STORMWATER POLLUTION PREVENTION PLAN for CONSTRUCTION ACTIVITIES at

WILSON HILL SOLAR, LLC
TOWN OF HOOSICK, NY

Prepared for

WILSON HILL SOLAR, LLC, A SUBSIDIARY OF NEXAMP, INC.
101 SUMMER STREET, 2ND FLOOR
BOSTON NY, 02110

Prepared by
The Environmental Design Partnership, LLP
900 Route 146
Clifton Park, NY 12065
Telephone: (518) 371-7621
Facsimile: (518) 371-9540

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NOI Permittee: WILSON HILL SOLAR, LLC
WILSON HILL SOLAR

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SECTION 1

Written Stormwater Pollution Prevention Plan

I. SCOPE

A. **PURPOSE:** WILSON HILL SOLAR, LLC intends to implement the appropriate Stormwater Pollution Prevention Plan measures in accordance with the SPDES general permit governing stormwater discharges during construction, and in accordance with erosion control practices. This section provides a descriptive explanation of the means by which WILSON HILL SOLAR, LLC will comply with the National Stormwater Pollution Prevention Program.

B. **NPDES GENERAL PERMITS FOR STORMWATER DISCHARGE FROM CONSTRUCTION SITES:** Regulations promulgated by the New York State Department of Environmental Conservation (NYSDEC) regulate the discharge of storm water from construction activities on sites where one (1) or more acres of soil is disturbed. One of the ways to comply with these regulations for affected sites is to request coverage under the General Permit for Construction Activities. (Copy enclosed herewith) In order to be authorized to discharge under the General Permit, a Stormwater Pollution Prevention Plan (SWPPP) for the site must be prepared in accordance with all applicable requirements of this permit and followed during the construction activities. If the construction activity is **not** subject to the requirements of a regulated, traditional land use control MS4 a Notice of Intent (NOI) form must be completed and received by the New York State Department of Environmental Conservation at least 5-days prior to any earth-disturbing activities. If the construction activity is subject to the requirements of a regulated, traditional land use control MS4, then the owner/operator must have its SWPPP reviewed and accepted by the MS4 prior to submitting the NOI to the Department. The owner/operator shall have the "MS4 SWPPP Acceptance" form signed and then submit that form along with the NOI to the Department.

C. **RESPONSIBILITIES OF CONTRACTOR REGARDING THE GENERAL PERMIT:** The CONTRACTOR shall manage the discharge of stormwater from the site in accordance with the SPDES General Permit for Construction Activities conditions and the following provisions of this section of the specifications. The CONTRACTOR shall be responsible for conducting the stormwater management practices in accordance with the permit. The CONTRACTOR shall be responsible for providing qualified inspectors to conduct the inspections required by the SWPPP. The CONTRACTOR shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the CONTRACTOR'S failure to comply with the permit provisions. It shall be the responsibility of the CONTRACTOR to make any changes to the SWPPP necessary when the CONTRACTOR or any of his subcontractors elects to use borrow or fill or material storage sites, either contiguous to or remote from the construction site, when such sites are used solely for this construction site. Such sites are considered to be part of the construction site covered by the permit and this SWPPP. Off-site borrow, fill, or material storage sites which are used for multiple construction projects are not subject to this requirement, unless specifically required by state or local jurisdictional entity regulations. The CONTRACTOR should consider this requirement in negotiating with earthwork subcontractors, since the choice of an off-site borrow, fill, or material storage site may impact their duty to implement, make changes to, and perform inspections required by the SWPPP for the site.

D. **NOTICE OF INTENT:** The NOI Permittee petitions the New York State Department of Environmental Conservation for the stormwater discharges during construction at this site to be covered by the SPDES General Permit for Construction Activity for the State of New York. A Notice of Intent (NOI) (using the form required by the NYSDEC) to be covered under this permit is hereby filed. An Erosion and Sediment Control Plan has been prepared and is attached herewith.

E. **CONTRACTOR RESPONSIBILITIES**: The SWPPP and associated Erosion and Sediment Control Plans represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. WILSON HILL SOLAR, LLC and the CONTRACTOR understand that additional erosion and sediment control measures will be necessary during construction. It will be the responsibility of the CONTRACTOR to implement additional erosion and sediment control measures as necessary to protect the site

during construction. WILSON HILL SOLAR, LLC and the CONTRACTOR shall designate a Project Manager prior to commencing construction. The Project Manager will ensure that all construction managers and sub-contractors are appropriately assigned and understand the importance of the following topics:

- Erosion and Sedimentation Control for Water Quality Protection
- Implementation of the Erosion and Sedimentation Control Plan
- The Importance to Proper Installation of Erosion and Sedimentation Control Measures
- Regular Inspection by qualified personnel of Erosion and Sedimentation Control Measures
- Diligent Maintenance of Erosion and Sedimentation Control Measures
- Contemporaneous preparation of accurate and complete records regarding inspection and maintenance of Erosion and Sedimentation Control Measures
- Record Keeping for Inspections and Maintenance activities

F. **REQUIREMENTS FOR THE CONTRACTOR AND SUBCONTRACTOR(S):** The *SWPPP Ledger* shall provide a "Contractor's Certification Log" **(Form 2)**, identifying the Company Name, Business Address and Telephone Number along with the Responsible Person for the CONTRACTOR and all subcontractors' who will implement the measures identified in the SWPPP. Each of the entities identified on **Form 2** shall sign a "Contractor's Certification" **(Form 3)**, verifying they have been instructed and fully understand the requirements of the New York State Department of Environmental Conservation and SWPPP. **This certification must be signed, by a fully qualified individual on behalf of each entity, prior to the beginning of any construction activities and shall be filed in the project's *SWPPP* Ledger.**

Additionally, the "Trained Contractor" must be identified on Form 3 and his/her credentials should be kept on-site in the SWPPP ledger.

G. **STORMWATER POLLUTION PREVENTION PROGRAM LOCATION REQUIREMENTS:** The *SWPPP Ledger* is meant to be a working document that shall be maintained at the site of the Construction Activities at all times throughout the project, shall be readily available upon request by the NOI Permittee's personnel or New York State Department of Environmental Conservation or any other agency with regulatory authority over stormwater issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. Refer to Part VII., F., Duty to Provide Information, of the General Permit for additional public viewing requirements.

H. **SWPPP LEDGER:** The SWPPP Ledger shall be a 3-ring Binder, tabbed and indexed for the following sections:

SECTION 1:
- **Written SWPPP**

SECTION 2:
- **Site Map and General Location Map**
- **Erosion and Sediment Control Plan(s)**
- **Phasing Plan**
- **NYSDEC Deep-Ripping and Decompaction April 2008**

SECTION 3:
- **New York State Notice of Intent**
- **New York State NOI Acknowledgement Letter**

SECTION 4:
- **New York State SPDES General Permit**

SECTION 5:
- **NOI Permittee's Certification (Form 1)**

- **Contractor's/Subcontractor's Certification Log (Form 2)**
- **Contractor's Certification for each contractor listed on Form 2 (Form 3)**
- **Inspection Report (Form 4)**
- **Modification Report (Form 5)**
- **Record of Stabilization and Construction Activities Report (Form 6)**
- **Record of Temporary Erosion and Sediment Control Practices (Form 6A)**
- **Project Rainfall Log (Form 7)**
- **Final Stabilization/Termination Checklist (Form 8)**

SECTION 6:

- **Supplemental Information**
  – Stormwater Management Report
  – FEMA Flood Mapping
  – NYSDEC ERM Mapper
  – SHPO Letter of No Effect
  – Soils Report (USDA)
  – USFW IPAC Results

SECTION 7:

- **Completed Inspection Forms**

The Project Manager must review and evaluate for compliance the *SWPPP Ledger* at each Project Review meeting. All Inspection and Maintenance Forms (*Forms 4 - 7*) will be initialed by the Project Manager at each reporting interval.

I. **INSPECTIONS AND RECORD KEEPING:** Inspections are required at least weekly by a "Qualified Inspector". Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections. Inspections shall continue until the site complies with the "Final Stabilization" section of this document and a Notice of Termination (NOT) has been filed with the NYSDEC. Each inspection must be followed up by a report documenting the inspector's findings and request the required maintenance and/or repair for the erosion and sedimentation control measures. The inspector shall notify the Project Manager within one day of the inspection of any deficiencies. Within one day of this notification the Project Manager must commence with corrective measures. It is imperative that the Project Manager documents the Inspection and Maintenance of all erosion and sedimentation control measures as soon as possible after the inspection and/or maintenance is completed. These records are used to prove that the required inspection and maintenance were performed and shall be placed in the *SWPPP Ledger*. In addition to inspection and maintenance reports, records should be kept of the Construction Activities that occur on the site. The Project Sponsor shall retain copies of the SWPPP, all reports and data for a minimum of five (5) years after the project is complete. The following list identifies the **required** Inspection and Maintenance documentation that must be maintained by the Project Manager under this SWPPP.

- **Form 4 Inspection Report for SWPPP**
- **Form 5 Requested Changes to the SWPPP (Modification Report)**
- **Form 6 Record of Stabilization and Construction Activities**
- **Form 6A Record of Temporary Erosion and Sediment Control Practices**
- **Form 7 Project Rainfall Log**

J. **SWPPP MODIFICATIONS:** The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever the design, construction, operation, or maintenance of the site changes in a way which significantly affects the potential for the discharge of pollutants or when the plan proves to be ineffective in eliminating or significantly minimizing pollutant discharges. Any such changes to the SWPPP must be made in writing on the Modification Report Form **(Form 5)** within 7 days of the date such modification or amendment is made. The CONTRACTOR'S failure to monitor or report deficiencies to the NOI Permittee will

result in the CONTRACTOR being liable for fines and construction delays resulting from any federal, state, or local agency enforcement action.

K. **FINAL STABILIZATION AND TERMINATION OF PERMIT COVERAGE:** The site will be considered finally stabilized when all soil disturbing activities have been completed and a uniform perennial vegetative cover for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established and the development area no longer discharges stormwater associated with construction activities and a Notice of Termination (NOT) form filed by the NOI Permittee with the New York State Department of Environmental Conservation. This filing terminates coverage under the General Permit and terminates the CONTRACTOR'S responsibility to implement the SWPPP. Requirements of the SWPPP, including periodic inspections, must be continued until the NOT is filed.

II. SITE DESCRIPTION

A. PROJECT NAME AND LOCATION

The Wilson Hill Solar, LLC project site is geographically situation at Latitude N 42° 54' 10.9", Longitude W 73° 22' 50.7" in the Town of WILSON HILL SOLAR, RENSSELAER COUNTY, NEW YORK. The site is located on the north side of WILSON HILL ROAD, east of the intersection with FOG HILL ROAD. The project site is comprised of 99.52 +/- acres of land. The overall disturbance area is ±25.7 acres. The project is bounded on the north, east, and west by PRIVATE RURAL PROPERTY and on the south by WILSON HILL ROAD. Access to the project will be from WILSON HILL ROAD. The entire parcel will remain privately owned and maintained. Approximately ±7.96 acres of impervious surfaces, including travel surfaces and buildings will be constructed. Reclamation of disturbed areas will be conducted on an ongoing basis as construction progresses. On-going reclamation during construction will consist of all activities listed in Section 1.III.A.1 for temporary actions. Permanent reclamation activities for the laydown area and temporary access road outside of the solar array shall follow the NYSDEC Deep-Ripping and Decompaction April 2008 guidance. Final stabilization is defined as the completion of all soil disturbance activities with the phase area having perennial vegetative cover with a density of eighty (80) percent, or other equivalent stabilization measures such as permanent landscape mulches, rock rip-rap or washed/crushed stone.

B. NOI PERMITTEE'S NAME AND ADDRESS

WILSON HILL SOLAR, LLC
101 SUMMER STREET, 2nd FLOOR
BOSTON, MA 02110

C. PROJECT DESCRIPTION

The project will involve the installation of 585 W solar modules installed on a ground mounted racking system. The modules will be wired in series strings and connected in parallel to the inverters, which convert the photovoltaic output power from DC to AC. The solar electric system will be interconnected with the existing site electrical system in accordance with the applicable electrical code and National Grid requirements, and as approved by the Town of Hoosick. Also included, as a permanent element of the development is on-site stormwater management. The estimated time for completion of the construction project is approximately one (1) year.

The proposed project will consist of the following key components:

- Solar modules
- Power inverter enclosures
- Power transformers

- Underground electrical conduits
- Operations and Maintenance (O&M)
- Building supervisory control and data acquisition (SCADA) system
- Overhead interconnection electrical line
- Access and maintenance roads

D. RUNOFF COEFFICIENT, SOILS, AND RAINFALL INFORMATION

The predevelopment Curve Number (CN) for green areas was determined to be 71 (HSG C) or 78 (HSG D). Soils within the project area consist of silty loams that fall in the hydrologic soil group C or D, as described by the Soil Conservation Service. The post development CN for disturbed green areas outside of the fenced array is 71 (HSG C) or 78 (HSG D), and for inside of the array the CN for the disturbed areas is 80 (HSG D), and the weighted CN for the post-development contributing area is 79. A CN of 98 was used for all post-development impervious surface areas.

The site is in Rensselaer County, which receives an average of 42 inches of rainfall annually with the highest amounts of rainfall received in the months of June and July.

E. NAME OF RECEIVING WATERS

Drainage will be direct to open, vegetated swales along the proposed access roads to a series of stormwater management or stormwater diversion areas (bioretention area, ponds), with emergency overflows directed to the minor tributary of middle Hoosic River to the east.

F. INDIAN COUNTRY LANDS

The site is not located on any known current or previously designated Indian Country lands.

G. ENDANGERED OR THREATENED SPECIES

A review of the New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper (http://www.dec.ny.gov/imsmaps/ERM/viewer.htm) indicated no known State regulated rare plants, rare animals or significant natural communities on-site. A letter has been directed to NYSDEC New York Natural Heritage Program requesting they provide us with a determination as to whether the proposed activity is likely to result in the take or taking of any species listed as endangered or threatened in 6 NYCRR Part 182.

H. HISTORIC PLACES

A review of the New York State Historic Preservation Office (OPRHP) Geographic Information System Mapper (http://www.oprhp.state.ny.us/nr/main.asp) indicated that the site is not located in an archeo sensitive area. A letter has been received from the OPRHP Historic Preservation Field Services Bureau stating that the project is likely to have no impact. This letter is included within Section 6 of the SWPPP.

III. CONTROLS

A. EROSION AND SEDIMENT CONTROLS

The following section describes the anticipated Erosion and Sediment Controls required for use during construction of the proposed site. These controls represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. **Additional erosion and sediment control measures will be necessary during construction.** It will be the responsibility of the NOI permittee to

authorize the CONTRACTOR to implement all additional erosion and sediment control measures necessary to protect the site during construction.

1. Stabilization practices include (but not limited to):
   a) Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed
   b) Frequent watering of excavation and fill areas to minimize wind erosion during construction.
   c) Use of stabilization fabric for all slopes having a slope of 1V:3H or greater.
   d) Seeding and planting of all unpaved areas
      - Temporary seedings should be made within 24 hours of construction or disturbance. If not, the soil must be scarified prior to seeding.
      - Broadcasting or hydroseeding may be used as seeding methods.
      - Seeding mixtures should be as follows
        a) Ryegrass (annual or perennial) applied at 30 lbs. per acre (0.7 lbs./1000 sq. ft.)
        b) Certified "Aroostook" winter rye (cereal rye) applied at 100 lbs. per acre (2.5 lbs./1000 sq. ft.) *Winter rye shall be used if seeding in October/November.
   e) Soil Restoration
      - For heavy construction staging areas outside of the solar array and the temporary road, follow the NYSDEC Deep Ripping and Decompaction April 2008 guidance.
      - Scarify all compact, slowly permeable, medium and fine textured subsoil areas. Scarify at approximately right angles to the slope direction in soil areas that are steeper than 5 percent.
      - Remove refuse, woody plant parts, stones over 3 inches in diameter, and other liter.
      - Topsoil material shall have at least 2 percent by weight of fine textured stable organic material, and no greater than 6 percent.
      - Topsoil shall have no less than 20 percent fine textured material (passing the No. 200 sieve) and not more than 15 percent clay.
      - Topsoil shall not be placed when it is partly frozen, muddy, or on frozen slopes or over ice, snow, or standing water.
   f) Mulching
      - 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.
      - For grass / legume establishment apply straw mulch applied at 2 ton/acre (90 lbs./1000 sq. ft.) and anchor with wood fiber mulch (hydromulch) at 500-750 lbs./acre (11 – 17 lbs./1000 sq. ft.)
   g) Protecting Vegetation During Construction
      - Limit soil placement over existing tree and shrub roots to a maximum of 3 inches.
      - Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree.
      - Avoid trenching within the dripline of the tree.
      - Construction limits should be identified and clearly marked to exclude equipment.

2. Structural practices include (but not limited to):

   a) Inlet protection and outlet protection using silt fences
      - See detail on Erosion and Sediment Control Plans
   b) Perimeter protection using silt fences
   c) Sediment basin(s)
   d) Stabilized construction exit points
      - Aggregate size shall be 2 inch stone or reclaimed / recycled concrete equivalent
      - Thickness shall be not less than 6 inches

- Width to be the full width of the access point, but not less than 12 ft
- Length shall be as required, but not less than 50 ft.
- Filter cloth shall be applied over the entire area to be covered with aggregate
- The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way.

e) Storm sewer
f) Stormwater detention ponds (which may also serve as a temporary sediment basin)
g) Straw Bale Dike
- Straw bale dikes have an estimated design life of three months.
- Shall only be used where no other practice is feasible

i) Stone Check Dam
- Use graded stone 2 to 15 inches in size
- Sediment accumulated behind the check dam shall be removed as needed to allow drainage through the check dam and prevent large flows from carrying sediment over the dam.

3. NYS Ag and Markets Requirements

Stripped topsoil should be stockpiled from work areas (e.g. parking areas, electric conductor trenches, along access roads, equipment pads) and kept separate from other excavated material (rock and/or subsoil) until the completion of the facility for final restoration. For proper topsoil segregation, at least 25 feet of additional temporary workspace (ATWS) may be needed along "open-cut" underground utility trenches. All topsoil will be stockpiled as close as is reasonably practical to the area where stripped/removed and shall be used for restoration on that particular area. Any topsoil removed from permanently converted agricultural areas (e.g. permanent roads, etc.) should be temporarily stockpiled and eventually spread evenly in adjacent agricultural areas within the project Limits of Disturbance (LOD); however not to significantly alter the hydrology of the area. Clearly designate topsoil stockpile areas and topsoil disposal areas in the field and on construction drawings; changes or additions to the designated stockpile areas may be needed based on field conditions in consultation with the EM. Sufficient LOD (as designated on the site plan or by the EM) area should be allotted to allow adequate access to the stockpile for topsoil replacement during restoration.

Topsoil stockpiles on agricultural areas left in place prior to October 31st should he seeded with Aroostook Winter Rye or equivalent at an application rate of three bushels (168 lbs.) per acre and mulched with straw mulch at rate of two to three bales per 1000 Sq. Ft.

Topsoil stockpiles left in place between October 31st and May 31st should be mulched with straw at a rate of two to three bales per 1000 Sq. Ft. to prevent soil loss.

4. Sequence of Major Activities

The CONTRACTOR will be responsible for implementing erosion and sediment control measures outlined in the SWPPP and any additional erosion and sediment control measures required to stabilize the site. The CONTRACTOR may designate these tasks to certain subcontractors as appropriate, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the CONTRACTOR. The order of activities will be as follows (refer to Stormwater Pollution Prevention Plan Sheet contained in this SWPPP for additional details):

Phase 1:

a) Conduct a delineation of the limits of disturbance for each project phase. The project shall be constructed in phases not to exceed 5 acres as shown on the phasing plans. Each phase shall be completed and stabilized before the commencement of the next phase.

b) Install perimeter silt fences and grade stormwater areas. Stormwater areas are to be used as temporary sediment basins during construction.

c) Construct temporary construction roads and laydown areas at locations shown on the SWPPP plan sheet.

d) Grade stormwater areas, to be used as temporary sediment traps during construction.

e) Remove topsoil, as required, and stockpile according to Ags & Market's recommendations.

f) Install temporary access road and laydown area.

g) Begin clearing and grubbing operations. Clearing and grubbing shall be done only in areas where earthwork will be performed and only in areas where building is planned to commence within 7 days after clearing and grubbing. Clearing and grubbing operations shall be limited so that no more than 5 acres of disturbed soil exists at any one time without prior written approval from the NYS DEC.

h) Temporary Stabilization.

Phase 2:

a) Field delineation of the limits of work.

b) Install erosion and sediment control practices within phase.

c) Frequent watering of the excavation and fill areas shall be done to minimize wind erosion.

d) Commence site grading and solar panel construction.

e) Disturbed areas of the site where construction activity has ceased for more than 7 days should be temporarily seeded and watered.

f) Install protective silt fences at the ends of all exposed storm sewer pipes.

g) Place required riprap at locations shown on the plans.

h) Carry out final grading and seeding and planting, including stormwater management basins.

i) Install overland flow dispersion devices with compost filter socks upgrade of devices.

j) Install solar racking and panels. Move compost filter socks as necessary.

Phase 3:

a) Field delineation of the limits of work.

b) Install erosion and sediment control practices within phase.

c) Frequent watering of the excavation and fill areas shall be done to minimize wind erosion.

d) Commence site grading and solar panel construction.

e) Disturbed areas of the site where construction activity has ceased for more than 7 days should be temporarily seeded and watered.

f) Install protective silt fences at the ends of all exposed storm sewer pipes.

g) Place required riprap at locations shown on the plans.

h) Carry out final grading and seeding and planting, including stormwater management basins.

i) Install overland flow dispersion devices with compost filter socks upgrade of devices.

j) Install solar racking and panels. Move compost filter socks as necessary.

Phase 4:

a) Field delineation of the limits of work.

b) Install erosion and sediment control practices within phase.

c) Frequent watering of the excavation and fill areas shall be done to minimize wind erosion.

d) Solar panel construction.

e) Disturbed areas of the site where construction activity has ceased for more than 7 days should be temporarily seeded and watered.

f) Carry out final grading and seeding and planting.

g) Install overland flow dispersion devices with compost filter socks upgrade of devices.

h) Install solar racking and panels. Move compost filter socks as necessary.

Phase 5:

k) Remove temporary construction roads only prior to the utility maintenance road construction in these areas (These areas are to be constructed last).

l) Construct permanent maintenance access road for utilities.

m) Remove silt fencing only after all construction is complete and exposed surfaces are stabilized.

n) Follow NYSDEC guidance included in Section 2 to reclaim all soils that have been compacted due to heavy construction laydown and the temporary access road outside of solar array. Final stabilization is defined as the completion of all soil disturbance activities with the phase area having perennial vegetative cover with a density of eighty (80) percent, or other equivalent stabilization measures such as permanent landscape mulches, rock rip-rap or washed/crushed stone.

5. Stormwater Management

The proposed stormwater management system was designed by The Environmental Design Partnership, Clifton Park, NY. The following paragraphs summarize the stormwater management measures to be incorporated on the site to control pollutants in stormwater discharges after construction is completed. A copy of the Stormwater Management Report is enclosed under Section 6 – Supplemental Information.

Five (5) stormwater management areas, constructed as bioretention areas and a wet pond, will be constructed to provide sufficient volume to hold all storm events up to 100 years and allow the water to recharge into the ground. The basins will have an emergency overflow spillway area to provide a safe overland flow path in the event that the basin capacities may be exceeded.

6. Post-Construction Maintenance of the Stormwater Management System

Post construction maintenance and protection of the Stormwater Management System shall be performed in accordance with Section VI. LONG TERM OPERATION AND MAINTENANCE PROCEDURES of the SWPPP.

B. OTHER CONTROLS

1. Waste Disposal

All waste materials will be collected and stored in a securely lidded metal dumpster rented from a local waste management company which must be a solid waste management company licensed to do business in New York State. The dumpster will comply with all local and state solid waste management regulations.

All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied as often as necessary, and the trash will be hauled to a landfill approved by New York State and the local government authority. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedures for waste disposal. Notices stating these practices will be posted in the job site construction office trailer, and the job site superintendent will be responsible for seeing that these procedures are followed.

2. Sanitary Waste

All sanitary waste will be collected from the portable units a minimum of two times per week by a licensed portable facility provider in complete compliance with local and state regulations.

3. Off-Site Vehicle Tracking

A stabilized construction exit will be provided to help reduce vehicle tracking of sediments. The paved streets adjacent to the site entrance will be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin. The job site superintendent will be responsible for seeing that these procedures are followed.

4. Concrete Waste From Concrete Trucks

a) Emptying of excess concrete and/or washout from concrete delivery trucks will be allowed on the job site, but only in either (1) specifically designated diked areas which have been prepared to prevent contact between the concrete and/or washout and stormwater which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

b) The hardened residue from the concrete washout diked areas will be disposed of in accordance with the procedures given in the Spill Prevention Control and Countermeasures (SPCC) Plan and in accordance with applicable state and federal regulations. The job site superintendent will be responsible for seeing that these procedures are followed.

5. Hazardous Substances and Hazardous Waste

a) All hazardous waste materials will be disposed of by the CONTRACTOR in the manner specified by local, state, and/or federal regulations and by the manufacturer of such products. Site personnel will be instructed in these practices by the job site superintendent, who will also be responsible for seeing that these practices are followed. Material Safety Data Sheets (MSDS's) for each substance with hazardous properties that is used on the job site will be obtained and used for the proper management of potential wastes that may result from these

products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the SWPPP file at the job site construction trailer office. Each employee who must handle a substance with hazardous properties will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

b) The CONTRACTOR will implement the Spill Prevention Control and Countermeasures (SPCC) Plan found within this SWPPP and will train all personnel in the proper cleanup and handling of spilled materials. No spilled hazardous materials or hazardous wastes will be allowed to come in contact with stormwater discharges. If such contact occurs, the stormwater discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated stormwater. It shall be the responsibility of the job site superintendent to properly train all personnel in the use of the SPCC plan.

c) Any spills of hazardous materials which are in quantities in excess of Reportable Quantities as defined by EPA regulations shall be immediately reported to the EPA National Response Center 1-800-424-8802.

d) In order to minimize the potential for a spill of hazardous materials to come into contact with stormwater, the following steps will be implemented:

- All materials with hazardous properties (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, under cover, when not in use. All such materials shall have secondary containment to prevent contamination of soil and runoff.

- The minimum practical quantity of all such materials will be kept on the job site.

- A spill control and containment kit (containing, for example, absorbent such as kitty litter or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.

- All of the product in a container will be used before the container is disposed of. All such containers will be triple-rinsed with water prior to disposal. The rinse water used in these containers will be disposed of in a manner in compliance with state and federal regulations and will not be allowed to mix with stormwater discharges.

- All products will be stored in and used from the original container with the original product label.

- All products will be used in strict compliance with instructions on the product label.

- The disposal of excess or used products will be in strict compliance with instructions on the product label.

6. Contaminated Soils

a) Any contaminated soils (resulting from spills of materials with hazardous properties) which may result from construction activities will be contained and cleaned up immediately in accordance with the procedures given in the Spill Prevention Control and Countermeasures (SPCC) Plan and in accordance with applicable state and federal regulations.

b) The job site superintendent will be responsible for seeing that these procedures are followed.

IV. COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

A. The CONTRACTOR will obtain copies of any and all local and state regulations that are applicable to stormwater management, erosion control, and pollution minimization at this job site and will comply fully with such regulations. The CONTRACTOR will submit written evidence of such compliance if requested by any agent of a regulatory body. The CONTRACTOR will comply with all conditions of the New York State Department of Environmental Conservation SPDES General Permit for Construction Activities, including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the job site and allowing regulatory personnel access to the job site and to records in order to determine compliance.

V. MAINTENANCE/INSPECTION PROCEDURES DURING CONSTRUCTION

A. Erosion and Sediment Control and Stabilization Measures Maintenance and Inspection Practices

1. The following is a list of erosion and sediment controls to be used on this site during construction practice.

    a) Stabilization practices for this site include:
        - Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed
        - Frequent watering of excavation and fill areas to minimize wind erosion during construction.
        - Use of stabilization fabric for all slopes having a slope of 1V:3H or greater.
        - Temporary seeding and planting of all unpaved areas using the hydromulching grass seeding technique shall be conducted where soil has been disturbed. In areas of staging and the temporary road, deep-ripping and decompaction shall be applied after temporary seeding and planting.
        - Permanent seeding and planting of all unpaved areas using the hydromulching grass seeding technique shall be conducted where soil has been disturbed, and after deep-ripping and decompaction in specified areas.

    b) Structural practices for this site include:
        - Perimeter protection using silt fences
        - Inlet protection and outlet protection using silt fences
        - Storm sewer
        - Stabilized construction exit points
        - Stormwater detention ponds (which may also serve as a temporary sediment basin)

    c) All erosion and sediment controls measures shall remain in place until 80% vegetative cover has been achieved. Any resulting disturbance from said removal to be seeded prior to demobilization. Final stabilization activities for this site include:
        - Permanent seeding and planting of all unpaved areas using the hydromulching grass seeding technique shall be conducted where soil has been disturbed, and after deep-ripping and decompaction in specified areas.
        - Restoration of impermeable gravel roads with gravel conforming to NYSDOT Item 304.03 Type 2 minimum CBR 20% fine grade to within ±1/4" of true grade compacted to a minimum 95% modified proctor maximum density.
        - Restoration of permeable roads shall include deep-ripping and decompaction conforming to NYSDEC guidelines with clean gravel meeting the specifications of NYSDOT Item 703.02 with size designation 3 and 3A of Table 703-4 filling the geogrid per approved NYSDEC Limited Use Pervious Access Road Detail. Gravel shall not be compacted.
        - Roadside ditches shall be cleaned out of any eroded sediment and brush.
        - Removal of any sediment from stormwater management systems.
        - Additional erosion and sediment controls may be required after construction.

2. The following inspection and maintenance practices will be used to maintain erosion and sediment controls and stabilization measures.

    a) All control measures will be inspected once every seven (7) days at a minimum. Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections.
    b) All measures will be maintained in good working order; if repairs are found to be necessary, they will be initiated within 24 hours of report.
    c) Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.
    d) Silt fences will be inspected for depth of sediment, tears, etc., to see if the fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground.
    e) The sediment basins will be inspected for depth of sediment and built up sediment will be removed when it reaches 50 percent of the capacity.
    f) Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.
    g) A maintenance inspection report will be made after each inspection. Copies of the report forms to be completed by the inspector are included in this SWPPP.
    h) The job site superintendent will be responsible for selecting and training the individuals who will be responsible for these inspections, maintenance and repair activities, and filling out inspection and maintenance reports.
    i) Personnel selected for the inspection and maintenance responsibilities will receive appropriate instruction from the job site superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls that are used onsite in good working order. They will also be trained in the completion of, initiation of actions required by, and the filing of the inspection forms. Documentation of this personnel training will be kept on site with the SWPPP.
    j) Disturbed areas and material storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.
    k) Report to the NYS Department of Environmental Conservation within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event.

B. Inspection and Maintenance Report Forms

Once installation of any required or optional erosion control device or measure has been implemented, weekly inspections of each measure shall be performed by the CONTRACTOR'S inspection personnel. The Inspection and Maintenance Reports found in this SWPPP shall be used by the inspectors to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order.

These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the NOI Permittee's Engineer, and the NOI Permittee for review upon request during visits to the project site. In addition, copies of the reports shall be provided to any of these persons, upon request, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the NOI Permittee for five years following the final stabilization of the site.

C. Other Record-Keeping Requirements

The CONTRACTOR shall keep the following records related to construction activities at the site:
- Dates when major grading activities occur and the areas that were graded
- Dates and details concerning the installation of structural controls
- Dates when construction activities cease in an area
- Dates when areas are stabilized, either temporarily or permanently
- Dates of rainfall and the amount of rainfall

- Dates and descriptions of the character and amount of any spills of hazardous materials
- Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled

D. Winter Operations

The following is a list of erosion and sediment controls and inspection and maintenance practices for winter operations for this site.

a) **Prior to November 1st of any given year all exposed soil areas must be covered with:**
   - Mulch
   - Seed and mulch
   - Geotextile
   - Erosion control matting
   - Rock or
   - Other approved mulch to prevent soil from eroding

b) Install sediment barriers (silt fence or drop inlet protection) at ALL necessary perimeter and sensitive locations BEFORE SOIL FREEZES.

c) Slopes and Stockpiles:
   - Protect slopes and stockpiles with anchored straw or mulch, rolled erosion control product or other durable covering.
   - Sediment barrier must be installed around piles and at slope toes to prevent soil transport from the pile or slope.
   - Stabilize exposed areas BEFORE snow covers them.

d) All entrance/exit locations must be properly stabilized and maintained to accommodate snow management.

e) Inspections:
   - If soil disturbance is COMPLETELY suspended AND site is PROPERLY STABILIZED, qualified inspection frequency may be reduced with written notification to NYSDEC or MS4.
   - Confirmation must be received from NYSDEC prior to reducing inspection frequency.
   - Monthly inspections must be performed at a minimum.
   - Sediment control measures should be checked after rain or snowmelt events.
   - Regular inspections must resume by March 15th.

VI. LONG TERM OPERATION AND MAINTENANCE PROCEDURES

A. The proposed WILSON HILL SOLAR project will be PRIVATELY and the operation and maintenance requirements will be the responsibility of the private owner.

The entire Stormwater Management System shall be inspected on a yearly basis to ensure that the system operates in the manner originally intended. Specific components of the system shall require additional attention as described below.

1. Bioretention Areas
   a. Bioretention Areas shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended. The inspection should include, but not be limited to, the following components; all outlet orifices, embankment, emergency spillway, drain, accumulation of sediment, and general erosion control measures.
   b. Re-grading and re-vegetation shall be performed as necessary and rip-rap shall be replaced as necessary.

c. Embankments shall be mowed a minimum of twice per year to discourage woody growth and control weeds.
d. Debris and litter shall be removed from basins during regular mowing operations or more frequently as necessary.
e. Accumulated sediment shall be removed from the wet pond area when 10 percent of the basin capacity has been lost due to sedimentation or at a minimum of every 10 to 20 years.

2. Wet Ponds
    a. Ponds shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended. The inspection should include, but not be limited to, the following components; all outlet orifices, embankment, emergency spillway, drain, accumulation of sediment, and general erosion control measures.
    b. Special attention should be provided to ensure the low flow outlet orifice continues to function properly with the base Pocket Pond elevation maintained at the elevation of the low flow outlet orifice.
    c. Re-grading and re-vegetation shall be performed as necessary and rip-rap shall be replaced as necessary.
    d. Embankments shall be mowed a minimum of twice per year to discourage woody growth and control weeds.
    e. Debris and litter shall be removed from basins during regular mowing operations or more frequently as necessary.
    f. Accumulated sediment shall be removed from the wet pond area when 10 percent of the pond capacity has been lost due to sedimentation or at a minimum of every 10 to 20 years.
    g. Accumulated sediment in the forebay shall occur every five to six years or after 50% of the total forebay capacity has been filled.

3. Attenuation Areas
    a. Ponds shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended. The inspection should include, but not be limited to, the following components; all outlet orifices, embankment, emergency spillway, drain, accumulation of sediment, and general erosion control measures.
    b. Re-grading and re-vegetation shall be performed as necessary and rip-rap shall be replaced as necessary.
    c. Embankments shall be mowed a minimum of twice per year to discourage woody growth and control weeds.
    d. Debris and litter shall be removed from basins during regular mowing operations or more frequently as necessary.
    e. Accumulated sediment shall be removed from the wet pond area when 10 percent of the pond capacity has been lost due to sedimentation or at a minimum of every 10 to 20 years.

4. Open Channels
    a. Open channels shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended.
    b. Removal of sediment build-up within the bottom of the channel or filter strip shall be required when 25% of the channel volume has been exceeded.

5. Closed Drainage System
    a. Pipes shall be inspected annually and following major storm events to ensure the system operates in the manner originally intended.

6. Soil Restoration
    a. The laydown area and temporary access road outside of the solar array is required to receive “full soil restoration” according to NYSDEC Deep-Ripping and De-compaction April 2008.
    b. All other disturbed arrays shall be seeded per the Planting Plan.

STORMWATER POLLUTION PREVENTION PLAN
SUMMARY OF EROSION AND SEDIMENT CONTROL AND STABILIZATION MEASURES
MAINTENANCE/INSPECTION PROCEDURES

☐ All control measures will be inspected at least once every seven (7) days. Sites that have a waiver to disturb greater than five (5) acres require two (2) inspections every seven (7) days with at least two (2) days between inspections.

☐ All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of report.

☐ Built-up sediment will be removed from silt fences when it has reached one-third the height of the fence.

☐ Silt fences will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.

☐ Sediment basins, if present, will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 50% of the design capacity or at the end of the job.

☐ Diversion dikes, if present, will be inspected and any breaches promptly repaired.

☐ Temporary and permanent seeding and planting and other stabilization measures will be inspected for bare spots, washouts, and healthy growth.

☐ A maintenance inspection report will be made after each inspection. Copies of the report forms to be used are included in this SWPPP.

☐ The site job superintendent will select the individuals who will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance reports.

☐ Personnel selected for inspection and maintenance responsibilities will receive training from the site job superintendent. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

☐ Disturbed areas and materials storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.

☐ Report to The Department of Environmental Conservation within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event.

STORMWATER POLLUTION PREVENTION PLAN

CONSTRUCTION/IMPLEMENTATION CHECKLIST

1. Maintain Records (Project Manager) of Construction Activities, including:

   ☐ Dates when major grading activities occur

   ☐ Dates when construction activities temporarily cease on a portion of the site

   ☐ Dates when construction activities permanently cease on a portion of the site

   ☐ Dates when stabilization measures are initiated on the site

   ☐ Dates of rainfall and the amount of rainfall

   ☐ Dates and descriptions of the character and amount of any spills of hazardous materials

   ☐ Records of reports filed with regulatory agencies if reportable quantities of hazardous materials spilled

2. Prepare Inspection Reports (Qualified Inspector) summarizing:

   ☐ Name of inspector

   ☐ Qualifications of inspector

   ☐ Measures/areas inspected

   ☐ Observed conditions

   ☐ Changes necessary to the SWPPP

3. Report Releases of Reportable Quantities of Oil or Hazardous Materials (Project Manager, if they occur):

   ☐ Notify National Response Center (1-800-424-8802) immediately

   ☐ Notify permitting authority in writing within 14 days

   ☐ Modify the pollution prevention plan to include:

   - the date of release
   - circumstances leading to the release
   - steps taken to prevent reoccurrence of the release

4. Modify Pollution Prevention Plan (per Qualified Inspector) as necessary to:

   ☐ Comply with the minimum permit requirements when notified by The Department of Environmental Conservation that the plan does not comply

   ☐ Address a change in design, construction operation, or maintenance that has an effect on the potential for discharge of pollutants

   ☐ Prevent reoccurrence of reportable quantity releases of a hazardous material or oil

VII. SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN

A. MATERIALS COVERED

The following materials or substances with known hazardous properties are expected to be present onsite during construction:

Concrete	Cleaning solvents
Detergents	Petroleum based products
Paints	Pesticides
Paint solvents	Acids
Fertilizers	Concrete additives
Soil stabilization additives	

B. MATERIAL MANAGEMENT PRACTICES

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

1. Good Housekeeping

The following good housekeeping practices will be followed onsite during the construction project.

a) An effort will be made to store only enough product required to do the job.

b) All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or other enclosure.

c) Products will be kept in their original containers with the original manufacturer's label in legible condition.

d) Substances will not be mixed with one another unless recommended by the manufacturer.

e) Whenever possible, all of a product will be used up before disposing of the container.

f) Manufacturer's recommendations for proper use and disposal will be followed.

g) The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

2. Hazardous Products

These practices will be used to reduce the risks associated with hazardous materials.

a) Products will be kept in original containers with the original labels in legible condition.

b) Original labels and material safety data sheets (MSDS's) will be procured and used for each material.

c) If surplus product must be disposed of, manufacturer's or local/state/federal recommended methods for proper disposal will be followed.

d) A spill control and containment kit (containing, for example, absorbent such as kitty litter or sawdust, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.

e) All of the product in a container will be used before the container is disposed of. All such containers will be triple-rinsed with water prior to disposal. The rinse water used in these containers will be disposed of in a manner in compliance with state and federal regulations and will not be allowed to mix with stormwater discharges.

3. Product Specific Practices

The following product specific practices will be followed on the job site.

a) Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any petroleum storage tanks used onsite will have a dike or berm containment structure constructed around it to contain any spills that may occur. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

b) Fertilizers

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked in the soil to limit exposure to stormwater. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

c) Paints, Paint Solvents, and Cleaning Solvents

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or state and federal regulations.

d) Concrete Trucks

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in either (1) specifically designated diked areas which have been prepared to prevent contact between the concrete and/or washout from stormwater and groundwater with a plastic liner of 10 mil or greater which will be discharged from the site or (2) in locations where waste concrete can be poured into forms to make riprap or other useful concrete products.

The hardened residue from the concrete washout diked areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the CONTRACTOR. The job site superintendent will be responsible for seeing that these procedures are followed.

4. Spill Prevention Practices

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

a) Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

b) Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite in spill control and containment kit (containing, for example, absorbent such as kitty

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

c) All spills will be cleaned up immediately after discovery.

d) The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substances.

e) Spills of toxic or hazardous materials will be reported to the appropriate federal, state, and/or local government agency, regardless of the size of the spill. Spills of amounts that exceed Reportable Quantities of certain substances specifically mentioned in federal regulations (40 CFR 302 list and oil) will be immediately reported to the EPA National Response Center, telephone 1-800-424-8802. Reportable Quantities of some substances which may be used at the job site are as follows:

oil - appearance of a film or sheen on water

pesticides - usually 1 lb.

acids - 5000 lb.

solvents, flammable - 100 lb.

f) The SPCC plan will be adjusted to include measures to prevent this type of spill from recurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included. If the spill exceeds a Reportable Quantity, all federal regulations regarding reports of the incident will be complied with.

g) The job site superintendent will be the spill prevention and cleanup coordinator. He will designate the individuals who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of these personnel will be posted in the material storage area and in the office trailer onsite.

VIII. CONTROL OF ALLOWABLE NON-STORMWATER DISCHARGES

A. Certain types of discharges are allowable under the NYS Department of Environmental Conservation SPDES General Permit for Construction Activity, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures, which have been outlined previously in this SWPPP, will be strictly followed to ensure that no contamination of these non-stormwater discharges takes place. The following allowable non-stormwater discharges that may occur from the job site include:

a) Discharges from fire fighting activities

b) Fire hydrant flushings (see note below)

c) Waters used to wash vehicles or control dust in order to minimize offsite sediment tracking

d) Potable water sources such as waterline flushings (see note below), irrigation drainage from watering vegetation, routine exterior building washdown (without detergents present) (See Note below)

e) Pavement washwaters where spills or leaks of hazardous materials have not occurred or detergents have not been used

f) Springs and other uncontaminated groundwater, including dewatering ground water infiltration

g) Foundation or footing drains where no contamination with process materials such as solvents is present

NOTE: CONTRACTOR shall neutralize any super-chlorinated water from water distribution pipes before releasing it into the environment. Neutralization techniques are available from the Operator's Engineer.

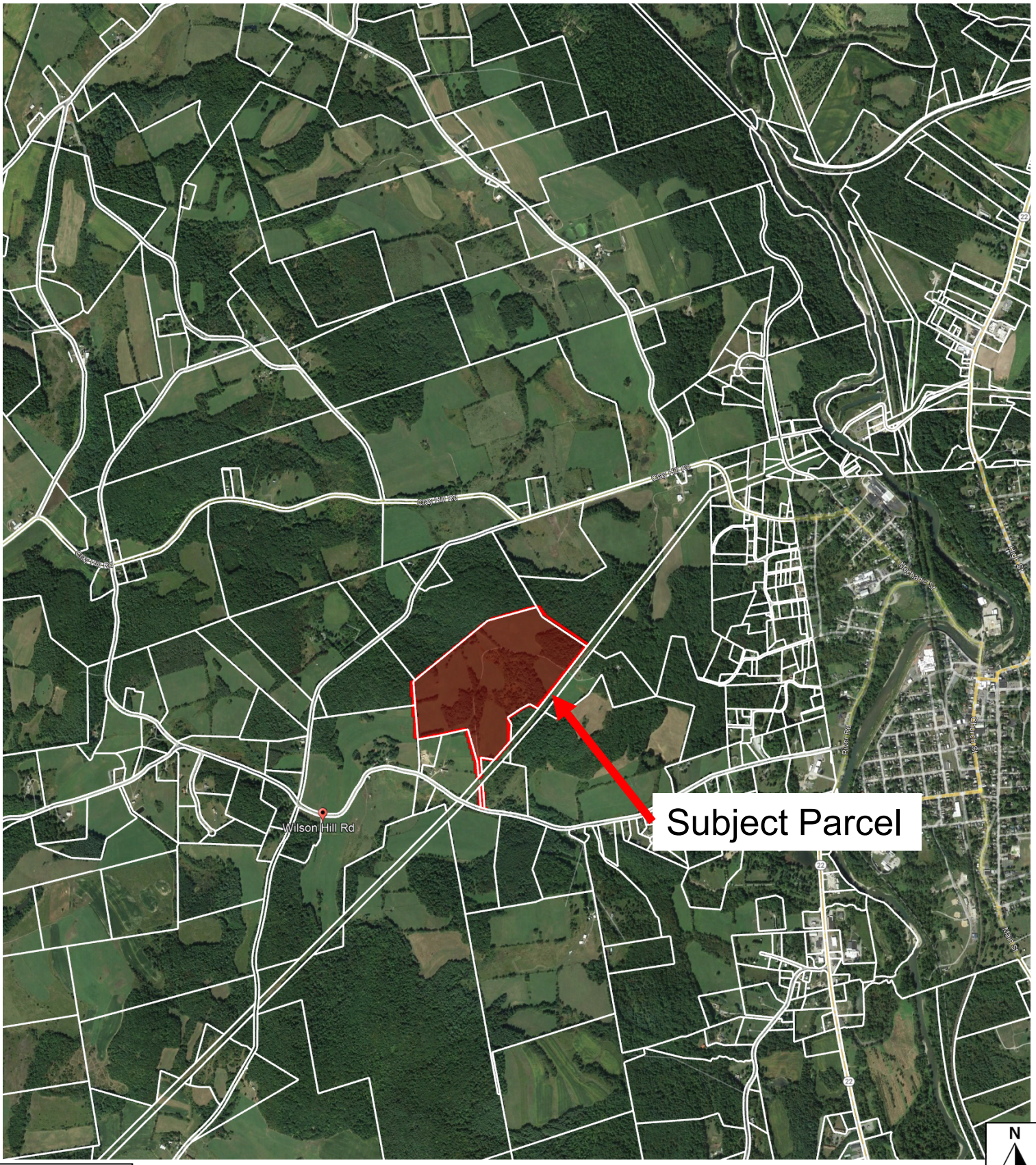
IX. CERTIFICATION AND NOTIFICATION

A. The NYS Department of Environmental Conservation requires that certifications of knowledge of the contents of this SWPPP and agreement to follow the SWPPP be made by the NOI Permittee and the CONTRACTOR. The terms of the General Permit also require that each CONTRACTOR sign the SWPPP plan, (Form 3) thereby making them co-permittees and acknowledging their responsibility for certain operational aspects of the plan. These certifications should be signed before the CONTRACTOR begins activities and should be filed with the site's SWPPP at the jobsite. These certifications are provided within this document, see Table of Contents for location.

SECTION 2

Plan Set

Site Map and General Location Map



NOT TO SCALE

Site Location Map
469 Wilson Hill Road

Town of Hoosick

Rensselaer County, NY

Source: Google Earth

August 21, 2023

Figure: 1

CIVIL PERMIT PLANS
FOR
WILSON HILL ROAD SOLAR ARRAY
5.0 MW AC
LOCATED AT
469 Wilson Hill Road
Hoosick, NY 12090

TOWN OF HOOSICK ZONING BOARD OF APPEALS

APPLICANT/PROJECT OWNER
WILSON HILL SOLAR, LLC
101 SUMMER STREET, 2ND FLOOR
BOSTON, MA 02110

CIVIL ENGINEER
THE ENVIRONMENTAL DESIGN PARTNERSHIP, LLP
900 ROUTE 146
CLIFTON PARK, NY 12065
(518) 371-7621

SURVEYOR
THE ENVIRONMENTAL DESIGN PARTNERSHIP, LLP
900 ROUTE 146
CLIFTON PARK, NY 12065
(518) 371-7621

SOLAR CONSULTANT
NEXAMP, INC.
101 SUMMER STREET, 2ND FLOOR
BOSTON, MA 02110
CONTACT: STACEY EMERICK
PHONE: 828-707-6514

LOCATION MAP
(NOT TO SCALE)

Sheet List Table

SHEET NUMBER	SHEET TITLE
C-100	COVER SHEET
2 OF 2	BOUNDARY AND TOPOGRAPHIC SURVEY MAP
C-201	REMOVALS AND TREE CLEARING PLAN
C-300	OVERALL LAYOUT AND MATERIALS PLAN
C-301	LAYOUT AND MATERIALS PLAN
C-302	LAYOUT AND MATERIALS PLAN
C-303	LAYOUT AND MATERIALS PLAN
C-400	OVERALL EROSION AND SEDIMENT CONTROL PLAN
C-401	EROSION AND SEDIMENT CONTROL PLAN
C-402	EROSION AND SEDIMENT CONTROL PLAN
C-403	EROSION AND SEDIMENT CONTROL PLAN
C-404	EROSION AND SEDIMENT CONTROL DETAILS
C-500	OVERALL DRAINAGE AND GRADING PLAN
C-501	DRAINAGE AND GRADING PLAN
C-502	DRAINAGE AND GRADING PLAN
C-503	DRAINAGE AND GRADING PLAN
C-505	ACCESS ROAD PROFILES
C-600	SITE DETAILS
C-601	SITE DETAILS
C-602	SITE DETAILS
C-700	PHASING PLAN
C-701	PHASING PLAN
L-100	LANDSCAPING AND BUFFER PLAN

SITE INFORMATION

PARCEL ZONING
AGRICULTURAL / RESIDENTIAL (AR)

PROJECT DESCRIPTION
5.0 MW AC FIXED TILT PV SYSTEM

BENCHMARKS

BENCHMARKS:
CONTROL TO BE SET BY EDPLLP

FOR MUNICIPAL APPROVAL ONLY - NOT INTENDED FOR CONSTRUCTION

nexamp
101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
900 Route 146 Clifton Park, New York 12065
(518) 371-7621 edpllp.com

Rev	Issued For	Date
A	PRELIM. PLAN SET	5/22/2023
B	INTERNAL COMMENTS	8/10/2023
C	INTERNAL COMMENTS	9/15/2023
D	ACCESS ROAD REVISIONS	10/27/2023
E	ACCESS ROAD REVISIONS	11/17/2023
F	INTERNAL REVISIONS	11/30/2023
G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:
STATE OF NEW YORK * STEPHANI ALESSANDRINI * 138310 * PROFESSIONAL ENGINEER * LICENSED

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
COVER SHEET
NOT FOR CONSTRUCTION
Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-100 Size: D Sheet Rev: G

LANDS N/F OF ROLF M. STERNBERG AS TRUSTEE OF THE ROLF M. STERNBERG TRUST U/A & ALLISON J. ALLEN
BOOK 6128 OF DEEDS AT PAGE 140

LANDS N/F OF DONNA MARIA deCREEFT PERKINS & CHARLES CALLAHAN PERKINS IV
BOOK 1494 OF DEEDS AT PAGE 149

LANDS N/F OF FILKINS VALLEY FARMS, LLC
BOOK 8646 OF DEEDS AT PAGE 141

LANDS N/F OF CHRISTOPHER M. ECKERT & JESSICA M. ECKERT
BOOK 7350 OF DEEDS AT PAGE 60

LANDS OF JENNIFER M. MATTISON-DaROSA AND GEORGE T. BUGBEE, TRUSTEES OF THE MATTISON FAMILY IRREVOCABLE TRUST DATED FEBRUARY 25, 2021
BOOK 9530 OF DEEDS AT PAGE 343

LANDS N/F OF HAROLD J. NOLAN & FRANCES M. NOLAN
BOOK 1343 OF DEEDS AT PAGE 812

LANDS OF NIAGARA MOHAWK POWER CORPORATION
BOOK 1037 OF DEEDS AT PAGE 57
PARCEL No. 3
(SEE SCHEDULE B EXCEPTION #1)

LANDS OF NIAGARA MOHAWK POWER CORPORATION
BOOK 1037 OF DEEDS AT PAGE 57
PARCEL No. 4
(SEE SCHEDULE B EXCEPTION #1)

LANDS N/F OF FREDERICK SURA
BOOK 9156 OF DEEDS AT PAGE 276

LANDS N/F OF KATHERINE L. BUGBEE
BOOK 1585 OF DEEDS AT PAGE 113

OTHER LANDS
LARRY BUGBEE
AS CONVEYED IN ROLL 93 OF DEEDS AT FRAME 604
AREA = 18± ACRES
(NOT SURVEYED)

N50°12'10"E 1,520.00'
N73°26'20"E 792.00' (12" CHAINS)
S39°53'10"E 191.40' (2.90" CHAINS)
S39°53'10"E 790.00'
S38°08'30"W 1,267.50'
S69°07'20"W 2,499.5' (GOOD TEST, MORE OR LESS, FROM AN IRON PIPE IN THE NORTHEASTERLY CORNER)
N05°37'20"W 855.00'
S77°16'50"W 781.90'
N16°59'50"W 550.74'
N26°57'50"W 246.80'
N80°23'40"W 288.39'
S06°57'50"E 244.23'
S38°08'30"W 377.22'
N44°14'30"E 64.15'
S44°14'30"W 64.15'
N06°57'50"W 318.85'
S06°57'50"E 377.38'
N76°55'20"W 53.22'
N58°06'30"E 390.00'
S23°55'20"E 86.00'
S20°08'10"E 280.60'
N65°26'40"W 120.00'

TOTAL SURVEYED LANDS
AREA = 81.523± ACRES

LIMITS OF JURISDICTION

ALO EXISTING ACCESS AND UTILITY EASEMENT
(SEE SCHEDULE B – EXCEPTIONS #10a, #10b, #10c, #1, #12, #13c & 13b)
EASEMENT AREA = 4.266 ACRES

ALO UTILITY MAINTENANCE EASEMENT
(SEE SCHEDULE B – EXCEPTIONS #2)

EXISTING CELLULAR TOWER LEASE PARCEL
(SEE SCHEDULE B – EXCEPTIONS #10a, #10b, #10c, #1, #13c & #13b)
EASEMENT AREA = 10,000± SQ.FT.

WETLAND
WETLAND CONTINUES
POND

GRAVEL TRACK
DIRT TRACK
ASPHALT DRIVEWAY
WOODS
STONE WALL
EOR
EOW
BARBED WIRE FENCE REMAINS (TYP)
BOUNDARY LINE GENERALLY FOLLOWS A STONE WALL AND THE REMAINS OF A BARBED WIRE FENCE
BOUNDARY LINE GENERALLY FOLLOWS THE REMAINS OF A BARBED WIRE FENCE AND A MEANDERING STONE WALL
BOUNDARY LINE GENERALLY FOLLOWS A MEANDERING STONE WALL
BOUNDARY LINE GENERALLY FOLLOWS THE REMAINS OF A BARBED WIRE FENCE AND A STONE WALL
BOUNDARY LINE GENERALLY FOLLOWS A MEANDERING BOWMIRE FENCE
BOUNDARY LINE GENERALLY FOLLOWS THE REMAINS OF A BARBED WIRE FENCE AND A MEANDERING STONE WALL
BOUNDARY LINE GENERALLY FOLLOWS THE REMAINS OF A BARBED WIRE FENCE AND A STONE WALL
BOUNDARY LINE GENERALLY FOLLOWS THE REMAINS OF A BARBED WIRE FENCE AND THE CENTERLINE OF A KNOWN 30' WIDE RIGHT-OF-WAY
APPARENT DEED PLOT LINE. BOUNDARY LINE HAS BEEN ESTABLISHED ALONG THE FIELD EVIDENCE.
BOUNDARY LINE GENERALLY FOLLOWS THE REMAING OF A BARBED WIRE FENCE AND A MEANDERING STONE WALL
UNDERGROUND COMMUNICATION UTILITY BOX
NOTE: EASEMENT PLOTTING APPARENTLY OVERLAPS WITH ADJOINING PARCEL
CIRF (ROURKE)
CIRF (WILEY)
MCIRF (WILEY) (ON-LINE)
LIRF
MCIRF (ROURKE)
CIRF
12" HOPE
48" HOPE
24.75' TO ℄ OF WILSON HILL ROAD (SEE NOTE No. 8)
18" CMP
WOOD POWER POLE #1
WOOD POWER POLE #2
SIGN POST
UP
OHTL
NM 155
NO 156
NO 157
NM 158
NM 159
NM 160
NM153
SHACK
6' HIGH CHAIN LINK FENCE
MISC. UTILITY INSTALLATIONS
DSF
WILSON HILL ROAD
TRUE NORTH AT THE 74°30' MERIDIAN OF WEST LONGITUDE
CORNER FALLS IN 10" TREE WITH BARBED WIRE

SITE LOCATION MAP
SCALE: 1" = 2,000'
NORTH
SITE

LEGEND:

A5◎ denotes Wetland Flag
~825~ denotes Topographic 1-Foot Contour Line
ALO denotes Approximate location of
CIRF denotes Capped Iron Rod Found
EOW denotes Edge of Woods
HDPE denotes Black Plastic Pipe
LIRF denotes Leaning Iron Rod Found
MCIRF denotes Metal Capped Iron Rod Found
MISC. denotes Miscellaneous
NG denotes National Grid Utility Pole
NM denotes Niagara Mohawk Utility Pole
OHTL denotes Overhead Transmission Line
OHUL denotes Overhead Utility Line

SURVEY NOTES:

1) Survey map as prepared for Nexamp.
2) No monumentation set.
3) All underground utilities, if any, not field located.
4) Review of the title report as prepared by Chicago Title Insurance Company, dated December 23, 2023 as title no. 2317-1254EC. This certified survey reflects those documents disclosed in the noted Title Report to locate easements, restrictions and other matters of record. No independent search of the record title was performed by the undersigned.
5) Topographic information (1' contours) of the non-wooded areas shown hereon are the result of Aerial Imagery recorded on February 22, 2023 with some snow and ice cover. Photogrammetric analysis, LiDAR data, and analytical triangulation completed by The Environmental Design Partnership, LLP. All mapping within the National Map Accuracy Standards as published by U.S.G.S. Contours shown hereon have been verified and supplimented with field instrument locations.
6) Field instrument survey completed on March 6, 2023 with approximately 2 feet of snow and ice cover.
7) Elevation datum: NAVD 1988
8) The Right-of-Way line shown hereon was established 25 feet from the ℄ of the pavement and was subject to an exhaustive search of highway records, Warren County Highway Department provided no record mapping.

DEED REFERENCE:

1) TITLE SOURCE [Warranty Deed with Lien Covenant (Corporation)]
Grantor: Oxford Properties, Corp.
Grantee: Larry Bugbee
Dated: May 4, 1998
Recorded: May 8, 1998
Roll 93 of Deeds at Frame 604

MAP REFERENCE:

1) Map Entitled: "Map Showing a Property of George & Agnes Sura"
Map Date: May-June 1969
Prepared By: John J. Hayden, P.E. & L.S. – N.Y. Lic. #20634
2) Rensselaer County Real Property Tax Map
Town of Hoosick
Section 26.00
Block 1
Lot No. 12.21

SCHEDULE B – EXCEPTIONS:

EASEMENTS:

#1. EASEMENT
Granted to: Charles Sherman Cottrell and Emma Jane Cottrell
Book 1037 of Deeds at Page 57
(RESERVING, however, unto the Parties of the First Part (Cottrell), right to cross and recross said strips of lands at five (5) points, which said crossings shall be 25 feet in width and be at points to be designated by the Party of the Second Part (Niagara Mohawk Power Corporation)... Location undetermined – affects the Subject Premises.)

#2. EASEMENT
Granted to: Niagara Mohawk Power Corporation
Book 1037 of Deeds at Page 657
(...right to erect, maintain, repair, crossarms, wires and appurtenances...right to permit wires, cables, fixtures and other apparatus...right to cut, trim and remove, from time to time, any trees, brush or other obstructions... – affects the Subject Premises.)

#3. EASEMENT
Granted to: Niagara Mohawk Power Corporation
Book 1339 of Deeds at Page 437
(...right to erect, maintain, repair, crossarms, wires and appurtenances...right to permit wires, cables, fixtures and other apparatus...right to cut, trim and remove, from time to time, any trees, brush or other obstructions... – affects the Subject Premises.)

MEMORANDA OF LEASES

#10 FIRST AMENDMENT TO OPTION AND LAND LEASE
Leased to: SBA Properties, Inc.
Instrument No. 2002-68761
(Cellular Tower Lease Parcel lies within Memorandum of Option and Ground Lease Agreement (See Instrument No. 2022-612165) Cellular Tower Lease Parcel lies east of the project area and does not affect the project area. – Lease parcel plotted hereon.)

#11 ASSIGNMENT OF LESSOR'S INTEREST IN LEASES
Assigned to: SBA CMCS-1 Depositor LLC
Instrument No. 2006-236114
(Cellular Tower Lease Parcel lies within Memorandum of Option and Ground Lease Agreement (See Instrument No. 2022-612165) Cellular Tower Lease Parcel lies east of the project area and does not affect the project area. – Lease parcel plotted hereon.)

#12 MEMORANDUM OF ANNTENNA SITE AGREEMENT
Leased from: SBA Properties, INC.
Leased to: Cellco Partnership
Instrument No. 2006-244433
(Cellular Tower Lease Parcel lies within Memorandum of Option and Ground Lease Agreement (See Instrument No. 2022-612165) Cellular Tower Lease Parcel lies east of the project area and does not affect the project area. – Lease parcel plotted hereon.)

#13 ASSIGNMENT OF ASSIGNMENT OF LESSOR'S INTEREST IN LEASES
Assigned to: LaSalle Bank National Association and Bank of New York Mellon Trust Company Americas
Instrument No. 2012-402744
(Cellular Tower Lease Parcel lies within Memorandum of Option and Ground Lease Agreement (See Instrument No. 2022-612165) Cellular Tower Lease Parcel lies east of the project area and does not affect the project area. – Lease parcel plotted hereon.)

GRAPHIC SCALE
100 50 0 100 200
(IN FEET)
1 INCH = 100 FT.

GPS

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
300 Route 146 Clifton Park, New York 12065
(518) 371-7421 edpllp.com

TAX MAP SBL#: 26.00-1-12.21
MARCH 31, 2023

BOUNDARY AND TOPOGRAPHIC SURVEY OF A PORTION OF LANDS OF
LARRY BUGBEE
ALONG WILSON HILL ROAD
TOWN OF HOOSICK
RENSSELAER COUNTY, NEW YORK

DRAWN BY	LMR
CHECKED BY	XXX
EDP PROJECT NUMBER	13153

REVISION	DATE	BY
ISSUE OF TITLE REPORT, UPDATE MAP WITH SCHEDULE B EXCEPTION ITEMS.	4/12/23	LMR

TIMOTHY J. McALONEN
PLS 50,471
tmcalonen@edpllp.com

STATE OF NEW YORK
TIMOTHY JOSEPH McALONEN
050471
LICENSED LAND SURVEYOR

SCALE: 1" = 100'

DRAFT

SHEET TITLE:
BOUNDARY AND TOPOGRAPHIC SURVEY MAP

SHEET:
2 of 2

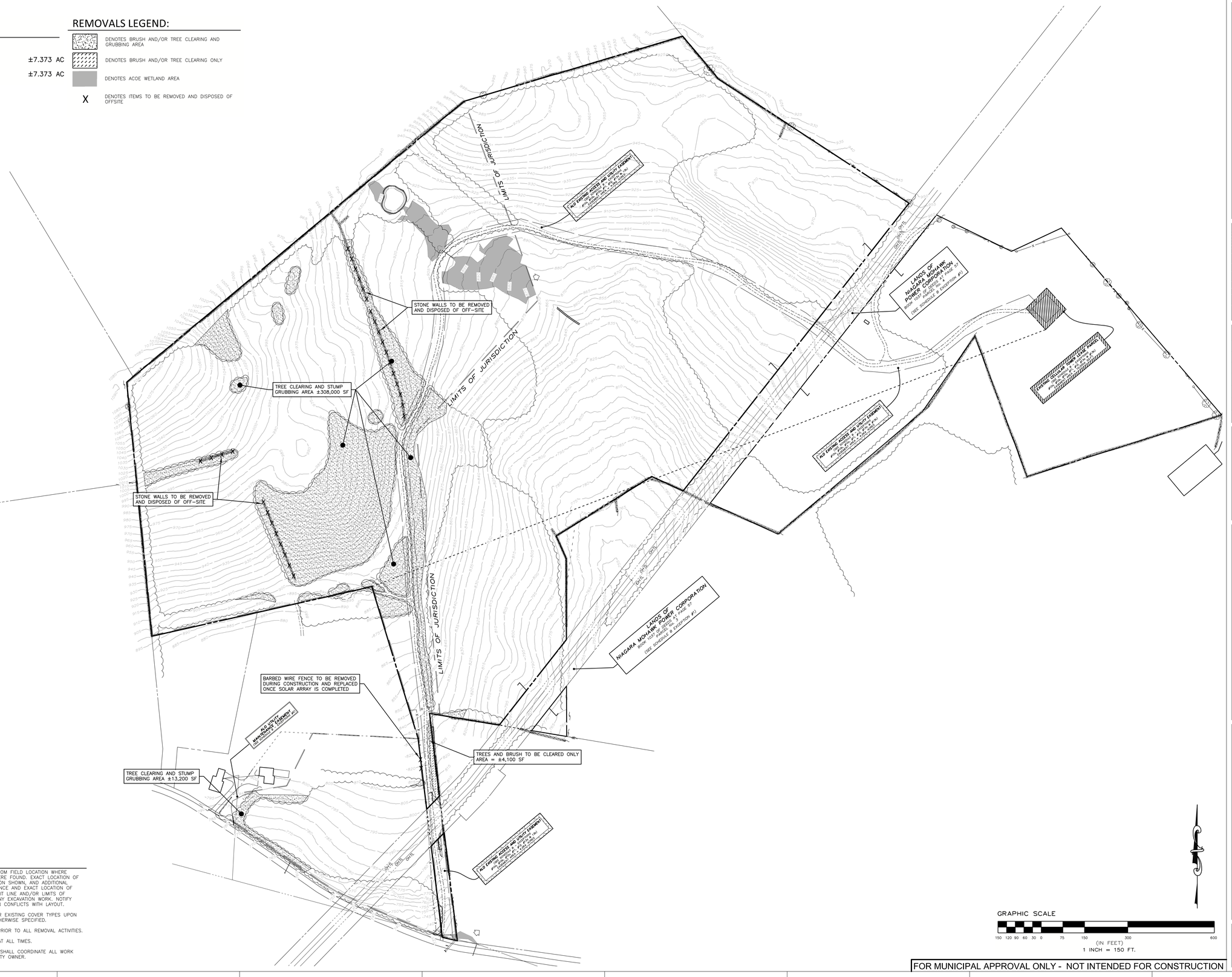
C:\Users\lawilson\Environmental Design Partnership\SharePoint Site - Documents\13 A-Z\MCNICKEL,KERI\HOOSICK\Wilson Hill Road\469 - Nexamp Solar-US-dwg\Survey\SHEETS\2023_NEXAMP_WILSON-HILL.dwg Jan 29, 2024 11:50:18AM

SITE REMOVAL AREAS

BRUSH & TREE CLEARING AND GRUBBING	±7.373 AC
TOTAL TREE CLEARING	±7.373 AC

REMOVALS LEGEND:

- DENOTES BRUSH AND/OR TREE CLEARING AND GRUBBING AREA
- DENOTES BRUSH AND/OR TREE CLEARING ONLY
- DENOTES ACOE WETLAND AREA
- X — DENOTES ITEMS TO BE REMOVED AND DISPOSED OF OFFSITE



REMOVALS NOTE:

1. UNDERGROUND UTILITIES ARE SHOWN FROM FIELD LOCATION WHERE POSSIBLE AND FROM RECORD DATA WHERE FOUND. EXACT LOCATION OF UTILITIES MAY DIFFER FROM THE LOCATION SHOWN, AND ADDITIONAL UTILITIES MAY EXIST. VERIFY THE PRESENCE AND EXACT LOCATION OF ALL UTILITIES WITHIN THE CONTRACT LIMIT LINE AND/OR LIMITS OF DISTURBANCE PRIOR TO COMMENCING ANY EXCAVATION WORK. NOTIFY SITE ENGINEER IMMEDIATELY IF LOCATION CONFLICTS WITH LAYOUT.
2. RETURN ALL DISTURBED AREAS TO THEIR EXISTING COVER TYPES UPON CONSTRUCTION COMPLETION UNLESS OTHERWISE SPECIFIED.
3. INSTALL EROSION CONTROL MEASURES PRIOR TO ALL REMOVAL ACTIVITIES.
4. MAINTAIN EMERGENCY ACCESS TO SITE AT ALL TIMES.
5. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL COORDINATE ALL WORK WITH UTILITY EASEMENT AREA WITH UTILITY OWNER.

GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.

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101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

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900 Route 146 Clifton Park, New York 12065
(518) 371-7621 edpllp.com

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G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE J. ALESSANDRINI * 128104 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

REMOVALS AND TREE CLEARING PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW | Scale: As Shown | Approved by: STA

Dwg No:	Size: D	Sheet Rev:
C-201		G

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LAYOUT AND MATERIALS PLAN LEGEND

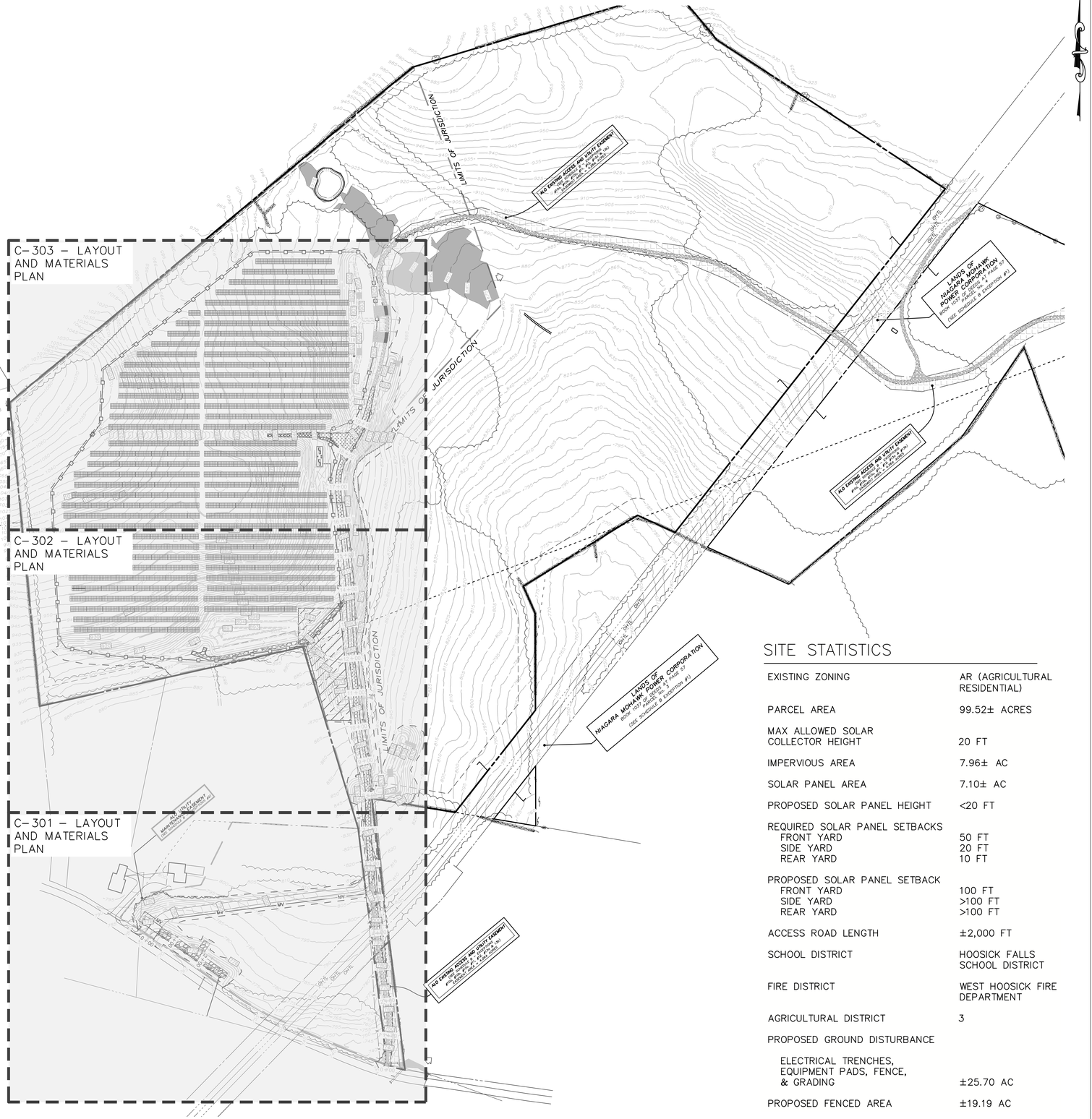
- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES TEMPORARY CONSTRUCTION ACCESS ROAD — 2 / C-600
- DENOTES IMPROVED IMPERVIOUS GRAVEL PORTIONS OF MAINTENANCE ACCESS ROAD — 2 / C-600
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 / C-602
- DENOTES RIP-RAP SLOPE/OUTLET PROTECTION — 4 / C-601
- DENOTES TEMPORARY EROSION CONTROL BLANKET — 2 / C-404
- DENOTES FIXED KNOT FARM FENCE — 3 / C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 / C-601
- DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 10 / C-601
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 / C-601
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 / C-601

GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.



SITE STATISTICS

EXISTING ZONING	AR (AGRICULTURAL RESIDENTIAL)
PARCEL AREA	99.52± ACRES
MAX ALLOWED SOLAR COLLECTOR HEIGHT	20 FT
IMPERVIOUS AREA	7.96± AC
SOLAR PANEL AREA	7.10± AC
PROPOSED SOLAR PANEL HEIGHT	<20 FT
REQUIRED SOLAR PANEL SETBACKS	
FRONT YARD	50 FT
SIDE YARD	20 FT
REAR YARD	10 FT
PROPOSED SOLAR PANEL SETBACK	
FRONT YARD	100 FT
SIDE YARD	>100 FT
REAR YARD	>100 FT
ACCESS ROAD LENGTH	±2,000 FT
SCHOOL DISTRICT	HOOSICK FALLS SCHOOL DISTRICT
FIRE DISTRICT	WEST HOOSICK FIRE DEPARTMENT
AGRICULTURAL DISTRICT	3
PROPOSED GROUND DISTURBANCE	
ELECTRICAL TRENCHES, EQUIPMENT PADS, FENCE, & GRADING	±25.70 AC
PROPOSED FENCED AREA	±19.19 AC

NOTES:

1. PROPOSED UTILITY AND CUSTOMER POLE LOCATIONS ARE SUBJECT TO UTILITY APPROVAL AND MAY CHANGE. CONTRACTOR SHALL VERIFY FINAL POLE LOCATIONS WITH THE OWNER PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION.

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101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

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900 Route 146 Clifton Park, New York 12065
(518) 371-7621 edp@c.com

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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE J. ALESSANDRINI * 128104 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

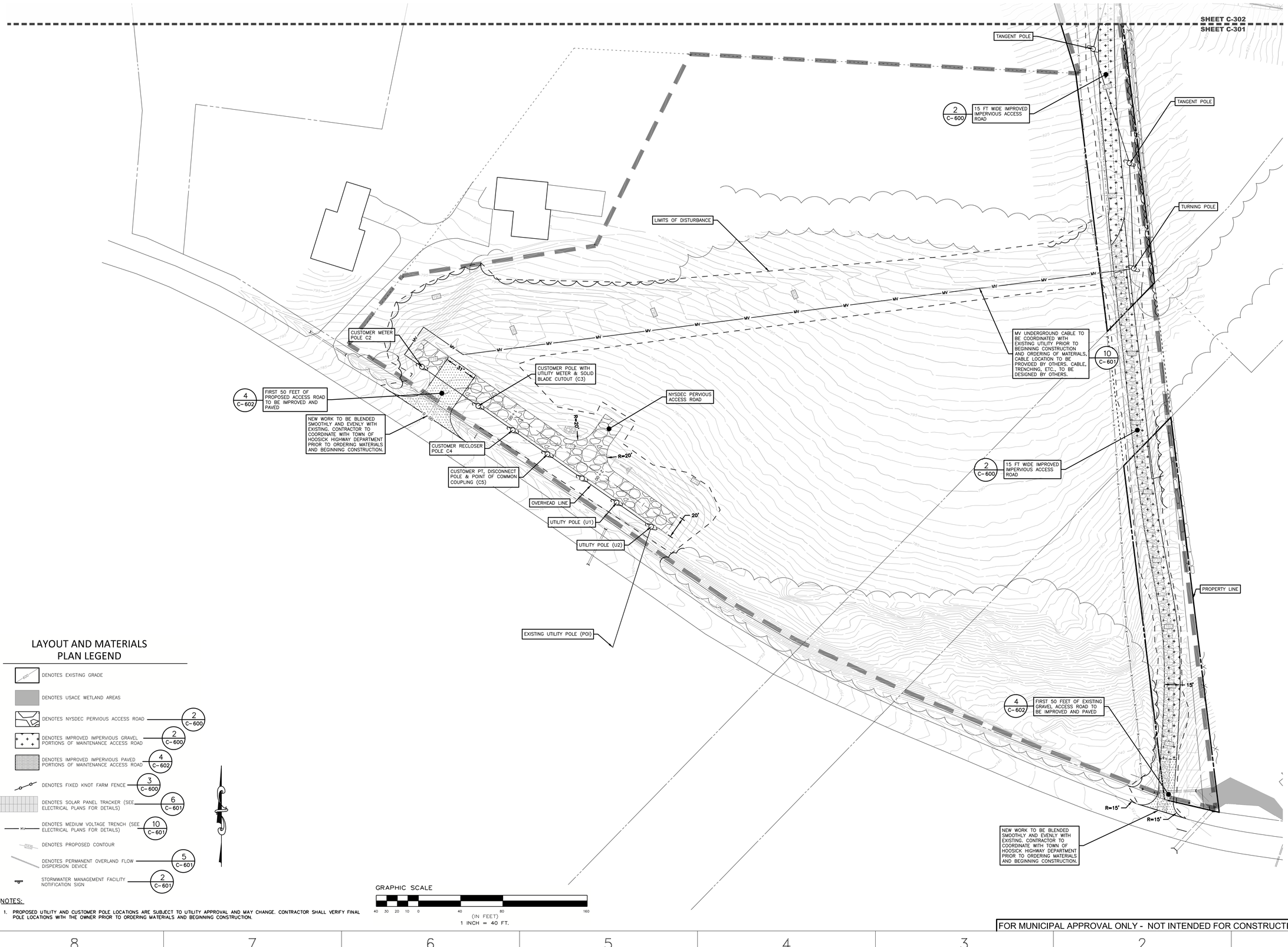
Drawing Title:

OVERALL LAYOUT AND MATERIALS PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No:	Size: D	Sheet Rev:
C-300		G



LAYOUT AND MATERIALS PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES NYSDEC PERVIOUS ACCESS ROAD — 2 C-600
- DENOTES IMPROVED IMPERVIOUS GRAVEL PORTIONS OF MAINTENANCE ACCESS ROAD — 2 C-600
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 C-602
- DENOTES FIXED KNOT FARM FENCE — 3 C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 C-601
- DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 10 C-601
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 C-601
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 C-601

NOTES:

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GRAPHIC SCALE

40 30 20 10 0 40 80 160

(IN FEET)
1 INCH = 40 FT.

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Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
LAYOUT AND MATERIALS PLAN
NOT FOR CONSTRUCTION
Scale: As Shown Approved by: STA
Drawn by: BMW

Dwg No: C-301 Size: D Sheet Rev: G

SHEET C-303
SHEET C-302

6 C-601 SOLAR PANEL, TYP.

15 FT WIDE PAVED ACCESS ROAD — 4 C-602

TANGENT POLE

LIMITS OF DISTURBANCE

2 C-601 STORMWATER MANAGEMENT AREA NOTIFICATION SIGN

1 C-600 4' PERSONNEL GATE

TANGENT POLE

15 FT WIDE GRAVEL ACCESS ROAD — 2 C-600

TANGENT POLE

PROPERTY LINE

EXISTING GRAVEL ACCESS ROAD TO BE IMPROVED AND PAVED. — 4 C-602

TANGENT POLE

STORMWATER MANAGEMENT AREA NOTIFICATION SIGN — 2 C-601

15'
38'
15'

R=10'
10'
R=10'

50' FRONT SETBACK

3 C-600 8 FT HIGH PERIMETER FIXED KNOT FARM FENCE

2 C-600 10' WIDE NYSDEC PERVIOUS ACCESS ROAD

LAYOUT AND MATERIALS PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES NYSDEC PERVIOUS ACCESS ROAD — 2 C-600
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- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 C-601
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 C-601

GRAPHIC SCALE
40 30 20 10 0 40 80 160
(IN FEET)
1 INCH = 40 FT

SHEET C-302
SHEET C-301

NOTES:

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P.E. seal/Consultant:

STATE OF NEW YORK * JAMES ALESSANDRINI * 28104 * LICENSED PROFESSIONAL ENGINEER

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
LAYOUT AND MATERIALS PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-302 Size: D Sheet Rev: G

LAYOUT AND MATERIALS PLAN LEGEND

- DENOTES EXISTING GRADE
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- DENOTES NYSDEC PERVIOUS ACCESS ROAD — 2 / C-600
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- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 / C-601

GRAPHIC SCALE

40 30 20 10 0 40 80 160

(IN FEET)

1 INCH = 40 FT.

1 / C-600 4" PERSONNEL GATE

KEEP ALL UNNECESSARY EQUIPMENT OFF OF BIORETENTION AREAS THROUGHOUT CONSTRUCTION

50' REAR SETBACK

PROPERTY LINE

3 / C-600 8 FT HIGH PERIMETER FIXED KNOT FARM FENCE

NEW EDGE OF WOODS, TYP.

SOLAR PANEL RACK, TYP.

STORMWATER MANAGEMENT AREA NOTIFICATION SIGN 2 / C-601

STORMWATER MANAGEMENT AREA NOTIFICATION SIGN 2 / C-601

LIMITS OF DISTURBANCE

18'

15'

15'

1 / C-600 4" PERSONNEL GATE

4 / C-600 20' WIDE ACCESS GATE

2 / C-601 STORMWATER MANAGEMENT AREA NOTIFICATION SIGN

1 / C-600 4' PERSONNEL GATE

4 / C-600 20' WIDE ACCESS GATE

7 / C-404 CHECK DAM, TYP.

GUARDRAIL, TYP. SPECIFIC TYPE OF GUIDE RAIL TO BE SELECTED BY OWNER PRIOR TO BEGINNING CONSTRUCTION.

1V:2H RIP RAP SLOPE

R=55'

12'

EQUIPMENT PAD (INVERTER AND TRANSFORMER LOCATION TYP.) SEE STRUCTURAL SHEETS

59'

17'

R=55'

NEW EDGE OF WOODS, TYP.

10 / C-601 MV UNDERGROUND CABLE, CABLE LOCATION TO BE PROVIDED BY OTHERS. CABLE, TRENCHING, ETC., TO BE DESIGNED BY OTHERS.

FENCE POSTS TO BE PLACED IN A WAY WHICH AVOID MV CABLE TRENCH.

TANGENT POLE

1V:2H RIP RAP SLOPE

15 FT WIDE PAVED ACCESS ROAD 4 / C-602

SHEET C-303

SHEET C-302

NOTES:

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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE T. ALESSANDRINI * 28104 * LICENSED PROFESSIONAL ENGINEER

Project: WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title: LAYOUT AND MATERIALS PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No:	Size: D	Sheet Rev:
C-303		G

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EROSION, LAYOUT, AND MATERIALS PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES TEMPORARY CONSTRUCTION ACCESS ROAD — 2 / C-600
- DENOTES IMPROVED IMPERVIOUS GRAVEL PORTIONS OF MAINTENANCE ACCESS ROAD — 2 / C-600
- DENOTES TURF REINFORCEMENT MATTING
- DENOTES TEMPORARY EROSION CONTROL BLANKET — 2 / C-404
- DENOTES FIXED KNOT FARM FENCE — 3 / C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 / C-601
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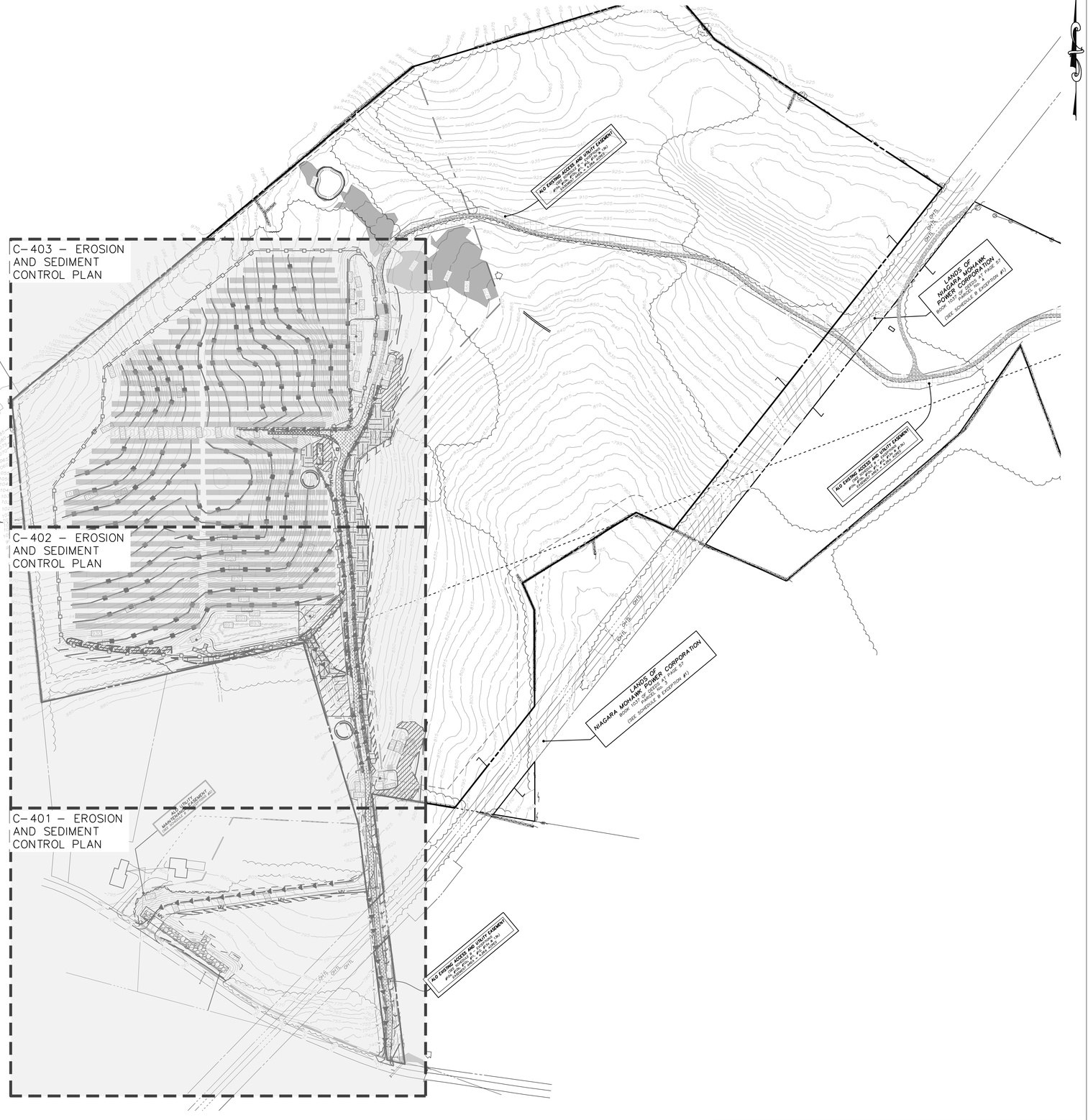
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 / C-601
- DENOTES PROPOSED 12" COMPOST FILTER SOCK — 9 / C-404
- DENOTES SWALE WITH CHECK DAM — 7 / C-404
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 / C-601
- 9 / C-404
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 / C-602

GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.



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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE J. ALESSANDRINI * 128104 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

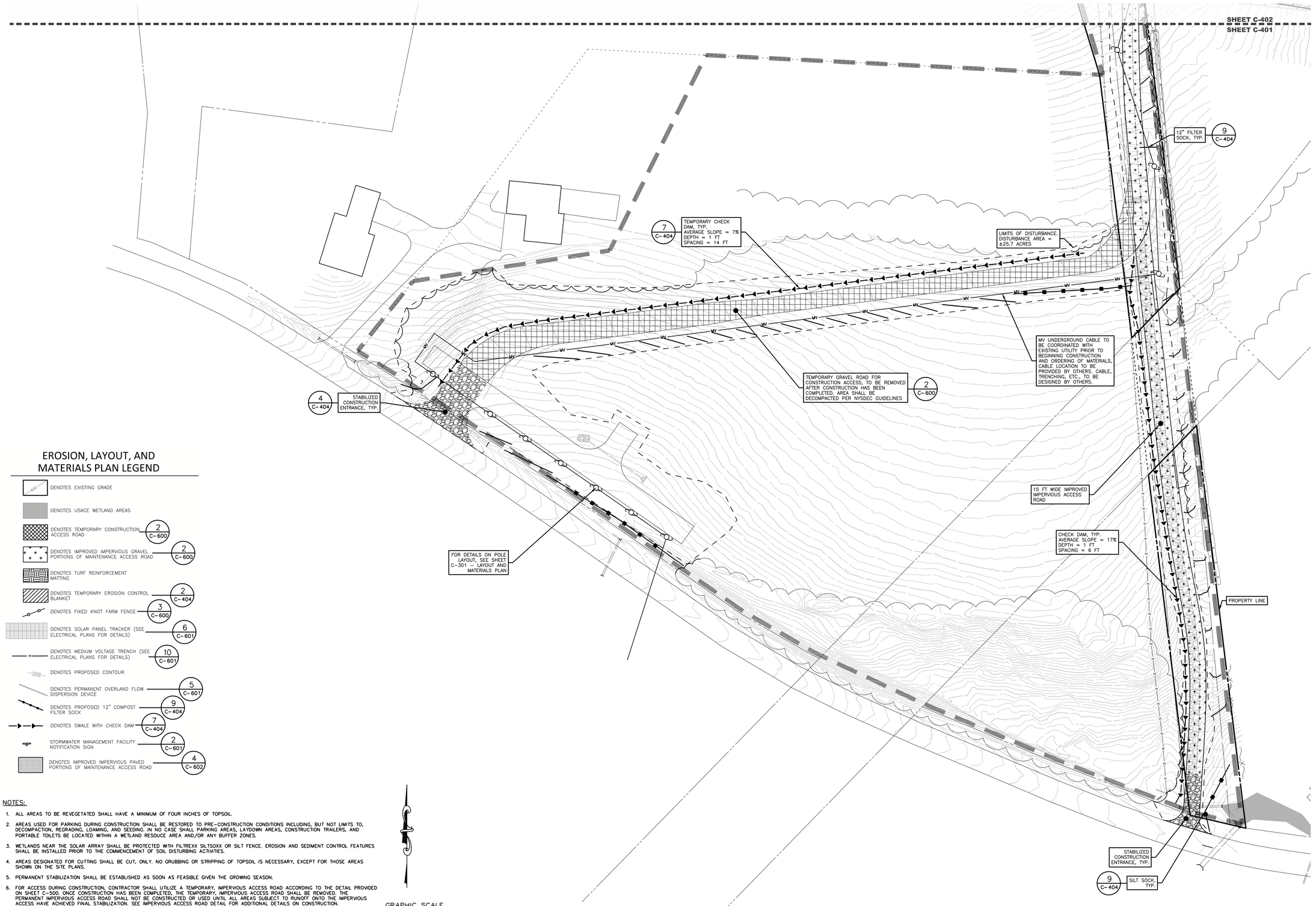
OVERALL EROSION AND SEDIMENT CONTROL PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No:	Size: D	Sheet Rev:
C-400		G

SHEET C-402
SHEET C-401



EROSION, LAYOUT, AND MATERIALS PLAN LEGEND

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- DENOTES USACE WETLAND AREAS
- DENOTES TEMPORARY CONSTRUCTION ACCESS ROAD — 2 C-600
- DENOTES IMPROVED IMPERVIOUS GRAVEL PORTIONS OF MAINTENANCE ACCESS ROAD — 2 C-600
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- DENOTES TEMPORARY EROSION CONTROL BLANKET — 2 C-404
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GRAPHIC SCALE
40 30 20 10 0 40 80 160
(IN FEET)
1 INCH = 40 FT.

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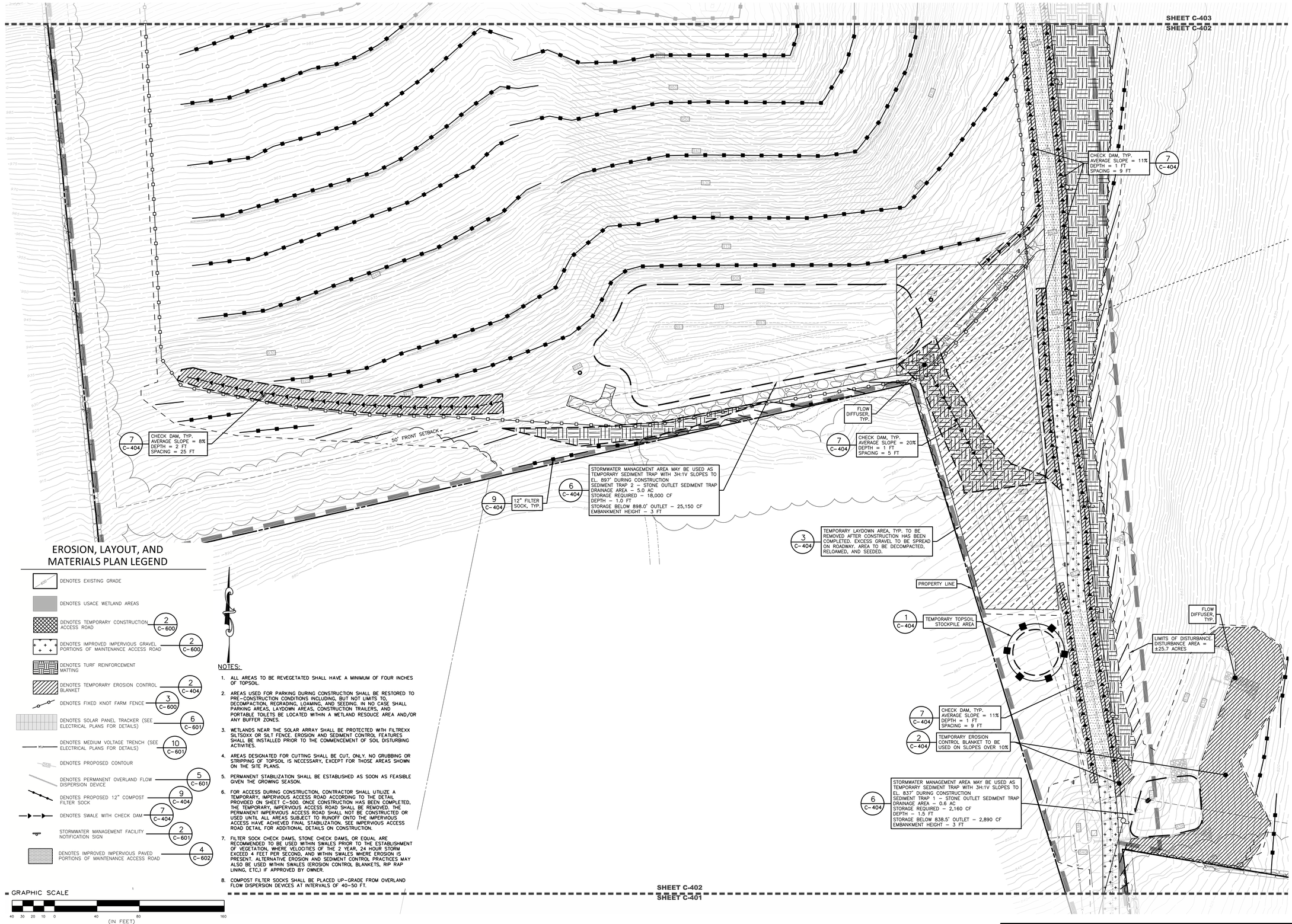

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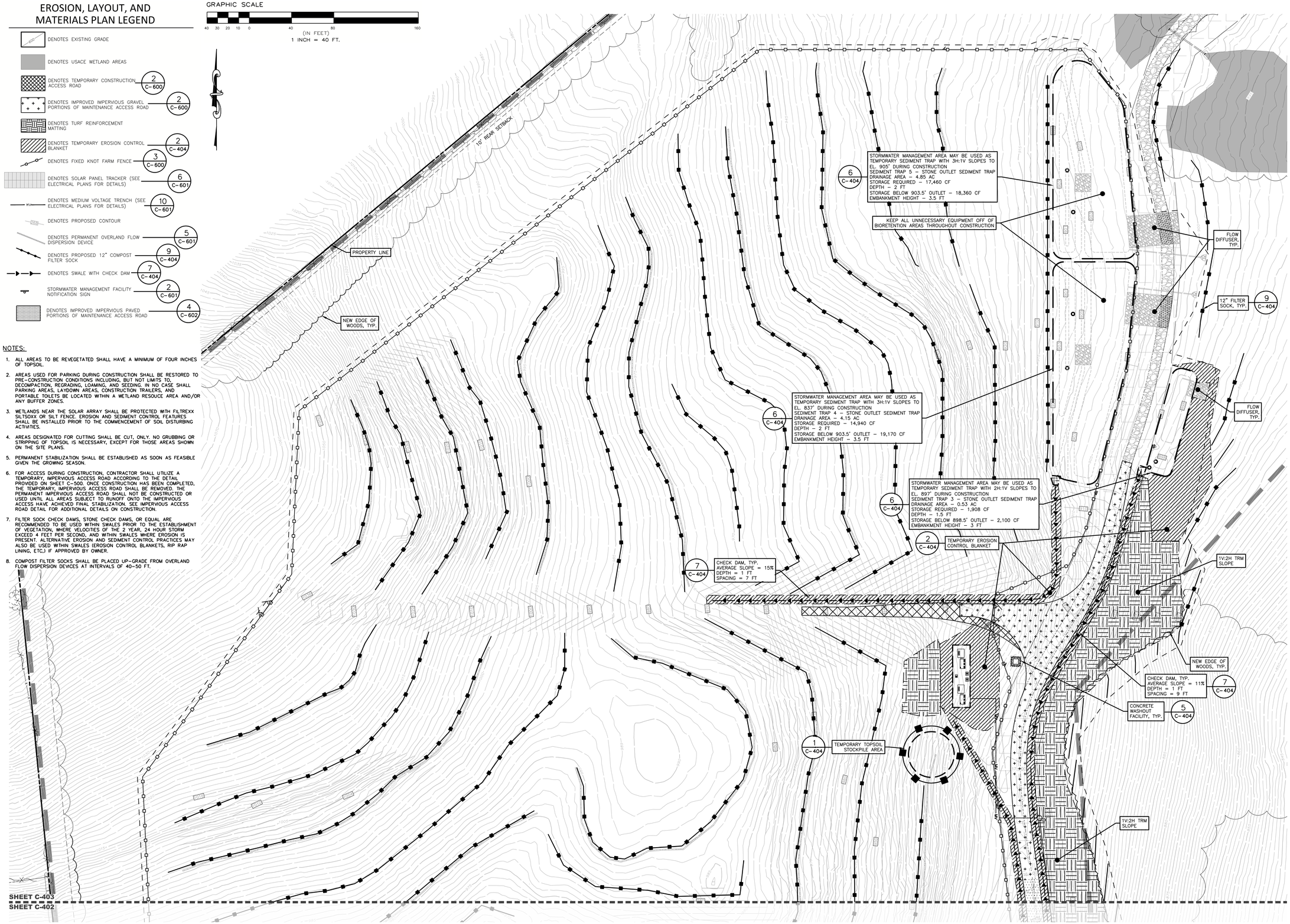

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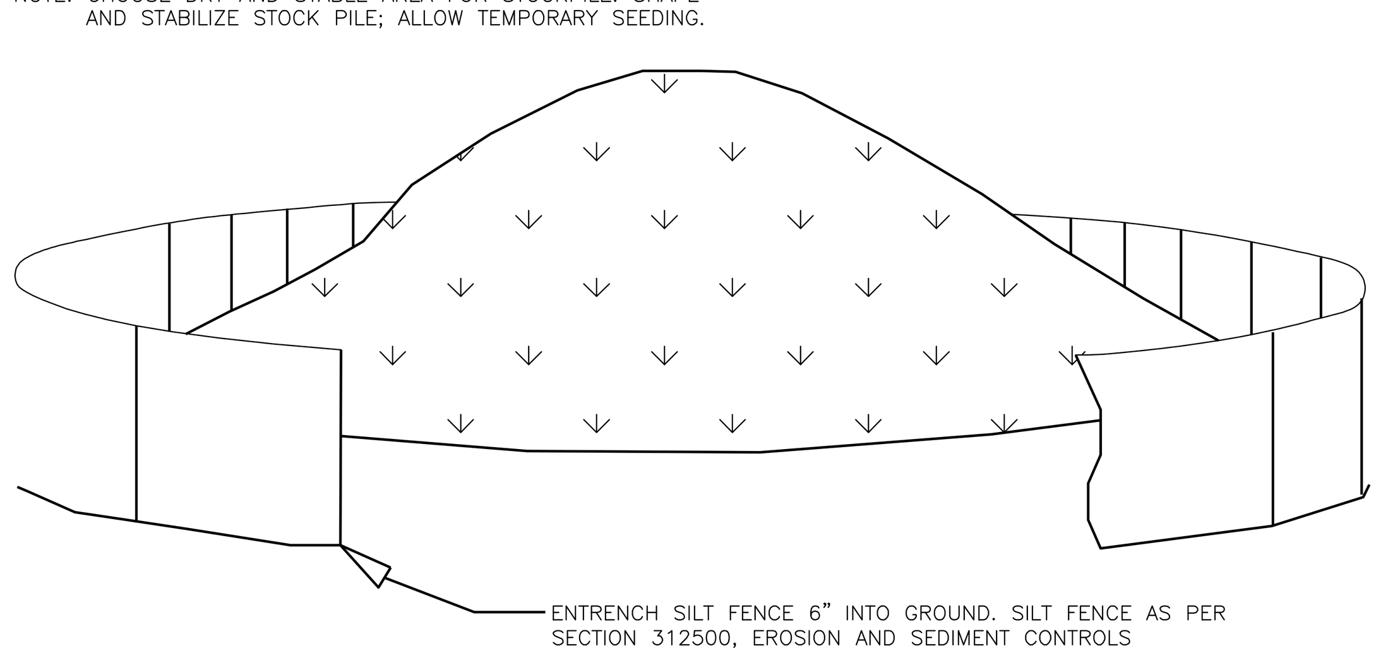
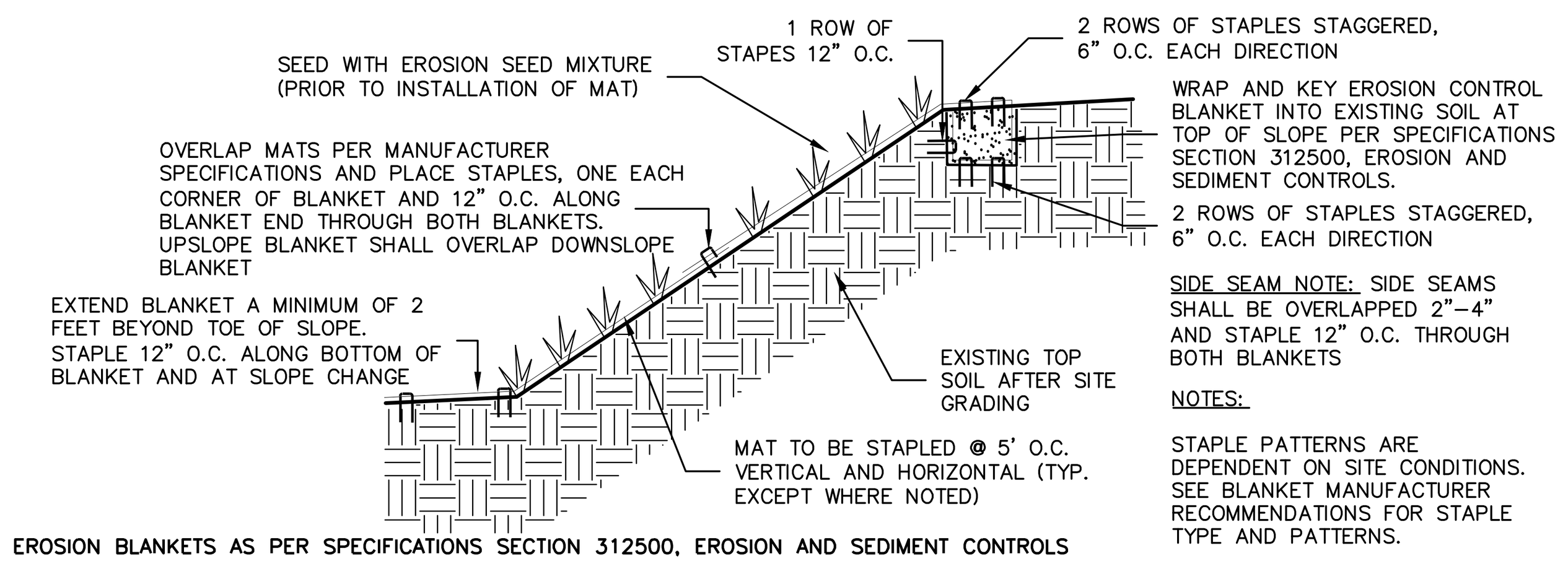
NOTE: CHOOSE DRY AND STABLE AREA FOR STOCKPILE. SHAPE AND STABILIZE STOCK PILE; ALLOW TEMPORARY SEEDING.



1 C-404 SOIL STOCKPILE AREA

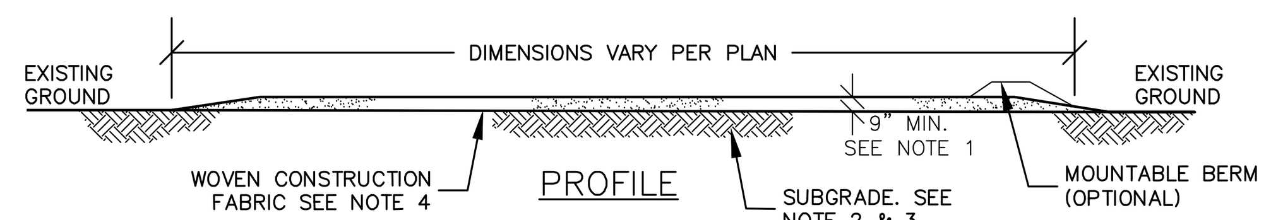
NOT TO SCALE



EROSION BLANKETS AS PER SPECIFICATIONS SECTION 312500, EROSION AND SEDIMENT CONTROLS

2 C-404 EROSION CONTROL BLANKET

NOT TO SCALE

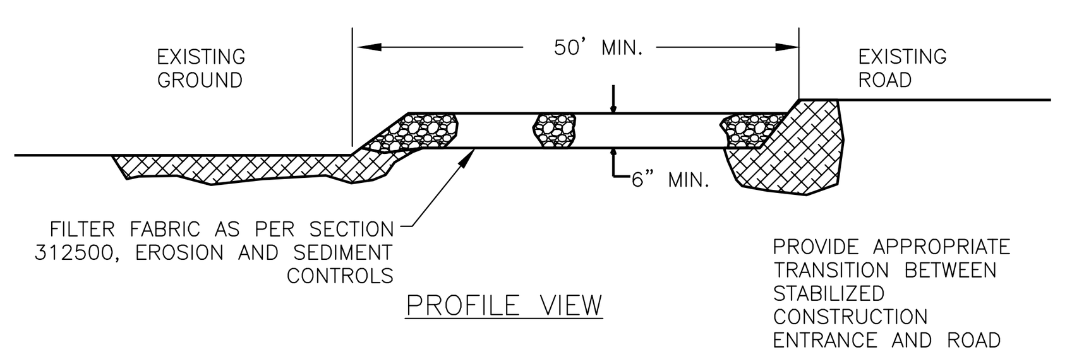


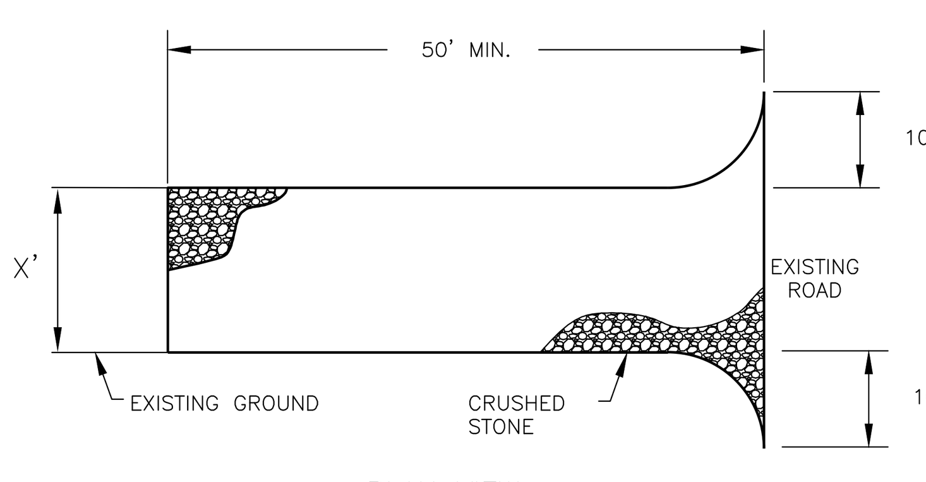
NOTES:

1. CONSTRUCTION STAGING ARE TO BE 9" GRAVEL COURSE, WELL GRADED, WELL COMPACTED, TO CONFORM TO NYS DOT ITEM NO. 304.05 TYPE. MIN. COMPACTION 95% MODIFIED PROCTOR OR 9" CRUSHED STONE COURSE, WELL GRADED WELL COMPACTED, TO CONFORM TO NYS DOT ITEM NO. 304.03 TYPE 2 MIN. COMPACTION 95% MODIFIED PROCTOR
2. SUBGRADE MUST BE PROOF–ROLLED PRIOR TO PLACEMENT OF CRUSHED STONE.
3. WELL COMPACTED SUBGRADE MIN. COMPACTION 90% MODIFIED PROCTOR
4. WOVEN CONSTRUCTION FABRIC TO BE A.O.B.E. PROPEX GEOTEXT 315ST OR EQUAL
5. TEMPORARY STAGING AREA TO BE INSTALLED WITHOUT DISTURBANCE TO EXISTING GROUND

3 C-404 TEMPORARY STAGING AREA

NOT TO SCALE

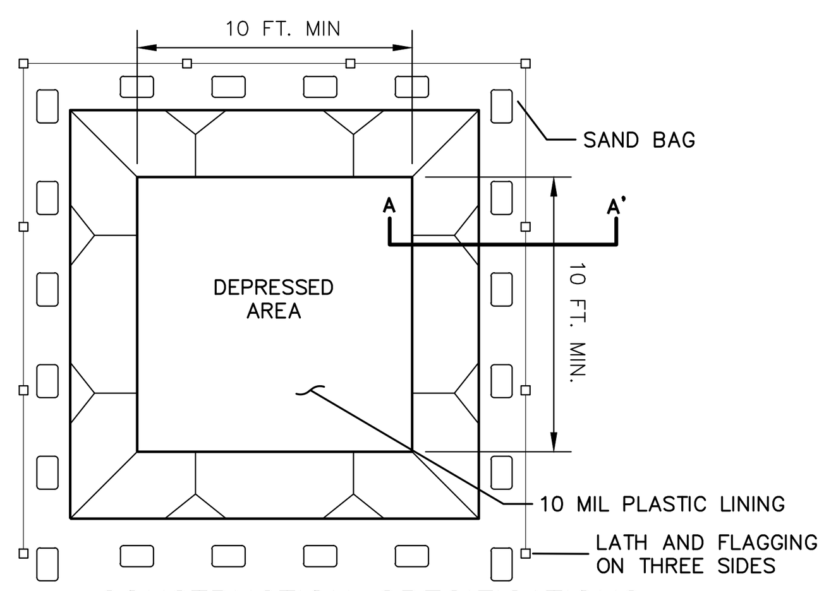


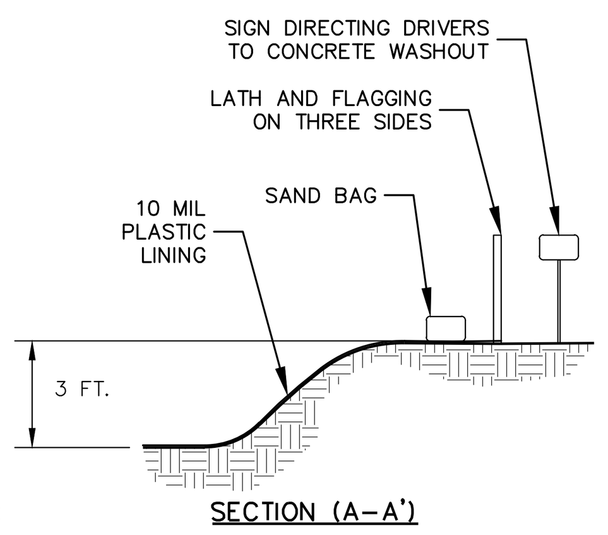


1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE PROPOSED ENTRANCE.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARDS THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE SURFACE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING ROAD. THIS MANY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO EXISTING ROAD SHALL BE REMOVED IMMEDIATELY.

4 C-404 STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE





CONSTRUCTION SPECIFICATIONS

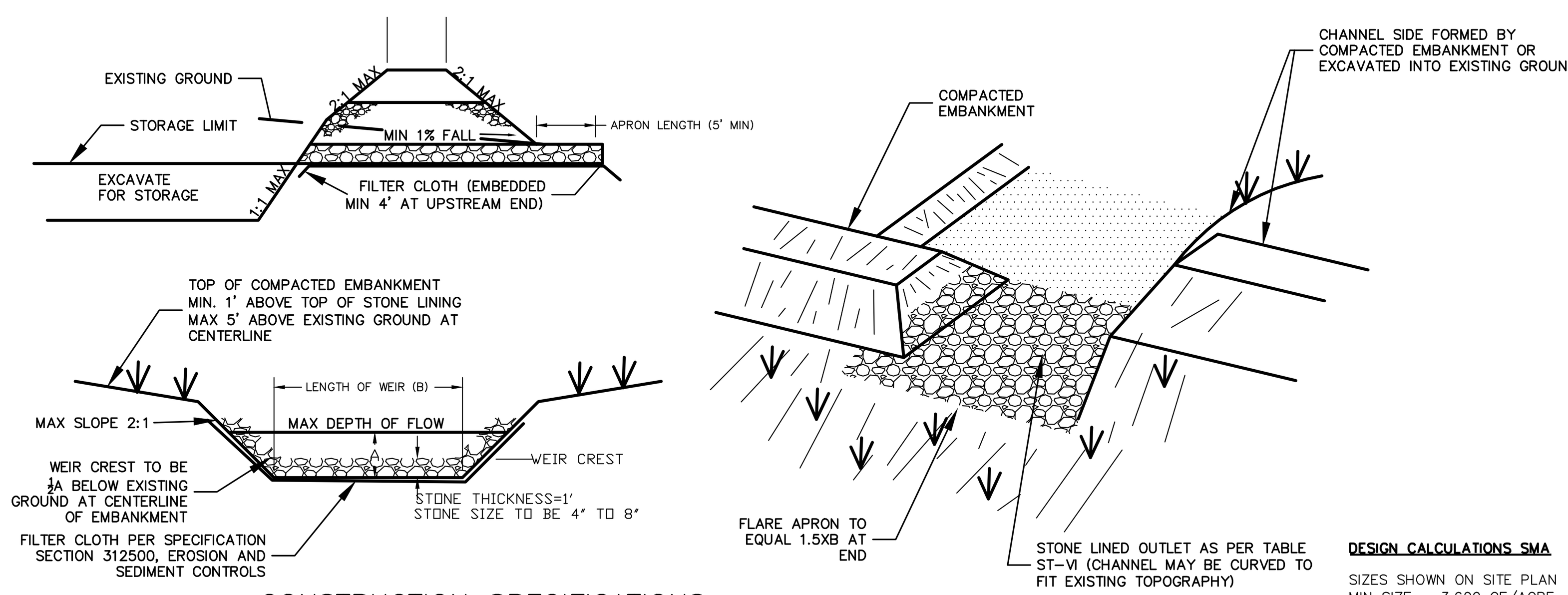
1. CONCRETE WASHOUT FACILITY SHALL BE LOCATED A MINIMUM OF FIFTY FEET (50') FROM SENSITIVE AREAS.
2. THE BASIN DIMENSIONS DEPICTED ABOVE ARE REQUIRED MINIMUMS. CONCRETE WASHOUT FACILITY SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE ENERATED BY WASHOUT OPERATIONS. (APPROXIMATELY 60 GALLONS OF WASTE AND WATER PER TRUCK).
3. PLASTIC LINING MATERIAL SHALL BE A MINIMUM 10 MIN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.
4. WASHOUT FACILITY MUST BE CLEANED, OR NEW FACILITES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75% FULL.

MAINTENANCE AND CLEANING

1. DO NOT DISCHARGE LIQUID OR SLURRY TO WATERWAYS, STORM DRAINS OR DIRECTLY ONTO GROUND
2. DO NOT USE SANITARY SEWER WITHOUT LOCAL APPROVAL.
3. PLACE A SECURE NON COLLAPSING, NON–WATER COLLECTING COVER OVER THE FACILITY PRIOR TO PREDICTED WET WEATHER TO PREVENT ACCUMULATION AND OVERFLOW.
4. REMOVE AND DISPOSE OF HARDEN CONCRETE AND RETURN THE STRUCTURE TO A FUNCTIONAL STATE.
5. INSPECT THE WASHOUT FACILITY FOR SIGNS OF WEAKENING OR DAMAGE AND REPAIR AS NESSESARY(RELINE THE STRUCTURE WITH NEW POLY SHEETING AFTER EACH CLEANING).

5 C-404 CONCRETE WASHOUT FACILITY

NOT TO SCALE



DESIGN CALCULATIONS SMA

SIZES SHOWN ON SITE PLAN
MIN SIZE = 3,600 CF/ACRE

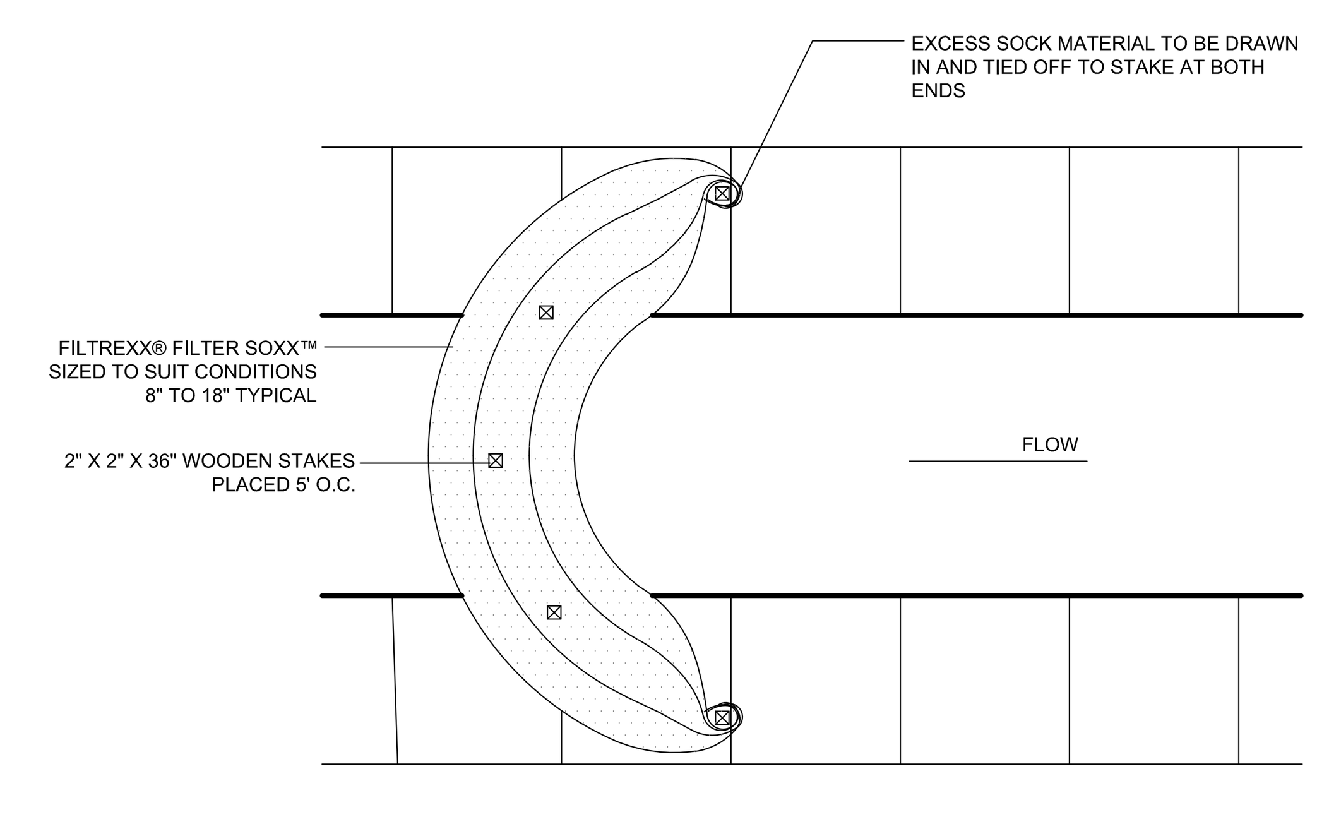
CONTRIBUTING AREA (ACRES)	DEPTH OF CHANNEL (A) (FT)	LENGTH OF WEIR (B) (FT)
1	1.5	4.0
2	1.5	5.0
3	1.5	6.0
4	1.5	10.0
5	1.5	12.0
6	1.5	14.0
7	1.5	16.0
8	2.0	10.0
9	2.0	10.0
10	2.0	12.0

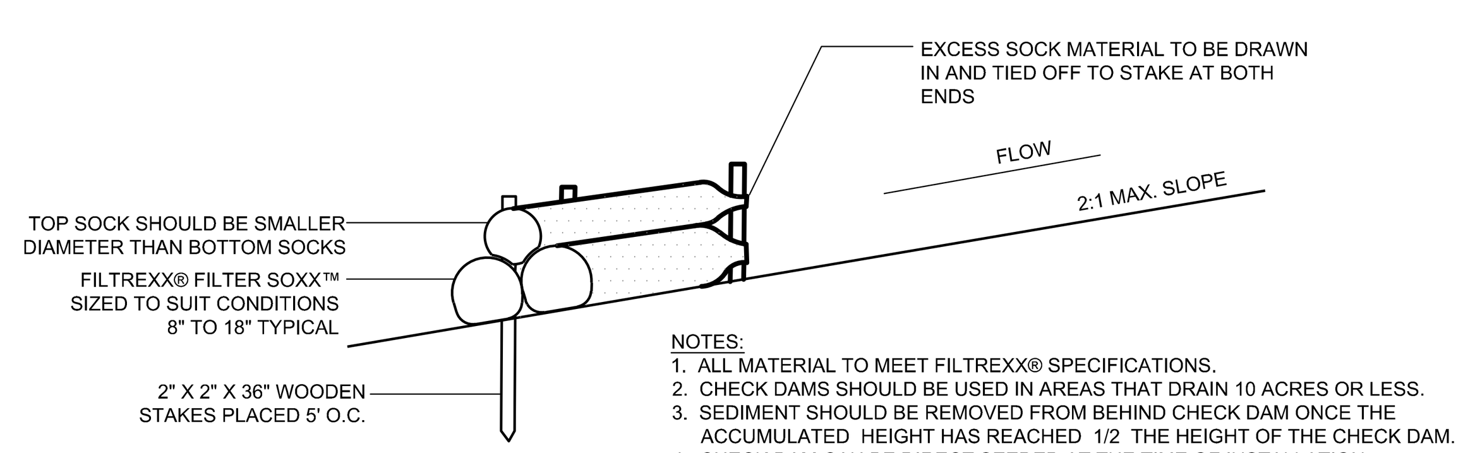
CONSTRUCTION SPECIFICATIONS

1. THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER–SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF EMBANKMENT SHALL BE 5 FEET, MEASURED AT CENTERLINE OF EMBANKMENT.
3. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER, CUT SLOPES 1:1 OR FLATTER
4. EXCAVATION OF THE TOP OF ANY DIKE DIRECTING WATER INTO TRAP MUST EQUAL OR EXCEED THE HEIGHT OF THE EMBANKMENT
5. STORAGE AREA PROVIDED SHALL BE FIGURED BY COMPUTING THE VOLUME AVAILABLE BEHIND THE OUTLET CHANNEL UP TO AN ELEVATION OF ONE (1) FOOT BELOW THE LEVEL WEIR CREST
6. FILTER CLOTH SHALL BE PLACED OVER THE BOTTOM AND SIDES OF THE OUTLET CHANNEL PRIOR TO TO PLACEMENT IN STONE. SECTIONS OF FABRIC MUST OVERLAP AT LEAST 1 FOOT WITH SECTION NEAREST THE ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST 6 INCHES INTO EXISTING GROUND AT ENTRANCE OUTLET CHANNEL.S
7. STONE USED IN THE OUTLET CHANNEL SHALL BE 4 TO 8 INCH RIP–RAP. TO PROVIDE A FILTERING EFFECT, A LAYER OF FILTER CLOTH SHALL BE EMBEDDED 1 FOOT WITH SECTION NEAREST ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST 6 INCHES INTO EXISTING GROUND AT ENTRANCE OUTLET CHANNEL.
8. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO ½ THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER IT WILL NOT ERODE.
9. THE STRUCTURE SHALL BE REPAIRED AFTER EACH RAIN AND REPAIRED AS NEEDED
10. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER EROSION AND WATER POLLUTION ARE MINIMIZED
11. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN DRAINAGE AREA HAS BEEN PROPERLY STABILIZED
12. DRAINAGE FOR THIS AREA IS LIMITED TO 15 ACRES OR LESS.
13. IF LOCATED IN THE SAME LOCATION AS A PROPOSED INFILTRATION BASIN THE BOTTOM OF THE SEDIMENT SHALL BE A MINIMUM OF 1' ABOVE THE BOTTOM OF THE PROPOSED INFILTRATION BASIN.

6 C-404 STONE OUTLET SEDIMENT TRAP

NOT TO SCALE





NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. CHECK DAMS SHOULD BE USED IN AREAS THAT DRAIN 10 ACRES OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED 1/2 THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED INSTALLER.

7 C-404 FILTER SOCK CHECK DAM

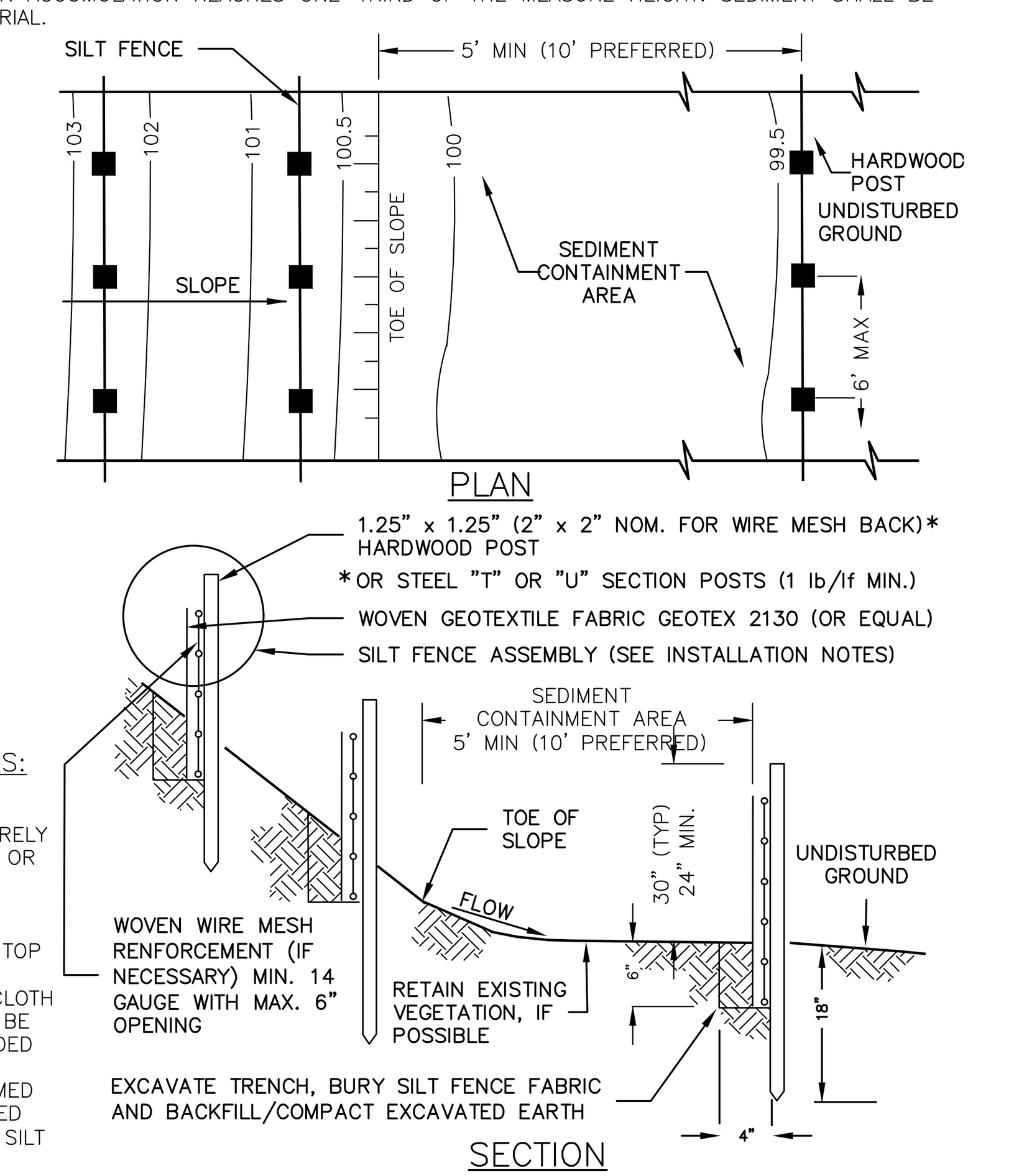
NOT TO SCALE

SILT FENCE GENERAL NOTES:

1. SILT FENCE SHALL BE PLACED A MINIMUM OF 5 FT. FROM TOE OF SLOPE, 10 FT. PREFERRED, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OF SEDIMENT CONTAINMENT AREA.
2. POSTS MAY BE 1.25"x1.25" (MINIMUM) HARDWOOD, TYPICALLY. FOR WIRE MESH BACK USE 2"x2" NOM. HARDWOOD, OR STEEL "T" OR "U" POSTS (1lb per lf). SILT FENCE SHALL BE WOVEN GEOTEXTILE FABRIC(GEOTEX 2130 OR EQUAL).
3. SILT FENCE ASSEMBLIES MAY HAVE 4 FT. OR 6 FT. POST SPACING, AND MAY OR MAY NOT HAVE MESH REINFORCEMENT. SENSITIVE AREAS TO BE PROTECTED MAY NEED TO BE REINFORCED BY USING HEAVY WIRE FENCING FOR ADDED SUPPORT TO PREVENT COLLAPSE.
4. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 6" BELOW GROUND. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSTREAM SIDE OF THE FABRIC.
5. MAXIMUM ALLOWABLE SLOPE LENGTHS CONTRIBUTING RUNOFF TO A SILT FENCE PLACED ON A SLOPE ARE:

SLOPE STEEPNESS	MAXIMUM SLOPE LENGTH /FENCE LENGTH (ft.)
<2%	300/1500
2–10%	125/1000
10–20%	100/750
20–33%	60/500
33–50%	40/250
>50%	20/125

6. MAXIMUM DRAINAGE AREA FOR OVERLAND FLOW TO A SILT FENCE SHALL NOT EXCEED ¼ ACRE PER 100 FEET OF FENCE, WITH MAXIMUM PONDING DEPTH OF 1.5 FEET BEHIND THE FENCE; AND EROSION WOULD OCCUR IN THE FORM OF SHEET EROSION; AND THERE IS NO CONCENTRATION OF WATER FLOWING TO THE BARRIER.
7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS, AFTER EACH RAINFALL OF .5" OR MORE WITHIN A 12 HOUR PERIOD, OR DAILY DURING PROLONGED RAINFALL. MEASURES SHALL BE CLEANED AND REPAIRED AS REQUIRED.
8. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE–THIRD OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.



SILT FENCE INSTALLATION NOTES:

1. GEOTEXTILE FABRIC AND WOVEN WIREMESH TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACES EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED.
4. MAINTENANCE SHALL BE PERFFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

EROSION AND SEDIMENT CONTROL AND STABILIZATION MEASURES, MAINTENANCE AND INSPECTION PRACTICES:

1. THE FOLLOWING IS A LIST OF EROSION AND SEDIMENT CONTROLS TO BE USED ON THIS SITE DURING CONSTRUCTION:

A. STABILIZATION PRACTICES FOR THIS SITE INCLUDE:
- LAND CLEARING ACTIVITIES SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED AND SHALL PROGRESS AS EARTHWORK IS NEEDED
- WATERING OF EXCAVATION AND FILL AREAS TO MINIMIZE WIND EROSION DURING CONSTRUCTION AS NEEDED.
- USE OF STABILIZATION FABRIC FOR ALL SLOPES HAVING A SLOPE OF 1V:2H OR GREATER AND FILL SLOPES 1V:3H OR GREATER.
- PERMANENT SEEDING AND PLANTING OF ALL UNPAVED AREAS USING THE HYDROMULCHING GRASS SEEDING TECHNIQUE.

B. STRUCTURAL PRACTICES FOR THIS SITE INCLUDE:
- PERIMETER PROTECTION USING COMPOST FILTER SOCKS
- STABILIZED CONSTRUCTION EXIT POINTS
- SEDIMENT TRAPS OR FILTER SOCKS
- CHECK DAMS

2. THE FOLLOWING INSPECTION AND MAINTENANCE PRACTICES WILL BE USED TO MAINTAIN EROSION AND SEDIMENT CONTROLS AND STABILIZATION MEASURES.

A. ALL CONTROL MEASURES WILL BE INSPECTED ONCE EVERY SEVEN (7) DAYS BY A QUALIFIED INSPECTOR AS DESCRIBED IN PART IV, SECTION C OF THE SPDES PERMIT FOR CONSTRUCTION ACTIVITY NO. GP–0–20–001. SITES THAT HAVE A WAIVER TO DISTURB GREATER THAN FIVE (5) ACRES REQUIRE (2) INSPECTIONS EVERY SEVEN (7) DAYS WITH AT LEAST TWO (2) DAYS BETWEEN INSPECTIONS.
B. DISTURBED AREAS SHALL BE STABILIZED AS SOON AS PRACTICAL AFTER CONSTRUCTION ACTIVITIES HAVE CONCLUDED IN AN AREA. ALL BARE AREAS AND AREAS SUBJECT TO EROSION SHALL BE BLANKETED OR SEEDED AND MULCHED WITHIN 7 DAYS WITH TEMPORARY EROSION CONTROL SEEDING.
C. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER; IF REPAIRS ARE FOUND TO BE NECESSARY, THEY WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
D. BUILT UP SEDIMENT WILL BE REMOVED FROM FILTER SOCKS WHEN IT HAS REACHED ONE–HALF THE HEIGHT OF THE SOCK. AN ADDITIONAL FILTER SOCK MAY BE INSTALLED ON TOP OF THE ORIGINAL TO INCREASE SEDIMENT STORAGE CAPACITY/PREVENT SEDIMENT DISTURBANCE.
E. FILTER SOCKS WILL BE INSPECTED FOR DEPTH OF SEDIMENT, DISLODGEMENT, BREAKS, TEARS, ETC. DAMAGED OR DISLODGED FILTER SOCKS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.
F. TEMPORARY AND PERMANENT SEEDING AND ALL OTHER STABILIZATION MEASURES WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
G. SEDIMENT BASINS WILL BE INSPECTED FOR DEPTH OF SEDIMENT. BUILT UP SEDIMENT WILL BE REMOVED WHEN IT REACHES 50 PERCENT OF THE CAPACITY.
H. CHECK DAMS WILL BE INSPECTED FOR DEPTH OF SEDIMENT, WASHOUT, ETC. BUILT UP SEDIMENT WILL BE REMOVED FROM THE CHECK DAM WHEN IT REACHES ONE–THIRD OF THE HEIGHT OF THE CHECK DAM.
I. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION. COPIES OF THE REPORT FORMS TO BE COMPLETED BY THE INSPECTOR ARE INCLUDED IN THIS SWPPP. UPON COMPLETION, COPIES OF THE REPORTS SHALL BE SUBMITTED TO THE TOWN.
J. THE JOB SITE SUPERINTENDENT WILL BE RESPONSIBLE FOR SELECTING AND TRAINING THE INDIVIDUALS WHO WILL BE RESPONSIBLE FOR THESE INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES, AND FILLING OUT INSPECTION AND MAINTENANCE REPORTS. ALL PERSONNEL PERFORMING INSPECTIONS MUST MEET THE REQUIREMENTS DESCRIBED IN PART IV, SECTION C OF THE SPDES PERMIT FOR CONSTRUCTION ACTIVITY NO. GP–0–20–001.
K. PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES WILL RECEIVE APPROPRIATE INSTRUCTION FROM THE JOB SITE SUPERINTENDENT. THEY WILL BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS THAT ARE USED ONSITE IN GOOD WORKING ORDER. THEY WILL ALSO BE TRAINED IN THE COMPLETION OF, INITIATION OF ACTIONS REQUIRED BY, AND THE FILING OF THE INSPECTION FORMS. DOCUMENTATION OF THIS PERSONNEL TRAINING WILL BE KEPT ON SITE WITH THE SWPPP. ALL PERSONNEL PERFORMING INSPECTIONS MUST MEET THE REQUIREMENTS DESCRIBED IN PART IV, SECTION C OF THE SPDES PERMIT FOR CONSTRUCTION ACTIVITY NO. GP–0–20–001.
L. DISTURBED AREAS AND MATERIAL STORAGE AREAS WILL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING STORMWATER SYSTEMS.
M. REPORT TO THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION WITHIN 24 HOURS ANY NONCOMPLIANCE WITH THE SWPPP THAT WILL ENDANGER PUBLIC HEALTH OR THE ENVIRONMENT. FOLLOW UP WITH A WRITTEN REPORT WITHIN 5 DAYS OF THE NONCOMPLIANCE EVENT.
N. NECESSARY MEASURES SHALL BE TAKEN TO CONTAIN ANY FUEL OR POLLUTION RUNOFF. NO RE–FUELING SHALL BE OCCUR WITHIN 100 FEET OF ANY WETLAND RESOURCE AREA AND 200 FEET FROM RIVERFRONT. LEAKING EQUIPMENT OR SUPPLIES SHALL IMEEDIATELY BE REPAIRED OR EMOVED FROM THE SITE.
O. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DUST FROM FORMING.

ADDITIONAL EROSION CONTROL AND GRADING NOTES:

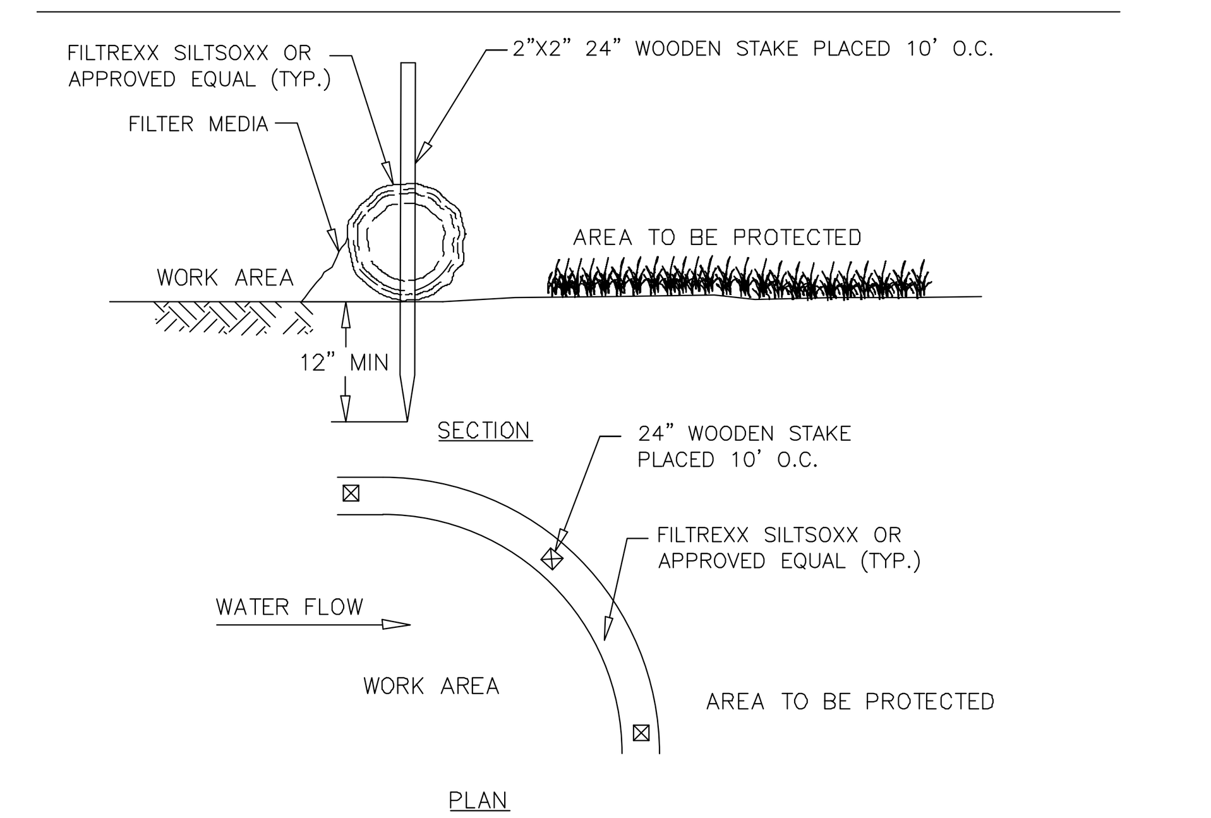
1. MINIMAL EROSION CONTROL DEVICES ARE ILLUSTRATED ON SITE PLAN IN A SCHEMATIC MANNER BASED ON NY STATE GUIDELINES FOR EROSION AND SEDIMENT CONTROL. IT WILL BE NECESSARY TO ADJUST THE ACTUAL LOCATION AND QUANTITY OF EROSION CONTROL DEVICES DEPENDING UPON FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THESE MEASURES AS REQUIRED TO PROTECT THE SITE.
2. SLOPES SHALL TYPICALLY BE GRADED AT A MAXIMUM OF 3:1 (3 HORIZ. 1 VERT.) WITHIN ALL CUT OR FILL AREAS, UNLESS OTHERWISE DESIGNATED ON PLANS.
3. TEMPORARY SEED SHALL BE A COMMERCIALLY AVAILABLE MIXTURE OF PERENNIAL RYE AND UTILITY GRADE FESCUE. PERCENTAGE OF PERENNIAL RYE SHALL NOT EXCEED 50%. PERMANENT SEED SHALL BE AS SPECIFIED ON THE PLANTING PLANS.
4. SEEDED AREAS SHALL BE FULLY COVERED WITH A LEAN STRAW OR MULCH MATERIAL. IF ORDERED BY THE ENGINEER OR MUNICIPALITY, A BIODEGRADABLE NETTING (E.G., EXCELSIOR BLANKET, COIR GEOTEXTILE) SHALL BE ANCHORED OVER SEEDED AREAS WHICH DEMONSTRATE "RILLING" OR OTHER EROSION PROCESSES.
5. TOPSOIL AND SEED SHALL BE REAPPLIED TO ANY AREAS WHICH FAIL TO ESTABLISH AS A RESULT OF INITIAL APPLICATION.
6. FILTER SOCK BARRIERS SHALL BE PLACED WITHIN ALL AREAS OF EXPOSED SLOPES TO CONTROL SOIL EROSION DURING AND AFTER CONSTRUCTION.
7. EROSION CONTROL (ERO–MAT), GEOTEXTILE FABRIC, COMPOST BLANKET, RIPRAP, OR APPROVED EQUAL, SHALL BE INSTALLED ON ALL 6H:1V SLOPES: AN ORGANIC FIBER PROTECTIVE MAT, HALF INCH LAYER OF CHOPPED STRAW, KNITTED INTO A RUGGED MAT WITH A THIN NETTING OF PHOTODEGRADABLE POLYPROPYLENE. SECURE MAT TO SLOPE WITH 6" STEEL U–SHAPED STABLES, 2 STAPLES PER SQUARE YARD, OR AS PER MANUFACTURER'S INSTRUCTIONS.
8. PRIOR TO SEEDING, ACCESS AISLES, TEMPORARY STAGING AREAS, STORAGE, AND PARKING AREAS TO BE DECOMPACTED AND RELOAMED.
9. SEDIMENT BARRIERS SHALL BE CONSTRUCTED AROUND ALL SOIL STOCKPILE AREAS.
10. STREAM REACHES ON–SITE AND DOWNSTREAM OF CONSTRUCTION SHALL NOT HAVE SUBSTANTIAL VISIBLE CONTRAST RELATIVE TO COLOR, TASTE, ODOR, TURBIDITY AND SEDIMENT DEPOSITION FROM THE REACHES UPSTREAM OF THE CONSTRUCTION ACTIVITY.
11. VEHICULAR ACCESS POINTS SHALL BE MONITORED AND INSPECTED AT THE SAME FREQUENCY AS EROSION CONTROL FEATURES TO INSURE THAT DEPOSITS OF SAND, SILT OR OTHER MATERIAL IS NOT BEING DEPOSITED ON PUBLIC ROADWAYS. IN THE EVENT ANY SIGNIFICANT DEPOSITS OCCUR THEY SHALL BE CLEANED UP IMMEDIATELY.
12. A SPDES PERMIT SHALL BE IN PLACE PRIOR TO COMMENCING ANY GROUND DISTURBANCE.
13. PROJECT DRAINAGE FEATURES TO BE CLEANED OUT AFTER COMPLETION OF CONSTRUCTION.

SEQUENCE OF CONSTRUCTION ACTIVITIES:

1. SITE TO BE MOBILIZED. FIELD DELINEATION OF THE LIMITS OF DISTURBANCE FOR EACH PHASE ON THE PHASING PLAN AND THE OVERALL LIMITS OF DISTURBANCE. REFERENCE PHASING PLANS FOR FURTHER CONSTRUCTION SEQUENCING AS NEEDED.
2. EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED IN CONJUNCTION WITH ANY BRUSH OR TREE CLEARING REQUIRED. NOTE: EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH SHEETS C–400, C–401, C–402, AND C–403 AND ASSOCIATED DETAILS AS WELL AS NYS DEC CONSTRUCTION GENERAL PERMIT #GP–0–20–001. IN ANY INSTANCE THAT A CONFLICT BETWEEN THESE TWO GUIDELINES IS PRESENT, THE MORE CONSERVATIVE GUIDELINE TAKES PRECEDENT.
3. CLEARING AND GRUBBING OPERATIONS CREW SHALL CHIP AND MULCH DIRECTLY BEHIND OPERATION TO MAKE SURE NO AREAS ABOVE FIVE ACRES SHALL BE DISTURBED AT ANY TIME. NO MORE THAN FIVE ACRES SHALL BE DISTURBED AT ANY ONE TIME WITHOUT PRIOR APPROVAL FROM NYSDEC.
4. INSTALLATION OF ACCESS ROAD TO COMMENCE. NOTE: ANY AREAS OF DISTURBANCE SHALL BE STABILIZED WITH TEMPORARY SEEDING PER THE REQUIRED TIMELINES AS PER NYS DEC CONSTRUCTION GENERAL PERMIT #GP–0–20–001.
5. MV TRENCHES AND FOUNDATIONS INSTALLATION IN CONJUNCTION WITH THE PLACEMENT OF CONCRETE FOUNDATIONS FOR THE ELECTRICAL EQUIPMENT PADS TO COMMENNCE.
6. WATERING OF THE EXCAVATION AND FILL AREAS SHALL BE DONE TO MINIMIZE WIND EROSION AS NEEDED THROUGHOUT CONSTRUCTION.
7. AS OVERLAND FLOW DISPERSION DEVICES ARE INSTALLED COMPOST FILTER SOCKS SHALL BE PLACED UP–GRADE AS SHOWN ON SHEETS C–400, C–401, C–402, AND C–403.
8. RACKING, TABLES, MODULES, INVERTERS AND ELECTRICAL EQUIPMENT INSTALLATION TO COMMENCE.
9. REMOVE LAYDOWN AREA, SPREAD GRAVEL ON ROADWAY, AND SEED AREAS. CONSTRUCT PERVIOUS MAINTENANCE ACCESS ROAD.
10. FINAL SITE STABILIZATION TO COMMENCE.
11. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE REMOVED ONCE 80% VEGETATIVE COVER HAS BEEN ACHIEVED. REMOVE FILTER SOCKS, STABILIZED CONSTRUCTION ENTRANCES, AND OTHER TEMPORARY EROSION AND SEDIMENT CONTROLS. ANY RESULTING AREAS OF DISTURBANCE FROM SAID REMOVAL TO BE SEEDED PRIOR TO DEMOBILIZATION.
12. SITE TO BE DEMOBILIZED.

SOIL RESTORATION:

AS PER CHAPTER 5 OF THE NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL, SOIL RESTORATION IS REQUIRED ON THIS SITE IN ALL NON–IMPERVIOUS AREAS ONCE FINAL SUBGRADE ELEVATION IS ACHIEVED. IN AREAS OF CUT OR FILL THE SOILS SHALL BE AERATED AND 6 INCHES OF TOPSOIL SHALL BE APPLIED. IN AREAS OF HEAVY CONSTRUCTION TRAFFIC (ESPECIALLY IN AREAS 5 TO 25 FEET FROM BUILDING, BUT NOT WITHIN 5 FEET OF FOUNDATION WALLS) FULL SOIL RESTORATION PER NYSDEC DEEP–RIPPING AND DECOMPACTION GUIDANCE APRIL 2008 SHALL BE APPLIED.



1. FILTER SOCK SHALL BE 12" DIAMETER MIN.
2. SOCKS TO BE FILLED WITH BIODEGRADABLE COMPOST MATERIAL.

DIA	SLOPE %						
	2	5	10	20	25	33	50
12"	250*	225	125	65	50	40	25

9 C-404 12 IN. FILTER SOCK

NOT TO SCALE

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nexamp
101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

edp ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
900 Route 146 Clifton Park, New York 12065
(518) 371-7621 edpllp.com

Rev	Issued For	Date
A	PRELIM. PLAN SET	5/22/2023
B	INTERNAL COMMENTS	8/10/2023
C	INTERNAL COMMENTS	9/15/2023
D	ACCESS ROAD REVISIONS	10/27/2023
E	ACCESS ROAD REVISIONS	11/17/2023
F	INTERNAL REVISIONS	11/30/2023
G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant: STATE OF NEW YORK ★ STEPHANIE T ALESSANDRINI ★ 100887 ★ LICENSED PROFESSIONAL ENGINEER

Project: WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title: EROSION AND SEDIMENT CONTROL DETAILS

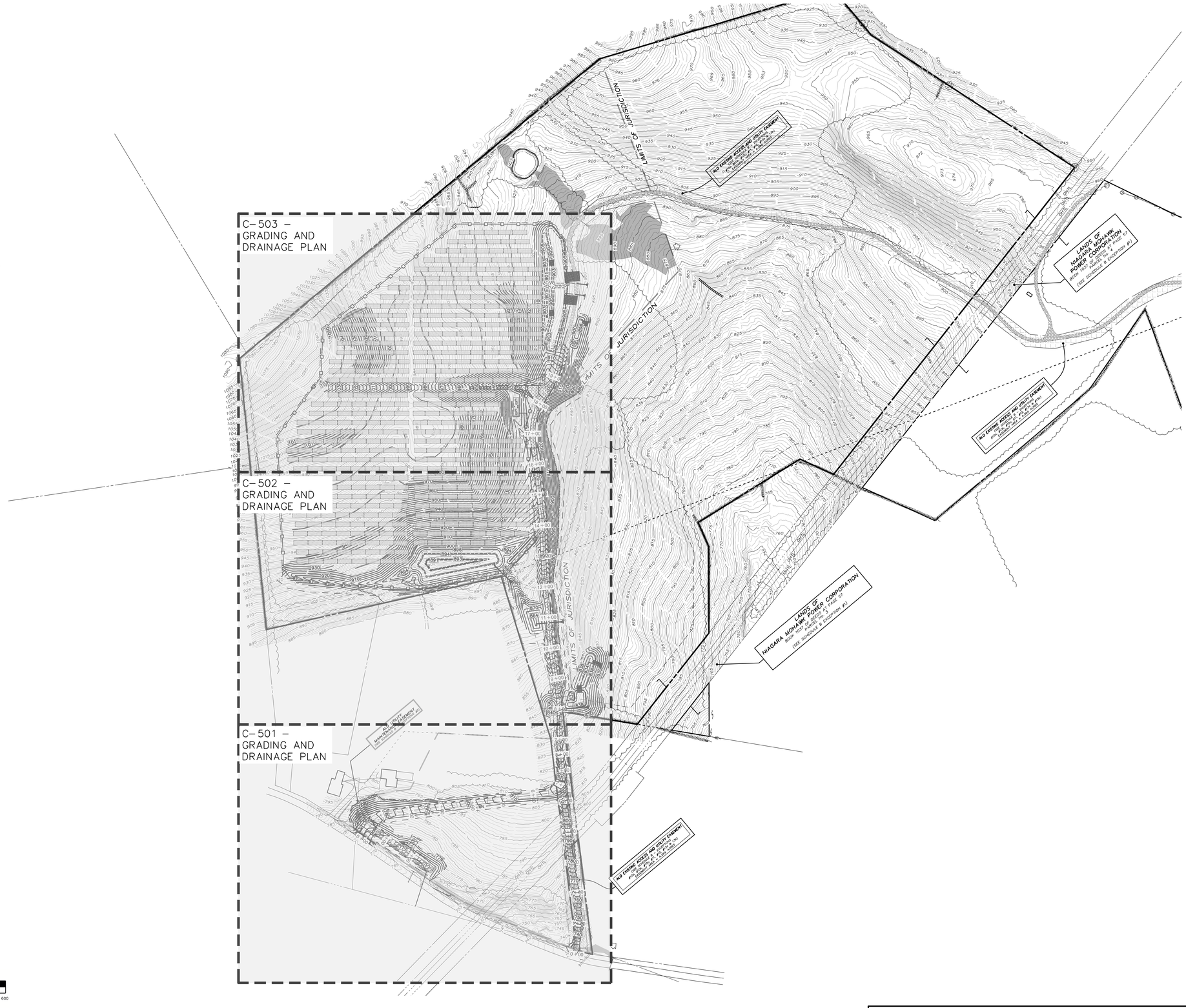
NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-404 Size: D Sheet Rev: G

DRAINAGE AND GRADING PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES EMERGENCY OVERFLOW WEIR — 4 / C-601
- PERVIOUS UTILITY ACCCESS ROAD — 5 / C-602
- DENOTES TEMPORARY IMPERVIOUS CONSTRUCTION ROAD — 2 / C-600
- DENOTES IMPERVIOUS MAINTENANCE ACCESS ROAD — 4 / C-602
- DENOTES FIXED KNOT FARM FENCE — 3 / C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 / C-601
- DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 5 / C-601
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 / C-601
- DENOTES PROPOSED 12" COMPOST FILTER SOCK — 9 / C-404
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 / C-602
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 / C-601



GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.

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Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.

900 Route 146 Clifton Park, New York 12065

(518) 371-7621 edp@c.com

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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE M. ALESSANDRINI * 28104 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

OVERALL GRADING AND DRAINAGE PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No:	Size: D	Sheet Rev:
C-500		G

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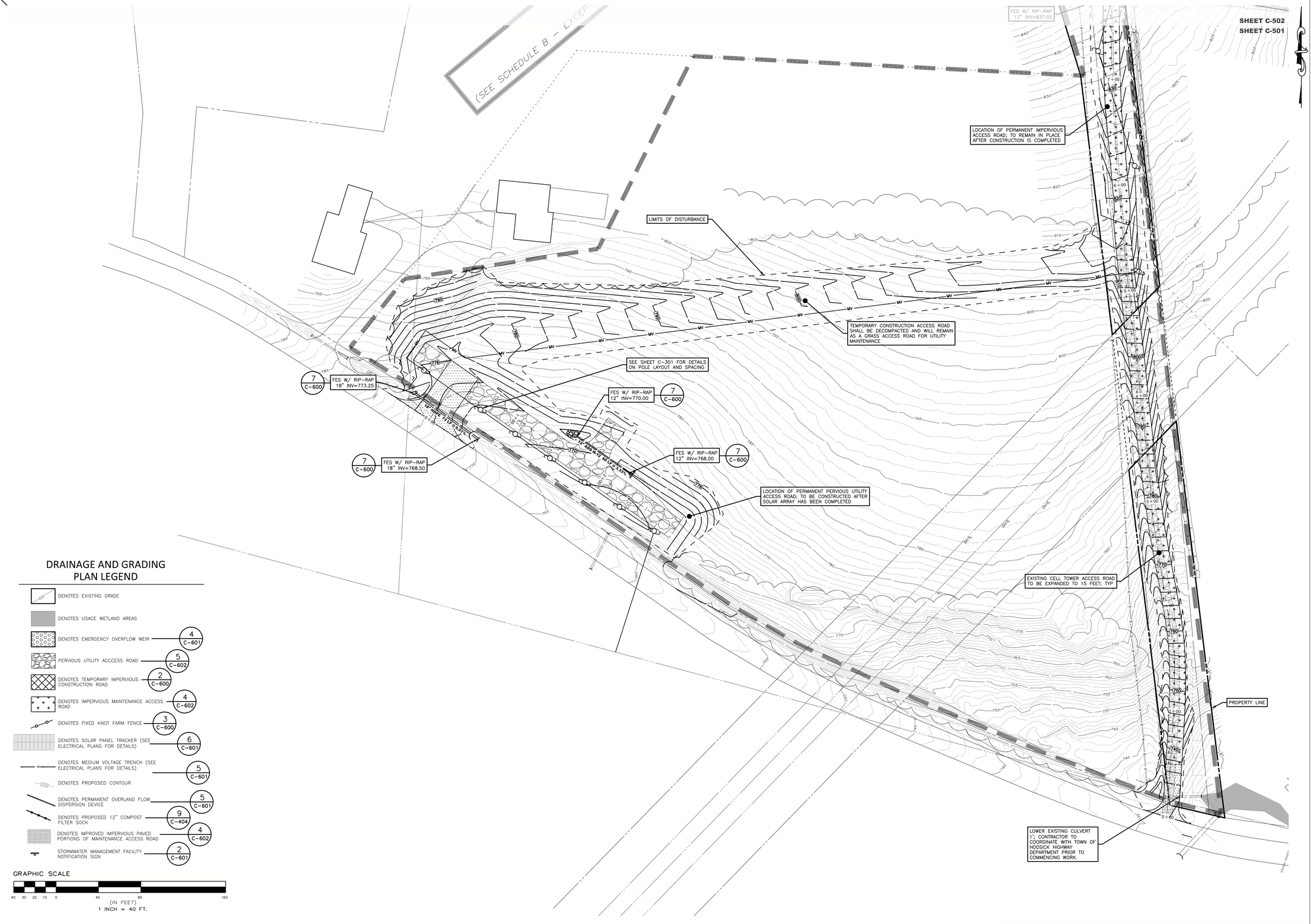

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101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
695 Rte. 146, Clifton Park, New York, 12065
(518) 371-4424 edpllp.com

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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE T. ALESSANDRINI * 118010 * LICENSED PROFESSIONAL ENGINEER

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
GRADING AND DRAINAGE PLAN

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SHEET C-503
SHEET C-502

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±475 LF

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±375 LF

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±572 LF

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±331 LF

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±352 LF

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±434 LF

PERMANENT POOL ELEVATION

SEDIMENT MARKER

SMA FOREBAY

FOREBAY OERFLOW AT 898.00'

POND OVERFLOW AT 898.75'

WET POND WITH LINER (P-1)

FOREBAY OVERFLOW AT 898.00'

5 C-600 OVERLAND FLOW DISPERSION DEVICE: ±132 LF

SMA FOREBAY

SEDIMENT MARKER

SMA ACCESS ROAD

12" HDPE 7 LF @ 1.43%

12" STAND PIPE
TOP PIPE = 896.10
3.0" VERT INV=894.00
12" INV OUT=894.00

OCS#1
TF=896.85
12" INV IN=893.90
18" INV OUT=893.90

7 C-600 FES W/ RIP-RAP 18" INV=892.00

3 C-600 8 FT HIGH PERIMETER FIXED KNOT FARM FENCE

PROPERTY LINE

LIMITS OF DISTURBANCE

SECTION OF ACCESS ROAD TO BE PAVED 4 C-602

STORMWATER ATTENUATION AREA

7 C-600 FES W/ RIP-RAP 18" INV=862.00

7 C-600 FES W/ RIP-RAP 18" INV=861.00

18" HDPE 79 LF @ 1.27%

7 C-600 FES W/ RIP-RAP 10" INV=833.00

SECTION OF ACCESS ROAD TO BE PAVED 4 C-602

PROPERTY LINE

7 C-600 FES W/ RIP-RAP 8" INV=835.00

10" ADS N-12 33 LF @ 2.73%

10" STAND PIPE
TOP PIPE = 836.00
2.0" VERT INV=834.00
10" INV OUT=833.90

8" HDPE 15 LF @ 1.40%

BIORETENTION AREA WITH LINER (B-4), TYP.

STORMWATER ATTENUATION AREA

SEDIMENT MARKER

STORMWATER ATTENUATION AREA

12" HDPE 100 LF @ 1.00%

7 C-600 FES W/ RIP-RAP 12" INV=838.00

7 C-600 FES W/ RIP-RAP 12" INV=837.00

SHEET C-502
SHEET C-501

DRAINAGE AND GRADING PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES EMERGENCY OVERFLOW WEIR — 4 C-601
- DENOTES PERVIOUS UTILITY ACCCESS ROAD — 5 C-602
- DENOTES TEMPORARY IMPERVIOUS CONSTRUCTION ROAD — 2 C-600
- DENOTES IMPERVIOUS MAINTENANCE ACCESS ROAD — 4 C-602
- DENOTES FIXED KNOT FARM FENCE — 3 C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 C-601
- DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS) — 5 C-601
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE — 5 C-601
- DENOTES PROPOSED 12" COMPOST FILTER SOCK — 9 C-404
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 C-602
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 C-601

GRAPHIC SCALE
40 30 20 10 0 40 80 160
(IN FEET)
1 INCH = 40 FT.

FOR MUNICIPAL APPROVAL ONLY - NOT INTENDED FOR CONSTRUCTION

nexamp
101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
900 Route 146 Clifton Park, New York 12065
(518) 371-7621 edpllp.com

Rev	Issued For	Date
A	PRELIM. PLAN SET	5/22/2023
B	INTERNAL COMMENTS	8/10/2023
C	INTERNAL COMMENTS	9/15/2023
D	ACCESS ROAD REVISIONS	10/27/2023
E	ACCESS ROAD REVISIONS	11/17/2023
F	INTERNAL REVISIONS	11/30/2023
G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE J. ALESSANDRINI * 28104 * LICENSED PROFESSIONAL ENGINEER

Project: WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title: GRADING AND DRAINAGE PLAN
NOT FOR CONSTRUCTION
Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-502 Size: D Sheet Rev: G

DRAINAGE AND GRADING PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES EMERGENCY OVERFLOW WEIR — 4 / C-601
- PERVIOUS UTILITY ACCCESS ROAD — 5 / C-602
- DENOTES TEMPORARY IMPERVIOUS CONSTRUCTION ROAD — 2 / C-600
- DENOTES IMPERVIOUS MAINTENANCE ACCESS ROAD — 4 / C-602
- DENOTES FIXED KNOT FARM FENCE — 3 / C-600
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS) — 6 / C-601
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- DENOTES PROPOSED 12" COMPOST FILTER SOCK — 9 / C-404
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD — 4 / C-602
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN — 2 / C-601

GRAPHIC SCALE
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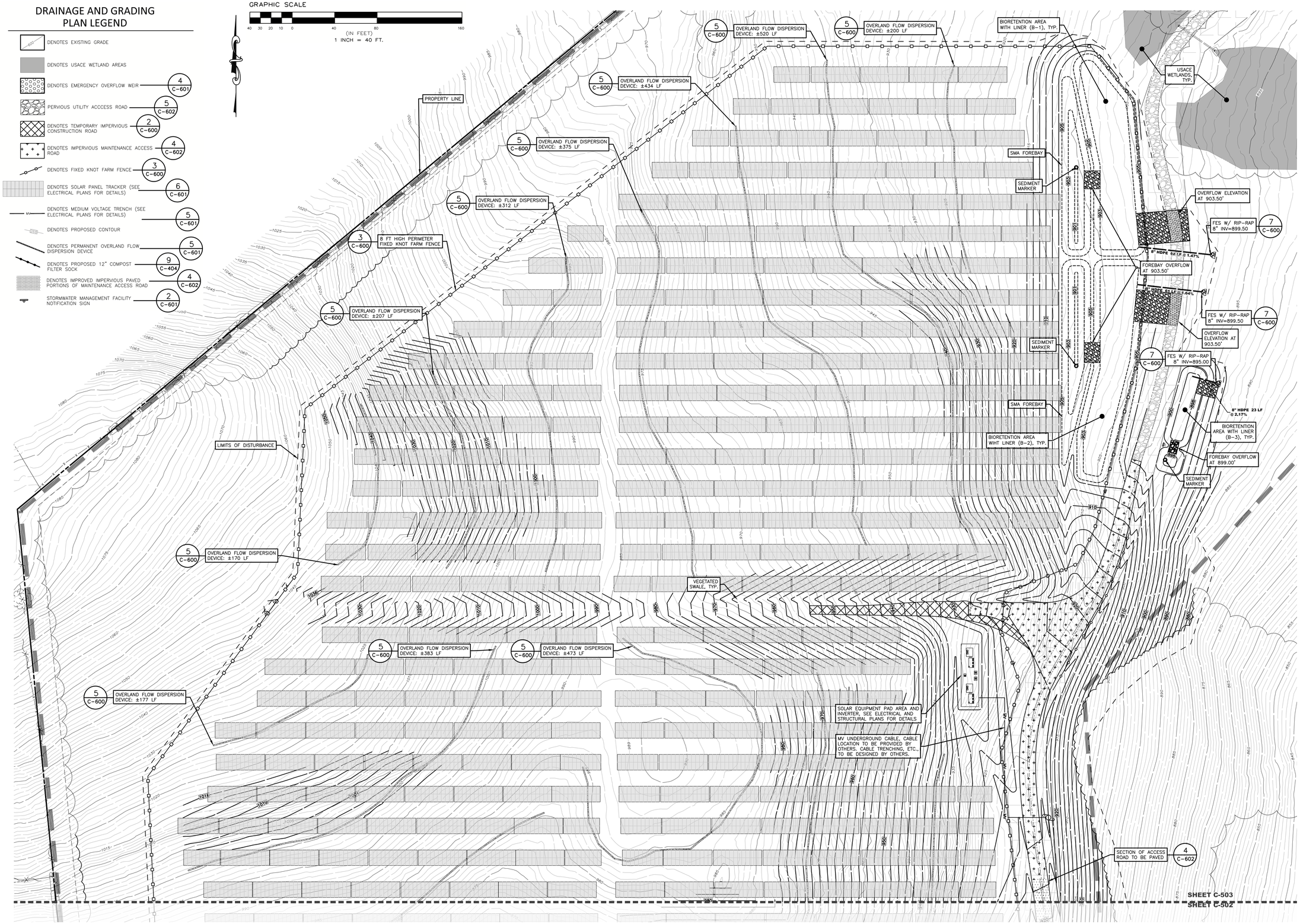
(IN FEET)
1 INCH = 40 FT.



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STATE OF NEW YORK * STEPHANIE T. ALESSANDRINI * 128104 * LICENSED PROFESSIONAL ENGINEER

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
GRADING AND DRAINAGE PLAN
NOT FOR CONSTRUCTION
Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-503 Size: D Sheet Rev: G

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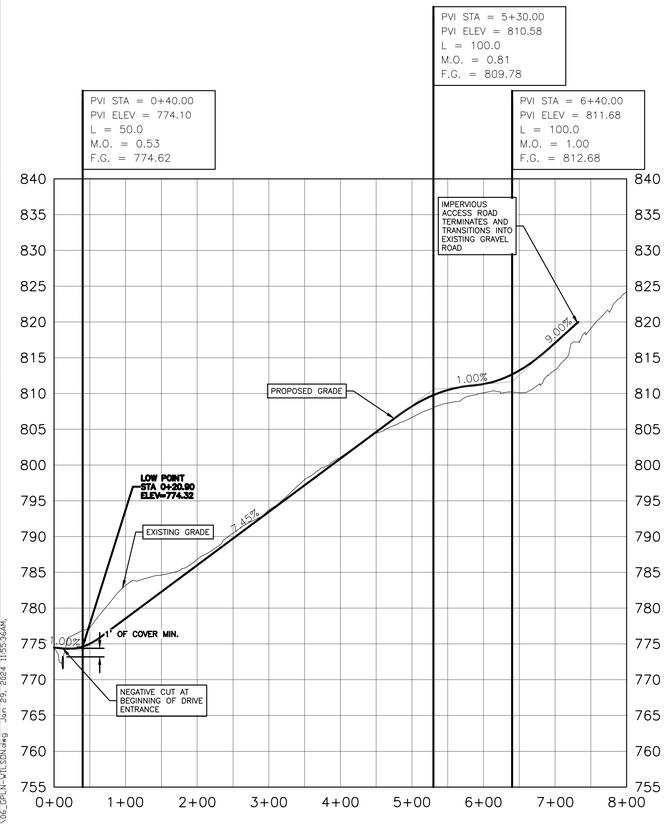
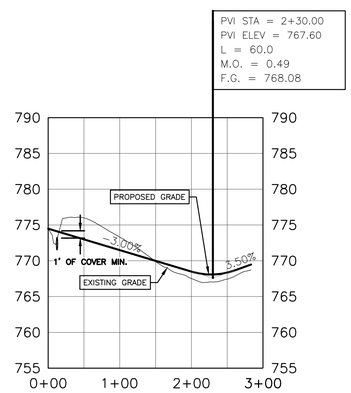


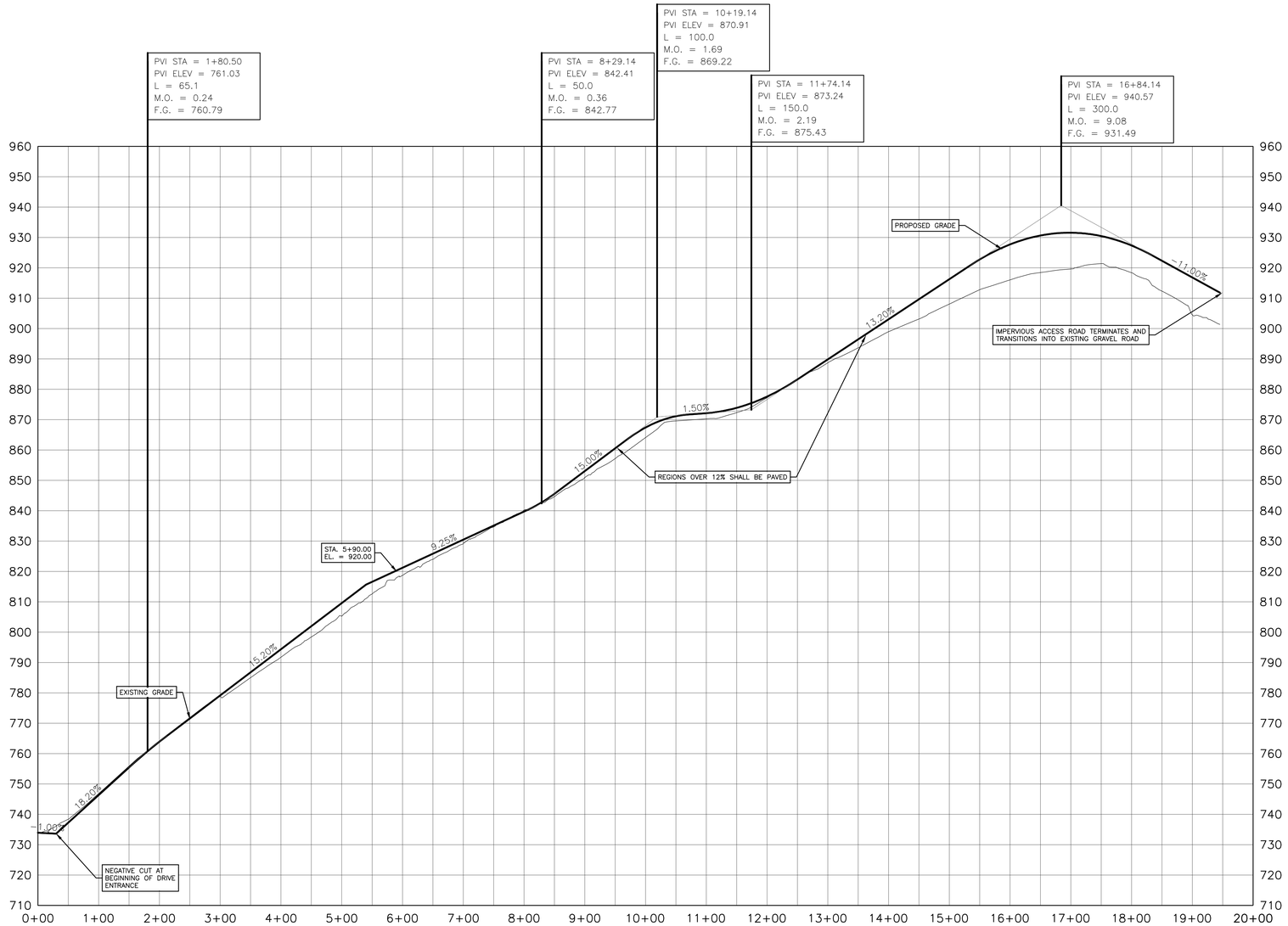
TEMPORARY CONSTRUCTION ACCESS ROAD PROFILE

SCALE: HORIZONTAL 1"=100' VERTICAL 1"=10' (STA 0+00 TO 8+00)



UTILITY ACCESS ROAD PROFILE

SCALE: HORIZONTAL 1"=100' VERTICAL 1"=10' (STA 0+00 TO 3+00)



EXISTING CELL TOWER/SOLAR MAINTENANCE ACCESS ROAD PROFILE

SCALE: HORIZONTAL 1"=100' VERTICAL 1"=20' (STA 0+00 TO 20+00)

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ep ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE T. ALESSANDRINI * 128010 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

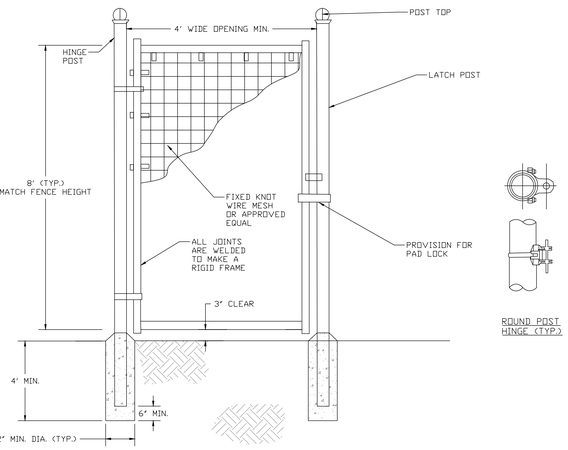
Drawing Title:

ACCESS ROAD PROFILES

NOT FOR CONSTRUCTION

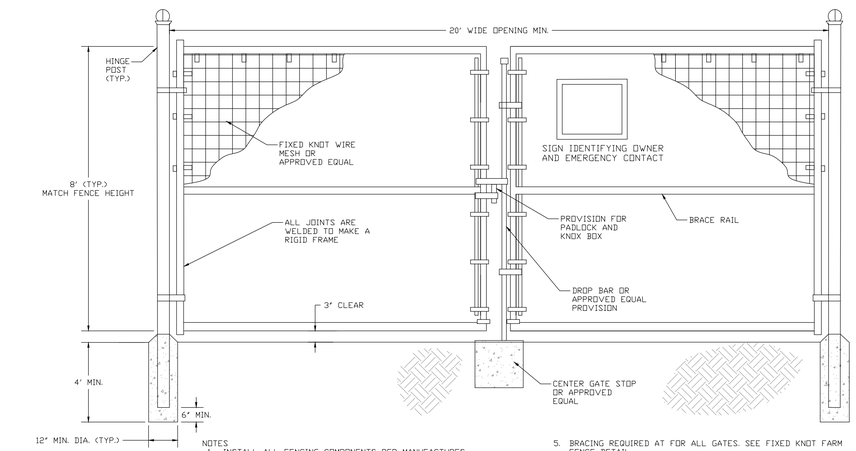
Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-504 Size: D Sheet Rev: G



NOTES
1. INSTALL ALL FENCING COMPONENTS PER MANUFACTURES SPECIFICATIONS.
2. ALL FENCING AND HARDWARE SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. HINGE POSTS MAY BE TIMBER IF CONTRACTOR DESIRES, TIMBER HINGE POSTS DO NOT NEED TO BE SET IN CONCRETE. UTILIZE HINGE THRU BOLTS TO CONNECT TO TIMBER HINGE POSTS OR LAG SCREWS, PER MANUFACTURERS RECOMMENDATIONS.
4. IF CONTRACTOR UTILIZES METAL HINGE POST THAN POSTS SHALL BE SET IN CONCRETE AS SHOWN ON DETAIL.
5. BRACING REQUIRED AT FOR ALL GATES. SEE FIXED KNOT FARM FENCE DETAIL.
6. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK^2 PRD, 12.5 GAUGE, CLASS 3 GALVANIZED, 6' VERTICAL SPACING OR APPROVED EQUAL
7. BRACE RAILS AND/ OR TRUSS RODS ARE NOT SHOWN, MAY BE REQUIRED PER MANUFACTURES RECOMMENDATIONS

1 C-600 FIXED KNOT FARM FENCE - PERSONNEL GATE
NOT TO SCALE



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4. IF CONTRACTOR UTILIZES METAL HINGE POST THAN POSTS SHALL BE SET IN CONCRETE AS SHOWN ON DETAIL.
5. BRACING REQUIRED AT FOR ALL GATES. SEE FIXED KNOT FARM FENCE DETAIL.
6. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK^2 PRD, 12.5 GAUGE, CLASS 3 GALVANIZED, 6' VERTICAL SPACING OR APPROVED EQUAL
7. BRACE RAIL SHOWN FOR REFERENCE ADDITIONAL BRACE RAILS MAY BE REQUIRED (NOT SHOWN) OR TRUSS RODS MAY BE REQUIRED PER MANUFACTURES RECOMMENDATIONS

4 C-600 FIXED KNOT FARM FENCE - DOUBLE GATE
NOT TO SCALE

GENERAL NOTES:

THE ENVIRONMENTAL DESIGN PARTNERSHIP IS NOT RESPONSIBLE FOR ANY CONSTRUCTION WORK PERFORMED PRIOR TO FINAL APPROVAL OF ALL PLANS AND SECURING OF ALL PERMITS AND FILING OF ALL MAPS.

CONTRACTOR TO ARRANGE A PRECONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL DESIGN PARTNERSHIP AND MUNICIPALITY PRIOR TO CONSTRUCTION.

FIELD ADJUSTMENTS MUST BE APPROVED BY THE ENVIRONMENTAL DESIGN PARTNERSHIP AND THE MUNICIPALITY'S ENGINEER PRIOR TO CONSTRUCTION.

CONTRACTOR IS TO VERIFY THAT ALL NECESSARY WORK PERMITS AND EASEMENTS ARE IN PLACE PRIOR TO COMMENCEMENT OF WORK.

THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS AND TAKE ALL SPECIAL TEMPORARY AND PERMANENT PRECAUTIONS NECESSARY TO ENSURE A STABLE AND SECURE JOB.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY TOWN, COUNTY OR STATE HIGHWAY CUT PERMITS.

THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND EASEMENTS PRIOR TO CONSTRUCTION AND BECOME FAMILIAR WITH THE CONDITIONS OF EACH PERMIT.

THE CONTRACTOR SHALL PROTECT AND SUSTAIN IN NORMAL SERVICE ALL EXISTING UTILITIES, STRUCTURES, EQUIPMENT, ROADWAYS, AND DRIVEWAYS.

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES AND RIGHT-OF-WAY PROPERTY LINES PRIOR TO CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES SUCH AS GAS, POWER, TELEPHONE, CABLE TV, WATER, SEWER, ETC. PRIOR TO COMMENCEMENT OF CONSTRUCTION.

AS PER NYS INDUSTRIAL CODE 53: CONTRACTOR TO CALL DIG SAFELY NEW YORK, INC. AT 1-800-962-7962 TO LOCATE BURIED CABLES OR OTHER UNDERGROUND UTILITIES NO LESS THAN TWO OR MORE THAN TEN WORKING DAYS PRIOR TO DIGGING, DRILLING, EXCAVATING, DRIVING POSTS, ETC.

CONTRACTOR MUST VERIFY THE ACCEPTABILITY OF ALL CONSTRUCTION MATERIALS WITH MUNICIPALITY'S ENGINEER PRIOR TO ORDERING.

INSTALLATION AND MATERIAL SPECIFICATIONS FOR STORM SEWER SHALL CONFORM TO THE MUNICIPALITY'S STANDARD DETAILS AND REQUIREMENTS. INSTALLATION PROCEDURES AND MATERIALS MUST BE VERIFIED WITH MUNICIPALITY PRIOR TO CONSTRUCTION.

ANY EXISTING STORM SEWERS AND UNDERGROUND UTILITIES ARE SHOWN IN THEIR RELATIVE POSITION AND FOR INFORMATION ONLY. THE CONTRACTOR SHALL HAVE THEIR EXACT LOCATION CHECKED AT THE SITE BEFORE CONSTRUCTION BEGINS.

CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING PIPE INVERT ELEVATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES WHICH RESULT MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, GRADES, PIPE INVERTS AND ELEVATIONS AND REVIEW WITH CONSULTANT BEFORE CONSTRUCTION.

ALL EXCAVATION TO MEET OSHA AND NYS DOT SAFETY REGULATIONS AND STANDARDS.

THE CONTRACTOR SHALL FILL IN, AND RE-EXCAVATE, AS NECESSARY TO RESUME WORK, ANY EXCAVATIONS OR TRENCHES AT LOCATIONS AND AS OFTEN AS MAY BE REQUIRED TO ENSURE PROTECTION OF THE WORK, ANY ADJACENT EXISTING FACILITIES, OR THE PUBLIC.
THE CONTRACTOR SHALL CLEAN UP THE JOB SITE DAILY BEFORE LEAVING THE JOBSITE. ALL RUBBISH MUST BE CLEANED UP AND CONSTRUCTION EQUIPMENT MUST BE PROPERLY TAKEN CARE OF AND STORED AT THE END OF THE DAY.

CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL AND SAFETY DURING CONSTRUCTION. THE CONTRACTOR SHALL FURNISH ALL FLAGMEN AND SIGNS, DELINEATORS, BARRIERS, AND DEVICES NECESSARY FOR TRAFFIC CONTROL DURING ANY EARTH-MOVING OPERATION OR OTHER CONSTRUCTION ACTIVITY WHICH INVOLVES PUBLIC HIGHWAYS.

ALL TRAFFIC SIGNS, CONTROL DEVICES AND INFORMATIONAL ITEMS, IF DISTURBED DURING CONSTRUCTION WITHIN CONTRACT LIMIT LINES, SHALL BE RELOCATED AS PER APPROVAL OF MUNICIPALITY.

RESTORATION OF PAVEMENT IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL REPLACE AND RESTORE PAVEMENT WITH MATERIAL TO A CONDITION EQUAL TO OR BETTER THAN PRECONSTRUCTION CONDITIONS. ALL PAVEMENT AND RIGHT-OF-WAY RESTORATION WORK TO BE DONE TO THE SATISFACTION OF THE STATE, COUNTY OR LOCAL MUNICIPAL HIGHWAY DEPARTMENT.

CONTRACTOR SHALL RESTORE ALL LAWNS, DRIVEWAYS, WALKS, WALLS, CURBS, FENCES, ETC. TO A CONDITIONS AT LEAST AS GOOD AS THEY WERE BEFORE BEING DISTURBED.

BOX ALL TREES AND HOUSE ALL SHRUBS AND HEDGES BEFORE PLACING EARTH AGAINST OR NEAR THEM. SHRUBS AND HEDGES THAT MUST BE REMOVED DURING CONSTRUCTION SHALL BE HEALED OR REPLANTED IN AS GOOD A CONDITION AS THEY WERE BEFORE THEIR REMOVAL. ANY DAMAGED ITEMS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

POSTS, MAILBOXES, ETC. SHALL BE PROTECTED, OR REMOVED AND REPLACED EXACTLY AS THEY WERE BEFORE BEING DISTURBED. DAMAGED ITEMS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

IT MAY BE NECESSARY TO TIE OR HOLD BACK UTILITY POLES DURING CONSTRUCTION. THIS SHOULD BE ACCOMPLISHED IN COOPERATION WITH UTILITY COMPANIES.

NO WORK, STORAGE OR TRESPASS SHALL BE PERMITTED BEYOND THE BOUNDARIES OF ANY EASEMENTS OR R.O.W. AS SHOWN.

CONTRACTOR TO COMPLY WITH ALL OSHA AND OTHER STATE AND LOCAL SAFETY REQUIREMENTS DURING CONSTRUCTION (PROPER SHORING, ETC.).

ALL SITE WORK SHALL BE SMOOTHLY AND EVENLY BLENDED INTO EXISTING CONDITIONS. WHERE ACCESS OR WORK OUTSIDE OF PROPERTY BOUNDARY IS NECESSARY, THE PERMISSION OF ADJOINING PROPERTY OWNER MUST FIRST BE OBTAINED.

ALL AREAS OF THE SITE WHICH ARE DISTURBED AND NOT PAVED SHALL BE TOPSOILED AND SEEDED.

THE INFORMATION REPRESENTED WITHIN THESE DOCUMENTS DOES NOT IMPLY ANY CONTRACT WITH, OR OBLIGATION FOR, PERFORMING ANY OR ALL TOWN, COUNTY, OR STATE REQUIRED INSPECTIONS DURING THE COURSE OF CONSTRUCTION OR PURSUANT TO OBTAINING CERTIFICATE OF OCCUPANCY. SUCH INSPECTION SERVICES, IF PERFORMED BY THIS OFFICE, SHALL BE ESTABLISHED BY SEPARATE CONTRACT.

IN THE EVENT THAT THE CONSTRUCTION STAKEOUT AND INSPECTION OF THE WORK IS NOT PERFORMED BY THE ENVIRONMENTAL DESIGN PARTNERSHIP (EDP), EDP WILL NOT BE HELD RESPONSIBLE FOR ANY ERRORS, OMISSIONS, COSTS, EXPENSES OR LIABILITY OF WHATEVER KIND AND NATURE RESULTING FROM FIELD CHANGES AND/OR ERRORS WHICH EDP WOULD OTHERWISE HAVE HAD AN OPPORTUNITY TO CHECK AND CORRECT WERE THEY IN A POSITION TO CONTROL THE PROJECT THROUGH STAKEOUT AND INSPECTION.

CLAIMS MADE AGAINST CONSULTANT FOR SURVEY STAKEOUT ERRORS WILL BE HONORED ONLY IF CONSULTANT IS NOTIFIED FOR VERIFICATION OF THE ERROR IMMEDIATELY UPON DISCOVERY AND BEFORE ANY CONTROL STAKES ARE DISTURBED. IF, AFTER VERIFICATION, IT IS DETERMINED THAT NO STAKEOUT ERROR OCCURRED, THE CLIENT WILL REIMBURSE THE CONSULTANT FOR ADDITIONAL EXPENSES INCURRED FOR SUCH VERIFICATION.

ALL ERRORS, OMISSIONS AND DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF THE ENVIRONMENTAL DESIGN PARTNERSHIP IMMEDIATELY UPON DISCOVERY, OTHERWISE, THE ENVIRONMENTAL DESIGN PARTNERSHIP WILL ACCEPT NO RESPONSIBILITY.

INSPECTION SERVICES BY THE ENVIRONMENTAL DESIGN PARTNERSHIP ARE NOT SUPERVISORY. ACCORDINGLY, THE ENVIRONMENTAL DESIGN PARTNERSHIP CAN NEITHER GUARANTEE THE PERFORMANCE OF THE CONSTRUCTION CONTRACTS BY CONTRACTORS NOR ASSUME RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO FURNISH AND PERFORM WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

SOLAR PANEL, EQUIPMENT PAD, AND MV UNDERGROUND CABLE LAYOUT WERE PROVIDED BY OTHERS.

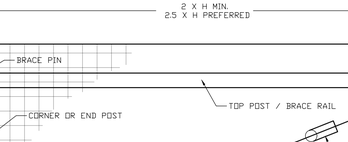
SOLAR PANEL, EQUIPMENT PAD, AND MV UNDERGROUND CABLE DESIGN, INCLUDING, BUT NOT LIMITED TO, SUBGRADE SUITABILITY, PREPARATION, REQUIRED TRENCHING, AND BEDDING TO BE DESIGNED BY OTHERS.

DRAINAGE HANDHOLE DETAIL AND LOCATIONS PROVIDED BY OTHERS. CONTRACTOR TO COORDINATE DIRECTLY WITH NEXAMP PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION. CONTRACTOR TO CONFIRM LOCATIONS AND INVERT ELEVATIONS IN FIELD AND NOTIFY ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARISE.

NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS CONSTRUCTION REQUIREMENTS:

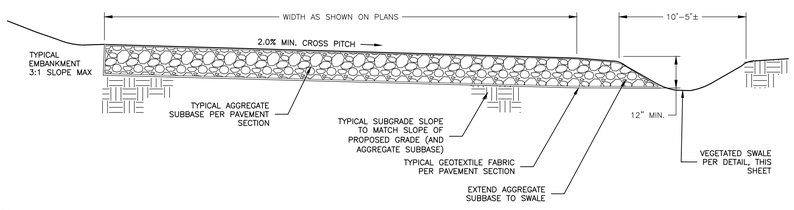
1. CONSTRUCTION ACTIVITIES ON THIS SITE MUST COMPLY WITH THE NYS DEPARTMENT OF AGRICULTURE AND MARKETS (NYSDAM) PUBLISHED GUIDELINES FOR CONSTRUCTION MITIGATION FOR AGRICULTURAL LANDS LAST REVISED OCTOBER 18, 2019. THE FOLLOWING REPRESENTS ONLY A CONSOLIDATED SUMMARY OF THE GUIDELINES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE COMPLETE GUIDELINES AND COMPLY WITH THE APPLICABLE REQUIREMENTS DURING CONSTRUCTION.
2. PRIOR TO CONSTRUCTION CONTRACTOR SHALL OBTAIN SOIL SAMPLES FROM AREAS TO BE DISTURBED (ONE (1) SET OF SOIL SAMPLES FOR EVERY 10 ACRES OF DISTURBANCE) AND SUBMITTED TO AN APPROVED LABORATORY FOR TESTING OF PH, PERCENT ORGANIC MATERIAL, CATION EXCHANGE CAPACITY, PHOSPHORUS / PHOSPHATE(P), AND POTASSIUM/POTASH(K). SOIL SAMPLING SHALL BE CONSISTENT WITH CORNELL UNIVERSITY'S SOIL TESTING GUIDELINES WITHIN REPRESENTATIVE AREAS OF THE PROPOSED DISTURBANCE. RESULTS SHALL BE SUBMITTED TO THE OWNER.
3. STRIPPED TOPSOIL SHALL BE STOCKPILED FROM WORK AREAS AND KEPT SEPARATE FROM OTHER EXCAVATED MATERIAL UNTIL THE COMPLETION OF THE FACILITY FOR FINAL RESTORATION. EXCESS TOPSOIL SHALL BE SPREAD EVENLY IN AGRICULTURAL AREAS WITHIN THE LIMIT OF DISTURBANCE OR AS NOTED ON THE PLANS. IN NO CASE SHALL THE SPREADING OF EXCESS TOPSOIL ALTER THE HYDROLOGY OF THE AREA.
4. TOPSOIL STOCKPILES ON AGRICULTURAL AREAS LEFT IN PLACE PRIOR TO OCTOBER 31 SHALL BE SEEDED WITH AROOSTOOK WINTER RYE OR EQUIVALENT AT AN APPLICATION RATE OF THREE BUSHELS (168 LB) PER ACRE AND MULCHED WITH STRAW AT A RATE OF TWO TO THREE BALES PER 1000 SF.
5. TOPSOIL STOCKPILES ON AGRICULTURAL AREAS LEFT IN PLACE BETWEEN OCTOBER 31 AND MAY 31 SHALL BE MULCHED WITH STRAW AT A RATE OF TWO TO THREE BALES PER 1000 SF TO PREVENT SOIL LOSS.
6. THE SURFACE OF ACCESS ROADS LOCATED OUTSIDE OF THE FENCED AREA AND CONSTRUCTED THROUGH AGRICULTURAL FIELDS SHALL BE LEVEL WITH THE ADJACENT FIELD SURFACE UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL ENSURE THAT NO VEHICLES OR EQUIPMENT ARE ALLOWED OUTSIDE THE DESIGNED LIMIT OF DISTURBANCE. VEHICLE AND EQUIPMENT TRAFFIC, PARKING AND MATERIAL STORAGE SHALL BE LIMITED TO THE ACCESS ROADS AND/OR DESIGNATED WORK AREAS WITH THE EXCEPTION OF LOW GROUND PRESSURE EQUIPMENT.
8. ALL BURIED UTILITIES LOCATED WITHIN THE FENCED AREA MUST HAVE A MINIMUM COVER DEPTH OF 18 INCHES IF LOCATED WITHIN CONDUIT AND 24 INCHES IF DIRECT BURIED
9. ALL BURIED UTILITIES LOCATED OUTSIDE OF THE FENCED AREA SHALL HAVE A MINIMUM COVER DEPTH OF 48 INCHES IF LOCATED WITHIN CROPLAND, HAYLAND OR IMPROVED PASTURE AREAS. IN AREAS WHERE THE DEPTH OF SOIL OVER BEDROCK IS LESS THAN 48 INCHES THE ELECTRICAL CONDUCTORS MUST BE BURIED BELOW THE SURFACE OF THE BEDROCK IF FRIABLE/RIPPABLE OR AS NEAR AS POSSIBLE TO THE SURFACE OF THE BEDROCK. ALL BURIED UTILITIES LOCATED IN UNIMPROVED GRAZING AREAS OR ON LAND PERMANENTLY DEVOTED TO PASTURE SHALL HAVE A MINIMUM COVER DEPTH OF 36 INCHES. WHERE ELECTRICAL CONDUCTORS ARE BURIED DIRECTLY BELOW THE GENERATION FACILITY'S ACCESS ROAD OR IMMEDIATELY ADJACENT TO THE ACCESS ROAD THE MINIMUM DEPTH OF COVER MUST BE 24 INCHES.
10. EXCESS STRIPPED TOPSOIL SHALL NOT BE UTILIZED FOR FILL WITHIN PROJECT AREAS.
11. CONTRACTOR TO REPAIR ALL SURFACE OR SUBSURFACE DRAINAGE STRUCTURES DAMAGED DURING CONSTRUCTION.
12. RESTORATION WORK ON AGRICULTURAL LAND SHALL BE COMPLETED DURING FAVORABLE (WORKABLE, RELATIVELY DRY) CONDITIONS AND NOT WHILE SOILS AREA IN A WET OR PLASTIC STATE OF CONSISTENCY.
13. IN ALL CONTINUED USE AGRICULTURAL LAND WHERE THE TOPSOIL WAS STRIPPED SUBSOIL DECOMPACTION SHALL BE CONDUCTED PRIOR TO TOPSOIL REPLACEMENT TO A DEPTH OF 18 INCHES WITH A TRACTOR MOUNTED DEEP RIPPER OR HEAVY-DUTY CHISEL PLOW.
14. CONTRACTOR SHALL SEED ALL AREAS FROM WHICH VEGETATION WAS REMOVED OR DESTROYED WITH THE SEED MIX SPECIFIED BY OWNER.

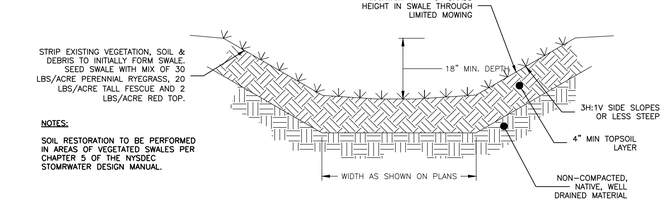
NOTES:
1. IF UNSTABLE SUBGRADE IS ENCOUNTERED DURING CONSTRUCTION ENGINEER MUST BE NOTIFIED IMMEDIATELY.
2. SUBGRADE MUST BE PROOF-ROLLED PRIOR TO PLACEMENT OF CRUSHED STONE.
3. PAVEMENT DESIGN IS PER GEOTECHNICAL REPORT ENTITLED "NEXAMP – OPPENHEIM 11553" PREPARED BY THE CHAZEN COMPANIES DATED MARCH 5, 2021.
4. PAVEMENT DESIGN IS FOR "LIGHTLY LOADED VEHICLES. ADDITIONAL GRAVEL MAY BE NEEDED FOR CONSTRUCTION ACCESS.



PAVEMENT SECTION

2 C-600 GRAVEL ACCESS DRIVE SECTION
NOT TO SCALE



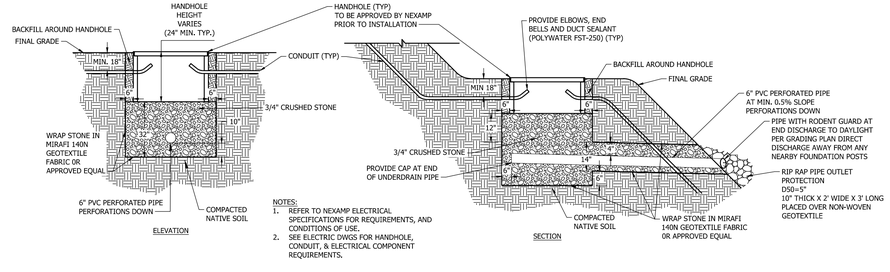


NOTES:
SOIL RESTORATION TO BE PERFORMED IN AREAS OF VEGETATED SWALES PER CHAPTER 5 OF THE NYSDEC STORMWATER DESIGN MANUAL.

5 C-600 VEGETATED SWALE
NOT TO SCALE

NOTES
1. INSTALL ALL FENCING COMPONENTS PER MANUFACTURES SPECIFICATIONS.
2. ALL FENCING AND HARDWARE SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. ALL SQUARE POSTS TO BE MIN. 5"x5" NOMINAL SIZE OR ROUND POST WITH MIN. 5" OR 6" DIAMETER PRESSURE TREATED WOOD OR APPROVED EQUAL. PREFER POSTS TO HAVE A CHAMFERED TOP.
4. ALL LINE POST TO BE SET TO A MIN. DEPTH OF 4' BELOW GRADE, ALL CORNER, END OR GATE POSTS SHALL BE SET TO A MIN. DEPTH OF 6' BELOW GRADE, UNLESS OTHERWISE NOTED.
5. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK^2 PRD, 12.5 GAUGE, CLASS 3 GALVANIZED, 6" VERTICAL SPACING OR APPROVED EQUAL, BRACING IS REQUIRED AT ALL CORNER, END, AND GATE POSTS. DOUBLE BRACING (TWO BRACE ASSEMBLIES IN A ROW) SHOULD BE USED FOR STRAIGHT RUNS OF FENCE THAT EXCEED 1,000 LF. AN ADDITIONAL BRACE ASSEMBLY SHOULD BE INSTALLED MID SPAN FOR STRAIGHT RUNS OF FENCE THAT EXCEED 1,320 LF. ADDITIONAL BRACING MAY BE STILL BE REQUIRED OVER UNEVEN TERRAIN, CONTRACTOR SHALL INSTALL ADDITIONAL BRACING AS NEEDED IF DEFLECTION IS NOTICED DURING TENSIONING.

3 C-600 FIXED KNOT FARM FENCE
NOT TO SCALE



NOTES:
1. REFER TO NEXAMP ELECTRICAL SPECIFICATIONS FOR REQUIREMENTS, AND CONDITIONS OF USE.
2. SEE ELECTRIC DWGS FOR HANDHOLE, CONDUIT, & ELECTRICAL COMPONENT REQUIREMENTS.

6 C-600 DRAINAGE HANDHOLE
NOT TO SCALE

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nexamp
101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
900 Route 146 Clifton Park, New York 12065
(518) 371-0421 edpllc.com

Rev	Issued For	Date
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G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * STEPHEN M. SANDNER * 118004 * LICENSED PROFESSIONAL ENGINEER

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
SITE DETAILS
NOT FOR CONSTRUCTION
Scale: As Shown
Approved by: STA
Drawn by: BMW

Dwg No:	Size: D	Sheet Rev:
C-600		G

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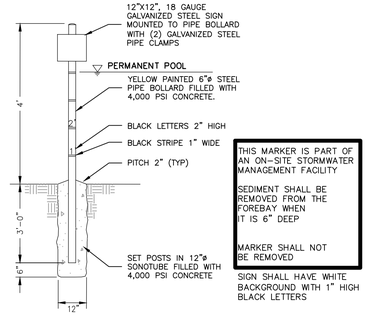


THIS MARKER IS PART OF AN ON-SITE STORMWATER MANAGEMENT FACILITY

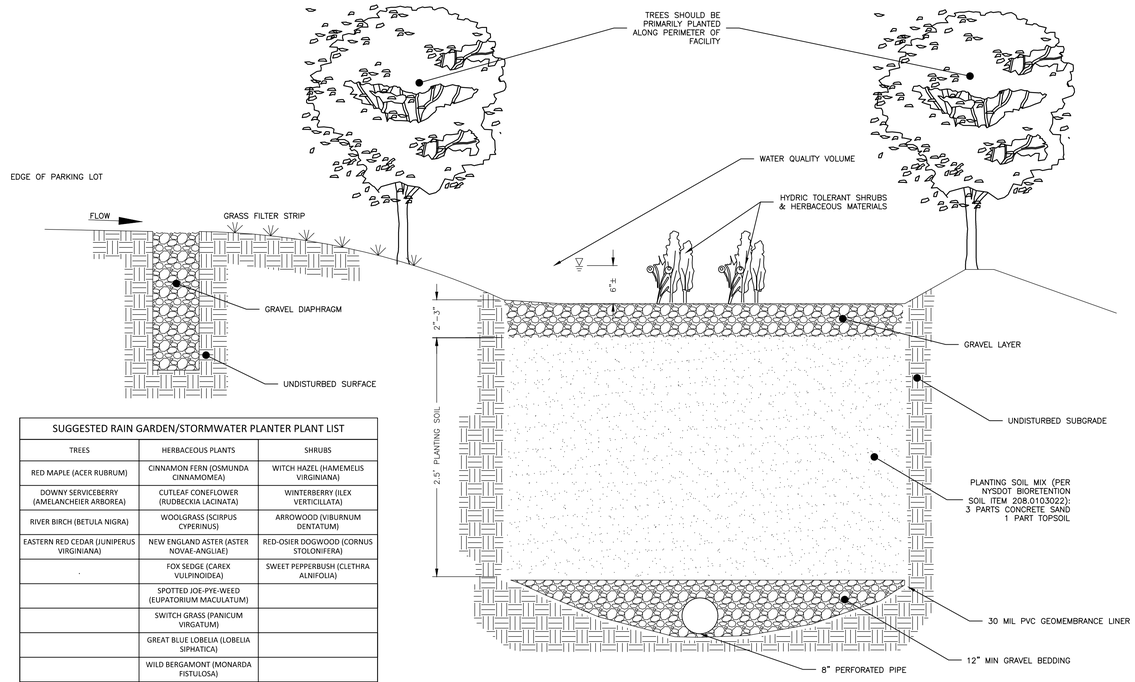
SEDIMENT SHALL BE REMOVED FROM THE FOREBAY WHEN IT IS 6" DEEP

MARKER SHALL NOT BE REMOVED

SIGN SHALL HAVE WHITE BACKGROUND WITH 1" HIGH BLACK LETTERS

1 C-601 SEDIMENT DEPTH GAUGE

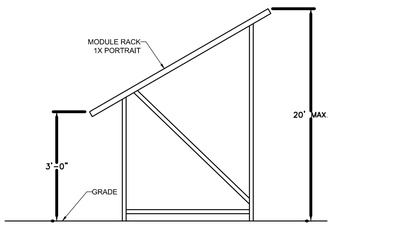
NOT TO SCALE



SUGGESTED RAIN GARDEN/STORMWATER PLANTER PLANT LIST		
TREES	HERBACEOUS PLANTS	SHRUBS
RED MAPLE (ACER RUBRUM)	CINNAMON FERN (OSMUNDA CINNAMOMEA)	WITCH HAZEL (HAMEMELIS VIRGINIANA)
DOWNY SERVICEBERRY (AMELANCHEIER ARBOREA)	CUTLEAF CONEFLOWER (RUDBECKIA LACINATA)	WINTERBERRY (ILEX VERTICILLATA)
RIVER BIRCH (BETULA NIGRA)	WOOLGRASS (SCIRPUS CYPERINUS)	ARROWOOD (VIBURNUM DENTATUM)
EASTERN RED CEDAR (JUNIPERUS VIRGINIANA)	NEW ENGLAND ASTER (ASTER NOVAE-ANGLIAE)	RED-OSIER DOGWOOD (CORNUS STOLONIFERA)
.	FOX SEDGE (CAREX VULPINOIDEA)	SWEET PEPPERBUSH (CLETHRA ALNIFOLIA)
	SPOTTED JOE-PYE-WEED (EUPATORIUM MACULATUM)	
	SWITCH GRASS (PANICUM VIRGATUM)	
	GREAT BLUE LOBELIA (LOBELIA SIPHATICA)	
	WILD BERGAMONT (MONARDA FISTULOSA)	
	RED MILKWEED (ASCLEPIAS INCARNATE)	

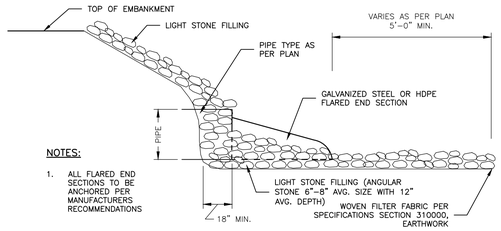
3 C-601 BIORETENTION AREA

NOT TO SCALE



6 C-601 SOLAR ARRAY FIXED TILT RACK DETAIL

NOT TO SCALE

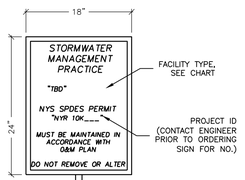


NOTES:

1. ALL FLARED END SECTIONS TO BE ANCHORED PER MANUFACTURERS RECOMMENDATIONS

7 C-601 FLARED END SECTION

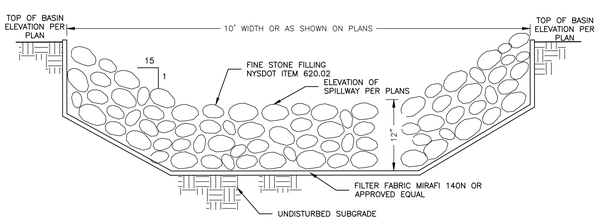
NOT TO SCALE



FACILITY TYPE	LOCATION (SEE SITE PLAN)
(F-5) BIORETENTION AREAS	4
(P-2) WET POND	1
DETENTION AREA	2

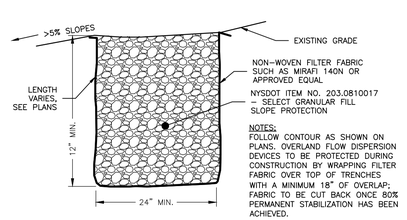
2 C-601 STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN

NOT TO SCALE



4 C-601 EMERGENCY SPILLWAY

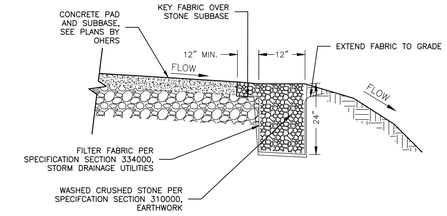
NOT TO SCALE



NOTES:
FOLLOW CONTOUR AS SHOWN ON PLANS. OVERLAND FLOW DISPERSION DEVICES TO BE PROTECTED DURING CONSTRUCTION BY WRAPPING FILTER FABRIC OVER TOP OF TRENCHES WITH A MINIMUM 18" OF OVERLAP; FABRIC TO BE CUT BACK ONCE 80% PERMANENT STABILIZATION HAS BEEN ACHIEVED.

5 C-601 OVERLAND FLOW DISPERSION DEVICE

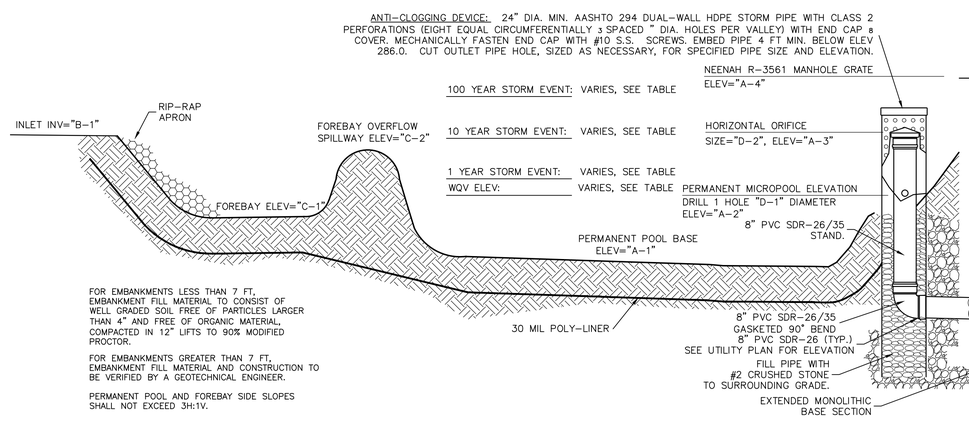
NOT TO SCALE



8 C-601 GRAVEL DIAPHRAGM

NOT TO SCALE

MICROPOOL EXTENDED DETENTION POND ELEVATIONS	
	SMA #1
A-1 (FT)	891.00
A-2 (FT)	894.00
A-3 (FT)	895.80
A-4 (FT)	896.85
A-5 (FT)	898.00
B-1 (FT)	899.00
B-2 (FT)	893.90
B-3 (FT)	892.50
C-1 (FT)	894.00
C-2 (FT)	898.00
D-1 (IN)	3.0"
D-2 (IN)	12.0"
STORM EVENT	
1 YR (FT)	895.78
10 YR (FT)	896.81
25 YR (FT)	897.21
100 YR (FT)	897.98



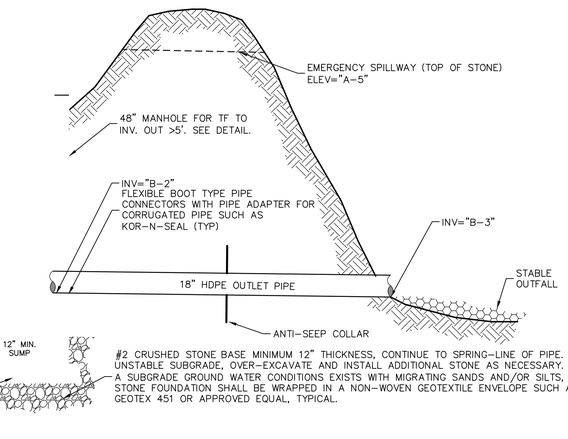
FOR EMBANKMENTS LESS THAN 7 FT, EMBANKMENT FILL MATERIAL TO CONSIST OF WELL GRADED SOIL FREE OF PARTICLES LARGER THAN 4" AND FREE OF ORGANIC MATERIAL, COMPACTED IN 12" LIFTS TO 90% MODIFIED PROCTOR.

FOR EMBANKMENTS GREATER THAN 7 FT, EMBANKMENT FILL MATERIAL AND CONSTRUCTION TO BE VERIFIED BY A GEOTECHNICAL ENGINEER.

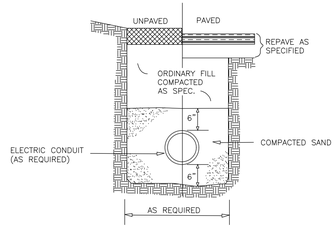
PERMANENT POOL AND FOREBAY SIDE SLOPES SHALL NOT EXCEED 3H:1V.

9 C-601 WET POND

NOT TO SCALE



#2 CRUSHED STONE BASE MINIMUM 12" THICKNESS, CONTINUE TO SPRING-LINE OF PIPE. FOR UNSTABLE SUBGRADE, OVER-EXCAVATE AND INSTALL ADDITIONAL STONE AS NECESSARY. WHERE A SUBGRADE GROUND WATER CONDITIONS EXISTS WITH MIGRATING SANDS AND/OR SILTS, ENTIRE STONE FOUNDATION SHALL BE WRAPPED IN A NON-WOVEN GEOTEXTILE ENVELOPE SUCH AS GEOTEX 451 OR APPROVED EQUAL, TYPICAL.



10 C-601 MV CABLE TRENCH

NOT TO SCALE

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nexamp
101 Summer Street, Boston, MA 02110
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660 Plank Rd, Ste Clifton Park, New York 12065
(518) 371-7557 http://edpllp.com

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P.E. Seal/Consultant:

STATE OF NEW YORK * ALESSANDRINI * 98108 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

SITE DETAILS

NOT FOR CONSTRUCTION

Scale: As Shown Approved by: STA

Drawn by: BMW

Dwg No: C-601 Size: D Sheet Rev: G

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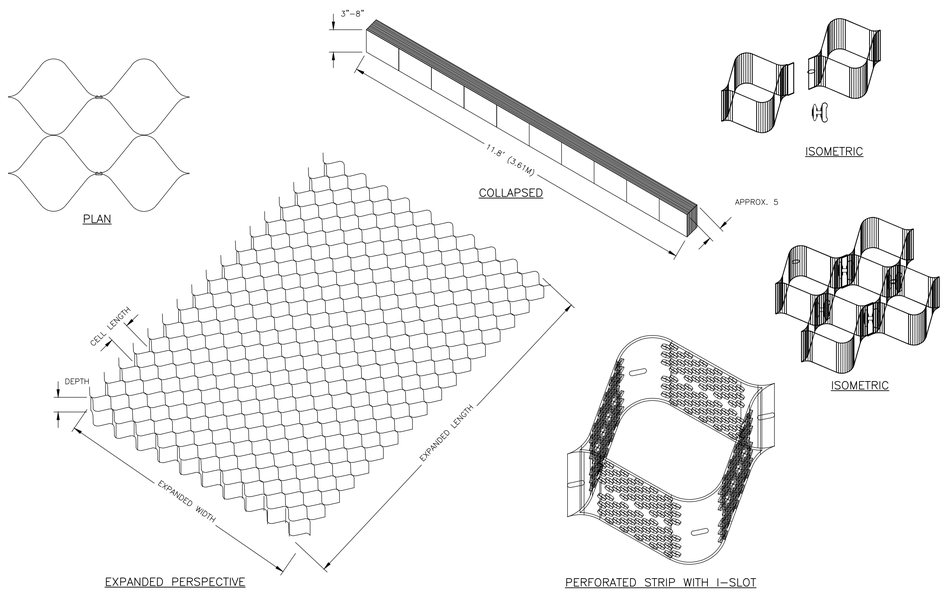
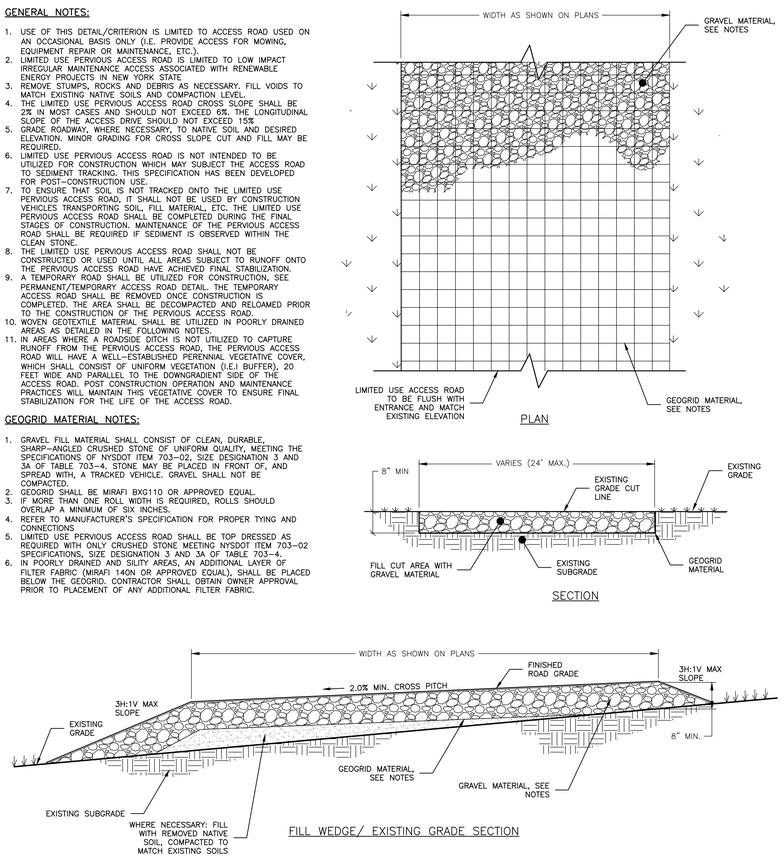


1 GEOWEB FOR PERVIOUS ACCESS ROAD

C-602 NOT TO SCALE



GENERAL NOTES:

1. USE OF THIS DETAIL/CRITERION IS LIMITED TO ACCESS ROAD USED ON AN OCCASIONAL BASIS ONLY (I.E. PROVIDE ACCESS FOR MOWING, EQUIPMENT REPAIR OR MAINTENANCE, ETC.).
2. LIMITED USE PERVIOUS ACCESS ROAD IS LIMITED TO LOW IMPACT IRREGULAR MAINTENANCE ACCESS ASSOCIATED WITH RENEWABLE ENERGY PROJECTS IN NEW YORK STATE
3. REMOVE STUMPS, ROCKS AND DEBRIS AS NECESSARY. FILL VOIDS TO MATCH EXISTING NATIVE SOILS AND COMPACTION LEVEL.
4. THE LIMITED USE PERVIOUS ACCESS ROAD CROSS SLOPE SHALL BE 2% IN MOST CASES AND SHALL NOT EXCEED 6%. THE LONGITUDINAL SLOPE OF THE ACCESS DRIVE SHALL NOT EXCEED 15%.
5. GRADE ROADWAY, WHERE NECESSARY, TO NATIVE SOIL AND DESIRED ELEVATION. MINOR GRADING FOR CROSS SLOPE CUT AND FILL MAY BE REQUIRED.
6. LIMITED USE PERVIOUS ACCESS ROAD IS NOT INTENDED TO BE UTILIZED FOR CONSTRUCTION WHICH MAY SUBJECT THE ACCESS ROAD TO SEDIMENT TRACKING. THIS SPECIFICATION HAS BEEN DEVELOPED FOR POST–CONSTRUCTION USE.
7. TO ENSURE THAT SOIL IS NOT TRACKED ONTO THE LIMITED USE PERVIOUS ACCESS ROAD, IT SHALL NOT BE USED BY CONSTRUCTION VEHICLES TRANSPORTING SOIL, FILL MATERIAL, ETC. THE LIMITED USE PERVIOUS ACCESS ROAD SHALL BE COMPLETED DURING THE FINAL STAGES OF CONSTRUCTION. MAINTENANCE OF THE PERVIOUS ACCESS ROAD SHALL BE REQUIRED IF SEDIMENT IS OBSERVED WITHIN THE CLEAN STONE.
8. THE LIMITED USE PERVIOUS ACCESS ROAD SHALL NOT BE CONSTRUCTED OR USED UNTIL ALL AREAS SUBJECT TO RUNOFF ONTO THE PERVIOUS ACCESS ROAD HAVE ACHIEVED FINAL STABILIZATION.
9. A TEMPORARY ROAD SHALL BE UTILIZED FOR CONSTRUCTION, SEE PERMANENT/TEMPORARY ACCESS ROAD DETAIL. THE TEMPORARY ACCESS ROAD SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED. THE AREA SHALL BE DECOMPACTED AND RELOAMED PRIOR TO THE CONSTRUCTION OF THE PERVIOUS ACCESS ROAD.
10. WOVEN GEOTEXTILE MATERIAL SHALL BE UTILIZED IN POORLY DRAINED AREAS AS DETAILED IN THE FOLLOWING NOTES.
11. IN AREAS WHERE A ROADSIDE DITCH IS NOT UTILIZED TO CAPTURE RUNOFF FROM THE PERVIOUS ACCESS ROAD, THE PERVIOUS ACCESS ROAD WILL HAVE A WELL–ESTABLISHED PERENNIAL VEGETATIVE COVER, WHICH SHALL CONSIST OF UNIFORM VEGETATION (I.E.I BUFFER), 20 FEET WIDE AND PARALLEL TO THE DOWNGRADIENT 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:

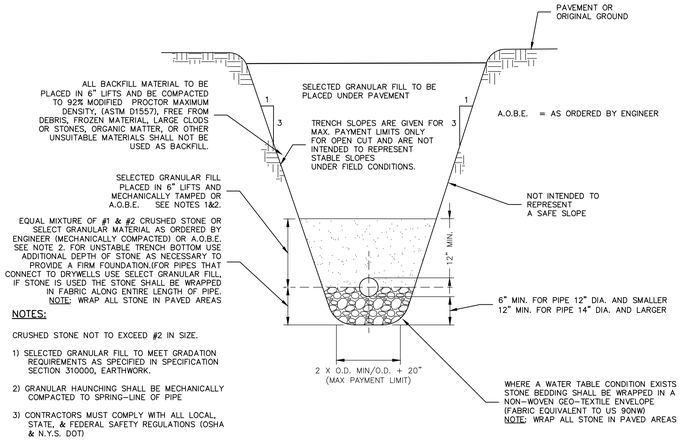
1. GRAVEL FILL MATERIAL SHALL CONSIST OF CLEAN, DURABLE, SHARP–ANGLED CRUSHED STONE OF UNIFORM QUALITY, MEETING THE SPECIFICATIONS OF NYSDOT ITEM 703–02, SIZE DESIGNATION 3 AND 3A OF TABLE 703–4. STONE MAY BE PLACED IN FRONT OF, AND SPREAD WITH, A TRACKED VEHICLE. GRAVEL SHALL NOT BE COMPACTED.
2. GEOGRID SHALL BE MIRAFI BXG110 OR APPROVED EQUAL.
3. IF MORE THAN ONE ROLL WIDTH IS REQUIRED, ROLLS SHOULD OVERLAP A MINIMUM OF SIX INCHES.
4. REFER TO MANUFACTURER'S SPECIFICATION FOR PROPER TYING AND CONNECTIONS
5. LIMITED USE PERVIOUS ACCESS ROAD SHALL BE TOP DRESSED AS REQUIRED WITH ONLY CRUSHED STONE MEETING NYSDOT ITEM 703–02 SPECIFICATIONS, SIZE DESIGNATION 3 AND 3A OF TABLE 703–4.
6. IN POORLY DRAINED AND SILTY AREAS, AN ADDITIONAL LAYER OF FILTER FABRIC (MIRAFI 140N OR APPROVED EQUAL), SHALL BE PLACED BELOW THE GEOGRID. CONTRACTOR SHALL OBTAIN OWNER APPROVAL PRIOR TO PLACEMENT OF ANY ADDITIONAL FILTER FABRIC.

2 NYSDEC LIMITED USE PERVIOUS ACCESS ROAD 0% TO 5% SLOPES

C-602 NOT TO SCALE

3 STORM TRENCH

C-602 NOT TO SCALE



GENERAL NOTES:

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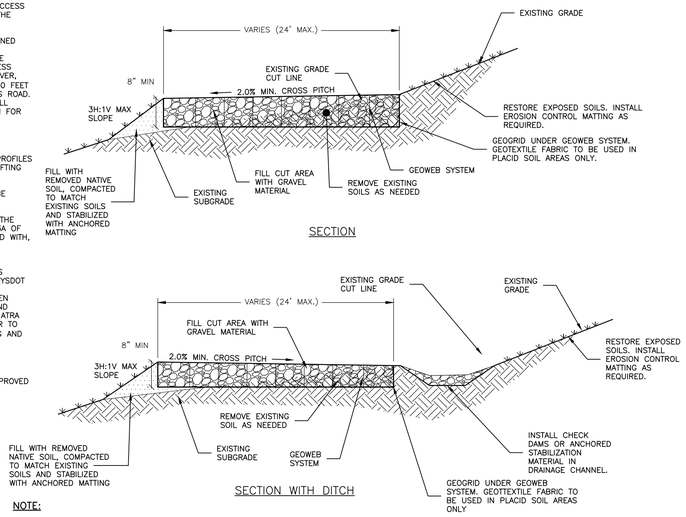
2. LIMITED USE PERVIOUS ACCESS ROAD IS LIMITED TO LOW IMPACT IRREGULAR MAINTENANCE ACCESS ASSOCIATED WITH RENEWABLE ENERGY PROJECTS IN NEW YORK STATE.
3. REMOVE STUMPS, ROCKS AND DEBRIS AS NECESSARY, FILL VOIDS TO MATCH EXISTING NATIVE SOILS AND COMPACTION LEVEL.
4. THE LIMITED USE PERVIOUS ACCESS ROAD CROSS SLOPE SHALL BE 2% IN MOST CASES AND SHALL NOT EXCEED 6%. THE LONGITUDINAL SLOPE OF THE ACCESS DRIVE SHALL NOT EXCEED 15%.
5. GRADE ROADWAY, WHERE NECESSARY, TO NATIVE SOIL AND DESIRED ELEVATION. MINOR GRADING FOR CROSS SLOPE CUT AND FILL MAY BE REQUIRED.
6. LIMITED USE PERVIOUS ACCESS ROAD IS NOT INTENDED TO BE UTILIZED FOR CONSTRUCTION WHICH MAY SUBJECT THE ACCESS ROAD TO SEDIMENT TRACKING. THIS SPECIFICATION HAS BEEN DEVELOPED FOR POST–CONSTRUCTION USE.
7. TO ENSURE THAT SOIL IS NOT TRACKED ONTO THE LIMITED USE PERVIOUS ACCESS ROAD, IT SHALL NOT BE USED BY CONSTRUCTION VEHICLES TRANSPORTING SOIL, FILL MATERIAL, ETC. THE LIMITED USE PERVIOUS ACCESS ROAD SHALL BE COMPLETED DURING THE FINAL STAGES OF CONSTRUCTION. MAINTENANCE OF THE PERVIOUS ACCESS ROAD SHALL BE REQUIRED IF SEDIMENT IS OBSERVED WITHIN THE CLEAN STONE.
8. THE LIMITED USE PERVIOUS ACCESS ROAD SHALL NOT BE CONSTRUCTED OR USED UNTIL ALL AREAS SUBJECT TO RUNOFF ONTO THE PERVIOUS ACCESS HAVE ACHIEVED FINAL STABILIZATION.
9. A TEMPORARY ROAD SHALL BE UTILIZED FOR CONSTRUCTION, SEE PERMANENT/TEMPORARY ACCESS ROAD DETAIL. THE TEMPORARY ACCESS ROAD SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED. THE AREA SHALL BE DECOMPACTED AND RELOAMED PRIOR TO THE CONSTRUCTION OF THE PERVIOUS ACCESS ROAD.
10. WOVEN GEOTEXTILE MATERIAL SHALL BE UTILIZED IN POORLY DRAINED AREAS AS DETAILED IN THE FOLLOWING NOTES.
11. IN AREAS WHERE A ROADSIDE DITCH IS NOT UTILIZED TO CAPTURE RUNOFF FROM THE PERVIOUS ACCESS ROAD, THE PERVIOUS ACCESS ROAD WILL HAVE A WELL–ESTABLISHED PERENNIAL VEGETATIVE COVER, WHICH SHALL CONSIST OF UNIFORM VEGETATION (I.E.I BUFFER), 20 FEET WIDE AND PARALLEL TO THE DOWNGRADIENT 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.

GEOWEB MATERIAL NOTES:

1. THE GEOWEB, OR APPROVED EQUAL, SHALL BE USED ON ROAD PROFILES EXCEEDING 5%. THE GEOWEB PRODUCT IS INTENDED TO LIMIT SHIFTING STONE MATERIAL DURING USE.
2. WHERE REQUIRED, A NATIVE SOIL WEDGE SHALL BE PLACED TO ACCOMMODATE ROAD CROSS SLOPE OF 2%. NATIVE SOIL SHALL BE COMPACTED TO MATCH EXISTING SOIL CONDITIONS.
3. GRAVEL FILL MATERIAL SHALL CONSIST OF CLEAN, DURABLE, SHARP–ANGLED CRUSHED STONE OF UNIFORM QUALITY, MEETING THE SPECIFICATIONS OF NYSDOT ITEM 703–02, SIZE DESIGNATION 3–3A OF TABLE 703–4. STONE MAY BE PLACED IN FRONT OF, AND SPREAD WITH, A TRACKED VEHICLE. GRAVEL SHALL NOT BE COMPACTED.
4. GEOWEB SYSTEM SHALL BE AS SPECIFIED IN SECTION 310000, EARTHWORK, OR APPROVED EQUAL.
5. LIMITED USE PERVIOUS ACCESS ROAD SHALL BE TOP DRESSED AS REQUIRED WITH ONLY CRUSHED STONE, SIZE 3 – 3A, MEETING NYSDOT ITEM 703–02 SPECIFICATIONS.
6. THE TOP EDGES OF ADJACENT CELL WALLS SHALL BE FLUSH WHEN CONNECTING. ALIGN THE I–SLOTS FOR INTERLEAF AND END TO END CONNECTIONS. THE GEOWEB PANELS SHALL BE CONNECTED WITH ATRA KEYS AT EACH INTERLEAD AND END TO END CONNECTIONS. REFER TO MANUFACTURER'S SPECIFICATION FOR PROPER INSTALLATION, TYING AND CONNECTIONS.

WOVEN GEOTEXTILE NOTES:

1. SPECIFIED GEOTEXTILE SHALL BE MIRAFI BXG, MIRAFI H2Ri, OR APPROVED EQUAL.



NOTE:

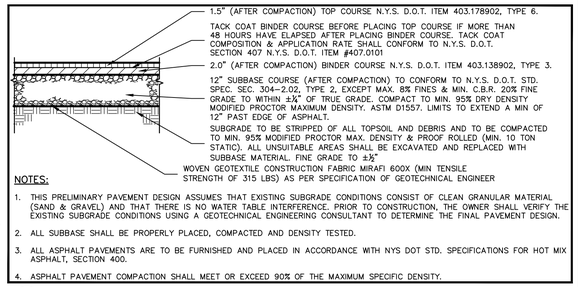
1. THE ROADSIDE DITCH SHALL BE DESIGNED IN ACCORDANCE WITH THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROLS FOR GRASSED AND VEGETATED WATERWAYS. ADDITIONAL DETAILS WILL BE PROVIDED SPECIFIC TO THE SITE DESIGN.

5 NYSDEC LIMITED USE PERVIOUS ACCESS ROAD GREATER THAN 5% SLOPES

C-602 NOT TO SCALE

4 MEDIUM DUTY PAVEMENT SECTION

C-602 NOT TO SCALE



NOTES:

1. THIS PRELIMINARY PAVEMENT DESIGN ASSUMES THAT EXISTING SUBGRADE CONDITIONS CONSIST OF CLEAN GRANULAR MATERIAL (SAND & GRAVEL) AND THAT THERE IS NO WATER TABLE INTERFERENCE. PRIOR TO CONSTRUCTION, THE OWNER SHALL VERIFY THE EXISTING SUBGRADE CONDITIONS USING A GEOTECHNICAL ENGINEERING CONSULTANT TO DETERMINE THE FINAL PAVEMENT DESIGN.
2. ALL SUBBASE SHALL BE PROPERLY PLACED, COMPACTED AND DENSITY TESTED.
3. ALL ASPHALT PAVEMENTS ARE TO BE FURNISHED AND PLACED IN ACCORDANCE WITH NYS DOT STD. SPECIFICATIONS FOR HOT MIX ASPHALT, SECTION 400.
4. ASPHALT PAVEMENT COMPACTION SHALL MEET OR EXCEED 90% OF THE MAXIMUM SPECIFIC DENSITY.

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668 Route 146 Clifton Park, New York 12065
(518) 371-7557 http://edpnet

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G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANE I. ALESSANDRINI * 109801 * LICENSED PROFESSIONAL ENGINEER

Project: WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title: SITE DETAILS

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-602 Size: D Sheet Rev: G

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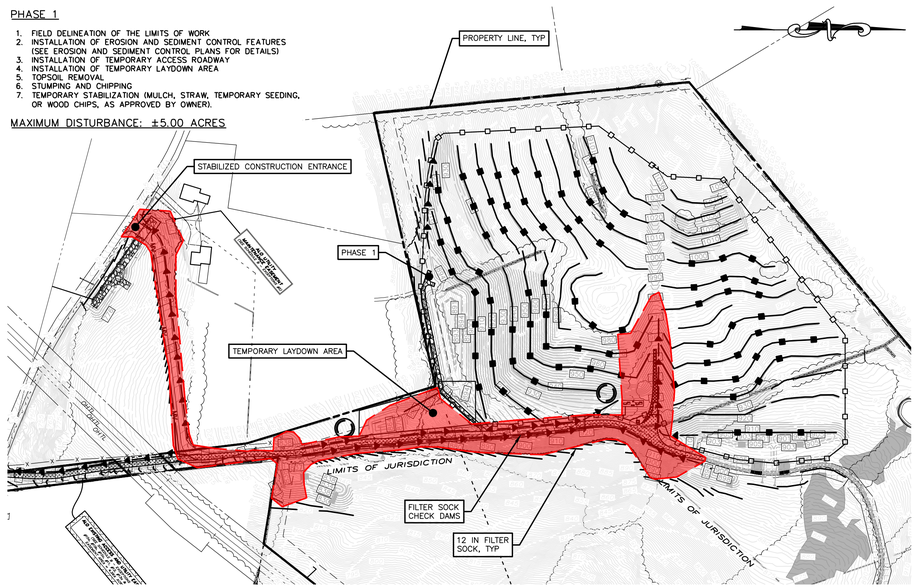
PHASE 1

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. INSTALLATION OF EROSION AND SEDIMENT CONTROL FEATURES (SEE EROSION AND SEDIMENT CONTROL PLANS FOR DETAILS)
3. INSTALLATION OF TEMPORARY ACCESS ROADWAY
4. INSTALLATION OF TEMPORARY LAYDOWN AREA
5. TOPSOIL REMOVAL
6. STUMPING AND CHIPPING
7. TEMPORARY STABILIZATION (MULCH, STRAW, TEMPORARY SEEDING, OR WOOD CHIPS, AS APPROVED BY OWNER).

MAXIMUM DISTURBANCE: ±5.00 ACRES



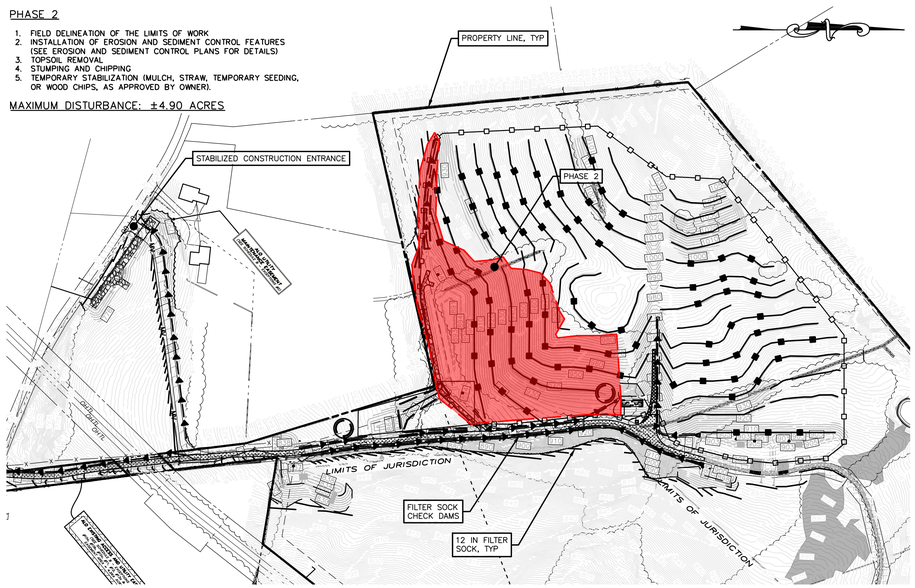
PHASE 1 DISTURBANCE

SCALE: 1"=200'

PHASE 2

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. INSTALLATION OF EROSION AND SEDIMENT CONTROL FEATURES (SEE EROSION AND SEDIMENT CONTROL PLANS FOR DETAILS)
3. TOPSOIL REMOVAL
4. STUMPING AND CHIPPING
5. TEMPORARY STABILIZATION (MULCH, STRAW, TEMPORARY SEEDING, OR WOOD CHIPS, AS APPROVED BY OWNER).

MAXIMUM DISTURBANCE: ±4.90 ACRES



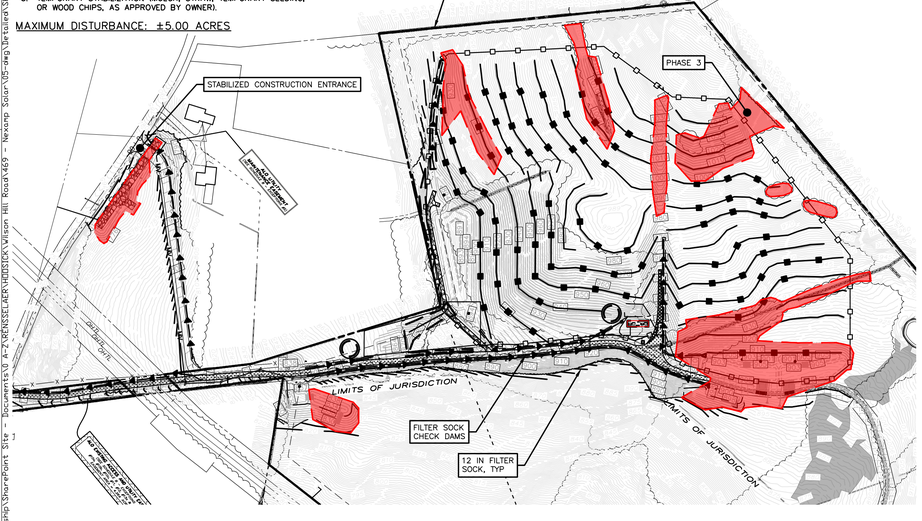
PHASE 2 DISTURBANCE

SCALE: 1"=200'

PHASE 3

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. INSTALLATION OF EROSION AND SEDIMENT CONTROL FEATURES (SEE EROSION AND SEDIMENT CONTROL PLANS FOR DETAILS)
3. TOPSOIL REMOVAL
4. STUMPING AND CHIPPING
5. TEMPORARY STABILIZATION (MULCH, STRAW, TEMPORARY SEEDING, OR WOOD CHIPS, AS APPROVED BY OWNER).

MAXIMUM DISTURBANCE: ±5.00 ACRES



PHASE 3 DISTURBANCE

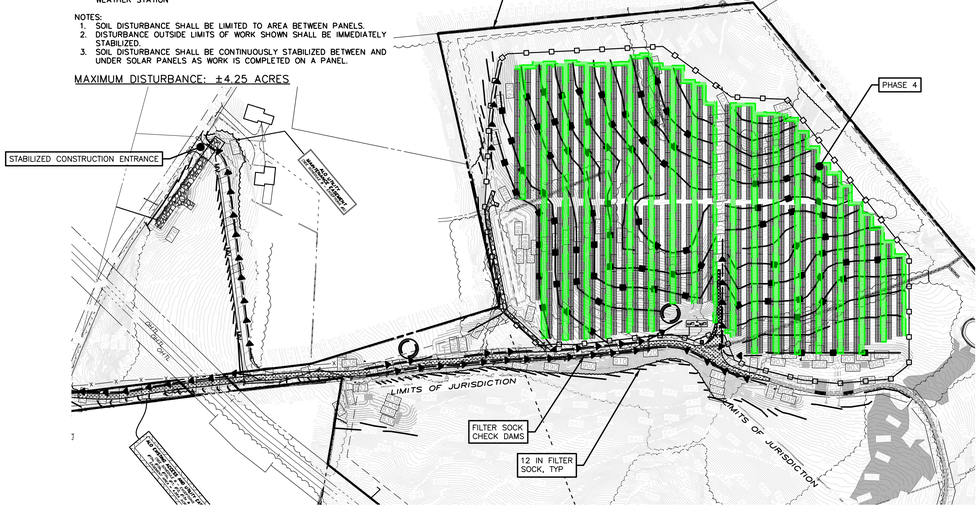
SCALE: 1"=200'

PHASE 4

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. FOUNDATION INSTALLATION/COMBINER BOX INSTALLATION
3. RACK INSTALLATION
4. MODULE INSTALLATIONS
5. STRING WIRE/SWITCHGEAR INSTALLATION, CENTRAL STRING INVERTER, WEATHER STATION

NOTES:
1. SOIL DISTURBANCE SHALL BE LIMITED TO AREA BETWEEN PANELS.
2. DISTURBANCE OUTSIDE LIMITS OF WORK SHOWN SHALL BE IMMEDIATELY STABILIZED.
3. SOIL DISTURBANCE SHALL BE CONTINUOUSLY STABILIZED BETWEEN AND UNDER SOLAR PANELS AS WORK IS COMPLETED ON A PANEL.

MAXIMUM DISTURBANCE: ±4.25 ACRES



PHASE 4 DISTURBANCE

SCALE: 1"=200'

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(518) 371-7621 edpllp.com

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P.E. seal/Consultant:

STATE OF NEW YORK * ALESSANDRINI * SUPERVISING ENGINEER 28104 LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

PHASING PLAN

NOT FOR CONSTRUCTION

Drawn by: BMW | Scale: As Shown | Approved by: STA

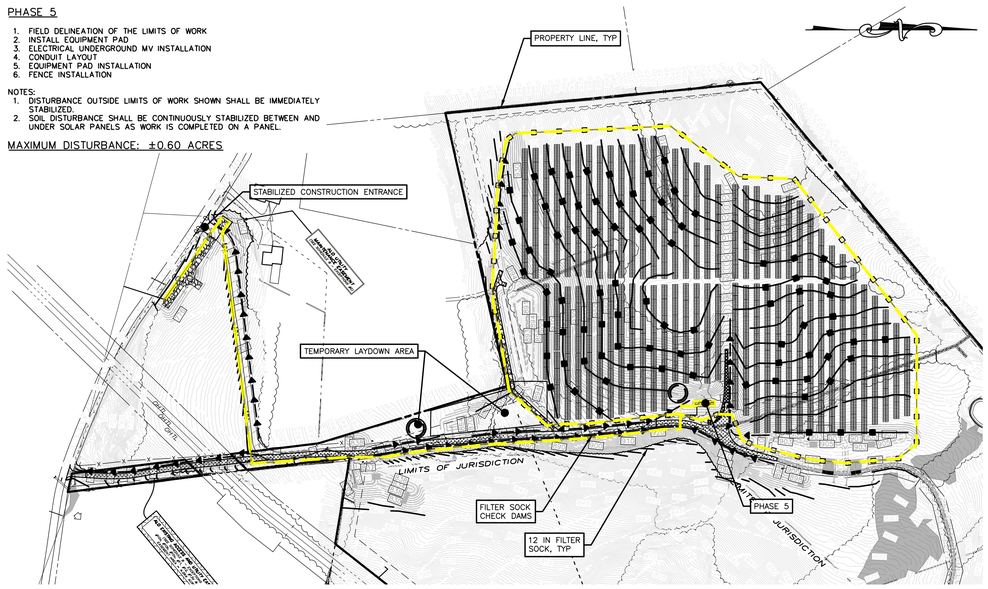
Dwg No:	Size: D	Sheet Rev:
C-700		G

PHASE 5

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. INSTALL EQUIPMENT PAD
3. ELECTRICAL UNDERGROUND MV INSTALLATION
4. CONDUIT LAYOUT
5. EQUIPMENT PAD INSTALLATION
6. FENCE INSTALLATION

NOTES:
1. DISTURBANCE OUTSIDE LIMITS OF WORK SHOWN SHALL BE IMMEDIATELY STABILIZED.
2. SOIL DISTURBANCE SHALL BE CONTINUOUSLY STABILIZED BETWEEN AND UNDER SOLAR PANELS AS WORK IS COMPLETED ON A PANEL.

MAXIMUM DISTURBANCE: ±0.60 ACRES



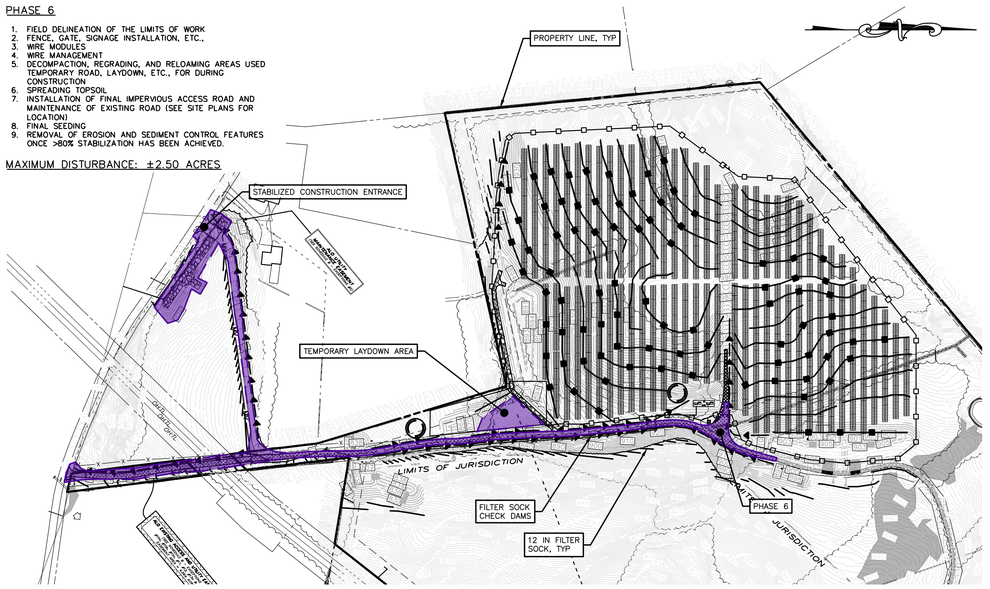
PHASE 5 DISTURBANCE

SCALE: 1"=200'

PHASE 6

1. FIELD DELINEATION OF THE LIMITS OF WORK
2. FENCE, GATE, SIGNAGE INSTALLATION, ETC.,
3. WIRE MODULES
4. WIRE MANAGEMENT
5. DECOMPACTION, REGRADING, AND RELOAMING AREAS USED TEMPORARY ROAD, LAYDOWN, ETC., FOR DURING CONSTRUCTION
6. SPREADING TOPSOIL
7. INSTALLATION OF FINAL IMPERVIOUS ACCESS ROAD AND MAINTENANCE OF EXISTING ROAD (SEE SITE PLANS FOR LOCATION)
8. FINAL SEEDING
9. REMOVAL OF EROSION AND SEDIMENT CONTROL FEATURES ONCE >80% STABILIZATION HAS BEEN ACHIEVED.

MAXIMUM DISTURBANCE: ±2.50 ACRES



PHASE 6 DISTURBANCE

SCALE: 1"=200'

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P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE M. ALESSANDRONI * 28104 * LICENSED PROFESSIONAL ENGINEER

Project:
WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:
PHASING PLAN
NOT FOR CONSTRUCTION
Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: C-701 Size: D Sheet Rev: G

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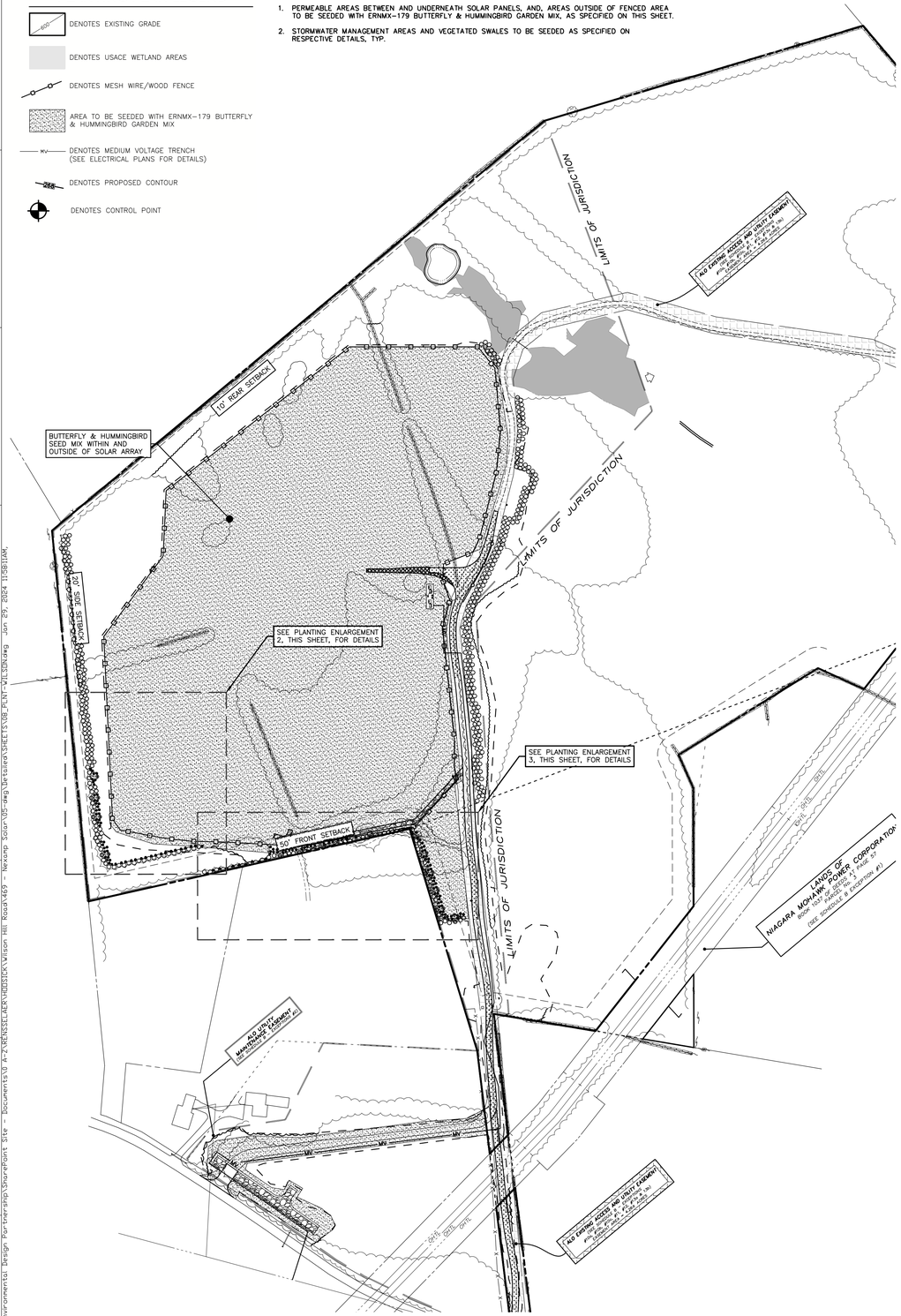
PLANTING PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES MESH WIRE/WOOD FENCE
- AREA TO BE SEEDED WITH ERNMX-179 BUTTERFLY & HUMMINGBIRD GARDEN MIX
- MV — DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS)
- DENOTES PROPOSED CONTOUR
- DENOTES CONTROL POINT

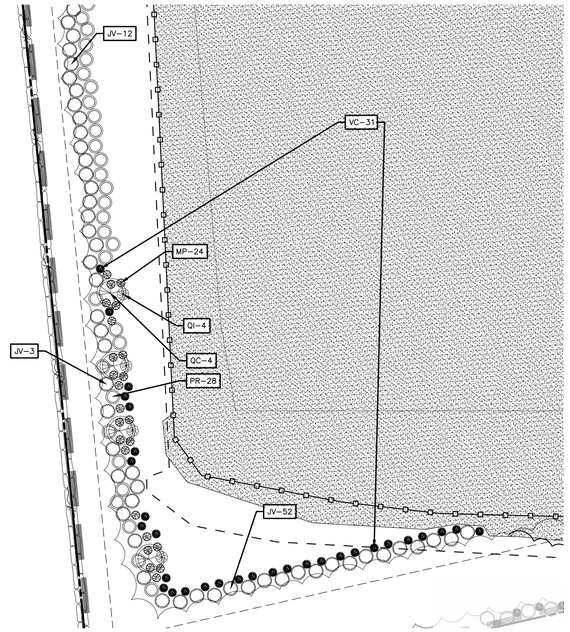
NOTES:

1. PERMEABLE AREAS BETWEEN AND UNDERNEATH SOLAR PANELS, AND, AREAS OUTSIDE OF FENCED AREA TO BE SEEDED WITH ERNMX-179 BUTTERFLY & HUMMINGBIRD GARDEN MIX, AS SPECIFIED ON THIS SHEET.
2. STORMWATER MANAGEMENT AREAS AND VEGETATED SWALES TO BE SEEDED AS SPECIFIED ON RESPECTIVE DETAILS, TYP.

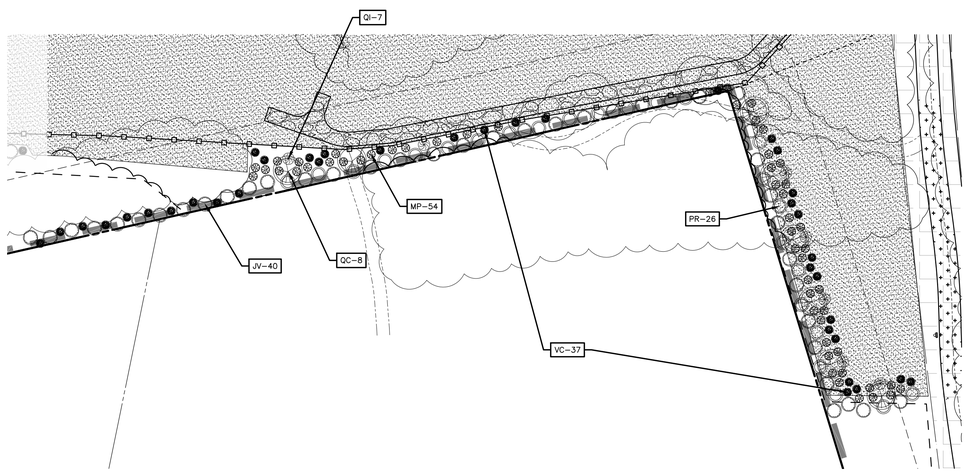


1 L-100 OVERALL PLANTING PLAN
SCALE: 1"=50'

GRAPHIC SCALE
150 120 90 60 30 0 75 150 300 600
(IN FEET)
1 INCH = 150 FT.



2 L-100 PLANTING ENLARGEMENT
SCALE: 1"=50'



3 L-100 PLANTING ENLARGEMENT
SCALE: 1"=50'

ERNST SEEDS (ERNMX - 179)*			
QUANTITY	SPECIES	COMMON	APPLICATION RATE
29.6%	SCHIZACHYRIUM SCOPARIUM, FORT INDIANTOWN GAP - PA ECOTYPE	LITTLE BLUESTEM, FORT INDIANTOWN GAP-PA ECOTYPE	30 LB PER ACRE
10.0%	ELYMUS VIRGINICUS, PA ECOTYPE	VIRGINIA WILDRYE, PA ECOTYPE	
9.4%	ECHINACEA PURPUREA	PURPLE CONEFLOWER	
6.0%	DELPHINIUM AJACIS	ROCKET LARKSPUR	
6.0%	CENTAUREA CYANUS, TALL MIXED	BACHELOR'S BUTTON TALL MIXED/CORNFLOWER	
6.0%	COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS	
6.0%	RUDBECKIA HIRTA	BLACKEYED SUSAN	
5.0%	DIANTHUS BARBATUS	SWEETWILLIAM	
4.0%	CHRYSANTHEMUM MAXIMUM	SHASTA DAISY	
2.2%	BAPTISIA AUSTRALIS, SOUTHERN WV ECOTYPE	BLUE FALS INDIGO, SOUTHERN WV ECOTYPE	
2.0%	LIATRIS SPICATA	MARSH BLAZING STAR	
1.4%	HELIOPSIS HELIANTHOIDES, PA ECOTYPE	OXEYE SUNFLOWER, PA ECOTYPE	
1.2%	ASCLEPIAS TUBEROSA, PA ECOTYPE	BUTTERFLY MILKWEED, PA ECOTYPE	
1.1%	PYCNANTHEMUM TENUIFOLIUM	NARROWLEAF MOUNTAINMINT	
1.0%	ASCLEPIAS INCARNATA, PA ECOTYPE	SWAMP MILKWEED, PA ECOTYPE	
1.0%	ERYNGIUM YUCCIFOLIUM, OH ECOTYPE	RATTLESNAKE MASTER, OH ECOTYPE	
1.0%	ESCHSCHOLZIA CALIFORNICA	CALIFORNIA ORANGE POPPY	
1.0%	PAPAVER RHOEAS, RED	CORN POPPY, RED	
1.0%	RATIBIDA PINNATA, OH ECOTYPE	GREY HEADED CONEFLOWER, OH ECOTYPE	
0.8%	PENSTEMON DIGITALIS, PA ECOTYPE	TALL WHITE BEARDTONGUE, PA ECOTYPE	
0.7%	COREOPSIS TINCTORIA	PLANS COREOPSIS	
0.6%	ZIZIA AUREA, PA ECOTYPE	GOLDEN ALEXANDERS, PA ECOTYPE	
0.5%	ERAGROSTIS SPECTABILIS, RI ECOTYPE	PURPLE LOVEGRASS, RI ECOTYPE	
0.5%	MONARDA FISTULOSA, FORT INDIANTOWN GAP-PA ECOTYPE	WILD BERGAMOT, FORT INDIANATOWN GAP-PA ECOTYPE	
0.4%	SOLIDAGO NEMORALIS, PA ECOTYPE	GRAY GOLDENROD, PA ECOTYPE	
0.4%	TRADESCANTIA OHIENSIS, PA ECOTYPE	OHIO SPIDERWORT, PA ECOTYPE	
0.3%	ASTER OBLONGIFOLIUS, PA ECOTYPE	AROMATIC ASTER, PA ECOTYPE	
0.2%	ASTER LAEVIS, NY ECOTYPE	SMOOTH BLUE ASTER, NY ECOTYPE	
0.2%	ASTER NOVAE-ANGLIAE, PA ECOTYPE	NEW ENGLAND ASTER, PA ECOTYPE	
0.2%	OENOTHERA FRUTICOSA VAR. FRUTICOSA	SUNDROPS	
0.1%	ASTER PILOSUS, PA ECOTYPE	HEATH ASTER, PA ECOTYPE	
0.1%	SOLIDAGO BICOLOR, PA ECOTYPE	WHITE GOLDENROD, PA ECOTYPE	
0.1%	SOLIDAGO ODORA, PA ECOTYPE	LICORICE SCENTED GOLDENROD, PA ECOTYPE	

*AREAS OUTSIDE OF FENCE TO BE SEEDED WITH ERNMX - 179 OR OWNER APPROVED EQUAL AT A RATE OF 30 LB PER ACRE. BETWEEN DECEMBER 1ST THROUGH APRIL 1ST, EACH TYPE OF SEED SHALL HAVE AN ADDITIONAL 1 LB PER 1,000 SF OF WINTER RYEGRASS OR GRAIN RYE GRASS SEED INCLUDED

PLANTING SCHEDULE

KEY	COMMON	BOTANICAL	SIZE	NO.	SPACING
MP	GRAY DOGWOOD	CORNUS RACEMOSA	3'-4' HT	78	6' O.C. & STAGGERED
QC	SCARLET OAK	QUERCUS COCCINEA	12'-14' Ht	12	45' O.C.
VC	COMMON ELDERBERRY	SAMBUCUS	5-7 GALLON	68	6' O.C. & STAGGERED
JV	EASTERN RED CEDAR	JUNIPERUS VIRGINIANA	6'-8' HT	236	18' O.C.**
PR	WHITE PINE	PINUS STROBUS	8-10' Ht	202	20' O.C. & STAGGERED
QI	SCRUB OAK	QUERCUS ILICIFOLIA	3'-4' Ht	11	45' O.C.

*NO. DENOTES TOTAL NUMBER OF PROPOSED PLANTINGS FOR ENTIRE SITE PLAN
**UNLESS OTHERWISE NOTED

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P.E. seal/Consultant:

Project: WILSON HILL SOLAR
469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title: PLANTING PLAN
NOT FOR CONSTRUCTION
Drawn by: BMW Approved by: STA Scale: As Shown

Dwg No: L-100 Size: D Sheet Rev: G

SECTION 3

Federal, State or Local Notice of Intent (NOI)

NYSDEC NOI Acknowledgement Letter

NYSDEC Deep-Ripping and Decompaction Guidance

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.37

(Submission #: HQ1-0XR3-VGHF6, version 1)

Details

Submission Alias	Wilson Hill Road Solar Array
Originally Started By	Brandon Ferguson
Alternate Identifier	Wilson Hill Road Solar Array
Submission ID	HQ1-0XR3-VGHF6
Submission Reason	New
Status	Draft

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)
Wilson Hill Solar, LLC

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

Owner/Operator Contact Person First Name
Kelley

Owner/Operator Mailing Address
101 Summer Street, 2nd Floor

City
Boston

State
MA

Zip
02110

Phone
845-772-2963

Email
kfike@nexamp.com

Federal Tax ID
26-1541318

> If the owner/operator is an organization, provide the Federal Tax ID number, or Employer Identification Number (EIN), in the format xx-xxxxxxx. If the owner/operator is an individual and not an organization, enter "Not Applicable" or "N/A" and do not provide the individual's social security number.

Project Location

Project/Site Name
Wilson Hill Road Solar Array

Street Address (Not P.O. Box)
469 Wilson Hill Road

Side of Street
North

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

State
NY

Zip
12090

DEC Region
4

> The DEC Region must be provided. Please use the NYSDEC Stormwater Interactive Map (https://gisservices.dec.ny.gov/gis/stormwater/) to confirm which DEC Region this site is located in. To view the DEC Regions, click on "Other Useful Reference Layers" on the left side of the map, then click on "DEC Administrative Boundary." Zoom out as needed to see the Region boundaries.

> For projects that span multiple Regions, please select a primary Region and then provide the additional Regions as a note in Question 39.

County
RENSSELAER

Name of Nearest Cross Street
Fog Hill Road

Distance to Nearest Cross Street (Feet)
850

Project In Relation to Cross Street
East

Tax Map Numbers Section-Block-Parcel
26-1-12.21/1

Tax Map Numbers
NONE PROVIDED

> If the project does not have tax map numbers (e.g. linear projects), enter “Not Applicable” or "N/A".

1. Coordinates

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

Navigate to your location and click on the map to get the X,Y coordinates
42.900895102639076,-73.38223675800164

Project Details

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

> For the purposes of this eNOI, “New Construction” refers to any project that does not involve the disturbance of existing impervious area (i.e. 0 acres). If existing impervious area will be disturbed on the project site, it is considered redevelopment with either increase in impervious area or no increase in impervious area.

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

Pre-Development Existing Landuse
Pasture/Open Land

Post-Development Future Land Use
Other: Solar Field

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

---

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

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

Total Site Area (acres)
99.5

Total Area to be Disturbed (acres)
25.3

Existing Impervious Area to be Disturbed (acres)
0.3

Future Impervious Area Within Disturbed Area (acres)
0.6

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

---

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

A (%)
0.0

B (%)
0.0

C (%)
3.2

D (%)
96.8

7. Is this a phased project?
Yes

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

Start Date
04/01/2024

End Date
09/30/2024

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.
Minor Tributary of the middle Hoosick River

> Drainage ditches and storm sewer systems are not considered surface waterbodies. Please identify the surface waterbody that they discharge to. If the nearest surface waterbody is unnamed, provide a description of the waterbody, such as, “Unnamed tributary to Niagara River.”

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

Other Waterbody Type Off Site Description
NONE PROVIDED

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

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

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

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

> Please use the DEC Stormwater Interactive Map (https://gisservices.dec.ny.gov/gis/stormwater/) to confirm if this site is located in one of the watersheds of an AA or AA-S classified water. To view the watershed areas, click on “Permit Related Layers” on the left side of the map, then click on “Class AA AAS Watersheds.”

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 D (provided the map unit name is inclusive of slopes greater than 25%), E or F on the USDA Soil Survey?
NONE PROVIDED

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

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

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?
Yes

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

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

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

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

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

Required SWPPP Components

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

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

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

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

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

SWPPP Preparer
Environmental Design Partnership

Contact Name (Last, First)
Alessandrini Stephanie

Mailing Address
900 Rt 146

City
Clifton Park

State
NY

Zip
12065

Phone
518-371-7621

Email
salessandrini@edpllp.com

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

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2) The certified SWPPP preparer should sign this form
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swpppcert_ex.pdf - 12/22/2023 07:45 AM
Comment
NONE PROVIDED

Erosion & Sediment Control Criteria

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

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

Temporary Structural
Check Dams
Construction Road Stabilization
Level Spreader
Sediment Traps
Silt Fence
Stabilized Construction Entrance

Biotechnical
None

Vegetative Measures
Grassed Waterway
Seeding
Topsoiling

Permanent Structural
Land Grading
Riprap Slope Protection
Rock Outlet Protection

Other
NONE PROVIDED

Post-Construction Criteria

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

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

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

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)
0.730

29. Post-construction SMP Identification

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

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

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

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)
0.148

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

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

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)
0.144

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

If Yes, go to question 33.

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

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

33. SMPs

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

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

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

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)
0.582

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

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).
0.730

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

If Yes, go to question 36.

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

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

CPv Required (acre-feet)
NONE PROVIDED

CPv Provided (acre-feet)
NONE PROVIDED

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

Overbank Flood Control Criteria (Qp)

Pre-Development (CFS)
70.73

Post-Development (CFS)
46.56

Total Extreme Flood Control Criteria (Qf)

Pre-Development (CFS)
141.81

Post-Development (CFS)
101.36

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

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

If Yes, Identify the entity responsible for the long term Operation and Maintenance
Wilson Hill Solar, LLC

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.
Steep slopes and poor soil conditions prevent the possibility of using other stormwater treatment practices to meet the criteria.

Post-Construction SMP Identification

Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs

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

RR Techniques (Area Reduction)

Round to the nearest tenth

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

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

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

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

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

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

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

RR Techniques (Volume Reduction)

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

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

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

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

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

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

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

Standard SMPs with RRv Capacity

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

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

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

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

Total Contributing Impervious Acres for Bioretention (F-5)
3.71

Total Contributing Impervious Acres for Dry Swale (O-1)
NONE PROVIDED

Standard SMPs

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

Total Contributing Impervious Acres for Wet Pond (P-2)
3.92

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

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

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

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

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

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

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

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

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

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

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

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

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

Total Contributing Impervious Area for Hydrodynamic
NONE PROVIDED

Total Contributing Impervious Area for Wet Vault
NONE PROVIDED

Total Contributing Impervious Area for Media Filter
NONE PROVIDED

"Other" Alternative SMP?
NONE PROVIDED

Total Contributing Impervious Area for "Other"
NONE PROVIDED

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

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

Manufacturer of Alternative SMP
NONE PROVIDED

Name of Alternative SMP
NONE PROVIDED

Other Permits

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

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

If Other, then identify
NONE PROVIDED

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

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

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

MS4 SWPPP Acceptance

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

If No, skip question 44

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

MS4 SWPPP Acceptance Form Download

Download form from the link below. Complete, sign, and upload.
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Comment
NONE PROVIDED

Owner/Operator Certification

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Attachments

Date	Attachment Name	Context	User
12/22/2023 7:45 AM	swpppcert_ex.pdf	Attachment	Brandon Ferguson
12/22/2023 7:34 AM	Wilson Hill NOI_OwnerOperator_Executed.pdf	Attachment	Brandon Ferguson

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

Deep-Ripping and Decompaction

April 2008

New York State
Department of Environmental Conservation

Document Prepared by:

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

Alternative Stormwater Management
Deep-Ripping and Decompaction

Description

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

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

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

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

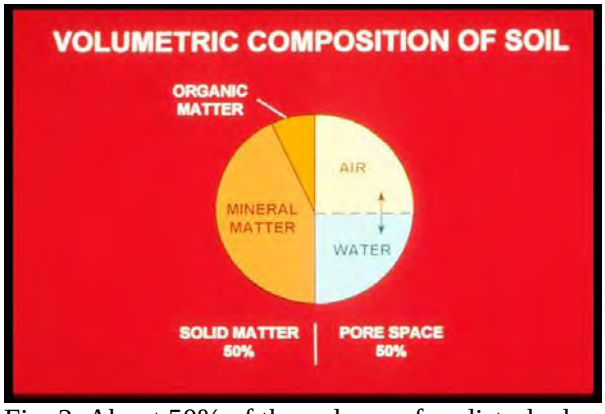

Fig. 2. About 50% of the volume of undisturbed loam surface soil is pore space, when soil is in good condition for plant growth. Brady, 2002.

Recommended Application of Practice

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

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

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

Benefits

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

- Increases the project (larger size) area's direct surface infiltration of rainfall by providing the open site's mitigated soil condition and lowers the demand on concentrated runoff control structures

- Enhances direct groundwater recharge through greater dispersion across and through a broader surface than afforded by some runoff-control structural measures

- Decreases runoff volume generated and provides hydrologic source control

- May be planned for application in feasible open locations either alone or in

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

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

Feasibility / Limitations

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

Soil

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

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

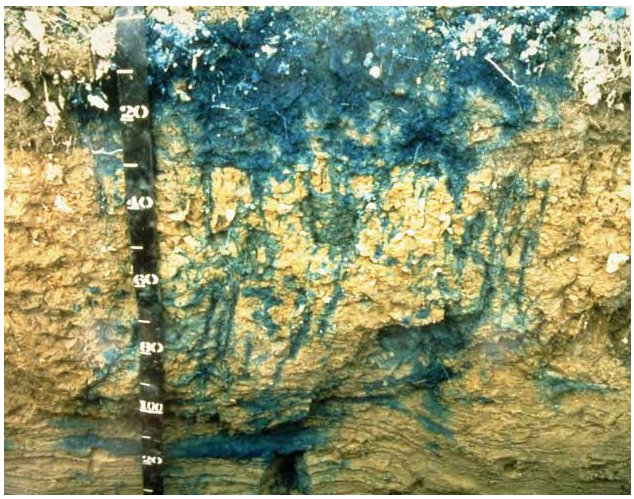

Fig. 4. Profile (in centimeters) displaying the infiltration test result of the natural undisturbed horizons of a soil in Hydrologic Soil Group C.

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

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

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

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

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

Slope

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

Local Weather/Timing/Soil Moisture

Effective fracturing of compressed subsoil material from the exposed work surface, laterally and vertically down through the affected zone is achieved only when the soil material is moderately dry to moderately moist. Neither one of the two-phases, deep ripping nor decompaction (deep

subsoiling), can be effectively conducted when the soil material (subsoil or replaced topsoil) is in either a "plastic" or "liquid" state of soil consistency. Pulling the respective implements legs through the soil when it is overly moist only results in the "slicing and smearing" of the material or added "squeezing and compression" instead of the necessary fracturing. Ample drying time is needed for a "rippable" soil condition not merely in the material close to the surface, but throughout the material located down to the bottom of the physically compressed zone of the subsoil.

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

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

Design Guidance

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

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

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

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

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

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

Implements

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

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

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

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

Pulling-Power of Equipment

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

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

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

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

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

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

Depth and Patterns of Movement

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

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

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

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

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

Every separate series (pattern) consists of parallel, forward-and-return runs, with each progressive

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

Large, Unobstructed Areas

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

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

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

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

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

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

Corridors

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

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

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

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

Maintenance and Cost

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

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

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

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

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

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

Resources

Publications:

- American Society of Agricultural Engineers. 1971. *Compaction of Agricultural Soils.* ASAE.

- Brady, N.C., and R.R. Weil. 2002. *The Nature and Properties of Soils. 13th ed.* Pearson Education, Inc.

- Baver, L.D. 1948. *Soil Physics.* John Wiley & Sons.

- Carpachi, N. 1987 (1995 fifth printing). *Excavation and Grading Handbook, Revised. 2nd ed.* Craftsman Book Company
- Ellis, B. (Editor). 1997. Safe & Easy Lawn Care: The Complete Guide to Organic Low Maintenance Lawn. Houghton Mifflin.

- Harpstead, M.I., T.J. Sauer, and W.F. Bennett. 2001. *Soil Science Simplified. 4th ed.* Iowa State University Press.

- Magdoff, F., and H. van Es. 2000. *Building Soils for Better Crops. 2nd ed.* Sustainable Agricultural Networks

- McCarthy, D.F. 1993. *Essentials of Soil Mechanics and Foundations, Basic Geotechnics 4th ed.* Regents/Prentice Hall.

- Plaster, E.J. 1992. *Soil Science & Management. 3rd ed.* Delmar Publishers.

- Union Gas Limited, Ontario, Canada. 1984. *Rehabilitation of Agricultural Lands, Dawn-Kerwood Loop Pipeline; Technical Report*. Ecological Services for Planning, Ltd.; Robinson, Merritt & Devries, Ltd. and Smith, Hoffman Associates, Ltd.

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

Internet Access:

- Examples of implements:

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

- Soils data of USDA Natural Resources Conservation Service. *NRCS Web Soil Survey.* http://websoilsurvey.nrcs.usda.gov/app/ and *USDA-NRCS Official Soil Series Descriptions; View by Name.* http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi . *Last visited Jan. 08.*

- Soil penetrometer information. Access by internet searches of: *Diagnosing Soil Compaction using a Penetrometer (soil compaction tester), PSU Extension;* as well as *Dickey-john Soil Compaction Tester*.
http://www.dickey-johnproducts.com/pdf/SoilCompactionTest.pdf and http://cropsoil.psu.edu/Extension/Facts/uc178pdf Last visited Sept. 07

SECTION 4

Federal, State or Local NPDES General Permit

SECTION 5

Certifications, Forms, Reports, and Daily Logs

STORMWATER POLLUTION PREVENTION PLAN
NOI PERMITTEE'S CERTIFICATION

FORM 1

Construction Site
WILSON HILL SOLAR
TOWN OF HOOSICK, Rensselaer County, New York

STORMWATER POLLUTION PREVENTION PLAN DATED August, 2023, revised January, 2024

NOI PERMITTEE'S CERTIFICATION:

"I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

NOI Permittee's
Designated Project Manager: _____

Signed: _____

Printed Name: _____

Position: _____

Date: _____

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S CERTIFICATION LOG

FORM 2

Construction Site

WILSON HILL SOLAR

TOWN OF HOOSICK, Rensselaer County, New York

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Company Name	
Address	
Contact Name	
Telephone Number	
Cell Phone/Pager	
Scope of Services	
Certification Date	

Designated Project Manager____________________

STORMWATER POLLUTION PREVENTION PLAN
CONTRACTOR'S/SUBCONTRACTOR'S CERTIFICATION
FORM 3

This form to be completed for each contractor listed on Form 2. Reproduce as needed

Construction Site

WILSON HILL SOLAR

TOWN OF HOOSICK, Rensselaer County, New York

CONSTRUCTION POLLUTION PREVENTION PROGRAM

DATED August, 2023, revised January, 2024

CONTRACTOR'S CERTIFICATION:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

The Contractor/Subcontractor further understands that the SWPPP and associated Erosion and Sediment Control Plans represent the **MINIMUM** erosion and sediment control measures that will be required to protect the site during construction. Additional erosion and sediment control measures will be necessary during construction. It will be the responsibility of Contractor/Subcontractor to implement all additional erosion and sediment control measures necessary to protect the site during construction.

CONTRACTOR:	**SUB**CONTRACTOR:
Name (Print): _____	Name (Print): _____
Signature: _____	Signature: _____
Date: _____	Date: _____
Title: _____	Title: _____
Company Name: _____	Company Name: _____
Address: _____	Address: _____
_____	_____
Phone: _____	Phone: _____

Elements of SWPPP Contractor/Subcontractor responsible for: _____

Name of Trained Contractor Responsible for SWPPP Implementation: _____

Title of Trained Contractor Responsible for SWPPP Implementation: _____

FORM 4
WILSON HILL SOLAR, LLC – WILSON HILL SOLAR
SWPPP # _____
This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORTS Page 1 of _____
Date _____

Weather and Soil Conditions
Weather Conditions: _____
Soil Conditions: Dry [ ] Wet [ ] Saturated [ ] Snow Covered [ ] Frozen [ ]

Maintaining Water Quality

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

Housekeeping
1. General Site Conditions

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

2. Temporary Stream Crossing

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

Runoff Control Practices
1. Excavation Dewatering

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

2. Water Bar

Yes	No	NA	
[ ]	[ ]	[ ]	Installed per plan with vehicle crossings stabilized with gravel.
[ ]	[ ]	[ ]	Outlet located on undisturbed soil or lined with riprap.
[ ]	[ ]	[ ]	Bar height is 12-inch minimum from bottom of channel with minimum base width of 6-foot.

3. Interceptor Dikes and Swales

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

SWPPP INSPECTION REPORT Page 2 of _____
Date _____

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.
[ ]	[ ]	[ ]	Four inches minimum of topsoil has been applied under permanent seedings.

Sediment Control Practices

1. Stabilized Construction Entrance

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

2. Silt Fence

Yes	No	NA	
[ ]	[ ]	[ ]	Installed on Contour, ten feet from toe of slope (not across conveyance channels).
[ ]	[ ]	[ ]	Joints constructed by wrapping the two ends together for continuous support.
[ ]	[ ]	[ ]	Fabric buried six inches minimum.
[ ]	[ ]	[ ]	Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is _____% of design capacity.

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

Yes	No	NA	
[ ]	[ ]	[ ]	Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ]	[ ]	[ ]	Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ]	[ ]	[ ]	Drainage area is one acre 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 three-foot maximum spacing between posts.
[ ]	[ ]	[ ]	Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at maximum eight inch spacing.
[ ]	[ ]	[ ]	Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation _____% of design capacity.

SWPPP INSPECTION REPORT Page 3 of _____
Date _____

4. Temporary Sediment Trap

Yes	No	NA	
[ ]	[ ]	[ ]	Outlet structure is constructed per the approved plan or drawing.
[ ]	[ ]	[ ]	Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is _____% of design capacity.

5. Temporary Sediment Basin

Yes	No	NA	
[ ]	[ ]	[ ]	Basin and outlet structure constructed per the approved plan.
[ ]	[ ]	[ ]	Basin side slopes are stabilized with seed/mulch.
[ ]	[ ]	[ ]	Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is _____% of design capacity.

Dust Control Practices

1. Haul Road and Current Work Areas

Yes	No	NA	
[ ]	[ ]	[ ]	Are all traffic surface areas sufficiently treated to prevent fugitive dust?
[ ]	[ ]	[ ]	Are any areas of site's non-traffic and work area experiencing wind erosion?
[ ]	[ ]	[ ]	Are there any disturbed areas in need of temporary seed and mulch to protect surface from wind erosion?
[ ]	[ ]	[ ]	Is watering truck on-site?
[ ]	[ ]	[ ]	Is dust visible in air at any location of the site?

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site-specific design.
Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

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

_____

_____

_____

Description 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 (see Page 5 for Sketch). _____

_____

_____

_____

FORM 4
WILSON HILL SOLAR, LLC – WILSON HILL SOLAR
SWPPP # _____
This form to be completed by Contractor's designated inspector at least weekly. Reproduce as needed.

SWPPP INSPECTION REPORT

Date _____

ADDITIONAL COMMENTS*:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ _____
Inspector (print name and title) Date and Time of Inspection

_____ _____
Qualified Professional (print name) Qualified Professional Signature

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

***Attach photographs of practices identified as needing corrective actions.**

NOTE: IN ACCORDANCE WITH PART IV.C.4 OF THE SPDES GENERAL PERMIT (GP-0-20-001), THE QUALIFIED INSPECTOR MUST NOTIFY THE OWNER OR OPERATOR AND APPROPRIATE CONTRACTOR OF ANY CORRECTIVE ACTIONS THAT NEED TO BE TAKEN. THE CONTRACTOR SHALL BEGIN IMPLEMENTING THE CORRECTIVE ACTIONS WITHIN ONE (1) BUSINESS DAY OF THIS NOTIFICATION AND SHALL COMPLETE THE CORRECTIVE ACTIONS IN A REASONABLE TIME FRAME.

STORMWATER POLLUTION PREVENTION PLAN
MODIFICATION REPORT
FORM 5

This form to be used only when Contractor's designated inspector believes changes to the SWPPP and/or Erosion and Sediment control plans is warranted. For example, additional erosion control measures needed or removal of specific control measures can be done without adverse impact. This form must be approved by Designated Project Manager prior to implementation.

Construction Site
WILSON HILL SOLAR
TOWN OF HOOSICK, Rensselaer County, New York

CHANGES REQUIRED FOR STORMWATER POLLUTION PREVENTION PLAN

To:	**Designated Project Manager**	**Date:**	
Address:			
Telephone:			
Facsimile:			
Sent Via:	☐ **Facsimile**	☐ **E-mail**	☐ **US Mail**

INSPECTOR: _____ DATE: _____
(Print)

_____
(Signature)

QUALIFICATIONS OF INSPECTOR: _____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN: _____

_____

_____

REASONS FOR CHANGES: _____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

APPROVED BY DESIGNATED PROJECT MANAGER _____ DATE: _____

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF STABILIZATION AND CONSTRUCTION ACTIVITIES
FORM 6

Construction Site

WILSON HILL SOLAR

TOWN OF HOOSICK, Rensselaer County, New York

A record of dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be maintained until final site stabilization is achieved and the Notice of Termination is filed. *Reproduce copies of this form as needed.*

MAJOR GRADING, CONSTRUCTION, OR STABILIZATION ACTIVITIES

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Description of Activity: _____

Begin Date:_____ Site Contractor: _____

Location: _____

End Date: _____

Designated Project Manager_____

STORMWATER POLLUTION PREVENTION PLAN
RECORD OF TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES
FORM 6A

Construction Site

WILSON HILL SOLAR

TOWN OF HOOSICK, Rensselaer County, New York

A record of the timing of temporary erosion and sediment control practices to be implemented, including the timing of initial placement and the duration that each practice should remain in place. The record may reflect the actual date of planned installation or the specific construction activity with which it will be associated. The timing of removal may reflect an actual date or the length of time over which the practice will be implemented.

TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES

Description of Practice: ______________________________

Date/Timing of Initial Placement:__________ Site Contractor: ______________________________

Location: ______________________________

Projected Date/Timing of Removal: ______________________________

Description of Practice: ______________________________

Date/Timing of Initial Placement:__________ Site Contractor: ______________________________

Location: ______________________________

Projected Date/Timing of Removal: ______________________________

Description of Practice: ______________________________

Date/Timing of Initial Placement:__________ Site Contractor: ______________________________

Location: ______________________________

Projected Date/Timing of Removal: ______________________________

Description of Practice: ______________________________

Date/Timing of Initial Placement:__________ Site Contractor: ______________________________

Location: ______________________________

Projected Date/Timing of Removal: ______________________________

Description of Practice: ______________________________

Date/Timing of Initial Placement:__________ Site Contractor: ______________________________

Location: ______________________________

Projected Date/Timing of Removal: ______________________________

Designated Project Manager______________________

PROJECT RAINFALL LOG (to be completed by Contractor)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Day												
1												
2												
3												
4												
5												
6												
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28												
29												
30												
31												
PM Initials												

STORMWATER POLLUTION PREVENTION PLAN

FINAL STABILIZATION CERTIFICATION /NOTICE OF TERMINATION CHECKLIST

FORM 8

This form is to be completed by Contractor and submitted to Designated Project Manager for approval only afterContractor believes all work regulated by SWPPP is complete.

Construction Site
WILSON HILL SOLAR
TOWN OF HOOSICK, Rensselaer County, New York

1. ☐ **All soil disturbing activities are complete.**

2. ☐ **Temporary Erosion and Sediment Control Measures have been removed or will be removed at the appropriate time.**

3. ☐ **All areas of the Construction Site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 85% or equivalent measures have been employed.**

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that all storm water discharges associated with industrial activity from the identified project that are authorized by NPDES general permit have been eliminated and that all disturbed areas and soils at the construction site have achieved Final Stabilization and all temporary erosion and sediment control measures have been removed or will be removed at the appropriate time."

Company Name _____

Name (Print) _____

Signature _____

Date _____

APPROVED BY DESIGNATED PROJECT MANAGER_____ DATE: _____

SECTION 6

Supplemental Information

1. **Stormwater Management Narrative – Appendices and Figures Available Upon Request**
2. **FEMA Flood Mapping**
3. **NYSDEC Environmental Resource Mapper**
4. **SHPO Letter of No Effect**
5. **Soils Report (USDA)**
6. **USFW IPAC Results**

Stormwater Management Narrative

Wilson Hill Road Solar Array

469 Wilson Hill Road

Town of Hoosick

Rensselaer County, New York

Applicant:

Wilson Hill Solar, LLC

101 Summer Street, 2nd Floor

Boston, MA 02110

JUNE 2023

Revised January, 2024

Prepared By:

The Environmental Design Partnership, LLP

900 Route 146

Clifton Park, NY 12065

TABLE OF CONTENTS

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Figures

Attachments

900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621

1.0 Introduction

Wilson Hill Solar, LLC is proposing the development of a solar farm on an existing parcel of land totaling approximately 99.52± acres located on the northern side of Wilson Hill Road in the Town of Hoosick, New York. The proposed site development includes a solar farm which consists of approximately 7.00± acres of solar panels spaced 30.0± feet center to center and the construction of approximately 2,300± linear feet (LF) of access road, stormwater management areas, and eight-foot-high perimeter fencing. The total area of proposed disturbance is approximately 25.5± acres and 8.05± acres of impervious area will be added to the site.

A stormwater management system has been designed to provide pollutant removal, reduce channel erosion, prevent overbank flooding, and safely control extreme flood events in accordance with the NYS Stormwater Management Design Manual (Design Manual). The NYS Department of Environmental Conservation (NYSDEC) issued specific guidance in April 2018 relative to stormwater management design considerations for solar panel installations. The temporary erosion control measures and post-construction stormwater management systems for this project have been designed in accordance with those guidelines and subsequent discussions with the NYSDEC relative to their guidelines. Section 7.0 of this report addresses specific solar panel application guidance.

The proposed stormwater management system for the project will include roadside swales, attenuation ponds, bioretention areas, and a wet pond designed to convey runoff from the proposed gravel or paved stormwater access roads, solar panels, and the solar equipment pad. Runoff from the impervious access road and solar panels is directed into vegetated swales that discharge into bioretention areas or a wet pond. Additional roadside swales are proposed to direct stormwater runoff from the solar panel array into attenuation ponds to protect against washouts.

This narrative presents a review of the design concepts and parameters of the stormwater management system for the proposed increased impervious areas, in accordance with NYSDEC solar application guidance, including the access roads and the equipment pads. The purpose of the stormwater management narrative is to assure that changes in the surface runoff characteristics, as a result of the proposed construction, will not adversely impact adjacent or downstream properties. On-site stormwater management will be implemented in accordance with the Design Manual and NYSDEC solar application guidance to accommodate both additional stormwater runoff and to provide water quality treatment according to the green infrastructure standards.

2.0 Redevelopment Justification

Redevelopment Activity is defined as "…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,

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subdivision, etc.)", according to the NYSDEC SPDES General Permit GP-0-20-001 for Stormwater Discharges from Construction Activity.

The proposed solar facility will be constructed on an abandoned farm field. As part of the proposed development, a section of an existing impervious roadway will be improved. Therefore, this project is considered a redevelopment project.

The Design Manual states several of the challenges encountered during redevelopment projects include "…the need to tie in to the existing drainage infrastructure… …the presence of underground utilities, incompatible surrounding land usages, highly compacted soils that are not suitable for infiltration, and contaminated soils that require mitigation."
Due to these constraints, the Design Manual offers "alternative sizing criteria" which differs from the standards and sizing criteria listed in other portions of the manual. These standards include:

- Water Quantity: Analyzing how redevelopment and new development activities change the existing hydrology and discharge rates from the project site.
- Channel Protection: Channel protection is known as stream channel protection, designed to protect stream channels from erosion. It is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event. For redevelopment projects, channel protection is not required if the post-construction 1-year 24-hour discharge rate and velocity is less than or equal to the pre-construction discharge rate.
- Water Quality: Water quality volumes must be treated for redevelopment projects by implementing conventional treatment standards, alternative treatment standards, or a combination of both.

The proposed redevelopment meets the alternative sizing criteria put forth in the Design Manual; more detail will be provided in Section 6 of this report.

3.0 Existing Conditions

The site generally consists of a farm field with small patches of wooded areas. The topography of the land consists of drainage from northeast to southwest. The typical slopes in the area of proposed development range from 10% to 20%, with localized areas over 30%. Elevations at the site vary between 734 and 1087 feet above sea level.

3.1 Soil and Groundwater Conditions

The USDA Natural Resources Conservation Service Soil Survey identifies the soils on the site, in the area of proposed development, to consist of sandy to silty loams, which range from somewhat poorly drained to moderately well drained, and which are predominantly classified as Hydrologic Soil Group (HSG) C/D. The results from the USDA Natural Resources Conservation Soil Survey (Soil Survey) are included in Section 6 of the SWPPP.

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4.0 Predevelopment Stormwater Analysis

The existing hydrologic conditions, in the area to be disturbed as a result of the proposed construction, were analyzed using Applied Microcomputer Systems' "HydroCAD" computer modeling program. The HydroCAD stormwater modeling program employs the United States Department of Agriculture's Soil Conservation Service (SCS) Technical Release 20 (TR-20) method for stormwater analysis. Using this modeling technique, the site is divided into "subcatchments" that represent specific areas contributing stormwater runoff to an existing, or proposed drainage feature. The subcatchments typically flow through "reaches" (i.e., swales, channels, or pipes) that convey the stormwater to storm basins or discharge areas.

A hydrologic model of the existing site was prepared using the Hydrocad program. Five (5) subcatchments were used to represent the existing drainage condition, see Figure 2.

The existing parameters of topography, vegetation, slope and soil type are all incorporated into the predevelopment model.

Table 1 presents a summary of the pre-development stormwater peak discharge for the 1 year, 10 year and 100-year design storm events at the respective Design Points. As will be discussed in subsequent sections, the post development stormwater discharge rate has been limited to the predevelopment discharge rate for the 1-year, 10-year, and 100-year storm events.

Table 1: Pre-Development Runoff Rates

Storm Event	Design Point Discharge (cfs)					Total Discharge offsite (cfs)
	OFFA	OFFB	OFFC	OFFD	OFFE	
1-Year (2.19")	7.92	9.21	1.72	1.09	2.50	20.41
10-Year (3.63")	24.66	30.68	5.54	3.35	10.70	70.73
50-Year (5.18")	40.17	50.98	9.05	5.44	15.29	119.29
100-Year (6.05")	47.36	60.34	10.66	6.40	22.81	141.81

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The pre-development Curve Numbers (CN) for the existing ground covers are listed in Table 2.

Table 2: Pre-Development Ground Cover

Pre-Development Ground Cover Description	Curve Number
Gravel Surface, HSG C/D	96
Meadow non-grazed, HSG D	78
Meadow non-grazed, HSG C	71
Woods, Fair HSG D	79

The weighted CN for the pre-development conditions for the site is approximately 79. The HydroCAD model results for the pre-development conditions are included within Attachment B.

Design Point OFFA conveys flows to the neighboring property to the south. Design Point OFFB, OFFC, and OFFD conveys flows to a low point off the property in the southeastern direction. Design Point OFFE includes runoff from the existing gravel access drive that flows to the south into a roadside ditch.

5.0 Stormwater Management Planning and Practice Selection

The site layout and stormwater design for this project was completed while taking into consideration the potential impacts on the existing site and downstream hydrology. Stormwater runoff from the existing site predominately sheet flows to areas to the south of the site. The stormwater management system will replicate similar practices.

Stormwater from impervious areas on the site is designed to be treated with bioretention areas with underdrains and a wet pond. This design method was considered ideal on this site given the steep topography which eliminates the possibility of using a majority of other treatment practices. Bioretention areas are considered standard stormwater management practices with runoff reduction volume capacity and wet ponds are considered standard stormwater management practices.

The total disturbance for the project will be on the order of 25.7± acres. The proposed redevelopment will result in an increase of impervious cover by 7.52± acres.

6.0 Post-Development Stormwater Analysis

The post-development conditions were analyzed using the HydroCAD computer modeling program.

Twelve (12) subcatchments were used to represent the post development drainage conditions of the site in the areas of the proposed development. Site improvements to the property will consist of a solar farm which will include 7.10± acres of solar panels, approximately 2,300± LF of

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access road, a solar electrical equipment pad, and chain link fencing. Also included, as permanent elements of the development, are the on-site stormwater management areas. Stormwater management practices have been designed to provide storage, treatment, and attenuation of stormwater runoff from the proposed impervious surfaces on the site.

Stormwater runoff from the proposed impervious access road, solar panels, and solar electrical equipment pads will flow into vegetated swales which will convey flows to five (5) stormwater management areas, designed as bioretention areas and a wet pond.

Runoff from the undeveloped site perimeter, outside of the stormwater management areas, will sheet flow off site, which is similar to predevelopment drainage patterns. In areas with slopes greater than 5% where solar panels will be installed, overland flow dispersion devices will be installed on 100-foot intervals. The overland flow dispersion devices will maintain sheet flow patterns similar to predevelopment conditions.

The post-development ground cover Curve Numbers (CN) are listed in Table 3.

Table 3: Post-Development Ground Cover

Post-Development Ground Cover Description	Curve Number
Meadow, non-grazed, HSG D	78
Meadow, non-grazed, HSG C	71
Gravel Access Road	96
Improved Entrance Road, Equipment Pad	98
Woods, Fair HSG D	79
>70% Grass Cover, Good, HSG D	80

The weighted CN for the post-development conditions for the site is approximately 79. The HydroCAD model results for the post-development conditions are included within Attachment B. The contributing area to each stormwater management area is identified on Figure 3.

Table 4 presents a summary of the post-development stormwater peak discharge for the 1 year, 10 year and 100-year design storm events at the respective Design Points.

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Table 4: Pre-Development Runoff Rates

Storm Event	Design Point Discharge (cfs)					Total Discharge offsite (cfs)
	OFFA	OFFB	OFFC	OFFD	OFFE	
1-Year (2.19")	1.65	2.61	1.24	0.37	2.44	7.25
10-Year (3.63")	5.16	28.62	4.78	2.11	9.96	46.56
50-Year (5.18”)	8.41	50.01	8.78	4.94	17.42	85.92
100-Year (6.05")	9.92	58.50	9.87	5.95	20.96	101.36

6.1 Stormwater Management Areas #1 through #4 – Bioretention Areas

Stormwater Management Areas (SMA) #1 through #4 are designed as bioretention areas with underdrains. They will provide detention and treatment of stormwater runoff from the improved access road, solar panels, and equipment pad.

Stormwater runoff contributing to SMA #1 and #2 will sheet flow from the existing slope into forebays that will distribute into bioretention areas. Runoff contributing to SMA #3 and #4 will be collected in swales located adjacent to the roadway.

Stormwater runoff contributing to SMA #1 through #4 will receive pretreatment through the forebays that convey flows to the proposed SMAs. According to the Design Manual, a minimum pretreatment volume of 10% of the WQv must be provided.

6.2 Stormwater Management Area #5 – Wet Pond

Stormwater Management Area (SMA) #5 is designed as a wet pond. It will provide the primary detention and treatment of stormwater runoff from the solar panels.

Stormwater runoff contributing to SMA #1 will be collected in vegetated swales located adjacent to the solar panels and will receive pretreatment through the sediment forebays within the wet pond. According to the Design Manual, a minimum pretreatment volume of 10% of the WQv must be provided.

6.3 Redevelopment Criteria

Chapter 9 of the Design Manual states specific sizing criteria for water quantity, channel protection, and water quality volume as described below in the following sections.

6.3.1 Water Quantity

In accordance with Chapter 9 of the Design Manual, if the redevelopment results in no change to hydrology that increases the discharge rate from the project site, the 10-Year and 100-Year criteria do not apply.

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The 1-Year, 10-Year, and 100-Year storm events were analyzed using HydroCAD under the post-development conditions shown in Figure 3. The following table presents the pre-development and post development discharge rates for discharges off the site. As indicated, the post development discharge rate is less than the predevelopment rate, and therefore, no additional water quantity controls are required.

Table 5: Water Quantity Summary

Storm Event	Predevelopment Runoff (CFS)	Post development Runoff (CFS)	Runoff Reduction (CFS)
1-Year (2.19")	20.41	7.25	13.16
10-Year (3.63")	70.73	46.56	24.17
50-Year (5.18”)	119.29	85.92	33.37
100-Year (6.05")	141.81	101.36	40.45

6.3.2 Channel Protection

For redevelopment projects, channel protection is not required if there are no changes to hydrology that increase the discharge rate from the project site; however, as is shown in the HydroCAD analysis, the bioretention areas and wet pond attenuate a 1-year 24-hour storm for at least 24 hours.

6.3.3 Water Quality (WQ_v)

Chapter 9 of the Design Manual lists several options for providing water quality treatment on a redevelopment project. These options include the following:

1. Reduce the existing impervious cover by a minimum of 25% of the total disturbed, impervious area.
2. Treat at least 25% of the Water Quality Volume (WQ_v) from the disturbed, impervious area through the implementation of standard stormwater management practices or by reduction through the implementation of green infrastructure techniques.
3. Propose the use of alternative SMPs to treat at least 75% of the WQ_v from the disturbed impervious area, as well as any additional runoff from tributary areas that are not within the disturbed, impervious area.
4. Use a combination of impervious cover reduction and standard alternative SMPs that provide a weighted average of at least two of the above methods using the following formula: %WQv treatment by Alternative Practice = (25 – (% IC Reduction + % WQv treatment by Standard Practice + % Runoff Reduction))*3

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The proposed development uses Option 2 to meet the Water Quality Treatment requirements. The bioretention areas and the wet pond are sized to treat 100% of all disturbed impervious areas on the site. The Design Manual allows for a runoff reduction equivalent to the water quality volume associated with the bioretention practices.

The runoff reduction for the bioretention areas is on the order of 6,454 CF. Attachment A contains the WQv and RRv calculations for the bioretention areas.

The proposed solar farm includes both redevelopment and new development activities. As such, the new development portions of the project have been designed in accordance with the sizing criteria in Chapter 4 of the Design Manual.

In general, small storm events and the initial runoff from larger storm events are an environmental concern as this stormwater runoff typically contains roadway pollutants and thermal energy stored by the asphalt. In accordance with the Design Manual, this initial runoff is designated as the Water Quality Volume (WQ_v) and special attention is given to this volume of runoff to meet water quality objectives.

The water quality storage volume, WQ_v, is calculated as follows:

$$WQ_v = \frac{P \cdot R_v \cdot A}{12}$$

Where: WQ_v = water quality volume (acre-feet)

P = 90% rainfall event number

R_v = 0.05+0.009(I), where I is percent impervious cover excluding 75% of redevelopment impervious area (Option 2 above)

A = site area (acres), impervious area used with I = 100%

Table 6 below lists the required water quality volume for each stormwater management area in the areas of new development.

Table 6: Required Water Quality Volume

SMA I.D.	P	R_v	A (AC)	Required WQ_v (cf)	Provided WQv (cf)
SMA#1	1.1	0.36	4.85	7,042	7,042
SMA#2	1.1	0.40	4.15	6,614	6,614
SMA#3	1.1	0.25	0.85	853	853
SMA#4	1.1	0.36	11.49	16,381	16,381
SMA#5	1.1	0.38	0.88	1,326	1,326
TOTAL				32,216	32,216

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The total disturbed existing impervious area on site is 0.44 acres, which results in a required WQv of 417 CF, according to the Chapter 9 redevelopment criteria (25% of the disturbed impervious area). The required WQv for the proposed improved impervious access road south of station 8+00 is on the order of 768 CF, using redevelopment calculations, which includes 0.17 acres of existing impervious area and 0.16 acres of new impervious area. The required WQv for the improved access road north of station 8+00 is on the order of 1,233 CF, using redevelopment calculations, which includes 0.26 acres of existing impervious area and 0.26 acres of new impervious area. The proposed stormwater management areas are providing treatment for 100% of the impervious area which is 928 CF more that the required WQv using the redevelopment calculations (1,233 CF) as shown in the GI Worksheets attached in Appendix A. Therefore, the treatment of 100% of the disturbed existing impervious area of the northern portion of the access road accounts for the untreated impervious areas south of station 8+00.

6.3.4 Runoff Reduction Volume (RRv)

The Design Manual specifies that runoff shall be reduced by 100% of the site WQv using standard SMPs with RRv capacity and green infrastructure techniques. The proposed project area is approximately 25.7± acres with a total proposed impervious area on the order of 7.96± acres. The resulting WQv for the site coverage is computed as 31,803± CF.

Site constraints, including poor soils and steep topography prohibit the ability to meet 100% of the RRv reduction. The minimum RRv for the site has been calculated as 6,281 CF. See Attachment A for the minimum RRv calculations.

6.3.4.1 Green Infrastructure Practices

The proposed impervious area on the site will be treated through a combination of SMA's #1 through #5. The SMA's have been designed to increase the time of concentration and reduce the peak discharge. The runoff reduction for the SMA's is on the order of 6,454 CF. Attachment A contains WQv and RRv calculations for this Green Infrastructure Practice. Attachment A contains the WQv and RRv calculations for this green infrastructure practice. Table 7 provides a summary of the runoff reduction provided.

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Table 7: Runoff Reduction Volume Summary

Runoff Reduction Technique	RRv (cf)
B1 (Bioretention Area)	2,856
B2 (Bioretention Area)	2,678
B3 (Bioretention Area)	343
B4 (Bioretention Area)	576
Total Site Reduction	**6,454**
Minimum RRv	**6,281**
% of Min. RRv	**103%**

Many of the green infrastructure practices recommended in the Design Manual were not applied to the stormwater management design on this site due to either site restrictions or the use of more feasible green infrastructure or standard SMP techniques in place of more restrictive and/or maintenance intensive practices. The following table discusses why the unused green infrastructure practices were not feasible.

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Table 8: Non-Feasible Green Infrastructure Practices

Green Infrastructure Practice	Reason use is not feasible
Conservation of Natural Areas	Existing natural areas on site will be conserved to the greatest extent possible, solar facilities are considered temporary in nature, however the added reduction is minimal.
Porous Pavement	Porous Pavement is not economically feasible on this site.
Tree Planting/Tree box	Trees will be saved on the site as possible to conserve the natural areas. Trees will also be planted to maintain a buffer from the roadway and viewshed to the proposed site, though the resulting runoff reduction value for adding additional trees is minimal.
Disconnection of Rooftop Runoff	No structures are proposed within the project area
Stream Daylighting	No streams exist on the project site.
Rain Gardens	Rain gardens are not recommended for commercial applications as well as not economically feasible.
Green Roofs	Rooftops are not present on the site.
Stormwater Planters	The proposed practices were deemed more economically feasible and effective as opposed to stormwater planters. Additionally, they require less maintenance.
Rain Barrels/Cisterns	Rain Barrels/Cisterns would require the ability to use the water between storm events which is not feasible for this project type.

7.0 NYSDEC Solar Panel Construction Guidance Stormwater Analysis

Due to the increase in solar projects throughout New York State, the Department of Environmental Conservation (NYSDEC) released guidance for solar panel stormwater permitting and stormwater pollution prevention plans (SWPPP) in April 2018. The NYSDEC Solar Panel Construction Guidance (SPCG) classifies solar projects under two separate "Scenarios". Scenario 1 Solar Projects are considered *"…Land clearing and grading for the purposes of creating vegetated open space…".* These projects typically require a SWPPP that only addresses erosion and sediment controls. Solar projects are categorized as Scenario 1 if they are designed and constructed in accordance with a specific set of six criteria. Solar projects that aren't designed and constructed to meet these six (6) criteria are classified as Scenario 2 and require a SWPPP that addresses post-construction stormwater management practices which are designed in accordance with the sizing criteria in the Designed Manual. Table 9 provides an analysis of the six (6) criteria provided by the NYSDEC SPCG as they pertain to the Wilson Hill Solar Farm:

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Table 9: NYSDEC Solar Panel Criteria

Scenario 1 Criteria	Proposed Solar Farm Design
1. Solar panels are constructed on post or rack systems and elevated off the ground surface.	Solar panels will be installed on mechanically driven posts with approximately 36 inches between the bottom of the panel and existing grade.
2. The panels are spaced apart so that rain water can flow off the down gradient side of the panel and continue to sheet flow across the ground surface*.	Panels are spaced 30± feet from center to center with 15.9± feet between the panel rows (adjacent edge of panel to adjacent edge of panel). The typical width of a solar panel rack is 14.1± feet. The panel spacing is the larger than the panel width, therefore, sheet flow is maintained.
3. For solar panels constructed on slopes, the individual rows of solar panels are generally installed along the contour so rain water sheet flows down slope*.	Panels are constructed generally along the contours to maintain sheet flow. In locations where panels are not along contours, and slopes are greater than 5%, overland flow dispersion devices are spaced at 100 ft apart are proposed to maintain sheet flow down slope in accordance with discussions with NYSDEC.
4. The ground surface below the panels consist of a well-established vegetative cover.	All ground surface below the panels will have well-established vegetative cover in accordance with the "Final Stabilization" noted in Appendix A of the SPDES Construction General Permit (see Section 4 of the SWPPP).
5. The project does not include the construction of any traditional imperious areas.	The proposed project does contain a solar equipment pad and a gravel road, both of which are considered impervious. **This project therefore falls under Scenario 2.**
6. Construction of the solar panels will not alter the hydrology from pre-to post development conditions.	Based on the analysis performed in this report, the project will create minor disturbance, and add impervious area however, the pre-to post development hydrology will be maintained.

Criteria 5 of the NYSDEC SPCG is not met as traditional impervious area will be added to the site, therefore, this project falls under Scenario 2 and will require post-construction stormwater management controls for impervious areas of the project (gravel access road and equipment pads). This interpretation is also included in the **Notes- Item 5 portion of the NYSDEC SPCG.

*The NYSDEC SPCG also references the Maryland Department of the Environment's (MDE) "Stormwater Design Guidance - Solar Panel Installations" memo for further guidance on panel installation. The MDE's memo provides guidance using two examples of solar panels to provide direction; Example 1 references solar panels which are installed on average slopes less than 5% and Example 2 references solar panels which are installed on average slopes between 5% and 10%.

<u>Example 1- Using Non-Rooftop Disconnection Where the Average Slope ≤ 5%</u>

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MDE states that in order for solar panels to qualify as non-rooftop disconnect, the disconnection length must be greater than or equal to the solar panel width. The proposed solar panel project uses a rack system with a width of 14.1± feet and a disconnection length of 15.9± feet. The spacing between the panel rows is greater than the width of the solar racks, therefore, the solar panels meet the MDE requirements for runoff treatment under non-rooftop disconnection.

Example 2- Using Non-Rooftop Disconnection Where the Average Slope ≥ 5% but ≤ 10%

In this example, the MDE advises the use of level spreaders along the drip edge of the panels to maintain sheet flow and dissipate energy in addition to maintaining a disconnection length greater than or equal to the solar panel width. Areas where slopes are ≥ 5%, overland flow dispersion devices are proposed which are parallel to contours in ±100-foot intervals in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (Blue Book) requirements for level spreaders and discussions with NYSDEC representatives regarding the application of the NYSDEC SPCG for use with tracker style systems.

In accordance with the aforementioned guidance, post-construction stormwater management is required for all new impervious areas on the project site. Therefore, SMA #1 through SMA #3 have been designed in accordance with the Design Manual to treat the proposed gravel access road and solar equipment pad. Since this project has been designed in accordance with Criteria 1 through Criteria 4 of the NYSDEC SPCG Criteria, the WQv and RRv requirements for the solar panels do not need to be addressed, however, stormwater controls have been provided for the solar panels themselves as this was specifically requested by the Town's reviewing engineer.

8.0 Summary

Development of the proposed project site will alter the stormwater drainage characteristics of the site; impervious area will be added in the form of an improved compacted gravel or paved access road, solar panels, and a solar equipment pad. Changes to the stormwater drainage characteristics of the site have been evaluated in accordance with the Design Manual. The proposed stormwater management system has been designed to comply with the recommendations in the Design Manual and the NYSDEC SPCG as it relates to maintaining sheet flow, providing water quality/runoff reduction/channel protection volume, overbank flood control and extreme flood control for new development projects.

The proposed stormwater management system has been designed to attenuate and treat the stormwater runoff generated from the contributing areas for storm events to the pre-development rates, up to and including the 100-Year design storm event. The proposed stormwater management design includes the use of bioretention areas and attenuation ponds.

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Stormwater modeling results indicate the ability to reduce the overall post-development discharge rate from the site as summarized in Table 10.

Table 10: Post Development Stormwater Peak Discharge Rates

Peak Discharge Rates in cfs	1-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Pre-Development	20.41	70.73	119.29	141.81
Post-Development	7.25	46.56	85.92	101.36
Overall Reduction (cfs)	13.16	24.17	33.37	40.45

Through the implementation of acceptable stormwater management practices, recommended by the NYS Stormwater Management Design Manual, the proposed project will not adversely affect adjacent or downstream properties.

Prepared by:

The Environmental Design Partnership, LLP

Ben Willson, Project Engineer

Reviewed by:

Stephanie Alessandrini, P.E.

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phone (518) 371-7621

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Figures

1. Site Location map
2. Pre-Development Drainage Map
3. Post Development Drainage Map

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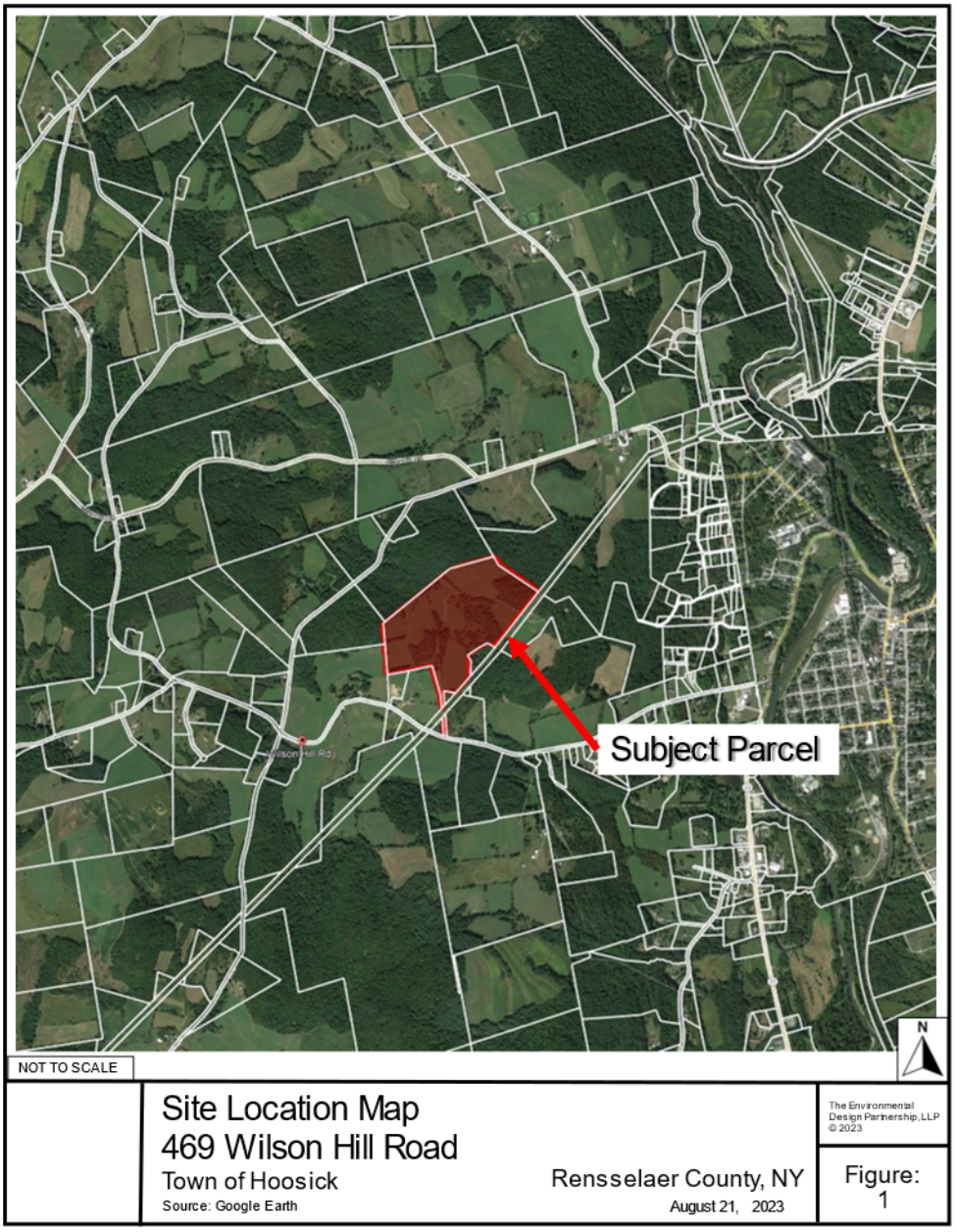

Figure 1: Site Location Map

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MAP KEY	
	SUBCATCHMENT BOUNDARY
S10	SUBCATCHMENT I.D.
4P	STORMWATER DEVICE
DP	DESIGN POINT
	TC PATH

GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.

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nexamp

101 Summer Street, Boston, MA 02110

Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.

300 Rabro, 140 Clifton Park, New York, 12065

(518) 371-7621 www.edp-pllc.com

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D	ACCESS ROAD REVISIONS	10/27/2023
E	ACCESS ROAD REVISIONS	11/17/2023
F	INTERNAL REVISIONS	11/30/2023
G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * STEPHANIE ALESSANDRINI * 118108 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

EXISTING DRAINAGE MAP

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No:	Size: D	Sheet Rev:
1 OF 2		G

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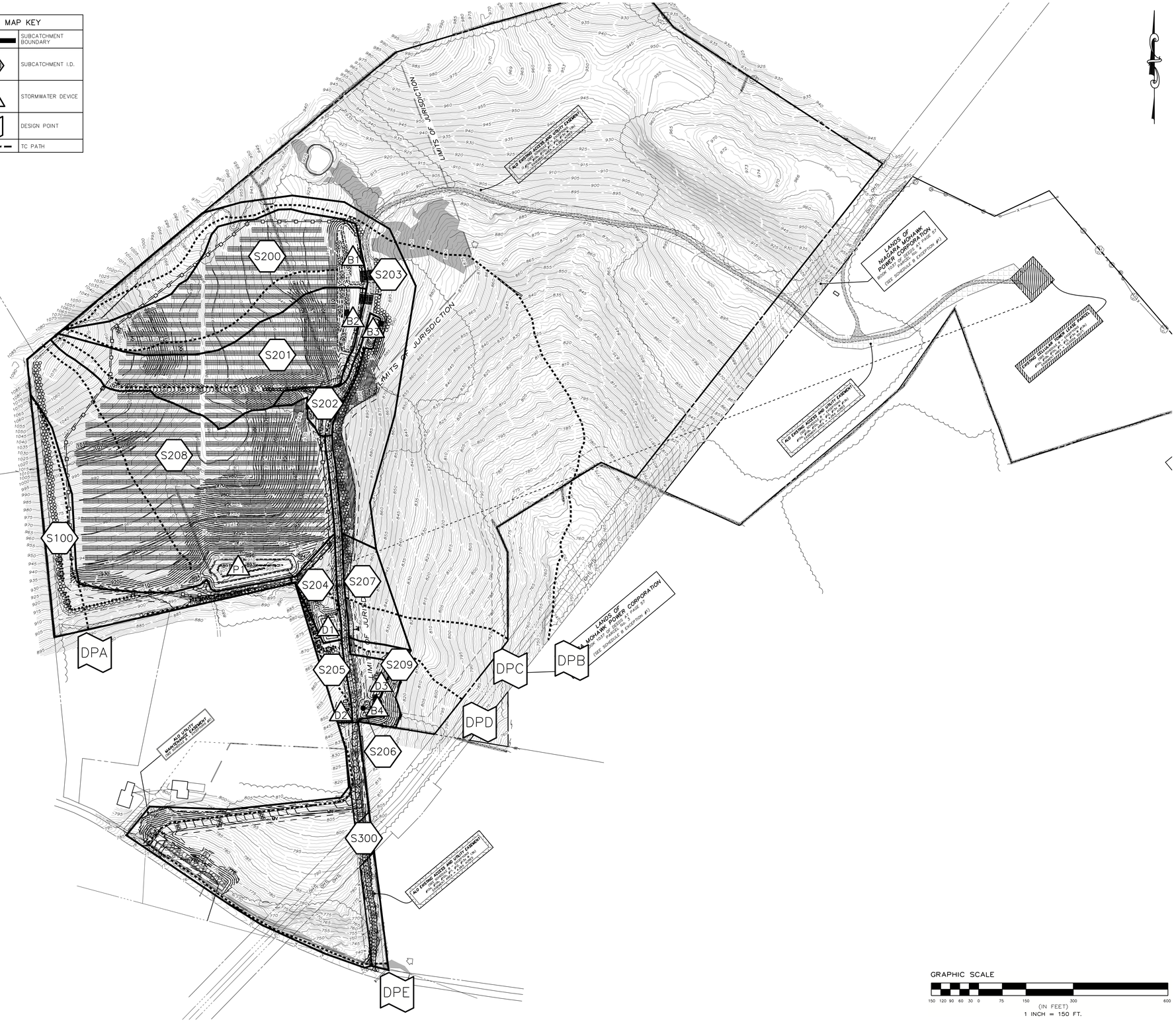
DRAINAGE PLAN LEGEND

- DENOTES EXISTING GRADE
- DENOTES USACE WETLAND AREAS
- DENOTES EMERGENCY OVERFLOW WEIR
- DENOTES PERVIOUS UTILITY ACCCESS ROAD
- DENOTES TEMPORARY IMPERVIOUS CONSTRUCTION ROAD
- DENOTES IMPERVIOUS MAINTENANCE ACCESS ROAD
- DENOTES FIXED KNOT FARM FENCE
- DENOTES SOLAR PANEL TRACKER (SEE ELECTRICAL PLANS FOR DETAILS)
- DENOTES MEDIUM VOLTAGE TRENCH (SEE ELECTRICAL PLANS FOR DETAILS)
- DENOTES PROPOSED CONTOUR
- DENOTES PERMANENT OVERLAND FLOW DISPERSION DEVICE
- DENOTES PROPOSED 12" COMPOST FILTER SOCK
- DENOTES IMPROVED IMPERVIOUS PAVED PORTIONS OF MAINTENANCE ACCESS ROAD
- STORMWATER MANAGEMENT FACILITY NOTIFICATION SIGN

MAP KEY	
	SUBCATCHMENT BOUNDARY
S10	SUBCATCHMENT I.D.
4P	STORMWATER DEVICE
DP	DESIGN POINT
	TC PATH



GRAPHIC SCALE

150 120 90 60 30 0 75 150 300 600

(IN FEET)

1 INCH = 150 FT.

FOR MUNICIPAL APPROVAL ONLY - NOT INTENDED FOR CONSTRUCTION

nexamp
101 Summer Street, Boston, MA 02110
Tel: (617) 431-1440 Fax: (978) 416-2525 Web: nexamp.com

ep
ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
300 Rabro Dr. East, Hauppauge, New York 11788
(631) 231-1220 www.epdesign.com

Rev	Issued For	Date
A	PRELIM. PLAN SET	5/22/2023
B	INTERNAL COMMENTS	8/10/2023
C	INTERNAL COMMENTS	9/15/2023
D	ACCESS ROAD REVISIONS	10/27/2023
E	ACCESS ROAD REVISIONS	11/17/2023
F	INTERNAL REVISIONS	11/30/2023
G	REVISIONS PER TDE COMMENTS	1/29/2024

P.E. seal/Consultant:

STATE OF NEW YORK * ALESSANDRINI * 118706 * LICENSED PROFESSIONAL ENGINEER

Project:

WILSON HILL SOLAR

469 Wilson Hill Road
Hoosick Falls, NY 12090

Drawing Title:

PROPOSED DRAINAGE MAP

NOT FOR CONSTRUCTION

Drawn by: BMW Scale: As Shown Approved by: STA

Dwg No: 2 OF 2 Size: D Sheet Rev: G

C:\Users\kwilson\Environmental Design Partnership\SharePoint Site - Documents\U A-Z\KENSSELAER\KOOSICK\Wilson Hill Road\469 - Nexamp Solar\05-dwg\Updated\FIGURES\2023-8-4 STORMWATER.dwg Jan 29, 2024 11:50:37AM.

Attachment A

Water Quality Calculation

Runoff Reduction Calculation

900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621

Version 1.8 Total Water Quality Volume Calculation

Last Updated: 11/09/2015 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:	A	
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
S200 1	4.85	1.67	34%	0.36	6,970	Bioretention
S201 2	4.15	1.52	37%	0.38	6,291	Bioretention
S202 3	0.58	0.20	34%	0.36	835	Bioretention
S208 4	11.49	3.92	34%	0.36	16,381	Wet Pond
S206 5	0.88	0.32	36%	0.38	1,326	Bioretention
6						
7						
8						
9						
10						
Subtotal (1-30)	21.95	7.63	35%	0.36	**31,803**	**Subtotal 1**
Total	21.95	7.63	35%	0.36	**31,803**	**Initial WQv**

Identify Runoff Reduction Techniques By Area

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

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
"<<Initial WQv"	21.95	7.63	35%	0.36	31,803
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**21.95**	**7.63**	35%	0.36	31,803
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	21.95	7.63	35%	0.36	**31,803**
WQv reduced by Area Reduction techniques					0

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	0.00	0.00		
	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	10.46	3.71	6454	8968
	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	11.49	3.92		16381
	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		→	0.00	0.00	0	
Totals by Volume Reduction		→	0.00	0.00	0	
Totals by Standard SMP w/RRV		→	10.46	3.71	6454	8968
Totals by Standard SMP		→	11.49	3.92		16381
Totals (Area + Volume + all SMPs)		→	21.95	7.63	6,454	25,349

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A		55%
B		40%
C	6.56	30%
D	**31.99**	20%
Total Area	38.55	
Calculate the Minimum RRv		
S =	**0.22**	
Impervious =	7.63	*acre*
Precipitation	1.1	*in*
Rv	0.95	
Minimum RRv	**6,281**	***ft3***
	0.14	af

Bioretention Worksheet

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

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

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

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

Design Point:	**A**

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	4.85	1.67	0.34	0.36	6969.78	1.10	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	34%	0.36	6,970	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	ft^3	

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

Calculate the Minimum Filter Area				
		Value	Units	Notes
WQv		6,970	ft^3	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**5808**	ft^2	

Determine Actual Bio-Retention Area			
Filter Width	35	*ft*	
Filter Length	170	*ft*	
Filter Area	5950	ft^2	
Actual Volume Provided	7140	ft^3	

Determine Runoff Reduction			
Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	2,856		
RRv applied	**2,856**	ft^3	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	4,114	ft^3	*This is the portion of the WQv that is not reduced in the practice.*
Volume Directed	0	ft^3	This volume is directed another practice
Sizing √	OK		*Check to be sure Area provided ≥ Af*

Bioretention Worksheet

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

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

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

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

Design Point:	**A**

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
2	4.15	1.52	0.37	0.38	6290.97	1.10	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops			37%	0.38	6,291	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						*ft^3*	

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

Calculate the Minimum Filter Area				
		Value	Units	Notes
WQv		6,291	*ft^3*	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**5242**	***ft^2***	

Determine Actual Bio-Retention Area			
Filter Width	36	*ft*	
Filter Length	155	*ft*	
Filter Area	5580	*ft^2*	
Actual Volume Provided	6696	*ft^3*	

Determine Runoff Reduction			
Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	2,678		
RRv applied	**2,678**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	3,613	*ft^3*	*This is the portion of the WQv that is not reduced in the practice.*
Volume Directed	0	*ft^3*	This volume is directed another practice
Sizing √	OK		*Check to be sure Area provided ≥ Af*

Bioretention Worksheet

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

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

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

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

Design Point:	**A**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
3	0.58	0.20	0.34	0.36	834.54	1.10	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	34%	0.36	835	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		835	*ft^3*	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**695**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	11	*ft*	
Filter Length	65	*ft*	
Filter Area	715	*ft^2*	
Actual Volume Provided	858	*ft^3*	

Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	343		
RRv applied	**343**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	491	*ft^3*	*This is the portion of the WQv that is not reduced in the practice.*
Volume Directed	0	*ft^3*	This volume is directed another practice
Sizing √	OK		*Check to be sure Area provided ≥ Af*

Bioretention Worksheet

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

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

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

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

Design Point:	**A**

Enter Site Data For Drainage Area to be Treated by Practice

Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
5	0.88	0.32	0.36	0.38	1326.27	1.10	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	36%	0.38	1,326	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	*ft^3*	

Soil Information

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

Calculate the Minimum Filter Area

		Value	Units	Notes
WQv		1,326	*ft^3*	
Enter Depth of Soil Media	*df*	2.5	*ft*	*2.5-4 ft*
Enter Hydraulic Conductivity	*k*	0.5	*ft/day*	
Enter Average Height of Ponding	*hf*	0.5	*ft*	*6 inches max.*
Enter Filter Time	*tf*	2	*days*	
Required Filter Area	***Af***	**1105**	***ft^2***	

Determine Actual Bio-Retention Area

Filter Width	30	*ft*	
Filter Length	40	*ft*	
Filter Area	1200	*ft^2*	
Actual Volume Provided	1440	*ft^3*	

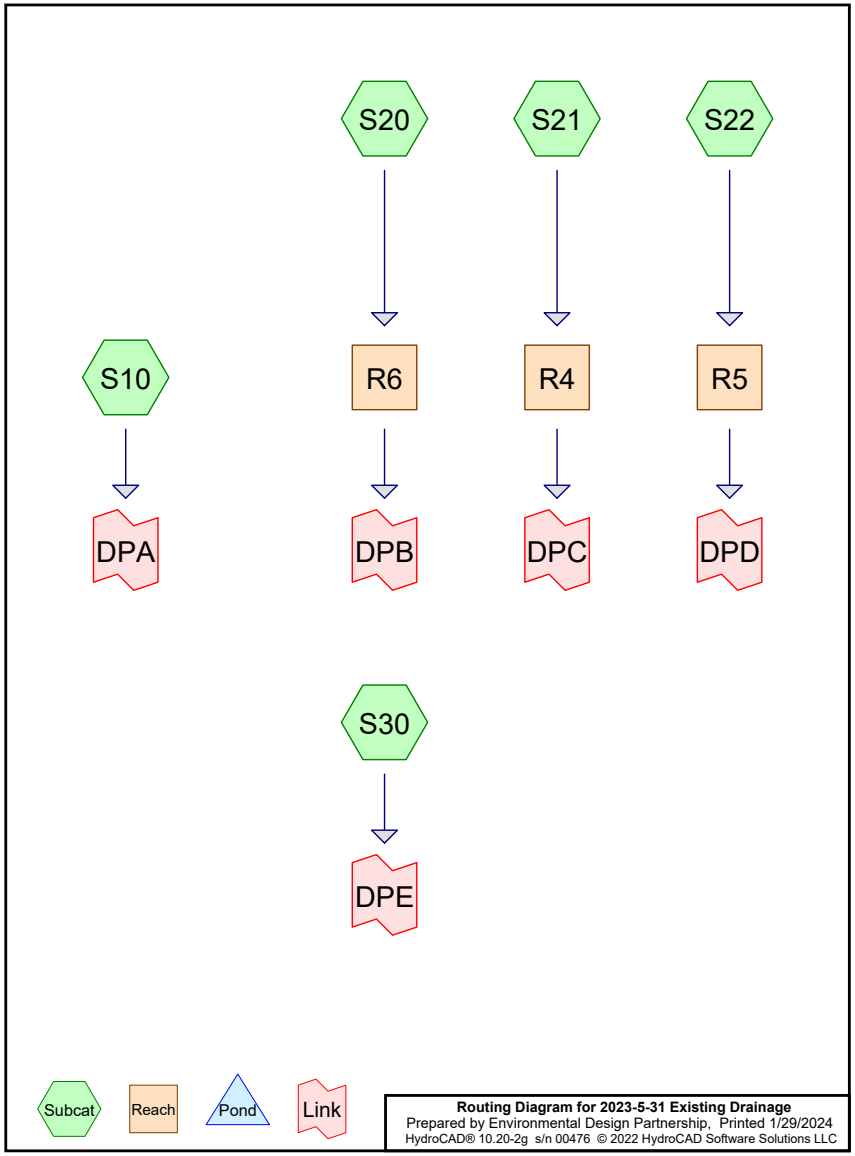
Determine Runoff Reduction

Is the Bioretention contributing flow to another practice?	No	Select Practice	
RRv	576		
RRv applied	**576**	***ft^3***	***This is 40% of the storage provided or WQv whichever is less.***
Volume Treated	750	*ft^3*	*This is the portion of the WQv that is not reduced in the practice.*
Volume Directed	0	*ft^3*	This volume is directed another practice
Sizing √	OK		*Check to be sure Area provided ≥ Af*

Attachment B

Stormwater Modeling Calculations

900 Route 146, Clifton Park, New York 12065
phone (518) 371-7621



Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YR	NRCC 24-hr	B	Default	24.00	1	2.25	2
2	10-YR	NRCC 24-hr	B	Default	24.00	1	3.95	2
3	50-YR	NRCC 24-hr	B	Default	24.00	1	5.35	2
4	100-YR	NRCC 24-hr	B	Default	24.00	1	5.98	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.165	96	Gravel surface, HSG C (S30)
0.365	96	Gravel surface, HSG D (S20, S21, S22)
4.650	71	Meadow, non-grazed, HSG C (S30)
21.760	78	Meadow, non-grazed, HSG D (S10, S20, S21, S22)
1.749	73	Woods, Fair, HSG C (S30)
9.862	79	Woods, Fair, HSG D (S10, S20, S21, S22)
38.551	**77**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
6.564	HSG C	S30
31.987	HSG D	S10, S20, S21, S22
0.000	Other	
38.551		**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	0.165	0.365	0.000	0.530	Gravel surface	S20, S21, S22, S30
0.000	0.000	4.650	21.760	0.000	26.410	Meadow, non-grazed	S10, S20, S21, S22, S30
0.000	0.000	1.749	9.862	0.000	11.611	Woods, Fair	S10, S20, S21, S22, S30
0.000	**0.000**	**6.564**	**31.987**	**0.000**	**38.551**	**TOTAL AREA**	

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS10: Runoff Area=11.450 ac 0.00% Impervious Runoff Depth=0.63"
Flow Length=975' Tc=11.2 min CN=78 Runoff=7.92 cfs 0.602 af

SubcatchmentS20: Runoff Area=16.243 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=1,201' Tc=13.5 min CN=79 Runoff=11.17 cfs 0.913 af

SubcatchmentS21: Runoff Area=2.737 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=515' Tc=12.9 min CN=79 Runoff=1.93 cfs 0.154 af

SubcatchmentS22: Runoff Area=1.557 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=465' Tc=11.7 min CN=79 Runoff=1.14 cfs 0.088 af

SubcatchmentS30: Runoff Area=6.564 ac 0.00% Impervious Runoff Depth=0.40"
Flow Length=837' Tc=11.2 min CN=72 Runoff=2.50 cfs 0.221 af

Reach R4: Avg. Flow Depth=0.02' Max Vel=1.48 fps Inflow=1.93 cfs 0.154 af
n=0.035 L=495.0' S=0.1818 '/' Capacity=1,071.38 cfs Outflow=1.72 cfs 0.154 af

Reach R5: Avg. Flow Depth=0.01' Max Vel=1.58 fps Inflow=1.14 cfs 0.088 af
n=0.020 L=290.0' S=0.1207 '/' Capacity=1,527.56 cfs Outflow=1.09 cfs 0.088 af

Reach R6: Avg. Flow Depth=0.06' Max Vel=3.12 fps Inflow=11.17 cfs 0.913 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=9.21 cfs 0.913 af

Link DPA: Inflow=7.92 cfs 0.602 af
Primary=7.92 cfs 0.602 af

Link DPB: Inflow=9.21 cfs 0.913 af
Primary=9.21 cfs 0.913 af

Link DPC: Inflow=1.72 cfs 0.154 af
Primary=1.72 cfs 0.154 af

Link DPD: Inflow=1.09 cfs 0.088 af
Primary=1.09 cfs 0.088 af

Link DPE: Inflow=2.50 cfs 0.221 af
Primary=2.50 cfs 0.221 af

Total Runoff Area = 38.551 ac Runoff Volume = 1.978 af Average Runoff Depth = 0.62"
100.00% Pervious = 38.551 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment S10:

Runoff = 7.92 cfs @ 12.20 hrs, Volume= 0.602 af, Depth= 0.63"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
8.383	78	Meadow, non-grazed, HSG D
3.067	79	Woods, Fair, HSG D
11.450	78	Weighted Average
11.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
4.6	875	0.2080	3.19		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	975	Total			

Summary for Subcatchment S20:

Runoff = 11.17 cfs @ 12.23 hrs, Volume= 0.913 af, Depth= 0.67"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
11.063	78	Meadow, non-grazed, HSG D
4.953	79	Woods, Fair, HSG D
0.227	96	Gravel surface, HSG D
16.243	79	Weighted Average
16.243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	98	0.2857	2.67		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
5.7	1,003	0.1751	2.93		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.5	1,201	Total			

Summary for Subcatchment S21:

Runoff = 1.93 cfs @ 12.22 hrs, Volume= 0.154 af, Depth= 0.67"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
1.596	79	Woods, Fair, HSG D
0.082	96	Gravel surface, HSG D
1.059	78	Meadow, non-grazed, HSG D
2.737	79	Weighted Average
2.737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.7	415	0.2600	2.55		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
12.9	515	Total			

Summary for Subcatchment S22:

Runoff = 1.14 cfs @ 12.21 hrs, Volume= 0.088 af, Depth= 0.67"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.246	79	Woods, Fair, HSG D
0.056	96	Gravel surface, HSG D
1.255	78	Meadow, non-grazed, HSG D
1.557	79	Weighted Average
1.557		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.2	365	0.1600	2.80		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.7	465	Total			

Summary for Subcatchment S30:

Runoff = 2.50 cfs @ 12.21 hrs, Volume= 0.221 af, Depth= 0.40"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
4.650	71	Meadow, non-grazed, HSG C
0.165	96	Gravel surface, HSG C
1.749	73	Woods, Fair, HSG C
6.564	72	Weighted Average
6.564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
1.3	192	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.4	130	0.0923	4.89		**Shallow Concentrated Flow, SCF - GRAVEL** Unpaved Kv= 16.1 fps
2.5	415	0.1542	2.75		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	837	Total			

Summary for Reach R4:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 1.93 cfs @ 12.22 hrs, Volume= 0.154 af
Outflow = 1.72 cfs @ 12.28 hrs, Volume= 0.154 af, Atten= 11%, Lag= 3.9 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.48 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 9.6 min

Peak Storage= 574 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 50.92'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,071.38 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 495.0' Slope= 0.1818 '/'
Inlet Invert= 857.00', Outlet Invert= 767.00'

Summary for Reach R5:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 1.14 cfs @ 12.21 hrs, Volume= 0.088 af
Outflow = 1.09 cfs @ 12.24 hrs, Volume= 0.088 af, Atten= 5%, Lag= 2.2 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.58 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 4.0 min

Peak Storage= 201 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 50.55'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,527.56 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 290.0' Slope= 0.1207 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

Summary for Reach R6:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 11.17 cfs @ 12.23 hrs, Volume= 0.913 af
Outflow = 9.21 cfs @ 12.32 hrs, Volume= 0.913 af, Atten= 18%, Lag= 5.4 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 8.6 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 23.7 min

Peak Storage= 4,726 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 52.30'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

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Summary for Link DPA:

Inflow Area = 11.450 ac, 0.00% Impervious, Inflow Depth = 0.63" for 1-YR event
Inflow = 7.92 cfs @ 12.20 hrs, Volume= 0.602 af
Primary = 7.92 cfs @ 12.20 hrs, Volume= 0.602 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPB:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 9.21 cfs @ 12.32 hrs, Volume= 0.913 af
Primary = 9.21 cfs @ 12.32 hrs, Volume= 0.913 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPC:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 1.72 cfs @ 12.28 hrs, Volume= 0.154 af
Primary = 1.72 cfs @ 12.28 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPD:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR event
Inflow = 1.09 cfs @ 12.24 hrs, Volume= 0.088 af
Primary = 1.09 cfs @ 12.24 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPE:

Inflow Area = 6.564 ac, 0.00% Impervious, Inflow Depth = 0.40" for 1-YR event
Inflow = 2.50 cfs @ 12.21 hrs, Volume= 0.221 af
Primary = 2.50 cfs @ 12.21 hrs, Volume= 0.221 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS10: Runoff Area=11.450 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=975' Tc=11.2 min CN=78 Runoff=24.66 cfs 1.763 af

SubcatchmentS20: Runoff Area=16.243 ac 0.00% Impervious Runoff Depth=1.92"
Flow Length=1,201' Tc=13.5 min CN=79 Runoff=33.82 cfs 2.603 af

SubcatchmentS21: Runoff Area=2.737 ac 0.00% Impervious Runoff Depth=1.92"
Flow Length=515' Tc=12.9 min CN=79 Runoff=5.82 cfs 0.439 af

SubcatchmentS22: Runoff Area=1.557 ac 0.00% Impervious Runoff Depth=1.92"
Flow Length=465' Tc=11.7 min CN=79 Runoff=3.43 cfs 0.250 af

SubcatchmentS30: Runoff Area=6.564 ac 0.00% Impervious Runoff Depth=1.43"
Flow Length=837' Tc=11.2 min CN=72 Runoff=10.70 cfs 0.780 af

Reach R4: Avg. Flow Depth=0.05' Max Vel=2.33 fps Inflow=5.82 cfs 0.439 af
n=0.035 L=495.0' S=0.1818 '/' Capacity=1,071.38 cfs Outflow=5.54 cfs 0.439 af

Reach R5: Avg. Flow Depth=0.03' Max Vel=2.37 fps Inflow=3.43 cfs 0.250 af
n=0.020 L=290.0' S=0.1207 '/' Capacity=1,527.56 cfs Outflow=3.35 cfs 0.250 af

Reach R6: Avg. Flow Depth=0.12' Max Vel=4.95 fps Inflow=33.82 cfs 2.603 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=30.68 cfs 2.603 af

Link DPA: Inflow=24.66 cfs 1.763 af
Primary=24.66 cfs 1.763 af

Link DPB: Inflow=30.68 cfs 2.603 af
Primary=30.68 cfs 2.603 af

Link DPC: Inflow=5.54 cfs 0.439 af
Primary=5.54 cfs 0.439 af

Link DPD: Inflow=3.35 cfs 0.250 af
Primary=3.35 cfs 0.250 af

Link DPE: Inflow=10.70 cfs 0.780 af
Primary=10.70 cfs 0.780 af

Total Runoff Area = 38.551 ac Runoff Volume = 5.833 af Average Runoff Depth = 1.82"
100.00% Pervious = 38.551 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment S10:

Runoff = 24.66 cfs @ 12.19 hrs, Volume= 1.763 af, Depth= 1.85"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
8.383	78	Meadow, non-grazed, HSG D
3.067	79	Woods, Fair, HSG D
11.450	78	Weighted Average
11.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
4.6	875	0.2080	3.19		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	975	Total			

Summary for Subcatchment S20:

Runoff = 33.82 cfs @ 12.22 hrs, Volume= 2.603 af, Depth= 1.92"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
11.063	78	Meadow, non-grazed, HSG D
4.953	79	Woods, Fair, HSG D
0.227	96	Gravel surface, HSG D
16.243	79	Weighted Average
16.243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	98	0.2857	2.67		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
5.7	1,003	0.1751	2.93		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.5	1,201	Total			

Summary for Subcatchment S21:

Runoff = 5.82 cfs @ 12.21 hrs, Volume= 0.439 af, Depth= 1.92"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
1.596	79	Woods, Fair, HSG D
0.082	96	Gravel surface, HSG D
1.059	78	Meadow, non-grazed, HSG D
2.737	79	Weighted Average
2.737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.7	415	0.2600	2.55		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
12.9	515	Total			

Summary for Subcatchment S22:

Runoff = 3.43 cfs @ 12.20 hrs, Volume= 0.250 af, Depth= 1.92"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.246	79	Woods, Fair, HSG D
0.056	96	Gravel surface, HSG D
1.255	78	Meadow, non-grazed, HSG D
1.557	79	Weighted Average
1.557		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.2	365	0.1600	2.80		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.7	465	Total			

Summary for Subcatchment S30:

Runoff = 10.70 cfs @ 12.20 hrs, Volume= 0.780 af, Depth= 1.43"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
4.650	71	Meadow, non-grazed, HSG C
0.165	96	Gravel surface, HSG C
1.749	73	Woods, Fair, HSG C
6.564	72	Weighted Average
6.564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
1.3	192	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.4	130	0.0923	4.89		**Shallow Concentrated Flow, SCF - GRAVEL** Unpaved Kv= 16.1 fps
2.5	415	0.1542	2.75		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	837	Total			

Summary for Reach R4:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 5.82 cfs @ 12.21 hrs, Volume= 0.439 af
Outflow = 5.54 cfs @ 12.25 hrs, Volume= 0.439 af, Atten= 5%, Lag= 2.4 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 9.1 min

Peak Storage= 1,176 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 51.87'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,071.38 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 495.0' Slope= 0.1818 '/'
Inlet Invert= 857.00', Outlet Invert= 767.00'

Summary for Reach R5:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 3.43 cfs @ 12.20 hrs, Volume= 0.250 af
Outflow = 3.35 cfs @ 12.22 hrs, Volume= 0.250 af, Atten= 2%, Lag= 1.3 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.37 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 3.9 min

Peak Storage= 408 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 51.11'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,527.56 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 290.0' Slope= 0.1207 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

Summary for Reach R6:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 33.82 cfs @ 12.22 hrs, Volume= 2.603 af
Outflow = 30.68 cfs @ 12.28 hrs, Volume= 2.603 af, Atten= 9%, Lag= 3.4 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 19.4 min

Peak Storage= 9,920 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 54.72'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

Summary for Link DPA:

Inflow Area = 11.450 ac, 0.00% Impervious, Inflow Depth = 1.85" for 10-YR event
Inflow = 24.66 cfs @ 12.19 hrs, Volume= 1.763 af
Primary = 24.66 cfs @ 12.19 hrs, Volume= 1.763 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPB:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 30.68 cfs @ 12.28 hrs, Volume= 2.603 af
Primary = 30.68 cfs @ 12.28 hrs, Volume= 2.603 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPC:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 5.54 cfs @ 12.25 hrs, Volume= 0.439 af
Primary = 5.54 cfs @ 12.25 hrs, Volume= 0.439 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPD:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 1.92" for 10-YR event
Inflow = 3.35 cfs @ 12.22 hrs, Volume= 0.250 af
Primary = 3.35 cfs @ 12.22 hrs, Volume= 0.250 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPE:

Inflow Area = 6.564 ac, 0.00% Impervious, Inflow Depth = 1.43" for 10-YR event
Inflow = 10.70 cfs @ 12.20 hrs, Volume= 0.780 af
Primary = 10.70 cfs @ 12.20 hrs, Volume= 0.780 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS10: Runoff Area=11.450 ac 0.00% Impervious Runoff Depth=3.01"
Flow Length=975' Tc=11.2 min CN=78 Runoff=40.17 cfs 2.873 af

SubcatchmentS20: Runoff Area=16.243 ac 0.00% Impervious Runoff Depth=3.11"
Flow Length=1,201' Tc=13.5 min CN=79 Runoff=54.56 cfs 4.203 af

SubcatchmentS21: Runoff Area=2.737 ac 0.00% Impervious Runoff Depth=3.11"
Flow Length=515' Tc=12.9 min CN=79 Runoff=9.39 cfs 0.708 af

SubcatchmentS22: Runoff Area=1.557 ac 0.00% Impervious Runoff Depth=3.11"
Flow Length=465' Tc=11.7 min CN=79 Runoff=5.53 cfs 0.403 af

SubcatchmentS30: Runoff Area=6.564 ac 0.00% Impervious Runoff Depth=2.47"
Flow Length=837' Tc=11.2 min CN=72 Runoff=18.90 cfs 1.351 af

Reach R4: Avg. Flow Depth=0.06' Max Vel=2.82 fps Inflow=9.39 cfs 0.708 af
n=0.035 L=495.0' S=0.1818 '/' Capacity=1,071.38 cfs Outflow=9.05 cfs 0.708 af

Reach R5: Avg. Flow Depth=0.04' Max Vel=2.87 fps Inflow=5.53 cfs 0.403 af
n=0.020 L=290.0' S=0.1207 '/' Capacity=1,527.56 cfs Outflow=5.44 cfs 0.403 af

Reach R6: Avg. Flow Depth=0.16' Max Vel=6.00 fps Inflow=54.56 cfs 4.203 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=50.98 cfs 4.203 af

Link DPA: Inflow=40.17 cfs 2.873 af
Primary=40.17 cfs 2.873 af

Link DPB: Inflow=50.98 cfs 4.203 af
Primary=50.98 cfs 4.203 af

Link DPC: Inflow=9.05 cfs 0.708 af
Primary=9.05 cfs 0.708 af

Link DPD: Inflow=5.44 cfs 0.403 af
Primary=5.44 cfs 0.403 af

Link DPE: Inflow=18.90 cfs 1.351 af
Primary=18.90 cfs 1.351 af

Total Runoff Area = 38.551 ac Runoff Volume = 9.539 af Average Runoff Depth = 2.97"
100.00% Pervious = 38.551 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment S10:

Runoff = 40.17 cfs @ 12.19 hrs, Volume= 2.873 af, Depth= 3.01"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
8.383	78	Meadow, non-grazed, HSG D
3.067	79	Woods, Fair, HSG D
11.450	78	Weighted Average
11.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
4.6	875	0.2080	3.19		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	975	Total			

Summary for Subcatchment S20:

Runoff = 54.56 cfs @ 12.22 hrs, Volume= 4.203 af, Depth= 3.11"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
11.063	78	Meadow, non-grazed, HSG D
4.953	79	Woods, Fair, HSG D
0.227	96	Gravel surface, HSG D
16.243	79	Weighted Average
16.243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	98	0.2857	2.67		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
5.7	1,003	0.1751	2.93		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.5	1,201	Total			

Summary for Subcatchment S21:

Runoff = 9.39 cfs @ 12.21 hrs, Volume= 0.708 af, Depth= 3.11"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
1.596	79	Woods, Fair, HSG D
0.082	96	Gravel surface, HSG D
1.059	78	Meadow, non-grazed, HSG D
2.737	79	Weighted Average
2.737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.7	415	0.2600	2.55		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
12.9	515	Total			

Summary for Subcatchment S22:

Runoff = 5.53 cfs @ 12.20 hrs, Volume= 0.403 af, Depth= 3.11"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.246	79	Woods, Fair, HSG D
0.056	96	Gravel surface, HSG D
1.255	78	Meadow, non-grazed, HSG D
1.557	79	Weighted Average
1.557		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.2	365	0.1600	2.80		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.7	465	Total			

Summary for Subcatchment S30:

Runoff = 18.90 cfs @ 12.19 hrs, Volume= 1.351 af, Depth= 2.47"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
4.650	71	Meadow, non-grazed, HSG C
0.165	96	Gravel surface, HSG C
1.749	73	Woods, Fair, HSG C
6.564	72	Weighted Average
6.564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
1.3	192	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.4	130	0.0923	4.89		**Shallow Concentrated Flow, SCF - GRAVEL** Unpaved Kv= 16.1 fps
2.5	415	0.1542	2.75		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	837	Total			

Summary for Reach R4:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 9.39 cfs @ 12.21 hrs, Volume= 0.708 af
Outflow = 9.05 cfs @ 12.24 hrs, Volume= 0.708 af, Atten= 4%, Lag= 2.1 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.82 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.94 fps, Avg. Travel Time= 8.8 min

Peak Storage= 1,590 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 52.51'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,071.38 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 495.0' Slope= 0.1818 '/'
Inlet Invert= 857.00', Outlet Invert= 767.00'

Summary for Reach R5:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 5.53 cfs @ 12.20 hrs, Volume= 0.403 af
Outflow = 5.44 cfs @ 12.21 hrs, Volume= 0.403 af, Atten= 1%, Lag= 1.1 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 3.9 min

Peak Storage= 549 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 51.49'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,527.56 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 290.0' Slope= 0.1207 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

Summary for Reach R6:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 54.56 cfs @ 12.22 hrs, Volume= 4.203 af
Outflow = 50.98 cfs @ 12.26 hrs, Volume= 4.203 af, Atten= 7%, Lag= 2.9 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.00 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 17.2 min

Peak Storage= 13,621 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 56.38'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

‡

Summary for Link DPA:

Inflow Area = 11.450 ac, 0.00% Impervious, Inflow Depth = 3.01" for 50-YR event
Inflow = 40.17 cfs @ 12.19 hrs, Volume= 2.873 af
Primary = 40.17 cfs @ 12.19 hrs, Volume= 2.873 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPB:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 50.98 cfs @ 12.26 hrs, Volume= 4.203 af
Primary = 50.98 cfs @ 12.26 hrs, Volume= 4.203 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPC:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 9.05 cfs @ 12.24 hrs, Volume= 0.708 af
Primary = 9.05 cfs @ 12.24 hrs, Volume= 0.708 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPD:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 3.11" for 50-YR event
Inflow = 5.44 cfs @ 12.21 hrs, Volume= 0.403 af
Primary = 5.44 cfs @ 12.21 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPE:

Inflow Area = 6.564 ac, 0.00% Impervious, Inflow Depth = 2.47" for 50-YR event
Inflow = 18.90 cfs @ 12.19 hrs, Volume= 1.351 af
Primary = 18.90 cfs @ 12.19 hrs, Volume= 1.351 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS10: Runoff Area=11.450 ac 0.00% Impervious Runoff Depth=3.56"
Flow Length=975' Tc=11.2 min CN=78 Runoff=47.36 cfs 3.398 af

SubcatchmentS20: Runoff Area=16.243 ac 0.00% Impervious Runoff Depth=3.66"
Flow Length=1,201' Tc=13.5 min CN=79 Runoff=64.15 cfs 4.957 af

SubcatchmentS21: Runoff Area=2.737 ac 0.00% Impervious Runoff Depth=3.66"
Flow Length=515' Tc=12.9 min CN=79 Runoff=11.03 cfs 0.835 af

SubcatchmentS22: Runoff Area=1.557 ac 0.00% Impervious Runoff Depth=3.66"
Flow Length=465' Tc=11.7 min CN=79 Runoff=6.49 cfs 0.475 af

SubcatchmentS30: Runoff Area=6.564 ac 0.00% Impervious Runoff Depth=2.98"
Flow Length=837' Tc=11.2 min CN=72 Runoff=22.81 cfs 1.628 af

Reach R4: Avg. Flow Depth=0.07' Max Vel=3.00 fps Inflow=11.03 cfs 0.835 af
n=0.035 L=495.0' S=0.1818 '/' Capacity=1,071.38 cfs Outflow=10.66 cfs 0.835 af

Reach R5: Avg. Flow Depth=0.04' Max Vel=3.05 fps Inflow=6.49 cfs 0.475 af
n=0.020 L=290.0' S=0.1207 '/' Capacity=1,527.56 cfs Outflow=6.40 cfs 0.475 af

Reach R6: Avg. Flow Depth=0.18' Max Vel=6.39 fps Inflow=64.15 cfs 4.957 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=60.34 cfs 4.957 af

Link DPA: Inflow=47.36 cfs 3.398 af
Primary=47.36 cfs 3.398 af

Link DPB: Inflow=60.34 cfs 4.957 af
Primary=60.34 cfs 4.957 af

Link DPC: Inflow=10.66 cfs 0.835 af
Primary=10.66 cfs 0.835 af

Link DPD: Inflow=6.40 cfs 0.475 af
Primary=6.40 cfs 0.475 af

Link DPE: Inflow=22.81 cfs 1.628 af
Primary=22.81 cfs 1.628 af

Total Runoff Area = 38.551 ac Runoff Volume = 11.293 af Average Runoff Depth = 3.52"
100.00% Pervious = 38.551 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment S10:

Runoff = 47.36 cfs @ 12.19 hrs, Volume= 3.398 af, Depth= 3.56"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
8.383	78	Meadow, non-grazed, HSG D
3.067	79	Woods, Fair, HSG D
11.450	78	Weighted Average
11.450		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
4.6	875	0.2080	3.19		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	975	Total			

Summary for Subcatchment S20:

Runoff = 64.15 cfs @ 12.22 hrs, Volume= 4.957 af, Depth= 3.66"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
11.063	78	Meadow, non-grazed, HSG D
4.953	79	Woods, Fair, HSG D
0.227	96	Gravel surface, HSG D
16.243	79	Weighted Average
16.243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	98	0.2857	2.67		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
5.7	1,003	0.1751	2.93		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.5	1,201	Total			

Summary for Subcatchment S21:

Runoff = 11.03 cfs @ 12.21 hrs, Volume= 0.835 af, Depth= 3.66"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
1.596	79	Woods, Fair, HSG D
0.082	96	Gravel surface, HSG D
1.059	78	Meadow, non-grazed, HSG D
2.737	79	Weighted Average
2.737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	100	0.1600	0.16		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.7	415	0.2600	2.55		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
12.9	515	Total			

Summary for Subcatchment S22:

Runoff = 6.49 cfs @ 12.20 hrs, Volume= 0.475 af, Depth= 3.66"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.246	79	Woods, Fair, HSG D
0.056	96	Gravel surface, HSG D
1.255	78	Meadow, non-grazed, HSG D
1.557	79	Weighted Average
1.557		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
2.2	365	0.1600	2.80		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.7	465	Total			

Summary for Subcatchment S30:

Runoff = 22.81 cfs @ 12.19 hrs, Volume= 1.628 af, Depth= 2.98"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
4.650	71	Meadow, non-grazed, HSG C
0.165	96	Gravel surface, HSG C
1.749	73	Woods, Fair, HSG C
6.564	72	Weighted Average
6.564		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
1.3	192	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.4	130	0.0923	4.89		**Shallow Concentrated Flow, SCF - GRAVEL** Unpaved Kv= 16.1 fps
2.5	415	0.1542	2.75		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
11.2	837	Total			

Summary for Reach R4:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 11.03 cfs @ 12.21 hrs, Volume= 0.835 af
Outflow = 10.66 cfs @ 12.24 hrs, Volume= 0.835 af, Atten= 3%, Lag= 1.9 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 8.7 min

Peak Storage= 1,759 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 52.77'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,071.38 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 495.0' Slope= 0.1818 '/'
Inlet Invert= 857.00', Outlet Invert= 767.00'

Summary for Reach R5:

Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 6.49 cfs @ 12.20 hrs, Volume= 0.475 af
Outflow = 6.40 cfs @ 12.21 hrs, Volume= 0.475 af, Atten= 1%, Lag= 1.0 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.05 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 3.8 min

Peak Storage= 608 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 51.65'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,527.56 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 290.0' Slope= 0.1207 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

Summary for Reach R6:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 64.15 cfs @ 12.22 hrs, Volume= 4.957 af
Outflow = 60.34 cfs @ 12.26 hrs, Volume= 4.957 af, Atten= 6%, Lag= 2.8 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.39 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 16.6 min

Peak Storage= 15,140 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 57.05'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

Summary for Link DPA:

Inflow Area = 11.450 ac, 0.00% Impervious, Inflow Depth = 3.56" for 100-YR event
Inflow = 47.36 cfs @ 12.19 hrs, Volume= 3.398 af
Primary = 47.36 cfs @ 12.19 hrs, Volume= 3.398 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPB:

Inflow Area = 16.243 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 60.34 cfs @ 12.26 hrs, Volume= 4.957 af
Primary = 60.34 cfs @ 12.26 hrs, Volume= 4.957 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPC:

Inflow Area = 2.737 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 10.66 cfs @ 12.24 hrs, Volume= 0.835 af
Primary = 10.66 cfs @ 12.24 hrs, Volume= 0.835 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPD:

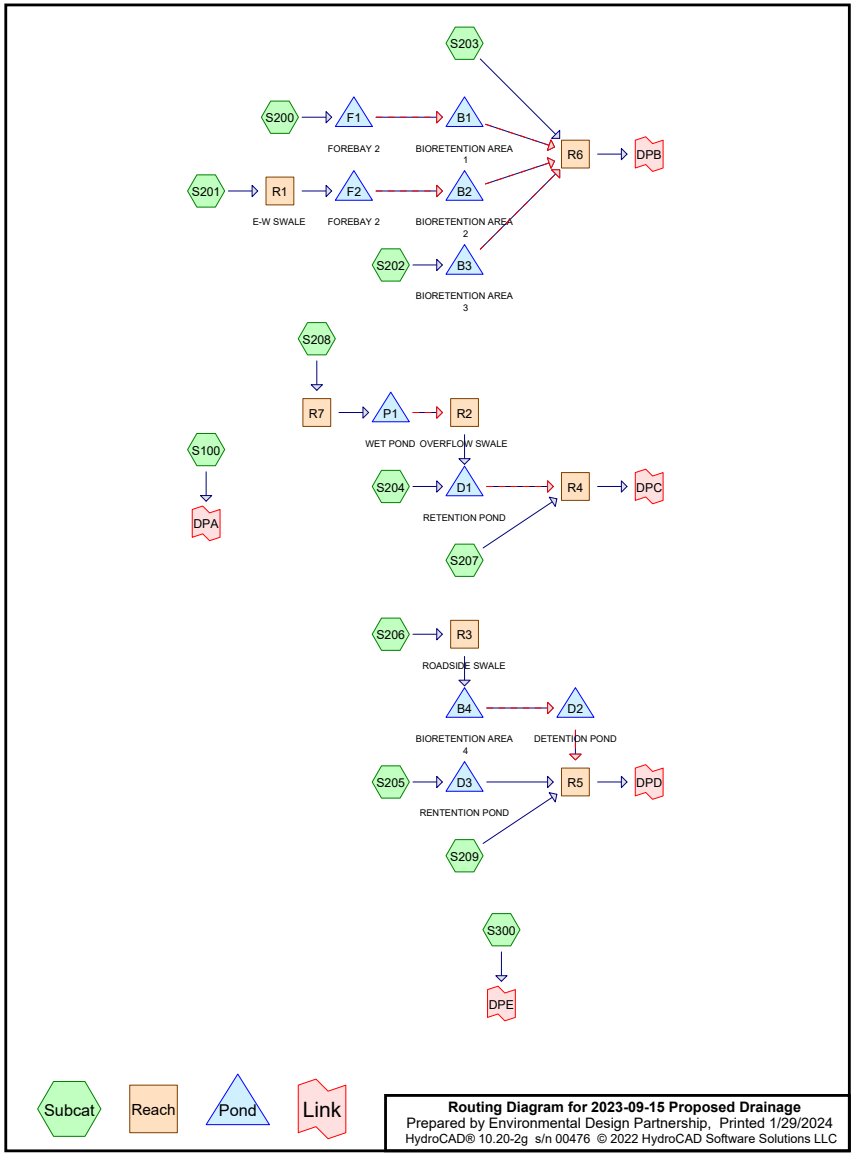
Inflow Area = 1.557 ac, 0.00% Impervious, Inflow Depth = 3.66" for 100-YR event
Inflow = 6.40 cfs @ 12.21 hrs, Volume= 0.475 af
Primary = 6.40 cfs @ 12.21 hrs, Volume= 0.475 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Summary for Link DPE:

Inflow Area = 6.564 ac, 0.00% Impervious, Inflow Depth = 2.98" for 100-YR event
Inflow = 22.81 cfs @ 12.19 hrs, Volume= 1.628 af
Primary = 22.81 cfs @ 12.19 hrs, Volume= 1.628 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 2L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs



Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-YR	NRCC 24-hr	B	Default	24.00	1	2.25	2
2	10-YR	NRCC 24-hr	B	Default	24.00	1	3.95	2
3	50-YR	NRCC 24-hr	B	Default	24.00	1	5.35	2
4	100-YR	NRCC 24-hr	B	Default	24.00	1	5.98	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.415	80	>75% Grass cover, Good, HSG D (S200, S201, S203, S208)
0.110	96	Gravel surface, HSG D (S203)
4.927	71	Meadow, non-grazed, HSG C (S300)
11.625	78	Meadow, non-grazed, HSG D (S100, S200, S201, S202, S203, S204, S205, S206, S207, S208, S209)
0.327	98	Paved parking, HSG C (S300)
0.523	98	Paved parking, HSG D (S202, S206)
7.107	98	SOLAR PANELS (S200, S201, S208)
1.260	73	Woods, Fair, HSG C (S300)
3.257	79	Woods, Fair, HSG D (S100, S200, S201, S203, S207, S208, S209)
38.551	**82**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
6.514	HSG C	S300
24.930	HSG D	S100, S200, S201, S202, S203, S204, S205, S206, S207, S208, S209
7.107	Other	S200, S201, S208
38.551		**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	9.415	0.000	9.415	>75% Grass cover, Good	S200, S201, S203, S208
0.000	0.000	0.000	0.110	0.000	0.110	Gravel surface	S203
0.000	0.000	4.927	11.625	0.000	16.552	Meadow, non-grazed	S100, S200, S201, S202, S203, S204, S205, S206, S207, S208, S209, S300
0.000	0.000	0.327	0.523	0.000	0.850	Paved parking	S202, S206, S300
0.000	0.000	0.000	0.000	7.107	7.107	SOLAR PANELS	S200, S201, S208
0.000	0.000	1.260	3.257	0.000	4.517	Woods, Fair	S100, S200, S201, S203, S207, S208, S209, S300
0.000	**0.000**	**6.514**	**24.930**	**7.107**	**38.551**	**TOTAL AREA**	

Pipe Listing (selected 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	B1	900.50	899.00	50.0	0.0300	0.020	0.0	8.0	0.0
2	B2	900.50	899.00	50.0	0.0300	0.020	0.0	8.0	0.0
3	B3	895.50	895.00	60.0	0.0083	0.020	0.0	8.0	0.0
4	B4	835.50	834.00	25.0	0.0600	0.020	0.0	8.0	0.0
5	D1	864.00	863.00	50.0	0.0200	0.020	0.0	15.0	0.0
6	D2	833.90	833.00	30.0	0.0300	0.020	0.0	10.0	0.0
7	D3	838.00	837.00	100.0	0.0100	0.020	0.0	12.0	0.0
8	P1	893.90	892.00	70.0	0.0271	0.020	0.0	18.0	0.0

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS100: Runoff Area=2.376 ac 0.00% Impervious Runoff Depth=0.63"
Flow Length=775' Tc=11.3 min CN=78 Runoff=1.65 cfs 0.125 af

SubcatchmentS200: Runoff Area=4.851 ac 34.30% Impervious Runoff Depth=1.04"
Flow Length=1,171' Tc=13.3 min CN=86 Runoff=5.53 cfs 0.421 af

SubcatchmentS201: Runoff Area=4.342 ac 35.08% Impervious Runoff Depth=1.04"
Flow Length=636' Tc=9.7 min CN=86 Runoff=5.63 cfs 0.377 af

SubcatchmentS202: Runoff Area=0.583 ac 34.82% Impervious Runoff Depth=0.98"
Flow Length=319' Tc=2.7 min CN=85 Runoff=0.94 cfs 0.048 af

SubcatchmentS203: Runoff Area=5.029 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=1,218' Tc=16.3 min CN=79 Runoff=3.21 cfs 0.283 af

SubcatchmentS204: Runoff Area=0.687 ac 0.00% Impervious Runoff Depth=0.63"
Flow Length=200' Tc=7.4 min CN=78 Runoff=0.56 cfs 0.036 af

SubcatchmentS205: Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=0.63"
Flow Length=450' Tc=9.0 min CN=78 Runoff=0.37 cfs 0.025 af

SubcatchmentS206: Runoff Area=0.883 ac 36.24% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=85 Runoff=1.26 cfs 0.072 af

SubcatchmentS207: Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=180' Tc=8.1 min CN=79 Runoff=0.73 cfs 0.048 af

SubcatchmentS208: Runoff Area=11.490 ac 34.12% Impervious Runoff Depth=1.04"
Flow Length=670' Tc=10.3 min CN=86 Runoff=14.58 cfs 0.998 af

SubcatchmentS209: Runoff Area=0.465 ac 0.00% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=78 Runoff=0.41 cfs 0.024 af

SubcatchmentS300: Runoff Area=6.514 ac 5.02% Impervious Runoff Depth=0.44"
Flow Length=1,800' Tc=15.0 min CN=73 Runoff=2.44 cfs 0.238 af

Reach R1: E-W SWALE Avg. Flow Depth=0.33' Max Vel=8.63 fps Inflow=5.63 cfs 0.377 af
n=0.022 L=485.0' S=0.1299 '/' Capacity=65.06 cfs Outflow=5.59 cfs 0.377 af

Reach R2: OVERFLOW SWALE Avg. Flow Depth=0.04' Max Vel=3.49 fps Inflow=0.31 cfs 0.576 af
n=0.022 L=120.0' S=0.1958 '/' Capacity=507.22 cfs Outflow=0.31 cfs 0.576 af

Reach R3: ROADSIDE SWALE Avg. Flow Depth=0.18' Max Vel=4.05 fps Inflow=1.26 cfs 0.072 af
n=0.030 L=825.0' S=0.1018 '/' Capacity=42.24 cfs Outflow=1.12 cfs 0.072 af

Reach R4: Avg. Flow Depth=0.02' Max Vel=1.29 fps Inflow=1.41 cfs 0.658 af
n=0.035 L=360.0' S=0.1778 '/' Capacity=1,059.41 cfs Outflow=1.24 cfs 0.656 af

Reach R5: Avg. Flow Depth=0.01' Max Vel=1.37 fps Inflow=0.42 cfs 0.102 af
n=0.020 L=220.0' S=0.1591 '/' Capacity=1,753.82 cfs Outflow=0.37 cfs 0.102 af

Reach R6: Avg. Flow Depth=0.03' Max Vel=1.92 fps Inflow=3.60 cfs 0.823 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=2.61 cfs 0.818 af

Reach R7: Avg. Flow Depth=0.47' Max Vel=8.94 fps Inflow=14.58 cfs 0.998 af
n=0.022 L=330.0' S=0.0788 '/' Capacity=321.73 cfs Outflow=14.52 cfs 0.998 af

Pond B1: BIORETENTION AREA 1 Peak Elev=903.55' Storage=3,458 cf Inflow=2.24 cfs 0.251 af
Primary=0.08 cfs 0.146 af Secondary=0.50 cfs 0.102 af Outflow=0.58 cfs 0.248 af

Pond B2: BIORETENTION AREA 2 Peak Elev=903.56' Storage=3,258 cf Inflow=2.92 cfs 0.247 af
Primary=0.07 cfs 0.136 af Secondary=0.64 cfs 0.108 af Outflow=0.71 cfs 0.245 af

Pond B3: BIORETENTION AREA 3 Peak Elev=898.59' Storage=605 cf Inflow=0.94 cfs 0.048 af
Primary=0.01 cfs 0.026 af Secondary=0.61 cfs 0.022 af Outflow=0.62 cfs 0.048 af

Pond B4: BIORETENTION AREA 4 Peak Elev=838.52' Storage=1,569 cf Inflow=1.12 cfs 0.072 af
Primary=0.02 cfs 0.040 af Secondary=0.16 cfs 0.016 af Outflow=0.18 cfs 0.056 af

Pond D1: RETENTION POND Peak Elev=864.40' Storage=117 cf Inflow=0.74 cfs 0.612 af
Primary=0.70 cfs 0.611 af Secondary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.611 af

Pond D2: DETENTION POND Peak Elev=834.70' Storage=223 cf Inflow=0.18 cfs 0.056 af
Primary=0.08 cfs 0.056 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.056 af

Pond D3: RENTENTION POND Peak Elev=838.26' Storage=280 cf Inflow=0.37 cfs 0.025 af
12.0" Round Culvert n=0.020 L=100.0' S=0.0100 '/' Outflow=0.20 cfs 0.021 af

Pond F1: FOREBAY 2 Peak Elev=903.63' Storage=7,900 cf Inflow=5.53 cfs 0.421 af
Outflow=2.24 cfs 0.251 af

Pond F2: FOREBAY 2 Peak Elev=903.65' Storage=6,162 cf Inflow=5.59 cfs 0.377 af
Outflow=2.92 cfs 0.247 af

Pond P1: WET POND Peak Elev=895.85' Storage=49,442 cf Inflow=14.52 cfs 0.998 af
Primary=0.31 cfs 0.576 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.576 af

Link DPA: Inflow=1.65 cfs 0.125 af
Primary=1.65 cfs 0.125 af

Link DPB: Inflow=2.61 cfs 0.818 af
Primary=2.61 cfs 0.818 af

Link DPC: Inflow=1.24 cfs 0.656 af
Primary=1.24 cfs 0.656 af

Link DPD: Inflow=0.37 cfs 0.102 af
Primary=0.37 cfs 0.102 af

Link DPE: Inflow=2.44 cfs 0.238 af
Primary=2.44 cfs 0.238 af

Total Runoff Area = 38.551 ac Runoff Volume = 2.696 af Average Runoff Depth = 0.84"
79.36% Pervious = 30.594 ac 20.64% Impervious = 7.957 ac

Summary for Subcatchment S100:

Runoff = 1.65 cfs @ 12.20 hrs, Volume= 0.125 af, Depth= 0.63"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.763	79	Woods, Fair, HSG D
1.613	78	Meadow, non-grazed, HSG D
2.376	78	Weighted Average
2.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.2800	0.18		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
3.1	50	0.2800	0.27		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
3.2	635	0.2272	3.34		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.3	40	0.2272	2.38		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
11.3	775	Total			

Summary for Subcatchment S200:

Runoff = 5.53 cfs @ 12.22 hrs, Volume= 0.421 af, Depth= 1.04"
Routed to Pond F1 : FOREBAY 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

	Area (ac)	CN	Description
	0.013	79	Woods, Fair, HSG D
	0.992	78	Meadow, non-grazed, HSG D
*	1.664	98	SOLAR PANELS
	2.182	80	>75% Grass cover, Good, HSG D
	4.851	86	Weighted Average
	3.187		65.70% Pervious Area
	1.664		34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
6.3	1,071	0.1634	2.83		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.3	1,171	Total			

Summary for Subcatchment S201:

Runoff = 5.63 cfs @ 12.17 hrs, Volume= 0.377 af, Depth= 1.04"
Routed to Reach R1 : E-W SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.014	79	Woods, Fair, HSG D
1.056	78	Meadow, non-grazed, HSG D
* 1.523	98	SOLAR PANELS
1.749	80	>75% Grass cover, Good, HSG D
4.342	86	Weighted Average
2.819		64.92% Pervious Area
1.523		35.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	536	0.1900	3.05		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.7	636	Total			

Summary for Subcatchment S202:

Runoff = 0.94 cfs @ 12.10 hrs, Volume= 0.048 af, Depth= 0.98"
Routed to Pond B3 : BIORETENTION AREA 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.380	78	Meadow, non-grazed, HSG D
0.203	98	Paved parking, HSG D
0.583	85	Weighted Average
0.380		65.18% Pervious Area
0.203		34.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.1500	0.84		**Sheet Flow, SF - GRAVEL** Fallow n= 0.050 P2= 2.68"
0.7	219	0.1100	4.97		**Shallow Concentrated Flow, SCF - CHANNEL** Grassed Waterway Kv= 15.0 fps
2.7	319	Total			

Summary for Subcatchment S203:

Runoff = 3.21 cfs @ 12.26 hrs, Volume= 0.283 af, Depth= 0.67"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
3.148	78	Meadow, non-grazed, HSG D
1.685	79	Woods, Fair, HSG D
0.110	96	Gravel surface, HSG D
0.086	80	>75% Grass cover, Good, HSG D
5.029	79	Weighted Average
5.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - MEADOW** Woods: Light underbrush n= 0.400 P2= 2.68"
6.8	1,118	0.1512	2.72		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
16.3	1,218	Total			

Summary for Subcatchment S204:

Runoff = 0.56 cfs @ 12.15 hrs, Volume= 0.036 af, Depth= 0.63"
Routed to Pond D1 : RETENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.687	78	Meadow, non-grazed, HSG D
0.687		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	100	0.1500	2.71		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
7.4	200	Total			

Summary for Subcatchment S205:

Runoff = 0.37 cfs @ 12.17 hrs, Volume= 0.025 af, Depth= 0.63"
Routed to Pond D3 : RENTENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.484	78	Meadow, non-grazed, HSG D
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - WOODS** Grass: Dense n= 0.240 P2= 2.68"
2.4	350	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.0	450	Total			

Summary for Subcatchment S206:

Runoff = 1.26 cfs @ 12.13 hrs, Volume= 0.072 af, Depth= 0.98"
Routed to Reach R3 : ROADSIDE SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.320	98	Paved parking, HSG D
0.563	78	Meadow, non-grazed, HSG D
0.883	85	Weighted Average
0.563		63.76% Pervious Area
0.320		36.24% Impervious Area

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

Summary for Subcatchment S207:

Runoff = 0.73 cfs @ 12.16 hrs, Volume= 0.048 af, Depth= 0.67"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.683	79	Woods, Fair, HSG D
0.164	78	Meadow, non-grazed, HSG D
0.847	79	Weighted Average
0.847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	30	0.5000	0.30		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.68"
6.0	70	0.3000	0.20		**Sheet Flow, SF WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
0.5	80	0.3000	2.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
8.1	180	Total			

Summary for Subcatchment S208:

Runoff = 14.58 cfs @ 12.18 hrs, Volume= 0.998 af, Depth= 1.04"
Routed to Reach R7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

	Area (ac)	CN	Description
	0.087	79	Woods, Fair, HSG D
	2.085	78	Meadow, non-grazed, HSG D
*	3.920	98	SOLAR PANELS
	5.398	80	>75% Grass cover, Good, HSG D
	11.490	86	Weighted Average
	7.570		65.88% Pervious Area
	3.920		34.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1300	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	570	0.2235	3.31		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
10.3	670	Total			

Summary for Subcatchment S209:

Runoff = 0.41 cfs @ 12.14 hrs, Volume= 0.024 af, Depth= 0.63"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.012	79	Woods, Fair, HSG D
0.453	78	Meadow, non-grazed, HSG D
0.465	78	Weighted Average
0.465		100.00% Pervious Area

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

Summary for Subcatchment S300:

Runoff = 2.44 cfs @ 12.26 hrs, Volume= 0.238 af, Depth= 0.44"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 1-YR Rainfall=2.25"

Area (ac)	CN	Description
0.327	98	Paved parking, HSG C
4.927	71	Meadow, non-grazed, HSG C
1.260	73	Woods, Fair, HSG C
6.514	73	Weighted Average
6.187		94.98% Pervious Area
0.327		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
7.8	1,700	0.0588	3.64		**Shallow Concentrated Flow, SCF - MEADOW** Grassed Waterway Kv= 15.0 fps
15.0	1,800	Total			

Summary for Reach R1: E-W SWALE

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 1.04" for 1-YR event
Inflow = 5.63 cfs @ 12.17 hrs, Volume= 0.377 af
Outflow = 5.59 cfs @ 12.19 hrs, Volume= 0.377 af, Atten= 1%, Lag= 0.7 min
Routed to Pond F2 : FOREBAY 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 8.63 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.94 fps, Avg. Travel Time= 2.8 min

Peak Storage= 314 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 2.96'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 65.06 cfs

1.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 485.0' Slope= 0.1299 '/'
Inlet Invert= 968.00', Outlet Invert= 905.00'

Summary for Reach R2: OVERFLOW SWALE

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth > 0.60" for 1-YR event
Inflow = 0.31 cfs @ 18.22 hrs, Volume= 0.576 af
Outflow = 0.31 cfs @ 18.22 hrs, Volume= 0.576 af, Atten= 0%, Lag= 0.3 min
Routed to Pond D1 : RETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.6 min

Peak Storage= 11 cf @ 18.22 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 2.25'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 507.22 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 120.0' Slope= 0.1958 '/'
Inlet Invert= 893.50', Outlet Invert= 870.00'

Summary for Reach R3: ROADSIDE SWALE

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 0.98" for 1-YR event
Inflow = 1.26 cfs @ 12.13 hrs, Volume= 0.072 af
Outflow = 1.12 cfs @ 12.16 hrs, Volume= 0.072 af, Atten= 11%, Lag= 1.8 min
Routed to Pond B4 : BIORETENTION AREA 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 10.9 min

Peak Storage= 229 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 2.08'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 42.24 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 825.0' Slope= 0.1018 '/'
Inlet Invert= 924.00', Outlet Invert= 840.00'

Summary for Reach R4:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 0.61" for 1-YR event
Inflow = 1.41 cfs @ 12.17 hrs, Volume= 0.658 af
Outflow = 1.24 cfs @ 12.22 hrs, Volume= 0.656 af, Atten= 12%, Lag= 3.0 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 7.2 min

Peak Storage= 347 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 50.76'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,059.41 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 360.0' Slope= 0.1778 '/'
Inlet Invert= 831.00', Outlet Invert= 767.00'

‡

Summary for Reach R5:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 0.67" for 1-YR event
Inflow = 0.42 cfs @ 12.14 hrs, Volume= 0.102 af
Outflow = 0.37 cfs @ 12.18 hrs, Volume= 0.102 af, Atten= 12%, Lag= 2.3 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 1.37 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 2.7 min

Peak Storage= 59 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 50.21'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,753.82 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 220.0' Slope= 0.1591 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

‡

Summary for Reach R6:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 0.67" for 1-YR event
Inflow = 3.60 cfs @ 12.26 hrs, Volume= 0.823 af
Outflow = 2.61 cfs @ 12.41 hrs, Volume= 0.818 af, Atten= 27%, Lag= 8.9 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 1.92 fps, Min. Travel Time= 13.9 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 25.4 min

Peak Storage= 2,178 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 51.07'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

‡

Summary for Reach R7:

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 1.04" for 1-YR event
Inflow = 14.58 cfs @ 12.18 hrs, Volume= 0.998 af
Outflow = 14.52 cfs @ 12.19 hrs, Volume= 0.998 af, Atten= 0%, Lag= 0.4 min
Routed to Pond P1 : WET POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 8.94 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.97 fps, Avg. Travel Time= 1.9 min

Peak Storage= 535 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.47' , Surface Width= 4.84'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 321.73 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 330.0' Slope= 0.0788 '/'
Inlet Invert= 924.00', Outlet Invert= 898.00'

Summary for Pond B1: BIORETENTION AREA 1

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 0.62" for 1-YR event
Inflow = 2.24 cfs @ 12.48 hrs, Volume= 0.251 af
Outflow = 0.58 cfs @ 13.38 hrs, Volume= 0.248 af, Atten= 74%, Lag= 53.9 min
Primary = 0.08 cfs @ 13.38 hrs, Volume= 0.146 af
Routed to Reach R6 :
Secondary = 0.50 cfs @ 13.38 hrs, Volume= 0.102 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.55' @ 13.38 hrs Surf.Area= 6,665 sf Storage= 3,458 cf

Plug-Flow detention time= 308.0 min calculated for 0.248 af (99% of inflow)
Center-of-Mass det. time= 301.9 min (1,237.2 - 935.3)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	14,542 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,991	427.0	0	0	5,991
905.00	8,631	465.0	14,542	14,542	8,832

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 13.38 hrs HW=903.55' TW=895.02' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 1.97 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=0.50 cfs @ 13.38 hrs HW=903.55' TW=895.02' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.50 cfs @ 0.52 fps)

Summary for Pond B2: BIORETENTION AREA 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 0.68" for 1-YR event
Inflow = 2.92 cfs @ 12.34 hrs, Volume= 0.247 af
Outflow = 0.71 cfs @ 13.01 hrs, Volume= 0.245 af, Atten= 76%, Lag= 40.4 min
Primary = 0.07 cfs @ 13.01 hrs, Volume= 0.136 af
Routed to Reach R6 :
Secondary = 0.64 cfs @ 13.01 hrs, Volume= 0.108 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.56' @ 13.01 hrs Surf.Area= 6,191 sf Storage= 3,258 cf

Plug-Flow detention time= 293.3 min calculated for 0.245 af (99% of inflow)
Center-of-Mass det. time= 288.0 min (1,203.8 - 915.8)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	13,497 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,550	421.0	0	0	5,550
905.00	8,023	459.0	13,497	13,497	8,353

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65
2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.07 cfs @ 13.01 hrs HW=903.56' TW=895.02' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.07 cfs of 1.97 cfs potential flow)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Secondary OutFlow Max=0.64 cfs @ 13.01 hrs HW=903.56' TW=895.02' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.64 cfs @ 0.56 fps)

Summary for Pond B3: BIORETENTION AREA 3

Inflow Area = 0.583 ac, 34.82% Impervious, Inflow Depth = 0.98" for 1-YR event
Inflow = 0.94 cfs @ 12.10 hrs, Volume= 0.048 af
Outflow = 0.62 cfs @ 12.15 hrs, Volume= 0.048 af, Atten= 33%, Lag= 2.7 min
Primary = 0.01 cfs @ 12.15 hrs, Volume= 0.026 af
Routed to Reach R6 :
Secondary = 0.61 cfs @ 12.15 hrs, Volume= 0.022 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 898.59' @ 12.15 hrs Surf.Area= 1,268 sf Storage= 605 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 248.6 min (1,087.2 - 838.6)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	3,200 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	800	0	0
900.00	2,400	3,200	3,200

Device	Routing	Invert	Outlet Devices
#1	Device 3	898.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	898.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	895.50'	**8.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 895.50' / 895.00' S= 0.0083 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.01 cfs @ 12.15 hrs HW=898.58' TW=895.01' (Dynamic Tailwater)
└─**3=Culvert** (Passes 0.01 cfs of 1.55 cfs potential flow)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.59 cfs @ 12.15 hrs HW=898.58' TW=895.01' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.59 cfs @ 0.71 fps)

Summary for Pond B4: BIORETENTION AREA 4

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 0.98" for 1-YR event
Inflow = 1.12 cfs @ 12.16 hrs, Volume= 0.072 af
Outflow = 0.18 cfs @ 12.74 hrs, Volume= 0.056 af, Atten= 84%, Lag= 34.7 min
Primary = 0.02 cfs @ 12.74 hrs, Volume= 0.040 af
Routed to Pond D2 : DETENTION POND
Secondary = 0.16 cfs @ 12.74 hrs, Volume= 0.016 af
Routed to Pond D2 : DETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.52' @ 12.74 hrs Surf.Area= 1,872 sf Storage= 1,569 cf

Plug-Flow detention time= 479.3 min calculated for 0.056 af (78% of inflow)
Center-of-Mass det. time= 391.2 min (1,240.1 - 848.9)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	5,303 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	15	0	0
838.00	1,417	716	716
840.00	3,170	4,587	5,303

Device	Routing	Invert	Outlet Devices
#1	Device 3	837.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	838.50'	**25.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	835.50'	**8.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 835.50' / 834.00' S= 0.0600 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.74 hrs HW=838.52' TW=834.31' (Dynamic Tailwater)
└─**3=Culvert** (Passes 0.02 cfs of 2.17 cfs potential flow)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.16 cfs @ 12.74 hrs HW=838.52' TW=834.31' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.16 cfs @ 0.34 fps)

Summary for Pond D1: RETENTION POND

Inflow Area = 12.177 ac, 32.19% Impervious, Inflow Depth > 0.60" for 1-YR event
Inflow = 0.74 cfs @ 12.16 hrs, Volume= 0.612 af
Outflow = 0.70 cfs @ 12.19 hrs, Volume= 0.611 af, Atten= 5%, Lag= 1.7 min
Primary = 0.70 cfs @ 12.19 hrs, Volume= 0.611 af
Routed to Reach R4 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 864.40' @ 12.19 hrs Surf.Area= 357 sf Storage= 117 cf

Plug-Flow detention time= 3.9 min calculated for 0.610 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (1,389.1 - 1,387.0)

Volume	Invert	Avail.Storage	Storage Description
#1	864.00'	12,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
864.00	230	80.0	0	0	230
866.00	1,140	145.0	1,255	1,255	1,415
868.00	2,560	210.0	3,606	4,860	3,286
870.00	4,800	270.0	7,244	12,104	5,627

Device	Routing	Invert	Outlet Devices
#1	Primary	864.00'	**15.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 864.00' / 863.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#2	Secondary	868.75'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.70 cfs @ 12.19 hrs HW=864.40' TW=831.02' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.70 cfs @ 3.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=864.00' TW=831.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: DETENTION POND

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth > 0.77" for 1-YR event
Inflow = 0.18 cfs @ 12.74 hrs, Volume= 0.056 af
Outflow = 0.08 cfs @ 13.61 hrs, Volume= 0.056 af, Atten= 54%, Lag= 51.9 min
Primary = 0.08 cfs @ 13.61 hrs, Volume= 0.056 af
Routed to Reach R5 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 834.70' @ 13.61 hrs Surf.Area= 513 sf Storage= 223 cf

Plug-Flow detention time= 25.0 min calculated for 0.056 af (99% of inflow)
Center-of-Mass det. time= 17.8 min (1,258.0 - 1,240.1)

Volume	Invert	Avail.Storage	Storage Description
#1	834.00'	6,977 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
834.00	160	85.0	0	0	160
836.00	1,710	225.0	1,595	1,595	3,628
838.00	3,810	285.0	5,382	6,977	6,115

Device	Routing	Invert	Outlet Devices
#1	Secondary	836.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 4	834.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	836.00'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	833.90'	**10.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 833.90' / 833.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.55 sf

Primary OutFlow Max=0.08 cfs @ 13.61 hrs HW=834.70' TW=822.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.08 cfs of 1.29 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 3.77 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=834.00' TW=822.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: RENTENTION POND

Inflow Area = 0.484 ac, 0.00% Impervious, Inflow Depth = 0.63" for 1-YR event
Inflow = 0.37 cfs @ 12.17 hrs, Volume= 0.025 af
Outflow = 0.20 cfs @ 12.32 hrs, Volume= 0.021 af, Atten= 47%, Lag= 8.9 min
Primary = 0.20 cfs @ 12.32 hrs, Volume= 0.021 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.26' @ 12.32 hrs Surf.Area= 418 sf Storage= 280 cf

Plug-Flow detention time= 126.9 min calculated for 0.021 af (83% of inflow)
Center-of-Mass det. time= 51.5 min (923.0 - 871.5)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	1,625 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	60	0	0
838.00	310	185	185
840.00	1,130	1,440	1,625

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 100.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.20 cfs @ 12.32 hrs HW=838.26' TW=822.01' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.20 cfs @ 1.79 fps)

Summary for Pond F1: FOREBAY 2

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 1.04" for 1-YR event
Inflow = 5.53 cfs @ 12.22 hrs, Volume= 0.421 af
Outflow = 2.24 cfs @ 12.48 hrs, Volume= 0.251 af, Atten= 60%, Lag= 16.1 min
Primary = 2.24 cfs @ 12.48 hrs, Volume= 0.251 af
Routed to Pond B1 : BIORETENTION AREA 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.63' @ 12.48 hrs Surf.Area= 3,885 sf Storage= 7,900 cf

Plug-Flow detention time= 202.2 min calculated for 0.251 af (60% of inflow)
Center-of-Mass det. time= 90.8 min (935.3 - 844.5)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	14,382 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	218	86.0	0	0	218
901.00	1,277	230.0	1,348	1,348	3,853
903.00	3,198	372.0	4,331	5,679	10,682
905.00	5,618	426.0	8,703	14,382	14,203

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=2.23 cfs @ 12.48 hrs HW=903.63' TW=903.10' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 2.23 cfs @ 0.87 fps)

Summary for Pond F2: FOREBAY 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 1.04" for 1-YR event
Inflow = 5.59 cfs @ 12.19 hrs, Volume= 0.377 af
Outflow = 2.92 cfs @ 12.34 hrs, Volume= 0.247 af, Atten= 48%, Lag= 9.2 min
Primary = 2.92 cfs @ 12.34 hrs, Volume= 0.247 af
Routed to Pond B2 : BIORETENTION AREA 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.65' @ 12.34 hrs Surf.Area= 3,279 sf Storage= 6,162 cf

Plug-Flow detention time= 179.2 min calculated for 0.247 af (65% of inflow)
Center-of-Mass det. time= 72.8 min (915.8 - 843.0)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	11,697 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	98	53.0	0	0	98
901.00	930	189.0	887	887	2,728
903.00	2,575	324.0	3,368	4,255	8,263
905.00	5,000	439.0	7,442	11,697	15,287

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=2.91 cfs @ 12.34 hrs HW=903.65' TW=903.10' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 2.91 cfs @ 0.95 fps)

Summary for Pond P1: WET POND

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 1.04" for 1-YR event
Inflow = 14.52 cfs @ 12.19 hrs, Volume= 0.998 af
Outflow = 0.31 cfs @ 18.22 hrs, Volume= 0.576 af, Atten= 98%, Lag= 361.6 min
Primary = 0.31 cfs @ 18.22 hrs, Volume= 0.576 af
Routed to Reach R2 : OVERFLOW SWALE
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R2 : OVERFLOW SWALE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 894.00' Surf.Area= 12,390 sf Storage= 18,141 cf
Peak Elev= 895.85' @ 18.22 hrs Surf.Area= 21,951 sf Storage= 49,442 cf (31,302 cf above start)
Flood Elev= 900.00' Surf.Area= 35,579 sf Storage= 168,762 cf (150,621 cf above start)

Plug-Flow detention time= 1,234.7 min calculated for 0.160 af (16% of inflow)
Center-of-Mass det. time= 576.2 min (1,419.1 - 843.0)

Volume	Invert	Avail.Storage	Storage Description
#1	891.00'	168,762 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
891.00	2,741	349.0	0	0	2,741
892.00	3,525	397.0	3,125	3,125	5,615
894.00	12,390	626.0	15,016	18,141	24,285
896.00	22,863	877.0	34,722	52,863	54,344
898.00	28,845	1,061.0	51,592	104,455	82,786
900.00	35,579	1,100.0	64,306	168,762	89,833

Device	Routing	Invert	Outlet Devices
#1	Secondary	898.75'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Device 5	894.00'	**3.0" Vert. Low Flow Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 5	895.90'	**12.0" Horiz. Stand Pipe** C= 0.600 Limited to weir flow at low heads
#4	Device 5	898.50'	**1.0" x 4.0" Horiz. Orifice/Grate X 13.00 columns** X 5 rows C= 0.600 in 30.0" x 30.0" Grate (29% open area)
#5	Primary	893.90'	**18.0" Round Culvert** L= 70.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.90' / 892.00' S= 0.0271 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.31 cfs @ 18.22 hrs HW=895.85' TW=893.54' (Dynamic Tailwater)
└**5=Culvert** (Passes 0.31 cfs of 9.31 cfs potential flow)
├**2=Low Flow Orifice** (Orifice Controls 0.31 cfs @ 6.32 fps)
├**3=Stand Pipe** (Controls 0.00 cfs)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=894.00' TW=893.50' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DPA:

Inflow Area = 2.376 ac, 0.00% Impervious, Inflow Depth = 0.63" for 1-YR event
Inflow = 1.65 cfs @ 12.20 hrs, Volume= 0.125 af
Primary = 1.65 cfs @ 12.20 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPB:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 0.66" for 1-YR event
Inflow = 2.61 cfs @ 12.41 hrs, Volume= 0.818 af
Primary = 2.61 cfs @ 12.41 hrs, Volume= 0.818 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPC:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 0.60" for 1-YR event
Inflow = 1.24 cfs @ 12.22 hrs, Volume= 0.656 af
Primary = 1.24 cfs @ 12.22 hrs, Volume= 0.656 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPD:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 0.67" for 1-YR event
Inflow = 0.37 cfs @ 12.18 hrs, Volume= 0.102 af
Primary = 0.37 cfs @ 12.18 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPE:

Inflow Area = 6.514 ac, 5.02% Impervious, Inflow Depth = 0.44" for 1-YR event
Inflow = 2.44 cfs @ 12.26 hrs, Volume= 0.238 af
Primary = 2.44 cfs @ 12.26 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS100: Runoff Area=2.376 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=775' Tc=11.3 min CN=78 Runoff=5.16 cfs 0.366 af

SubcatchmentS200: Runoff Area=4.851 ac 34.30% Impervious Runoff Depth=2.50"
Flow Length=1,171' Tc=13.3 min CN=86 Runoff=13.21 cfs 1.011 af

SubcatchmentS201: Runoff Area=4.342 ac 35.08% Impervious Runoff Depth=2.50"
Flow Length=636' Tc=9.7 min CN=86 Runoff=13.38 cfs 0.905 af

SubcatchmentS202: Runoff Area=0.583 ac 34.82% Impervious Runoff Depth=2.41"
Flow Length=319' Tc=2.7 min CN=85 Runoff=2.24 cfs 0.117 af

SubcatchmentS203: Runoff Area=5.029 ac 0.00% Impervious Runoff Depth=1.92"
Flow Length=1,218' Tc=16.3 min CN=79 Runoff=9.70 cfs 0.806 af

SubcatchmentS204: Runoff Area=0.687 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=200' Tc=7.4 min CN=78 Runoff=1.74 cfs 0.106 af

SubcatchmentS205: Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=1.85"
Flow Length=450' Tc=9.0 min CN=78 Runoff=1.15 cfs 0.075 af

SubcatchmentS206: Runoff Area=0.883 ac 36.24% Impervious Runoff Depth=2.41"
Tc=6.0 min CN=85 Runoff=3.05 cfs 0.178 af

SubcatchmentS207: Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=1.92"
Flow Length=180' Tc=8.1 min CN=79 Runoff=2.17 cfs 0.136 af

SubcatchmentS208: Runoff Area=11.490 ac 34.12% Impervious Runoff Depth=2.50"
Flow Length=670' Tc=10.3 min CN=86 Runoff=34.65 cfs 2.395 af

SubcatchmentS209: Runoff Area=0.465 ac 0.00% Impervious Runoff Depth=1.85"
Tc=6.0 min CN=78 Runoff=1.25 cfs 0.072 af

SubcatchmentS300: Runoff Area=6.514 ac 5.02% Impervious Runoff Depth=1.49"
Flow Length=1,800' Tc=15.0 min CN=73 Runoff=9.96 cfs 0.810 af

Reach R1: E-W SWALE Avg. Flow Depth=0.49' Max Vel=10.85 fps Inflow=13.38 cfs 0.905 af
n=0.022 L=485.0' S=0.1299 '/' Capacity=65.06 cfs Outflow=13.31 cfs 0.905 af

Reach R2: OVERFLOW SWALE Avg. Flow Depth=0.19' Max Vel=8.53 fps Inflow=4.16 cfs 1.909 af
n=0.022 L=120.0' S=0.1958 '/' Capacity=507.22 cfs Outflow=4.16 cfs 1.908 af

Reach R3: ROADSIDE SWALE Avg. Flow Depth=0.29' Max Vel=5.24 fps Inflow=3.05 cfs 0.178 af
n=0.030 L=825.0' S=0.1018 '/' Capacity=42.24 cfs Outflow=2.83 cfs 0.178 af

Reach R4: Avg. Flow Depth=0.04' Max Vel=2.19 fps Inflow=4.79 cfs 2.148 af
n=0.035 L=360.0' S=0.1778 '/' Capacity=1,059.41 cfs Outflow=4.78 cfs 2.146 af

Reach R5: Avg. Flow Depth=0.02' Max Vel=2.15 fps Inflow=2.17 cfs 0.302 af
n=0.020 L=220.0' S=0.1591 '/' Capacity=1,753.82 cfs Outflow=2.11 cfs 0.302 af

Reach R6: Avg. Flow Depth=0.11' Max Vel=4.84 fps Inflow=32.40 cfs 2.531 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=28.62 cfs 2.525 af

Reach R7: Avg. Flow Depth=0.73' Max Vel=11.32 fps Inflow=34.65 cfs 2.395 af
n=0.022 L=330.0' S=0.0788 '/' Capacity=321.73 cfs Outflow=34.57 cfs 2.395 af

Pond B1: BIORETENTION AREA 1 Peak Elev=903.83' Storage=5,382 cf Inflow=11.87 cfs 0.841 af
Primary=0.08 cfs 0.149 af Secondary=11.12 cfs 0.687 af Outflow=11.20 cfs 0.837 af

Pond B2: BIORETENTION AREA 2 Peak Elev=903.83' Storage=5,029 cf Inflow=12.28 cfs 0.775 af
Primary=0.08 cfs 0.139 af Secondary=11.49 cfs 0.632 af Outflow=11.56 cfs 0.771 af

Pond B3: BIORETENTION AREA 3 Peak Elev=898.70' Storage=752 cf Inflow=2.24 cfs 0.117 af
Primary=0.02 cfs 0.029 af Secondary=2.13 cfs 0.088 af Outflow=2.15 cfs 0.117 af

Pond B4: BIORETENTION AREA 4 Peak Elev=838.63' Storage=1,776 cf Inflow=2.83 cfs 0.178 af
Primary=0.02 cfs 0.043 af Secondary=2.74 cfs 0.118 af Outflow=2.76 cfs 0.161 af

Pond D1: RETENTION POND Peak Elev=865.17' Storage=508 cf Inflow=4.37 cfs 2.014 af
Primary=4.37 cfs 2.013 af Secondary=0.00 cfs 0.000 af Outflow=4.37 cfs 2.013 af

Pond D2: DETENTION POND Peak Elev=836.18' Storage=1,926 cf Inflow=2.76 cfs 0.161 af
Primary=0.83 cfs 0.160 af Secondary=0.00 cfs 0.000 af Outflow=0.83 cfs 0.160 af

Pond D3: RENTENTION POND Peak Elev=838.62' Storage=458 cf Inflow=1.15 cfs 0.075 af
12.0" Round Culvert n=0.020 L=100.0' S=0.0100 '/' Outflow=1.02 cfs 0.070 af

Pond F1: FOREBAY 2 Peak Elev=903.96' Storage=9,241 cf Inflow=13.21 cfs 1.011 af
Outflow=11.87 cfs 0.841 af

Pond F2: FOREBAY 2 Peak Elev=903.97' Storage=7,244 cf Inflow=13.31 cfs 0.905 af
Outflow=12.28 cfs 0.775 af

Pond P1: WET POND Peak Elev=896.89' Storage=74,389 cf Inflow=34.57 cfs 2.395 af
Primary=4.16 cfs 1.909 af Secondary=0.00 cfs 0.000 af Outflow=4.16 cfs 1.909 af

Link DPA: Inflow=5.16 cfs 0.366 af
Primary=5.16 cfs 0.366 af

Link DPB: Inflow=28.62 cfs 2.525 af
Primary=28.62 cfs 2.525 af

Link DPC: Inflow=4.78 cfs 2.146 af
Primary=4.78 cfs 2.146 af

Link DPD: Inflow=2.11 cfs 0.302 af
Primary=2.11 cfs 0.302 af

Link DPE: Inflow=9.96 cfs 0.810 af
Primary=9.96 cfs 0.810 af

Total Runoff Area = 38.551 ac Runoff Volume = 6.975 af Average Runoff Depth = 2.17"
79.36% Pervious = 30.594 ac 20.64% Impervious = 7.957 ac

Summary for Subcatchment S100:

Runoff = 5.16 cfs @ 12.19 hrs, Volume= 0.366 af, Depth= 1.85"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.763	79	Woods, Fair, HSG D
1.613	78	Meadow, non-grazed, HSG D
2.376	78	Weighted Average
2.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.2800	0.18		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
3.1	50	0.2800	0.27		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
3.2	635	0.2272	3.34		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.3	40	0.2272	2.38		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
11.3	775	Total			

Summary for Subcatchment S200:

Runoff = 13.21 cfs @ 12.21 hrs, Volume= 1.011 af, Depth= 2.50"
Routed to Pond F1 : FOREBAY 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

	Area (ac)	CN	Description
	0.013	79	Woods, Fair, HSG D
	0.992	78	Meadow, non-grazed, HSG D
*	1.664	98	SOLAR PANELS
	2.182	80	>75% Grass cover, Good, HSG D
	4.851	86	Weighted Average
	3.187		65.70% Pervious Area
	1.664		34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
6.3	1,071	0.1634	2.83		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.3	1,171	Total			

Summary for Subcatchment S201:

Runoff = 13.38 cfs @ 12.17 hrs, Volume= 0.905 af, Depth= 2.50"
Routed to Reach R1 : E-W SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

	Area (ac)	CN	Description
	0.014	79	Woods, Fair, HSG D
	1.056	78	Meadow, non-grazed, HSG D
*	1.523	98	SOLAR PANELS
	1.749	80	>75% Grass cover, Good, HSG D
	4.342	86	Weighted Average
	2.819		64.92% Pervious Area
	1.523		35.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	536	0.1900	3.05		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.7	636	Total			

Summary for Subcatchment S202:

Runoff = 2.24 cfs @ 12.10 hrs, Volume= 0.117 af, Depth= 2.41"
Routed to Pond B3 : BIORETENTION AREA 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.380	78	Meadow, non-grazed, HSG D
0.203	98	Paved parking, HSG D
0.583	85	Weighted Average
0.380		65.18% Pervious Area
0.203		34.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.1500	0.84		**Sheet Flow, SF - GRAVEL** Fallow n= 0.050 P2= 2.68"
0.7	219	0.1100	4.97		**Shallow Concentrated Flow, SCF - CHANNEL** Grassed Waterway Kv= 15.0 fps
2.7	319	Total			

Summary for Subcatchment S203:

Runoff = 9.70 cfs @ 12.25 hrs, Volume= 0.806 af, Depth= 1.92"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
3.148	78	Meadow, non-grazed, HSG D
1.685	79	Woods, Fair, HSG D
0.110	96	Gravel surface, HSG D
0.086	80	>75% Grass cover, Good, HSG D
5.029	79	Weighted Average
5.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - MEADOW** Woods: Light underbrush n= 0.400 P2= 2.68"
6.8	1,118	0.1512	2.72		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
16.3	1,218	Total			

Summary for Subcatchment S204:

Runoff = 1.74 cfs @ 12.15 hrs, Volume= 0.106 af, Depth= 1.85"
Routed to Pond D1 : RETENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.687	78	Meadow, non-grazed, HSG D
0.687		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	100	0.1500	2.71		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
7.4	200	Total			

Summary for Subcatchment S205:

Runoff = 1.15 cfs @ 12.17 hrs, Volume= 0.075 af, Depth= 1.85"
Routed to Pond D3 : RENTENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.484	78	Meadow, non-grazed, HSG D
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - WOODS** Grass: Dense n= 0.240 P2= 2.68"
2.4	350	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.0	450	Total			

Summary for Subcatchment S206:

Runoff = 3.05 cfs @ 12.13 hrs, Volume= 0.178 af, Depth= 2.41"
Routed to Reach R3 : ROADSIDE SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.320	98	Paved parking, HSG D
0.563	78	Meadow, non-grazed, HSG D
0.883	85	Weighted Average
0.563		63.76% Pervious Area
0.320		36.24% Impervious Area

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

Summary for Subcatchment S207:

Runoff = 2.17 cfs @ 12.16 hrs, Volume= 0.136 af, Depth= 1.92"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.683	79	Woods, Fair, HSG D
0.164	78	Meadow, non-grazed, HSG D
0.847	79	Weighted Average
0.847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	30	0.5000	0.30		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.68"
6.0	70	0.3000	0.20		**Sheet Flow, SF WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
0.5	80	0.3000	2.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
8.1	180	Total			

Summary for Subcatchment S208:

Runoff = 34.65 cfs @ 12.18 hrs, Volume= 2.395 af, Depth= 2.50"
Routed to Reach R7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

	Area (ac)	CN	Description
	0.087	79	Woods, Fair, HSG D
	2.085	78	Meadow, non-grazed, HSG D
*	3.920	98	SOLAR PANELS
	5.398	80	>75% Grass cover, Good, HSG D
	11.490	86	Weighted Average
	7.570		65.88% Pervious Area
	3.920		34.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1300	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	570	0.2235	3.31		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
10.3	670	Total			

Summary for Subcatchment S209:

Runoff = 1.25 cfs @ 12.13 hrs, Volume= 0.072 af, Depth= 1.85"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.012	79	Woods, Fair, HSG D
0.453	78	Meadow, non-grazed, HSG D
0.465	78	Weighted Average
0.465		100.00% Pervious Area

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

Summary for Subcatchment S300:

Runoff = 9.96 cfs @ 12.24 hrs, Volume= 0.810 af, Depth= 1.49"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 10-YR Rainfall=3.95"

Area (ac)	CN	Description
0.327	98	Paved parking, HSG C
4.927	71	Meadow, non-grazed, HSG C
1.260	73	Woods, Fair, HSG C
6.514	73	Weighted Average
6.187		94.98% Pervious Area
0.327		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
7.8	1,700	0.0588	3.64		**Shallow Concentrated Flow, SCF - MEADOW** Grassed Waterway Kv= 15.0 fps
15.0	1,800	Total			

Summary for Reach R1: E-W SWALE

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 2.50" for 10-YR event
Inflow = 13.38 cfs @ 12.17 hrs, Volume= 0.905 af
Outflow = 13.31 cfs @ 12.18 hrs, Volume= 0.905 af, Atten= 1%, Lag= 0.6 min
Routed to Pond F2 : FOREBAY 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 10.85 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.59 fps, Avg. Travel Time= 2.3 min

Peak Storage= 595 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 3.97'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 65.06 cfs

1.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 485.0' Slope= 0.1299 '/'
Inlet Invert= 968.00', Outlet Invert= 905.00'

Summary for Reach R2: OVERFLOW SWALE

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth > 1.99" for 10-YR event
Inflow = 4.16 cfs @ 12.96 hrs, Volume= 1.909 af
Outflow = 4.16 cfs @ 12.96 hrs, Volume= 1.908 af, Atten= 0%, Lag= 0.2 min
Routed to Pond D1 : RETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 8.53 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.24 fps, Avg. Travel Time= 0.5 min

Peak Storage= 58 cf @ 12.96 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 3.14'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 507.22 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 120.0' Slope= 0.1958 '/'
Inlet Invert= 893.50', Outlet Invert= 870.00'

Summary for Reach R3: ROADSIDE SWALE

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 2.41" for 10-YR event
Inflow = 3.05 cfs @ 12.13 hrs, Volume= 0.178 af
Outflow = 2.83 cfs @ 12.16 hrs, Volume= 0.178 af, Atten= 7%, Lag= 1.5 min
Routed to Pond B4 : BIORETENTION AREA 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.24 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 8.8 min

Peak Storage= 446 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 2.74'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 42.24 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 825.0' Slope= 0.1018 '/'
Inlet Invert= 924.00', Outlet Invert= 840.00'

Summary for Reach R4:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 1.98" for 10-YR event
Inflow = 4.79 cfs @ 12.56 hrs, Volume= 2.148 af
Outflow = 4.78 cfs @ 12.58 hrs, Volume= 2.146 af, Atten= 0%, Lag= 1.2 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 5.6 min

Peak Storage= 788 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 51.72'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,059.41 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 360.0' Slope= 0.1778 '/'
Inlet Invert= 831.00', Outlet Invert= 767.00'

‡

Summary for Reach R5:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 1.98" for 10-YR event
Inflow = 2.17 cfs @ 12.15 hrs, Volume= 0.302 af
Outflow = 2.11 cfs @ 12.17 hrs, Volume= 0.302 af, Atten= 3%, Lag= 1.3 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 2.6 min

Peak Storage= 216 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 50.78'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,753.82 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 220.0' Slope= 0.1591 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

‡

Summary for Reach R6:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 2.05" for 10-YR event
Inflow = 32.40 cfs @ 12.26 hrs, Volume= 2.531 af
Outflow = 28.62 cfs @ 12.33 hrs, Volume= 2.525 af, Atten= 12%, Lag= 4.2 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.84 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 21.8 min

Peak Storage= 9,501 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 54.53'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

‡

Summary for Reach R7:

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 2.50" for 10-YR event
Inflow = 34.65 cfs @ 12.18 hrs, Volume= 2.395 af
Outflow = 34.57 cfs @ 12.18 hrs, Volume= 2.395 af, Atten= 0%, Lag= 0.4 min
Routed to Pond P1 : WET POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 11.32 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.65 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1,007 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.73' , Surface Width= 6.37'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 321.73 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 330.0' Slope= 0.0788 '/'
Inlet Invert= 924.00', Outlet Invert= 898.00'

Summary for Pond B1: BIORETENTION AREA 1

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 2.08" for 10-YR event
Inflow = 11.87 cfs @ 12.24 hrs, Volume= 0.841 af
Outflow = 11.20 cfs @ 12.29 hrs, Volume= 0.837 af, Atten= 6%, Lag= 3.0 min
Primary = 0.08 cfs @ 12.29 hrs, Volume= 0.149 af
Routed to Reach R6 :
Secondary = 11.12 cfs @ 12.29 hrs, Volume= 0.687 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.83' @ 12.29 hrs Surf.Area= 7,025 sf Storage= 5,382 cf

Plug-Flow detention time= 98.6 min calculated for 0.837 af (99% of inflow)
Center-of-Mass det. time= 95.4 min (952.0 - 856.6)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	14,542 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,991	427.0	0	0	5,991
905.00	8,631	465.0	14,542	14,542	8,832

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.29 hrs HW=903.83' TW=895.11' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 2.04 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=11.09 cfs @ 12.29 hrs HW=903.83' TW=895.11' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 11.09 cfs @ 1.36 fps)

Summary for Pond B2: BIORETENTION AREA 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 2.14" for 10-YR event
Inflow = 12.28 cfs @ 12.20 hrs, Volume= 0.775 af
Outflow = 11.56 cfs @ 12.24 hrs, Volume= 0.771 af, Atten= 6%, Lag= 2.1 min
Primary = 0.08 cfs @ 12.24 hrs, Volume= 0.139 af
Routed to Reach R6 :
Secondary = 11.49 cfs @ 12.24 hrs, Volume= 0.632 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.83' @ 12.24 hrs Surf.Area= 6,526 sf Storage= 5,029 cf

Plug-Flow detention time= 99.1 min calculated for 0.771 af (100% of inflow)
Center-of-Mass det. time= 96.3 min (946.2 - 850.0)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	13,497 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,550	421.0	0	0	5,550
905.00	8,023	459.0	13,497	13,497	8,353

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

			Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.24 hrs HW=903.83' TW=895.09' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 2.04 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=11.47 cfs @ 12.24 hrs HW=903.83' TW=895.09' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 11.47 cfs @ 1.38 fps)

Summary for Pond B3: BIORETENTION AREA 3

Inflow Area = 0.583 ac, 34.82% Impervious, Inflow Depth = 2.41" for 10-YR event
Inflow = 2.24 cfs @ 12.10 hrs, Volume= 0.117 af
Outflow = 2.15 cfs @ 12.11 hrs, Volume= 0.117 af, Atten= 4%, Lag= 1.0 min
Primary = 0.02 cfs @ 12.11 hrs, Volume= 0.029 af
Routed to Reach R6 :
Secondary = 2.13 cfs @ 12.11 hrs, Volume= 0.088 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 898.70' @ 12.11 hrs Surf.Area= 1,358 sf Storage= 752 cf

Plug-Flow detention time= 112.1 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 111.6 min (925.3 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	3,200 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	800	0	0
900.00	2,400	3,200	3,200

Device	Routing	Invert	Outlet Devices
#1	Device 3	898.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	898.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	895.50'	**8.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 895.50' / 895.00' S= 0.0083 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.11 hrs HW=898.70' TW=895.04' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.02 cfs of 1.58 cfs potential flow)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=2.11 cfs @ 12.11 hrs HW=898.70' TW=895.04' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.11 cfs @ 1.08 fps)

Summary for Pond B4: BIORETENTION AREA 4

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 2.41" for 10-YR event
Inflow = 2.83 cfs @ 12.16 hrs, Volume= 0.178 af
Outflow = 2.76 cfs @ 12.17 hrs, Volume= 0.161 af, Atten= 2%, Lag= 1.0 min
Primary = 0.02 cfs @ 12.17 hrs, Volume= 0.043 af
Routed to Pond D2 : DETENTION POND
Secondary = 2.74 cfs @ 12.17 hrs, Volume= 0.118 af
Routed to Pond D2 : DETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.63' @ 12.17 hrs Surf.Area= 1,966 sf Storage= 1,776 cf

Plug-Flow detention time= 191.2 min calculated for 0.160 af (90% of inflow)
Center-of-Mass det. time= 142.9 min (965.2 - 822.3)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	5,303 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	15	0	0
838.00	1,417	716	716
840.00	3,170	4,587	5,303

Device	Routing	Invert	Outlet Devices
#1	Device 3	837.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	838.50'	**25.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	835.50'	**8.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 835.50' / 834.00' S= 0.0600 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.17 hrs HW=838.63' TW=835.45' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.02 cfs of 2.21 cfs potential flow)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=2.72 cfs @ 12.17 hrs HW=838.63' TW=835.45' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.72 cfs @ 0.87 fps)

Summary for Pond D1: RETENTION POND

Inflow Area = 12.177 ac, 32.19% Impervious, Inflow Depth > 1.98" for 10-YR event
Inflow = 4.37 cfs @ 12.81 hrs, Volume= 2.014 af
Outflow = 4.37 cfs @ 12.85 hrs, Volume= 2.013 af, Atten= 0%, Lag= 2.3 min
Primary = 4.37 cfs @ 12.85 hrs, Volume= 2.013 af
Routed to Reach R4 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 865.17' @ 12.85 hrs Surf.Area= 678 sf Storage= 508 cf

Plug-Flow detention time= 2.4 min calculated for 2.011 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (1,054.1 - 1,052.5)

Volume	Invert	Avail.Storage	Storage Description
#1	864.00'	12,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
864.00	230	80.0	0	0	230
866.00	1,140	145.0	1,255	1,255	1,415
868.00	2,560	210.0	3,606	4,860	3,286
870.00	4,800	270.0	7,244	12,104	5,627

Device	Routing	Invert	Outlet Devices
#1	Primary	864.00'	**15.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 864.00' / 863.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#2	Secondary	868.75'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.37 cfs @ 12.85 hrs HW=865.17' TW=831.04' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 4.37 cfs @ 4.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=864.00' TW=831.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: DETENTION POND

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth > 2.18" for 10-YR event
Inflow = 2.76 cfs @ 12.17 hrs, Volume= 0.161 af
Outflow = 0.83 cfs @ 12.43 hrs, Volume= 0.160 af, Atten= 70%, Lag= 15.4 min
Primary = 0.83 cfs @ 12.43 hrs, Volume= 0.160 af
Routed to Reach R5 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 836.18' @ 12.43 hrs Surf.Area= 1,869 sf Storage= 1,926 cf

Plug-Flow detention time= 87.4 min calculated for 0.160 af (100% of inflow)
Center-of-Mass det. time= 84.0 min (1,049.2 - 965.2)

Volume	Invert	Avail.Storage	Storage Description
#1	834.00'	6,977 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
834.00	160	85.0	0	0	160
836.00	1,710	225.0	1,595	1,595	3,628
838.00	3,810	285.0	5,382	6,977	6,115

Device	Routing	Invert	Outlet Devices
#1	Secondary	836.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 4	834.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	836.00'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	833.90'	**10.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 833.90' / 833.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.55 sf

Primary OutFlow Max=0.83 cfs @ 12.43 hrs HW=836.18' TW=822.02' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.83 cfs of 2.83 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 6.98 fps)
└**3=Orifice/Grate** (Weir Controls 0.68 cfs @ 1.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=834.00' TW=822.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: RENTENTION POND

Inflow Area = 0.484 ac, 0.00% Impervious, Inflow Depth = 1.85" for 10-YR event
Inflow = 1.15 cfs @ 12.17 hrs, Volume= 0.075 af
Outflow = 1.02 cfs @ 12.21 hrs, Volume= 0.070 af, Atten= 12%, Lag= 2.6 min
Primary = 1.02 cfs @ 12.21 hrs, Volume= 0.070 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.62' @ 12.21 hrs Surf.Area= 566 sf Storage= 458 cf

Plug-Flow detention time= 53.0 min calculated for 0.070 af (94% of inflow)
Center-of-Mass det. time= 21.7 min (861.6 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	1,625 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	60	0	0
838.00	310	185	185
840.00	1,130	1,440	1,625

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 100.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 12.21 hrs HW=838.62' TW=822.02' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.01 cfs @ 2.81 fps)

Summary for Pond F1: FOREBAY 2

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 2.50" for 10-YR event
Inflow = 13.21 cfs @ 12.21 hrs, Volume= 1.011 af
Outflow = 11.87 cfs @ 12.24 hrs, Volume= 0.841 af, Atten= 10%, Lag= 1.9 min
Primary = 11.87 cfs @ 12.24 hrs, Volume= 0.841 af
Routed to Pond B1 : BIORETENTION AREA 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.96' @ 12.28 hrs Surf.Area= 4,272 sf Storage= 9,241 cf

Plug-Flow detention time= 107.4 min calculated for 0.841 af (83% of inflow)
Center-of-Mass det. time= 36.2 min (856.6 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	14,382 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	218	86.0	0	0	218
901.00	1,277	230.0	1,348	1,348	3,853
903.00	3,198	372.0	4,331	5,679	10,682
905.00	5,618	426.0	8,703	14,382	14,203

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=11.16 cfs @ 12.24 hrs HW=903.94' TW=903.81' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 11.16 cfs @ 1.26 fps)

Summary for Pond F2: FOREBAY 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 2.50" for 10-YR event
Inflow = 13.31 cfs @ 12.18 hrs, Volume= 0.905 af
Outflow = 12.28 cfs @ 12.20 hrs, Volume= 0.775 af, Atten= 8%, Lag= 1.4 min
Primary = 12.28 cfs @ 12.20 hrs, Volume= 0.775 af
Routed to Pond B2 : BIORETENTION AREA 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.97' @ 12.22 hrs Surf.Area= 3,646 sf Storage= 7,244 cf

Plug-Flow detention time= 95.9 min calculated for 0.774 af (86% of inflow)
Center-of-Mass det. time= 31.5 min (850.0 - 818.4)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	11,697 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	98	53.0	0	0	98
901.00	930	189.0	887	887	2,728
903.00	2,575	324.0	3,368	4,255	8,263
905.00	5,000	439.0	7,442	11,697	15,287

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=11.63 cfs @ 12.20 hrs HW=903.96' TW=903.82' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 11.63 cfs @ 1.27 fps)

Summary for Pond P1: WET POND

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 2.50" for 10-YR event
Inflow = 34.57 cfs @ 12.18 hrs, Volume= 2.395 af
Outflow = 4.16 cfs @ 12.96 hrs, Volume= 1.909 af, Atten= 88%, Lag= 46.4 min
Primary = 4.16 cfs @ 12.96 hrs, Volume= 1.909 af
Routed to Reach R2 : OVERFLOW SWALE
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R2 : OVERFLOW SWALE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 894.00' Surf.Area= 12,390 sf Storage= 18,141 cf
Peak Elev= 896.89' @ 12.96 hrs Surf.Area= 25,444 sf Storage= 74,389 cf (56,248 cf above start)
Flood Elev= 900.00' Surf.Area= 35,579 sf Storage= 168,762 cf (150,621 cf above start)

Plug-Flow detention time= 430.6 min calculated for 1.491 af (62% of inflow)
Center-of-Mass det. time= 245.6 min (1,064.1 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	891.00'	168,762 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
891.00	2,741	349.0	0	0	2,741
892.00	3,525	397.0	3,125	3,125	5,615
894.00	12,390	626.0	15,016	18,141	24,285
896.00	22,863	877.0	34,722	52,863	54,344
898.00	28,845	1,061.0	51,592	104,455	82,786
900.00	35,579	1,100.0	64,306	168,762	89,833

Device	Routing	Invert	Outlet Devices
#1	Secondary	898.75'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Device 5	894.00'	**3.0" Vert. Low Flow Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 5	895.90'	**12.0" Horiz. Stand Pipe** C= 0.600 Limited to weir flow at low heads
#4	Device 5	898.50'	**1.0" x 4.0" Horiz. Orifice/Grate X 13.00 columns** X 5 rows C= 0.600 in 30.0" x 30.0" Grate (29% open area)
#5	Primary	893.90'	**18.0" Round Culvert** L= 70.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.90' / 892.00' S= 0.0271 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.16 cfs @ 12.96 hrs HW=896.89' TW=893.69' (Dynamic Tailwater)
└**5=Culvert** (Passes 4.16 cfs of 11.92 cfs potential flow)
  ├**2=Low Flow Orifice** (Orifice Controls 0.39 cfs @ 8.01 fps)
  ├**3=Stand Pipe** (Orifice Controls 3.77 cfs @ 4.79 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=894.00' TW=893.50' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DPA:

Inflow Area = 2.376 ac, 0.00% Impervious, Inflow Depth = 1.85" for 10-YR event
Inflow = 5.16 cfs @ 12.19 hrs, Volume= 0.366 af
Primary = 5.16 cfs @ 12.19 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPB:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 2.05" for 10-YR event
Inflow = 28.62 cfs @ 12.33 hrs, Volume= 2.525 af
Primary = 28.62 cfs @ 12.33 hrs, Volume= 2.525 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPC:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 1.98" for 10-YR event
Inflow = 4.78 cfs @ 12.58 hrs, Volume= 2.146 af
Primary = 4.78 cfs @ 12.58 hrs, Volume= 2.146 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPD:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 1.98" for 10-YR event
Inflow = 2.11 cfs @ 12.17 hrs, Volume= 0.302 af
Primary = 2.11 cfs @ 12.17 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPE:

Inflow Area = 6.514 ac, 5.02% Impervious, Inflow Depth = 1.49" for 10-YR event
Inflow = 9.96 cfs @ 12.24 hrs, Volume= 0.810 af
Primary = 9.96 cfs @ 12.24 hrs, Volume= 0.810 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS100: Runoff Area=2.376 ac 0.00% Impervious Runoff Depth=3.01"
Flow Length=775' Tc=11.3 min CN=78 Runoff=8.41 cfs 0.596 af

SubcatchmentS200: Runoff Area=4.851 ac 34.30% Impervious Runoff Depth=3.79"
Flow Length=1,171' Tc=13.3 min CN=86 Runoff=19.75 cfs 1.534 af

SubcatchmentS201: Runoff Area=4.342 ac 35.08% Impervious Runoff Depth=3.79"
Flow Length=636' Tc=9.7 min CN=86 Runoff=19.96 cfs 1.373 af

SubcatchmentS202: Runoff Area=0.583 ac 34.82% Impervious Runoff Depth=3.69"
Flow Length=319' Tc=2.7 min CN=85 Runoff=3.36 cfs 0.179 af

SubcatchmentS203: Runoff Area=5.029 ac 0.00% Impervious Runoff Depth=3.11"
Flow Length=1,218' Tc=16.3 min CN=79 Runoff=15.68 cfs 1.301 af

SubcatchmentS204: Runoff Area=0.687 ac 0.00% Impervious Runoff Depth=3.01"
Flow Length=200' Tc=7.4 min CN=78 Runoff=2.82 cfs 0.172 af

SubcatchmentS205: Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=3.01"
Flow Length=450' Tc=9.0 min CN=78 Runoff=1.88 cfs 0.121 af

SubcatchmentS206: Runoff Area=0.883 ac 36.24% Impervious Runoff Depth=3.69"
Tc=6.0 min CN=85 Runoff=4.58 cfs 0.272 af

SubcatchmentS207: Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=3.11"
Flow Length=180' Tc=8.1 min CN=79 Runoff=3.48 cfs 0.219 af

SubcatchmentS208: Runoff Area=11.490 ac 34.12% Impervious Runoff Depth=3.79"
Flow Length=670' Tc=10.3 min CN=86 Runoff=51.70 cfs 3.634 af

SubcatchmentS209: Runoff Area=0.465 ac 0.00% Impervious Runoff Depth=3.01"
Tc=6.0 min CN=78 Runoff=2.02 cfs 0.117 af

SubcatchmentS300: Runoff Area=6.514 ac 5.02% Impervious Runoff Depth=2.56"
Flow Length=1,800' Tc=15.0 min CN=73 Runoff=17.42 cfs 1.389 af

Reach R1: E-W SWALE Avg. Flow Depth=0.59' Max Vel=12.03 fps Inflow=19.96 cfs 1.373 af
n=0.022 L=485.0' S=0.1299 '/' Capacity=65.06 cfs Outflow=19.87 cfs 1.373 af

Reach R2: OVERFLOW SWALE Avg. Flow Depth=0.23' Max Vel=9.55 fps Inflow=5.98 cfs 3.137 af
n=0.022 L=120.0' S=0.1958 '/' Capacity=507.22 cfs Outflow=5.98 cfs 3.137 af

Reach R3: ROADSIDE SWALE Avg. Flow Depth=0.36' Max Vel=5.86 fps Inflow=4.58 cfs 0.272 af
n=0.030 L=825.0' S=0.1018 '/' Capacity=42.24 cfs Outflow=4.30 cfs 0.272 af

Reach R4: Avg. Flow Depth=0.06' Max Vel=2.77 fps Inflow=8.95 cfs 3.527 af
n=0.035 L=360.0' S=0.1778 '/' Capacity=1,059.41 cfs Outflow=8.78 cfs 3.524 af

Reach R5: Avg. Flow Depth=0.03' Max Vel=3.01 fps Inflow=4.98 cfs 0.488 af
n=0.020 L=220.0' S=0.1591 '/' Capacity=1,753.82 cfs Outflow=4.94 cfs 0.488 af

Reach R6: Avg. Flow Depth=0.16' Max Vel=5.97 fps Inflow=53.23 cfs 4.079 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=50.01 cfs 4.073 af

Reach R7: Avg. Flow Depth=0.88' Max Vel=12.59 fps Inflow=51.70 cfs 3.634 af
n=0.022 L=330.0' S=0.0788 '/' Capacity=321.73 cfs Outflow=51.60 cfs 3.634 af

Pond B1: BIORETENTION AREA 1 Peak Elev=903.93' Storage=6,142 cf Inflow=18.94 cfs 1.364 af
Primary=0.08 cfs 0.153 af Secondary=18.46 cfs 1.206 af Outflow=18.54 cfs 1.359 af

Pond B2: BIORETENTION AREA 2 Peak Elev=903.93' Storage=5,689 cf Inflow=19.00 cfs 1.243 af
Primary=0.08 cfs 0.143 af Secondary=18.39 cfs 1.096 af Outflow=18.47 cfs 1.239 af

Pond B3: BIORETENTION AREA 3 Peak Elev=898.76' Storage=836 cf Inflow=3.36 cfs 0.179 af
Primary=0.02 cfs 0.031 af Secondary=3.24 cfs 0.149 af Outflow=3.26 cfs 0.179 af

Pond B4: BIORETENTION AREA 4 Peak Elev=838.67' Storage=1,858 cf Inflow=4.30 cfs 0.272 af
Primary=0.02 cfs 0.045 af Secondary=4.20 cfs 0.210 af Outflow=4.22 cfs 0.255 af

Pond D1: RETENTION POND Peak Elev=866.00' Storage=1,256 cf Inflow=6.59 cfs 3.309 af
Primary=6.31 cfs 3.308 af Secondary=0.00 cfs 0.000 af Outflow=6.31 cfs 3.308 af

Pond D2: DETENTION POND Peak Elev=836.60' Storage=2,781 cf Inflow=4.22 cfs 0.255 af
Primary=2.20 cfs 0.254 af Secondary=0.00 cfs 0.000 af Outflow=2.20 cfs 0.254 af

Pond D3: RENTENTION POND Peak Elev=838.84' Storage=590 cf Inflow=1.88 cfs 0.121 af
12.0" Round Culvert n=0.020 L=100.0' S=0.0100 '/' Outflow=1.65 cfs 0.117 af

Pond F1: FOREBAY 2 Peak Elev=904.12' Storage=9,949 cf Inflow=19.75 cfs 1.534 af
Outflow=18.94 cfs 1.364 af

Pond F2: FOREBAY 2 Peak Elev=904.12' Storage=7,810 cf Inflow=19.87 cfs 1.373 af
Outflow=19.00 cfs 1.243 af

Pond P1: WET POND Peak Elev=898.02' Storage=105,167 cf Inflow=51.60 cfs 3.634 af
Primary=5.98 cfs 3.137 af Secondary=0.00 cfs 0.000 af Outflow=5.98 cfs 3.137 af

Link DPA: Inflow=8.41 cfs 0.596 af
Primary=8.41 cfs 0.596 af

Link DPB: Inflow=50.01 cfs 4.073 af
Primary=50.01 cfs 4.073 af

Link DPC: Inflow=8.78 cfs 3.524 af
Primary=8.78 cfs 3.524 af

Link DPD: Inflow=4.94 cfs 0.488 af
Primary=4.94 cfs 0.488 af

Link DPE: Inflow=17.42 cfs 1.389 af
Primary=17.42 cfs 1.389 af

Total Runoff Area = 38.551 ac Runoff Volume = 10.908 af Average Runoff Depth = 3.40"
79.36% Pervious = 30.594 ac 20.64% Impervious = 7.957 ac

Summary for Subcatchment S100:

Runoff = 8.41 cfs @ 12.19 hrs, Volume= 0.596 af, Depth= 3.01"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.763	79	Woods, Fair, HSG D
1.613	78	Meadow, non-grazed, HSG D
2.376	78	Weighted Average
2.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.2800	0.18		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
3.1	50	0.2800	0.27		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
3.2	635	0.2272	3.34		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.3	40	0.2272	2.38		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
11.3	775	Total			

Summary for Subcatchment S200:

Runoff = 19.75 cfs @ 12.21 hrs, Volume= 1.534 af, Depth= 3.79"
Routed to Pond F1 : FOREBAY 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

	Area (ac)	CN	Description
	0.013	79	Woods, Fair, HSG D
	0.992	78	Meadow, non-grazed, HSG D
*	1.664	98	SOLAR PANELS
	2.182	80	>75% Grass cover, Good, HSG D
	4.851	86	Weighted Average
	3.187		65.70% Pervious Area
	1.664		34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
6.3	1,071	0.1634	2.83		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.3	1,171	Total			

Summary for Subcatchment S201:

Runoff = 19.96 cfs @ 12.17 hrs, Volume= 1.373 af, Depth= 3.79"
Routed to Reach R1 : E-W SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

	Area (ac)	CN	Description
	0.014	79	Woods, Fair, HSG D
	1.056	78	Meadow, non-grazed, HSG D
*	1.523	98	SOLAR PANELS
	1.749	80	>75% Grass cover, Good, HSG D
	4.342	86	Weighted Average
	2.819		64.92% Pervious Area
	1.523		35.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	536	0.1900	3.05		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.7	636	Total			

Summary for Subcatchment S202:

Runoff = 3.36 cfs @ 12.10 hrs, Volume= 0.179 af, Depth= 3.69"
Routed to Pond B3 : BIORETENTION AREA 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.380	78	Meadow, non-grazed, HSG D
0.203	98	Paved parking, HSG D
0.583	85	Weighted Average
0.380		65.18% Pervious Area
0.203		34.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.1500	0.84		**Sheet Flow, SF - GRAVEL** Fallow n= 0.050 P2= 2.68"
0.7	219	0.1100	4.97		**Shallow Concentrated Flow, SCF - CHANNEL** Grassed Waterway Kv= 15.0 fps
2.7	319	Total			

Summary for Subcatchment S203:

Runoff = 15.68 cfs @ 12.25 hrs, Volume= 1.301 af, Depth= 3.11"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
3.148	78	Meadow, non-grazed, HSG D
1.685	79	Woods, Fair, HSG D
0.110	96	Gravel surface, HSG D
0.086	80	>75% Grass cover, Good, HSG D
5.029	79	Weighted Average
5.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - MEADOW** Woods: Light underbrush n= 0.400 P2= 2.68"
6.8	1,118	0.1512	2.72		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
16.3	1,218	Total			

Summary for Subcatchment S204:

Runoff = 2.82 cfs @ 12.15 hrs, Volume= 0.172 af, Depth= 3.01"
Routed to Pond D1 : RETENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.687	78	Meadow, non-grazed, HSG D
0.687		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	100	0.1500	2.71		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
7.4	200	Total			

Summary for Subcatchment S205:

Runoff = 1.88 cfs @ 12.16 hrs, Volume= 0.121 af, Depth= 3.01"
Routed to Pond D3 : RENTENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.484	78	Meadow, non-grazed, HSG D
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - WOODS** Grass: Dense n= 0.240 P2= 2.68"
2.4	350	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.0	450	Total			

Summary for Subcatchment S206:

Runoff = 4.58 cfs @ 12.13 hrs, Volume= 0.272 af, Depth= 3.69"
Routed to Reach R3 : ROADSIDE SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.320	98	Paved parking, HSG D
0.563	78	Meadow, non-grazed, HSG D
0.883	85	Weighted Average
0.563		63.76% Pervious Area
0.320		36.24% Impervious Area

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

Summary for Subcatchment S207:

Runoff = 3.48 cfs @ 12.15 hrs, Volume= 0.219 af, Depth= 3.11"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.683	79	Woods, Fair, HSG D
0.164	78	Meadow, non-grazed, HSG D
0.847	79	Weighted Average
0.847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	30	0.5000	0.30		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.68"
6.0	70	0.3000	0.20		**Sheet Flow, SF WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
0.5	80	0.3000	2.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
8.1	180	Total			

Summary for Subcatchment S208:

Runoff = 51.70 cfs @ 12.18 hrs, Volume= 3.634 af, Depth= 3.79"
Routed to Reach R7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.087	79	Woods, Fair, HSG D
2.085	78	Meadow, non-grazed, HSG D
* 3.920	98	SOLAR PANELS
5.398	80	>75% Grass cover, Good, HSG D
11.490	86	Weighted Average
7.570		65.88% Pervious Area
3.920		34.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1300	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	570	0.2235	3.31		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
10.3	670	Total			

Summary for Subcatchment S209:

Runoff = 2.02 cfs @ 12.13 hrs, Volume= 0.117 af, Depth= 3.01"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.012	79	Woods, Fair, HSG D
0.453	78	Meadow, non-grazed, HSG D
0.465	78	Weighted Average
0.465		100.00% Pervious Area

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

Summary for Subcatchment S300:

Runoff = 17.42 cfs @ 12.24 hrs, Volume= 1.389 af, Depth= 2.56"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 50-YR Rainfall=5.35"

Area (ac)	CN	Description
0.327	98	Paved parking, HSG C
4.927	71	Meadow, non-grazed, HSG C
1.260	73	Woods, Fair, HSG C
6.514	73	Weighted Average
6.187		94.98% Pervious Area
0.327		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
7.8	1,700	0.0588	3.64		**Shallow Concentrated Flow, SCF - MEADOW** Grassed Waterway Kv= 15.0 fps
15.0	1,800	Total			

Summary for Reach R1: E-W SWALE

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 3.79" for 50-YR event
Inflow = 19.96 cfs @ 12.17 hrs, Volume= 1.373 af
Outflow = 19.87 cfs @ 12.18 hrs, Volume= 1.373 af, Atten= 0%, Lag= 0.5 min
Routed to Pond F2 : FOREBAY 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 12.03 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.96 fps, Avg. Travel Time= 2.0 min

Peak Storage= 801 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 4.56'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 65.06 cfs

1.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 485.0' Slope= 0.1299 '/'
Inlet Invert= 968.00', Outlet Invert= 905.00'

Summary for Reach R2: OVERFLOW SWALE

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth > 3.28" for 50-YR event
Inflow = 5.98 cfs @ 12.96 hrs, Volume= 3.137 af
Outflow = 5.98 cfs @ 12.96 hrs, Volume= 3.137 af, Atten= 0%, Lag= 0.1 min
Routed to Pond D1 : RETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 9.55 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.69 fps, Avg. Travel Time= 0.4 min

Peak Storage= 75 cf @ 12.96 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 3.39'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 507.22 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 120.0' Slope= 0.1958 '/'
Inlet Invert= 893.50', Outlet Invert= 870.00'

Summary for Reach R3: ROADSIDE SWALE

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 3.69" for 50-YR event
Inflow = 4.58 cfs @ 12.13 hrs, Volume= 0.272 af
Outflow = 4.30 cfs @ 12.15 hrs, Volume= 0.272 af, Atten= 6%, Lag= 1.4 min
Routed to Pond B4 : BIORETENTION AREA 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 8.0 min

Peak Storage= 605 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 3.13'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 42.24 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 825.0' Slope= 0.1018 '/'
Inlet Invert= 924.00', Outlet Invert= 840.00'

Summary for Reach R4:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 3.25" for 50-YR event
Inflow = 8.95 cfs @ 12.18 hrs, Volume= 3.527 af
Outflow = 8.78 cfs @ 12.20 hrs, Volume= 3.524 af, Atten= 2%, Lag= 1.4 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 5.0 min

Peak Storage= 1,143 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.06' , Surface Width= 52.48'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,059.41 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 360.0' Slope= 0.1778 '/'
Inlet Invert= 831.00', Outlet Invert= 767.00'

‡

Summary for Reach R5:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 3.20" for 50-YR event
Inflow = 4.98 cfs @ 12.17 hrs, Volume= 0.488 af
Outflow = 4.94 cfs @ 12.19 hrs, Volume= 0.488 af, Atten= 1%, Lag= 1.1 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.01 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 2.6 min

Peak Storage= 361 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 51.30'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,753.82 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 220.0' Slope= 0.1591 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

‡

Summary for Reach R6:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 3.31" for 50-YR event
Inflow = 53.23 cfs @ 12.24 hrs, Volume= 4.079 af
Outflow = 50.01 cfs @ 12.28 hrs, Volume= 4.073 af, Atten= 6%, Lag= 2.8 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 20.1 min

Peak Storage= 13,455 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 56.30'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

‡

Summary for Reach R7:

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 3.79" for 50-YR event
Inflow = 51.70 cfs @ 12.18 hrs, Volume= 3.634 af
Outflow = 51.60 cfs @ 12.18 hrs, Volume= 3.634 af, Atten= 0%, Lag= 0.3 min
Routed to Pond P1 : WET POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 12.59 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.04 fps, Avg. Travel Time= 1.4 min

Peak Storage= 1,353 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.88' , Surface Width= 7.29'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 321.73 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 330.0' Slope= 0.0788 '/'
Inlet Invert= 924.00', Outlet Invert= 898.00'

Summary for Pond B1: BIORETENTION AREA 1

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 3.37" for 50-YR event
Inflow = 18.94 cfs @ 12.23 hrs, Volume= 1.364 af
Outflow = 18.54 cfs @ 12.26 hrs, Volume= 1.359 af, Atten= 2%, Lag= 1.6 min
Primary = 0.08 cfs @ 12.26 hrs, Volume= 0.153 af
Routed to Reach R6 :
Secondary = 18.46 cfs @ 12.26 hrs, Volume= 1.206 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.93' @ 12.26 hrs Surf.Area= 7,165 sf Storage= 6,142 cf

Plug-Flow detention time= 63.0 min calculated for 1.358 af (100% of inflow)
Center-of-Mass det. time= 61.2 min (899.4 - 838.2)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	14,542 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,991	427.0	0	0	5,991
905.00	8,631	465.0	14,542	14,542	8,832

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.26 hrs HW=903.93' TW=895.16' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 2.06 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=18.45 cfs @ 12.26 hrs HW=903.93' TW=895.16' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 18.45 cfs @ 1.60 fps)

Summary for Pond B2: BIORETENTION AREA 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 3.43" for 50-YR event
Inflow = 19.00 cfs @ 12.19 hrs, Volume= 1.243 af
Outflow = 18.47 cfs @ 12.22 hrs, Volume= 1.239 af, Atten= 3%, Lag= 1.5 min
Primary = 0.08 cfs @ 12.22 hrs, Volume= 0.143 af
Routed to Reach R6 :
Secondary = 18.39 cfs @ 12.22 hrs, Volume= 1.096 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.93' @ 12.22 hrs Surf.Area= 6,648 sf Storage= 5,689 cf

Plug-Flow detention time= 64.3 min calculated for 1.238 af (100% of inflow)
Center-of-Mass det. time= 62.6 min (895.4 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	13,497 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,550	421.0	0	0	5,550
905.00	8,023	459.0	13,497	13,497	8,353

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.22 hrs HW=903.93' TW=895.15' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.08 cfs of 2.06 cfs potential flow)
└─**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=18.37 cfs @ 12.22 hrs HW=903.93' TW=895.15' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 18.37 cfs @ 1.60 fps)

Summary for Pond B3: BIORETENTION AREA 3

Inflow Area = 0.583 ac, 34.82% Impervious, Inflow Depth = 3.69" for 50-YR event
Inflow = 3.36 cfs @ 12.10 hrs, Volume= 0.179 af
Outflow = 3.26 cfs @ 12.11 hrs, Volume= 0.179 af, Atten= 3%, Lag= 1.0 min
Primary = 0.02 cfs @ 12.11 hrs, Volume= 0.031 af
Routed to Reach R6 :
Secondary = 3.24 cfs @ 12.11 hrs, Volume= 0.149 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 898.76' @ 12.11 hrs Surf.Area= 1,406 sf Storage= 836 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 77.3 min (879.3 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	3,200 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	800	0	0
900.00	2,400	3,200	3,200

Device	Routing	Invert	Outlet Devices
#1	Device 3	898.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	898.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	895.50'	**8.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 895.50' / 895.00' S= 0.0083 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.11 hrs HW=898.76' TW=895.10' (Dynamic Tailwater)
└─**3=Culvert** (Passes 0.02 cfs of 1.59 cfs potential flow)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=3.19 cfs @ 12.11 hrs HW=898.76' TW=895.10' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 3.19 cfs @ 1.25 fps)

Summary for Pond B4: BIORETENTION AREA 4

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 3.69" for 50-YR event
Inflow = 4.30 cfs @ 12.15 hrs, Volume= 0.272 af
Outflow = 4.22 cfs @ 12.17 hrs, Volume= 0.255 af, Atten= 2%, Lag= 0.8 min
Primary = 0.02 cfs @ 12.17 hrs, Volume= 0.045 af
Routed to Pond D2 : DETENTION POND
Secondary = 4.20 cfs @ 12.17 hrs, Volume= 0.210 af
Routed to Pond D2 : DETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.67' @ 12.17 hrs Surf.Area= 2,003 sf Storage= 1,858 cf

Plug-Flow detention time= 130.6 min calculated for 0.255 af (94% of inflow)
Center-of-Mass det. time= 95.9 min (905.9 - 810.0)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	5,303 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	15	0	0
838.00	1,417	716	716
840.00	3,170	4,587	5,303

Device	Routing	Invert	Outlet Devices
#1	Device 3	837.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	838.50'	**25.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	835.50'	**8.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 835.50' / 834.00' S= 0.0600 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.17 hrs HW=838.67' TW=836.35' (Dynamic Tailwater)
└─**3=Culvert** (Passes 0.02 cfs of 1.89 cfs potential flow)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=4.17 cfs @ 12.17 hrs HW=838.67' TW=836.35' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4.17 cfs @ 1.00 fps)

Summary for Pond D1: RETENTION POND

Inflow Area = 12.177 ac, 32.19% Impervious, Inflow Depth > 3.26" for 50-YR event
Inflow = 6.59 cfs @ 12.18 hrs, Volume= 3.309 af
Outflow = 6.31 cfs @ 12.76 hrs, Volume= 3.308 af, Atten= 4%, Lag= 35.1 min
Primary = 6.31 cfs @ 12.76 hrs, Volume= 3.308 af
Routed to Reach R4 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 866.00' @ 12.76 hrs Surf.Area= 1,141 sf Storage= 1,256 cf

Plug-Flow detention time= 2.6 min calculated for 3.308 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (1,012.4 - 1,010.2)

Volume	Invert	Avail.Storage	Storage Description
#1	864.00'	12,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
864.00	230	80.0	0	0	230
866.00	1,140	145.0	1,255	1,255	1,415
868.00	2,560	210.0	3,606	4,860	3,286
870.00	4,800	270.0	7,244	12,104	5,627

Device	Routing	Invert	Outlet Devices
#1	Primary	864.00'	**15.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 864.00' / 863.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#2	Secondary	868.75'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=6.31 cfs @ 12.76 hrs HW=866.00' TW=831.05' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 6.31 cfs @ 5.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=864.00' TW=831.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: DETENTION POND

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth > 3.46" for 50-YR event
Inflow = 4.22 cfs @ 12.17 hrs, Volume= 0.255 af
Outflow = 2.20 cfs @ 12.29 hrs, Volume= 0.254 af, Atten= 48%, Lag= 7.4 min
Primary = 2.20 cfs @ 12.29 hrs, Volume= 0.254 af
Routed to Reach R5 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 836.60' @ 12.29 hrs Surf.Area= 2,253 sf Storage= 2,781 cf

Plug-Flow detention time= 72.5 min calculated for 0.254 af (100% of inflow)
Center-of-Mass det. time= 70.3 min (976.2 - 905.9)

Volume	Invert	Avail.Storage	Storage Description
#1	834.00'	6,977 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
834.00	160	85.0	0	0	160
836.00	1,710	225.0	1,595	1,595	3,628
838.00	3,810	285.0	5,382	6,977	6,115

Device	Routing	Invert	Outlet Devices
#1	Secondary	836.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 4	834.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	836.00'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	833.90'	**10.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 833.90' / 833.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.20 cfs @ 12.29 hrs HW=836.60' TW=822.03' (Dynamic Tailwater)
└**4=Culvert** (Passes 2.20 cfs of 3.13 cfs potential flow)
├**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.64 fps)
└**3=Orifice/Grate** (Orifice Controls 2.03 cfs @ 3.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=834.00' TW=822.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D3: RENTENTION POND

Inflow Area = 0.484 ac, 0.00% Impervious, Inflow Depth = 3.01" for 50-YR event
Inflow = 1.88 cfs @ 12.16 hrs, Volume= 0.121 af
Outflow = 1.65 cfs @ 12.21 hrs, Volume= 0.117 af, Atten= 12%, Lag= 2.6 min
Primary = 1.65 cfs @ 12.21 hrs, Volume= 0.117 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.84' @ 12.21 hrs Surf.Area= 654 sf Storage= 590 cf

Plug-Flow detention time= 37.5 min calculated for 0.117 af (96% of inflow)
Center-of-Mass det. time= 17.2 min (843.5 - 826.3)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	1,625 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	60	0	0
838.00	310	185	185
840.00	1,130	1,440	1,625

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 100.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.64 cfs @ 12.21 hrs HW=838.84' TW=822.03' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.64 cfs @ 3.16 fps)

Summary for Pond F1: FOREBAY 2

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 3.79" for 50-YR event
Inflow = 19.75 cfs @ 12.21 hrs, Volume= 1.534 af
Outflow = 18.94 cfs @ 12.23 hrs, Volume= 1.364 af, Atten= 4%, Lag= 1.3 min
Primary = 18.94 cfs @ 12.23 hrs, Volume= 1.364 af
Routed to Pond B1 : BIORETENTION AREA 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 904.12' @ 12.25 hrs Surf.Area= 4,469 sf Storage= 9,949 cf

Plug-Flow detention time= 82.8 min calculated for 1.363 af (89% of inflow)
Center-of-Mass det. time= 29.4 min (838.2 - 808.9)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	14,382 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	218	86.0	0	0	218
901.00	1,277	230.0	1,348	1,348	3,853
903.00	3,198	372.0	4,331	5,679	10,682
905.00	5,618	426.0	8,703	14,382	14,203

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=18.49 cfs @ 12.23 hrs HW=904.12' TW=903.93' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 18.49 cfs @ 1.50 fps)

Summary for Pond F2: FOREBAY 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 3.79" for 50-YR event
Inflow = 19.87 cfs @ 12.18 hrs, Volume= 1.373 af
Outflow = 19.00 cfs @ 12.19 hrs, Volume= 1.243 af, Atten= 4%, Lag= 1.0 min
Primary = 19.00 cfs @ 12.19 hrs, Volume= 1.243 af
Routed to Pond B2 : BIORETENTION AREA 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 904.12' @ 12.21 hrs Surf.Area= 3,831 sf Storage= 7,810 cf

Plug-Flow detention time= 74.1 min calculated for 1.243 af (91% of inflow)
Center-of-Mass det. time= 26.0 min (832.8 - 806.8)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	11,697 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	98	53.0	0	0	98
901.00	930	189.0	887	887	2,728
903.00	2,575	324.0	3,368	4,255	8,263
905.00	5,000	439.0	7,442	11,697	15,287

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=18.39 cfs @ 12.19 hrs HW=904.11' TW=903.93' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 18.39 cfs @ 1.50 fps)

Summary for Pond P1: WET POND

[61] Hint: Exceeded Reach R7 outlet invert by 0.02' @ 12.96 hrs

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 3.79" for 50-YR event
Inflow = 51.60 cfs @ 12.18 hrs, Volume= 3.634 af
Outflow = 5.98 cfs @ 12.96 hrs, Volume= 3.137 af, Atten= 88%, Lag= 46.4 min
Primary = 5.98 cfs @ 12.96 hrs, Volume= 3.137 af
Routed to Reach R2 : OVERFLOW SWALE
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R2 : OVERFLOW SWALE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 894.00' Surf.Area= 12,390 sf Storage= 18,141 cf
Peak Elev= 898.02' @ 12.96 hrs Surf.Area= 28,924 sf Storage= 105,167 cf (87,026 cf above start)
Flood Elev= 900.00' Surf.Area= 35,579 sf Storage= 168,762 cf (150,621 cf above start)

Plug-Flow detention time= 341.9 min calculated for 2.719 af (75% of inflow)
Center-of-Mass det. time= 213.3 min (1,020.2 - 806.9)

Volume	Invert	Avail.Storage	Storage Description
#1	891.00'	168,762 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
891.00	2,741	349.0	0	0	2,741
892.00	3,525	397.0	3,125	3,125	5,615
894.00	12,390	626.0	15,016	18,141	24,285
896.00	22,863	877.0	34,722	52,863	54,344
898.00	28,845	1,061.0	51,592	104,455	82,786
900.00	35,579	1,100.0	64,306	168,762	89,833

Device	Routing	Invert	Outlet Devices
#1	Secondary	898.75'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Device 5	894.00'	**3.0" Vert. Low Flow Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 5	895.90'	**12.0" Horiz. Stand Pipe** C= 0.600 Limited to weir flow at low heads
#4	Device 5	898.50'	**1.0" x 4.0" Horiz. Orifice/Grate X 13.00 columns** X 5 rows C= 0.600 in 30.0" x 30.0" Grate (29% open area)
#5	Primary	893.90'	**18.0" Round Culvert** L= 70.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.90' / 892.00' S= 0.0271 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.98 cfs @ 12.96 hrs HW=898.02' TW=893.73' (Dynamic Tailwater)
└─**5=Culvert** (Passes 5.98 cfs of 13.80 cfs potential flow)
├─**2=Low Flow Orifice** (Orifice Controls 0.47 cfs @ 9.51 fps)
├─**3=Stand Pipe** (Orifice Controls 5.51 cfs @ 7.02 fps)
└─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=894.00' TW=893.50' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DPA:

Inflow Area = 2.376 ac, 0.00% Impervious, Inflow Depth = 3.01" for 50-YR event
Inflow = 8.41 cfs @ 12.19 hrs, Volume= 0.596 af
Primary = 8.41 cfs @ 12.19 hrs, Volume= 0.596 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPB:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 3.30" for 50-YR event
Inflow = 50.01 cfs @ 12.28 hrs, Volume= 4.073 af
Primary = 50.01 cfs @ 12.28 hrs, Volume= 4.073 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPC:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 3.25" for 50-YR event
Inflow = 8.78 cfs @ 12.20 hrs, Volume= 3.524 af
Primary = 8.78 cfs @ 12.20 hrs, Volume= 3.524 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPD:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 3.20" for 50-YR event
Inflow = 4.94 cfs @ 12.19 hrs, Volume= 0.488 af
Primary = 4.94 cfs @ 12.19 hrs, Volume= 0.488 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPE:

Inflow Area = 6.514 ac, 5.02% Impervious, Inflow Depth = 2.56" for 50-YR event
Inflow = 17.42 cfs @ 12.24 hrs, Volume= 1.389 af
Primary = 17.42 cfs @ 12.24 hrs, Volume= 1.389 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentS100: Runoff Area=2.376 ac 0.00% Impervious Runoff Depth=3.56"
Flow Length=775' Tc=11.3 min CN=78 Runoff=9.92 cfs 0.705 af

SubcatchmentS200: Runoff Area=4.851 ac 34.30% Impervious Runoff Depth=4.39"
Flow Length=1,171' Tc=13.3 min CN=86 Runoff=22.70 cfs 1.775 af

SubcatchmentS201: Runoff Area=4.342 ac 35.08% Impervious Runoff Depth=4.39"
Flow Length=636' Tc=9.7 min CN=86 Runoff=22.92 cfs 1.589 af

SubcatchmentS202: Runoff Area=0.583 ac 34.82% Impervious Runoff Depth=4.28"
Flow Length=319' Tc=2.7 min CN=85 Runoff=3.86 cfs 0.208 af

SubcatchmentS203: Runoff Area=5.029 ac 0.00% Impervious Runoff Depth=3.66"
Flow Length=1,218' Tc=16.3 min CN=79 Runoff=18.44 cfs 1.535 af

SubcatchmentS204: Runoff Area=0.687 ac 0.00% Impervious Runoff Depth=3.56"
Flow Length=200' Tc=7.4 min CN=78 Runoff=3.32 cfs 0.204 af

SubcatchmentS205: Runoff Area=0.484 ac 0.00% Impervious Runoff Depth=3.56"
Flow Length=450' Tc=9.0 min CN=78 Runoff=2.21 cfs 0.144 af

SubcatchmentS206: Runoff Area=0.883 ac 36.24% Impervious Runoff Depth=4.28"
Tc=6.0 min CN=85 Runoff=5.27 cfs 0.315 af

SubcatchmentS207: Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=3.66"
Flow Length=180' Tc=8.1 min CN=79 Runoff=4.09 cfs 0.258 af

SubcatchmentS208: Runoff Area=11.490 ac 34.12% Impervious Runoff Depth=4.39"
Flow Length=670' Tc=10.3 min CN=86 Runoff=59.38 cfs 4.204 af

SubcatchmentS209: Runoff Area=0.465 ac 0.00% Impervious Runoff Depth=3.56"
Tc=6.0 min CN=78 Runoff=2.38 cfs 0.138 af

SubcatchmentS300: Runoff Area=6.514 ac 5.02% Impervious Runoff Depth=3.07"
Flow Length=1,800' Tc=15.0 min CN=73 Runoff=20.96 cfs 1.668 af

Reach R1: E-W SWALE Avg. Flow Depth=0.63' Max Vel=12.46 fps Inflow=22.92 cfs 1.589 af
n=0.022 L=485.0' S=0.1299 '/' Capacity=65.06 cfs Outflow=22.83 cfs 1.589 af

Reach R2: OVERFLOW SWALE Avg. Flow Depth=0.26' Max Vel=10.16 fps Inflow=7.32 cfs 3.704 af
n=0.022 L=120.0' S=0.1958 '/' Capacity=507.22 cfs Outflow=7.32 cfs 3.704 af

Reach R3: ROADSIDE SWALE Avg. Flow Depth=0.38' Max Vel=6.09 fps Inflow=5.27 cfs 0.315 af
n=0.030 L=825.0' S=0.1018 '/' Capacity=42.24 cfs Outflow=4.97 cfs 0.315 af

Reach R4: Avg. Flow Depth=0.07' Max Vel=2.89 fps Inflow=10.00 cfs 4.165 af
n=0.035 L=360.0' S=0.1778 '/' Capacity=1,059.41 cfs Outflow=9.87 cfs 4.162 af

Reach R5: Avg. Flow Depth=0.04' Max Vel=3.24 fps Inflow=5.99 cfs 0.575 af
n=0.020 L=220.0' S=0.1591 '/' Capacity=1,753.82 cfs Outflow=5.95 cfs 0.575 af

Reach R6: Avg. Flow Depth=0.17' Max Vel=6.33 fps Inflow=61.83 cfs 4.796 af
n=0.022 L=1,606.0' S=0.0990 '/' Capacity=1,257.76 cfs Outflow=58.50 cfs 4.791 af

Reach R7: Avg. Flow Depth=0.94' Max Vel=13.05 fps Inflow=59.38 cfs 4.204 af
n=0.022 L=330.0' S=0.0788 '/' Capacity=321.73 cfs Outflow=59.27 cfs 4.204 af

Pond B1: BIORETENTION AREA 1 Peak Elev=903.97' Storage=6,395 cf Inflow=21.84 cfs 1.605 af
Primary=0.08 cfs 0.154 af Secondary=21.35 cfs 1.445 af Outflow=21.44 cfs 1.600 af

Pond B2: BIORETENTION AREA 2 Peak Elev=903.97' Storage=5,924 cf Inflow=21.88 cfs 1.458 af
Primary=0.08 cfs 0.144 af Secondary=21.27 cfs 1.310 af Outflow=21.35 cfs 1.454 af

Pond B3: BIORETENTION AREA 3 Peak Elev=898.78' Storage=870 cf Inflow=3.86 cfs 0.208 af
Primary=0.02 cfs 0.031 af Secondary=3.74 cfs 0.177 af Outflow=3.76 cfs 0.208 af

Pond B4: BIORETENTION AREA 4 Peak Elev=838.69' Storage=1,893 cf Inflow=4.97 cfs 0.315 af
Primary=0.02 cfs 0.046 af Secondary=4.86 cfs 0.253 af Outflow=4.89 cfs 0.298 af

Pond D1: RETENTION POND Peak Elev=866.61' Storage=2,058 cf Inflow=7.77 cfs 3.908 af
Primary=7.33 cfs 3.906 af Secondary=0.00 cfs 0.000 af Outflow=7.33 cfs 3.906 af

Pond D2: DETENTION POND Peak Elev=836.80' Storage=3,248 cf Inflow=4.89 cfs 0.298 af
Primary=2.52 cfs 0.296 af Secondary=0.26 cfs 0.002 af Outflow=2.78 cfs 0.298 af

Pond D3: RENTENTION POND Peak Elev=838.94' Storage=655 cf Inflow=2.21 cfs 0.144 af
12.0" Round Culvert n=0.020 L=100.0' S=0.0100 '/' Outflow=1.93 cfs 0.139 af

Pond F1: FOREBAY 2 Peak Elev=904.18' Storage=10,214 cf Inflow=22.70 cfs 1.775 af
Outflow=21.84 cfs 1.605 af

Pond F2: FOREBAY 2 Peak Elev=904.18' Storage=8,037 cf Inflow=22.83 cfs 1.589 af
Outflow=21.88 cfs 1.458 af

Pond P1: WET POND Peak Elev=898.51' Storage=119,491 cf Inflow=59.27 cfs 4.204 af
Primary=7.32 cfs 3.704 af Secondary=0.00 cfs 0.000 af Outflow=7.32 cfs 3.704 af

Link DPA: Inflow=9.92 cfs 0.705 af
Primary=9.92 cfs 0.705 af

Link DPB: Inflow=58.50 cfs 4.791 af
Primary=58.50 cfs 4.791 af

Link DPC: Inflow=9.87 cfs 4.162 af
Primary=9.87 cfs 4.162 af

Link DPD: Inflow=5.95 cfs 0.575 af
Primary=5.95 cfs 0.575 af

Link DPE: Inflow=20.96 cfs 1.668 af
Primary=20.96 cfs 1.668 af

Total Runoff Area = 38.551 ac Runoff Volume = 12.742 af Average Runoff Depth = 3.97"
79.36% Pervious = 30.594 ac 20.64% Impervious = 7.957 ac

Summary for Subcatchment S100:

Runoff = 9.92 cfs @ 12.19 hrs, Volume= 0.705 af, Depth= 3.56"
Routed to Link DPA :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.763	79	Woods, Fair, HSG D
1.613	78	Meadow, non-grazed, HSG D
2.376	78	Weighted Average
2.376		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.2800	0.18		**Sheet Flow, SF - WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
3.1	50	0.2800	0.27		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
3.2	635	0.2272	3.34		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
0.3	40	0.2272	2.38		**Shallow Concentrated Flow, SCF - WOODS** Woodland Kv= 5.0 fps
11.3	775	Total			

Summary for Subcatchment S200:

Runoff = 22.70 cfs @ 12.21 hrs, Volume= 1.775 af, Depth= 4.39"
Routed to Pond F1 : FOREBAY 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

	Area (ac)	CN	Description
	0.013	79	Woods, Fair, HSG D
	0.992	78	Meadow, non-grazed, HSG D
*	1.664	98	SOLAR PANELS
	2.182	80	>75% Grass cover, Good, HSG D
	4.851	86	Weighted Average
	3.187		65.70% Pervious Area
	1.664		34.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.1500	0.24		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
6.3	1,071	0.1634	2.83		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
13.3	1,171	Total			

Summary for Subcatchment S201:

Runoff = 22.92 cfs @ 12.17 hrs, Volume= 1.589 af, Depth= 4.39"
Routed to Reach R1 : E-W SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

	Area (ac)	CN	Description
	0.014	79	Woods, Fair, HSG D
	1.056	78	Meadow, non-grazed, HSG D
*	1.523	98	SOLAR PANELS
	1.749	80	>75% Grass cover, Good, HSG D
	4.342	86	Weighted Average
	2.819		64.92% Pervious Area
	1.523		35.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	536	0.1900	3.05		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.7	636	Total			

Summary for Subcatchment S202:

Runoff = 3.86 cfs @ 12.10 hrs, Volume= 0.208 af, Depth= 4.28"
Routed to Pond B3 : BIORETENTION AREA 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.380	78	Meadow, non-grazed, HSG D
0.203	98	Paved parking, HSG D
0.583	85	Weighted Average
0.380		65.18% Pervious Area
0.203		34.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	100	0.1500	0.84		**Sheet Flow, SF - GRAVEL** Fallow n= 0.050 P2= 2.68"
0.7	219	0.1100	4.97		**Shallow Concentrated Flow, SCF - CHANNEL** Grassed Waterway Kv= 15.0 fps
2.7	319	Total			

Summary for Subcatchment S203:

Runoff = 18.44 cfs @ 12.25 hrs, Volume= 1.535 af, Depth= 3.66"
Routed to Reach R6 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
3.148	78	Meadow, non-grazed, HSG D
1.685	79	Woods, Fair, HSG D
0.110	96	Gravel surface, HSG D
0.086	80	>75% Grass cover, Good, HSG D
5.029	79	Weighted Average
5.029		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1900	0.17		**Sheet Flow, SF - MEADOW** Woods: Light underbrush n= 0.400 P2= 2.68"
6.8	1,118	0.1512	2.72		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
16.3	1,218	Total			

Summary for Subcatchment S204:

Runoff = 3.32 cfs @ 12.15 hrs, Volume= 0.204 af, Depth= 3.56"
Routed to Pond D1 : RETENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.687	78	Meadow, non-grazed, HSG D
0.687		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.1600	0.25		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
0.6	100	0.1500	2.71		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
7.4	200	Total			

Summary for Subcatchment S205:

Runoff = 2.21 cfs @ 12.16 hrs, Volume= 0.144 af, Depth= 3.56"
Routed to Pond D3 : RENTENTION POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.484	78	Meadow, non-grazed, HSG D
0.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.1700	0.25		**Sheet Flow, SF - WOODS** Grass: Dense n= 0.240 P2= 2.68"
2.4	350	0.1200	2.42		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
9.0	450	Total			

Summary for Subcatchment S206:

Runoff = 5.27 cfs @ 12.13 hrs, Volume= 0.315 af, Depth= 4.28"
Routed to Reach R3 : ROADSIDE SWALE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.320	98	Paved parking, HSG D
0.563	78	Meadow, non-grazed, HSG D
0.883	85	Weighted Average
0.563		63.76% Pervious Area
0.320		36.24% Impervious Area

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

Summary for Subcatchment S207:

Runoff = 4.09 cfs @ 12.15 hrs, Volume= 0.258 af, Depth= 3.66"
Routed to Reach R4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.683	79	Woods, Fair, HSG D
0.164	78	Meadow, non-grazed, HSG D
0.847	79	Weighted Average
0.847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	30	0.5000	0.30		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 2.68"
6.0	70	0.3000	0.20		**Sheet Flow, SF WOODS** Woods: Light underbrush n= 0.400 P2= 2.68"
0.5	80	0.3000	2.74		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
8.1	180	Total			

Summary for Subcatchment S208:

Runoff = 59.38 cfs @ 12.18 hrs, Volume= 4.204 af, Depth= 4.39"
Routed to Reach R7 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

	Area (ac)	CN	Description
	0.087	79	Woods, Fair, HSG D
	2.085	78	Meadow, non-grazed, HSG D
*	3.920	98	SOLAR PANELS
	5.398	80	>75% Grass cover, Good, HSG D
	11.490	86	Weighted Average
	7.570		65.88% Pervious Area
	3.920		34.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.1300	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
2.9	570	0.2235	3.31		**Shallow Concentrated Flow, SCF - MEADOW** Short Grass Pasture Kv= 7.0 fps
10.3	670	Total			

Summary for Subcatchment S209:

Runoff = 2.38 cfs @ 12.13 hrs, Volume= 0.138 af, Depth= 3.56"
Routed to Reach R5 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.012	79	Woods, Fair, HSG D
0.453	78	Meadow, non-grazed, HSG D
0.465	78	Weighted Average
0.465		100.00% Pervious Area

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

Summary for Subcatchment S300:

Runoff = 20.96 cfs @ 12.23 hrs, Volume= 1.668 af, Depth= 3.07"
Routed to Link DPE :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
NRCC 24-hr B 100-YR Rainfall=5.98"

Area (ac)	CN	Description
0.327	98	Paved parking, HSG C
4.927	71	Meadow, non-grazed, HSG C
1.260	73	Woods, Fair, HSG C
6.514	73	Weighted Average
6.187		94.98% Pervious Area
0.327		5.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.1400	0.23		**Sheet Flow, SF - MEADOW** Grass: Dense n= 0.240 P2= 2.68"
7.8	1,700	0.0588	3.64		**Shallow Concentrated Flow, SCF - MEADOW** Grassed Waterway Kv= 15.0 fps
15.0	1,800	Total			

Summary for Reach R1: E-W SWALE

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 4.39" for 100-YR event
Inflow = 22.92 cfs @ 12.17 hrs, Volume= 1.589 af
Outflow = 22.83 cfs @ 12.18 hrs, Volume= 1.589 af, Atten= 0%, Lag= 0.5 min
Routed to Pond F2 : FOREBAY 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 12.46 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 4.11 fps, Avg. Travel Time= 2.0 min

Peak Storage= 888 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 4.79'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 65.06 cfs

1.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 485.0' Slope= 0.1299 '/'
Inlet Invert= 968.00', Outlet Invert= 905.00'

Summary for Reach R2: OVERFLOW SWALE

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth > 3.87" for 100-YR event
Inflow = 7.32 cfs @ 12.88 hrs, Volume= 3.704 af
Outflow = 7.32 cfs @ 12.90 hrs, Volume= 3.704 af, Atten= 0%, Lag= 1.0 min
Routed to Pond D1 : RETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 10.16 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.86 fps, Avg. Travel Time= 0.4 min

Peak Storage= 87 cf @ 12.90 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 3.56'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 507.22 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 120.0' Slope= 0.1958 '/'
Inlet Invert= 893.50', Outlet Invert= 870.00'

Summary for Reach R3: ROADSIDE SWALE

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 4.28" for 100-YR event
Inflow = 5.27 cfs @ 12.13 hrs, Volume= 0.315 af
Outflow = 4.97 cfs @ 12.15 hrs, Volume= 0.315 af, Atten= 6%, Lag= 1.3 min
Routed to Pond B4 : BIORETENTION AREA 4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 6.09 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 7.7 min

Peak Storage= 673 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 3.29'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 42.24 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 825.0' Slope= 0.1018 '/'
Inlet Invert= 924.00', Outlet Invert= 840.00'

Summary for Reach R4:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 3.84" for 100-YR event
Inflow = 10.00 cfs @ 12.17 hrs, Volume= 4.165 af
Outflow = 9.87 cfs @ 12.19 hrs, Volume= 4.162 af, Atten= 1%, Lag= 1.3 min
Routed to Link DPC :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 4.7 min

Peak Storage= 1,228 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 52.66'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,059.41 cfs

50.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 360.0' Slope= 0.1778 '/'
Inlet Invert= 831.00', Outlet Invert= 767.00'

‡

Summary for Reach R5:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 3.77" for 100-YR event
Inflow = 5.99 cfs @ 12.16 hrs, Volume= 0.575 af
Outflow = 5.95 cfs @ 12.18 hrs, Volume= 0.575 af, Atten= 1%, Lag= 0.8 min
Routed to Link DPD :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 2.6 min

Peak Storage= 404 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.04' , Surface Width= 51.45'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,753.82 cfs

50.00' x 1.00' deep channel, n= 0.020 Corrugated PE, corrugated interior
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 220.0' Slope= 0.1591 '/'
Inlet Invert= 822.00', Outlet Invert= 787.00'

‡

Summary for Reach R6:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 3.89" for 100-YR event
Inflow = 61.83 cfs @ 12.23 hrs, Volume= 4.796 af
Outflow = 58.50 cfs @ 12.28 hrs, Volume= 4.791 af, Atten= 5%, Lag= 2.7 min
Routed to Link DPB :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 6.33 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 19.4 min

Peak Storage= 14,846 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 56.92'
Bank-Full Depth= 1.00' Flow Area= 70.0 sf, Capacity= 1,257.76 cfs

50.00' x 1.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 20.0 '/' Top Width= 90.00'
Length= 1,606.0' Slope= 0.0990 '/'
Inlet Invert= 895.00', Outlet Invert= 736.00'

‡

Summary for Reach R7:

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 4.39" for 100-YR event
Inflow = 59.38 cfs @ 12.18 hrs, Volume= 4.204 af
Outflow = 59.27 cfs @ 12.18 hrs, Volume= 4.204 af, Atten= 0%, Lag= 0.3 min
Routed to Pond P1 : WET POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Max. Velocity= 13.05 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.20 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,499 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.94' , Surface Width= 7.65'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 321.73 cfs

2.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 330.0' Slope= 0.0788 '/'
Inlet Invert= 924.00', Outlet Invert= 898.00'

Summary for Pond B1: BIORETENTION AREA 1

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 3.97" for 100-YR event
Inflow = 21.84 cfs @ 12.23 hrs, Volume= 1.605 af
Outflow = 21.44 cfs @ 12.26 hrs, Volume= 1.600 af, Atten= 2%, Lag= 1.5 min
Primary = 0.08 cfs @ 12.26 hrs, Volume= 0.154 af
Routed to Reach R6 :
Secondary = 21.35 cfs @ 12.26 hrs, Volume= 1.445 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.97' @ 12.26 hrs Surf.Area= 7,212 sf Storage= 6,395 cf

Plug-Flow detention time= 54.7 min calculated for 1.599 af (100% of inflow)
Center-of-Mass det. time= 53.1 min (885.8 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	14,542 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,991	427.0	0	0	5,991
905.00	8,631	465.0	14,542	14,542	8,832

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.26 hrs HW=903.97' TW=895.17' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 2.07 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=21.31 cfs @ 12.26 hrs HW=903.97' TW=895.17' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 21.31 cfs @ 1.68 fps)

Summary for Pond B2: BIORETENTION AREA 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 4.03" for 100-YR event
Inflow = 21.88 cfs @ 12.19 hrs, Volume= 1.458 af
Outflow = 21.35 cfs @ 12.22 hrs, Volume= 1.454 af, Atten= 2%, Lag= 1.3 min
Primary = 0.08 cfs @ 12.22 hrs, Volume= 0.144 af
Routed to Reach R6 :
Secondary = 21.27 cfs @ 12.22 hrs, Volume= 1.310 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 903.97' @ 12.22 hrs Surf.Area= 6,692 sf Storage= 5,924 cf

Plug-Flow detention time= 56.0 min calculated for 1.453 af (100% of inflow)
Center-of-Mass det. time= 54.5 min (882.0 - 827.5)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	13,497 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
903.00	5,550	421.0	0	0	5,550
905.00	8,023	459.0	13,497	13,497	8,353

Device	Routing	Invert	Outlet Devices
#1	Primary	900.50'	**8.0" Round Culvert** L= 50.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 900.50' / 899.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf
#2	Secondary	903.50'	**20.0' long + 15.0 '/' SideZ x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

			Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#3	Device 1	903.00'	**0.500 in/hr Exfiltration over Surface area**

Primary OutFlow Max=0.08 cfs @ 12.22 hrs HW=903.97' TW=895.16' (Dynamic Tailwater)
↑└**1=Culvert** (Passes 0.08 cfs of 2.07 cfs potential flow)
↑└**3=Exfiltration** (Exfiltration Controls 0.08 cfs)

Secondary OutFlow Max=21.21 cfs @ 12.22 hrs HW=903.97' TW=895.16' (Dynamic Tailwater)
↑└**2=Broad-Crested Rectangular Weir** (Weir Controls 21.21 cfs @ 1.68 fps)

Summary for Pond B3: BIORETENTION AREA 3

Inflow Area = 0.583 ac, 34.82% Impervious, Inflow Depth = 4.28" for 100-YR event
Inflow = 3.86 cfs @ 12.10 hrs, Volume= 0.208 af
Outflow = 3.76 cfs @ 12.11 hrs, Volume= 0.208 af, Atten= 3%, Lag= 0.9 min
Primary = 0.02 cfs @ 12.11 hrs, Volume= 0.031 af
Routed to Reach R6 :
Secondary = 3.74 cfs @ 12.11 hrs, Volume= 0.177 af
Routed to Reach R6 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 898.78' @ 12.11 hrs Surf.Area= 1,426 sf Storage= 870 cf

Plug-Flow detention time= 68.9 min calculated for 0.208 af (100% of inflow)
Center-of-Mass det. time= 68.4 min (866.4 - 797.9)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	3,200 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	800	0	0
900.00	2,400	3,200	3,200

Device	Routing	Invert	Outlet Devices
#1	Device 3	898.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	898.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	895.50'	**8.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 895.50' / 895.00' S= 0.0083 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.11 hrs HW=898.78' TW=895.12' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.02 cfs of 1.60 cfs potential flow)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=3.68 cfs @ 12.11 hrs HW=898.78' TW=895.12' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 3.68 cfs @ 1.32 fps)

Summary for Pond B4: BIORETENTION AREA 4

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth = 4.28" for 100-YR event
Inflow = 4.97 cfs @ 12.15 hrs, Volume= 0.315 af
Outflow = 4.89 cfs @ 12.17 hrs, Volume= 0.298 af, Atten= 2%, Lag= 0.8 min
Primary = 0.02 cfs @ 12.17 hrs, Volume= 0.046 af
Routed to Pond D2 : DETENTION POND
Secondary = 4.86 cfs @ 12.17 hrs, Volume= 0.253 af
Routed to Pond D2 : DETENTION POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.69' @ 12.17 hrs Surf.Area= 2,018 sf Storage= 1,893 cf

Plug-Flow detention time= 114.7 min calculated for 0.298 af (95% of inflow)
Center-of-Mass det. time= 84.5 min (890.2 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	5,303 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	15	0	0
838.00	1,417	716	716
840.00	3,170	4,587	5,303

Device	Routing	Invert	Outlet Devices
#1	Device 3	837.00'	**0.500 in/hr Exfiltration over Surface area**
#2	Secondary	838.50'	**25.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	835.50'	**8.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 835.50' / 834.00' S= 0.0600 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.02 cfs @ 12.17 hrs HW=838.68' TW=836.55' (Dynamic Tailwater)
└**3=Culvert** (Passes 0.02 cfs of 1.81 cfs potential flow)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=4.83 cfs @ 12.17 hrs HW=838.68' TW=836.55' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.83 cfs @ 1.05 fps)

Summary for Pond D1: RETENTION POND

Inflow Area = 12.177 ac, 32.19% Impervious, Inflow Depth > 3.85" for 100-YR event
Inflow = 7.77 cfs @ 12.17 hrs, Volume= 3.908 af
Outflow = 7.33 cfs @ 13.00 hrs, Volume= 3.906 af, Atten= 6%, Lag= 50.1 min
Primary = 7.33 cfs @ 13.00 hrs, Volume= 3.906 af
Routed to Reach R4 :
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R4 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 866.61' @ 13.00 hrs Surf.Area= 1,512 sf Storage= 2,058 cf

Plug-Flow detention time= 3.0 min calculated for 3.904 af (100% of inflow)
Center-of-Mass det. time= 2.5 min (1,007.3 - 1,004.8)

Volume	Invert	Avail.Storage	Storage Description
#1	864.00'	12,104 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
864.00	230	80.0	0	0	230
866.00	1,140	145.0	1,255	1,255	1,415
868.00	2,560	210.0	3,606	4,860	3,286
870.00	4,800	270.0	7,244	12,104	5,627

Device	Routing	Invert	Outlet Devices
#1	Primary	864.00'	**15.0" Round Culvert** L= 50.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 864.00' / 863.00' S= 0.0200 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.23 sf
#2	Secondary	868.75'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=7.33 cfs @ 13.00 hrs HW=866.61' TW=831.06' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 7.33 cfs @ 5.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=864.00' TW=831.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D2: DETENTION POND

Inflow Area = 0.883 ac, 36.24% Impervious, Inflow Depth > 4.05" for 100-YR event
Inflow = 4.89 cfs @ 12.17 hrs, Volume= 0.298 af
Outflow = 2.78 cfs @ 12.28 hrs, Volume= 0.298 af, Atten= 43%, Lag= 6.5 min
Primary = 2.52 cfs @ 12.27 hrs, Volume= 0.296 af
Routed to Reach R5 :
Secondary = 0.26 cfs @ 12.28 hrs, Volume= 0.002 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 836.80' @ 12.27 hrs Surf.Area= 2,449 sf Storage= 3,248 cf

Plug-Flow detention time= 69.2 min calculated for 0.298 af (100% of inflow)
Center-of-Mass det. time= 67.3 min (957.5 - 890.2)

Volume	Invert	Avail.Storage	Storage Description
#1	834.00'	6,977 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
834.00	160	85.0	0	0	160
836.00	1,710	225.0	1,595	1,595	3,628
838.00	3,810	285.0	5,382	6,977	6,115

Device	Routing	Invert	Outlet Devices
#1	Secondary	836.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 4	834.00'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	836.00'	**10.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	833.90'	**10.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 833.90' / 833.00' S= 0.0300 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.55 sf

Primary OutFlow Max=2.52 cfs @ 12.27 hrs HW=836.80' TW=822.03' (Dynamic Tailwater)
└**4=Culvert** (Passes 2.52 cfs of 3.27 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.93 fps)
└**3=Orifice/Grate** (Orifice Controls 2.35 cfs @ 4.30 fps)

Secondary OutFlow Max=0.26 cfs @ 12.28 hrs HW=836.80' TW=822.03' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.53 fps)

Summary for Pond D3: RENTENTION POND

Inflow Area = 0.484 ac, 0.00% Impervious, Inflow Depth = 3.56" for 100-YR event
Inflow = 2.21 cfs @ 12.16 hrs, Volume= 0.144 af
Outflow = 1.93 cfs @ 12.21 hrs, Volume= 0.139 af, Atten= 13%, Lag= 2.7 min
Primary = 1.93 cfs @ 12.21 hrs, Volume= 0.139 af
Routed to Reach R5 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 838.94' @ 12.21 hrs Surf.Area= 694 sf Storage= 655 cf

Plug-Flow detention time= 33.3 min calculated for 0.139 af (97% of inflow)
Center-of-Mass det. time= 16.1 min (837.8 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	837.00'	1,625 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
837.00	60	0	0
838.00	310	185	185
840.00	1,130	1,440	1,625

Device	Routing	Invert	Outlet Devices
#1	Primary	838.00'	**12.0" Round Culvert** L= 100.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 838.00' / 837.00' S= 0.0100 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.21 hrs HW=838.93' TW=822.04' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.92 cfs @ 3.27 fps)

Summary for Pond F1: FOREBAY 2

Inflow Area = 4.851 ac, 34.30% Impervious, Inflow Depth = 4.39" for 100-YR event
Inflow = 22.70 cfs @ 12.21 hrs, Volume= 1.775 af
Outflow = 21.84 cfs @ 12.23 hrs, Volume= 1.605 af, Atten= 4%, Lag= 1.3 min
Primary = 21.84 cfs @ 12.23 hrs, Volume= 1.605 af
Routed to Pond B1 : BIORETENTION AREA 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 904.18' @ 12.24 hrs Surf.Area= 4,541 sf Storage= 10,214 cf

Plug-Flow detention time= 75.9 min calculated for 1.604 af (90% of inflow)
Center-of-Mass det. time= 27.8 min (832.7 - 804.9)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	14,382 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	218	86.0	0	0	218
901.00	1,277	230.0	1,348	1,348	3,853
903.00	3,198	372.0	4,331	5,679	10,682
905.00	5,618	426.0	8,703	14,382	14,203

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=21.38 cfs @ 12.23 hrs HW=904.17' TW=903.96' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 21.38 cfs @ 1.59 fps)

Summary for Pond F2: FOREBAY 2

Inflow Area = 4.342 ac, 35.08% Impervious, Inflow Depth = 4.39" for 100-YR event
Inflow = 22.83 cfs @ 12.18 hrs, Volume= 1.589 af
Outflow = 21.88 cfs @ 12.19 hrs, Volume= 1.458 af, Atten= 4%, Lag= 1.0 min
Primary = 21.88 cfs @ 12.19 hrs, Volume= 1.458 af
Routed to Pond B2 : BIORETENTION AREA 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 904.18' @ 12.21 hrs Surf.Area= 3,904 sf Storage= 8,037 cf

Plug-Flow detention time= 67.4 min calculated for 1.458 af (92% of inflow)
Center-of-Mass det. time= 24.7 min (827.5 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1	899.00'	11,697 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
899.00	98	53.0	0	0	98
901.00	930	189.0	887	887	2,728
903.00	2,575	324.0	3,368	4,255	8,263
905.00	5,000	439.0	7,442	11,697	15,287

Device	Routing	Invert	Outlet Devices
#1	Primary	903.50'	**20.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=21.26 cfs @ 12.19 hrs HW=904.17' TW=903.96' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 21.26 cfs @ 1.58 fps)

Summary for Pond P1: WET POND

[62] Hint: Exceeded Reach R7 OUTLET depth by 0.21' @ 13.20 hrs

Inflow Area = 11.490 ac, 34.12% Impervious, Inflow Depth = 4.39" for 100-YR event
Inflow = 59.27 cfs @ 12.18 hrs, Volume= 4.204 af
Outflow = 7.32 cfs @ 12.88 hrs, Volume= 3.704 af, Atten= 88%, Lag= 42.1 min
Primary = 7.32 cfs @ 12.88 hrs, Volume= 3.704 af
Routed to Reach R2 : OVERFLOW SWALE
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach R2 : OVERFLOW SWALE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Starting Elev= 894.00' Surf.Area= 12,390 sf Storage= 18,141 cf
Peak Elev= 898.51' @ 12.88 hrs Surf.Area= 30,485 sf Storage= 119,491 cf (101,351 cf above start)
Flood Elev= 900.00' Surf.Area= 35,579 sf Storage= 168,762 cf (150,621 cf above start)

Plug-Flow detention time= 327.9 min calculated for 3.286 af (78% of inflow)
Center-of-Mass det. time= 211.8 min (1,014.7 - 802.9)

Volume	Invert	Avail.Storage	Storage Description
#1	891.00'	168,762 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
891.00	2,741	349.0	0	0	2,741
892.00	3,525	397.0	3,125	3,125	5,615
894.00	12,390	626.0	15,016	18,141	24,285
896.00	22,863	877.0	34,722	52,863	54,344
898.00	28,845	1,061.0	51,592	104,455	82,786
900.00	35,579	1,100.0	64,306	168,762	89,833

Device	Routing	Invert	Outlet Devices
#1	Secondary	898.75'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Device 5	894.00'	**3.0" Vert. Low Flow Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 5	895.90'	**12.0" Horiz. Stand Pipe** C= 0.600 Limited to weir flow at low heads
#4	Device 5	898.50'	**1.0" x 4.0" Horiz. Orifice/Grate X 13.00 columns** X 5 rows C= 0.600 in 30.0" x 30.0" Grate (29% open area)
#5	Primary	893.90'	**18.0" Round Culvert** L= 70.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 893.90' / 892.00' S= 0.0271 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.32 cfs @ 12.88 hrs HW=898.51' TW=893.76' (Dynamic Tailwater)
└**5=Culvert** (Passes 7.32 cfs of 14.52 cfs potential flow)
  ├**2=Low Flow Orifice** (Orifice Controls 0.49 cfs @ 10.08 fps)
  ├**3=Stand Pipe** (Orifice Controls 6.11 cfs @ 7.77 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.72 cfs @ 0.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=894.00' TW=893.50' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DPA:

Inflow Area = 2.376 ac, 0.00% Impervious, Inflow Depth = 3.56" for 100-YR event
Inflow = 9.92 cfs @ 12.19 hrs, Volume= 0.705 af
Primary = 9.92 cfs @ 12.19 hrs, Volume= 0.705 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPB:

Inflow Area = 14.805 ac, 22.90% Impervious, Inflow Depth > 3.88" for 100-YR event
Inflow = 58.50 cfs @ 12.28 hrs, Volume= 4.791 af
Primary = 58.50 cfs @ 12.28 hrs, Volume= 4.791 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPC:

Inflow Area = 13.024 ac, 30.10% Impervious, Inflow Depth > 3.83" for 100-YR event
Inflow = 9.87 cfs @ 12.19 hrs, Volume= 4.162 af
Primary = 9.87 cfs @ 12.19 hrs, Volume= 4.162 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPD:

Inflow Area = 1.832 ac, 17.47% Impervious, Inflow Depth > 3.77" for 100-YR event
Inflow = 5.95 cfs @ 12.18 hrs, Volume= 0.575 af
Primary = 5.95 cfs @ 12.18 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

Summary for Link DPE:

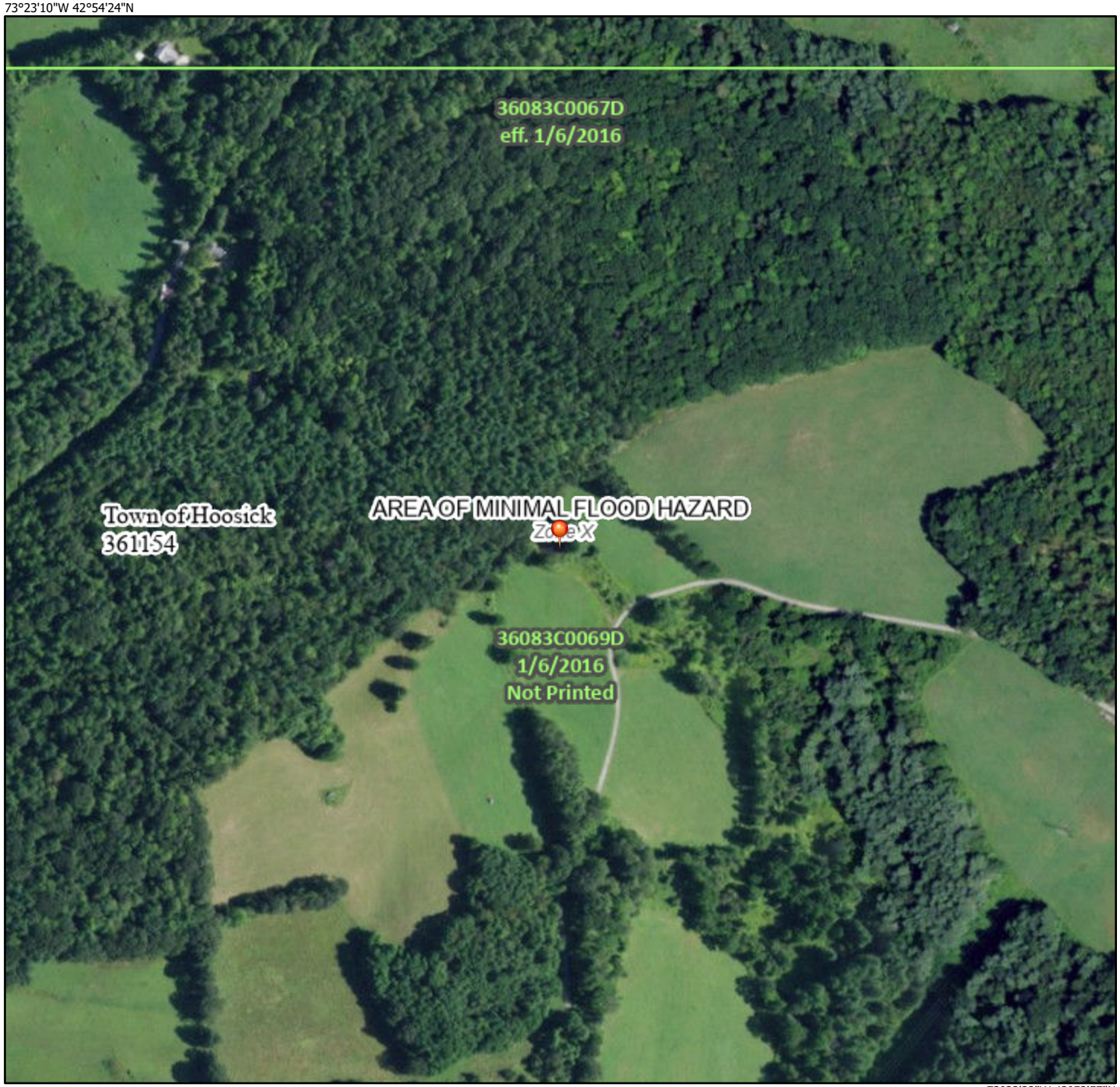
Inflow Area = 6.514 ac, 5.02% Impervious, Inflow Depth = 3.07" for 100-YR event
Inflow = 20.96 cfs @ 12.23 hrs, Volume= 1.668 af
Primary = 20.96 cfs @ 12.23 hrs, Volume= 1.668 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 1L

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs

National Flood Hazard Layer FIRMette

FEMA

73°23'10"W 42°54'24"N



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

1:6,000

73°22'32"W 42°53'57"N

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
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 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

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Environmental Resource Mapper

The coordinates of the point you clicked on are:

UTM 18	**Easting:**	632251.4840309622	**Northing:**	4751169.578054071
Longitude/Latitude	**Longitude:**	-73.38004679975852	**Latitude:**	42.90168921695387

The approximate address of the point you clicked on is:
12090, Hoosick Falls, New York

County: Rensselaer
Town: Hoosick
USGS Quad: EAGLE BRIDGE

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

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

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

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

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

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

April 03, 2023

Laurel Mitchell
900 Route 146
Clifton Park, NY 12065

Re: NYSERDA
Wilson Hill Solar/5 MW/19.63 Acres
Tax parcel 26.-1-12.21/1 - Wilson Hill Rd, Town of Hoosick, Rensselaer County, NY
23PR02744

Dear Laurel Mitchell:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Historic Preservation Act of 1980 (Section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the OPRHP 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 (New York Environmental Conservation Law Article 8) and its implementing regulations (6 NYCRR Part 617).

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

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

Sincerely,

R. Daniel Mackay

Deputy Commissioner for Historic Preservation
Division for Historic Preservation

rev: D. Bagrow

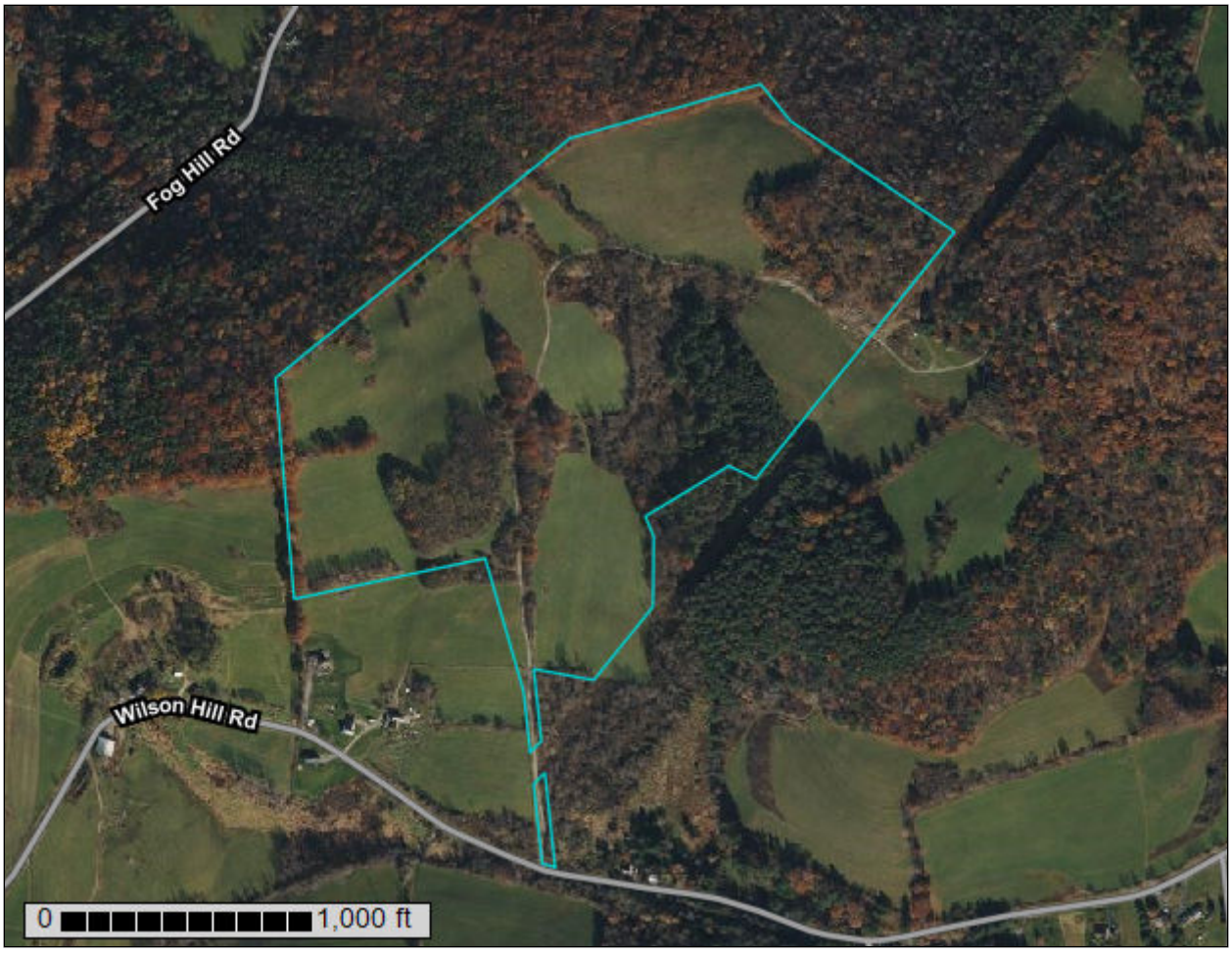
United States Department of Agriculture

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 Rensselaer County, New York



August 24, 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:6,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

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: Rensselaer County, New York
Survey Area Data: Version 19, 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: Aug 15, 2021—Nov 8, 2021

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
BeC	Bernardston gravelly silt loam, 8 to 15 percent slopes	5.9	7.3%
BeD	Bernardston gravelly silt loam, 15 to 25 percent slopes	14.0	17.2%
BnC	Bernardston-Nassau complex, rolling	8.8	10.7%
BnD	Bernardston-Nassau complex, hilly	37.7	46.2%
NrD	Nassau-Rock outcrop complex, hilly	4.9	6.0%
PtB	Pittstown gravelly silt loam, 3 to 8 percent slopes	2.4	3.0%
PtC	Pittstown gravelly silt loam, 8 to 15 percent slopes	0.5	0.7%
SrB	Scriba silt loam, 3 to 8 percent slopes	7.3	9.0%
Totals for Area of Interest		**81.5**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Rensselaer County, New York

BeC—Bernardston gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v15
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Bernardston and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: 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 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

BeD—Bernardston gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9v16
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Bernardston and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: 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 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

BnC—Bernardston-Nassau complex, rolling

Map Unit Setting

National map unit symbol: 9v1c
Elevation: 0 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Bernardston and similar soils: 45 percent
Nassau and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: 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 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

BnD—Bernardston-Nassau complex, hilly

Map Unit Setting

National map unit symbol: 9v1d
Elevation: 0 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Bernardston and similar soils: 40 percent
Nassau and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bernardston

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 30 inches: gravelly loam
H3 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: 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 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

NrD—Nassau-Rock outcrop complex, hilly

Map Unit Setting
National map unit symbol: 9v2n
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition
Nassau and similar soils: 40 percent
Rock outcrop: 35 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile
H1 - 0 to 7 inches: very channery silt loam
H2 - 7 to 15 inches: very channery loam
H3 - 15 to 19 inches: unweathered bedrock

Properties and qualities
Slope: 25 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 1 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

PtB—Pittstown gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v2s
Elevation: 100 to 1,390 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pittstown and similar soils: 80 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittstown

Setting

Landform: Drumlinoid ridges, till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 24 inches: gravelly silt loam
H3 - 24 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
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 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

PtC—Pittstown gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v2t
Elevation: 20 to 1,890 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Pittstown and similar soils: 80 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittstown

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: Loamy till

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 24 inches: gravelly silt loam
H3 - 24 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to densic material
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 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

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

Minor Components

Alden

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

SrB—Scriba silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v36
Elevation: 30 to 1,440 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scriba and similar soils: 80 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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 10 inches: silt loam
H2 - 10 to 21 inches: silt loam
H3 - 21 to 50 inches: gravelly silt loam
H4 - 50 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 12 to 21 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: No

Minor Components

Alden

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
Email Address: fw5es_nyfo@fws.gov

In Reply Refer To:
Project Code: 2023-0047131
Project Name: Wilson Hill

February 20, 2023

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

To Whom It May Concern:

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

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

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

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

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

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

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

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

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

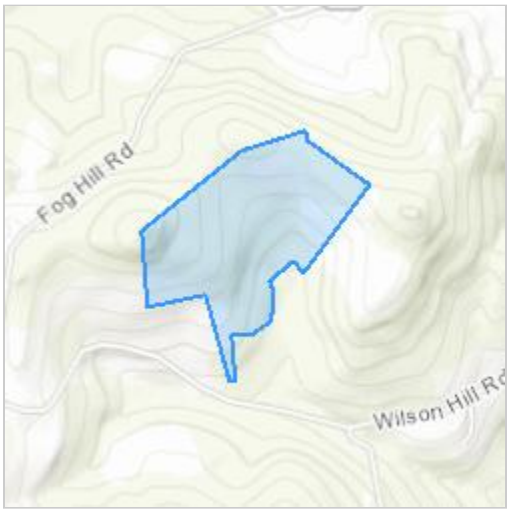
This species list is provided by:

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

PROJECT SUMMARY

Project Code: 2023-0047131
Project Name: Wilson Hill
Project Type: Power Gen - Solar
Project Description: power gen
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.90083575,-73.38041766015009,14z



Counties: Rensselaer County, New York

ENDANGERED SPECIES ACT SPECIES

There is a total of 1 threatened, endangered, or candidate species on this species list.

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

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

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

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

INSECTS

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

CRITICAL HABITATS

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

IPAC USER CONTACT INFORMATION

Agency: Environmental Design Partnership
Name: Laurel Mitchell
Address: 900 Route 146
City: Clifton Park
State: NY
Zip: 12065
Email laurel@laurelmitchell.com
Phone: 5183477141

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

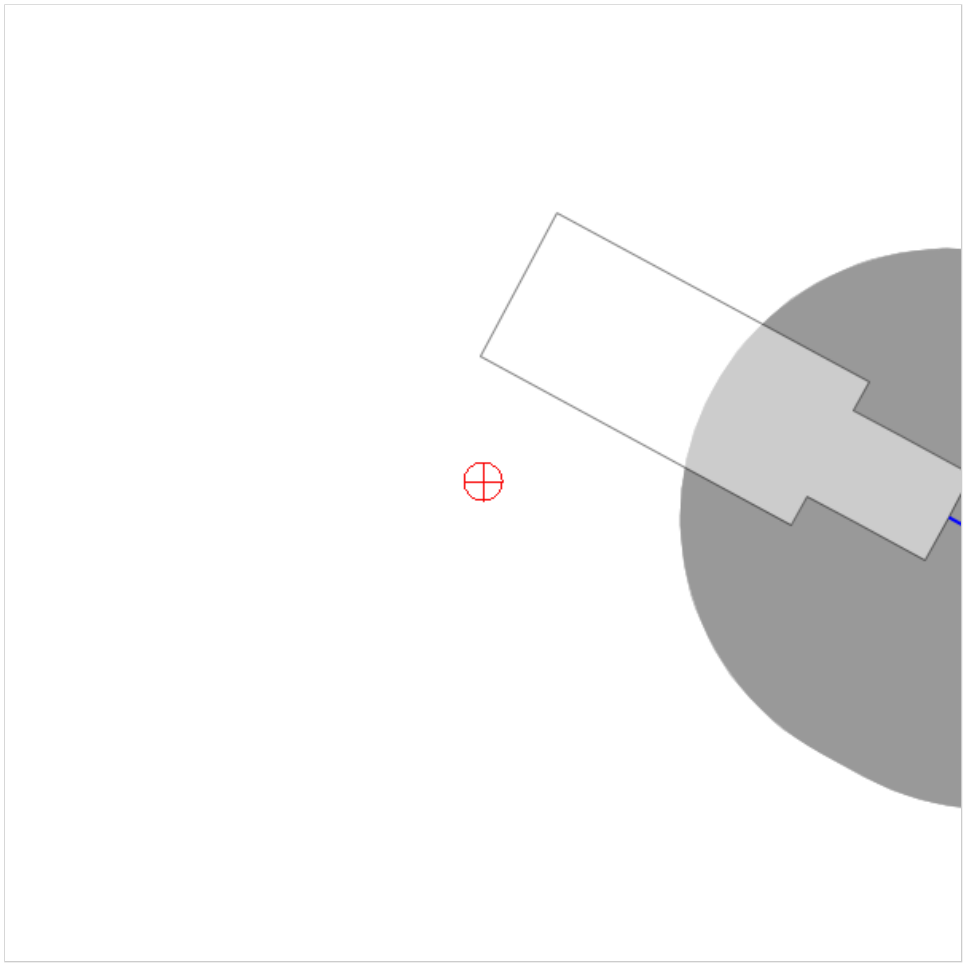
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport 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 54 M 02.85 S N
Longitude:	73 Deg 22 M 55.76 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	988 (nearest foot)
Structure Height :	20 (nearest foot)
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.



SECTION 7

Completed Inspection Reports