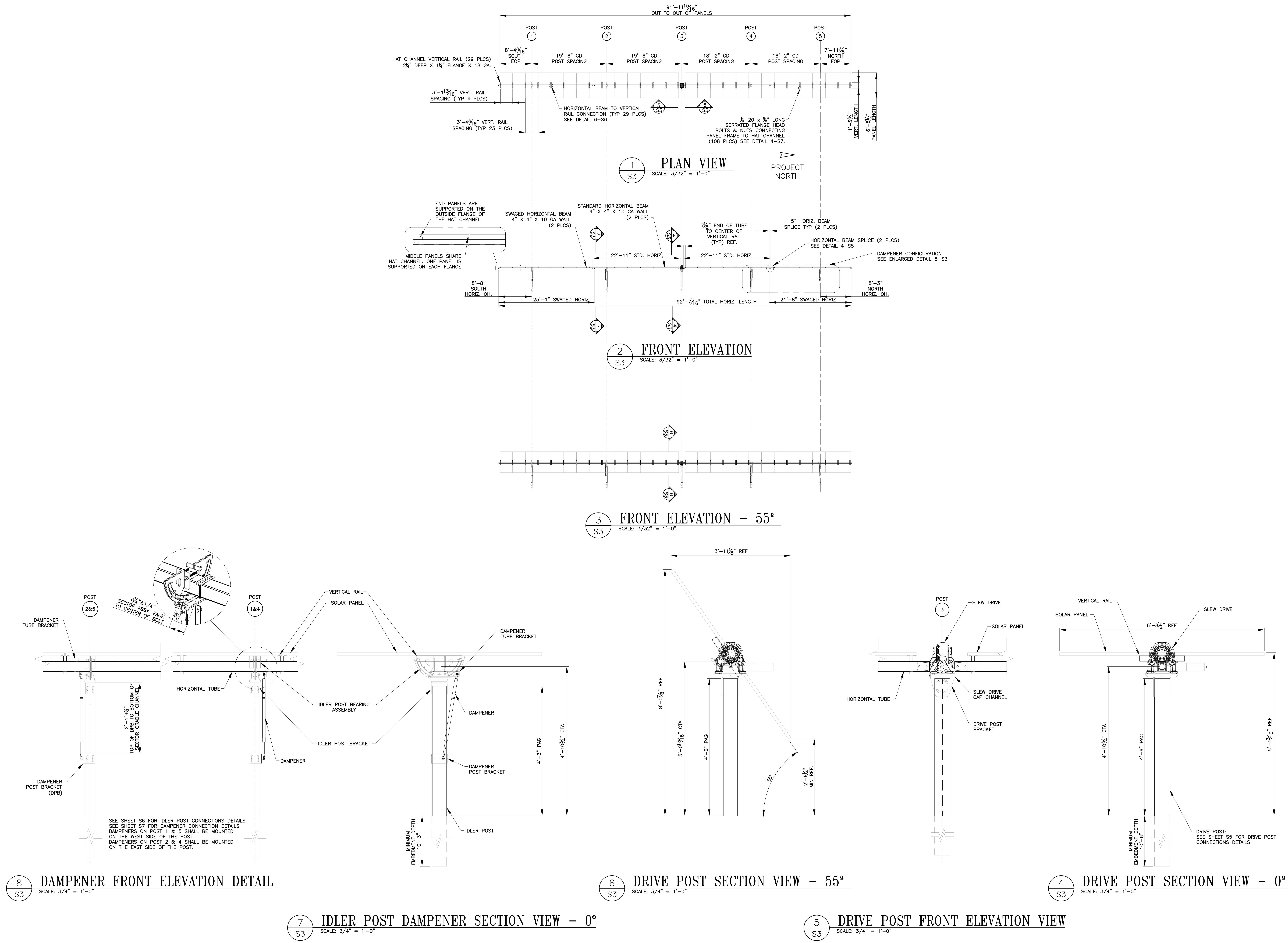
PAGE: S2 of S7	Sheet S2

SERAPHIM SEG-395-BMA-BG 395W
1X54 SOLAR FLEXRACK TDP2.0

SOLAR FLEXRACK
A Division of Northern States Metals
3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

REV	DESCRIPTION	CHG. BY	DATE



COMPANY NAME
PROJECT NAME
CITY, STATE ZIP

CUSTOMER:

DATE: XX/XX/XXXX
JOB #: XXXX
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PAGE: S3 of S7
Sheet: S3

SERAPHIM SEG-395-BMA-BG 395W
1X27 SOLAR FLEXRACK TDP2.0

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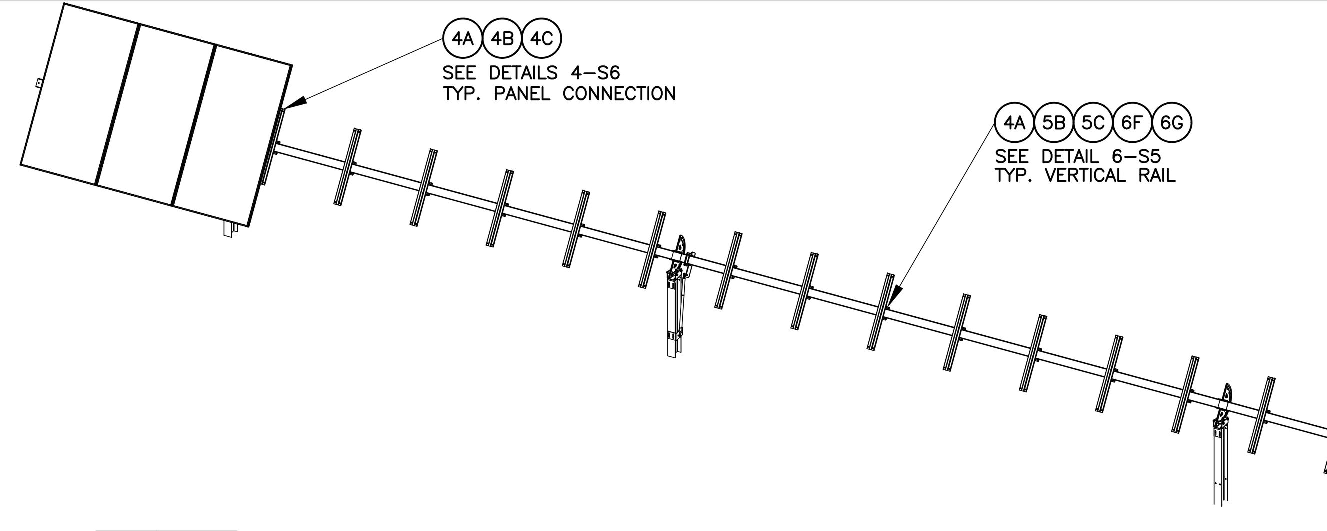
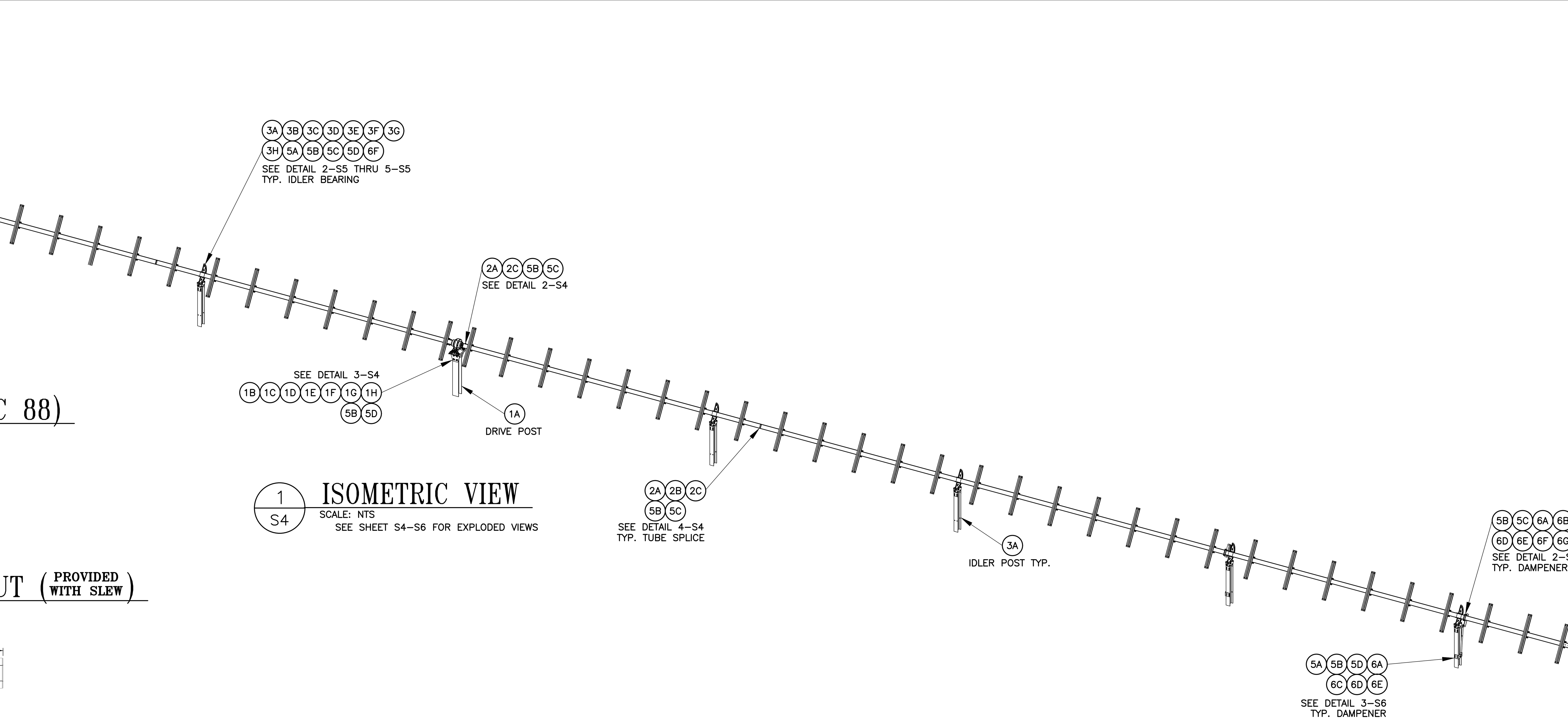
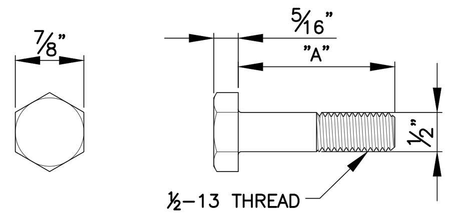
REV	DESCRIPTION	CHG. BY	DATE

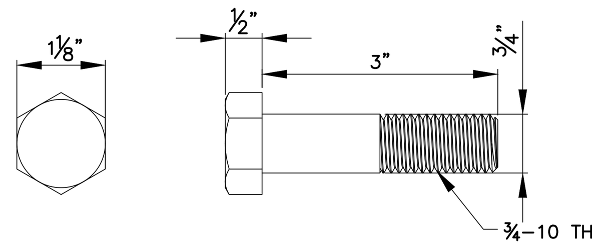



1 / S4 ISOMETRIC VIEW
SCALE: NTS
SEE SHEET S4-S6 FOR EXPLODED VIEWS

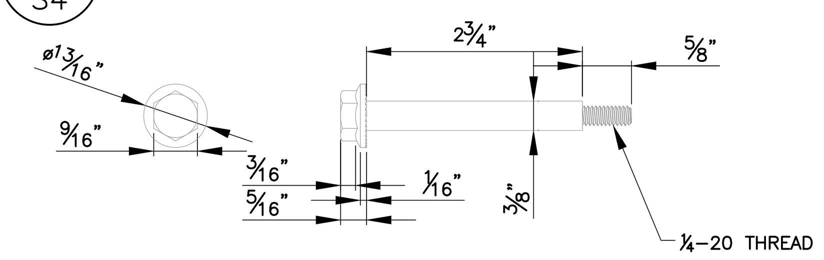


A	S/C
1¾"	39
5"	47
1½"	57

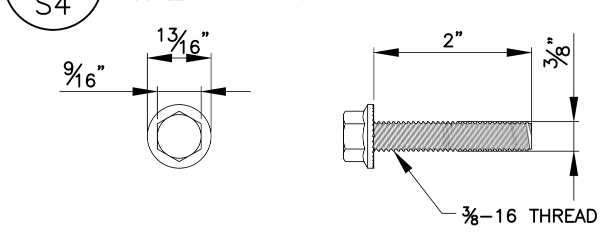
9 / S4 1/2-13 BOLT
SCALE: 6" = 1'-0"



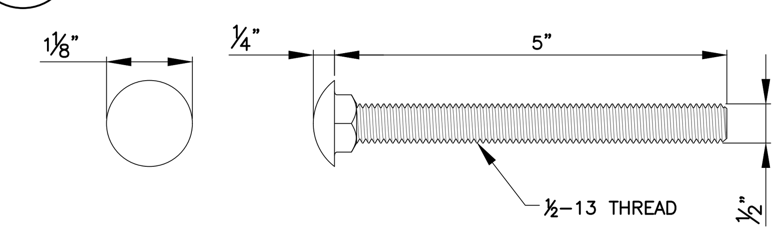
10 / S4 3/4"-10 X 3" BOLT (PROVIDED WITH SLEW)
SCALE: 6" = 1'-0"



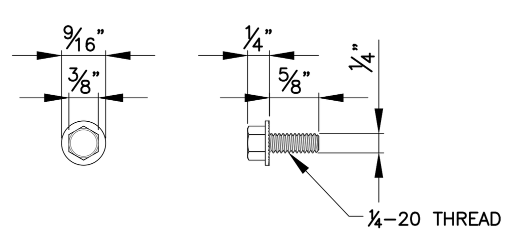
11 / S4 3/8" X 2.75" SHOULDER BOLT (S/C 5662)
SCALE: 6" = 1'-0"



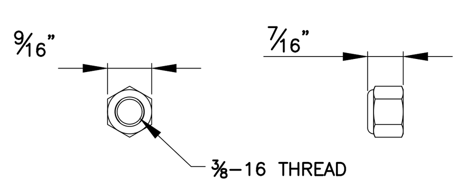
12 / S4 3/8-16 X 2" SERRATED BOLT (S/C 58)
SCALE: 6" = 1'-0"



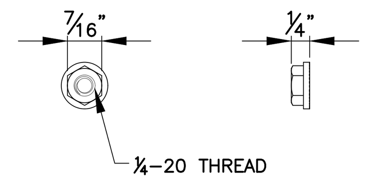
13 / S4 1/2-13 X 5" CARRIAGE BOLT (S/C 3746)
SCALE: 6" = 1'-0"



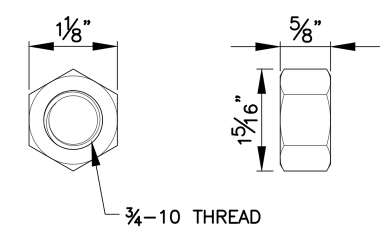
14 / S4 1/4-20 X 5/8" BOLT (S/C 5181)
SCALE: 6" = 1'-0"



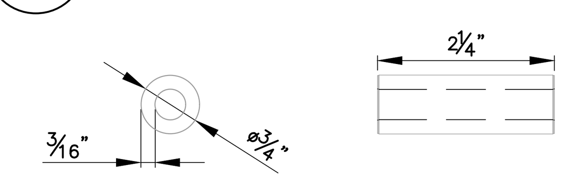
15 / S4 3/8-16 NYLON LOCK NUT (S/C 78)
SCALE: 6" = 1'-0"



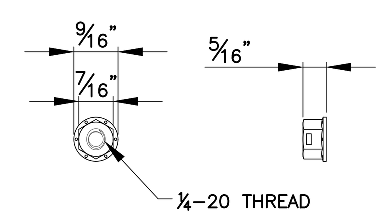
2 / S4 1/4-20 NUT (S/C 88)
SCALE: 6" = 1'-0"



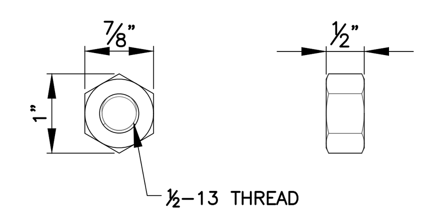
3 / S4 3/4"-10 A563 NUT (PROVIDED WITH SLEW)
SCALE: 6" = 1'-0"



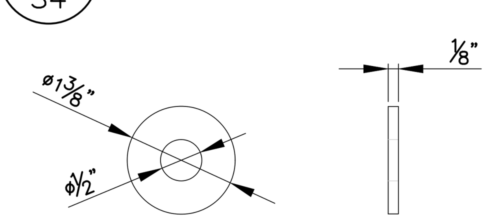
4 / S4 2.25" SHOULDER BOLT SLEEVE (S/C 5661)
SCALE: 6" = 1'-0"



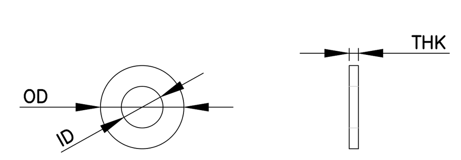
5 / S4 1/4-20 LOCKNUT (S/C 7356)
SCALE: 6" = 1'-0"



6 / S4 1/2-13 NUT (S/C 83)
SCALE: 6" = 1'-0"



7 / S4 FENDER WASHER (S/C 126)
SCALE: 6" = 1'-0"



S/C	OD	ID	THK
N/A (1D)	1½"	1 3/16"	3/16"
105	1 1/16"	½"	⅛"

8 / S4 STD F436 WASHER
SCALE: 6" = 1'-0"

BILL OF MATERIALS – TDP 2.0 TRACKER COMPONENTS

ITEM GROUP	ITEM SUB	QTY 1X81	QTY 1X54	S/C	PART DESCRIPTION	MATERIAL	FINISH
1	A	1	1	7435	W6X15 POST	ASTM A992 GR. 50 STEEL	HDG PER ASTM A123
	B	1	1	6607	SLEW DRIVE – 24V	+/-55° ROTATION	ACRYLIC URETHANE COATING
	C	4	4	PROVIDED WITH SLEW DRIVE	3/4IN -10 x 3IN LONG	ASTM A307 OR BETTER	HDG PER ASTM F2329
	D	8	8		1.469IN OD x 0.812IN ID x .122IN THK	ASTM F436	ASTM B695 MECH GALV.
	E	4	4		3/4IN -10 NUT	ASTM A194 2H	HDG PER ASTM F2329
	F	1	1	5796	SLEW POST CAP CHANNEL (2-1/4IN RETURN)	ASTM A572 (GR50 STEEL)	PREGALVANIZED G90
	G	2	2	5329	SLEW POST ANGLE BRACKET (1/2IN HARDWARE)	ASTM A572 (GR50 STEEL)	HDG PER ASTM A123
	H	8	8	57	1/2 – 13 X 1-1/2IN BOLT	ASTM A325	HDG PER ASTM F2329
2	A	2	2	SEE PART DESCRIPTION	STD. TUBE – 4IN HSS (5381 & 6506)	ASTM A500 GR.C GR. 60 STEEL	COATED PER ASTM A1057 ZT 60
	B	6	4	SEE PART DESCRIPTION	SWAGED TUBE – 4IN HSS (5379 & 7437)	ASTM A500 GR.C GR. 60 STEEL	COATED PER ASTM A1057 ZT 60
	C	16	12	47	1/2-13 X 5IN BOLT	ASTM A325	HDG PER ASTM F2329
3	A	12	8	7436	W6X7 POST	ASTM A992 GR. 50 STEEL	HDG PER ASTM A123
	B	12	8	5337	BEARING CRADLE SUPPORT POST CLAMP (I-BEAM 2.0 IDLER)	ASTM A572 (GR50 STEEL)	PREGALVANIZED G90
	C	12	8	5647	SECTOR CRADLE CHANNEL 0.180IN THK. DACROMET	ASTM A572 (GR50 STEEL)	PREGALVANIZED G90
	D	12	8	5333	SECTOR CLAMP 0.134IN THK. SPRING PLATE	ASTM A572 (GR50 STEEL)	PREGALVANIZED G90
	E	12	8	5857	(2) SECTOR PLATES AND (1) PLASTIC SECTOR BEARING RIVETED	–	–
	E1	24	16	5331	SECTOR PLATE 0.180IN THK. DACROMET	ASTM A572 (GR50 STEEL)	PREGALVANIZED G90
	E2	12	8	5334	PLASTIC SECTOR BEARING	ACETAL-RTP 0899X88199	BLACK WITH UV PROTECTION
	E3	96	64	5858	1/4-20 FOR 0.625-0.75 MATERIAL THICKNESS (RIVET)	ALUMINUM	ALUMINUM
	F	24	16	5661	0.75 X 2.25IN TDP2.0 SHOULDER BOLT SLEEVE	FC-0208-50 PER MPIF STD 35	BLACK ZN-NI (ASTM B841 TYPE D&E GR. 8)
	G	24	16	5662	3/8IN X 2 3/4IN SHOULDER BOLT WITH 1/4-20 THREADS	ASTM A449 (SAE J429) GRADE 5	BLACK ZN-NI (NINKLAD 1000B)
	H	48	32	7356	1/4-20 REGULAR FLANGE GRADE G LOCKNUT	GRADE G STEEL	MAGNI 560
4	A	83	56	6279	TRACKER VERTICAL RAIL – HAT CHANNEL	ASTM A653 SS GR.50	PREGALVANIZED G90
	B	324	216	5181	1/4-20 X 5/8IN LONG FLANGEHEAD BOLT	ASTM A449 GRADE 5	MAGNI 560
	C	324	216	88	1/4-20 SERRATED FLANGEHEAD NUT	GRADE 2 STEEL	MAGNI 560
5	A	112	80	39	1/2 – 13 X 1 1/4IN BOLT	ASTM A325	HDG PER ASTM F2329
	B	334	236	83	1/2 – 13 HEAVY HEX NUT	ASTM A563	HDG PER ASTM F2329
	C	310	212	105	1/2IN STD WASHER (1.063IN OD X .531IN ID X .117IN THK)	ASTM F436	ASTM B695 MECH GALV.
	D	72	56	126	1/2IN FENDER WASHER (1.5IN OD X 0.531IN ID X .117IN THK)	1035/1065 SPRING STEEL	ASTM B695 MECH GALV.
6	A	4	4	4862	STABILUS DAMPENER – 071965	–	–
	B	4	4	6675	DAMPENER TUBE BRACKET – 7.0 IN CTA (2.0) – L2X2X1/4 X 11.768IN	ASTM A36 (GR 36 STEEL)	HDG PER ASTM A123
	C	4	4	5389	DAMPENER POST LOWER BRACKET	ASTM A36 (GR 36 STEEL)	PREGALVANIZED G90
	D	8	8	58	3/8-16 X 2IN LONG SERRATED FLANGEHEAD BOLT	ASTM A449 GRADE 5	MAGNI 560
	E	16	16	78	3/8-16 – NYLON LOCKNUT	NE SERIES STEEL	MAGNI 560
	F	198	136	3746	1/2-13 X 5IN CARRIAGE BOLT	GRADE 5 STEEL	HDG PER ASTM F2329
	G	87	60	4027	VERTICAL RAIL CONNECTION CHANNEL	ASTM A653 SS GR. 50 STEEL	PREGALVANIZED G90

CUSTOMER:
COMPANY NAME
PROJECT NAME
CITY, STATE ZIP

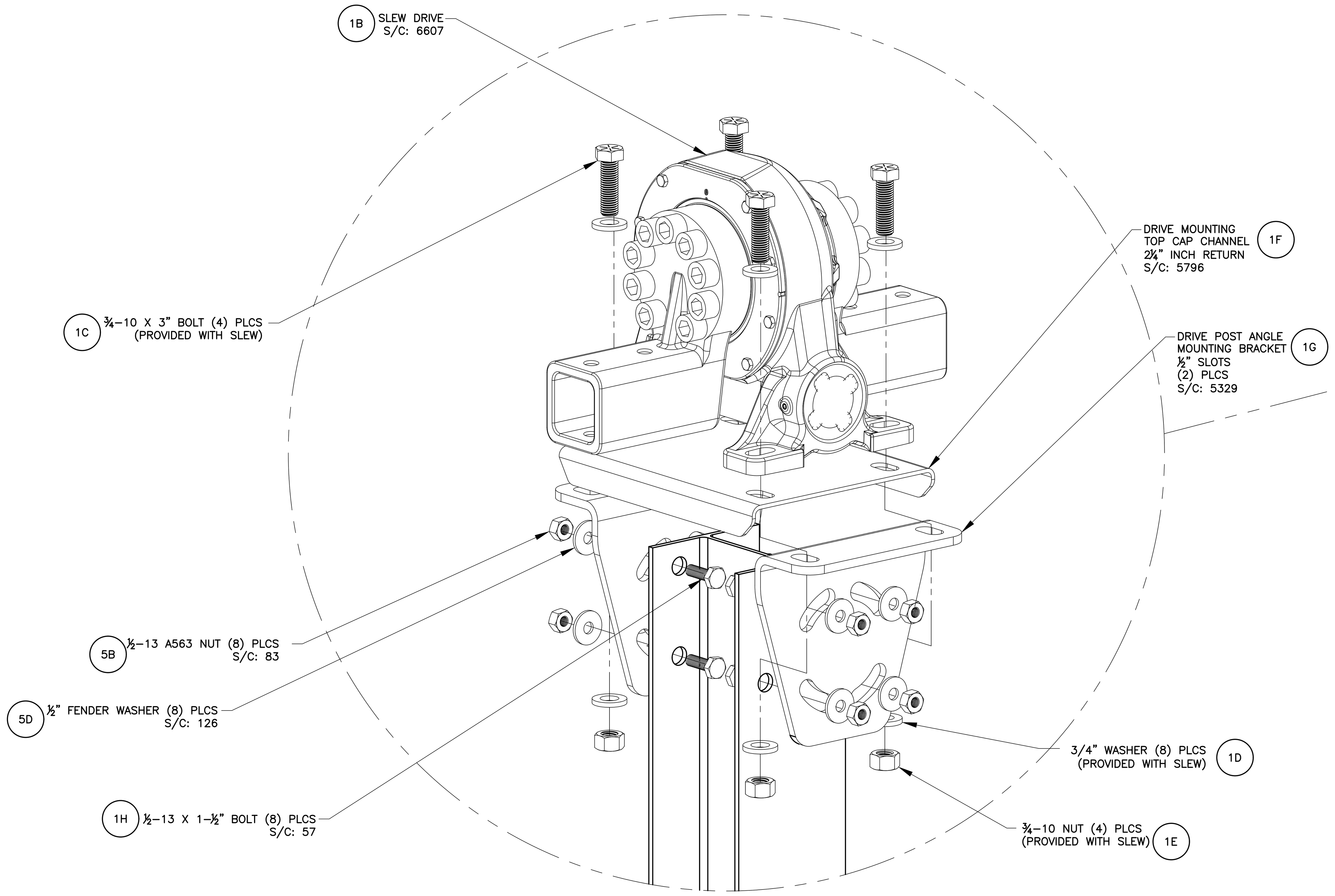
DATE: XX/XX/XXXX JOB #: XXXX
DRAWN BY: XX CHECK BY: XX PAGE: S4 of S7
Sheet S4

ISO VIEW, BILL OF MATERIAL, & HARDWARE DETAILS

SOLAR FLEXRACK
A Division of Northern States Metals

3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

REV	DESCRIPTION	CHG. BY	DATE

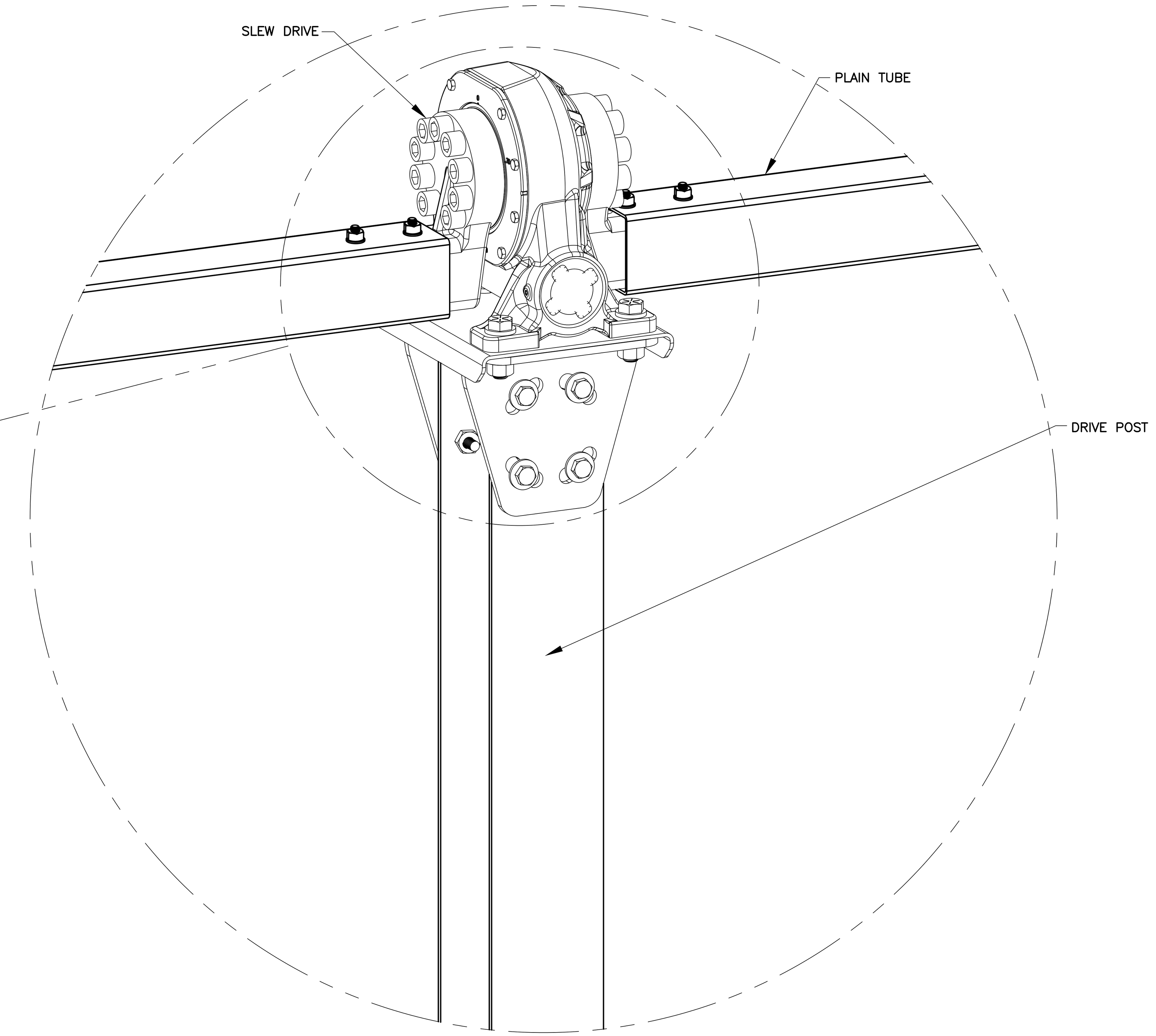


3/S5 DRIVE POST SLEW DRIVE CONNECTION

SCALE: NTS

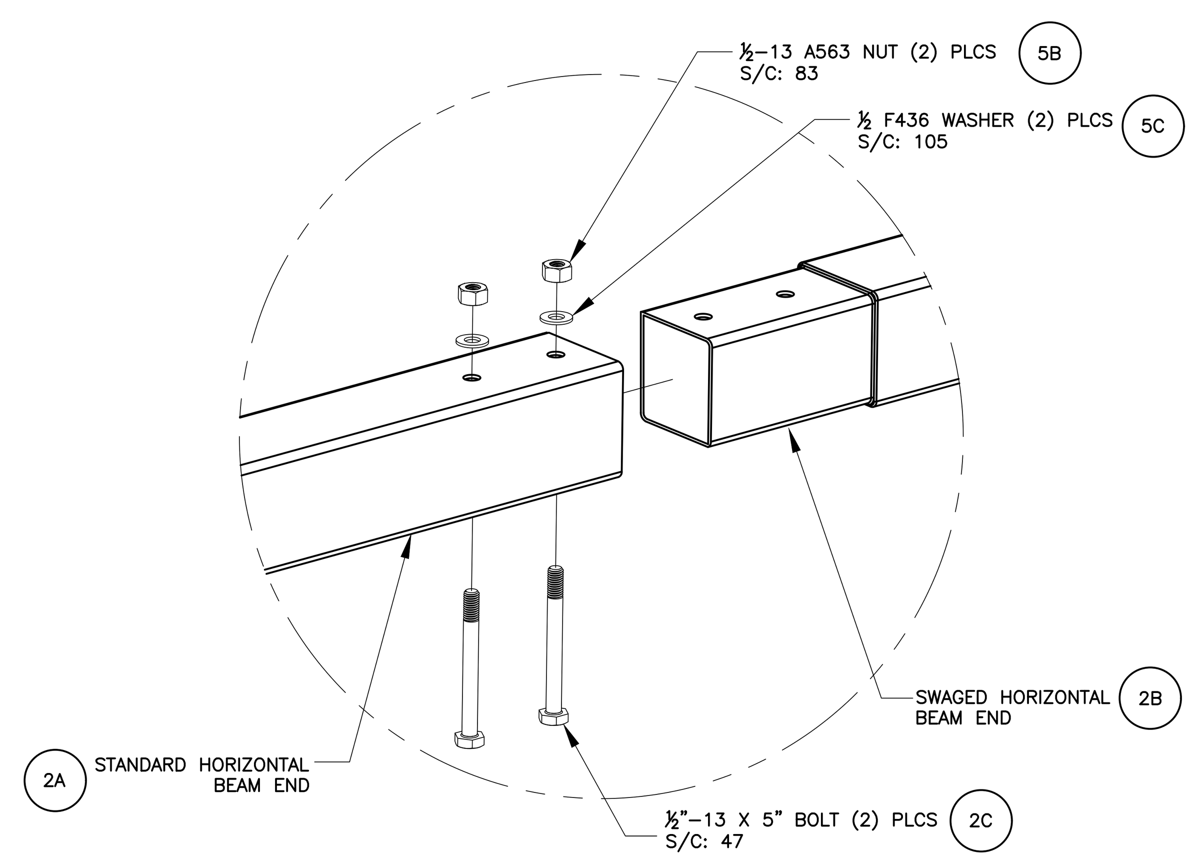
*½-13 X 1½" BOLTS CONNECTING POST BRACKET TO POST MUST BE FASTENED BY TURN OF THE NUT METHOD PER THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) (⅓ TURN PAST SNUG TIGHT)

*¾-10 X 3" BOLTS CONNECTING SLEW DRIVE TO DRIVE POST MOUNTING TOP CAP CHANNEL & ANGLE MOUNTING BRACKET MUST BE FASTENED BY TURN OF THE NUT METHOD PER THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) (⅓ TURN PAST SNUG TIGHT)



1/S5 DRIVE POST ISOMETRIC VIEW

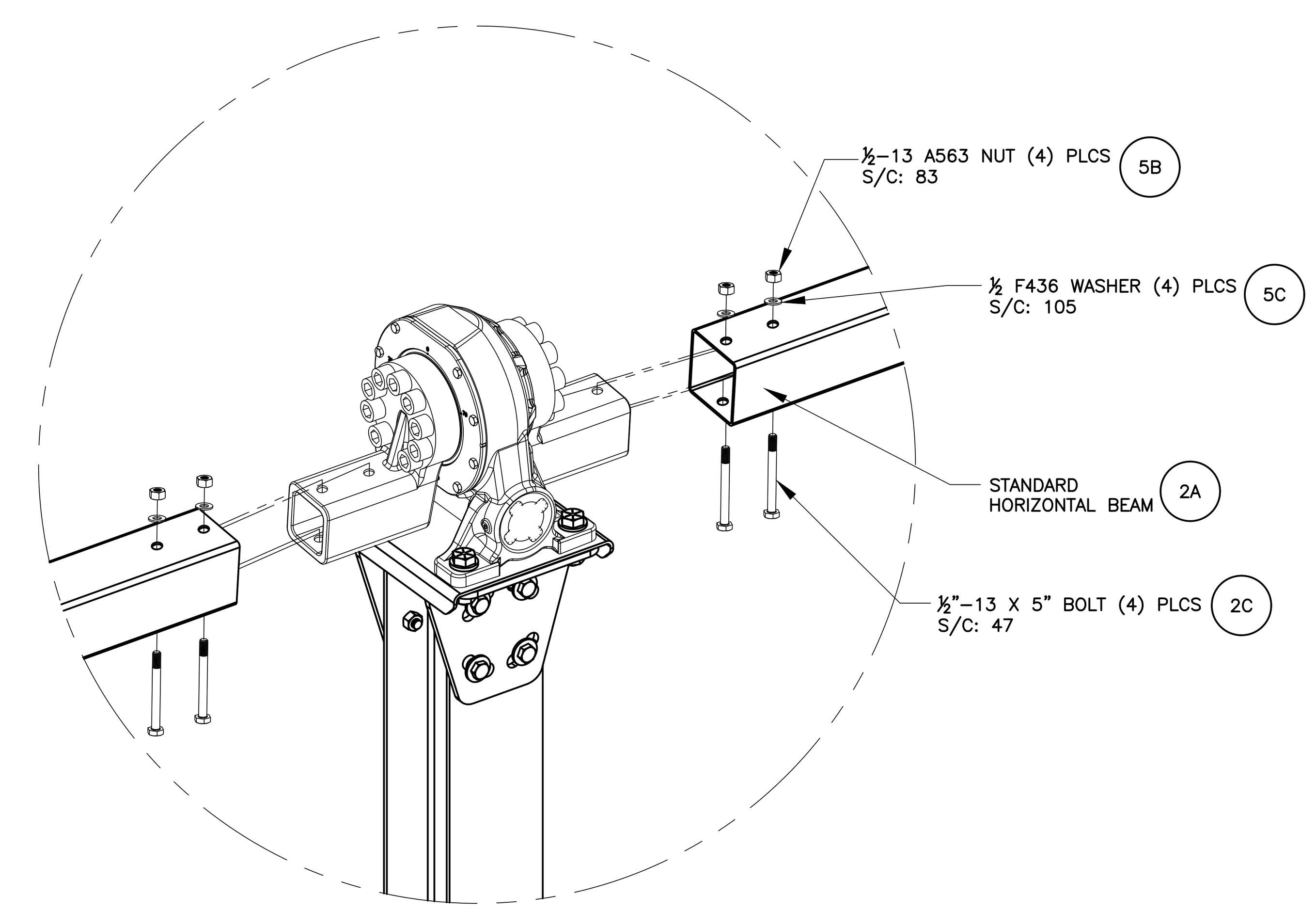
SCALE: NTS



4/S5 HORIZ BEAM SPLICE EXPLODED

SCALE: NTS

HORIZONTAL BEAM SPLICE MUST BE ORIENTED WITH THE BOLT INSTALLED VERTICALLY.
TORQUE VALUE: 50-60 FT-LBS



2/S5 BEAM TO SLEW CONNECTION EXPLODED

SCALE: NTS

CONNECTION MUST BE ORIENTED WITH THE BOLT INSTALLED VERTICALLY.
TORQUE VALUE: 50-60 FT-LBS

Sheet: S5

COMPANY NAME
PROJECT NAME
CITY, STATE ZIP

DATE: XX/XX/XXXX	JOB #: XXXX	PAGE: S5 of S7
DRAWN BY: XX	CHECK BY: XX	

CUSTOMER:

DRIVE POST & SPLICE CONNECTION DETAILS

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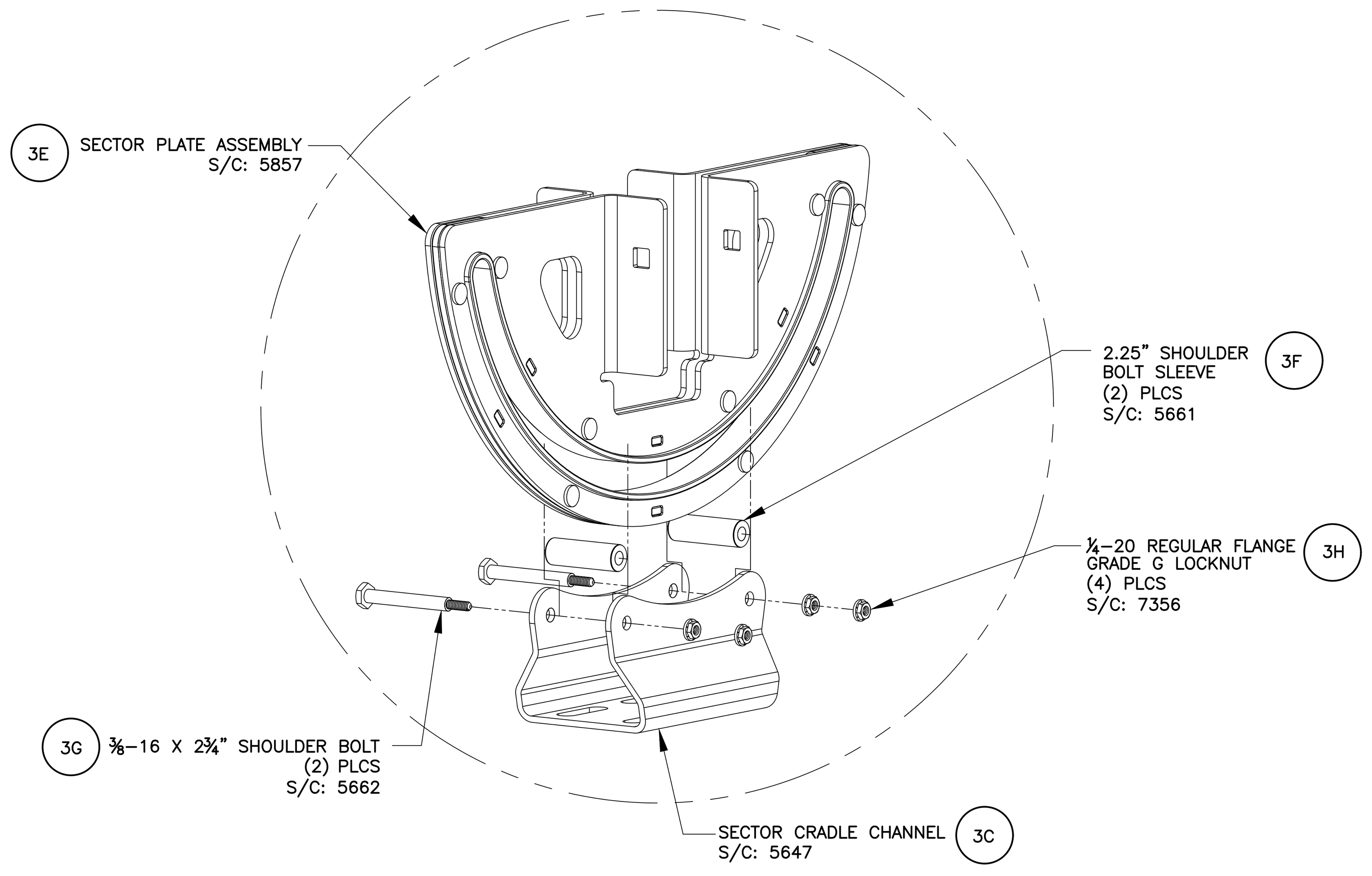
3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

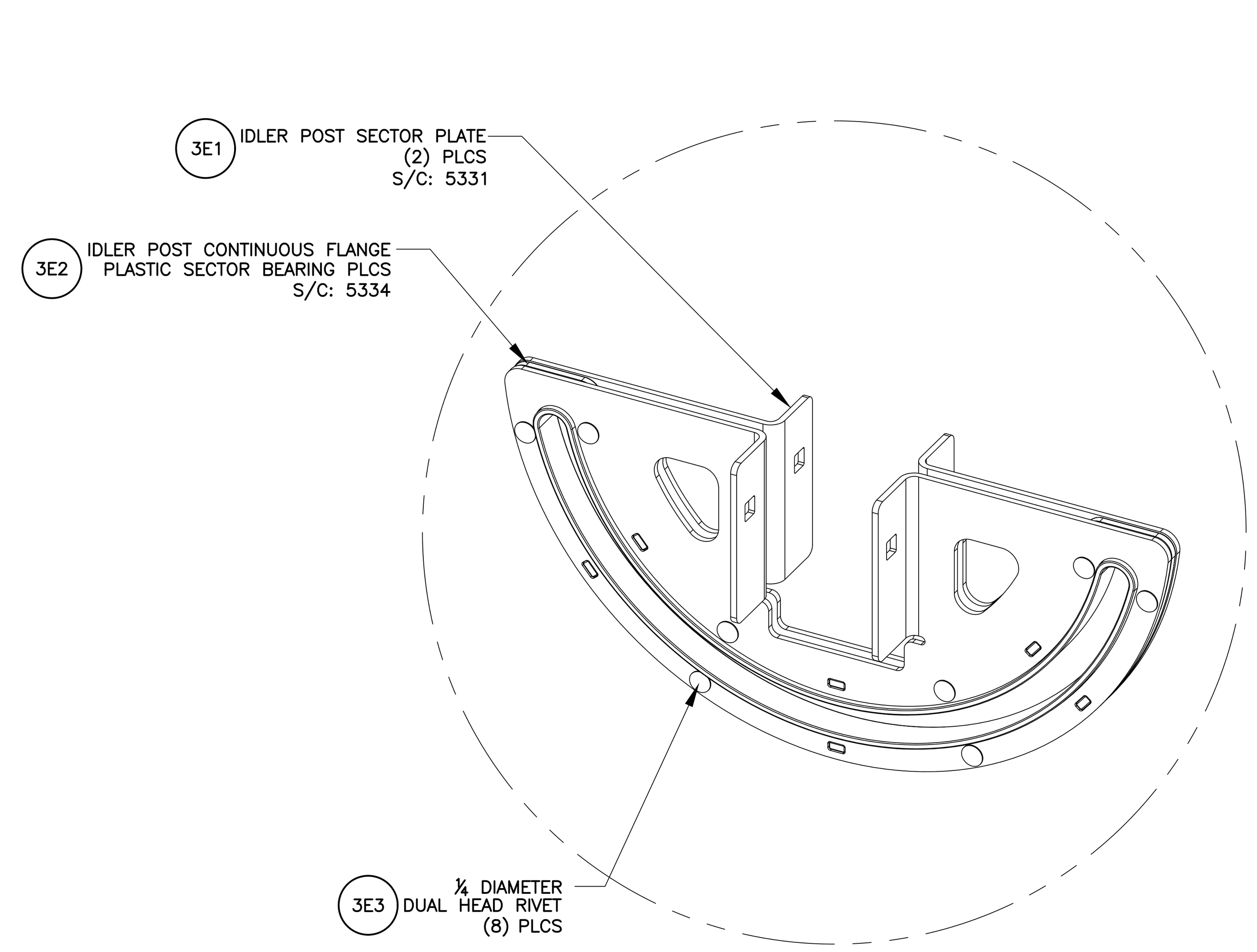
REV	DESCRIPTION	CHG. BY	DATE



5 / S6 BEARING CRADLE ASSEMBLY EXPLODED

SCALE: 3" = 1'-0"

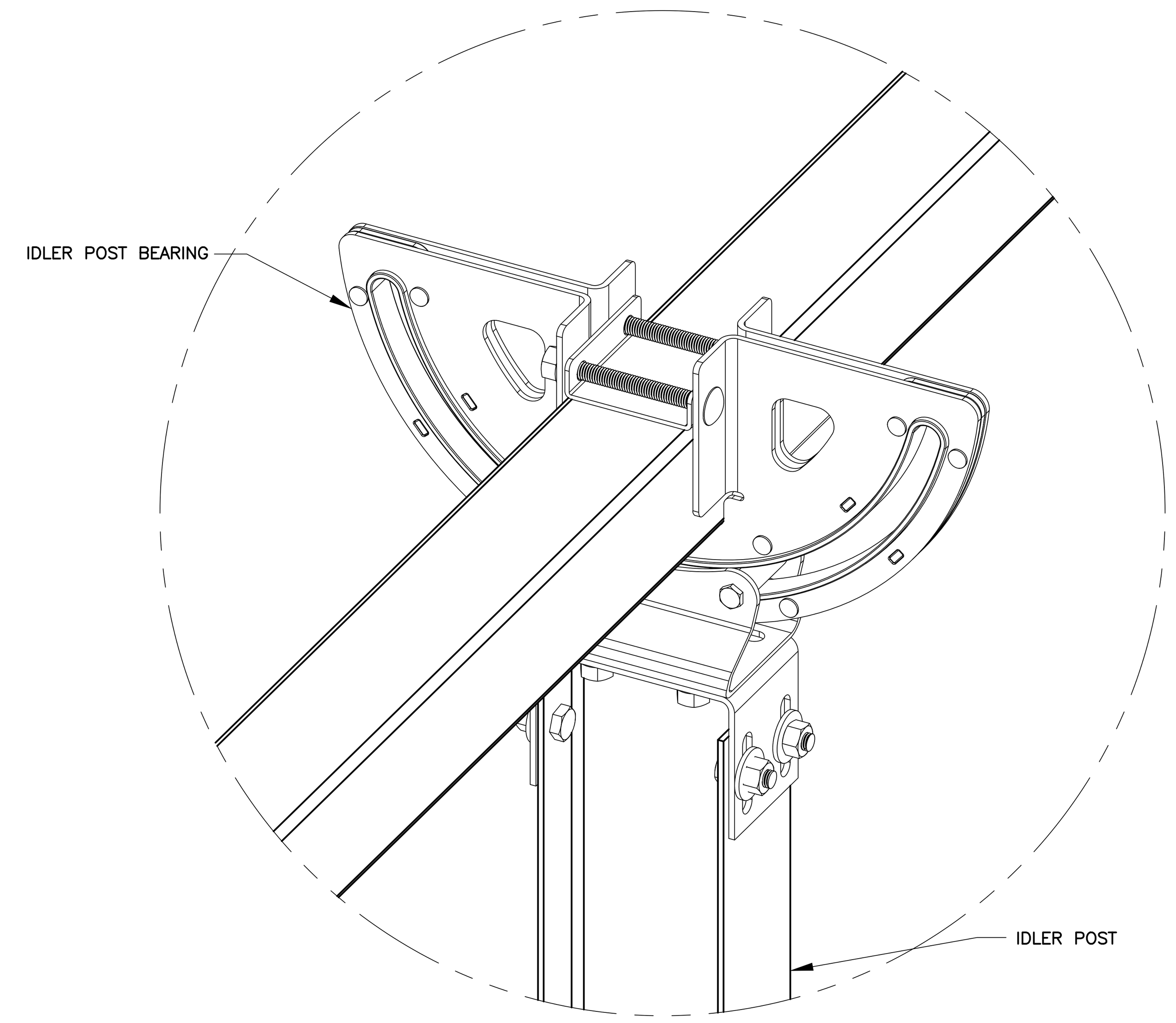
SHOULDER OF BOLT MUST EXTEND THROUGH BOTH FACES OF THE SECTOR CRADLE CHANNEL, SUCH THAT NO FORCE IS BEING EXERTED VERTICALLY ON THE THREADS.



3 / S6 SECTOR PLATE PRE-ASSEMBLY

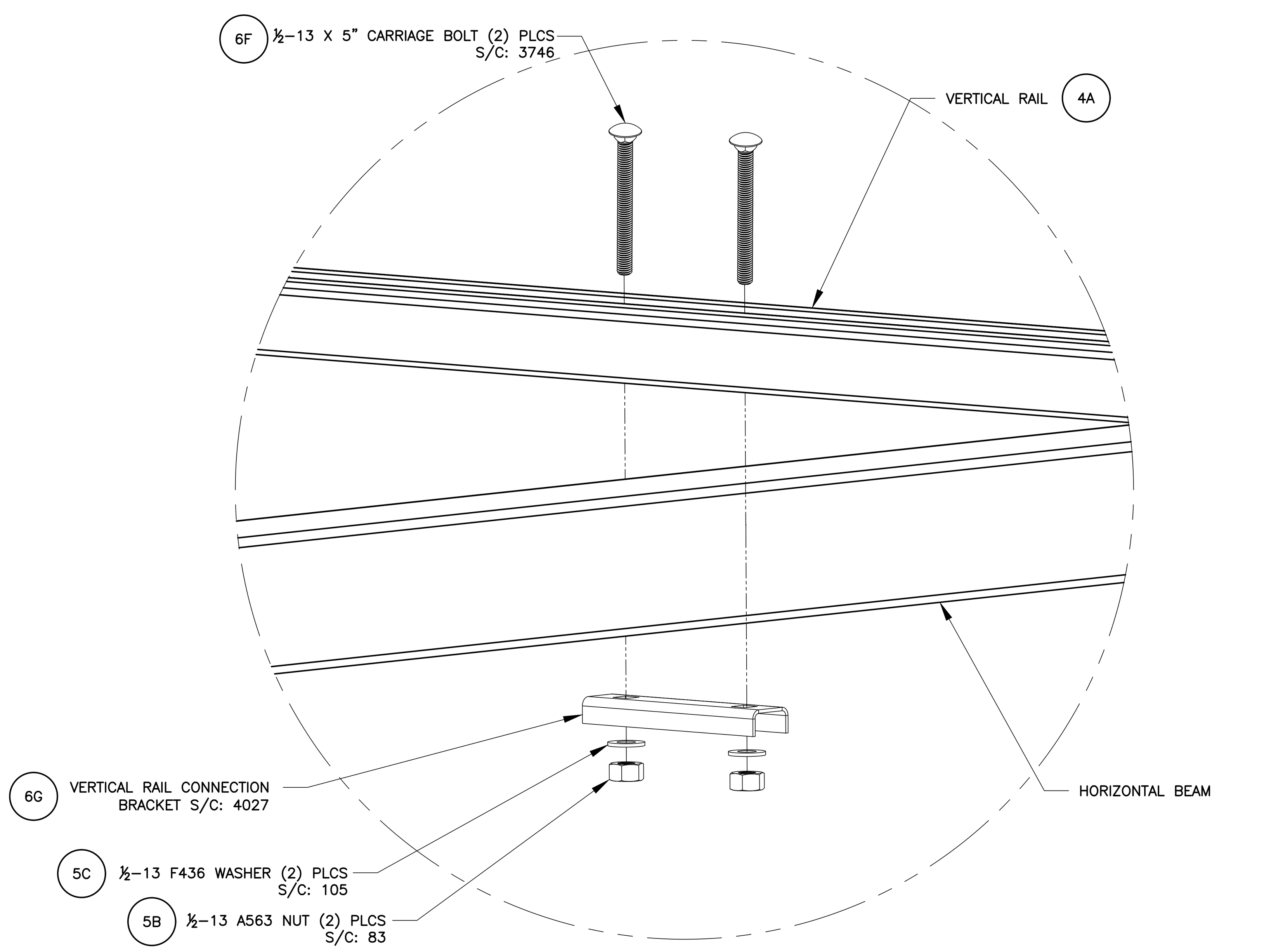
SCALE: 3" = 1'-0"

PRE-ASSEMBLY (S/C: 5857)



1 / S6 IDLER POST ISOMETRIC VIEW

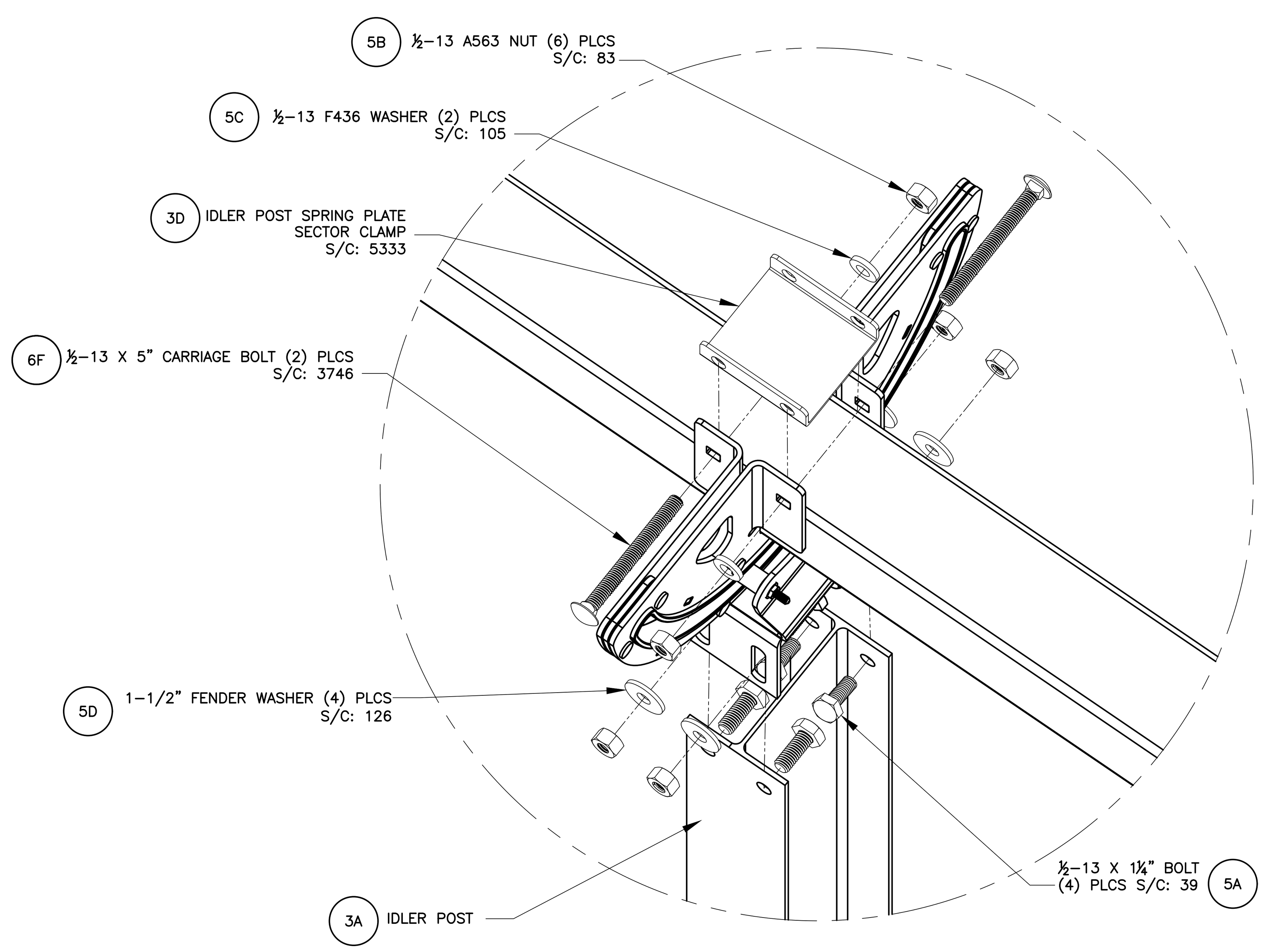
SCALE: NTS



6 / S6 VERT RAIL TO HORIZ BEAM EXPLODED

SCALE: NTS

TORQUE VALUE: 30-35 FT-LBS

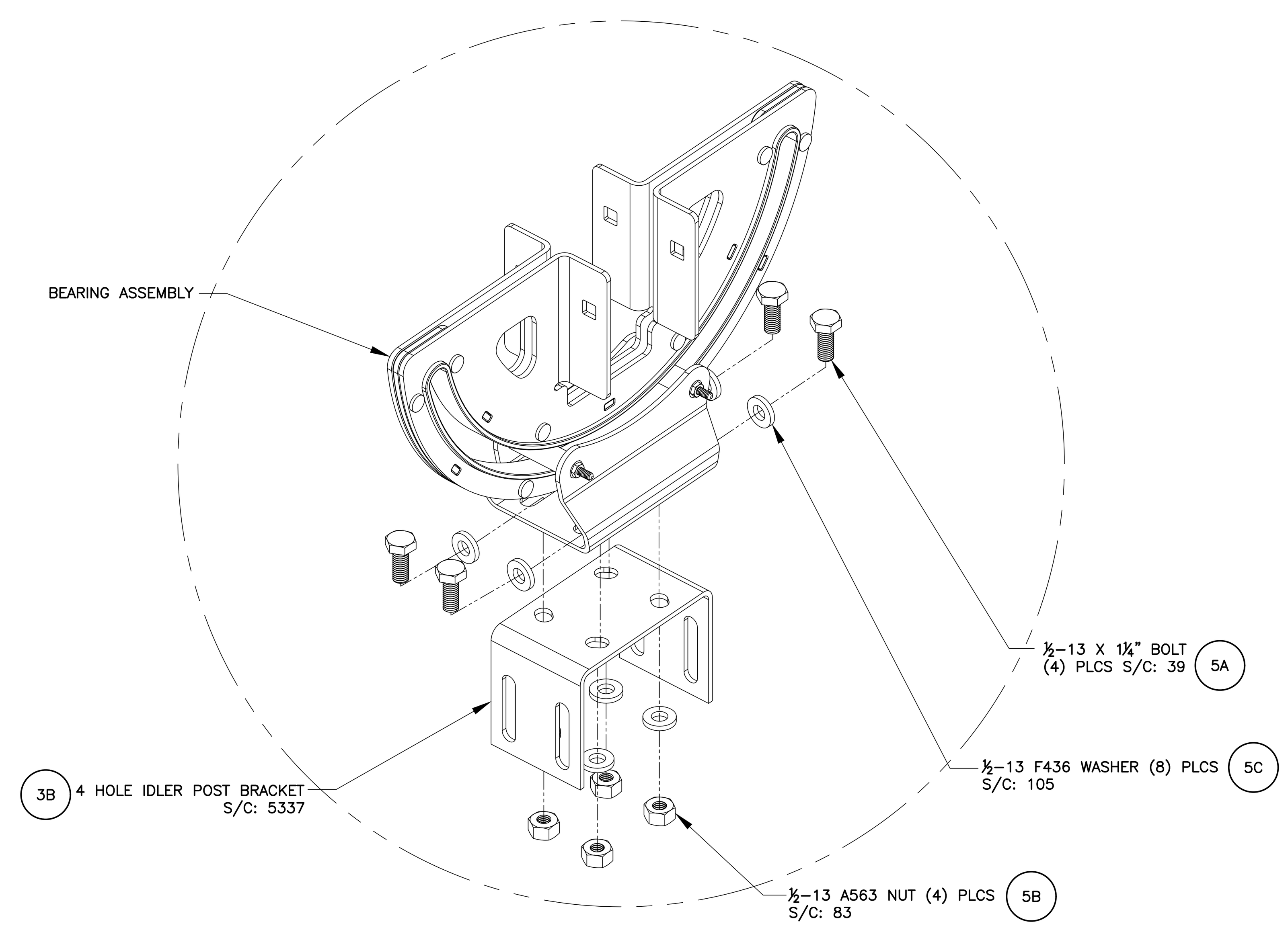


4 / S6 IDLER POST TO BEARING ASSEMBLY EXPLODED

SCALE: 3" = 1'-0"

*½-13 X 1¼" BOLTS CONNECTING POST BRACKET TO POST MUST BE FASTENED BY TURN OF THE NUT METHOD PER THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) (⅓ TURN PAST SNUG TIGHT)

*TIGHTEN ½-13 X 5" CARRAIGE BOLT HARDWARE TO 50-60 FT-LBS



2 / S6 IDLER BEARING ASSEMBLY EXPLODED

SCALE: 3" = 1'-0"

*½-13 X 1¼" BOLTS CONNECTING SECTOR CRADLE CHANNEL TO IDLER POST BRACKET MUST BE TIGHTENED TO TORQUE VALUE: 50-60 FT-LBS

COMPANY NAME
PROJECT NAME
CITY, STATE ZIP

CUSTOMER:

DATE: XX/XX/XXXX | JOB #: XXXX | DRAWN BY: XX | CHECK BY: XX | PAGE: S6 of S7 | Sheet S6

IDLER POST & VERTICAL RAIL CONNECTION DETAILS

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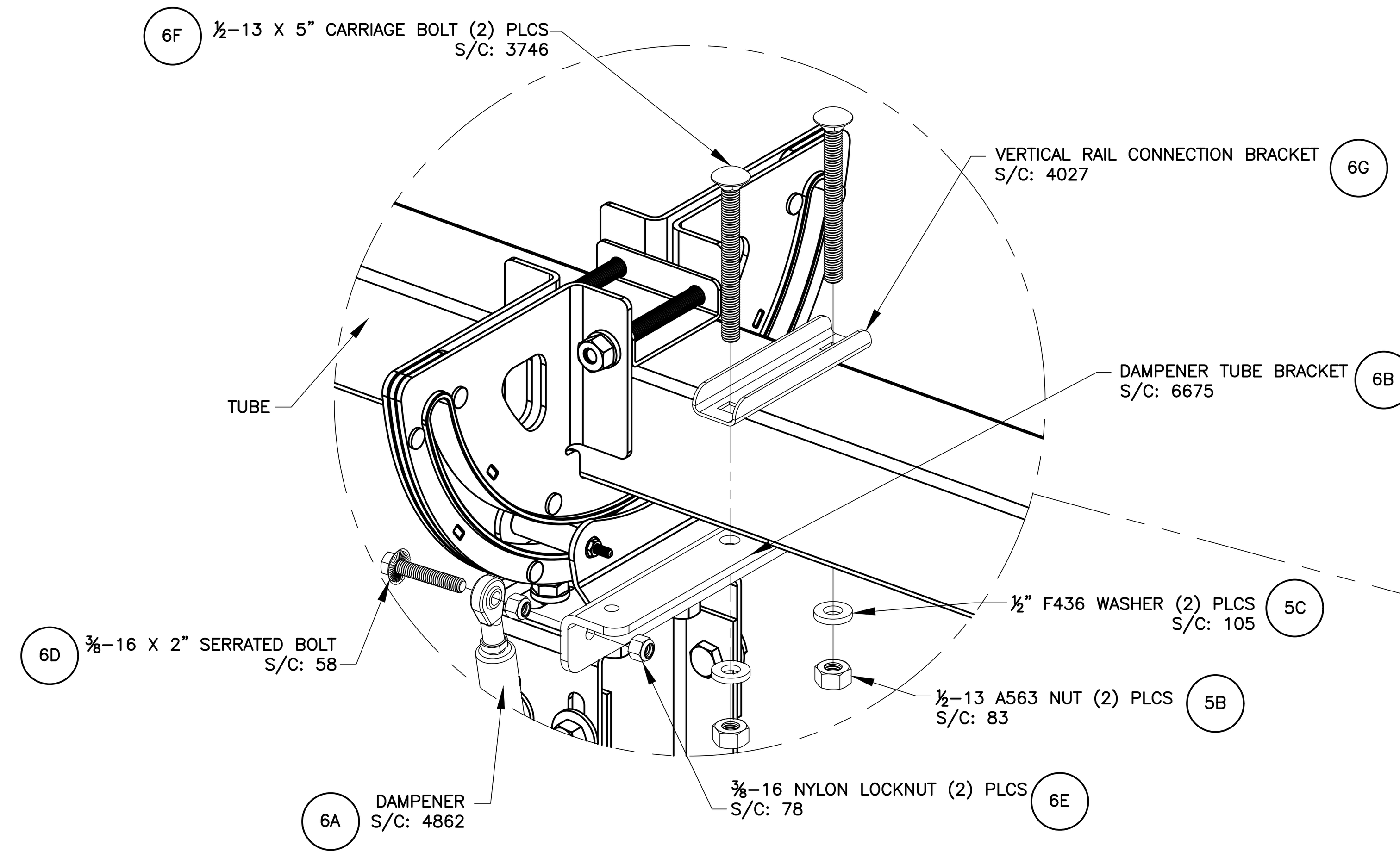
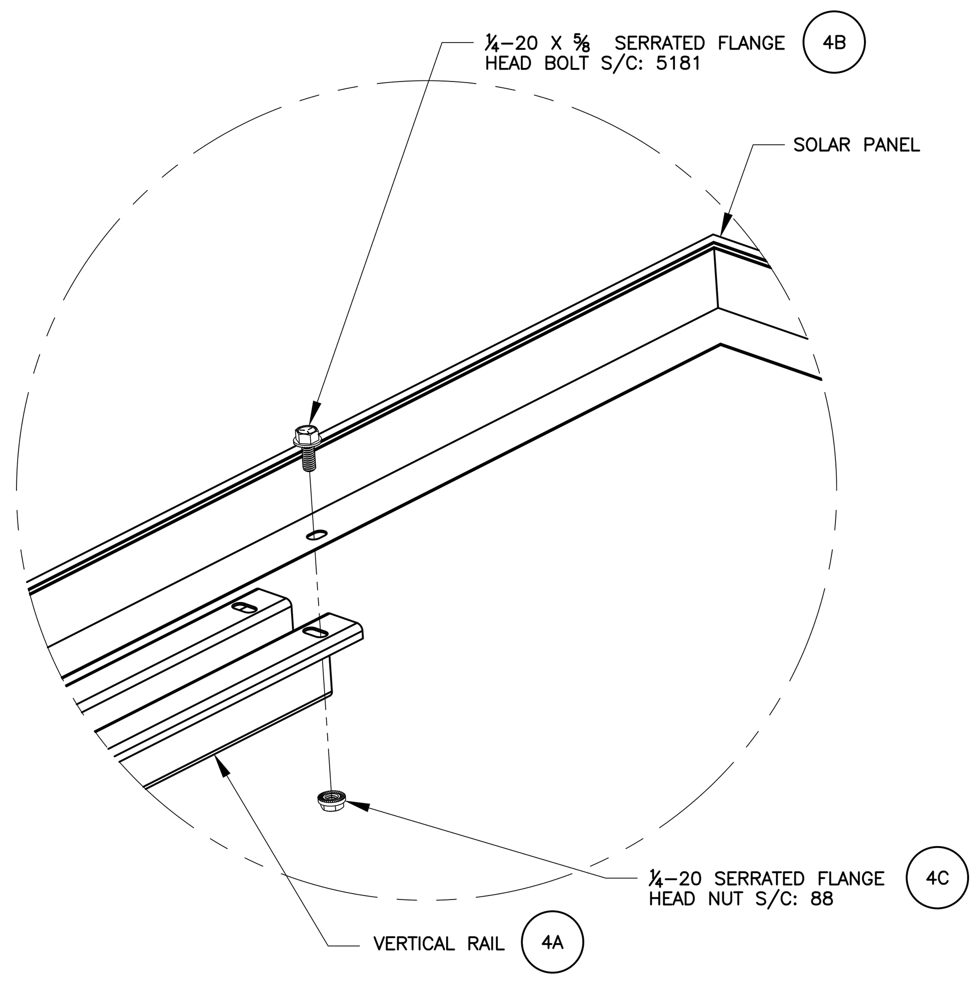
A Division of Northern States Metals
3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

REV	DESCRIPTION	CHG. BY	DATE



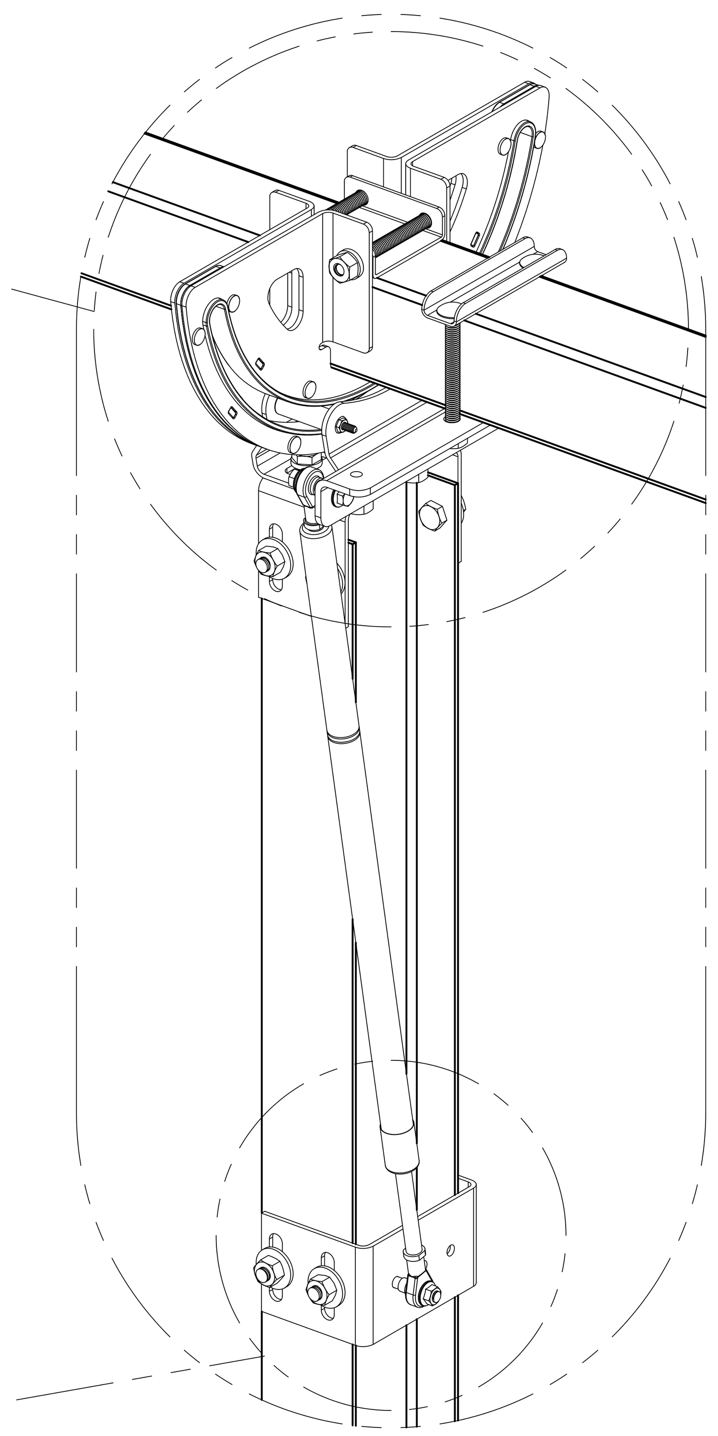
2/S7 DAMPENER CONNECTION TO TUBE EXPLODED

SCALE: 1-1/2" = 1'-0"



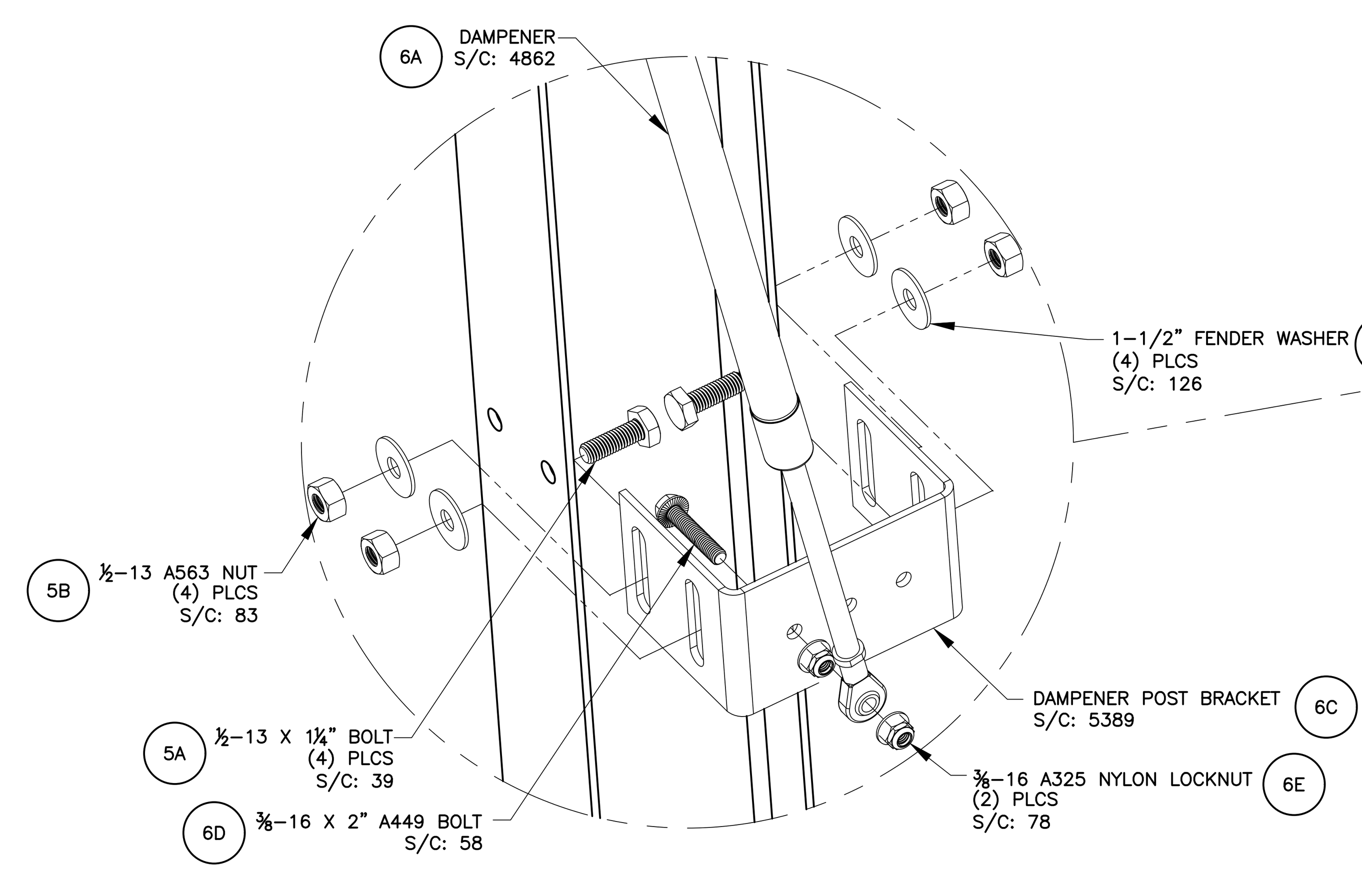
4/S7 SOLAR PANEL TO VERT RAIL CONNECTION EXPLODED

SCALE: 1-1/2" = 1'-0"
TORQUE VALUE: 8-14 FT-LBS



1/S7 DAMPENER CONNECTION ISOMETRIC VIEW

SCALE: NTS



3/S7 DAMPENER CONNECTION TO POST EXPLODED

SCALE: 1-1/2" = 1'-0"
*½-13 X 1¼" BOLTS CONNECTING POST BRACKET TO POST MUST BE FASTENED BY TURN OF THE NUT METHOD PER THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) (⅓ TURN PAST SNUG TIGHT)

TORQUE VALUE:
-10-12 FT-LBS FOR ⅜-16 HARDWARE

FIRST ⅜"-16 NYLON LOCK NUT MUST BE TIGHTENED TO SNUG TIGHT PRIOR TO THE INSTALLATION OF THE DAMPENER IN THE POST BRACKET.

COMPANY NAME
PROJECT NAME
CITY, STATE ZIP

CUSTOMER:	DATE: XX/XX/XXXX	JOB #: XXXX
	DRAWN BY: XX	CHECK BY: XX
	PAGE: S7 of S7	Sheet S7

DAMPENER & PANEL CONNECTION DETAILS

SOLAR FLEXRACK
A Division of Northern States Metals

3207 Innovation Place
Youngstown, OH 44509-4023
Phone (888) 380-8138

REV	DESCRIPTION	CHG. BY	DATE

Test Name: Solar FlexRack Noise Study
Part Number: TD127SF-59956
Report Issued: February 4, 2021

	Name	Date
Product Development Engineer	**Andrew Grossman**	2-04-2021
Engineering Manager	**Jim Gerds**	2-04-2021
Engineering Director	**Tim Puckett**	2-04-2021

Cone Drive Operations, Inc.
240 E. 12th Street
Traverse City, MI 49685
Ph: 231-946-8410

Test Purpose

Cone Drive was asked to evaluate the noise of the Solar FlexRack (SFR) Slewing Drive under normal operating conditions.

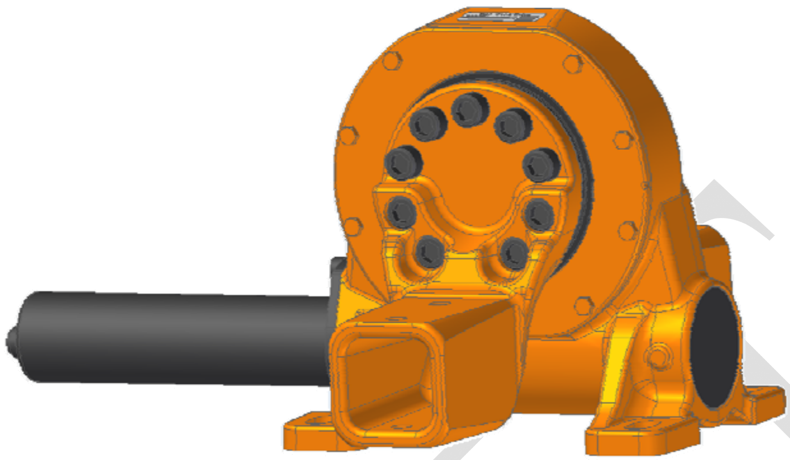


Figure 1. TD127SF-59956

Conclusions

The SFR Slew Drive, part number TD127SF-59956, was measured to have sound levels equivalent to Urban Residence, and less than a Conversation from 3 feet away.

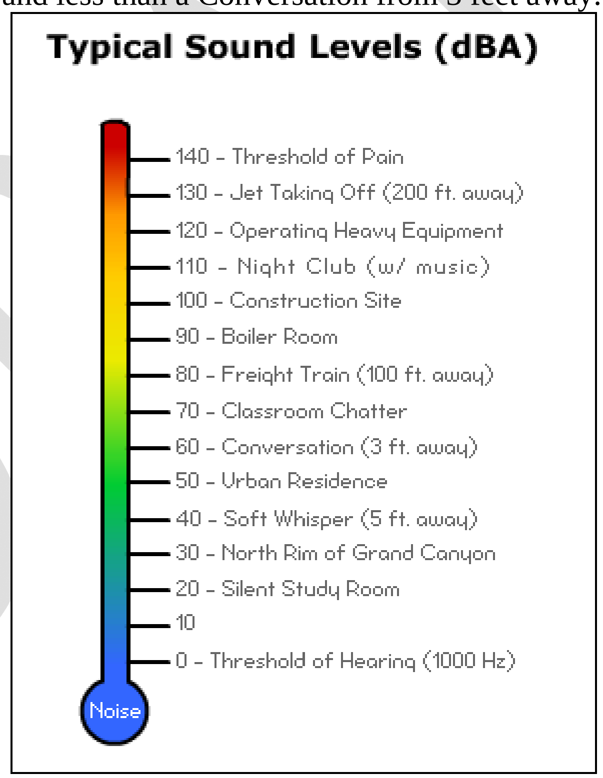


Figure 2. OSHA Sound Level Guide https://www.osha.gov/noise

Test Overview

The SFR Slew Drive was placed in 2 various setups in order to determine the noise levels. In each setup, the unit was tested at an output speed 0.067 RPM. The first test was performed in the Dyno Lab, in order to get a baseline. Note the first test did not involve the production gearmotor. The second test was performed in the Dyno Control Room, in order to achieve better sound resolution. Note this test did use the production gearmotor.

Test Setups

The dynamic test was setup with the following features (images in Appendix A & B).

- Lab Setup
  - Servo motor
  - Reducer
  - Input torque meter
  - Test unit bolted to test fixture
  - Sound meter

- Control Room Setup
  - Gearmotor
  - Power supply
  - Test unit
  - Sound meter

In each setup, the sound meter was placed 1 meter away from the unit, on a 45° angle between the input and output, at the centerline of the gear mesh.

Test Results

The unit as-built, without production gearmotor, when tested in the lab produced the following sound levels

Sound Level (dBA)	Condition	Notes
44.5	Servo-drive disabled	Ambient sound level
45.5	Servo-drive enabled, but not running	Ambient sound level
50.4	Servo-drive enabled, running, but not connected to test unit	Servo sound level
50.2	Servo-drive enabled, running, connected to test unit	Operational sound level

Note, while listening to the operation during various setups, the meter was unable to discern any operational noise from the test unit versus ambient noise.

The unit as-built, with production gearmotor, when tested in the lab control room produced the following sound levels

Sound Level (dBA)	Condition	Notes
NA* (below 40dBA)	Gearmotor disabled	Ambient sound level
52.5	Gearmotor enabled, running, but not connected to test unit	Gearmotor sound level
51.4	Gearmotor enabled, running CW, connected to test unit	Operational sound level
50.4	Gearmotor enabled, running CCW, connected to test unit	Operational sound level

*Note, the meter cannot read sounds levels below 40 dBA.

Appendix A: Lab Setup

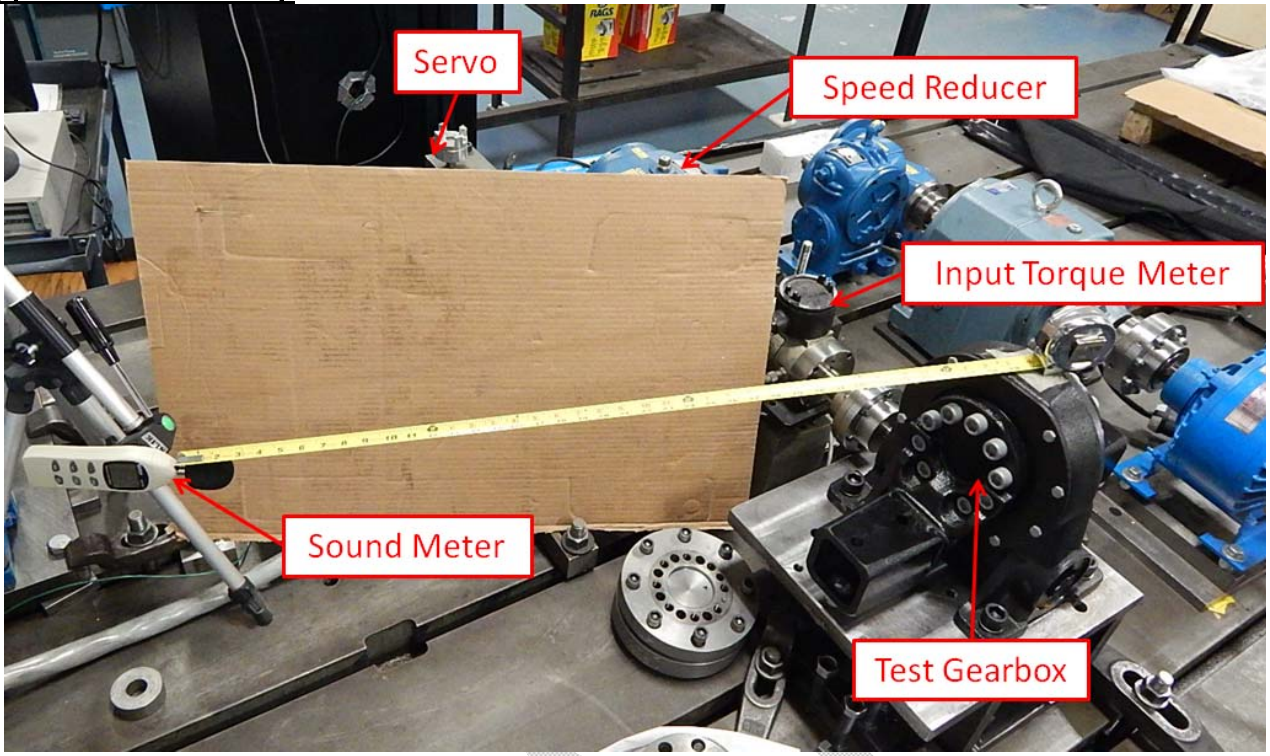


Figure 3. Dynamic Test Setup in Dyno Lab

Appendix B: Control Room Setup

Figure 4. Dynamic Test Setup in Control Room

ATTACHMENT D

ELECTRICAL DESIGN

FOR UTILITY SUBMISSION
NOT FOR CONSTRUCTION

1 SITE PLAN
SCALE: NTS

N

PV System Description	
DC System Size	2,342.52 kW DC
AC System Size	1,875.00 kW AC
Modules	(4,338) HELIENE 144HC M10 540W
Inverters	(15) CPS 125KTL-DO/US-600
DC/AC Ratio	1.25

CTEC SOLAR

1 GRIFFIN RD S #200
BLOOMFIELD, CT 06002
PHONE: (860) 580-7171
FAX: (860) 580-7915
WWW.CTECSOLAR.COM

HEBERT-SCHENECTADY SOLAR
10516 WESTERN TURNPIKE
DELANSON, NY 12053

PROJECT NAME: HEBERT-SCHENECTADY SOLAR

REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1.0	10/16/2023	ISSUED FOR TOWN SUBMISSION	CR	N/A

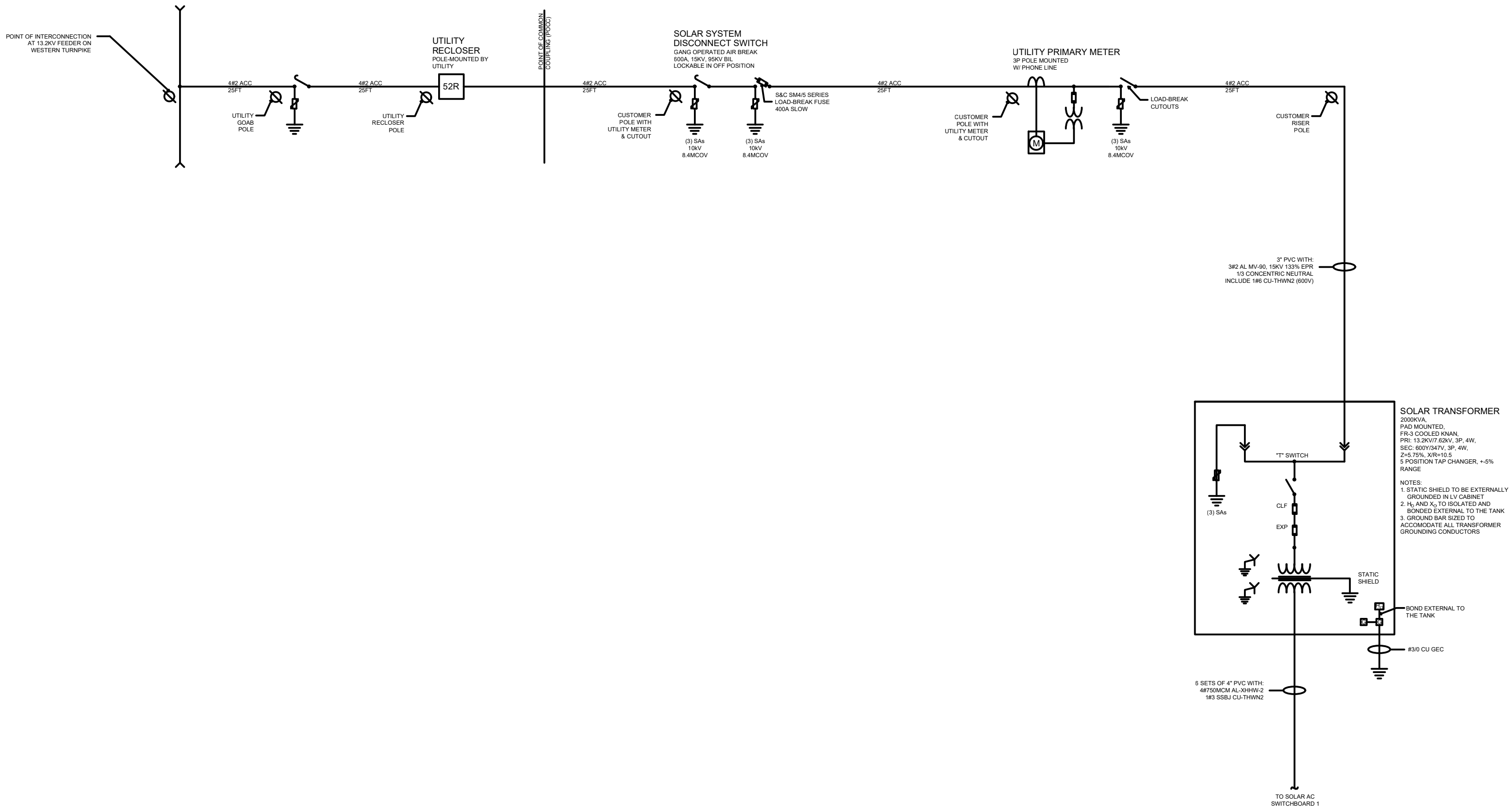
DRAWING NOT TO SCALE

G-1.0
SITE PLAN

NOT ISSUED FOR CONSTRUCTION

SHEET NOTES:

1. CONTRACTOR SHALL FIELD-VERIFY INTERCONNECTION MEANS/METHODS PRIOR TO INSTALLATION. COORDINATED SHUTDOWN MAY BE REQUIRED.
2. PROVIDE TORQUE MARKS INSIDE INVERTERS
3. SET ELECTRONIC-TRIP BREAKERS TO THE SETTINGS BELOW, UNLESS OTHERWISE NOTED IN POWER STUDY. "NOMINAL TRIP" REFERS TO BREAKER TRIP RATING INDICATED ON ONE-LINE. SETTINGS BELOW ARE NOT FOR COORDINATION PURPOSES.
   - L = 100% OF NOMINAL TRIP (EXACT)\ MINIMUM TIME DELAY
   - S = 125% OF NOMINAL TRIP (OR NEXT HIGHER) MINIMUM TIME DELAY
   - I = 150% OF NOMINAL TRIP (OR NEXT HIGHER)
   - G = 20% OF NOMINAL TRIP (OR NEXT HIGHER) 0.5 SEC TIME DELAY



1 ELECTRICAL SINGLE LINE DIAGRAM

FOR UTILITY SUBMISSION
NOT FOR CONSTRUCTION

PV System Description	
DC System Size	2,342.52 kW DC
AC System Size	1,875.00 kW AC
Modules	(4,338) HELIENE 144HC M10 540W
Inverters	(15) CPS 125KTL-DO/US-600
DC/AC Ratio	1.25

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10516 WESTERN TURNPIKE
DELANSON, NY 12053

PROJECT NAME: HEBERT-SCHENECTADY SOLAR

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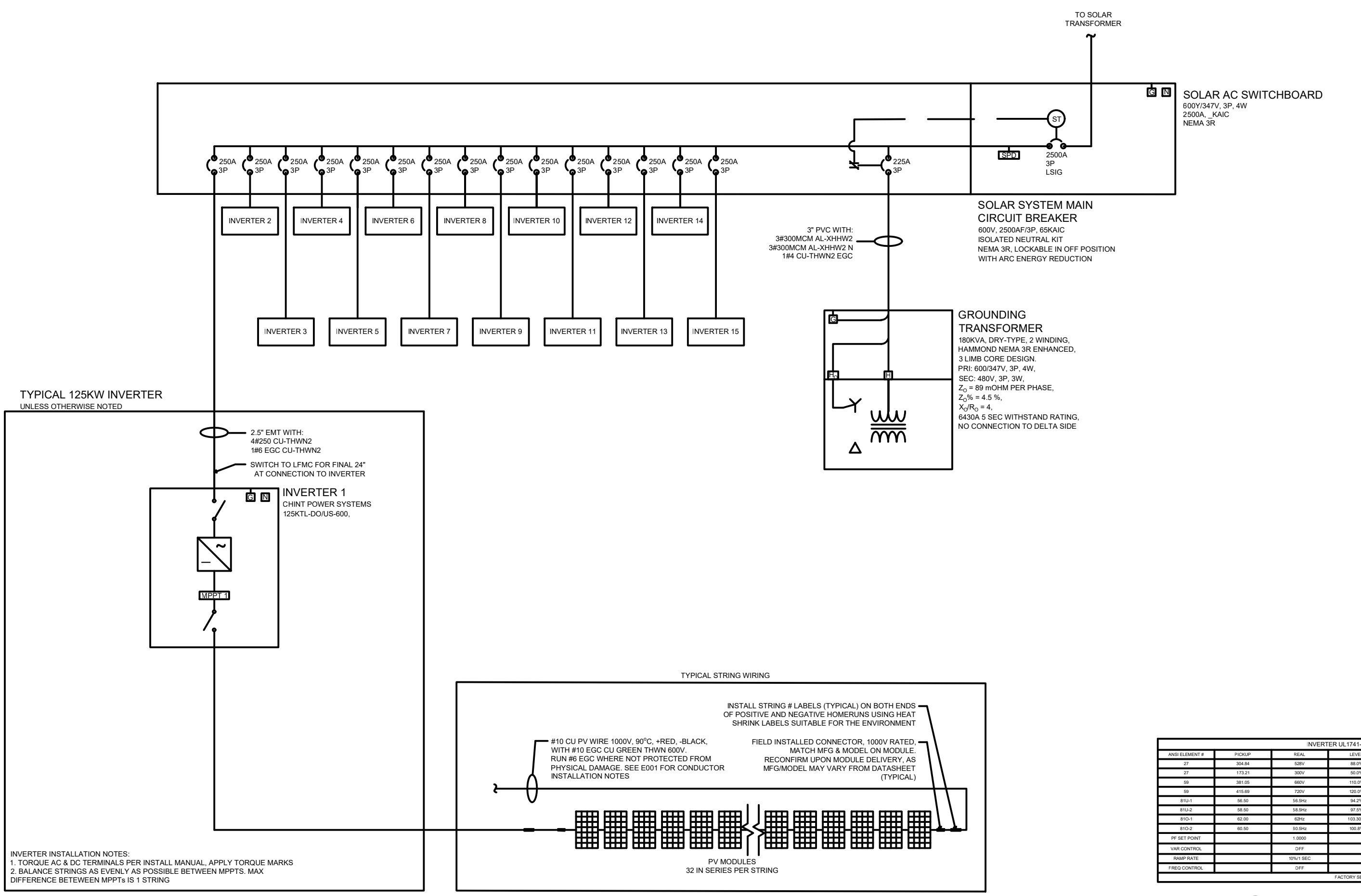
DRAWING NOT TO SCALE

E-1.0
AC 1-LINE

NOT ISSUED FOR CONSTRUCTION

FOR UTILITY SUBMISSION
NOT FOR CONSTRUCTION



1 ELECTRICAL SINGLE LINE DIAGRAM

INVERTER UL1741-SA COMPLIANT						
ANSI ELEMENT #	PICKUP	REAL	LEVEL	DELAY (SEC)	CURVE	DESCRIPTION
27	304.84	528V	88.0%	2.00		SLOW UV
27	173.21	300V	50.0%	1.10		FAST UV
59	381.05	660V	110.0%	2.10		SLOW OV
59	415.69	720V	120.0%	0.16		FAST OV
81U-1	56.50	56.5Hz	94.2%	0.16		FAST UF
81U-2	58.50	58.5Hz	97.5%	300.00		SLOW UF
81O-1	62.00	62Hz	103.30%	0.16		FAST OF
81O-2	60.50	60.5Hz	100.8%	300.00		SLOW OF
PF SET POINT		1.0000				POWER FACTOR CONTROL
VAR CONTROL		OFF				REACTIVE POWER CONTROL
RAMP RATE		10%/1 SEC				dkw / dt
FREQ CONTROL		OFF				SPEED CONTROL
FACTORY SETTINGS						

2 INVERTER SETTINGS

PV System Description	
DC System Size	2,342.52 kW DC
AC System Size	1,875.00 kW AC
Modules	(4,338) HELIENE 144HC M10 540W
Inverters	(15) CPS 125KTL-DO/US-600
DC/AC Ratio	1.25

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BLOOMFIELD, CT 06002
PHONE: (860) 580-7171
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WWW.CTECSOLAR.COM

HEBERT-SCHENECTADY SOLAR
10516 WESTERN TURNPIKE
DELANSON, NY 12053

PROJECT NAME: HEBERT-SCHENECTADY SOLAR

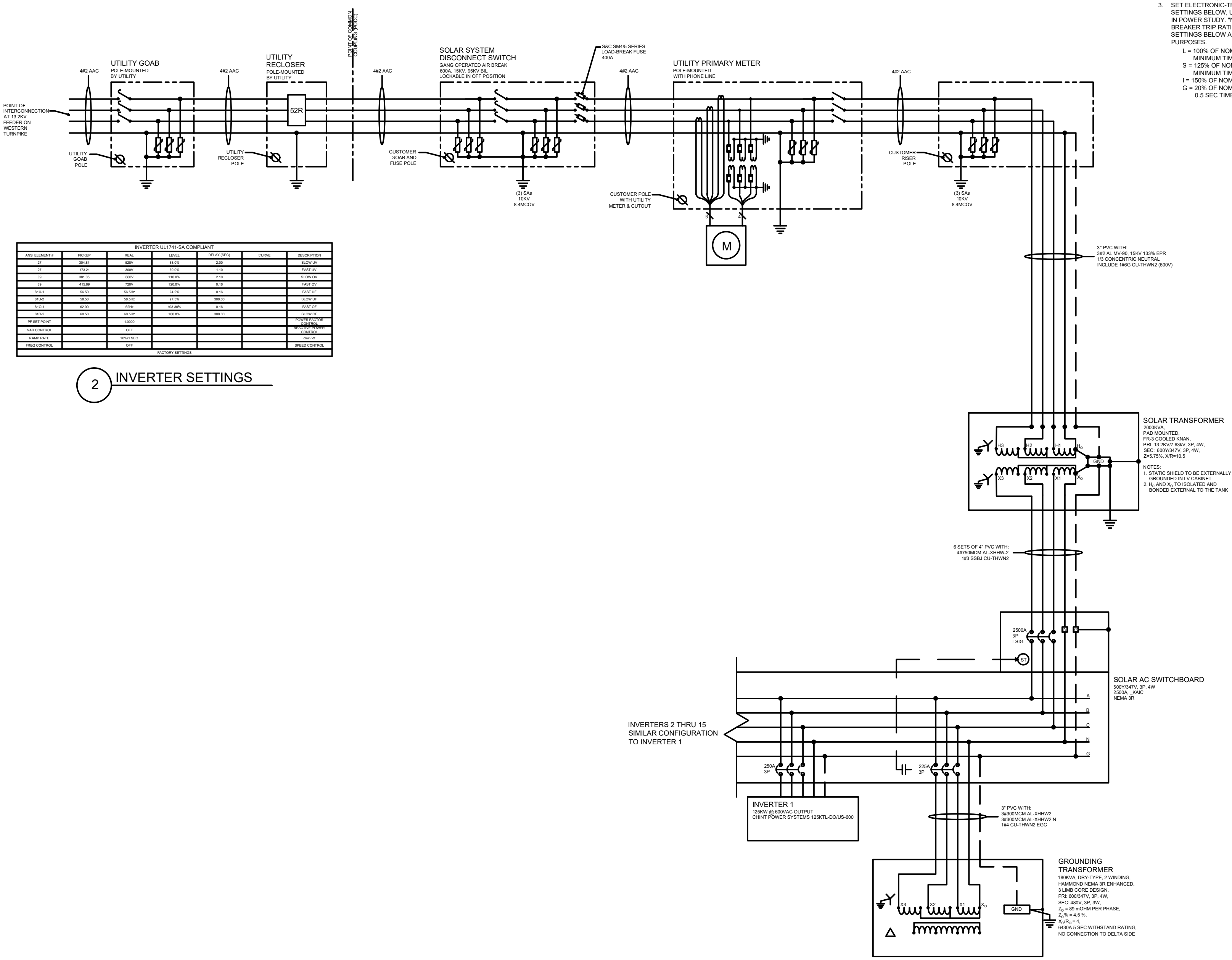
REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1.0	10/16/2023	ISSUED FOR TOWN SUBMISSION	CR	N/A

DRAWING NOT TO SCALE

E-1.1
AC 1-LINE

NOT ISSUED FOR CONSTRUCTION

SHEET NOTES:
1. CONTRACTOR SHALL FIELD-VERIFY INTERCONNECTION MEANS/METHODS PRIOR TO INSTALLATION. COORDINATED SHUTDOWN MAY BE REQUIRED.
2. PROVIDE TORQUE MARKS INSIDE INVERTERS
3. SET ELECTRONIC-TRIP BREAKERS TO THE SETTINGS BELOW, UNLESS OTHERWISE NOTED IN POWER STUDY. "NOMINAL TRIP" REFERS TO BREAKER TRIP RATING INDICATED ON ONE-LINE. SETTINGS BELOW ARE NOT FOR COORDINATION PURPOSES.
   - L = 100% OF NOMINAL TRIP (EXACT)\ MINIMUM TIME DELAY
   - S = 125% OF NOMINAL TRIP (OR NEXT HIGHER) MINIMUM TIME DELAY
   - I = 150% OF NOMINAL TRIP (OR NEXT HIGHER)
   - G = 20% OF NOMINAL TRIP (OR NEXT HIGHER) 0.5 SEC TIME DELAY



INVERTER UL1741-SA COMPLIANT						
ANSI ELEMENT #	PICKUP	REAL	LEVEL	DELAY (SEC)	CURVE	DESCRIPTION
27	304.84	528V	88.0%	2.00		SLOW UV
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59	381.05	660V	110.0%	2.10		SLOW OV
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81O-1	62.00	62Hz	103.30%	0.16		FAST OF
81O-2	60.50	60.5Hz	100.8%	300.00		SLOW OF
PF SET POINT		1.0000				POWER FACTOR CONTROL
VAR CONTROL		OFF				REACTIVE POWER CONTROL
RAMP RATE		10%/1 SEC				dkw / dt
FREQ CONTROL		OFF				SPEED CONTROL
FACTORY SETTINGS						

2 INVERTER SETTINGS

1 ELECTRICAL THREE LINE DIAGRAM

FOR UTILITY SUBMISSION
NOT FOR CONSTRUCTION

PV System Description	
DC System Size	2,342.52 kW DC
AC System Size	1,875.00 kW AC
Modules	(4,338) HELIENE 144HC M10 540W
Inverters	(15) CPS 125KTL-DO/US-600
DC/AC Ratio	1.25

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WWW.CTECSOLAR.COM

HEBERT-SCHENECTADY SOLAR
10516 WESTERN TURNPIKE
DELANSON, NY 12053

PROJECT NAME: HEBERT-SCHENECTADY SOLAR

REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1.0	10/16/2023	ISSUED FOR TOWN SUBMISSION	CR	N/A

DRAWING NOT TO SCALE

E-2.0
AC THREE LINE

NOT ISSUED FOR CONSTRUCTION

ATTACHMENT E

STORMWATER POLLUTION PREVENTION PLAN

Preliminary Stormwater Pollution Prevention Plan (SWPPP)

Mardon Community Solar Project
10516 Western Turnpike
Duanesburg, NY 12056

November 2023

PREPARED FOR:

CTEC Solar
1 Griffin Rd South, Suite 200
Bloomfield, CT 06002

PREPARED BY:

Tetra Tech, Inc.
3136 South Winton Road, Suite 303
Rochester, NY 14623

SWPPP AMENDMENT LOG

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared By [Name(s) and Title]

SIGNATORY REQUIREMENTS

The owner or operator has signed this document as acknowledgement that they have read and understand this SWPPP; and shall ensure that the provisions of this SWPPP are implemented as defined by the NYSDEC SPDES General Permit No. GP-0-20-001 and outlined herein.

____

Owner/Operator Signature Date

____

Owner/Operator Printed Name Title

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CWA	Clean Water Act
ECL	Environmental Conservation Law
FIRM	Flood Insurance Rate Map
NTS	Not to Scale
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OPRHP	Office of Parks, Recreation and Historic Preservation
PV	Photovoltaic
SCS	Soil Conservation Service
SHPA	State Historic Preservation Act
SMDM	Stormwater Management Design Manual (NYS)
SMP	Stormwater Management Practice
SPDES	State Pollutant Discharge Elimination System
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture

1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for CTEC SOLAR for proposed activities associated with construction of Mardon Solar Project (the Project) located east of the intersection of NY-30 and Western Turnpike in the Town of Duanesburg, Schenectady County, NY. The property on which the Project is located comprises approximately 84.4 acres of land. The Project will encompass an approximately 9.80-acre subset of that property (the Site).

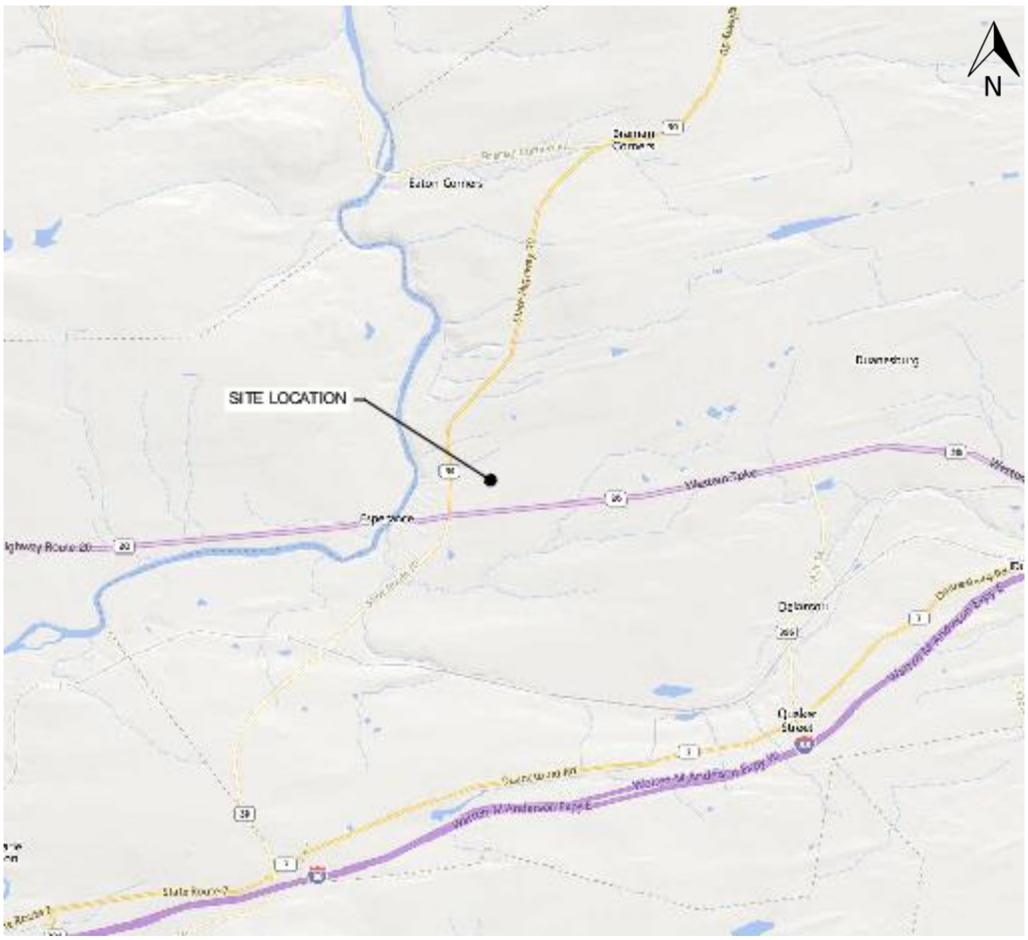

Figure 1 – Project Location and Surrounding Area

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. The New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) permit program is a NPDES-approved program with permits issued in accordance with the Environmental Conservation Law (ECL). The General Permit for Stormwater Discharges from Construction Activity, General Permit Number GP-0-20-001 (the Permit) is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL.

The Permit authorizes stormwater discharges to surface waters of the State from construction activities involving soil disturbances of one or more acres, provided all of the eligibility provisions of the Permit are met. Part III.C of the Permit states that construction activities identified in Table 1 of Appendix B (of the Permit) are required to prepare a SWPPP that only includes erosion and sediment control practices. Construction activities identified in Table 2 of Appendix B (of the Permit) are required to prepare a SWPPP that also includes post-construction stormwater management practices.

The Project involves construction of a ground-mounted solar photovoltaic (PV) array, a permanent pervious access road, and concrete equipment pads. Although the overall impervious area is relatively small and a majority of the site will consist of vegetative cover, the construction activities described above are identified in Table 2 of the Permit, and therefore post-construction stormwater management practices will be included in this SWPPP.

The area of soil disturbance considered for the project is 16.6 acres. This value assumes that the entirety of the project area will be disturbed from temporary construction activities such as land clearing/ grading, trenching and vehicle access corridors.

It is not expected that more than 5 acres of the Project area will be disturbed at one given time. **If more than 5 acres of the Project area will be disturbed at one given time, the following are required by the Owner and Contractor**:

- Obtain written authorization from the NYSDEC prior to construction.
- Conduct at least two site inspections in accordance with Part IV.C of the General Permit every seven calendar days, for as long as greater than five acres of soil remain disturbed. The two inspections shall be separated by a minimum of two full calendar days.
- Initiate soil stabilization measures by the end of the next business day in areas where soil disturbance has temporarily or permanently ceased and complete within seven days from the date the current soil disturbance activity ceased.
- Prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.
- Install additional site-specific practices needed to protect water quality.

Refer to Appendix B for a copy of the Permit.

2.0 SITE DESCRIPTION

2.1 PROPERTY

The Site, as previously noted, covers approximately 84.4 acres of a larger parcel located within Duanesburg, New York. The general area around the Site consists of residential lots, forested areas, and agricultural land. The Site is bounded by Western Turnpike to the south, residential lots to the west and east, and agricultural lots to the north. The Site is currently grass/ former agricultural area with a woodland to the north.

2.2 TOPOGRAPHY

The maximum elevation of the Site is approximately 984 feet above sea level. The Site slopes from east to west. A majority of site runoff flows toward Schoharie Creek tributaries to the north and south of the property. Survey data shows that slopes range from 1% to approximately 15% across the site.

2.3 SOILS

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey for Schenectady County was reviewed and provided surficial soil conditions for the Site. The SCS identified the presence of five (5) soil types within the Site. Figure 2 shows the soil map for the property.

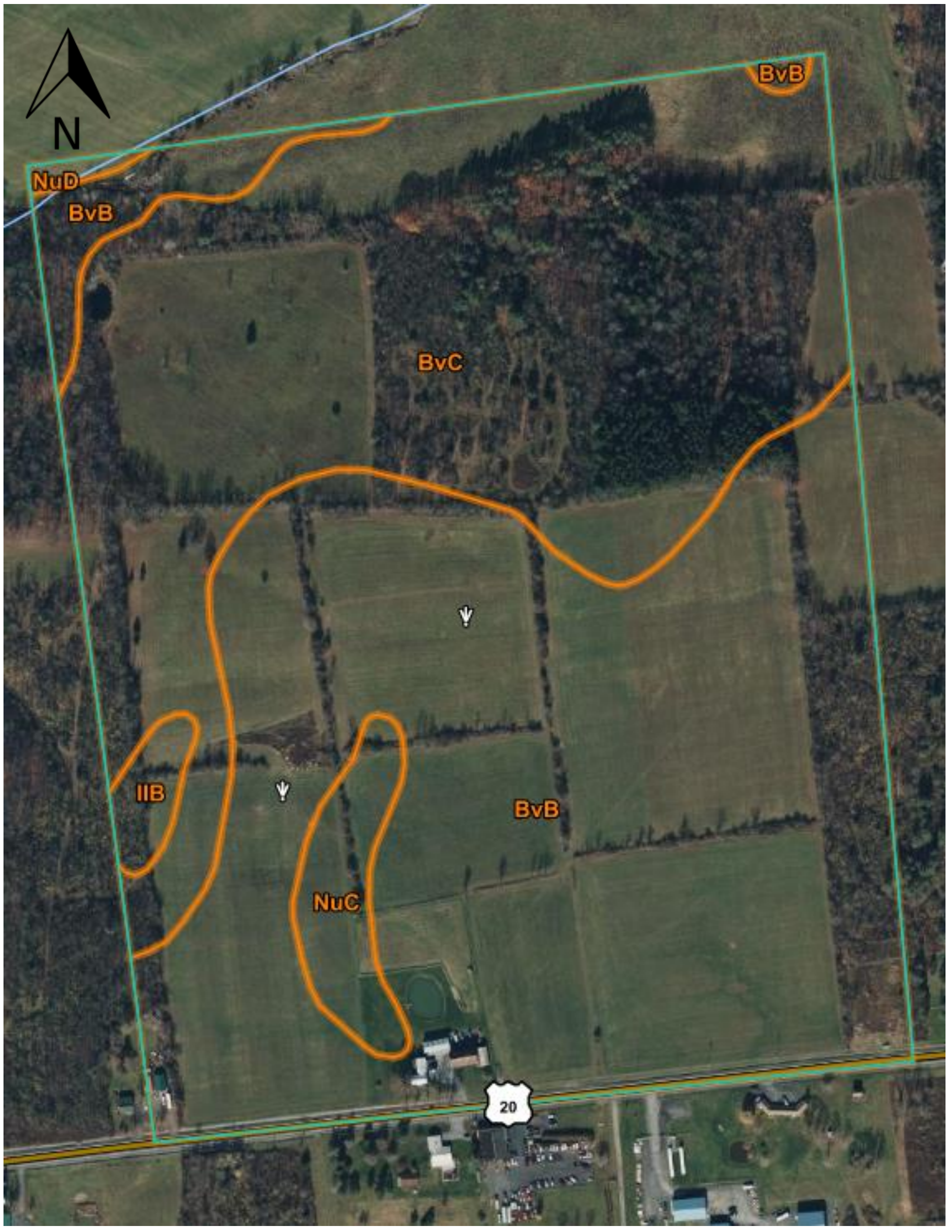

Figure 2 – Soil Map (NTS)

Soil data as provided by the SCS is presented in Table 1.

Table 1 – Soils Data

MAP SYMBOL/ DESCRIPTION	HYDROLOGIC SOIL GROUP	SLOPE (%)	SOIL PROFILE DEPTH (IN)	SOIL PROFILE USDA TEXTURE	K VALUE (Erodibility Factor)	DEPTH TO WATER TABLE (FT)
Burdett-Scriba channery silt loams (BvB)	C/D	3-8	0-9	channery silt loam	0.06-0.20	0.5-1.5
			9-16	channery silt loam		
			16-44	very gravelly silty clay loam		
			44-60	very gravelly silty clay loam		
Burdett-Scriba channery silt loams (BvC)	C/D	8-15	0-9	channery silt loam	0.06-0.20	0.5-1.5
			9-16	channery silt loam		
			16-44	very gravelly silty clay loam		
			44-60	very gravelly silty clay loam		
Ilion silt loam (IlB)	C/D	3-8	0-9	silt loam	0.06-0.20	0.0
			9-14	silty clay loam		
			14-39	channery silty clay loam		
			39-60	gravelly silt loam		
Nunda channery silt loam (NuC)	C/D	8-15	0-7	channery silt loam	0.06-0.20	1.25-2.0
			7-25	channery silt loam		
			25-42	gravelly silty clay loam		
			42-60	gravelly loam		
Nunda channery silt loam (NuD)	C/D	15-25	0-7	channery silt loam	0.06-0.20	1.25-2.0
			7-25	channery silt loam		
			25-42	gravelly silty clay loam		
			42-60	gravelly loam		

The SCS defines the hydrologic soil groups as follows:

Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a moderate rate of water transmission.

Type B Soils: Soils having a moderate infiltration rate when thoroughly wet and consists mainly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately course textures. These soils have a moderate rate of water transmission.

Type C Soils: Soils having a low infiltration rate when thoroughly wet. These soils consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine-to-fine texture. These soils have a low rate of water transmission.

Type D Soils: Soils having a very low infiltration rate and high runoff potential when thoroughly wet. These soils consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high-water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very low rate of water transmission.

The complete USDA Soil Survey (including the soil map to scale) for the Site can be found in Appendix E.

2.4 COVER CONDITIONS

The existing Site cover condition is grass/ agriculture. The Site cover condition post-construction is to be a permanent grassed vegetative cover in the array area, a pervious gravel access road, and concrete equipment pads. Disturbed areas will receive topsoil, as required, and seeding for final stabilization.

Runoff curve numbers for the various cover types and descriptions used in the stormwater evaluation for this project were obtained from Tables 2-2a-d of the *Urban Hydrology for Small Watersheds Technical Release 55* by the USDA. A summary of the typical curve numbers used in the modeling of solar projects are provided in Table 2.

Table 2 – Curve Numbers for Hydrologic Soil Group

Cover Type	A	B	C	D
Grass Cover > 75%, Good	39	61	74	80
Woods, Poor Condition	45	66	77	83
Paved parking lots, roofs, driveways, etc.	98	98	98	98
Meadow, Non grazed	30	58	71	78

2.5 WETLANDS

According to the Wetland Delineation Report performed by Tetra Tech dated August 2023, one manmade pond was identified within the project area potentially non-jurisdiction. An ephemeral stream was located just outside the project area and extends beyond the study limits of the project boundary. These types of ephemeral streams have flowing water during most times of the year, but during dry periods, these streams may not have flowing water. The locations of the pond can be found in the civil design plan set, Appendix A.

During construction, the natural hydrology, and drainage paths of the site should be preserved to the maximum extent practicable.

2.6 HISTORIC PRESERVATION

The NYSDEC and NYS Office of Parks, Recreation and Historic Preservation (OPRHP) developed a process for construction projects to identify and address potential impacts on archeological and historic resources. In an attached letter found in Appendix C dated June 1st, 2023 indicates that the project is not in an archaeologically sensitive location and is appropriately sited to minimize visual impacts to the National Register listed resources.

2.7 SURFACE WATERS & FLOOD PLAINS

Runoff from the Site flows over agricultural areas and infiltrates into surface soils. Runoff leaves the site in 1 main direction: west through the forested area; ultimately draining into the Schoharie Creek.

The Site is located within the Mohawk River Basin. This watershed is not listed within Appendix C of the Permit; as such, enhanced phosphorous removal standards are not required.

According to the Federal Emergency Management Agency (FEMA), the Mardon Solar Project, Duanesburg, NY, # 36093C0113D, effective 01/08/2014, the site is identified as Zone X, or Area of Minimal Flood Hazard. The FIRMette can be found in Appendix D.

2.8 RAINFALL DATA

In accordance with the *2016 New York State Standards and Specifications for Erosion and Sediment Control*, hydrologic data and rainfall distributions published by the Northeast Regional Climate Center (NRCC) on their website (http://precip.eas.cornell.edu/) are used in the stormwater hydrology calculations herein. The rainfall data for various 24-hour storm events anticipated at the Site is presented in Table 3.

Table 3 – Rainfall Data

Storm Event	24-Hour Rainfall
1-year	2.18–inches
2-year	2.51–inches
10-year	3.57–inches
100-year	5.94–inches

3.0 EROSION & SEDIMENT CONTROL

This section of the SWPPP and the associated construction drawings identify the temporary and permanent erosion and sediment control (ESC) measures that have been incorporated into the design of this Project. These measures will be implemented during construction to protect the waters of the State from sediment loads during runoff events.

The anticipated order of construction activities is outlined below along with the ESC measures to be implemented for each construction activity that will result in soil disturbance. The SWPPP and construction drawings provide a description of the temporary and permanent ESC measures including limitations on the duration of soil exposure, criteria and specifications for placement and installation of the ESC measures, and a maintenance schedule.

An emphasis was placed on the preservation of natural features, conserving existing drainage patterns and minimizing impervious surfaces, slowing down runoff, increasing infiltration, and utilizing green infrastructure techniques throughout the design process.

3.1 CONSTRUCTION SEQUENCE

The construction will begin with the initial site preparation, tree clearing, preliminary site grading, installation of access roadways, erection of arrays, electrical installation, and commissioning/startup.

The following is a typical sequence of operations and phasing plan describing the intended order of construction activities:

Initial Phase

1. Hold a pre-construction meeting on-site to be attended by the qualified inspector, the Town of Duanesburg Engineer, and any involved subcontractors to discuss responsibilities as they relate to the implementation of the SWPPP, identify the secure location where the SWPPP will be kept on the Site (must be accessible during normal business hours), and review appropriate measures to avoid and minimize impacts to protected species during remediation, demolition, and construction. If contractors and subcontractors have not already done so, the certification statements in Appendix L shall be signed at this time.

2. Delineate limits of work disturbance, proposed infrastructure areas for the Project, and resources to protect.

3. Install and stabilize temporary ESC measures (i.e., sediment control barrier, stabilized construction entrance). Minimal clearing may be required for this installation.

4. Perform over tree clearing in areas required for the following:

    a. Rough grading; and
    b. Placement of construction office trailer and parking areas, if applicable.

5. Install temporary infrastructure (e.g., construction office trailer, interim road, fence, security measures), if applicable.

6. Establish equipment staging (laydown area), topsoil stockpile, and concrete truck washout areas.

7. Identify post-construction stormwater management practice areas to be protected in order to preserve native soil permeability and water resource integrity.

Interim Phase

1. Perform grading, tree clearing/ grubbing for the remainder of the site per approved construction drawings.

2. Install permanent perimeter fencing.

3. Mount and install the supporting structure and racking system.

4. Install solar panels, string inverters and connections.

5. Construct equipment pads (transformer, central inverters, battery storage systems, etc.).

6. Install underground electric wiring and/or above ground cable management systems.

Final Phase

1. Install permanent ESC measures.

2. Install permanent access road and paved access road entrance (if required).

3. Begin fine grading operations (if applicable).

4. Install permanent post-construction stormwater management practices (if required)

5. Conduct soil restoration (as required).

6. Complete fine grading, landscaping, seeding and soil stabilization.

7. Remove sediment from temporary sediment traps and establish final grades and erosion control features for permanent detention ponds.

8. Remove temporary ESC measures.

9. Restore and stabilize any disturbed areas remaining upon removal of temporary ESC measures

If the disturbed area exceeds 5 acres at any given time, written acceptance of this plan from the Regional NYSDEC office must be received and attached.

3.2 TEMPORARY EROSION & SEDIMENT CONTROL MEASURES

Temporary erosion and sediment control measures that may be used as part of the construction drawings or during unanticipated field construction activities and described herein.

3.2.1 Stabilized Construction Entrance

During the initial phase, a stabilized construction entrance shall be installed, as shown on the construction drawings, to reduce the tracking of sediment onto public roadways.

Construction traffic must enter and exit the Site at the stabilized construction entrance. The intent is to trap dust and mud that would otherwise be carried off-Site by construction traffic.

The entrance shall be maintained in a condition that will control tracking of sediment onto the local roadway. When necessary, the placement of additional aggregate atop the filter fabric will be done to assure the minimum thickness is maintained. All sediments and soils spilled, dropped, or washed onto any public right-of-way must be removed immediately. Periodic inspection and needed maintenance shall be provided after each substantial rainfall event.

3.2.2 Dust Control

Water trucks may be used as needed during construction to reduce dust generated on the Site. Dust control must be provided by the Contractor to a degree that is acceptable to the Owner, and in compliance with the applicable local and state dust control requirements.

3.2.3 Material Storage & Equipment Staging Areas

Construction materials shall be stored in a dedicated staging area. The staging area shall be located in an area that minimizes the impacts of the construction materials affecting stormwater quality and protected by a temporary sediment control barrier.

Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the Site, treated and disposed at an approved solid waste or chemical disposal facility.

Material resulting from the clearing and grubbing operation shall be stockpiled up slope from adequate sedimentation controls or at an off-site location with appropriate protections for re-use during the restoration stage.

3.2.4 Concrete Wash Area

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the Site, but only in a specifically designated diked and impervious washout area which has been prepared to prevent contact between the concrete wash and stormwater. Waste generated from concrete wash water shall not be allowed to flow into drainage ways, inlets, receiving waters or highway right of ways, or any location other than the designated Concrete Wash Areas. Proper signage designating the “Concrete Wash Area” shall be implemented. The Concrete Wash Area shall be located at minimum 100 linear feet from drainage ways, inlets, and surface waters.

The hardened residue from the Concrete Wash Area shall be disposed of in the same manner as other non-hazardous construction waste materials. Maintenance of the wash area shall include removal of hardened concrete. The Facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 12 inches. The Facility shall not be filled beyond 95 percent capacity and shall be cleaned out once 75 percent full unless a new facility is constructed. The Contractor will be responsible for seeing that these procedures are followed.

Saw-cut Portland Cement Concrete (PCC) slurry shall not be allowed to enter storm drains or watercourses. Saw-cut residue should not be left on the surface of pavement or be allowed to flow over and off pavement.

All concrete washout areas shall be inspected daily and repaired or replaced as necessary. The Site shall be inspected daily to ensure that no concrete discharges are taking place in non-designated areas.

3.2.5 Sediment Control Barrier

Prior to the initiation of and during construction activities, a geotextile filter fabric (or silt fence) or compost filter sock will be established along the perimeter of areas to be disturbed as a result of the construction that lies upgradient of water courses or adjacent properties. These barriers may extend into non-impact areas to ensure adequate protection of adjacent lands.

Clearing and grubbing will be performed only as necessary for the installation of the sediment control barrier. To ensure effectiveness of the sediment control barrier, daily inspections and inspections immediately after significant storm events will be performed by Site personnel. Maintenance will be performed as needed.

3.2.6 Dewatering

Dewatering shall be used to intercept sediment-laden stormwater or pumped groundwater and allow it to settle out of the pumped discharge prior to being discharged from the Site. Water from dewatering operations shall be treated to eliminate the discharge of sediment and other pollutants. Water resulting from dewatering operations shall be directed to the temporary sediment traps, or dewatering devices, such as the Dandy Dewatering Bag, manufactured by Mirafi Geosynthetics or approved equivalent. Temporary sediment traps and dewatering bags shall be provided, installed and maintained at down-gradient locations to control sediment deposits to wetlands.

3.2.7 Temporary Soil Stockpile

Materials, such as topsoil or removed soil for special handling, shall be temporarily stockpiled (if necessary) on the Site during the grading and construction process. Stockpiles shall be located in an area away from storm drainage, water bodies and/or courses, and shall be properly protected from erosion by a surrounding sediment control barrier. Heights of stockpiles should generally not exceed 20 feet in height.

3.2.8 Preservation of Natural Areas

During the initial phase, limits of construction and resources to protect shall be identified in accordance with the construction drawings. Sturdy fences or other protective materials shall be placed around valuable vegetation for protection from construction equipment as noted by the construction drawings. Soil placement over existing tree and shrub roots shall be limited to a maximum of 3 inches.

3.2.9 Temporary Seeding

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.

3.2.10 Temporary Slope Protection

Erosion control blankets shall be installed on all slopes exceeding 3H:1V. Erosion control blankets provide temporary erosion protection, rapid vegetative establishment, and long-term erosion resistance to shear stresses associated with high runoff flow velocities associated with steep slopes.

3.2.11 Temporary Soil Stabilization

In areas where soil disturbance activity has temporarily ceased (i.e., an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance), the application of temporary soil stabilization measures shall 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.

Temporary soil stabilization can be achieved by covering exposed soil with mulch, seed and mulch, and/or erosion control mats (e.g., jute twisted yarn, excelsior wood fiber mats, etc.) to prevent the exposed soil from eroding until permanent soil stabilization has been implemented and achieved.

3.3 PERMANENT EROSION & SEDIMENT CONTROL MEASURES

Permanent erosion and sediment control measures are included as part of the construction drawings provided in Appendix A and described herein.

3.3.1 Permanent Soil Stabilization

Disturbed areas that will be vegetated must be seeded in accordance with the construction drawings. The type of seed, mulch, and maintenance measures are also defined in the construction drawings.

All areas at final grade must be seeded and mulched within 7 days after completion of the major construction activity. All seeded areas should be protected with mulch.

Final Site stabilization is achieved when all soil-disturbing activities at the Site have been completed and a uniform, perennial vegetative cover with a density of 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.

3.3.2 Rock Outlet Protection

Outlet protection will be utilized as necessary using rock riprap at culvert outlets and new channels constructed as outlets for culverts and conduits. Permanent sections of rock protection at outlets reduce the depth, velocity, and energy of the water in order to prevent the flow from eroding downstream soils.

3.3.3 Gravel Diaphragms

Gravel Diaphragms are proposed within the array area to reduce erosive flows on slopes. These trenches backfilled with gravel ensure sheet flow is maintained beneath the arrays during high intensity rain events. These features are spaced approximately 100 feet apart and installed along the contour.

Establish the diaphragms along with the other temporary erosion and sediment control practices prior to the start of construction. Prevent damage to these practices by mitigation travel across the diaphragms during construction. Provide sediment barriers if the contributing areas is not properly stabilized. Inspection should be conducted daily to note any deformation in the trench and identify areas where more gravel is required.

3.3.4 Stone Check Dams

Stone check dams shall be installed within drainage ditches to reduce the velocity of stormwater runoff, to promote settling of sediment, and to reduce sediment transport offsite.

The stone check dams shall be inspected after each runoff event. Damage shall be repaired upon discovery. If significant erosion has occurred between structures, a liner of stone or other suitable material shall be installed in that portion of the channel.

Sediment accumulated behind the stone check dam shall be removed as needed to allow the channel to drain through the stone check dam and prevent large flows from carrying sediment over or around the dam. Stones shall be replaced as needed to maintain the design cross section of the structures.

3.3.5 Soil Restoration

The structure of healthy soil is permeable, with spaces between solid particles where water, air, and soil organisms can move. Soil compaction occurs when weight on the soil surface collapses these spaces, creating a hard, solid mass. Water, air, and roots may be completely unable to penetrate compacted soil, reducing or destroying its capacity to sustain life. Soil restoration promotes greater stormwater infiltration in areas with pervious cover and, therefore, helps to reduce runoff volume.

In the area of the proposed pervious road, ensure the soil is restored and de-compacted to predevelopment conditions to ensure proper functionality. Failure to do so may result in washouts or ponded water.

Soil restoration is achieved by aeration through mechanical loosening, and addition of organic matter and soil amendments. In areas where significant soil disturbance has occurred outside of buildings and pavement areas, the disturbed sub-soils shall be returned to rough grade and soils restoration steps applied, in accordance with Table 4.6, Soil Restoration Requirements of the NYS Standards and Specifications for Erosion and Sediment Control dated July 2016 and amended in November 2016 and Section 5.1.6, Soil Restoration of the NYS Stormwater Management Design Manual, dated May 2022.

Table 4 provides the soil restoration requirements for various types of soil disturbance. Grading and soil restoration requirements shall be in accordance with the construction drawings.

Table 4 – Soil Restoration Requirements

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No Soil Disturbance	Restoration not permitted.		Preservation of natural features.
Minimal Soil Disturbance	Restoration not required.		Clearing and grubbing.
Areas where topsoil is stripped only – no change in grade	HSG A & B	HSG C & D	Protect areas from any ongoing construction activities.
	Apply 6 inches of topsoil	Aerate* and apply 6 inches of	

		topsoil	
Areas of cut or fill	HSG A & B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full soil restoration**	
Heavy traffic areas on site (especially within 5-25 feet of buildings but not within a 5-foot perimeter around foundation walls)	Apply full soil restoration (de-compaction and compost enhancement)		
Areas where runoff reduction and/or infiltration practices are applied	Restoration not required but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment away from crossing these areas.

***** Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.
** Per "Deep Ripping and De-compaction, DEC 2008"

4.0 STORMWATER MANAGEMENT DESIGN

The design described herein is in conformance with the sizing criteria outlined in the Permit, and the performance criteria provided in New York State Stormwater Management Design Manual (SMDM). The SMDM outlines provisions for water quality, runoff reduction, channel protection, overbank flood control, and extreme flood management in the State of New York.

The design objectives are focused on water quality and quantity. Utilization of green infrastructure techniques to the maximum extent possible reduces the total water quality volume and the overall site runoff volume. Additional structural SMPs may be required to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, but only after all other techniques to reduce runoff have been exhausted or deemed infeasible.

4.1 STORMWATER MANAGEMENT PRACTICES (SMPS)

The SWPPP and construction drawings identify the stormwater management practices that have been incorporated into the design of this Project. Stormwater runoff from the proposed development will be collected and conveyed to the quantity and quality control systems described herein.

4.1.1 Reduction of Clearing & Grading

Clearing and grading of the site has been limited to the minimum amount needed for the development function, road access, and infrastructure. The areas to be cleared shall be completed in accordance with the attached construction drawings. Limits of work disturbance have been established for all development activities.

4.1.2 Reduction of Impervious Cover

Reduction of impervious cover utilized in this design includes methods to reduce the amount of parking lots, roadways, and other surfaces that do not allow rainfall to infiltrate the soil, in order to reduce the volume of stormwater runoff, increase groundwater recharge, and reduce pollutant loadings that are generated from a site.

The design of the access road is based on minimum lengths and widths required to meet applicable federal, state, and local codes and support the necessary equipment accessing the Site.

4.1.3 Pervious Access Road

The use of a pervious road design allows for runoff to infiltrate into the underlying soil, reducing the potential runoff increase produced from the use of impervious paving. A pervious road design requires low traffic volumes to prevent compaction from heavy use. By converting sections of the access road to a pervious design, runoff can be reduced from affected areas.

4.1.4 Detention Ponds

Detention basins have been designed and sized to reduce peak rate runoff from the site. Because these features will be constructed as temporary sediment basins during construction, they are actually substantially larger than needed to attenuate the peak rate for the 10-year storm, and in some cases, effectively contain runoff from the 100yr-24hr storm. Outfall culverts have been designed to minimize peak rate discharge from the ponds and to reduce erosion downstream of the ponds. Outlet protection has been designed to reduce erosion at the outlet of these culverts. Overflow protection has also been included at the lowest points of the 'berm' of the ponds to minimize erosion during larger storm events.

Refer to the construction drawings for detailed design and other specifications.

4.1.5 Vegetated Filter Strips

Vegetated filter strips are utilized to slow and treat the stormwater runoff for a portion of the site. The filter strip is a vegetated surface designed to treat sheet flow from the adjacent drainage area and remove pollutants through filtration and infiltration. See the construction drawings for the location and dimensions of the vegetated filter strips.

Areas draining by sheet flow to a filter strip can be subtracted from the total contributing drainage area for water quality volume calculations. If the area draining contains impervious surface, the runoff reduction volume is reduced as well.

A gravel diaphragm is proposed at the top of the slope of the filter strips receiving runoff from the adjacent access road. This diaphragm promotes sheet flow.

Compost soil amendments shall extend over the full length and width of the filter strip. The required depth of compost and specifications shall be in accordance with the construction drawings. Rake the amended area to achieve the most level slope possible without using heavy construction equipment and stabilize rapidly with perennial grass and/or herbaceous species.

Soil compaction or disturbance in the area of the proposed filter strip should be minimized to the extent practicable. If this is unavoidable, the area should be restored by tilling or otherwise re-establishing the soil permeability via soil restoration requirements in Table 4.

4.1.6 Disconnection of Non-rooftop Runoff

Due to the nature of ground mounted solar system installation, the solar panels themselves are not considered to contribute to the amount of impervious area by acting as a pervious cover. The memorandum from the NYSDEC dated February 21, 2018 provides guidance for solar panel construction stormwater permitting. This project falls under scenario 2, which requires post-construction stormwater practices to be designed in accordance with Chapter 4 of the SMDM. However, the water quality volume and runoff reduction volume sizing criteria can be addressed by design and constructing the solar panels in accordance with the criteria in items 1-4, which are summarized below.

1. Solar panels are constructed on post or rack systems elevated off the ground surface.
2. The panels are spaced apart so that rainwater can flow off the down gradient side of the panel and continue as sheet flow across the ground surface.
3. For solar panels constructed on slopes, the individual rows of solar panels are generally installed along the contour so rainwater sheet flows down slope.
4. The ground surface below the panels consist of a well-established vegetative cover (see "Final Stabilization" definition in Appendix A of the General Permit).

This guidance is consistent with the rationale behind solar panels acting as a pervious cover. By providing adequate row spacing, enough distance below the racking system to allow for natural sheet flow, and a well-established vegetative cover, the infiltration rate into the ground beneath the panels will be equal to the rate of infiltration prior to construction or better. An important component of this rationale is that the existing cultivated row crops and agricultural field within the Site will be seeded and brought to a permanent vegetation for the life of the system. Ground cover is one of the most important factors for erosion mitigation.

The proposed design does not conform to the specific guidance regarding slopes as mentioned above. Inter-array slopes are greater than 5% in most areas across the site on the slopes of the hills. These areas will have permanently vegetated grass cover to reduce erosion potential. In addition, there are proposed gravel diaphragms to ensure sheet flow toward off site areas. If permanent ground coverage cannot be well established due to drip line erosion noticed during the Site inspections, a gravel level spreader or turf mat may be installed along the edge of the panels to help with final stabilization and prevent further erosion.

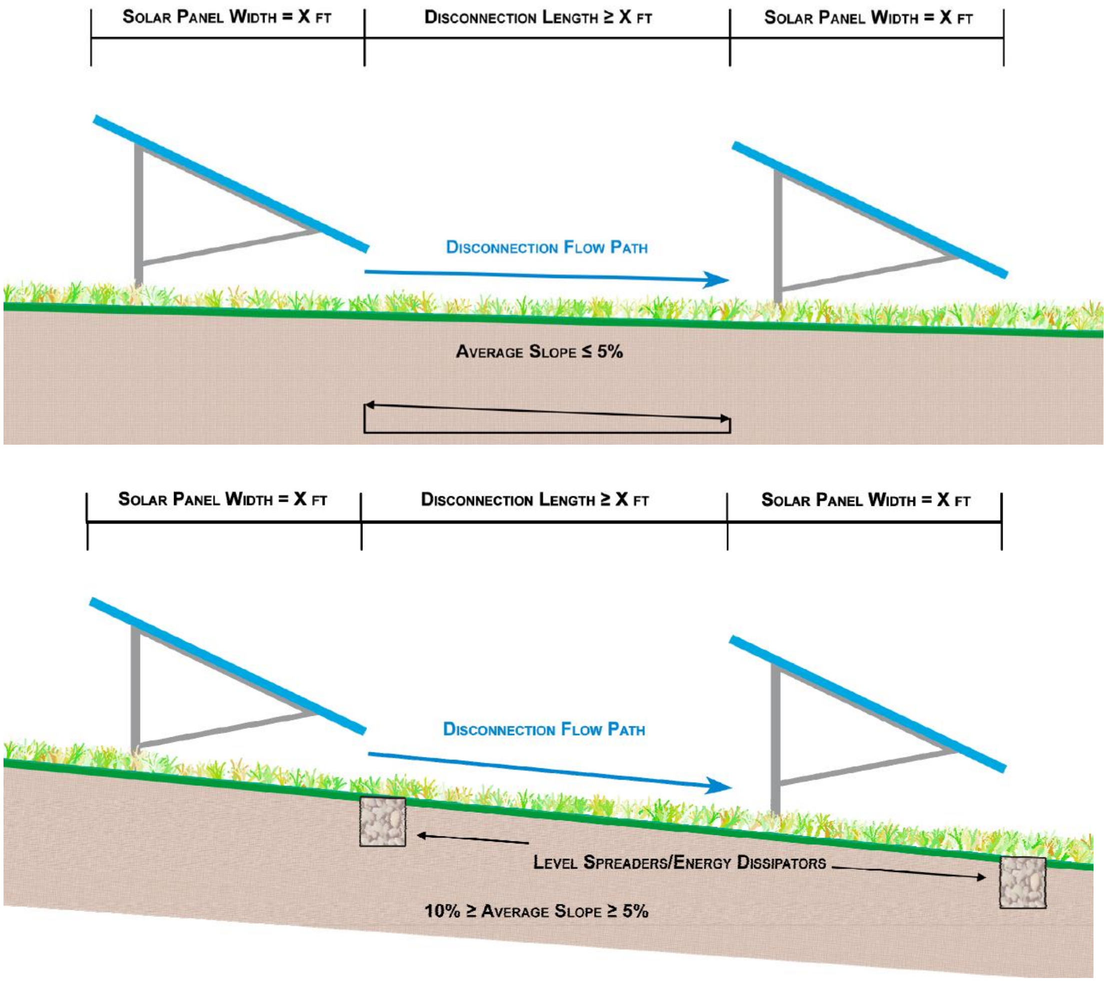

Figure 3 - Disconnected Flow Paths of Typical Fixed Tilt Solar Installations

In addition to the panels, the smaller concrete equipment pads that contribute a relatively small amount of impervious surface have been designed with enough separation and routed to pervious areas such that they are considered to be adequately disconnected. There is over 100 feet of well-established vegetation between the equipment pads and the discharge point that will be maintained throughout the life of the project and act as a biofilter for stormwater runoff.

4.2 DRAINAGE AREAS

The study area for this Project consists of drainage areas that encompass approximately 46 acres. These primary drainage areas discharge to eight different outfall locations, each defined as a Discharge Point (DP).

The separation of the drainage areas was dictated by watershed conditions, methods of collection, conveyance, and points of discharge. Watershed characteristics for each drainage area were assessed using aerial photographs, a topographical survey, soil surveys, Site investigations, and land use maps.

Table 5 summarizes the location and acreage for each of the drainage areas.

Table 5 – Summary of Drainage Areas

Drainage Area	Acreage	Description
1	Pre = 2.71 Post = 2.71	Runoff flows from east to west ultimately discharging offsite into a roadside ditch along western turnpike.
2	Pre = 1.85 Post = 1.85	Runoff flows from east to west and ultimately discharges into a manmade pond behind an adjacent residence.
3	Pre = 4.34 Post = 4.34	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.
4	Pre = 9.91 Post = 7.71	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.
5	Pre = 8.49 Post = 11.23	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.
6	Pre = 7.81 Post = 7.81	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.
7	Pre = 7.66 Post = 7.66	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.
8	Pre = 3.18 Post = 3.18	Runoff flows from east to west ultimately discharging offsite into the forested area to the west.

Drainage maps are provided in Appendix F and depict the extent of the drainage areas, the locations of the design points, the flow paths and routing, and the soils within each drainage area for both pre-development and post-development conditions. Drainage area acreage is subject to change between the pre and post development condition.

4.3 STORMWATER QUALITY CONTROL

Stormwater runoff from impervious surfaces is recognized as a significant contributor of pollution that can adversely affect the quality of the receiving water bodies. Therefore, treatment of stormwater runoff is important since most runoff related water quality contaminants are transported from land, particularly the impervious surfaces, during the initial stages of storm events.

The objective for this design in accordance with the Permit is to reduce the total water quality volume of the Site by application of runoff reduction techniques and standard SMPs with runoff reduction volume capacity. The NYS SMDM provides a unified approach for calculating the water quality volume, runoff reduction volumes, and sizing green infrastructure and SMPs to meet pollutant removal goals.

4.3.1 Water Quality Volume (WQ_v)

The Water Quality Volume (WQ_v) is intended to improve water quality by capturing and treating runoff from small, frequent storm events that tend to contain higher pollutant levels. New York has defined the WQ_v as the volume generated from the 90th percentile rain event.

The following equation is used to determine the water quality volume (in acre-feet of storage):

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

Where:

WQ_v	=	Water Quality Volume (acre-feet)
P	=	1-Year, 24-Hour Rainfall Event Number (Figure 4.2 in NYS SMDM)
R_v	=	0.05 + 0.009(I), where I is percent impervious cover
A	=	Site contributing area (acres)

The WQ_v is calculated in the Runoff Reduction Worksheet provided by NYSDEC for each drainage area.

Full calculations are provided in Appendix G. Runoff reduction techniques previously discussed that help to reduce the overall contributing area have been accounted for in this calculation and are summarized in Table 6.

4.3.2 Runoff Reduction Volume (RR_v)

The NYS SMDM states that runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, or evaporation/evapotranspiration of 100 percent of the post-development water quality volume to the maximum extent practical. If the runoff reduction volume (RR_v) is greater than the WQ_v, then the Project has already met the requirement for WQ_v by applying runoff reduction techniques.

Projects that do not achieve runoff reduction requirements must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the Site. In no case shall the runoff reduction achieved be less than the minimum RR_v.

The percent reduction is based upon the Hydrologic Soil Group (HSG) of the Site and is defined as the Specific Reduction Factor (S). Section 4.3 of the NYS SMDM defines the minimum Runoff Reduction Volume ($RR_{v\,min}$) as:

$$RR_{vmin} = \frac{(P)(\overline{R}_V{}^*)(A_{ic})(S)}{12}$$

Where:

RR_{vmin}	=	Minimum Runoff Reduction Volume required (acre-feet)
P	=	1-Year percent Rainfall Event Number
$\overline{R}_V{}^*$	=	0.05 + 0.009 (I), where I is 100% impervious
A_{ic}	=	Total Area of New Impervious Cover (Acres)
S	=	Hydrologic Soil Group (HSG) Specific Reduction Factor where:

HSG A = 0.55	HSG C = 0.30
HSG B = 0.40	HSG D = 0.20

The RR_v provided and the RR_{vmin} are calculated in the Runoff Reduction Worksheet provided by NYSDEC. Full calculations are provided in Appendix G and summarized in Table 6.

The runoff reduction volume for each of the SMPs utilized in this project are summarized in Table 6.

4.3.3 Summary

The following table summarizes the water quality volume, the runoff reduction volume provided by the implemented green infrastructure practices and the total water quality volume that has been treated for each drainage area.

Table 6 – Runoff Reduction and Area Reduction Practices

Drainage Area	WQ_v (cf)	Runoff Reduction Technique(s)	RR_v (cf)	WQ_v Treated (cf)
--	--	--	--	--
Drainage Area	**WQ_v (cf)**	**Area Reduction Technique(s)**	**Contributing Impervious Area (ac)**	**Impervious Area Reduced (ac)**
FS-1	77.9	Filter Strip	0.02	0.02

4.4 STORMWATER QUANTITY CONTROL

This section presents the methodology and analysis performed for the pre- and post-development conditions of the Site to address erosion and flood control during specified storm events.

4.4.1 Hydrologic & Hydraulic Analysis

The methodology Hydrocad® Storm and Sanitary Analysis, a comprehensive hydrology and hydraulic analysis application, was used to compute the stormwater peak discharge rate at the drainage area outfalls for each storm event. A stormwater network model was produced consisting of three types of components as described below:

- Subbasin: Hydrologic areas of land whose topography and drainage system elements direct surface runoff to a single discharge point.
- Conveyance Link: Channels, pipes and culverts used to route the stormwater runoff to various features.
- Storage Nodes: Catchbasins, detention ponds, reservoirs and lakes associated with storage volume.

A comparison of the pre- and post-development watershed conditions was performed for all design points and storm events evaluated herein.

The hydrologic and hydraulic analysis considers the SCS Type II 24-hour storm events and uses TR-20 methodology. The TR-55 method is used for calculating the time of concentration (T_c). Input data required to perform the analysis includes acreages and curve numbers for the associated drainage areas, and slopes and flow lengths for the time of concentration calculations.

The analyses demonstrate that the peak rate of runoff will not be increased post-development for each design point and design storm. Therefore, the Project will not have a significant adverse impact on the adjacent or downstream properties or receiving water courses.

The results of the computer modeling used to analyze the pre- and post-development conditions are presented in Appendix H and Appendix I, respectively. Table 7 summarizes the results.

Design Point (DP #)	24-Hour Storm Event (cfs)					
	1-year		10-year		100-year	
	Pre	Post	Pre	Post	Pre	Post
1	3.08	3.08	7.28	7.28	14.99	14.99
2	2.00	2.00	4.87	4.87	10.19	10.19
3	3.73	3.73	9.78	9.78	21.35	21.35
4	6.64	4.42	17.67	11.83	38.95	26.20
5	5.87	6.17	15.59	16.59	34.32	36.81
6	4.81	2.69	13.29	7.62	29.9	17.39
7	4.66	2.06	12.9	5.86	29.03	13.41
8	2.2	1.37	6.22	4	14.18	9.29
Total	**32.99**	**25.52**	**87.60**	**67.83**	**192.91**	**149.63**

Table 7 shows that there is no increase in runoff from the pre-development to post development conditions.

4.4.2 Stream Channel Protection Volume (Cp_v)

The stream channel protection volume requirement is designed to protect stream channels from erosion. This is accomplished by providing 24 hours of extended detention for the 1 year, 24-hour storm event, remaining from runoff reduction. The NYS SMDM defines the Cp_v detention time as the center of mass detention time through each stormwater management practice.

The Cp_v requirement does not apply when the reduction of the entire Cp_v is achieved at a site through green infrastructure or infiltration systems.

4.4.3 Overbank Flood Control (Q_p)

The overbank flood control requirement is designed to prevent an increase in the frequency and magnitude of flow events that exceed the bank-full capacity of a channel, and, therefore, must spill over into the floodplain. The control requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Q_p) to pre-development rates.

Table 7 shows the results of the 24-hour, 10-year storm event for pre- and post-development.

4.4.4 Extreme Flood Control (Q_f)

The extreme flood control requirement is designed to prevent the increased risk of flood damage from large storm events, to maintain the boundaries of the pre-development 100-year floodplain, and to protect the physical integrity of stormwater management practices. The control requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Q_f) to pre-development rates.

Table 7 shows the results of the 24-hour, 100-year storm event for pre- and post-development.

5.0 SPILL PREVENTION & SOLID WASTE MANAGEMENT

The following describes other control measures to be employed during all phases of construction.

5.1 SPILL PREVENTION & RESPONSE

A Spill Prevention and Response Plan shall be developed for the Site by the Contractor. The plan shall detail the steps needed to be followed in the event of an accidental spill and shall identify contact names and phone numbers of people and agencies that must be notified.

The plan shall include Material Safety Data Sheets (MSDS) for materials to be stored on-Site. Workers on-Site will be required to be trained on safe handling and spill prevention procedures for all materials used during construction.

The use of detergents for large scale washing is prohibited (e.g., vehicles, buildings, pavement surfaces, etc.)

5.2 SOLID & LIQUID WASTE DISPOSAL

No solid or liquid waste, including building materials, are allowed to be discharged from the Site with stormwater. All solid waste, including disposable materials incidental to the major construction activities, must be collected and placed in containers. The containers shall be emptied periodically by a licensed solid waste disposal service and hauled away from the Site and disposed of a permitted facility.

Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary to ensure that they do not discharge from the Site. As an example, special care must be exercised during equipment fueling and servicing operations. A designated refueling area will be provided that will allow for appropriate containment; however, if a spill occurs, it must be contained and disposed so that it will not flow from the Site or enter groundwater, even if this requires removal, treatment, and disposal of soil. In this regard, potentially polluting substances should be handled in a manner consistent with the impact they represent.

5.2.1 Sanitary Facilities

Temporary sanitary facilities will be provided throughout the construction phase. These facilities will be utilized by construction personnel and will be serviced by an outside contractor. These facilities shall comply with state and local sanitary or septic system regulations.

5.2.2 Water Source

Non-stormwater components of Site discharge must be clean water. Water used for construction, which discharged from the Site, must originate from a public water supply or private well approved by the Schenectady County Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the Site. It can be retained until it infiltrates and evaporates.

6.0 INSPECTION & MAINTENANCE REQUIREMENTS

6.1 PRE-CONSTRUCTION INSPECTION

Prior to the commencement of construction, 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 (1) person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the Trained Contractor, who shall be on site on a daily basis when soil disturbance activities are being performed.

The responsible Contractor or Subcontractor shall sign the form included in Appendix L.

A Qualified Inspector shall conduct an assessment of the Site and certify that the appropriate erosion and sediment control structures have been adequately installed and implemented. Refer to the inspection forms in Appendix M.

6.2 CONSTRUCTION PHASE INSPECTIONS & MAINTENANCE

A Qualified Inspector, as defined in Appendix A of the General Permit GP-0-020-001, shall conduct weekly Site inspections between the time the SWPPP is implemented and final site stabilization. To ensure the stability and effectiveness of all protective measures and practices during construction, all erosion and sediment control measures employed will be inspected by the Qualified Inspector at least every 7 calendar days. If disturbance exceeds 5 acres, the Qualified Inspector shall conduct at least two inspections every 7 calendar days. The two inspections shall be separated by a minimum of two full calendar days.

The purpose of Site inspections is to assess performance of pollutant controls. Based on these inspections, the Qualified Inspector shall decide whether it is necessary to modify this SWPPP, add or relocate sediment barriers, or whatever else may be needed in order to prevent pollutants from leaving the Site via stormwater runoff. The Construction Contractor has the duty to cause pollutant control measures to be repaired, modified, maintained, supplemented, or whatever else is necessary in order to achieve effective pollutant control.

Examples of particular items to evaluate during Site inspections are listed below. This list is not intended to be comprehensive. During each inspection the inspector must evaluate overall pollutant control system performance as well as particular details of individual system components. Additional factors should be considered as appropriate to the circumstances.

- Locations where vehicles enter and exit the Site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent sediment from leaving the Site on vehicles.

- Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material from behind sediment barriers will be stockpiled on the up-slope side. Additional sediment barriers must be constructed as needed.

- Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered, or original covers must be repaired or supplemented. Also, protective berms must be constructed, if needed, in order to contain runoff from material storage areas.

- Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The Site will be considered to have achieved final stabilization once all areas are covered with building foundation, pavement, or gravel, or have a stand of grass with at least 80 percent density, which is considered stabilized or mulched. Areas must be watered, fertilized, and reseeded as needed to achieve this goal.

- All discharge points must be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters.

Within 1 business day of the completion of an inspection, the Qualified Inspector shall notify the Owner or Operator and appropriate Contractor (or subcontractor) of any corrective actions that need to be taken. The Contractor (or subcontractor) shall begin implementing corrective actions within 1 business day of this notification and shall complete the corrective actions in a reasonable time frame.

In addition to the inspections performed by the Qualified Inspector, the Contractor shall perform routine inspections that include a visual check of all erosion and sediment control measures. All inspections and maintenance shall be performed in accordance with the inspection and maintenance schedule provided on the Drawings. Sediment removed from erosion and sediment control measures will be exported from the Site, stockpiled for later use, or used immediately for general non-structural fill.

It is the responsibility of the Contractor to assure the adequacy of Site pollutant discharge controls. Actual physical Site conditions or Contractor practices could make it necessary to install more erosion and sediment controls than shown on the attached Drawings. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.) Assessing the need for additional controls and implementing them or adjusting existing controls will need to be addressed throughout all aspects of this Project, and until the Site achieves final stabilization.

6.3 INSPECTION & MAINTENANCE REPORTS

Inspection reports must be completed for every inspection conducted and include additional remarks if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the Site was in compliance with the SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Sample inspection forms are included in Appendix M. At a minimum, the inspection report shall include and/or address the following:

- Date and time of inspection;
- Name and title of person(s) performing inspection;
- A description of the weather and soil conditions (e.g., dry, wet, saturated) at the time of the inspection;
- 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 (e.g., pipes, culverts, ditches, etc.) and overland flow;
- Identification of all erosion and sediment control practices that need repair or maintenance;
- Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

- 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; and
- Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices, and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).
- Include color photographs with date stamp, taken with a digital camera that clearly show the condition of all practices that have been identified as needing corrective actions. Color copies of photographs shall be attached to the inspection report within 7 calendar days of inspection. Color photographs with date stamp, taken with a digital camera must clearly show the condition of practice(s) after the corrective action has been completed. Color copies of the photographs, that document completion of the corrective action work within 7 calendar days of inspection, shall be attached to inspection report.

All inspection reports shall be signed by the Qualified Inspector and shall be maintained on Site with the SWPPP, kept in Appendix N.

6.4 TEMPORARY SUSPENSION OF CONSTRUCTION ACTIVITIES

For constructions areas where soil disturbance activities have been temporarily suspended (e.g., winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the frequency of Qualified Inspector inspections can be reduced to once every 30 calendar days. Prior to reducing the frequency of inspections, the Owner/Operator shall notify the NYSDEC Division of Water in writing.

6.5 PARTIAL PROJECT COMPLETION

For construction areas 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 and 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 NYSDEC Region 4 Water (SPDES) Program contact 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, and 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 Notice of Termination (NOT).

6.6 POST-CONSTRUCTION OR PLANNED SHUTDOWN INSPECTION

The Owner or Operator shall have the Qualified Inspector perform a final Site inspection prior to submitting the NOT when all disturbed areas are stabilized, and all stormwater management systems are in place and operable. The Qualified Inspector shall certify that all disturbed areas have achieved final stabilization; and 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.

Prior to submitting the Notice of Termination, the Owner or Operator must have a deed restriction in place to ensure that the Operation and Maintenance Plan is implemented for the post-construction stormwater management practices.

6.7 RETENTION OF RECORDS

The owner or operator shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, and any inspection reports that were prepared in conjunction with this permit for a period of at least 5 years from the date that the Site achieves final stabilization. This period may be extended by the NYSDEC, in its sole discretion, at any time upon written notification.

With the exception of the NOI, and NOT, all written correspondence requested by the NYSDEC, including individual permit applications, shall be sent to the following NYSDEC address:

NYSDEC Region 4 Office
1130 N. Westcott Rd
Schenectady NY 12306

7.0 CONCLUSION

This Project is not subject to the requirements of a regulated Municipal Separate Storm Sewer System (MS4) or is located within an agricultural district. This SWPPP has been prepared in conformance with the New York State Stormwater Design Manual 2015 with additional guidance provided by the NYSDEC. As such, it is anticipated that GP-0-20-001 coverage will be effective 5 business days from the date the NYSDEC receives the complete electronic version of the NOI (eNOI) or 10 business days from the date the NYSDEC receives the complete paper version of the NOI, unless notified otherwise by the NYSDEC.

Following construction of the project, the Site soils shall be restored in accordance with Section 5.1.6 of the NYS SMDM, and re-vegetation shall be implemented.

The post-construction stormwater management practice(s) will be owned by the Owner. Policies and procedures will be put in place that ensure that operation and maintenance of the practice(s) are in accordance with the operation and maintenance plan.

As demonstrated within this SWPPP, the proposed Project will not adversely impact adjacent or downstream properties.

8.0 LIMITATIONS

The work product included in this report was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and, thus, should be relied upon and used by our client recognizing these considerations and limitations. Tetra Tech shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

9.0 REFERENCES

NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-20-001 (effective January 29, 2020, expires January 28, 2025, latest revision November 23, 2016).

New York State Department of Environmental Conservation, Stormwater Toolbox, from World Wide Web: http://www.dec.ny.gov/.

New York State Department of Environmental Conservation, Memorandum "Solar Panel Construction Stormwater Permitting/SWPPP Guidance", April 5, 2018.

New York State Stormwater Management Design Manual (Draft May 2022).

New York State Standards and Specifications for Erosion and Sediment Control, NYSDEC (November 2016).

Maryland Department of the Environment Stormwater Design Guidance – Solar Panel Installations.

APPENDIX A – CONSTRUCTION DRAWINGS

Civil drawings are bound separately and will be included in the appendices of the final SWPPP

APPENDIX B – NYSDEC GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITY PERMIT NO. 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

Authorized Signature

1-23-20

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 **<u>not</u>** 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* and 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,* and 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* <u>or</u> *alter the hydrology from pre to post development* conditions, <u>and</u> 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

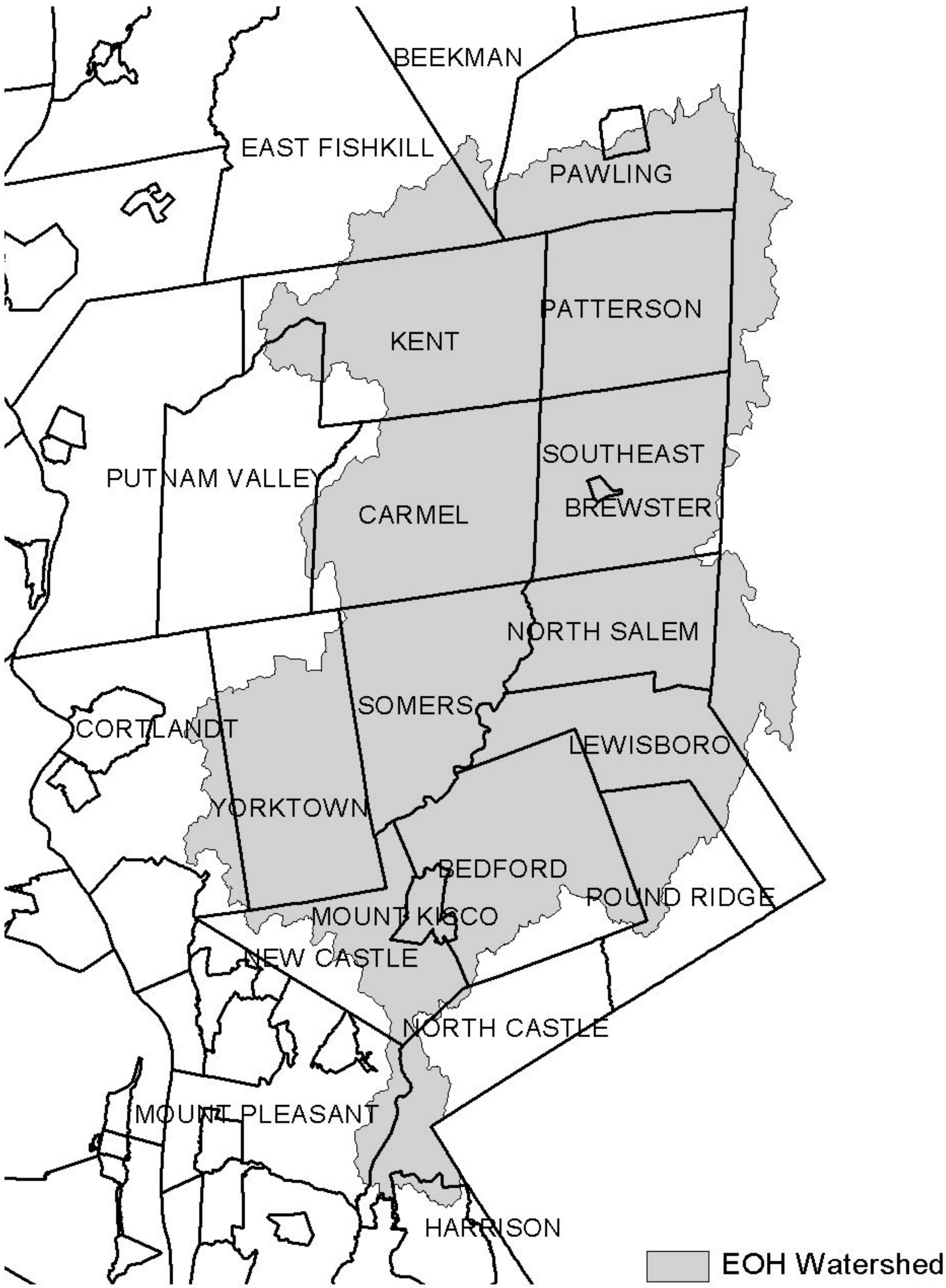


Figure 2 - Onondaga Lake Watershed

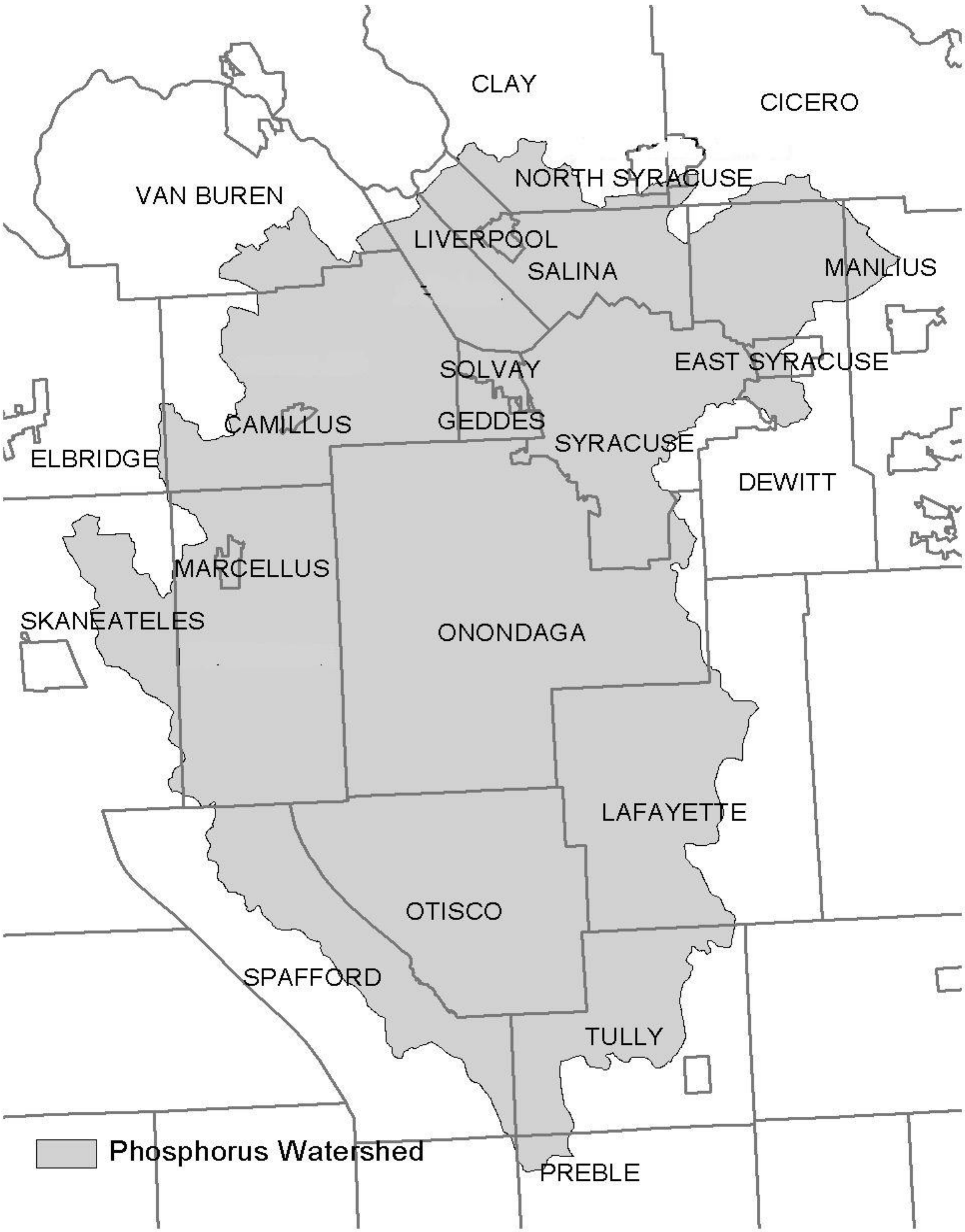


Figure 3 - Greenwood Lake Watershed

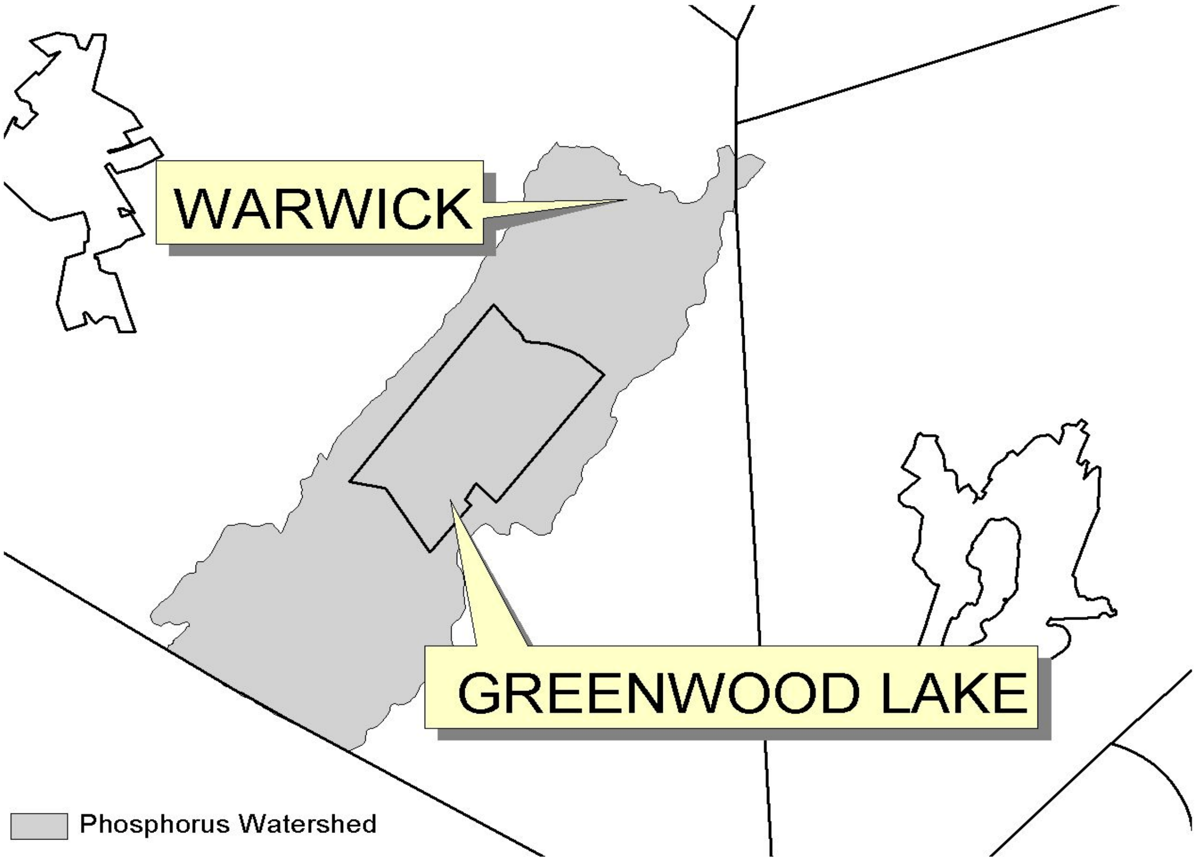


Figure 4 - Oscawana Lake Watershed

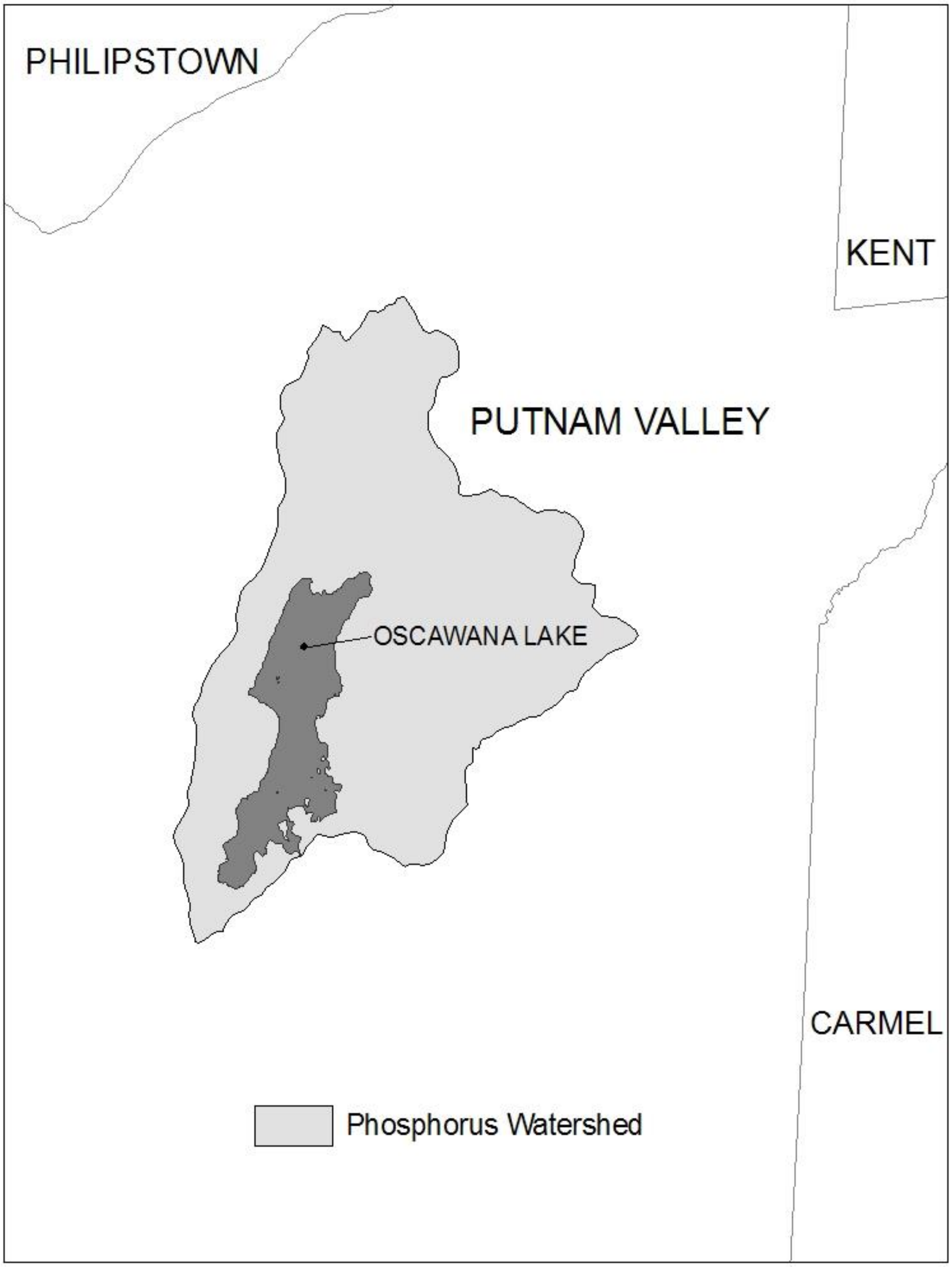
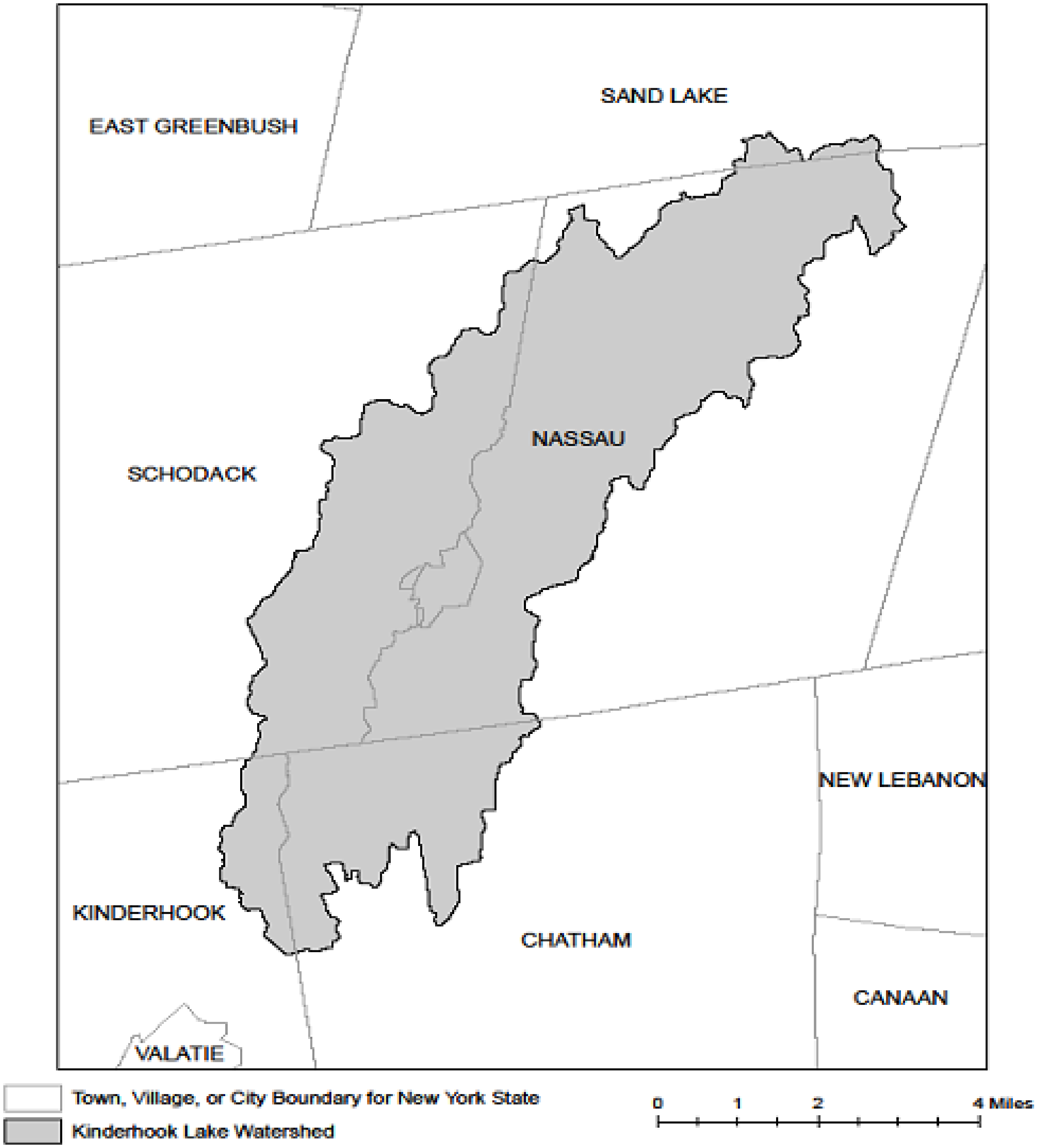


Figure 5 - Kinderhook Lake Watershed



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 C – LETTER FROM NYS OPRHP

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

June 1, 2023

Sonja Torpey
Tetra Tech
3136 South Winton Road, Suite 303
Rochester, NY 14623

Re: SEQRA
MarDon Community Solar Site/2.8 MW/8.49 Acres
Town of Delanson, Schenectady County, NY
23PR04031

Dear Sonja Torpey:

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 documents under the State Environmental Quality Review Act (SEQRA) as requested. These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (NY Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR § 617).

We note that the project site is located within the State and National Register listed William R. Wing Farm Complex and is contiguous with the State and National Register listed Avery Farmhouse property. We have reviewed the site plan and Preliminary Civil Design Set for the proposed solar energy installation.

Based on this review, it appears that the solar array is appropriately sited to minimize visual impacts to the National Register listed resources. In addition, there are no archaeological concerns associated with this project.

Please be aware that if this project will involve state or federal permits, funding or licenses it may be subject to a more rigorous review by those agencies and this office for impacts to historic and archaeological resources under Section 106 of the National Historic Preservation Act or Section 14.09 of the NYS Parks, Recreation and Historic Preservation Law.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Weston Davey
Historic Site Restoration Coordinator 518-268-2164 | Weston.Davey@parks.ny.gov

APPENDIX D – FLOOD INSURANCE RATE MAP (FIRM)

National Flood Hazard Layer FIRMette

FEMA

74°14'40"W 42°46'5"N

74°14'3"W 42°45'39"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/21/2023 at 9:43 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX E – NRCS SOILS REPORT

United States Department of Agriculture

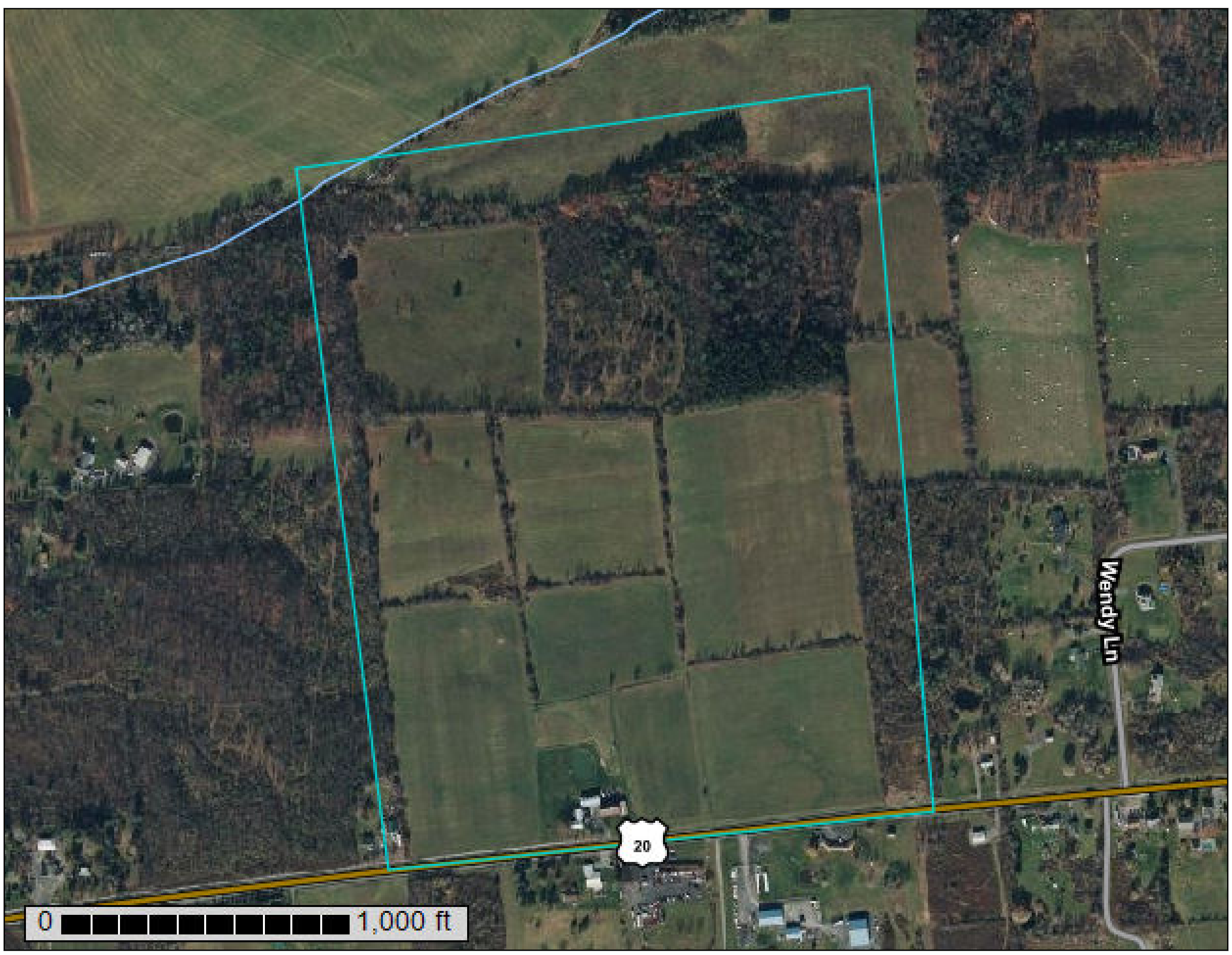
NRCS

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

Schenectady County, New York



August 21, 2023

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.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

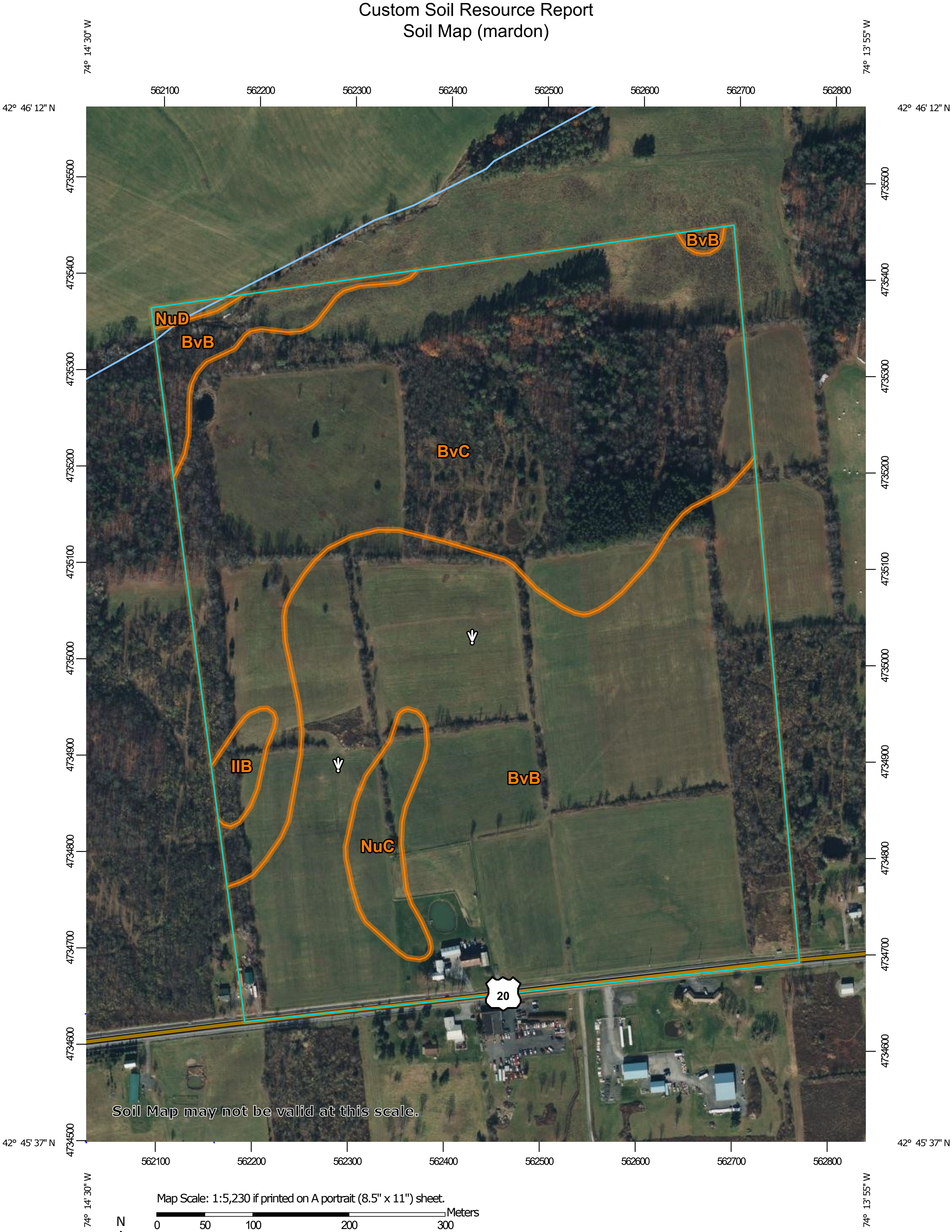
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (mardon)



Map Scale: 1:5,230 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 250, 500, 1000, 1500

N

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Schenectady County, New York
Survey Area Data: Version 21, Sep 10, 2022

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

Date(s) aerial images were photographed: Sep 4, 2020—Nov 7, 2020

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

Map Unit Legend (mardon)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes	60.0	53.5%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes	47.4	42.3%
IlB	Ilion silt loam, 3 to 8 percent slopes	1.2	1.1%
NuC	Nunda channery silt loam, 8 to 15 percent slopes	3.2	2.8%
NuD	Nunda channery silt loam, 15 to 25 percent slopes	0.3	0.3%
Totals for Area of Interest		**112.2**	**100.0%**

Map Unit Descriptions (mardon)

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.

Schenectady County, New York

BvB—Burdett-Scriba channery silt loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: bd3j
Elevation: 200 to 1,600 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Burdett and similar soils: 50 percent
Scriba and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burdett

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A thin silt mantle overlying till that is strongly influenced by shale

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 16 inches: channery silt loam
H3 - 16 to 44 inches: very gravelly silty clay loam
H4 - 44 to 60 inches: very gravelly silty clay loam

Properties and qualities

Slope: 3 to 8 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 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Description of Scriba

Setting

Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 15 inches: channery silt loam
Bx - 15 to 43 inches: very gravelly loam
C - 43 to 60 inches: very gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 12 to 18 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 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Varick

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

Darien

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

Angola

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

Ilion

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

BvC—Burdett-Scriba channery silt loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: bd3k
Elevation: 250 to 1,600 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Burdett and similar soils: 45 percent
Scriba and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burdett

Setting

Landform: Till plains, drumlinoid ridges, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: A thin silt mantle overlying till that is strongly influenced by shale

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 16 inches: channery silt loam
H3 - 16 to 44 inches: very gravelly silty clay loam
H4 - 44 to 60 inches: very gravelly silty clay loam

Properties and qualities

Slope: 8 to 15 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 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F101XY013NY - Moist Till

Hydric soil rating: No

Description of Scriba

Setting

Landform: Till plains, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till dominated by sandstone, with lesser amounts of limestone and shale

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 15 inches: channery silt loam
Bx - 15 to 43 inches: very gravelly loam
C - 43 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 12 to 18 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 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Nunda

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

Ilion

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

Darien

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

Varick

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

Angola

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

IlB—Ilion silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: bd4v
Elevation: 600 to 1,800 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Ilion

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy till derived from calcareous dark shale

Typical profile

Ap - 0 to 9 inches: silt loam
E - 9 to 14 inches: silty clay loam
2B - 14 to 39 inches: channery silty clay loam
3C - 39 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 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 moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY014NY - Wet Till Depression
Hydric soil rating: Yes

Minor Components

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

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

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

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

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

NuC—Nunda channery silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: bd62
Elevation: 400 to 1,600 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Farmland of statewide importance

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

Description of Nunda

Setting
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave

Across-slope shape: Convex
Parent material: A silty mantle over loamy till derived from calcareous shale and siltstone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 25 inches: channery silt loam
H3 - 25 to 42 inches: gravelly silty clay loam
H4 - 42 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well 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 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Burdett

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

Lansing

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

Mohawk

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

Darien

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

Angola

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

NuD—Nunda channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: bd63
Elevation: 400 to 1,600 feet
Mean annual precipitation: 38 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Nunda

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: A silty mantle over loamy till derived from calcareous shale and siltstone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 25 inches: channery silt loam
H3 - 25 to 42 inches: gravelly silty clay loam
H4 - 42 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well 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 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F101XY013NY - Moist Till
Hydric soil rating: No

Minor Components

Mohawk

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

Arnot

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

Burdett

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

Lansing

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

Manlius

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

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (mardon)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four 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). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group (mardon)

Map Scale: 1:5,230 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 250, 500, 1000, 1500

N

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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: Schenectady County, New York
Survey Area Data: Version 21, Sep 10, 2022

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

Date(s) aerial images were photographed: Sep 4, 2020—Nov 7, 2020

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

Table—Hydrologic Soil Group (mardon)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes	C/D	60.0	53.5%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes	C/D	47.4	42.3%
IlB	Ilion silt loam, 3 to 8 percent slopes	C/D	1.2	1.1%
NuC	Nunda channery silt loam, 8 to 15 percent slopes	C/D	3.2	2.8%
NuD	Nunda channery silt loam, 15 to 25 percent slopes	C/D	0.3	0.3%
Totals for Area of Interest			**112.2**	**100.0%**

Rating Options—Hydrologic Soil Group (mardon)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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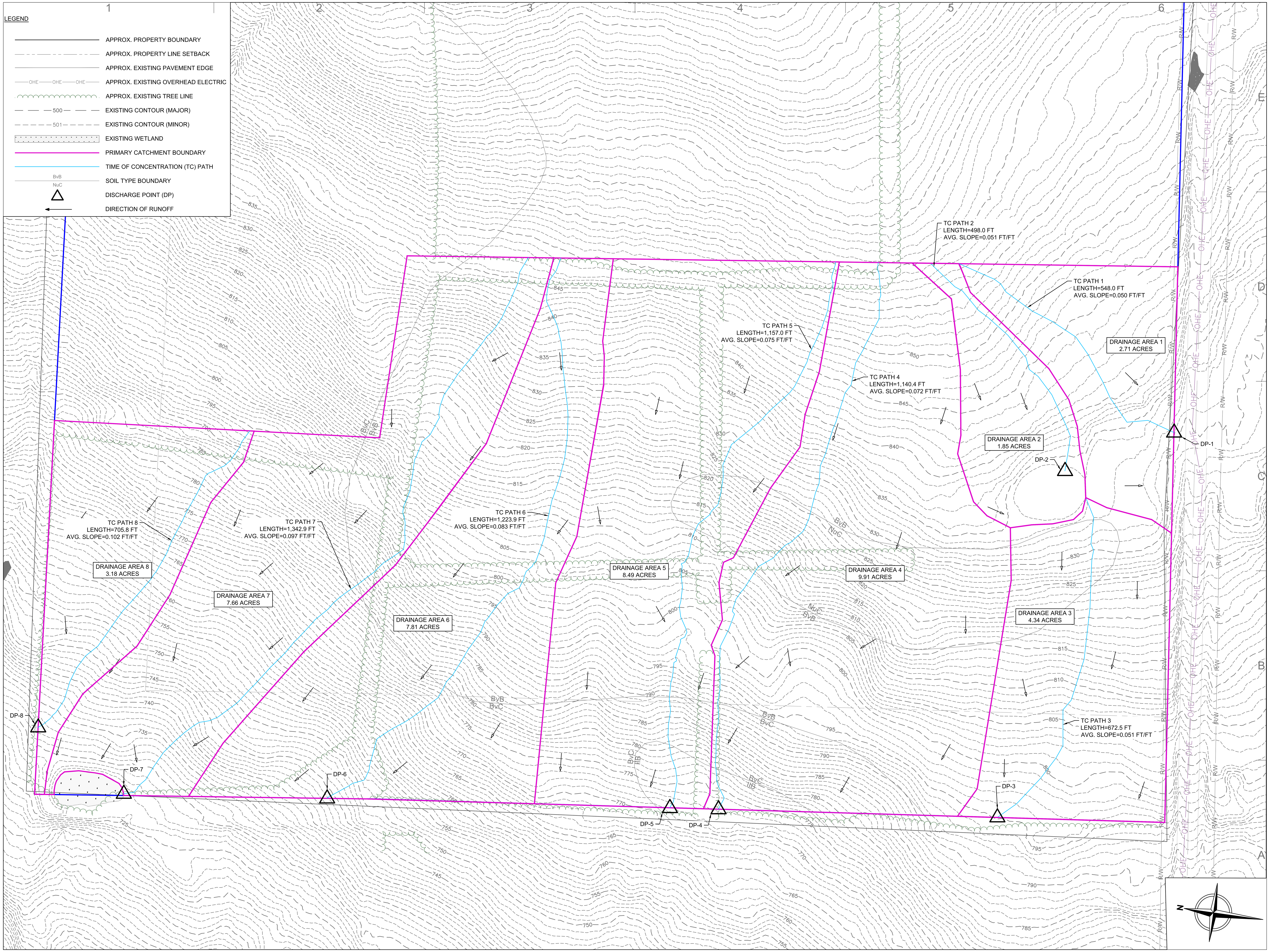
APPENDIX F – DRAINAGE MAPS



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MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS: 194-1409-0003

SHEET TITLE: PRE DEVELOPMENT DRAINAGE

SHEET SIZE: ARCH "D" 24" X 36" (610 x 914)

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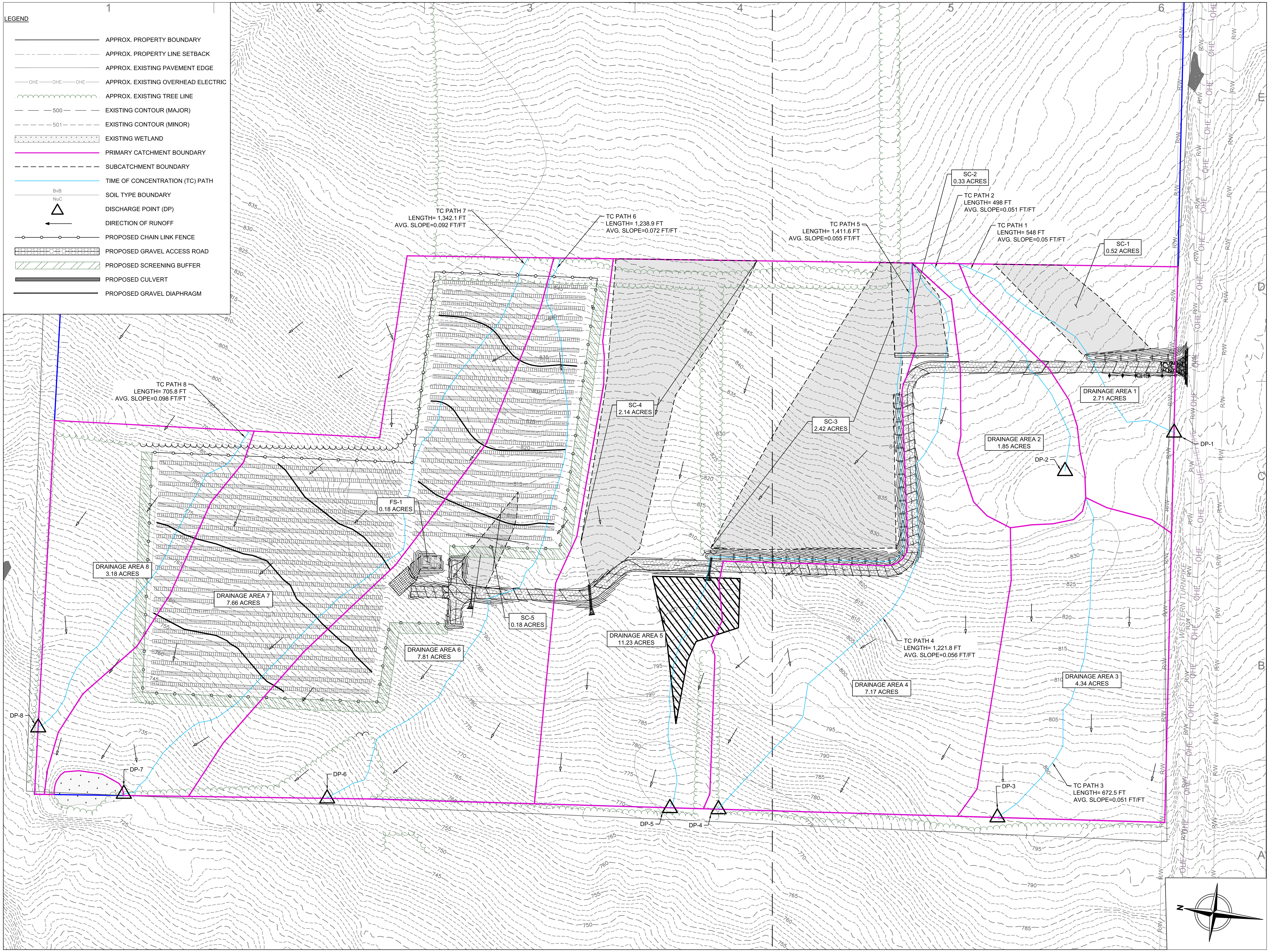
NO.	REVISION	DATE	INIT.
A	30% DESIGN	08/23/2023	RCD

DATE: 08/23/2023
DRAWN BY: R. DEMILIO
ENGINEER: R. DEMILIO
APPROVED BY:

PROJECT PHASE: PRELIMINARY SWPPP

SCALE: 1" = 80'

SHEET NO.: SW-100



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MARDON COMMUNITY SOLAR PROJECT

WESTERN TURNPIKE
DUANESBURG, NY 12056

PROJECT NUMBERS:
194-1409-0003

SHEET TITLE:
POST DEVELOPMENT DRAINAGE

SHEET SIZE:
ARCH "D"
24" X 36" (610 x 914)

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NO.	REVISION	DATE	INIT.
A	30% DESIGN	08/23/2023	RCD

DATE: 08/23/2023
DRAWN BY: R. DEMILIO
ENGINEER: R. DEMILIO
APPROVED BY:

PROJECT PHASE:
PRELIMINARY SWPPP

SCALE: 1" = 80'

SHEET NO.:
SW-200

APPENDIX G – DESIGN CALCULATIONS

Time of Concentration Pre-Development

Drainage Area 1			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.055	Grass
Shallow Concentrated Flow	448.0	0.045	Grass
Total Length/Average Slope	548.00	0.050	--

Drainage Area 2			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.051	Grass
Shallow Concentrated Flow	398.0	0.050	Grass
Total Length/Average Slope	498.0	0.051	--

Drainage Area 3			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.040	Grass
Shallow Concentrated Flow	572.5	0.062	Grass
Total Length/Average Slope	672.5	0.051	--

Drainage Area 4			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	45.9	0.064	Woods - Poor
Sheet Flow	54.1	0.065	Grass
Shallow Concentrated Flow	505.0	0.083	Grass
Shallow Concentrated Flow	43.6	0.080	Woods - Poor
Shallow Concentrated Flow	491.8	0.069	Grass
Total Length/Average Slope	1140.4	0.072	--

Drainage Area 5			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	19.7	0.058	Grass
Sheet Flow	27.2	0.067	Woods - Poor
Sheet Flow	53.1	0.072	Grass
Shallow Concentrated Flow	434.8	0.090	Grass
Shallow Concentrated Flow	38.9	0.097	Woods - Poor
Shallow Concentrated Flow	90.9	0.078	Grass
Shallow Concentrated Flow	26.6	0.060	Woods - Poor
Shallow Concentrated Flow	20.0	0.087	Grass
Shallow Concentrated Flow	200.4	0.057	Brush - Poor
Shallow Concentrated Flow	245.4	0.081	Grass
Total Length/Average Slope	1157.0	0.075	--

Drainage Area 6			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	49.9	0.070	Woods - Poor
Sheet Flow	50.1	0.080	Grass

Shallow Concentrated Flow	506.0	0.076	Grass
Shallow Concentrated Flow	33.8	0.072	Woods - Poor
Shallow Concentrated Flow	441.2	0.105	Grass
Shallow Concentrated Flow	142.9	0.092	Woods - Poor
Total Length/Average Slope	1223.90	0.083	--

Drainage Area 7			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	47.8	0.064	Woods - Poor
Sheet Flow	52.2	0.086	Grass
Shallow Concentrated Flow	537.9	0.088	Grass
Shallow Concentrated Flow	44.3	0.150	Woods - Poor
Shallow Concentrated Flow	660.7	0.096	Grass
Total Length/Average Slope	1342.90	0.097	--

Drainage Area 8			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	55.9	0.120	Woods - Poor
Sheet Flow	44.1	0.100	Grass
Shallow Concentrated Flow	605.8	0.086	Grass
Total Length/Average Slope	705.80	0.102	--

Ground Cover Acreages Pre-Development			
Drainage Area	**Type**	**Area (acres)**	Check
1	Grass Cover (>75%) HSG D	2.28	
	Impervious	0.43	
	Total	**2.71**	2.71
2	Grass Cover (>75%) HSG D	1.67	
	Impervious	0.18	
	Total	**1.85**	1.85
3	Grass Cover (>75%) HSG D	4.34	
	Total	**4.34**	4.34
4	Grass Cover (>75%) HSG D	9.51	
	Woods - Poor HSG D	0.40	
	Total	**9.91**	9.91
5	Grass Cover (>75%) HSG D	7.15	
	Woods - Poor HSG D	0.98	
	Brush - Poor HSG D	0.36	
	Total	**8.49**	8.49
6	Grass Cover (>75%) HSG D	3.04	
	Meadow HSG D	3.90	
	Woods - Poor HSG D	0.87	
	Total	**7.81**	7.81
7	Meadow HSG D	6.42	
	Woods - Poor HSG D	1.24	7.66
	Total	**7.66**	
8	Meadow HSG D	2.87	
	Woods - Poor HSG D	0.31	3.18
	Total	**3.18**	
	Total	45.95	

Time of Concentration Post-Development

Drainage Area 1			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.055	Grass
Shallow Concentrated Flow	448.0	0.045	Grass
Total Length/Average Slope	548.00	0.050	--

Drainage Area 2			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.051	Grass
Shallow Concentrated Flow	398.0	0.050	Grass
Total Length/Average Slope	498.0	0.051	--

Drainage Area 3			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.040	Grass
Shallow Concentrated Flow	572.5	0.062	Grass
Total Length/Average Slope	672.5	0.051	--

Drainage Area 4			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.055	Grass
Shallow Concentrated Flow	93.9	0.048	Grass
Sheet Flow	100.0	0.048	Grass
Shallow Concentrated Flow	927.9	0.071	Grass
Total Length/Average Slope	1221.8	0.056	--

Drainage Area 5			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	100.0	0.060	Grass
Shallow Concentrated Flow	72.5	0.056	Grass
Sheet Flow	80.0	0.052	Grass
Channel Flow	670.0	0.060	Grass w/ stone check dams
Pipe Flow	44.0	0.010	Culvert
Sheet Flow	100.0	0.054	Brush
Shallow Concentrated Flow	99.7	0.061	Brush
Shallow Concentrated Flow	245.4	0.085	Grass
Total Length/Average Slope	1411.6	0.055	--

Drainage Area 6			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	49.9	0.070	Woods - Poor
Sheet Flow	50.1	0.080	Meadow
Shallow Concentrated Flow	50.7	0.076	Meadow
Sheet Flow	100.0	0.076	Meadow
Shallow Concentrated Flow	16.6	0.087	Meadow

Sheet Flow	100.0	0.089	Meadow
Shallow Concentrated Flow	89.4	0.080	Meadow
Sheet Flow	100.0	0.066	Meadow
Shallow Concentrated Flow	105.2	0.059	Meadow
Shallow Concentrated Flow	58.9	0.020	Grass
Shallow Concentrated Flow	375.0	0.108	Grass
Shallow Concentrated Flow	142.9	0.092	Woods - Poor
Total Length/Average Slope	1238.70	0.075	--

Drainage Area 7			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	47.8	0.064	Woods - Poor
Sheet Flow	52.2	0.086	Meadow
Shallow Concentrated Flow	20.9	0.104	Meadow
Sheet Flow	100.0	0.115	Meadow
Shallow Concentrated Flow	7.3	0.115	Meadow
Sheet Flow	77.4	0.053	Meadow
Shallow Concentrated Flow	260.6	0.106	Meadow
Sheet Flow	100.0	0.119	Meadow
Shallow Concentrated Flow	8.7	0.114	Meadow
Sheet Flow	100.0	0.096	Meadow
Shallow Concentrated Flow	13.9	0.102	Meadow
Sheet Flow	97.0	0.102	Meadow
Sheet Flow	100.0	0.088	Meadow
Shallow Concentrated Flow	256.8	0.096	Meadow
Total Length/Average Slope	1242.60	0.097	--

Drainage Area 8			
Type	**Length (ft)**	**Slope (ft/ft)**	**Cover Type**
Sheet Flow	31.8	0.120	Woods - Poor
Sheet Flow	24.0	0.120	Grass
Sheet Flow	44.2	0.088	Meadow
Shallow Concentrated Flow	63.3	0.090	Meadow
Sheet Flow	100.0	0.097	Meadow
Shallow Concentrated Flow	17.9	0.113	Meadow
Sheet Flow	100.0	0.086	Meadow
Shallow Concentrated Flow	324.5	0.080	Meadow
Total Length/Average Slope	705.70	0.099	--

Ground Cover Acreages Post-Development			
Drainage Area	**Type**	**Area (acres)**	Check
1	Grass Cover (>75%) HSG D	2.28	
	Impervious	0.43	
	Total	**2.71**	2.71
2	Grass Cover (>75%) HSG D	1.67	
	Impervious	0.18	
	Total	**1.85**	1.85
3	Grass Cover (>75%) HSG D	4.34	
	Total	**4.34**	4.34
4	Grass Cover (>75%) HSG D	7.11	
	Woods - Poor HSG D	0.06	
	Total	**7.17**	7.17
5	Grass Cover (>75%) HSG D	10.22	
	Woods - Poor HSG D	0.65	
	Brush - Poor HSG D	0.36	
	Total	**11.23**	11.23
6	Grass Cover (>75%) HSG D	3.85	
	Woods - Poor HSG D	0.48	
	Meadow HSG D	3.46	
	Impervious	0.02	
	Total	**7.81**	7.81
7	Woods - Poor HSG D	0.80	
	Meadow HSG D	6.86	
	Total	**7.66**	7.66
8	Woods - Poor HSG D	0.25	
	Meadow HSG D	2.93	
	Total	**3.18**	3.18
	Total	45.95	

Version 1.8
Last Updated: 11/09/2015

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

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?...		No
Design Point:	1	
P=	1.10	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**		
1	0.03	0.02	67%	0.65	78	Filter Strips		
2								
3								
4								
5								
6								
7								
8								
9								
10								
Subtotal (1-30)	0.03	0.02	67%	0.65	**78**	**Subtotal 1**		
Total	0.03	0.02	67%	0.65	**78**	**Initial WQv**	**0.00**	**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	0.03	0.02	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per*
Total	**0.03**	**0.02**	

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient Rv**	**WQv** *(ft^3)*		
"<<Initial WQv"	0.03	0.02	67%	0.65	78		
Subtract Area	-0.03	-0.02					
WQv adjusted after Area Reductions	**0.00**	**0.00**	0%	0.05	0		
Disconnection of Rooftops		0.00					
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.00	0.00	0%	0.05	**0**	**0.00**	**af**
WQv reduced by Area Reduction techniques					78	**0.00**	**af**

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**cf**	**cf**
Area/Volume Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.03	0.02		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.00		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive & Extensive)	RR-10	0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.00	0.00	0	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4				
	Bioretention & Infiltration Bioretention	F-5	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5				
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
	Wet Swale (O-2)	O-2				
	Totals by Area Reduction	→	0.03	0.02	78	
	Totals by Volume Reduction	→	0.00	0.00	0	
	Totals by Standard SMP w/RRV	→	0.00	0.00	0	0
	Totals by Standard SMP	→	0.00	0.00		0
	Totals (Area + Volume + all SMPs)	→	0.03	0.02	78	0
	Impervious Cover √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C		30%
D	**0.03**	20%
Total Area	0.03	
Calculate the Minimum RRv		
S =	**0.20**	
Impervious =	0.02	*acre*
Precipitation	1.1	*in*
Rv	0.95	
Minimum RRv	**15**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	78	*0.002*
30	Total RRV Provided	78	*0.002*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	15	*0.000*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	78	*0.002*
34	Sum of Volume Reduced and Treated	78	*0.002*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

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

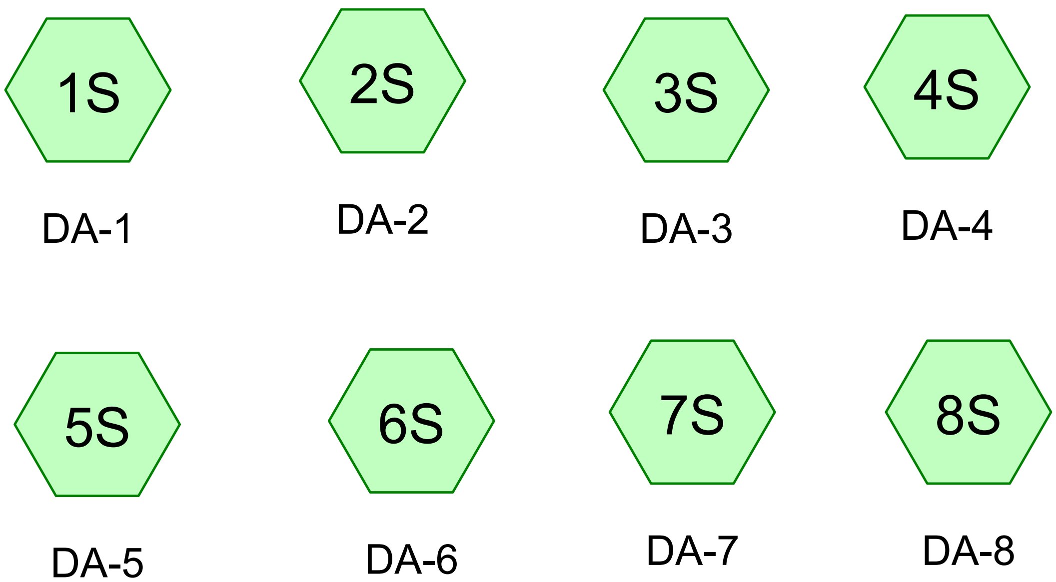
Filter Strip

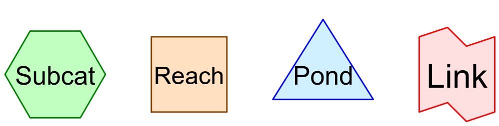
Design Point:	1						
Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	0.03	0.02	0.67	0.65	77.86	1.10	Filter Strips

Design Elements			
Is another area based practice applied to this area?	*Yes*	*Y/N*	*this practice is not applicable*
Amended Soils & Dense Turf Cover?	*Yes*	*Y/N*	
Is area protected from compaction from heavy equipment during construction?	*Yes*	*Y/N*	
Small Area of Impervious Area & close to source?	*Yes*	*Y/N*	
Composte Amendments?	*Yes*	*Y/N*	
Boundary Spreader?	*Yes*	*Y/N*	*Gravel Diaphram at top*
Boundary Zone?	*Yes*	*Y/N*	*25 feet of level grass*
Specify how sheet flow will be ensured.	GD		*level spreader shall be used for buffer slopes ranging from 3-15%*
Average contributing slope	10	*%*	*3% maximum unless a level spreader is*
Slope of first 10 feet of Filter Strip	2	*%*	*2% maximum*
Overall Slope	8	*%*	*8% maximum*
Contributing Length of Pervious Areas (PC)	10	*ft*	*150 ft maximum*
Contributing Length of Impervious areas (IC)	20	*ft*	*75 ft maximum*
Maximum PC Contributing Length for combination of PC & IC	130	*ft*	
Soil Group (HSG)	D		
Filter Strip Width	50	*ft*	*50 ft minimum for slopes 0-8%* *75 ft minimum for slopes 8-12%* *100 ft minimum for slopes 12-15%* *HSG C or D increase by 15-20%*
Are All Criteria for Filter Strips in Section 5.3.2 met?	*Yes*		
Area Reduction Adjustments			
Subtract	**0.03**	***Acres from total Area***	
Subtract	**0.02**	***Acres from total Impervious Area***	

FALSE

APPENDIX H – PRE-DEVELOPMENT ANALYSIS





Routing Diagram for MARDON PRE DEV DRAINAGE
Prepared by Tetra Tech Inc, Printed 11/14/2023
HydroCAD® 10.10-6a s/n 04051 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YR	Type II 24-hr		Default	24.00	1	2.18	2
2	10-YR	Type II 24-hr		Default	24.00	1	3.57	2
3	100-YR	Type II 24-hr		Default	24.00	1	5.93	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
27.990	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S)
0.360	83	Brush, Poor, HSG D (5S)
13.190	78	Meadow, non-grazed, HSG D (6S, 7S, 8S)
3.800	83	Woods, Poor, HSG D (4S, 5S, 6S, 7S, 8S)
0.610	98	impervious (1S, 2S)
45.950	**80**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
45.340	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S
0.610	Other	1S, 2S
45.950		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	27.990	0.000	27.990	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S
0.000	0.000	0.000	0.360	0.000	0.360	Brush, Poor	5S
0.000	0.000	0.000	13.190	0.000	13.190	Meadow, non-grazed	6S, 7S, 8S
0.000	0.000	0.000	3.800	0.000	3.800	Woods, Poor	4S, 5S, 6S, 7S, 8S
0.000	0.000	0.000	0.000	0.610	0.610	impervious	1S, 2S
0.000	**0.000**	**0.000**	**45.340**	**0.610**	**45.950**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>0.74"
Flow Length=548' Tc=12.4 min CN=83 Runoff=3.08 cfs 0.168 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>0.70"
Flow Length=498' Tc=11.8 min CN=82 Runoff=2.00 cfs 0.107 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>0.61"
Flow Length=673' Tc=13.9 min CN=80 Runoff=3.73 cfs 0.219 af

Subcatchment 4S: DA-4 Runoff Area=9.910 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=1,141' Tc=21.6 min CN=80 Runoff=6.64 cfs 0.498 af

Subcatchment 5S: DA-5 Runoff Area=8.490 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=1,157' Tc=20.5 min CN=80 Runoff=5.87 cfs 0.427 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.00% Impervious Runoff Depth>0.56"
Flow Length=1,224' Tc=21.6 min CN=79 Runoff=4.81 cfs 0.366 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>0.56"
Flow Length=1,343' Tc=22.0 min CN=79 Runoff=4.66 cfs 0.358 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>0.52"
Flow Length=706' Tc=15.3 min CN=78 Runoff=2.20 cfs 0.139 af

Total Runoff Area = 45.950 ac Runoff Volume = 2.282 af Average Runoff Depth = 0.60"
98.67% Pervious = 45.340 ac 1.33% Impervious = 0.610 ac

Summary for Subcatchment 1S: DA-1

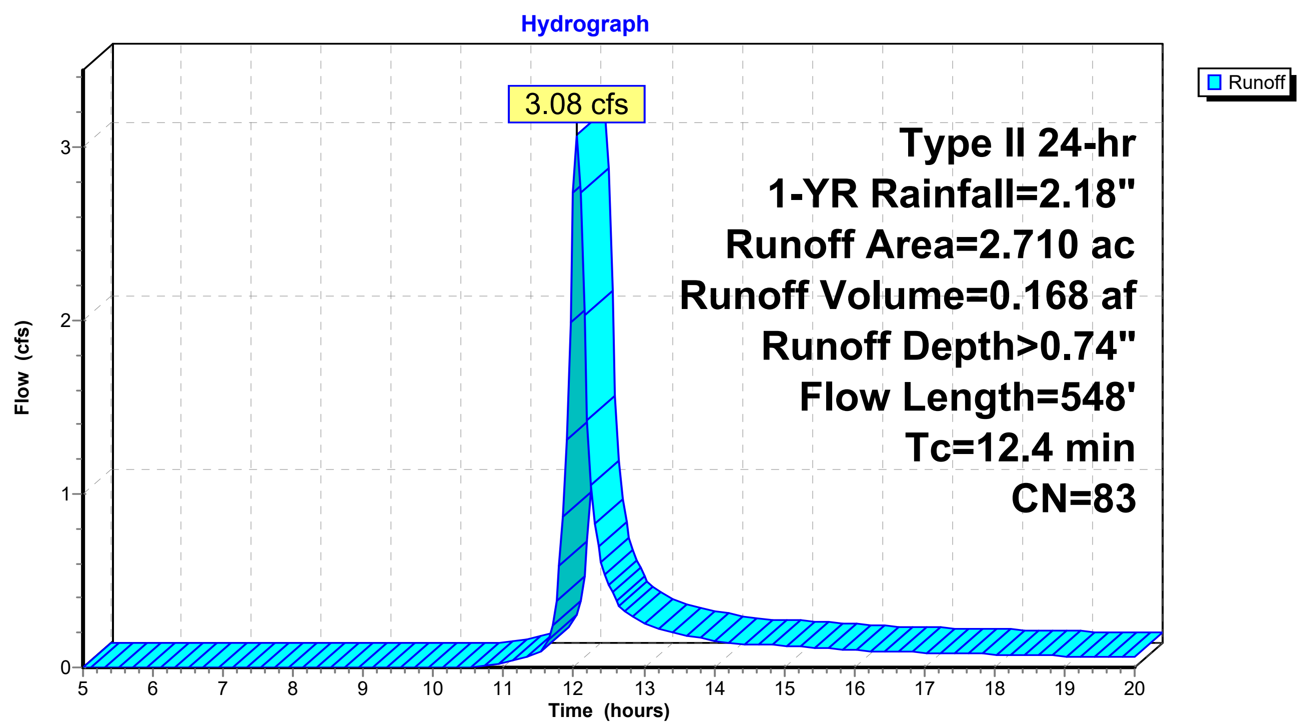
Runoff = 3.08 cfs @ 12.05 hrs, Volume= 0.168 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

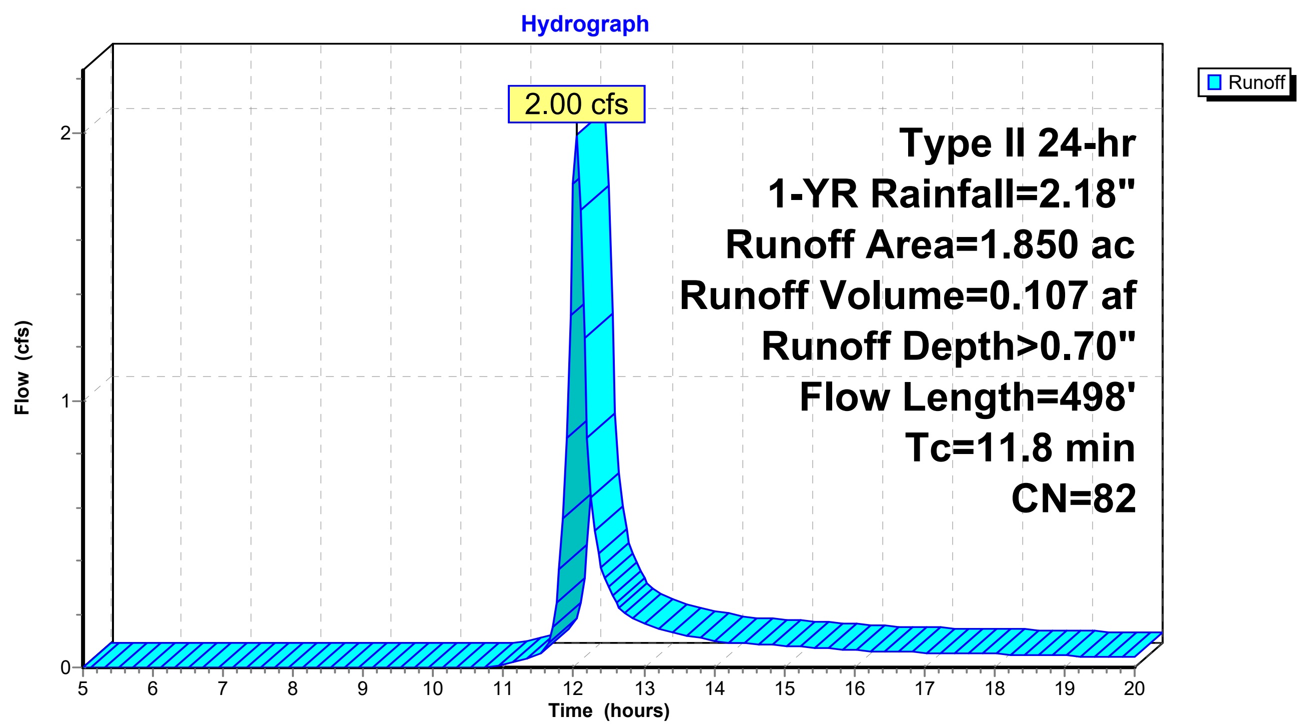
Runoff = 2.00 cfs @ 12.04 hrs, Volume= 0.107 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

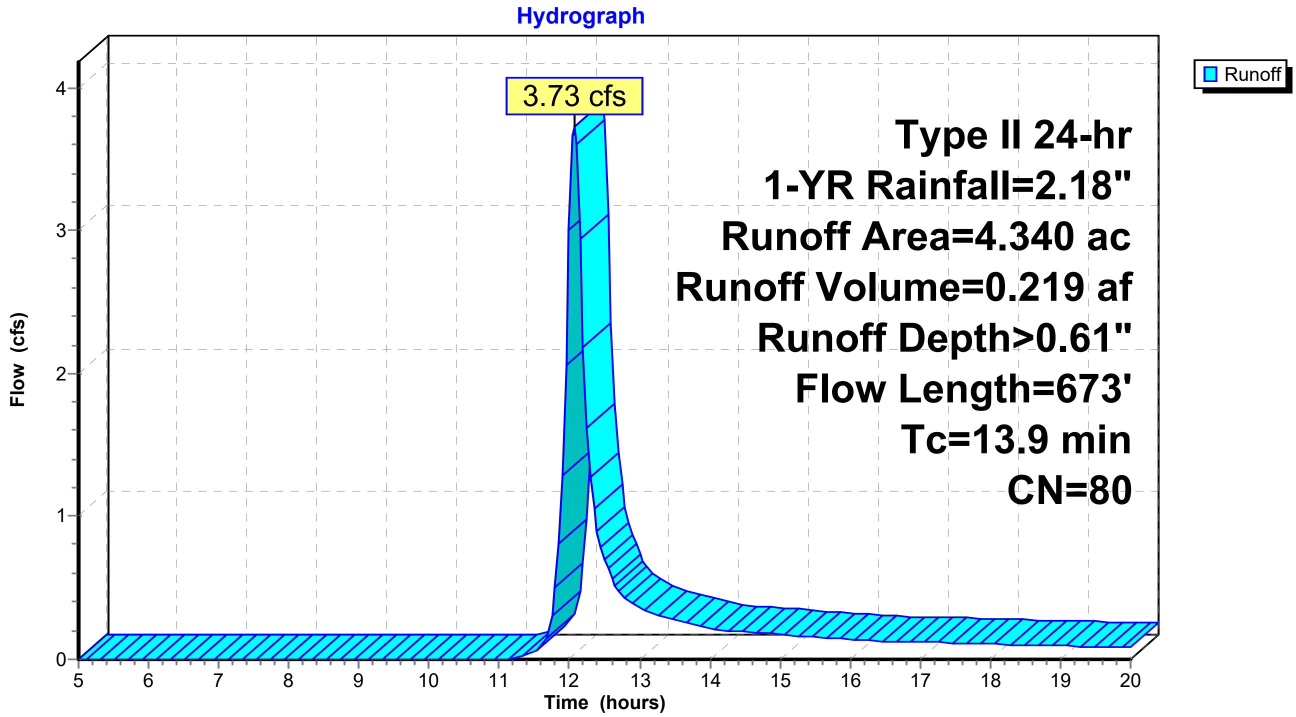
Runoff = 3.73 cfs @ 12.07 hrs, Volume= 0.219 af, Depth> 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

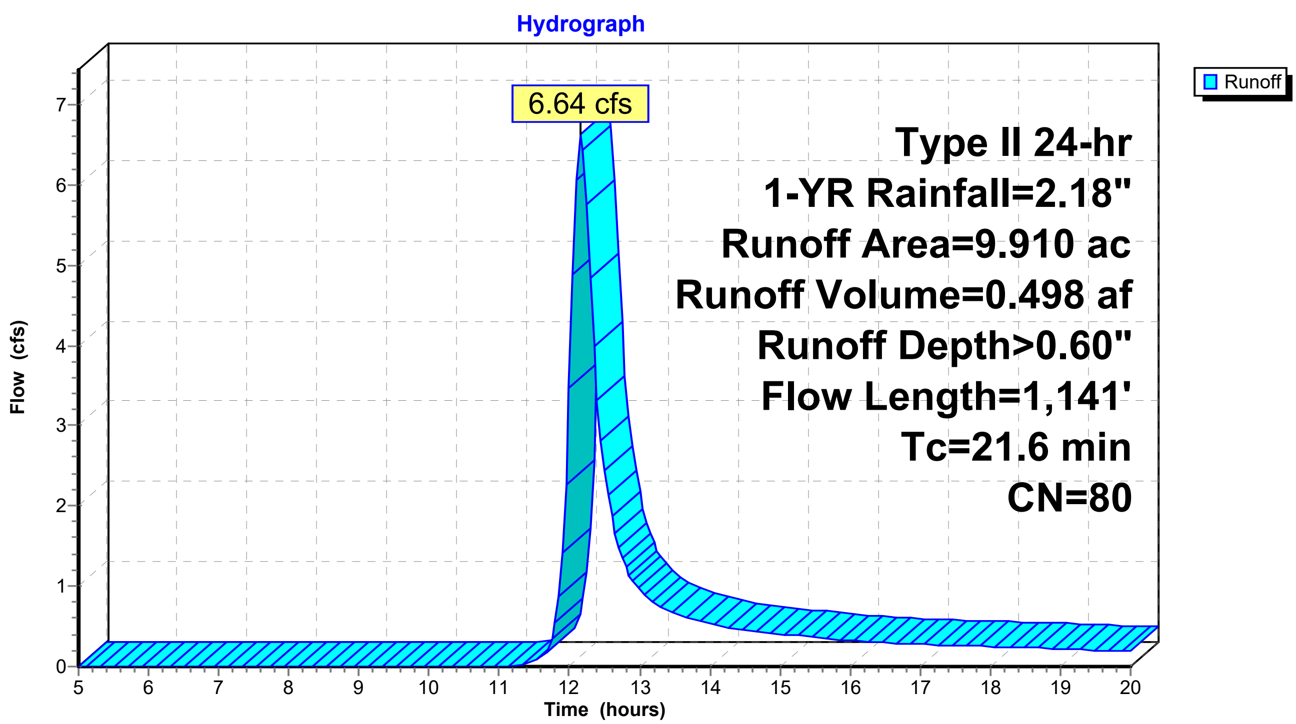
Runoff = 6.64 cfs @ 12.16 hrs, Volume= 0.498 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
9.510	80	>75% Grass cover, Good, HSG D
0.400	83	Woods, Poor, HSG D
9.910	80	Weighted Average
9.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	46	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.2	54	0.0650	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	505	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	44	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.5	492	0.0690	1.84		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.6	1,141	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

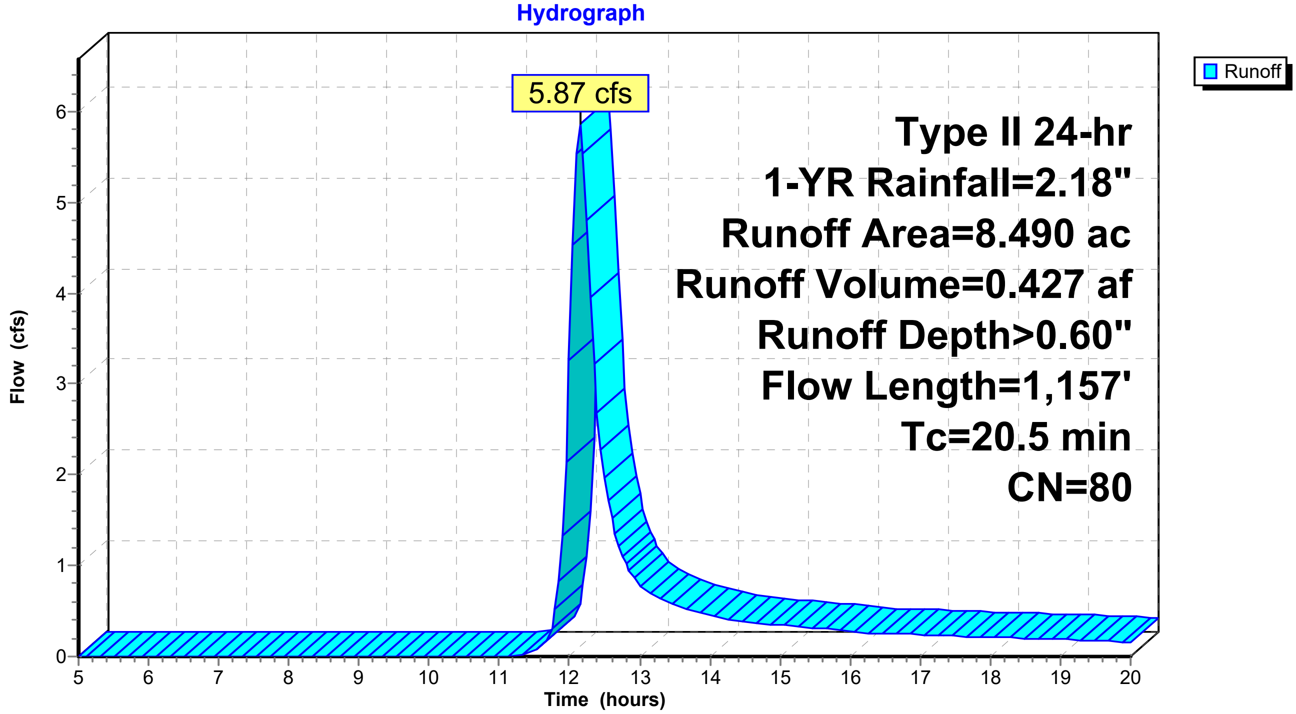
Runoff = 5.87 cfs @ 12.15 hrs, Volume= 0.427 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
7.150	80	>75% Grass cover, Good, HSG D
0.980	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
8.490	80	Weighted Average
8.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.0580	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.2	27	0.0670	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.0	53	0.0720	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
3.5	435	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0970	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	91	0.0780	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	27	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	200	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0810	1.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.5	1,157	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

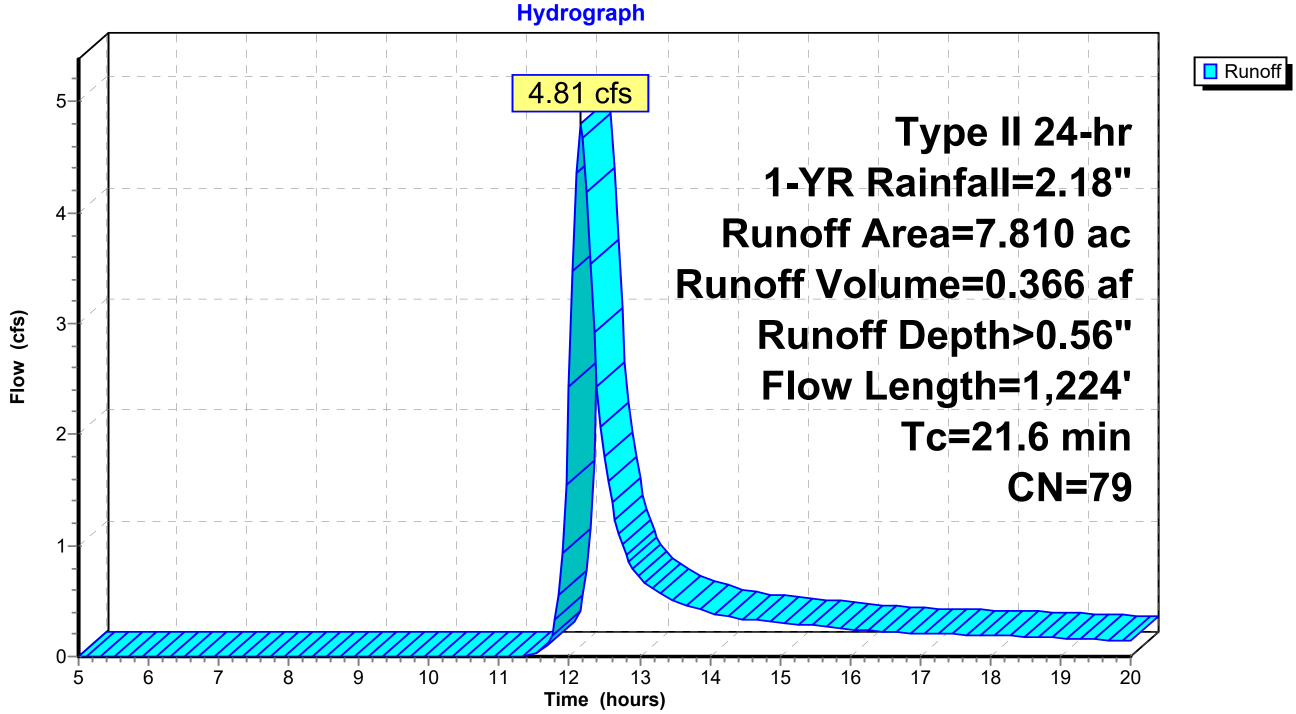
Runoff = 4.81 cfs @ 12.16 hrs, Volume= 0.366 af, Depth> 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
3.040	80	>75% Grass cover, Good, HSG D
3.900	78	Meadow, non-grazed, HSG D
0.870	83	Woods, Poor, HSG D
7.810	79	Weighted Average
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.6	50	0.0800	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.4	506	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	34	0.0720	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.2	441	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.6	1,224	Total			

Subcatchment 6S: DA-6



Summary for Subcatchment 7S: DA-7

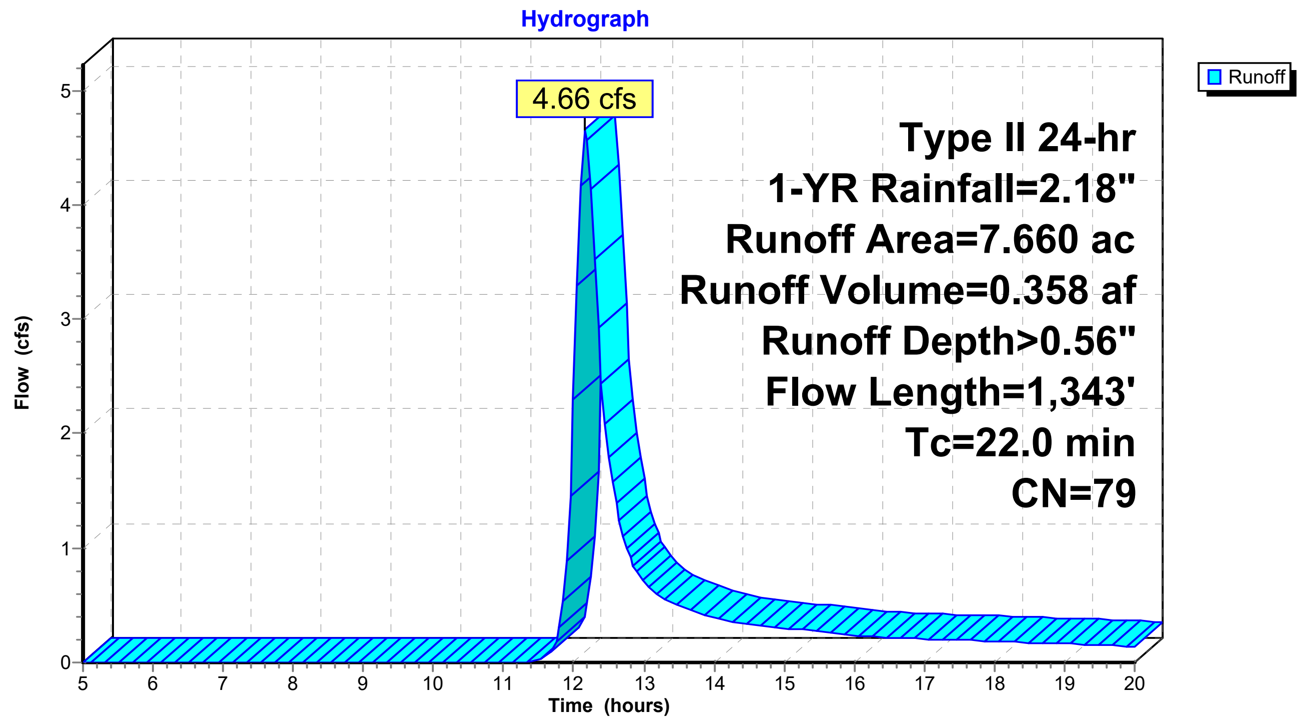
Runoff = 4.66 cfs @ 12.17 hrs, Volume= 0.358 af, Depth> 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
6.420	78	Meadow, non-grazed, HSG D
1.240	83	Woods, Poor, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.7	52	0.0860	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.3	538	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	661	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.0	1,343	Total			

Subcatchment 7S: DA-7



Summary for Subcatchment 8S: DA-8

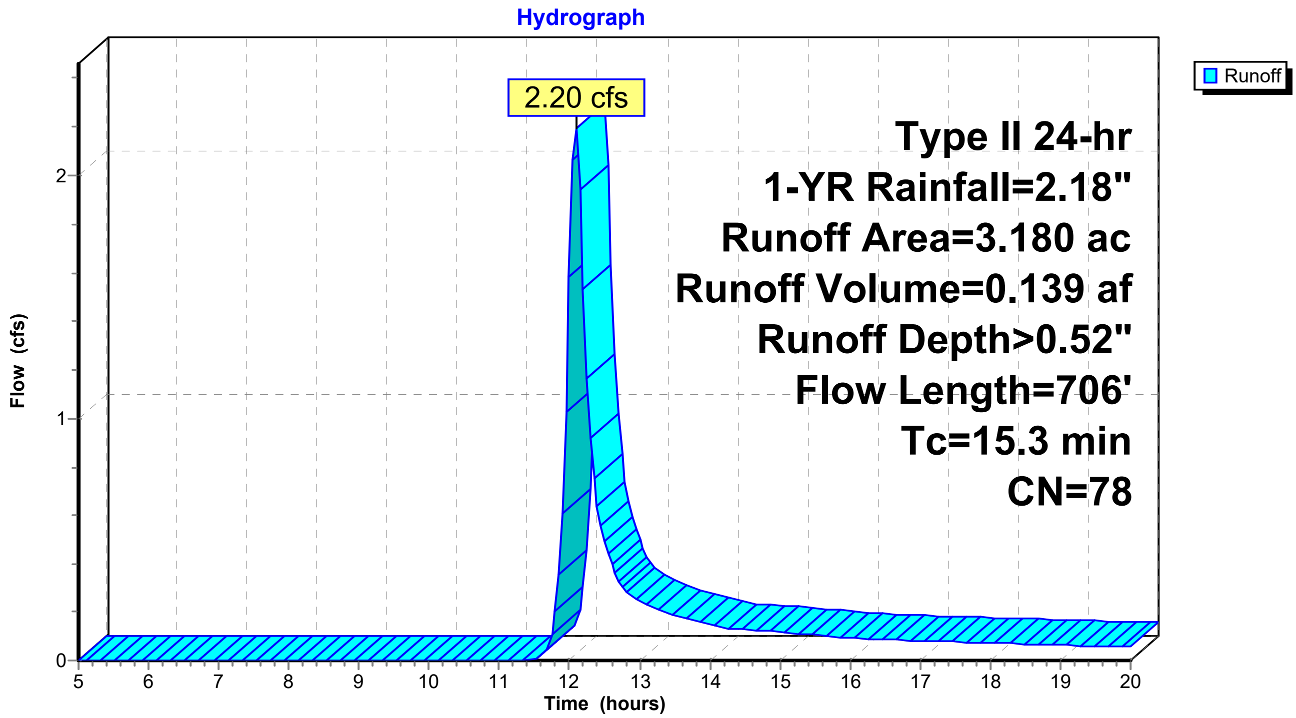
Runoff = 2.20 cfs @ 12.09 hrs, Volume= 0.139 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
2.870	78	Meadow, non-grazed, HSG D
0.310	83	Woods, Poor, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	56	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.0	44	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.9	606	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	706	Total			

Subcatchment 8S: DA-8



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>1.77"
Flow Length=548' Tc=12.4 min CN=83 Runoff=7.28 cfs 0.399 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>1.69"
Flow Length=498' Tc=11.8 min CN=82 Runoff=4.87 cfs 0.261 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=673' Tc=13.9 min CN=80 Runoff=9.78 cfs 0.560 af

Subcatchment 4S: DA-4 Runoff Area=9.910 ac 0.00% Impervious Runoff Depth>1.54"
Flow Length=1,141' Tc=21.6 min CN=80 Runoff=17.67 cfs 1.276 af

Subcatchment 5S: DA-5 Runoff Area=8.490 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=1,157' Tc=20.5 min CN=80 Runoff=15.59 cfs 1.093 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.00% Impervious Runoff Depth>1.48"
Flow Length=1,224' Tc=21.6 min CN=79 Runoff=13.29 cfs 0.961 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>1.48"
Flow Length=1,343' Tc=22.0 min CN=79 Runoff=12.90 cfs 0.942 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=706' Tc=15.3 min CN=78 Runoff=6.22 cfs 0.375 af

Total Runoff Area = 45.950 ac Runoff Volume = 5.867 af Average Runoff Depth = 1.53"
98.67% Pervious = 45.340 ac 1.33% Impervious = 0.610 ac

Summary for Subcatchment 1S: DA-1

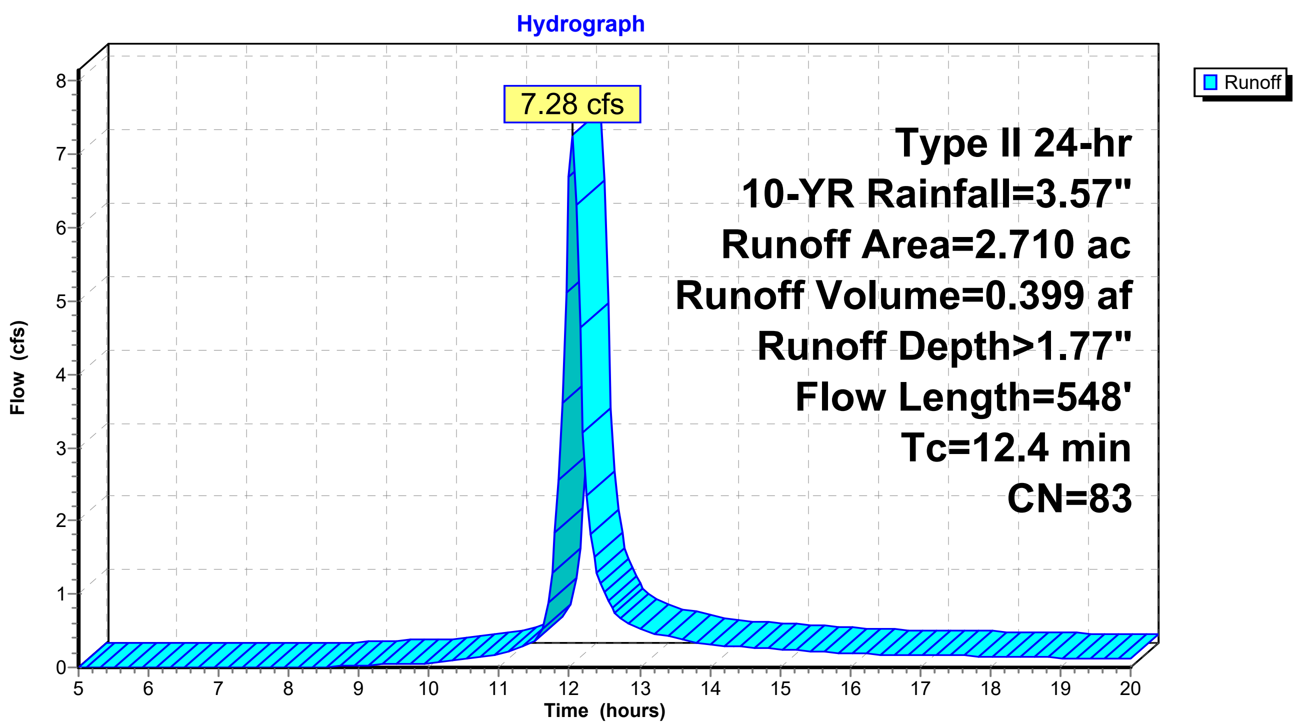
Runoff = 7.28 cfs @ 12.04 hrs, Volume= 0.399 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

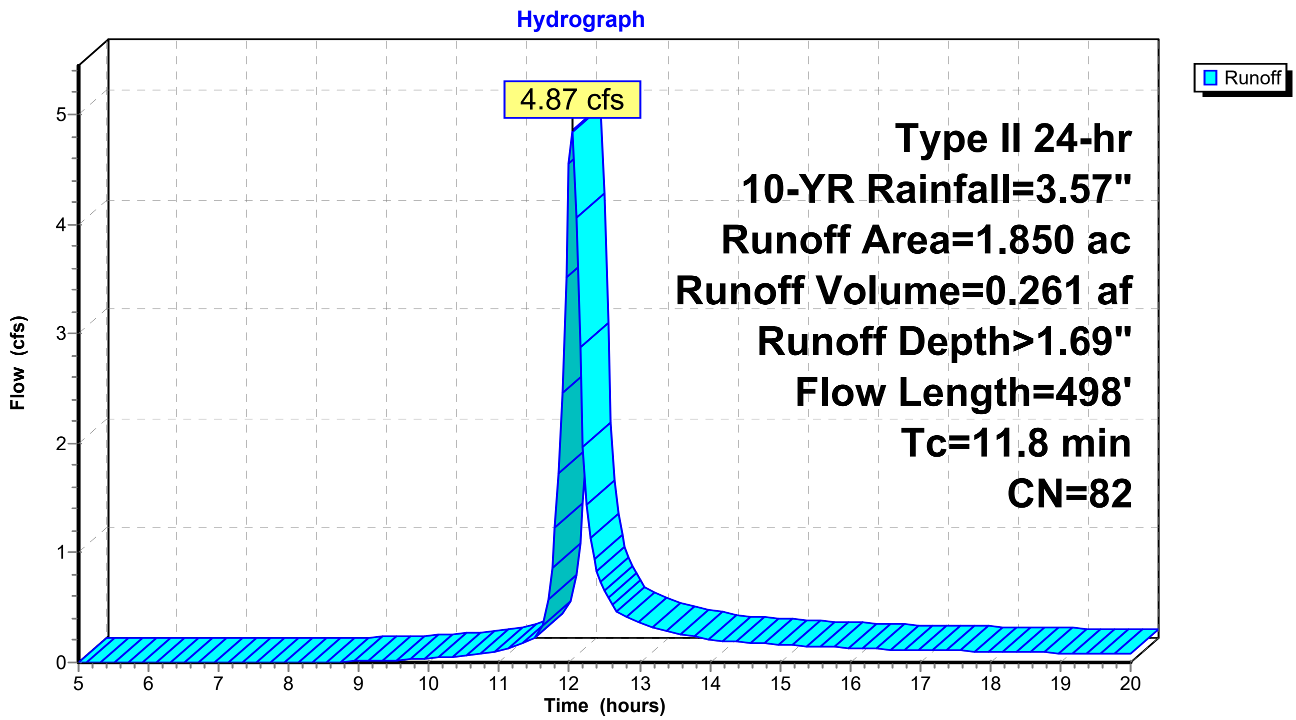
Runoff = 4.87 cfs @ 12.04 hrs, Volume= 0.261 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

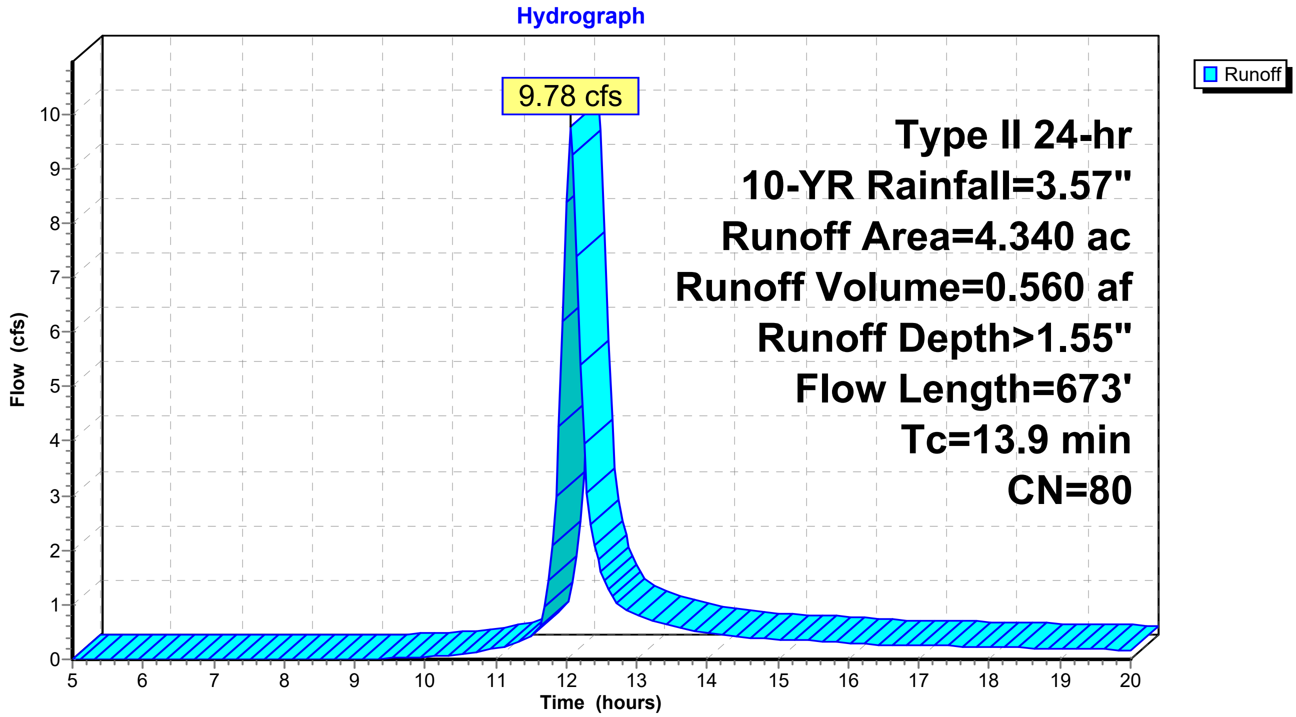
Runoff = 9.78 cfs @ 12.06 hrs, Volume= 0.560 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

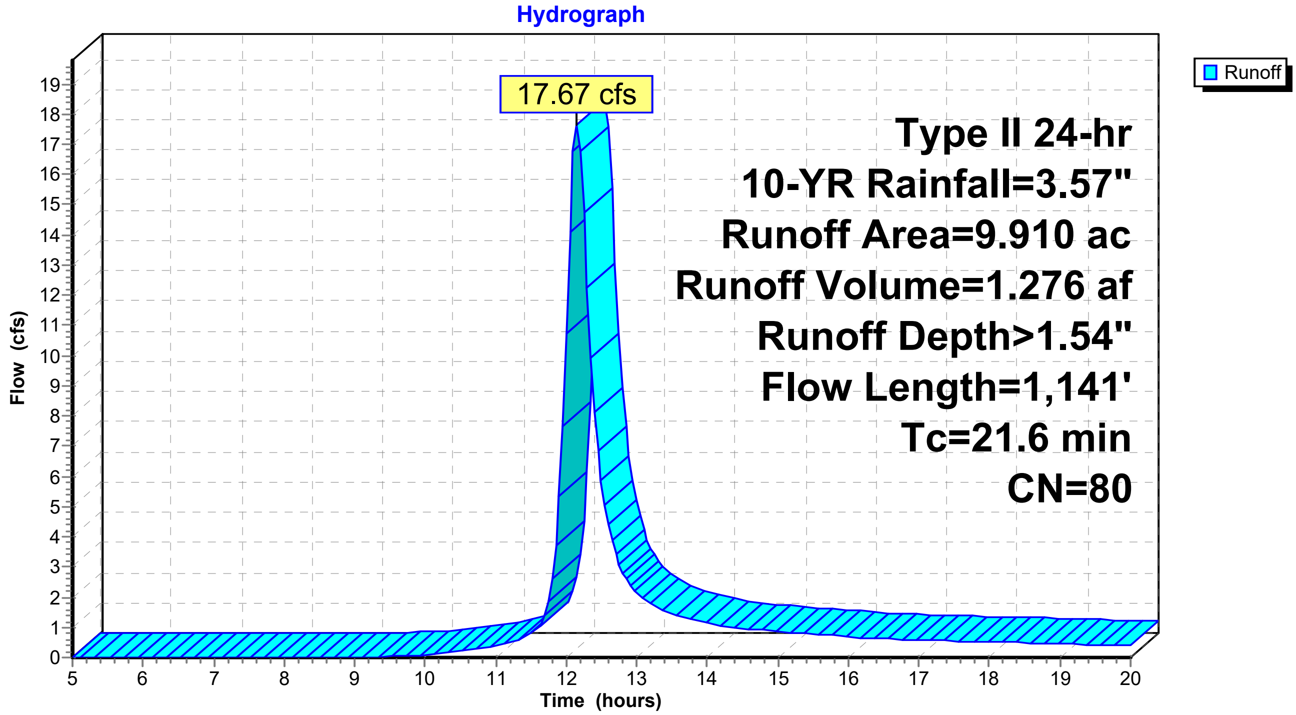
Runoff = 17.67 cfs @ 12.15 hrs, Volume= 1.276 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
9.510	80	>75% Grass cover, Good, HSG D
0.400	83	Woods, Poor, HSG D
9.910	80	Weighted Average
9.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	46	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.2	54	0.0650	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	505	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	44	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.5	492	0.0690	1.84		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.6	1,141	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

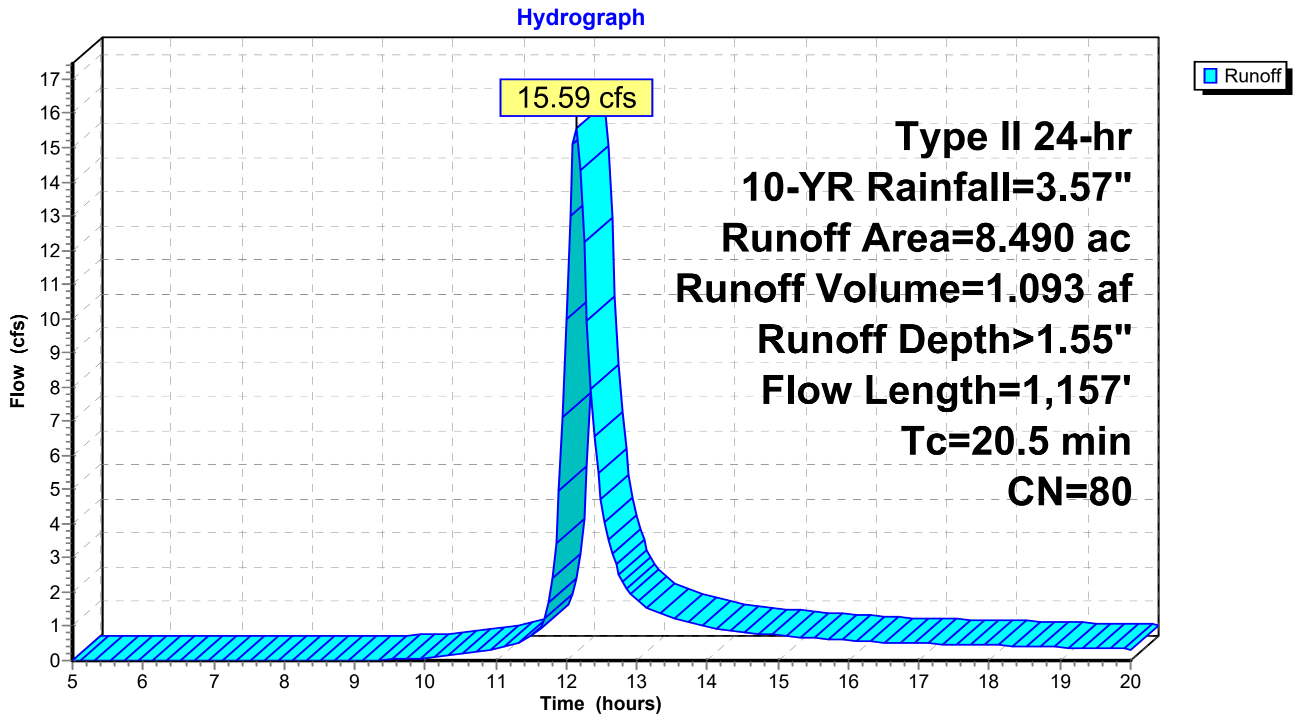
Runoff = 15.59 cfs @ 12.14 hrs, Volume= 1.093 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
7.150	80	>75% Grass cover, Good, HSG D
0.980	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
8.490	80	Weighted Average
8.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.0580	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.2	27	0.0670	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.0	53	0.0720	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
3.5	435	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0970	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	91	0.0780	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	27	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	200	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0810	1.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.5	1,157	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

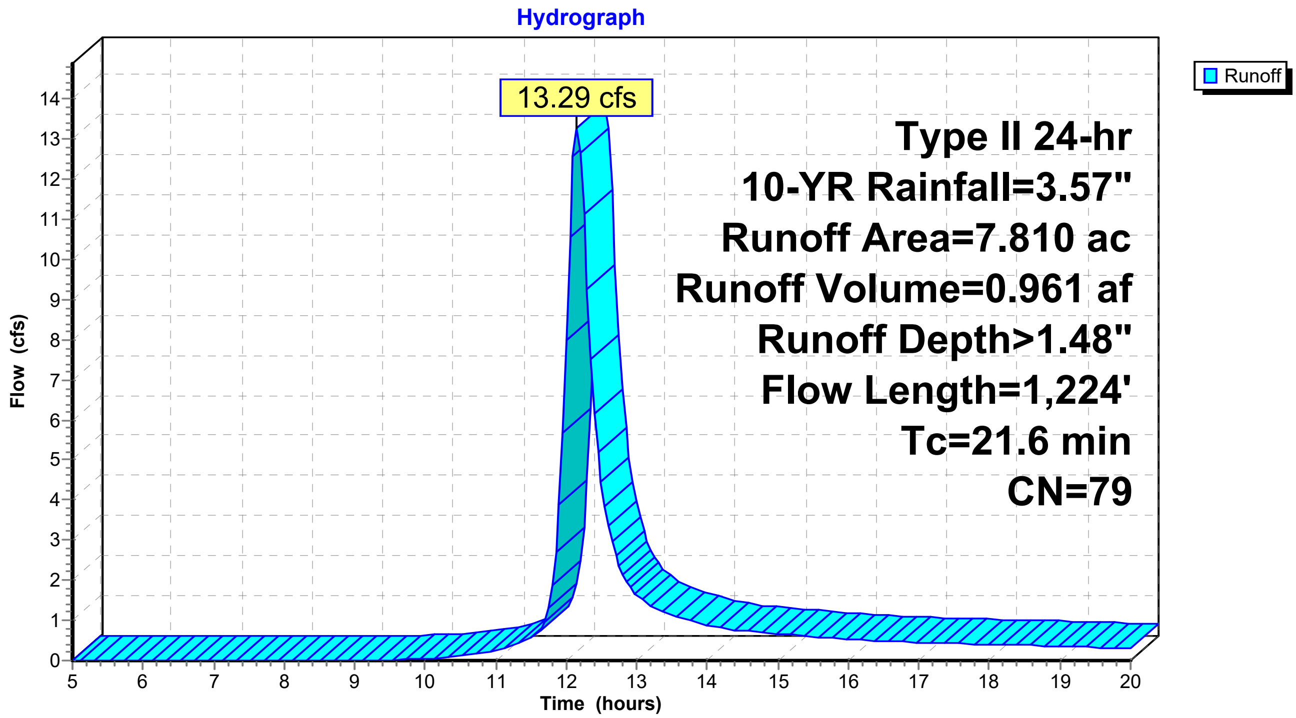
Runoff = 13.29 cfs @ 12.15 hrs, Volume= 0.961 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
3.040	80	>75% Grass cover, Good, HSG D
3.900	78	Meadow, non-grazed, HSG D
0.870	83	Woods, Poor, HSG D
7.810	79	Weighted Average
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.6	50	0.0800	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.4	506	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	34	0.0720	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.2	441	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.6	1,224	Total			

Subcatchment 6S: DA-6



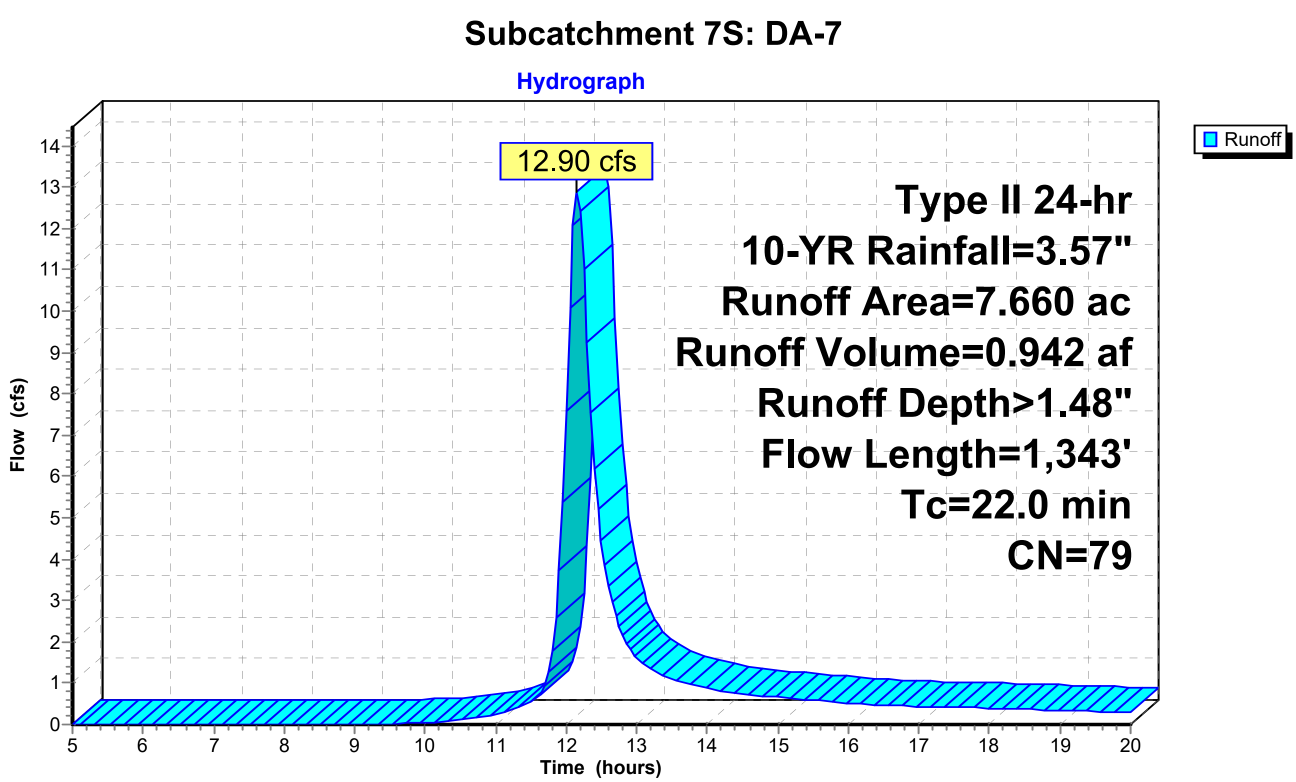
Summary for Subcatchment 7S: DA-7

Runoff = 12.90 cfs @ 12.16 hrs, Volume= 0.942 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
6.420	78	Meadow, non-grazed, HSG D
1.240	83	Woods, Poor, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.7	52	0.0860	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.3	538	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	661	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.0	1,343	Total			



Summary for Subcatchment 8S: DA-8

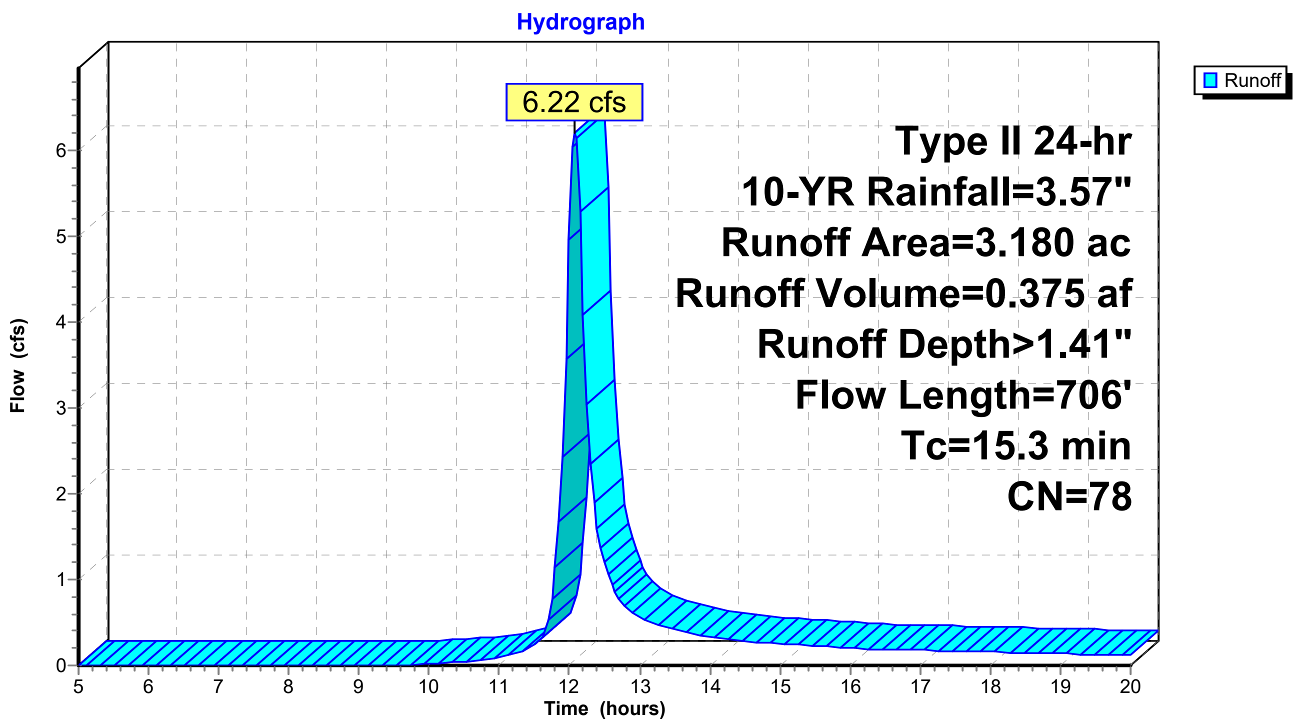
Runoff = 6.22 cfs @ 12.08 hrs, Volume= 0.375 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
2.870	78	Meadow, non-grazed, HSG D
0.310	83	Woods, Poor, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	56	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.0	44	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.9	606	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	706	Total			

Subcatchment 8S: DA-8



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>3.75"
Flow Length=548' Tc=12.4 min CN=83 Runoff=14.99 cfs 0.847 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>3.65"
Flow Length=498' Tc=11.8 min CN=82 Runoff=10.19 cfs 0.563 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>3.45"
Flow Length=673' Tc=13.9 min CN=80 Runoff=21.35 cfs 1.248 af

Subcatchment 4S: DA-4 Runoff Area=9.910 ac 0.00% Impervious Runoff Depth>3.44"
Flow Length=1,141' Tc=21.6 min CN=80 Runoff=38.95 cfs 2.842 af

Subcatchment 5S: DA-5 Runoff Area=8.490 ac 0.00% Impervious Runoff Depth>3.44"
Flow Length=1,157' Tc=20.5 min CN=80 Runoff=34.32 cfs 2.435 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=1,224' Tc=21.6 min CN=79 Runoff=29.90 cfs 2.176 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>3.34"
Flow Length=1,343' Tc=22.0 min CN=79 Runoff=29.03 cfs 2.134 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>3.25"
Flow Length=706' Tc=15.3 min CN=78 Runoff=14.18 cfs 0.862 af

Total Runoff Area = 45.950 ac Runoff Volume = 13.106 af Average Runoff Depth = 3.42"
98.67% Pervious = 45.340 ac 1.33% Impervious = 0.610 ac

Summary for Subcatchment 1S: DA-1

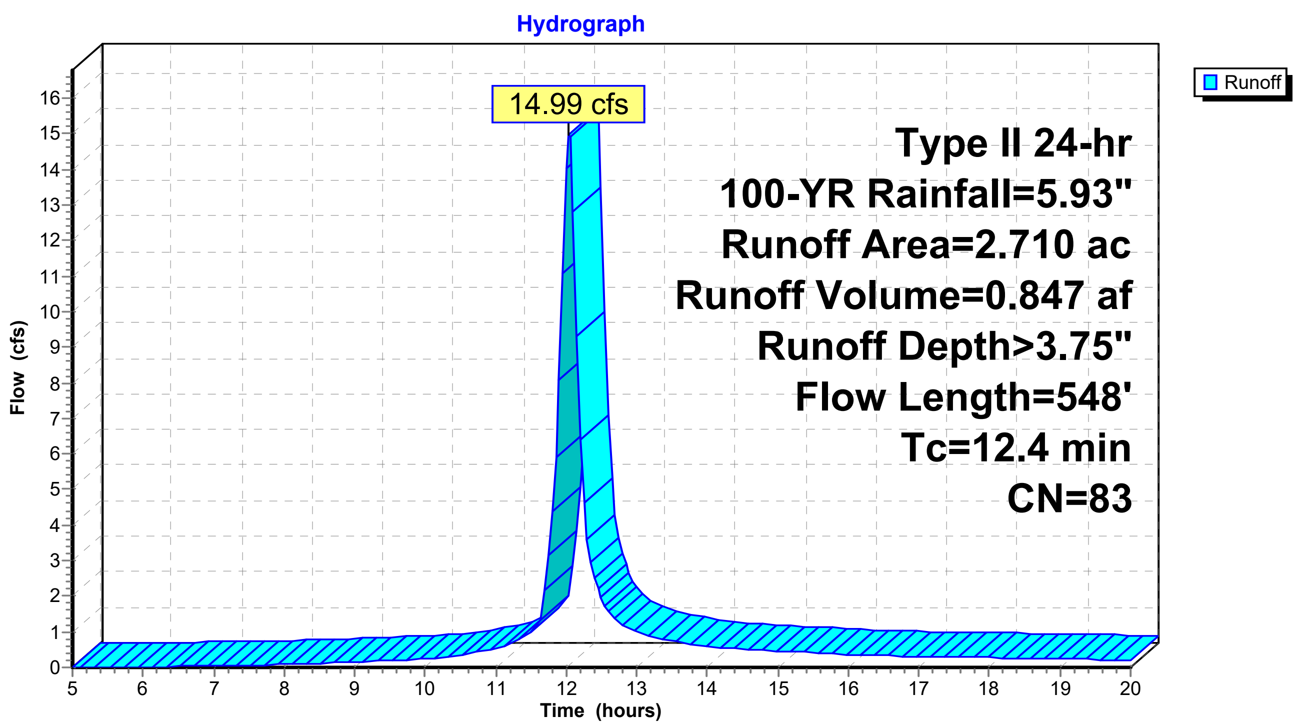
Runoff = 14.99 cfs @ 12.04 hrs, Volume= 0.847 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

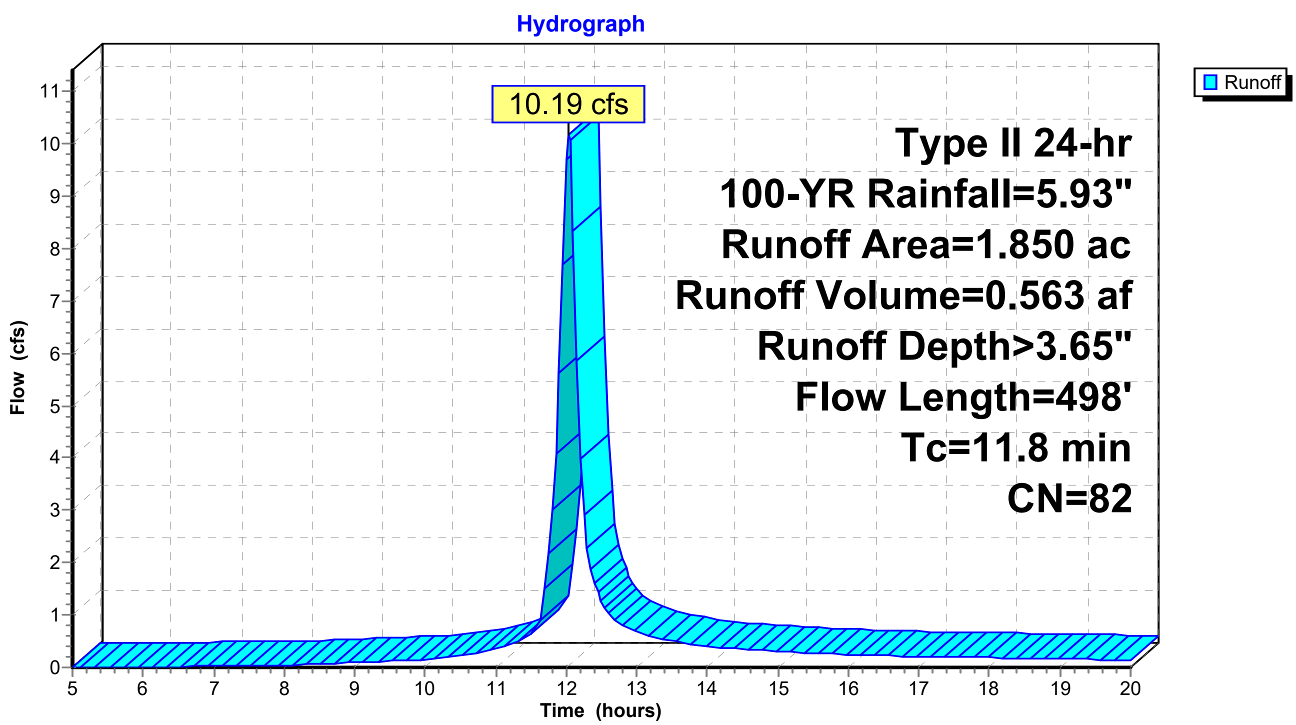
Runoff = 10.19 cfs @ 12.03 hrs, Volume= 0.563 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

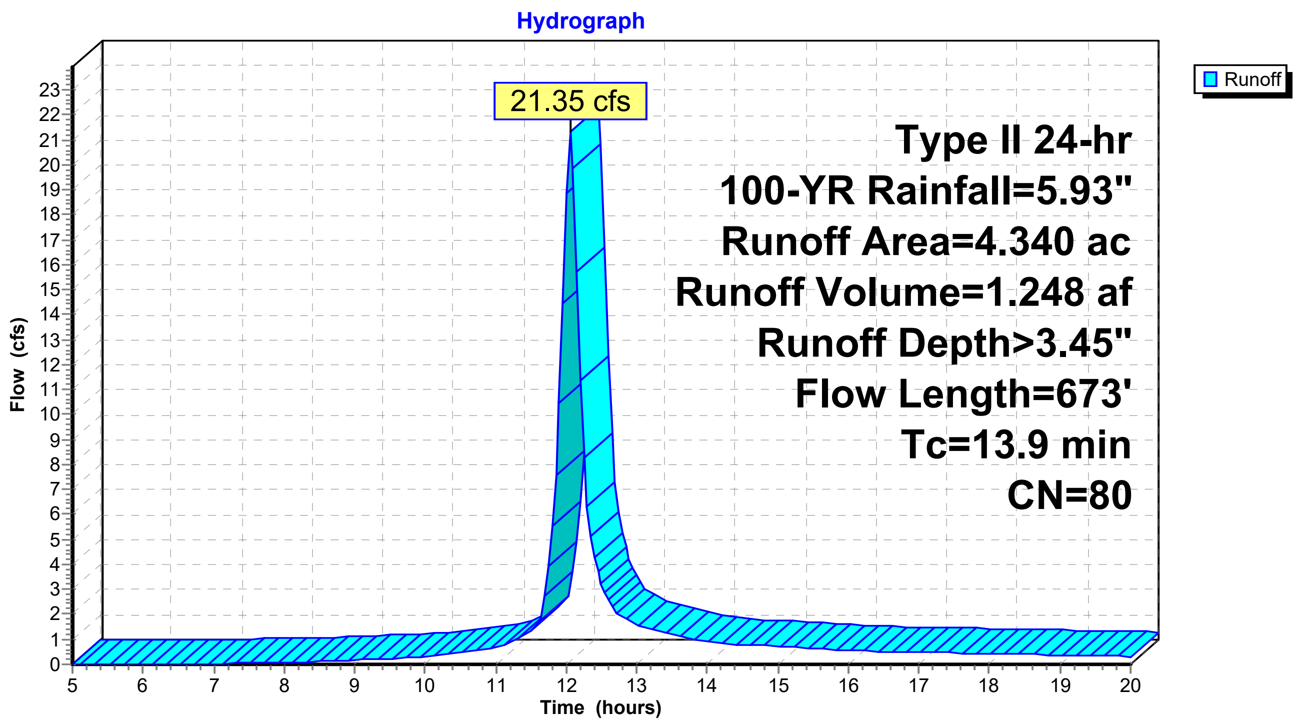
Runoff = 21.35 cfs @ 12.06 hrs, Volume= 1.248 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

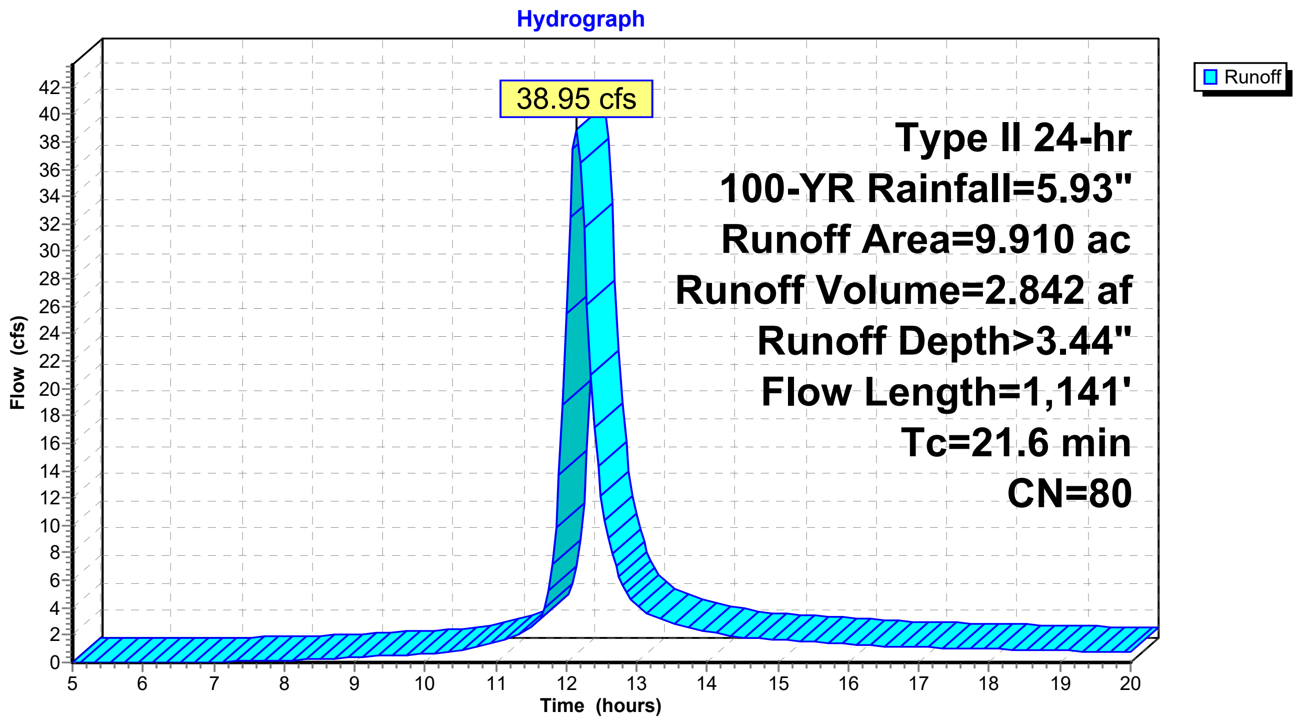
Runoff = 38.95 cfs @ 12.14 hrs, Volume= 2.842 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
9.510	80	>75% Grass cover, Good, HSG D
0.400	83	Woods, Poor, HSG D
9.910	80	Weighted Average
9.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	46	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.2	54	0.0650	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	505	0.0830	2.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	44	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.5	492	0.0690	1.84		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.6	1,141	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

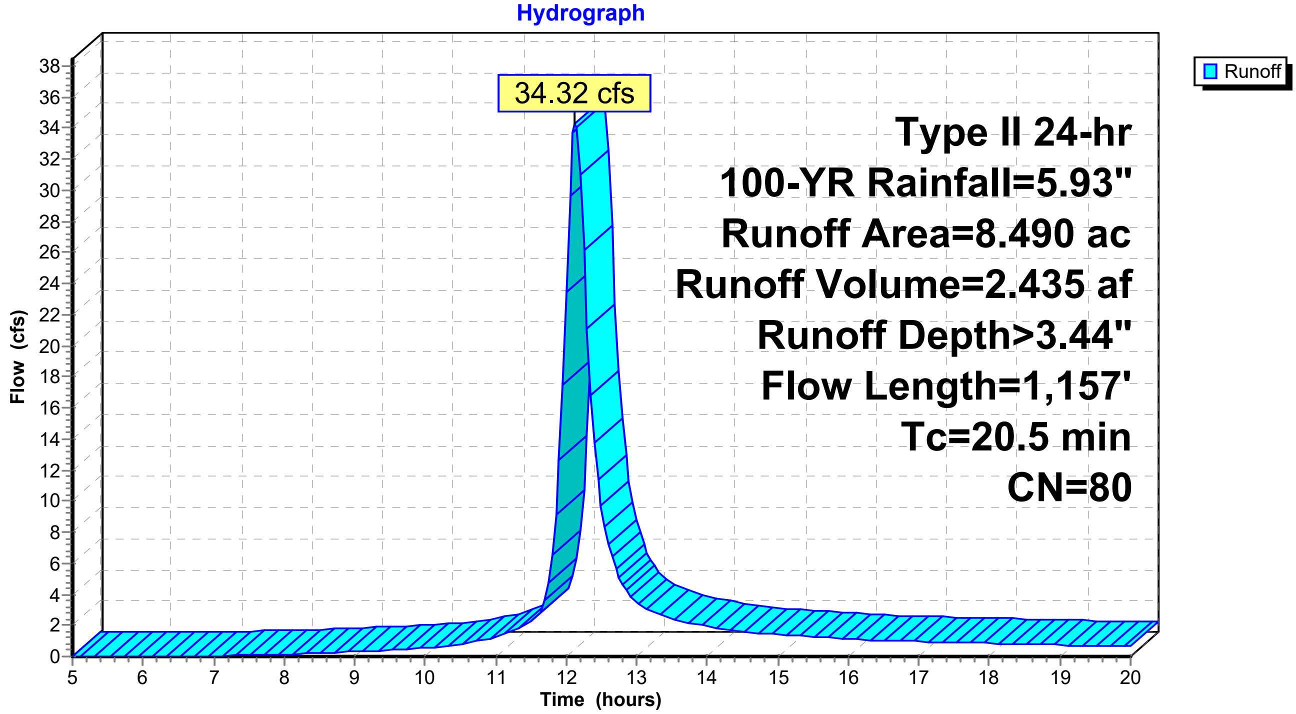
Runoff = 34.32 cfs @ 12.13 hrs, Volume= 2.435 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
7.150	80	>75% Grass cover, Good, HSG D
0.980	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
8.490	80	Weighted Average
8.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.0580	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.2	27	0.0670	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
4.0	53	0.0720	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
3.5	435	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0970	1.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	91	0.0780	1.95		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	27	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	20	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	200	0.0570	1.67		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0810	1.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.5	1,157	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

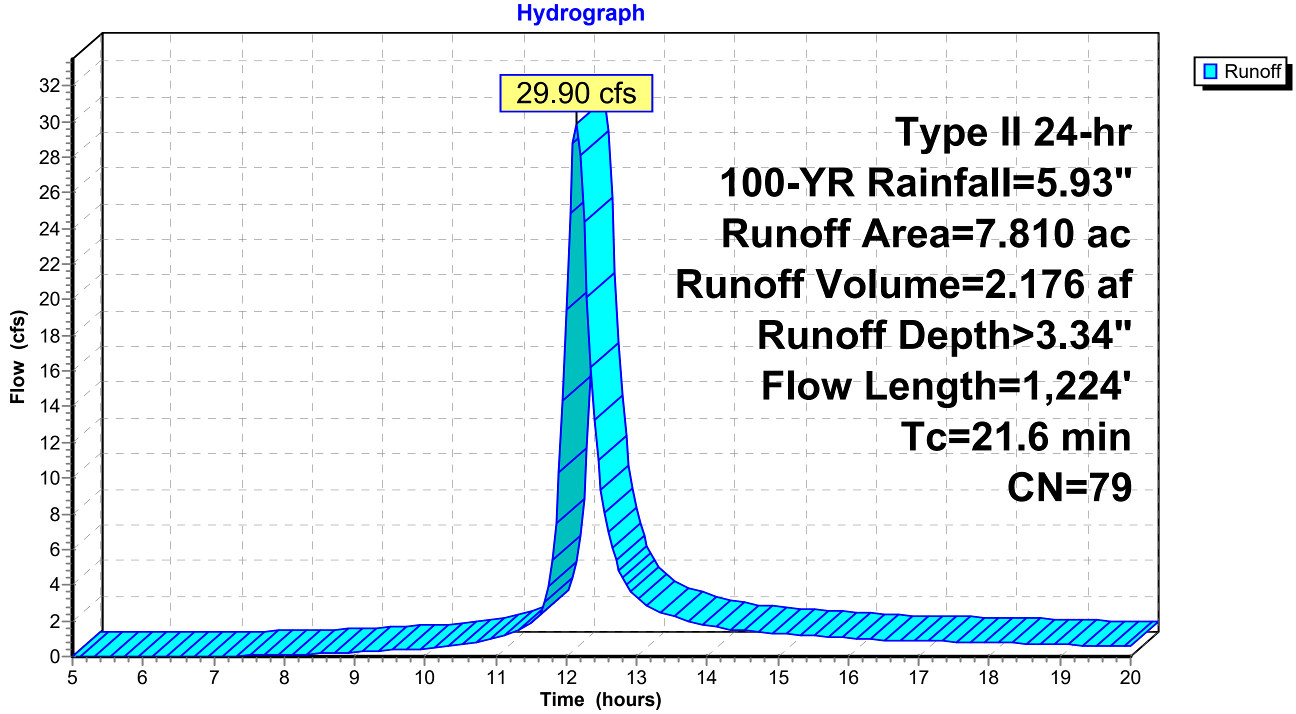
Runoff = 29.90 cfs @ 12.14 hrs, Volume= 2.176 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
3.040	80	>75% Grass cover, Good, HSG D
3.900	78	Meadow, non-grazed, HSG D
0.870	83	Woods, Poor, HSG D
7.810	79	Weighted Average
7.810		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.6	50	0.0800	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.4	506	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	34	0.0720	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.2	441	0.1050	2.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.6	1,224	Total			

Subcatchment 6S: DA-6



Summary for Subcatchment 7S: DA-7

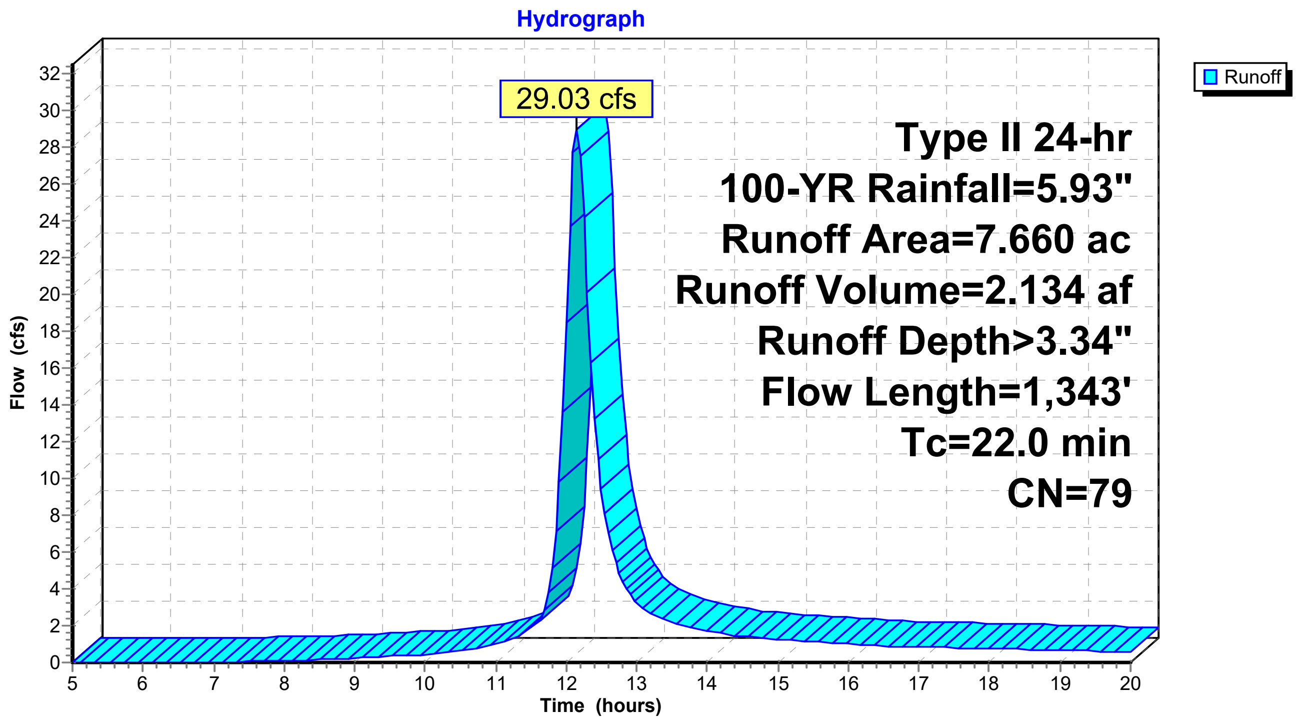
Runoff = 29.03 cfs @ 12.15 hrs, Volume= 2.134 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
6.420	78	Meadow, non-grazed, HSG D
1.240	83	Woods, Poor, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.7	52	0.0860	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.3	538	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.1	661	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.0	1,343	Total			

Subcatchment 7S: DA-7



Summary for Subcatchment 8S: DA-8

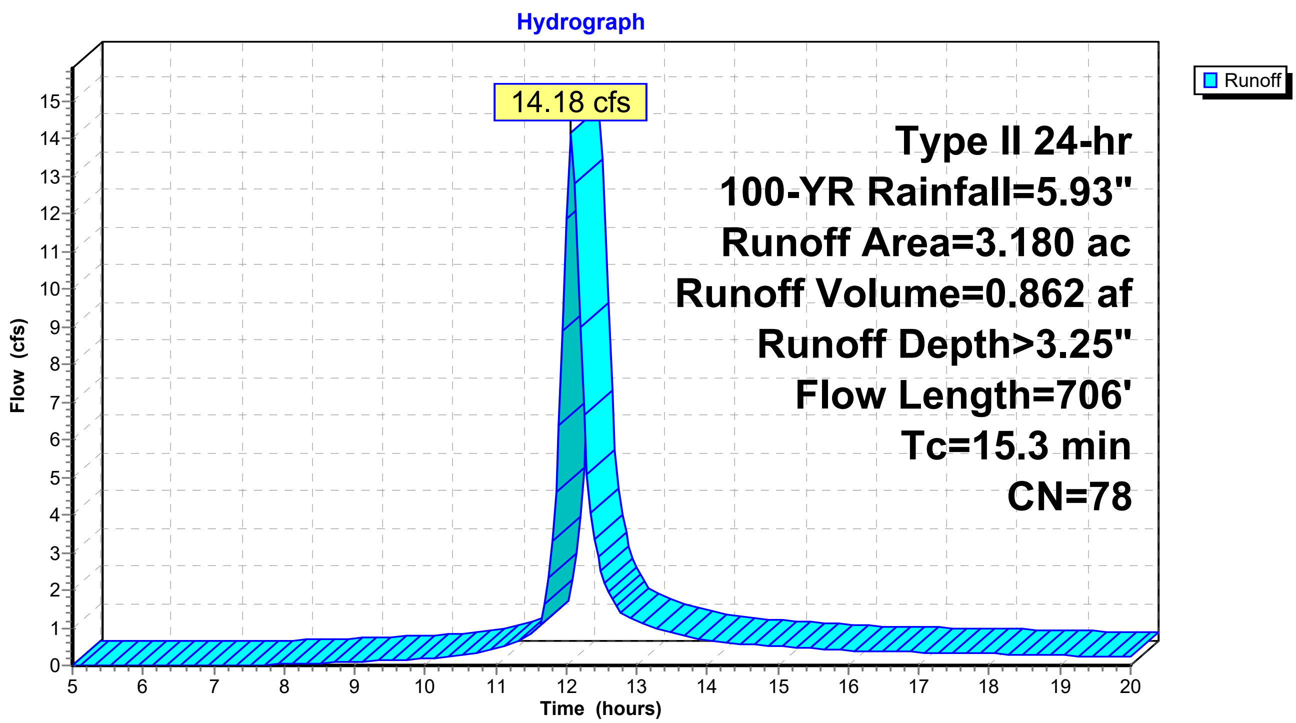
Runoff = 14.18 cfs @ 12.07 hrs, Volume= 0.862 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

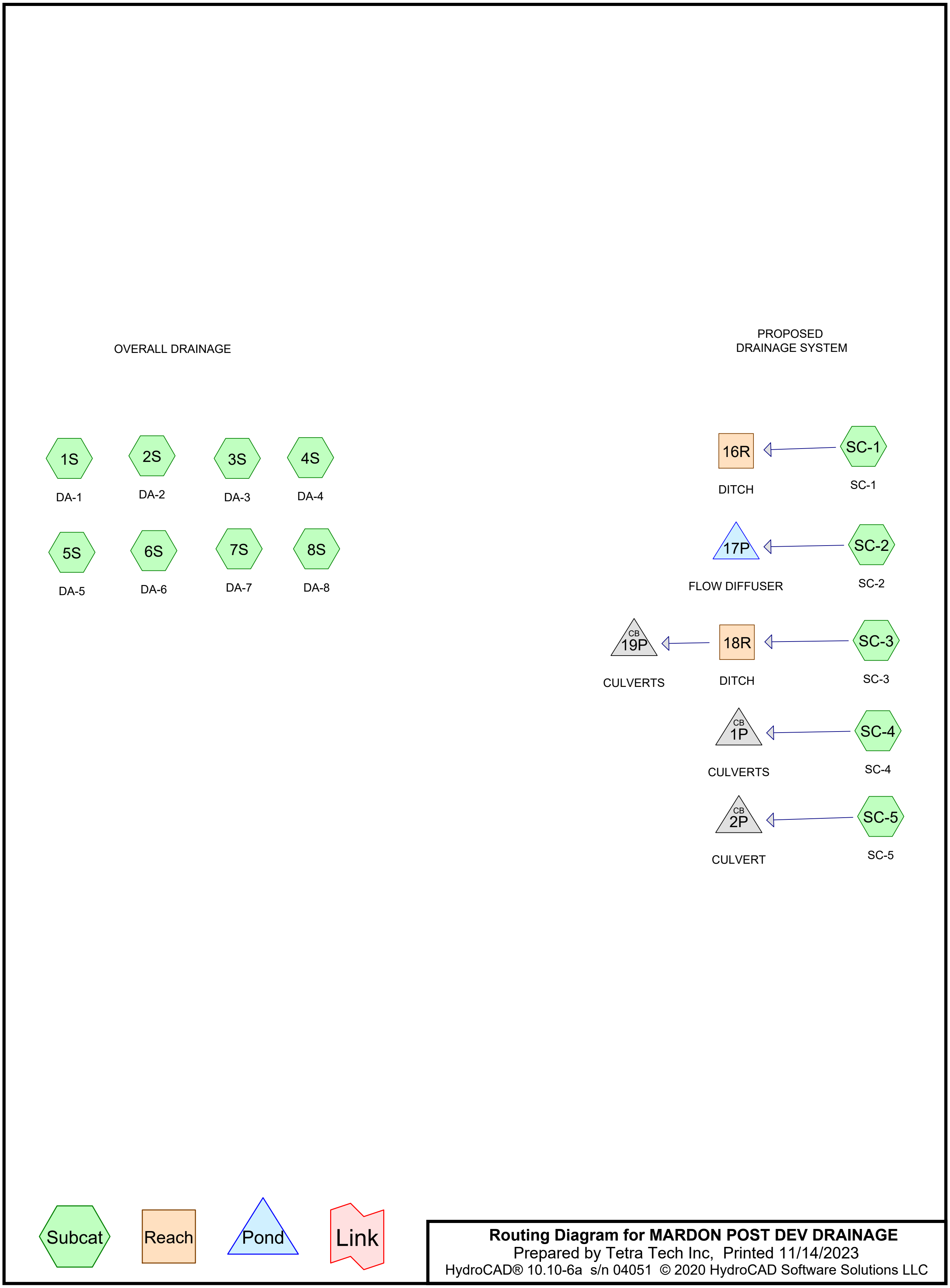
Area (ac)	CN	Description
2.870	78	Meadow, non-grazed, HSG D
0.310	83	Woods, Poor, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	56	0.1200	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.0	44	0.1000	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.9	606	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.3	706	Total			

Subcatchment 8S: DA-8



APPENDIX I – POST-DEVELOPMENT ANALYSIS


OVERALL DRAINAGE
1S
DA-1
2S
DA-2
3S
DA-3
4S
DA-4
5S
DA-5
6S
DA-6
7S
DA-7
8S
DA-8
PROPOSED
DRAINAGE SYSTEM
16R
DITCH
SC-1
SC-1
17P
FLOW DIFFUSER
SC-2
SC-2
CB
19P
CULVERTS
18R
DITCH
SC-3
SC-3
CB
1P
CULVERTS
SC-4
SC-4
CB
2P
CULVERT
SC-5
SC-5
Subcat
Reach
Pond
Link
Routing Diagram for MARDON POST DEV DRAINAGE
Prepared by Tetra Tech Inc, Printed 11/14/2023
HydroCAD® 10.10-6a s/n 04051 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YR	Type II 24-hr		Default	24.00	1	2.18	2
2	10-YR	Type II 24-hr		Default	24.00	1	3.57	2
3	100-YR	Type II 24-hr		Default	24.00	1	5.93	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
34.660	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, SC-1, SC-2, SC-3, SC-4)
0.360	83	Brush, Poor, HSG D (5S)
0.020	98	Impervious (6S)
13.430	78	Meadow, non-grazed, HSG D (6S, 7S, 8S, SC-5)
2.460	83	Woods, Poor, HSG D (4S, 5S, 6S, 7S, 8S, SC-4)
0.610	98	impervious (1S, 2S)
51.540	**80**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
50.910	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, SC-1, SC-2, SC-3, SC-4, SC-5
0.630	Other	1S, 2S, 6S
51.540		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	34.660	0.000	34.660	>75% Grass cover, Good	1S, 2S, 3S, 4S, 5S, 6S, SC-1, SC-2, SC-3, SC-4
0.000	0.000	0.000	0.360	0.000	0.360	Brush, Poor	5S
0.000	0.000	0.000	0.000	0.020	0.020	Impervious	6S
0.000	0.000	0.000	13.430	0.000	13.430	Meadow, non-grazed	6S, 7S, 8S, SC-5
0.000	0.000	0.000	2.460	0.000	2.460	Woods, Poor	4S, 5S, 6S, 7S, 8S, SC-4
0.000	0.000	0.000	0.000	0.610	0.610	impervious	1S, 2S
0.000	**0.000**	**0.000**	**50.910**	**0.630**	**51.540**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	5S	0.00	0.00	44.0	0.0100	0.013	0.0	12.0	0.0
2	1P	802.00	798.50	47.0	0.0745	0.013	0.0	15.0	0.0
3	2P	795.00	794.00	31.0	0.0323	0.013	0.0	12.0	0.0
4	19P	805.20	804.80	35.0	0.0114	0.013	0.0	15.0	0.0

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>0.74"
Flow Length=548' Tc=12.4 min CN=83 Runoff=3.08 cfs 0.168 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>0.70"
Flow Length=498' Tc=11.8 min CN=82 Runoff=2.00 cfs 0.107 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>0.61"
Flow Length=673' Tc=13.9 min CN=80 Runoff=3.73 cfs 0.219 af

Subcatchment 4S: DA-4 Runoff Area=7.170 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=1,222' Tc=24.5 min CN=80 Runoff=4.42 cfs 0.360 af

Subcatchment 5S: DA-5 Runoff Area=11.230 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=1,412' Tc=29.1 min CN=80 Runoff=6.17 cfs 0.563 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.26% Impervious Runoff Depth>0.55"
Flow Length=1,239' Tc=49.5 min CN=79 Runoff=2.69 cfs 0.360 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>0.55"
Flow Length=1,243' Tc=68.6 min CN=79 Runoff=2.06 cfs 0.349 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>0.52"
Flow Length=706' Tc=32.0 min CN=78 Runoff=1.37 cfs 0.138 af

Subcatchment SC-1: SC-1 Runoff Area=0.520 ac 0.00% Impervious Runoff Depth>0.61"
Flow Length=262' Tc=9.0 min CN=80 Runoff=0.54 cfs 0.026 af

Subcatchment SC-2: SC-2 Runoff Area=0.330 ac 0.00% Impervious Runoff Depth>0.61"
Flow Length=179' Tc=7.7 min CN=80 Runoff=0.36 cfs 0.017 af

Subcatchment SC-3: SC-3 Runoff Area=2.420 ac 0.00% Impervious Runoff Depth>0.61"
Flow Length=608' Tc=11.1 min CN=80 Runoff=2.31 cfs 0.122 af

Subcatchment SC-4: SC-4 Runoff Area=2.140 ac 0.00% Impervious Runoff Depth>0.60"
Flow Length=728' Tc=17.8 min CN=80 Runoff=1.61 cfs 0.108 af

Subcatchment SC-5: SC-5 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>0.53"
Flow Length=200' Tc=9.7 min CN=78 Runoff=0.15 cfs 0.008 af

Reach 16R: DITCH Avg. Flow Depth=0.11' Max Vel=2.00 fps Inflow=0.54 cfs 0.026 af
n=0.035 L=165.0' S=0.0503 '/' Capacity=161.59 cfs Outflow=0.51 cfs 0.026 af

Reach 18R: DITCH Avg. Flow Depth=0.24' Max Vel=3.29 fps Inflow=2.31 cfs 0.122 af
n=0.035 L=670.0' S=0.0582 '/' Capacity=173.82 cfs Outflow=2.11 cfs 0.121 af

Pond 1P: CULVERTS Peak Elev=802.42' Inflow=1.61 cfs 0.108 af
15.0" Round Culvert x 2.00 n=0.013 L=47.0' S=0.0745 '/' Outflow=1.61 cfs 0.108 af

Pond 2P: CULVERT Peak Elev=795.19' Inflow=0.15 cfs 0.008 af
12.0" Round Culvert n=0.013 L=31.0' S=0.0323 '/' Outflow=0.15 cfs 0.008 af

Pond 17P: FLOW DIFFUSER Peak Elev=850.00' Storage=0.002 af Inflow=0.36 cfs 0.017 af
Outflow=0.43 cfs 0.014 af

Pond 19P: CULVERTS Peak Elev=805.70' Inflow=2.11 cfs 0.121 af
15.0" Round Culvert x 2.00 n=0.013 L=35.0' S=0.0114 '/' Outflow=2.11 cfs 0.121 af

Total Runoff Area = 51.540 ac Runoff Volume = 2.545 af Average Runoff Depth = 0.59"
98.78% Pervious = 50.910 ac 1.22% Impervious = 0.630 ac

Summary for Subcatchment 1S: DA-1

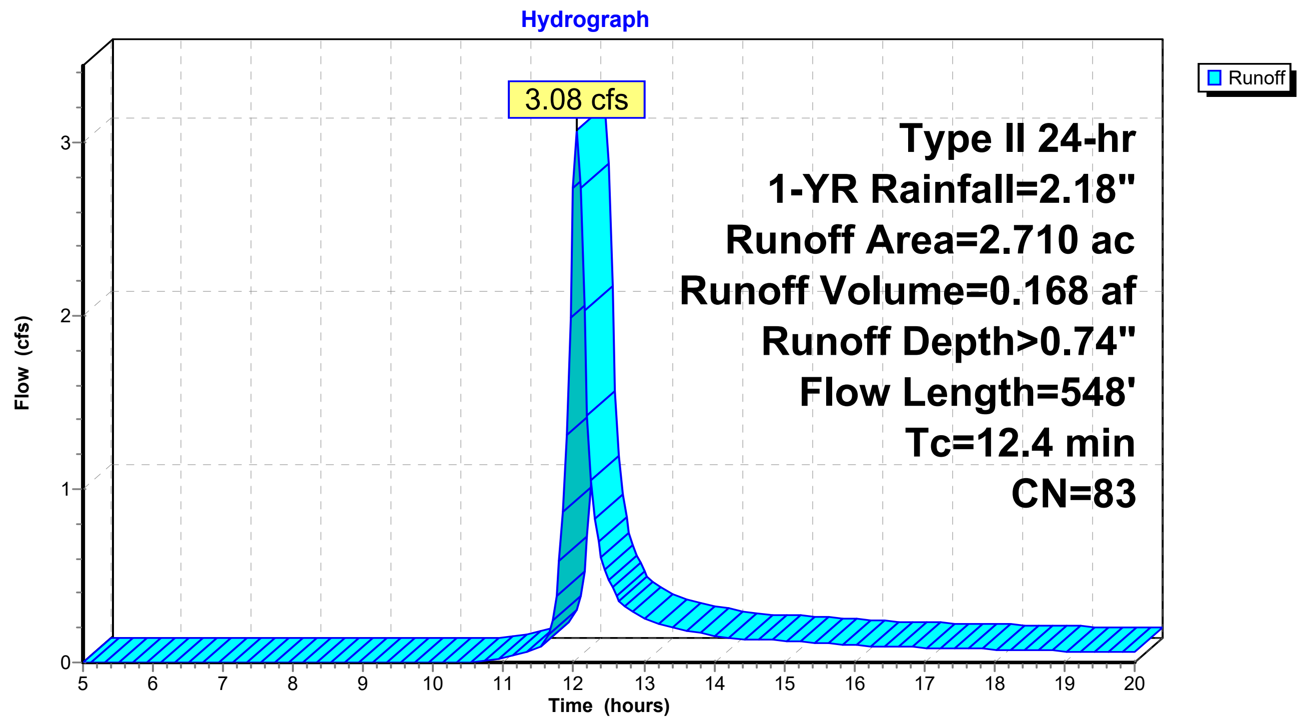
Runoff = 3.08 cfs @ 12.05 hrs, Volume= 0.168 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

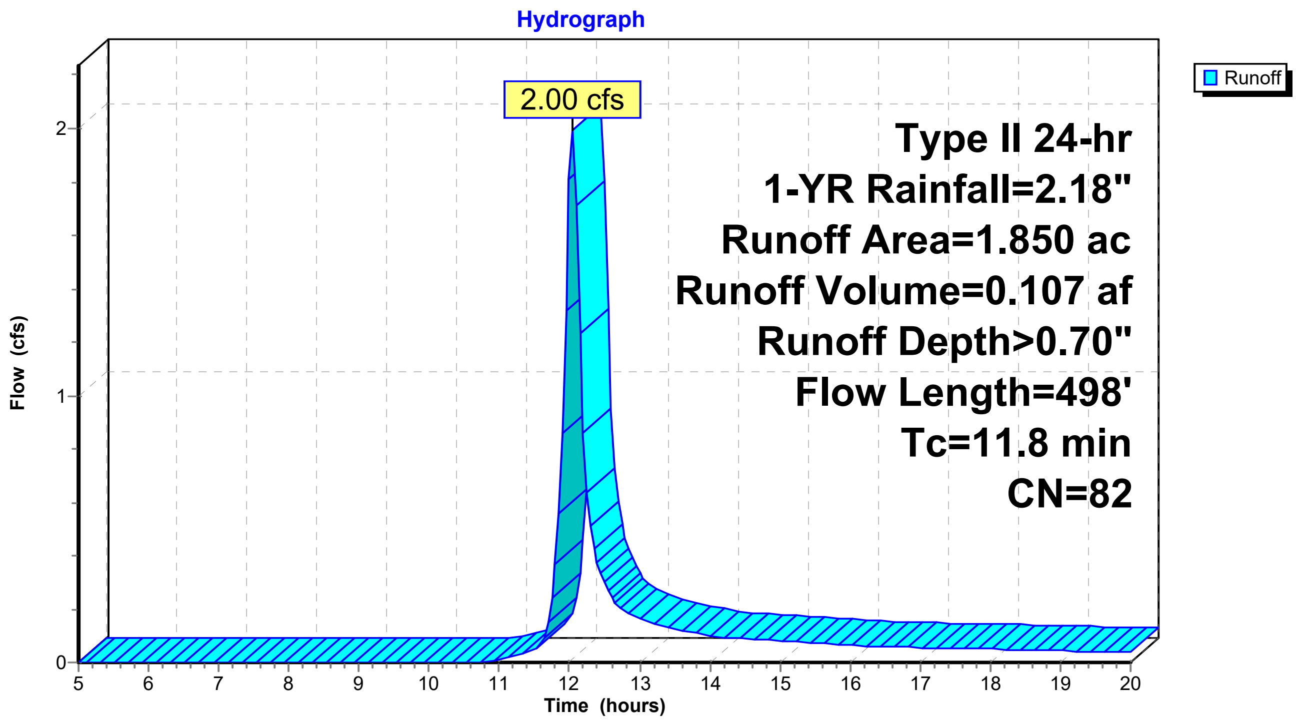
Runoff = 2.00 cfs @ 12.04 hrs, Volume= 0.107 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

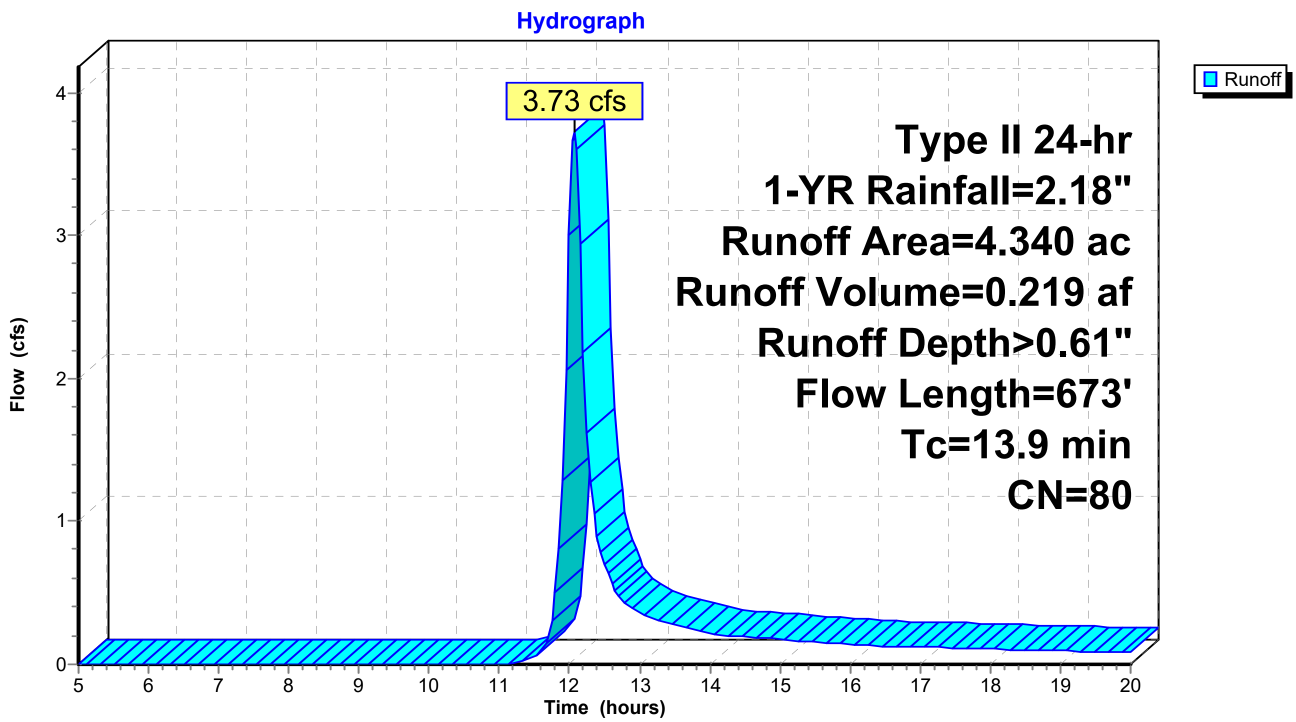
Runoff = 3.73 cfs @ 12.07 hrs, Volume= 0.219 af, Depth> 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

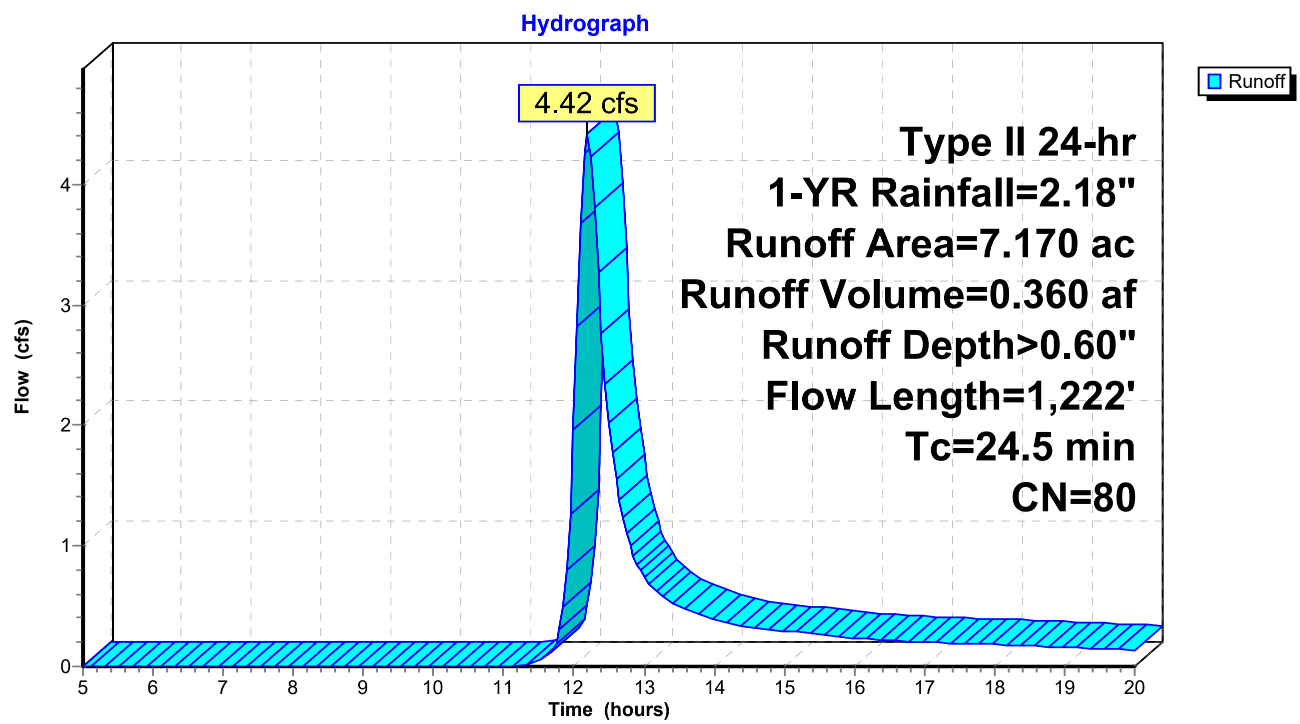
Runoff = 4.42 cfs @ 12.20 hrs, Volume= 0.360 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
7.110	80	>75% Grass cover, Good, HSG D
0.060	83	Woods, Poor, HSG D
7.170	80	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	94	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	100	0.0480	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
8.3	928	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.5	1,222	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

[47] Hint: Peak is 173% of capacity of segment #5

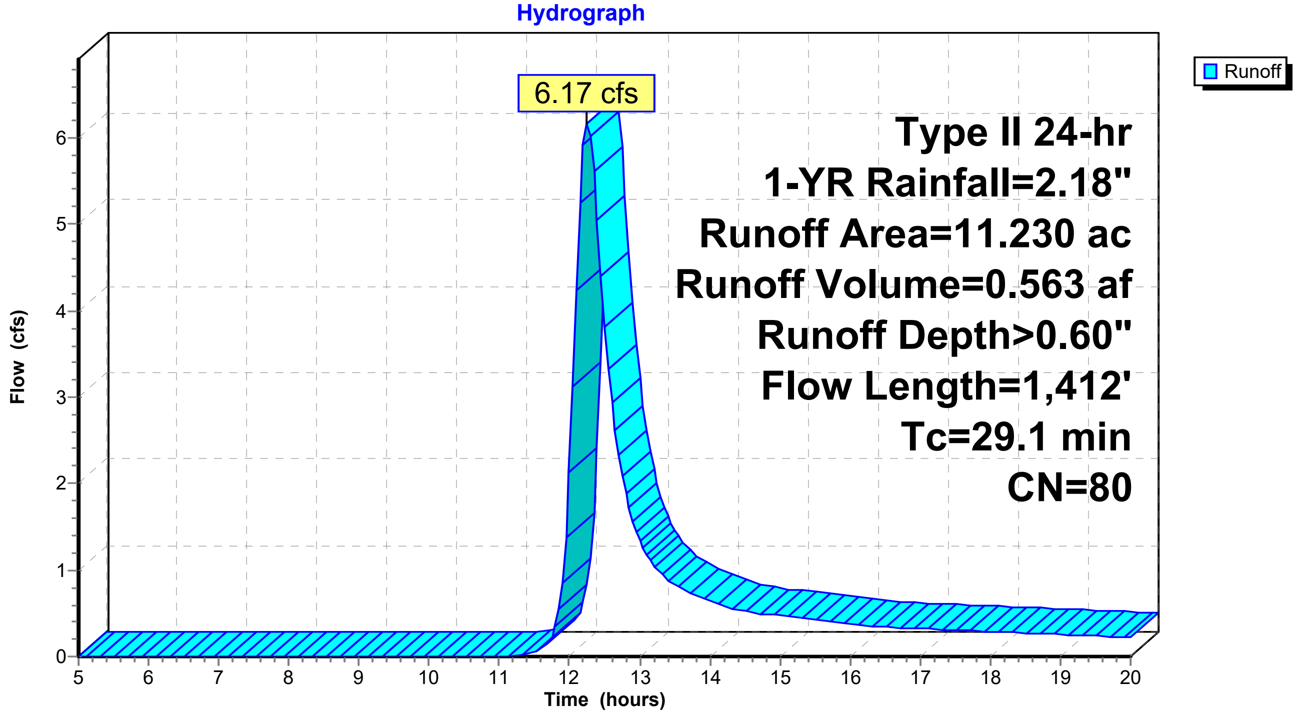
Runoff = 6.17 cfs @ 12.26 hrs, Volume= 0.563 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
10.220	80	>75% Grass cover, Good, HSG D
0.650	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
11.230	80	Weighted Average
11.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.7	73	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	80	0.0520	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	670	0.0600	11.03	176.48	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.035 Earth, dense weeds
0.2	44	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
10.8	100	0.0540	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	100	0.0610	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0850	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.1	1,412	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

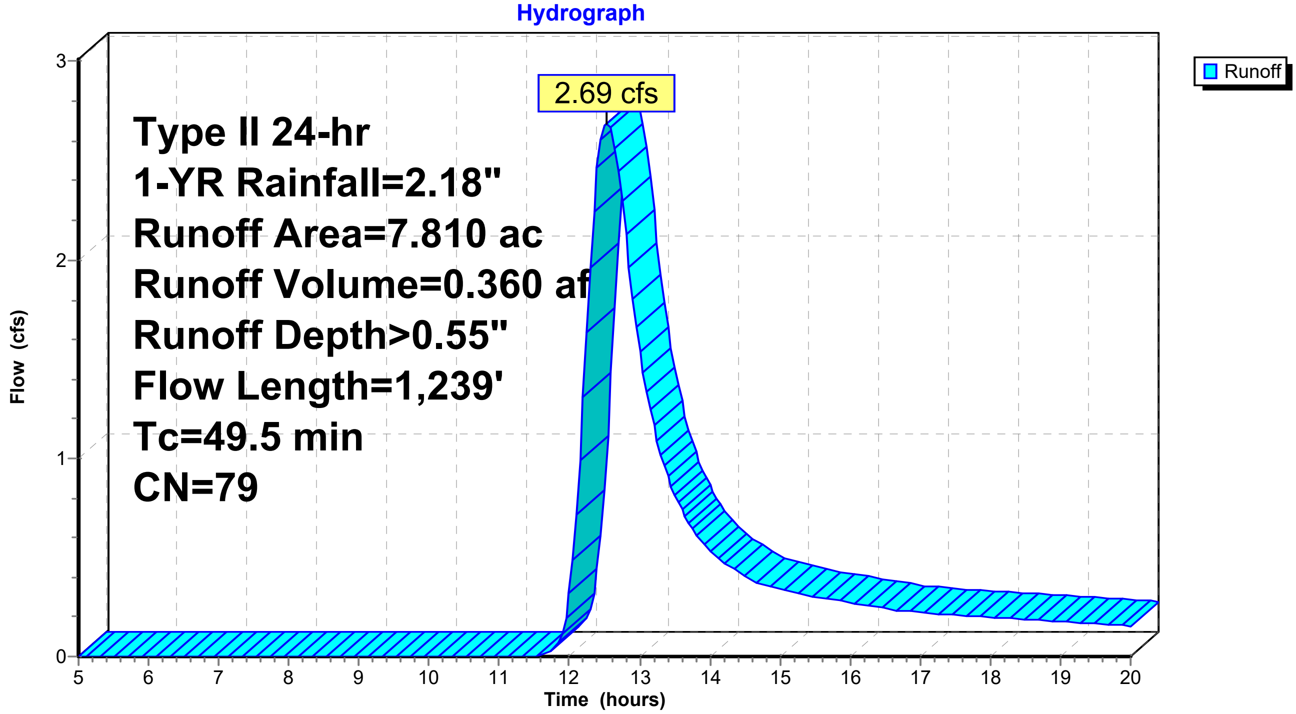
Runoff = 2.69 cfs @ 12.53 hrs, Volume= 0.360 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

	Area (ac)	CN	Description
	3.850	80	>75% Grass cover, Good, HSG D
	0.480	83	Woods, Poor, HSG D
	3.460	78	Meadow, non-grazed, HSG D
*	0.020	98	Impervious
	7.810	79	Weighted Average
	7.790		99.74% Pervious Area
	0.020		0.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	50	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.4	51	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	100	0.0760	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	17	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	0.0890	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.7	89	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.0	100	0.0660	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	105	0.0590	1.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	59	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	375	0.1080	2.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.5	1,239	Total			

Subcatchment 6S: DA-6



Summary for Subcatchment 7S: DA-7

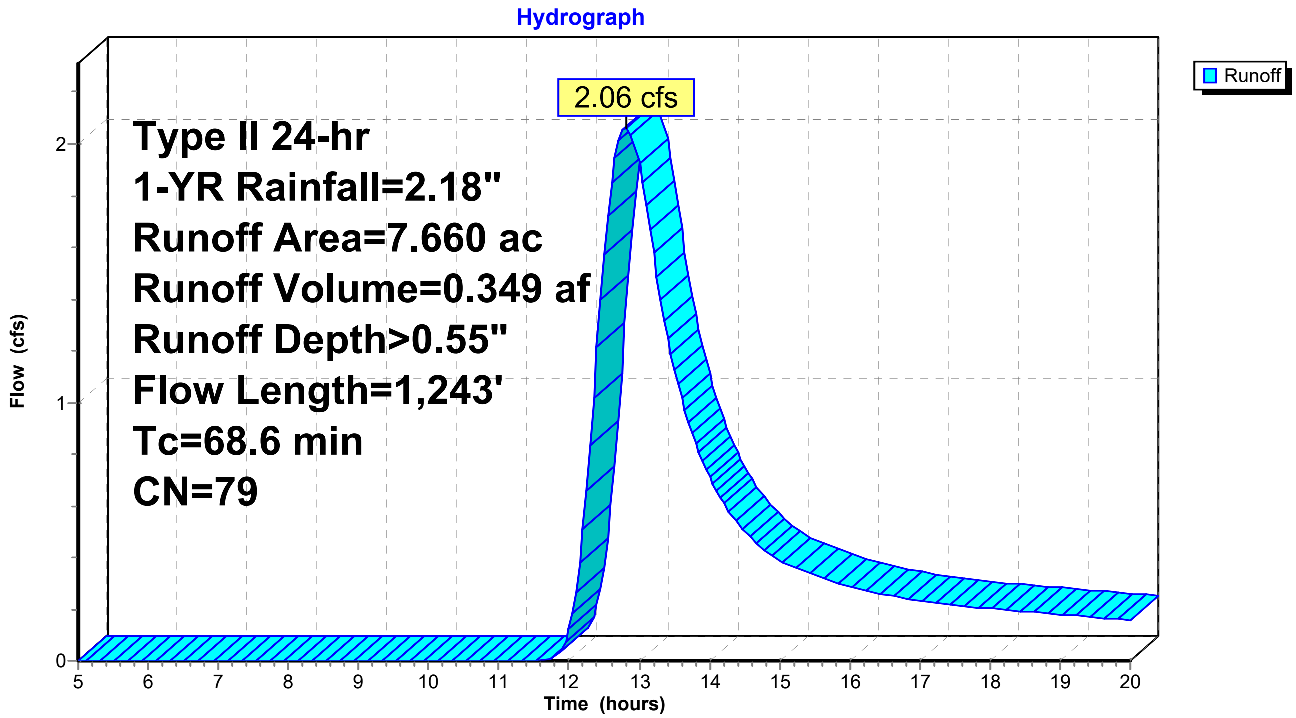
Runoff = 2.06 cfs @ 12.81 hrs, Volume= 0.349 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
0.800	83	Woods, Poor, HSG D
6.860	78	Meadow, non-grazed, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	52	0.0860	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.2	21	0.1040	2.26		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	100	0.1150	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.0	7	0.1150	2.37		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	77	0.0530	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.9	261	0.1060	2.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	100	0.1190	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	9	0.1140	2.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0960	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	14	0.1020	2.24		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	97	0.1020	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
8.9	100	0.0880	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.0	257	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
68.6	1,243	Total			

Subcatchment 7S: DA-7



Summary for Subcatchment 8S: DA-8

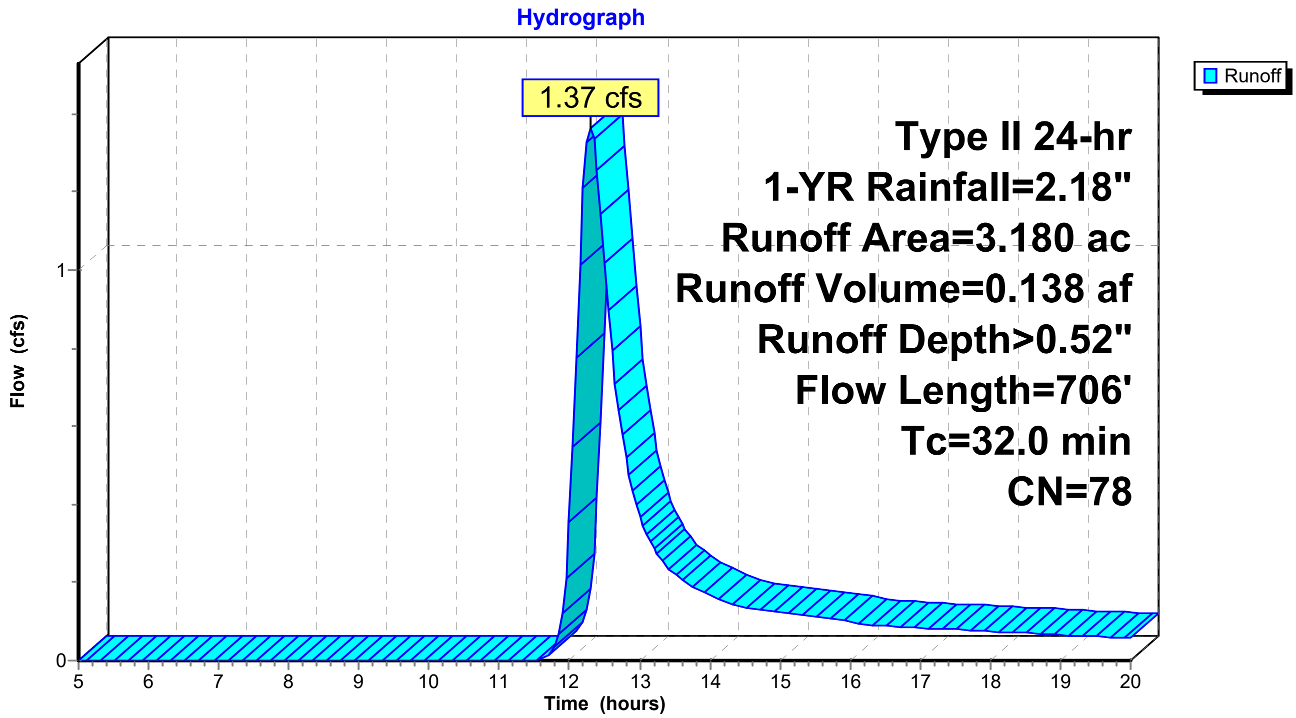
Runoff = 1.37 cfs @ 12.30 hrs, Volume= 0.138 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
0.250	83	Woods, Poor, HSG D
2.930	78	Meadow, non-grazed, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	32	0.1200	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
1.7	24	0.1200	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.6	44	0.0880	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.5	63	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0970	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	18	0.1130	2.35		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	100	0.0860	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.7	325	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	706	Total			

Subcatchment 8S: DA-8



Summary for Subcatchment SC-1: SC-1

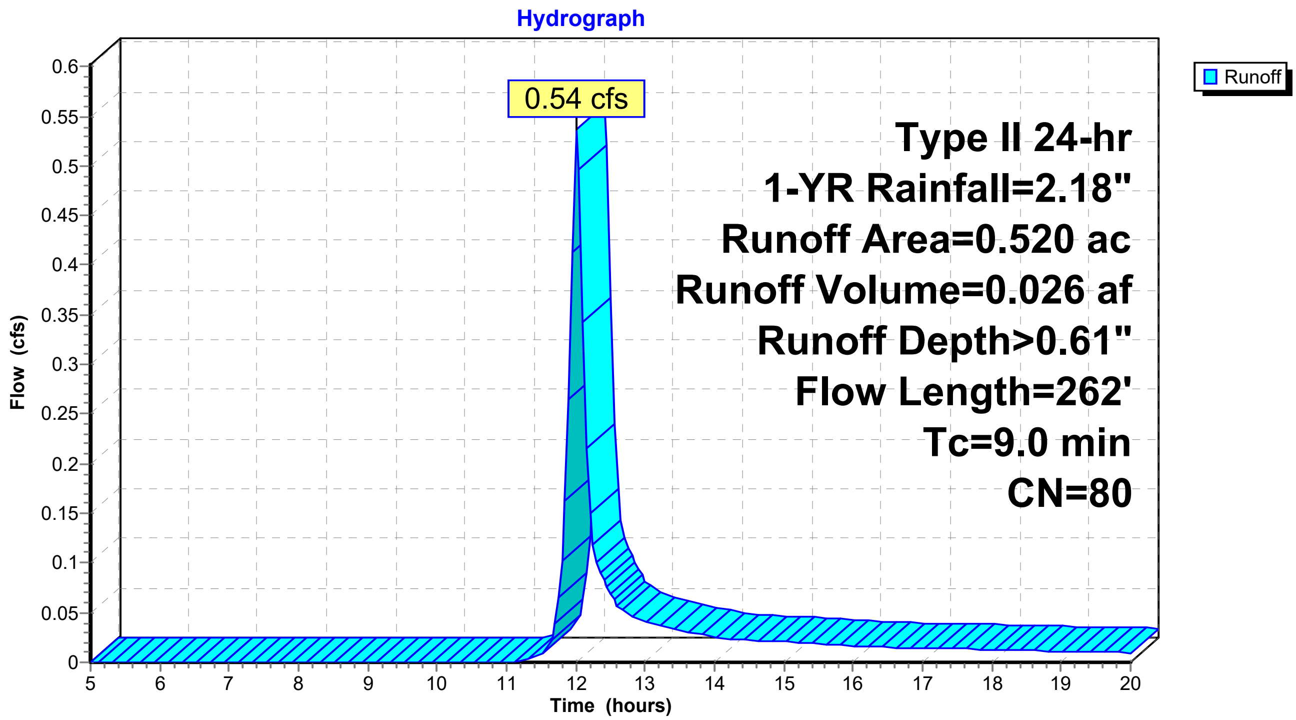
Runoff = 0.54 cfs @ 12.01 hrs, Volume= 0.026 af, Depth> 0.61"
Routed to Reach 16R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
0.520	80	>75% Grass cover, Good, HSG D
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0640	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
2.1	162	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	262	Total			

Subcatchment SC-1: SC-1



Summary for Subcatchment SC-2: SC-2

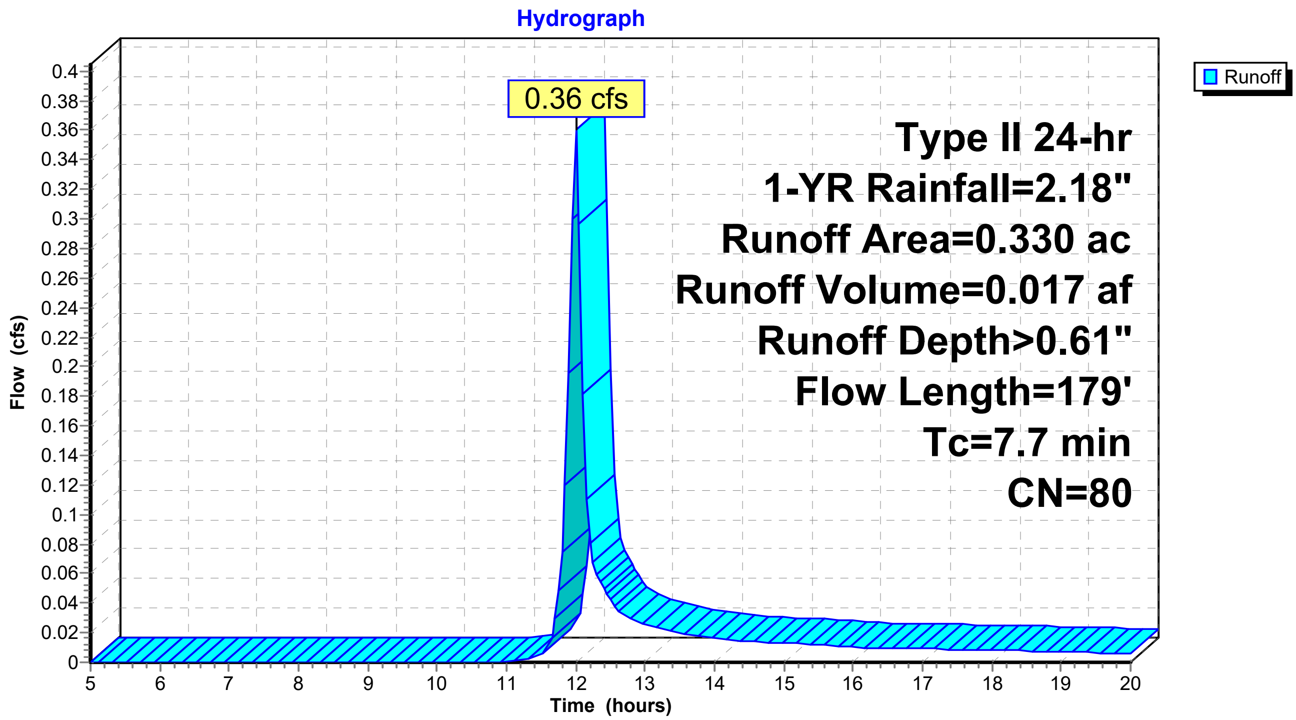
Runoff = 0.36 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 0.61"
Routed to Pond 17P : FLOW DIFFUSER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
0.330	80	>75% Grass cover, Good, HSG D
0.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0660	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	79	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	179	Total			

Subcatchment SC-2: SC-2



Summary for Subcatchment SC-3: SC-3

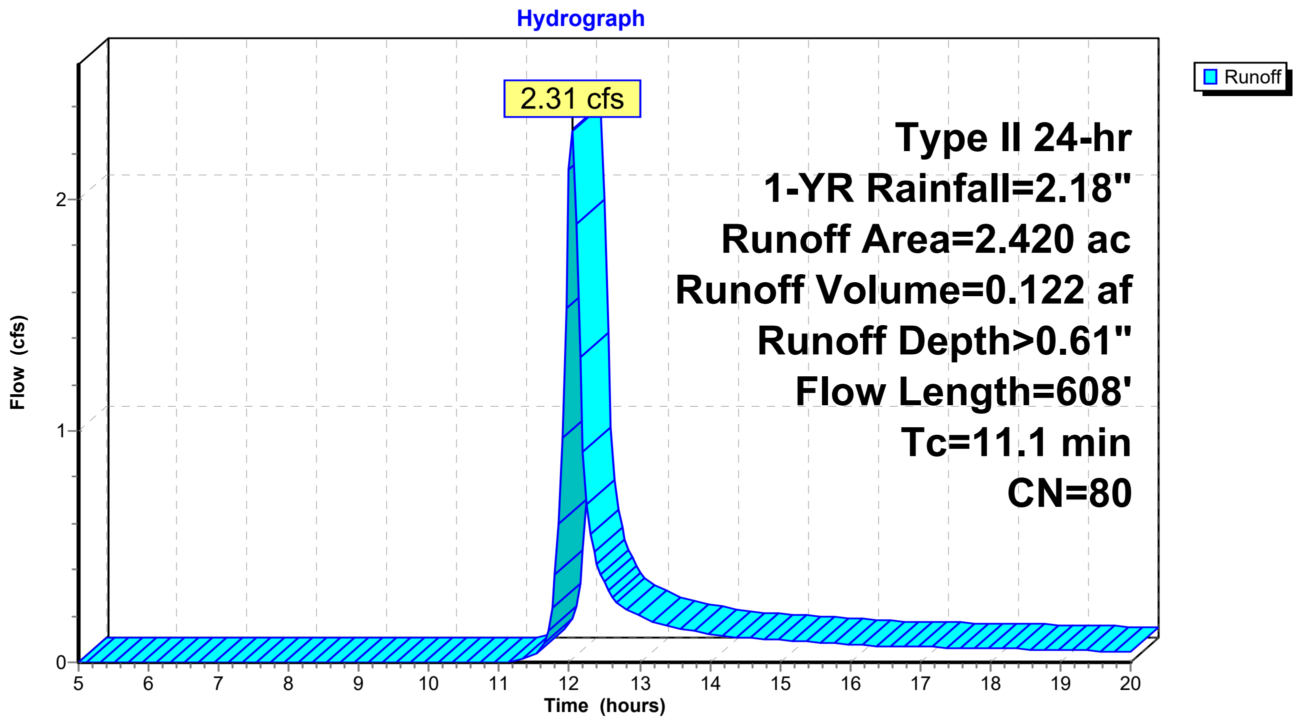
Runoff = 2.31 cfs @ 12.04 hrs, Volume= 0.122 af, Depth> 0.61"
Routed to Reach 18R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
2.420	80	>75% Grass cover, Good, HSG D
2.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0630	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.1	508	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	608	Total			

Subcatchment SC-3: SC-3



Summary for Subcatchment SC-4: SC-4

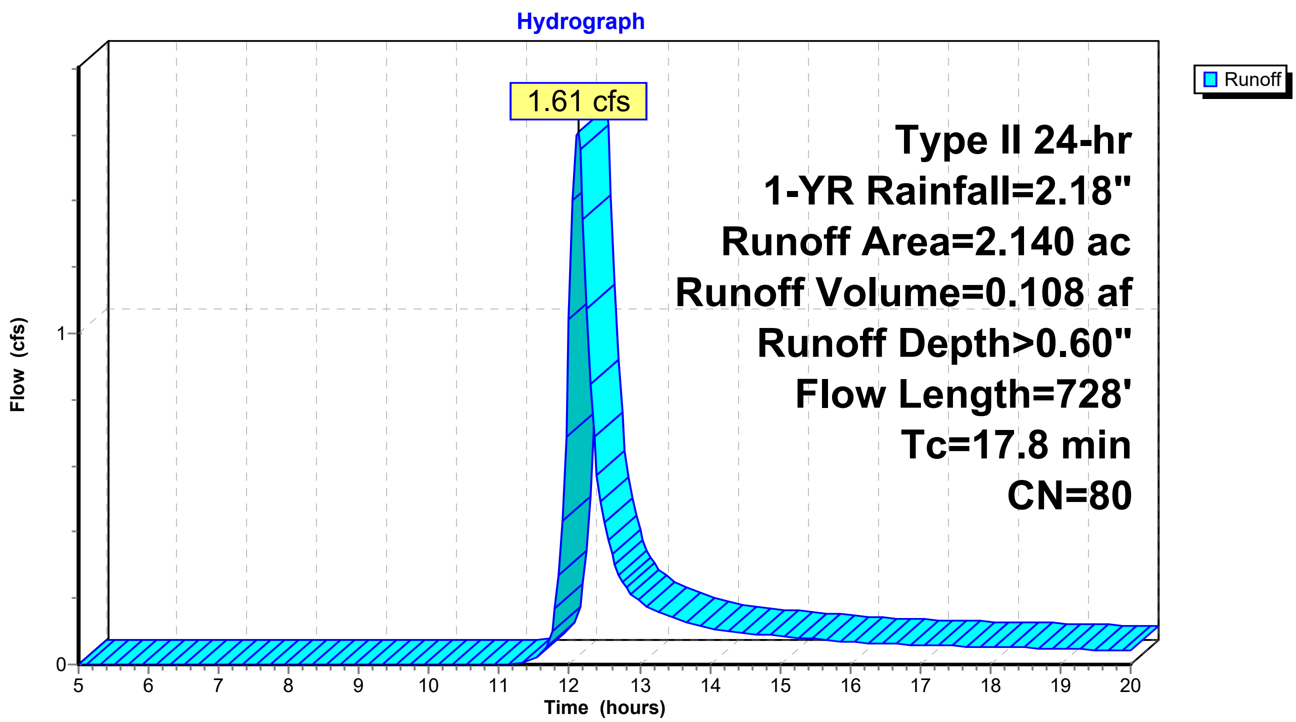
Runoff = 1.61 cfs @ 12.12 hrs, Volume= 0.108 af, Depth> 0.60"
Routed to Pond 1P : CULVERTS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
1.920	80	>75% Grass cover, Good, HSG D
0.220	83	Woods, Poor, HSG D
2.140	80	Weighted Average
2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	57	0.0870	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.5	43	0.0650	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	76	0.0890	1.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	552	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.8	728	Total			

Subcatchment SC-4: SC-4



Summary for Subcatchment SC-5: SC-5

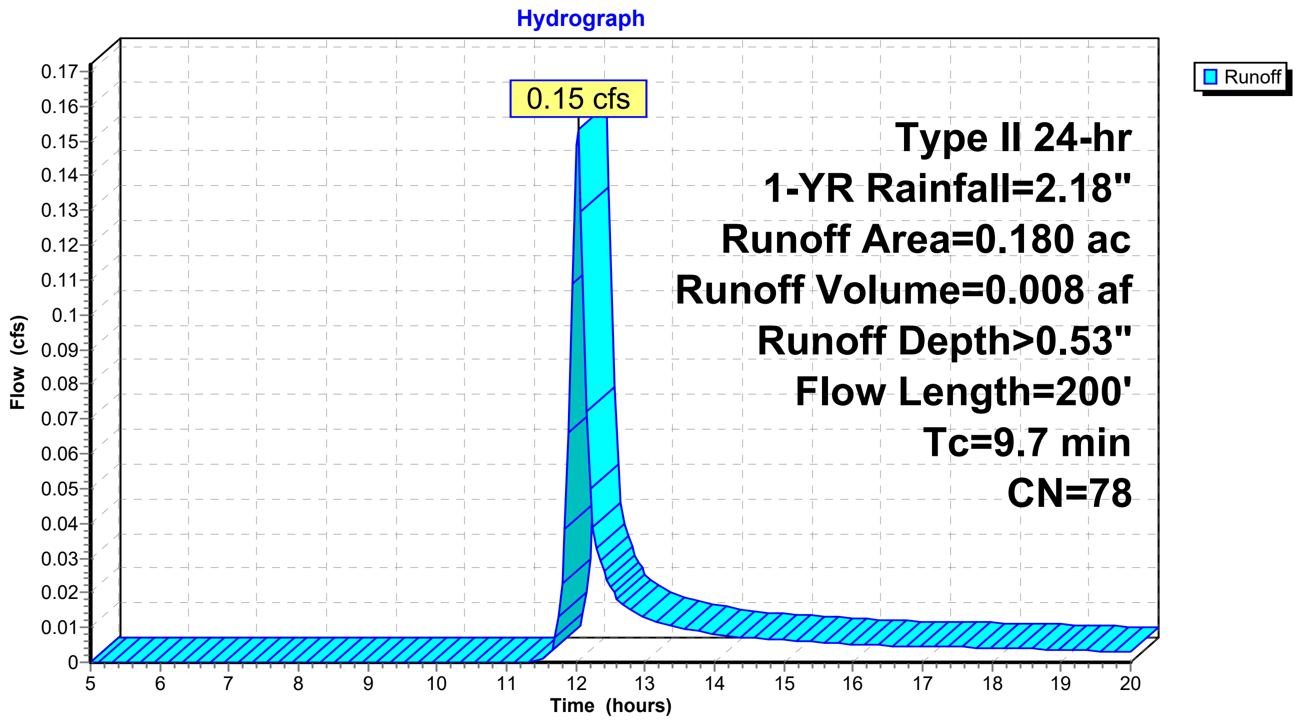
Runoff = 0.15 cfs @ 12.03 hrs, Volume= 0.008 af, Depth> 0.53"
Routed to Pond 2P : CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-YR Rainfall=2.18"

Area (ac)	CN	Description
0.180	78	Meadow, non-grazed, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0870	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.8	100	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	200	Total			

Subcatchment SC-5: SC-5



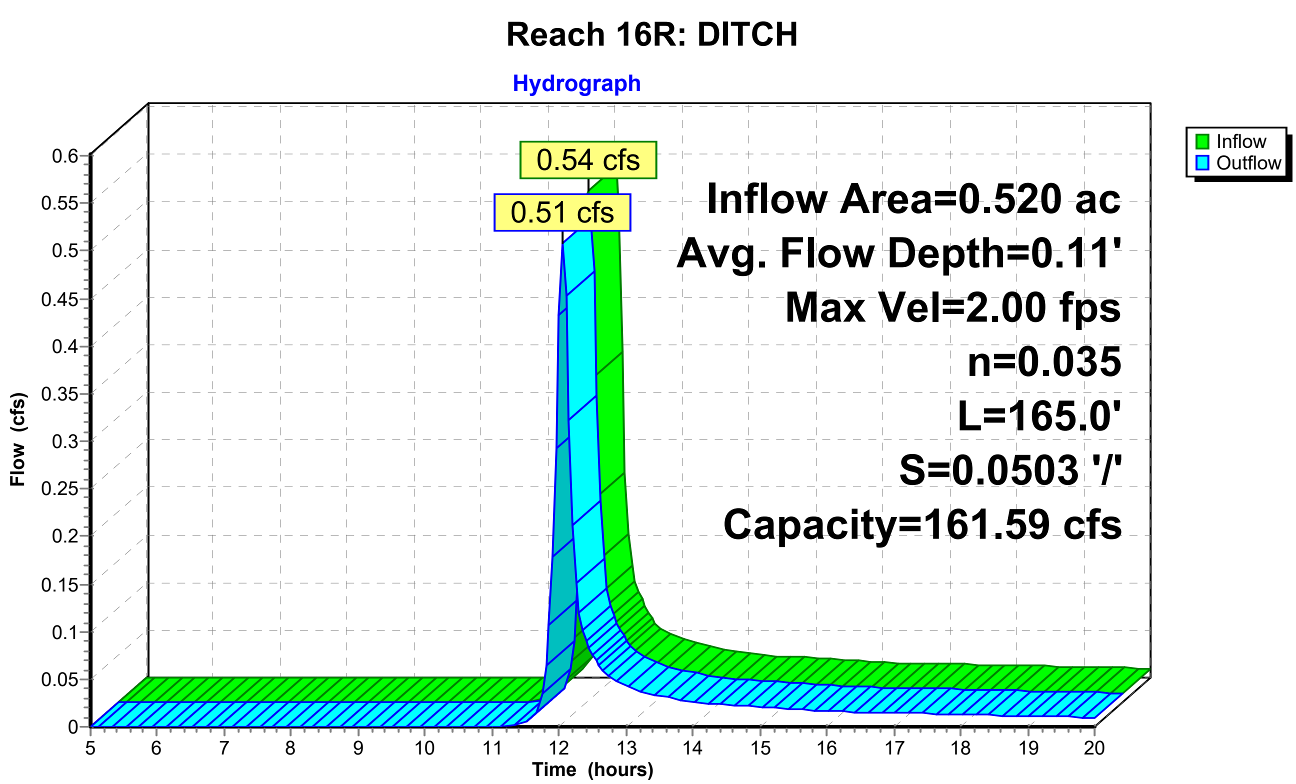
Summary for Reach 16R: DITCH

Inflow Area = 0.520 ac, 0.00% Impervious, Inflow Depth > 0.61" for 1-YR event
Inflow = 0.54 cfs @ 12.01 hrs, Volume= 0.026 af
Outflow = 0.51 cfs @ 12.05 hrs, Volume= 0.026 af, Atten= 5%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 3.6 min

Peak Storage= 43 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 2.67'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 161.59 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 165.0' Slope= 0.0503 '/'
Inlet Invert= 840.60', Outlet Invert= 832.30'



Summary for Reach 18R: DITCH

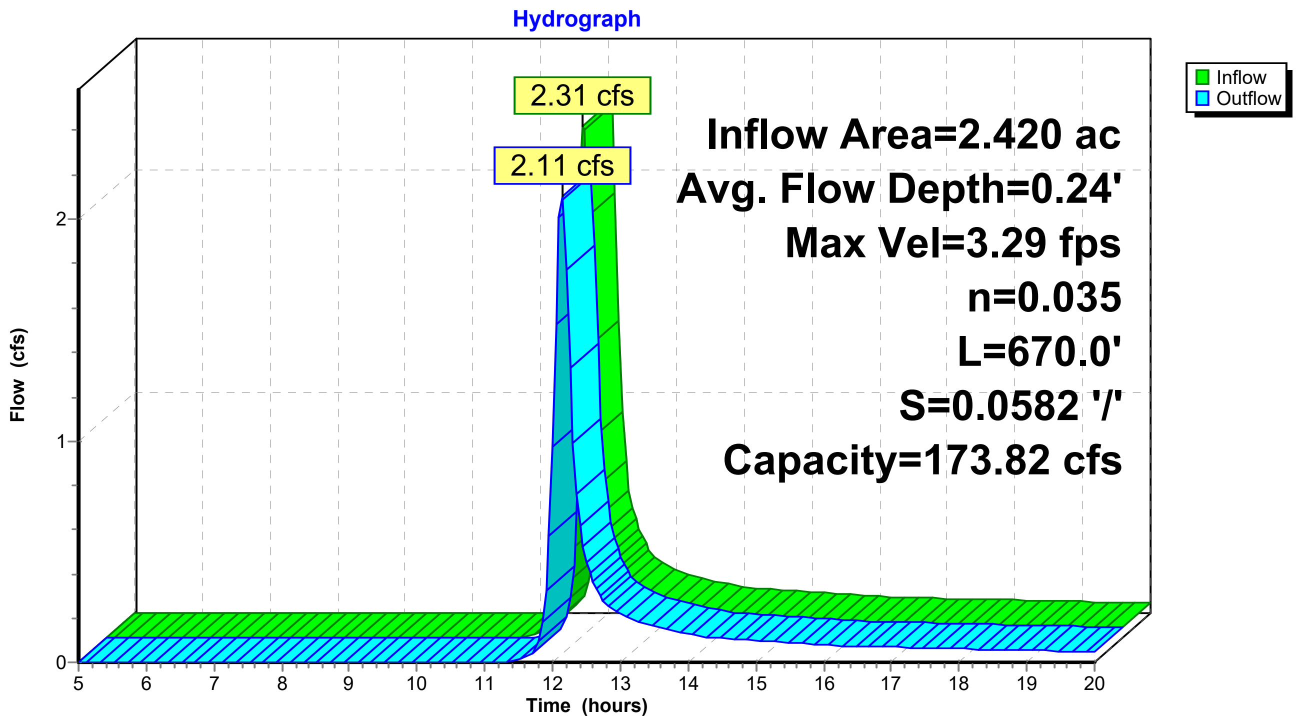
Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 0.61" for 1-YR event
Inflow = 2.31 cfs @ 12.04 hrs, Volume= 0.122 af
Outflow = 2.11 cfs @ 12.13 hrs, Volume= 0.121 af, Atten= 9%, Lag= 5.7 min
Routed to Pond 19P : CULVERTS

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 9.2 min

Peak Storage= 431 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 3.42'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 173.82 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 670.0' Slope= 0.0582 '/'
Inlet Invert= 844.00', Outlet Invert= 805.00'

Reach 18R: DITCH



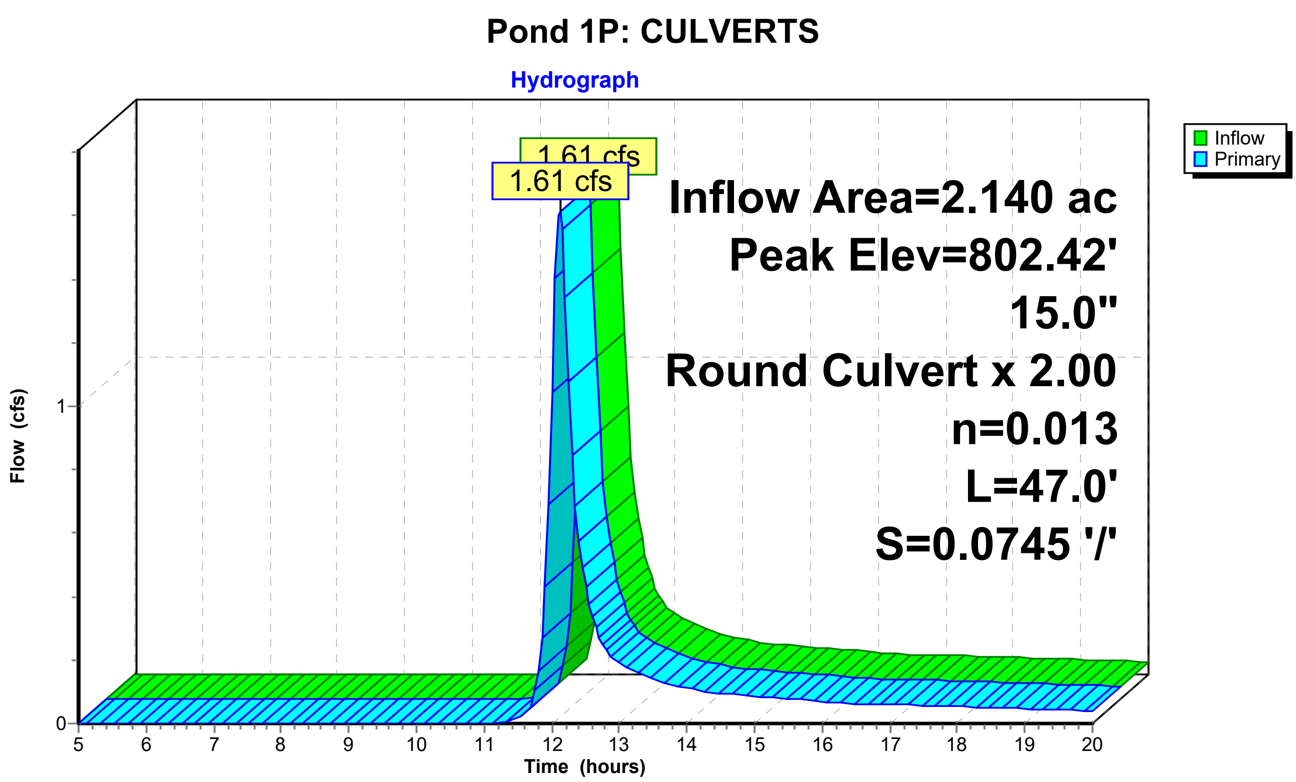
Summary for Pond 1P: CULVERTS

Inflow Area =	2.140 ac,	0.00% Impervious,	Inflow Depth > 0.60"	for 1-YR event
Inflow =	1.61 cfs @	12.12 hrs,	Volume=	0.108 af
Outflow =	1.61 cfs @	12.12 hrs,	Volume=	0.108 af, Atten= 0%, Lag= 0.0 min
Primary =	1.61 cfs @	12.12 hrs,	Volume=	0.108 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 802.42' @ 12.12 hrs
Flood Elev= 803.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.00'	**15.0" Round Culvert X 2.00** L= 47.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 802.00' / 798.50' S= 0.0745 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.59 cfs @ 12.12 hrs HW=802.42' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.59 cfs @ 2.20 fps)



Summary for Pond 2P: CULVERT

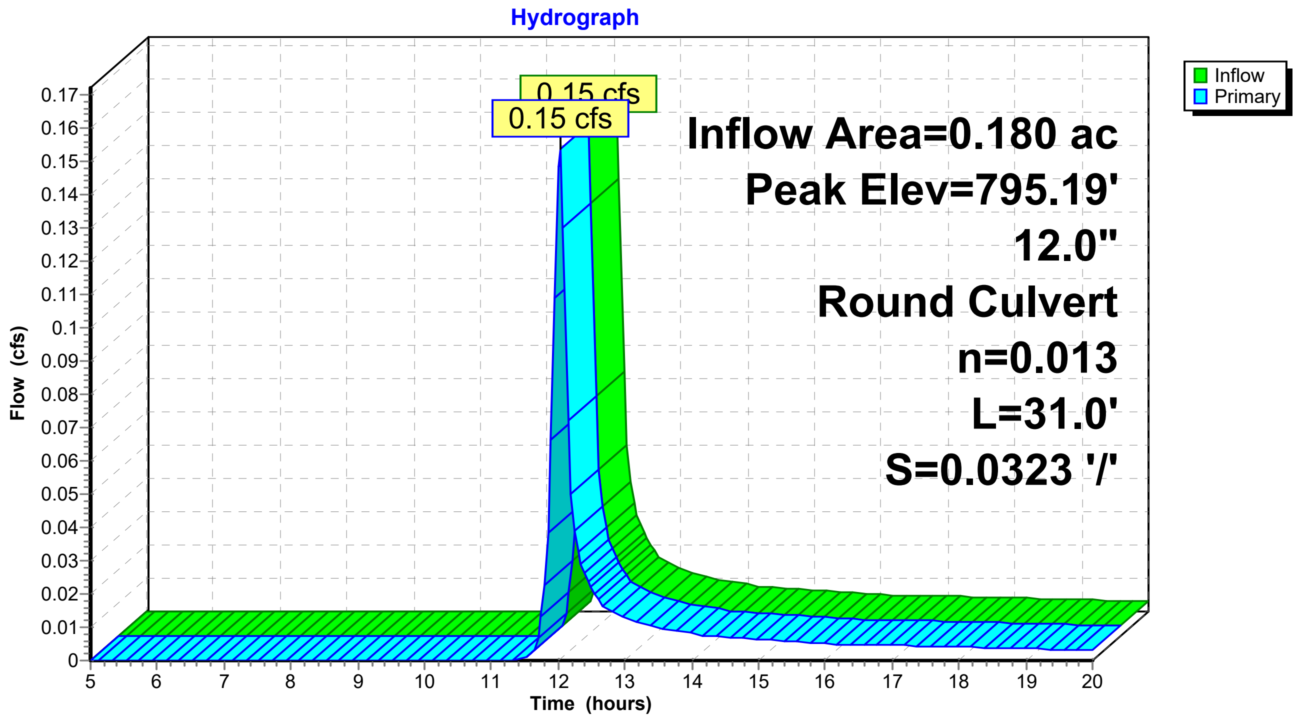
Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 0.53" for 1-YR event
Inflow = 0.15 cfs @ 12.03 hrs, Volume= 0.008 af
Outflow = 0.15 cfs @ 12.03 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.03 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 795.19' @ 12.03 hrs
Flood Elev= 796.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	795.00'	**12.0" Round Culvert** L= 31.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 795.00' / 794.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.03 hrs HW=795.19' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.15 cfs @ 1.47 fps)

Pond 2P: CULVERT



Summary for Pond 17P: FLOW DIFFUSER

[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.330 ac, 0.00% Impervious, Inflow Depth > 0.61" for 1-YR event
Inflow = 0.36 cfs @ 12.00 hrs, Volume= 0.017 af
Outflow = 0.43 cfs @ 12.00 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.00 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 850.00' @ 12.00 hrs Surf.Area= 0.007 ac Storage= 0.002 af

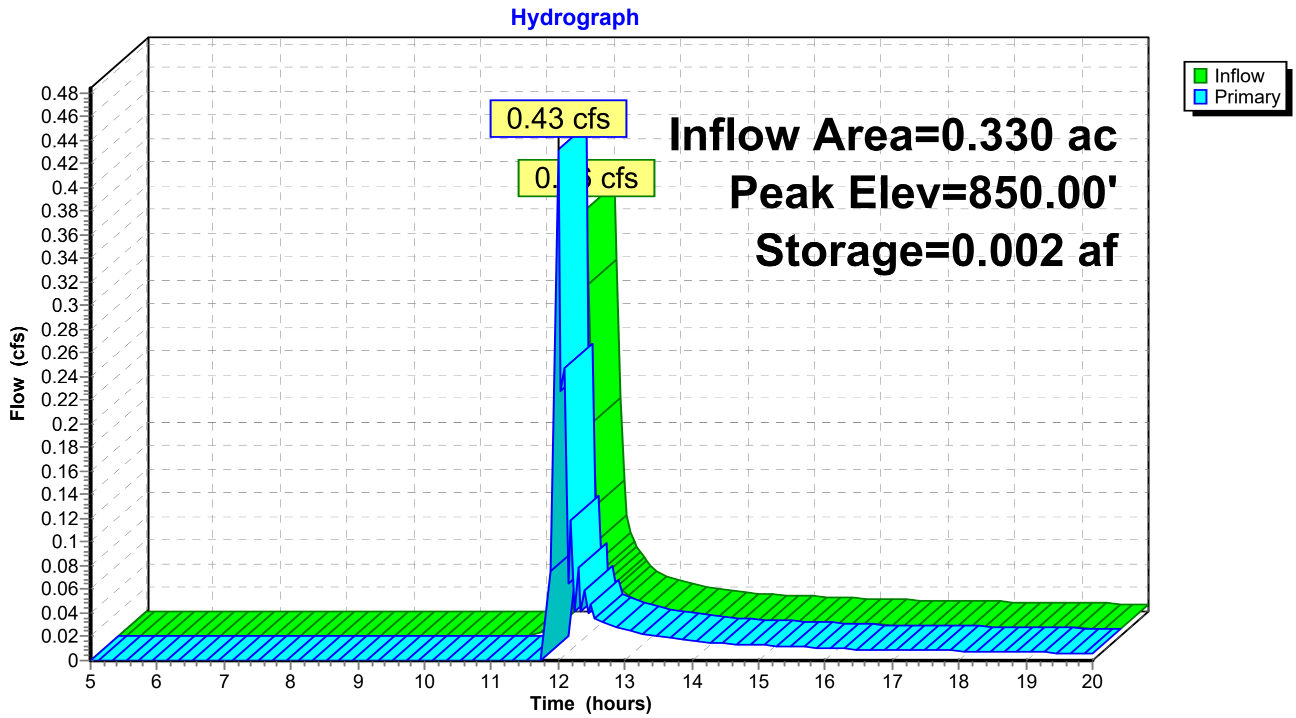
Plug-Flow detention time= 59.4 min calculated for 0.014 af (86% of inflow)
Center-of-Mass det. time= 16.3 min (828.1 - 811.9)

Volume	Invert	Avail.Storage	Storage Description
#1	849.50'	0.002 af	**1.00'W x 100.00'L x 0.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	849.99'	**100.0' long + 2.0 '/' SideZ x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.43 cfs @ 12.00 hrs HW=850.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 0.30 fps)

Pond 17P: FLOW DIFFUSER



Summary for Pond 19P: CULVERTS

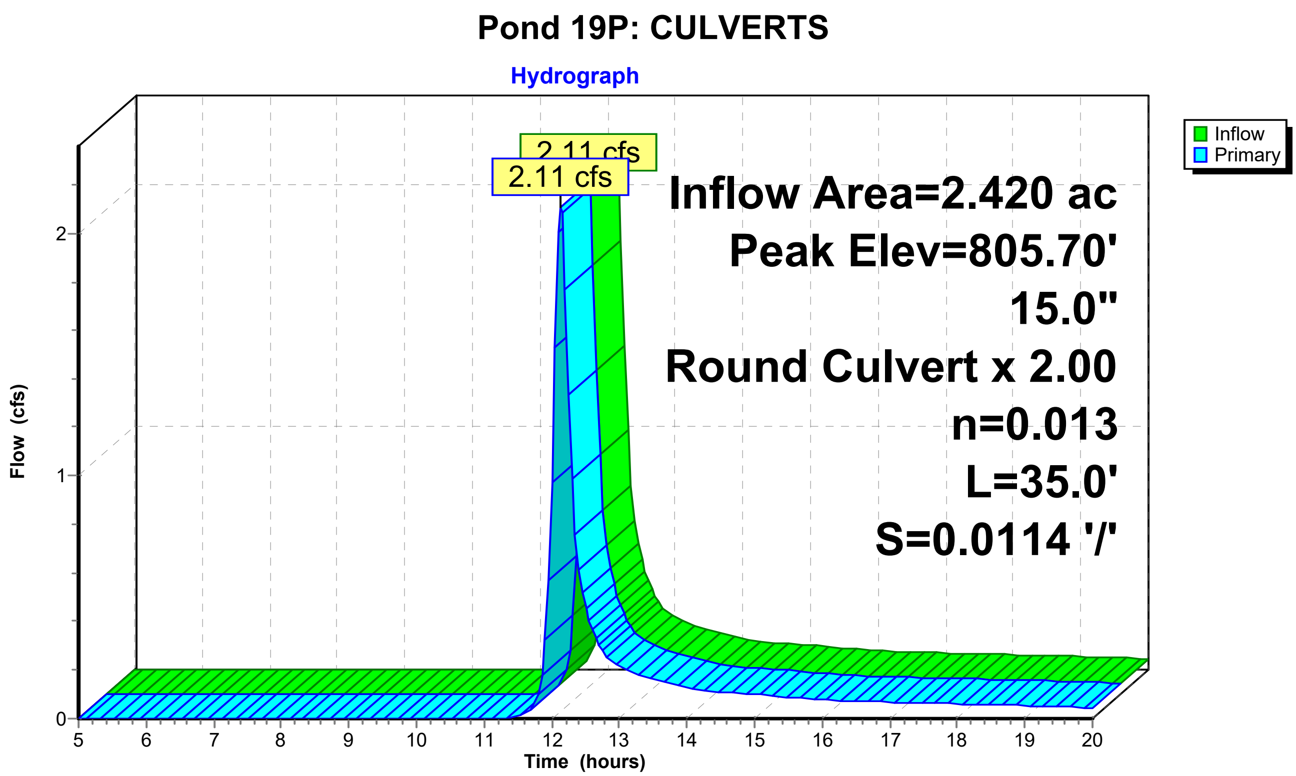
[62] Hint: Exceeded Reach 18R OUTLET depth by 0.48' @ 12.15 hrs

Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 0.60" for 1-YR event
Inflow = 2.11 cfs @ 12.13 hrs, Volume= 0.121 af
Outflow = 2.11 cfs @ 12.13 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.13 hrs, Volume= 0.121 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 805.70' @ 12.13 hrs
Flood Elev= 806.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	805.20'	**15.0" Round Culvert X 2.00** L= 35.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 805.20' / 804.80' S= 0.0114 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.06 cfs @ 12.13 hrs HW=805.69' (Free Discharge)
1=Culvert (Barrel Controls 2.06 cfs @ 3.42 fps)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>1.77"
Flow Length=548' Tc=12.4 min CN=83 Runoff=7.28 cfs 0.399 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>1.69"
Flow Length=498' Tc=11.8 min CN=82 Runoff=4.87 cfs 0.261 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=673' Tc=13.9 min CN=80 Runoff=9.78 cfs 0.560 af

Subcatchment 4S: DA-4 Runoff Area=7.170 ac 0.00% Impervious Runoff Depth>1.54"
Flow Length=1,222' Tc=24.5 min CN=80 Runoff=11.83 cfs 0.922 af

Subcatchment 5S: DA-5 Runoff Area=11.230 ac 0.00% Impervious Runoff Depth>1.54"
Flow Length=1,412' Tc=29.1 min CN=80 Runoff=16.59 cfs 1.441 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.26% Impervious Runoff Depth>1.46"
Flow Length=1,239' Tc=49.5 min CN=79 Runoff=7.62 cfs 0.950 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>1.45"
Flow Length=1,243' Tc=68.6 min CN=79 Runoff=5.86 cfs 0.923 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>1.40"
Flow Length=706' Tc=32.0 min CN=78 Runoff=4.00 cfs 0.372 af

Subcatchment SC-1: SC-1 Runoff Area=0.520 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=262' Tc=9.0 min CN=80 Runoff=1.39 cfs 0.067 af

Subcatchment SC-2: SC-2 Runoff Area=0.330 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=179' Tc=7.7 min CN=80 Runoff=0.92 cfs 0.043 af

Subcatchment SC-3: SC-3 Runoff Area=2.420 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=608' Tc=11.1 min CN=80 Runoff=5.98 cfs 0.313 af

Subcatchment SC-4: SC-4 Runoff Area=2.140 ac 0.00% Impervious Runoff Depth>1.55"
Flow Length=728' Tc=17.8 min CN=80 Runoff=4.26 cfs 0.276 af

Subcatchment SC-5: SC-5 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>1.42"
Flow Length=200' Tc=9.7 min CN=78 Runoff=0.43 cfs 0.021 af

Reach 16R: DITCH Avg. Flow Depth=0.19' Max Vel=2.73 fps Inflow=1.39 cfs 0.067 af
n=0.035 L=165.0' S=0.0503 '/' Capacity=161.59 cfs Outflow=1.33 cfs 0.067 af

Reach 18R: DITCH Avg. Flow Depth=0.40' Max Vel=4.42 fps Inflow=5.98 cfs 0.313 af
n=0.035 L=670.0' S=0.0582 '/' Capacity=173.82 cfs Outflow=5.65 cfs 0.311 af

Pond 1P: CULVERTS Peak Elev=802.72' Inflow=4.26 cfs 0.276 af
15.0" Round Culvert x 2.00 n=0.013 L=47.0' S=0.0745 '/' Outflow=4.26 cfs 0.276 af

Pond 2P: CULVERT Peak Elev=795.32' Inflow=0.43 cfs 0.021 af
12.0" Round Culvert n=0.013 L=31.0' S=0.0323 '/' Outflow=0.43 cfs 0.021 af

Pond 17P: FLOW DIFFUSER Peak Elev=850.01' Storage=0.002 af Inflow=0.92 cfs 0.043 af
Outflow=0.92 cfs 0.040 af

Pond 19P: CULVERTS Peak Elev=806.10' Inflow=5.65 cfs 0.311 af
15.0" Round Culvert x 2.00 n=0.013 L=35.0' S=0.0114 '/' Outflow=5.65 cfs 0.311 af

Total Runoff Area = 51.540 ac Runoff Volume = 6.548 af Average Runoff Depth = 1.52"
98.78% Pervious = 50.910 ac 1.22% Impervious = 0.630 ac

Summary for Subcatchment 1S: DA-1

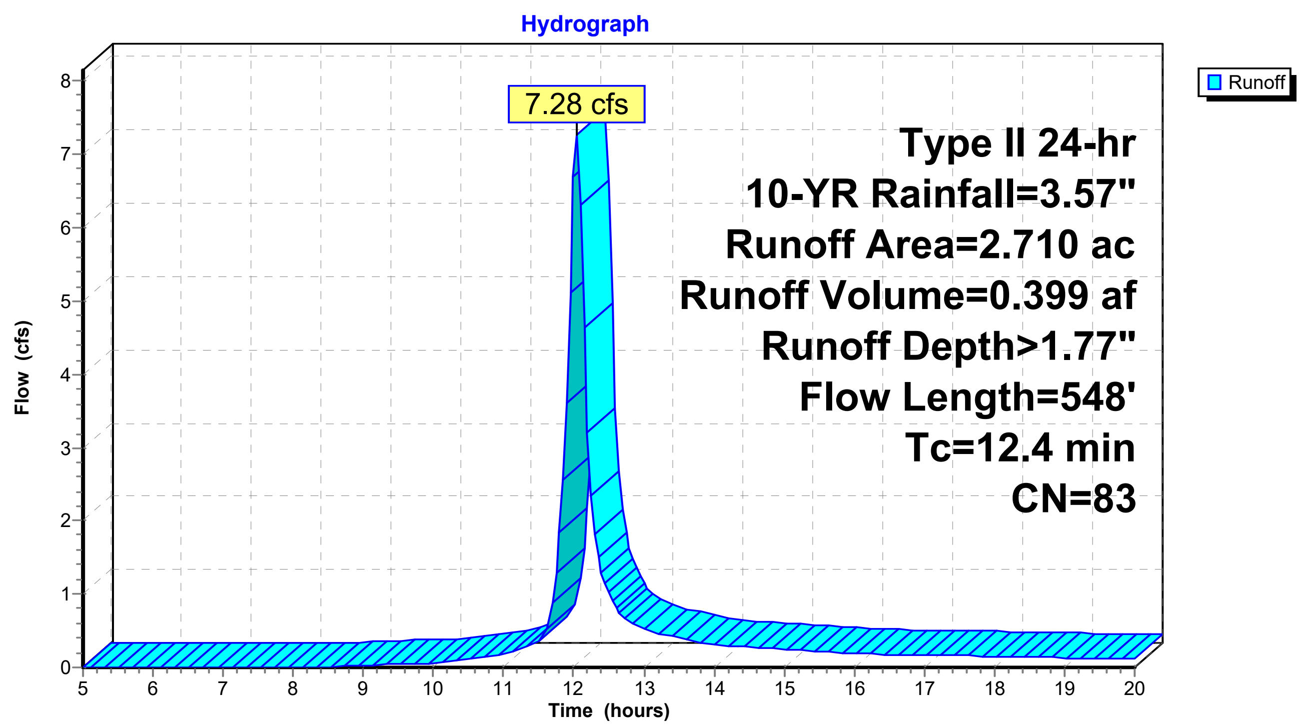
Runoff = 7.28 cfs @ 12.04 hrs, Volume= 0.399 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

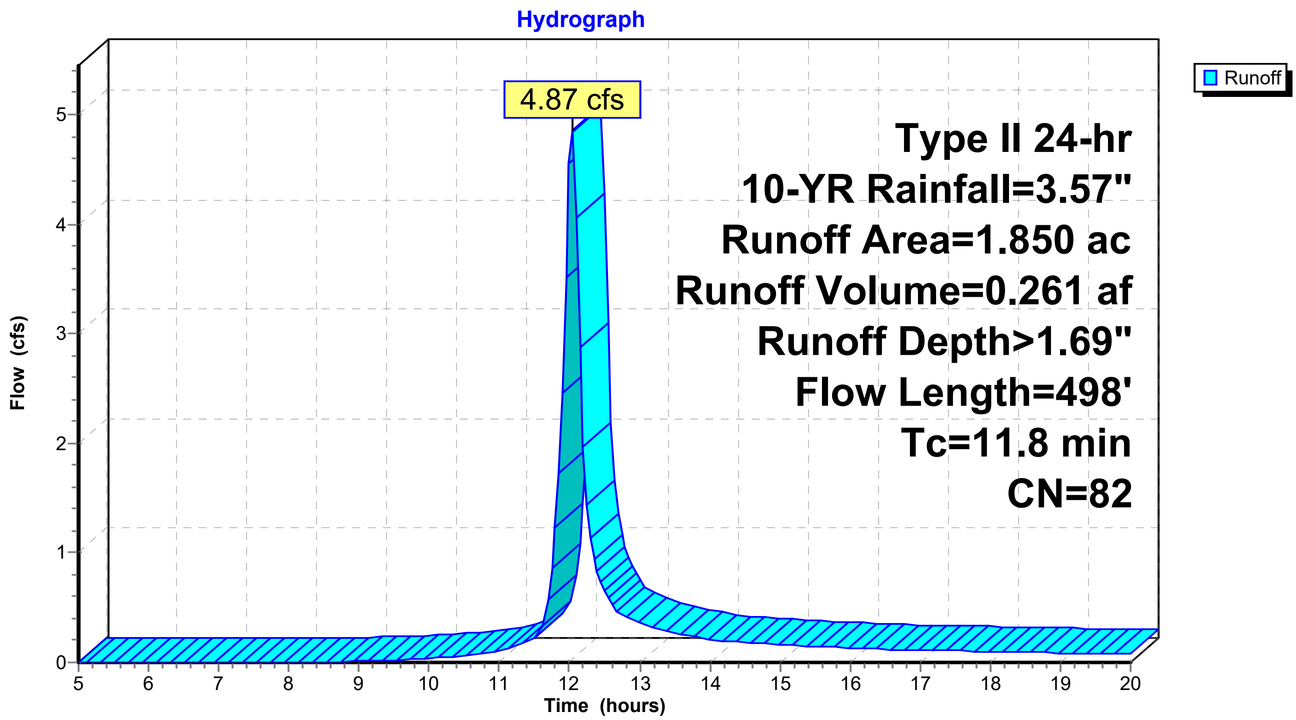
Runoff = 4.87 cfs @ 12.04 hrs, Volume= 0.261 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

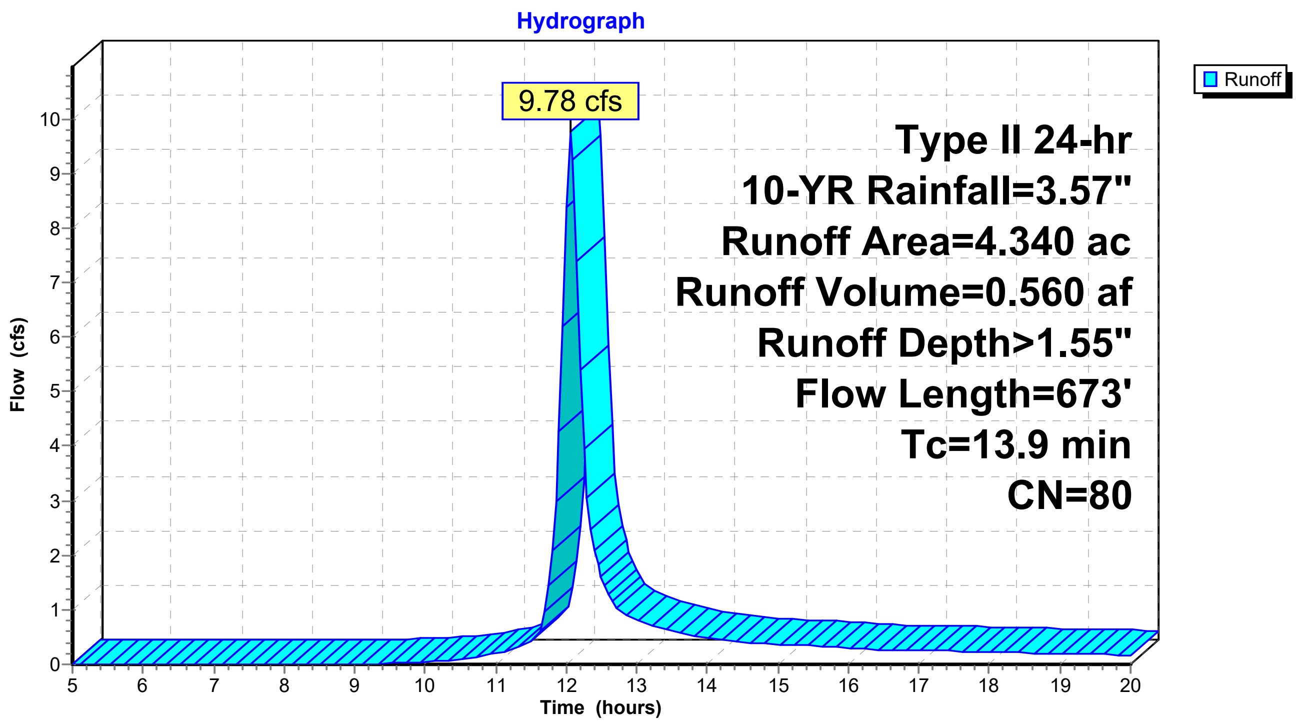
Runoff = 9.78 cfs @ 12.06 hrs, Volume= 0.560 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

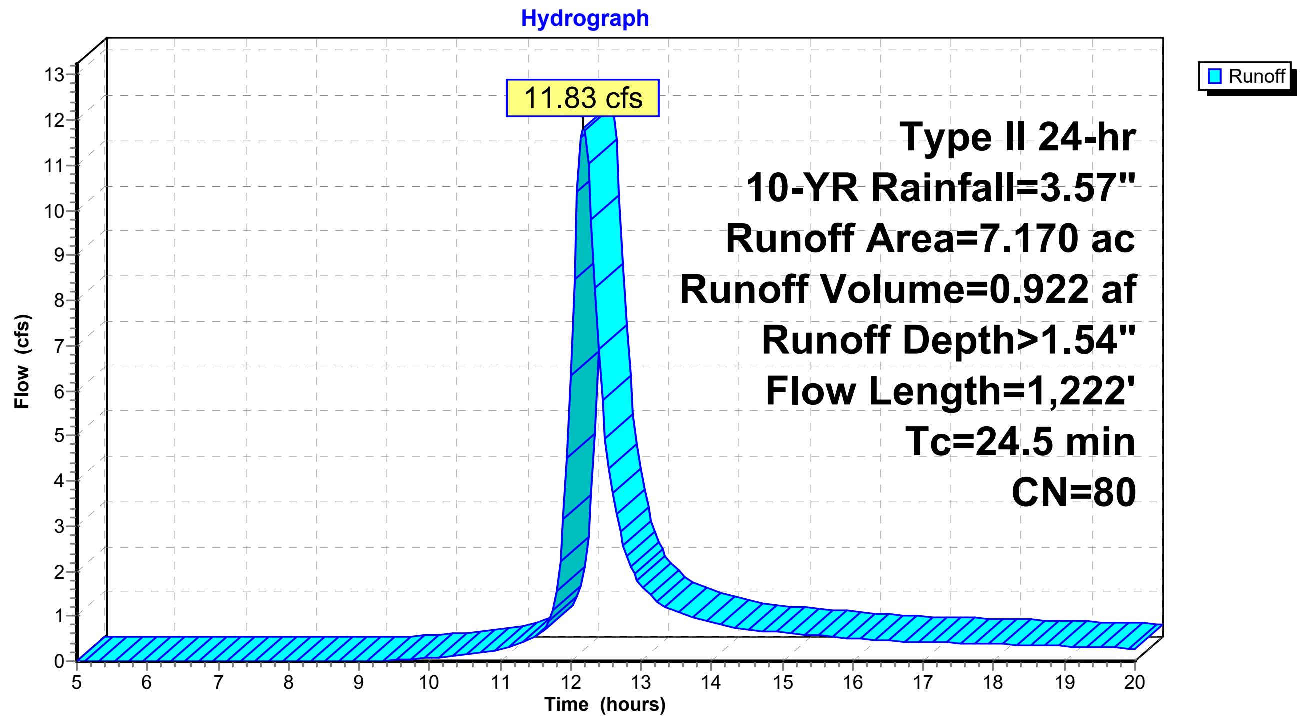
Runoff = 11.83 cfs @ 12.18 hrs, Volume= 0.922 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
7.110	80	>75% Grass cover, Good, HSG D
0.060	83	Woods, Poor, HSG D
7.170	80	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	94	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	100	0.0480	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
8.3	928	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.5	1,222	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

[47] Hint: Peak is 466% of capacity of segment #5

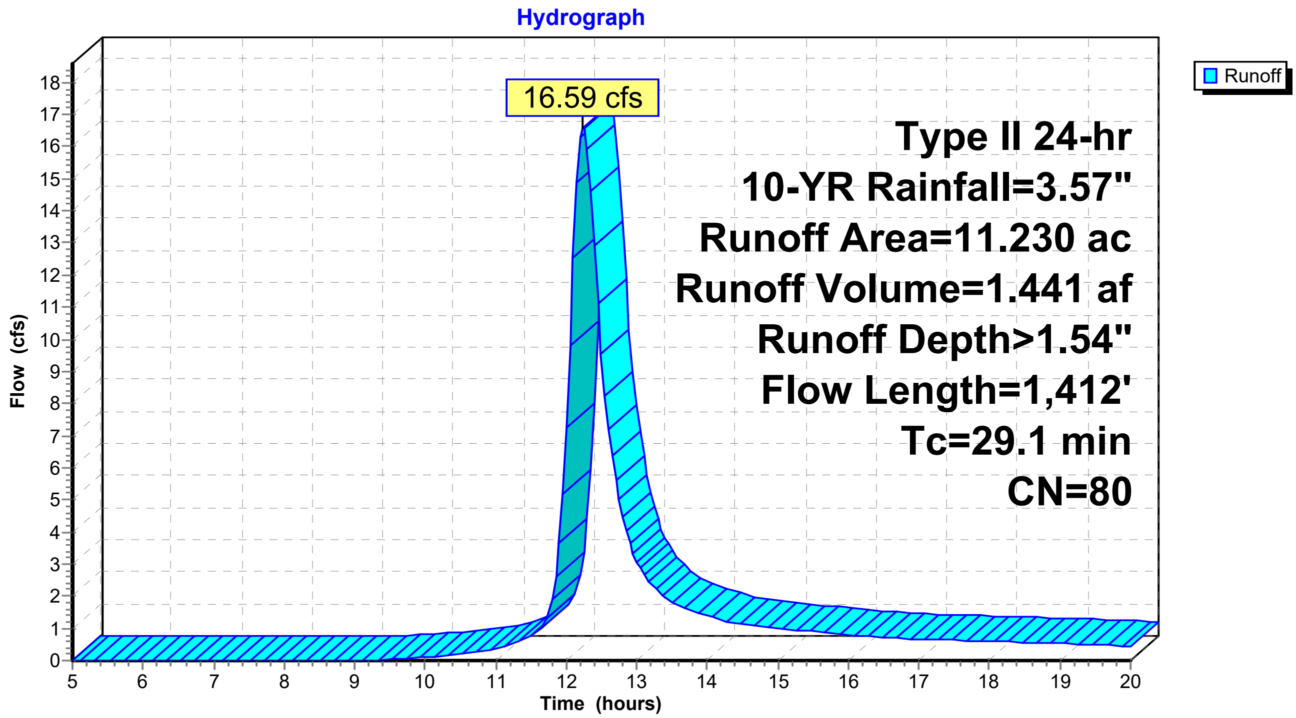
Runoff = 16.59 cfs @ 12.24 hrs, Volume= 1.441 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
10.220	80	>75% Grass cover, Good, HSG D
0.650	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
11.230	80	Weighted Average
11.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.7	73	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	80	0.0520	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	670	0.0600	11.03	176.48	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.035 Earth, dense weeds
0.2	44	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
10.8	100	0.0540	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	100	0.0610	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0850	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.1	1,412	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

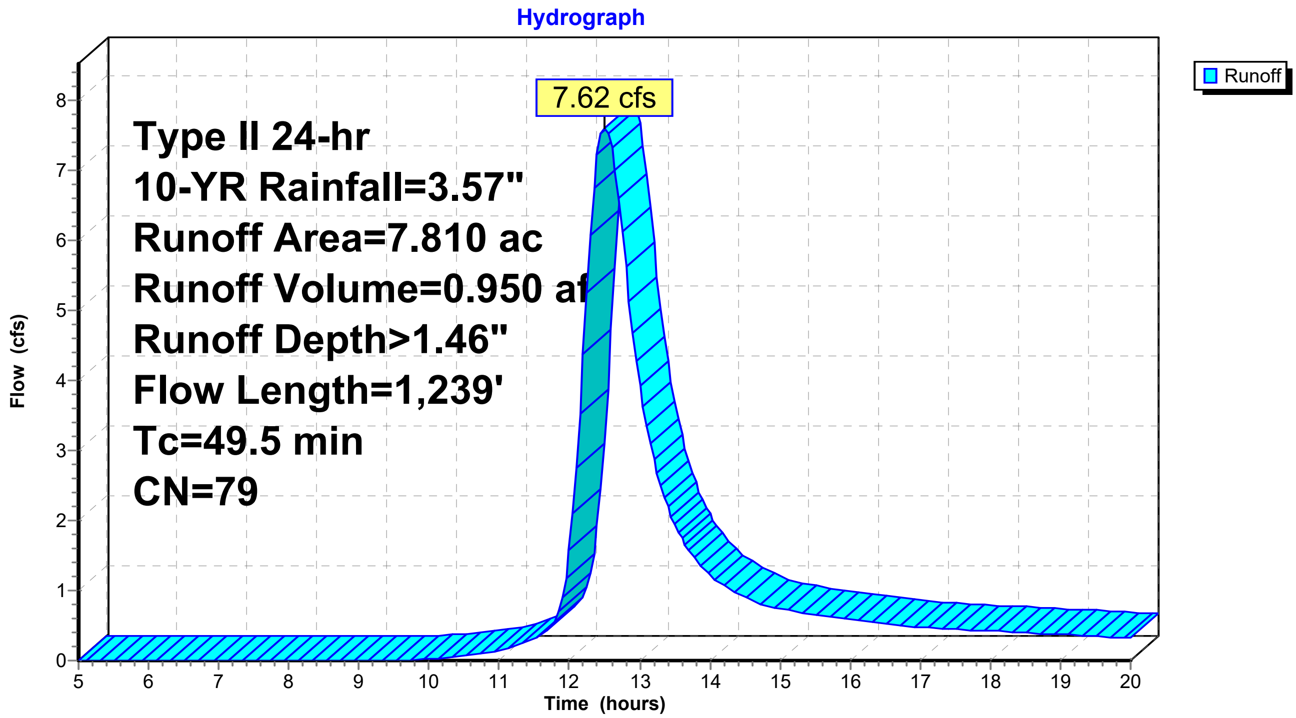
Runoff = 7.62 cfs @ 12.50 hrs, Volume= 0.950 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

	Area (ac)	CN	Description
	3.850	80	>75% Grass cover, Good, HSG D
	0.480	83	Woods, Poor, HSG D
	3.460	78	Meadow, non-grazed, HSG D
*	0.020	98	Impervious
	7.810	79	Weighted Average
	7.790		99.74% Pervious Area
	0.020		0.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	50	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.4	51	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	100	0.0760	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	17	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	0.0890	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.7	89	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.0	100	0.0660	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	105	0.0590	1.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	59	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	375	0.1080	2.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.5	1,239	Total			

Subcatchment 6S: DA-6



Summary for Subcatchment 7S: DA-7

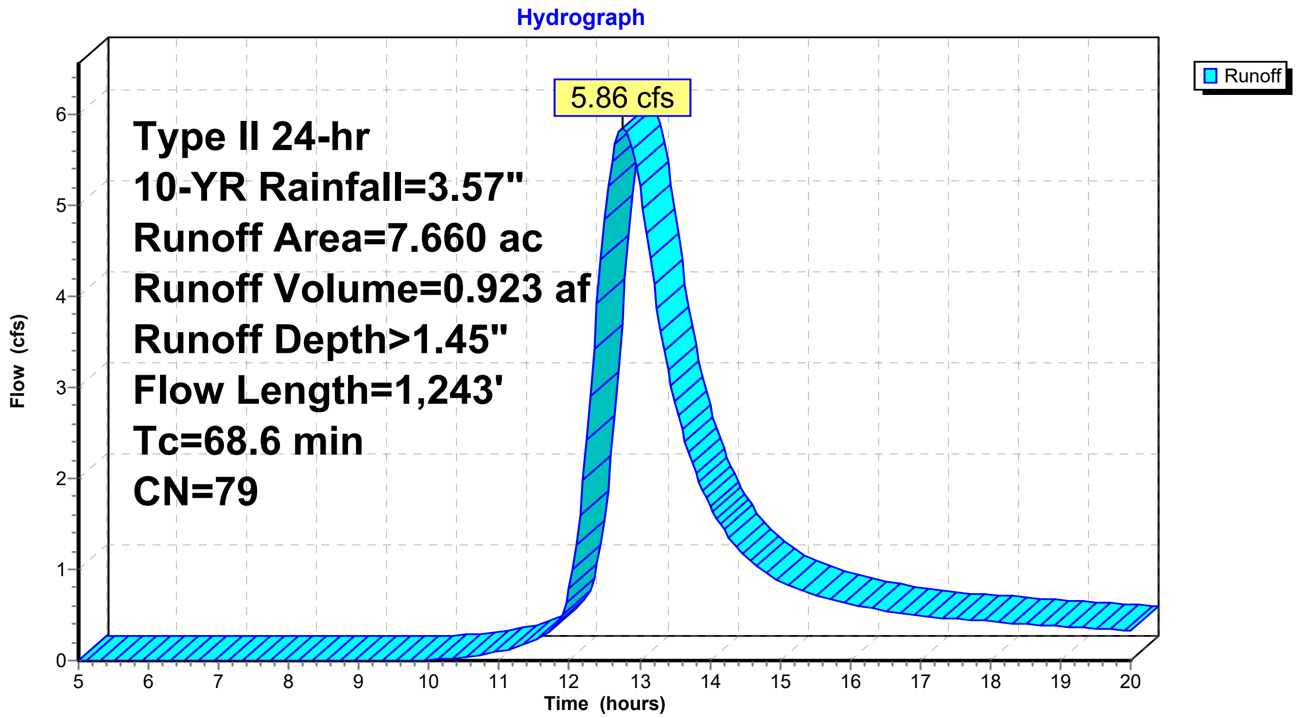
Runoff = 5.86 cfs @ 12.75 hrs, Volume= 0.923 af, Depth> 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
0.800	83	Woods, Poor, HSG D
6.860	78	Meadow, non-grazed, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	52	0.0860	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.2	21	0.1040	2.26		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	100	0.1150	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.0	7	0.1150	2.37		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	77	0.0530	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.9	261	0.1060	2.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	100	0.1190	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	9	0.1140	2.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0960	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	14	0.1020	2.24		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	97	0.1020	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
8.9	100	0.0880	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.0	257	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
68.6	1,243	Total			

Subcatchment 7S: DA-7



Summary for Subcatchment 8S: DA-8

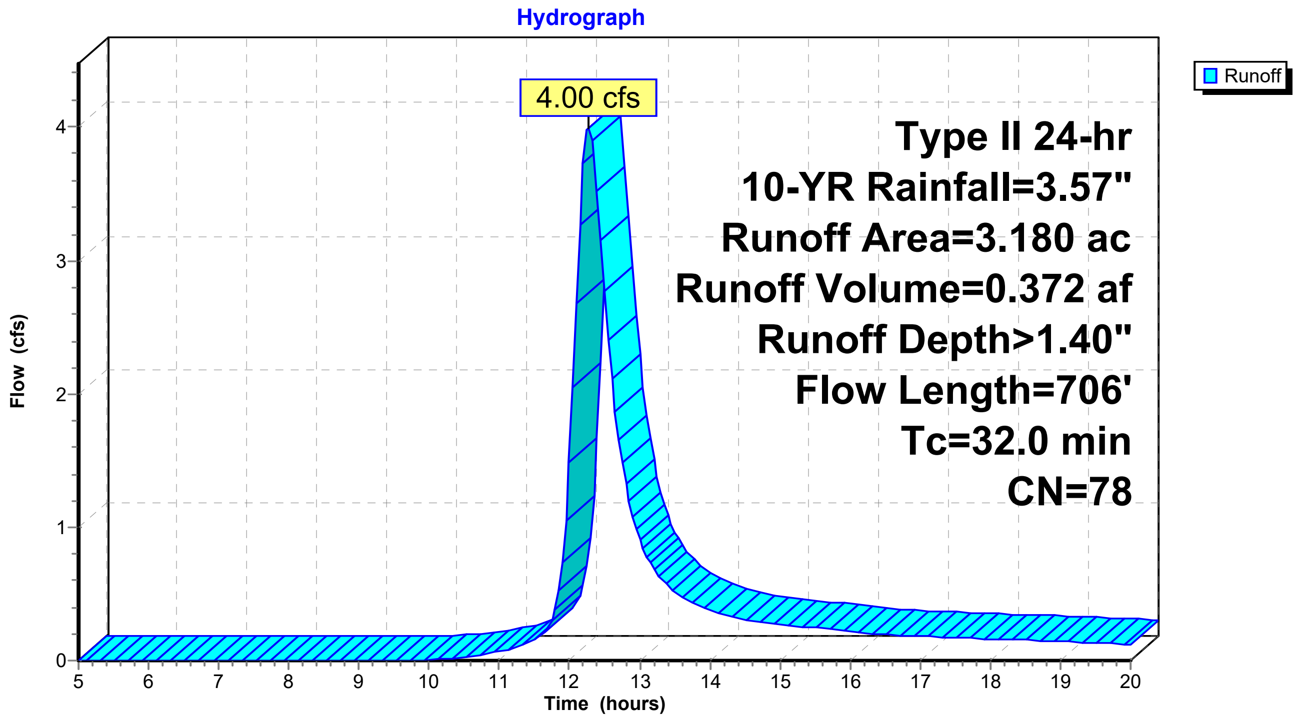
Runoff = 4.00 cfs @ 12.28 hrs, Volume= 0.372 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
0.250	83	Woods, Poor, HSG D
2.930	78	Meadow, non-grazed, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	32	0.1200	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
1.7	24	0.1200	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.6	44	0.0880	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.5	63	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0970	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	18	0.1130	2.35		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	100	0.0860	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.7	325	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	706	Total			

Subcatchment 8S: DA-8



Summary for Subcatchment SC-1: SC-1

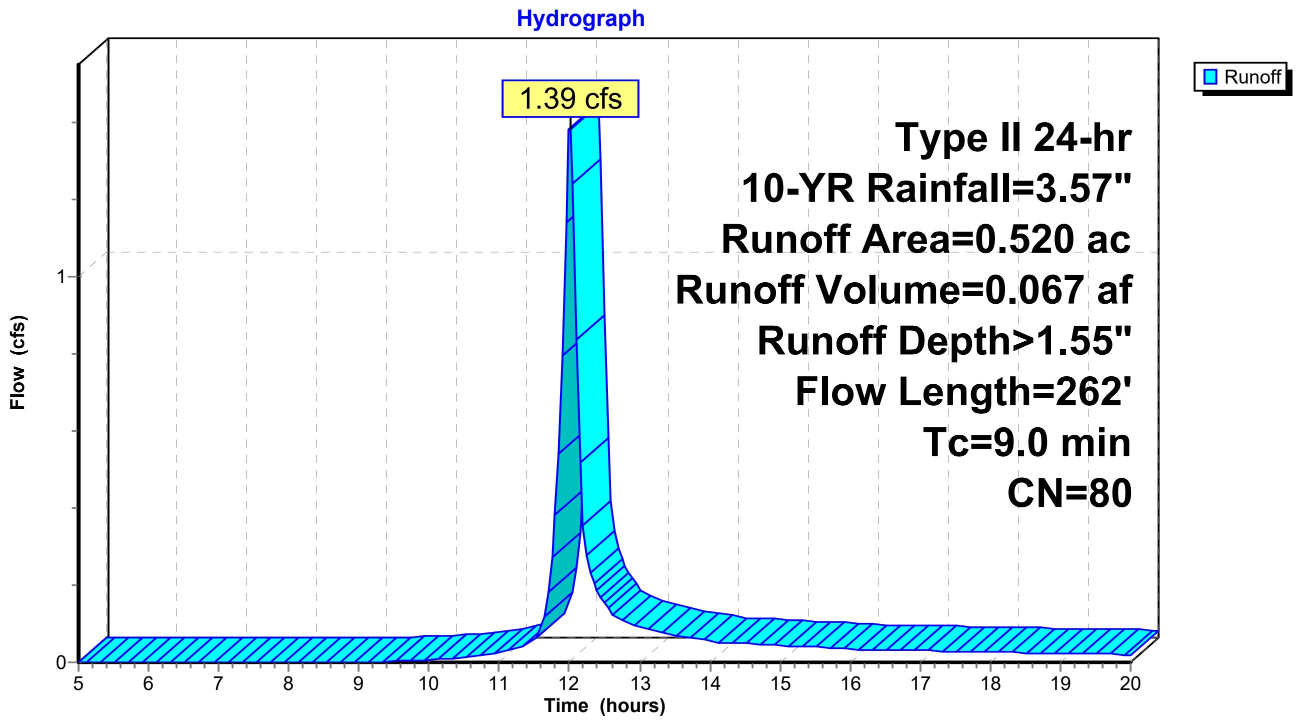
Runoff = 1.39 cfs @ 12.01 hrs, Volume= 0.067 af, Depth> 1.55"
Routed to Reach 16R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
0.520	80	>75% Grass cover, Good, HSG D
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0640	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
2.1	162	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	262	Total			

Subcatchment SC-1: SC-1



Summary for Subcatchment SC-2: SC-2

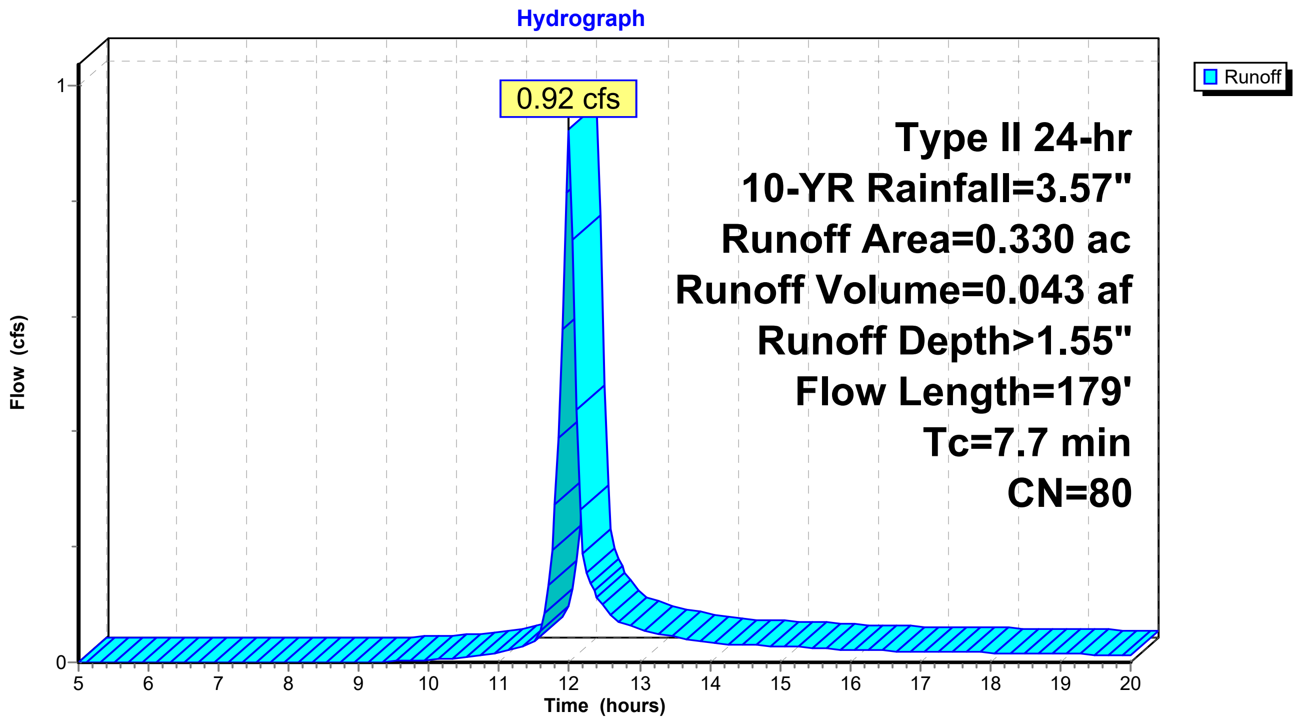
Runoff = 0.92 cfs @ 11.99 hrs, Volume= 0.043 af, Depth> 1.55"
Routed to Pond 17P : FLOW DIFFUSER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
0.330	80	>75% Grass cover, Good, HSG D
0.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0660	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	79	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	179	Total			

Subcatchment SC-2: SC-2



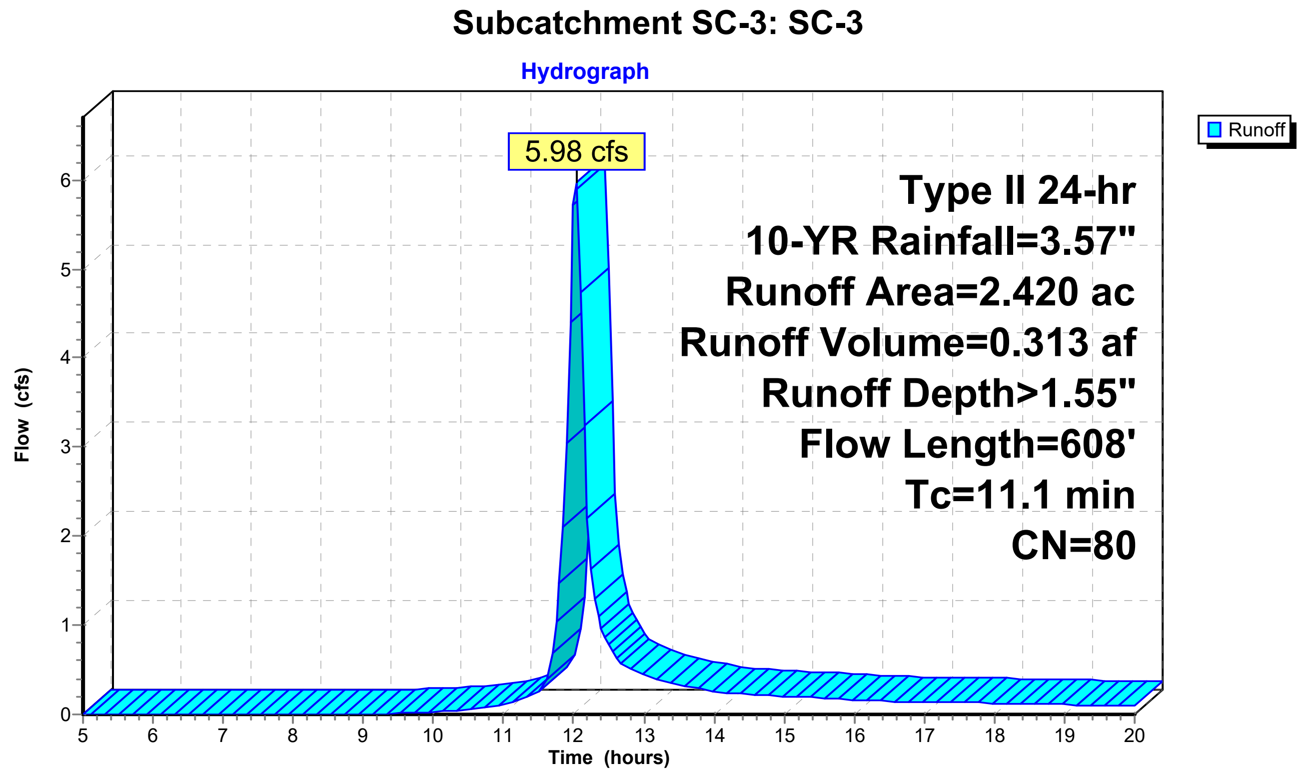
Summary for Subcatchment SC-3: SC-3

Runoff = 5.98 cfs @ 12.03 hrs, Volume= 0.313 af, Depth> 1.55"
Routed to Reach 18R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
2.420	80	>75% Grass cover, Good, HSG D
2.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0630	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.1	508	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	608	Total			



Summary for Subcatchment SC-4: SC-4

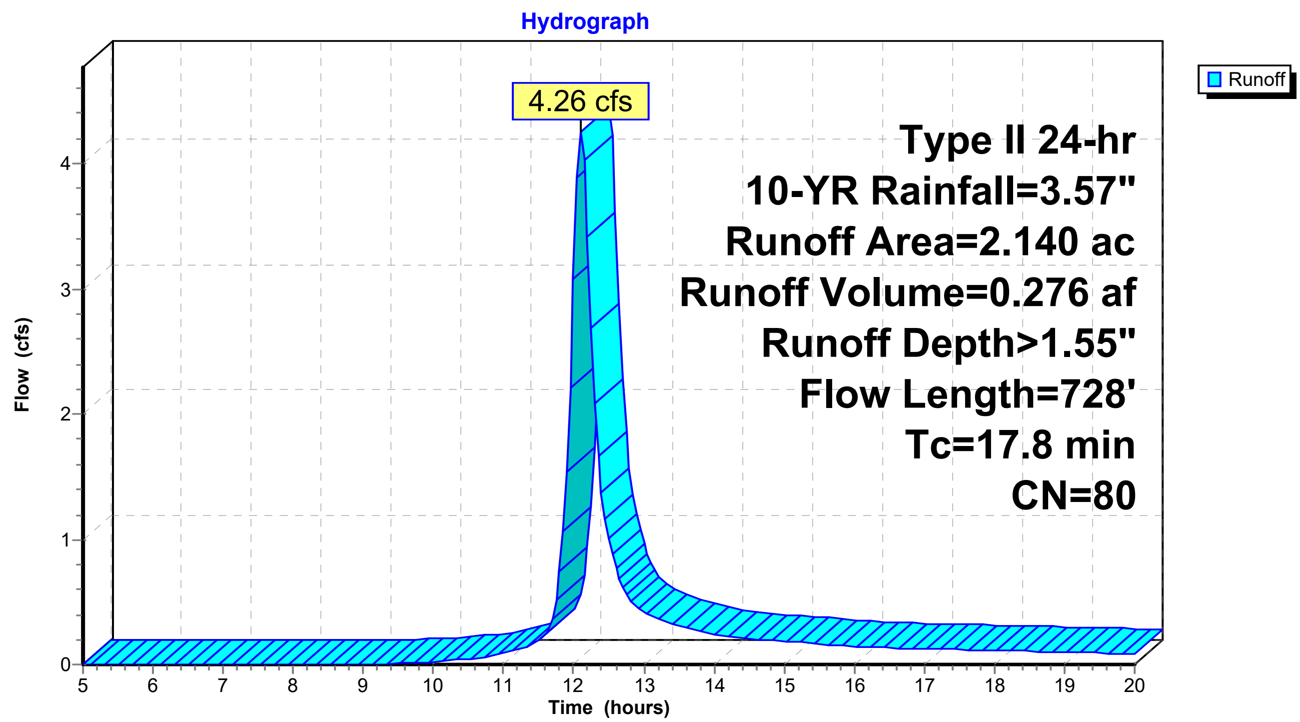
Runoff = 4.26 cfs @ 12.11 hrs, Volume= 0.276 af, Depth> 1.55"
Routed to Pond 1P : CULVERTS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
1.920	80	>75% Grass cover, Good, HSG D
0.220	83	Woods, Poor, HSG D
2.140	80	Weighted Average
2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	57	0.0870	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.5	43	0.0650	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	76	0.0890	1.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	552	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.8	728	Total			

Subcatchment SC-4: SC-4



Summary for Subcatchment SC-5: SC-5

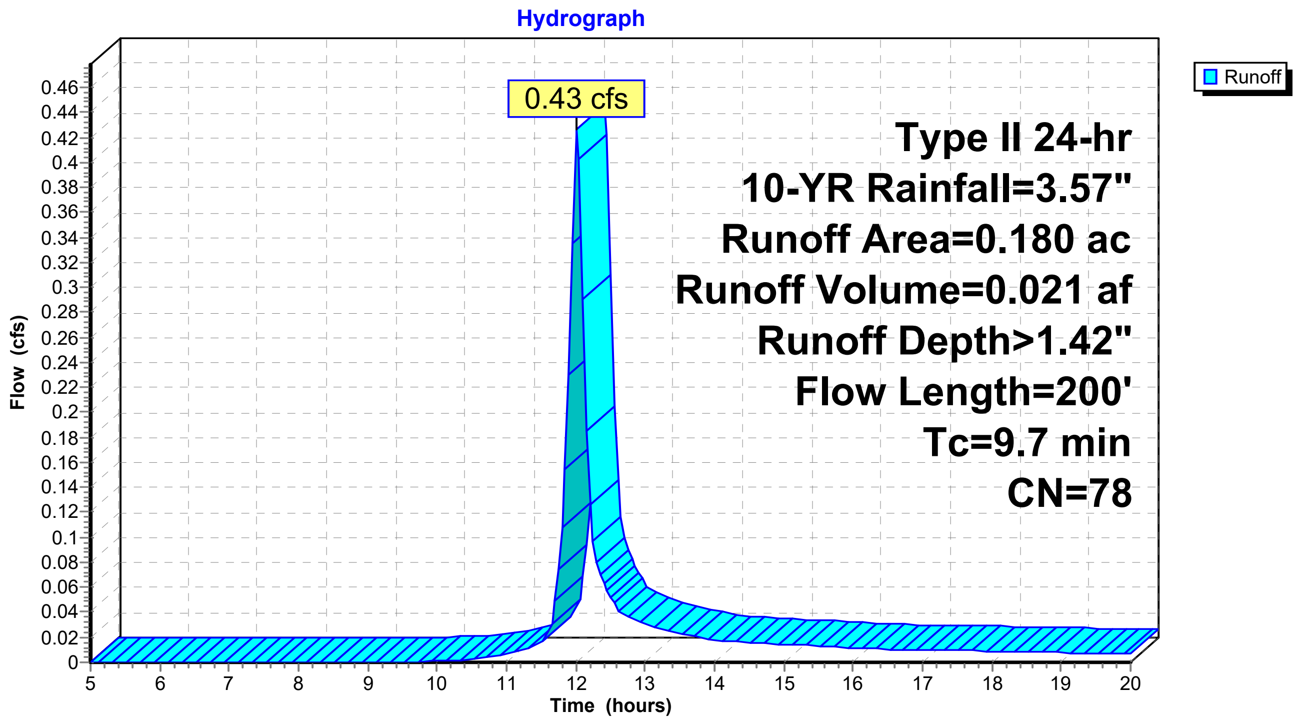
Runoff = 0.43 cfs @ 12.02 hrs, Volume= 0.021 af, Depth> 1.42"
Routed to Pond 2P : CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=3.57"

Area (ac)	CN	Description
0.180	78	Meadow, non-grazed, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0870	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.8	100	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	200	Total			

Subcatchment SC-5: SC-5



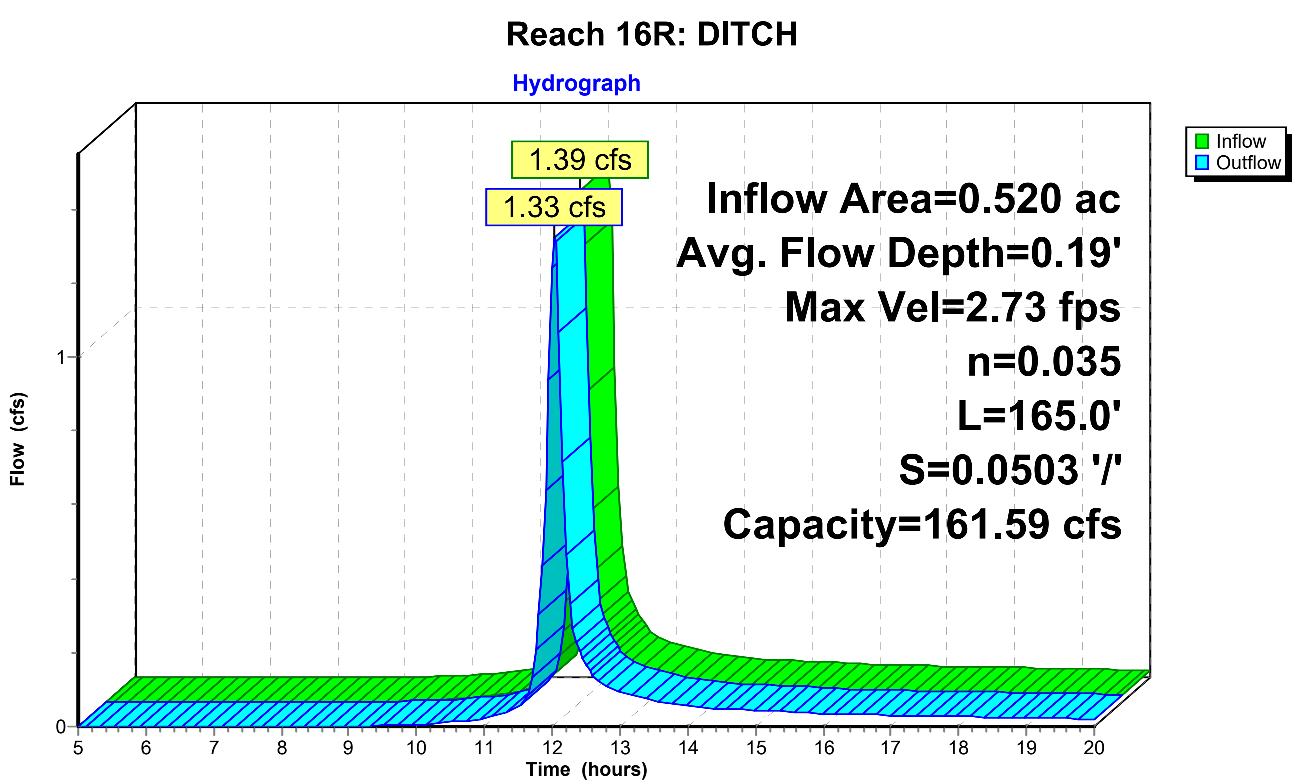
Summary for Reach 16R: DITCH

Inflow Area = 0.520 ac, 0.00% Impervious, Inflow Depth > 1.55" for 10-YR event
Inflow = 1.39 cfs @ 12.01 hrs, Volume= 0.067 af
Outflow = 1.33 cfs @ 12.04 hrs, Volume= 0.067 af, Atten= 4%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.73 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 3.2 min

Peak Storage= 82 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 3.16'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 161.59 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 165.0' Slope= 0.0503 '/'
Inlet Invert= 840.60', Outlet Invert= 832.30'



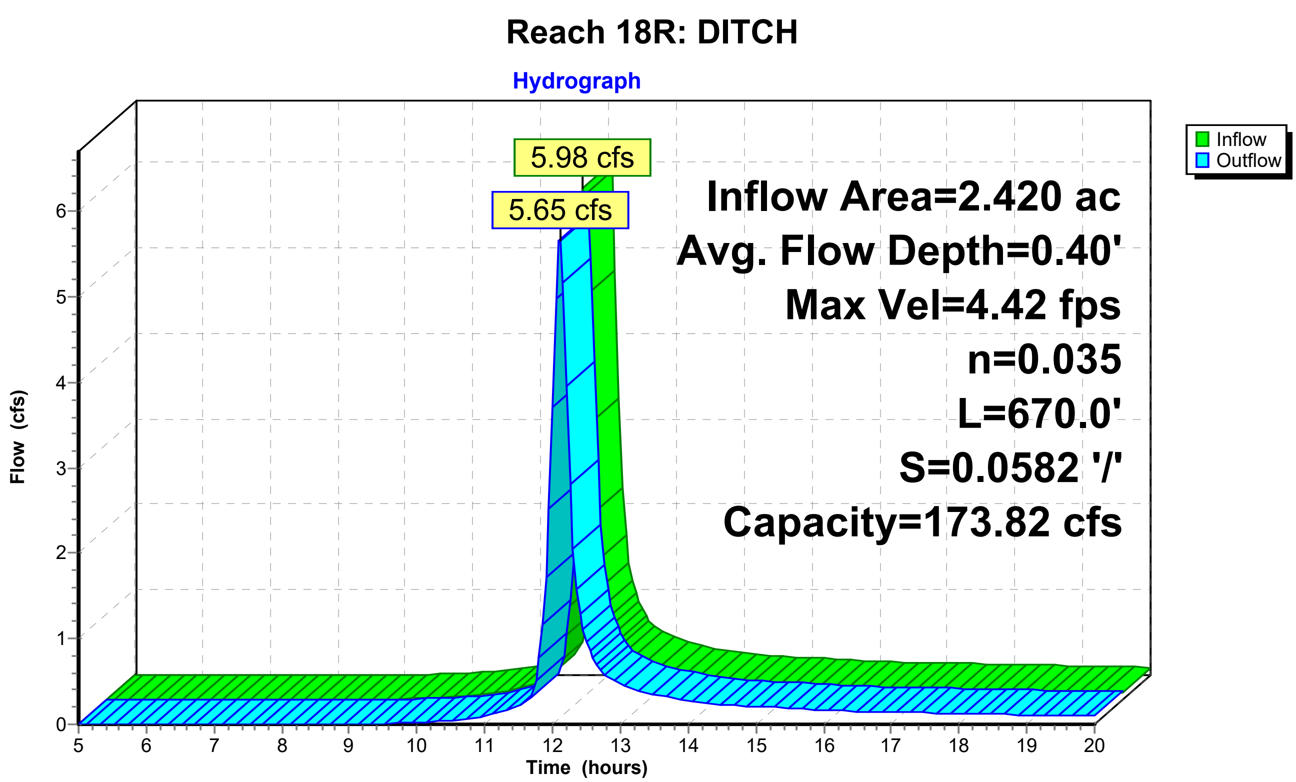
Summary for Reach 18R: DITCH

Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 1.55" for 10-YR event
Inflow = 5.98 cfs @ 12.03 hrs, Volume= 0.313 af
Outflow = 5.65 cfs @ 12.10 hrs, Volume= 0.311 af, Atten= 6%, Lag= 4.3 min
Routed to Pond 19P : CULVERTS

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 7.5 min

Peak Storage= 867 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 4.42'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 173.82 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 670.0' Slope= 0.0582 '/'
Inlet Invert= 844.00', Outlet Invert= 805.00'



Summary for Pond 1P: CULVERTS

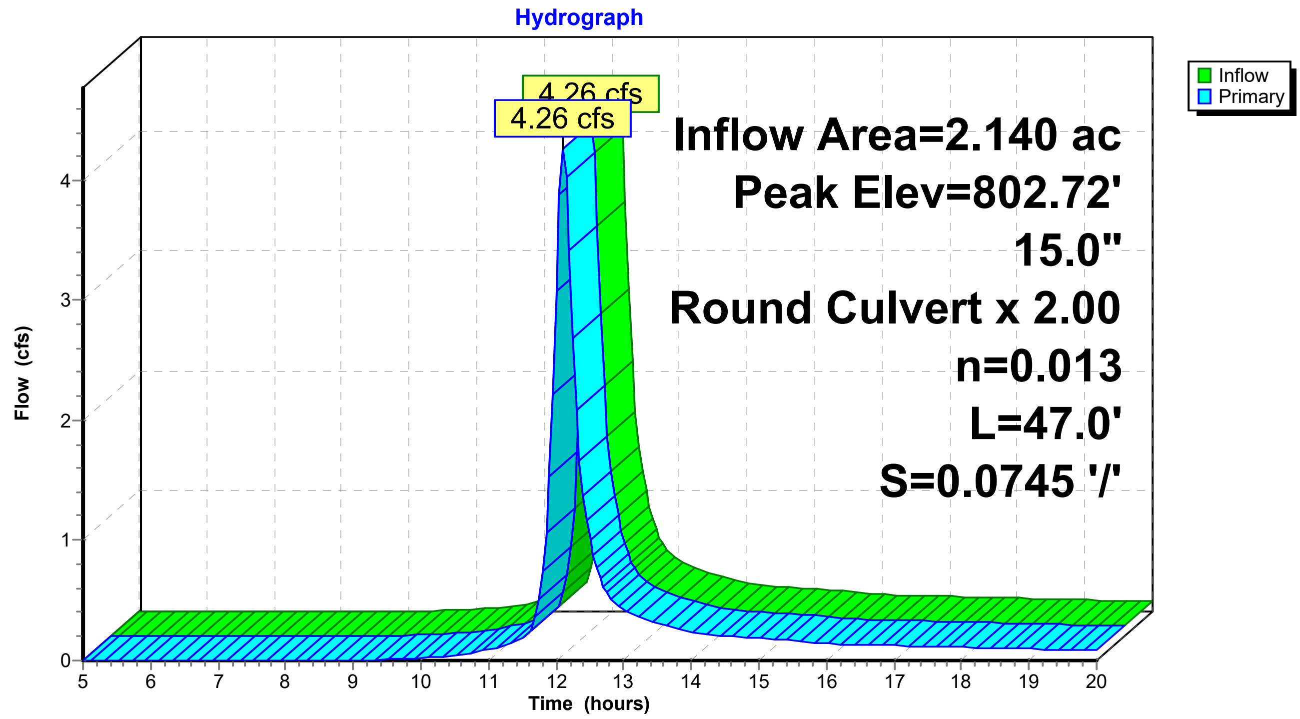
Inflow Area =	2.140 ac,	0.00% Impervious,	Inflow Depth > 1.55"	for 10-YR event
Inflow =	4.26 cfs @	12.11 hrs, Volume=	0.276 af	
Outflow =	4.26 cfs @	12.11 hrs, Volume=	0.276 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.26 cfs @	12.11 hrs, Volume=	0.276 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 802.72' @ 12.11 hrs
Flood Elev= 803.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.00'	**15.0" Round Culvert X 2.00** L= 47.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 802.00' / 798.50' S= 0.0745 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.23 cfs @ 12.11 hrs HW=802.72' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.23 cfs @ 2.89 fps)

Pond 1P: CULVERTS



Summary for Pond 2P: CULVERT

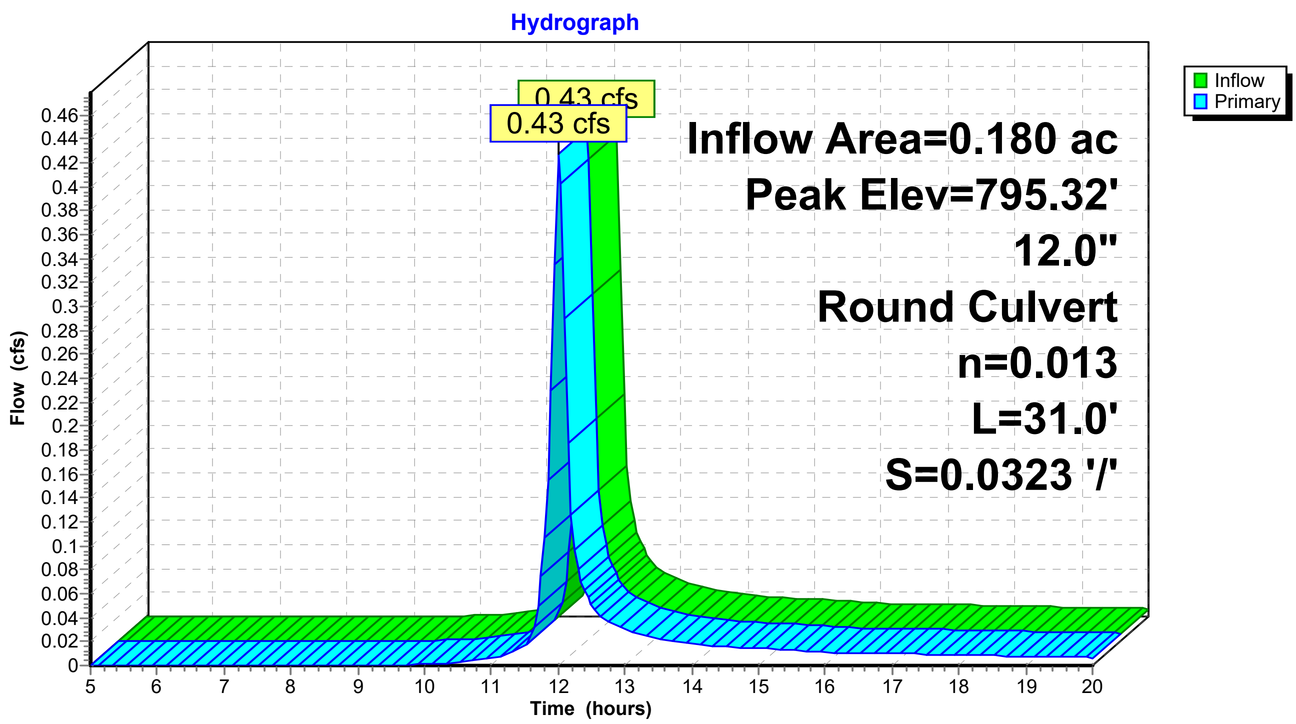
Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 1.42" for 10-YR event
Inflow = 0.43 cfs @ 12.02 hrs, Volume= 0.021 af
Outflow = 0.43 cfs @ 12.02 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.02 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 795.32' @ 12.02 hrs
Flood Elev= 796.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	795.00'	**12.0" Round Culvert** L= 31.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 795.00' / 794.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.02 hrs HW=795.32' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.42 cfs @ 1.92 fps)

Pond 2P: CULVERT



Summary for Pond 17P: FLOW DIFFUSER

[93] Warning: Storage range exceeded by 0.01'

Inflow Area = 0.330 ac, 0.00% Impervious, Inflow Depth > 1.55" for 10-YR event
Inflow = 0.92 cfs @ 11.99 hrs, Volume= 0.043 af
Outflow = 0.92 cfs @ 11.99 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.0 min
Primary = 0.92 cfs @ 11.99 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 850.01' @ 11.99 hrs Surf.Area= 0.007 ac Storage= 0.002 af

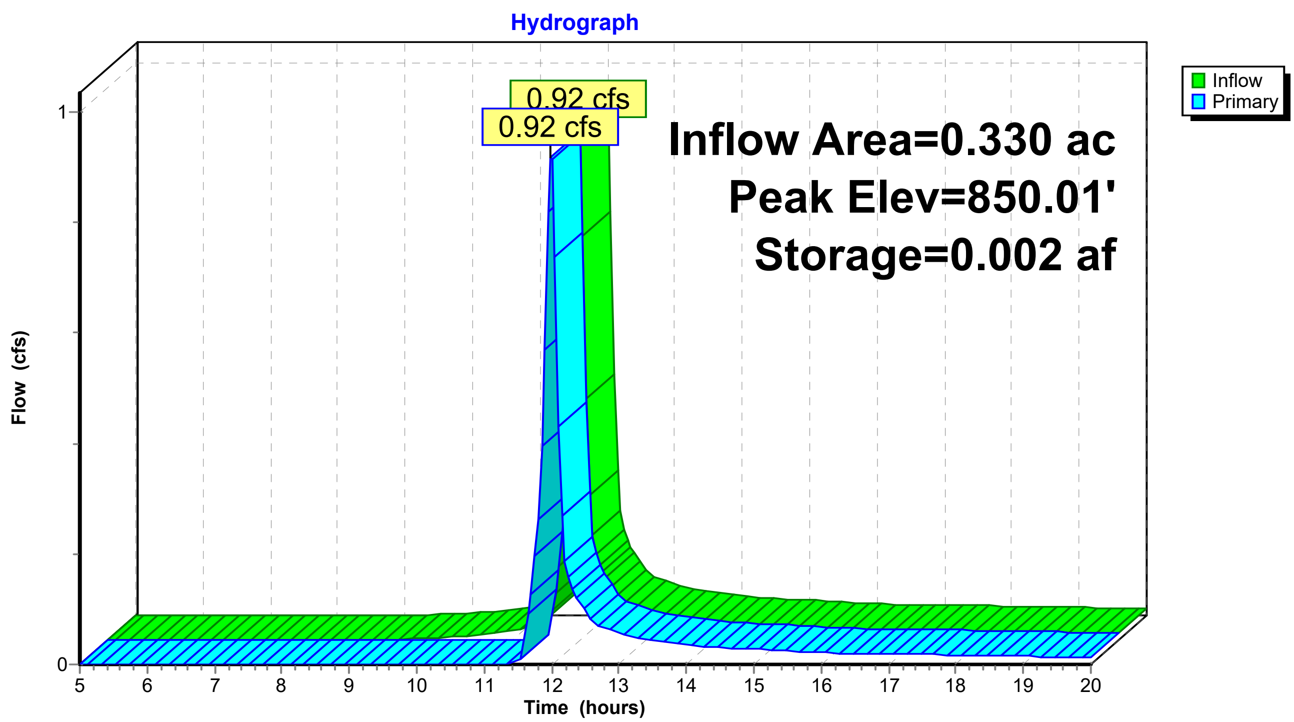
Plug-Flow detention time= 27.0 min calculated for 0.040 af (95% of inflow)
Center-of-Mass det. time= 7.6 min (799.7 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	849.50'	0.002 af	**1.00'W x 100.00'L x 0.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	849.99'	**100.0' long + 2.0 '/' SideZ x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.90 cfs @ 11.99 hrs HW=850.01' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 0.39 fps)

Pond 17P: FLOW DIFFUSER



Summary for Pond 19P: CULVERTS

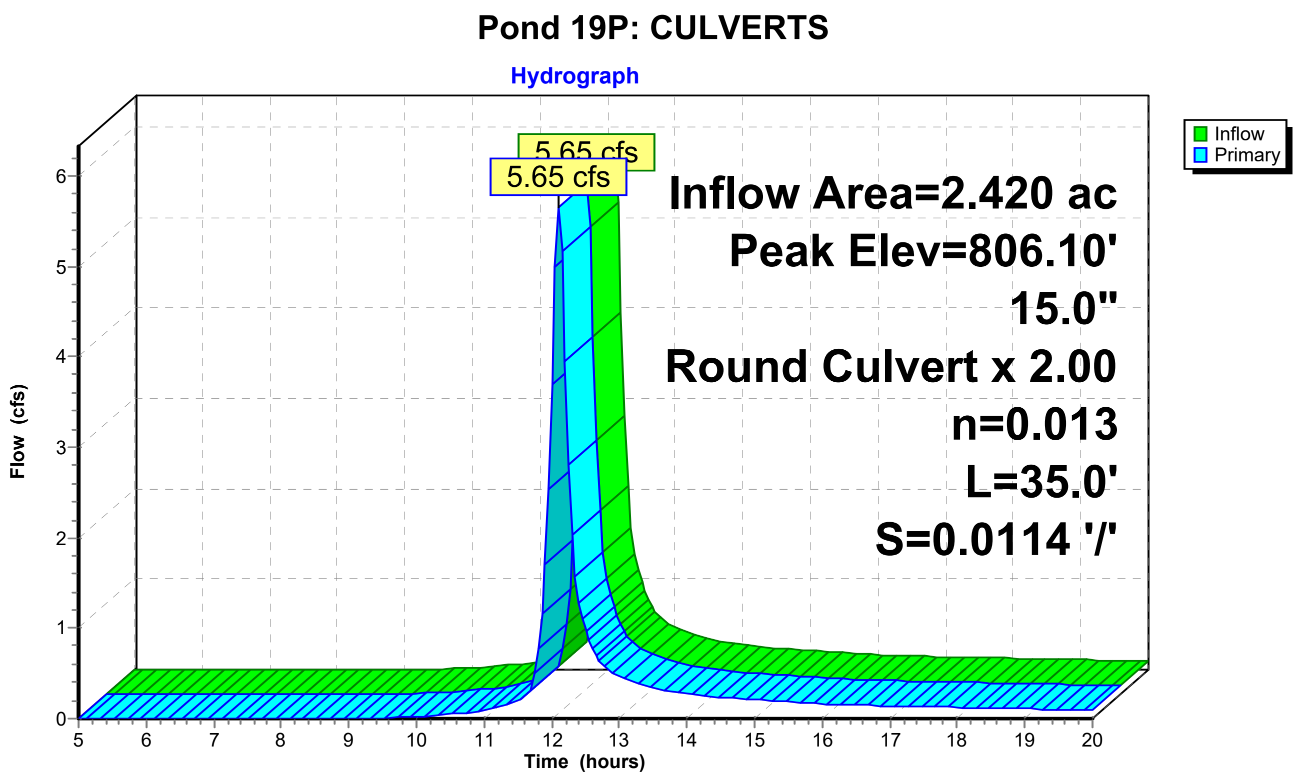
[62] Hint: Exceeded Reach 18R OUTLET depth by 0.71' @ 12.10 hrs

Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 1.54" for 10-YR event
Inflow = 5.65 cfs @ 12.10 hrs, Volume= 0.311 af
Outflow = 5.65 cfs @ 12.10 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min
Primary = 5.65 cfs @ 12.10 hrs, Volume= 0.311 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 806.10' @ 12.10 hrs
Flood Elev= 806.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	805.20'	**15.0" Round Culvert X 2.00** L= 35.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 805.20' / 804.80' S= 0.0114 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.61 cfs @ 12.10 hrs HW=806.09' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.61 cfs @ 4.20 fps)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA-1 Runoff Area=2.710 ac 15.87% Impervious Runoff Depth>3.75"
Flow Length=548' Tc=12.4 min CN=83 Runoff=14.99 cfs 0.847 af

Subcatchment 2S: DA-2 Runoff Area=1.850 ac 9.73% Impervious Runoff Depth>3.65"
Flow Length=498' Tc=11.8 min CN=82 Runoff=10.19 cfs 0.563 af

Subcatchment 3S: DA-3 Runoff Area=4.340 ac 0.00% Impervious Runoff Depth>3.45"
Flow Length=673' Tc=13.9 min CN=80 Runoff=21.35 cfs 1.248 af

Subcatchment 4S: DA-4 Runoff Area=7.170 ac 0.00% Impervious Runoff Depth>3.44"
Flow Length=1,222' Tc=24.5 min CN=80 Runoff=26.20 cfs 2.054 af

Subcatchment 5S: DA-5 Runoff Area=11.230 ac 0.00% Impervious Runoff Depth>3.43"
Flow Length=1,412' Tc=29.1 min CN=80 Runoff=36.81 cfs 3.212 af

Subcatchment 6S: DA-6 Runoff Area=7.810 ac 0.26% Impervious Runoff Depth>3.31"
Flow Length=1,239' Tc=49.5 min CN=79 Runoff=17.39 cfs 2.154 af

Subcatchment 7S: DA-7 Runoff Area=7.660 ac 0.00% Impervious Runoff Depth>3.29"
Flow Length=1,243' Tc=68.6 min CN=79 Runoff=13.41 cfs 2.097 af

Subcatchment 8S: DA-8 Runoff Area=3.180 ac 0.00% Impervious Runoff Depth>3.23"
Flow Length=706' Tc=32.0 min CN=78 Runoff=9.29 cfs 0.857 af

Subcatchment SC-1: SC-1 Runoff Area=0.520 ac 0.00% Impervious Runoff Depth>3.45"
Flow Length=262' Tc=9.0 min CN=80 Runoff=3.00 cfs 0.150 af

Subcatchment SC-2: SC-2 Runoff Area=0.330 ac 0.00% Impervious Runoff Depth>3.46"
Flow Length=179' Tc=7.7 min CN=80 Runoff=1.99 cfs 0.095 af

Subcatchment SC-3: SC-3 Runoff Area=2.420 ac 0.00% Impervious Runoff Depth>3.45"
Flow Length=608' Tc=11.1 min CN=80 Runoff=12.98 cfs 0.696 af

Subcatchment SC-4: SC-4 Runoff Area=2.140 ac 0.00% Impervious Runoff Depth>3.45"
Flow Length=728' Tc=17.8 min CN=80 Runoff=9.36 cfs 0.614 af

Subcatchment SC-5: SC-5 Runoff Area=0.180 ac 0.00% Impervious Runoff Depth>3.26"
Flow Length=200' Tc=9.7 min CN=78 Runoff=0.96 cfs 0.049 af

Reach 16R: DITCH Avg. Flow Depth=0.30' Max Vel=3.47 fps Inflow=3.00 cfs 0.150 af
n=0.035 L=165.0' S=0.0503 '/' Capacity=161.59 cfs Outflow=2.89 cfs 0.149 af

Reach 18R: DITCH Avg. Flow Depth=0.60' Max Vel=5.51 fps Inflow=12.98 cfs 0.696 af
n=0.035 L=670.0' S=0.0582 '/' Capacity=173.82 cfs Outflow=12.31 cfs 0.694 af

Pond 1P: CULVERTS Peak Elev=803.25' Inflow=9.36 cfs 0.614 af
15.0" Round Culvert x 2.00 n=0.013 L=47.0' S=0.0745 '/' Outflow=9.36 cfs 0.614 af

Pond 2P: CULVERT Peak Elev=795.51' Inflow=0.96 cfs 0.049 af
12.0" Round Culvert n=0.013 L=31.0' S=0.0323 '/' Outflow=0.96 cfs 0.049 af

Pond 17P: FLOW DIFFUSER Peak Elev=850.03' Storage=0.002 af Inflow=1.99 cfs 0.095 af
Outflow=2.00 cfs 0.093 af

Pond 19P: CULVERTS Peak Elev=806.95' Inflow=12.31 cfs 0.694 af
15.0" Round Culvert x 2.00 n=0.013 L=35.0' S=0.0114 '/' Outflow=12.31 cfs 0.694 af

Total Runoff Area = 51.540 ac Runoff Volume = 14.636 af Average Runoff Depth = 3.41"
98.78% Pervious = 50.910 ac 1.22% Impervious = 0.630 ac

Summary for Subcatchment 1S: DA-1

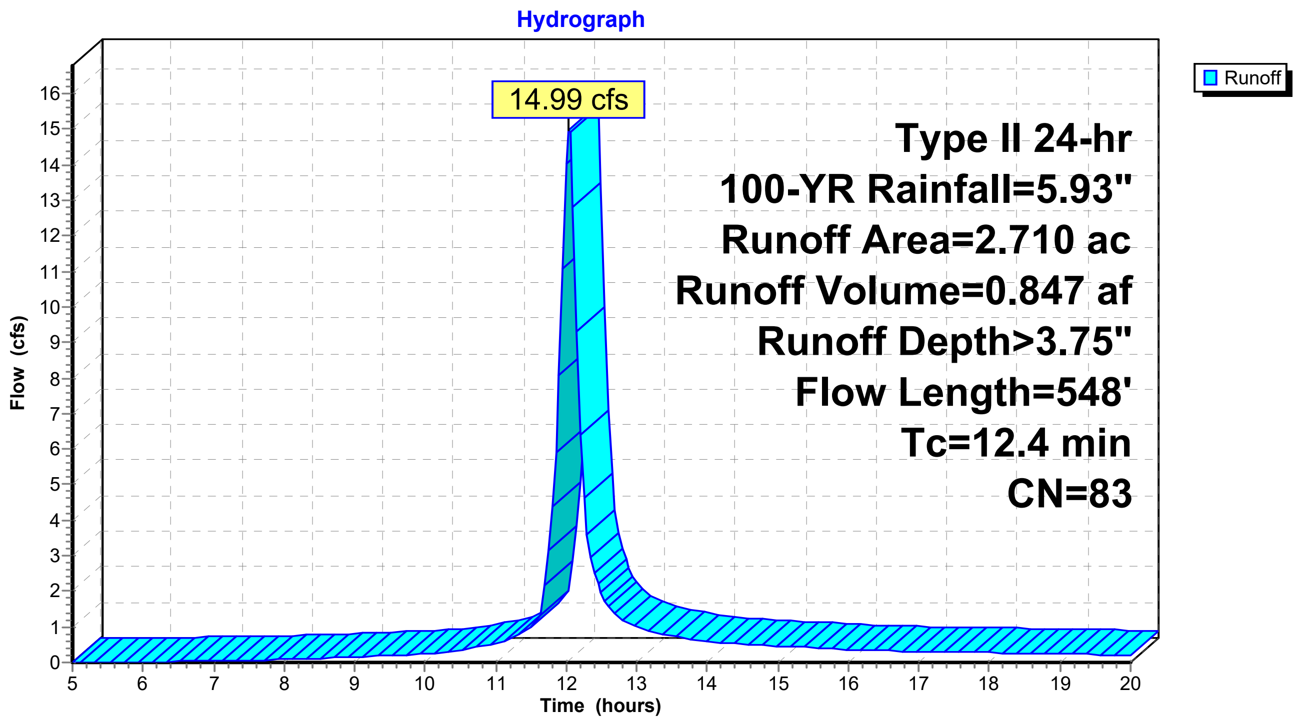
Runoff = 14.99 cfs @ 12.04 hrs, Volume= 0.847 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

	Area (ac)	CN	Description
	2.280	80	>75% Grass cover, Good, HSG D
*	0.430	98	impervious
	2.710	83	Weighted Average
	2.280		84.13% Pervious Area
	0.430		15.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.0	448	0.0450	1.48		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.4	548	Total			

Subcatchment 1S: DA-1



Summary for Subcatchment 2S: DA-2

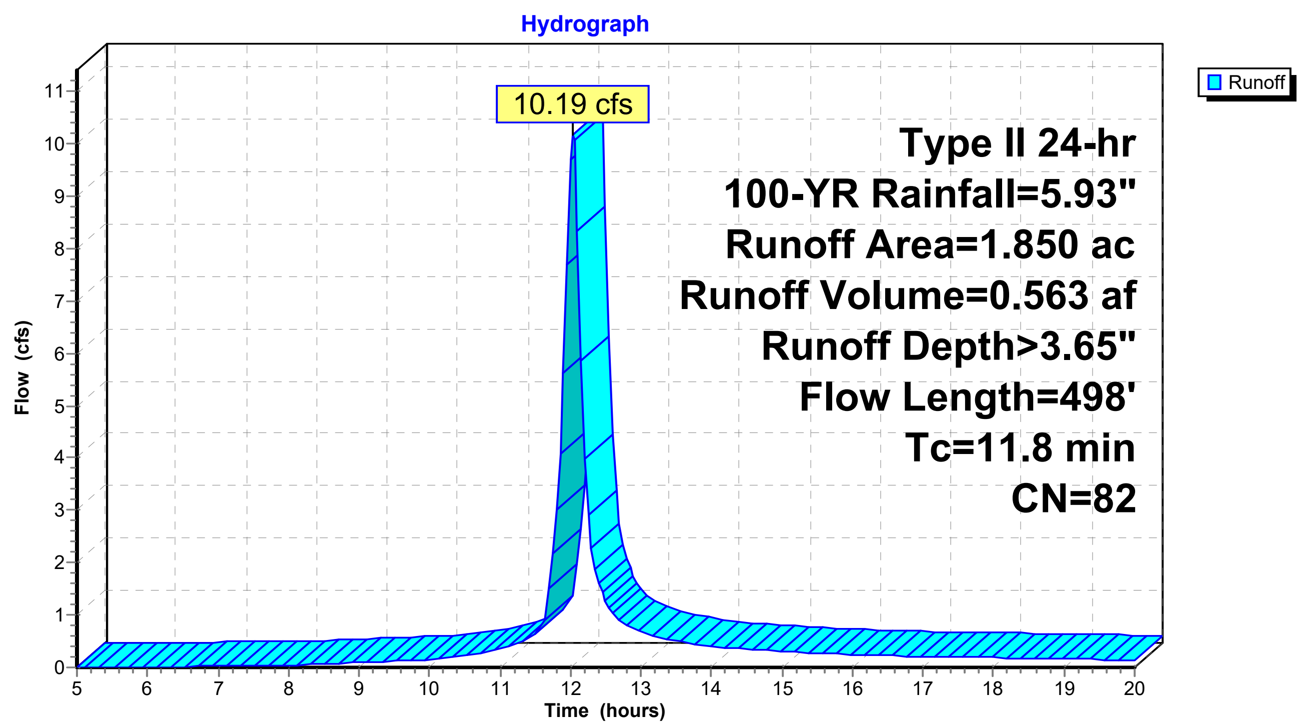
Runoff = 10.19 cfs @ 12.03 hrs, Volume= 0.563 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

	Area (ac)	CN	Description
	1.670	80	>75% Grass cover, Good, HSG D
*	0.180	98	impervious
	1.850	82	Weighted Average
	1.670		90.27% Pervious Area
	0.180		9.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	100	0.0510	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.2	398	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	498	Total			

Subcatchment 2S: DA-2



Summary for Subcatchment 3S: DA-3

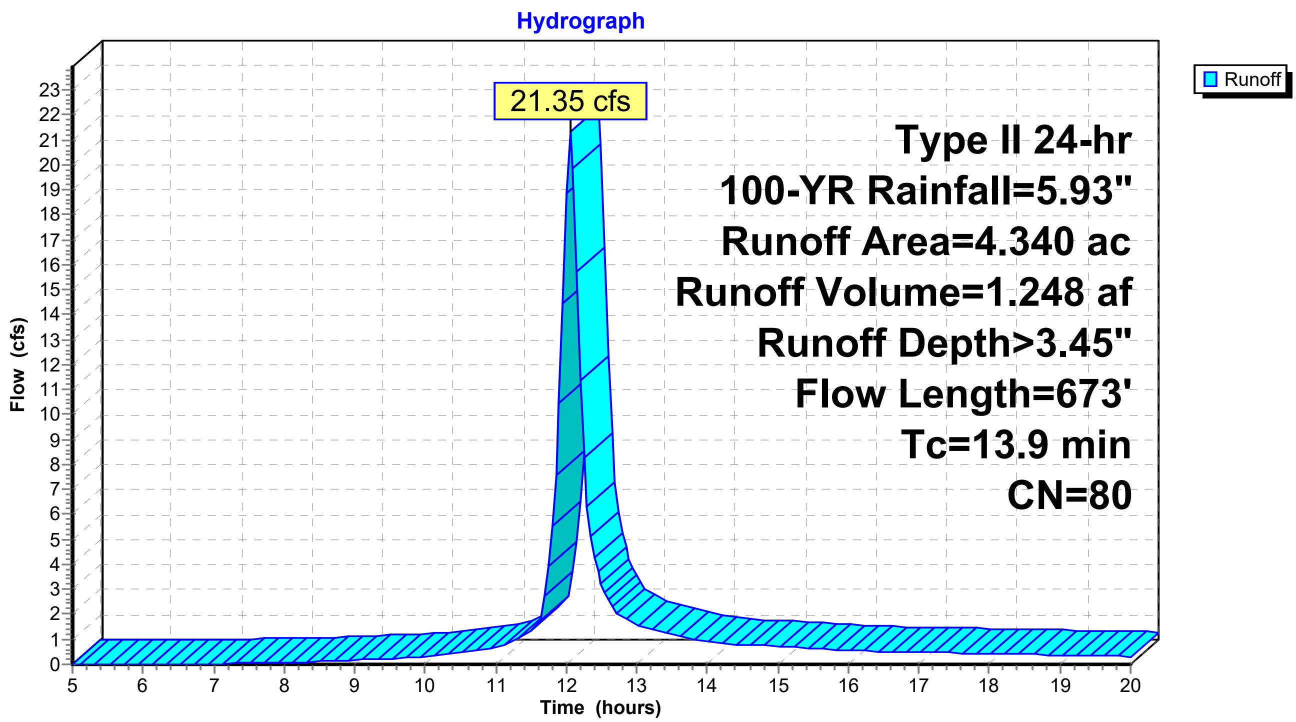
Runoff = 21.35 cfs @ 12.06 hrs, Volume= 1.248 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
4.340	80	>75% Grass cover, Good, HSG D
4.340		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0400	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
5.5	573	0.0620	1.74		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	673	Total			

Subcatchment 3S: DA-3



Summary for Subcatchment 4S: DA-4

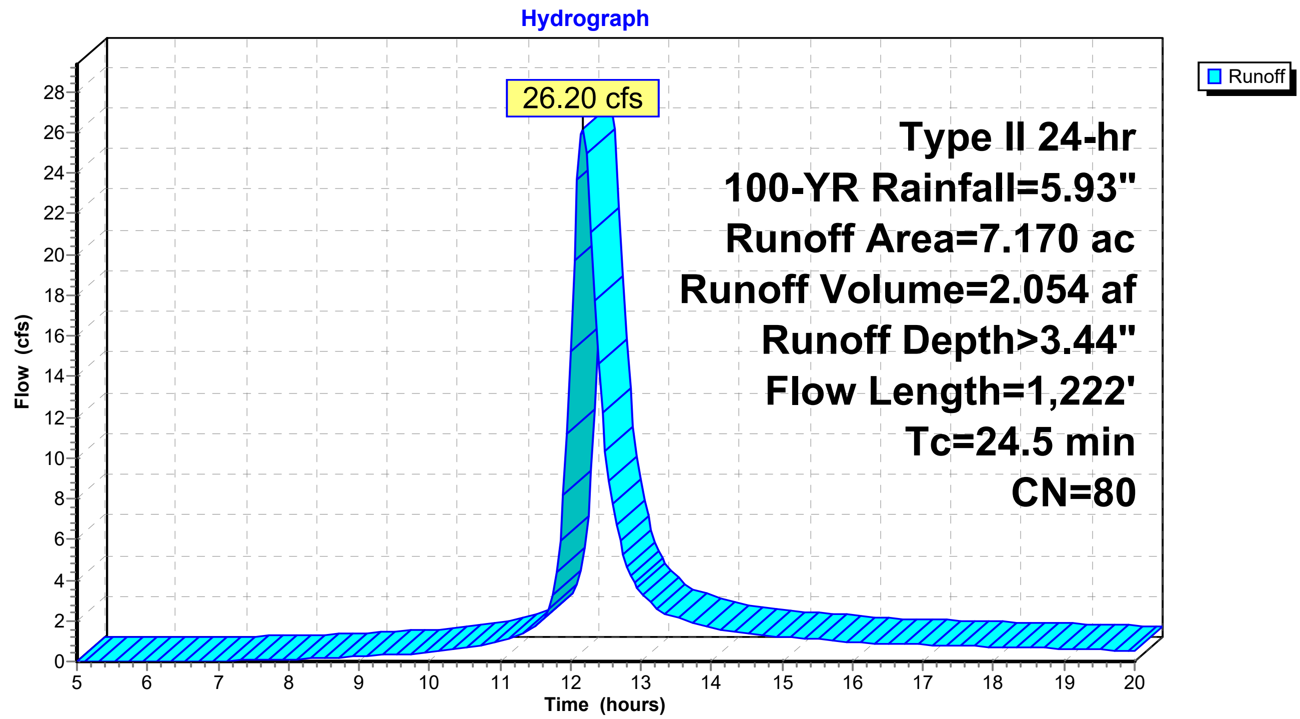
Runoff = 26.20 cfs @ 12.17 hrs, Volume= 2.054 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
7.110	80	>75% Grass cover, Good, HSG D
0.060	83	Woods, Poor, HSG D
7.170	80	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0550	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	94	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	100	0.0480	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
8.3	928	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.5	1,222	Total			

Subcatchment 4S: DA-4



Summary for Subcatchment 5S: DA-5

[47] Hint: Peak is 1033% of capacity of segment #5

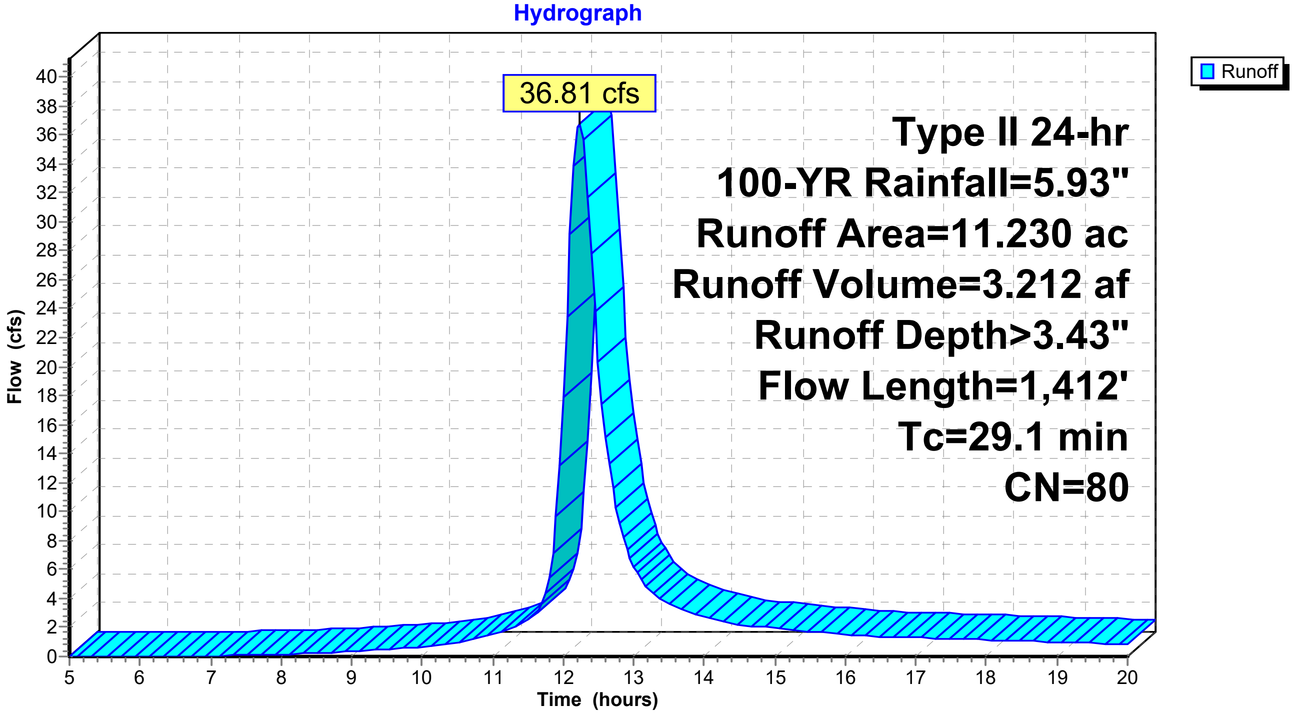
Runoff = 36.81 cfs @ 12.23 hrs, Volume= 3.212 af, Depth> 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
10.220	80	>75% Grass cover, Good, HSG D
0.650	83	Woods, Poor, HSG D
0.360	83	Brush, Poor, HSG D
11.230	80	Weighted Average
11.230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.0600	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.7	73	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.3	80	0.0520	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
1.0	670	0.0600	11.03	176.48	**Trap/Vee/Rect Channel Flow,** Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.035 Earth, dense weeds
0.2	44	0.0100	4.54	3.56	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
10.8	100	0.0540	0.15		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	100	0.0610	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.0	245	0.0850	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
29.1	1,412	Total			

Subcatchment 5S: DA-5



Summary for Subcatchment 6S: DA-6

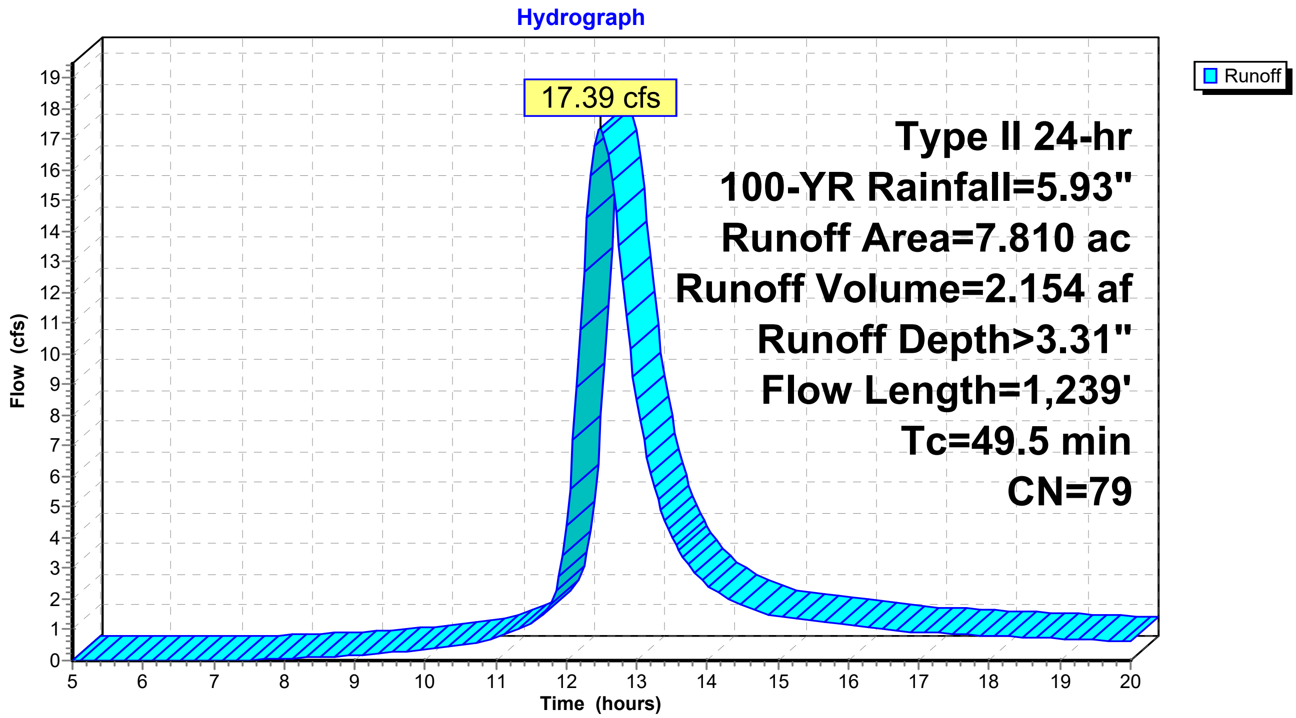
Runoff = 17.39 cfs @ 12.49 hrs, Volume= 2.154 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

	Area (ac)	CN	Description
	3.850	80	>75% Grass cover, Good, HSG D
	0.480	83	Woods, Poor, HSG D
	3.460	78	Meadow, non-grazed, HSG D
*	0.020	98	Impervious
	7.810	79	Weighted Average
	7.790		99.74% Pervious Area
	0.020		0.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	50	0.0700	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	50	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.4	51	0.0760	1.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	100	0.0760	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	17	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	0.0890	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.7	89	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.0	100	0.0660	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.0	105	0.0590	1.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	59	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.7	375	0.1080	2.30		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.6	143	0.0920	1.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
49.5	1,239	Total			

Subcatchment 6S: DA-6



Summary for Subcatchment 7S: DA-7

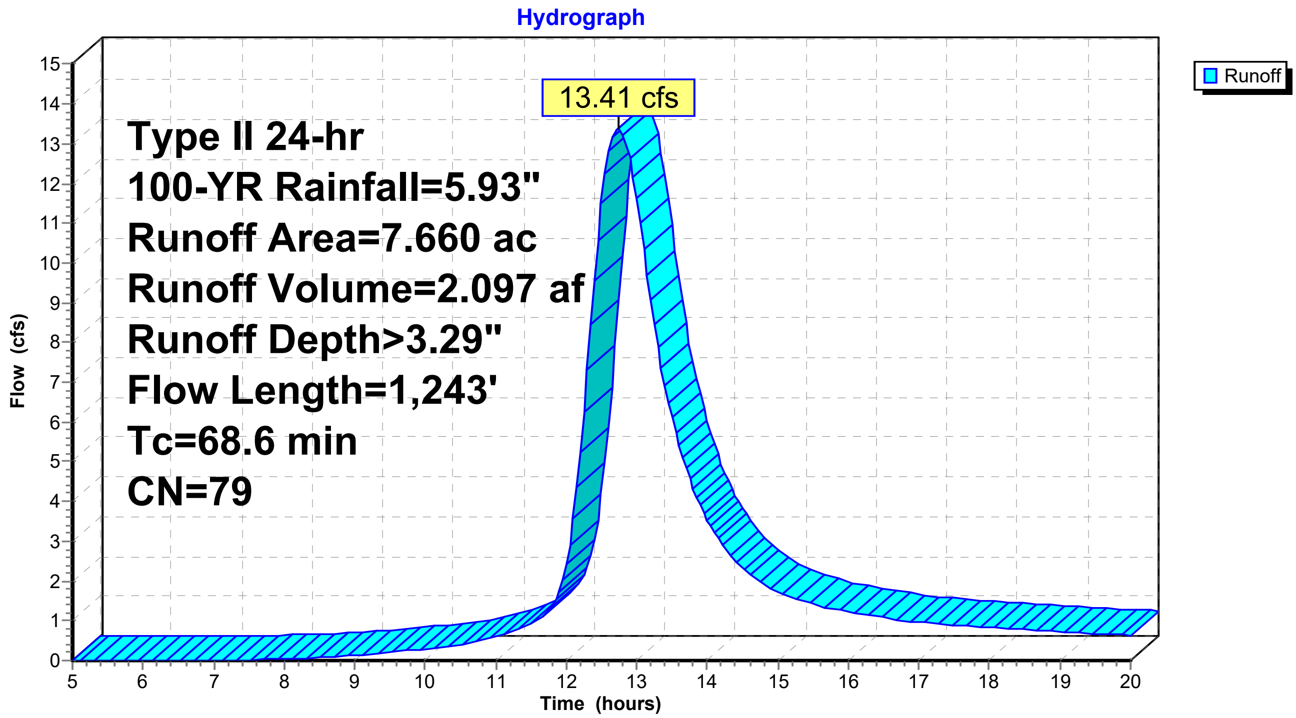
Runoff = 13.41 cfs @ 12.73 hrs, Volume= 2.097 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
0.800	83	Woods, Poor, HSG D
6.860	78	Meadow, non-grazed, HSG D
7.660	79	Weighted Average
7.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	48	0.0640	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
5.3	52	0.0860	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.2	21	0.1040	2.26		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.0	100	0.1150	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.0	7	0.1150	2.37		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	77	0.0530	0.14		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
1.9	261	0.1060	2.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.9	100	0.1190	0.21		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	9	0.1140	2.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0960	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	14	0.1020	2.24		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	97	0.1020	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
8.9	100	0.0880	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.0	257	0.0960	2.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
68.6	1,243	Total			

Subcatchment 7S: DA-7



Summary for Subcatchment 8S: DA-8

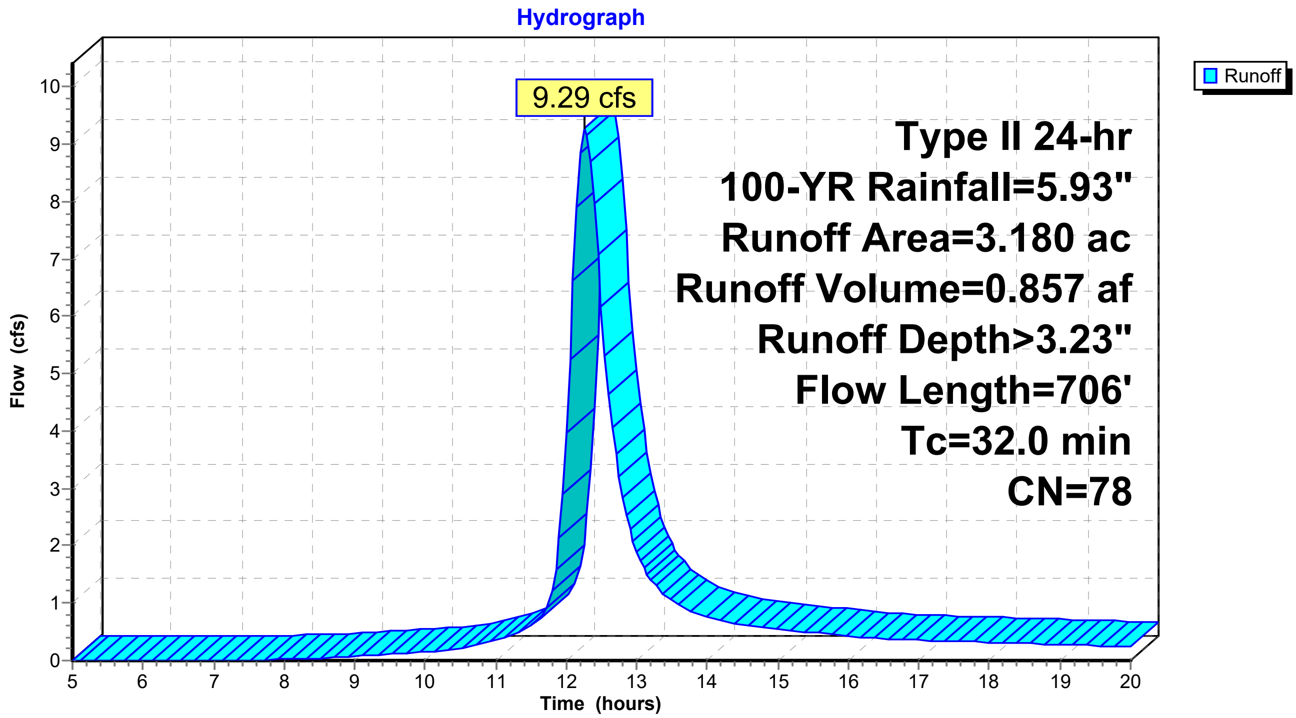
Runoff = 9.29 cfs @ 12.27 hrs, Volume= 0.857 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
0.250	83	Woods, Poor, HSG D
2.930	78	Meadow, non-grazed, HSG D
3.180	78	Weighted Average
3.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	32	0.1200	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
1.7	24	0.1200	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.6	44	0.0880	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.5	63	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	100	0.0970	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.1	18	0.1130	2.35		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	100	0.0860	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
2.7	325	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	706	Total			

Subcatchment 8S: DA-8



Summary for Subcatchment SC-1: SC-1

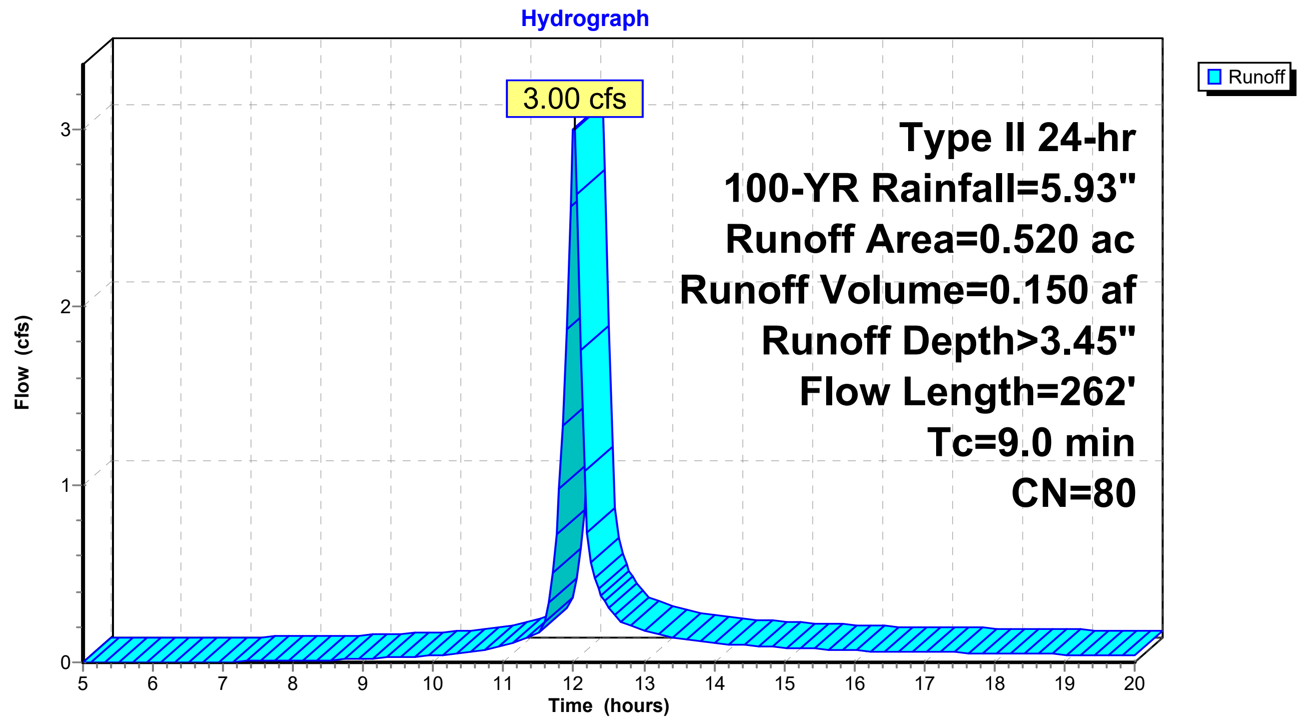
Runoff = 3.00 cfs @ 12.00 hrs, Volume= 0.150 af, Depth> 3.45"
Routed to Reach 16R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
0.520	80	>75% Grass cover, Good, HSG D
0.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0640	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
2.1	162	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.0	262	Total			

Subcatchment SC-1: SC-1



Summary for Subcatchment SC-2: SC-2

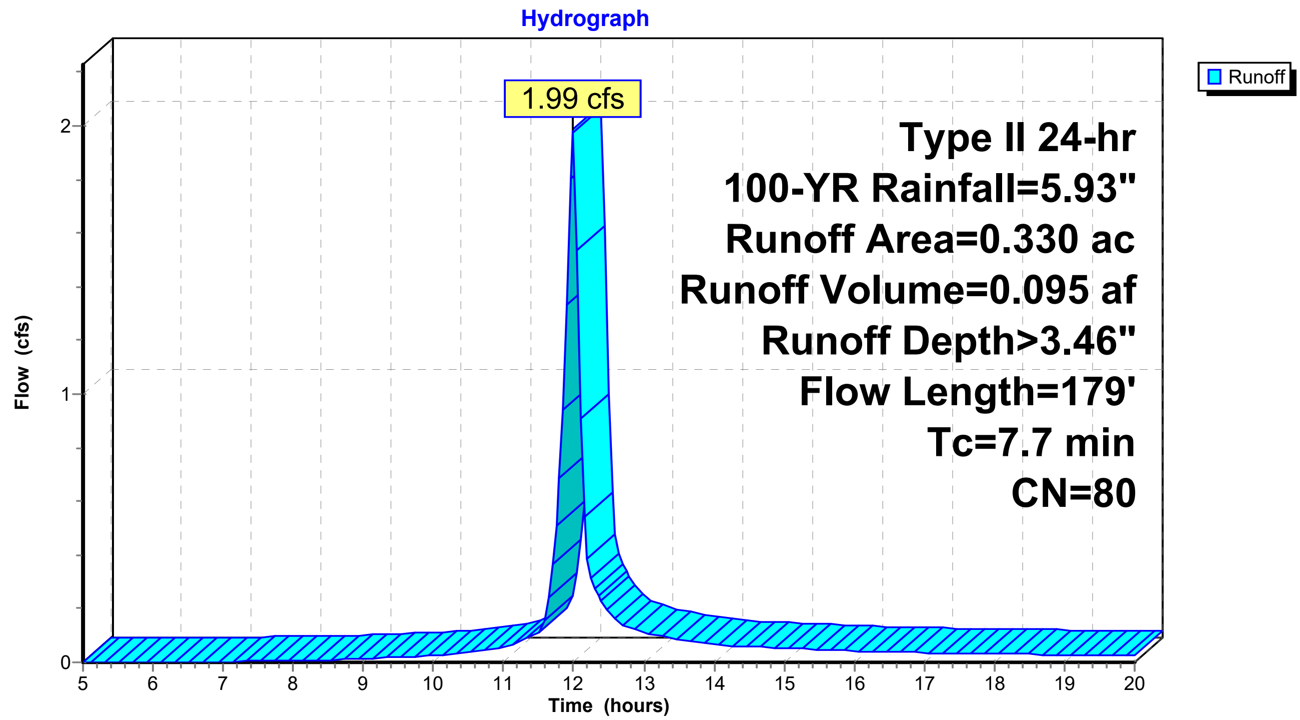
Runoff = 1.99 cfs @ 11.99 hrs, Volume= 0.095 af, Depth> 3.46"
Routed to Pond 17P : FLOW DIFFUSER

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
0.330	80	>75% Grass cover, Good, HSG D
0.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0660	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	79	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.7	179	Total			

Subcatchment SC-2: SC-2



Summary for Subcatchment SC-3: SC-3

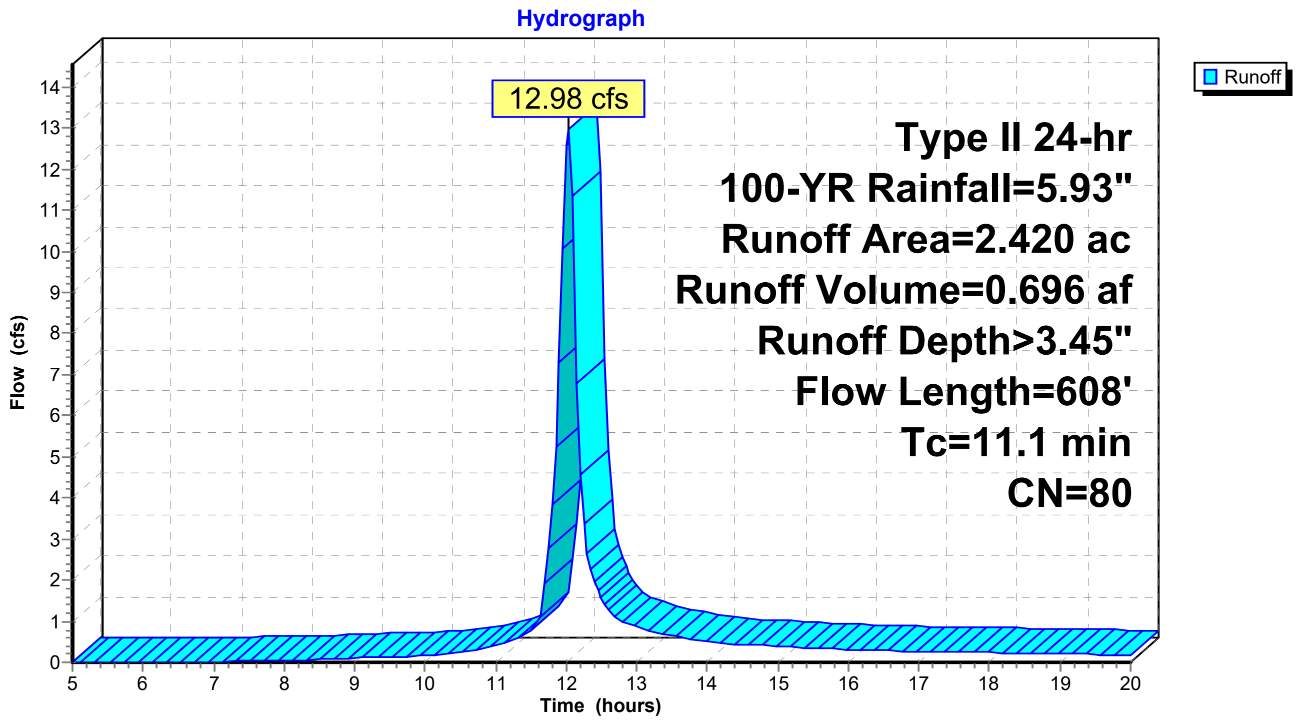
Runoff = 12.98 cfs @ 12.03 hrs, Volume= 0.696 af, Depth> 3.45"
Routed to Reach 18R : DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
2.420	80	>75% Grass cover, Good, HSG D
2.420		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0630	0.24		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
4.1	508	0.0860	2.05		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	608	Total			

Subcatchment SC-3: SC-3



Summary for Subcatchment SC-4: SC-4

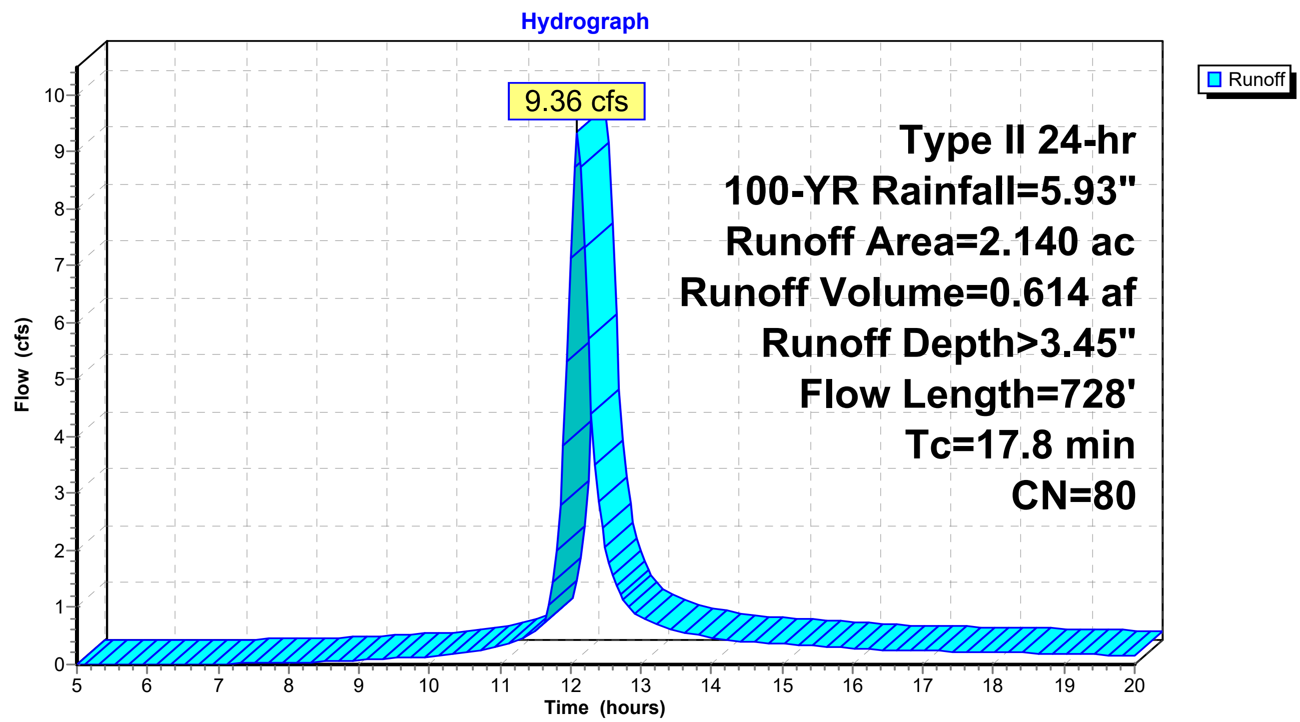
Runoff = 9.36 cfs @ 12.10 hrs, Volume= 0.614 af, Depth> 3.45"
Routed to Pond 1P : CULVERTS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
1.920	80	>75% Grass cover, Good, HSG D
0.220	83	Woods, Poor, HSG D
2.140	80	Weighted Average
2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	57	0.0870	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.51"
3.5	43	0.0650	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.51"
0.8	76	0.0890	1.49		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	552	0.0710	1.87		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.8	728	Total			

Subcatchment SC-4: SC-4



Summary for Subcatchment SC-5: SC-5

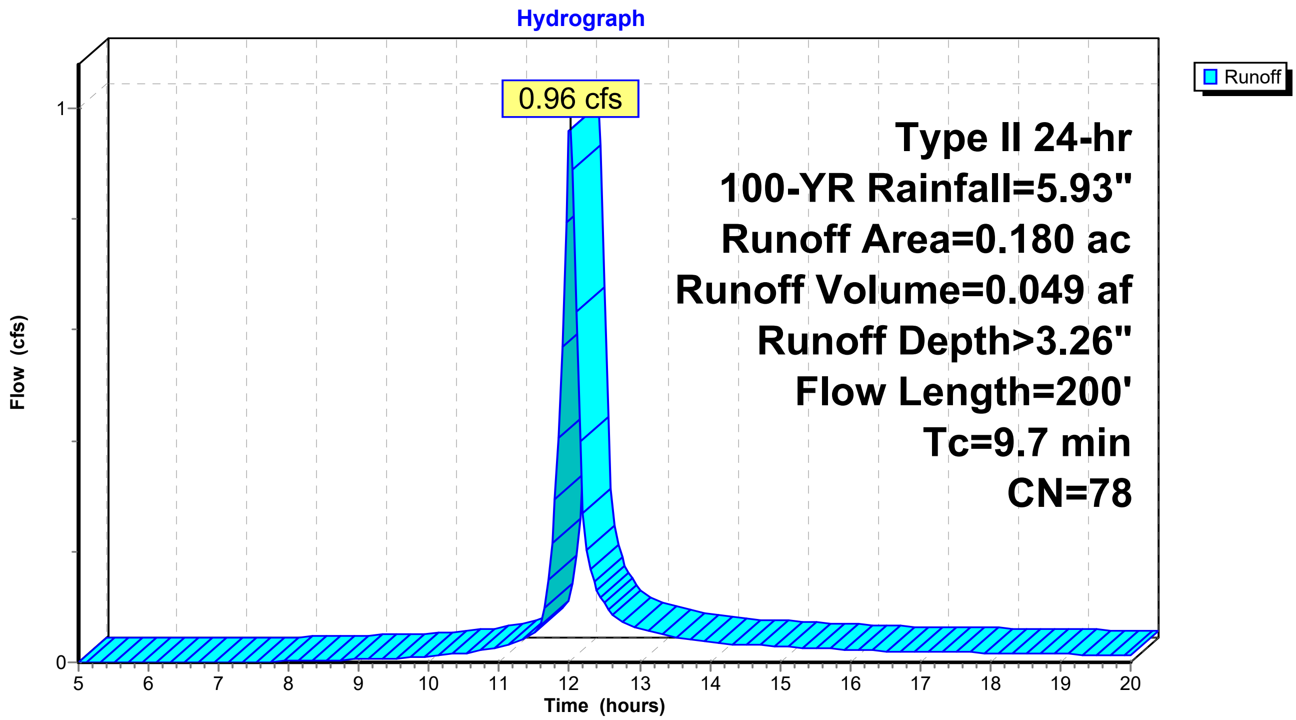
Runoff = 0.96 cfs @ 12.01 hrs, Volume= 0.049 af, Depth> 3.26"
Routed to Pond 2P : CULVERT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=5.93"

Area (ac)	CN	Description
0.180	78	Meadow, non-grazed, HSG D
0.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0870	0.19		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.51"
0.8	100	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.7	200	Total			

Subcatchment SC-5: SC-5



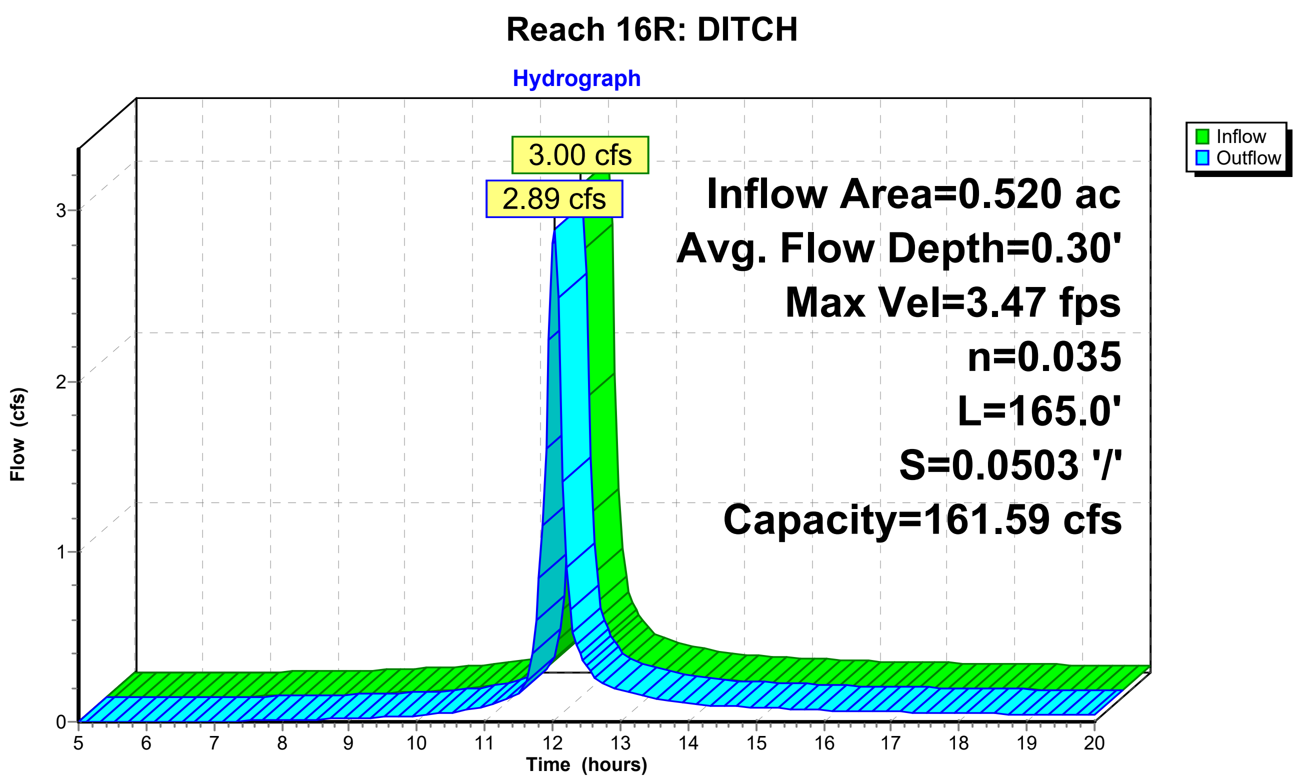
Summary for Reach 16R: DITCH

Inflow Area = 0.520 ac, 0.00% Impervious, Inflow Depth > 3.45" for 100-YR event
Inflow = 3.00 cfs @ 12.00 hrs, Volume= 0.150 af
Outflow = 2.89 cfs @ 12.03 hrs, Volume= 0.149 af, Atten= 4%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.47 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 2.7 min

Peak Storage= 141 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 3.77'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 161.59 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 165.0' Slope= 0.0503 '/'
Inlet Invert= 840.60', Outlet Invert= 832.30'



Summary for Reach 18R: DITCH

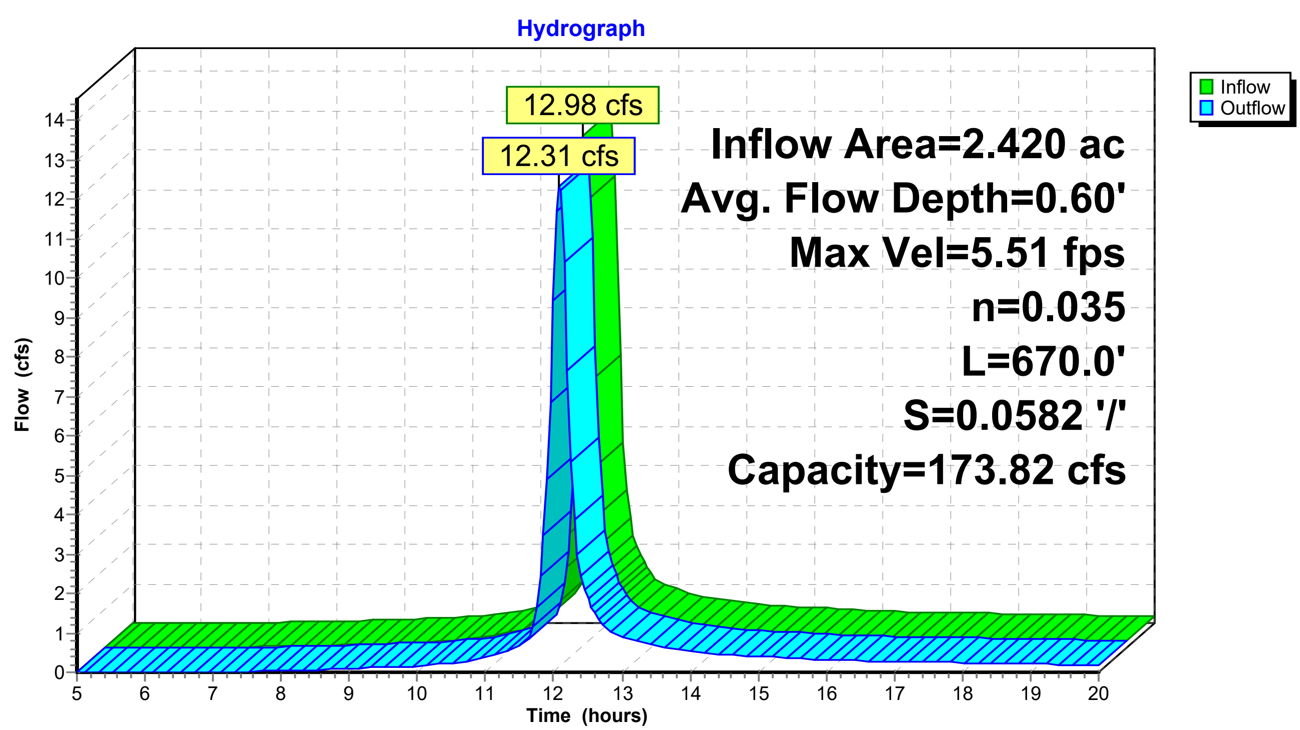
Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 3.45" for 100-YR event
Inflow = 12.98 cfs @ 12.03 hrs, Volume= 0.696 af
Outflow = 12.31 cfs @ 12.09 hrs, Volume= 0.694 af, Atten= 5%, Lag= 3.6 min
Routed to Pond 19P : CULVERTS

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.51 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 6.4 min

Peak Storage= 1,536 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 5.61'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 173.82 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 670.0' Slope= 0.0582 '/'
Inlet Invert= 844.00', Outlet Invert= 805.00'

Reach 18R: DITCH



Summary for Pond 1P: CULVERTS

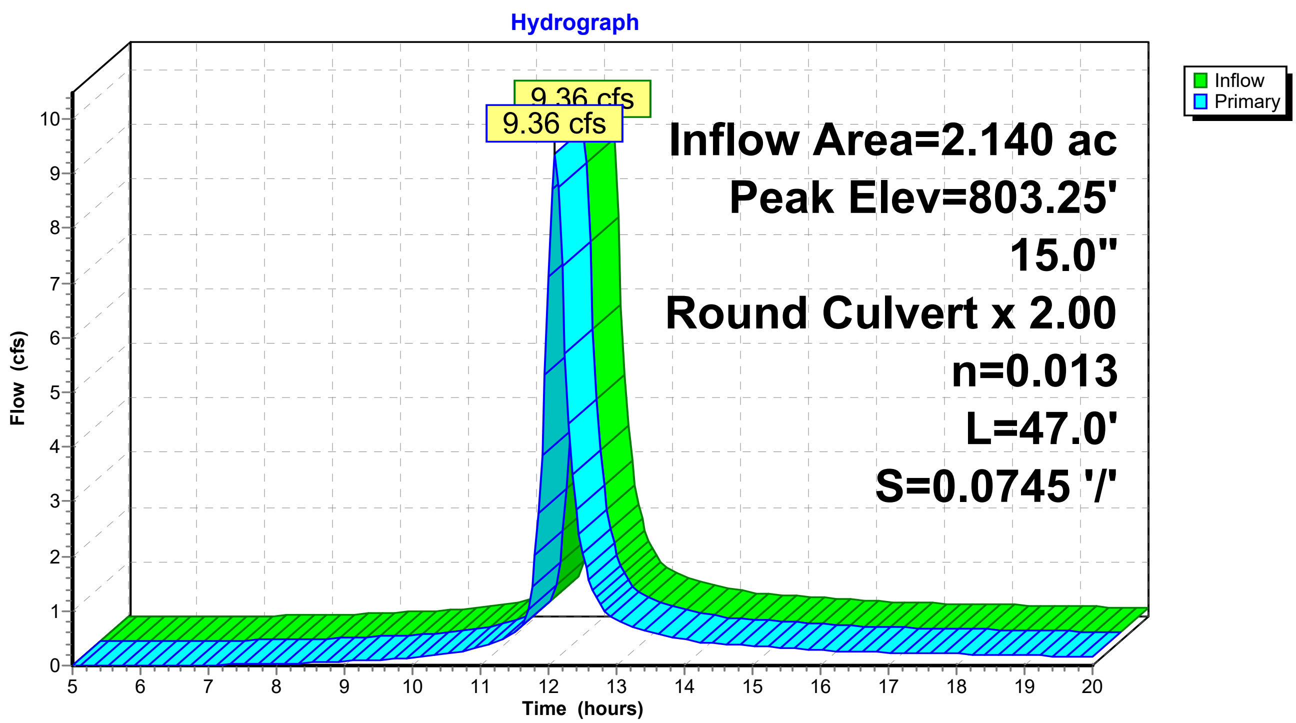
Inflow Area = 2.140 ac, 0.00% Impervious, Inflow Depth > 3.45" for 100-YR event
Inflow = 9.36 cfs @ 12.10 hrs, Volume= 0.614 af
Outflow = 9.36 cfs @ 12.10 hrs, Volume= 0.614 af, Atten= 0%, Lag= 0.0 min
Primary = 9.36 cfs @ 12.10 hrs, Volume= 0.614 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 803.25' @ 12.10 hrs
Flood Elev= 803.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	802.00'	**15.0" Round Culvert X 2.00** L= 47.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 802.00' / 798.50' S= 0.0745 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=9.35 cfs @ 12.10 hrs HW=803.25' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.35 cfs @ 3.81 fps)

Pond 1P: CULVERTS



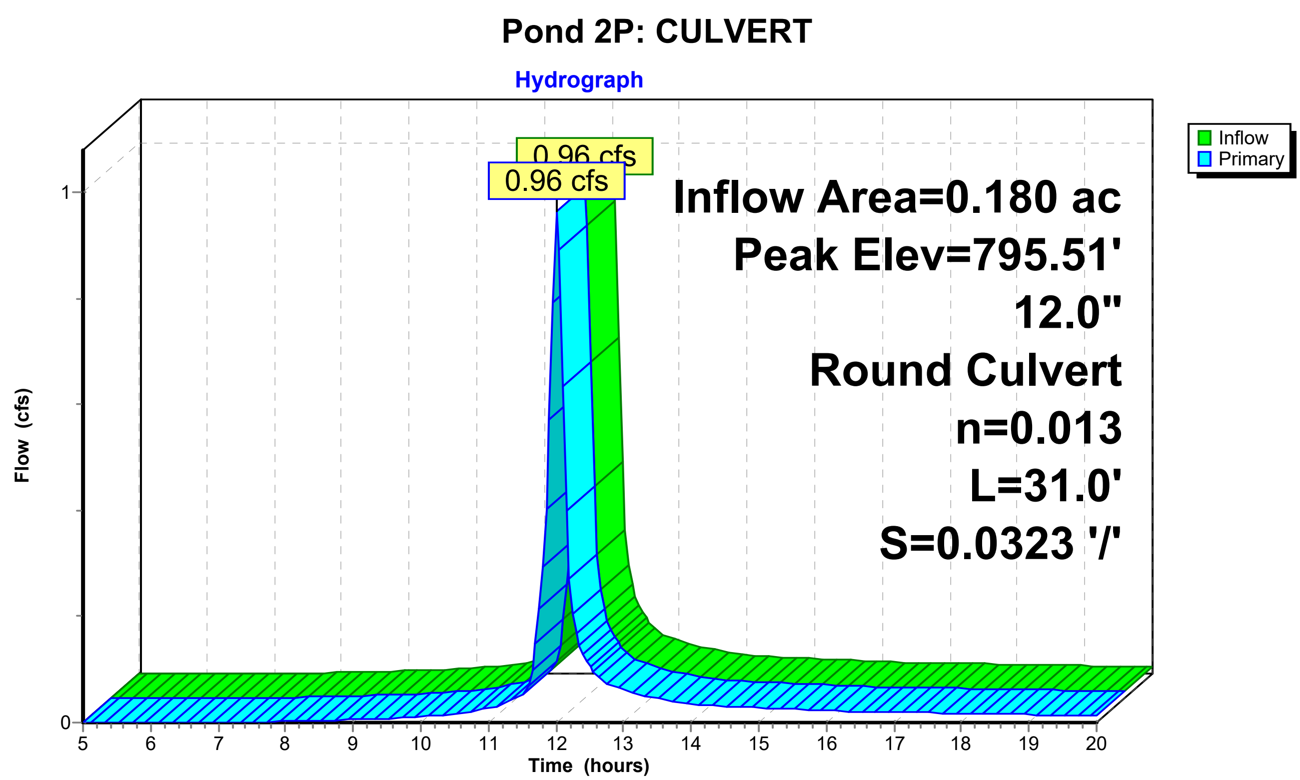
Summary for Pond 2P: CULVERT

Inflow Area = 0.180 ac, 0.00% Impervious, Inflow Depth > 3.26" for 100-YR event
Inflow = 0.96 cfs @ 12.01 hrs, Volume= 0.049 af
Outflow = 0.96 cfs @ 12.01 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Primary = 0.96 cfs @ 12.01 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 795.51' @ 12.01 hrs
Flood Elev= 796.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	795.00'	**12.0" Round Culvert** L= 31.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 795.00' / 794.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.94 cfs @ 12.01 hrs HW=795.50' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.94 cfs @ 2.41 fps)



Summary for Pond 17P: FLOW DIFFUSER

[93] Warning: Storage range exceeded by 0.03'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.330 ac, 0.00% Impervious, Inflow Depth > 3.46" for 100-YR event
Inflow = 1.99 cfs @ 11.99 hrs, Volume= 0.095 af
Outflow = 2.00 cfs @ 11.99 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Primary = 2.00 cfs @ 11.99 hrs, Volume= 0.093 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 850.03' @ 11.99 hrs Surf.Area= 0.007 ac Storage= 0.002 af

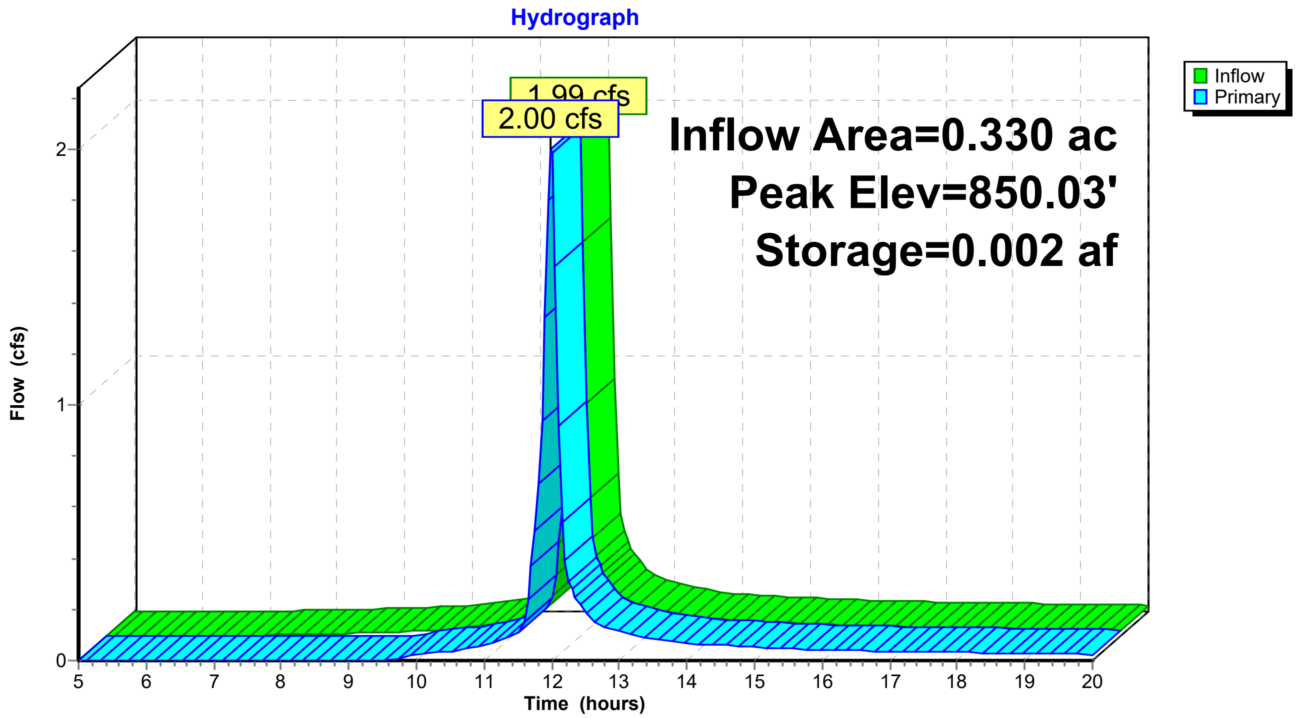
Plug-Flow detention time= 15.3 min calculated for 0.092 af (97% of inflow)
Center-of-Mass det. time= 6.1 min (780.8 - 774.6)

Volume	Invert	Avail.Storage	Storage Description
#1	849.50'	0.002 af	**1.00'W x 100.00'L x 0.50'H Prismatoid Z=2.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	849.99'	**100.0' long + 2.0 '/' SideZ x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.94 cfs @ 11.99 hrs HW=850.03' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1.94 cfs @ 0.50 fps)

Pond 17P: FLOW DIFFUSER



Summary for Pond 19P: CULVERTS

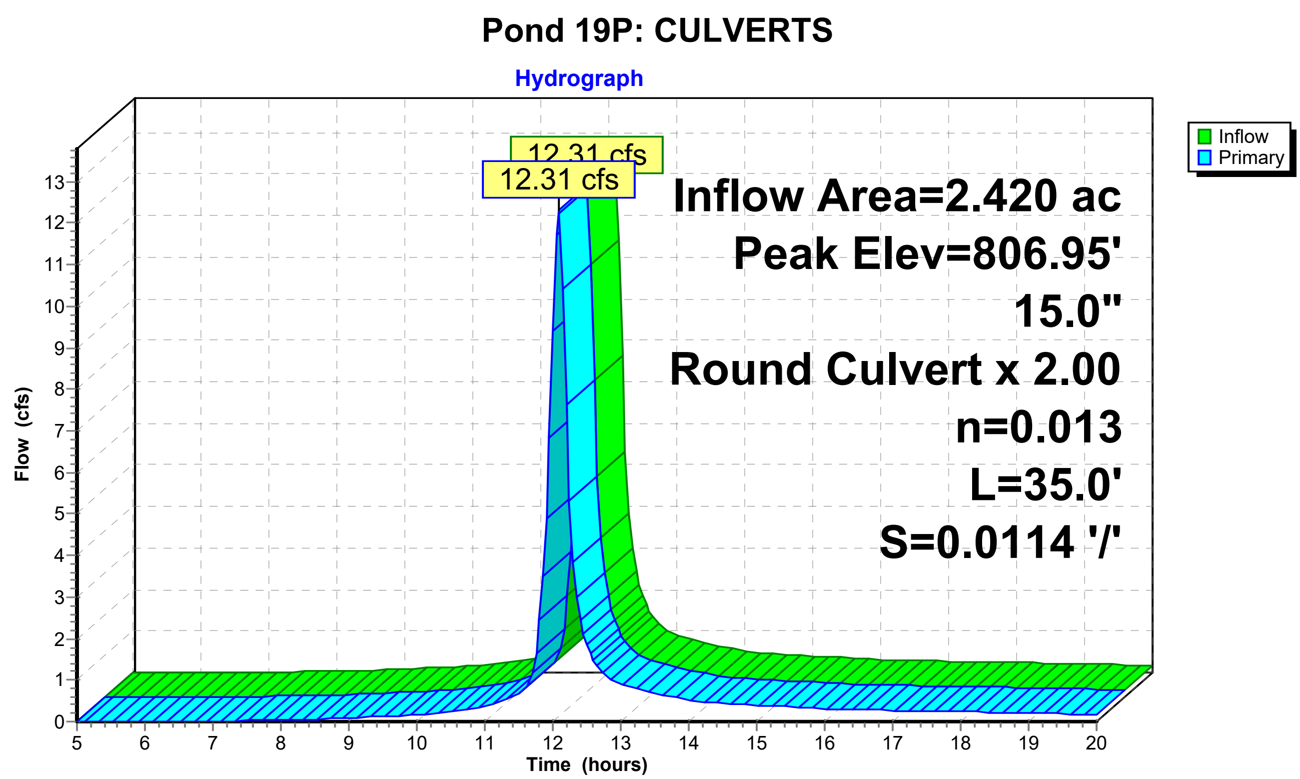
[58] Hint: Peaked 0.50' above defined flood level
[62] Hint: Exceeded Reach 18R OUTLET depth by 1.37' @ 12.10 hrs

Inflow Area = 2.420 ac, 0.00% Impervious, Inflow Depth > 3.44" for 100-YR event
Inflow = 12.31 cfs @ 12.09 hrs, Volume= 0.694 af
Outflow = 12.31 cfs @ 12.09 hrs, Volume= 0.694 af, Atten= 0%, Lag= 0.0 min
Primary = 12.31 cfs @ 12.09 hrs, Volume= 0.694 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 806.95' @ 12.09 hrs
Flood Elev= 806.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	805.20'	**15.0" Round Culvert X 2.00** L= 35.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 805.20' / 804.80' S= 0.0114 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=11.96 cfs @ 12.09 hrs HW=806.90' (Free Discharge)
└─**1=Culvert** (Barrel Controls 11.96 cfs @ 4.87 fps)



APPENDIX J – NOTICE OF INTENT (NOI)

The completed NOI will be included in the final SWPPP.

0644089821

NOTICE OF INTENT

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

NYR (for DEC use only)

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

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

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

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

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

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

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

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

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

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)**

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 — Number of Lots
- ○ 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

***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
.	.	.	.

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
%	%	%	%

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

9a. Type of waterbody identified in Question 9?

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

9b. How was the wetland identified?

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

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

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

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

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

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

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

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

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

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

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

First Name **MI**

Last Name

Signature

Date / /

0005089822

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

[| |] . [| |] **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)			.
○ 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	.
○ 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

Manufacturer

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

. **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

. **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

☐☐☐.☐☐☐ **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). ☐☐☐.☐☐☐

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 ☐☐☐.☐☐☐ **CFS**

Post-development ☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development ☐☐☐.☐☐☐ **CFS**

Post-development ☐☐☐.☐☐☐ **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

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? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. .

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

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

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.

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 K – 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:

2. Street Address:

3. City/State/Zip:

4. Contact Person:	4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

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:

(NYS DEC Notice of Termination - January 2015)

APPENDIX L – CERTIFICATION STATEMENTS

CONTRACTOR CERTIFICATION PAGE

Mardon Community Solar Project
Western Turnpike
Duanesburg, NY 12056

"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 Pollution 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."

____

Name of Contractor/Subcontractor Phone Number

____

Address City, State, Zip Code

____

Signature of Person Completing this Form Date

____

Printed Name Title

____

Name of Trained Contractor Title

<u>Responsibilities (check all that apply):</u>

Erosion and Sediment Control Practices:

- ❑ Installation and/or construction
- ❑ Repair
- ❑ Replacement
- ❑ Inspection
- ❑ Maintenance

Post-construction SMPs:

- ❑ Construction
- ❑ Repair
- ❑ Inspection
- ❑ Operation & Maintenance

CONTRACTOR CERTIFICATION PAGE

Mardon Solar Project
Western Turnpike
Duanesburg, NY 12056

"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 Pollution 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."

____
Name of Contractor/Subcontractor Phone Number

____
Address City, State, Zip Code

____
Signature of Person Completing this Form Date

____
Printed Name Title

____
Name of Trained Contractor Title

<u>Responsibilities (check all that apply):</u>

Erosion and Sediment Control Practices:

- ❑ Installation and/or construction
- ❑ Repair
- ❑ Replacement
- ❑ Inspection
- ❑ Maintenance

Post-construction SMPs:

- ❑ Construction
- ❑ Repair
- ❑ Inspection
- ❑ Operation & Maintenance

APPENDIX M – INSPECTION FORMS

I. **PRE-CONSTRUCTION MEETING DOCUMENTS**

Project Name ____

Permit No. ______________________ **Date of Authorization** ____________

Name of Operator ____

Prime Contractor ____

a. **Preamble to Site Assessment and Inspections**

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

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

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

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

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

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

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

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

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?________________________________
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_______________
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_______________
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page ______
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? ___________________

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

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

Required Elements:

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

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

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

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

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

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

SITE PLAN/SKETCH

______________________________ ______________________________
Inspector (print name) **Date of Inspection**

______________________________ ______________________________
Qualified Inspector (print name) **Qualified Inspector Signature**

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

Maintaining Water Quality

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

Housekeeping

1. General Site Conditions

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

2. Temporary Stream Crossing

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

3. Stabilized Construction Access

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

Runoff Control Practices

1. Excavation Dewatering

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

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

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

4. Stone Check Dam

Yes No NA

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

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.
Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

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

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

3. Temporary Sediment Trap

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

4. Temporary Sediment Basin

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

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

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

CONSTRUCTION DURATION INSPECTIONS

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

The Operator shall amend the SWPPP whenever:

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

Modification & Reason:

APPENDIX N – INSPECTION REPORTS & PHOTO LOG

ATTACHMENT F

WETLAND DELINEATION

Wetland Delineation Report
MarDon Community Solar Site
Town of Duanesburg, Schenectady County, New York

PRESENTED TO	PREPARED BY
CTEC Solar **1 Griffin Road** **Suite 200** **Bloomfield, CT 06002**	**Tetra Tech, Inc.** **3136 South Winton Road** **Suite 303** **Rochester, NY 14623**

May, 2023

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FIGURES

Figure 1. Site Location - Topographic
Figure 2. Site Location - Aerial
Figure 3. NRCS Soil Units and Hydric Rating Map
Figure 4. Mapped Aquatic Features
Figure 5. Delineated Wetlands and Waterbodies

APPENDIX

Appendix A. Wetland Data Sheets
Appendix B. Photo Log
Appendix C. NRCS Hydric Rating Map

Table 1: Mapped USDA NRCS Soil Series

Map Unit	Map Unit Name	Hydric Rating	Total Acres	% of Total
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes.	10	4.0	30.6%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes.	10	8.2	63.3%
NuC	Nunda channery silt loam, 8 to 15 percent slopes.	0	0.8	6.1%
Totals for Project			**12.9**	**100%**

1.2.4 Vegetation

The Project Area mainly consists of undeveloped agricultural land with a tree line boundary comprised of mainly shrubs and trees along an old stone wall . The undeveloped agricultural land was dominated by a multitude of grasses and herbaceous species including goldenrods *(Solidago juncea, Solidago canadensis*), red clover (*Trifolium pretense*), bedstraw (*Gallium* spp.), common dandelion (*Taraxacum officinale*), petty spurge (*Euphorbia peplus*), Shepard's-needle (*Scandix pecten-veneris*), and grass species that could not be identified at the time of survey. There was also evidence of shrub species within the agricultural field but could not be identified as there was evidence of landscaping/mowing and only the cut base of the shrubs were evident.

2.1 Desktop Review

Prior to conducting field surveys, Tetra Tech reviewed high-resolution aerial photography and Geographic Information System (GIS) data including National Wetland Inventory (NWI), National Hydrography Dataset (NHD), NRCS Web Soil Survey, and U.S. Geological Survey (USGS) topographic maps. These resources were used both prior to and during field surveys to identify potential wetland or waterbody areas.

The Project Area was evaluated using the above desktop resources to determine the potential presence of wetlands and waterbodies (streams and ponds). Data was also collected to document a lack of water features where desktop data, such as NWI data, indicated water features may be present but are not indicated in recent aerial photography. These were referred to as non-water points.

2.2 Resource Review

The following GIS data sources were reviewed to supplement the wetland and waterbody field surveys.

2.2.1 National Wetland Inventory

NWI data were overlaid on high-resolution aerial imagery and reviewed in conjunction with soil surveys and topographic maps. Because ground conditions change and because the criteria used to identify wetlands for mapping purposes may have been different than the currently required by the U.S. Army Corps of Engineers (USACE), wetland maps were only used as a guide to aide in identifying potential wetlands. This data was provided to field crew to guide fieldwork. NWI mapping is included in Figure 4.

2.2.2 National Hydrography Dataset

The NHD depicts surface waters across the United States, including some, but not all, rivers, streams, canals, lakes, and ponds. The data is provided at a scale of 1:24,000. Not all water features are shown at this scale and those that are provide only a moderate level of detail. The NHD layer includes data for perennial, intermittent, and ephemeral streams as well as underground conduit, artificial paths, canal/ditch, and connector. NHD mapped features are included in Figure 4. Table 2 below provides a description of the NHD classifications.

Table 2: Description of NHD Water Classifications

NHD Classification	NHD Waterbody Classification Description
Stream/River	A body of flowing water.
Perennial Stream	Stream that contains water throughout the year, except for infrequent periods of severe drought.
Intermittent Stream	Stream that contains water for only part of the year, but more than just after rainstorms and at snowmelt.
Ephemeral Stream	Stream that contains water only during or after a local rainstorm or heavy snowmelt.
Underground Conduit	Subsurface drainage channels formed from the dissolution of soluble rocks in Karst terrain or in terrain similar to karst but formed in non-soluble rocks, as by melting of permafrost or ground ice or collapse after mining.
Artificial Path	An abstraction to facilitate hydrologic modelling through open water bodies to act as a surrogate for lakes and other water bodies.
Canal/Ditch	An artificial open waterway constructed to transport water, to irrigate or drain land, to connect two or more bodies of water, or to serve as a waterway for watercraft.
Connector	A known, but nonspecific, connection between two nonadjacent network segments.

2.2.3 Soil Survey

The NRCS Web Soil Survey, called Soil Survey Geographic Database (SSRUGO), was used to obtain soil survey information for Schenectady County. The information was the most current county soil information available electronically. Existing soils maps were used as a guide to identify locations of potential hydric soils. Field investigation was required to verify the presence of hydric soils, particularly given the disturbed conditions present throughout much of the Project area. Figure 3 presents the soil series mapped in the Project Area.

2.2.4 Aerial Photography

High resolution aerial photography from July 2020 and several years of older imagery was reviewed to assist in evaluating the Project Area for possible wetland signatures and recent disturbances on the landscape that could influence the presence and extent of wetlands. Possible visual signatures include, but are not limited to, surface water, varying color changes in vegetation, and isolated areas within farmland that are not successfully farmed due to poor drainage.

2.3 Field Survey

Wetland delineation field surveys for the Project were conducted during one field mobilization that occurred on April 27, 2023. Wetland boundaries, waterbody thalweg or banks, data collection points, open waterbody boundaries, and non-water points were surveyed using an Eos Arrow Gold unit and tablet device. The field data collection settings within the GPS units used available satellites to capture location data. Note that while the GPS data collected during the survey provides reasonably accurate spatial information regarding the wetlands, open waterbodies, and non-water points delineated, typically one-meter accuracy with sufficient satellite reception, it does not constitute the same accuracy as a professional land survey.

2.3.1 Wetlands

Wetlands were delineated using the method described in the USACE 1987 Manual (USACE 1987, along with the Northcentral Northeast Regional Supplement (Version 2.0) (USACE 2012). Wetlands were also delineated consistent with the 2015 Clean Water Rule (USACE 2015). The wetland boundaries were delineated using the routine on-site determination method described in the Regional Supplement and the *National Wetland Plant List 2020* (NWPL) (Lichvar et al. 2012) for the determination of the plant indicator status and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979) to classify wetlands. According to the USACE 1987 Wetland Manual, three criteria or parameter are considered during the wetland delineation; for a plant community to be considered a wetland, it must have:

- A predominance of hydrophytic vegetation,
- Indications of wetland hydrology, and
- The presence of hydric soils under normal circumstances (i.e., where naturally problematic conditions or disturbances are absent).

Wetland datasheets were completed at sample points within each wetland community type (i.e., Cowardin classification) making up the wetland or wetland complex, along with a minimum of one corresponding upland community sample point.

2.3.1.1 Hydrophytic Vegetation

The 1987 Manual and NWPL define the wetland indicator status of plants as follows:

<u>Obligate Wetland Plants (OBL)</u>: almost always occur in wetlands (estimated probability >99 percent) in wetlands under natural conditions. With few exceptions, these plants (herbaceous or woody) are found in standing water or seasonally saturated soils (14 or more consecutive days) near the surface. These plants are of four types: submerged, floating, floating-leaved, and emergent.

<u>Facultative Wetland Plants (FACW)</u>: usually occur in wetlands (estimated probability >67 percent to 99 percent) but may occur in non-wetlands. These plants predominantly occur with hydric soils, often in geomorphic settings where water saturates the soils or floods the soil surface at least seasonally.

<u>Facultative Plants (FAC)</u>: occur in wetlands and uplands (estimated probability 33 percent to 99 percent within wetlands). These plants can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil pH and elevation. They have a wide tolerance of soil moisture conditions.

<u>Facultative Upland Plants (FACU)</u>: usually occur in uplands, but many occur in wetlands (estimated probability 1 percent to <33 percent in wetlands). These plants predominantly occur on drier or more mesic sites in geomorphic settings where water rarely saturates the soils or floods the soil surface seasonally.

<u>Upland Plants (UPL)</u>: almost never occur in wetlands (estimated probability <1 percent). These plants occupy mesic to xeric upland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.

Dominant vegetation was assessed for each stratum present (tree, sapling/shrub, woody vine, and herbaceous) at a sample point location. In most cases, plant dominance was determined using the USACE's "50/20 Rule" in which species from each stratum that individually or collectively make up more than 50 percent of the total cover in each stratum, plus any other species that account for at least 20 percent of the total cover in the stratum are determined to be dominant species. The hydrophytic vegetation criterion is met when greater than 50 percent of the dominant plant species are classified as OBL, FACW, or FAC. Vegetation information was recorded on the appropriate USACE data forms.

2.3.1.2 Wetland Hydrology

Hydrology is influenced by many variables, including seasonal and long-term rainfall patterns, local geology, topography, soil type, local water table conditions, and drainage. According to the 1987 Manual and Regional Supplements, wetland hydrology is present if 14 or more consecutive days of inundation or water saturation within 12 inches of the soil surface occurs during the growing season at a minimum frequency of 5 in 10 years.

Indicators of wetland hydrology provide evidence that a site has a persistent wetland hydrologic regime. The Regional Supplement provides a list of hydrology indicators that include primary and secondary indicators, which are grouped as:

- Observation of Surface Water or Saturated Soils
- Evidence of Recent Inundation
- Evidence of Current and Recent Soil Saturation
- Evidence of Other Site Conditions or Data

One primary indicator or two secondary indicators are required to confirm that wetland hydrology is present or occurs at some time during the growing season. Field observations of hydrology were made at each vegetation community sample point. Examples of key indicators observed include presence of water above the ground surface, high water table within the hole dug for soil observations, saturated soil in the upper portion of the soil profile, water-stained leaves, drainage patterns as evidence of water presence, and the geomorphic position of the vegetation community and sample point location. Hydrology information was recorded on the appropriate USACE datasheets.

2.3.1.3 Hydric Soil

Hydric soils are characterized by specific morphological characteristics developed in the soil profile over time due to reduction of iron, manganese, and sulfur under saturated and anaerobic conditions. The 1987 Manual defines hydric soils as soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part. The hydric soil indicators described in the Regional Supplement are a subset of hydric soil indicators described in *Field Indicators of Hydric Soils in the United States, Version 8.2* (USDA, NRCS 2018). The *Munsell Book of Soil Color Charts (2014)* was used to determine soil matrix and mottle colors (redoximorphic features) and record soil profile descriptions. The soils were observed and documented at representative sample point locations in both wetland communities and adjacent upland communities to help establish the wetland boundary. Soil profile descriptions were recorded on the appropriate USACE datasheets.

2.3.1.4 Cowardin Classification

The Cowardin Classification was developed in 1979 to classify a variety of wetland habitats and divides wetlands into five systems: marine, estuarine, riverine, lacustrine, and palustrine. These represent the five major landscape settings. The classification system further divides wetland communities into systems and classes. This survey was conducted in inland wetlands, and descriptions of the common Cowardin Classification inland community types are described in the bullets below.

- <u>Palustrine System Emergent Wetland Class (PEM)</u>: A PEM wetland is defined as a non- tidal wetland characterized by erect, rooted, hydrophytic herbaceous species. These wetland habitats are often dominated by perennial plants, where the vegetation is present for the majority of the growing season (Cowardin, 1979).

- Palustrine System Scrub-Shrub Wetland Class (PSS): A PSS wetland is defined as a non-tidal wetland consisting of woody vegetation that is less than 20 feet tall, including shrubs, young trees, and stunted trees or shrubs (Cowardin, 1979).
- Palustrine Forested Wetland Class (PFO): A PFO wetland is defined as a non-tidal wetland characterized by dominant woody vegetation that is greater than 20 feet tall, with an understory of small trees and shrubs, as well as an herbaceous layer (Cowardin, 1979).

Each wetland delineated was assigned a Cowardin class. For wetland complexes, or wetlands that are comprised of more than one wetland plant community (i.e., Cowardin class) a sample point was established, and observations recorded to document each community. Unique wetland IDs and separate polygons were established based on the wetland community present within the complex. The field crews collected wetland information for PEM, PSS, and PFO wetlands.

2.3.2 Waterbodies

Waterbodies documented during the field survey were assigned a Unique ID according to their flow and hydrology regimes: linear or flowing waterbodies, such as streams and rivers were assigned a unique ID starting with a "s"; non-flowing open waterbodies, such as ponds and lakes, were assigned a unique ID starting with an "o." Linear or flowing waterbodies were identified as landscape features with a channel that include a bed and a bank in a concave landscape position where water flow has resulted in a feature that possesses an ordinary high water mark (OHWM). Waterbodies do not include erosional features, such as gullies, rills, and ephemeral streams that do not have a bed and banks and OHWM, in accordance with the USACE Regulatory Guidance Letter regarding Ordinary High Water Mark Identification (USACE 2005).

Based on evidence of flow regime at the time of survey, linear waterbodies were attributed a flow regime according to the definitions provided by the USACE for the Nationwide Permit Program in Title 33 Code of Federal Regulations (CFR) Part 330 (Federal Register, 1993). Similarly, non-flowing, open waterbody features were assigned a Cowardin hydrology regime based on observations recorded at the time of survey. Definitions of these flow and hydrology regimes are included below, as defined in 33 CFR 330.

- Perennial Stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year, and groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.
- Intermittent Stream: An intermittent stream has flowing water during most times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water, and runoff from rainfall is a supplemental source of water for stream flow.
- Ephemeral Stream: An ephemeral stream has flowing water only during and for a short duration after precipitation events. Ephemeral stream beds are located above the water table year-round, therefore, groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Non-flowing or open waterbodies were documented based on the evidence of inundation/saturation at the time of surveys, utilizing one of four categories based on the Cowardin classification including the following:

- Non-flowing: Water covers the land surface throughout the year in all years.
- Semi-Non-flowing: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.
- Seasonally flooded: Surface water is present for extended periods especially early in the growing season but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.

- Temporarily flooded: Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season.

3.0 RESULTS

The following section summarizes wetland and waterbody delineation conducted in the Project Area on April 27, 2023. Field conditions were typical for spring in New York with a rainstorm occurring the previous night and soils were saturated and water table higher.

Tetra Tech identified one Pond on the Project Site and one ephemeral stream just off-site of the Project Area. Table 3 below lists the delineated wetlands and waterbody, including unique ID, location, size within the Project Area, presumed USACE and NYSDEC jurisdictional status, and Cowardin classification. Figure 5 shows the location of the wetland system identified during the delineation event. Data sheets can be found in Appendix A, and photographs of each sample point are provided in Appendix B.

Pond 1: Pond 1 is a 0.19-acre perennial open water body located in the far northwestern portion of the Project Area. The pond appears to be man-made with 0.02 acres of the pond located within the Project area. The pond was lacking vegetation except for two patches of common reed (*Phragmites australis*) located along the northern and southern boundaries. Based on submerged upland grass along the banks it is assumed that the pond had swelled with the recent rainstorm. An ephemeral stream appeared to connect to the southwest portion of the pond and flow to the northwest.

Ephemeral 1: Ephemeral 1 is an ephemeral stream located just outside of the northwestern portion of the Project Area and extends beyond the study limits of the Project Boundary. The stream flows northwest out of Pond 1 and is located in a forested area of concave topography.

Table 3 Summary Metrics of Waterbodies and Wetlands for the MarDon Community Solar Project

Wetland or Waterbody Name	Cowardin Class/Flow Regime	Centroid (Wetland) or Data Point (Stream) Coordinates		Area within Project Area (acres)	Length within Project Area (linear feet)	Jurisdiction: USACE / NYSDEC / Non-Jurisdictional
		Latitude (DD) °N	Longitude (DD) °W			
Pond 1	Open Water	42.767361	-74.240389	0.02	-	Potentially Non-jurisdiction

4.0 REFERENCES

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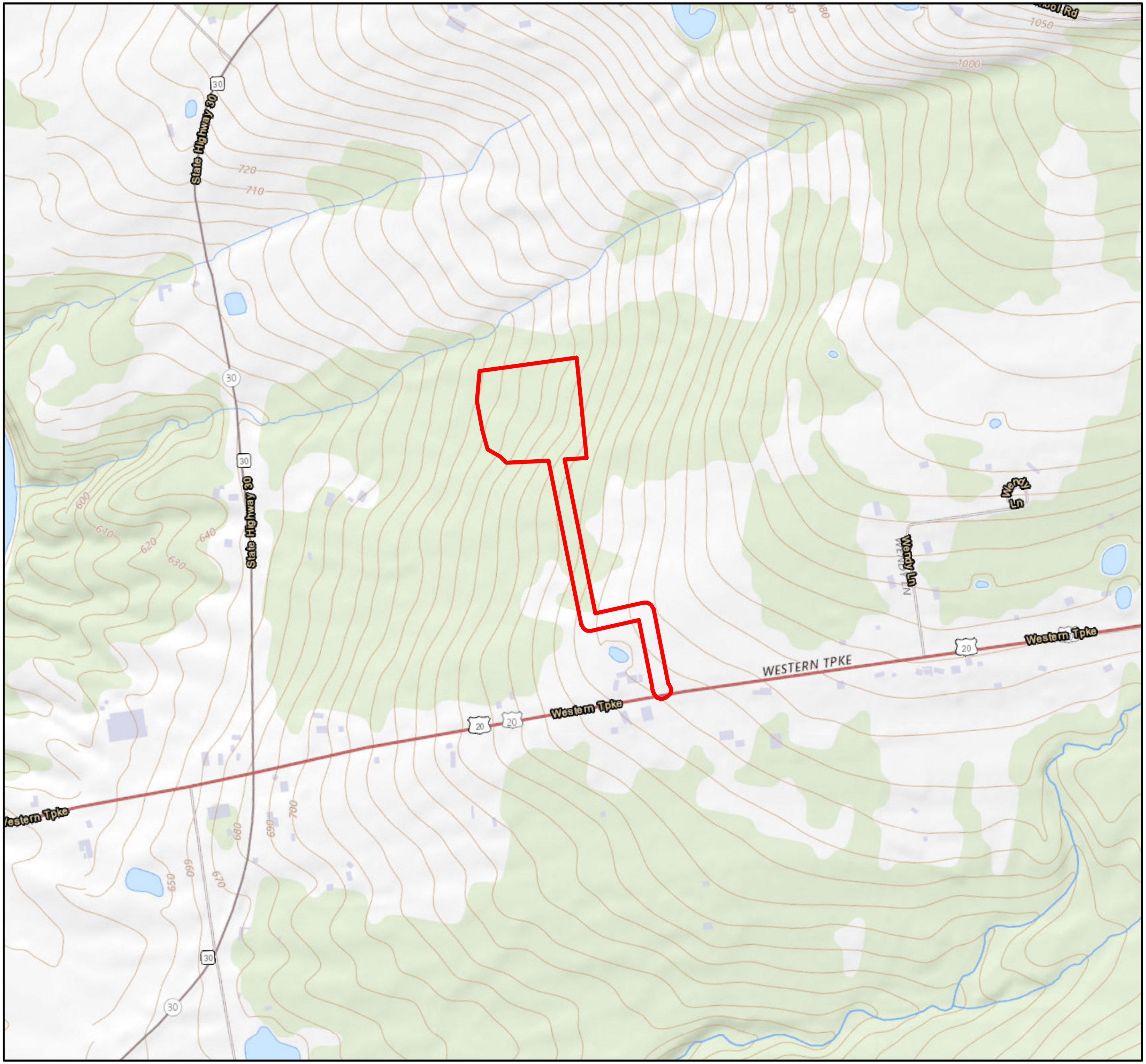
FIGURES



Legend

Project Area Boundary

N

Approximate Scale:

Feet
0 310 620 1,240

TETRA TECH

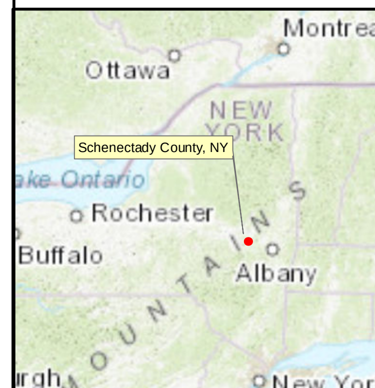
Date:
05/11/2023

Figure 1
Site Location- Topographic

MarDon Community Solar Site
10516 Western Turnpike
Duanesburge, New York

Legend

Project Area Boundary



N

Approximate Scale:

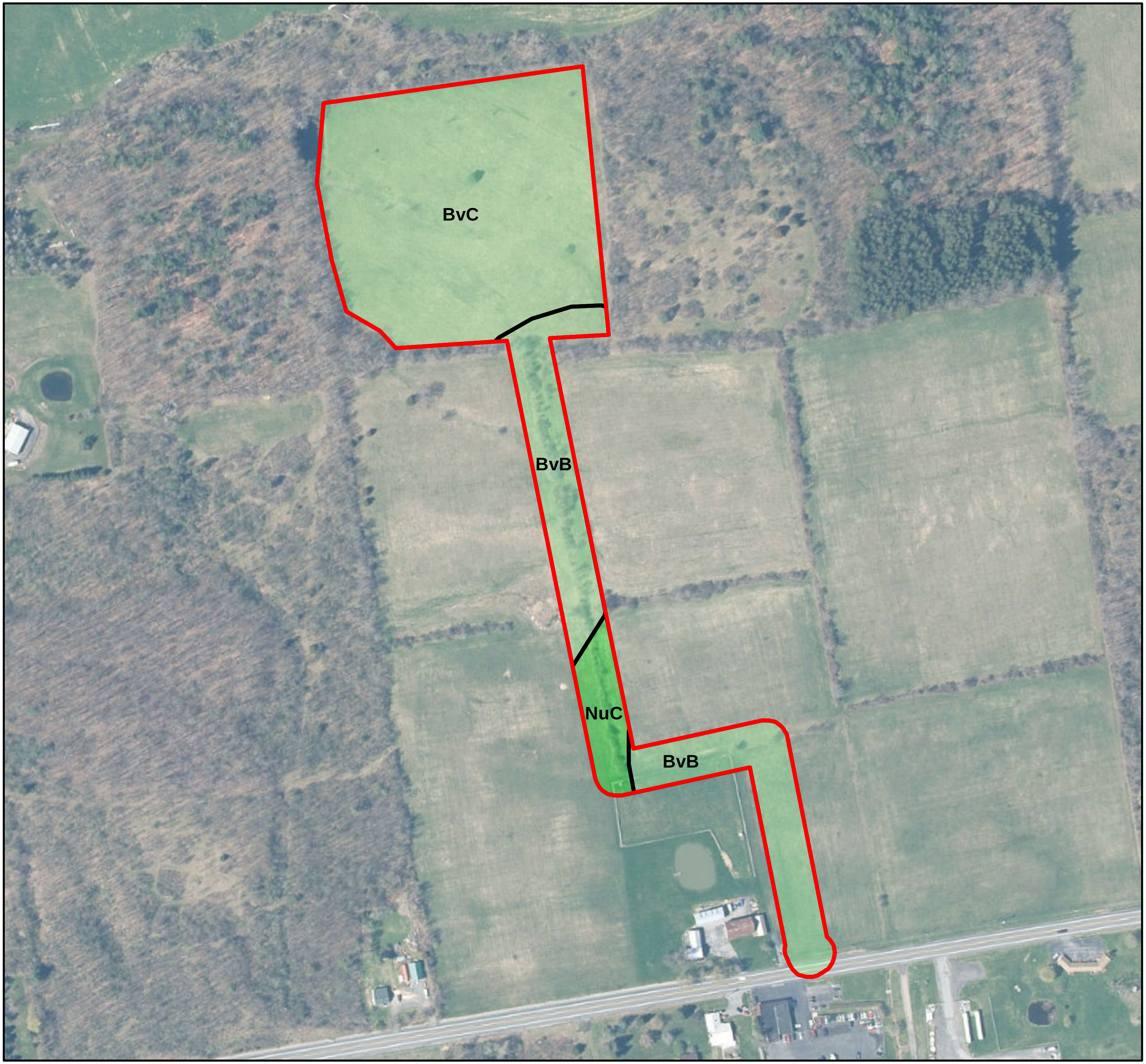
Feet
0 310 620 1,240

TETRA TECH

Date:
05/11/2023

Figure 2
Site Location- Aerial

MarDon Community Solar Site
10516 Western Turnpike
Duanesburge, New York



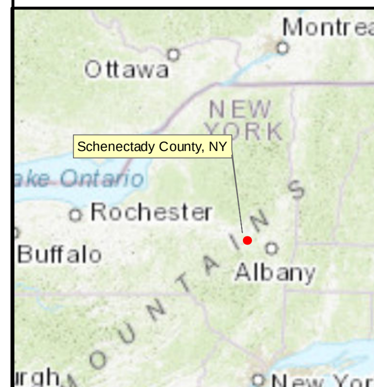
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors

Legend

- Project Area Boundary
- Mapped Soil Units

Hydric Rating by Map Unit

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available



Approximate Scale:

Feet
0 115 230 460

TETRA TECH

Date: 05/11/2023

Figure 3
NRCS Soil Units and Hydric Rating Map

MarDon Community Solar Site
10516 Western Turnpike
Duanesburge, New York

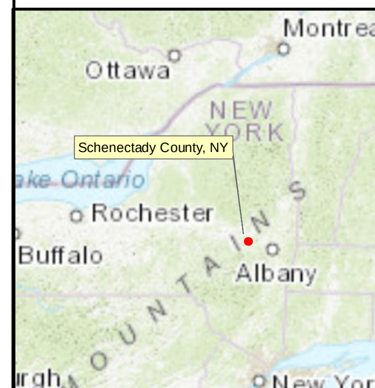
Legend

Project Area Boundary

NWI Mapped Wetlands

Freshwater Pond

Riverine



Approximate Scale:

Feet

0 115 230 460

TETRA TECH

Date:

05/11/2023

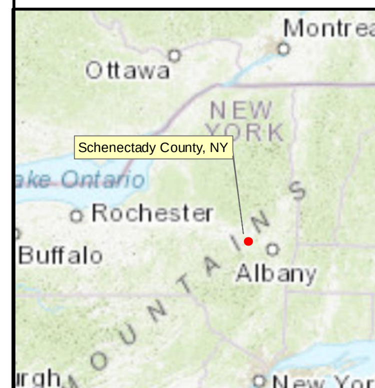
Figure 4
Mapped Aquatic Features

MarDon Community Solar Site
10516 Western Turnpike
Duanesburge, New York

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors

Legend

- Project Area Boundary
- Delineated Wetlands
- Delineated Stream
- Upland Datapoint



N

Approximate Scale:

Feet
0 115 230 460

TETRA TECH

Date:

05/11/2023

Figure 5
Delineated Wetlands
and Waterbodies

MarDon Community Solar Site
10516 Western Turnpike
Duanesburge, New York

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors

Appendix A

Wetland Datasheets

STREAM ID Ephemeral 1	**STREAM NAME** Unnamed
LAT 42.767149 **LONG** -74.240575	**DATE** 04/27/2023
PROJEC MarDon Solar	**CLIENT** CTEC
INVESTIGATORS Drew Timmis, Josh Collete	
FLOW REGIME Perennial ___ Intermittent___ Ephemeral ✔	**WATER TYPE** TNW ___ RPW ___ NRPW ✔

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 1.5 ft Top of Bank Height: LB 3.0 in RB 3.0 in Water Depth: 1.00 in Water Width: 1.0 ft High Water Mark: 4.0 in Flow Direction: Northwest	**Stream Erosion** ___ None ✔ Moderate ___ Heavy **Artificial, Modified or Channelized** ___ Yes ✔ No **Dam Present** ___ Yes ✔ No **Sinuosity** ___ Low ___ Medium ✔ High **Gradient** ___ Flat (0.5/100 ft ✔ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft)
FLOW CHARACTERISTICS	**Water Present** ___ No water, stream bed dry ___ Stream bed moist ___ Standing water ✔ Flowing water **Velocity** ___ Fast ___ Moderate ✔ Slow	**Proportion of Reach Represented by Stream Morphology Types** Riffle % Run 100 % Pool 0 % **Turbidity** ✔ Clear ___ Slightly turbid ___ Turbid ___ Opaque ___ Stained ___ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	70			
Clay	< 0.004 mm (slick)	25			

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✔ Forest ___ Commercial ___ Field/Pasture ___ Industrial ___ Agricultural ___ Residential ___ Other: **Canopy Cover** ___ Partly open ___ Partly shaded ✔ Shaded ___ Open	**Indicate the dominant type (Check one)** ✔ Trees ___ Shrubs ___ Grasses ___ Herbaceous **Floodplain Width** ___ Wide > 30ft ___ Moderate 15-30ft ✔ Narrow <16ft **Wetland Present** ✔ Yes ___ No **Wetland ID** Pond 1
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ___ Rooted emergent ___ Rooted submergent ___ Rooted floating ___ Free floating ___ Floating algae ___ Attached algae	

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	Ephemeral stream originating from a man-made pond and flows west/northwest through the adjacent forest located off-site. Due to recent rainstorm it is likely that the stream only slows during high precipitation events

Feature ID Ephemeral 1	**Feature NAME** Unnamed
LAT 42.767149 **LONG** -74.240575	**DATE** 04/27/2023
PROJEC MarDon Solar	**CLIENT** CTEC
INVESTIGATORS Drew Timmis, Josh Collete	
FLOW REGIME Perennial __ Intermittent __ Ephemeral ✔	**WATER TYPE** TNW __ RPW __ NRPW ✔

WATERBODY FEATURES	**Estimate Measurements** Top of Bank Width: 1.5 ft Top of Bank Height: LB 3.0 in RB 3.0 in Water Depth: 1.00 in Water Width: 1.0 ft High Water Mark: 4.0 in Flow Direction: Northwest	**Stream Erosion** __ None ✔ Moderate __ Heavy **Artificial, Modified or Channelized** __ Yes ✔ No **Dam Present** __ Yes ✔ No **Sinuosity** __ Low __ Medium ✔ High **Gradient** __ Flat (0.5/100 ft ✔ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft)
CHARACTERISTICS	**Water Present** __ No water, stream bed dry __ Stream bed moist __ Standing water ✔ Flowing water **Velocity** __ Fast __ Moderate ✔ Slow	**Proportion of Reach Represented by Stream Morphology Types** Riffle 0 % Run 100 % Pool 0 % **Turbidity** ✔ Clear __ Slightly turbid __ Turbid __ Opaque __ Stained __ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	70			
Clay	< 0.004 mm (slick)	25			

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✔ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural __ Residential __ Other: **Canopy Cover** __ Partly open __ Partly shaded ✔ Shaded __ Open	**Indicate the dominant type (Check one)** ✔ Trees __ Shrubs __ Grasses __ Herbaceous **Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft ✔ Narrow <16ft **Wetland Present** ✔ Yes __ No **Wetland ID** Pond 1
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** __ Rooted emergent __ Rooted submergent __ Rooted floating __ Free floating __ Floating algae __ Attached algae	

MACROINVERTEBRATES OR OTHER WILDLIFE OBSERVED/OTHER OBSERVATIONS AND NOTES	Ephemeral stream originating from a man-made pond and flows west/northwest through the adjacent forest located off-site. Due to recent rainstorm it is likely that the stream only slows during high precipitation events

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region** See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: MarDon Solar Site City/County: Duanesburg, Schenectady Sampling Date: 4/27/2023

Applicant/Owner: ______ State: NY Sampling Point: Upland 1

Investigator(s): Drew Timmis Section, Township, Range: Duanesburg, Schenectady

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope %: 4-8

Subregion (LRR or MLRA): LRR R Lat: 43.052077 Long: -77.879867 Datum: WGS84

Soil Map Unit Name: Burdett-Scriba channery solt loams, 8 to 15 slope NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation X , Soil ___ , or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation X , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	If yes, optional Wetland Site ID: ______

Remarks: (Explain alternative procedures here or in a separate report.)
Area appears to have been landscaped with shrub stumps observed and herbaceous species are newly grown. Hydrology disturbed due to overnight rainstorm, resulting in moist/saturated soils and higher water table than expected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ Water-Stained Leaves (B9)	
X High Water Table (A2)	___ Aquatic Fauna (B13)	
___ Saturation (A3)	___ Marl Deposits (B15)	
___ Water Marks (B1)	___ Hydrogen Sulfide Odor (C1)	
___ Sediment Deposits (B2)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Drift Deposits (B3)	___ Presence of Reduced Iron (C4)	
___ Algal Mat or Crust (B4)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Iron Deposits (B5)	___ Thin Muck Surface (C7)	
___ Inundation Visible on Aerial Imagery (B7)	___ Other (Explain in Remarks)	
___ Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
X Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
X Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
High water table noted, but most likely due to recent storm

VEGETATION – Use scientific names of plants.

Sampling Point: Upland 1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Solidago juncea*	35	Yes	UPL
2. *Solidago canadensis*	25	Yes	FACU
3. *Trifolium pratense*	5	No	FACU
4. *Taraxacum officinale*	5	No	FACU
5. *Euphorbia peplus*	15	No	UPL
6. *Scandix pecten-veneris*	7	No	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	92	=Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	35	x 4 =	140
UPL species	57	x 5 =	285
Column Totals:	92 (A)		425 (B)

Prevalence Index = B/A = 4.62

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point Upland 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/2	100					Loamy/Clayey	
1-8	10YR 3/2	100					Loamy/Clayey	
8-10	10YR 3/2	98	10YR 5/6	2	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
___ High Chroma Sands (S11) (**LRR K, L)**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) (**LRR K, L**)
___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Red Parent Material (F21) **(outside MLRA 145)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Bedrock

Depth (inches): 10

Hydric Soil Present? Yes ___ **No** X

Remarks:

Appendix B

Photolog

PHOTOGRAPHIC DOCUMENTATION			
Client:	CTEC Solar	**Project No:**	194-1409-0003
Site Name:	MarDon Community Solar	**Location:**	10516 Western Turnpike, Duanesburg, NY

Description:	View facing Southeast from Pond 1 towards agricultural field.

Photograph Number 1

Photograph taken by Josh Collette on April 27th, 2023.

PHOTOGRAPHIC DOCUMENTATION			
Client:	CTEC Solar	**Project No:**	194-1409-0003
Site Name:	MarDon Community Solar	**Location:**	10516 Western Turnpike, Duanesburg, NY

Description:	View of upland area sampled located upslope on the southern portion of the Project Area looking north.

Photograph Number 2

Photograph taken by Josh Collette on April 27th, 2023.

PHOTOGRAPHIC DOCUMENTATION			
Client:	CTEC Solar	**Project No:**	194-1409-0003
Site Name:	MarDon Community Solar	**Location:**	10516 Western Turnpike, Duanesburg, NY

Description:	View of southern end of the tree line boundary located were the proposed access road will be located, facing north.

TETRA TECH, INC.
Photograph taken by Josh Collette on April 27th, 2023.

PHOTOGRAPHIC DOCUMENTATION			
Client:	CTEC Solar	**Project No:**	194-1409-0003
Site Name:	MarDon Community Solar	**Location:**	10516 Western Turnpike, Duanesburg, NY

Description:	View of Pond 1 located in the northwestern corner of the Project Area, facing northwest.

Photograph Number 4

PHOTOGRAPHIC DOCUMENTATION			
Client:	CTEC Solar	**Project No:**	194-1409-0003
Site Name:	MarDon Community Solar	**Location:**	10516 Western Turnpike, Duanesburg, NY

Description:	View of Ephemeral stream located off-site facing west. Ephemeral stream connects to the southwestern edge of Pond 1.

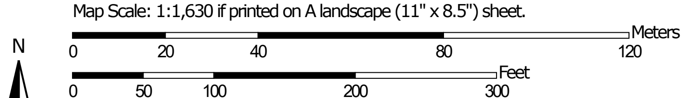
Photograph Number 5

Appendix C

NRCS Hydric Rating Soil Map

Soil Map—Schenectady County, New York
(Duanesburg_Site)

Map Scale: 1:1,630 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Schenectady County, New York
Survey Area Data: Version 21, Sep 10, 2022

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

Date(s) aerial images were photographed: Sep 4, 2020—Nov 7, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes	0.3	3.7%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes	8.2	96.3%
Totals for Area of Interest		**8.5**	**100.0%**

Soil Map—Schenectady County, New York
(Duanesburg Road Buffer)

Map Scale: 1:2,860 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

N

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Schenectady County, New York
Survey Area Data: Version 21, Sep 10, 2022

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

Date(s) aerial images were photographed: Sep 4, 2020—Nov 7, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes	3.7	80.8%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes	0.1	2.1%
NuC	Nunda channery silt loam, 8 to 15 percent slopes	0.8	17.1%
Totals for Area of Interest		**4.6**	**100.0%**

ATTACHMENT G

FARMLAND CLASSIFICATION & AGRICULTURAL DATA STATEMENT

Farmland Classification—Schenectady County, New York
(MarDon Solar Farmland Class Map)

Map Scale: 1:2,000 if printed on A landscape (11" x 8.5") sheet.

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated

- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

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: Schenectady County, New York
Survey Area Data: Version 22, Sep 5, 2023

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

Date(s) aerial images were photographed: Sep 4, 2020—Nov 7, 2020

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

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BvB	Burdett-Scriba channery silt loams, 3 to 8 percent slopes	Prime farmland if drained	3.9	44.0%
BvC	Burdett-Scriba channery silt loams, 8 to 15 percent slopes	Farmland of statewide importance	5.0	56.0%
Totals for Area of Interest			**8.9**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

TOWN OF DUANESBURG Application#____________

Agricultural Data Statement Date: 12/8/2023

Instructions: Per § 305-a of the New York State Agriculture and Markets Law, any application for a special use permit, site plan approval, use variance or a subdivision approval requiring municipal review and approval would occur on property within a New York State Certified Agricultural District containing a farm operation or property with boundaries within 500 feet of a farm operation located in an Agricultural District shall include an Agricultural Data Statement.

Applicant	Owner if Different from Applicant
Name: Mike Lewis, CTEC Solar, LLC Address: 1 Griffin Rd South, Suite 200 Bloomfield, CT 06002	Name: Martin & Donna Hebert 10516 Western Turnpike Delanson, NY 12053

1. Type of Application: Special Use Permit; Site Plan Approval; Use Variance; Area Variance; Subdivision Approval (circle one or more)
2. Description of proposed project: CTEC proposes to build a 1.875 megawatt (MW) community solar energy generating facility on approximately 8.91 acres of a 84.4-acre parcel. The project will include single-axis tracker solar modules, attached inverters, underground collector cables, an equipment pad, perimeter fencing, access road and riser pole for the point of interconnection at State Rt 20.
3. Location of project: Address: 10516 Western Turnpike
   Tax Map Number (TMP) 64.00-2-8
4. Is this parcel within an Agricultural District? YES NO (Check with your local assessor if you do not know.)
5. If YES, Agricultural District Number__________
6. Is this parcel actively farmed? YES NO
7. List all farm operations within 500 feet of your parcel. Attach additional sheet if necessary.

NAME: Paul W. Pohls, parcel 52.00-1-13 ADDRESS: 5204 State Highway 30 Esperance, NY 12066 Is this parcel actively farmed? YES NO	NAME: Paul W. Pohls, parcel 52.00-1-14.1 ADDRESS: 5204 State Highway 30 Esperance, NY 12066 Is this parcel actively farmed? YES NO
NAME: Kenneth Romanski, parcel 52.00-1-12.31 ADDRESS: 1614 McGuire School Rd Delanson, NY 12053 Is this parcel actively farmed? YES NO	NAME: ADDRESS: Is this parcel actively farmed? YES NO

____________________ Signature of Applicant

____________________ Signature of Owner (if other than applicant)

Reviewed by: ____________________ Dale R. Warner

____________ Date

Revised 4/4/17

FARM NOTE

Prospective residents should be aware that farm operations may generate dust, odor, smoke, noise, vibration and other conditions that may be objectionable to nearby properties. Local governments shall not unreasonably restrict or regulate farm operations within State Certified Agricultural Districts unless it can be shown that the public health or safety is threatened.

NOTE TO REFERRAL AGENCY: County Planning Board review is required. A copy of the Agricultural Data Statement must be submitted along with the referral to the County Planning Department.

ATTACHMENT H

ENVIRONMENTAL ASSESSMENT FORM

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either “Yes” or “No”. If the answer to the initial question is “Yes”, complete the sub-questions that follow. If the answer to the initial question is “No”, proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the applicant or project sponsor to verify that the information contained in Part 1is accurate and complete.

A. Project and Applicant/Sponsor Information.

Name of Action or Project: MarDon Community Solar		
Project Location (describe, and attach a general location map): Project will be located at 10516 Western Turnpike, Delanson, NY, Schenectady County tax parcel 64.00-2-8		
Brief Description of Proposed Action (include purpose or need): CTEC Solar, LLC proposes to develop a 1.875 megawatt alternating current solar energy generating facility on 8.91 acres of an 84.4-acre parcel in the Town of Duanesburg. The facility will be comprised of a solar array with driven-pile single-axis tracker modules, an equipment pad, inverters, switchgear, transformer, access road, perimeter fence and riser poles to the point of interconnection with the regional utility at State Rt 20. The facility will be surrounded by a 20' wide vegetative screening buffer and will not require removal of trees in forested areas.		
Name of Applicant/Sponsor: CTEC Solar, LLC	Telephone:	
	E-Mail: michael.lewis@ctecsolar.com	
Address: 1 Griffin Road South, Suite 200		
City/PO: Bloomfield	State: CT	Zip Code: 06002
Project Contact (if not same as sponsor; give name and title/role): Sonja Torpey (Tetra Tech Project Manager) on behalf of CTEC Solar	Telephone: 585-705-5289	
	E-Mail: sonja.torpey@tetratech.com	
Address: 3136 South Winton Road, Suite 303		
City/PO: Rochester	State: NY	Zip Code: 14623
Property Owner (if not same as sponsor): Martin and Donna Hebert	Telephone:	
	E-Mail:	
Address: 10516 Western Turnpike		
City/PO: Delanson	State: NY	Zip Code: 12053

B. Government Approvals

B. Government Approvals, Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity		If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Counsel, Town Board, or Village Board of Trustees	☐Yes ☑No		
b. City, Town or Village Planning Board or Commission	☑Yes ☐No	Special Use Permit and Site Plan Approval	December 8, 2023
c. City, Town or Village Zoning Board of Appeals	☐Yes ☑No		
d. Other local agencies	☐Yes ☑No		
e. County agencies	☐Yes ☑No		
f. Regional agencies	☐Yes ☑No		
g. State agencies	☐Yes ☑No		
h. Federal agencies	☐Yes ☑No		

i. Coastal Resources.

i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? ☐Yes ☑No

ii. Is the project site located in a community with an approved Local Waterfront Revitalization Program? ☐Yes ☑No

iii. Is the project site within a Coastal Erosion Hazard Area? ☐Yes ☑No

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☑Yes ☐No

- **If Yes,** complete sections C, F and G.
- **If No,** proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ☑Yes ☐No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ☐Yes ☑No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway; Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ☑Yes ☐No

If Yes, identify the plan(s):

NYS Heritage Areas:Mohawk Valley Heritage Corridor

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☐Yes ☑No

If Yes, identify the plan(s):

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. ☑ Yes ☐ No

If Yes, what is the zoning classification(s) including any applicable overlay district?

Part of the parcel is zoned Commercial-1, part of it is zoned Agricultural-Residential (AR). The facility would be sited on the AR portion, with access road on the Commercial portion.

b. Is the use permitted or allowed by a special or conditional use permit? ☑ Yes ☐ No

c. Is a zoning change requested as part of the proposed action? ☐ Yes ☑ No

If Yes,

i. What is the proposed new zoning for the site? ______

C.4. Existing community services.

a. In what school district is the project site located? Duanesburg Central School District

b. What police or other public protection forces serve the project site?

Rotterdam Police Department

c. Which fire protection and emergency medical services serve the project site?

Delanson Volunteer Fire Department

d. What parks serve the project site?

Not Applicable

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)?

______

b. a. Total acreage of the site of the proposed action? ______ acres

b. Total acreage to be physically disturbed? ______ acres

c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? ______ acres

c. Is the proposed action an expansion of an existing project or use? ☐ Yes ☐ No

i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % ______ Units: ______

d. Is the proposed action a subdivision, or does it include a subdivision? ☐ Yes ☐ No

If Yes,

i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types)

______

ii. Is a cluster/conservation layout proposed? ☐ Yes ☐ No

iii. Number of lots proposed? ______

iv. Minimum and maximum proposed lot sizes? Minimum ______ Maximum ______

e. Will the proposed action be constructed in multiple phases? ☐ Yes ☐ No

i. If No, anticipated period of construction: ______ months

ii. If Yes:

- Total number of phases anticipated ______
- Anticipated commencement date of phase 1 (including demolition) ______ month ______ year
- Anticipated completion date of final phase ______ month ______ year
- Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: ______

f. Does the project include new residential uses? ☐Yes ☐No
If Yes, show numbers of units proposed.

	One Family	Two Family	Three Family	Multiple Family (four or more)
Initial Phase	___________	___________	____________	________________________
At completion of all phases	___________	___________	____________	________________________

g. Does the proposed action include new non-residential construction (including expansions)? ☐Yes ☐No
If Yes,
i. Total number of structures ___________
ii. Dimensions (in feet) of largest proposed structure: ________height; ________width; and _______ length
iii. Approximate extent of building space to be heated or cooled: ______________________ square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? ☐Yes ☐No
If Yes,
i. Purpose of the impoundment: ____
ii. If a water impoundment, the principal source of the water: ☐ Ground water ☐ Surface water streams ☐ Other specify:
____
iii. If other than water, identify the type of impounded/contained liquids and their source.
____
iv. Approximate size of the proposed impoundment. Volume: ____________ million gallons; surface area: ____________ acres
v. Dimensions of the proposed dam or impounding structure: ________ height; _______ length
vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete):
____

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? ☐Yes ☐No
(Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite)
If Yes:
i .What is the purpose of the excavation or dredging? ____
ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?
- Volume (specify tons or cubic yards): ____
- Over what duration of time? ____

iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them.
____
____
iv. Will there be onsite dewatering or processing of excavated materials? ☐Yes ☐No
If yes, describe. ____
____
v. What is the total area to be dredged or excavated? _____________________________________acres
vi. What is the maximum area to be worked at any one time? ________________________________ acres
vii. What would be the maximum depth of excavation or dredging? __________________________ feet
viii. Will the excavation require blasting? ☐Yes ☐No
ix. Summarize site reclamation goals and plan: ____
____
____

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? ☐Yes ☐No
If Yes:
i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description): ____
____

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

____

iii. Will the proposed action cause or result in disturbance to bottom sediments? ☐Yes☐No

If Yes, describe: ______________________________

iv. Will the proposed action cause or result in the destruction or removal of aquatic vegetation? ☐Yes☐No

If Yes:

- acres of aquatic vegetation proposed to be removed: ______________________________
- expected acreage of aquatic vegetation remaining after project completion:______________________________
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access): ______________________________
- proposed method of plant removal: ______________________________
- if chemical/herbicide treatment will be used, specify product(s): ______________________________

v. Describe any proposed reclamation/mitigation following disturbance: ______________________________

c. Will the proposed action use, or create a new demand for water? ☐Yes☐No

If Yes:

i. Total anticipated water usage/demand per day: ______________________________ gallons/day

ii. Will the proposed action obtain water from an existing public water supply? ☐Yes☐No

If Yes:

- Name of district or service area: ______________________________
- Does the existing public water supply have capacity to serve the proposal? ☐Yes☐ No
- Is the project site in the existing district? ☐Yes☐ No
- Is expansion of the district needed? ☐Yes☐ No
- Do existing lines serve the project site? ☐Yes☐ No

iii. Will line extension within an existing district be necessary to supply the project? ☐Yes☐No

If Yes:

- Describe extensions or capacity expansions proposed to serve this project: ______________________________
- Source(s) of supply for the district: ______________________________

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☐ Yes☐No

If, Yes:

- Applicant/sponsor for new district: ______________________________
- Date application submitted or anticipated: ______________________________
- Proposed source(s) of supply for new district: ______________________________

v. If a public water supply will not be used, describe plans to provide water supply for the project: ______________________________

vi. If water supply will be from wells (public or private), what is the maximum pumping capacity: _______ gallons/minute.

d. Will the proposed action generate liquid wastes? ☐Yes☐No

If Yes:

i. Total anticipated liquid waste generation per day: ________________ gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each): ______________________________

iii. Will the proposed action use any existing public wastewater treatment facilities? ☐Yes☐No

If Yes:

- Name of wastewater treatment plant to be used: ______________________________
- Name of district: ______________________________
- Does the existing wastewater treatment plant have capacity to serve the project? ☐Yes☐No
- Is the project site in the existing district? ☐Yes☐No
- Is expansion of the district needed? ☐Yes☐No

- Do existing sewer lines serve the project site? ☐Yes☐No
- Will a line extension within an existing district be necessary to serve the project? ☐Yes☐No

  If Yes:
  - Describe extensions or capacity expansions proposed to serve this project: ______________________________________

    ____

    ____

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? ☐Yes☐No

If Yes:

- Applicant/sponsor for new district: ______________________________________
- Date application submitted or anticipated: ______________________________________
- What is the receiving water for the wastewater discharge? ______________________________________

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge or describe subsurface disposal plans):

____

____

vi. Describe any plans or designs to capture, recycle or reuse liquid waste: ______________________________________

____

____

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? ☐Yes☐No

If Yes:

i. How much impervious surface will the project create in relation to total size of project parcel?

_____ Square feet or _____ acres (impervious surface)

_____ Square feet or _____ acres (parcel size)

ii. Describe types of new point sources. ______________________________________

____

iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?

____

____

- If to surface waters, identify receiving water bodies or wetlands: ______________________________________

  ____

  ____
- Will stormwater runoff flow to adjacent properties? ☐Yes☐No

iv. Does the proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? ☐Yes☐No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? ☐Yes☐No

If Yes, identify:

i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)

____

ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)

____

iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)

____

g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? ☐Yes☐No

If Yes:

i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) ☐Yes☐No

ii. In addition to emissions as calculated in the application, the project will generate:

- ___________Tons/year (short tons) of Carbon Dioxide (CO_2)
- ___________Tons/year (short tons) of Nitrous Oxide (N_2O)
- ___________Tons/year (short tons) of Perfluorocarbons (PFCs)
- ___________Tons/year (short tons) of Sulfur Hexafluoride (SF_6)
- ___________Tons/year (short tons) of Carbon Dioxide equivalent of Hydroflourocarbons (HFCs)
- ___________Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? ☐Yes☐No

If Yes:

i. Estimate methane generation in tons/year (metric): ______________________________

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): ______________________________

____

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? ☐Yes☐No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

____

____

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? ☐Yes☐No

If Yes:

i. When is the peak traffic expected (Check all that apply): ☐ Morning ☐ Evening ☐Weekend

☐ Randomly between hours of __________ to ________.

ii. For commercial activities only, projected number of truck trips/day and type (e.g., semi trailers and dump trucks): _____________

____

iii. Parking spaces: Existing ____________________ Proposed ___________ Net increase/decrease ______________________

iv. Does the proposed action include any shared use parking? ☐Yes☐No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:

____

vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? ☐Yes☐No

vii Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? ☐Yes☐No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? ☐Yes☐No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? ☐Yes☐No

If Yes:

i. Estimate annual electricity demand during operation of the proposed action: ______________________________

____

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other):

____

iii. Will the proposed action require a new, or an upgrade, to an existing substation? ☐Yes☐No

l. Hours of operation. Answer all items which apply.

i. During Construction:

- Monday - Friday: _________________________
- Saturday: _________________________
- Sunday: _________________________
- Holidays: _________________________

ii. During Operations:

- Monday - Friday: _________________________
- Saturday: _________________________
- Sunday: _________________________
- Holidays: _________________________

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? ☐ Yes ☐ No

If yes:

i. Provide details including sources, time of day and duration:

____

____

ii. Will the proposed action remove existing natural barriers that could act as a noise barrier or screen? ☐ Yes ☐ No

Describe: ____

____

n. Will the proposed action have outdoor lighting? ☐ Yes ☐ No

If yes:

i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:

____

____

ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? ☐ Yes ☐ No

Describe: ____

____

o. Does the proposed action have the potential to produce odors for more than one hour per day? ☐ Yes ☐ No

If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures: ____

____

____

p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products 185 gallons in above ground storage or any amount in underground storage? ☐ Yes ☐ No

If Yes:

i. Product(s) to be stored ____

ii. Volume(s) ______ per unit time ____________ (e.g., month, year)

iii. Generally, describe the proposed storage facilities:____

____

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? ☐ Yes ☐ No

If Yes:

i. Describe proposed treatment(s):

____

____

____

____

ii. Will the proposed action use Integrated Pest Management Practices? ☐ Yes ☐ No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? ☐ Yes ☐ No

If Yes:

i. Describe any solid waste(s) to be generated during construction or operation of the facility:

- Construction: ____________________ tons per ________________ (unit of time)
- Operation : ____________________ tons per ________________ (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:

- Construction: ____

  ____
- Operation: ____

  ____

iii. Proposed disposal methods/facilities for solid waste generated on-site:

- Construction: ____

  ____
- Operation: ____

  ____

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ☐ No

If Yes:

i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): ____________________

ii. Anticipated rate of disposal/processing:

- ________ Tons/month, if transfer or other non-combustion/thermal treatment, or
- ________ Tons/hour, if combustion or thermal treatment

iii. If landfill, anticipated site life: ____________________ years

t. Will the proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐Yes ☐No

If Yes:

i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: ____________________

ii. Generally describe processes or activities involving hazardous wastes or constituents: ____________________

iii. Specify amount to be handled or generated _____ tons/month

iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: ____________________

v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐Yes ☐No

If Yes: provide name and location of facility: ____________________

If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

____

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site

a. Existing land uses.

i. Check all uses that occur on, adjoining and near the project site.

☐ Urban ☐ Industrial ☐ Commercial ☐ Residential (suburban) ☐ Rural (non-farm)

☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): ____________________

ii. If mix of uses, generally describe:

____

b. Land uses and covertypes on the project site.

Land use or Covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces			
• Forested			
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)			
• Agricultural (includes active orchards, field, greenhouse etc.)			
• Surface water features (lakes, ponds, streams, rivers, etc.)			
• Wetlands (freshwater or tidal)			
• Non-vegetated (bare rock, earth or fill)			
• Other Describe: ____________________			

c. Is the project site presently used by members of the community for public recreation? ☐ Yes ☐ No
i. If Yes: explain: ____________________

d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? ☐ Yes ☐ No
If Yes,
i. Identify Facilities:
____
____

e. Does the project site contain an existing dam? ☐ Yes ☐ No
If Yes:
i. Dimensions of the dam and impoundment:

- Dam height: ____________________ feet
- Dam length: ____________________ feet
- Surface area: ____________________ acres
- Volume impounded: ____________________ gallons OR acre-feet

ii. Dam's existing hazard classification: ____________________
iii. Provide date and summarize results of last inspection:
____
____

f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? ☐ Yes ☐ No
If Yes:
i. Has the facility been formally closed? ☐ Yes ☐ No

- If yes, cite sources/documentation: ____________________

ii. Describe the location of the project site relative to the boundaries of the solid waste management facility:
____
____
iii. Describe any development constraints due to the prior solid waste activities: ____________________
____

g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? ☐ Yes ☐ No
If Yes:
i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred:
____
____

h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? ☐ Yes ☐ No
If Yes:
i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: ☐ Yes ☐ No

☐ Yes – Spills Incidents database Provide DEC ID number(s): ____________________
☐ Yes – Environmental Site Remediation database Provide DEC ID number(s): ____________________
☐ Neither database

ii. If site has been subject of RCRA corrective activities, describe control measures: ____________________
____
____

iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? ☐ Yes ☑ No
If yes, provide DEC ID number(s): ____________________

iv. If yes to (i), (ii) or (iii) above, describe current status of site(s):
____
____

v. Is the project site subject to an institutional control limiting property uses? ☐ Yes ☐ No

- If yes, DEC site ID number: ____________
- Describe the type of institutional control (e.g., deed restriction or easement): ____________
- Describe any use limitations: ____________
- Describe any engineering controls: ____________
- Will the project affect the institutional or engineering controls in place? ☐ Yes ☐ No
- Explain: ____________

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? ________ feet

b. Are there bedrock outcroppings on the project site? ☐ Yes ☐ No
If Yes, what proportion of the site is comprised of bedrock outcroppings? ________%

c. Predominant soil type(s) present on project site: ____________ ______%
____________ ______%
____________ ______%

d. What is the average depth to the water table on the project site? Average: ______ feet

e. Drainage status of project site soils: ☐ Well Drained: _____% of site
☐ Moderately Well Drained: _____% of site
☐ Poorly Drained _____% of site

f. Approximate proportion of proposed action site with slopes: ☐ 0-10%: _____% of site
☐ 10-15%: _____% of site
☐ 15% or greater: _____% of site

g. Are there any unique geologic features on the project site? ☐ Yes ☑ No
If Yes, describe: ____________

h. Surface water features.
i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? ☑ Yes ☐ No
ii. Do any wetlands or other waterbodies adjoin the project site? ☑ Yes ☐ No
If Yes to either *i* or *ii*, continue. If No, skip to E.2.i.
iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? ☑ Yes ☐ No
iv. For each identified regulated wetland and waterbody on the project site, provide the following information:

- Streams: Name ____________ Classification ____________
- Lakes or Ponds: Name ____________ Classification ____________
- Wetlands: Name Federal Waters, Federal Waters Approximate Size ____________
- Wetland No. (if regulated by DEC) ____________

v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? ☐ Yes ☑ No
If yes, name of impaired water body/bodies and basis for listing as impaired: ____________

i. Is the project site in a designated Floodway? ☐ Yes ☑ No

j. Is the project site in the 100-year Floodplain? ☐ Yes ☑ No

k. Is the project site in the 500-year Floodplain? ☐ Yes ☑ No

l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? ☐ Yes ☑ No
If Yes:
i. Name of aquifer: ____________

m. Identify the predominant wildlife species that occupy or use the project site: ______________________________

n. Does the project site contain a designated significant natural community? ☐ Yes ☑ No
If Yes:
i. Describe the habitat/community (composition, function, and basis for designation): ______________________________
ii. Source(s) of description or evaluation: ______________________________
iii. Extent of community/habitat:
- Currently: ______________________ acres
- Following completion of project as proposed: ______________________ acres
- Gain or loss (indicate + or -): ______________________ acres

o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? ☑ Yes ☐ No
If Yes:
i. Species and listing (endangered or threatened): ______________________________
Northern Long-eared Bat

p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? ☐ Yes ☑ No
If Yes:
i. Species and listing: ______________________________

q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? ☐ Yes ☐ No
If yes, give a brief description of how the proposed action may affect that use: ______________________________

E.3. Designated Public Resources On or Near Project Site

a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? ☑ Yes ☐ No
If Yes, provide county plus district name/number: SCHE001

b. Are agricultural lands consisting of highly productive soils present? ☐ Yes ☐ No
i. If Yes: acreage(s) on project site? ______________________________
ii. Source(s) of soil rating(s): ______________________________

c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? ☐ Yes ☑ No
If Yes:
i. Nature of the natural landmark: ☐ Biological Community ☐ Geological Feature
ii. Provide brief description of landmark, including values behind designation and approximate size/extent: ______________________________

d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? ☐ Yes ☑ No
If Yes:
i. CEA name: ______________________________
ii. Basis for designation: ______________________________
iii. Designating agency and date: ______________________________

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? ☑ Yes ☐ No

If Yes:

i. Nature of historic/archaeological resource: ☐ Archaeological Site ☐ Historic Building or District

ii. Name: Wing, William R., Farm Complex, Avery Farmhouse

iii. Brief description of attributes on which listing is based:

f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? ☐ Yes ☑ No

g. Have additional archaeological or historic site(s) or resources been identified on the project site? ☐ Yes ☐ No

If Yes:

i. Describe possible resource(s):

ii. Basis for identification:

h. Is the project site within fives miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? ☐ Yes ☐ No

If Yes:

i. Identify resource:

ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.):

iii. Distance between project and resource: ______________________ miles.

i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? ☐ Yes ☑ No

If Yes:

i. Identify the name of the river and its designation:

ii. Is the activity consistent with development restrictions contained in 6NYCRR Part 666? ☐ Yes ☐ No

F. Additional Information

Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

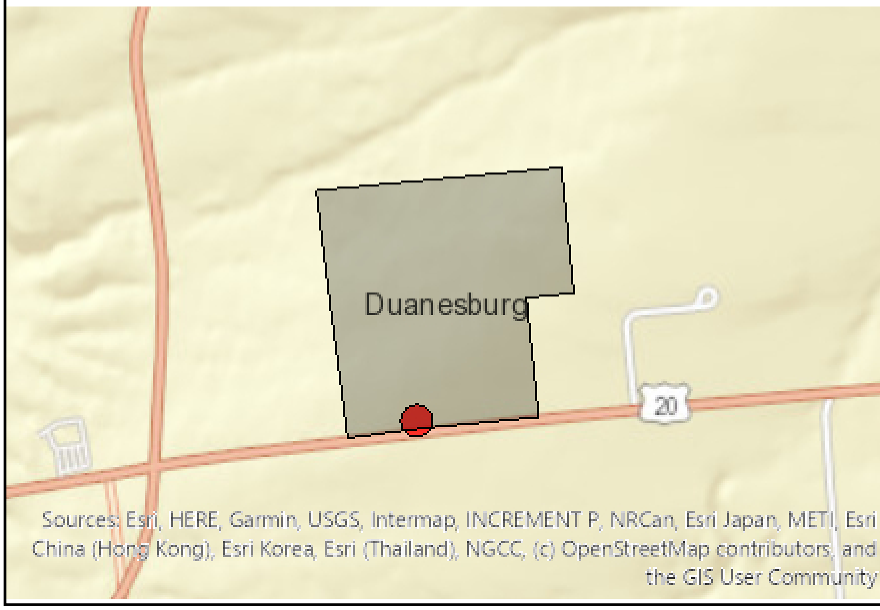
G. Verification

I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name Sonja Torpey Date December 8, 2023

Signature Sonja Torpey Title Environmental Scientist / Project Manager

PRINT FORM



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.

B.i.i [Coastal or Waterfront Area]	No
B.i.ii [Local Waterfront Revitalization Area]	No
C.2.b. [Special Planning District]	Yes - Digital mapping data are not available for all Special Planning Districts. Refer to EAF Workbook.
C.2.b. [Special Planning District - Name]	NYS Heritage Areas:Mohawk Valley Heritage Corridor
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]	No
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 - Wetlands Name]	Federal Waters
E.2.h.v [Impaired Water Bodies]	No
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]	Northern Long-eared Bat
E.2.p. [Rare Plants or Animals]	No
E.3.a. [Agricultural District]	Yes
E.3.a. [Agricultural District]	SCHE001
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]	Yes - Digital mapping data for archaeological site boundaries are not available. Refer to EAF Workbook.
E.3.e.ii [National or State Register of Historic Places or State Eligible Sites - Name]	Wing, William R., Farm Complex, Avery Farmhouse
E.3.f. [Archeological Sites]	No
E.3.i. [Designated River Corridor]	No

ATTACHMENT I

IPAC & HABITAT SURVEY

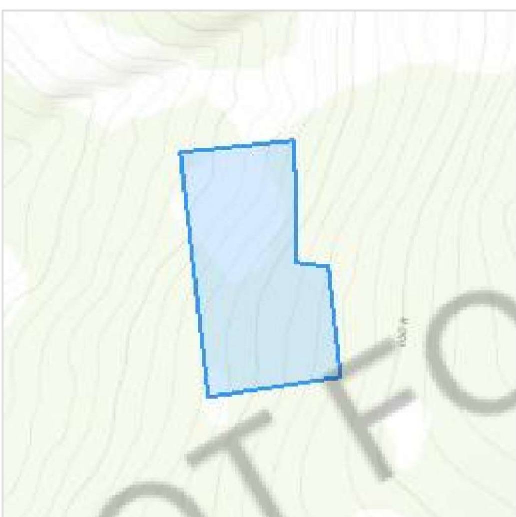
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Schenectady County, New York



Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699
fw5es_nyfo@fws.gov

3817 Luker Road
Cortland, NY 13045-9385

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Insects

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

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

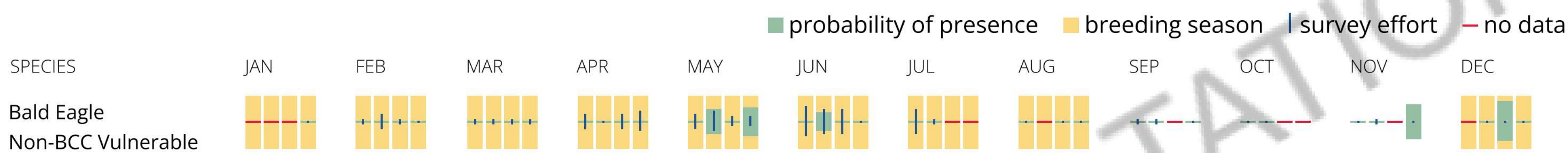
Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network (AKN)](). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets]() and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act]() requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator (RAIL) Tool]().

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern (BCC)]() and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network (AKN)](). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets]() and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act]() requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/ documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Belted Kingfisher *Megaceryle alcyon* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 15 to Jul 25
Blue-winged Warbler *Vermivora pinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25

Eastern Meadowlark Sturnella magna
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 25 to Aug 31

Lesser Yellowlegs Tringa flavipes
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Breeds elsewhere

Prairie Warbler Dendroica discolor
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

Wood Thrush Hylocichla mustelina
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

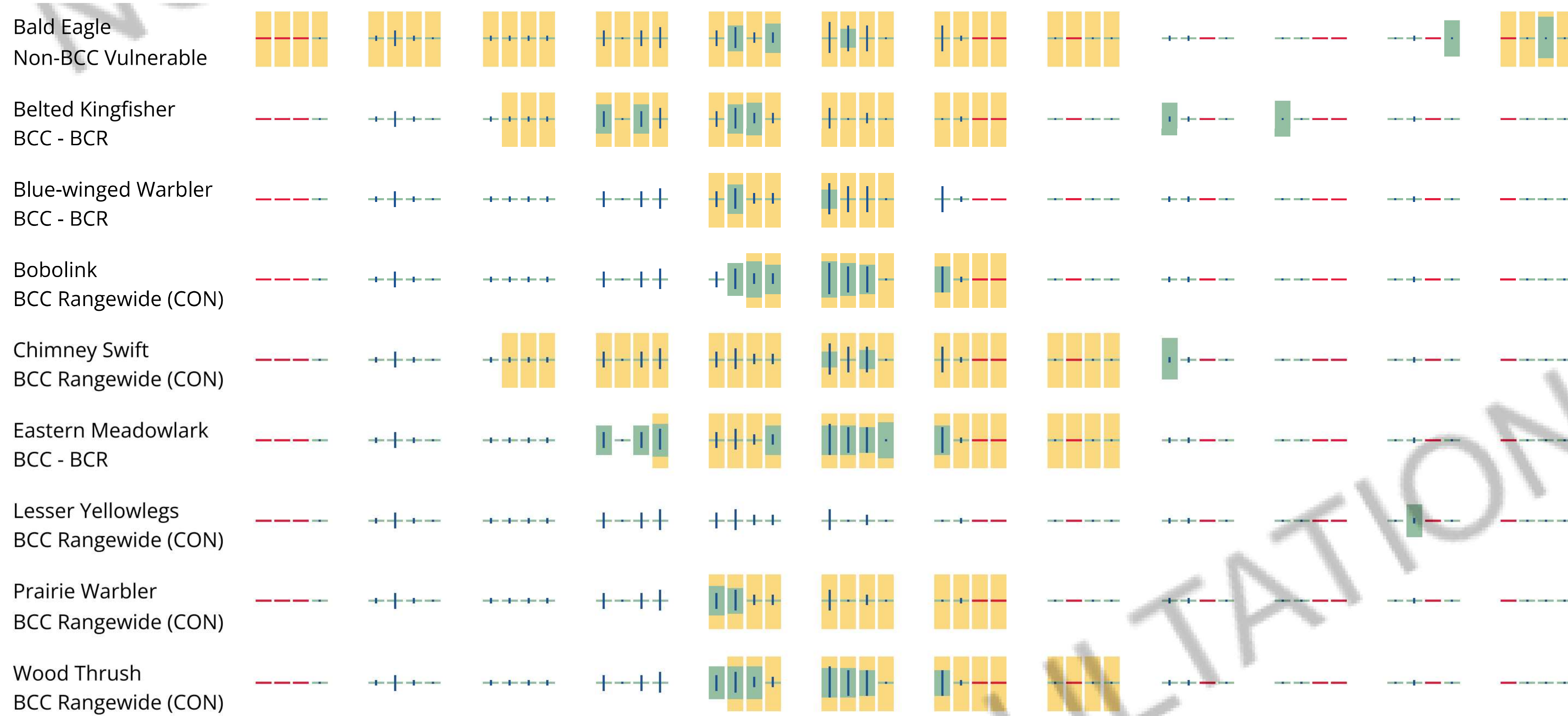
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

TETRA TECH

Memo

Project Site: MarDon Community Solar Site

Address: 10516 Western Turnpike, Duanesburg

County: Schenectady

Total Parcel Acreage: Approximately 84.4 acres

Proposed Area of Interest Acreage: Approximately 8.91 acres

Date: May 23, 2023

Tetra Tech Project Number: 194-1409-0003.12

1.0 Introduction

Tetra Tech has prepared this ecological community and bat habitat survey for a project proposed by CTEC Solar, LLC (CTEC), located at 10516 Western Turnpike, Duanesburg on an approximately 84.4-acre parcel of land located west the Town of Duanesburg, Schenectady County, New York. Within the Property, CTEC intends to develop approximately 8.91 acres of the property into an alternating current (AC) solar array (Project). The purpose of this survey is to determine the ecological communities present within the parcel area and to determine if there is potentially suitable bat habitat within the forested areas of the Site, specifically the federally-endangered northern long-eared bat (*Myotis septentrionalis*).

2.0 Methodology

Potential state- and federally- protected wildlife species likely to be present on or in the vicinity of the Project were determined by first compiling a list of species known to occur within the county using NYSDEC data through the New York Natural Heritage Program (NYNHP) and USFWS data using the Information for Planning and Conservation (IPaC) project planning tool. For species known to occur in the county, the likelihood of occurrence within the Property was then assessed by evaluating the presence or absence of suitable habitat on and adjacent to the Property through desktop analysis of land cover. Potential state- and federally- protected plant species were treated as a group, and their potential occurrence was based on the presence or absence of undisturbed natural habitats in the Property. New York State (NYS) law allows for the disturbance of rare plant habitat with the consent of the property owner (New York State Environmental Conservation Law 9-1503). According to the results IPaC Official Species list for the Project Area, only northern long-eared bat has the potential within the area with Monarch butterfly (*Danaus plexippus*) listed as a candidate species.

The northern long-eared bat is a forest-dependent species, primarily feeding on insects within forests and surrounding lands. During the winter period it hibernates in caves or other underground features with elevated air temperatures. During the summer period, northern long-eared bats roosts in trees, including maternal roost trees, where pups are raised. For northern long-eared bat, the following development activities would be considered to have an incidental take (requiring formal consultation under the Endangered Species Act):

- All incidental take within hibernacula; or
- Incidental take resulting from tree removal within a 0.25 mile of a known occupied northern long-eared bat hibernacula or within 150 feet of a known occupied maternity roost tree during the pup-rearing season (June 1 through July 31)

A habitat assessment was conducted to determine potential bat habitat within the Project Area. Bat habitat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (dbh) for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of another forested/wooded habitat. Northern long-eared bat has also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat.

As part of the survey ecological communities within the Project Area were determined. Determinations were made based on the NYNHP Ecological Communities of New York (Edinger et al, 2014).

3.0 Results

The field survey was conducted April 27, 2023, during typical conditions for mid-spring. Several ecological communities were identified including agricultural land within the Project and hemlock-northern hardwood forest and Appalachian oak-hickory forest forest boarding the Site.

Pastureland consists of the majority of the Proposed Site and is actively maintained agricultural land. Species were difficult to identify due to recent landscaping and early growth, with species observed including goldenrods *(Solidago juncea, Solidago canadensis*), red clover (*Trifolium pretense*), bedstraw (*Gallium* spp.), common dandelion (*Taraxacum officinale*), petty spurge (*Euphorbia peplus*), Shepard's-needle (*Scandix pecten-veneris*), and grass species.With the potential roost trees observed (see Figure 1), there was bat habitat observed within the tree/shrub line along the southern and northern boundary of the Proposed Site and the forested area to the west off-site.

The Project was bordered by hemlock-northern hardwood and Appalachian oak-hickory forest. Hemlock-northern hardwood forests are a mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Appalachian oak-hickory forest is a hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. Both forest types are broadly defined and a very widespread community, with many regional and edaphic variants.

Tree species identified within the forest include eastern hemlock (*Tsuga canadensis*), red and black oak (*Quercus rubra, Quercus velutina*), American beech (*Fagus grandifolia*), white pine (*Pinus strobus*), sugar maple (*Acer saccharum*), basswood (*Tilia americana*) and shagbark hickory (*Carya ovata*). The understory was mainly open with areas of false Solomon' seal (*Maianthemum racemosum*). The community is mainly comprised of younger tree stands with 80% having 3–8-inch dbh, 15% 9–15-inch dbh, and 5% >15-inch dbh. There were four trees (two shagbark hickories and two dead snags) along the southern tree line, and several shagbark hickories within the adjacent western forest that are potential roosting trees. Dead snags had exfoliating bark, cracks, and/or crevices that could provide roosting habitat.

4.0 Summary

Due to observations of potential roosting habitat consisting of mainly dead tree snags within forested areas, and the riparian feature that runs west from the man-made pond into the forested area, the habitat to the west of the Project Area is considered to contain suitable habitat for northern long-eared bat. The Project Area is not considered to contain suitable habitat for northern long eared bat but recommend avoidance of the boundary forest area, and if tree clearing is necessary for shading of solar arrays, then performing seasonal clearings between November 1 through March 31. In addition, it is recommended that snags and cavity trees are left uncut.

5.0 References

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

New York Natural Heritage Program (NYNHP). 2021. Online Conservation Guide for *Myotis sodalis*. Available from: https://guides.nynhp.org/indiana-bat/. Accessed September 3, 2021.

ATTACHMENTS

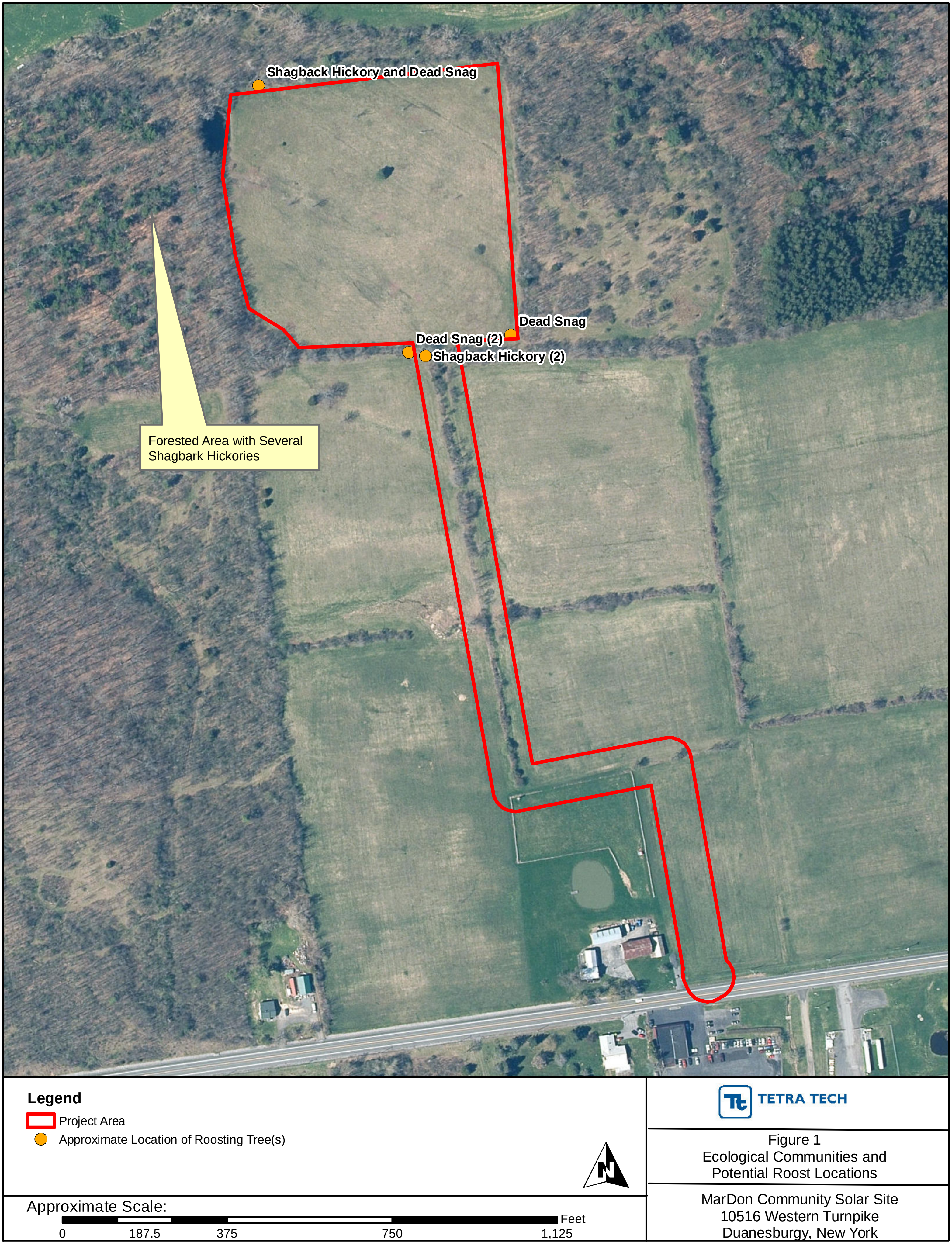


Figure 1
Ecological Communities and Potential Roost Locations

MarDon Community Solar Site
10516 Western Turnpike
Duanesburgy, New York

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors

ATTACHMENT J

SHPO LETTER

June 1, 2023

Sonja Torpey
Tetra Tech
3136 South Winton Road, Suite 303
Rochester, NY 14623

Re: SEQRA
MarDon Community Solar Site/2.8 MW/8.49 Acres
Town of Delanson, Schenectady County, NY
23PR04031

Dear Sonja Torpey:

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 documents under the State Environmental Quality Review Act (SEQRA) as requested. These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (NY Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR § 617).

We note that the project site is located within the State and National Register listed William R. Wing Farm Complex and is contiguous with the State and National Register listed Avery Farmhouse property. We have reviewed the site plan and Preliminary Civil Design Set for the proposed solar energy installation.

Based on this review, it appears that the solar array is appropriately sited to minimize visual impacts to the National Register listed resources. In addition, there are no archaeological concerns associated with this project.

Please be aware that if this project will involve state or federal permits, funding or licenses it may be subject to a more rigorous review by those agencies and this office for impacts to historic and archaeological resources under Section 106 of the National Historic Preservation Act or Section 14.09 of the NYS Parks, Recreation and Historic Preservation Law.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

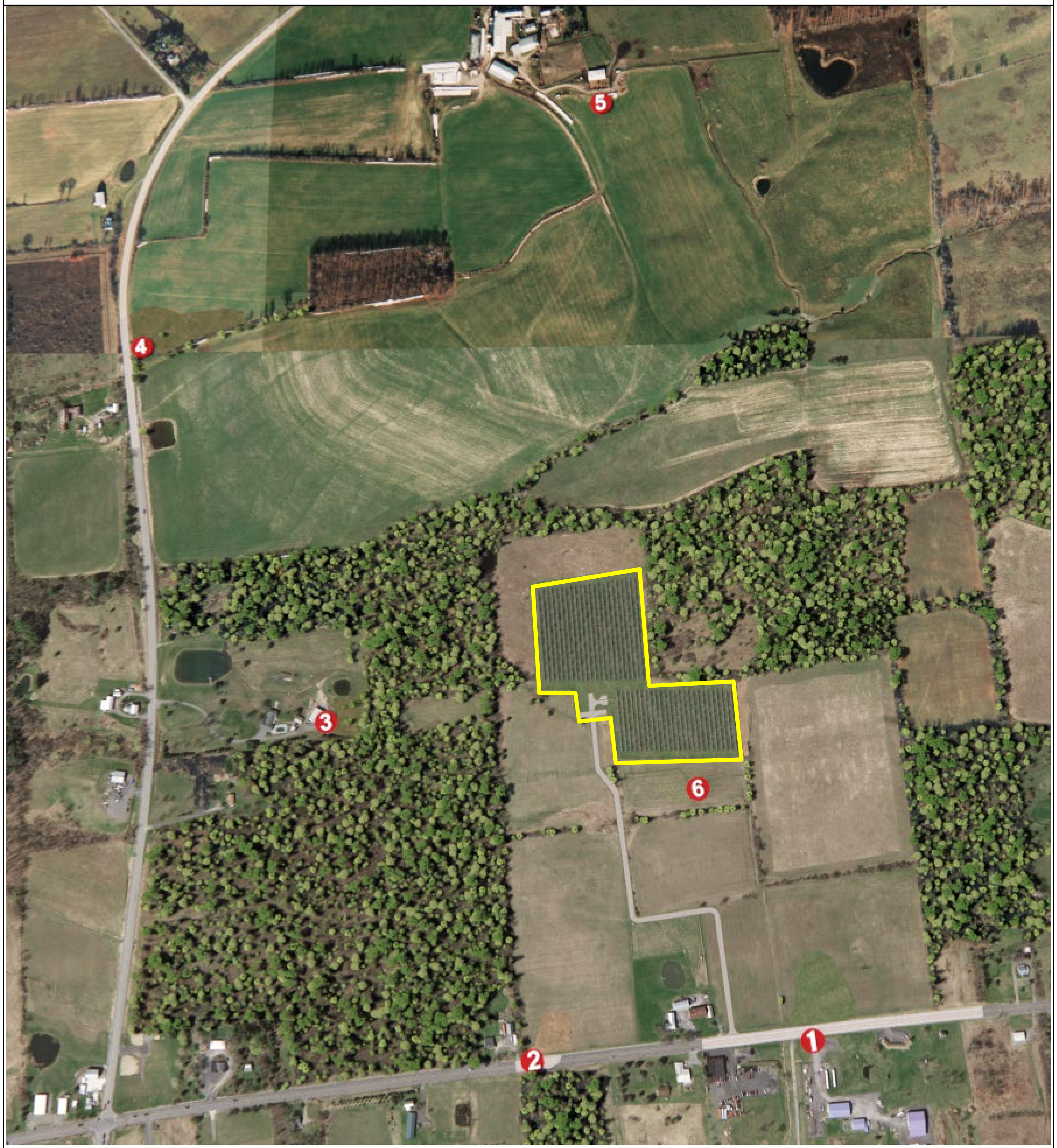
Sincerely,

Weston Davey
Historic Site Restoration Coordinator 518-268-2164 | Weston.Davey@parks.ny.gov

ATTACHMENT K

VISUAL SIMULATIONS & VIEWSHED ANALYSIS

Aerial Mapping of Visual Receptor Observation Points 1-6



Aerial view of Facility looking north from south side of Western Turnpike

Observation Point 1 – Pedestrian View
Facing north toward Facility from Western Turnpike

Observation Point 2 – Pedestrian View
Facing north toward Facility from Western Turnpike

Observation Point 3 – Pedestrian View

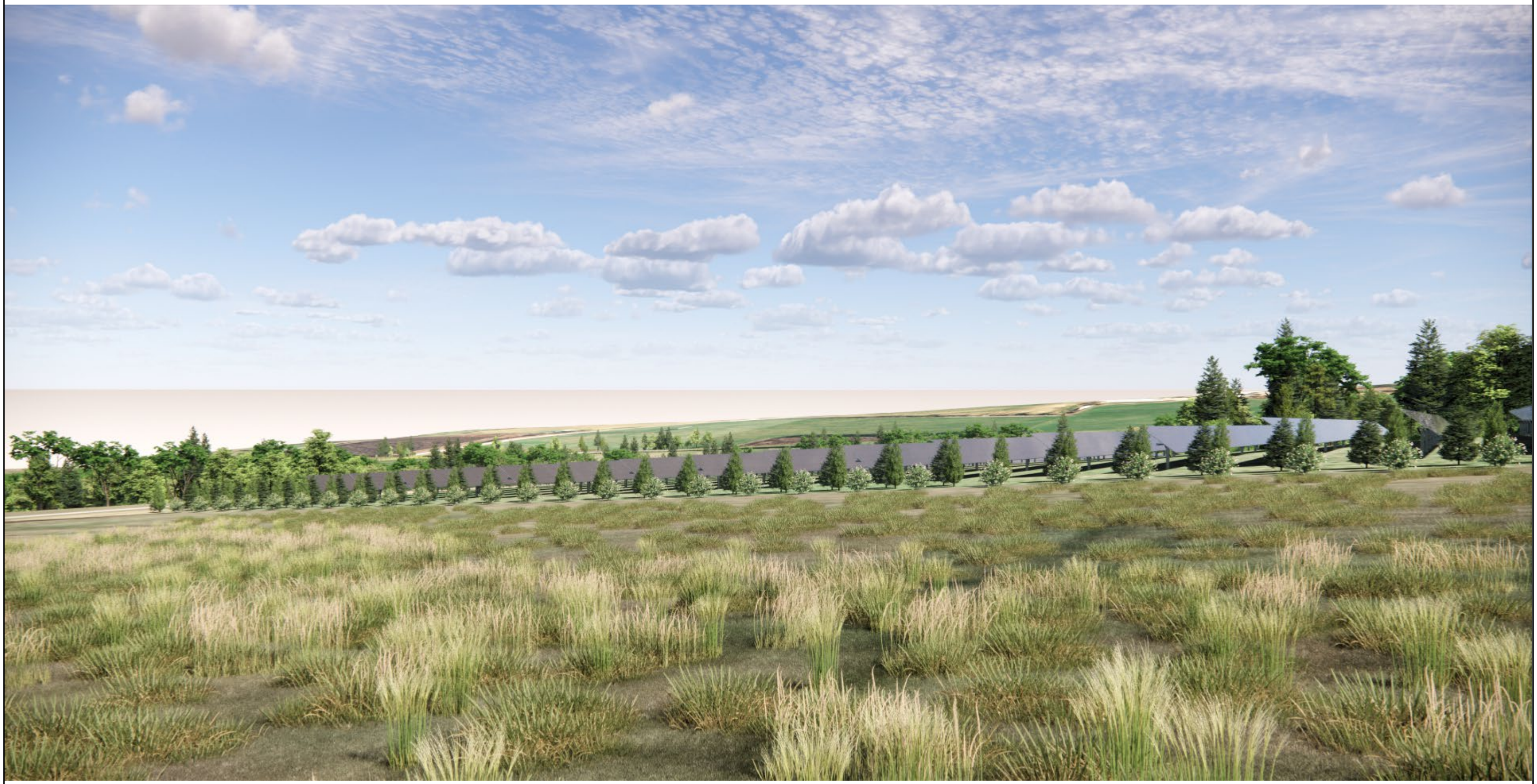
Facing east toward Facility from back yard of residence at 4318 State Highway 30

Observation Point 4 – Pedestrian View
Facing southeast toward Facility from agricultural property parcel 52.00-1-14.1 on State Highway 30

Observation Point 5 – Pedestrian View

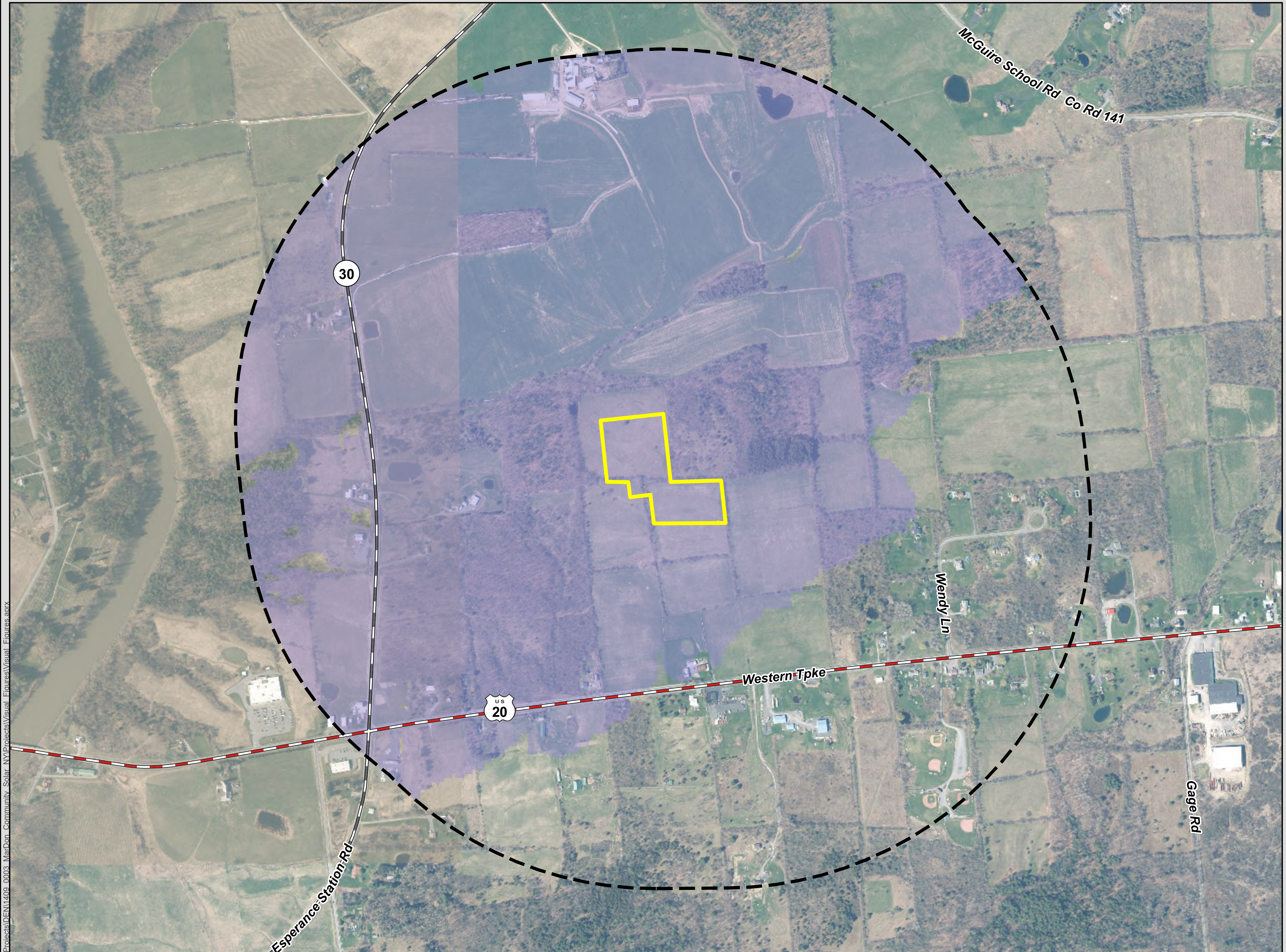
Facing southwest toward Facility from farm residence located at 5204 State Highway 30

Observation Point 6 – Pedestrian View
Facing north toward Facility from center of participating host property (parcel 64.00-2-8)



Aerial view looking northwest from center of participating host property (parcel 64.00-2-8)

Aerial view looking eastward and down upon the Facility from above the residential property located at 4318 State Highway 30 (parcel 64.00-2-3.1)



MarDon Community Solar Project

Solar Panel Array Viewshed Analysis - December 2023

10516 Western Turnpike, Delanson, Schenectady County, NY

Legend

Solar Array Fence Line

Zone of Visual Impact (0.5-mile)

Viewshed Analysis

Potential Visibility*

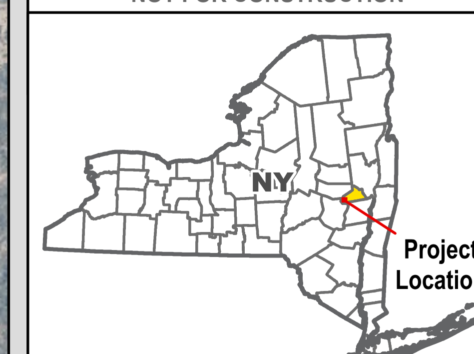
*Viewshed analysis based on USGS NED 10m. The purpose of this analysis is to evaluate the potential visibility of the proposed solar farm. An array height of 12ft and observer height of 6ft were assumed in the analysis. Areas that are not shaded in purple indicate that the proposed solar farm is likely not visible at that location.

N

0 500 1,000

Feet

NOT FOR CONSTRUCTION



TETRA TECH

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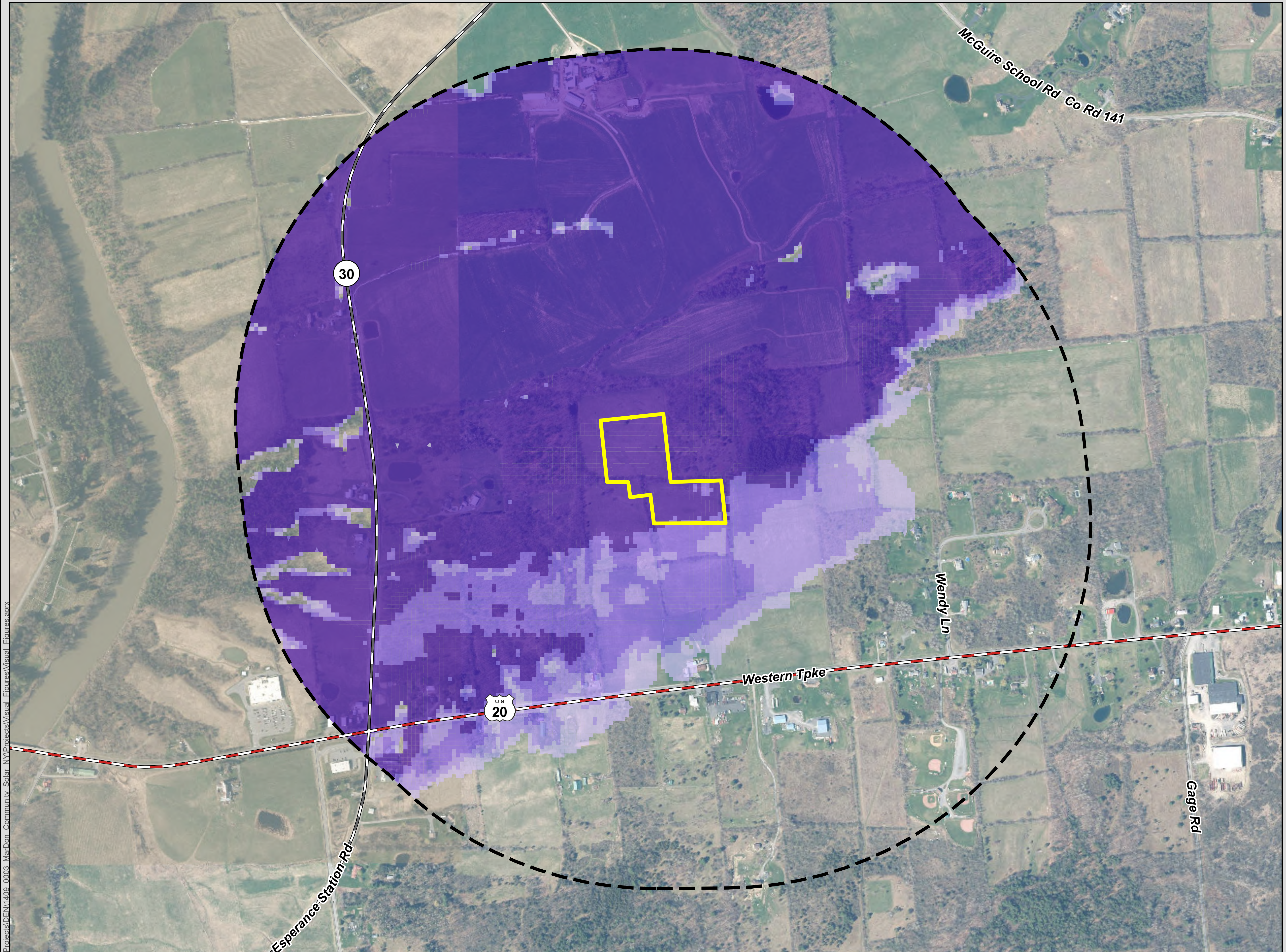


MarDon Community Solar Project

Solar Panel Array Viewshed Analysis - December 2023

10516 Western Turnpike, Delanson, Schenectady County, NY

Legend

Solar Array Fence Line

Zone of Visual Impact (0.5-mile)

% of PV Panels Potentially Visible*

< 25%

25% - 50%

50% - 75%

> 75%

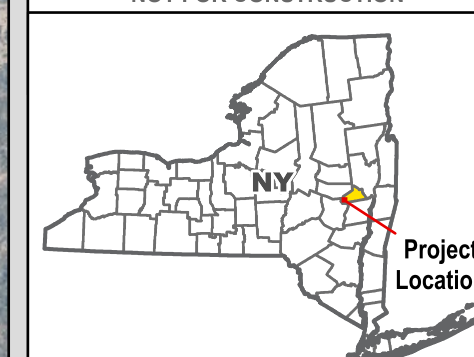
*Viewshed analysis based on USGS NED 10m. The purpose of this analysis is to evaluate the potential visibility of the proposed solar farm. An array height of 12ft and observer height of 6ft were assumed in the analysis. Areas that are not shaded in purple indicate that the proposed solar farm is likely not visible at that location.

N

0 500 1,000

Feet

NOT FOR CONSTRUCTION



TETRA TECH

ATTACHMENT L

GLARE MEMO

MEMO

To:	C TEC Solar
From:	Ali Flake, Tetra Tech, Inc.
Date:	August 8, 2023
Subject:	Glint and Glare Analysis of the MarDon Community Solar in Duanesburg, New York

At the request of C TEC Solar (CTEC), Tetra Tech, Inc. (Tetra Tech) conducted a glint and glare analysis of the proposed MarDon Community Solar Project (Project) located at 10516 Western Turnpike in the Town of Duanesburg, Schenectady County, New York. The Project site occupies an approximately 7.96-acre portion of a larger approximately 84.4-acre parcel (the "Target Property"). The Project site consists of wooded and agricultural land and is bounded by wooded and/or agricultural land to the north, south, east, and west.

Topography throughout the Project site varies, ranging from approximately 760 feet above mean sea level (amsl) in the northwestern portion of the Project site to approximately 800 feet amsl in the southeastern portion of the Project site. The nearest public airports are the Bluen Heron Airport (N25) and the Duanesburg Airport (4B1), located approximately 5.0 miles south-southeast and approximately 5.0 miles east of the Project, respectively.

This memorandum provides a description of the glint and glare anticipated from use of the Project site as a solar energy generating facility. Included are the Sandia glare analysis reports (Attachment A), and the Federal Aviation Administration (FAA) Notice Criteria Tool Report (Attachment B).

GLARE ANALYSIS METHOD

With growing numbers of solar energy systems being proposed and installed throughout the United States, the potential impact of glint (a momentary flash of bright light) and glare (a continuous source of bright light) from solar photovoltaic modules has come under scrutiny by aviation authorities. The FAA issued an Interim Policy (78 FR 63276) on October 23, 2013, describing methods for obtaining FAA review and approval of proposed solar arrays on airport property. These methods involved the use of the Sandia Laboratories Solar Glare Hazard Analysis Tool (SGHAT), a modeling/compliance analysis tool now licensed for public use within the ForgeSolar GlareGauge cloud software application. The SGHAT is considered to be an industry best practice for analysis of glare and glint related to solar energy generating facilities and is required by the FAA under 78 FR 63276 to measure ocular impacts for solar projects located on federally obligated airports and is recommended for projects located off federally obligated airports.

> *Sandia developed SGHAT v. 3.0, a web-based tool and methodology to evaluate potential glint/glare associated with solar energy installations. The validated tool provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g. anti-reflective coating, texturing), and models developed over several years at Sandia. The results are presented in a simple*

easy-to-interpret plot that specifies when glare will occur throughout the year, with color indicating the potential ocular hazard (Sandia Laboratories, 2016).

Based on this background, Tetra Tech has utilized the SGHAT tool as licensed for use in ForgeSolar GlareGauge cloud software application for modeling and analysis. ForgeSolar GlareGauge with SGHAT modeling provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g., anti-reflective coating, texturing), and models developed over several years at Sandia National Laboratory. The results are presented in a simple easy-to-interpret plot that specifies when glare will occur throughout the year, with color indicating the potential ocular hazard.

The SGHAT was utilized to evaluate the potential for glint and glare when driving along 1) proximal segments of McGuire School Road, State Route 30 North, State Route 30 South, Wendy Lane, and Western Turnpike; and 2) 13 nearby locations selected to represent observer views at neighboring properties. The analysis reports are included as Attachment A.

The FAA Notice Criteria Tool allows the user to determine if a proposed structure would require a formal submission to the FAA under CFR Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace). This online tool was utilized to determine if the proposed Project would require formal filing to the FAA. Based on the results of the FAA Notice Criteria Tool, the Project does not exceed notice criteria; therefore, it is not required for the Project to be formally filed with the FAA Obstruction Evaluation Group. With filing with FAA not required for the Project and the nearest public airports being five miles away, the airports were not included in the glare analysis. The FAA Notice Criteria Tool Report is included as Attachment B.

The panels to be used on the proposed Project are smooth glass surface material with an anti-reflection coating (ARC), which is noted in the glare analysis. Two analyses were performed to simulate fixed-tilt panels with a 25° tilt. The analyses were conducted for a panel height of 7.5 feet above ground surface (centroid height) with applicable panel specifications. The panel orientation, location, and specifications used in the analysis were based on information as provided by C TEC Solar. The input features used in the analyses are summarized in Table 1 and Table 2.

Table 1. Glare Analyses Input Features

Analysis No.	Racking Type	Module Orientation	Tilt (degrees)	Module Height[1] (feet)	OP Height[2] (feet)	Route Height[3] (feet)	ATCT	Flight Paths
1	Fixed	East-facing	25	7.5	6	5	-	-
2	Fixed	East-facing	25	7.5	16	9	-	-

1. Average module centroid height above ground surface.

2. Height of observation point receptor: 6 feet represents an average first floor residential/commercial point of view and 16 feet represents an average second floor residential/commercial point of view.

3. Height of vehicular route receptor: 5 feet represents typical commuter car height and 9 feet represents typical semi-tractor-trailer truck views.

The GlareGauge model does not consider obstacles (either man-made or natural) between the defined photovoltaic (PV) arrays and the receptors. ForgeSolar is updating their glare analysis tool and has provided a tool to model obstructions. The "Obstruction" component simulates obstacles and blocking geometries that may mitigate PV glare. These obstructions are modeled as multi-line paths as parallelograms with vertical sides that extend upward from ground elevation. These obstructions are assumed to be opaque, with incoming sunlight and emanating glare reflections completely mitigated if they intersect with the obstruction face. Both analyses used this tool to model areas of dense forest or tree lines found north, east, and west of the Project site. A total of four obstructions were used to simulate the natural vegetation buffer and proposed vegetative screening, using an average height of 20 feet for existing tree lines (Obstruction 1 through 4).

GLARE ANALYSIS RESULTS

Analyses 1 – 1st Story Receptors

Analysis 1 analyzed three PV Array Areas for 13 first-story receptors (OP-1 through OP-13) and five proximal route receptors along segments of McGuire School Road, State Route 30 North, State Route 30 South, Wendy Lane, and Western Turnpike from the height of a standard commuter vehicle. The SGHAT GlareGauge modeled the results for the Project. No glare is predicted for any OP or route segments.

Analyses 2 – 2nd Story Receptors

Analysis 2 analyzed three PV Array Areas for 13 first-story receptors (OP-1 through OP-13) and five proximal route receptors along segments of McGuire School Road, State Route 30 North, State Route 30 South, Wendy Lane, and Western Turnpike from the height of a typical tractor trailer. The SGHAT GlareGauge modeled the results for the Project. No glare is predicted for any OP or route segments.

SUMMARY

The Project Site layout was modeled on SGHAT GlareGauge in order to evaluate the potential extent of any glint and glare the proposed Project may have upon nearby points of observation and vehicle routes. Two analyses were performed: the analyses represented a fixed-tilt system with 25° tilt and panel specifications of smooth glass with ARC. No glare was predicted.

The GlareGauge model does not account for varying ambient conditions (i.e., cloudy days, precipitation), atmospheric attenuation, screening due to existing topography not located within the defined array layouts. However, through the use of the obstruction feature, sections of existing natural screening buffering between the Project and non-participating property lines was modeled. As such, the predicted results are considered to be conservative. Lastly, based on the results of the FAA Notice Criteria Tool, the Project does not exceed notice criteria; therefore, it is not required for the Project to be formally filed with the FAA Obstruction Evaluation Group.

REFERENCES

Sandia Solar Glare Hazard Analysis Tool, GlareGauge hosted by ForgeSolar. Accessed online https://www.forgesolar.com/.

Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports. 78 FR 63276. October 23, 2013.

Federal Aviation Administration. CFR Title 14 Part 77.9 Notice of Proposed Construction or Alteration Requiring Notice. 2010.

Federal Aviation Administration. Technical Guidance for Evaluating Selected Solar Technologies on Airports. 2010.

Attachment A

Glare Analysis Reports

FORGESOLAR GLARE ANALYSIS

Project: **MarDon Community Colar**
Site configuration: **Analysis 1**

Client: CTEC

Created 19 Jul, 2023
Updated 04 Aug, 2023
Time-step 1 minute
Timezone offset UTC-5
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 1 MW to 5 MW
Site ID 95620.16755

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	25.0	180.0	0	0.0	0	0.0	-
PV array 2	25.0	180.0	0	0.0	0	0.0	-
PV array 3	25.0	180.0	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.767100	-74.238207	776.12	7.50	783.62
2	42.766989	-74.239591	743.73	7.50	751.23
3	42.766024	-74.239403	766.04	7.50	773.54
4	42.766150	-74.238035	797.89	7.50	805.39

Name: PV array 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.764866	-74.238440	802.93	7.50	810.43
2	42.765784	-74.238647	791.98	7.50	799.48
3	42.765713	-74.239355	774.72	7.50	782.22
4	42.764789	-74.239130	788.94	7.50	796.44

Name: PV array 3
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: 0.1
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.765788	-74.238400	799.01	7.50	806.51
2	42.764925	-74.238172	809.84	7.50	817.34
3	42.765010	-74.237405	823.97	7.50	831.47
4	42.765766	-74.237603	814.09	7.50	821.59
5	42.765837	-74.237982	806.26	7.50	813.76

Route Receptors

Name: McGuire School Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.777413	-74.232650	981.94	5.00	986.94
2	42.775405	-74.230509	1046.53	5.00	1051.53
3	42.774027	-74.228567	1055.17	5.00	1060.17
4	42.773065	-74.225975	1066.74	5.00	1071.74
5	42.773108	-74.222231	1070.67	5.00	1075.67
6	42.771151	-74.214479	1049.05	5.00	1054.05

Name: State Route 30 North
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.773554	-74.245172	761.44	5.00	766.44
2	42.775956	-74.241889	808.01	5.00	813.01
3	42.778783	-74.238541	857.67	5.00	862.67
4	42.780288	-74.236396	900.03	5.00	905.03

Name: State Route 30 South
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.760059	-74.246132	683.73	5.00	688.73
2	42.764439	-74.245746	654.13	5.00	659.13
3	42.766061	-74.245682	651.20	5.00	656.20
4	42.770047	-74.246497	681.02	5.00	686.02

Name: Wendy Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.762448	-74.230352	875.18	5.00	880.18
2	42.764519	-74.230604	915.61	5.00	920.61
3	42.764700	-74.230395	918.80	5.00	923.80
4	42.764878	-74.228163	926.48	5.00	931.48

Name: Western Turnpike
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.760847	-74.247439	656.95	5.00	661.95
2	42.761280	-74.243909	715.65	5.00	720.65
3	42.761946	-74.236254	832.70	5.00	837.70
4	42.762312	-74.231276	871.90	5.00	876.90
5	42.762686	-74.225627	868.93	5.00	873.93

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	42.762059	-74.237444	831.46	6.00
OP 2	2	42.761882	-74.240170	791.82	6.00
OP 3	3	42.765568	-74.243837	679.62	6.00
OP 4	4	42.762659	-74.232174	878.69	6.00
OP 5	5	42.764893	-74.231186	922.76	6.00
OP 6	6	42.773255	-74.228724	1046.36	6.00
OP 7	7	42.769317	-74.246663	673.23	6.00
OP 8	8	42.773795	-74.245984	748.34	6.00
OP 9	9	42.774299	-74.239540	853.15	6.00
OP 10	10	42.772545	-74.221648	1051.30	6.00
OP 11	11	42.761230	-74.246262	678.65	6.00
OP 12	12	42.768432	-74.208293	1082.59	6.00
OP 13	13	42.777497	-74.232310	987.90	6.00

Obstruction Components

Name: Obs
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.764611	-74.236240	850.56
2	42.765949	-74.236408	846.24
3	42.765960	-74.237805	809.27
4	42.767837	-74.237841	802.18
5	42.767637	-74.240467	743.79
6	42.761759	-74.239705	792.06

Name: Obs 2
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.766163	-74.234025	897.54
2	42.762235	-74.233470	856.55

Name: Obs 3
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.766829	-74.242290	716.06
2	42.765285	-74.242281	727.40
3	42.765264	-74.243005	703.24

Name: Obs 4
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.769487	-74.210511	1108.56
2	42.768242	-74.210522	1070.29
3	42.766935	-74.210222	1093.95

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	25.0	180.0	0	0.0	0	0.0	-
PV array 2	25.0	180.0	0	0.0	0	0.0	-
PV array 3	25.0	180.0	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV: PV array 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 1 and Route: McGuire School Road

No glare found

PV array 1 and Route: State Route 30 North

No glare found

PV array 1 and Route: State Route 30 South

No glare found

PV array 1 and Route: Wendy Lane

No glare found

PV array 1 and Route: Western Turnpike

No glare found

PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 2 and Route: McGuire School Road

No glare found

PV array 2 and Route: State Route 30 North

No glare found

PV array 2 and Route: State Route 30 South

No glare found

PV array 2 and Route: Wendy Lane

No glare found

PV array 2 and Route: Western Turnpike

No glare found

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV: PV array 3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 3 and Route: McGuire School Road

No glare found

PV array 3 and Route: State Route 30 North

No glare found

PV array 3 and Route: State Route 30 South

No glare found

PV array 3 and Route: Wendy Lane

No glare found

PV array 3 and Route: Western Turnpike

No glare found

PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 3

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FORGESOLAR GLARE ANALYSIS

Project: **MarDon Community Solar**
Site configuration: **Analysis 2**

Client: CTEC

Created 03 Aug, 2023
Updated 04 Aug, 2023
Time-step 1 minute
Timezone offset UTC-5
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 1 MW to 5 MW
Site ID 96741.16755

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	25.0	180.0	0	0.0	0	0.0	-
PV array 2	25.0	180.0	0	0.0	0	0.0	-
PV array 3	25.0	180.0	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.767100	-74.238207	776.12	7.50	783.62
2	42.766989	-74.239591	743.73	7.50	751.23
3	42.766024	-74.239403	766.04	7.50	773.54
4	42.766150	-74.238035	797.89	7.50	805.39

Name: PV array 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.764866	-74.238440	802.93	7.50	810.43
2	42.765784	-74.238647	791.98	7.50	799.48
3	42.765713	-74.239355	774.72	7.50	782.22
4	42.764789	-74.239130	788.94	7.50	796.44

Name: PV array 3
Axis tracking: Fixed (no rotation)
Tilt: 25.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: 0.1
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.765788	-74.238400	799.01	7.50	806.51
2	42.764925	-74.238172	809.84	7.50	817.34
3	42.765010	-74.237405	823.97	7.50	831.47
4	42.765766	-74.237603	814.09	7.50	821.59
5	42.765837	-74.237982	806.26	7.50	813.76

Route Receptors

Name: McGuire School Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.777413	-74.232650	981.94	9.00	990.94
2	42.775405	-74.230509	1046.53	9.00	1055.53
3	42.774027	-74.228567	1055.17	9.00	1064.17
4	42.773065	-74.225975	1066.74	9.00	1075.74
5	42.773108	-74.222231	1070.67	9.00	1079.67
6	42.771151	-74.214479	1049.05	9.00	1058.05

Name: State Route 30 North
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.773554	-74.245172	761.44	9.00	770.44
2	42.775956	-74.241889	808.01	9.00	817.01
3	42.778783	-74.238541	857.67	9.00	866.67
4	42.780288	-74.236396	900.03	9.00	909.03

Name: State Route 30 South
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.760059	-74.246132	683.73	9.00	692.73
2	42.764439	-74.245746	654.13	9.00	663.13
3	42.766061	-74.245682	651.20	9.00	660.20
4	42.770047	-74.246497	681.02	9.00	690.02

Name: Wendy Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.762448	-74.230352	875.18	9.00	884.18
2	42.764519	-74.230604	915.61	9.00	924.61
3	42.764700	-74.230395	918.80	9.00	927.80
4	42.764878	-74.228163	926.48	9.00	935.48

Name: Western Turnpike
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	42.760847	-74.247439	656.95	9.00	665.95
2	42.761280	-74.243909	715.65	9.00	724.65
3	42.761946	-74.236254	832.70	9.00	841.70
4	42.762312	-74.231276	871.90	9.00	880.90
5	42.762686	-74.225627	868.93	9.00	877.93

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	42.762059	-74.237444	831.46	16.00
OP 2	2	42.761882	-74.240170	791.82	16.00
OP 3	3	42.765568	-74.243837	679.62	16.00
OP 4	4	42.762659	-74.232174	878.69	16.00
OP 5	5	42.764893	-74.231186	922.76	16.00
OP 6	6	42.773255	-74.228724	1046.36	16.00
OP 7	7	42.769317	-74.246663	673.23	16.00
OP 8	8	42.773795	-74.245984	748.34	16.00
OP 9	9	42.774299	-74.239540	853.15	16.00
OP 10	10	42.772545	-74.221648	1051.30	16.00
OP 11	11	42.761230	-74.246262	678.65	16.00
OP 12	12	42.768432	-74.208293	1082.59	16.00
OP 13	13	42.777497	-74.232310	987.90	16.00

Obstruction Components

Name: Obs 1
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.764611	-74.236240	850.56
2	42.765949	-74.236408	846.24
3	42.765960	-74.237805	809.27
4	42.767837	-74.237841	802.18
5	42.767637	-74.240467	743.79
6	42.761759	-74.239705	792.06

Name: Obs 2
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.766163	-74.234025	897.54
2	42.762235	-74.233470	856.55

Name: Obs 3
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.766829	-74.242290	716.06
2	42.765285	-74.242281	727.40
3	42.765264	-74.243005	703.24

Name: Obs 4
Top height: 20.0 ft

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	42.769596	-74.210512	1127.51
2	42.767927	-74.210501	1076.57
3	42.766729	-74.210137	1110.87

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	25.0	180.0	0	0.0	0	0.0	-
PV array 2	25.0	180.0	0	0.0	0	0.0	-
PV array 3	25.0	180.0	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV: PV array 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 1 and Route: McGuire School Road

No glare found

PV array 1 and Route: State Route 30 North

No glare found

PV array 1 and Route: State Route 30 South

No glare found

PV array 1 and Route: Wendy Lane

No glare found

PV array 1 and Route: Western Turnpike

No glare found

PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 2 and Route: McGuire School Road

No glare found

PV array 2 and Route: State Route 30 North

No glare found

PV array 2 and Route: State Route 30 South

No glare found

PV array 2 and Route: Wendy Lane

No glare found

PV array 2 and Route: Western Turnpike

No glare found

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV: PV array 3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
McGuire School Road	0	0.0	0	0.0
State Route 30 North	0	0.0	0	0.0
State Route 30 South	0	0.0	0	0.0
Wendy Lane	0	0.0	0	0.0
Western Turnpike	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0

PV array 3 and Route: McGuire School Road

No glare found

PV array 3 and Route: State Route 30 North

No glare found

PV array 3 and Route: State Route 30 South

No glare found

PV array 3 and Route: Wendy Lane

No glare found

PV array 3 and Route: Western Turnpike

No glare found

PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 3

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

Attachment B

FAA Notice Criteria Tool

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

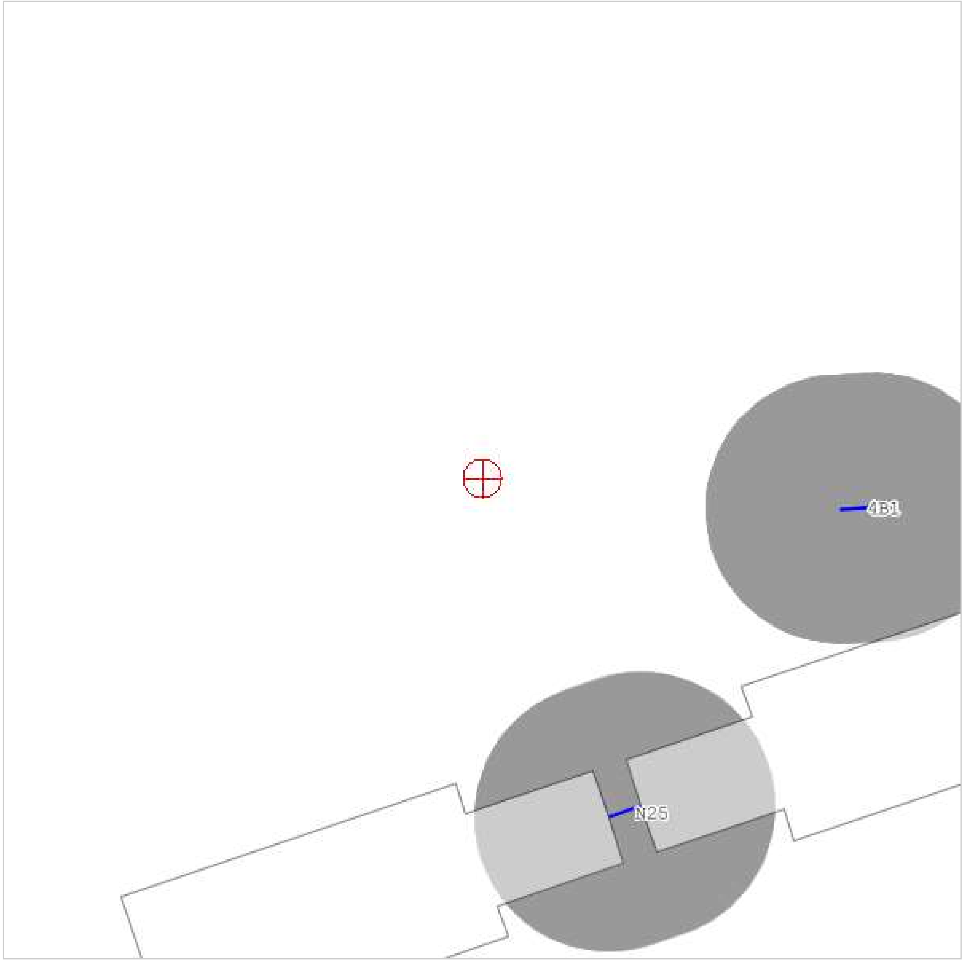
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

*** Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	42 Deg 45 M 56.42 S N
Longitude:	74 Deg 14 M 20.23 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	790 (nearest foot)
Structure Height :	12 (nearest foot)
Is structure on airport:	◉ No ○ Yes

Results

You do not exceed Notice Criteria.



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ATTACHMENT M

SOUND STUDY

NOISE IMPACT STUDY

MarDon Solar Project

Delanson, New York

September 2023

Prepared for:

CTEC Solar

1 Griffin Rd South, Suite 200

Bloomfield, CT 06002

Prepared by:

Tetra Tech, Inc.

3136 South Winton Road, Suite 303

Rochester, NY 14623

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ACRONYMS AND ABBREVIATIONS

μPa	microPascal
ANSI	American National Standards Institute
dB	decibel
dBA	A-weighted decibel
dBL	linear decibel
FTA	Federal Transit Administration
Hz	hertz
ISO	International Organization for Standardization
kV	kilovolt
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_P	sound pressure level
L_W	sound power level
MWAc	megawatts alternating current
PV	photovoltaic
Tetra Tech	Tetra Tech, Inc.
USEPA	United States Environmental Protection Agency

1.0 OVERVIEW

Tetra Tech, Inc. (Tetra Tech) has prepared this noise impact assessment for the proposed MarDon Community Solar (Project) located at 10516 Western Turnpike in Delanson, NY 12053. The proposed Project is situated within an approximately 8.49-acre portion of an approximately 84.4-acre parcel of private land, zoned as Agricultural-Residential (R-2) within the Town of Duanesburg, in Schenectady County, New York and consists of the installation of a 2.0 MWAC community solar facility. The facility will include racking equipment, solar panels, electrical conversion equipment, gravel access paths, and a security fence, among other project components. The solar array will be connected to inverters, which are current conversion devices, and switches.

Tetra Tech has prepared this acoustic assessment for the Project to evaluate potential sound impacts relative to the applicable noise requirements described in section 3.0. The existing ambient acoustic environment was characterized based on short term ambient measurements at the Project site. An acoustic analysis was conducted evaluating sound produced during both construction and operation. The only identified operational sound source is the inverters. The overall objectives of this assessment were to: 1) identify Project sound sources and estimate sound propagation characteristics; 2) computer-simulate sound levels using internationally accepted calculation standards; and 3) confirm that the Project will operate in compliance with the applicable noise requirements. Acoustic modeling results demonstrate that the Project will successfully comply with all applicable noise requirements and acoustic design goals at all nearby noise sensitive receptors (i.e., residences).

1.1 PROJECT SETTING

The Site covers approximately 8.49 acres of a larger parcel located within the Town of Duanesburg in Schenectady County, New York. The area surrounding the subject property consists of wooded land, farmland, and residential and commercial properties. The subject property is bordered to the north, east, and west by wooded and residential land, and to the south by US Route 20, and residential and commercial land. A total of 19 potential residential receptors were identified for this analysis (see Figure 1).

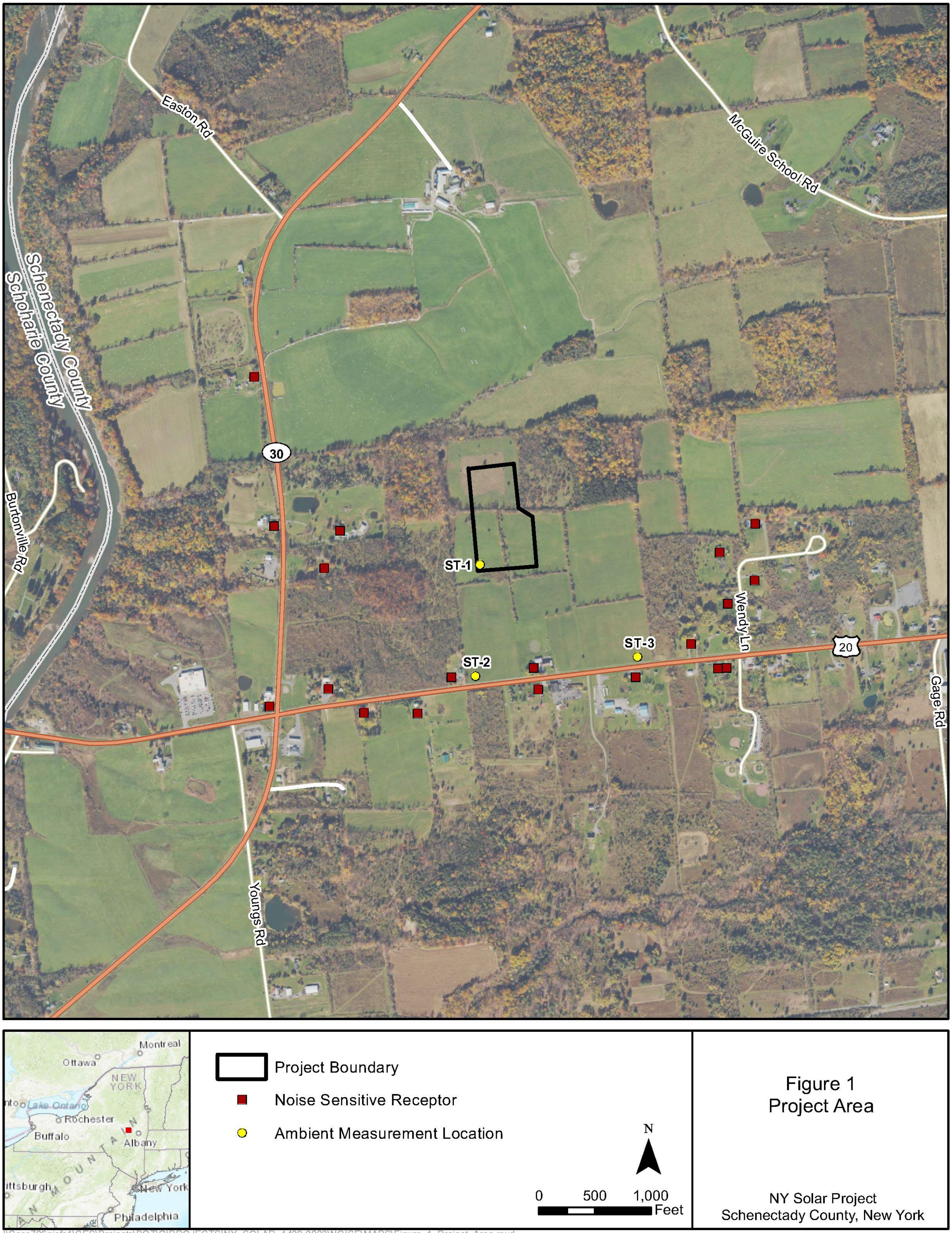

Figure 1
Project Area

\\Cess706gisfs1\CES\Projects\BOT\G\PROJECTS\NY_SOLAR_1409-0003\NOISE\MAPS\Figure_1_Project_Area.mxd

2.0 ACOUSTIC METRICS AND TERMINOLOGY

All sounds originate with a source, whether it is a human voice, motor vehicles on a roadway, or a combustion turbine. Energy is required to produce sound and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. A sound source is defined by a sound power level (abbreviated "L_W"), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts.

A source sound power level cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source outside the acoustic and geometric near-field. A sound pressure level (abbreviated "L_P") is a measure of the sound wave fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. The sound pressure level in decibels (dB) is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 microPascals (μPa), multiplied by 20.1. The range of sound pressures that can be detected by a person with normal hearing is very wide, ranging from about 20 μPa for very faint sounds at the threshold of hearing, to nearly 10 million μPa for extremely loud sounds such as a jet during take-off at a distance of 300 feet.

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. The unit of frequency is hertz (Hz), measuring the cycles per second of the sound pressure waves. Typically, the frequency analysis examines 11 octave bands ranging from 16 Hz (low) to 16,000 Hz (high). Since the human ear does not perceive every frequency with equal loudness, spectrally-varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system and is represented in A-Weighted Decibel (dBA).

Sound can be measured, modeled, and presented in various formats, with the most common metric being the equivalent sound level (L_{eq}). The L_{eq} has been shown to provide both an effective and uniform method for comparing time-varying sound levels and is widely used in acoustic assessments in the State of New York. Estimates of noise sources and outdoor acoustic environments, and the comparison of relative loudness are presented in Table 1. Table 2 presents additional reference information on terminology used in the report.

Table 1. Sound Pressure Levels (L_P) and Relative Loudness of Typical Noise Sources and Acoustic Environments

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 miles per hour (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; Bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing

Adapted from: Kurze and Beranek (1988) and USEPA (1971)

Table 2. Acoustic Terms and Definitions

Term	Definition
Noise	Typically defined as unwanted sound. This word adds the subjective response of humans to the physical phenomenon of sound. It is commonly used when negative effects on people are known to occur.
Sound Pressure Level (L_P)	Pressure fluctuations in a medium. Sound pressure is measured in dB referenced to 20 μPa, the approximate threshold of human perception to sound at 1,000 Hz.
Sound Power Level (L_W)	The total acoustic power of a noise source measured in dB referenced to picowatts (one trillionth of a watt). Noise specifications are provided by equipment manufacturers as sound power as it is independent of the environment in which it is located. A sound level meter does not directly measure sound power.
Equivalent Sound Level (L_{eq})	The L_{eq} is the continuous equivalent sound level, defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.
Day-Night Average Sound Level (L_{dn})	The L_{dn} represents a 24-hour A-weighted sound level average conducted from midnight to midnight, where sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting, but no added weighting to the evening hours.
A-Weighted Decibel (dBA)	Environmental sound is typically composed of acoustic energy across all frequencies. To compensate for the auditory frequency response of the human ear, an A-weighting filter is commonly used for describing environmental sound levels. Sound levels that are A-weighted are presented as dBA in this report.
Unweighted Decibels (dBL)	Unweighted sound levels are referred to as linear. Linear decibels are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise. Sound levels that are linear are presented as dBL in this report.
Propagation and Attenuation	Propagation is the decrease in amplitude of an acoustic signal due to geometric spreading losses with increased distance from the source. Additional sound attenuation factors include air absorption, terrain effects, sound interaction with the ground, diffraction of sound around objects and topographical features, foliage, and meteorological conditions including wind velocity, temperature, humidity, and atmospheric conditions.

3.0 APPLICABLE GUIDELINES AND REGULATIONS

3.1 FEDERAL

There are no federal noise regulations or guidelines that apply to solar energy facilities.

3.2 NEW YORK STATE

3.2.1 NYSDEC Noise Guidelines

The NYSDEC noise guidelines are defined in the publication "Assessing and Mitigating Noise Impacts" (2001). This document states that L_P increases from 0 to 3 dBA should have no appreciable effect on receivers; increases of 3 to 6 dBA may have the potential for adverse impact only in cases where the most sensitive of receptors are present; and increases of more than 6 dBA may require a closer analysis of impact potential depending on existing noise levels and character of surrounding land use. The NYSDEC guidance states that the 6-dBA increase is to be used as a general guideline. Although not explicitly stated in the policy, the 6-dBA increase has been applied to the minimum measured L_{eq} or alternatively the time averaged L_{90} sound level for the licensing of other projects in New York State. There are other guidelines that should also be considered. For example, in settings with low ambient sound levels, NYSDEC guidance has deemed an absolute limit of 40 dBA as adequately protective.

The NYSDEC policy further states that the United States Environmental Protection Agency (USEPA) "Protective Noise Levels" guidance found that an annual day-night sound level (L_{dn}) of 55 dBA was sufficient to protect the public health and welfare, and in most cases, did not create an annoyance. A 55 dBA L_{dn} would be equivalent to a daytime sound level of 55 dBA L_{eq}, and a nighttime sound level of 45 dBA L_{eq}, or a continuous level of approximately 49 dBA L_{eq}. In terms of absolute threshold values, the introduction of any new noise source should not raise ambient levels above 65 dBA L_{eq} in non-industrial settings to protect against speech disturbance or above approximately 79 dBA L_{eq} for industrial environments for associated noise-related health and safety reasons. In most cases, NYSDEC recommends that projects exceeding either of these threshold levels or resulting in an increase of 10 dBA consider avoidance and mitigation measures.

3.3 SCHENECTADY COUNTY

Schenectady County does not have noise limits that apply to solar projects.

3.4 TOWN OF DUANESBURG

The Town of Duanesburg does have language specific to noise impacts from solar operations within the Duanesburg Solar Energy Facilities Law. This law states that:

> "A sound study providing details of the proposed noise that may be generated by inverter fans, or other noise-generating equipment that may be included in the project, including actual readings of existing daytime and nighttime ambient noise at the boundary of the participating properties; the sound study shall predict the potential increase in noise from the project over the existing ambient noise levels."

3.5 OTHER APPLICABLE NOISE STANDARDS AND GUIDELINES

3.5.1 World Health Organization Guidelines

Table 4.1 of the World Health Organization (WHO) "Guideline for Community Noise" document states that daytime and evening outdoor living area sound levels at a residence should not exceed an L_{eq} of 55 dBA to prevent serious annoyance and an L_{eq} of 50 dBA to prevent moderate annoyance from a steady, continuous noise (WHO 1999). At night, sound levels at the outside facades of the living spaces should not exceed an L_{eq} of 45 dBA, so that people may sleep with bedroom windows open.

The time base for these WHO sound levels is 16 hours for daytime and 8 hours for nighttime. In other words, they are not 10-minute averages, but rather averaged over a longer period of time. In 2009, the WHO released another report entitled "Night Noise Guidelines for Europe," which recommended a Night Noise Guideline (NNG) of 40 dBA (WHO 2009). This is a health-based limit to protect the public (Executive Summary pp. XVII-XVIII). However, the 40 dBA guideline is an "L_{night}, outside" descriptor, which is not the same as a short-term measurement. L_{night}, outside is defined as the A-weighted long-term average sound level determined over all eight-hour nighttime periods over a year. Thus, the L_{night}, outside is an annual average, and is not an appropriate descriptor to use for evaluating a permit's compliance criteria.

3.5.2 Speech Interference

The 1974 USEPA "Levels" document states that at an outdoor level of 55 dBA (L_{dn}) there is 100% sentence intelligibility indoors, and 99% sentence intelligibility at 1-meter (m) outdoors. These are the maximum sound levels below which there are no effects on public health and welfare due to interference with speech or other activity. This has a 5-dBA margin of safety – in other words the USEPA believes the actual threshold is 60 dBA but has reduced it by 5 dBA. An outdoor L_{dn} is equivalent to a 24-hour sound level of 49 dBA.

The "Guideline for Community Noise" (WHO 1999) recommends an indoor sound level of 35 dBA (L_{eq}) to protect speech intelligibility. This is equivalent to approximately 50 dBA L_{eq} outdoors.

3.5.3 Federal Transit Administration Construction Noise Guidelines

There is no standardized state or federal regulatory standards developed for assessing construction noise impacts. However, the FTA has developed and published a guideline criterion that is considered to be reasonable to assess noise impacts from construction operations. The FTA criteria is summarized in Table 3 below.

Table 3. Federal Transit Administration Construction Noise Criteria

Land Use	8-hour (dBA L_{eq})		30-Day Average L_{dn} (dB) or L_{eq} (dBA)
	Day	Night	
Residential	80	70	75[a]
Commercial	85	85	80[b]
Industrial	90	90	85[b]

[a] In urban areas with very high ambient noise levels (Ldn > 65 dB), Ldn from construction operations should not exceed existing ambient + 10 dB.
[b] Twenty-four-hour Leq, not Ldn.

4.0 EXISTING SOUND ENVIRONMENT

To characterize the existing ambient sound environment, short-term measurements lasting 30 minutes in duration were taken at three locations relative to the Project site. The measurements were taken during both the daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods on August 29th. Weather during the measurement period was sunny to slightly cloudy and temperature ranging from 74-82 degrees Fahrenheit. The primary noise source experienced at each measurement location was insect noise, which resulted in the higher noise levels seen during the nighttime period. A summary of the measured ambient sound levels can be found below in Table 4 with the locations shown in Figure 1.

Table 4. Measured Ambient Sound Levels

Measurement Location	Time Period	L_{eq} (dBA)
ST-1	Day	53
	Night	56
ST-2	Day	52
	Night	53
ST-3	Day	56
	Night	56

5.0 PROJECT CONSTRUCTION

Noise levels resulting from construction activities vary greatly depending on the type of equipment; the specific equipment model; the operations being performed; and the overall condition of the equipment. The USEPA (USEPA 1971) has published data on the average sound levels (L_{eq}) for typical construction phases. Each identified construction phase will require several types of construction equipment. For the purposes of the acoustic modeling analysis it was assumed that, at any given time, construction equipment would be distributed throughout the Project area.

The construction timeline and expected equipment to be used in unknown at this time. Table 5 presents the types of construction equipment estimated for each phase, their estimated usage factor over a standard eight-hour workday, and their maximum sound level (L_{max}) at 50 ft and at 800 ft at the closest residence from the solar array where racking will occur. Decommissioning activities will take place at the end of the Project's useful life. These activities are expected to be similar in nature to the construction phases and sound levels provided in Table 5. Construction noise will be temporary in nature and, as such, no long-term or significant noise impacts are anticipated. Reasonable efforts will be made to minimize potential offsite impacts from construction noise.

Table 5. Summary of Solar Farm Construction Equipment by Phase

Phase No.	Construction Phase	Construction Equipment	Usage Factor %	Maximum L_{max} Equipment Noise Level at 50 ft (15 m) dBA	Maximum L_{max} Equipment Noise Level at 800 ft (244 m) dBA
1	Site Preparation and Grading	(2) Graders (174 hp) (1) Rubber Tired Loaders (164 hp) (1) Scrapers (313 hp) (2) Water Trucks (189 hp) (2) Generator Sets	57 59 72 50 74	88 85 89 83 84	64 61 64 56 59
2	Trenching and Road Construction	(2) Excavators (168 hp) (2) Graders (174 hp) (2) Water Trucks (189 hp) (1) Trencher (63 hp) (2) Rubber Tired Loaders (164 hp) (2) Generator Sets	57 57 50 75 54 74	88 88 83 83 88 84	64 64 59 59 64 60

Table 5. Summary of Solar Farm Construction Equipment by Phase

Phase No.	Construction Phase	Construction Equipment	Usage Factor %	Maximum L_{max} Equipment Noise Level at 50 ft (15 m) dBA	Maximum L_{max} Equipment Noise Level at 800 ft (244 m) dBA
3	Equipment Installation	(1) Crane (399 hp) (5) Forklifts (145 hp) (15) Pickup Trucks/ATVs (2) Water Trucks (189 hp) (2) Generator Sets	43 30 40 50 74	83 92 67 83 84	59 68 43 59 60
4	Commissioning	(5) Pickup Trucks/ATVs	40	62	38

5.1 CONSTRUCTION NOISE MITIGATION

Since construction machines operate intermittently, and the types of machines in use at the Project site change with the stage of construction, noise emitted during construction would be mobile and highly variable, making it challenging to control. The construction management protocols would include the following noise mitigation measures to minimize noise impacts:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications;
- Limit use of major excavating and earth-moving machinery to daytime hours;
- To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours, would be required to occur continuously until completion;
- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks;
- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible; and
- Limit possible evening shift work to low noise activities such as welding, wire pulling, and other similar activities, together with appropriate material handling equipment.

6.0 OPERATIONAL NOISE

This section describes the model utilized for the assessment; input assumptions used to calculate noise levels due to the Project's normal operation; a conceptual noise mitigation strategy, and the results of the noise impact analysis.

6.1 NOISE PREDICTION MODEL

The Cadna-A® computer noise model was used to calculate sound pressure levels from the operation of the Project equipment in the vicinity of the Project site. An industry standard, Cadna-A® was developed by DataKustik GmbH to provide an estimate of sound levels at distances from sources of known emission. It is used by acousticians and acoustic engineers due to the capability to accurately describe noise emission and propagation from complex facilities consisting of various equipment types like the Project and in most cases, yields conservative results of operational noise levels in the surrounding community.

The current International Organization for Standardization (ISO) standard for outdoor sound propagation, ISO 9613 Part 2 – “Attenuation of Sound during Propagation Outdoors,” was used within Cadna-A (ISO 1996). The method described in this standard calculates sound attenuation under weather conditions that are favorable for sound propagation, such as for downwind propagation or atmospheric inversion, conditions which are typically considered worst-case. The calculation of sound propagation from source to receiver locations consists of full octave band sound frequency algorithms, which incorporate the following physical effects:

- Geometric spreading wave divergence;
- Reflection from surfaces;
- Atmospheric absorption at 10 degrees Celsius and 70 percent relative humidity;
- Screening by topography and obstacles;
- The effects of terrain features including relative elevations of noise sources;
- Sound power levels from stationary and mobile sources;
- The locations of noise-sensitive land use types;
- Intervening objects including buildings and barrier walls, to the extent included in the design;
- Ground effects due to areas of pavement and unpaved ground;
- Sound power at multiple frequencies;
- Source directivity factors;
- Multiple noise sources and source type (point, area, and/or line); and
- Averaging predicted sound levels over a given time.

Cadna-A allows for three basic types of sound sources to be introduced into the model: point, line, and area sources. Each noise-radiating element was modeled based on its noise emission pattern. Off-site topography was obtained using the publicly available United States Geological Survey digital elevation data. A default ground attenuation factor of 0.5 was assumed for off-site sound propagation over acoustically “mixed” ground. A ground attenuation factor of 0.0 for a reflective surface was assumed for onsite areas. The output from Cadna-A includes tabular sound level results at selected receiver locations and color-coded noise contour maps (isopleths) that show areas of equal and similar sound levels.

6.2 INPUT TO THE NOISE PREDICTION MODEL

The Project’s general arrangement was reviewed and directly imported into the acoustic model so that on-site equipment could be easily identified; buildings and structures could be added; and sound emission data could be assigned to sources as appropriate. Figure 2 shows the Project equipment layout based on overall civil plan dated July 12, 2023.

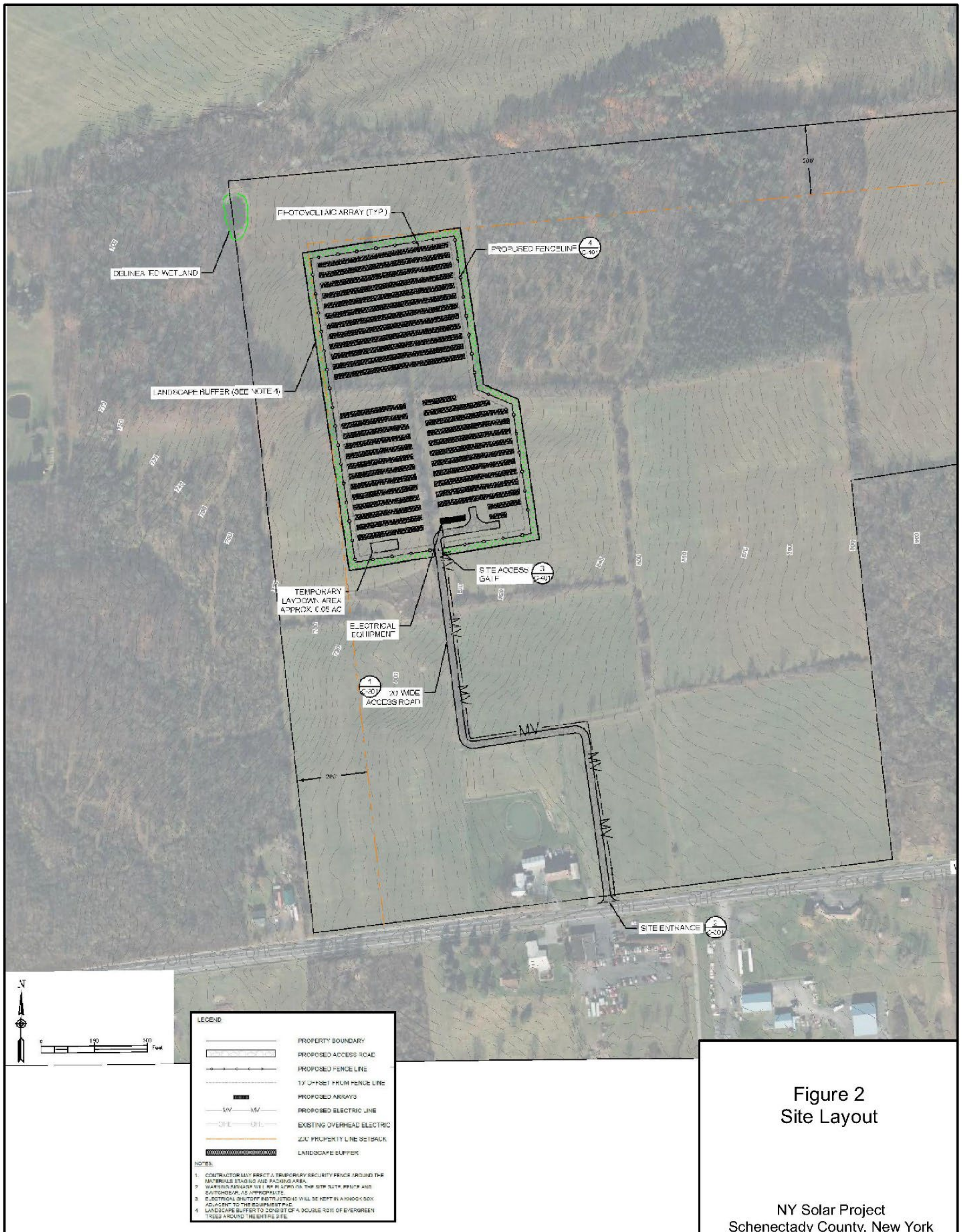

Figure 2
Site Layout

NY Solar Project
Schenectady County, New York

\\Cess706gisfs1\CES\Projects\BOT\G\PROJECTS\NY_SOLAR_1409-0003\NOISE\MAPS\Figure_2_Site_Layout.mxd

The primary noise sources during operations are the inverters. The locations of the inverters are not known at this time, and as such, they were assumed to be operating in the electrical equipment area identified in Figure 2. For the purposes of noise modeling, it is conservatively assumed that all equipment would operate during the daytime and nighttime period. The reference sound pressure level input to Cadna-A was provided by the equipment manufacturer and is rated to be 73 dBA at 1 meter.

6.3 NOISE PREDICTION MODEL RESULTS

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 3 for daytime and nighttime levels. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational sound would be distributed over the surrounding area of the Project site. The contour lines shown are analogous to elevation contours on a topographic map, i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of noise.

Table 6 shows the projected exterior sound levels resulting from full, normal operation of the Project during daytime and nighttime periods at identified receptor locations. The tabulated results and contour plots are independent of the existing acoustic environment and are representative of expected Project sound levels only. Based on the modeling results the highest operational sound levels would be 35 dBA at Receptor ID 11, which is the current property owner of the Project site, during the daytime and nighttime period. This level is below both the daytime and nighttime measured ambient.

Table 6. Summary of Operational Noise Modeling Results

Receptor ID	UTM Coordinates (meters)		Modeled L_{eq}, dBA
	Easting	Northing	
1	561633	4735472	24
2	561867	4735053	30
3	561687	4735066	27
4	561824	4734951	29
5	561674	4734575	25
6	561836	4734622	28
7	561932	4734558	28
8	562079	4734556	30
9	562171	4734654	33
10	562407	4734621	32
11	562395	4734680	35
12	562672	4734653	29
13	562895	4734678	27
14	562822	4734744	29
15	562920	4734680	27
16	562923	4734854	27
17	562995	4734917	26
18	562901	4734994	29
19	562997	4735072	27

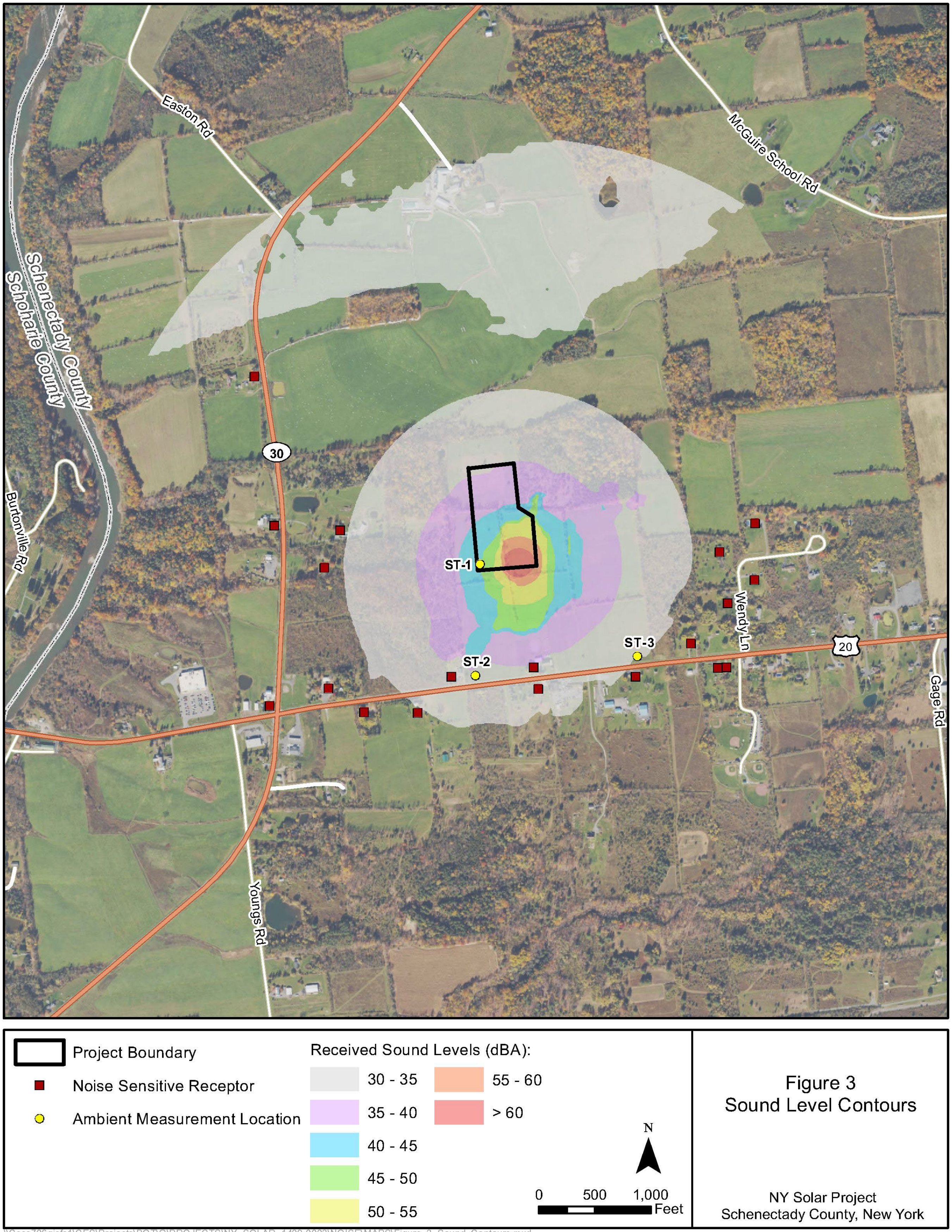

Figure 3
Sound Level Contours

NY Solar Project
Schenectady County, New York

\\Cess706gisfs1\CES\Projects\BOT\G\PROJECTS\NY_SOLAR_1409-0003\NOISE\MAPS\Figure_3_Sound_Contours.mxd

7.0 CONCLUSIONS

Tetra Tech completed an acoustic assessment of the Project, proposed in the Town of Duanesburg, Schenectady County, New York. The assessment included measurements of the baseline sound levels and evaluation of potential Project sound level impacts during construction and operation phases.

There are no quantitative noise limits that apply to this project. Therefore, noise resulting from Project operations was compared to the measured ambient noise environment. The construction noise assessment indicated that construction noise will be periodically audible at offsite locations; however, work in proximity to any specific residence will likely last no more than a few weeks, as construction activities progress. Therefore, no one residence will be exposed to significant noise levels for any extended period. Traffic noise generated during construction on and offsite will also add to overall sound levels but will be intermittent and short-term.

For the purposes of noise modeling, it is conservatively assumed that all equipment would operate during the daytime and nighttime period. The highest operational sound levels would be 35 dBA at Receptor ID 11 during the daytime and nighttime period. This level is below both the daytime and nighttime measured ambient.

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ATTACHMENT N

DECOMMISSIONING PLAN

Preliminary Decommissioning Plan
MarDon Community Solar Facility
Town of Duanesburg, New York

1 Introduction

CTEC Solar LLC ("**Owner**") is proposing to develop, construct, and operate a 1.875 megawatt (MW) alternating current (AC) solar photovoltaic ("**PV**") facility ("Facility") in the Town of Duanesburg (the "**Town**") in Schenectady County, New York. The Owner will operate the PV project as a community solar array and sell electricity bill credits to customers in the New York service territory for the regional utility (the "**Utility**"). This document provides an estimate for the cost of decommissioning the solar system at the end of its useful life and an overview of the decommissioning process.

2 Proposed Facility Installation

The Owner proposes a 1.875 MWAC community solar to be installed and connected to the Utility grid. The PV project is designed for a 25-year useful life. The facility will include racking equipment, solar panels, electrical conversion equipment, equipment pads, gravel access road, and a security fence, among other project components.

The Facility installation will be done with minimal permanent alterations to the existing site. Wherever possible, "screw piles" or similar technologies for the foundations of the ground-mounted solar energy system will be utilized to reduce the extent of demolition. Therefore, upon decommissioning, the Applicant will restore the project site to pre-construction conditions as is reasonably practical, including removal of structures, foundations, and the restoration of soil and vegetation. The restoration plan will be submitted to the Town of Duanesburg Planning Board for approval. Very limited grading is anticipated to be performed to restore the site to its original condition, since there will be limited grading during installation of the facility. The system will be dismantled and removed using minimal impact construction equipment. Materials will be safely recycled or disposed of at a licensed (regulated) facility. During the decommissioning, the Applicant will use appropriate temporary construction-related erosion and sediment control measures and best management practices (BMP).

The solar array will be connected to inverters, which are current conversion devices, and switches. The electric power from the inverters will be run via buried conduits to the electric utility interconnect equipment at the edge of the array. The generated renewable electricity will be exported to the electrical distribution network.

3 Decommissioning Purpose

The Owner plans to operate the PV facility for 25 years and will take reasonable measures to extend this lifetime, as possible. At the end of the project's useful life, the Owner or any subsequent owner has the obligation to decommission the PV project. This guide outlines the steps in the decommissioning process and provides a cost estimate for labor and materials required to disassemble and remove all Facility components.

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4 Decommissioning & Reclamation Plan

The solar facility will be decommissioned at the end of its useful life. The majority of the Facility components will be disassembled and brought off site by crews of workers on foot. Facility components that cannot be disassembled by hand will be removed by low-impact machinery. All Facility components will be loaded onto flatbed trucks to be hauled to appropriate recycling or disposal facilities. These trucks will be pulled into the site along the existing and proposed improved access roads and leave by the same route they entered. Transport of components during the decommissioning process will not require installation of temporary heavy-duty driveways.

The solar facility will be decommissioned by trained contractors who can safely de-energize the system, remove equipment, and return the site to its original condition. The following decommissioning activities will be performed in compliance with the Solar Energy Facilities Law Town of Duanesburg Local Law No. 1 2023.

The Applicant shall:

1. Obtain a special use permit as required for the decommissioning, removal, and legal disposal of the system components prior to the commencement of the decommissioning activities in accordance with local, State, and Federal waste disposal regulations.
2. Calculate cost of removing the entire solar energy system based upon prevailing wages and any other requirements applicable to municipalities under state or federal law and no salvage value shall be attributed to any of the components of the solar energy system and/or the solar energy equipment.
3. Submit schedule and methods for the removal of the solar energy system and/or the solar energy equipment, including any ancillary structures including the time required to restore the property to its pre-installed condition and to repair any damage caused to the property by the installation and removal of the solar energy system.
4. Submit a plan for restoring the property to its pre-installed condition, including grading and vegetative stabilization to eliminate any negative impacts to surrounding properties, and, where if it was previously used for farming, with vegetation suitable for farming purposes, i.e. a hay field, crops or grazing. Such restoration shall follow NYS Department of Agriculture & Markets Guidelines for Solar Energy Projects — Construction Mitigation for Agricultural Lands, as updated.

In addition to the requirements according to the Solar Energy Facilities Law Town of Duanesburg Local Law No. 1 2023, the Applicant shall:

1. Remove hazardous materials (if any) and transport them to be disposed of by licensed contractors at an appropriate facility in accordance with Federal and State rules and regulations.
2. Work with local electrical utility to disconnect PV array from power grid.
3. Remove aboveground and below-ground components of the solar energy system to the point of interconnection *i.e.*, transformer, inverters switch gear, power poles, racking, modules, above ground wiring, etc.) and all nonutility owned equipment (*i.e.*, conduit less than 4 feet in depth, structures, fencing, roads, foundations, etc.). The cost estimate assumes the cable/conduit buried at a depth of 4 feet or deeper would remain in place following decommissioning.

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4. Remove any stormwater control features.
5. Reclaim gravel from access road unless requested by the property owner to retain the road.
6. Re-grade area to an approximation of the original contours.
7. Reseed and mulch distributed areas using a native seed mix, excluding any invasive species.
8. Recycle or dispose of gravel, glass, concrete, rebar, fencing, steel piers, steel racking, solar modules, copper and aluminum wiring, inverters, disconnects, switchgear and transformer.

This plan includes a timeframe not to exceed 6 months following initiation of activities to complete the work. The property shall be restored to as natural a condition as possible within six months. The Applicant and/or its Successors will be responsible for updating this Decommissioning Plan.

5 Decommissioning Costs

Decommissioning of the solar PV system shall be implemented in accordance with the decommissioning process as described above. A Tetra Tech professional estimator has performed an independent, detailed cost analysis based upon industry standard cost data (RS Means by Gordian™) to determine the net cost to decommission the Facility and return the site to its existing pre-condition. Tetra Tech is a third-party engineering and consulting company and has conducted this cost estimate independently from the Applicant.

The **$230,701** decommissioning cost estimate was compiled from an itemized list of project components and decommissioning tasks with standard cost of removal per unit and in total. The Decommissioning Estimate calculation sheet is included in Appendix A.

This decommissioning cost estimate is based on the best available government guidance and industry knowledge. However, decommissioning costs may change over a project's lifetime due to future economic and industry conditions. Economic conditions such as inflation could increase costs. However, improvements in industry practices and higher levels of decommissioning experience could reduce decommissioning costs.

The major task descriptions to complete decommissioning are provided in Table 1. The units of measure are either a lump sum, which will be a one-time event occurrence, or a measurable weight or length. The weight or length of the units represents the quantity of that described material needed for the decommissioning of the solar project. The total cost is the unit cost multiplied by the unit of measure.

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Table 1 - MarDon Solar Facility Decommissioning Plan Major Task Summary

CBS Position Code	Description	Forecast (T/O) Quantity	Unit of Measure	Unit Cost	Total Cost (Forecast)
1	**MARDON SOLAR**	**1**	**Lump Sum**	**$230,701.47**	**$230,701.47**
1.1	**Mob / Demob**	**1**	**Lump Sum**	**$21,400.00**	**$21,400.00**
1.1.1	Equipment Mob	1	Lump Sum	$20,300.00	$20,300.00
1.1.2	Site Facilities	1	Lump Sum	$1,100.00	$1,100.00
1.2	**Site Facilities**	**1**	**Month**	**$2,005.00**	**$2,005.00**
1.3	**Field Management**	**4**	**Week**	**$5,654.82**	**$22,619.28**
1.4	**Transformer, AC Panel & Utility Tie**	**1**	**Lump Sum**	**$11,302.81**	**$11,302.81**
1.4.1	Transformer & AC Panel Removal	1	Each	$3,452.15	$3,452.15
1.4.2	Remove Foundations To Subgrade	8	Cubic Yard	$60.86	$486.90
1.4.3	Conductor Removal	250	Linear Feet	$13.22	$3,305.48
1.4.4	Utility Pole Removal	3	Each	$1,352.76	$4,058.28
1.5	**Solar Array Removal**	**1**	**Lump Sum**	**$120,799.44**	**$120,799.44**
1.5.1	Fence Removal	2700	Linear Feet	$2.23	$6,019.95
1.5.2	String Inverter Removal	15	Each	$134.57	$2,018.48
1.5.3	Solar Panel Removal	5252	Each	$6.30	$33,104.45
1.5.4	Solar Rack (Trackers) & Post Removal	1	Lump Sum	$67,084.85	$67,084.85
1.5.5	Above Grade Cable Removal - Rack Mounted	50500	Linear Feet	$0.25	$12,571.72
1.6	**Below Grade Cable & Conduit Removal**	**2000**	**Linear Feet**	**$4.20**	**$8,397.43**
1.6.1	Removal	2000	Linear Feet	$3.48	$6,967.43
1.6.2	Trucking - Per Load	1	Each	$1,375.00	$1,375.00
1.6.3	Disposal Cost (PVC Conduit)	1	Ton	$55.00	$55.00
1.7	**Site Restoration**	**1**	**Lump Sum**	**$4,533.16**	**$4,533.16**
1.7.1	Restore Roads, Remove Base & Surface Course.	311	Cubic Yard	$4.40	$1,369.72
1.7.2	Spot Grade Disturbed Areas	4	Acre	$290.86	$1,163.44
1.7.3	Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction	4	Acre	$500.00	$2,000.00
1.8	**Home Office, Project Management (5% Of Cost)**	**1**	**Lump Sum**	**$9,552.85**	**$9,552.85**
1.9	**Contractor OH & Fee (15% Of Cost)**	**1**	**Lump Sum**	**$30,091.50**	**$30,091.50**

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The bolded break lines in Table 1 show grouped together estimates for the required items to be decommissioned from the Facility site. As noted above please refer to Appendix A for a more detailed itemized decommissioning estimate breakdown.

5.1 Decommissioning Bond

According to the Decommissioning Plan requirements in the Solar Energy Facilities Law Town of Duanesburg Local Law No. 1 2023:

> *Security shall be in an amount sufficient to ensure the good faith performance of the terms and conditions of the permit issued pursuant hereto and to provide for the removal of the solar energy system and restoration of the site subsequent to removal. The Security shall be an evergreen letter of credit issued by an A-rated financial institution (relating to Standard & Poor's Rating Services, Inc. ("S&P") or any successor agency thereto) or an A3 rating financial institution (relating to Moody's Investor Services ("Moody's") or any successor rating agency thereto)) on behalf of the company, substantially in the form attached hereto as Exhibit A. The amount of the security shall be 125 percent of the estimated cost of removal of the solar energy system and restoration of the property, with an escalator of 2 percent annually (or Consumer Price Index change if more than the annual escalator of 2 percent) for the life of the solar energy system, and shall not take into account the net salvage value of any such project components. The security established by the agreement shall not be subject to disclaimer or rejection in a bankruptcy proceeding.*
>
> *In the event of default upon performance of such conditions, after proper notice and expiration of any cure periods, the security shall be forfeited to the Town, which shall be entitled to maintain an action thereon. The security shall remain in full force and effect until 90 days after the restoration of the property, as set forth in the decommissioning plan, is completed.*

A form for the required Letter of Credit is provided in Appendix B. Owner acknowledges that it or any subsequent owner is required to decommission the PV project pursuant to the regulations and requirements of the time at the end of the project's useful life. As an added level of protection for the municipality, Owner will provide a decommissioning surety or bond solely for the Town's benefit. No other entity, including the Owner, shall have the ability to demand payment from the bond. Upon completion of decommissioning, Owner shall seek a certification of completion. The certification will be provided to the issuing surety with instructions to terminate the bond.

In the unlikely scenario where Owner is not able or willing to meet its decommissioning obligations, the Town could call on the bond (under defined conditions) to pay for the decommissioning of the solar PV system. Prior to the Town drawing on the bond, Owner shall have a reasonable period of time to

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commence decommissioning, not to exceed ninety days, following issuance of a Town order requiring decommissioning of the Facility.

As stated in the Decommissioning Costs section, the estimated solar system decommissioning cost is **$230,701**. Owner will provide documentation of the bond for **$230,701** prior to system commissioning**.** Owner is responsible for providing annual evidence that the bond is in place.

Every five years and for the Facility's life, Owner shall file a report with the Town on the effects of the annual inflation adjustment and technological advancements, including a revised decommissioning cost estimate. If the revised estimated decommissioning cost exceeds the value of the current bond, then a new or amended bond (or other appropriate financial security) must be issued to reflect the revised decommissioning cost estimate. In the event the CPI has a negative value at the time the annual adjustment is calculated, the value of the Bond shall not be reduced.

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Appendix A
Decommissioning Estimate

Estimate Summary
TETRA TECH EC, INC.
Job Code: Mardon Solar
Description: Decommissioning Estimate

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1	1.00	Lump Sum	MARDON SOLAR	0.02	Detail	U.S. Dollar	230,701.47	230,701.47
1.1	1.00	Lump Sum	Mob / Demob	0.00	Detail	U.S. Dollar	21,400.00	21,400.00
1.1.1	1.00	Lump Sum	Equipment Mob	0.00	Detail	U.S. Dollar	20,300.00	20,300.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UERNTRLG	Rental Equip Transp-Large		2.00	Each	U.S. Dollar	10,000.00	20,000.00
UERNTRSM	Rental Equip Transp-Small		2.00	Each	U.S. Dollar	150.00	300.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.1.2	1.00	Lump Sum	Site Facilities	0.00	Detail	U.S. Dollar	1,100.00	1,100.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UOCONMOB	Connex Box Mob		1.00	Each	U.S. Dollar	300.00	300.00
UOTRLTRN	Trailer Trnsp/Setup/Trdwn		1.00	Each	U.S. Dollar	800.00	800.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.2	1.00	Month	Site Facilities	0.00	Detail	U.S. Dollar	2,005.00	2,005.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
URCONNEX	Connex Box		1.00	Month	U.S. Dollar	150.00	150.00
UROFFTRL	Office Trailer -12x60		1.00	Month	U.S. Dollar	500.00	500.00
UO1STAID	1st Aid Supplies		1.00	Month	U.S. Dollar	300.00	300.00
UOOFFPHN	Monthly Office Phone		1.00	Month	U.S. Dollar	500.00	500.00
UOOFFSUP	Office Supplies($/prs/mo)		1.00	Month	U.S. Dollar	55.00	55.00
UINT	Internet		1.00	Month	U.S. Dollar	200.00	200.00
URPRTAJH	Port-a-John Unit(s) (4)		1.00	Month	U.S. Dollar	300.00	300.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.3	4.00	Week	Field Management	0.17	Detail	U.S. Dollar	5,654.82	22,619.28

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L90FXX02	Field - Proj Superintendent	240.00	1.00	Each (hourly)	U.S. Dollar	83.18	19,963.68
RPUTRK05	F-250 4X4 3/4 TON PICKUP	240.00	1.00	Each (hourly)	U.S. Dollar	11.07	2,655.60

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4	1.00	Lump Sum	Transformer, AC Panel & Utility Tie	0.41	Detail	U.S. Dollar	11,302.81	11,302.81
1.4.1	1.00	Each	Transformer & AC Panel Removal	1.00	Detail	U.S. Dollar	3,452.15	3,452.15
1.4.1.1	1.00	Each	Disconnect Electrical	2.00	Detail	U.S. Dollar	755.69	755.69

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010110	ELECTRCIAN	5.00	1.00	Each (hourly)	U.S. Dollar	84.11	420.57
L060100	GENERAL LABORER	5.00	1.00	Each (hourly)	U.S. Dollar	55.96	279.80
RPUTRK05	F-250 4X4 3/4 TON PICKUP	5.00	1.00	Each (hourly)	U.S. Dollar	11.07	55.33

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.1.2	1.00	Each	Loadout Transformer & AC Panel	2.00	Detail	U.S. Dollar	1,321.46	1,321.46

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	10.00	2.00	Each (hourly)	U.S. Dollar	55.96	559.59
L010101	OPERATOR	5.00	1.00	Each (hourly)	U.S. Dollar	87.09	435.47
RHYDCR06	GROVE RT880 73 TON	5.00	1.00	Each (hourly)	U.S. Dollar	65.28	326.40

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.1.3	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.2	8.00	Cubic Yard	Remove Foundations To Subgrade	44.44	Detail	U.S. Dollar	60.86	486.90
1.4.2.1	8.00	Cubic Yard	Excavate / Remove Foundation - Various Depth	80.00	Detail	U.S. Dollar	48.89	391.11

Cost Item								
CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	1.00	1.00	Each (hourly)	U.S. Dollar	55.96	55.96
L010101	OPERATOR	2.00	2.00	Each (hourly)	U.S. Dollar	87.09	174.19
*REXCAV06C	Excav 100K w/ Hammer	1.00	1.00	Each (hourly)	U.S. Dollar	160.97	160.97

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.2.2	8.00	Cubic Yard	Concrete Transport Offsite	100.00	Detail	U.S. Dollar	11.97	95.79

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RDUTRK06	CAT D350D, 18CY-24CY	0.80	1.00	Each (hourly)	U.S. Dollar	74.29	59.43
L080940	TEAMSTER	0.80	1.00	Each (hourly)	U.S. Dollar	45.44	36.36

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.3	250.00	Linear Feet	Conductor Removal	500.00	Detail	U.S. Dollar	13.22	3,305.48
1.4.3.1	1.00	Lump Sum	Cut / Lower Cable, Size & Loadout	2.00	Detail	U.S. Dollar	1,930.48	1,930.48

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	20.00	4.00	Each (hourly)	U.S. Dollar	55.96	1,119.18
L010101	OPERATOR	5.00	1.00	Each (hourly)	U.S. Dollar	87.09	435.47
*RXMISC14	MAN LIFT GAS 125ft	5.00	1.00	Each (hourly)	U.S. Dollar	53.52	267.60
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	5.00	1.00	Each (hourly)	U.S. Dollar	21.65	108.23

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.3.2	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.4	3.00	Each	Utility Pole Removal	4.00	Detail	U.S. Dollar	1,352.76	4,058.28
1.4.4.1	3.00	Each	Cut / Lower Pole	8.00	Detail	U.S. Dollar	447.21	1,341.64

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	15.00	4.00	Each (hourly)	U.S. Dollar	55.96	839.39
L010101	OPERATOR	3.75	1.00	Each (hourly)	U.S. Dollar	87.09	326.60
RHYDCR05	GROVE RT600E 40 TON	3.75	1.00	Each (hourly)	U.S. Dollar	46.84	175.65

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.4.2	3.00	Each	Size & Loadout	8.00	Detail	U.S. Dollar	447.21	1,341.64

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	15.00	4.00	Each (hourly)	U.S. Dollar	55.96	839.39
L010101	OPERATOR	3.75	1.00	Each (hourly)	U.S. Dollar	87.09	326.60
RHYDCR05	GROVE RT600E 40 TON	3.75	1.00	Each (hourly)	U.S. Dollar	46.84	175.65

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.4.3	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.5	1.00	Lump Sum	Solar Array Removal	0.05	Detail	U.S. Dollar	120,799.44	120,799.44
1.5.1	2,700.00	Linear Feet	Fence Removal	1,350.00	Detail	U.S. Dollar	2.23	6,019.95
1.5.1.1	2,700.00	Linear Feet	Fence Removal	1,350.00	Detail	U.S. Dollar	1.72	4,644.95

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	20.00	1.00	Each (hourly)	U.S. Dollar	87.09	1,741.89
L060100	GENERAL LABORER	40.00	2.00	Each (hourly)	U.S. Dollar	55.96	2,238.36
RBACKH09	Deere 710J BACKHOE, 1.62CY	20.00	1.00	Each (hourly)	U.S. Dollar	33.24	664.70

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.5.1.2	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

Cost Item							
CBS Position Code	Quantity UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost

Notes: *********************************
Assumption: 8 lbs per foot fence & posts
****

1.5.2	15.00 Each	String Inverter Removal	12.59	Detail	U.S. Dollar	134.57	2,018.48
1.5.2.1	15.00 Each	Disconnect Electrical	20.00	Detail	U.S. Dollar	75.57	1,133.53

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
L010110	ELECTRCIAN	7.50	1.00 Each (hourly)	U.S. Dollar	84.11	630.85
L060100	GENERAL LABORER	7.50	1.00 Each (hourly)	U.S. Dollar	55.96	419.69
RPUTRK05	F-250 4X4 3/4 TON PICKUP	7.50	1.00 Each (hourly)	U.S. Dollar	11.07	82.99

1.5.2.2	15.00 Each	Loadout Inverter	34.00	Detail	U.S. Dollar	59.00	884.94

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	13.24	3.00 Each (hourly)	U.S. Dollar	55.96	740.63
RPUTRK05	F-250 4X4 3/4 TON PICKUP	4.41	1.00 Each (hourly)	U.S. Dollar	11.07	48.82
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	4.41	1.00 Each (hourly)	U.S. Dollar	21.65	95.49

1.5.3	5,252.00 Each	Solar Panel Removal	1,799.29	Detail	U.S. Dollar	6.30	33,104.45
1.5.3.1	5,252.00 Each	Solar Panel Removal	1,799.29	Detail	U.S. Dollar	2.47	12,974.45

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	29.19	1.00 Each (hourly)	U.S. Dollar	21.65	631.80
L010101	OPERATOR	29.19	1.00 Each (hourly)	U.S. Dollar	87.09	2,542.22
L060100	GENERAL LABORER	175.14	6.00 Each (hourly)	U.S. Dollar	55.96	9,800.42

Notes: ***
Assumed production: 30 panels per laborer per hour,
includes packaging and preparing for shipment offsite.
****

1.5.3.2	8.00 Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	11,000.00

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		11,000.00 Each	U.S. Dollar	1.00	11,000.00

Notes: **************************************
Assumption: 45,000 lbs per load
****

1.5.3.3	166.00 Ton	Disposal Cost	0.00	Detail	U.S. Dollar	55.00	9,130.00

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		9,130.00 Each	U.S. Dollar	1.00	9,130.00

Notes: **
Assumption: 5,252 modules x 63.05 lbs each
****

1.5.4	1.00 Lump Sum	Solar Rack (Trackers) & Post Removal	0.10	Detail	U.S. Dollar	67,084.85	67,084.85
1.5.4.1	202.00 Each	Solar Rack (Trackers) & Post Removal	20.00	Detail	U.S. Dollar	298.07	60,209.85

Resource Code	Description	Hours	Quantity UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	202.00	2.00 Each (hourly)	U.S. Dollar	87.09	17,593.09
L060100	GENERAL LABORER	202.00	2.00 Each (hourly)	U.S. Dollar	55.96	11,303.73
*REXCAV06A	Excav 100K w/ Bucket & Grapple	101.00	1.00 Each (hourly)	U.S. Dollar	124.54	12,578.04
*REXCAV06E	Excav 100K w/ Shear	101.00	1.00 Each (hourly)	U.S. Dollar	185.50	18,735.00

Notes: **
Assumed production: .5 hour per rack per crew. Crew to include
1 excavator w/shear, 1 excavator w/grapple, 2 operators and 2
laborers. Includes post removal and sizing of steel for sale as scrap,
and loadout to haul trucks.
Quantity assumption: 26 modules per rack assembly
****

			Cost Item					
CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.5.4.2	5.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	6,875.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		6,875.00	Each	U.S. Dollar	1.00	6,875.00

Notes: **************************************
Assumption: 45,000 lbs per load
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.5.5	50,500.00	Linear Feet	Above Grade Cable Removal - Rack Mounted	15,000.00	Detail	U.S. Dollar	0.25	12,571.72
1.5.5.1	50,500.00	Linear Feet	Remove Cable From Rack	15,000.00	Detail	U.S. Dollar	0.22	11,196.72

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	33.67	1.00	Each (hourly)	U.S. Dollar	21.65	728.72
L010101	OPERATOR	33.67	1.00	Each (hourly)	U.S. Dollar	87.09	2,932.18
L060100	GENERAL LABORER	134.67	4.00	Each (hourly)	U.S. Dollar	55.96	7,535.82

Notes: ******************************
Assume .10 lbs per lf, 250 lf per rack
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.5.5.2	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.6	2,000.00	Linear Feet	Below Grade Cable & Conduit Removal	666.67	Detail	U.S. Dollar	4.20	8,397.43
1.6.1	2,000.00	Linear Feet	Removal	666.67	Detail	U.S. Dollar	3.48	6,967.43

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	30.00	1.00	Each (hourly)	U.S. Dollar	87.09	2,612.83
L060100	GENERAL LABORER	60.00	2.00	Each (hourly)	U.S. Dollar	55.96	3,357.54
RBACKH09	Deere 710J BACKHOE, 1.62CY	30.00	1.00	Each (hourly)	U.S. Dollar	33.24	997.05

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.6.2	1.00	Each	Trucking - Per Load	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.6.3	1.00	Ton	Disposal Cost (PVC Conduit)	0.00	Detail	U.S. Dollar	55.00	55.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		55.00	Each	U.S. Dollar	1.00	55.00

Notes: **
Assumption: 5,252 modules x 63.05 lbs each
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.7	1.00	Lump Sum	Site Restoration	0.81	Detail	U.S. Dollar	4,533.16	4,533.16
1.7.1	311.00	Cubic Yard	Restore Roads, Remove Base & Surface Course.	703.75	Detail	U.S. Dollar	4.40	1,369.72

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*RDOZER08	CAT D6 LGP Dozer	4.42	1.00	Each (hourly)	U.S. Dollar	58.34	257.79
L010101	OPERATOR	8.84	2.00	Each (hourly)	U.S. Dollar	87.09	769.77
*RFELWH08C	CAT 980 LOADER	4.42	1.00	Each (hourly)	U.S. Dollar	77.43	342.16

Notes: **
Assumption: 1,400' of road x .5' depth
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.7.2	4.00	Acre	Spot Grade Disturbed Areas	5.00	Detail	U.S. Dollar	290.86	1,163.44

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*RDOZER08	CAT D6 LGP Dozer	8.00	1.00	Each (hourly)	U.S. Dollar	58.34	466.68

Cost Item								
CBS Position Code	**Quantity**	**UM**	**Description**	**UM/Day**	**Cost Source**	**Currency**	**Unit Cost**	**Total Cost**

L010101	OPERATOR	8.00	1.00	Each (hourly)	U.S. Dollar	87.09	696.76

Notes: ******************************
Assumption: 50% of project footprint
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.7.3	4.00	Acre	Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction	0.00	Detail	U.S. Dollar	500.00	2,000.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USLANDSCAPE	Landscape Sub		4.00	Acre	U.S. Dollar	500.00	2,000.00

Notes: ******************************
Assumption: 50% of project footprint
****

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.8	1.00	Lump Sum	Home Office, Project Management (5% Of Cost)	0.00	Detail	U.S. Dollar	9,552.85	9,552.85

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USMARKUP5	5% Markup		191,057.00	Each	U.S. Dollar	0.05	9,552.85

CBS Position Code	Quantity	UM	Description	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.9	1.00	Lump Sum	Contractor OH & Fee (15% Of Cost)	0.00	Detail	U.S. Dollar	30,091.50	30,091.50

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USMARKUP	15% Markup		200,610.00	Each	U.S. Dollar	0.15	30,091.50

Report Total:	230,701.47

Category	Total
Labor	90,728.05
Rented Equipment	40,564.07
Supplies	355.00
Subcontract	97,254.35
ODCs	1,800.00

Exhibit A
Form of Letter of Credit

Tetra Tech Inc.
3136 South Winton Road, Suite 303
Rochester, NY 14623
tetratech.com

EXHIBIT A

FORM OF LETTER OF CREDIT

[*ISSUING BANK]* IRREVOCABLE STANDBY LETTER OF CREDIT

DATE OF ISSUANCE:
[Date of issuance]

Town of Duanesburg ("**Beneficiary**")
5853 Western Turnpike
Duanesburg, New York 12056
Attention: Town Supervisor

Re: [ISSUING BANK] Irrevocable Standby Letter of Credit No.________

Sir/Madam:

We hereby establish in favor of Beneficiary (sometimes alternatively referred to herein as "**you**") this Irrevocable Standby Letter of Credit No. _______ (the "**Letter of Credit**") for the account of ______________ on behalf of __________________located at ______________________ ("**Account Parties**"), effective immediately and expiring on the date determined as specified in numbered paragraph 5 below.

We have been informed that this Letter of Credit is issued pursuant to the terms and conditions of the Decommissioning Agreement to be executed by the Account Parties.

1. Stated Amount. The maximum amount available for drawing by you under this Letter of Credit shall be _____________________________ United States Dollars (US$__________________) (such maximum amount referred to as the "**Stated Amount**").

2. Drawings. A drawing hereunder may be made by you on any Business Day on or prior to the date this Letter of Credit expires by delivering to *[ISSUING BANK]*, at any time during its business hours on such Business Day, at *[bank address]* (or at such other address as may be designated by written notice delivered to you as contemplated by numbered *paragraph 8* hereof), a copy of this Letter of Credit together with (i) a Draw Certificate executed by an authorized person substantially in the form of *Attachment A* hereto (the "**Draw Certificate**"), appropriately completed and signed by your authorized officer (signing as such) and (ii) your draft substantially in the form of *Attachment B* hereto (the "**Draft**"), appropriately completed and signed by your authorized officer (signed as such). Partial drawings and multiple presentations may be made under this Letter of Credit. Draw Certificates and Drafts under this Letter of Credit may be presented by Beneficiary by means of facsimile to our fax no. **[insert fax number]** or original documents sent by overnight delivery or courier to *[ISSUING BANK]* at our address set forth above, *Attention*: ___________ (or at such other address as may be designated by written notice delivered to you as contemplated by numbered *paragraph 8* below). If presentation is made by facsimile transmission, you must contact us at **[insert phone number]** to confirm our receipt of the transmission. In the event of a presentation by facsimile transmission, the original of such documents need not be sent to us.

3. Time and Method for Payment. We hereby agree to honor a drawing hereunder made in compliance with this Letter of Credit by transferring in immediately available funds the amount specified in the Draft delivered to us in connection with such drawing to such account at such bank in the United

States as you may specify in your Draw Certificate. If the Draw Certificate is presented to us at such address by 12:00 noon, (Eastern Standard Time) time on any Business Day, payment will be made not later than our close of business on the third succeeding Business Day and if such Draw Certificate is so presented to us after 12:00 noon, (Eastern Standard Time) time on any Business Day, payment will be made on the fourth succeeding Business Day.

In clarification, we agree to honor the Draw Certificate as specified in the preceding sentences, without regard to the truth or falsity of the assertions made therein.

4. Non-Conforming Demands. If a demand for payment made by you hereunder does not, in any instance, materially conform to the terms and conditions of this Letter of Credit, we shall give you prompt notice not later than two (2) Business Days that the demand for payment was not effectuated in accordance with the terms and conditions of this Letter of Credit, stating the reasons therefor and that we will upon your instructions hold any documents at your disposal or return the same to you. Upon being notified that the demand for payment was not effectuated in conformity with this Letter of Credit, you may correct any such non-conforming demand and re-submit on or before the then current expiry date.

5. Expiration, Initial Period and Automatic Extension. The initial period of this Letter of Credit shall terminate on [*one year from the issuance date*] (the "**Initial Expiration Date**"). The Letter of Credit shall be automatically extended without amendment for one (1) year periods from the Initial Expiration Date or any future expiration date, unless at least sixty (60) days prior to any such expiration date we send you notice by registered mail or courier at your address first shown (or such other address as may be designated by you as contemplated by numbered *paragraph 8*) that we elect not to consider this Letter of Credit extended for any such additional one year period. Notwithstanding the foregoing extension provision, this Letter of Credit shall automatically expire at the close of business on the date on which we receive a Cancellation Certificate in the form of *Attachment C* hereto executed by your authorized officer and sent along with the original of this Letter of Credit and all amendments (if any). Upon receipt by you of such notice of non-extension, you may draw hereunder up to the available amount, on or before the then current expiry date, against presentation to us of your draft substantially in the form of *Attachment B* hereto (the "**Draft**"), appropriately completed and signed by your authorized officer (signed as such).

6. Business Day. As used herein, "**Business Day**" shall mean any day on which commercial banks are not authorized or required to close in the State of New York, and inter-bank payments can be effected on the Fedwire system.

7. Governing Law. THIS LETTER OF CREDIT IS GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH THE INTERNATIONAL STANDBY PRACTICES, ICC PUBLICATION NO. 590 (THE "ISP98"), AND AS TO MATTERS NOT ADDRESSED IN ISP98, BY THE LAWS OF THE STATE OF NEW YORK.

8. Notices. All communications to you in respect of this Letter of Credit shall be in writing and shall be delivered to the address first shown for you above or such other address as may from time to time be designated by you in a written notice to us. All documents to be presented to us hereunder and all other communications to us in respect of this Letter of Credit, which other communications shall be in writing, shall be delivered to the address for us indicated above, or such other address as may from time to time be designated by us in a written notice to you.

9. Irrevocability. This Letter of Credit is irrevocable.

10. Bankruptcy. This Letter of Credit and the proceeds thereof shall not be subject to any claims or encumbrances of secured or unsecured creditors of the Applicant and shall not be considered to be property of the estate of the Applicant involving a bankruptcy or insolvency of the Applicant.

11. Complete Agreement. This Letter of Credit sets forth in full our undertaking, and such undertaking shall not in any way be modified, amended, amplified or limited by reference to any document, instrument or agreement referred to herein, except for the ISP98 and *Attachment A*, *Attachment B*, and *Attachment C* hereto and the notices referred to herein and any such reference shall not be deemed to incorporate herein by reference any document, instrument or agreement except as set forth above.

*   *   *

Sincerely,
[ISSUING BANK]

____

By: ________________________

Title: ______________________
Address: