Weston & Sampson

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Site Plan Review & Special Permit Application

March 2025

PROPOSED 4.04 MW DC SOLAR PHOTOVOLTAIC DEVELOPMENT

89 CHESTER ROAD
BLANDFORD, MA 01008

PREPARED FOR: PEEBLES BROOK, LLC

SUBMITTED TO: TOWN OF BLANDFORD
PLANNING BOARD

March 31, 2025

55 Walkers Brook Drive, Suite 100, Reading, MA 01867
Tel: 978.532.1900

Mr. Paul Martin
Planning Board Chair
Town of Blandford
1 Russell Stage Road
Blandford, MA 01008

Re: **Site Plan Review & Special Permit Application Package**
4.04 MW DC Solar Photovoltaic Development
89 Chester Road, Blandford, MA 01008

Dear Mr. Martin:

Weston & Sampson Engineers, Inc. (Weston & Sampson) is submitting this application package which includes a combined Site Plan Review & Special Permit Application and related appendices to be filed with the Town of Blandford Planning Board for the above-mentioned project on behalf of Peebles Brook, LLC, wholly owned subsidiary of Bluewave (the Applicant). The Applicant proposes to develop the project, an approximately 4.04 megawatts (MW) direct current (DC) single-axis tracking solar photovoltaic with associated battery storage system (BESS), at the site located at 89 Chester Road.

The project will consist of a solar array, a battery energy storage system (BESS) and associated equipment pads. This project will be dual use, meaning the areas between the panels will be used to grow and harvest hay. There is a proposed gravel access road to allow for site access and maintenance. The solar array will be comprised of PV panels on racking structures which bring the PV panels to a height of 10 feet or greater. The solar array will not be surrounded by fencing as the National Electric Code (NEC) does not require PV panels at a height of 10 feet or greater to be fenced in. The electrical equipment will be surrounded by a 7-foot-tall chain link fence as detailed in the attached site plans and as required by the NEC. The electricity generated by the PV modules will be exported to the electric grid in accordance with the utility's interconnection standards and regulations. This application package includes the following attachments.

- Project Narrative
- Appendix A – Special Permit Application Form and Application Fees
    - $300.00 (Special Permit Application Fee) Payable to Town of Blandford
    - $10,000.00 (Site Plan Review Fee) Payable to Town of Blandford sufficient to cover any fees connected with a public hearing and review of plans)
- Appendix B – Site Plans - Issued for Permitting
- Appendix C – One Line Diagram and Electrical Specs
- Appendix D – Proof of Liability Insurance
- Appendix E – Public Outreach Plan
- Appendix F – Site Control
- Appendix G – Solar Operation and Maintenance Plan
- Appendix H – Stormwater Report
- Appendix I – Abandonment and Decommissioning Plan
- Appendix J – Certified Abutters List

If you have any further questions or require any additional information, please feel free to contact me by phone at (978) 532-1900 or by email at costello.melinda@wseinc.com.

Sincerely,
WESTON & SAMPSON ENGINEERS, INC.

Melinda Costello, P.E.
Project Manager

Andrew Hamel
Project Manager

cc: Marco Addonizio, Director of Project Development, Peebles Brook, LLC

PROJECT NARRATIVE

Introduction

Peebles Brook, LLC (the Applicant) proposes construction of a ground mounted solar photovoltaic (PV) array and battery energy storage system (BESS) encompassing approximately 24.13 acres of the approximately 32.587-acre site, located at 89 Chester Road, Blandford, MA (Map 408, Lot 19.1). The project site is located in the Agricultural District. The property is not located within any overlay districts according to the Zoning Map of the Town of Blandford (Revision Date: August 1, 2024).

The property currently consists of agricultural fields. A residential parcel (Map 408, Lot 19.2) is located centrally along the property's frontage on Chester Road. The project limit of work will not disturb this portion of the parcel. The project is bordered by Chester Road along the northern and eastern boundaries, and by undeveloped woodland to the south and west.

The following narrative and documentation is hereby submitted to the Planning Board under Section IX of the Town of Blandford Zoning By-Laws, revision date: August 1, 2024 (the "By-Laws") in accordance with Section VIII: Ground Mounted Solar Photovoltaic Installations of the By-Laws.

This application package includes a combined Site Plan Review and Special Permit Application and related appendices. The local applications mentioned above are being submitted according to the application procedure requirements in Section IX of the Town of Blandford Zoning Bylaws, which requires nine copies of the Site Plan Review and Special Permit Application be filed with the Town Clerk and Town Tax Collector. The application appendices can be referenced in the cover letter included in this package. The Special Permit Application Form is included in Appendix A. There is no Site Plan Review application form.

Proposed Project

The proposed solar PV site will be accessed from Chester Road via a proposed gravel access road. The parcel is owned by Mary E. Martin and James Lloyd Martin. Ground-Mounted Solar Photovoltaic Installation is a permitted use within the Agricultural District via a Special Permit and Site Plan Review by the Planning Board per Section 4.3.1.6 of the By-Laws and listed as Use 5.3 in Table 5.0 Wholesale, Transportation, and Industrial Use located in Section XII: Schedule of Uses Table.

As currently designed, the proposed ground mounted solar PV system has a capacity of 4.04 megawatts (MW) direct current (DC) with associated BESS. The proposed solar PV arrays will be track mounted on racking structures that will make the height of the PV array greater than 10 feet. The National Electric Code (NEC) does not require PV panels at a height of 10 feet of greater to be enclosed by fencing. A BESS and accessory use equipment is proposed at the end of the gravel access road that will be enclosed with 7-foot-tall chain link fence in accordance with NEC. There is a proposed gravel access road to allow for site access and maintenance and a stormwater management system. The electricity generated by the PV modules will be exported to the electric grid in accordance with the local utility's interconnection standards and regulations.

The name of the Project Developer is:

Peebles Brook, LLC
116 Huntington Avenue, Suite 601
Boston, MA 02116
Contact: Marco Addonizio
Phone: 617-380-3014
Email: maddonizio@bluewave.energy

The name and contact information of the Engineer authorized to represent the Project Developer:

Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
Contact: Rob Bukowski, P.E.
Phone: (978) 532-1900
e-mail: Bukowski.Rob@wseinc.com

Project Schedule

The following is an estimated schedule related to permitting and construction of this project.

Construction Start: Q4 2026 – Q1 2027
Construction End: Q4 2027 – Q1 2028

The developer is planning to start construction following receipt of all permits as early as October 2026 with a construction completion date of the start of 2028.

Compliance with By-Laws

On behalf of the applicant, Weston & Sampson has developed a set of plans (**Appendix B**) that are intended to meet requirements set forth in the By-Laws for the Agricultural Zoning District in which the project is proposed as well as the dimension requirements listed specifically for Ground Mounted Solar PV Installations of 250 kW or greater. Below is a summary of the dimensional aspects of the project:

Table 1 Dimensional and Density Regulations:

Requirements	Required	Proposed[3]
Minimum Frontage[1]	300 ft	>300 ft
Minimum Lot Area[1]	87,120 sf	1,613,157 sf (Unchanged)
Minimum Front Yard Setback[2]	100 ft	108 ft (min)
Minimum Rear Yard Setback[2]	100 ft	104 ft (min)
Minimum Side Yard Setback[2]	100 ft	100 ft (min)
Access Road Setback from Side and Rear Lot Line[2]	25 ft	25 ft (min)
Maximum Structure Height	25 ft	15 ft±
Minimum Lot Size[2]	12 ac	32.579 ac

1. Setback based on underlying zoning district (Agricultural) dimension requirements listed in Section 4.3.2.
2. Setbacks listed in Section 8.3.3 of the By-Laws which list dimension and density requirements for Ground Mounted Solar Photovoltaic Installations of 250 kW or greater.
3. Proposed setbacks measured from the property line to the nearest solar array table.

An Approval Not Required (ANR) plan, which will split the residential portion of the lot from the solar array parcel, will be submitted separately to the Planning Board prior to construction. All dimensional regulations listed in Table 1 above will be upheld with the new lot line delineations as they apply to the parcel where the solar array is proposed. The proposed ANR lot line is shown on C101 and C102 of the Site Plans, which have been included in **Appendix B.**

Provisions of the By-Laws relative to the project, followed by an analysis of the project's compliance with applicable provisions (in underlined font), are listed below. The outlined regulations represent an analysis primarily applicable to Section VIII: Ground Mounted Solar Photovoltaic Installations of the By-Laws, however,

there are additional provisions that were analyzed under Section IX and Section XVI of the By-Laws. The client has requested one waiver from Section 16.5 of the Zoning Bylaws.

SECTION VIII: GROUND MOUNTED SOLAR PHOTOVOLTAIC INSTALLATIONS

8.1 PURPOSE

The purpose of this Section is to provide standards for the Placement, design, construction, operation, monitoring, modification, and removal of Ground Mounted Solar Photovoltaic installations that address public safety and minimize impacts on scenic, natural, and historic resources.

Acknowledged.

8.1.2 Definitions

SOLAR PHOTOVOLTAIC INSTALLATION, LARGE SCALE GROUNDMOUNTED: a solar photovoltaic system that is structurally mounted on the ground and is not roof mounted and has a nameplate capacity greater than 250 KW DC or occupies more than 40,0000 square feet of surface area.

The proposed solar photovoltaic development qualifies as a Large-Scale Ground Mounted Solar Photovoltaic Installation as the solar PV panels will be ground mounted, the capacity will be greater than 250 kW DC, and the site will occupy more than 40,000 square feet of surface area.

8.2 APPLICABILITY

8.1.2 This Section applies to all ground mounted solar photovoltaic installations proposed to be constructed after the effective date of this Section. This Section also pertains to physical modifications that materially alter the type, configuration, or size of these installations or related equipment.

Section VIII is applicable to the proposed project and all requirements listed will be met.

8.2.2 All Large Ground Mounted Solar Photovoltaic Installations shall require a Special Permit and Site Plan Approval issued by the Planning Boad in accordance with this section and Section IX.

This narrative is a portion of the larger combined Special Permit and Site Plan Applications being submitted to the Town of Blandford Planning Board in accordance with Section VIII and Section IX.

8.3 GENERAL REQUIREMENTS FOR ALL GROUND MOUNTED SOLAR PHOTOVOLTAIC INSTALLATIONS

8.3.1 Site Plan Review – All Ground Mounted Solar Photovoltaic Installations shall undergo site plan review, in accordance with Section IX, prior to construction, installation or modification as provided in this Section. In addition to the submission requirements of Section IX, the following shall be required:

Acknowledged.

8.3.1.1 General – All plans and maps shall be prepared, stamped, and signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

All plans and maps are stamped and signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.

8.3.1.2 Required Documents – Pursuant to the site plan review process, the Project Proponent shall provide the following documents:

(a) A site plan showing:
   (1) Property lines and physical features, including roads for the project site;
   (2) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
   (3) Blueprints or drawings of the Ground Mounted Solar Photovoltaic Installations signed by a Professional Engineer licensed to practice in the
   (4) Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures;
   (5) One- or three-line electrical diagram detailing the Ground Mounted Solar Photovoltaic Installations, associated components, and electrical interconnection methods, with all Massachusetts Electrical Code compliant disconnects and overcurrent devices;
   (6) Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;
   (7) Name, address, and contact information for proposed Ground Mounted Solar Photovoltaic Installation's installer
   (8) Name, address, phone number, and signature of the Project Proponent;
   (9) The name, contact information and signature of any agents representing the Project Proponent;

   Plans in substantial conformance with the requirements of Section 8.3.1.2 (a) are included in Appendix B. The electrical one line diagram and specifications of major system components associated with the proposed array are included in Appendix C.

(b) Erosion and sediment control plan

An erosion and sediment control plan is included in the Site Plans included in Appendix B.

(c) Proof of liability insurance and builder's risk insurance

Proof of liability insurance is included in Appendix D.

(d) A public outreach plan, including a project development timeline, which indicates how the Project Proponent will meet the required site plan review notification procedures and otherwise inform abutters and the community.

The materials used for the public outreach plan, including a project development timeline are included Appendix E.

(e) Site Control – The Project Proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed Ground Mounted Solar Photovoltaic Installations.

Documentation of access and control of the project site in included in Appendix F.

(f) Operation and Maintenance Plan – The Project Proponent shall submit a plan for the operation and maintenance of the Ground Mounted Solar Photovoltaic Installation, which shall include measures for maintaining safe access to the installation, storm water controls, as well as general procedures for operational maintenance of the installation.

A solar facility Operation and Maintenance Plan is included in Appendix G. A stormwater best management practice (BMP) Operation and Maintenance Manual is included within the Stormwater Report included in Appendix H.

(g) Abandonment and Decommissioning Plan – The Project Proponent shall submit a Decommissioning Plan. Any Ground Mounted Solar Photovoltaic Installation

(h) Which has reached the end of its useful life or has been abandoned (i.e., when either it fails to be completed within a commercially reasonable time (such that power generation can commence), or it fails to operate for an elapsed time of more than one year without the written consent of the Planning Board) shall physically remove the installation within 150 days of abandonment or the proposed date of decommissioning. The Project Proponent shall notify the Planning Board by certified mail of the proposed date of the discontinued operations and plans for removal. The Abandonment and Decommissioning Plan shall include a detailed description of how all of the following will be addressed:

(1) Physical removal of all structures; equipment, building, security barriers and transmission lines from the site, including any materials used to limit vegetation.

(2) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.

(3) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Planning Board may allow the Project Proponent to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

(4) Financial surety for decommissioning – Proponents of Ground Mounted Solar Photovoltaic Installations shall provide a form of surety, either through escrow account, bond or other form of surety approved by the Planning Board to cover the estimated cost of removal in the event the Town must remove the installation and remediate the landscape, in an amount ad form determined to be reasonable by the Planning Board, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirement set forth herein, as determined by the project proponent and the Town. Such surety will not be required for municipal or state-owned facilities. The project proponent shall submit a fully inclusive detailed itemized cost estimate of the Town's estimated costs (including "prevailing wages") associated with removal and full decommissioning of the facility and site, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation during the life of the facility, and the Planning Board may at any time require an increase in surety or a change in the form or security as may be required to ensure continued satisfaction of the requirements of this section. Said estimated cost shall not include or deduct the value of material recycling. Said surety in its full amount shall be presented to the Planning Board prior to the Project Proponent applying for Building Permits or the commencement of construction.

(5) All legal documents required to enable the Town to exercise its rights and responsibilities under the plan to decommission the site, enter the property and physically remove the installation.

An Abandonment and Decommissioning Plan has been included in **Appendix I.** Prior to construction, the Applicant will provide the planning board with a form of surety for review and approval to cover the cost of removal.

8.3.2 Utility Notification – No Ground Mounted Solar Photovoltaic Installation shall be constructed until evidence has been provided to the Building Inspector that the utility company that operates the electrical grid where the installation is to be located has been informed of the Project Proponent's intent to install the Ground Mounted Solar Photovoltaic Installation and connect it to the grid. Off grid systems shall be exempt from this requirement.

Proof of a notification to the local utility company will be provided to the municipality prior to start of construction.

8.3.3 Dimension and Density Requirement – Ground Mounted Solar Photovoltaic Installations shall comply with the same dimension and density requirements required in the underlying district except that for such facilities of 250 kw or greater the following shall apply:

8.3.3.1 Front, rear and side yard setbacks shall be a minimum 100 feet;

The front, side, and rear setbacks have been maintained and are shown on the plans in **Appendix B**. Please refer to Table 1 titled "Dimensional and Density Regulations" provided at the start of this Compliance with Bylaws Section of the Project Narrative for a summary of setbacks.

8.3.3.2 Access roads or driveways shall be setback at least 25 feet from side and rear lot lines;

The proposed access road has been setback at least 25 feet from the side and rear lot lines. Please refer to Table 1 titled "Dimensional and Density Regulations" provided at the start of this Compliance with Bylaws Section of the Project Narrative for a summary of setbacks.

8.3.3.3 The height of the structures at the tallest point shall not exceed twenty-five feet;

Acknowledged, the proposed ground-mounted solar energy system will not exceed 25 feet in height. Please refer to Table 1 titled "Dimensional and Density Regulations" provided at the start of this Compliance with Bylaws Section of the Project Narrative for a summary of setbacks.

8.3.3.4 The minimum lot size for a large-scale ground mounted photovoltaic installation is twelve (12) acres;

Acknowledged, the project site (Map 408, Lot 19.1) has a land area of 32.58 acres. Please refer to Table 1 titled "Dimensional and Density Regulations" provided at the start of this Compliance with Bylaws Section of the Project Narrative for a summary of setbacks.

8.3.4 Structures – All structures for largescale Ground Mounted Solar Photovoltaic Installations shall be subject to existing bylaws. All appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other.

Acknowledged, the only proposed appurtenant structures are equipment pads and electrical equipment including transformers. The proposed appurtenant structures shall be architecturally compatible with one another.

8.3.5 Visual Impact Mitigation - The plan for a Ground Mounted Solar Photovoltaic Installation shall be designed to maximize the preservation of on-site and abutting natural and developed features. In natural (undeveloped) areas, existing vegetation shall be retained to the greatest extent possible, especially where such vegetation provides a benefit to the natural environment. In developed areas, the design of the installation shall consider and incorporate human-designed landscape features to the greatest extent, including contextual landscaping and landscape amenities that complement the physical features of the site and abutting properties. Whenever reasonable, structures should be screened from view by vegetation and/or joined or clustered to avoid adverse visual impacts and be architecturally compatible with each other. Vegetation shall be of varieties native to New England and a mix of deciduous and evergreen species. Vegetative screening shall reach a mature form to effectively screen the installation within five years of installation. The mature height of the vegetated screening shall be such that the installation's structures are not apparent to a person upon any public road and viewing the installation from a height of 10 feet. Planting of the vegetative screening shall be completed prior to final approval of the photovoltaic installation by the Building Inspector.

The site has been designed to preserve the on-site and abutting natural and developed features. The project does not propose any clearing of wooded areas onsite; maintaining existing screening of the site to the maximum extent practicable. The site is currently used for agricultural purposes and due to the agrivoltaic, dual -use, nature of the solar photovoltaic design, the site can continue to be used for agricultural purposes.

8.3.6 Design Standards – Projects shall be designed to:

8.3.6.1 Minimize the volume of cut and fill, the number of removed trees 10" caliper or larger, the length of removed stone walls, the area of wetland vegetation displaced, the extent of storm water flow increases from the site, soil erosion and threat of air and water pollution.

The proposed project minimizes the amount of cut and fill volume to the maximum extent practicable. There is no grading proposed for the solar PV ground mount array installation. The proposed project only requires minor grading of the equipment pad area, gravel access road and a grass swale to manage stormwater runoff.

8.3.6.2 Maximize pedestrian and vehicular safety both on the site and entering and exiting the site;

The proposed gravel access road is depicted on the site plans and provide access to the solar array area and electrical equipment. The road has been designed with turning radii large enough for a ladder fire truck. The site will be clearly marked as a construction zone while under construction, and is not intended for public access.

8.3.6.3 Minimize obstruction of scenic views from publicly accessible locations;

The site is not expected to cause obstruction of scenic views from publicly accessible locations.

8.3.6.4 Minimize visual intrusion by controlling the visibility of parking, storage, or other outdoor service areas viewed from public ways or premises residentially used or zoned;

The project does not propose any permanent parking, storage, or other outdoor service areas.

8.3.6.5 Minimize glare from headlights and light trespass;

Acknowledged. The site is bounded by woodland to the west and south which will provide screening along these boundaries. The site is bounded by Chester Road on the north and east. The solar panels are setback according to the Town of Blandford requirements and are not proposed closer than 108 feet to the road. There is not any anticipated glare from headlights and/or light trespass.

8.3.6.6 Ensure adequate access to each structure for fire and service equipment and adequate provision for utilities and storm water drainage.

No buildings are proposed on site. The proposed gravel access road is depicted on the site plans and provide access to the solar array area and electrical equipment. The road has been designed with turning radii large enough for a ladder fire truck in case of emergency. Electrical utilities, and stormwater management best management practices are proposed on site. See Sheets C101 and C102 in the site plans included in Appendix B.

8.3.6.7 Site Lighting – Lighting of Ground Mounted Solar Photovoltaic Installations shall be consistent with local, state, and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the Ground Mounted Solar Photovoltaic Installation shall be directed downward and shall incorporate full cutoff fixtures to reduce light pollution.

Not applicable. There is no lighting proposed for this project.

8.3.6.8 Signage – No signage on Ground Mounted Solar Photovoltaic Installations is permitted other than those required to identify voltage and electrocution hazards as well as the owner and provide a 24-hour emergency contact phone number. Ground Mounted Solar Photovoltaic Installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of Ground Mounted Solar Photovoltaic Installation.

The required signage will be posted on the equipment pad fencing. Refer to detail sheet C502 in the drawings included in Appendix B for the proposed signage. A 24-hour contact number will be posted to the equipment pad fencing. This number can be called for general information or emergencies related to the system. Advertising will not be displayed anywhere at the site.

8.3.6.9 Utility Connections – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the Ground Mounted Solar Photovoltaic Installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

The proposed solar energy system includes underground electrical lines from the panels to the equipment pads and electrical equipment housings. From the electrical equipment pad an electrical line will run underground to the first utility pole which will include a riser to bring electric utility above ground. There will be approximately six new utility poles that will be used to reach the point of interconnection on Chester Road. The Applicant intends to provide underground electrical lines where efforts allow, but will place above ground wiring where required by the utility provider.

8.3.7 Safety and Environmental Standards

8.3.7.1 Emergency Services – The Ground Mounted Solar Photovoltaic Installation Project Proponent shall provide a copy of the project summary, electrical schematic, and sit(e) plan to the local fire chief. Upon request the Project Proponent shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the Ground Mounted Solar Photovoltaic Installation shall be clearly marked. The Project Proponent shall identify a responsible person for public inquiries throughout the life of the installation.

Acknowledged. The owner and/or operator will submit a copy of the project summary (this Project Narrative), electrical schematic (Appendix C), and site plan (Appendix B) to the local fire chief. A copy of the Solar Operation and Maintenance Plan is included in Appendix G. Upon the town's request, the owner/operator will work with local emergency services to develop an emergency response plan. Emergency shutdown procedures will be clearly marked, and the owner/operator will identify and publicly list the contact number for a responsible person for public inquiries.

8.3.7.2 Land Clearing, Soil Erosion and Habitat Impacts – Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Ground Mounted Solar Photovoltaic Installation or otherwise prescribed by applicable laws, regulations, and bylaws. Such installations shall not occur on any slopes greater than 15& in order to minimize erosion. No more than 50% of the land parcel utilized for Ground Mounted Solar Photovoltaic Installations shall contain land requiring clearing of forest.

The project does not propose any clearing of wooded areas onsite; maintaining existing screening of the site to the maximum extent practicable. The proposed solar installation is not placed on any slopes greater than 15%.

8.3.7.3 No topsoil shall be removed from the land parcel under consideration for Ground Mounted Solar Photovoltaic Installation. If earthworks operations are required, topsoil shall be stockpiled within the property bounds and protected against erosion until such earthwork operations are completed and topsoil can be re-spread over parcel. Earthworks shall be planned to limit export of soil material (non-topsoil) to 1000 cubic yards per acre affected by installation. A detailed earthworks estimate is a required submittal component proving this quantity is maintained.

There is no grading proposed for the solar PV installation. The proposed project requires only minor grading of the equipment pad area, gravel access road and a grass swale to manage stormwater runoff. No topsoil shall be removed from the parcel, and any topsoil stockpiled within the property boundaries will be protected against erosion until it can be re-spread within the parcel boundaries. As grading has been limited to the maximum extent practicable, a detailed earthworks estimate has not been included.

8.3.7.4 Impact on Agricultural and Environmentally Sensitive Land- The Ground Mounted Solar Photovoltaic Installation shall be designed to minimize impacts to agricultural and environmentally sensitive land and to be compatible with continued agricultural use of the land whenever possible. No more than 50% of the total land area proposed for the Ground Mounted Solar Photovoltaic Installation may be occupied by the solar panels, with the remainder of the land remaining as undeveloped open space left in its natural state.

The site has been designed to preserve the on-site and abutting natural and developed features. The site is currently used for agricultural purposes and due to the agrivoltaic, dual -

use, nature of the solar photovoltaic design, the site can continue to be used for agricultural purposes. The lot coverage by the Ground Mounted Solar Photovoltaic Installation (solar panels only) is approximately 15% and less than the maximum 50% lot coverage requirement.

8.3.7.5 Vegetation Management – Herbicides, pesticides, or chemical fertilizers shall not be used to manage vegetation at the Ground mounted Solar Photovoltaic Installation. Mowing, grazing, or using geotextile materials underneath the solar array are possible alternatives. Low growing grasses are optimal. Other grasses must be regularly mowed or grazed so as to minimize the amount and height of "fuel" available in case of fire.

Herbicides, pesticides, and chemical fertilizers will not be used onsite. Mowing and/or farming will be completed as part of the site maintenance. Please refer to the Solar Operation & Maintenance Schedule included in Appendix G for more information regarding vegetation management.

8.3.7.6 All land associated with the Ground Mounted Solar Photovoltaic Installation shall be covered and grown in natural vegetation. All ground surface areas beneath solar arrays and setback areas shall be pervious to maximize onsite infiltration of storm water. Impervious paving of areas beneath solar arrays is prohibited. To the greatest extent possible, a diversity of plant species shall be used, with preference given to species that are native to New England. Use of plants identified by the most recent copy of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources is prohibited.

The existing site is a meadow field used for agricultural purposes. The proposed solar PV installation will not change the underlying vegetation of the site. All ground surface beneath solar arrays will remain pervious. Any disturbance to the meadow field will be repaired/reseeded with Timothy Hay and Clover. For further information regarding seeding materials see Soil Erosion and Sedimentation Control Notes and Specifications Sheet C001 included in the Site Plans located in Appendix B.

8.3.8 Monitoring and Maintenance

8.3.8.1 Maintenance – The Project Proponent shall maintain the Ground Mounted Solar Photovoltaic Installation in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, fencing and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The Project Proponent shall be responsible for the cost of maintaining the Ground Mounted Solar Photovoltaic Installation and any access road(s) not accepted as public ways.

Acknowledged. The owner and/or operator will maintain the facility in good condition. Maintenance responsibilities include the items listed in the above regulation, please refer to the Solar Operation and Maintenance Plan included in Appendix G for further information regarding site maintenance. Site access to the equipment pad will be provided with chain link fence as required by the NEC. The owner/operator will be responsible for the cost of maintaining the solar installation and gravel access road.

8.3.8.2 Modifications – All material modifications to a Ground Mounted Solar Photovoltaic Installation made after issuance of the required building permit shall require approval by the Special Permit and Site Plan Review Authority.

Acknowledged, any material modifications to the solar installation after receipt of the building permit will be submitted to the Planning Board for approval. Please note it is unlikely that material modifications will be made after the building permit is received.

8.3.9 Outside Consultant Fees – In accordance with G.L. c.44, §53G, the Planning Board is authorized to retain such registered professional engineers, architects, landscape architects, attorneys, or other professional consultants as may be necessary in the Planning Board's opinion to review and advise the Board on any or all aspects of applications submitted under this Section VII. The applicant shall be responsible for the cost of such review, and the Planning Board may request the applicant to deposit funds for such review with the Planning Board in advance of such review and to replenish such funds as necessary at the Planning Board's request. Failure to provide such funds or to pay costs of such professional review when due shall be good grounds for denial of an application.

Acknowledged, the application fee, including consultant fees, will be paid prior to the start of the review process.

8.3.10 Waivers – The Planning Board may, upon the prior written request of the applicant and by a 2/3 majority affirmative vote of the members of the Board, waive any of the requirements of this Section VIII, but must state their reasons for doing so in writing as part of their decision.

Acknowledged, no waivers are requested at this time.

SECTION IX: SITE PLAN REVIEW AND SPECIAL PERMITS

9.1 SITE PLAN REVIEW

9.1.1 Purpose

9.1.1.1 To the health, safety, and general welfare of the inhabitants of the Town of Blandford;
9.1.1.2 To promote attractive and viable residential, business, and agricultural districts; and
9.1.1.3 To protect the rural character, aesthetic visual qualities, natural environmental features, historical features and property values of the Town of Blandford and neighboring properties.

Acknowledged, the dual-use agrivoltaic nature of the project will maintain the rural character of the site.

9.1.2 Projects Requiring Site Plan Review

No building permit shall be issued and no application for such permits shall be accepted for construction, exterior alteration, relocation, or change in use except where noted in Section 6.8.3, unless a site plan has been endorsed by the Planning Board, after consultation with other boards, including but not limited to the following: Building Inspector, Board of Health, Board of Selectmen, Historical Commission, Conservation Commission, Highway Department, Fire Department and Police Department. The Planning Board may waive any or all requirements of site plan review for external enlargements of less than 10% of the existing floor area.

Acknowledged, this combined Special Permit and Site Plan Review Application Package is being submitted for endorsement by the Planning Board.

9.1.3 Exemptions from Site Plan Review

Site plan review shall not be required for:

9.1.3.1 The construction or enlargement of any single family or two-family dwelling or building accessory to such dwelling;

9.1.3.2 Any building used exclusively for agriculture, horticulture, or floriculture.

Acknowledged, not applicable.

9.1.4 Application Procedure

9.1.4.1 Each application for Site Plan Review shall be submitted to the Planning Board by the current owner of record, accompanied by nine (9) copies of the site plan. The applicant shall file a copy of the application with the Town Clerk and the Tax Collector.

Acknowledged, nine copies of this combined Special Permit and Site Plan Review Application Package, including site plans, has been submitted to the Planning Board. A copy of this application package has been filed with the Town Clerk and Tax Collector.

9.1.4.2 The Planning Board shall obtain with each submission a deposit sufficient to cover any fees connected with a public hearing and review of plans, including the cost of any engineering or planning consultant services for review purposes.

Acknowledged, the application fee, including consultant fees, will be paid prior to the start of the review process.

9.1.4.3 The following information shall be filed at the time of application: a site plan, which shall include landscape, utility and drainage information, building elevations as illustrated further in Section 6.8.5, and a traffic plan.

Site Plans have been included in this application package as **Appendix B**.

9.1.5 Required Site Plan Contents

9.1.5.1 An architect, landscape architect, or professional engineer duly licensed by the Commonwealth of Massachusetts shall prepare all site plans unless the Planning Board waives this requirement because of unusually simple circumstances. All site plans shall be on standard 24" x 36" sheets at a scale of one inch equaling 20 feet, with additional narrative, as necessary. Site plans shall include the following information:

(a) Name of the project-locus, date and scale plan;
Acknowledged and included in **Appendix B.**

(b) Name and address of the owner of record, developer, and seal of the engineer, landscape architect or engineer;
Acknowledged and included in **Appendix B.**

(c) The location and boundaries of the lot, adjacent streets or ways, names of owners and location of all adjacent properties and those within 300 feet of the property line, and any relevant zoning district boundaries;
Acknowledged and included in **Appendix B.**

(d) Existing and proposed topography at the two-foot contour interval, the location of wetlands, streams, water bodies, drainage swales, areas subject to flooding and base flood elevations and unique natural land features;
Acknowledged and included in **Appendix B.**

(e) Existing and proposed structures, including dimensions and elevations; and all exterior entrances and exits;
Acknowledged and included in Appendix B.

(f) The location of existing and proposed parking and loading areas, public and private ways, driveways, walkways, sidewalks, curbing, access and egress points;
Acknowledged and included in Appendix B.

(g) The location and description of all proposed septic systems, a soil percolation test, water supply, storm drainage systems including existing and proposed drain lines, culverts, drainage swales, catch basins, drainage calculations, and sub-drainage along with soil logs, utilities, hydrants, manholes, lighting fixtures, and refuse and other waste disposal methods and facilities;
This subsection is not applicable to the proposed site.

(h) Proposed landscape features including the location and a description of buffers, screening, fencing, and plantings, including the size and type of plants material;
This subsection is not applicable to the proposed site at this time.

(i) Location, dimensions, height, color, illumination and characteristics of existing and proposed signs;
This subsection is not applicable to the proposed site, except where the fenced equipment area will have a contact sign.

(j) The location and a description of proposed open space or recreation areas;
This subsection is not applicable to the proposed site.

(k) A lighting plan, including parking lot and building exterior lighting and any provision of light reduction through the use of shields, screening, or similar actions;
This subsection is not applicable to the proposed site.

(l) Estimated daily and peak-hour vehicle trips to be generated by the site and traffic flow patterns for vehicles and pedestrians showing adequate access to and from the site and adequate circulation within the site;
This subsection is not applicable to the proposed site. The long term traffic operation at the site is not anticipated to increase.

(m) A plan for the control of erosion, dust, and silt, both during and after construction sequencing, temporary and permanent erosion control, and protection of water bodies;
Acknowledged and included in Appendix B and Appendix G.

(n) For commercial uses, maximum areas of the building to be used for selling, offices, business or other uses, number of employees, seating capacity where applicable, and number of parking spaces required for intended use.
This subsection is not applicable to the proposed site.

The Planning Board may waive any information requirements it judges to be an unnecessary to the review of a particular plan. A request for a waiver(s) by an applicant must be made in writing by the applicant to the Planning Board.

9.1.6 Review Procedure

The Planning Board shall transmit one copy each to the Building Inspector, Board of Selectmen, Board of Health, Conservation Commission, Highway Department, Historical Commission, Fire Department, and Police Department, who shall review the application and submit their recommendations and comments to the Planning Board concerning:

9.1.6.1 The completeness and adequacy of the data and methodology used by the applicant to determine the impacts of the proposed development;
9.1.6.2 The effects of the projected impacts of the proposed development; and
9.1.6.3 Recommended conditions or remedial measures to accommodate or mitigate the expected impacts of the proposed development.
9.1.6.4 Failure of the above boards, commissions, committees, and town staff to make recommendations within 35 days of the referral of the application from the Planning Board shall be deemed to be lack of opposition.

Acknowledged.

9.1.7 Planning Board Decision

The Planning Board shall hold a public hearing within sixty-five (65) days of the receipt of an application deemed to be complete and after due consideration of the recommendations received, the Board shall take final action within 90 days from the time of hearing. The Planning Board's final action in writing shall consist of either:

9.1.7.1 Approval of the site plan based on a determination that the proposed project will constitute a suitable development and is in compliance with the standards set forth in this bylaw;
9.1.7.2 Disapproval of the site plan based on a determination that the application was incomplete and insufficient information was submitted to review the proposal; or

9.1.7.3 Approval of the project subject to any conditions, modifications and restrictions which will ensure that the project meets the Criteria for Review.

The period of review for a special permit requiring site plan review shall be the same as any other special permit and shall conform to the requirements of state Zoning Act, M.G.L. Chapter 40A. Specifically, a joint public hearing to address the Special Permit application and Site Plan Review application shall be held within sixty-five (65) days of the filing of a special permit application with the Planning Board or Board of Appeals. The Planning Board shall then have 90 days following the public hearing in which to act.

Acknowledged.

9.1.8 Criteria for Review

The following criteria and guidelines shall be used by the Planning Board in evaluating the Site Plan and all information submitted as part of the application:

9.1.8.1 The site plan conforms with all appropriate provisions of the Zoning Bylaw.

Plans in substantial conformance with the requirements of Section 8.3.1.2 (a) are included in Appendix B.

9.1.8.2 The site plan minimizes traffic and safety impacts of the proposed development on adjacent highways or roads and maximizes the convenience and safety of vehicular and pedestrian movement within the site.

The proposed gravel access road is depicted on the site plans and provides access to the solar array area and electrical equipment. The road has been designed with turning radii

large enough for a ladder fire truck. The site will be clearly marked as a construction zone while under construction, and is not intended for public access. There are no long-term traffic impacts as part of the construction of this array. Impacts to traffic during construction are expected to be minor.

9.1.8.3 The proposed development, to the extent feasible:

(a) is integrated into the existing landscape and protects abutting properties;
(b) minimizes adverse environmental impacts on such features as wetlands, floodplains, and aquifer recharge areas;
(c) minimizes obstruction of scenic views from publicly accessible locations;
(d) preserves unique natural or historical features;
(e) minimizes removal of trees, vegetation, and soil and grade changes,
(f) maximizes open space retention;
(g) screens objectionable features from neighboring properties and roadways;
(h) complies with all State and Federal requirements for handicap access; and
(i) offsite impacts from noise, temperature, and wind conditions.

The dual-use agrivoltaic nature of the project will maintain the rural character of the site and existing landscape. The project does not pose environmental impacts and does not propose any disturbance to wetland resource areas or buffer areas. The project does not propose any clearing of wooded areas onsite; maintaining existing screening of the site to the maximum extent practicable. The project requires only minor grading for the gravel access road and stormwater management swale. The project will not be accessible to the public and thus does not need to comply with State and Federal handicap requirements. The project will not cause impacts to the existing noise, temperature, or wind conditions onsite.

9.1.8.4 The architectural design, layout and landscaping of the proposed development is in harmony with the historic, rural character of the neighborhood and the Town of Blandford

The dual-use agrovoltaic nature of the project will maintain the rural character of the site and existing landscape.

9.1.8.5 The proposed development is served with adequate water supply and waste disposal systems and will not place excessive demands on Town services and infrastructure.

The solar installation will not require water or sewer utilities and thus will not affect demands on Town services or infrastructure.

9.1.8.6 The site plan shows adequate measures to prevent pollution of surface or groundwater, to minimize erosion and sedimentation, to prevent changes in groundwater levels, and potential for flooding, and a stormwater management plan prepared in accordance with good engineering, hydrologic and pollution control practices.

The proposed solar installation does not cause pollution or stormwater pollutants, and the site will not use pesticides, herbicides, or chemical fertilizers that could cause pollution of surface or groundwater. The site has been designed to minimize erosion and sedimentation, please refer to the Soil Erosion and Sedimentation Control Notes and Specifications in Appendix B. A stormwater management plan has been included in the Stormwater report provided in Appendix H.

9.1.9 Enforcement

9.1.9.1 The Planning Board may require the posting of a bond or other adequate security to assure compliance with the site plan and conditions and may suspend any permit or license when work is not performed as required.

Acknowledged, adequate security will be provided if the Planning Board requires it.

9.1.9.2 Any site plan issued under this section shall lapse within one (1) year if a substantially complete use (as defined in this zoning bylaw) thereof has not commenced sooner except for good cause. The time required to pursue and await determination of a judicial appeal pursuant to Chapter 40A of the General Laws shall be included within the one (1) year time limit.

Acknowledged.

9.1.9.3 The Planning Board may periodically amend or add rules and regulations relating to the procedures and administration of this section.

Acknowledged.

9.2 SPECIAL PERMITS

9.2.1 Special permit Granting Authority

Unless specifically designated otherwise, the Board of Appeals shall act as the Special Permit Granting Authority.

Acknowledged, according to Section 4.3.1.6 in the Bylaws, "Ground Mounted Solar Photovoltaic Installation – requires a Special Permit and Site Plan Review issued by the Planning Board in accordance with Section VII and IX.

9.2.2 Criteria

Special permits shall be granted by the Special Permit Granting Authority, unless otherwise specified herein, only upon its written determination that the adverse effects of the proposed use will not outweigh its beneficial impacts to the town or the neighborhood, in view of the particular characteristics of the site, and of the proposal in relation to that site. In addition to any specific factors that may be set forth in this By-Law, the determination shall include consideration of each of the following:

a) Social, economic, or community needs which are served by the proposal;
b) Traffic flow and safety, including parking and loading;
c) Adequacy of utilities and other public services;
d) Neighborhood character and social structures;
e) Impacts on the cultural, historical, and natural environments; and
f) Potential fiscal impact, including impact on town services, tax base, and employment.

Acknowledged, there is no anticipated impact to the tax base, utilities, or services as part of this project. To promote the overall wellbeing of the Town of Blandford, Bluewave, on behalf of Peebles Brook, LLC, would enter into a long-term Payment In Lieu of Taxes (PILOT) agreement with the Town of Blandford, which can provide a reliable and consistent tax benefit to the Town during the life of the project.

9.2.3 Procedures

An application for a special permit shall be filed in accordance with the rules and regulations of the Special Permit Granting Authority.

Acknowledged, this combined Special Permit and Site Plan Review Application Package has been filed in accordance with the rules and regulations of the Planning Board in conjunction with the Site Plan Review Application Package.

9.2.4 Conditions

Special permits may be granted with such reasonable conditions, safeguards, or limitations on time or use, including performance guarantees, as the Special Permit Granting Authority may deem necessary to serve the purposes of this By-Law.

Acknowledged, the applicant understands special permits may be granted with conditions or limitations.

9.2.5 Plans

An applicant for a special permit shall submit a plan as required by and in substantial conformance with the rules and regulations of the Special Permit Granting Authority. The provisions of this Section should not apply to applications for special permits to reconstruct, extend, alter, or structurally change a nonconforming single or two-family structure. The SPGA shall establish procedures governing such applications by regulation.

Plans in substantial conformance with the requirements of Section 8.3.1.2 (a) are included in **Appendix B.**

9.2.6 Regulations
The Special Permit Granting Authority may adopt rules and regulations for the administration of this section.

Acknowledged.

9.2.7 Fees
The Special Permit Granting Authority may adopt reasonable administrative fees and technical review fees for applications for special permits.

Acknowledged, the application/administrative fees, including consultant fees, will be paid prior to the start of the review process.

9.2.8 Lapse
Special permits shall lapse within 24 months, not including the time required to pursue or await the determination of an appeal referred to in G.L. c. 40A, s.17, from the grant thereof, if a substantial use thereof has not sooner commenced except for good cause or, in the case of permit for construction, if construction has not begun by such date except for good cause.

Acknowledged.

SECTION XVI: BATTERY ENERGY STORAGE SYSTEMS

16.1 PURPOSE

The purpose of this bylaw is to provide for the construction and operation of Battery Energy Storage Systems (BESS) and to provide standards for the placement, design, construction, monitoring, modification and removal of energy storage systems that address public safety, minimize impacts on scenic, natural and historic resources of the Town of Blandford and provide adequate financial assurance for decommissioning. The provisions set forth in this section shall take precedence over all other sections when considering applications related to the construction, operation, and/or repair of Battery Energy Storage Systems.

Acknowledged.

16.2 DEFINITIONS

BATTERY OR BATTERIES – a single cell or a group of cells connected together electrically in series, in parallel, or a combination of both, which can charge, discharge, and store energy electrochemically. For the purposes of this bylaw, batteries utilized in consumer products are excluded from these requirements.

BATTERY ENERGY STORAGE SYSTEM – a physical container providing secondary containment to one or more battery cells for storing electrical energy derived from solar or sourced directly from the grid that is equipped with cooling, ventilation, fire suppression, and an electronic battery management system. It may be a primary use or accessory to a solar energy facility, power generation facility, an electrical sub-station, or other similar uses. A Battery Energy Storage System can be classified as a Tier 1, Tier 2, or Tier 3 Battery Energy Storage System, as follows:

A. Tier 1 Battery Energy Storage Systems are defined as those that have an aggregate energy capacity up to 20kWh and greater and, whose purpose is to store energy from residential solar energy systems if in a room or enclosed area, consist of only a single energy storage system technology.

The facility must comply with the State's electrical code (527 CMR. 12.00) and the State's Fire Code (527 CMR 1.00).

B. Tier 2 Battery Energy Storage Systems are defined as those that are interconnected to utility distribution lines and have an aggregate energy capacity greater than 20kWh but less than or equal to 10 Megawatts. The facility must comply with the State's electrical code (527 CMR. 12.00) and the State's Fire Code (527 CMR 1.00).

C. Tier 3 Battery Energy Storage Systems are defined as those that are interconnected to high voltage transmission lines and have an aggregate energy capacity greater than 10 Megawatts. The facility must comply with the State's electrical code (527 CMR. 12.00) and the State's Fire Code (527 CMR 1.00).

Acknowledged. This site would utilize a Tier 2 battery system.

16.3 APPLICABILITY

A. Building-integrated Battery Energy Storage Systems
   1. Battery Energy Storage Systems that are building-integrated, whether a residential or commercial building, energy storage systems shall not be erected, constructed, installed, or modified as provided in this section without first obtaining a building permit from the Building Inspector.
   2. Building-integrated energy storage systems may be coupled with rooftop solar or behind the meter applications for peak shaving.
   3. Building-integrated battery energy storage systems may be located in any zoning district within the Town of Blandford.

B. Co-located Battery Energy Storage Systems
   1. Battery Energy Storage Facilities are encouraged to co-locate with solar photovoltaic installations, energy, power generation stations, and electrical sub-stations.
   2. Battery Energy Storage Systems associated with on-site solar power generation shall be permitted in all districts where solar photovoltaic installations are permitted with a Special Permit and Site Plan Approval, and shall be subject to the requirements of this Zoning Bylaw applicable to the co-located solar photovoltaic installations, in addition to the requirements set forth herein.

C. Battery Energy Storage systems not associated with on-site solar generation shall only be permitted in the Agricultural Zoning District and shall require a Special Permit from the Planning Board.

D. Modifications to, retrofits or replacements of an existing battery energy storage system that increase the total battery energy storage system designed discharge duration or power rating shall be subject to this bylaw.

Acknowledged. This battery system would be co-located on site with the proposed solar system. The system is within the Agricultural District in the Town of Blandford.

16.4 GENERAL REQUIREMENTS

A. All Tier 2 and 3 battery energy storage systems shall require a special permit and site plan approval by the Planning Board prior to construction, installation, or modification as provided in this bylaw.

B. The construction, operation, and decommissioning of all battery storage energy storage systems shall be consistent with all applicable local, state, and federal requirements, including but not limited to all applicable environmental, safety, construction, fire, and electrical requirements.

C. A building permit and an electrical permit shall be required for installation of all battery energy storage systems.

Acknowledged.

16.5 APPLICATION MATERIALS

A. In addition to requirements for Special Permit and Site Plan Approval, in accordance with Section IX, the application shall include the following:

1. A site plan prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts, that shows the following:
   a. An existing conditions plan with property lines and physical features, including topography and roads, characteristics of vegetation (trees- mature, old growth, shrubs, open field, etc), wetlands, streams, ledge, for the project site;
   b. Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems; including total acreage of disturbed area, total vegetation cleared, not including mowed fields;
   c. Trees with a DBH of 20" or greater within project parcel(s) shall be identified to determine tree loss, along with inventorying of diseased or hazard trees slated to be removed due to proposed development;
   d. Property lines and physical dimensions of the subject property with contour intervals of no more than 10 feet;
   e. Property lines of adjacent parcels within 30 feet;
   f. Location, dimensions, and types of existing major structures on the property;
   g. Location of the proposed battery energy storage structures, foundations, and associated equipment;
   h. The right-of-way of any public road that is contiguous with the property;
   i. Any overhead or underground utilities;
   j. At least one color photograph of the existing site, measuring eight inches by 10 inches.
   k. Locations of floodplains or inundation areas for moderate or high hazard dams;
   l. Locations of local or National Historic Districts.
   m. Stormwater management and erosion and sediment control

   Acknowledged. Plans in conformance with Section 16.6 of the bylaw have been included in Appendix B.

2. A preliminary equipment specification sheet that documents the proposed battery energy storage system components, inverters and associated electrical equipment that are to be installed, including manufacturer and model. A final equipment specification sheet shall be submitted prior to the issuance of building permit;

   Acknowledged in included in Appendix C.

3. One- or three-line electrical diagram showing associated components, and electrical interconnection methods, with all NEC compliant disconnects and overcurrent devices;

   Acknowledged. A SLD is included withing Appendix C.

4. Contact information and signature of the project proponent, as well as all co- proponents, if any, and all property owners;

   Acknowledged and included in Appendix F.

5. Contact information and signature of agents representing the project proponent, if any;

   Acknowledged. Contact for Weston & Sampson Engineers has been included on the Cover Letter.

6. Contact information for the person(s) responsible for public inquiries throughout the life of the system;

   Acknowledged. Peebles Brook, LLC would be responsible for the life of the system and can be contacted at 617-256-2120.

7. An operations and maintenance plan for Battery Energy Storage System. Such plan shall describe continuing battery energy storage system maintenance and property upkeep, as well as design, construction, installation, testing and commissioning information;

   Acknowledged and included within Appendix G.

8. Energy Storage System technical specifications, including manufacturer and model;

   Acknowledged and included in Appendix C.

9. Electrical schematic;

   Acknowledged and included in Appendix C.

10. Documentation that shows the owner of the Energy Storage System has site control, which shall include easements and access roads;

    Acknowledged. Site control has been included in Appendix F.

11. Documentation that shows the owner of the Energy Storage System has notified the electric utility of this installation.

    Acknowledged. A copy of the interconnection application has been included in Appendix C.

12. Emergency Operations Plan. A copy of the approved Emergency Operations Plan shall be given to the system owner, the local fire department, and local fire code official. A permanent copy shall also be placed in an approved location to be accessible to facility personnel, fire code officials, and emergency responders. The emergency operations plan shall include the following information:
    a. Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe start-up following cessation of emergency conditions.
    b. Procedures for inspection and testing of associated alarms, interlocks, and controls.
    c. Procedures to be followed in response to notifications from the Battery Energy Storage Management System, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure.
    d. Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions.

Procedures can include sounding the alarm, notifying the fire department, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire.

e. Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required.
f. Procedures for dealing with battery energy storage system equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged battery energy storage system equipment from the facility.
g. Other procedures as determined necessary by the Town to provide for the safety of occupants, neighboring properties, and emergency responders.
h. Procedures and schedules for conducting drills of these procedures and for training local first responders on the contents of the plan and appropriate response procedures.

Acknowledged. The Applicant kindly requests that the submission of an Emergency Operations Plan prior to construction be made a condition of the Special Permit. Thus, allowing the response plan to be formulated around the finalized equipment prior to construction.

13. Proof of liability insurance: The applicant shall be required to provide evidence of liability insurance in an amount and for a duration sufficient to cover loss or damage to persons and property caused by the failure of the system.

Acknowledged. Proof of Liability Insurance has been included in **Appendix D.**

14. A noise study, prepared by a qualified individual with experience in environmental acoustics, to assess the impact of all noise sources generated from the project to abutting properties, and determine the appropriate layout, design, and control measures. The report should include details of assessment methods, summarize the results, and recommend the required outdoor as well as any indoor control measures.

Acknowledged. Noise calculation based on the proposed equipment for this site have been included in **Appendix K.**

15. Pollinator-Friendly Certification. No Battery Energy Storage System shall be constructed until proof has been given to the Site Plan Approval Authority that the project proponent has obtained Pollinator-Friendly Certification for the Battery Energy Storage System through the UMass Clean Energy Extension Pollinator-Friendly Certification Program at a minimum of the Certified Certification Level, or other equivalent certification as determined by the Planning Board. This certification must be maintained throughout the life of the installation.

The Applicant kindly requests that this requirement be waived. The site as proposed is, and will stay, in agricultural use.

16.6 DESIGN AND SITE STANDARDS

A. All battery energy storage systems that require a special permit and site plan approval shall be set back a minimum of 100 feet from all side, rear, and front lot lines.

Acknowledged.

B. In addition to the standards for Special Permit and Site Plan Approval, in accordance with Section IX, the applicant shall adhere to the following standards and provide such information on the site plan:

1. Utility Lines. All on-site utility lines shall be placed underground to the extent feasible and as permitted by the serving utility.

   Acknowledged. Utility lines have been placed underground, except where required by the local Utility.

2. Signage. The signage shall include the type of technology associated with the systems, any special hazards associated, the type of suppression system installed, and 24-hour emergency contact information. All information shall be clearly displayed on a light reflective surface. Clearly visible warning signs concerning voltage shall be placed at the base of all pad-mounted transformers and substations.

   Acknowledged. Upon selection of final equipment, signage detailing the special hazards, type of suppression system, and 24-hour contact information will be submitted to the Planning Board and Fire Chief for approval. The Applicant kindly requests this be made a condition of the Special Permit.

3. Lighting. Lighting of the systems shall be limited to that minimally required for safety and operational purposes and shall be reasonably shielded and downcast from abutting properties.

   Acknowledged. No lighting is proposed.

4. Vegetation and Tree-Cutting. Areas within ten (10) feet on each side of a system shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees or shrubbery and cultivated ground covers such as green grass, ivy, succulents, or similar plants shall be exempt provided that they do not form a means of readily transmitting fire. Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the system and that which is otherwise prescribed by applicable bylaws and regulations.

   Acknowledged. The proposed battery system is to be placed on a concrete equipment pad.

5. Noise. The 1-hour average noise generated from the systems, components, and associated ancillary equipment shall not exceed a noise level of 60 dBA as measured at the property line.

   Acknowledged, noise calculations have been included in Appendix K.

16.7 SPECIAL PERMIT CRITERIA

A. The Planning Board may approve an application if the Board finds that the system complies with the Special Permit and Site Plan Approval criteria and with the conditions for granting Special Permits. Battery energy storage systems shall also satisfy the following additional criteria: Environmental features of the site are protected, and surface runoff will not cause damage to surrounding properties or increase soil erosion and sedimentation of nearby streams and ponds.

1. The Planning Board may also impose conditions as it finds reasonably appropriate to safeguard the town or neighborhood including, but not limited to, screening, lighting, noise,

fences, modification of the exterior appearance of electrical cabinets, battery storage systems, or other structures, limitation upon system size, and means of vehicular access or traffic features.

2. No occupancy permit shall be granted by the Building Commissioner, nor shall the site be energized or interconnected to the utility until the Planning Board has received, reviewed, and approved an as-built plan that demonstrates that the work proposed on the approved site plan, including all stormwater management components and associated off-site improvements, have been completed in accordance with the approved plan and certified same to the Building Commissioner.
3. The Planning Board may, in its discretion, approve an as-built plan upon provision of a proper bond, covenant, or third-party agreement to secure incomplete work where such work is not immediately necessary for lawful operation of the system without negative effect on public health and safety and surrounding properties.
4. The applicant shall make every effort to coordinate necessary surveying and finalization of the as-built plans and submission of required construction control documents prior to the conclusion of construction. Notwithstanding the above, a temporary occupancy permit may be granted with the approval of the Planning Board subject to conditions for completion of work imposed by the Board.

Acknowledged.

16.8 DECOMMISSIONING

A. As part of the applicant's submission to the Board, the applicant shall submit a decommissioning plan, to be implemented upon abandonment or in conjunction with removal from property. The plan shall include:
   a. A narrative description of the activities to be accomplished, including who will perform that activity and at what point in time, for complete physical removal of all battery energy storage system components, structures, equipment, security barriers, and transmission lines from the property.
   b. Disposal of all solid and hazardous waste in accordance with local, state, and federal regulations.
   c. The anticipated life of the battery energy storage systems.
   d. The estimated decommissioning costs and how said estimate was determined.
   e. The method of ensuring that funds will be available for decommissioning and restoration.
   f. The method by which the decommissioning cost will be kept current.
   g. The manner in which the site will be restored, including a description of how any changes to the surrounding areas and other systems adjacent to the battery energy storage system, such as, but not limited to, structural elements, building penetrations, means of egress, and required fire detection suppression systems, will be protected during decommissioning and confirmed as being acceptable after the system is removed.
   h. A listing of any contingencies for removing an intact operational battery energy storage system from service, and for removing an energy storage system from service that has been damaged by a fire or other event.

Acknowledged. A decommissioning plan and estimate have been included in **Appendix I.**

B. Decommissioning Fund. The owner and/or operator of the energy storage system, shall continuously maintain a fund or bond payable to the Town of Blandford, in an approved form for the removal of the battery energy storage system, in an amount to be determined by the Planning Board, for the period of the life of the facility. All costs of the financial security shall be borne by the applicant. The amount shall include a mechanism for calculating increased removal costs due to inflation.

Acknowledged. The decommissioning estimate has been escalated at a rate of 2.5% year over year for the estimated lifespan of the system.

C. An inspection of the completed decommissioned area shall be reviewed by a consultant hired by the Planning Board before approving the decommissioning work in accordance with the Decommissioning Plan. The owner and/or operator shall pay for the cost of this review with such payment being provided by the owner and/or operator prior to the consultant undertaking said review, in accordance with MGL Chapter 44, Section 53G.

Acknowledged.

16.9 SAFETY

A. System Certification. Battery energy storage systems and equipment shall be listed by a Nationally Recognized Testing Laboratory to UL 9540 (Standard for battery energy storage systems and Equipment) or approved equivalent, with subcomponents meeting each of the following standards as applicable:

i. UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications)
j. UL 1642 (Standard for Lithium Batteries)
k. UL 1741 or UL 62109 (Inverters and Power Converters)
l. Certified under the applicable electrical, building, and fire prevention codes as required.
m. Alternatively, field evaluation by an approved testing laboratory for compliance with UL 9540 (or approved equivalent) and applicable codes, regulations and safety standards may be used to meet system certification requirements.

Acknowledged. A specification sheet for the anticipated BESS has been included in **Appendix C.** The sheet lists the standards and certifications that the proposed system is compliant with.

B. Site Access. Battery energy storage systems shall be maintained in good working order and in accordance with industry standards. Site access shall be maintained, including snow removal at a level acceptable to the local fire department.

Acknowledged.

C. Battery energy storage systems, components, and associated ancillary equipment shall have required working space clearances, and electrical circuitry shall be within weatherproof enclosures marked with the environmental rating suitable for the type of exposure in compliance with NFPA 70.

Acknowledged.

16.10 ABANDONMENT

A. The battery energy storage system shall be considered abandoned when it ceases to operate consistently for more than twelve (12) months. The system shall be presumed abandoned if the owner and/or operator fails to respond affirmatively within thirty (30) days to a written inquiry from the Building Inspector as to the continued validity and operation of the system. If the owner or operator fails to comply with decommissioning upon any abandonment, the Town may, at its discretion, and utilize the available bond or surety for the removal of a system and restore the site in accordance with the decommissioning plan.

Acknowledged.

16.11 SEVERABILITY

If any provision of this By-Law is found to be invalid by a court of competent jurisdiction, the remainder of this By-Law shall not be affected but remain in full force. The invalidity of any provision of this By-Law shall not affect the validity of the remainder of the Blandford Zoning Bylaw.

Acknowledged.

Appendix A – Special Permit Application Form & Fee Checks

TOWN OF BLANDFORD, MASSACHUSETTS

PLANNING BOARD

1 Russell Stage Road, Blandford, MA 01008

Tel 1-413-848-4279 ext. 207, Fax 1-413-848-0908, E-mail: planning@townofblandford.com

SPECIAL PERMIT APPLICATION – GM SOLAR - MARIJUANA ESTABLISHMENTS

Town Use Only (Official Date Stamp below)

Received by ZBA/PB: (9 full sets) Received by Town Clerk **(1 full set):**

Building Inspector **(1 full set)**:

Section 1: SITE INFORMATION

Street Address 89 Chester Road, Blandford, MA 01008

Assessors Map # 408 Parcel # 19.1 District AG Registry of Deeds: Book 21051 Page 384

(Required for filing Board's Decision)

Land Area (acres or square footage) 32.5796 ac Town Maintained Road Lot Frontage: >300 ft

Any Portion in a Flood Plain? No

Section 2: APPLICANT INFORMATION

Applicant Name(s) and Address(es) Peebles Brook, LLC Contact: Marco Addonizio

116 Huntington Ave, Suite 601, Boston, MA 02116

(If applicant is a corporation or partnership – is copy of condition or similar document attached?) YES/NO Yes

Home Telephone # _____ Work # _____ Cell Phone # _____ E-mail maddonizio@bluewave.energy

317-380-3014

Section 3: I/WE REQUEST A SPECIAL PERMIT FOR

Description for proposed work or use: Project proposes the construction of a 4.04 megawatt (MW) direct current (DC) single-axis tracking solar photovoltaic (PV) installation with a battery energy storage system (BESS). The project will involve construction of a gravel access road and minor grading for stormwater management features.

Application is made under Section(s) Sections VIII & IX of the Blandford Zoning By-Law.

I hereby certify that the information above and on the Site-Plan is correct to the best of my knowledge and permission is granted for the site inspection.

Applicant: Peebles Brook, LLC **Co-Applicant** _____ **Date:** 03/18/2025

Site Plans (**9**+ copies + mylar, if applicable) attached ☒ Certified Abutters List attached ☒ Fee(s) enclosed ☒

PLEASE USE AN ADDITIONAL SHEET OF PAPER IF NECESSARY AND ATTACH IT TO THIS FORM ALONG WITH ANY OTHER INFORMATION YOU THINK MY BE HELPFUL IN PROCESSING YOUR APPLICATION. (MAPS, ETC.)

The Commonwealth of Massachusetts

Town of Blandford Planning Board

1 Russell Stage Road
Tel 1-413-848-4279 ext. 207
Fax 1-413-848-0908
Townofblandford.com/planning

SPECIAL PERMIT GENERAL INSTRUCTIONS

(Subject to Change)

Applicant Responsibilities

1. Two (2) copies of the Special Permit Application must be submitted to the Planning Board.
   - The Planning Board will forward the fully completed applications to
   - The Town Clerk, who will certify receipt of the fully completed Application.
2. The Application (Including Appeals) are used to schedule required public hearings and are not deemed complete until all required submissions including Site Plans, (9 sets plus mylar, if applicable) certified abutter's list, and fee(s) have been gathered and submitted to the Planning Board. The Planning Board will date/time stamp the application and forward it to the Town Clerk. Applicant(s) should contact the Board to see if additional information is required. **If the Application is deemed incomplete by the Board the "clock will stop" until the application is deemed complete**. Minimum requirements are as follows:
   - Detailed site plan drawn as nearly to scale as possible (typically 1"= 40'). stamped by the registered engineer, architect, or land surveyor including:
     - Lot dimensions, public way frontage, current and proposed applicable setbacks, existing and proposed buildings, structures, signs, lighting plans, driveway openings, driveways, service areas, other open uses, location of septic facilities and septic lines and well(s), refuse and other waste disposal, surface water drainage, and landscape features such as fences, walls, planted areas, and walks. Footprint(s) of existing and proposed structure(s) specifying distances to boundary lines and clear indication of boundary lines.
   - Written description of proposed project
     $300.00 or as required, nonrefundable application fee made payable to "Town of Blandford".
     Applications received on or before the first of the month will be placed on the <u>following</u> month's agenda *(i.e. Received 3/2 -4/1: On May Agenda.)*
   - Certified abutters list within 300 feet must be included with the application. Certified abutters lists can be procured through the Town of Blandford Assessors website for a $35.00 fee.
2. Reimburse town costs of legally mandated notifications for required public hearing:
   - Mailing cost of abutters notices
   - Legal notices, publication cost
3. Must attend the public hearing or have a legally appointed representative attend.
4. Submit <u>Notice for Recording in the Registry</u> to the Registry of Deeds.
   (This will be supplied by the Town Clerk after the 20-day appeal period.)

<u>Additional Requirements for Signs</u>

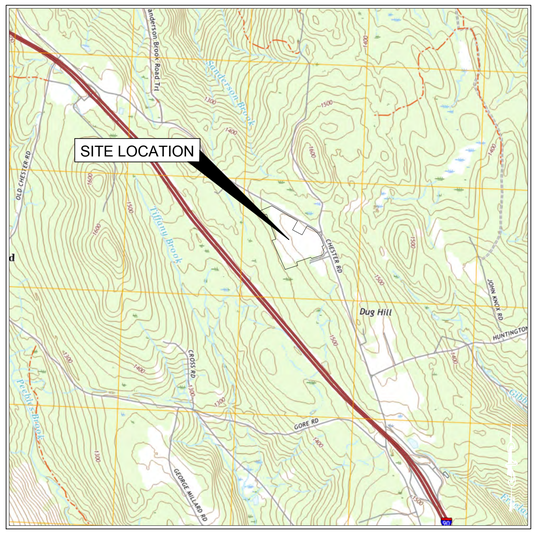
1. Place a stake in the ground at the site of proposed sign.
2. Member of the Board or third party will complete a site visit.
3. Photos of the site of the proposed sign must be submitted with application. Photos and dimensions of sign must be submitted **before the public hearing.**
4. Applicant will directly contact the Town Building Inspector/Zoning Enforcement Officer. Photos and/or drawings must be submitted to the above officer in addition to a copy of the application.
5. Written permission must be obtained for the property owner *(if owner is not applicant).*

Appendix B – Site Plans – Issued for Permitting

PEEBLES BROOK, LLC

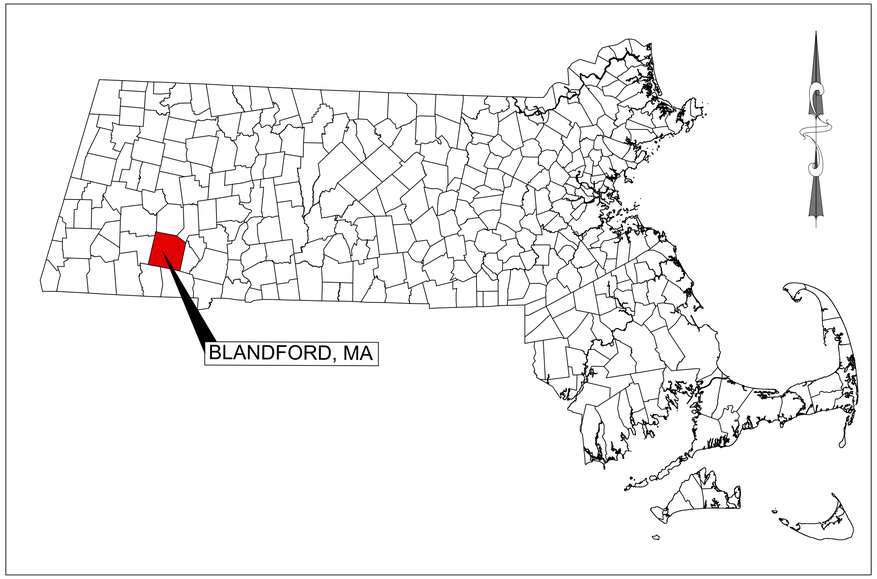
PROPOSED 4.04 MW DC SOLAR PHOTOVOLTAIC INSTALLATION, LARGE SCALE

89 CHESTER ROAD, BLANDFORD, MASSACHUSETTS



SITE LOCUS MAP

1" = 2,000'



MASSACHUSETTS MUNICIPAL MAP

NOT TO SCALE

SITE AERIAL MAP

1" = 1,000'

DRAWING INDEX	
DRAWING NUMBER	**DRAWING TITLE**
G001	COVER SHEET
G002	GENERAL NOTES
V101	EXISTING CONDITIONS PLAN
C001	SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND SPECIFICATIONS
C101	SITE LAYOUT PLAN
C102	GRADING, ACCESS AND UTILITY PLAN
C501	SOIL EROSION AND SEDIMENTATION CONTROL DETAILS
C502	CIVIL DETAILS
C503	DUAL USE SOLAR STANDARD AGRICULTURAL DETAILS
C504	DUAL USE SOLAR STANDARD AGRICULTURAL DETAILS

NOT FOR CONSTRUCTION

Project:
PEEBLES BROOK, LLC

89 CHESTER ROAD
BLANDFORD, MA 01008

Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

Client:

BLUEWAVE

Peebles Brook, LLC
116 Huntington Ave, Suite 601
Boston, MA 02116
tel: (617) 209-3122
https://bluewave.energy/

811 Know what's Below. Call before you dig.

No.	Description	Date
0	ISSUED FOR PERMITTING	03/28/25

Revisions

Seal:

COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41492
REGISTERED PROFESSIONAL ENGINEER
3/28/25

Issued For:

PERMITTING

Scale:	AS SHOWN
Issued Date:	03/28/2025
Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:

COVER SHEET

Sheet Number:

G001

I:\Projects\Bluewave Solar\Blandford - Chester Road\Design\Civil\2503 Sheets\01 - G001 Cover Sheet.dwg

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL CALL DIG SAFE AT 811 OR 1-888-DIG-SAFE AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIG SAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.

2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.

3. STONE WALLS, FENCES, CURBS, ETC., SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT.

4. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PROJECT AREA SHALL BE RESTORED AT THE CONTRACTORS EXPENSE.

5. NOTHING SHOWN OR OMITTED FROM THE DOCUMENTS PROVIDED SHALL RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, BYLAWS, AND ORDINANCES.

MATERIAL SPECIFICATIONS:

GEOSYNTHETICS:

1. GENERAL:
INSTALLATION OF GEOTEXTILE FABRICS SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND SPECIFIC LAYOUT PLANS AND DETAILS REVIEWED BY ENGINEER.

1. WOVEN GEOTEXTILE:
THE WOVEN GEOTEXTILE SHALL BE TENCATE MIRAFI HP270 FABRIC, OR APPROVED EQUIVALENT. THE WOVEN GEOTEXTILE SHALL BE COMPOSED OF POLYPROPYLENE STABILIZED WITH CARBON BLACK TO RESIST ULTRAVIOLET DEGRADATION AND BE RESISTANT TO BIOLOGICAL AND CHEMICAL DEGRADATION DUE TO ALL NATURALLY OCCURRING ORGANISMS OR REAGENTS NORMALLY ENCOUNTERED IN NATURAL SOIL ENVIRONMENTS.

2. NON-WOVEN GEOTEXTILE:
THE NON-WOVEN GEOTEXTILE SHALL BE TENCATE MIRAFI 140N FABRIC, OR APPROVED EQUIVALENT. THE NONWOVEN FABRIC SHALL BE INERT TO BIOLOGICAL DEGRADATION AND RESIST NATURALLY ENCOUNTERED CHEMICALS, ALKALIS, AND ACIDS.

EARTHWORK MATERIALS:

1. MODIFIED ROCK FILL:
MODIFIED ROCK FILL SHALL MEET THE REQUIREMENTS LISTED IN MASSDOT SPECIFICATION SECTION M2.02.4.

U.S. STANDARD SIEVE	PERCENT PASSING
8 INCH	95-100
4 INCH	0-25
2 1/2 INCH	0-5

2. CRUSHED STONE:
2-3 INCH CRUSHED STONE SHALL BE USED FOR THE CONSTRUCTION ENTRANCE/EXIT AS SHOWN ON THE DRAWINGS, AND SHALL MEET THE REQUIREMENTS LISTED BELOW.

U.S. STANDARD SIEVE	PERCENT PASSING
4 INCH	95-100
3 INCH	0-25
2 INCH	0-5

3. GRAVEL BORROW:
GRAVEL BORROW SHALL SATISFY THE REQUIREMENTS LISTED IN MASSDOT SPECIFICATION M1.03.0-TYPE B GRAVEL BORROW.

U.S. STANDARD SIEVE	PERCENT PASSING
3 INCH	100
1/2 INCH	50-85
NO. 4	40-75
NO. 50	8-28
NO. 200	0-10

*3 INCH DIAMETER LARGEST DIMENSION

4. LOAM:
4.1. LOAM SHALL SATISFY THE REQUIREMENTS LISTED IN MASSDOT SPECIFICATION M1.05.0: LOAM.

U.S. STANDARD SIEVE	PERCENT PASSING
NO. 10	85-100
NO. 40	35-85
NO. 200	10-35
<20 MICROMETER	<5

4.2. LOAM SHALL BE A NATURAL, FERTILE, FRIABLE SOIL, TYPICAL OF PRODUCTIVE SOILS IN THE VICINITY, OBTAINED FROM NATURALLY WELL-DRAINED AREAS, NEITHER EXCESSIVELY ACID NOR ALKALINE, AND CONTAINING NO SUBSTANCES HARMFUL TO GRASS GROWTH. LOAM SHALL NOT BE DELIVERED TO THE SITE IN FROZEN OR MUDDY CONDITION AND SHALL BE REASONABLY FREE OF STUMPS, ROOTS, HEAVY OR STIFF CLAY, STONES LARGER THAN 1-INCH IN DIAMETER, LUMPS, COARSE SAND, NOXIOUS WEEDS, STICKS, BRUSH OR OTHER LITTER.

4.3. LOAM SHALL CONTAIN NOT LESS THAN 4 PERCENT OR MORE THAN 10 PERCENT ORGANIC MATTER AS DETERMINED BY THE LOSS OF WEIGHT BY IGNITION OF OVEN-DRIED SAMPLES. TEST SAMPLES SHALL BE OVEN-DRIED TO A CONSTANT WEIGHT AT A TEMPERATURE OF 230 DEGREES F.

5. COMPACTED IMPERVIOUS MATERIAL:
5.1. SHALL SATISFY THE REQUIREMENTS LISTED IN MASSDOT SPECIFICATION M1.08.0: IMPERVIOUS SOIL BORROW WHICH REFERENCES THE SPECIFICATION UNDER AASHTO M 145. THE IMPERVIOUS SOILS SHALL HAVE THE PHYSICAL CHARACTERISTICS OF ONE OF THE FOLLOWING:
5.1.1. A-4, A-5, A-6, A-7 SOILS; OR
5.1.2. A-2 SOILS CONTAINING MORE THAN 20% BY WEIGHT PASSING THE NO. 200 SIEVE.

5.2. AASHTO SOIL CLASSIFICATION SYSTEM INFORMATION IS LISTED BELOW:

GROUP CLASSIFICATION	% PASSING NO. 200 SIEVE	USUAL TYPES OF SIGNIFICANT CONSTITUENT MATERIALS
A-2	35% OR LESS	SILTEY OR CLAYEY GRAVEL AND SAND
A-4	36% MINIMUM	SILTY SOILS
A-5	36% MINIMUM	SILTY SOILS
A-6	36% MINIMUM	CLAYEY SOILS
A-7	36% MINIMUM	CLAYEY SOILS

5.3. MATERIAL SHALL BE THOROUGHLY COMPACTED AND SHALL BE FREE FROM DELETRIOUS, ORGANIC, ELASTIC OR FOREIGN MATTER.

SLOPE PROTECTION:

1. EROSION CONTROL BLANKET
EROSION CONTROL BLANKET (ECB) SHALL BE NORTH AMERICAN GREEN, BIONET SC150BN OR APPROVED EQUAL. ECB SHALL BE INSTALLED USING STAPLE PATTERN C IN ACCORDANCE WITH THE INSTALLATION DETAIL INCLUDED ON SHEET C501.

BACKFILL MATERIALS:

1. GRANULAR BORROW:

EMBANKMENT FILL SHALL BE USED IN AREAS WHERE GRADE INCREASES ARE PROPOSED. FILL MATERIAL SHALL MEET THE REQUIREMENTS OF MASSDOT MATERIAL SPECIFICATION M1.01.0 ORDINARY BORROW WITH LESS THAN 15 PERCENT PASSING THE NO 200 SIEVE.

ON-SITE GRANULAR SOILS FROM CUT AREAS CONTAINING LESS THAN 20 PERCENT FINES AND FREE OF ORGANICS, CONTAMINATION (INCLUDING METALS, VOCS, SVOCS, ETC.), AND OTHER DELETERIOUS MATERIALS MAY BE SUITABLE FOR USE AS EMBANKMENT FILL WITH PROPER MOISTURE CONDITIONS.

FILL MATERIALS SHALL BE PLACED IN MAXIMUM OF 12-INCH LOOSE LIFTS AND COMPACTED TO ALEAST 95 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) FOR THE SPECIFIC FILL MATERIAL.

BACKFILL PLACEMENT AND COMPACTION:

1. PRIOR TO BACKFILLING, THE CONTRACTOR SHALL COMPACT THE EXPOSED NATURAL SUBGRADE AS SPECIFIED HEREIN.

2. AFTER APPROVAL OF SUBGRADE BY THE ENGINEER, THE CONTRACTOR SHALL BACKFILL AREAS TO REQUIRED CONTOURS AND ELEVATIONS WITH SPECIFIED MATERIALS.

3. THE CONTRACTOR SHALL PLACE AND COMPACT MATERIALS IN CONTINUOUS HORIZONTAL LAYERS UNTIL FIRM. LIFT THICKNESS SHALL NOT EXCEED THE FOLLOWING THICKNESS:
3.1. ACCESS ROADS - 6 INCHES
3.2. EQUIPMENT PADS - 6 INCHES.

4. IF THE MATERIAL REMOVED FROM THE EXCAVATION IS SUITABLE FOR BACKFILL WITH THE EXCEPTION THAT IT CONTAINS STONES LARGER THAN PERMITTED, THE CONTRACTOR HAS THE OPTION TO REMOVE THE OVERSIZED STONES AND USE THE MATERIAL FOR BACKFILL OR TO PROVIDE REPLACEMENT BACKFILL AT NO ADDITIONAL COST TO THE OWNER.

DUST CONTROL:

1. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED TO MINIMIZE AREAS OF DISTURBED SOIL EXPOSED AT ONE TIME.

2. DUST SHALL BE CONTROLLED ON CONSTRUCTION ROUTES AND OTHER DISTURBED AREAS SUBJECT TO SURFACE DUST MOVEMENT AND DUST BLOWING.

3. MAINTAIN DUST CONTROL MEASURES PROPERLY THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.

4. DUST CONTROL METHODS SHALL INCLUDE VEGETATIVE COVER, MULCH (INCLUDING GRAVEL MULCH), WATER SPRINKLING, STONE, AND BARRIERS.

FROST PROTECTION AND SNOW REMOVAL:

1. THE CONTRACTOR SHALL, AT ITS OWN EXPENSE, KEEP EARTHWORK OPERATIONS CLEAR AND FREE OF ACCUMULATIONS OF SNOW AS REQUIRED TO CARRY OUT THE WORK.

2. THE CONTRACTOR SHALL PROTECT THE SUBGRADE BENEATH NEW STRUCTURES AND PIPES FROM FROST PENETRATION WHEN FREEZING TEMPERATURES ARE EXPECTED.

LAND OWNER:

MARY E. MARTIN
MAP 408, LOT 19.1
89 CHESTER ROAD,
BLANDFORD, MA 01008

PROJECT DEVELOPER:

PEEBLES BROOK, LLC
116 HUNTINGTON AVENUE, SUITE 601
BOSTON, MA 02116
CONTACT: MARCO ADDONIZIO

CIVIL ENGINEER:

WESTON & SAMPSON ENGINEERS, INC.
55 WALKERS BROOK DRIVE, SUITE 100
READING, MA 01867
CONTACT: ROB BUKOWSKI, P.E.
PHONE: (978) 532-1900

CONTRACTOR:

TBD

TYPICAL SEQUENCE OF CONSTRUCTION:

PRIOR TO THE DEVELOPMENT OF THE SITE, EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AS NOTED ON THE PLANS. SITE DEVELOPMENT SCHEDULING SHALL TAKE INTO CONSIDERATION THE GROWING SEASON, SUCH THAT BULK OF THE EARTHWORK IS NOT INITIATED DURING A PERIOD WHEN VEGETATIVE STABILIZATION CANNOT BE ACHIEVED WITHIN 14 DAYS OF COMPLETING THE EARTHWORK IN A GIVEN AREA. A TYPICAL SEQUENCE OF CONSTRUCTION IS:

1. CONTRACTOR SHALL CONFIRM FLAGGING FOR WETLANDS, BUFFERS, STREAMS, AND/OR OTHER CRITICAL AREAS. IF FLAGGING IS NOT AVAILABLE CONTRACTOR OR CONTRACTOR'S REPRESENTATIVE SHALL FLAG WETLANDS, BUFFERS, STREAMS, AND/OR OTHER CRITICAL AREAS PRIOR TO STARTING ANY WORK ON SITE.

2. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL OBTAIN ALL PERMITS, NOTIFY APPROPRIATE OFFICIALS OF CONSTRUCTION COMMENCEMENT, AND SUBMIT CONSTRUCTION TIMETABLE.

3. ON-SITE CONSTRUCTION SHALL START WITH THE MINIMUM AMOUNT OF CLEARING REQUIRED TO INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS NOTED ON SHEET C101. THIS INCLUDES SILT FENCE, CONSTRUCTION ENTRANCE/EXIT, EROSION CONTROL MIX BERMS, SEDIMENT TRAPS, SEDIMENT BASINS AND OTHER MEASURES NOTED ON THE PLAN. NO WORK SHALL TAKE PLACE UNTIL THE ENGINEER HAS INSPECTED AND APPROVED INSTALLED MEASURES.

4. CUT TREES WITHIN THE DEFINED CLEARING LIMITS AND REMOVE CUT WOOD. STUMPS SHALL BE REMOVED OR GROUND IN-PLACE OR LEFT IN PLACE AS SHOWN ON THE PLANS. EROSION CONTROL MIX BERMS SHALL BE INSTALLED ALONG DISTURBED SLOPES. CONTRACTOR TO COORDINATE STOCKPILE LOCATION WITH OWNER.

5. REMOVE AND STOCKPILE TOPSOIL AS REQUIRED FOR PROPOSED GRADING ACTIVITY. STOCKPILED TOPSOIL SHALL BE SEEDED AND MULCHED WHEN IT IS TO BE STORED MORE THAN 30 DAYS FROM TIME OF STOCKPILING. STOCKPILES SHALL NOT BE PLACED WITHIN THE WETLAND BUFFER ZONES. SEE SHEET C501 FOR A TYPICAL TEMPORARY STOCKPILE DETAIL.

6. CONSTRUCT GRAVEL ACCESS ROADS AND TEMPORARY CONSTRUCTION BMPS. INSTALL ADDITIONAL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED TO PREVENT EROSION OF GRAVEL SURFACE AND STORMWATER MANAGEMENT FEATURES.

7. REMOVE AND STOCKPILE TOPSOIL IN AREAS OF PROPOSED GRADING TO ACHIEVE REQUIRED RACKING SYSTEM SLOPES. LOAM AND SEED DISTURBED AREAS WITH TEMPORARY SEEDING AND INSTALL INTERMEDIATE EROSION CONTROL MEASURES PARALLEL TO THE SLOPES IMMEDIATELY FOLLOWING COMPLETION OF GRADING.

8. IN AREAS OF PROPOSED GRADING WHERE SEEDING HAS TAKEN PLACE, ALLOW FOR ADEQUATE GROWTH TO ESTABLISH DENSE VEGETATION PRIOR TO SOLAR ARRAY CONSTRUCTION TO LIMIT RISK OF EROSION.

9. PROCEED WITH SOLAR PHOTOVOLTAIC (PV) SYSTEM INSTALLATION/CONSTRUCTION WORK.

10. CONVERT TEMPORARY CONSTRUCTION BMPS TO PERMANENT STORMWATER BMPS PER PLAN GRADING AND DETAILS.

11. REPAIR ALL DISTURBED AREAS, AND REAPPLY LOAM WHERE NECESSARY. INTER-ROW AREAS SHALL BE DECOMPACTED TO A DEPTH OF 12" WHILE ENSURING PROTECTION OF BURIED CONDUIT. REMOVE ANY ROCKS >2" TURNED UP DURING DECOMPACTION.

12. SEED ALL AREAS WITH PERMANENT SEED MIX AND STABILIZE SLOPES IN ACCORDANCE WITH THE CONSTRUCTION SITE PLAN DRAWINGS EROSION AND SEDIMENT CONTROL PLANS.

13. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL AFTER THE SITE IS STABILIZED IN ACCORDANCE WITH THE SWPPP.

NOT FOR CONSTRUCTION

Project:
PEEBLES BROOK, LLC
89 CHESTER ROAD
BLANDFORD, MA 01008

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

Client:
BLUEWAVE
Peebles Brook, LLC
116 Huntington Ave, Suite 601
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tel: (617) 209-3122
https://bluewave.energy/

No.	Description	Date
0	ISSUED FOR PERMITTING	03/28/25

Revisions

Seal:
COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41492
REGISTERED
PROFESSIONAL ENGINEER
3/28/25

Issued For:
PERMITTING

Scale:	AS SHOWN
Issued Date:	03/28/2025
Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
GENERAL NOTES

Sheet Number:
G002

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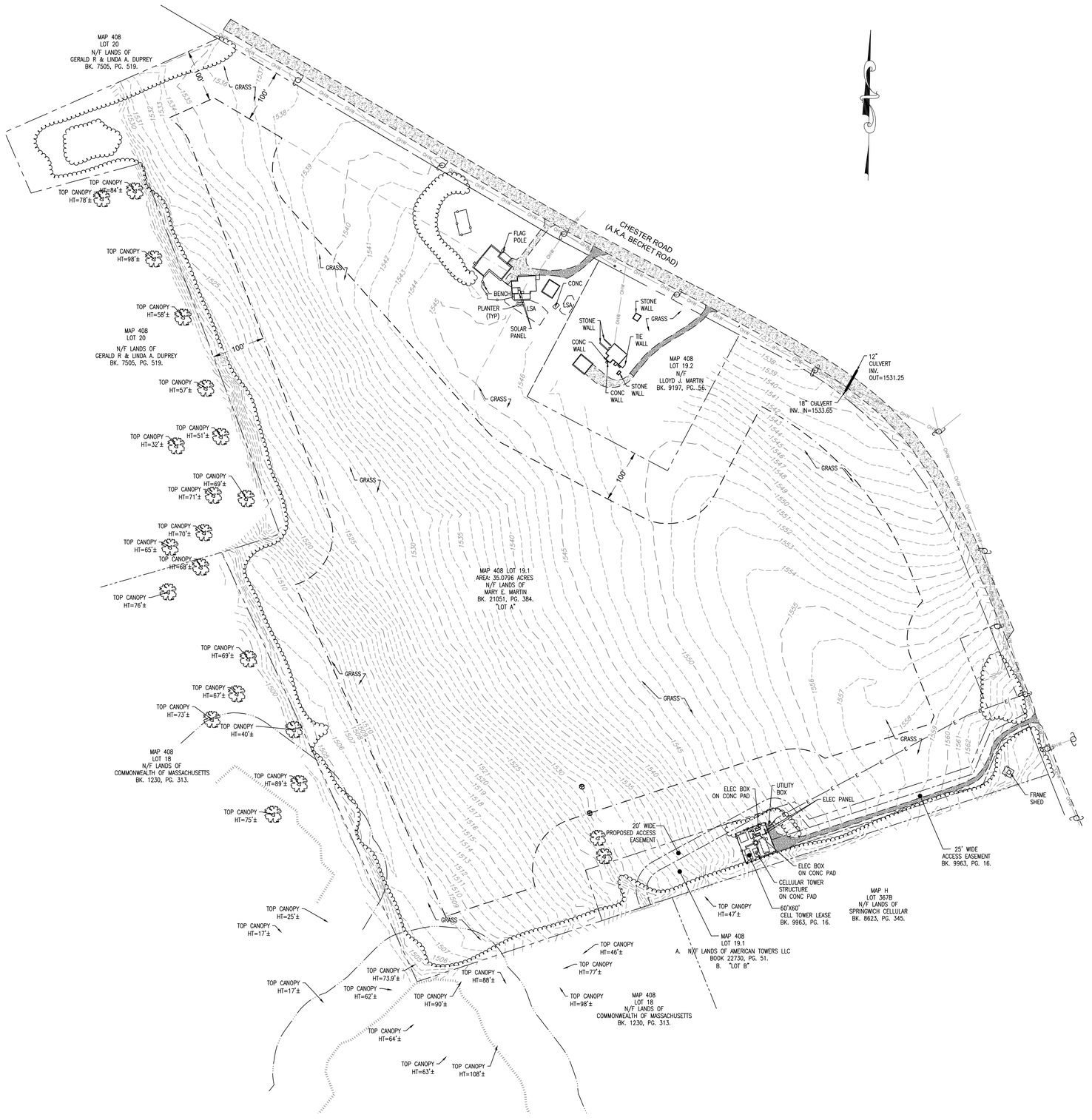

NOTES:

1. PROPERTY KNOWN AS LOT 19.1 AS SHOWN ON THE TOWN OF BLANDFORD, HAMPDEN COUNTY, COMMONWEALTH OF MASSACHUSETTS, MAP NO. 408.
2. AREA = 32.5796 ACRES (NOT INCLUDING RESIDENTIAL PARCELS).
3. UNDERGROUND UTILITIES HAVE NOT BEEN SHOWN. BEFORE ANY SITE EVALUATION, PREPARATION OF DESIGN DOCUMENTS OR EXCAVATION IS TO BEGIN, THE LOCATION OF UNDERGROUND UTILITIES SHOULD BE VERIFIED BY THE PROPER UTILITY COMPANIES.
4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC. ON DECEMBER 12, 2023, AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN. IT IS STRONGLY RECOMMENDED THAT A COMPLETE TITLE SEARCH BE PROVIDED TO THE SURVEYOR FOR REVIEW PRIOR TO THE PLACEMENT OF OR ALTERATION TO IMPROVEMENTS ON THE PROPERTY.
6. BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN FLOOD HAZARD ZONE X (AREAS OF MINIMAL FLOODING. (NO SHADING), PER REF. #2.
7. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, WAS NOT KNOWN AT THE TIME OF THE FIELD SURVEY.
8. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS). SURVEY DATA ADHERES TO ASPRS STANDARDS FOR A 5 CM RMSE HORIZONTAL, 5 CM RMSE VERTICAL (NON-VEGETATED) AND 10CM VERTICAL (VEGETATED) ACCURACY CLASS.
9. WESTON & SAMPSON ENGINEERS, INC. HAVE NOT INDEPENDENTLY VERIFIED THE LOCATION, EXISTENCE, AND SERVICEABILITY OF ANY UTILITIES AND MAKE NO GUARANTEE TO THE COMPLETENESS OR THE ACCURACY OF ANY UTILITIES. ADDITIONAL UTILITIES MAY EXIST IN THE FIELD, WHICH ARE NOT SHOWN ON THIS PLAN. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD PRIOR TO EXCAVATION OR OTHER CONSTRUCTION ACTIVITIES. CALL "DIG SAFE" AT 1-888-344-7233 OR DIAL 811. WESTON & SAMPSON ENGINEERS, INC. ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.

SITE INFORMATION

LAND OWNER	BOOK NO.	PAGE NO.	PARCEL ID	PARCEL AREA
MARTIN LLOYD JAMES	21,051	384	408-0-19.1	32.5796

REFERENCES:

1. THE TAX ASSESSOR'S MAP OF THE TOWN OF BLANDFORD, HAMPDEN COUNTY, MAP 408.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, TOWN OF BLANDFORD, MASSACHUSETTS, HAMPDEN COUNTY, PANEL 130 OF 506," COMMUNITY-PANEL NUMBER 25013C0130E EFFECTIVE DATE: JULY 16, 2013.
3. MAP ENTITLED "APPROVAL NOT REQUIRED, PLAN OF LAND IN BLANDFORD, MASSACHUSETTS, SURVEYED FOR LLOYD MARTIN", PREPARED BY: R. LEVESQUE ASSOCIATES, INC., DATED: DECEMBER 15, 2022, ON FILE AT THE HAMPDEN COUNTY REGISTRY OF DEEDS IN PLAN BOOK 397, PAGE 69.
4. MAP ENTITLED "DIVISION OF PROPERTY, BLANDFORD, MASSACHUSETTS, PREPARED FOR MR. & MRS LLOYD MARTIN", PREPARED BY: D.L.BEAN INC., DATED: APRIL 13, 1995, ON FILE AT THE HAMPDEN COUNTY REGISTRY OF DEEDS IN PLAN BOOK 293, PAGE 92.

LEGEND:

EXISTING:

- PROPERTY BOUNDARY
- APPROXIMATE ADJOINING PROPERTY BOUNDARY
- RIGHT OF WAY
- 1530 MAJOR CONTOUR
- 1531 MINOR CONTOUR
- 100' SOLAR SETBACK
- EDGE OF PAVEMENT
- WETLAND
- 100' WETLAND BUFFER
- TREE LINE
- OHW OVERHEAD ELECTRIC
- E UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- TREE
- UTILITY POLE
- GUY WIRE
- SIGN
- STRUCTURE
- GRAVEL
- ASPHALT

NOT FOR CONSTRUCTION

Project:
PROPOSED 4.04 MW DC SOLAR PV DEVELOPMENT

89 CHESTER ROAD
BLANDFORD, MA 01008

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811 Know what's Below. Call before you dig.

No.	Description	Date
0	ISSUED FOR PERMITTING	03/21/25

Revisions

Seal:
COMMONWEALTH OF MASSACHUSETTS
GERRY J. MCCARTHY
NO. 49211
REGISTERED
PROFESSIONAL LAND SURVEYOR

Issued For:
PERMITTING

Scale:	AS SHOWN
Issued Date:	03/21/2025
Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
EXISTING CONDITIONS PLAN

Sheet Number:
V101

P:\Private\Bluewave Solar\Blandford - Chester Road\Design\CAD\03 Sheets\03 - V101 Existing Conditions Plan.dwg

FROST PROTECTION AND SNOW REMOVAL:

1. THE CONTRACTOR SHALL, AT ITS OWN EXPENSE, KEEP EARTHWORK OPERATIONS CLEAR AND FREE OF ACCUMULATIONS OF SNOW AS REQUIRED TO CARRY OUT THE WORK.
2. THE CONTRACTOR SHALL PROTECT THE SUBGRADE BENEATH NEW STRUCTURES AND PIPES FROM FROST PENETRATION WHEN FREEZING TEMPERATURES ARE EXPECTED.

DRAINAGE PIPE:

1. HIGH DENSITY POLYETHYLENE (HDPE) CORRUGATED PIPE WITH SMOOTH INTERIOR AND MITERED EDGE MEETING AASHTO M252, TYPE C.

SOIL STABILIZATION NOTES:

1. ALL 3:1 SLOPES SHALL BE STABILIZED WITH A TEMPORARY EROSION CONTROL BLANKET (SEE SHEET C501).
2. ALL DISTURBED AREAS SHALL HAVE LOAM AND SEED AND STABILIZED WITH GRASS COVER (SEE SHEET C501).
3. IF SUFFICIENT STABILIZATION CANNOT BE ACCOMPLISHED AFTER SEEDING, AT THE CONTRACTOR'S SOLE EXPENSE, SHALL BE RESPONSIBLE FOR ADDING THE NECESSARY SOIL AMENDMENTS AND/OR LOAM UNTIL STABILIZATION IS ACHIEVED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

GENERAL MAINTENANCE PLAN (DURING CONSTRUCTION):

1. ALL EROSION AND SEDIMENTATION CONTROL PRACTICES SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS, OR EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.25 INCHES OR GREATER, IN ACCORDANCE WITH THE SWPPP.
2. IN THE EVENT WORK IS HALTED, ON SITE INSPECTIONS INSPECTIONS AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS SHALL CONTINUE PER THE SWPPP.
3. IF CONSTRUCTION ACTIVITIES ARE ENTIRELY SUSPENDED DUE TO FROZEN CONDITIONS; INSPECTIONS MAY BE TEMPORARILY SUSPENDED ONSITE UNTIL THAWING CONDITIONS OCCUR AS LONG AS DISCHARGES ARE UNLIKELY TO OCCUR DUE TO FROZEN CONDITIONS THAT ARE LIKELY TO CONTINUE FOR THREE (3) MONTHS BASED ON HISTORIC DATA, LAND DISTURBANCES HAVE BEEN HALTED, AND ALL DISTURBED AREAS HAVE BEEN ADEQUATELY STABILIZED.
4. IF CONSTRUCTION ACTIVITIES CONTINUE DURING FROZEN CONDITIONS, INSPECTION FREQUENCY MAY BE REDUCED TO MONTHLY INSPECTIONS IF DISCHARGES ARE UNLIKELY TO OCCUR DUE TO FROZEN CONDITIONS THAT ARE LIKELY TO CONTINUE FOR THREE (3) MONTHS BASED ON HISTORIC DATA AND DISTURBED AREAS HAVE BEEN ADEQUATELY STABILIZED EXCEPT FOR AREAS IN WHICH ACTIVE CONSTRUCTION IS TAKING PLACE.
5. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW WATTLES WHEN IT BECOMES 4 INCHES DEEP OR WHEN ACCUMULATIONS HAVE ADVERSELY AFFECTED IT'S FUNCTION. STRAW WATTLES SHALL BE REPAIRED BY REMOVING SILT AND SEDIMENTS AND THEN TAMPING LOOSE SOIL ALONG BASE, REPLACING DAMAGED OR WEAKENED POSTS AND STAKES, OR AS NECESSARY TO MAINTAIN A BARRIER.
6. ALL DISTURBED AREAS SHALL BE STABILIZED PER THESE SPECIFICATIONS TO MAINTAIN VIGOROUS, DENSE VEGETATION. REPAIR ANY ERODED SLOPES, REAPPLY TOPSOIL, RESEED AND STABILIZE REPAIR AREA AS REQUIRED FOR PERMANENT OR TEMPORARY MEANS. REPAIR SOIL AREAS DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT.
7. IMMEDIATELY REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION EQUIPMENT, MAINTENANCE OR OTHER ACTIVITY TO ANY EROSION AND SEDIMENTATION CONTROL MEASURE, OR BEST MANAGEMENT PRACTICE (BMP) OR DEVICE.
8. THE PRIME CONTRACTOR IS RESPONSIBLE FOR THE PERFORMANCE AND COMPLIANCE OF ITS SUBCONTRACTOR'S ACTIVITIES RELATING TO THE SWPPP. THEY SHALL MAKE FREQUENT INSPECTIONS OF THEIR WORK AND COORDINATE APPROPRIATE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL AND WATER QUALITY DEVICES.
9. EMPLOY POLLUTION PREVENTION MEASURES TO CONTROL LITTER, CONSTRUCTION CHEMICALS, SEDIMENT, AND CONSTRUCTION DEBRIS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING: SALVAGE AND REUSE OF MATERIALS, MINIMIZING PACKAGING WASTE, RECYCLING, PROPER DISPOSAL AT FREQUENT INTERVALS IN ACCORDANCE WITH PREVAILING LAWS, ONSITE INSTRUCTION REGARDING APPROPRIATE SEPARATION/HANDLING/RECYCLING, PERIODIC DEBRIS REMOVAL AT DRAINAGE STRUCTURES (GRATES AND SUMPS)/SEDIMENT TRAPS/ FOREBAY AND OTHER BMPS, PROPER MAINTENANCE OF SEDIMENT/ EROSION CONTROL SYSTEMS, ROUTINE AND EVENT RELATED INSPECTIONS OF DRAINAGE AND BMP SYSTEMS PER PERMIT REQUIREMENTS, PROVIDE APPROPRIATE SANITARY FACILITIES FOR ONSITE PERSONNEL, PICK UP TRASH AND DEBRIS FREQUENTLY AND USE WATER MIST, CALCIUM CHLORIDE, OR OTHER LEGAL MEANS TO LIMIT THE SPREAD OF DUST AND SOIL PARTICLES.
10. TRUCKS NEED TO BE WASHED OUT.

GENERAL SWPPP NOTES:

1. THE FOLLOWING NOTES ARE PROVIDED AS A SUMMARY REFERENCE FOR THE CONTRACTOR ONLY. THE REQUIREMENTS IN THE FULL SWPPP FOR THE PROJECT SHALL BE FOLLOWED BY THE CONTRACTOR. IN THE EVENT OF A CONFLICT BETWEEN THE DRAWINGS AND THE SWPPP, THE ENGINEER SHALL DETERMINE THE CORRECT REQUIREMENTS.
2. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE PERFORMED IN ACCORDANCE WITH THE MASSACHUSETTS EROSION AND SEDIMENTATION CONTROL GUIDELINES. THE CONTRACTOR SHALL OWN AND MAINTAIN A COPY OF THE GUIDELINES ON-SITE DURING CONSTRUCTION.
3. ALL DISTURBED AREAS SHALL BE KEPT TO A MINIMUM. FINAL GRADING AND RESTORATION SHALL BE ACCOMPLISHED AS SOON AS PRACTICAL.
4. EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE INSTALLED PRIOR TO SITE WORK.
5. SHOULD TRUCKS NEED TO BE WASHED OUT ONSITE; A CONCRETE WASHOUT BASIN SHALL BE INSTALLED. OTHERWISE TRUCKS MUST BE WASHED OUT OFFSITE.
6. ALL CONTROL STRUCTURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND REMOVED WHEN STABILIZATION HAS BEEN ATTAINED. IF THE PROPOSED CONTROL MEASURES ARE NOT SATISFACTORY TO THE ENGINEER, ADDITIONAL CONTROL MEASURES SHALL BE TAKEN.
7. ALL RUNOFF FROM THE DISTURBED AREA SHALL BE CONTROLLED AND FILTERED. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS.
8. CONTRACTOR IS RESPONSIBLE FOR OBTAINING NPDES CONSTRUCTION GENERAL PERMIT FOR THE PROPOSED PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION AND COMPLIANCE WITH THE APPROVED NPDES NOTICE OF INTENT (NOI) AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
9. THE CONTRACTOR MUST OBTAIN COPIES OF SITE SPECIFIC PERMITS PRIOR TO THE START OF WORK.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF EROSION AND SEDIMENTATION CONTROL MEASURES. THIS RESPONSIBILITY INCLUDES THE ACQUISITION OF MATERIALS, INSTALLATION, AND MAINTENANCE OF EROSION AND SEDIMENTATION STRUCTURES, THE COMMUNICATION AND DETAILED EXPLANATION TO ALL PEOPLE INVOLVED IN THE SITE WORK OF THE REQUIREMENTS AND OBJECTIVE OF THE EROSION AND SEDIMENTATION CONTROL MEASURES.
11. TWO (2) WEEKS PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL PROVIDE THE NAME AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR IMPLEMENTATION OF THE EROSION & SEDIMENTATION CONTROL PLAN TO THE ENGINEER.
12. THE ENGINEER SHALL BE NOTIFIED OF ANY PROPOSED ALTERATION TO THE EROSION AND SEDIMENTATION CONTROL PLAN, PRIOR TO ALTERING, IN ORDER TO ENSURE THE FEASIBILITY OF THE ADDITION, SUBTRACTION, OR CHANGE IN THE PLAN.

SEEDING NOTES:

1. THE SITE IS AN ACTIVELY MANAGED HAY FIELD AND IS INTENDED TO CONTINUE AS THE SAME USE AFTER CONSTRUCTION. SWPPP PRACTICES SHALL PRIORITIZE PROTECTION OF EXISTING VEGETATION, MINIMIZING COMPACT, AND REPLANTING TO MATCH EXISTING VEGETATION.
2. NO SEEDING OR SOIL PREPARATION SHALL BE DONE IF SOILS ARE MUDDY, DRY, AND/OR COMPACTED. BARE SOILS SHALL BE RAKED TO REMOVE SOIL CLODS, LUMPS, BRUSH, ROOTS, STUMP, LITTER AND OTHER FOREIGN MATTER. RUTS AND DEPRESSIONS SHALL BE FILLED WITH ADDITIONAL LOAM AND/OR COMPOST AND THE SOIL SHALL BE RE-GRADED TO A RELATIVELY SMOOTH FINISH CORRESPONDING TO THE REQUIRED GRADES.
3. ALL DISTURBED AREAS OUTSIDE OF PV DEVELOPMENT AREAS SHALL BE RESTORED WITH A VEGETATIVE STABILIZATION MATERIAL (GRASS).
4. THE SOIL SHALL BE ADJUSTED TO A PH OF 5.70 OR HIGHER. THIS CAN BE DONE BY USING THE APPROPRIATE AMOUNT OF GROUND LIMESTONE OR FERTILIZER, AS REQUIRED BY A SOIL TEST. IF A TEST IS NOT PERFORMED, THE AREA SHALL BE FERTILIZED WITH 10-10-10 U.F. OR EQUAL AT A RATE OF 300 POUNDS PER ACRE (11 POUNDS PER 1000 SQUARE FEET). THE LIME OR FERTILIZER SHALL BE WORKED INTO THE SOIL A MINIMUM OF 4 INCHES AND UNIFORMLY BLENDED.
5. AT SLOPES EXCEEDING 25% GRADE (IF APPLICABLE), AND IN AREAS DEPICTED WITHIN THE PLANS, SEEDING SHALL BE APPLIED IMMEDIATELY FOLLOWED BY THE INSTALLATION OF THE EROSION CONTROL BLANKET SPECIFIED ON SHEET G001 OR APPLIED VIA HYDROSEED WITH TACIFIER THAT MUST BE EITHER PLANT-BASED OR LIQUID OR DRY POLYMERIC EMULSION BLEND. TO BE APPROVED BY OWNERS ENGINEER PRIOR TO APPLICATION.
6. AT SLOPES EXCEEDING 25% GRADE (IF APPLICABLE), SEEDING SHALL OCCUR WITHIN 72 HOURS OF LOAM PLACEMENT TO PREVENT LOSS OF TOPSOIL.
7. ALL DISTURBED AREAS WITHIN THE PHOTOVOLTAIC DEVELOPMENT AREA SHALL BE SEEDED EITHER BY HAND, CYCLONE SEEDER, OR A CULTIPACKER TYPE SEEDER IN ACCORDANCE WITH THE FOLLOWING METHODS.
8. THE LIMING, FERTILIZING, AND SEEDING TO BE ACCOMPLISHED UNDER THIS SECTION SHALL BE DONE DURING A PERIOD OF TIME TO BE APPROVED BY THE ENGINEER OR LANDSCAPE ARCHITECT. CONTRACTOR SHALL NOTIFY THE ENGINEER OR ARCHITECT 30 DAYS PRIOR TO THE TIME THAT HE/SHE INTENDS TO BEGIN THIS WORK.
9. HEAVILY SCARIFYING THE EXISTING TURF GRASS AND OVER SEEDING WITH ADDITIONAL SEED MIX MAY BE NECESSARY IN SOME AREAS.
10. WHERE GRADING IS PROPOSED (AS DEPICTED ON THE GRADING PLANS), AREAS OF BARE SOIL SHALL RECEIVE 4-INCHES OF LOAM PRIOR TO SEEDING. THE EXISTING VEGETATION SHALL BE TOP DRESSED WITH 1 OR 2-INCHES OF LOAM BEFORE SEED IS APPLIED.
11. AFTER ALL SURFACES TO BE SEEDED HAVE BEEN BROUGHT TO FINISHED GRADE, THE CONTRACTOR SHALL FURNISH AND APPLY LIMESTONE AS HEREIN SPECIFIED.
12. LIMESTONE SHALL BE APPLIED AS DETERMINED BY THE RESULTS OF LABORATORY TESTING CONDUCTED BY AN APPROVED TESTING LABORATORY, OR AT A RATE UP TO A MAXIMUM OF 100 POUNDS PER 1000 SQUARE FEET.
13. IT IS RECOMMENDED THAT THE CONTRACTOR COLLECT TOPSOIL SAMPLES FOR LABORATORY ANALYSIS. A MINIMUM OF 4 SUB-SAMPLES, TAKEN TO THE PROPOSED DEPTH OF TOPSOIL, SHALL BE TAKEN PER ACRE OF AREA TO BE LIMED. THESE SAMPLES SHALL BE PLACED IN A SUITABLE CONTAINER OBTAINED FROM THE TESTING LABORATORY AND MARKED SO AS TO CLEARLY INDICATE THE ACRE AREA FROM WHICH THEY WERE TAKEN.
14. THE SAMPLE SHALL BE DELIVERED BY THE CONTRACTOR TO THE TESTING LABORATORY FOR CHEMICAL AND MECHANICAL ANALYSIS. THE TESTING LABORATORY SHALL BE DIRECTED BY THE CONTRACTOR TO FURNISH TEST RESULTS AND RECOMMENDATIONS FOR LIMING AND FERTILIZING TO THE ENGINEER OR ARCHITECT FOR APPROVAL.
15. LIME SHALL BE MECHANICALLY SPREAD IN TWO APPLICATIONS UP TO 50 POUNDS PER 1000 SQUARE FEET, ON ALL AREAS. THE LIME SHALL BE DISTRIBUTED UNIFORMLY.
16. FERTILIZER SHALL BE MECHANICALLY SPREAD SO AS TO OBTAIN UP TO A MINIMUM SOWN FERTILIZER COVERAGE YIELD OF 16 POUNDS PER 1000 SQUARE FEET. THE ACTUAL AMOUNTS AND TYPE OF FERTILIZER APPLIED SHALL BE AS DETERMINED BY THE RESULTS OF LABORATORY TESTS CONDUCTED ABOVE. AT SLOPES EXCEEDING 25% GRADE (IF APPLICABLE), THE FERTILIZER SHALL BE APPLIED MANUALLY IN AN APPROVED MANNER.
17. SEEDING SHALL BE UNDERTAKEN IN TWO SEPARATE PASSES AT NINETY DEGREES TO EACH OTHER. ONE-HALF THE SEEDING RATE SHALL BE APPLIED IN EACH DIRECTION (HORIZONTALLY AND VERTICALLY). TO ENSURE SEED-TO-SOIL CONTACT WITH BROADCASTING OF SEED, SEEDING SHALL BE FOLLOWED BY ROLLING OR TRACKING WITH EQUIPMENT APPROVED BY THE ENGINEER OR LANDSCAPE ARCHITECT.
18. SEED SHALL BE INCORPORATED WITH THE MULCHING MATERIAL SO AS TO OBTAIN A MINIMUM SOWN COVERAGE OF 200 POUNDS OF THE SPECIFIED MIX PER ACRE. SEED SUBSTITUTIONS MAY REQUIRE RATE ADJUSTMENTS AS RECOMMENDED BY THE SEED SUPPLIERS, IF APPROVED BY THE ENGINEER OR LANDSCAPE ARCHITECT.
19. AT SLOPES EXCEEDING 25% GRADE (IF APPLICABLE), SEEDING AND/OR STABILIZATION SHALL OCCUR AS SOON AS IS REASONABLE GIVEN THE CONSTRUCTION ACTIVITIES OR SEQUENCING WILL PERMIT. REFERENCE SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
20. AFTER THE FINE GRADING AND PREPARATIONS FOR SEEDING ARE APPROVED BY THE ENGINEER OR LANDSCAPE ARCHITECT, THE CONTRACTOR SHALL SEED THE AREA INDICATED, AS SPECIFIED HEREIN. THE SEED SHALL BE INCORPORATED WITH MULCHING MATERIALS COMPOSED OF WOOD CELLULOSE FIBERS THAT WILL READILY DISPERSE IN WATER TO FORM A UNIFORM AND HOMOGENEOUS MIXTURE WHEN AGITATED.
21. NO EXPOSED STONES OR WOODY DEBRIS SHALL BE AT THE SURFACE TO IMPROVE SEEDING AND ELIMINATE RISK OF DAMAGE FROM THROWN PROJECTILES WHILE MOWING.

SEEDING MATERIALS:

1. LIME:
   LIME SHALL BE STANDARD COMMERCIAL GROUND LIMESTONE CONTAINING AT LEAST 50% TOTAL OXIDES (CALCITIC LIMESTONE) AND 50% PERCENT OF THE MATERIAL MUST PASS THROUGH A #100 MESH SIEVE, WITH 98% PASSING A #20 MESH SIEVE.
2. FERTILIZER:
   FERTILIZER SHALL BE COMMERCIAL FERTILIZER 10-10-10 U.F. FERTILIZER MIXTURE CONTAINING AT LEAST 60% OF ORGANIC MATERIAL OR TYPE DETERMINED BY CHEMICAL SOIL ANALYSIS AS TESTED BY AN APPROVED LABORATORY. IT SHALL BE DELIVERED AT THE SITE IN THE ORIGINAL SEALED CONTAINERS WITH CONTENTS CLEARLY DESCRIBE.
3. SEED MIXES:
   THE ARRAY SHALL BE SEEDED WITH TWO DISTINCT SEED MIXES. THE TEMPORARY SEED MIX SHALL BE USED FOR SEEDING DURING CONSTRUCTION ACTIVITIES. THE TIMOTHY HAY AND CLOVER SEED MIX SHALL BE USED IN THE FINAL SEEDING OF INTERIOR AND EXTERIOR PERIMETER AREAS AND INTER-ROW AREAS AFTER ARRAY CONSTRUCTION.
4. MULCH:
   MULCH MATERIAL SHALL BE A MANUFACTURED PRODUCT OF NATURAL WOOD CELLULOSE FIBERS. MATERIAL SHALL BE INTERNATIONAL PAPER COMPANY'S "TURFIBER;" WEYERHAEUSER COMPANY'S "SILVA-FIBER," OR APPROVED EQUAL AND CLEARLY PACKED IN ORIGINAL CONTAINERS, SEALED AND CLEARLY LABELED WITH BRAND NAME AND MANUFACTURER. IT SHALL HAVE A DELIVERED MOISTURE CONTENT OF NOT OVER 12%.
5. PERMANENT SEED:
   THE SEED SHALL BE APPLIED BY EITHER HAND, CYCLONE SEEDER, OR A CULTIPACKER TYPE SEEDER. SEED MIX SHALL BE TIMOTHY HAY AND CLOVER SEED MIX WITH THE SPECIFICATIONS LISTED BELOW IN THE SEEDING TABLE, OR APPROVED EQUAL. SUBMIT SUPPLIER'S SEED BLEND SPECIFICATIONS TO THE ENGINEER OR LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO COMMENCING WITH SEEDING OPERATIONS.

TIMOTHY HAY AND CLOVER SEEDING TABLE

ITEM #	BOTANICAL (LATIN) NAME	COMMON NAME	WEIGHT
1	*DACTYLIS GLOMERATA*	ECHELON ORCHARD GRASS	20%
2	*SCHEDONORUS ARUNDINACEUS*	RUSTLER TALL FESCUE	20%
3	*FESTUCA ELATIOR x LOLIUM PERENNE*	DUO FESTULOLIUM	20%
4	*PHLEUM PRATENSE*	SUNRISE 11 BRAND TIMOTHY	15%
5	*MEDICAGO SATIVA*	PS105 BR EXTRA BRAND ALFALFA	10%
6	*TRIFOLIUM PRATENSE*	GALLANT RED CLOVER	10%
7	*TRIFOLIUM REPENS LATUM*	JUMBO LADINO CLOVER	5%
TOTAL			100%

SEEDING SHALL BE APPLIED AT A RATE OF 100-200 LB PER ACRE, OR 3-5 LB PER 1,000 SQFT. SEEDING SHALL BE COMPLETED BETWEEN APRIL 15 AND MAY 15 OR AUGUST 15 AND OCTOBER 15. ALL SEEDED AREAS SHALL BE MAINTAINED TO ENSURE PROPER GROWTH AND TO MINIMIZE EROSION.

6. TEMPORARY SEED:
   THE SEED MIX WITHIN THE LIMITS OF THE FENCE, WHEN SEEDING OCCURS DURING SPRING/SUMMER MONTHS, SHALL BE GRAIN OATS (ERNMX-181-1) NATIVE STEEP SLOPE MIX WITH THE SPECIFICATIONS LISTED BELOW IN THE SEEDING TABLE, OR APPROVED EQUAL. THE SEED MIX WITHIN THE LIMITS OF THE FENCE, WHEN SEEDING OCCURS DURING WINTER MONTHS, SHALL BE THREE-WAY RYEGRASS MIX (ERNMX-149) WITH THE SPECIFICATIONS LISTED BELOW IN THE SEEDING TABLE, OR APPROVED EQUAL. SUBMIT SUPPLIER'S SEED BLEND SPECIFICATIONS TO THE ENGINEER OR LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO COMMENCING WITH THE SEEDING OPERATIONS. SEEDING SHALL BE APPLIED AT A RATE OF 7-10 LB PER 1,000 SQ FT.

NATIVE STEEP SLOPE MIX W/ GRAIN OATS (ERNMX-81-1)

ITEM #	BOTANICAL (LATIN) NAME	COMMON NAME	WEIGHT
1	AVENA SATIVA	OATS, VARIETY NOT STATED	40.00%
2	ANDROPOGEN GERARDII	BIG BLUESTEM, 'SOUTHLOW'-MI ECOTYPE	19.12%
3	SORGHASTRUM NUTANS	INDIANGRASS, PA ECOTYPE	12.00%
4	ELYMUS VIRGINICUS	VIRGINIA WILDRYE, MADISON-NY ECOTYPE	10.72%
5	ELYMUS CANADENSIS	CANADA WILDRYE	5.28%
6	PANICUM VIRGATUM	SWITCHGRASS, 'SHAWNEE'	4.32%
7	AGROSTIS PERANNANS	AUTUMN BENTGRASS, ALBANY PINE BUSH-NY ECOTYPE	3.20%
8	PANICUM CLANDESTINUM	DEERTONGUE, TIOGA	2.24%
9	RUDBECKIA HIRTA	BLACKEYED SUSAN	0.80%
10	COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS	0.56%
11	ECHINACEA PURPUREA	PURPLE CONEFLOWER	0.56%
12	HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER, PA ECOTYPE	0.56%
13	ASTER PILOSUS	HEATH ASTER, PA ECOTYPE	0.16%
14	MONARDA FISTULOSA	WILD BERGAMOT	0.16%
15	SOLIDAGO RUGOSA	WRINKLELEAF GOLDENROD, PA ECOTYPE	0.16%
16	APOCYNUM CANNABINUM	INDIANHEMP, PA ECOTYPE	0.08%
17	ASCLEPIAS SYRIACA	COMMON MILKWEED	0.08%
TOTAL			100%

THREE-WAY RYGRASS MIX (ERNMX-149)

ITEM #	BOTANICAL (LATIN) NAME	COMMON NAME	WEIGHT
1	LOLIUM PERENNE, 'BIGLEAGUE'	PERENNIAL RYEGRASS	33%
2	LOLIUM PERENNE, 'AMAZING XL'	PERENNIAL RYEGRASS, (TURF TYPE)	33%
3	LOLIUM PERENNE, 'PASCO'	PERENNIAL RYEGRASS, (TURF TYPE)	33%
TOTAL			100%

MAINTENANCE OF SEEDED AREAS:

1. FOLLOWING THE FINAL SEEDING THE CONTRACTOR SHALL CONTINUE TO INSPECT EROSION AND SEDIMENTATION CONTROLS AT LEAST ONCE EVERY 7 CALENDAR DAYS, WITHIN 24 HOURS AFTER A STORM EVENT (RAINFALL OR EXCESS SNOWMELT), ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS ARE PERMANENTLY STABILIZED.
2. PERMANENT STABILIZATION IS ACHIEVED WHEN 90% MATURE VEGETATION COVER OF DESIRED SPECIES IS ACHIEVED IN ALL AREAS AND/OR PERMANENT NON-VEGETATIVE STABILIZATION MEASURES ARE IMPLEMENTED TO PROVIDE EFFECTIVE COVER OF ANY AREAS OF EXPOSED SOIL. IN THE EVENT OF ANY UNSATISFACTORY GROWTH, RESEEDING SHALL BE CARRIED OUT, WITH FOLLOW-UP INSPECTION.
3. THE CONTRACTOR SHALL MAINTAIN THE ENTIRE SEEDED AREAS UNTIL FINAL ACCEPTANCE AT THE COMPLETION OF THE PROJECT OR FOR 90 DAYS, WHICHEVER IS LONGER. MAINTENANCE SHALL INCLUDE WATERING ON AN AS-NEEDED BASIS SUCH THAT ESTABLISHMENT OF AT LEAST 70% OF THE SEEDED AREAS IS ACHIEVED AFTER ONE GROWING SEASON. MAINTENANCE SHALL ADDITIONALLY INCLUDE WEEDING, REMOVAL OF STONES WHICH MAY APPEAR, AND REGULAR CUTTINGS OF THE GRASS NO CLOSER THAN 10 DAYS APART. CONTRACTOR SHALL FURNISH ALL TEMPORARY PIPE AND CONNECTIONS FOR SPRINKLING. CONTRACTOR SHALL FURNISH ALL REQUIRED WATER AT NO EXPENSE TO THE OWNER.
4. ALL BARE SPOTS, WHICH BECOME APPARENT AS THE GRASS GERMINATES, SHALL BE RESEEDED BY THE CONTRACTOR AT HIS/HER OWN EXPENSE AS MANY TIMES AS NECESSARY TO SECURE AN ADEQUATE GROWTH, AND THE ENTIRE AREA SHALL BE MAINTAINED AND CUT UNTIL ALL WORK HAS BEEN COMPLETED AND FINAL ACCEPTANCE HAS OCCURRED. RESEEDING SHALL BE ACCOMPLISHED BY MECHANICAL MEANS AS DETERMINED BY THE AREA OF RESEEDING TO BE ACCOMPLISHED.
5. CONTRACTOR SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO PROTECT THE GRASS WHILE IT IS GERMINATING. THESE MEASURES SHALL INCLUDE SPRINKLING STRAW OR WOOD FIBER MULCH TO COVER THE AREA, AND/OR FURNISHING OF WARNING SIGNS, BARRIERS, TEMPORARY FENCE OR ANY OTHER NECESSARY MEASURES OF PROTECTION.
6. CONTRACTOR SHALL FURNISH, PROTECT, AND MAINTAIN ALL TEMPORARY BARRIERS UNTIL FINAL ACCEPTANCE OF THE SEEDED AREAS BY THE OWNER AND SHALL REMOVE THEM UPON SUCH FINAL ACCEPTANCE, THE BARRIERS SHALL REMAIN THE PROPERTY OF CONTRACTOR AT ALL TIMES.
7. AFTER THE ENGINEER, OR LANDSCAPE ARCHITECT HAS DETERMINED THAT THE PROJECT AREA HAS STABILIZED (90% MATURE VEGETATION COVER ACHIEVED), THE CONTRACTOR SHALL REMOVE ALL SEDIMENT BARRIERS AND ANY OTHER TEMPORARY EROSION CONTROL MEASURES WITHIN 30 DAYS.

NOT FOR CONSTRUCTION

Project:
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No.	Description	Date
0	ISSUED FOR PERMITTING	03/28/25

Revisions

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COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41492
REGISTERED PROFESSIONAL ENGINEER
3/28/25

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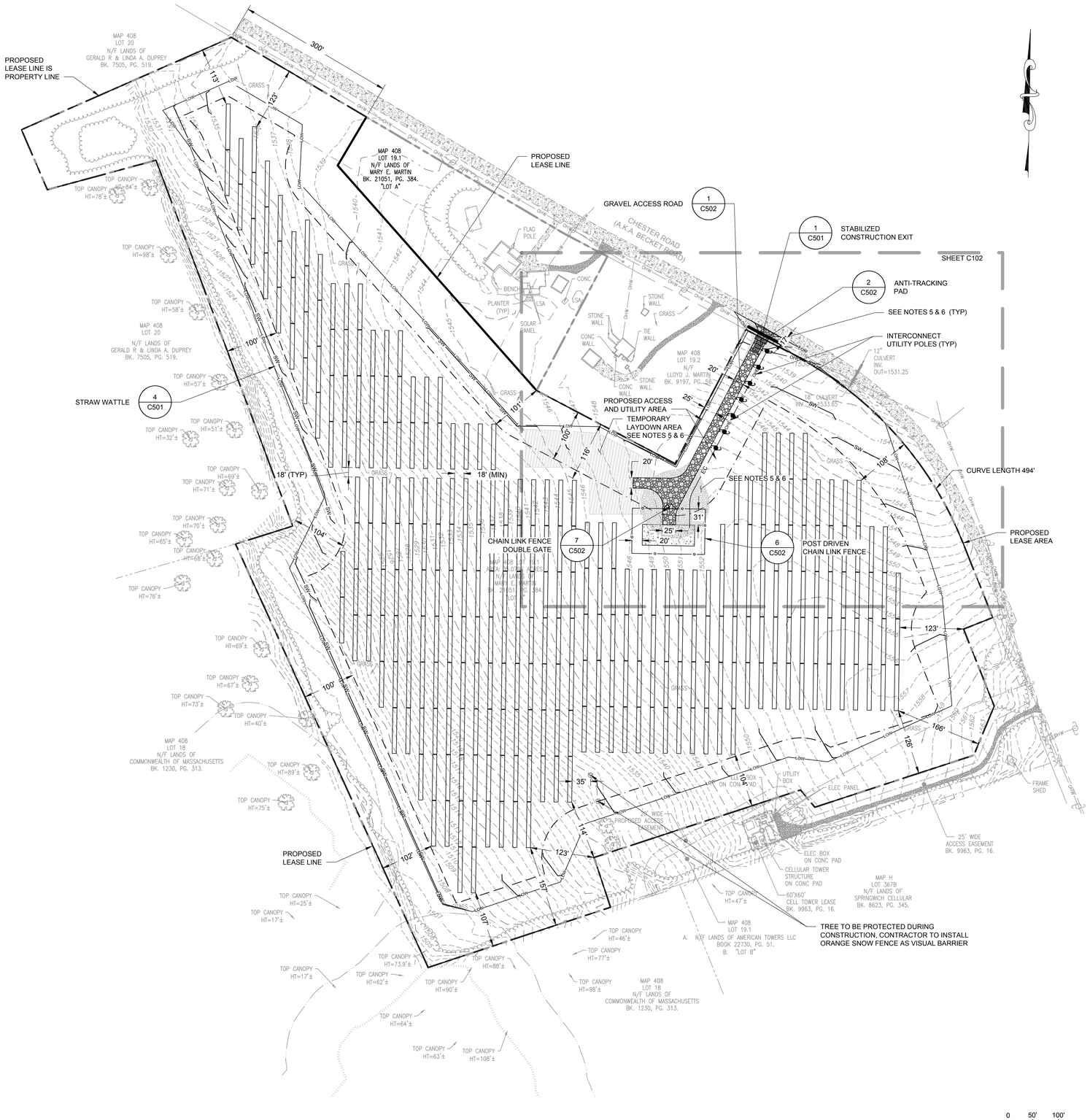
Issued Date:	03/28/2025
Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND SPECIFICATIONS

Sheet Number:
C001



NOTES:

1. THIS PLAN WAS PREPARED FOR PERMITTING AND IS NOT SUITABLE FOR CONSTRUCTION.
2. ELECTRICAL DESIGN, INCLUDING UTILITY POLES, PERFORMED BY OTHERS. ELECTRICAL EQUIPMENT AND COMPONENTS SHOWN TO ILLUSTRATE LOCATIONS ONLY. REFER TO ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SYSTEM INFORMATION.
3. SOLAR ARRAY LAYOUT IS SUBJECT TO FINAL DESIGN BUT WILL REMAIN WITHIN THE PROPOSED LIMITS OF WORK.
4. NOTHING SHOWN OR OMITTED FROM THE DOCUMENTS PROVIDED SHALL RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, BYLAWS, AND ORDINANCES.
5. CONTRACTOR SHALL INSTALL TEMPORARY LAYDOWN AREA AND ACCESS ROADS AS NEEDED DURING CONSTRUCTION. TEMPORARY ACCESS ROADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1 ON SHEET C502.
6. TEMPORARY GRAVEL AREAS FOR THE LAYDOWN AREA AND CONSTRUCTION VEHICLES TO BE REMOVED, LOAMED AND SEEDED PRIOR TO THE COMPLETION OF CONSTRUCTION.
7. PROPERTY LINE SHOWN IS PROPOSED AND WILL BE SUBMITTED TO THE PLANNING BOARD AS PART OF AN ANR PLAN SEPARATELY PRIOR TO CONSTRUCTION OF THE PROPOSED PROJECT SHOWN IN THESE PLANS.

ZONING ANALYSIS TABLE

ZONING DISTRICT:
AGRICULTURAL RESIDENTIAL, (A-R) ZONE (LARGE SCALE SOLAR)

ZONE CRITERIA	REQUIRED	EXISTING	PROPOSED
MINIMUM LOT AREA	12.0 ACRES	32.58 ACRES	NO CHANGE
MIN. FRONT SETBACK	100 FEET	N/A	108 FEET
MIN. SIDE SETBACK	100 FEET	N/A	104 FEET
MIN. REAR SETBACK	100 FEET	N/A	100 FEET
ACCESS ROAD / DRIVEWAY SETBCK	25 FEET	N/A	25 FEET
MAX. BUILDING HEIGHT	25 FEET	N/A	< 25 FEET
LOT COVERAGE	= < 50%	N/A	15%

N/A - NOT APPLICABLE
N/S - NOT SPECIFIED

SYSTEM SIZE

STRINGS / RACKS	PANELS	PANEL SIZE (W)	SIZE (MW)
290	6,960	580	4.04

LEGEND:

EXISTING:

- PROPERTY BOUNDARY / PROPOSED LEASE LINE
- APPROXIMATE ADJOINING PROPERTY BOUNDARY
- RIGHT OF WAY
- 1530 MAJOR CONTOUR
- 1531 MINOR CONTOUR
- 100' SOLAR SETBACK
- EDGE OF PAVEMENT
- WETLAND
- 100' WETLAND BUFFER
- TREE LINE
- OHW OVERHEAD ELECTRIC
- E UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- TREE
- UTILITY POLE
- GUY WIRE
- SIGN
- STRUCTURE
- GRAVEL
- ASPHALT

PROPOSED:

- 7' CHAIN LINK FENCE
- LOW LIMIT OF WORK
- EC ELECTRIC CONDUIT
- OHE OVERHEAD ELECTRIC LINE
- LEASE, ACCESS AND UTILITY AREA
- UTILITY POLE
- SW STRAW WATTLE
- 20' WIDE GRAVEL ACCESS WAY
- EQUIPMENT PAD
- SOLAR PV TABLE

NOT FOR CONSTRUCTION

Project:
PEEBLES BROOK, LLC

89 CHESTER ROAD
BLANDFORD, MA 01008

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No.	Description	Date
0	ISSUED FOR PERMITTING	03/28/25

Revisions

Seal:
COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41492
REGISTERED PROFESSIONAL ENGINEER
3/29/25

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Drawn By:	DED / RJR
Reviewed By:	AGH
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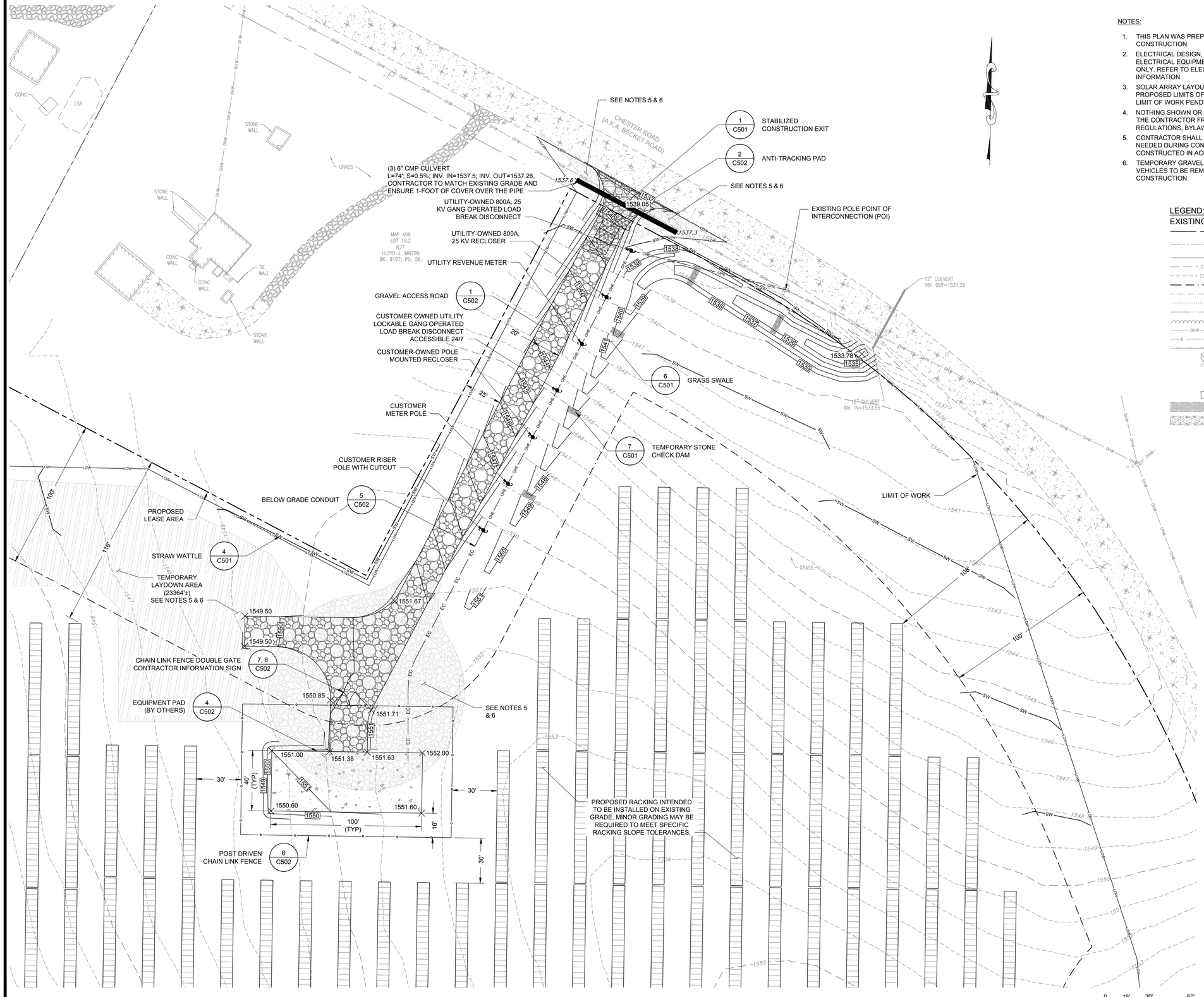
W&S Project No.:	ENG23-3160

Drawing Title:
SITE LAYOUT PLAN

Sheet Number:
C101



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3. SOLAR ARRAY LAYOUT IS SUBJECT TO FINAL DESIGN BUT WILL REMAIN WITHIN THE PROPOSED LIMITS OF WORK. PROPOSED FENCE MAY BE RELOCATED BEYOND THE LIMIT OF WORK PENDING FINAL DESIGN.
4. NOTHING SHOWN OR OMITTED FROM THE DOCUMENTS PROVIDED SHALL RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, BYLAWS, AND ORDINANCES.
5. CONTRACTOR SHALL INSTALL TEMPORARY LAYDOWN AREA AND ACCESS ROADS AS NEEDED DURING CONSTRUCTION. TEMPORARY ACCESS ROADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1 ON SHEET C502.
6. TEMPORARY GRAVEL AREAS FOR THE LAYDOWN AREA AND CONSTRUCTION VEHICLES TO BE REMOVED, LOAMED AND SEEDED PRIOR TO THE COMPLETION OF CONSTRUCTION.

LEGEND:

EXISTING:

- PROPERTY BOUNDARY / PROPOSED LEASE LINE
- APPROXIMATE ADJOINING PROPERTY BOUNDARY
- RIGHT OF WAY
- MAJOR CONTOUR
- MINOR CONTOUR
- 100' SOLAR SETBACK
- EDGE OF PAVEMENT
- WETLAND
- 100' WETLAND BUFFER
- TREE LINE
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- TREE
- UTILITY POLE
- GUY WIRE
- SIGN
- STRUCTURE
- GRAVEL
- ASPHALT

PROPOSED:

- 7' CHAIN LINK FENCE
- LIMIT OF WORK
- ELECTRIC CONDUIT
- OVERHEAD ELECTRIC LINE
- LEASE, ACCESS AND UTILITY AREA
- UTILITY POLE
- STRAW WATTLE
- 20' WIDE GRAVEL ACCESS WAY
- EQUIPMENT PAD
- SOLAR PV TABLE
- CONTOUR

NOT FOR CONSTRUCTION

Project:
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0	ISSUED FOR PERMITTING	03/28/25

Revisions

Seal:
COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41402
REGISTERED
PROFESSIONAL ENGINEER
3/28/25

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Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
GRADING, ACCESS AND UTILITY PLAN

Sheet Number:
C102

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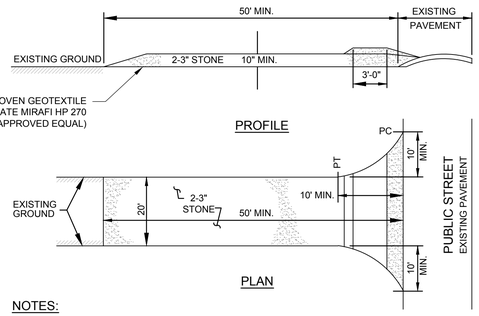
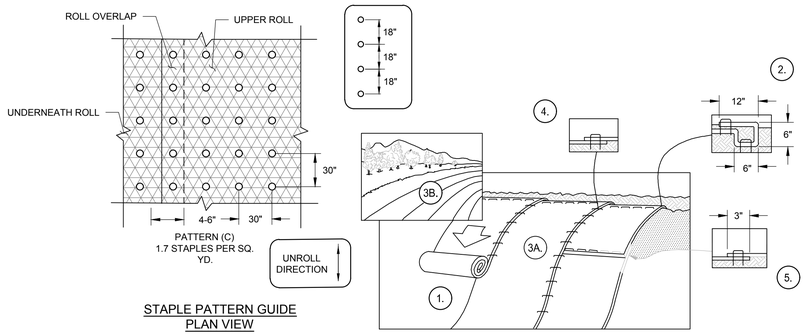


NOTES:

1. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
2. CONSTRUCTION MATERIAL PLACEMENT FOR EROSION AND SEDIMENT CONTROLS AND ANY MAINTENANCE THEREOF IS NOT TO BE COMPACTED.
3. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
4. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
5. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
6. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
7. STONE SHALL BE REMOVED AT THE CONCLUSION OF PROJECT AND ACCUMULATED SEDIMENT DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS. REMOVAL OF STONE SHALL BE AT NO ADDITIONAL COST TO THE OWNER.

1 STABILIZED CONSTRUCTION EXIT

NOT TO SCALE



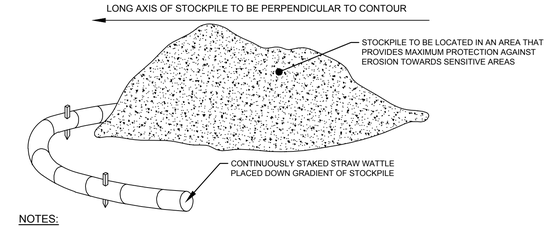
STAPLE PATTERN GUIDE
PLAN VIEW

NOTES:

1. EROSION CONTROL BLANKET (ECB) SHALL BE NORTH AMERICAN GREEN, BIONET SC150BN OR APPROVED EQUAL. ECB SHALL BE INSTALLED USING STAPLE PATTERN C IN ACCORDANCE WITH THE INSTALLATION DETAIL INCLUDED ON SHEET C501.
2. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLODS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF THE INSTALLATION.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES/PINS SPACED AT 18" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING AND FOLD THE ROLL OVER DOWNSLOPE. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES/PINS SPACED AT 18" APART ACROSS THE WIDTH OF THE RECPS.
4. ROLL THE RECPS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. WHEN LAYING RECPS HORIZONTAL, A MAXIMUM OF TWO ROLL WIDTHS OR 16 FEET, WHICHEVER IS LESS, MAY BE APPLIED UP THE SLOPE. IF TWO ROLL WIDTHS OR 16 FT IS INSUFFICIENT TO COVER THE SLOPE, MATERIAL SHALL BE PLACED VERTICALLY. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES/PINS IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. ROLLMAX RECPS AND ECBS SHOULD UTILIZE STAPLE PATTERN C.
5. THE EDGES OF PARALLEL RECPS MUST BE STAPLED WITH APPROXIMATELY 4" - 6" OVERLAP.
6. CONSECUTIVE RECPS SPLICED DOWN THE SLOPE MUST OVERLAPPED WITH THE UPSTREAM MAT ATOP THE DOWNSTREAM MAT (SHINGLE STYLE). THE OVERLAP SHOULD BE 4" - 6".
7. AT THE TERMINAL END, SECURE EACH MAT ACROSS THE WIDTH WITH A ROW OF STAPLES/STAKES/PINS SPACED AT 18". IF EXPOSED TO FLOW, FOOT TRAFFIC, WIND UPLIFT OR OTHER DISRUPTION, TRENCH THE TERMINAL END IN AS SHOWN IN DETAIL.
8. FASTENERS SHOULD PROVIDE A MINIMUM OF 20 LBS OF PULLOUT RESISTANCE. 6" X 1" 11 GAUGE STAPLES ARE TYPICALLY ADEQUATE. IN LOOSE SOILS, LONGER STAPLES MAY BE NECESSARY. TWIST PINS CAN PROVIDE THE GREATEST PULLOUT RESISTANCE. IN HARD OR ROCKY SOILS, STRAIGHT PINS MAY BY USED WHERE STAPLES OR TWIST PINS ARE REFUSED, PROVIDED THE MINIMUM PULLOUT REQUIREMENTS ARE MET.

2 EROSION CONTROL BLANKET

NOT TO SCALE

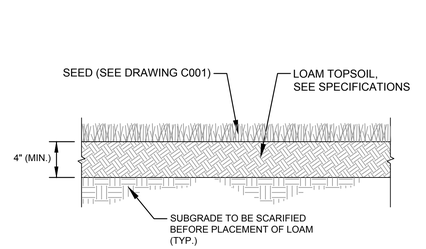


NOTES:

1. STOCKPILE AREAS SHALL BE LOCATED OUTSIDE OF NATURAL RESOURCE PROTECTION AREAS AND ASSOCIATED BUFFERS.
2. MAXIMUM STEEPNESS OF STOCKPILES NOT TO EXCEED 2:1 (H:V).

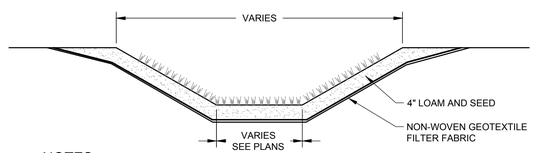
3 TEMPORARY STOCKPILE AREA

NOT TO SCALE



5 LOAM AND SEED

NOT TO SCALE

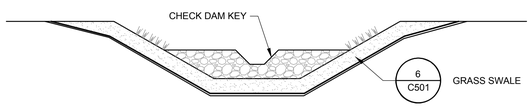


NOTES:

1. INSTALL STONE CHECK DAMS ALONG EACH SWALE, AS INDICATED ON THE STONE CHECK DAM DETAIL ON THIS SHEET.
2. DURING CONSTRUCTION, STONE CHECK DAMS SHALL BE INSTALLED AT A MINIMUM OF EVERY 60 FEET AS A TEMPORARY CONTROL TO MANAGE SEDIMENTATION DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN CHECK DAMS AND REMOVE SEDIMENTATION AS NEEDED FOR THE BMP TO PERFORM AS INTENDED.

6 GRASS SWALE

NOT TO SCALE



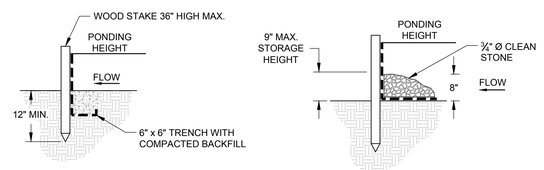
NOTES:

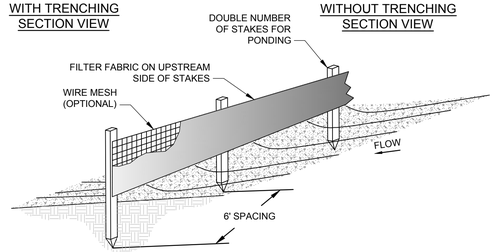
1. STONE TO BE ASTM NO. 1 (2"-4") CRUSHED CLEAN STONE.
2. HEIGHT OF CHECK DAM TO BE HALF THE HEIGHT OF THE GRASS SWALE.
3. CHECK DAM KEY TO BE HALF THE HEIGHT OF THE CHECK DAM.
4. 2:1 SIDE SLOPES ON SIDES PERPENDICULAR TO FLOW.
5. STONE CHECK DAMS ARE TO BE REMOVED AFTER CONSTRUCTION HAS BEEN COMPLETED, AND SWPPP NOTICE OF TERMINATION HAS BEEN SUBMITTED.

STONE CHECK DAM	
SLOPE %	MAX SPACING (FT)
0 - 2	100
3 - 5	67 - 40
6 - 9	33 - 22
10 - 15	20 -13

7 TEMPORARY STONE CHECK DAM

NOT TO SCALE



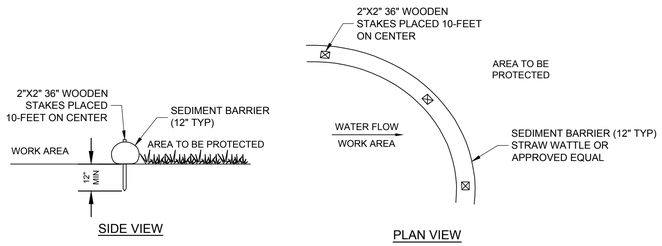


NOTES:

1. PREFABRICATED SILT FENCE MUST BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE FENCE SHALL BE ANCHORED TO RESIST PULL-OUT, AND BE STRETCHED TIGHTLY BETWEEN STAKES TO PREVENT SAGGING.
3. A 6-INCH WIDE AND 6-INCH DEEP TRENCH SHALL BE EXCAVATED UPGRADIENT OF THE FENCE LINE TO KEY THE "FLAP" OF THE FABRIC. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
4. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED BY WRAPPING END STAKES TOGETHER.
5. IN AREAS WHERE THE FLAP CANNOT BE KEYED PROPERLY (DUE TO FROZEN GROUND, BEDROCK, STONY SOIL, ROOTS NEAR A PROTECTED NATURAL RESOURCE, ETC.) THE SILT FENCE SHALL BE ANCHORED WITH AGGREGATE, CRUSHED STONE, EROSION CONTROL MIX, OR OTHER MATERIAL.

8 SILT FENCE

NOT TO SCALE



NOTES:

1. SEDIMENT BARRIER SHALL BE PLACED AROUND THE PERIMETER OF THE LIMIT OF WORK AS SHOWN ON THE PLANS, AS AN ALTERNATIVE TO SILT FENCE, AND INSTALLED PARALLEL TO EXISTING GROUND CONTOURS.
2. SEDIMENT BARRIER SHALL NOT BE PLACED UP SLOPE, OR IN A MANNER THAT WILL CREATE CHANNELIZED FLOW.
3. SEDIMENT BARRIERS SHALL BE INSPECTED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND IN ACCORDANCE WITH THE SITE EROSION AND SEDIMENTATION CONTROL PLAN.

4 STRAW WATTLE

NOT TO SCALE

NOT FOR CONSTRUCTION

Project:
PEEBLES BROOK, LLC
89 CHESTER ROAD
BLANDFORD, MA 01008

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ROBERT J. BUKOWSKI
CIVIL
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Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
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Drawing Title:
SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

Sheet Number:
C501

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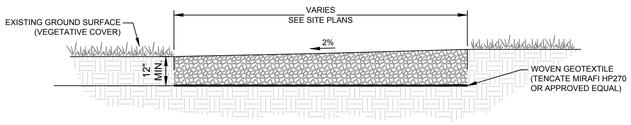
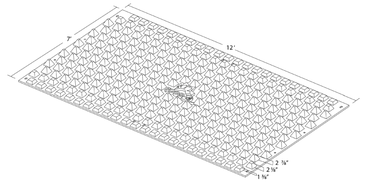


NOTES:

1. ACCESS ROAD TO BE CONSTRUCTED OF A MINIMUM 12" OF GRAVEL BORROW. SEE G001 FOR MATERIAL SPECIFICATIONS.
2. WOVEN GEOTEXTILE TO BE PLACED BETWEEN THE GROUND SURFACE AND THE GRAVEL BORROW.
3. CRUSHED GRAVEL SHALL BE COMPACTED TO A FIRM AND NON-YIELDING CONDITION.
4. ROAD SHALL BE CONSTRUCTED SO THAT STORMWATER DOES NOT CONCENTRATE ON THE ROAD SURFACE AND IS DISTRIBUTED IN SHEET FLOW TO VEGETATED SHOULDERS WHERE AVAILABLE.

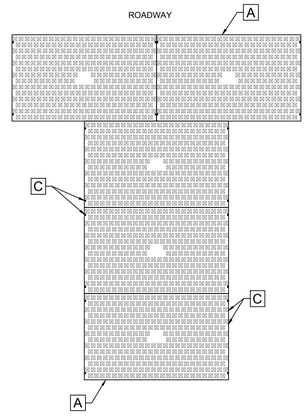
1 GRAVEL ACCESS ROAD

NOT TO SCALE



LEGEND:

A: FODS TRACKING CONTROL MAT OR ENGINEER APPROVED EQUAL
B: ANCHOR POINTS

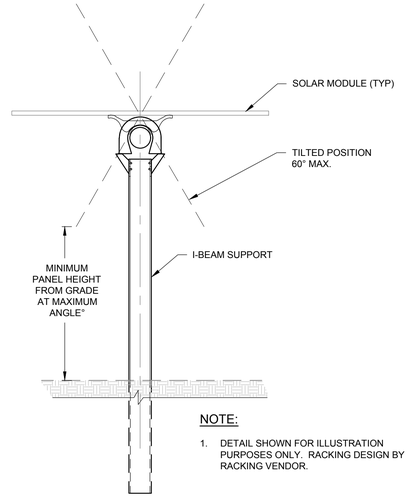


NOTES:

1. ANTI-TRACKING MAT TO BE FODS TRACKOUT CONTROL MATS MODEL #1100 OR ENGINEERING APPROVED EQUAL.
2. ANTI-TRACKING MAT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION GUIDELINES.
3. SEDIMENT TO BE REMOVED FROM ANTI-TRACKING MAT WHEN SEDIMENT BUILDING REACHES HALF THE HEIGHT OF THE PYRAMIDS WITHIN THE ANTI-TRACKING MAT.
4. SEDIMENT TO BE REINTRODUCED TO MEADOW AREAS AMONGST THE SITE AND STABILIZED.
5. GENERAL CONTRACTOR MAY USE ALTERNATIVE ANTI-TRACKING METHODS. ALTERNATIVE METHODS TO BE APPROVED PRIOR TO INSTALLATION.

2 ANTI-TRACKING MAT

NOT TO SCALE

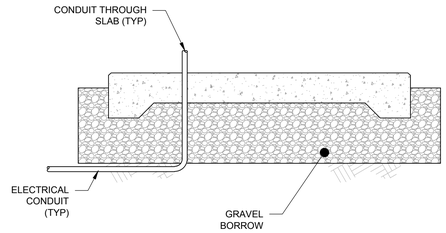


NOTE:

1. DETAIL SHOWN FOR ILLUSTRATION PURPOSES ONLY. RACKING DESIGN BY RACKING VENDOR.

3 SOLAR RACKING

NOT TO SCALE

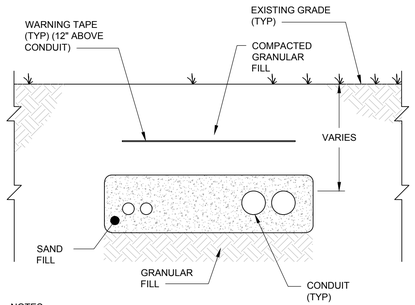


NOTES:

1. DETAIL IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. FINAL FOUNDATION DESIGN TO BE PROVIDED BY ELECTRICAL ENGINEER OF RECORD.
2. FINAL EQUIPMENT PAD DESIGN TO BE PROVIDED IN ELECTRICAL ENGINEER SET.

4 CONCRETE EQUIPMENT PAD (TYP.)

NOT TO SCALE

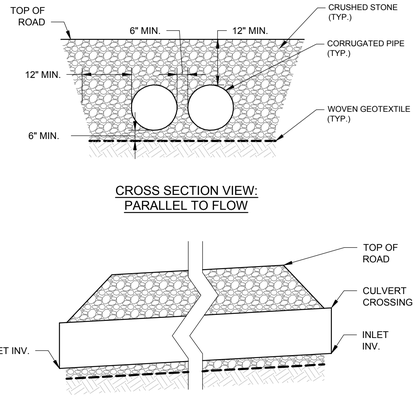


NOTES:

1. TRENCH SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. ELECTRICAL DESIGN AND CONFORMANCE WITH ELECTRICAL CODE REQUIREMENTS BY ELECTRICAL ENGINEER OF RECORD.
2. ALL SIDES OF CONDUITS SHALL HAVE A MINIMUM OF 6" OF SAND BEDDING OFFSET FROM ALL SIDES.
3. FINAL DESIGN TO BE PROVIDED IN ELECTRICAL ENGINEERING PLAN SET.

5 BELOW GRADE CONDUIT (TYP.)

NOT TO SCALE

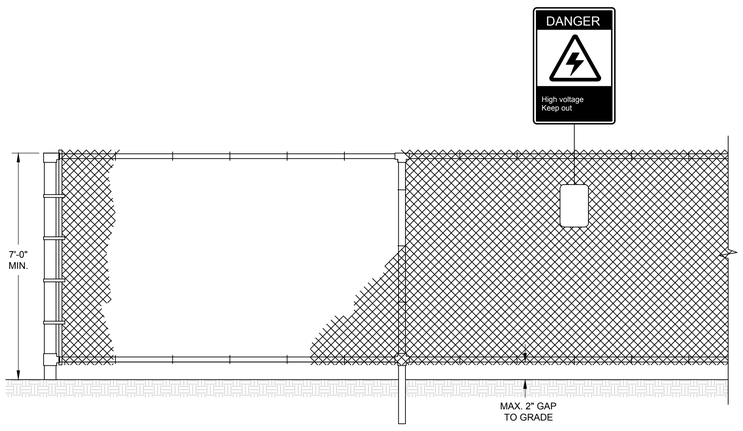


CROSS SECTION VIEW:
PARALLEL TO FLOW

CROSS SECTION VIEW:
PERPENDICULAR TO
FLOW

7 DOUBLE CULVERT CROSSING

NOT TO SCALE

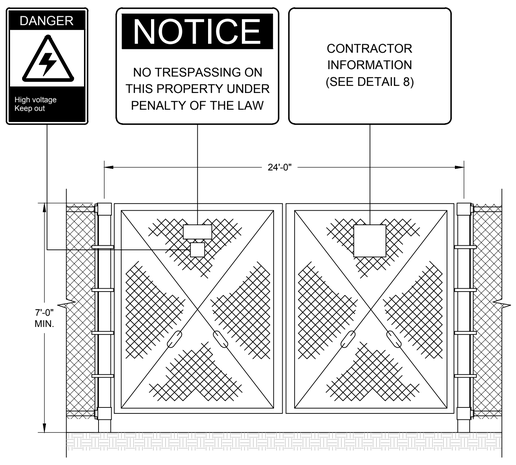


NOTES:

1. FENCE SHALL MEET OR EXCEED THE CHAIN LINK FENCE MANUFACTURER (CLFM) GUIDELINES FOR SECURITY AND CHAIN LINK FENCE MATERIALS AND INSTALLATION.
2. SECURITY FENCE AROUND THE EQUIPMENT PADS SHALL BE CONTINUOUS AND 7'-0" (MINIMUM) PER THE NEC 110.31.
3. THE SECURITY FENCE SHALL BE GROUNDED IN ALL AREAS WHERE THE PV MODULES ARE LOCATED LESS THAN 10'-0" FROM THE FENCE TO LIMIT THE RISE OF HAZARDOUS VOLTAGE (IF APPLICABLE).
4. ALL GATES TO BE INSTALLED WITH KNOX BOX AND SIGNAGE WITH EMERGENCY CONTACT INFORMATION (TYP.). KNOX BOX KEY SHALL BE GIVEN TO THE BLANDFORD FIRE DEPARTMENT.
5. FENCE POST DESIGN BY OTHERS.

6 POST DRIVEN CHAIN LINK FENCE

NOT TO SCALE



7 CHAIN LINK FENCE DOUBLE GATE

NOT TO SCALE

NOTE:

1. CONTRACTOR TO VERIFY EMERGENCY CONTACT NUMBER

8 CONTRACTOR INFORMATION SIGN

NOT TO SCALE

NOT FOR CONSTRUCTION

Project:
PEEBLES BROOK, LLC

89 CHESTER ROAD
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No.	Description	Date
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Revisions

Seal:
COMMONWEALTH OF MASSACHUSETTS
ROBERT J. BUKOWSKI
CIVIL
No. 41492
REGISTERED PROFESSIONAL ENGINEER
5/29/25

Issued For:
PERMITTING

Scale:	AS SHOWN
Issued Date:	03/28/2025
Drawn By:	DED / RJR
Reviewed By:	AGH
Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
CIVIL DETAILS

Sheet Number:
C502

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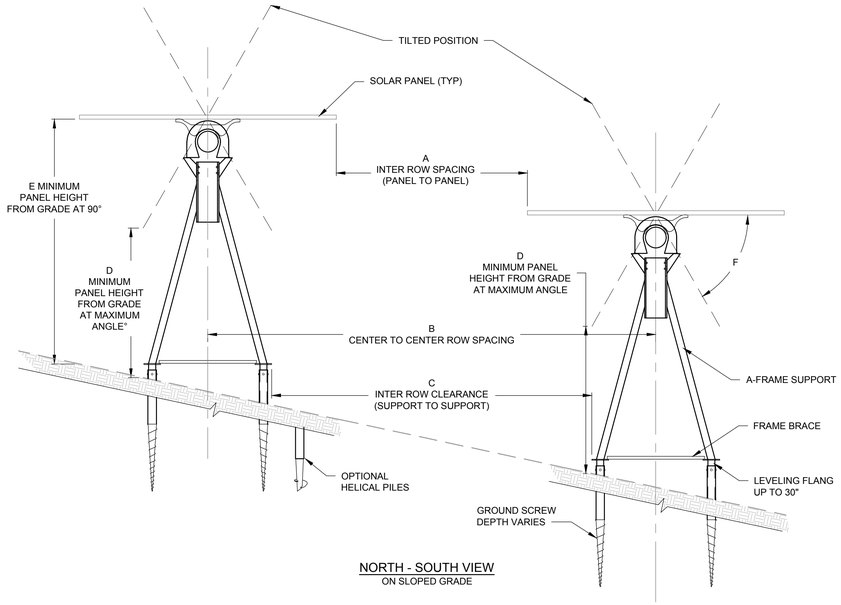
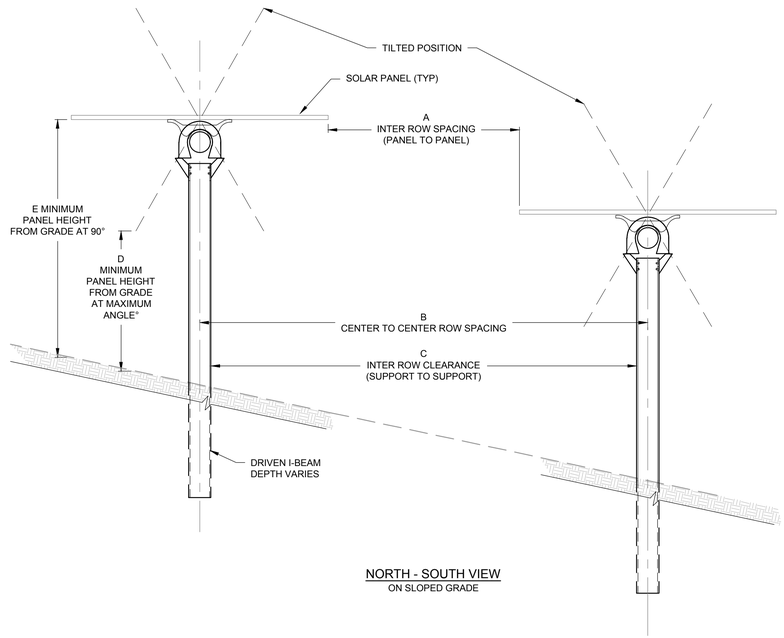
KEY SYSTEM DIMENSIONS						
NON-SOLAR USE	A (MIN)	B (MIN)	C (MIN)	D (MIN)	E (MIN)	F
HAY FIELD	18'	26'	20'	6'-6"	10'	60-DEG

NOTES:

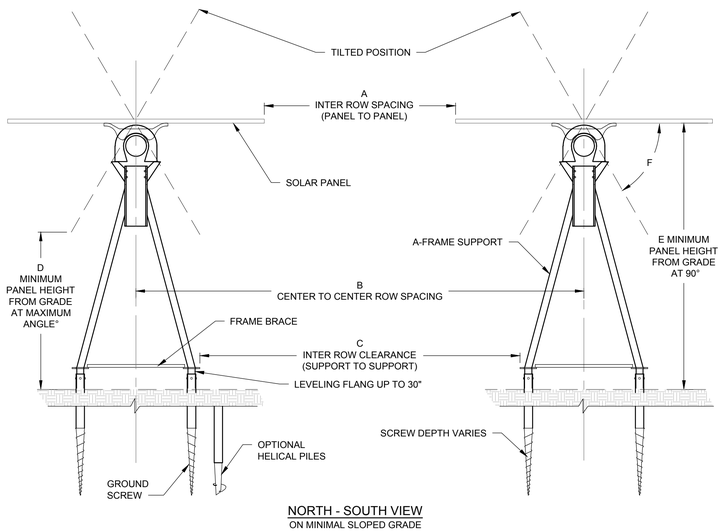
1. DETAILS SHOWN FOR ILLUSTRATION PURPOSES ONLY. RACKING DESIGN BY OTHERS.
2. REFER TO ELECTRICAL AND STRUCTURAL PLANS FOR FINAL RACKING DESIGN, CONFIGURATION, HEIGHT AND INTER ROW SPACING.



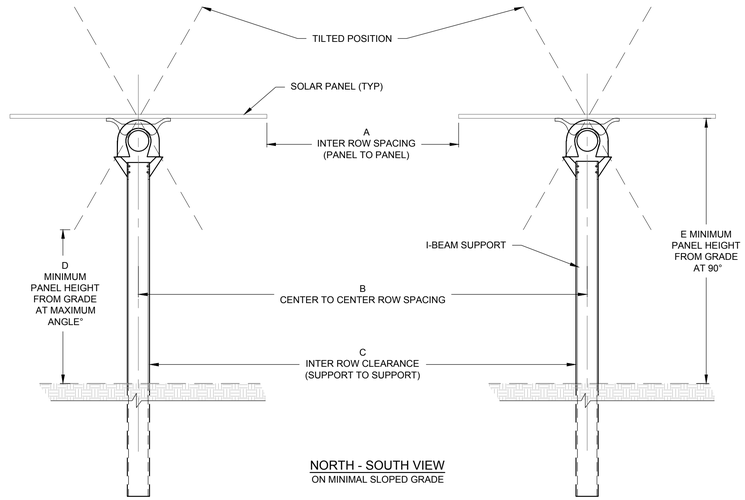
NORTH - SOUTH VIEW
ON SLOPED GRADE



NORTH - SOUTH VIEW
ON SLOPED GRADE



NORTH - SOUTH VIEW
ON MINIMAL SLOPED GRADE



NORTH - SOUTH VIEW
ON MINIMAL SLOPED GRADE

1 GENERAL ROW SPACING REQUIREMENTS A-FRAME STYLE SUPPORT SYSTEM

NOT TO SCALE

2 GENERAL ROW SPACING REQUIREMENTS I-BEAM STYLE SUPPORT SYSTEM

NOT TO SCALE

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Approved By:	RJB
W&S Project No.:	ENG23-3160

Drawing Title:
DUAL USE SOLAR STANDARD AGRICULTURAL DETAILS

Sheet Number:
C503

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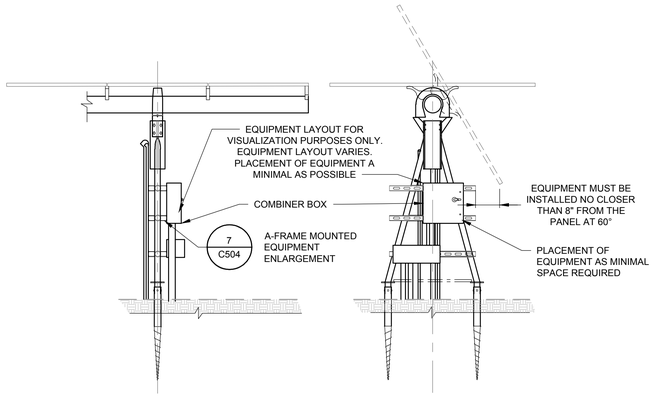
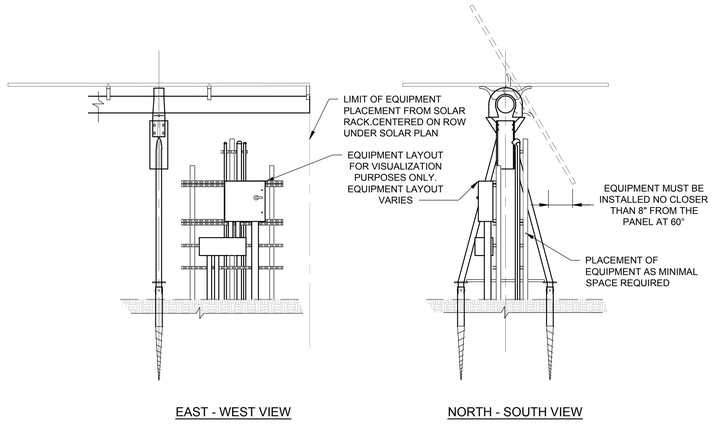


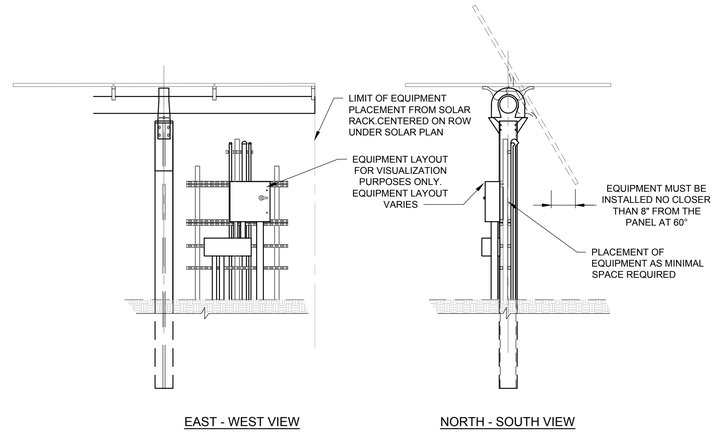
1 A-FRAME RACK SYSTEM WITH EQUIPMENT MOUNTED ON THE A-FRAME SYSTEM

NOT TO SCALE



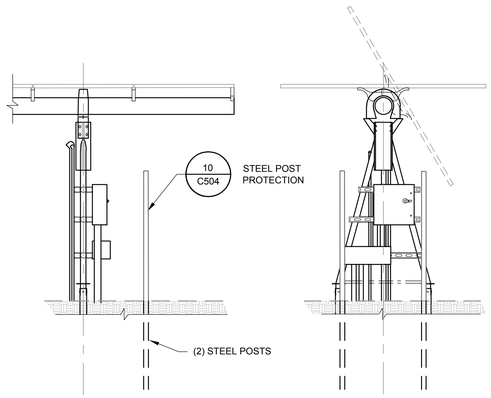
2 A-FRAME RACK SYSTEM WITH EQUIPMENT PLACEMENT UNDER SOLAR PANELS

NOT TO SCALE



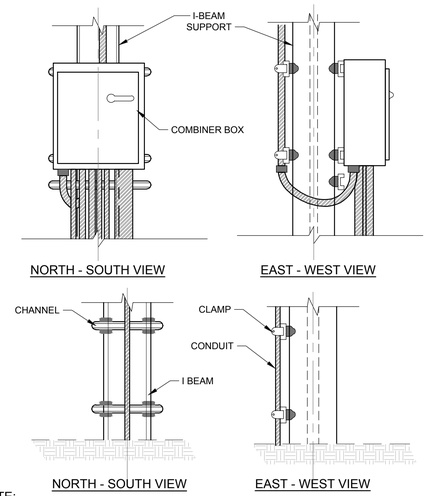
3 I-BEAM RACK SYSTEM WITH EQUIPMENT PLACEMENT UNDER SOLAR PANELS

NOT TO SCALE



4 STEEL POST PROTECTION

NOT TO SCALE

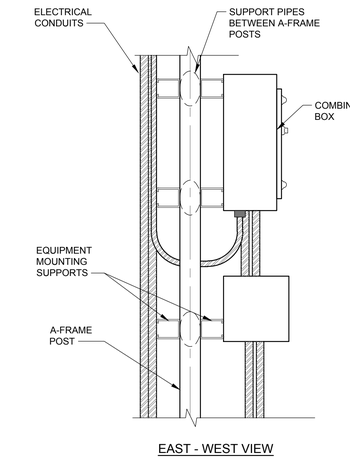


NOTE:

1. CONDUITS CAN BE IN THE WEB OF A FOUNDATION OR AGAINST THE FOUNDATION AS LONG AS COMPACTION REQUIREMENTS, AS SPECIFIED BY FOUNDATION MANUFACTURER, ARE MET.
2. COMBINERS CAN BE MOUNTED AT 6 FEET 7-INCHES TO THE MIDDLE OF THE DISCONNECT HANDLE.

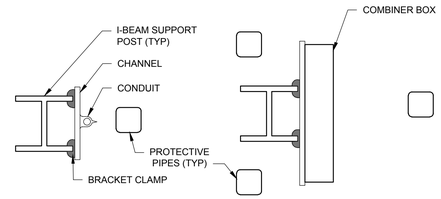
5 I-BEAM MOUNTED EQUIPMENT

NOT TO SCALE



6 A-FRAME MOUNTED EQUIPMENT ENLARGEMENT

NOT TO SCALE



7 STEEL POST PROTECTION

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NOT FOR CONSTRUCTION

Project:
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5/29/25

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Reviewed By:	AGH
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W&S Project No.:	ENG23-3160

Drawing Title:
DUAL USE SOLAR STANDARD AGRICULTURAL DETAILS

Sheet Number:
C504

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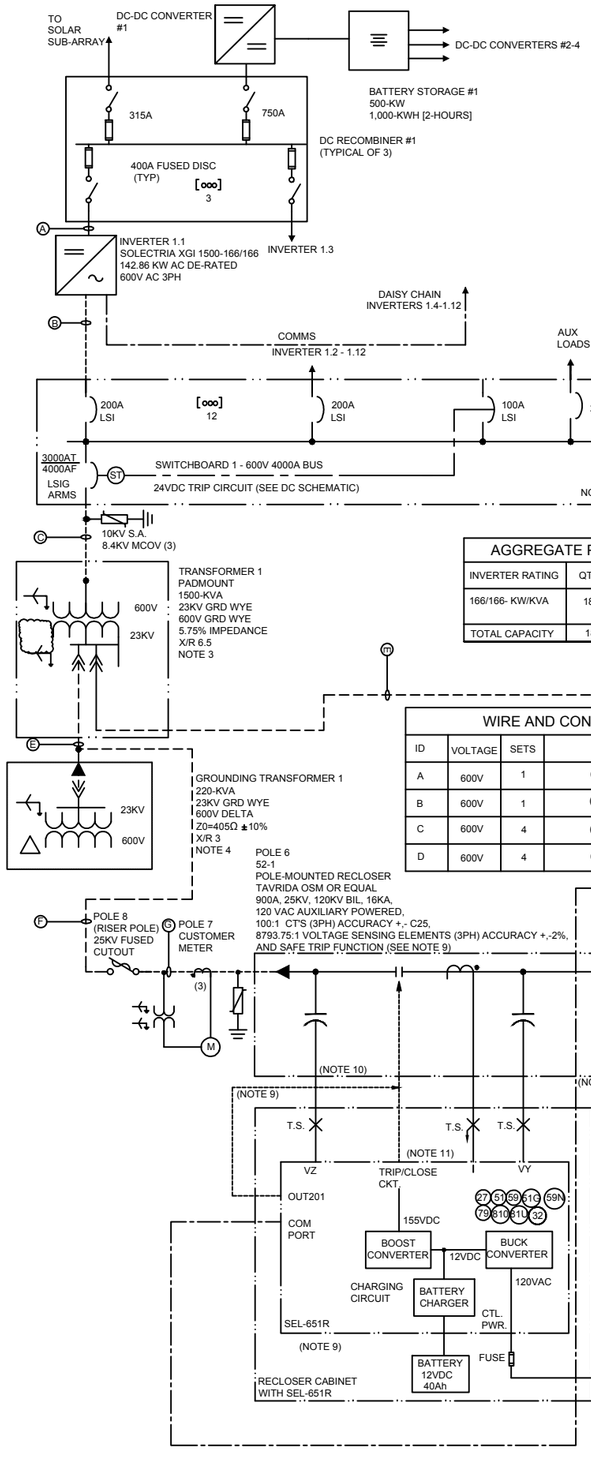
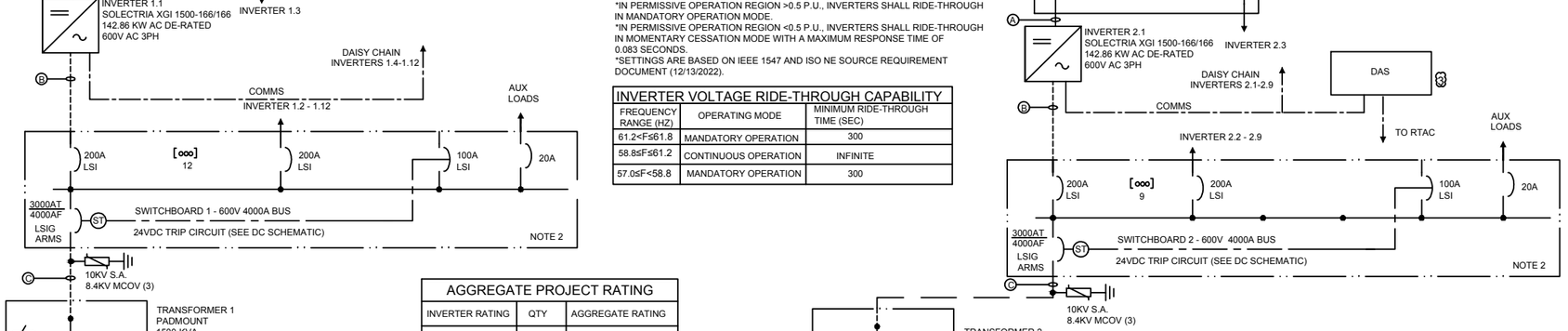
Appendix C – One Line Diagram and Electrical Specifications





INVERTER VOLTAGE RIDE-THROUGH CAPABILITY			
VOLTAGE RANGE	OPERATING MODE/RESPONSE	MINIMUM RIDE-THROUGH TIME (SEC)	MAXIMUM RESPONSE TIME (SEC)
V>1.20	CEASE TO ENERGIZE	N/A	.16
1.10<V≤1.20	MOMENTARY CESATION	2.0	N/A
0.88≤V≤1.10	CONTINUOUS OPERATION	INFINITE	N/A
0.50≤V<0.88	MANDATORY OPERATION	3.0	N/A
V<0.50	MOMENTARY CESATION	1.10	N/A

*IN PERMISSIVE OPERATION REGION >0.5 P.U., INVERTERS SHALL RIDE-THROUGH IN MANDATORY OPERATION MODE.
*IN PERMISSIVE OPERATION REGION <0.5 P.U., INVERTERS SHALL RIDE-THROUGH IN MOMENTARY CESSATION MODE WITH A MAXIMUM RESPONSE TIME OF 0.083 SECONDS.
*SETTINGS ARE BASED ON IEEE 1547 AND ISO NE SOURCE REQUIREMENT DOCUMENT (12/13/2022).

INVERTER VOLTAGE RIDE-THROUGH CAPABILITY		
FREQUENCY RANGE (HZ)	OPERATING MODE	MINIMUM RIDE-THROUGH TIME (SEC)
61.2<F≤61.8	MANDATORY OPERATION	300
58.8≤F≤61.2	CONTINUOUS OPERATION	INFINITE
57.0≤F<58.8	MANDATORY OPERATION	300

AGGREGATE PROJECT RATING		
INVERTER RATING	QTY	AGGREGATE RATING
166/166- KW/KVA	18	2,988-KW
TOTAL CAPACITY	18	2,988-KW

WIRE AND CONDUIT SCHEDULE				
ID	VOLTAGE	SETS	WIRE	CONDUIT
A	600V	1	(4) #500 KCMIL CU	(4) 4"
B	600V	1	(4) #3 / 0 AWG CU	(1) 2"
C	600V	4	(4) 500 KCMIL CU	(4) 4"
D	600V	4	(4) 600 KCMIL CU	(4) 4"

INVERTER PROTECTIVE SETTINGS			
INVERTER PROTECTIVE FUNCTIONS	PICKUP SETTING PERCENT	PICKUP SETTING VALUE	TOTAL CLEARING TIME CYC. (SEC)
27P1 - UNDERVOLTAGE	50%	300V	1.10
27P2 - UNDERVOLTAGE	88%	528V	3.00
59P1 - OVERVOLTAGE	110%	660V	2.00
59P2 - OVERVOLTAGE	120%	720V	0.16
81U1 - UNDERFREQUENCY	-	56.5 HZ	0.16
81U2 - UNDERFREQUENCY	-	58.5 HZ	300
81O1 - OVERFREQUENCY	-	61.2 HZ	300
81O2 - OVERFREQUENCY	-	62.0 HZ	0.16

PROTECTIVE RELAY SETTINGS 52-1			
SEL-651R PROTECTIVE FUNCTIONS	PICKUP SETTING PERCENT	PICKUP SETTING VALUE	OPERATING TIME (SECONDS)
27P1 - UNDERVOLTAGE	50%	(1.31V) 11,500V	TOTAL: 1.10 RELAY: 1.05
27P2 - UNDERVOLTAGE	88%	(2.30V) 20,240V	TOTAL: 3.00 RELAY: 1.95
59P1 - OVERVOLTAGE	110%	(2.88V) 25,300V	TOTAL: 2.00 RELAY: 1.95
59P2 - OVERVOLTAGE	120%	(3.14V) 27,600V	TOTAL: .16 RELAY: .11
81UP1 - UNDERFREQUENCY	-	56.5 Hz	TOTAL: .16 RELAY: .11
81UP2 - UNDERFREQUENCY	-	58.5 Hz	TOTAL: 300.00 RELAY: 299.95
81OP1 - OVERFREQUENCY	-	61.2 Hz	TOTAL: 300.00 RELAY: 299.95
81OP2 - OVERFREQUENCY	-	62.0 Hz	TOTAL: .16 RELAY: .11
32- REVERSE POWER RELAY	3,000 KW		TOTAL: .16 RELAY: .11
51 - PHASE TIME OVERCURRENT	1.09A (109A PRI.)		CURVE: U4 T.D.: 2
51G - GROUND TIME OVERCURRENT	.22A (22A PRI.)		CURVE: U3 T.D.: 1
59N - NEUTRAL OVERVOLTAGE	50%	(.76V) 6,640V	TOTAL: 1.00 RELAY: 0.95
79 - AUTO RESTORE VOLT. RANGE	1.43 (12,540) ≤V≤1.58 (13,860)		300
79 - AUTO RESTORE FREQ. RANGE	59.5 ≤f<60.5		300
ALARM - HARDWARE AND LOSS OF POWER (AC AND DC)	-	-	<2

NOTES:

1. DC DESIGN (ARRAY, CONVERTERS, ETC.) BY OTHERS.
2. PANELS AND SWITCHBOARD BREAKERS TO BE RATED FOR 100% DUTY, FOR BACK FEED, AND FOR THE APPROPRIATE FAULT DUTY AND LOCATION. BUS SIZING AND DISTRIBUTION SWITCHGEAR SHALL ADHERE TO NEC 705.12.
3. PROVIDE TRANSFORMER WITH BAY-O-NET FUSES, ELBOW TYPE S.A. (15.3KV MCOV), AND FULLY RATED NEUTRAL.
4. GROUNDING TRANSFORMER SPECS TO BE CONFIRMED BY UTILITY.
5. EQUIPMENT HAS BEEN SIZED FOR PRELIMINARY DESIGN PURPOSES. ALL EQUIPMENT, INCLUDING, SWITCHES, RECLOSERS, SWITCHGEAR, CABLES AND CONDUITS TO BE SIZED AND LISTED ON FINAL DESIGN DRAWINGS.
6. RELAY SETTINGS ARE PRELIMINARY. TO BE CONFIRMED VIA IMPACT STUDY AND ENGINEER OF RECORD.
7. AFTER AN AREA EPS DISTURBANCE, SYSTEM SHALL NOT RECONNECT UNTIL 5 MINUTES AFTER THE AREA EPS VOLTAGE IS WITHIN 95% TO 105% OF NOMINAL AND FREQUENCY IS WITHIN RANGE OF 59.5 HZ TO 60.5 HZ.
8. WIRELESS SERVICE TO BE PROVIDED TO UTILITY REVENUE METERING
9. TAVRIDA RECLOSER SHALL BE EQUIPPED WITH THE SAFE TRIP FUNCTION. THIS FUNCTION WILL BE USED TO TRIP THE RECLOSER ON LOSS OF DC. THE OUTPUT CONTACT (OUT201) IS WIRED TO AN INTEGRATED AUXILIARY RELAY MOUNTED UP AT THE RECLOSER. UPON LOSS OF ALL POWER TO THE RELAY THE AUXILIARY RELAY WILL DROP OUT AND THE RECLOSER WILL TRIP.
10. TAVRIDA VOLTAGE SENSING DEVICES PROVIDED LINE TO NEUTRAL VOLTAGE INPUTS ("WYE GROUNDED") TO THE SEL-651R. THE VY VOLTAGES ARE ON THE UTILITY SIDE OF THE RECLOSER.
11. RTAC REQUIREMENTS: CUSTOMER RTAC TO BE FAILSAFE. IF RTAC IS OFFLINE FOR 300 SECS, IT WILL SEND A TRIP SIGNAL TO THE RELAY. IF THE CUSTOMER RTAC RECIEVES A HARD-WIRED TRIP OR SOFTWARE TRIP ALARM, A PULSE WILL STAY ON THE RISING EDGE FOR SECONDS AND AGAIN SEND A TRIP SIGNAL TO THE RELAY. CUSTOMER RTAC WILL ISSUE A DELAYED TRIP IF ES RTAC TO DSCADA COMMUNICATION HAS FAILED (AFTER 5 MINUTES).
12. CUSTOMER RTAC WILL ISSUE A DELAYED TRIP IF ES RTAC TO DSCADA COMMUNICATION HAS FAILED (AFTER 5 MINUTES). CUSTOMER RTAC WILL ISSUE A DELAYED TRIP IF ES RTAC TO DSCADA COMMUNICATION HAS FAILED (AFTER 10 MINUTES)ENTIRE LOGIC SHALL BE IMPLEMENTED INSIDE THE RTAC. RELAY SETTINGS SHALL INCORPORATE REMOTE COMMAND FROM RTAC INTO TRIP AND BLOCK CLOSE EQUATIONS. RELAY WILL TRIP THE BREAKER IF IT LOSES COMMUNICATION WITH THE RTAC. SEL RELAY WILL TRIP THE BREAKER IF IT LOSES COMMUNICATION WITH THE RTAC (AFTER 1 MINUTE). CONNECTION MEDIUM FROM RELAY TO RTAC SHALL BE SERIAL OR ETHERNET. RTAC-RTAC AND RELAY-RTAC COMMUNICATION TO BE DNP3.
13. ALL INTERCONNECTION REQUIREMENTS SUCH AS MAXIMUM AND MINIMUM IMPORT/EXPORT LIMITS SHALL BE PROGRAMMED INSIDE THE CUSTOMER RTAC.
14. SOLECTRIA'S XGI 1500 INVERTERS OPERATE UNI-DIRECTIONALLY, EXPORTING POWER TO THE GRID. WHEN USED IN THE SOLECTRIA PVS-500 DC-COUPLED STORAGE SYSTEM. POWER CANNOT BE IMPORTED FROM THE GRID. CHARGING CONNECTED BATTERIES WITH POWER FROM THE GRID IS NOT POSSIBLE IN THE SOLECTRIA PVS-500 DCCOUPLED STORAGE SYSTEM.

MV AC WIRE AND CABLE SCHEDULE															
FROM	TO	CABLE ID	TYPE	MATERIAL	CONDUCTOR	VOLTAGE (KV)	FEET	OVERHEAD - OHMS/MILE UNDERGROUND - OHMS/1000 FT R1	X1	R0	X0	PER UNIT VALUE (100 MVA BASE) R1	X1	R0	X0
TRANSFORMER 1	GRNDING XMFR	E	UNDERGROUND	AL	#1 / 0 AWG	25	20	.1842	.0623	.3684	.1247	.01315	.00445	.02631	.00891
GRNDING XMFR	RISER	F	UNDERGROUND	AL	#1 AWG	25	225	1.0834	.7980	1.3689	3.2859	.00086	.00063	.00109	.00261
RISER	RECLOSER	G	OVERHEAD	ACSR	#1 AWG	25	50	1.0834	.7980	1.3689	3.2859	.00086	.00063	.00109	.00261
RECLOSER	GOAB	H	OVERHEAD	ACSR	#1 AWG	25	50	1.0834	.7980	1.3689	3.2859	.00086	.00063	.00109	.00261
GOAB	PCC	I	OVERHEAD	ACSR	#1 AWG	25	50	1.0834	.7980	1.3689	3.2859	.00086	.00063	.00109	.00261

*SETTINGS ARE BASED ON IEEE 1547 AND ISO NE SOURCE REQUIREMENT DOCUMENT (12/13/2022).

*RELAY WILL AUTOMATICALLY TRIP AND BLOCK CLOSE IF THERE IS A HARDWARE FAILURE OR POWER SUPPLY FAILURE AND ON ANY OVERCURRENT OPERATION (51 & 51G). THIS WILL BE DONE VIA LOGIC IN THE SEL-651R RELAY.

*TOTAL CLEARING TIME INCLUDES RELAY OPERATING TIME AND RECLOSER OPERATING TIME. RECLOSER OPERATING TIME IS 3.0 CYCLES.

*VOLTAGE SETTINGS BASED ON LINE TO NEUTRAL VOLTAGE.

*RECLOSER WILL ONLY BE ALLOWED TO CLOSE WHEN THE VOLTAGE AND FREQUENCY ARE IN COMPLIANCE WITH UTILITY REQUIREMENTS, VOLTAGE RANGE 95% TO 105% OF NOMINAL. VOLTAGE IS BASED ON LINE TO LINE VOLTAGE. FREQUENCY BETWEEN 59.5HZ TO 60.5HZ.

*32 REVERSE POWER RELAY TO BE PROVIDED AND SET TO ISOLATE DER GENERATOR FROM THE EPS. THE 52-1 SHALL OPEN ANY TIME THE POWER IMPORT DROPS BELOW 5% OF GROSS NAMEPLATE RATING.

*79 FUNCTION IS ONLY ENABLED ON VOLTAGE AND FREQUENCY DISTURBANCES. A 5 MINUTE DELAY FOR THE 79 FUNCTION IS ENABLED ON VOLTAGE AND FREQUENCY DISTURBANCES ONLY. A 5 MINUTE DELAY WILL BE SET FOR RECLOSING UPON GOOD QUALITY VOLTAGE, THE FIVE MINUTE TIME INTERVAL WILL RESTART IF THE UTILITY VOLTAGE OR FREQUENCY FALLS OUTSIDE OF THE WINDOW IDENTIFIED IN THE ABOVE CHART. RECLOSER WILL LOCKOUT ON OVERCURRENT OPERATION.

COMMONWEALTH OF MASSACHUSETTS
LAURENCE MICHAEL ELECTRICAL No. 58176 Laurence Michael
PROFESSIONAL ENGINEER

PROGRESS SET NOT FOR CONSTRUCTION

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BOSTON, MA 02116
(617) 209-3122
www.bluewavesolar.com

REV	DRN	DATE	COMMENTS
(3)		01/25/24	ADDED RTAC-RTAC CONNECTION
(2)		12/19/2023	UPDATED MV GROUNDING BANK
(1)		10/3/2023	INCORPORATE UTILITY COMMENTS

PROJECT:
MA BLANFORD 89 CHESTER
SINGLE LINE DIAGRAM
GPS:(42.2128, -72.9440) POI.

SHEET TITLE:

DRAWN BY:
PRINT DATE: MARCH 2024
SCALE:
SHEET NO.:

Larson Electronics LLC
9419 E US HWY 175, Kemp, TX 75143
Phone: 800.369.6671

www.LarsonElectronics.com
Email: sales@LarsonElectronics.com
Fax: 903.498.3364

MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1

1500 kVA Pad Mount Transformer - 12470 V Delta Primary- 480Y/277 Secondary - Oil Cooled

Product ID: 237237

Please see last page for supporting documentation for this product(certificates, CAD files & drawings, IES files, wiring diagrams, etc).

Larson Electronics LLC manufactures a wide variety of products, including custom built to spec designs. The pictures displayed for this unit are a general representation of form factor for the product line and may not accurately represent this exact configuration in every detail due to custom builds and changes between similar products in our standard catalog. The specifics for this configuration are listed in the specification table and supporting documentation (CAD files, Dimensional Drawing, Name Plate Diagram, Wiring Diagram, etc.). This means that specific details (receptacles, plugs, wires, connections, mounting brackets, external finishes, etc.) may not be accurately represented in images vs specifications. Please review specifications and do not order based solely on images.

MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 3PH Pad Mount Transformer

Transformer Type: Pad Mounted, Compartmental-Type
Transformer Configuration: Liquid Filled Pad Mounted, Corrosion Resistant Build
Transformer Feed Type: Loop Feed
Phase: Three Phase
Capacity: 1.5 MVA (1500 KVA)
Vector Group: DNY11
Primary Voltage: 12470V
Primary Voltage Class: 15 kV Class
Primary Phasor: Delta
Primary BIL: 95 KV
Secondary Voltage: 480Y/277
Secondary Voltage Class: 1.2 kV Class
Secondary Phasor: Wye-N
Secondary BIL: 30 KV
Frequency: 60 Hz
Temperature Rise: 65°C
Cooling Class: KNAN; Self-Cooled
Forced Air (Fans): None
Tap Changer: 5-position Tap Changer
Tap Qty: (2) FCAN Above Taps, (2) FCBN Below Taps
Tap %: 2.5%
Tap Changer Switch Location: High Voltage (HV) Front Compartment
Impedance (Typical): 5.0-7.5% Typical
Primary Connection Type: Dead Front

Ratings

Meets/Exceeds DOE 2016 Efficiency Ratings
Complies with ANSI / IEEE C57.12.00
Complies with ANSI / IEEE C57 12.28
Complies with ANSI / IEEE C57 12.34
Complies with ANSI / IEEE C57.12.70
Complies with ASTM D3487
Pentahead Entry Assembly
High-Fire Point Natural Ester Insulating Fluid
Non-PCB Insulating Fluid
Tamper Proof Housing
Hinged Front Compartment Doors, Pad Lockable

Efficiency %: 99.30%
Based on transformer operating at 50% of nameplate base kVA.

Load Losses Based on 85°C Reference Temp.
No Load Loss (in watts)): +/- 1,900W
Full Load Loss (in watts) at 100%: +/- 10,500W
Total Load Loss (in watts) at 100%: +/- 12,400W

Total Losses at 55°C LL Temp.& 20°C NL Temp.
Total Load Loss (in watts) at 50%: +/- 4,375W

Note: Losses offered are typical only, not guaranteed

Primary Termination: Standoff Well Bushings w/ Removable Studs, 600A Load Break Elbows
Primary Connection Qty: (6) Primary Connections w/ (6) Standoff Brackets for Parked Elbows
Primary Surge Arrestors: (3) High Voltage Elbow Surge Arrestors, Included
Primary Surge Arrestor Voltage Rating: 18 kV Class
Primary Surge Arrestor MCOV Rating: 15.3 kVrms
Primary Over Current Protection (OCP): Bayonet Fuses, Partial-Range Current-Limiting Fuses
Primary Over Current Protection Method: Fused
Primary Over Current Protection Holder: Bayonet Fuse Holder w/ Drip Shield
Secondary Connection Type: Live Font
Secondary Connections: NEMA Spade Terminals, 6-Hole Spade, Externally Clamped, Accepts up to (3) Double Lug connections with (3) cables per side of Spade connector
Secondary Connection Qty: (4), Staggered Terminal Arrangement
Secondary Over Current Protection (OCP): N/A
Grounding Provisions: (1) Grounding lug
Metering Current Transformer (CT): N/A
Metering Panel: N/A
Auxiliary Control Panel : N/A
Load Break Switch: 4-Position Load Break Switch
Load Break Switch Qty: (1)
Load Break Switch Location: High Voltage (HV) Front Compartment
Efficiency Standard(s): Meets DOE 2016 Standards, Meets ANSI/IEEE Standards
K-Factor Rating (Harmonic Mitigation): K-0 (Standard)
Pulse Drive Rating: N/A
Insulation Fluid: Biodegradable Natural Vegetable Oil Ester Insulating Fluid - Non-PCB Fluid
Fluid Capacity: 410 Gallons
Liquid Level Indicator: Analog Dial Gauge
Temperature Indicator: Analog Dial Gauge
Pressure/Vacuum Indicator: Analog Dial Gauge
Pressure Relief Device: Included, Automatic Action
Fill Valve: Removable Bolt
Fill Valve Location: Front Compartment
Drain Valve: Included, Drain Valve w/ Sampler
Drain Valve Location: Front Compartment
Winding Material: Copper
Ambient Temperature Rating: 40°C
Sound Level: 60 dBA
Elevation Rating: 3300ft (1000 meters) Above Sea Level
Core Material: Grain Oriented Steel
Tank Material: 304 Stainless Steel
Cabinet Material: 304 Stainless Steel
Base Platform Material: 304 Stainless Steel
Housing Type: Compartmental Cabinet w/ Doors, HV Compartment Left, LV Compartment Right
Paint Type: Weatherproof and UV Resistant Epoxy Coating and Undercoating
Finish Color: Munsell™ 7.0 GY 3.29/1.5 Bell Green
Mounting: Pad Mounted
Conduit Opening: Bottom Feed Underground Entry/Exit
Dimensions: 89"-W x 86"-D x 73"-H
Weight: 10300 lbs

*Please note that numbers are approximate and subject to change

100% Stainless Steel Construction, Corrosion Resistant

Special Orders - Special Requirements
Contact us for special requirements

Toll Free: 1-800-369-6671
Intl: 1-903-270-1187
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E-mail: sales@larsonelectronics.com

The MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 from Larson Electronics is an Industrial Pad Mount Transformer that offers powerful, reliable, and efficient power distribution in indoor, outdoor, and public locations. The low operating costs, low heat emissions, and low cost of ownership makes this transformer ideal for a wide range of applications and businesses. An enclosed design caters to installations on concrete pads without protective fencing.
PLEASE NOTE: ANY FREE SHIPPING OFFERS DO NOT APPLY TO POWER DISTRIBUTION PANELS, TRANSFORMERS, OR SUBSTATIONS*
Transformer Features: With a transformer rating of 1500 KVA (1.5 MVA), the industrial transformer features a primary voltage of three-phase 12470V Delta and

a secondary voltage of three-phase 480Y/277 V Wye. The unit has a primary loop feed for single installations and dead-front primary connections. This transformer features a 5-position tap changer with two, +/- 2.5% taps above and two, +/- 2.5% taps below to allow small changes for voltage. There are no load break switches, rapid rise relays and protection fuses present on the system.
Copper transformer winding material helps improve performance, reduce weight and lower cost. This transformer consists of rectangular coil and five-legged wound core design with three coils and four core loops (this is for three-phase transformers only; single-phase units have one coil and two core loops).
The MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 is air cooled and does not have fans or mounting provision for fans.
Enclosure Design: This pad mounted transformer is a compartmental design. The tank and housing are fabricated from stainless steel. The front electrical enclosure carries a NEMA 3R rating. The high voltage and low voltage compartments are located in front of the transformer tank, with the high voltage compartment on the left side and low voltage compartment on the right side. The HV and LV compartments are air filled and separated by a full length stainless steel barrier between the compartments. A removable stainless steel plate at the base of the HV and LV compartments prevents rodents and other intrusions from entering the enclosure once installed. This stainless steel plate allows for underground conduit entry into the enclosure compartments. Two hinged exterior doors allows for access into the compartments. A single pad lockable handle on the low voltage compartment door allows for securing the transformer. A spring loaded pin within the low voltage compartment prevents the high voltage door from being opened without pulling the safety pin. A hot stick is included in the high voltage compartment, mounted to the HV door.
Temperature Rise: This unit features 65°C temperature rise for reduced heat waste, increased reliability and longer life. At 65°C temperature rise, the transformer offers 1500 KVA (1.5 MVA). The transformer meets standard efficiency requirements. The combination of low temperature rise and high efficiency makes this unit suitable for use in electrical rooms, air conditioned spaces in buildings, underground vaults and similar locations, in addition to outdoor areas.
Insulation Fluid: The MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 features biodegradable cooling fluid (KNAN) with a capacity of 350 gallons. We offer transformers with FR-3 oil fluid, if needed.
Biodegradable Fluid: Biodegradable cooling fluid (vegetable oil) has a higher heat capacity compared to mineral oil, making the liquid safer to use and more reliable during operations. Vegetable oil has a higher flash point and fire point than mineral oil, hydrocarbon oil, silicone oil and synthetic ester. This cooling fluid is also non-toxic and can tolerate higher breakdown voltages than mineral oil. When operating at high temperatures, biodegradable cooling liquid sustains up to 120% loan conditions, which helps preserve the transformer's lifespan and performance.
Gauges: The following gauges are included with the system: liquid level, temperature and pressure/vacuum gauges. Standard liquid level, temperature and pressure/vacuum gauges are analog, manual reading types. These gauges do not have auxiliary contacts.
Fault Pressure Devices: This transformer features an automatic action fault pressure device. Fault pressure devices are used to detect high rates of pressure rise within the tank.
Rapid Rise Relay: There are no rapid rise relays on the unit. This safety component is designed for protection when a rapid increase in tank pressure occurs. The relay is suitable for detecting sudden pressure fluctuations above predetermined safe limits.
Surge arresters: This system comes with high elbow surge arresters on the primary side. Designed for over-voltage and transient voltage protection, the components prevent damage caused by lightning, internal switching or voltage surges. We can offer models without high elbow surge arresters that have mounting provisions for customer-provided surge arresters.

Load Break Switch: The transformer is equipped with a load break switch. This switch has four positions: A side on + transformer on, B side on + transformer on, A and B sides + transformer on, and A and B sides + transformer off.
Valves: The MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 is equipped with a pressure relief valve, fill valve, and drain valve with sampler port.
Protection Fuses: This transformer does not contain protection fuses. For units without protection fuses, up stream protection is provided. We recommend provisions for protection fuses when possible, as blown fuses may require more frequent oil changes.
Mount: The heavy-duty enclosure makes the unit suitable for both indoor and outdoor applications. This power distribution system can be pad mounted on concrete pads.
Benefits: The MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1 pad mount transformer offers many benefits to consumers. This transformer provides owners with significant energy savings, as well as offering environmental benefits. Higher efficiency not only extends the life of the transformer, but also turns into cost savings for owners in the form of lower energy bills and decreased cost of ownership.
Applications: General purposes, industrial sites, electrical rooms, underground vaults, manufacturing facilities, steel plants, offshore, commercial, military, processing plants, electric power distribution, utilities, public locations, and more. Larson Electronics is a manufacturer and as such can build stationary and portable transformer systems to your specifications. Although we carry several models of power distribution transformer systems, we can deliver custom ordered units almost as quickly as our prebuilt units. If this model does not meet your needs, please contact us at 1-800-369-6671 or sales@larsonelectronics.com to discuss your specific requirements.

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Frequently Asked Questions (FAQ)

Q. Can this transformer be customized?

A. Yes, Larson Electronics allows for customization of all transformers. Please send customization requests to sales@larsonelectronics.com. If you have an engineered specification or engineered drawings, please provide those at the time of request.

Q. What is the warranty of this transformer?

A. 12 months from point of connecting electrical service to the transformer or 18 months from point of ordering, whichever comes first.

Q. Where is the detailed dimensional drawing for this unit?

A. We can provide a feature drawing that shows accessories and estimated form factor. Due to the variety of options and varying voltages, an exact dimensional drawing for the specific unit you have ordered is not available until after purchase and engineering has completed the drawing for your sales order. We do not offer completed detailed engineered drawings before purchase. The feature drawings are detailed enough for concrete pad designs and preliminary engineering site designs.

Q. Does my primary and secondary voltage matter for a transformer?

A. Yes, this matters greatly. For primary voltage, most transformers will be equipped with a tap changer for small primary voltage changes due to voltage drop for losses experienced in the transmission line. Some transformers will be equipped with dual voltage primaries with a voltage selector switch to choose which voltage to operate the transformer on. In both cases, these are designed to provide a steady output voltage. It is very important to confirm what voltage your primary voltage being delivered from the utility provider and what the required electrical voltage for the building or house is. You cannot only provide the KVA size, or the abbreviated primary voltage as there is not standardized voltage across the country and each region can be different. Once manufacturing has started, these cannot be changed.

Q. What is required for mounting this transformer?

A. For mounting requirements, please see the ASTM Certificate 2 link.

Q. What types of transformer protection are available?

A. For over-current protection, Larson Electronics offers Fuses, breakers and interrupters. For over-voltage protection, Larson Electronics offers arresters. Larson Electronics can provide both Primary and Secondary protection equipment.

Q. Do you have to ground this transformer?

A. In most cases the enclosure of the transformer is grounded for safety reasons. However, a transformer will function properly without being grounded. Be sure to research all grounding requirements for your specific application against the NETA and NEC as well as any local electrical codes.

Q. How many BTU's of heat does a transformer generate?

A. The heat a transformer generates is dependent upon the transformer losses. To determine air conditioning requirements multiply the sum of the full load losses (obtained from factory or test report) of all transformers in the room by 3.41 to obtain the BTUs/hour. For example: A transformer with losses of 2000 watts will generate 6820 BTUs/hour.

Q. What is the difference between copper and aluminum windings inside the transformer?

A. Transformers wound with aluminum or copper wire have similar losses and performance. The choice of using copper or aluminum windings depends upon the application and the individual preferences. The type of winding material does not affect the transformer's reliability. A transformer's life is defined by the life of its insulation system.

Q. What is the difference between Dead Front and Live Front?

A. Live-front: The voltage-carrying parts are exposed. Live-front terminations have high voltage connectors, arresters, or fuses are exposed to the operator after cabinet has been opened. Dead-front: Often referred to as dead-front bushings. Safety is enhanced as there are no current-carrying parts exposed to the operator. For overhead distribution transformers and underground submersible transformers, live front is common. For pad mount transformers, the primary is typically dead front and the secondary is live front. Protection barriers can be added to live front pad mounted transformers

Q. What is the difference between Loop Feed and Radial Feed?

A. Radial feed Transformers will have three high voltage bushings (H1, H2, and H3). There is one bushing for each phase to allow for the incoming high voltage cables. On Wye and Grounded Wye connected Transformers, there will also be an H0 bushing. Loop feed Transformers will have six high voltage bushings (H1A, H2A, H3A, H1B, H2B, and H3B). There are two bushings for each phase. This allows the customer to connect all of their Transformers in a loop configuration. It will also allow the customer to bring two feeds to the Transformer. A four position switch can be used to switch between the A feed and the B feed.

Q. What is the lifespan of a transformer?

A. The average lifespan of a liquid filled transformer is 25 years. Many transformers will survive past the 25 year mark and are still in service for up to 35 years.

Q. Is this transformer UL Listed? Is this transformer CSA Listed?

A. By default, no. The majority of medium voltage transformer installations do not require certification by a Nationally Recognized Testing Laboratory (NRTL) unless being installed inside a building. Medium voltage equipment is built to and complies to ANSI, ASTM, DOE, IEEE, and NETA standards. UL is one of multiple NRTLs per OSHA certification for testing facilities for USA standards. CSA is one of multiple NRTLs per Canada certification standards. For an additional fee, we can submit your order for NRTL testing after completion of build. This testing service is per order, requires payment of testing fees, and will increase lead time.

Q. What are the transformer ratings?

A. IEEE Std C57.12.20 (Overhead Type), IEEE Std C57.12.34 (Three-Phase Pad-Mounted Compartmental), IEEE Std C57.12.38 (Single-Phase Pad-Mounted), IEEE Std C57.12.36 (Distribution Substation Transformers). For more detailed list of standards, please see the ASTM Certificate 1 link.

Q. Do Larson Electronics transformers contain PCB?

A. All dry-type and liquid filled transformers manufactured by Larson Electronics are PCB (polychlorinated biphenyl) free at the time of shipment. Mixtures of polychlorinated biphenyls (PCB's) were banned commercially for use as transformers cooling fluids in 1977 due to being toxic, bio-accumulative, not at all biodegradable, and difficult to dispose of safely. None of Larson Electronics transformers contain PCB and only use PCB-free fluids.

Q. What is the difference between FR3 fluid and biodegradable fluid?

A. Envirotemp FR3 is a brand name of biodegradable ester oils made by Cargill. Cargill is not the only manufacturer of

biodegradable ester fluids used for cooling liquid filled transformers. Larson Electronics stocks RAPO biodegradable fluid that exceeds testing for ASTM D6871. Cargill Envirotemp FR3 can be used in substitution of the standard biodegradable fluid. This substitution will increase cost and lead times.

Q. What is the difference between mineral oil (ONAN) and biodegradable fluid (KNAN)?

A. Mineral oil has a flash point of 147-165°C. Biodegradable insulation fluids have a higher flash point up to 350°C. Using biodegradable fluids reduce the risk of potential fire due to the transformer overheating. Utilizing biodegradable fluids extends the lifespan on the transformer due to better insulation, higher flash point, better moisture resistance, and higher maximum voltage breakdown points over mineral oils.

Q. What types of transformer liquids does Larson Electronics use?

A. Larson Electronics offered mineral oil fluid (ONAN) and biodegradable fluid (KNAN). On request we can provide brand name FR3 fluid or other brand name fluids for additional cost and lead time. All fluids offered by Larson Electronics are non-PCB containing fluids.

Q. What are the main benefits of a liquid filled transformer?

A. Liquid filled transformers have higher energy efficiency, durability, short circuit strength, low sound level, lower maintenance costs, and longer useful life expectancy compared to dry type transformers.

Q. What type of transformers does Larson Electronics offer?

A. Larson Electronics offered dry type transformers and liquid filled transformers. For liquid filled transformers, Larson Electronics' offers overhead distribution transformers (utility pole mount), pad mounted distribution transformers (mounts to a concrete pad), pad mounted power transformers, underground submersible distribution transformers, and substation transformers.

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MT-PML-R2-3P-DMR-1.5MVA-YE-LT-DF-A6-BB-CS-2B4-M1
Product ID: 237237

Harmonized System (HS) Code: 85043300
Export Control Classification Number (ECCN): EAR99

Links (Click on the below items to view):

- **ANSI Certificate 1**
- **ANSI Certificate 2**
- **Catalog Page - Product Series**
- **Dimensional Drawing 2D**
- **FCC Certificate (Federal Communications Commission, USA)**
- **Internal Component Spec Sheet 3**
- **MSDS (Material Safety Data Sheet**
- **Operations Manual**
- **HigResPic1**
- **HigResPic2**
- **HigResPic3**
- **HigResPic4**
- **HigResPic5**
- **Video1**
- **Video2**
- **ISO 9001 Certification**
- **Business Certificate**
- **Shipping Time Map**

NEW

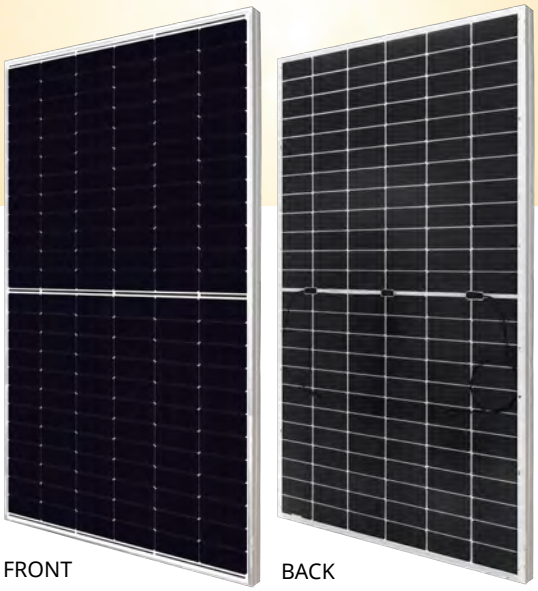
CanadianSolar

TOPBiHiKu6

N-type Bifacial TOPCon Technology

555 W ~ 580 W

CS6W-555|560|565|570|575|580TB-AG



MORE POWER

580 W — Module power up to 580 W
Module efficiency up to 22.5 %

EXTRA POWER — Up to 85% Power Bifaciality,
more power from the back side

Excellent anti-LeTID & anti-PID performance.
Low power degradation, high energy yield

Lower temperature coefficient (Pmax): -0.29%/°C,
increases energy yield in hot climate

Lower LCOE & system cost

MORE RELIABLE

Minimizes micro-crack impacts

Heavy snow load up to 5400 Pa,
wind load up to 2400 Pa*

12 Years **Enhanced Product Warranty on Materials and Workmanship***

30 Years **Linear Power Performance Warranty***

1st year power degradation no more than 1%
Subsequent annual power degradation no more than 0.4%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001: 2015 / Quality management system
ISO 14001: 2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety
IEC 62941: 2019 / Photovoltaic module manufacturing quality system

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE / INMETRO / MCS / UKCA / CGC
UL 61730 / IEC 61701 / IEC 62716 / IEC 60068-2-68
Take-e-way

* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI Solar Co., Ltd. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 22 years, it has successfully delivered around 100 GW of premium-quality solar modules across the world.

* For detailed information, please refer to the Installation Manual.

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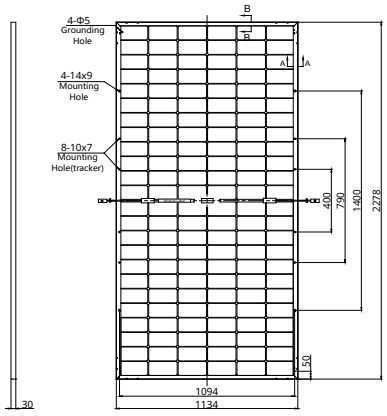
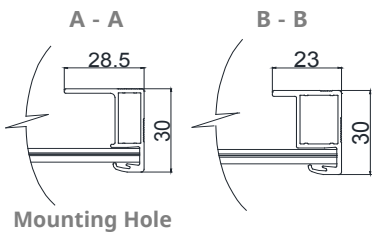
ENGINEERING DRAWING (mm)

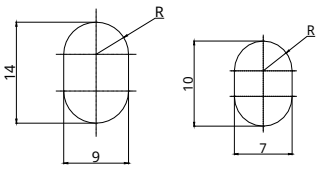
Rear View



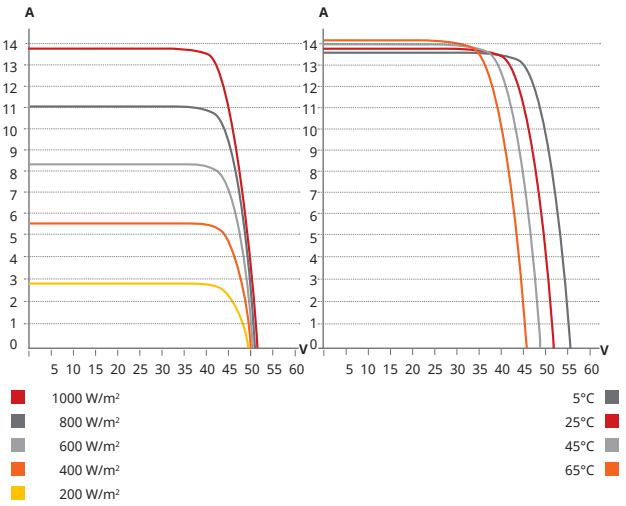
Frame Cross Section



Mounting Hole



CS6W-570TB-AG / I-V CURVES



ELECTRICAL DATA | STC*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
CS6W-555TB-AG	555 W	42.1 V	13.19 A	51.2 V	13.64 A	21.5%
Bifacial Gain** 5%	583 W	42.1 V	13.85 A	51.2 V	14.32 A	22.6%
Bifacial Gain** 10%	611 W	42.1 V	14.51 A	51.2 V	15.00 A	23.7%
Bifacial Gain** 20%	666 W	42.1 V	15.83 A	51.2 V	16.37 A	25.8%
CS6W-560TB-AG	560 W	42.3 V	13.24 A	51.4 V	13.69 A	21.7%
Bifacial Gain** 5%	588 W	42.3 V	13.90 A	51.4 V	14.37 A	22.8%
Bifacial Gain** 10%	616 W	42.3 V	14.56 A	51.4 V	15.06 A	23.8%
Bifacial Gain** 20%	672 W	42.3 V	15.89 A	51.4 V	16.43 A	26.0%
CS6W-565TB-AG	565 W	42.5 V	13.30 A	51.6 V	13.75 A	21.9%
Bifacial Gain** 5%	593 W	42.5 V	13.97 A	51.6 V	14.44 A	23.0%
Bifacial Gain** 10%	622 W	42.5 V	14.63 A	51.6 V	15.13 A	24.1%
Bifacial Gain** 20%	678 W	42.5 V	15.96 A	51.6 V	16.50 A	26.2%
CS6W-570TB-AG	570 W	42.7 V	13.35 A	51.8 V	13.81 A	22.1%
Bifacial Gain** 5%	599 W	42.7 V	14.02 A	51.8 V	14.50 A	23.2%
Bifacial Gain** 10%	627 W	42.7 V	14.69 A	51.8 V	15.19 A	24.3%
Bifacial Gain** 20%	684 W	42.7 V	16.02 A	51.8 V	16.57 A	26.5%
CS6W-575TB-AG	575 W	42.9 V	13.41 A	52.0 V	13.88 A	22.3%
Bifacial Gain** 5%	604 W	42.9 V	14.08 A	52.0 V	14.57 A	23.4%
Bifacial Gain** 10%	633 W	42.9 V	14.75 A	52.0 V	15.27 A	24.5%
Bifacial Gain** 20%	690 W	42.9 V	16.09 A	52.0 V	16.66 A	26.7%
CS6W-580TB-AG	580 W	43.1 V	13.46 A	52.2 V	13.93 A	22.5%
Bifacial Gain** 5%	609 W	43.1 V	14.13 A	52.2 V	14.63 A	23.6%
Bifacial Gain** 10%	638 W	43.1 V	14.81 A	52.2 V	15.32 A	24.7%
Bifacial Gain** 20%	696 W	43.1 V	16.15 A	52.2 V	16.72 A	26.9%

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

** Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

ELECTRICAL DATA | NMOT*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
CS6W-555TB-AG	420 W	39.8 V	10.55 A	48.5 V	11.00 A
CS6W-560TB-AG	424 W	40.0 V	10.59 A	48.7 V	11.04 A
CS6W-565TB-AG	427 W	40.2 V	10.64 A	48.9 V	11.09 A
CS6W-570TB-AG	431 W	40.4 V	10.68 A	49.0 V	11.14 A
CS6W-575TB-AG	435 W	40.6 V	10.72 A	49.2 V	11.19 A
CS6W-580TB-AG	439 W	40.7 V	10.77 A	49.4 V	11.23 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	30 A
Application Classification	Class A
Power Tolerance	0 ~ + 10 W
Power Bifaciality*	80 %

* Power Bifaciality = $Pmax_{rear}$ / $Pmax_{front}$, both $Pmax_{rear}$ and $Pmax_{front}$ are tested under STC, Bifaciality Tolerance: ± 5 %

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	144 [2 x (12 x 6)]
Dimensions	2278 × 1134 × 30 mm (89.7 × 44.6 × 1.18 in)
Weight	32.3 kg (71.2 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	350 mm (13.8 in) (+) / 250 mm (9.8 in) (-) or customized length*
Connector	T6 or MC4-EVO2 or MC4-EVO2A
Per Pallet	35 pieces
Per Container (40' HQ)	700 pieces or 560 pieces (only for US & Canada)

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.29 % / °C
Temperature Coefficient (Voc)	-0.25 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

PARTNER SECTION

CSI Solar Co., Ltd.
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com

SOLECTRIA® XGI 1500-250 SERIES

PREMIUM 3-PHASE TRANSFORMERLESS UTILITY-SCALE INVERTERS

FEATURES

- NEW and MORE POWERFUL!
  - XGI 1500-250/250-600
  - XGI 1500-225-600 (Selectable: 225kW/225kVA or 225kW/250kVA)
  - XGI 1500-200/200-480
  - XGI 1500-175-480 (Selectable: 175kW/175kVA or 175kW/200kVA)
- Industry-leading maximum DC/AC Ratio of 2.0
- Accepts two input PV Output Circuits, with no overcurrent protection required
- Made in the USA with global components
- Buy American Act (BAA) compliant
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SB
- Robust, dependable and built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified

OPTIONS

- PV Source Circuit Combiners
- Web-based monitoring
- Extended warranty

MADE IN THE USA
With U.S. and Global Components

Yaskawa Solectria Solar is pleased to introduce its most powerful XGI 1500 inverters, with the XGI 1500-250 models at 600 Vac, and the XGI 1500-200 models for 480 Vac service.

The XGI 1500-250 and XGI 1500-200 feature SiC technology, high power and high efficiency that places them at the top end of the utility-scale string inverters in the market.

Yaskawa Solectria Solar designs all XGI 1500 utility-scale string inverters for high reliability and builds them with the highest quality components -- selected, tested and proven to last beyond their warranty. The XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL 1741 standards for safety.

The XGI 1500 inverters provide ideal solutions for ground-mounted utility-scale PV systems, with models available for service connections at 600 Vac and 480 Vac. Designed and engineered in Lawrence, MA, the SOLECTRIA XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. The XGI 1500 inverters are Made in the USA with global components, and are compliant with the Buy American Act.

YASKAWA
SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com
Document No. FL.XGI1500-04 | 12/06/2024 |

SPECIFICATIONS

PRODUCT SPECIFICATION		XGI 1500 INVERTER MODEL			
		XGI 1500 250/250-600	XGI 1500 225-600	XGI 1500 200/200-480	XGI 1500 175-480
DC Input	Absolute Maximum Input Voltage	1500 VDC			
	Maximum Power Voltage Range (MPPT)	860-1250 VDC		750-1250 VDC	
	Operating Voltage Range (MPPT)	860-1450 VDC		750-1450 VDC	
	Number of MPP Trackers	1 MPPT			
	Maximum Operating Input Current	296.7 A	267 A	237.3 A	207.6 A
	Maximum Operating PV Power	255 kW	230 kW	204 kW	179 kW
	Maximum DC/AC Ratio | Max Rated PV Power	2.0 | 500 kW	2.22 | 500 kW	2.5 | 500 kW	2.86 | 500 kW
	Max Rated PV Short-Circuit Current (∑Isc x 1.25)	800 A			
AC Output	Nominal Output Voltage	600 VAC, 3-Phase		480 VAC, 3-Phase	
	AC Voltage Range	-12% to +10%			
	Continuous Real Output Power	250 kW	225 kW	200 kW	175 kW
	Continuous Apparent Output Power (kVA)	250	250 225	200	200 175
	Maximum Output Current (A_{RMS})	240.6	XGI 1500-225/225: 216.5 225/250: 240.6	240.6	XGI 1500-175/175: 210.5 175/200: 240.6
	Fault Current Contribution (1 cycle RMS)	390 A	390 A 351 A	312 A	312 A 273 A
	Conductor Compatibility	600 kcmil max, Cu or Alum, 1 or 2 conductors with lugs			
	Nominal Output Frequency	60 Hz			
	Power Factor (Unity default)	+/- 0.80 Adjustable			
	Total Harmonic Distortion (THD) @ Rated Load	< 3%			
	Grid Connection Type	3-Ph + N/GND			
Efficiency	Peak Efficiency	99.0%			
	CEC Average Efficiency	98.5%			
	Tare Loss	<1 W			
Temperature	Ambient Temperature Range	-40°F to 140°F (-40°C to 60°C)			
	De-Rating Temperature	113°F (45°C)	127°F (53°C)	113°F (45°C)	131°F (55°C)
	Storage Temperature Range	-40°F to 167°F (-40°C to 75°C)			
	Relative Humidity (non-condensing)	0 - 95%			
	Operating Altitude	9,840 ft (3 km)			
Communications	Advanced Graphical User Interface	WiFi			
	Communication Interface	Ethernet			
	Third-Party Monitoring Protocol	SunSpec Modbus TCP/IP			
	Web-Based Monitoring	Optional			
	Firmware Updates	Remote and Local			
Testing & Certifications	Safety Listings & Certifications	UL 1741, IEEE 1547, UL 1998, UL 1699b Photovoltaic Arc-Fault Circuit Protection Certified			
	Advanced Grid Support Functionality	Rule 21, UL 1741SB			
	Testing Agency	ETL			
	FCC Compliance	FCC Part 15 (Subpart B, Class A)			
Warranty	Standard and Options	5 Years Standard; Option for 10 Years			
Enclosure	Acoustic Noise Rating	73 dBA @ 1 m ; 67dBA @ 3 m			
	DC Disconnect	Integrated 2-Pole 400 A DC Disconnect			
	Mounting Angle	Vertical only			
	Dimensions	Height: 29.5 in. (750 mm) | Width: 44.3 in. (1125 mm) | Depth: 15.4 in. (390 mm)			
	Weight	290 lbs (131.5 kg)			
	Enclosure Rating and Finish	Listed Type 3R, Self-Certified NEMA 4X and IEC IP66, Polyester Powder-Coated Aluminum			

ETL LISTED

IT'S PERSONAL

YASKAWA SOLECTRIA SOLAR

Yaskawa Solectria Solar 1-978-683-9700 | Email: sales@solectria.com | solectria.com
Document No. FL.XGI1500-04 | 12/06/2024 |

Gotion EDGE 760

Lithium-Ion Battery Outdoor Cabinet for C&I

Advantages of Products

High Safety

- Cabinet-to-cabinet fire resistance
- Cabinet body : fire resistance rating of 1.5hours
- Temp and smoke sensors+aerosol and water fire protection system

Flexible Integration

- Prefabricated cabinets,simplified on-site installation
- Adapt to size of 20ft and 40ft standard container
- Supports parallel connection and system expansion

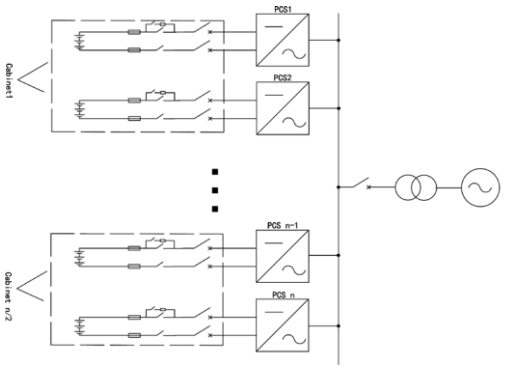
Multiple Scenarios

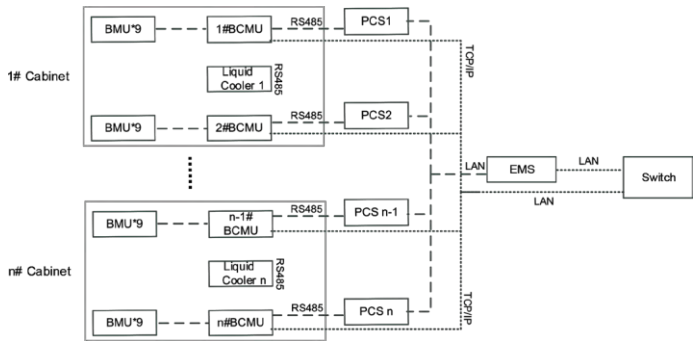
- Urban buildings,communities
- Low-voltage area network
- Highly integrated liquid-cooled C&I ESS

Smart and User-Friendly

- Supports parallel and offline mode
- Early fault warning and location
- Real-time monitoring and fault logging

Architecture Diagram





Model	ESD1267-05P760-G
Electrical	
Cell Type	LFP-300Ah
Configuration	Pack: 1P44S Rack: 1P396S System: 2P396S
Cycle Life	Cell: ≥8000 0.5P, @25°C±3°C
Nominal Energy (kWh)(0.5P@25°C)	Pack: 42.2 Rack: 380 System: 760
Rated Voltage (Vdc)	Pack: 140.8 Rack/System: 1267.2
Voltage Range (Vdc)	Pack: 123.2~158.4 Rack/System: 1069.2~ 1425.6
Charge/Discharge Rate	0.5P@25°C
Max. Charge Power(kW)	380 (0.5P)
Conditions	
Storage Temperature(°C)	-30~60
Working Temperature(°C)	-30~50
Working Relative Humidity(%)	0~95 (non-condensing)
Altitude (m)	<3000 (≥3000 derating)
Parameters	
Ingress Protection	IP54
Cooling Mode	Liquid-Cooling
Communication Interface	CAN, RS485, Ethernet
Communication Protocol	CAN, Modbus-TCP/IP, Modbus RTU, IEC104
Fire Suppression System	Aerosol/Water
Standards&Certification	UN38.3, UL1973, UL9540A, UL9540, IEC62619, IEC60356, IEC61000, IEC60730, IEC62477, NFPA855 Compliant
Dimensions(T * W * H)mm	1400 x 2400 x 2500
Weight (T)	≈8

Gotion High-Tech Co., Ltd.
en.gotion.com
Email:sales@gotion.com

Outlook

New DG Interconnection Application - ESMAEX-02512 BlueWave Origination, LLC

From Eversource MA DG <DoNotReply@PowerClerk.com>
Date Fri 7/7/2023 9:31 AM
To Interconnection <interconnection@bluewavesolar.com>

1 attachment (524 KB)
Application_Check-List.pdf;

Dear BlueWave Origination, LLC,

BlueWave Origination, LLC has submitted a new DG Interconnection Application on your behalf at the following **Service Address** 89 Chester Rd, Blandford MA 01008.

We look forward to working with you to support the installation of your distributed generation system.

Sincerely,

MA DG Customer Care Team

800 Boylston St., Boston, MA 02199

This email was sent to interconnection@bluewavesolar.com and contains information directly related to your Eversource account. Please do not reply to this automated message. For assistance, contact us Monday to Friday, from 8 a.m. to 6 p.m. ET.

Appendix D – Proof of Liability Insurance

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 4/12/2025 | 3/19/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lockton Insurance Brokers, LLC CA License #0B99399 777 S. Figueroa St., 52nd Floor Los Angeles CA 90017 (213) 689-0065	**CONTACT NAME:** **PHONE (A/C, No, Ext):** **FAX (A/C, No):** **E-MAIL ADDRESS:**
INSURED 1518913 Bluewave Public Benefit Corp 116 Huntington Avenue, Ste. 601 Boston MA 02116-5749	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** The Travelers Indemnity Company — 25658 **INSURER B :** Travelers Property Casualty Company of America — 25674 **INSURER C :** Twin City Fire Insurance Company — 29459 **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 21522480 **REVISION NUMBER:** XXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** [ ] CLAIMS-MADE [X] OCCUR X Ded. $5,000 GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:	N	N	DT-CO-7X648950-IND-25	2/12/2025	4/12/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 1,000,000 $ 300,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
A	**AUTOMOBILE LIABILITY** [ ] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY	N	N	BA-7X695705-25-26-G	2/12/2025	4/12/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ 1,000,000 $ XXXXXXX $ XXXXXXX $ XXXXXXX $ XXXXXXX
B	X **UMBRELLA LIAB** [ ] OCCUR **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $	N	N	CUP-7X695914-25-26	2/12/2025	4/12/2025	EACH OCCURRENCE AGGREGATE $	$ 10,000,000 $ 10,000,000 $ XXXXXXX
C	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	N	72 WE AU7ZHS	12/14/2024	12/14/2025	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

MA Blandford 89 Chester Rd; 89 Chester Rd, Blandford, MA 01008.

CERTIFICATE HOLDER

21522480
Town of Blandford
1 Russell Stage Road

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Appendix E – Public Outreach Plan

BLUEWAVE

Marco Addonizio
BlueWave
116 Huntington Ave, Suite 601
Boston, MA 02116

Mr. Paul Martin
Planning Board Chair
Town of Blandford
1 Russell Stage Road
Blandford, MA 01008

Re: Site Plan Review and Special Permit Application - Section 8.3.1(d) - Public Outreach Plan

Dear Mr. Martin

As part of Site Plan Review and Special Permit Application Package (Application), Peebles Brook, LLC, a wholly owned subsidiary of BlueWave, will comply with the standards set forth in Section 8.3 General Requirements For All Ground Mounted Solar Photovoltaic Installations, and more specifically, has established the following plan of outreach to the public, as required under subsection 8.3.1(d).

1) BlueWave estimates the following development timeline for the Peebles Brook, LLC solar project
    a. Anticipated Site Plan Review and Special Permit Application Submission – March 31, 2025
    b. Anticipated Public Hearing – May 7th, 2025
    c. Estimated Construction Start Date – October 1, 2026
    d. Estimated Construction End Date – January 1, 2028.

2) Upon request by members of the Planning Board or abutting landowners, during a public hearing, BlueWave is willing to schedule a site walk of the property to review, in person, the proposed project. If requested, notice of such a site walk would be published in a newspaper of general circulation in the Town of Blandford not less than fourteen days (14) before the date set for said hearing.

Marco Addonizio
maddonizio@bluewave.energy
617-380-3014

Appendix F – Site Control

Bk 25016 Pg133 #23492
05-24-2023 @ 08:43a

BLUEWAVE

[redacted]

MEMORANDUM OF OPTION

GRANTOR:

GRANTEE:

RECORDING REQUESTED BY
AND WHEN RECORDED RETURN TO:

(Space Above for Recorder's Use)

MEMORANDUM OF OPTION AGREEMENT FOR LAND LEASE AND EASEMENT AGREEMENT

89 Chester Road, Blandford, Massachusetts

THIS MEMORANDUM OF OPTION AGREEMENT FOR LAND LEASE AND EASEMENT AGREEMENT (this "Memorandum") is made and entered into as of May 18, 2023 by and between Lloyd J. Martin & Mary E. Martin, husband and wife as tenants-by-the-entirety ("Owner") and BlueWave Origination, LLC a Delaware limited liability company ("Developer").

Recitals

A. Owner and Developer are parties to that certain Option Agreement for a Lease and Easement Agreement, dated concurrently herewith ("Option Agreement"), pursuant to which Owner has granted to Developer an exclusive option to lease all or a portion of that certain real property real property including the air space thereon, located at 89 Chester Road, Blandford, Hampden County, State of Massachusetts and identified as Parcel ID 408-0-19.1, titled in the name of Owner by Deed recorded in the Hampden County Registry of Deeds in Deed Book 21051 at Page 384 more particularly described on Schedule "1" attached hereto (the "Property").

B. Owner and Developer now desire to provide for public notice of the existence of the Option Agreement and Developer's rights thereunder.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Grant of Option. Owner has granted to Developer the exclusive option to lease the

Property (the "Option") upon the terms and subject to the terms and conditions set forth in the Option Agreement.

2. Term of the Option. Subject to the terms and conditions set forth in the Option Agreement, the term of the Option expires on the 365th day after the Effective Date of the Option Agreement unless extended as provided therein. Developer is entitled to extend the Option Period for at least three (3) additional periods of 365 days each.

3. Conflict of Provisions. This Memorandum is prepared for the purpose of recordation and shall not alter or affect in any way the rights and obligations of Developer and Owner under the Option Agreement. In the event of any inconsistency between this Memorandum of Option and the Option Agreement, the terms of the Option Agreement shall control.

SIGNATURE PAGES TO FOLLOW

BLUEWAVE

IN WITNESS WHEREOF, the parties have executed this Memorandum as of the date first set forth above.

"Developer" BlueWave Origination, LLC

By: _____

Name: Marc D. Sylvia

Title: Authorized Signatory

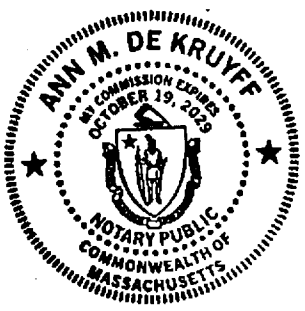
A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

COMMONWEALTH OF MASSACHUSETTS)
)
COUNTY OF Suffolk)

On May 18, 202_, before me, Ann DeKruyff, the undersigned Notary Public, personally appeared Mark Sylvia, personally known to me to be the person(s) whose name(s) is/are signed to the preceding or attached document, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) for its stated purpose as an Authorized Signatory of BlueWave Origination, LLC, and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument voluntarily for its stated purpose.

_____
Notary Public
My Commission Expires

[stamp]



BLUEWAVE

Lloyd J. Martin

By: Lloyd J Martin

Name: Lloyd. J. Martin

Title: _____

STATE/COMMONWEALTH OF MASSACHUSETTS

COUNTY OF Hampden)

On this 7th day of MAY, 2023 before me, the undersigned Notary Public, personally appeared the above-named Lloyd J. MARTIN, of the Town of Blandford Lloyd J. MARTIN proved to me by satisfactory evidence of identification, being (check whichever applies): □ driver's license or other state or federal governmental document bearing a photographic image, □ oath or affirmation of a credible witness known to me who knows the above signatory, or ☑ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing to be signed by him voluntarily for its stated purpose on behalf of _____.

Mary N. Kronholm

Notary Public

My Commission Expires:

MARY N. KRONHOLM
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
June 16, 2028

BLUEWAVE

Mary E. Martin

By: Mary E Martin

Name: Mary E. Martin

Title: _____

STATE/COMMONWEALTH OF MASSACHUSETTS

COUNTY OF Hampden)

On this 7th day of May, 2023 before me, the undersigned Notary Public, personally appeared the above-named Mary E. Martin the town of Blandford, MASS proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☑ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing to be signed by ~~him~~ her voluntarily for its stated purpose on behalf of _____.

Mary N. Kronholm

Notary Public

My Commission Expires:

MARY N. KRONHOLM
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
June 16, 2028

BLUEWAVE

Schedule "1"
to
Memorandum of Option Agreement

Legal Description

The Land in Blandford, Hampden County, Massachusetts, with the buildings thereon, bounded and described, in two tracts, as follows:

FIRST TRACT: Situated on the southerly side of the Becket Road, bounded northerly on said Becket Road; easterly by land now or formerly of C.L. Haines and land now or formerly of Francis J. Hallbourg and Herbert A. Dalton; southerly by land now or formerly of the Commonwealth of Massachusetts and land now or formerly of said Francis J. Hallbourg and Herbert A. Dalton; westerly by lands now or formerly of said Hallbourg and Herbert A. Dalton; containing 39.080 acres.

ASSIGNMENT AND ASSUMPTION AGREEMENT

ASSIGNMENT AND ASSUMPTION AGREEMENT ("**Assignment and Assumption Agreement**"), dated as of March 26, 2025 (the "**Effective Date**"), by and between **BlueWave Origination, LLC**, a Delaware limited liability company ("**Assignor**") and **Peebles Brook, LLC**, a Delaware limited liability company ("**Assignee**").

WHEREAS, on or about May 18, 2023, Assignor and Lloyd J. Martin and Mary E. Martin of 89 Chester Road, Blandford, Massachusetts, 01008 (collectively, the "**Owners**"), entered into that certain Option Agreement for Land Lease and Easement Agreement, as amended by First Amendment to Option Agreement, dated February 1, 2024 (the "**LOA**") as described on Exhibit A;

NOW THEREFORE, for the payment of ten dollars ($10) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Effective as of the Effective Date, Assignor hereby assigns to Assignee, and Assignee hereby accepts from Assignor, all of Assignor's right, title and interest in, to and under the LOA, to have and to hold the same unto Assignee and its successors and assigns from and after the date hereof subject to the covenants, conditions and provisions therein provided. Assignee hereby assumes and hereafter shall pay, discharge and perform if and when due, and to the extent not paid, performed or discharged prior to the date hereof, all liabilities and obligations of the Assignor under the LOA.

2. This Assignment and Assumption Agreement may be executed in any number of counterparts, each of which shall be deemed an original and all of which shall constitute one agreement.

3. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, without regard to its conflicts of laws principles. This Assignment and Assumption Agreement shall not enlarge any rights of third parties under the LOA.

4. At Assignee's request and without further consideration, the Assignor agrees to execute, acknowledge and deliver, as appropriate, any and all such other instruments, notices and other documents as Assignee may reasonably request to consummate the assignment in accordance with the terms hereof and to evidence the conveyance by Assignor to Assignee of any and all of the rights, title and benefits and interests that Assignor holds relating to the LOA.

[signatures follow]

IN WITNESS WHEREOF, the parties have duly executed and delivered this Assignment and Assumption Agreement under seal effective as of the date first written above.

ASSIGNOR:

BlueWave Origination, LLC

By: DocuSigned by: James Haley 9DAAC550B190441...
Name: James Haley
Title: Authorized Signatory

ASSIGNEE:

Peebles Brook, LLC

By: DocuSigned by: James Haley 9DAAC550B190441...
Name: James Haley
Title: Authorized Signatory

EXHIBIT A

Option Agreement for Land Lease and Easement Agreement dated May 18, 2023, by and between BlueWave Origination, LLC & Lloyd J. Martin and Mary E. Martin, as amended by First Amendment to Option Agreement, dated February 1, 2024 for the property located at 89 Chester Road, Blandford, MA 01008

Appendix G – Solar Operation and Maintenance Plan

BLUEWAVE

DRAFT
OPERATIONS & MAINTENANCE AGREEMENT

Single Axis Tracking Solar Project

at

PEEBLES BROOK, LLC SOLAR FARM

89 Chester Road

Blandford, MA 01008

Project Owner: PEEBLES BROOK, LLC

116 Huntington Ave, Suite 601

Boston, MA 02116

The following activities shall be the responsibility of the Project Owner and shall be performed as indicated and when required to maintain and operational site in compliance with local, state and federal policies and practices:

1.1 OPERATION & MAINTENANCE ANNUAL SCHEDULE

Task	Schedule
Full Site Visual Inspection & Report	Quarterly
Production Performance Report	Quarterly
Inverter Preventative Maintenance	Annually
Medium Voltage Gear Maintenance	Annually
String Voc/Imp	100%, Annually
IV Curve Tracing	100%, Annually
Thermal Imaging Combiners, Inverters, Disconnects	100%, Annually
Warranty Enforcement	4
Issue Tracking of Unscheduled Service Dispatches	4
24/7 Monitoring	4
Dispatch Commitment	48 hrs.
Three (3) Corrective Maintenance Troubleshooting Dispatches (total of 24 hrs.)	Annually
Vegetation Management	As needed
Stormwater and Drainage Structure Maintenance	See Long Term O&M Plan in Appendix I of Stormwater Management Report

1.2 EXHIBIT A – SYSTEM SERVICES

1.2.1 SYSTEM SERVICES FOR YEARS 1 – 10

PREVENTIVE MAINTENANCE SITE VISITS

One time, annually, additionally at request and expense of Project Owner for:

- System testing (voltage/amperage)
- System visual inspection and necessary corrections, excluding cost of replacement components:
- Inspect for stolen, broken or damaged PV modules, record damage and location. Operator to resolve issues as needed under the terms of this O&M contract, the EPC

Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.

- Inspect PV wiring for loose connections and wire condition. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect for wires in contact with the structure or hanging loose from racking. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check mechanical attachment of the PV modules to the racking. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check attachment of racking components to each other and the structure. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Verify proper system grounding is in place from panels to the inverter. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check conduits and raceways for proper anchorage to structures. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect all metallic parts for corrosion. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check combiner boxes for proper fuse size and continuity. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect all wiring connection for signs of poor contact at terminals (burning, discoloration, etc.). Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect disconnection for proper operation. Operator to resolve issues as needed

under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.

- Survey entire jobsite for debris or obstructions. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect fasteners for proper torque and corrosion. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect inverter pad for cracking or settling. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect electrical hardware for proper warning and rating labeling. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Review as built documentation as needed and update as built documentation as changes are required.
- Inspect alignment of arrays and racking to identify settling foundation or loose attachments. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect operation of tracking hinges, pivots, motors and actuators if present. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check proper operation and reporting of monitoring hardware. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect sealed electrical components for condensation buildup. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect wiring and hardware for signs of damage from vandalism or animal damage. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project

Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.

- Routine system maintenance to include correction of loose electrical connections, ground connections, replacement of defective modules found during testing, other minor maintenance repair work. Tree trimming, and plant trimming work not included.
- Routine DAS maintenance to include sensor calibration and data integrity check.

TROUBLESHOOTING, INSPECTION AND ADDITIONAL REPAIRS

- Dispatch of field services resources within two business days for repairs up to three times per year or as deemed necessary by Operator.
- Major system repairs, not to include mid-voltage switchgear or transformers.
- The Project Owner agrees to permit Town staff to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

CUSTOMER SERVICE SUPPORT

- *Support line is available to Project Owner staff to answer questions or report issues. PEEBLES BROOK, LLC, the Project Owner, can be contacted by email at _____and by phone at 617-209-3122.*

MAJOR COMPONENTS

- *Operator will represent Project Owner on all major component issues. In lieu of Operator, PEEBLES BROOK, LLC, the Project Owner, can be contacted by email at _____and by phone at 617-209-3122.*

REPORTING

- Monthly Production report will be available online to the Project Owner personnel.
- Annual Performance report will be sent electronically to the Project Owner personnel.
- O&M Manual updates. Complete versions of new editions to be delivered electronically to the Project Owner staff as they become available.
- As Built drawing updates, as necessary.

OTHER SYSTEM SERVICES

Facility staff training, one time per site which will include the follow basic training items:

- General Inspection: A full visual and physical inspection of all systems components and their immediate surroundings carried out in accordance with inspection checklists.
- Safety: Operator will train Project Owner staff on how to safely shut down the system.
- Tree Trimming/Plant Trimming: Operator will train Project Owner staff on what vegetation near structures that need to be trimmed as required by local site conditions.
- Structure Maintenance: Necessary preventive maintenance may be performed on system structural components to ensure continued safe and effective operation.
- The basics of performing a visual inspection: Checklist review with Operator.
- Performance characterization, as determined by Operator.
- O&M Manuals – additional copies, as needed. Updated editions of O&M manuals will be sent electronically to the Project Owner as they become available.
- Management of long-term service and warranty agreements, ongoing. Operator shall provide Project Owner local DFD/AFSD with updates as required.
- Stormwater and Drainage Structure Maintenance: See Appendix H,

Attachment F, "Operations and Maintenance Plan" of the Stormwater Management Report for Maintenance Schedule.

INVERTER REPAIR

Component replacement and refurbishment as required, in the event of a failure.

INVERTER INSPECTION AND REGULAR SERVICING

As required under inverter manufacturer's warranty specifications. Include but are not limited to the following, one time annually:

- Check appearance/cleanliness of the cabinet, ventilation system and all exposed surfaces.
- Inspect, clean/replace air filter elements.
- Check for corrosion on all terminals, cables and enclosure.
- Check all fuses.
- Perform a complete visual inspection of all internally mounted equipment including subassemblies, wiring harness, contractors, power supplies and all major components.
- Check condition of all the AC and DC surge suppressors.
- Torque terminals and all fasteners in electrical power connections.
- Check the operation of all safety devices (E-stop, door switches)
- Record all operating voltages and current readings via the front display panel.
- Record all inspections completed.
- Inform Manufacturer of all deficiencies identified.
- Manufacture will be responsible for the In-Warranty replacement of failed inverter components, parts and labor.

SERVICES UNDER THE FOLLOWING WARRANTIES

- 20-year warranty for inverters.
- 25-year warranty for PV Modules.

1.2.2 SYSTEM SERVICES FOR YEARS 11 – 20

PREVENTIVE MAINTENANCE SITE VISITS

One time, annually, additional at request and expense of Project Owner for:

- System testing (voltage/amperage)
- System visual inspection and necessary corrections, excluding cost of replacement components:
- Inspect for stolen, broken or damaged PV modules, record damage and location. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner
- Inspect PV wiring for loose connections and wire condition. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.

- Inspect for wires in contact with the structure or hanging loose from racking. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check mechanical attachment of the PV modules to the racking. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
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- Inspect operation of tracking hinges, pivots, motors and actuators if present. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
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- Inspect wiring and hardware for signs of damage from vandalism or animal damage. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project

Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.

- Routine system maintenance to include correction of loose electrical connections, ground connections, replacement of defective modules found during testing, other minor maintenance repair work. Tree trimming, and plant trimming work not included.
- Routine DAS maintenance to include sensor calibration and data integrity check.

TROUBLESHOOTING, INSPECTION AND ADDITIONAL REPAIRS

- Dispatch of field services resources within two business days for repairs up to three times per year or as deemed necessary by Operator.
- Major system repairs, not to include mid-voltage switchgear or transformers.
- The Project Owner agrees to permit Town staff to enter the property at reasonable times and in a reasonable manner for the purpose of inspection.

CUSTOMER SERVICE SUPPORT

- *Support line is available to Project Owner staff to answer questions or report issues. PEEBLES BROOK, LLC, the Project Owner, can be contacted by email at _____and by phone at 617-209-3122.*

MAJOR COMPONENTS

- *Operator will represent Project Owner on all major component issues. In lieu of Operator, PEEBLES BROOK, LLC, the Project Owner, can be contacted by email at _____and by phone at 617-209-3122.*

REPORTING

- Monthly Production report will be available online to the Project Owner personnel.
- Annual Performance report will be sent electronically to the Project Personnel.
- O&M Manual updates. Complete versions of new editions to be delivered electronically to the Project Owner staff as they become available.
- As Built drawings update as necessary.

OTHER SYSTEM SERVICES

Facility staff training, one time per site which will include the follow basic training items:

- General Inspection: A full visual and physical inspection of all systems components and their immediate surroundings carried out in accordance with inspection checklists.
- Safety: Operator will train Project Owner staff on how to safely shut down the system.
- Tree Trimming/Plant Trimming: Operator will train Project Owner staff on what vegetation near structures that need to be trimmed as required by local site conditions.
- Structure Maintenance: Necessary preventive maintenance may be performed on system structural components to ensure continued safe and effective operation.
- The basics of performing a visual inspection: Checklist review with Operator.
- Performance characterization, as determined by Operator.
- O&M Manuals – additional copies, as needed. Updated editions of O&M manuals will be sent electronically to the Project Owner as they become available.
- Management of long-term service and warranty agreements, ongoing. Operator shall provide Project Owner local DFD/AFSD with updates as required.

- Stormwater and Drainage Structure Maintenance: See Appendix I, "Long Term Operations and Maintenance Plan" of the Stormwater Management Report for Maintenance Schedule.

INVERTER REPAIR

Component replacement and refurbishment as required in the event of inverter failure.

INVERTER INSPECTION AND REGULAR SERVICING AS REQUIRED UNDER INVERTER MANUFACTURER'S WARRANTY

SPECIFICATIONS

Those include but are not limited to the following one time annually:

- Check appearance/cleanliness of the cabinet, ventilation system and all exposed surfaces.
- Inspect, clean/replace air filter elements.
- Check for corrosion on all terminals, cables and enclosure.
- Check all fuses.
- Perform a complete visual inspection of all internally mounted equipment including subassemblies, wiring harness, contractors, power supplies and all major components.
- Check condition of all the AC and DC surge suppressors.
- Torque terminals and all fasteners in electrical power connections.
- Check the operation of all safety devices (E-stop, door switches)
- Record all operating voltages and current readings via the front display panel.
- Record all inspections completed.
- Inform Manufacturer of all deficiencies identified.
- Manufacture will be responsible for the In-Warranty replacement of failed inverter components, parts and labor.

SERVICES UNDER THE FOLLOWING WARRANTIES

- 20-year warranty for inverters.
- 25-year warranty for PV Modules.

1.3 EXHIBIT B – ADDITIONAL SYSTEM SERVICES

1.3.1 ADDITIONAL SERVICES FOR YEARS 1 – 10

- Additional system and component training.
- Operations and Maintenance training in addition to what is already included in Exhibit A above.
- System performance evaluation will be covered under a 10-year Performance Guarantee for the first 10 years but is not included in this O&M agreement.
- Vegetation management.
- Module Cleaning. Operator may at its option and at no cost to the Project Owner clean the modules to ensure peak performance of the Solar System. Such cleaning is subject to Project Owner approval. If the Project Owner requests module cleaning, Operator shall provide the Project Owner with a competitive quote based on current market prices.
- Security services.
- Response and Repairs due to accidental damages upon request.

- Additional Maintenance, Inspection and Repair available upon request.
- Data Line: Project Owner shall provide Operator a high-speed internet data line for each site during the Term to enable the Operator to record the electric energy generated by the System.
- The Project Owner agrees to address any and all required repairs within thirty (30) days and understands that if repairs are not made within this time period, the Town may perform the necessary work at the owner's expense.

1.3.2 ADDITIONAL SERVICES FOR YEARS 11 – 20

- Additional system and component training
- Operations and Maintenance training.
- System performance evaluation will be provided to the Project Owner one time annual in our annual performance report.
- Vegetation management.
- Module Cleaning. Operator may at its option and at no cost to the Project Owner clean the modules to ensure peak performance of the Solar System. Such cleaning is subject to Project Owner approval. If the Project Owner requests module cleaning, Operator shall provide the Project Owner with a competitive quote based on current market prices.
- Security services.
- Response and Repairs due to accidental damages upon request.
- Additional Maintenance, Inspection and Repair available upon request.
- Data Line: Project Owner shall provide Operator a high-speed internet data line for each site during the Term to enable the Operator to record the electric energy generated by the System.
- The Project Owner agrees to address any and all required repairs within thirty (30) days and understands that if repairs are not made within this time period, the Town may perform the necessary work at the owner's expense.

Should the property or any portion of the property be transferred to another owner, the relevant Authorized Administrative Agency will be notified. The new owner will be notified of the presence of this Operation and Maintenance Agreement and be held responsible for the implementation of this plan and financing as it pertains to their property.

PROJECT OWNER:

PEEBLES BROOK, LLC

By: _____

Name: _____

Title: Authorized Signatory

Date: _____

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF _____

On this ____day of _____, 20____, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which was _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose on behalf of _____.

_____

Printed Name: _____

My Commission Expires: _____

BLUEWAVE

PRELIMINARY BATTERY ENERGY STORAGE SYSTEM (BESS) OPERATIONS AND MAINTENANCE PLAN

1 GENERAL PROTOCOL AND SAFETY

1.1 Contact Information

The primary points of contact for operations & maintenance related issues are as follows:

Owner

Peebles Brook, LLC
BlueWave
(617) 209-3122
operations@bluewavesolar.com

[Manufacturer]

XXXXXX (To be finalized prior to construction)
(XXX) XXX-XXXX (To be finalized prior to construction)
XXXX@XXXX.com (To be finalized prior to construction)

1.2 Safety Guidelines & Equipment

In the event of an emergency, immediately call 911 in order to alert local first responders. Emergency signage will be posted on-site for both the Local Fire Department and the contact of the Owner/Operator.

Owner/Operator will dispatch designated operational staff within 2 hours in the event of an emergency, and approximately 12 hours in the event of a non-emergency. In the event of an emergency, the Emergency Response Plan (ERP) on file with the Municipality and Local Fire Department should be referenced and appropriate procedures followed.

The Battery Energy Storage System (BESS) contains a number of high voltage AC and DC components and equipment. Only certified and [Manufacturer] approved technicians are authorized to conduct maintenance work on the system. Before performing work on the system, necessary Lockout-Tagout (LOTO) procedures should be followed to denergize the system and fully disconnect the system from AC power. Proper procedures for denergization should be referenced in the comprehensive Maintenance Manual provided by the system manufacturer prior to performing any maintenance tasks.

Equipment

All technicians and personnel performing work on the system are required to wear personal protective equipment (PPE) including but not limited to:

- Long pants and shirt (FR rated)
- Insulated gloves (See Arc Flash Study for required Protective Category)
- High visibility safety vest (FR Rate)
- Hardhat
- Eye protection
- Safety toe boots
- Arc Flash Personal Protective Equipment as needed or required by manufacturer

The following equipment and hand tools are required when performing work on the system, including but not limited to:

- 1,000V Multimeter
- 1,5000 Vdc Multimeter
- Proving Unit
- Test Leads
- Data Cable Test Unit
- Infrared Camera
- Electrostatic Discharge (ESD) Ground Wristband
- Insulated wrenches, ratches, and screwdrivers and other tools meeting IEC 60900

Additional equipment and safety procedures may be required and implemented during the operation of the system. All equipment must have valid calibration certifications if applicable.

2 OPERATION & MAINTENANCE ANNUAL SCHEDULE

O&M ANNUAL SCHEDULE		
Component Category	Service Descriptions	Frequency
Thermal Management System	Thermal management system inspection	Semi-Annual
	Thermal management system maintenance	Semi-Annual
	Motor Lubrication	Semi-Annual
	Clean Filters by rinsing with Water	Semi-Annual
	Electric Heater - Dust accumulation on the coil, signs of overheating on the heater frame, traces of water or rust on the electric heater control box.	Semi-Annual
	Coolant tester Visual inspection	Annual
Fire Safety System	Fire alarm and detection system inspection	Annual
	Fire alarm and detection system maintenance	Annual
	Fire suppression System Inspection	Annual
Battery	Set battery maintenance (system check, cell balancing)	Annual
	Battery cable, appearance,	Annual

	grounding, dust removal	
	Inspect battery management system alarms	Annual
	Visual inspection of all electrical terminations using thermal imager	Semi-Annual
Enclosure	Dust removal	Annual
	Inspect cable entry, grounding, sealing, dust removal	Annual
Reporting and Diagnostics	Inspection, maintenance reports and recommendations	Monthly
	Technical support and fault diagnosis	As required
	Data server connectivity check	Monthly
	Inspect battery running status, provide operating recommendations and maintain battery	Monthly
	System configuration check	Annual
General/ Miscellaneous	Auxiliary equipment maintenance and inspection	Annual
	Critical sensor calibration check	Annual
	Maintenance report	Annual
24/7 Monitoring	System is remote monitored 24/7 at the cell and enclosure level for voltage, temperature, and atmospheric conditions.	N/A
Dispatch Commitment	12 hrs.	

	In emergency situation, first responders will dispatch to site once farm alarm signal received, owner dispatch to follow within 2 hrs.	
Three (3) Corrective Maintenance Troubleshooting Dispatches (total of 24 hrs.)	Baseline assumptions of 3 corrective maintenance visits per year	Annually

3 PREVENTATIVE MAINTENANCE AND SYSTEM SERVICES

3.1 Lifetime System Services

PREVENTIVE MAINTENANCE SITE VISITS

One time, annually, additional at request and expense of Project Owner for:

- System testing (voltage/amperage)
- System visual inspection and necessary corrections, excluding cost of replacement components:
- Inspect for stolen, broken or damaged equipment, record damage and location. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect wiring for loose connections and wire condition. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect string controllers for damage and general condition. Inspect AC and DC fuses for replacement if needed. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect HVAC unit components for rust, damage, and general condition. Check condensate drain lines and refrigerant levels as required. Inspect exhaust outlets and bottom of unit for pooling, inspect and replace all filters as needed. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner,

present proposal and wait for authorization on a course of action from the Project Owner.

- Verify proper system grounding is in place from enclosures to the inverter. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check conduits and raceways for proper anchorage to structures. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect all enclosure metallic parts for corrosion. Inspect ESS labels and insure they match subpanel interior break. Verify that all enclosure doors, hinges and seals are in proper working order. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect all wiring connection for signs of poor contact at terminals (burning, discoloration, etc.). Verify all conductor connections and network cables are tight and solidly connected. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Visually inspect all interior components of the ESS enclosures for signs of damage, discoloration, water ingress, or deterioration. Inspect all batteries and battery management systems for signs of damage, discoloration, water ingress, or deterioration. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect disconnection for proper operation. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Survey entire jobsite for debris or obstructions. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect fasteners for proper torque and corrosion. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner,

present proposal and wait for authorization on a course of action from the Project Owner.

- Inspect inverter pad for cracking or settling. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect electrical hardware for proper warning and rating labeling. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Review as built documentation as needed and update as built documentation as changes are required.
- Inspect enclosure footings, anchor bolts, and alignment to identify settling foundation or loose attachments. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Check proper operation and reporting of monitoring hardware. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect sealed electrical components for condensation buildup. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Inspect wiring and hardware for signs of damage from vandalism or animal damage. Operator to resolve issues as needed under the terms of this O&M contract, the EPC Contract or Manufacturer's Warranty. If any costs are to be incurred by the Project Owner, Operator will notify the Project Owner, present proposal and wait for authorization on a course of action from the Project Owner.
- Routine system maintenance to include correction of loose electrical connections, ground connections, replacement of defective fuses, other minor maintenance repair work. Tree trimming, and plant trimming work not included.
- Routine DAS maintenance to include sensor calibration and data integrity check.

TROUBLESHOOTING, INSPECTION AND ADDITIONAL REPAIRS

- Dispatch of field services resources within 12 hours for repairs up to three times per year or as deemed necessary by Operator.
- Major system repairs, not to include mid-voltage switchgear or transformers.
- The Project Owner agrees to permit Town staff to enter the property at reasonable times

and in a reasonable manner for the purpose of inspection.

CUSTOMER SERVICE SUPPORT

- *Support line is available to Project Owner staff to answer questions or report issues. Peebles Brook, LLC, the Project Owner, can be contacted by email at operations@bluewavesolar.com and by phone at 617-681-4598.*

MAJOR COMPONENTS

- *Operator will represent Project Owner on all major component issues. In lieu of Operator, Peebles Brook, LLC, the Project Owner, can be contacted by email at operations@bluewavesolar.com and by phone at 617-681-4598.*

REPORTING

- Monthly Production report will be available online to the Project Owner personnel.
- Annual Performance report will be sent electronically to the Project Owner personnel.
- O&M Manual updates. Complete versions of new editions to be delivered electronically to the Project Owner staff as they become available.
- As Built drawing updates, as necessary.

OTHER SYSTEM SERVICES

Facility staff training, one time per site which will include the follow basic training items:

- General Inspection: A full visual and physical inspection of all systems components and their immediate surroundings carried out in accordance with inspection checklists.
- Safety: Operator will train Project Owner staff on how to safely shut down the system.
- Tree Trimming/Plant Trimming: Operator will train Project Owner staff on what vegetation near structures that need to be trimmed as required by local site conditions.
- Structure Maintenance: Necessary preventive maintenance may be performed on system structural components to ensure continued safe and effective operation.
- The basics of performing a visual inspection: Checklist review with Operator.
- Performance characterization, as determined by Operator.
- O&M Manuals – additional copies, as needed. Updated editions of O&M manuals will be sent electronically to the Project Owner as they become available.
- Management of long-term service and warranty agreements, ongoing. Operator shall provide Project Owner local DFD/AFSD with updates as required.
- Stormwater and Drainage Structure Maintenance: See Stormwater Report and associated BMP O&M and Long-Term Maintenance Plan on file with the Municipality for proper stormwater BMP maintenance schedule and procedures.

INVERTER REPAIR

Component replacement and refurbishment as required, in the event of a failure.

INVERTER INSPECTION AND REGULAR SERVICING

As required under inverter manufacturer's warranty specifications. Include but are not limited to the following, one time annually:

- Check appearance/cleanliness of the cabinet, ventilation system and all exposed surfaces.
- Inspect, clean/replace air filter elements.
- Check for corrosion on all terminals, cables and enclosure.
- Check all fuses.
- Perform a complete visual inspection of all internally mounted equipment including subassemblies, wiring harness, contractors, power supplies and all major components.
- Check condition of all the AC and DC surge suppressors.
- Torque terminals and all fasteners in electrical power connections.
- Check the operation of all safety devices (E-stop, door switches)
- Record all operating voltages and current readings via the front display panel.
- Record all inspections completed.
- Inform Manufacturer of all deficiencies identified.
- Manufacture will be responsible for the In-Warranty replacement of failed inverter components, parts and labor.

SERVICES UNDER THE FOLLOWING WARRANTIES

- 20-year warranty for inverters & batteries.

3.2 Notice of Transfer

Should the property or any portion of the property be transferred to another owner, the relevant Authorized Administrative Agency will be notified. The new owner will be notified of the presence of this Operation and Maintenance Plan and be held responsible for the implementation of this plan and financing as it pertains to their property.

Appendix H – Stormwater Report

Weston & Sampson

westonandsampson.com

55 Walkers Brook Drive, Suite 100
Reading, MA 01867
tel: 978.532.1900

REPORT

March 2025

Peebles Brook, LLC

4.04 MW DC Solar Photovoltaic Development

89 Chester Road
(Map 408, Lot 19.1)
Blandford, Massachusetts 01008

Stormwater Report

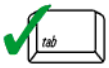
TABLE OF CONTENTS

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

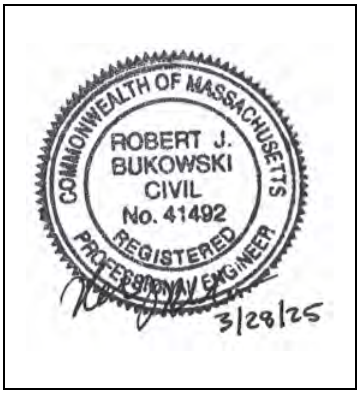
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☒ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Applicant/Project Name: Peebles Brook, LLC
4.04 MW DC Solar Photovoltaic (PV) Development

Project Location: 89 Chester Road, Blandford, MA 01008

Application Prepared by:
Firm: Weston & Sampson Engineers, Inc.
Registered PE: Rob Bukowski, P.E.

General

The proposed project is located at 89 Chester Road in Blandford, Massachusetts. The site is located on property Map 408, Lot 19.1 owned by Mary E. Martin with a land area of approximately 35.0796 acres. The proposed project site is largely made up of agricultural fields with woodlands around much of the boundaries of the site.

The site is bounded by Chester Road to the north and east. One residential parcel lies to the north of the proposed site on the western side of Chester Road. Undeveloped woodland borders the western and southern boundaries of the parcel. A small lot utilized for electrical utilities is located on the southern boundary of the site. A Locus Map is included as Figure 1 in Attachment A.

The project is located in the Agricultural District. The project does not appear to be within any overlay districts according to the Zoning Map of the Town of Blandford revised Mach 22, 2021. According to MassGIS the project is not within the vicinity of any Estimated Habitats of Rare Wildlife, Priority Habitats of Rare Species, Certified Vernal Pools, Potential Vernal Pools, or Coldwater Fisheries Resources. According to MassGIS the project is not within the vicinity or encompassed by any Areas of Environmental Concern. A portion of the project parcel is within an Outstanding Resource Waters (ORW) identified as the watershed of Cobble Mountain Reservoir, which is the principal public drinking water supply for the City of Springfield. The location of the ORW relative to the project location is included on Figure 2 in Attachment A.

Fleetwood Environmental Solutions, LLC conducted field wetland delineations on July 27, 2023. No Wetland Resource Areas occur directly on the project parcel but two bordering vegetated wetlands and one intermittent stream are located southwest of the property. The 100-foot Buffer Zones associated with these bordering vegetated wetlands do occur partially on the project parcel. In accordance with the Massachusetts Department of Environmental Protection (MA DEP) 310 CMR 10.00: Wetlands Protection Act (WPA) Regulations there is a 100-foot buffer zone associated with bordering vegetated wetlands. The 100-foot wetland buffer zone located on the southwestern corner of the project parcel will not be disturbed by the proposed project.

Project Description

The project proposes a 4.04 megawatt (MW) direct current (DC) single-axis tracker solar photovoltaic (PV) array with associated battery energy storage system (BESS). The PV panels will be mounted on racking structures that will make the height of the PV array greater than 10 feet. The National Electric Code (NEC) does not require PV panels at a height of 10 feet of greater to be fenced in. A BESS is proposed at the end of the gravel access road that will be enclosed by a 7-foot-tall chain link fence, as required by the NEC. The limit of work has a total area of approximately 24.13 acres. A gravel access driveway is proposed from Chester Road to enable vehicular access to the proposed solar array. The proposed gravel access driveway is 20 feet wide and approximately 400 feet long and includes a y-shaped turnaround adjacent to the electrical equipment pads.

Grading is proposed for the gravel access road, equipment pads, and roadside swale. No site grading is necessary. The gravel access road from Chester Road will follow existing grade but will be graded so as to

shed runoff towards the roadside swale to the east of the access road, which will direct stormwater runoff northerly to the roadside ditch parallel with Chester Road.

The site will not require tree clearing according to the proposed site plans as the site is currently an agricultural field. Existing vegetation will be preserved to the greatest extent possible during construction and disturbed areas will be revegetated before completion of the site.

Hydrology

According to USDA NRCS soil mapping data, the site is comprised of hydrologic soil group (HSG) type soils; HSG-B and HSG-D. The majority of the site consists of HSG-D, with only a small portion of the southwestern corner of the parcel being HSG-B soils. NRCS Web Soil Survey maps and reports for hydrologic soil group, depth to bedrock, and depth to water table are included as Attachment B.

The site is not located within any FEMA flood hazard zones. The FEMA FIRM map for the project site is included in Attachment B.

A hydrologic model was prepared using HydroCAD modeling software to compare pre- and post-development stormwater rates for the 2-, 10-, 25-, and 100-year 24-hour storm events. Two points of analysis (POA) have been determined to analyze the stormwater impacts of the post-development conditions compared to the pre-development conditions.

Rainfall data is referenced from NOAA Atlas 14, Volume 10, Version 3 for Blandford, Massachusetts and is included in Attachment B. The full HydroCAD stormwater reports for pre- and post-development conditions with associated site hydrologic maps are included in Attachment C.

The property includes two points of analysis to which stormwater flows in existing conditions. Under existing conditions, the site's topography includes a ridge which is the peak in elevation on the site that runs northwesterly through the site nearer to the northeast border and directs runoff either northeasterly toward Chester Road (POA-A) or southwesterly towards the southwestern boundary of the site (POA-B). Refer to the hydrologic maps in (Attachment C) for a visualization of the POAs in both existing and proposed site conditions.

Massachusetts Stormwater Management Standards

The Massachusetts Stormwater Management Standards were used for development and met to the maximum extent practicable as the site is outside of MassDEP Wetland Protection Act jurisdictional areas.

Below is an explanation describing Massachusetts Stormwater Management Standards 1-10 as they apply to the Solar PV Development project located at 89 Chester Road, Blandford, MA 01008.

Standard 1: No New Untreated Discharges

The proposed project is a new development project. Compared to pre-construction conditions, the proposed conditions will have an increase in gravel coverage due to the proposed gravel access road and an increase in impervious coverage due to the equipment pads and solar racking system support posts. The change in groundcover results in an increase in curve number (CN) from pre- to post-development conditions in some drainage area subcatchments. The increase in CN from pre- to post-development is minor and does not cause an increase in either peak runoff rate or runoff volume. Because there is no increase in peak runoff rates/volumes from pre- to post-development conditions, stormwater BMPs are not proposed. One roadside grassed swale is proposed to direct runoff from the gravel road toward the ditch and culvert located along Chester Road.

Stormwater treatment BMPs are not proposed because the impervious being added to the site, which includes the gravel access road, equipment pads, and solar racking system support posts, do not count as impervious coverage requiring treatment according to the Massachusetts Stormwater Standards. A summary of discharge velocities from post-development subcatchments is included in Attachment D to demonstrate the velocities are within the range of permissible velocities for associated ground cover types.

Standard 2: Peak Rate Attenuation

The post-development conditions do not cause an increase in post-development peak discharge rates compared to pre-development discharge rates at each of project's POAs for the 2-, 10-, 25-, and 100-year 24-hour storm events. A summary of the pre- and post-development peak flow rates is included in Attachment D.

Standard 3: Recharge

The total increase in impervious area for the project is related to disconnected impervious from the proposed equipment pads and gravel access road which accumulates to approximately 14,900 square feet. Runoff from these areas will either sheet flow to adjacent meadow groundcover conditions and then collect in the roadside swale or sheet flow to adjacent meadow groundcover.

No infiltration BMPs are proposed on the site as post-development conditions do not cause an increase in post-development discharge rates compared to pre-development discharge rates and the proposed added impervious coverage does not require treatment. The site is also comprised of mostly HSG-D soils which the Massachusetts Stormwater Handbook does not recommend infiltration within. Therefore, recharge calculations are not provided.

Standard 4: Water Quality

Source control and pollution prevention measures are identified in the Long-Term Pollution Prevention Plan (Attachment E) and best management practices (BMPs) will be maintained in accordance with the site specific Stormwater Operation and Maintenance Plan (Attachment F).

Added impervious area for the project includes disconnected concrete for the equipment pads, gravel access roadway, and solar PV table foundation ground screws / posts, and in accordance with the

Massachusetts Stormwater Handbook Volume 1, these features do not qualify as impervious features requiring total suspended solids (TSS) removal, therefore TSS calculations have not been provided.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

Not Applicable. There are no LUHPPLs in the work area.

Standard 6: Critical Areas

A portion of the project parcel is located within an Outstanding Resource Waters identified as the watershed of Cobble Mountain Reservoir, which is the principal public drinking water supply for the City of Springfield. According to the Massachusetts Stormwater Handbook Volume 1 Chapter 1, "Critical areas include Outstanding Resource Waters". The location of the Outstanding Resource Waters relative to the project location is included on Figure 2 in **Attachment A.**

The added impervious area for the project includes disconnected concrete for the equipment pads, gravel access roadway, and solar PV table foundation ground screws / posts, and in accordance with the Massachusetts Stormwater Handbook Volume 1, these features do not qualify as impervious features requiring total suspended solids (TSS) removal, therefore TSS BMPs have not been designed.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

Not applicable, this project is not a redevelopment project.

Standard 8: Construction Period Pollution Prevention and Erosion and Sediment Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan is included in **Attachment G**. To ensure that the work incorporates the performance standards recommended in MassDEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction as shown on the site plans.

The project will be covered under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). A Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) will be prepared and submitted prior to land disturbance.

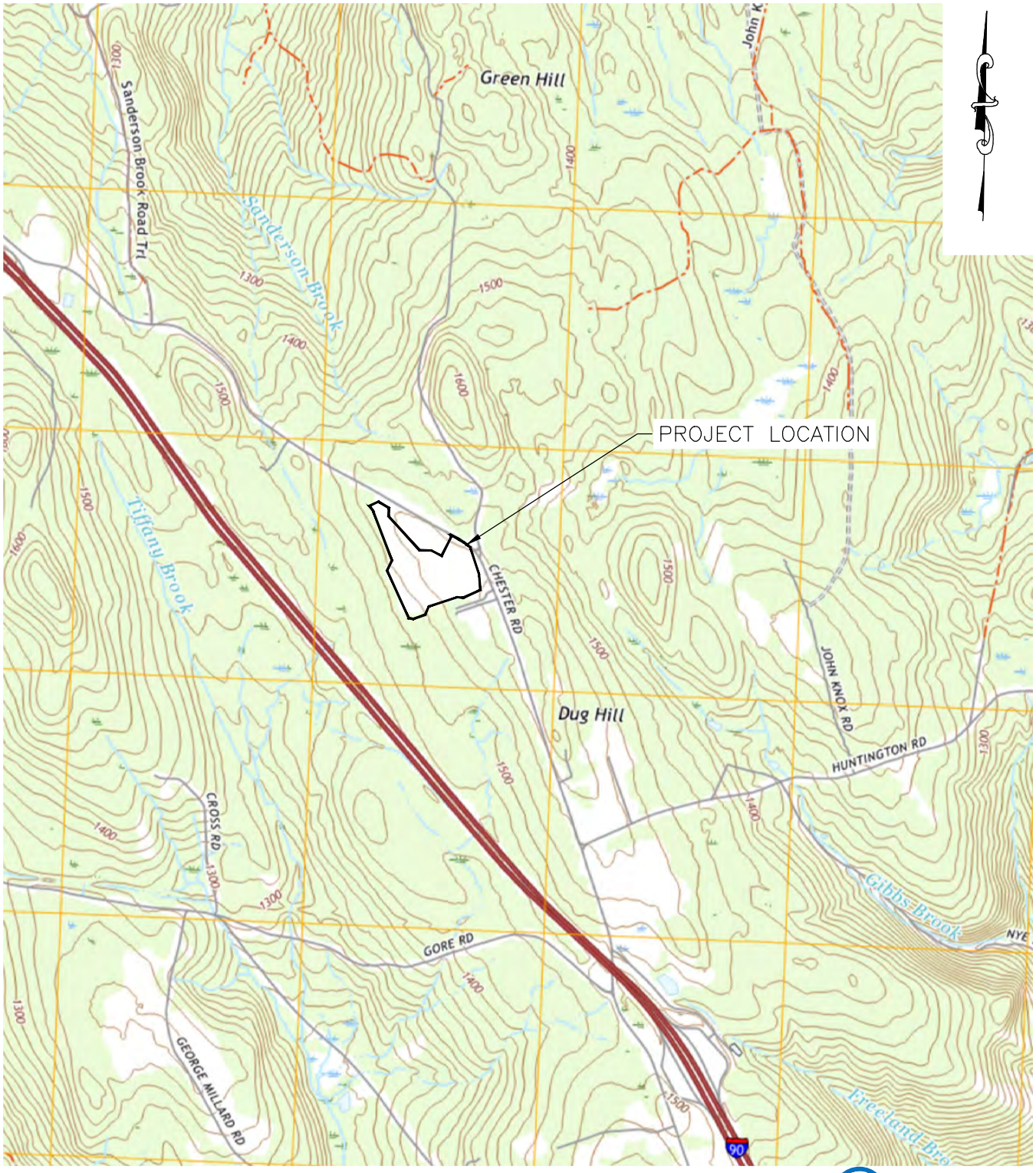
Standard 9: Operation and Maintenance Plan

A Stormwater Operation and Maintenance Plan for the proposed stormwater management system is provided with this report in **Attachment F**. Typical estimated costs for BMP maintenance is also included in the Stormwater Operation and Maintenance plan and will be included in the project developer's overall management plan for post construction preventative maintenance as well as vegetative and stormwater maintenance.

Standard 10: Prohibition of Illicit Discharges

There will be no illicit discharges associated with the project. An Illicit Discharge Compliance Statement is included in **Attachment H**.

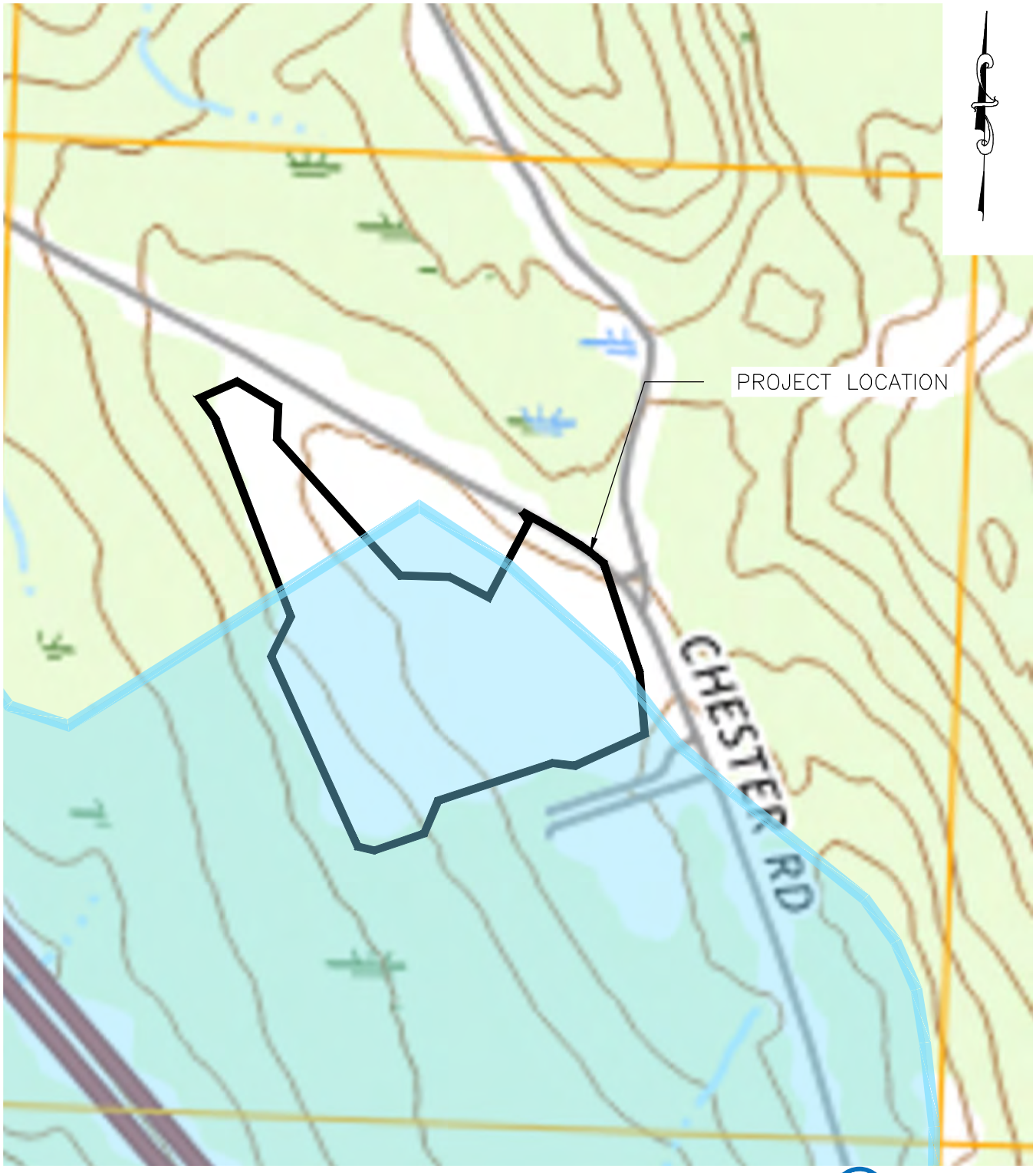
Attachment A - Figures



Weston & Sampson

FIGURE 1
USGS TOPOGRAPHIC MAP
BLANDFORD, MA
SCALE: 1" = 2,000'

0 1000' 2000' 4000'
1" = 2000' HORIZONTAL



Legend:

Outstanding Resource Waters

FIGURE 2
OUTSTANDING RESOURCE WATERS MAP
BLANDFORD, MA
SCALE: 1" = 500'

0 250' 500' 1000'
1" = 500' HORIZONTAL

NOTE:
1. ORW DATA FROM PUBLICALLY AVAILABLE MASSGIS DATABASE.

\\wse03.local\WSE\Projects\Private\BlueWave Solar\Blandford - Chester Road\Design\CAD\08 Exhibits\ORW Map.dwg

Attachment B - NRCS Web Soil Survey Maps & Reports:
Hydrologic Soils Group, Depth to Bedrock, Depth to Water Table
FEMA FIRMettes,
NOAA Atlas 14 Rainfall Data

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 Hampden and Hampshire Counties, Massachusetts, Western Part

August 2, 2024

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

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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: 1:4,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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 1:25,000.

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

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

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

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

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

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

Soil Survey Area: Hampden and Hampshire Counties, Massachusetts, Western Part
Survey Area Data: Version 19, Sep 10, 2023

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

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	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
121C	Millsite-Westminster-Rock outcrop complex, 8 to 15 percent slopes	0.9	2.0%
370B	Shelburne loam, 3 to 8 percent slopes	18.4	40.0%
370C	Shelburne loam, 8 to 15 percent slopes	16.8	36.5%
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	2.4	5.1%
911C	Ashfield-Shelburne association, rolling, extremely stony	4.8	10.4%
921C	Westminster-Millsite association, rolling, extremely stony	2.7	5.8%
922B	Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony	0.1	0.3%
Totals for Area of Interest		**46.0**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Hampden and Hampshire Counties, Massachusetts, Western Part

121C—Millsite-Westminster-Rock outcrop complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: vl1b
Elevation: 770 to 1,590 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Millsite and similar soils: 40 percent
Westminster and similar soils: 35 percent
Rock outcrop: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Millsite

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Moderately-deep coarse-loamy basal till derived from mica schist over mica schist

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 35 inches: fine sandy loam
H3 - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 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: B
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Description of Westminster

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 18 inches: fine sandy loam
H3 - 18 to 22 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
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 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: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Ecological site: F144BY801ME - Rockland (reserved)
Hydric soil rating: Unranked

Minor Components

Pillsbury

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Shelburne

Percent of map unit: 3 percent
Hydric soil rating: No

Ashfield

Percent of map unit: 2 percent
Hydric soil rating: No

Peacham

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

370B—Shelburne loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 99vs
Elevation: 1,000 to 3,000 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Shelburne

Setting

Landform: Ridges, drumlins
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 19 inches: fine sandy loam
H3 - 19 to 65 inches: fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 16 to 30 inches to densic material
Drainage class: Well drained
Runoff class: High
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 30 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Ashfield

Percent of map unit: 10 percent
Hydric soil rating: No

Pillsbury

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

370C—Shelburne loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99vt
Elevation: 1,000 to 3,000 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Shelburne

Setting

Landform: Ridges, drumlins
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense loamy lodgment till derived from granite and gneiss

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 19 inches: fine sandy loam

H3 - 19 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 16 to 30 inches to densic material
Drainage class: Well drained
Runoff class: High
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Ashfield

Percent of map unit: 10 percent
Hydric soil rating: No

Pillsbury

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

375C—Ashfield fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 99vw
Elevation: 400 to 2,500 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Ashfield and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ashfield

Setting

Landform: Till plains

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Friable loamy eolian deposits over dense coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 3 inches: fine sandy loam
H2 - 3 to 15 inches: fine sandy loam
H3 - 15 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 35 inches to densic material
Drainage class: Moderately well drained
Runoff class: Very high
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 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144BY506ME - Semi-rich Till Slope, F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Shelburne

Percent of map unit: 7 percent
Hydric soil rating: No

Pillsbury

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

911C—Ashfield-Shelburne association, rolling, extremely stony

Map Unit Setting

National map unit symbol: 99xw
Elevation: 400 to 3,000 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days

Farmland classification: Not prime farmland

Map Unit Composition

Ashfield and similar soils: 45 percent
Shelburne and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ashfield

Setting

Landform: Till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Friable loamy eolian deposits over dense coarse-loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 3 inches: fine sandy loam
H2 - 3 to 15 inches: fine sandy loam
H3 - 15 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 35 inches to densic material
Drainage class: Moderately well drained
Runoff class: Very high
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 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144BY506ME - Semi-rich Till Slope, F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Description of Shelburne

Setting

Landform: Ridges, hillslopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable coarse-loamy eolian deposits over dense loamy lodgment till derived from mica schist

Typical profile

H1 - 0 to 6 inches: loam

H2 - 6 to 19 inches: fine sandy loam
H3 - 19 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 16 to 30 inches to densic material
Drainage class: Well drained
Runoff class: High
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: F144BY501ME - Loamy Slope (Northern Hardwoods)
Hydric soil rating: No

Minor Components

Pillsbury

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

Millsite

Percent of map unit: 4 percent
Hydric soil rating: No

Peacham

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Westminster

Percent of map unit: 3 percent
Hydric soil rating: No

921C—Westminster-Millsite association, rolling, extremely stony

Map Unit Setting

National map unit symbol: 99y3
Elevation: 920 to 1,620 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Westminster and similar soils: 55 percent
Millsite and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westminster

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Mountaintop, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till derived from granite and gneiss over granite and gneiss

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 18 inches: fine sandy loam
H3 - 18 to 22 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
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 6.00 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: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Description of Millsite

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Mountaintop
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Moderately-deep, friable coarse-loamy basal till derived from mica schist over mica schist

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 35 inches: fine sandy loam
H3 - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Minor Components

Shelburne

Percent of map unit: 2 percent
Hydric soil rating: No

Ashfield

Percent of map unit: 1 percent
Hydric soil rating: No

Pillsbury

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Peacham

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

922B—Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2trs0
Elevation: 980 to 1,710 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Pillsbury, very stony, and similar soils: 60 percent
Peacham, very stony, and similar soils: 20 percent
Wonsqueak and similar soils: 10 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pillsbury, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy lodgment till derived from gneiss and/or granite and/or mica schist

Typical profile

Oe - 0 to 1 inches: mucky peat
A - 1 to 6 inches: fine sandy loam
Bg1 - 6 to 13 inches: cobbly fine sandy loam
Bg2 - 13 to 23 inches: cobbly fine sandy loam
Cd - 23 to 65 inches: cobbly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144BY305ME - Wet Loamy Flat, F144BY301ME - Loamy Till Swamp
Hydric soil rating: Yes

Description of Peacham, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material over loamy lodgment till derived from granite and gneiss and/or schist and/or phyllite

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 10 inches: muck
Bg - 10 to 15 inches: fine sandy loam
Cdg1 - 15 to 31 inches: fine sandy loam
Cdg2 - 31 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: 12 to 35 inches to densic material
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144BY301ME - Loamy Till Swamp
Hydric soil rating: Yes

Description of Wonsqueak

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over loamy till

Typical profile

Oa1 - 0 to 8 inches: muck
Oa2 - 8 to 32 inches: muck
2Cg - 32 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 18.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D
Ecological site: F144BY302ME - Mucky Swamp, F144BY301ME - Loamy Till Swamp
Hydric soil rating: Yes

Minor Components

Bucksport

Percent of map unit: 8 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Peru, very stony

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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Map Scale: 1:4,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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

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

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

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

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

Soil Survey Area: Hampden and Hampshire Counties, Massachusetts, Western Part
Survey Area Data: Version 19, Sep 10, 2023

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

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
121C	Millsite-Westminster-Rock outcrop complex, 8 to 15 percent slopes	B	0.9	2.0%
370B	Shelburne loam, 3 to 8 percent slopes	D	18.4	40.0%
370C	Shelburne loam, 8 to 15 percent slopes	D	16.8	36.5%
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	D	2.4	5.1%
911C	Ashfield-Shelburne association, rolling, extremely stony	D	4.8	10.4%
921C	Westminster-Millsite association, rolling, extremely stony	D	2.7	5.8%
922B	Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony	D	0.1	0.3%
Totals for Area of Interest			**46.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

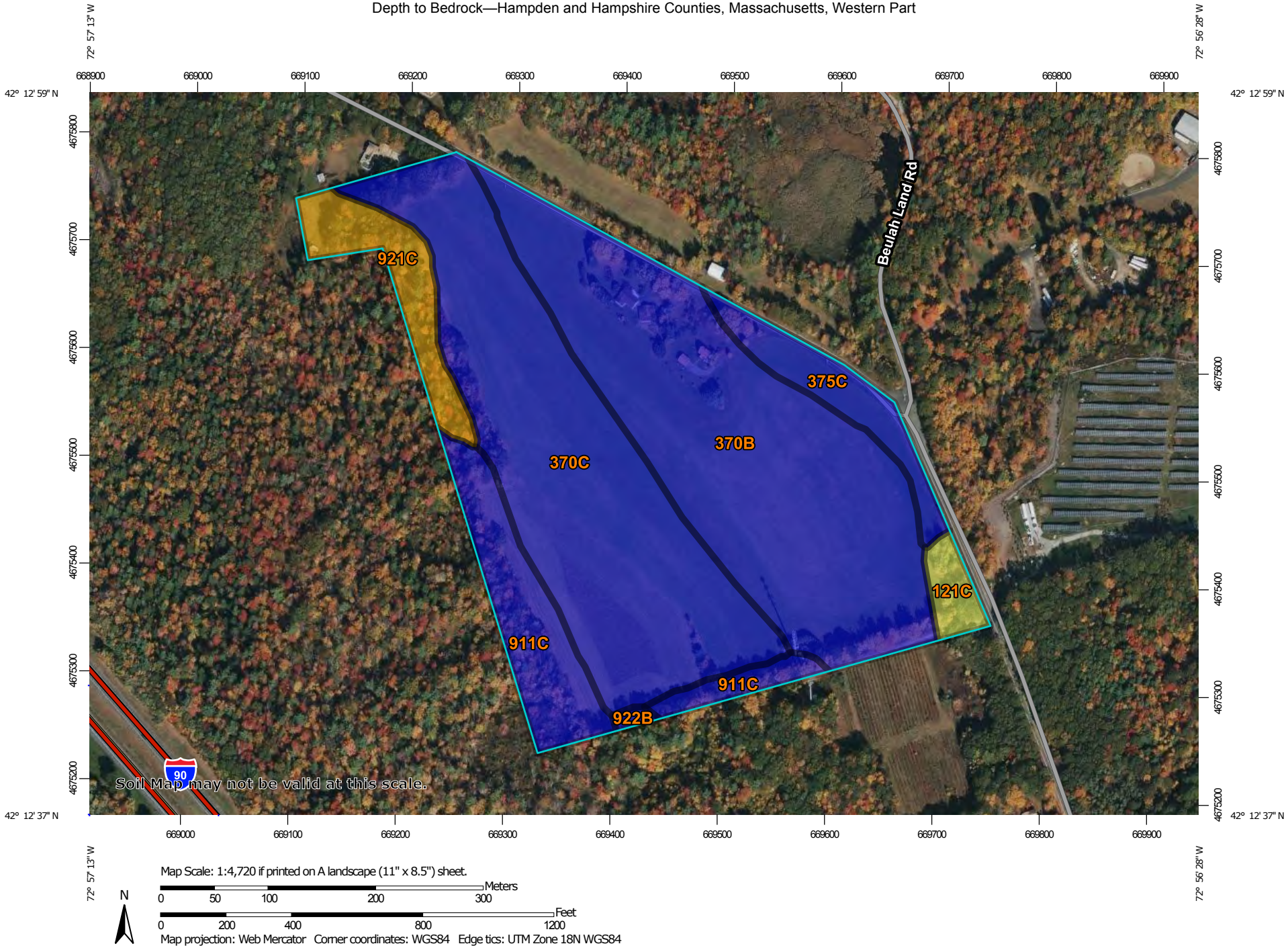
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:4,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 19, Sep 10, 2023

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Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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Depth to Bedrock

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
121C	Millsite-Westminster-Rock outcrop complex, 8 to 15 percent slopes	89	0.9	2.0%
370B	Shelburne loam, 3 to 8 percent slopes	>200	18.4	40.0%
370C	Shelburne loam, 8 to 15 percent slopes	>200	16.8	36.5%
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	>200	2.4	5.1%
911C	Ashfield-Shelburne association, rolling, extremely stony	>200	4.8	10.4%
921C	Westminster-Millsite association, rolling, extremely stony	46	2.7	5.8%
922B	Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony	>200	0.1	0.3%
Totals for Area of Interest			**46.0**	**100.0%**

Description

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

1) Lithic Bedrock

2) Paralithic Bedrock

3) Densic Bedrock

Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Depth to Water Table—Hampden and Hampshire Counties, Massachusetts, Western Part

Map Scale: 1:4,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

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- Aerial Photography

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Depth to Water Table

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121C	Millsite-Westminster-Rock outcrop complex, 8 to 15 percent slopes	>200	0.9	2.0%
370B	Shelburne loam, 3 to 8 percent slopes	61	18.4	40.0%
370C	Shelburne loam, 8 to 15 percent slopes	61	16.8	36.5%
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	46	2.4	5.1%
911C	Ashfield-Shelburne association, rolling, extremely stony	46	4.8	10.4%
921C	Westminster-Millsite association, rolling, extremely stony	>200	2.7	5.8%
922B	Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony	15	0.1	0.3%
Totals for Area of Interest			**46.0**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

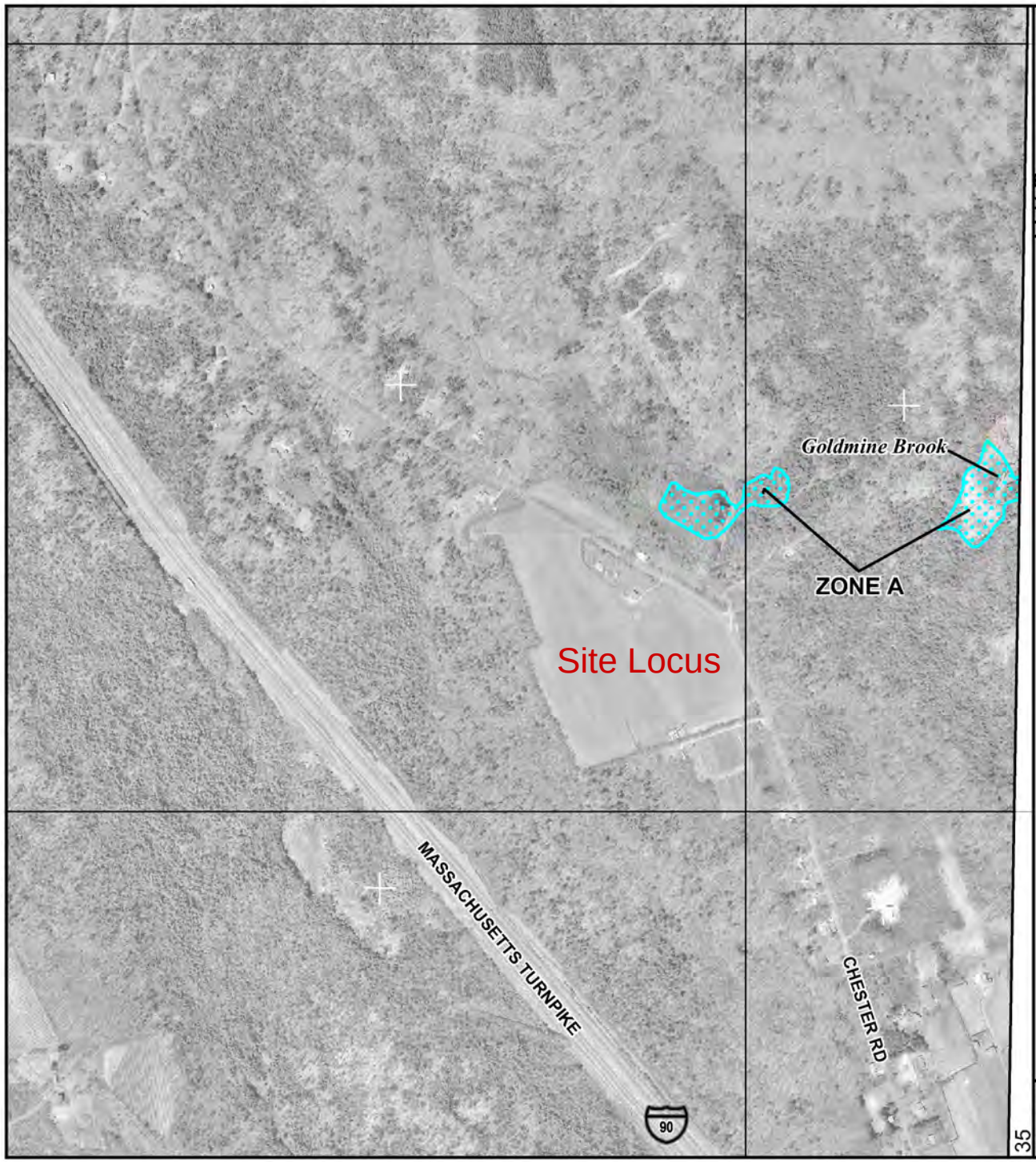
Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

00 0 300 600 MET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0130E

FIRM

FLOOD INSURANCE RATE MAP

HAMPDEN COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 130 OF 506

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BLANDFORD, TOWN OF	250134	0130	E
CHESTER, TOWN OF	250136	0130	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 25013C0130E

EFFECTIVE DATE JULY 16, 2013

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://msc.fema.gov.

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NOAA Atlas 14, Volume 10, Version 3
Location name: Blandford, Massachusetts, USA*
Latitude: 42.2143°, Longitude: -72.9473°
Elevation: 1546 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.338** (0.256-0.445)	**0.394** (0.298-0.520)	**0.486** (0.367-0.643)	**0.563** (0.423-0.749)	**0.669** (0.487-0.923)	**0.750** (0.536-1.05)	**0.831** (0.577-1.20)	**0.915** (0.612-1.37)	**1.03** (0.665-1.59)	**1.11** (0.704-1.76)
10-min	**0.479** (0.363-0.631)	**0.559** (0.423-0.737)	**0.690** (0.520-0.913)	**0.798** (0.599-1.06)	**0.947** (0.690-1.31)	**1.06** (0.759-1.49)	**1.18** (0.818-1.71)	**1.30** (0.867-1.94)	**1.45** (0.940-2.25)	**1.58** (0.997-2.49)
15-min	**0.563** (0.427-0.742)	**0.657** (0.497-0.867)	**0.811** (0.612-1.07)	**0.938** (0.704-1.25)	**1.11** (0.812-1.54)	**1.25** (0.892-1.76)	**1.38** (0.962-2.01)	**1.52** (1.02-2.28)	**1.71** (1.11-2.65)	**1.85** (1.17-2.93)
30-min	**0.790** (0.599-1.04)	**0.924** (0.700-1.22)	**1.14** (0.863-1.51)	**1.32** (0.995-1.76)	**1.58** (1.15-2.18)	**1.77** (1.26-2.49)	**1.96** (1.36-2.84)	**2.16** (1.44-3.23)	**2.42** (1.57-3.75)	**2.62** (1.66-4.14)
60-min	**1.02** (0.770-1.34)	**1.19** (0.902-1.57)	**1.48** (1.12-1.95)	**1.71** (1.29-2.28)	**2.04** (1.48-2.81)	**2.29** (1.63-3.22)	**2.54** (1.76-3.68)	**2.79** (1.87-4.18)	**3.13** (2.02-4.85)	**3.39** (2.14-5.36)
2-hr	**1.31** (0.996-1.71)	**1.53** (1.16-2.00)	**1.89** (1.43-2.49)	**2.19** (1.65-2.89)	**2.60** (1.90-3.57)	**2.91** (2.09-4.08)	**3.23** (2.26-4.68)	**3.57** (2.40-5.33)	**4.04** (2.62-6.23)	**4.41** (2.80-6.94)
3-hr	**1.50** (1.14-1.96)	**1.76** (1.34-2.30)	**2.19** (1.66-2.87)	**2.54** (1.92-3.35)	**3.03** (2.23-4.16)	**3.40** (2.46-4.76)	**3.78** (2.66-5.49)	**4.21** (2.83-6.26)	**4.81** (3.12-7.40)	**5.30** (3.37-8.32)
6-hr	**1.86** (1.43-2.42)	**2.23** (1.71-2.90)	**2.84** (2.17-3.70)	**3.34** (2.54-4.37)	**4.02** (2.99-5.53)	**4.54** (3.31-6.38)	**5.09** (3.63-7.45)	**5.75** (3.87-8.53)	**6.74** (4.39-10.3)	**7.58** (4.84-11.9)
12-hr	**2.26** (1.75-2.92)	**2.80** (2.16-3.61)	**3.67** (2.82-4.75)	**4.39** (3.35-5.72)	**5.38** (4.02-7.39)	**6.11** (4.50-8.60)	**6.91** (5.00-10.2)	**7.92** (5.35-11.7)	**9.52** (6.22-14.6)	**10.9** (6.99-17.0)
24-hr	**2.67** (2.07-3.42)	**3.37** (2.61-4.33)	**4.52** (3.50-5.83)	**5.48** (4.21-7.10)	**6.79** (5.11-9.32)	**7.75** (5.75-10.9)	**8.82** (6.45-13.0)	**10.2** (6.92-15.1)	**12.5** (8.18-19.1)	**14.5** (9.31-22.5)
2-day	**3.07** (2.39-3.91)	**3.91** (3.05-5.00)	**5.30** (4.12-6.79)	**6.45** (4.98-8.32)	**8.04** (6.08-11.0)	**9.18** (6.86-12.9)	**10.5** (7.72-15.5)	**12.2** (8.30-17.9)	**15.1** (9.90-22.9)	**17.7** (11.4-27.3)
3-day	**3.36** (2.62-4.27)	**4.29** (3.35-5.46)	**5.80** (4.52-7.42)	**7.07** (5.47-9.08)	**8.80** (6.68-12.0)	**10.1** (7.54-14.1)	**11.5** (8.49-17.0)	**13.4** (9.12-19.6)	**16.6** (10.9-25.2)	**19.5** (12.6-30.0)
4-day	**3.61** (2.83-4.58)	**4.60** (3.60-5.84)	**6.22** (4.85-7.92)	**7.56** (5.87-9.69)	**9.40** (7.16-12.8)	**10.7** (8.06-15.0)	**12.2** (9.08-18.1)	**14.3** (9.74-20.9)	**17.7** (11.6-26.8)	**20.7** (13.4-32.0)
7-day	**4.33** (3.41-5.46)	**5.43** (4.27-6.86)	**7.23** (5.67-9.17)	**8.73** (6.80-11.1)	**10.8** (8.22-14.6)	**12.3** (9.23-17.1)	**14.0** (10.3-20.4)	**16.2** (11.1-23.5)	**19.8** (13.1-29.8)	**23.0** (14.9-35.4)
10-day	**5.06** (3.99-6.36)	**6.21** (4.90-7.83)	**8.10** (6.37-10.2)	**9.67** (7.56-12.3)	**11.8** (9.03-15.9)	**13.4** (10.1-18.5)	**15.2** (11.2-22.0)	**17.4** (12.0-25.3)	**21.1** (13.9-31.7)	**24.3** (15.7-37.2)
20-day	**7.34** (5.82-9.18)	**8.54** (6.77-10.7)	**10.5** (8.30-13.2)	**12.1** (9.53-15.3)	**14.4** (11.0-19.1)	**16.0** (12.0-21.8)	**17.8** (13.1-25.3)	**20.0** (13.8-28.9)	**23.4** (15.5-35.0)	**26.3** (17.1-40.1)
30-day	**9.19** (7.32-11.5)	**10.4** (8.28-13.0)	**12.4** (9.84-15.6)	**14.1** (11.1-17.7)	**16.4** (12.5-21.6)	**18.1** (13.6-24.4)	**19.9** (14.5-27.9)	**22.0** (15.2-31.6)	**25.0** (16.7-37.3)	**27.6** (18.0-42.0)
45-day	**11.4** (9.10-14.2)	**12.7** (10.1-15.8)	**14.8** (11.7-18.4)	**16.5** (13.0-20.7)	**18.9** (14.5-24.7)	**20.7** (15.5-27.7)	**22.6** (16.4-31.2)	**24.5** (17.0-35.1)	**27.2** (18.2-40.4)	**29.3** (19.1-44.5)
60-day	**13.2** (10.5-16.3)	**14.5** (11.6-18.0)	**16.7** (13.3-20.8)	**18.6** (14.7-23.2)	**21.1** (16.1-27.4)	**23.0** (17.2-30.5)	**24.9** (18.0-34.2)	**26.8** (18.7-38.2)	**29.2** (19.6-43.2)	**30.9** (20.2-46.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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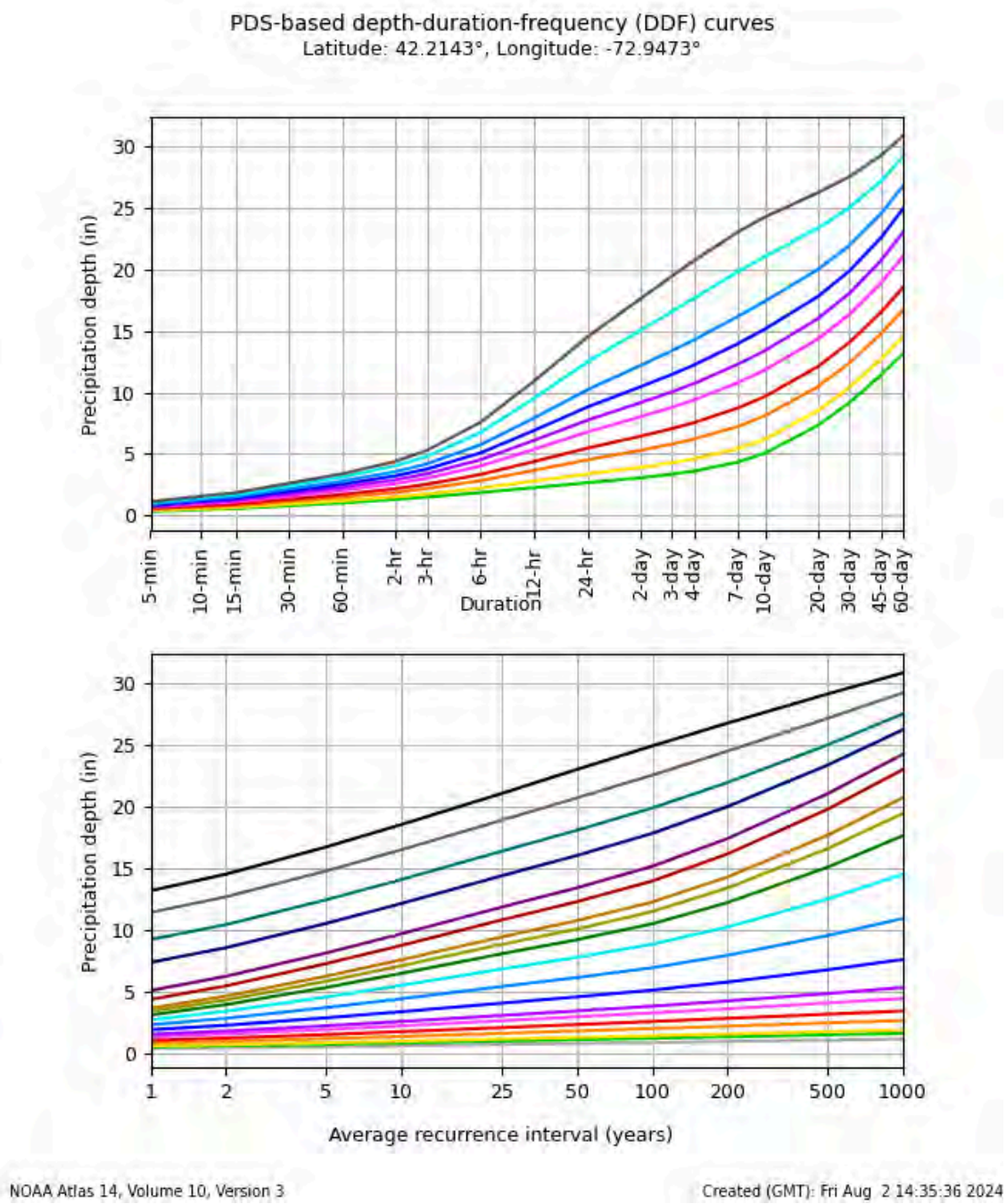
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Fri Aug 2 14:35:36 2024

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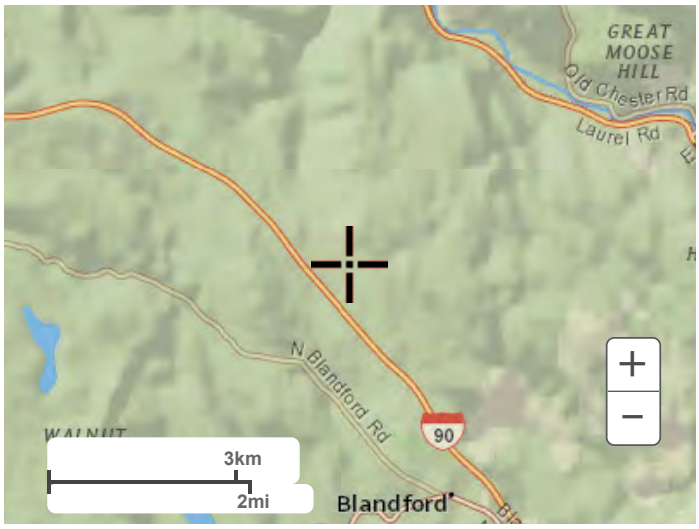
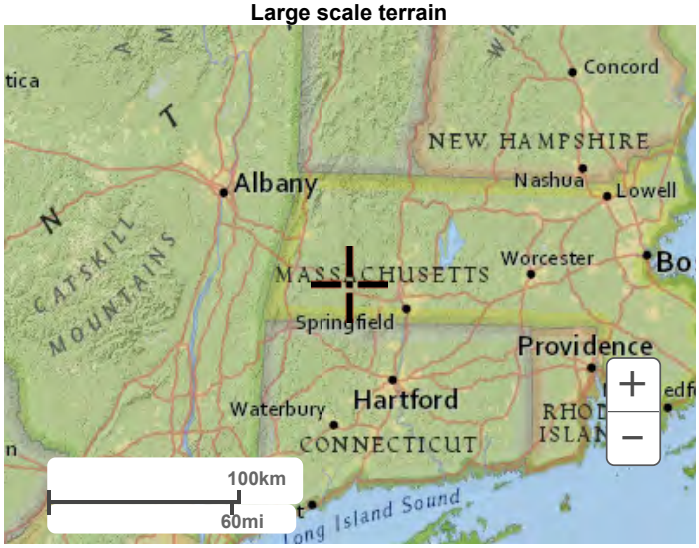
Maps & aerials

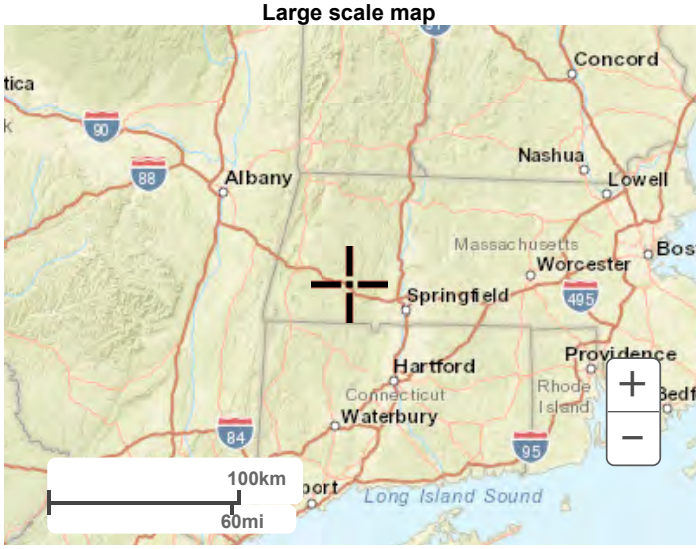
Small scale terrain



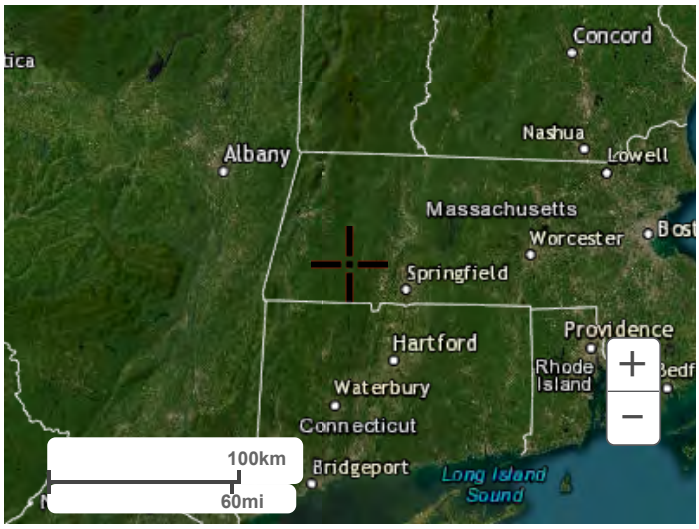
Large scale terrain



Large scale map



Large scale aerial



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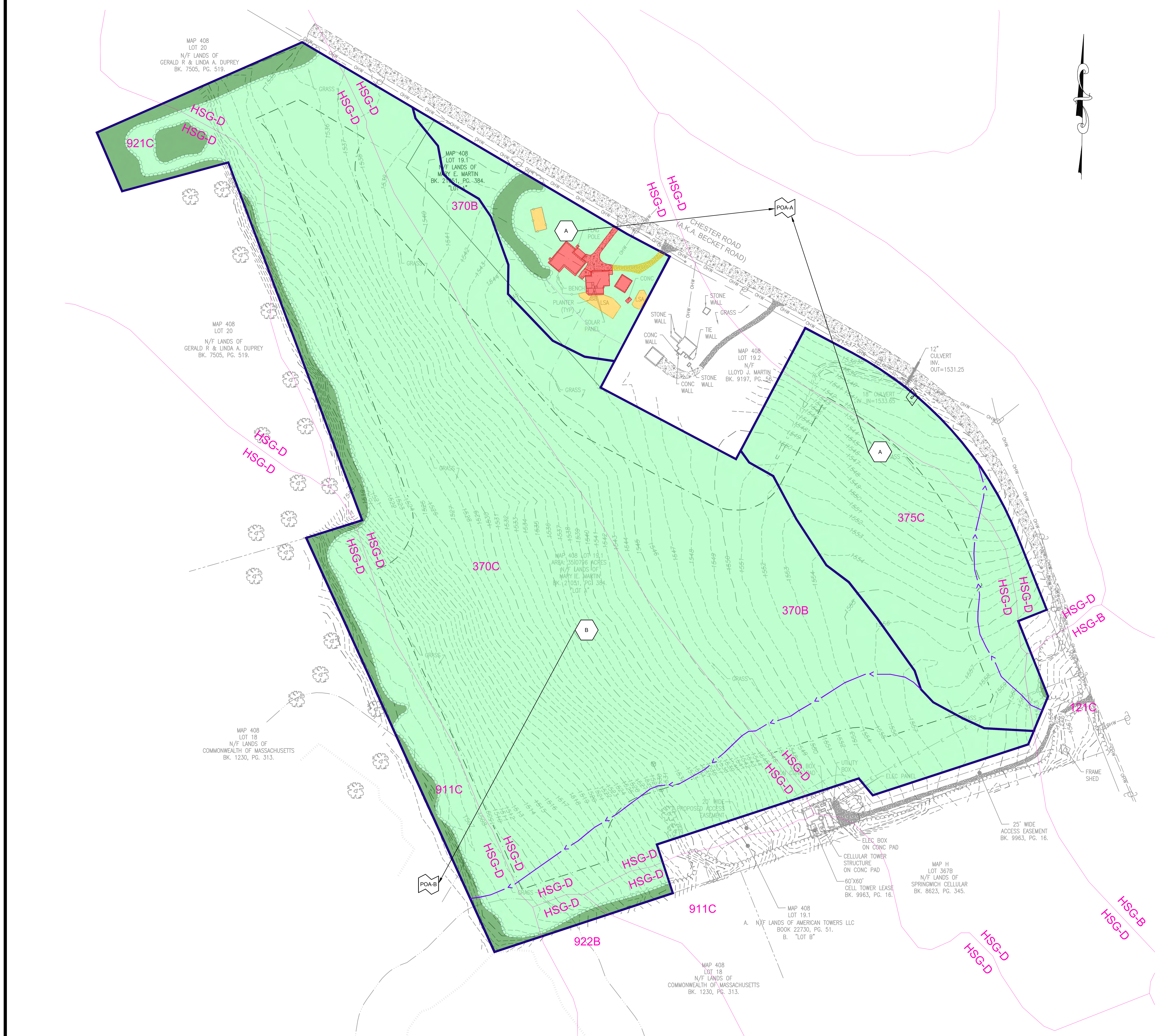
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Attachment C - Hydrologic Maps & HydroCAD Reports



LEGEND DRAINAGE AREA MAP:

HYDROLOGY:

- FLOW PATH / TIME OF CONCENTRATION
- SUBBASIN LABEL
- ANALYSIS POINT/POINT OF ANALYSIS
- MEADOW
- GRAVEL
- BARE SOIL
- IMPERVIOUS
- WOODS
- WATERSHED BOUNDARY
- NRCS SOIL BOUNDARY
- HSG X — NRCS SOIL MAP GROUP

SOIL DATA		
Map Unit Symbol	Map Unit Name	HSG Rating
121C	Millsite-Westminster-Rock Outcrop complex, 8 to 15 percent slopes	B
370B	Shelburne loam, 3 to 8 percent slopes	D
370C	Shelburne loam, 8 to 15 percent slopes	D
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	D
911C	Ashfield -Shelburne association, rolling, extremely stony	D
921C	Westminster-Millsite association, rolling, extremely stony	D
922B	Pillsbury-Peacham-Wonsqueak association, 0 to 8 percent slopes, extremely stony	D

EXISTING-CONDITIONS TC LIST				
Drainage Area	Flow Type	Ground Cover	Length (ft)	Slope
A	SHEET	MEADOW	50	4.00%
	SHALLOW	MEADOW	193	3.63%
	SHALLOW	MEADOW	297	4.04%
B	SHEET	MEADOW	50	2.00%
	SHALLOW	MEADOW	111	2.25%
	SHALLOW	MEADOW	229	4.37%
	SHALLOW	MEADOW	246	7.72%
	SHALLOW	MEADOW	241	6.22%
	SHALLOW	MEADOW	124	4.03%
	SHALLOW	WOODS	19	13.16%

LEGEND:

EXISTING:

- PROPERTY BOUNDARY
- APPROXIMATE ADJOINING PROPERTY BOUNDARY
- RIGHT OF WAY
- MAJOR CONTOUR
- MINOR CONTOUR
- 100' SOLAR SETBACK
- EDGE OF PAVEMENT
- WETLAND
- 100' WETLAND BUFFER
- TREE LINE
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- TREE
- UTILITY POLE
- GUY WIRE
- SIGN
- STRUCTURE
- GRAVEL
- ASPHALT

NOT FOR CONSTRUCTION

Project:
PROPOSED 4.04 MW SOLAR PV DEVELOPMENT

89 CHESTER ROAD
BLANDFORD, MA 01008

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

Client:

BLUEWAVE
Peebles Brook, LLC
116 Huntington Ave, Suite 601
Boston, MA 02116
tel: (617) 209-3122
https://bluewave.energy/

No.	Description	Date
A	PERMITTING	03/11/25

Revisions

Seal:

Issued For:

PERMITTING

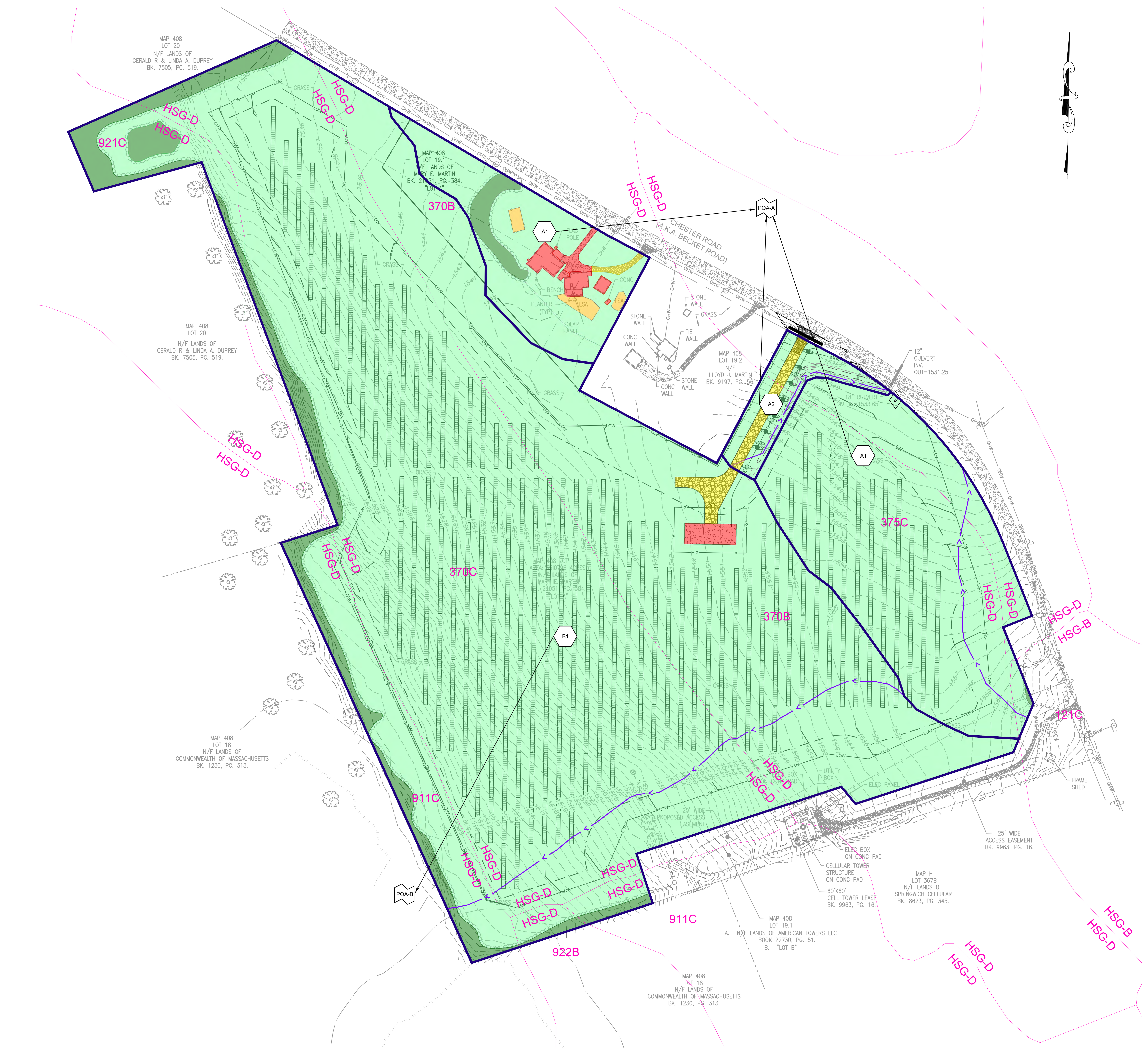
Scale:	
Issued Date:	03/11/2025
Drawn By:	MBS
Reviewed By:	AGH
Approved By:	MRC
W&S Project No.:	ENG23-3160

Drawing Title:

PRE-DEVELOPMENT DRAINAGE AREA MAP

Sheet Number:

FIGURE 1



SYSTEM SIZE			
STRINGS / RACKS	PANELS	PANEL SIZE (W)	SIZE (MW)
290	6,960	580	4.04

0 50' 100' 200'
1" = 100' HORIZONTAL

NOT FOR CONSTRUCTION

LEGEND DRAINAGE AREA MAP:

HYDROLOGY:

- FLOW PATH / TIME OF CONCENTRATION
- P-X SUBBASIN LABEL
- POA-X ANALYSIS POINT/POINT OF ANALYSIS
- XP STORMWATER BMP LABEL
- XR STORMWATER REACH LABEL
- MEADOW
- GRAVEL
- BARE SOIL
- IMPERVIOUS
- WOODS
- BRUSH
- WATERSHED BOUNDARY
- NRCS SOIL BOUNDARY
- HSG X NRCS SOIL MAP GROUP

SOIL DATA		
Map Unit Symbol	Map Unit Name	HSG Rating
121C	Millsite-Westminster-Rock Outcrop complex, 8 to 15 percent slopes	B
370B	Shelburne loam, 3 to 8 percent slopes	D
370C	Shelburne loam, 8 to 15 percent slopes	D
375C	Ashfield fine sandy loam, 8 to 15 percent slopes	D
911C	Ashfield -Shelburne association, rolling, extremely stony	D
921C	Westminster-Millsite association, rolling, extremely stony	D
922B	Pillsbury-Peacham-Wonsque ak association, 0 to 8 percent slopes, extremely stony	D

PROPOSED-CONDITIONS TC LIST				
Drainage Area	Flow Type	Ground Cover	Length (ft)	Slope
A1	SHEET	MEADOW	50	4.00%
	SHALLOW	MEADOW	193	3.63%
	SHALLOW	MEADOW	297	4.04%
B1	SHEET	MEADOW	50	2.00%
	SHALLOW	MEADOW	111	2.25%
	SHALLOW	MEADOW	229	4.37%
	SHALLOW	MEADOW	246	7.72%
	SHALLOW	MEADOW	241	6.22%
	SHALLOW	MEADOW	124	4.03%
	SHALLOW	WOODS	19	13.16%
A2	SHEET	GRAVEL	30	0.83%
	SHEET	MEADOW	20	0.25%
	SHALLOW	MEADOW	15	2.67%
	SWALE	MEADOW	339	3.62%

LEGEND:

EXISTING:

- PROPERTY BOUNDARY
- APPROXIMATE ADJOINING PROPERTY BOUNDARY
- RIGHT OF WAY
- MAJOR CONTOUR
- MINOR CONTOUR
- 100' SOLAR SETBACK
- EDGE OF PAVEMENT
- WETLAND
- 100' WETLAND BUFFER
- TREE LINE
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- CHAIN LINK FENCE
- TREE
- UTILITY POLE
- GUY WIRE
- SIGN
- STRUCTURE
- GRAVEL
- ASPHALT

PROPOSED:

- 7' CHAIN LINK FENCE
- LIMIT OF WORK
- ELECTRIC CONDUIT
- OVERHEAD ELECTRIC LINE
- LEASE, ACCESS AND UTILITY AREA
- UTILITY POLE
- STRAW WATTLE
- 20' WIDE GRAVEL ACCESS WAY
- EQUIPMENT PAD
- SOLAR PV TABLE

Project:
PROPOSED 4.04 MW SOLAR PV DEVELOPMENT

89 CHESTER ROAD
BLANDFORD, MA 01008

Weston & Sampson
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON
www.westonandsampson.com

Client:

BLUEWAVE

Peebles Brook, LLC
116 Huntington Ave, Suite 601
Boston, MA 02116
tel: (617) 209-3122
https://bluewave.energy/

811
Know what's Below.
Call before you dig.

No.	Description	Date
A	PERMITTING	03/11/25

Revisions

Seal:

Issued For:

PERMITTING

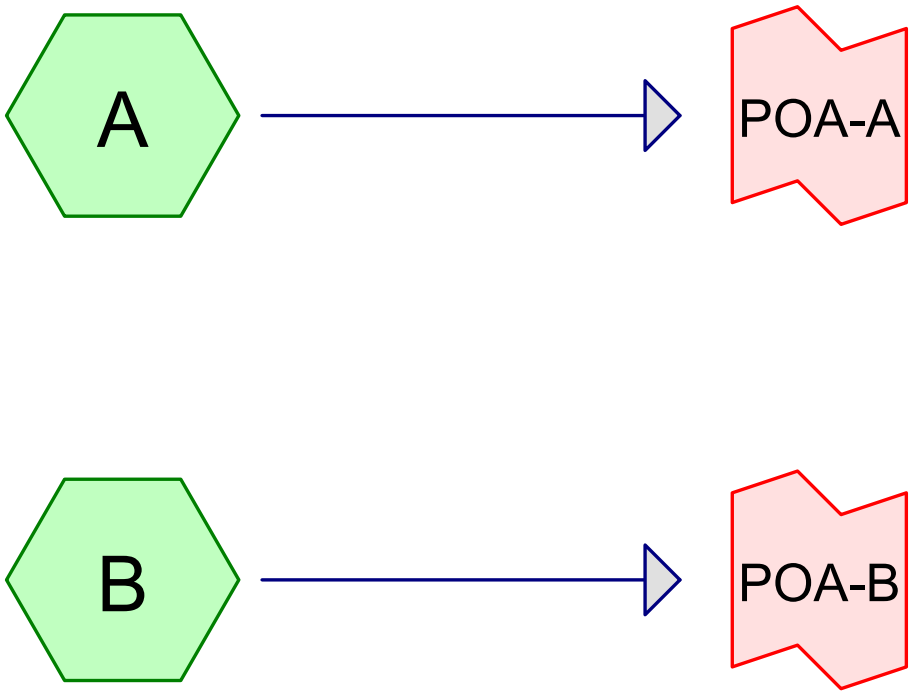
Scale:	
Issued Date:	03/11/2025
Drawn By:	MBS
Reviewed By:	AGH
Approved By:	MRC
W&S Project No.:	ENG23-3160

Drawing Title:

POST-DEVELOPMENT DRAINAGE AREA MAP

Sheet Number:

FIGURE 2



Subcat Reach Pond Link

Routing Diagram for BW Chester Rd Blanford MA Pre
Prepared by Weston & Sampson Engineers, Inc, Printed 8/1/2024

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.37	2
2	10-yr	Type III 24-hr		Default	24.00	1	5.48	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.79	2
4	100-yr	Type III 24-hr		Default	24.00	1	8.82	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.083	94	Fallow, bare soil, HSG D (A)
0.029	91	Gravel roads, HSG D (A)
0.075	58	Meadow, non-grazed, HSG B (A)
33.059	78	Meadow, non-grazed, HSG D (A, B)
0.177	98	Unconnected pavement, HSG D (A)
0.006	55	Woods, Good, HSG B (A)
1.650	77	Woods, Good, HSG D (A, B)
35.080	**78**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.081	HSG B	A
0.000	HSG C	
34.999	HSG D	A, B
0.000	Other	
35.080		**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	0.083	0.000	0.083	Fallow, bare soil	A
0.000	0.000	0.000	0.029	0.000	0.029	Gravel roads	A
0.000	0.075	0.000	33.059	0.000	33.133	Meadow, non-grazed	A, B
0.000	0.000	0.000	0.177	0.000	0.177	Unconnected pavement	A
0.000	0.006	0.000	1.650	0.000	1.657	Woods, Good	A, B
0.000	**0.081**	**0.000**	**34.999**	**0.000**	**35.080**	**TOTAL AREA**	

Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Runoff Area=331,140 sf 2.33% Impervious Runoff Depth=1.40"
Flow Length=540' Tc=12.0 min CN=78 Runoff=9.98 cfs 0.886 af

Subcatchment B: Runoff Area=1,196,928 sf 0.00% Impervious Runoff Depth=1.40"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=30.69 cfs 3.204 af

Link POA-A: Inflow=9.98 cfs 0.886 af
Primary=9.98 cfs 0.886 af

Link POA-B: Inflow=30.69 cfs 3.204 af
Primary=30.69 cfs 3.204 af

Total Runoff Area = 35.080 ac Runoff Volume = 4.091 af Average Runoff Depth = 1.40"
99.49% Pervious = 34.902 ac 0.51% Impervious = 0.177 ac

Summary for Subcatchment A:

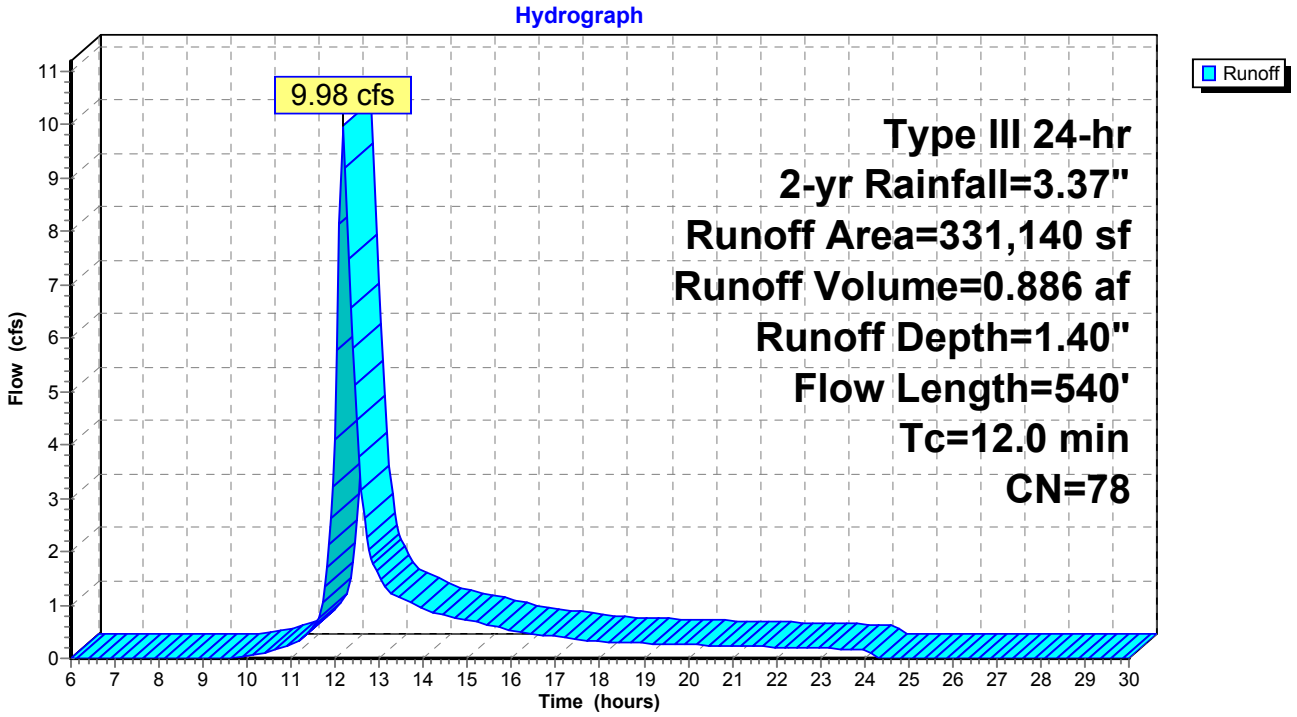
Runoff = 9.98 cfs @ 12.17 hrs, Volume= 0.886 af, Depth= 1.40"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.37"

Area (sf)	CN	Description
3,251	58	Meadow, non-grazed, HSG B
307,506	78	Meadow, non-grazed, HSG D
273	55	Woods, Good, HSG B
7,498	77	Woods, Good, HSG D
1,261	91	Gravel roads, HSG D
3,625	94	Fallow, bare soil, HSG D
7,726	98	Unconnected pavement, HSG D
331,140	78	Weighted Average
323,414		97.67% Pervious Area
7,726		2.33% Impervious Area
7,726		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A:



Summary for Subcatchment B:

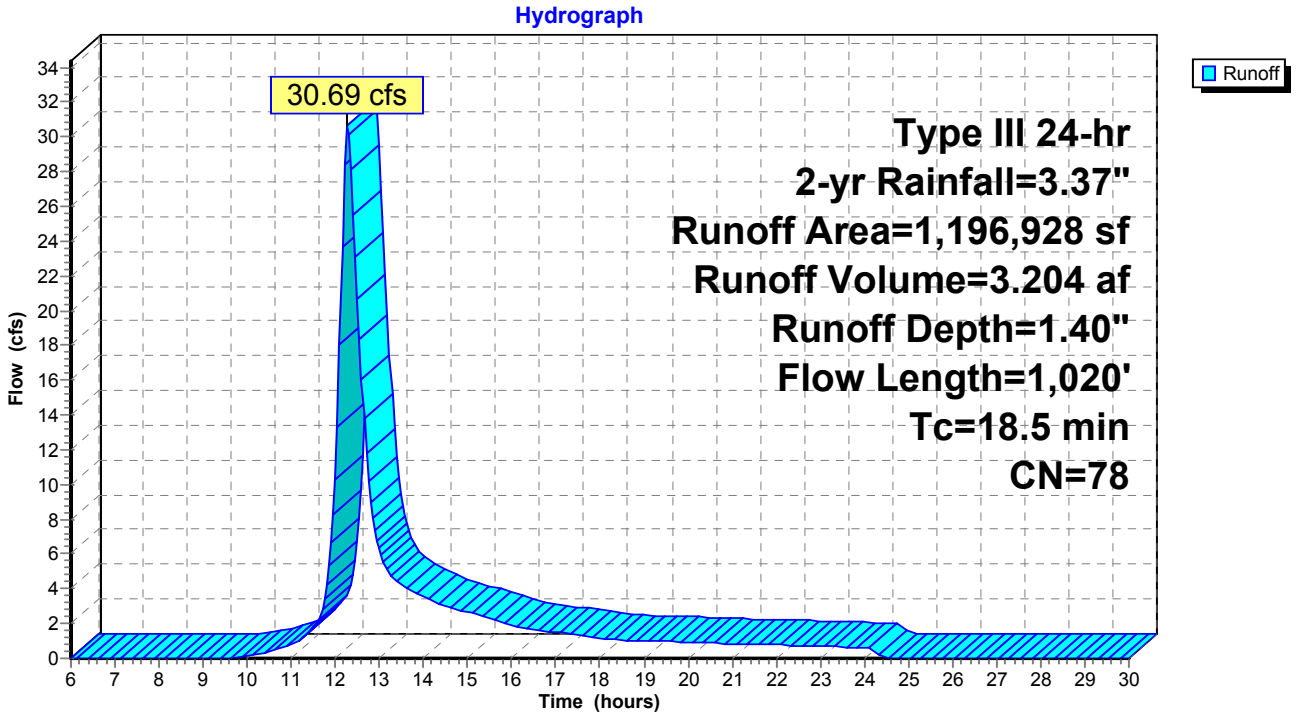
Runoff = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af, Depth= 1.40"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.37"

Area (sf)	CN	Description
1,132,531	78	Meadow, non-grazed, HSG D
64,397	77	Woods, Good, HSG D
1,196,928	78	Weighted Average
1,196,928		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B:

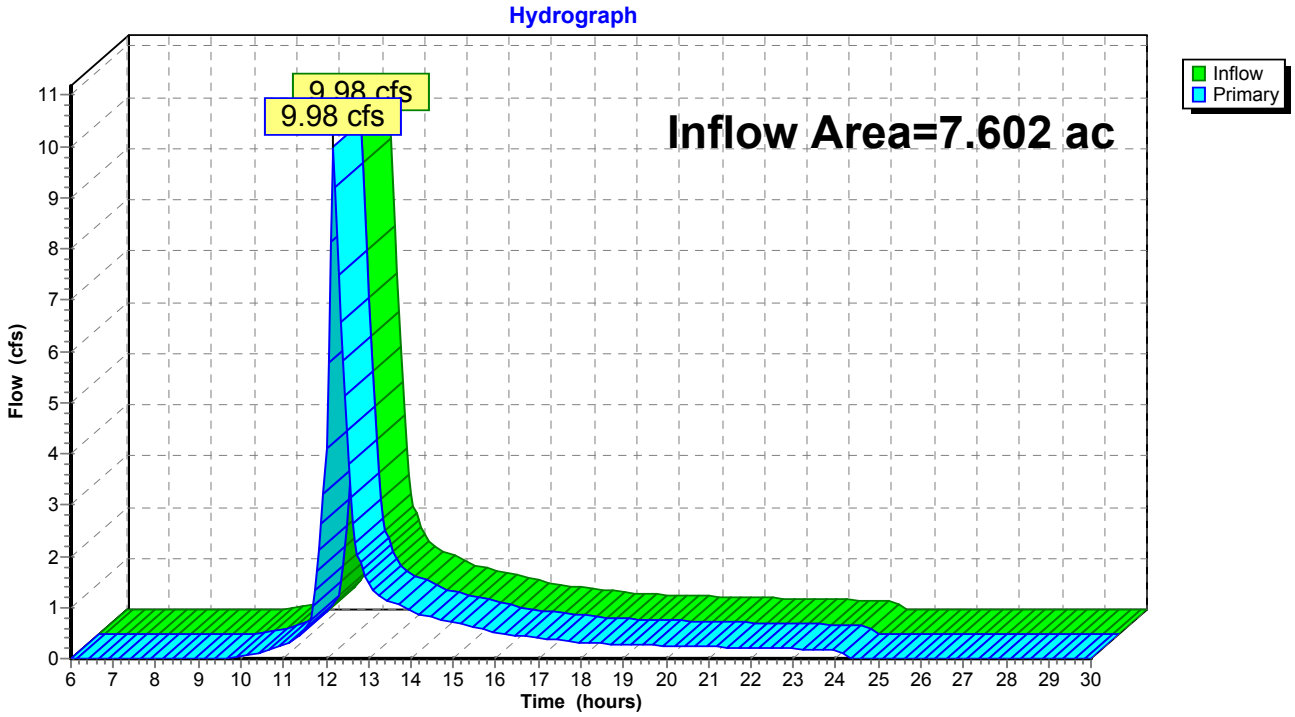


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.33% Impervious, Inflow Depth = 1.40" for 2-yr event
Inflow = 9.98 cfs @ 12.17 hrs, Volume= 0.886 af
Primary = 9.98 cfs @ 12.17 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

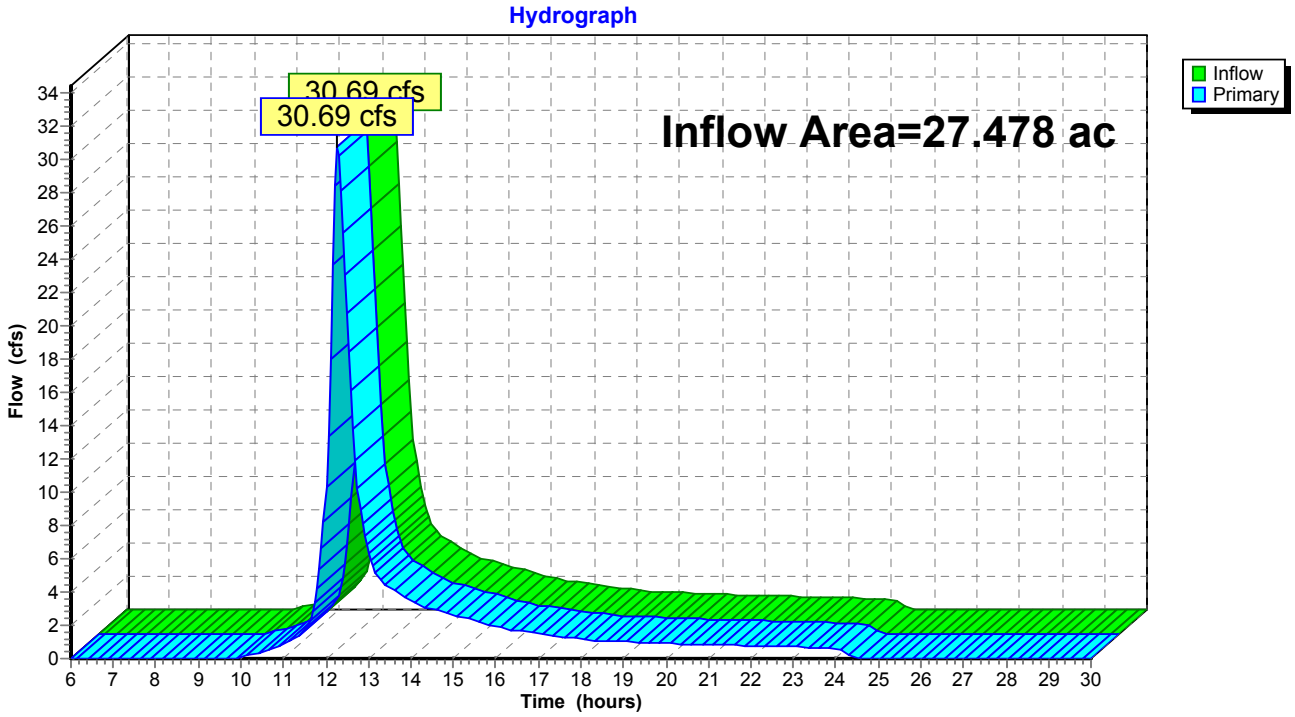


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.00% Impervious, Inflow Depth = 1.40" for 2-yr event
Inflow = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af
Primary = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Runoff Area=331,140 sf 2.33% Impervious Runoff Depth=3.12"
Flow Length=540' Tc=12.0 min CN=78 Runoff=22.73 cfs 1.979 af

Subcatchment B: Runoff Area=1,196,928 sf 0.00% Impervious Runoff Depth=3.12"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=69.90 cfs 7.153 af

Link POA-A: Inflow=22.73 cfs 1.979 af
Primary=22.73 cfs 1.979 af

Link POA-B: Inflow=69.90 cfs 7.153 af
Primary=69.90 cfs 7.153 af

Total Runoff Area = 35.080 ac Runoff Volume = 9.131 af Average Runoff Depth = 3.12"
99.49% Pervious = 34.902 ac 0.51% Impervious = 0.177 ac

Summary for Subcatchment A:

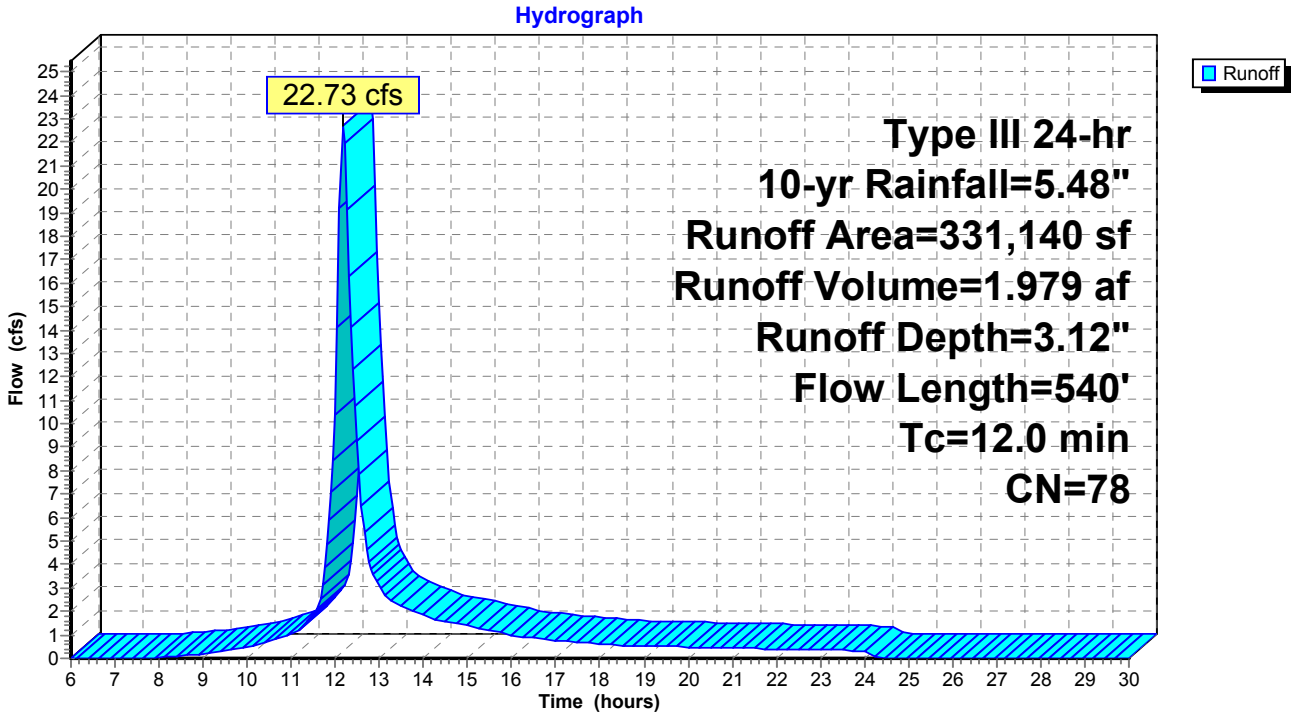
Runoff = 22.73 cfs @ 12.17 hrs, Volume= 1.979 af, Depth= 3.12"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.48"

Area (sf)	CN	Description
3,251	58	Meadow, non-grazed, HSG B
307,506	78	Meadow, non-grazed, HSG D
273	55	Woods, Good, HSG B
7,498	77	Woods, Good, HSG D
1,261	91	Gravel roads, HSG D
3,625	94	Fallow, bare soil, HSG D
7,726	98	Unconnected pavement, HSG D
331,140	78	Weighted Average
323,414		97.67% Pervious Area
7,726		2.33% Impervious Area
7,726		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A:



Summary for Subcatchment B:

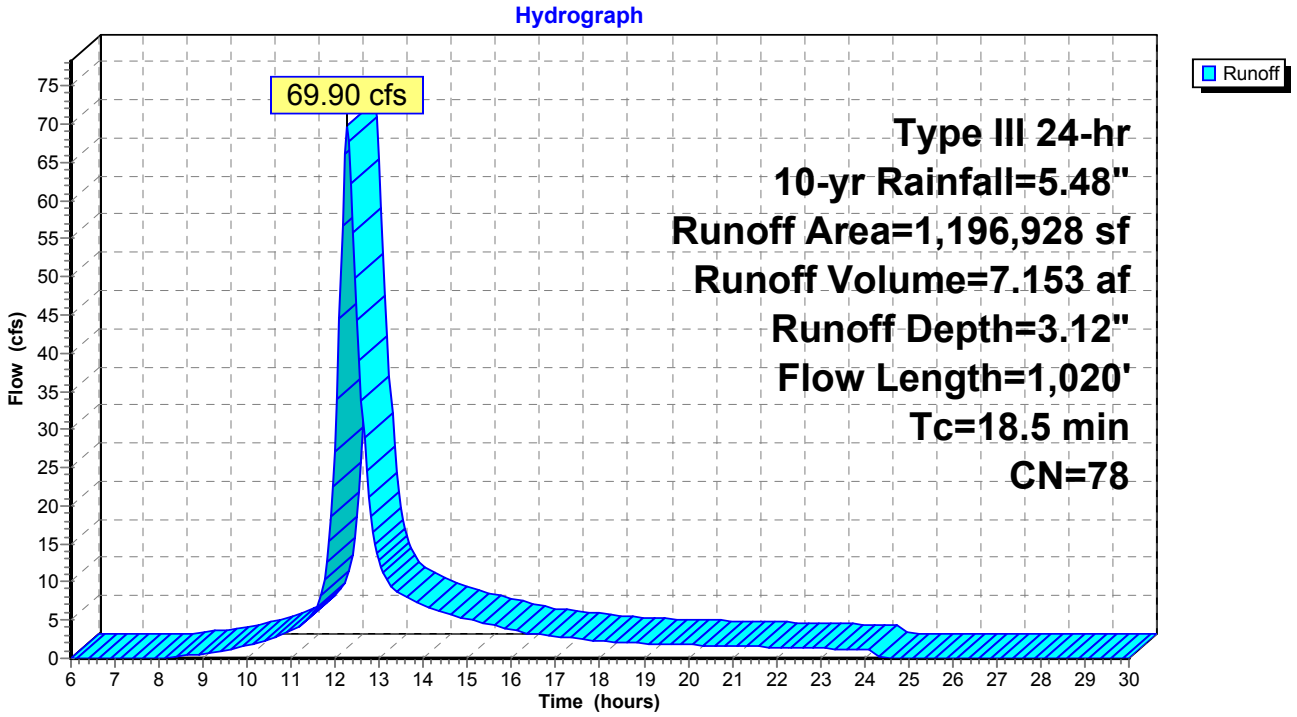
Runoff = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af, Depth= 3.12"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.48"

Area (sf)	CN	Description
1,132,531	78	Meadow, non-grazed, HSG D
64,397	77	Woods, Good, HSG D
1,196,928	78	Weighted Average
1,196,928		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B:

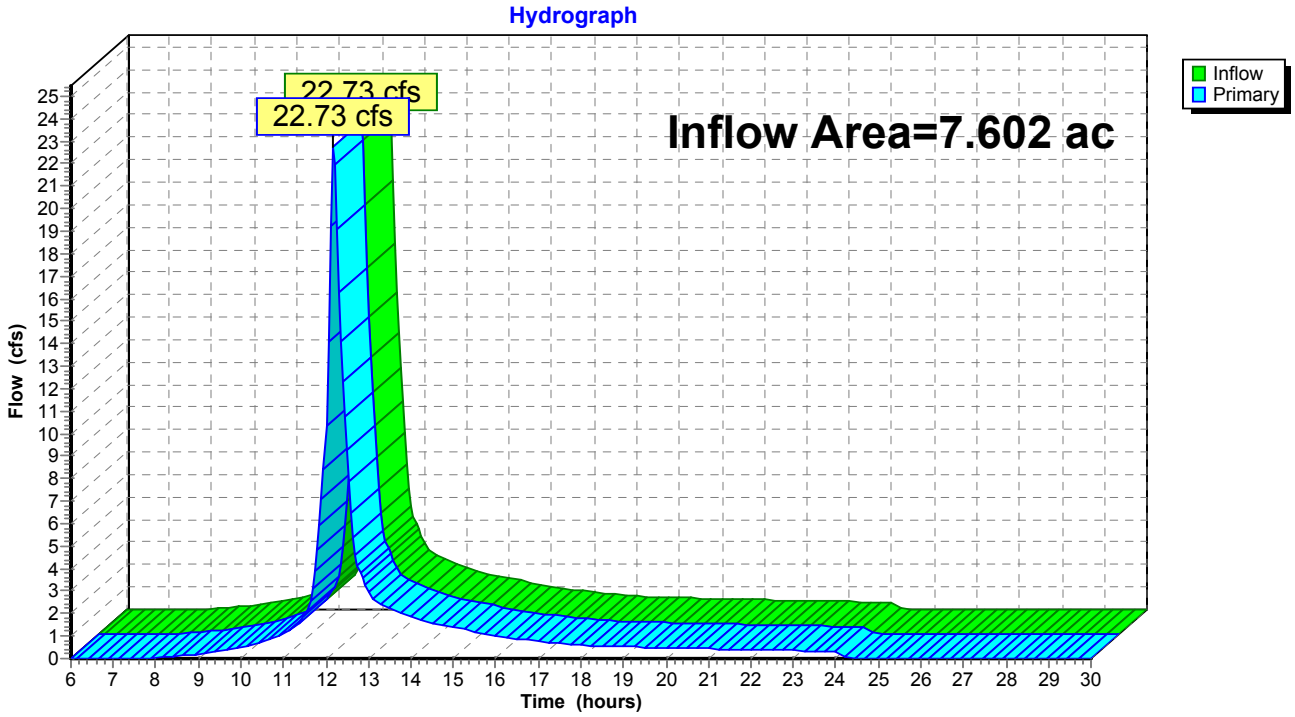


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.33% Impervious, Inflow Depth = 3.12" for 10-yr event
Inflow = 22.73 cfs @ 12.17 hrs, Volume= 1.979 af
Primary = 22.73 cfs @ 12.17 hrs, Volume= 1.979 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

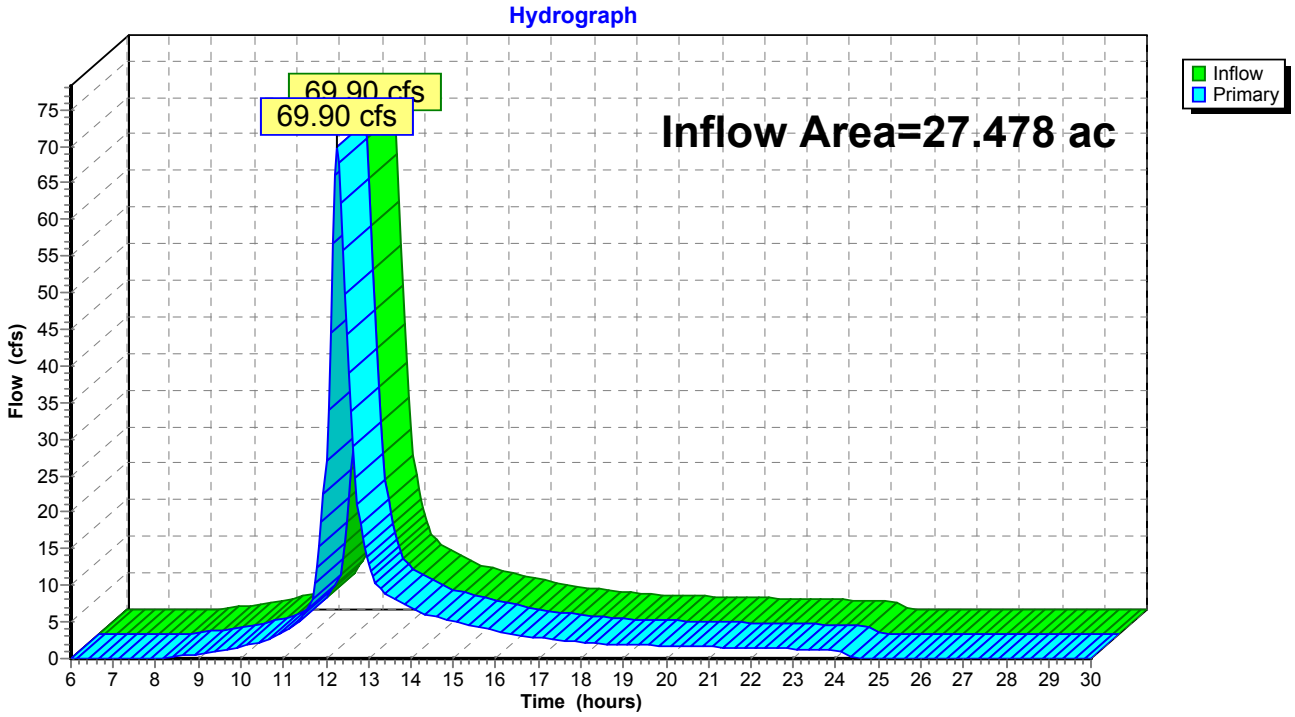


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.00% Impervious, Inflow Depth = 3.12" for 10-yr event
Inflow = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af
Primary = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Runoff Area=331,140 sf 2.33% Impervious Runoff Depth=4.28"
Flow Length=540' Tc=12.0 min CN=78 Runoff=31.09 cfs 2.714 af

Subcatchment B: Runoff Area=1,196,928 sf 0.00% Impervious Runoff Depth=4.28"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=95.63 cfs 9.811 af

Link POA-A: Inflow=31.09 cfs 2.714 af
Primary=31.09 cfs 2.714 af

Link POA-B: Inflow=95.63 cfs 9.811 af
Primary=95.63 cfs 9.811 af

Total Runoff Area = 35.080 ac Runoff Volume = 12.526 af Average Runoff Depth = 4.28"
99.49% Pervious = 34.902 ac 0.51% Impervious = 0.177 ac

Summary for Subcatchment A:

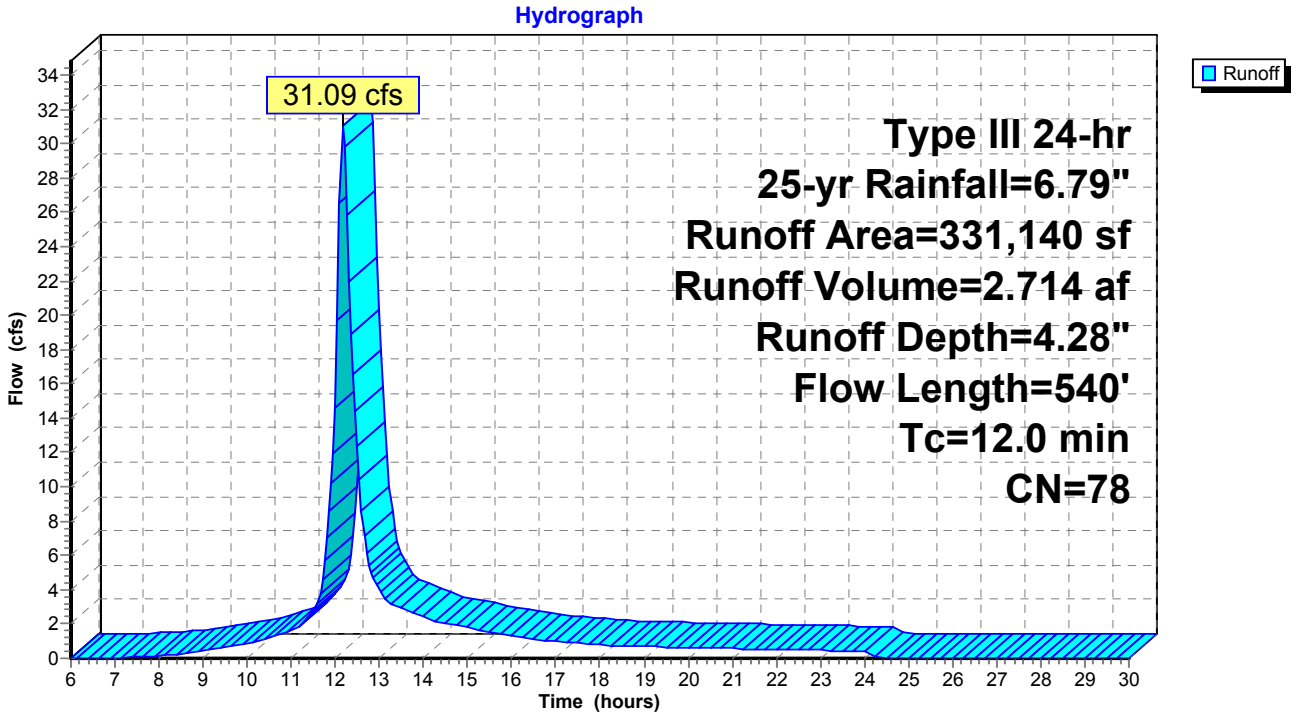
Runoff = 31.09 cfs @ 12.17 hrs, Volume= 2.714 af, Depth= 4.28"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.79"

Area (sf)	CN	Description
3,251	58	Meadow, non-grazed, HSG B
307,506	78	Meadow, non-grazed, HSG D
273	55	Woods, Good, HSG B
7,498	77	Woods, Good, HSG D
1,261	91	Gravel roads, HSG D
3,625	94	Fallow, bare soil, HSG D
7,726	98	Unconnected pavement, HSG D
331,140	78	Weighted Average
323,414		97.67% Pervious Area
7,726		2.33% Impervious Area
7,726		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A:



Summary for Subcatchment B:

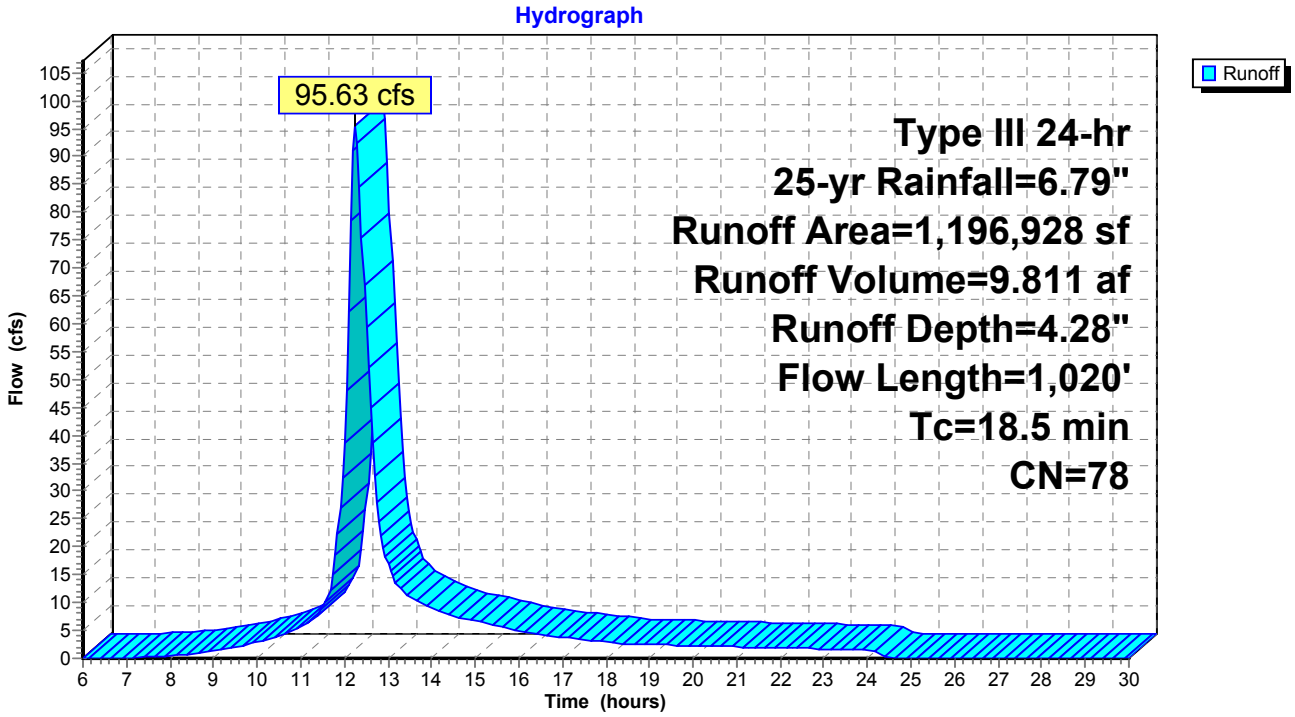
Runoff = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af, Depth= 4.28"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.79"

Area (sf)	CN	Description
1,132,531	78	Meadow, non-grazed, HSG D
64,397	77	Woods, Good, HSG D
1,196,928	78	Weighted Average
1,196,928		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B:

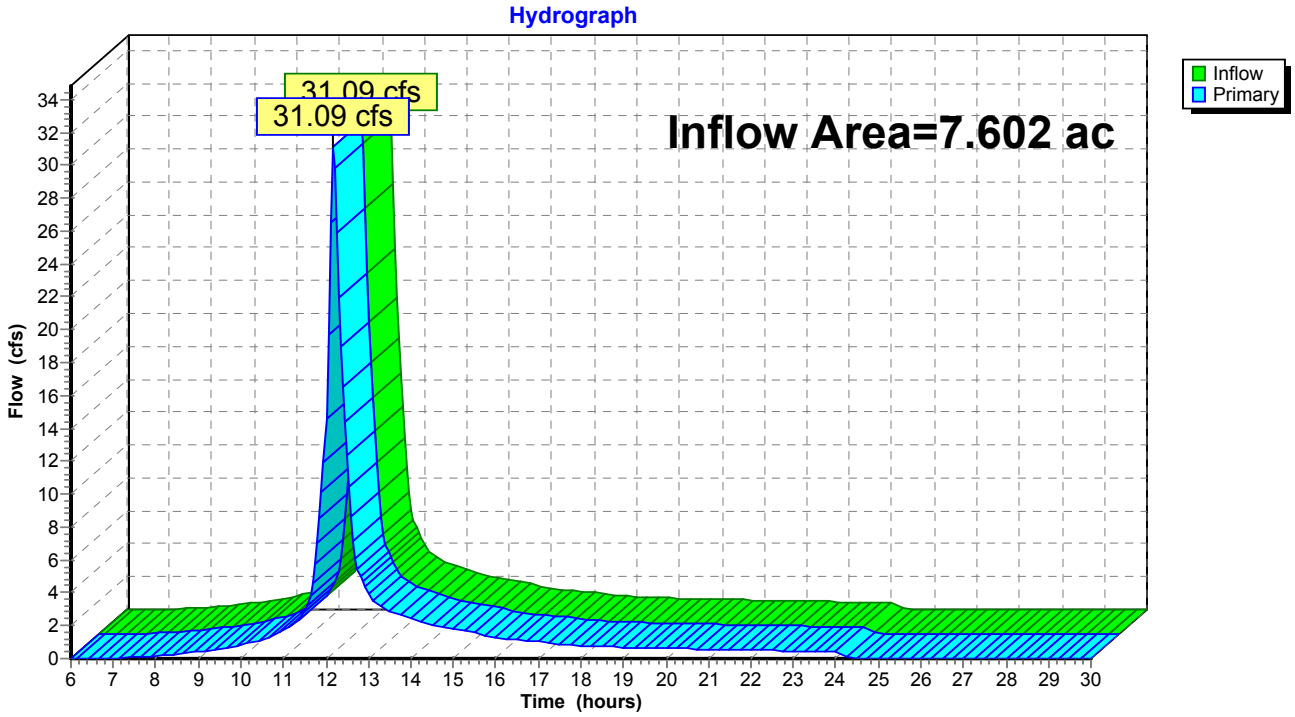


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.33% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 31.09 cfs @ 12.17 hrs, Volume= 2.714 af
Primary = 31.09 cfs @ 12.17 hrs, Volume= 2.714 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

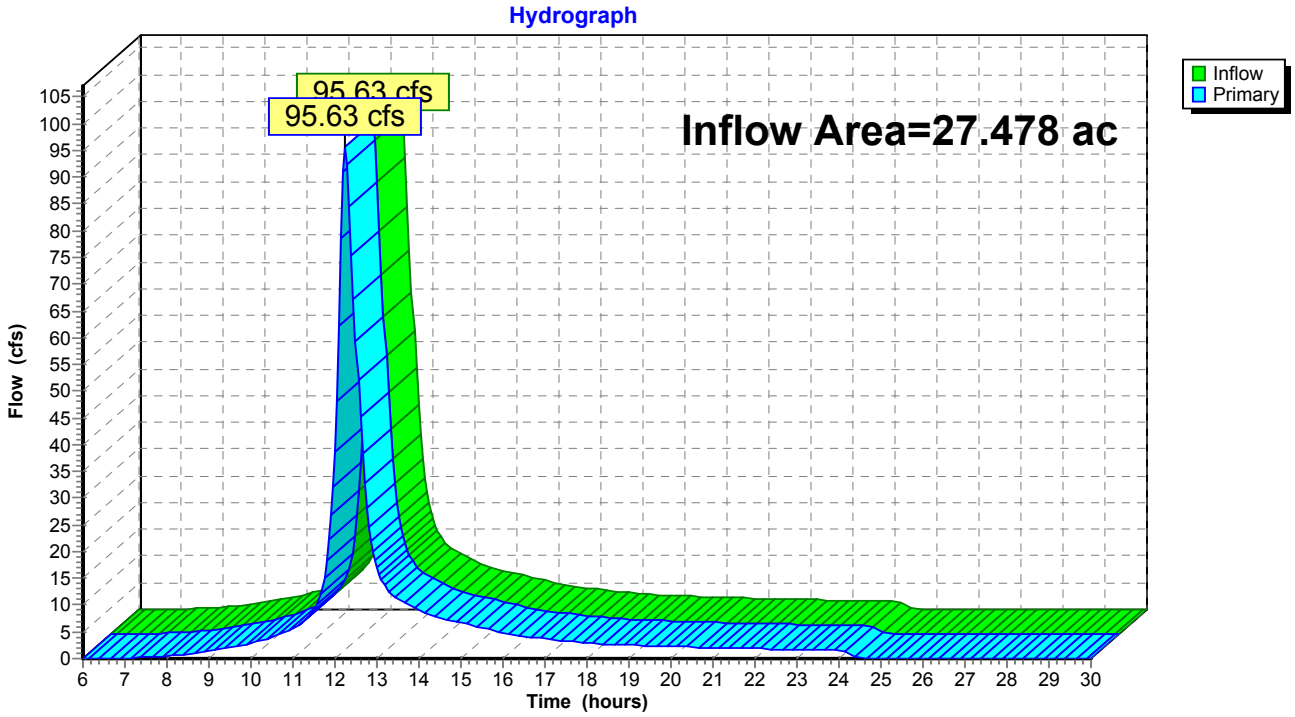


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.00% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af
Primary = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment A: Runoff Area=331,140 sf 2.33% Impervious Runoff Depth>6.15"
Flow Length=540' Tc=12.0 min CN=78 Runoff=44.24 cfs 3.898 af

Subcatchment B: Runoff Area=1,196,928 sf 0.00% Impervious Runoff Depth>6.15"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=136.14 cfs 14.090 af

Link POA-A: Inflow=44.24 cfs 3.898 af
Primary=44.24 cfs 3.898 af

Link POA-B: Inflow=136.14 cfs 14.090 af
Primary=136.14 cfs 14.090 af

Total Runoff Area = 35.080 ac Runoff Volume = 17.988 af Average Runoff Depth = 6.15"
99.49% Pervious = 34.902 ac 0.51% Impervious = 0.177 ac

Summary for Subcatchment A:

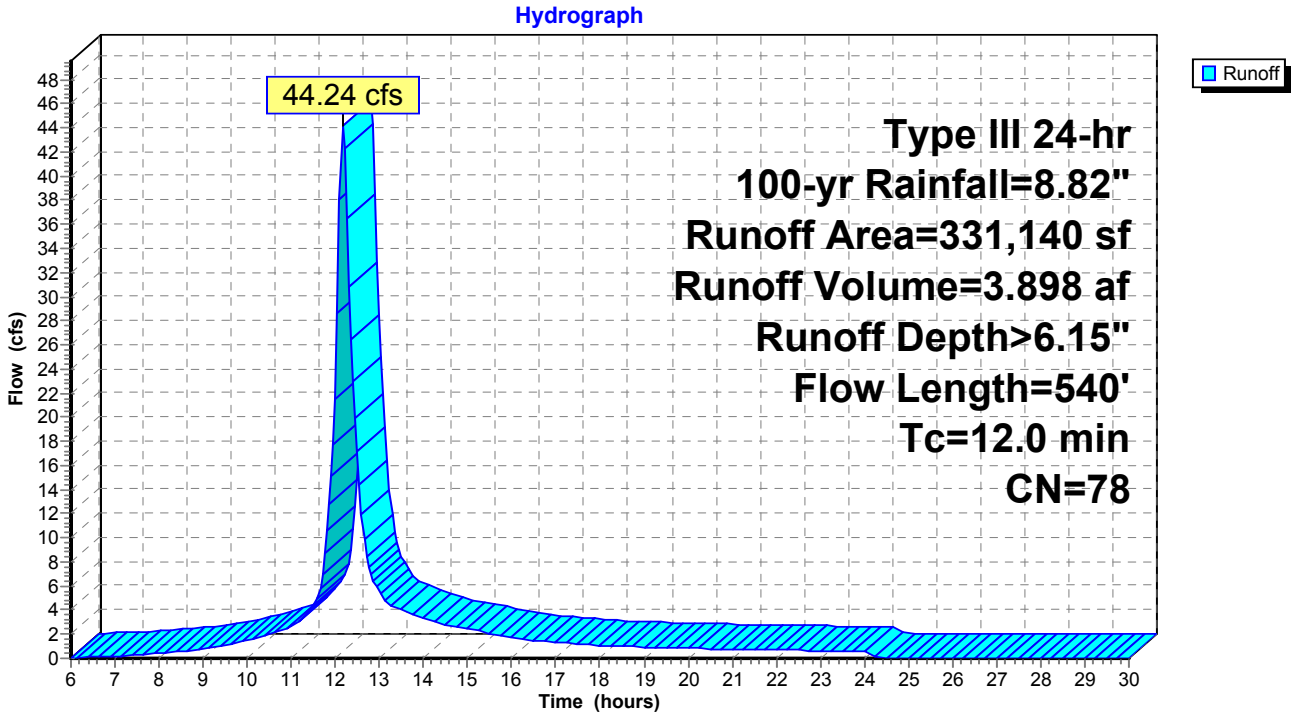
Runoff = 44.24 cfs @ 12.16 hrs, Volume= 3.898 af, Depth> 6.15"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.82"

Area (sf)	CN	Description
3,251	58	Meadow, non-grazed, HSG B
307,506	78	Meadow, non-grazed, HSG D
273	55	Woods, Good, HSG B
7,498	77	Woods, Good, HSG D
1,261	91	Gravel roads, HSG D
3,625	94	Fallow, bare soil, HSG D
7,726	98	Unconnected pavement, HSG D
331,140	78	Weighted Average
323,414		97.67% Pervious Area
7,726		2.33% Impervious Area
7,726		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A:



Summary for Subcatchment B:

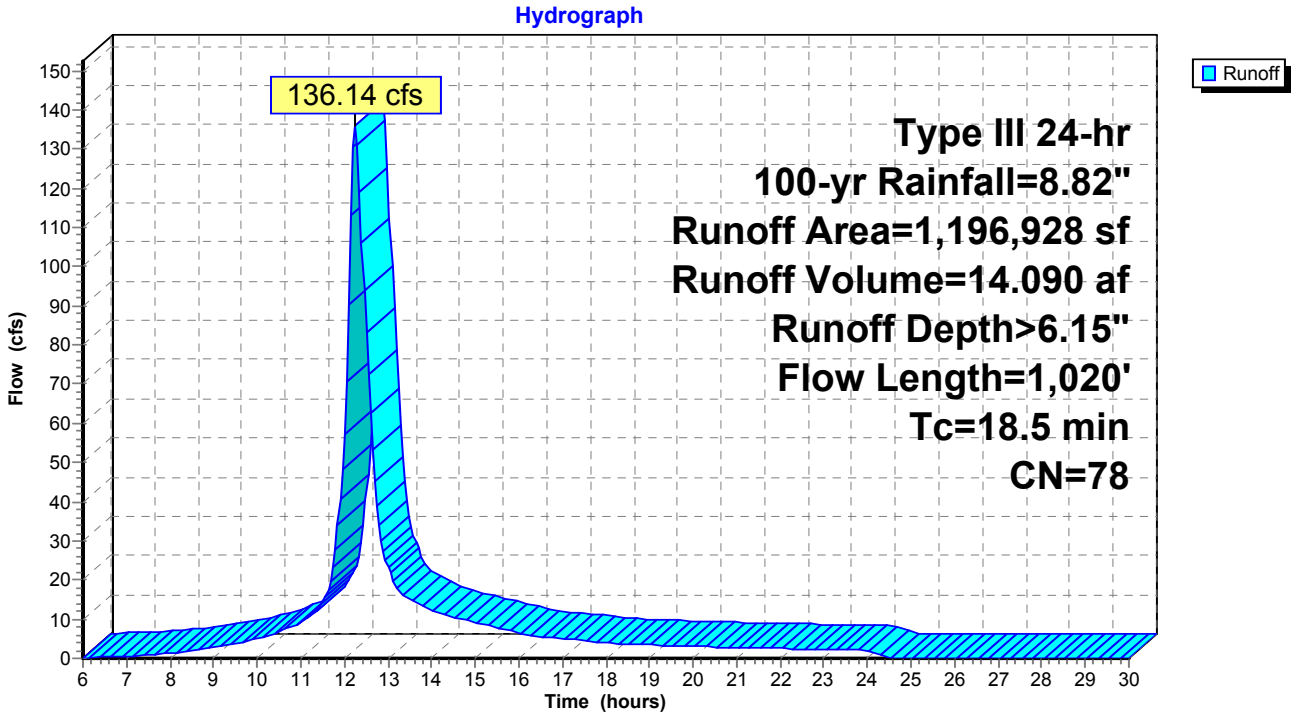
Runoff = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af, Depth> 6.15"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.82"

Area (sf)	CN	Description
1,132,531	78	Meadow, non-grazed, HSG D
64,397	77	Woods, Good, HSG D
1,196,928	78	Weighted Average
1,196,928		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B:

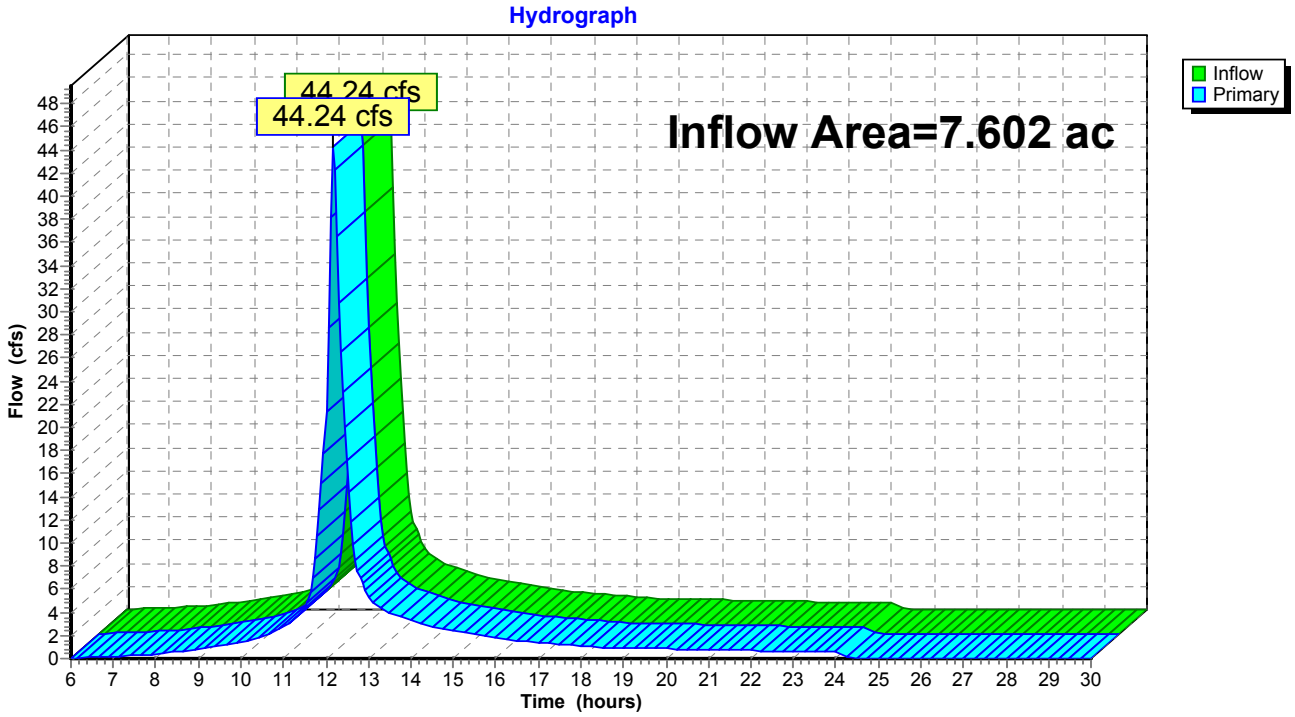


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.33% Impervious, Inflow Depth > 6.15" for 100-yr event
Inflow = 44.24 cfs @ 12.16 hrs, Volume= 3.898 af
Primary = 44.24 cfs @ 12.16 hrs, Volume= 3.898 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

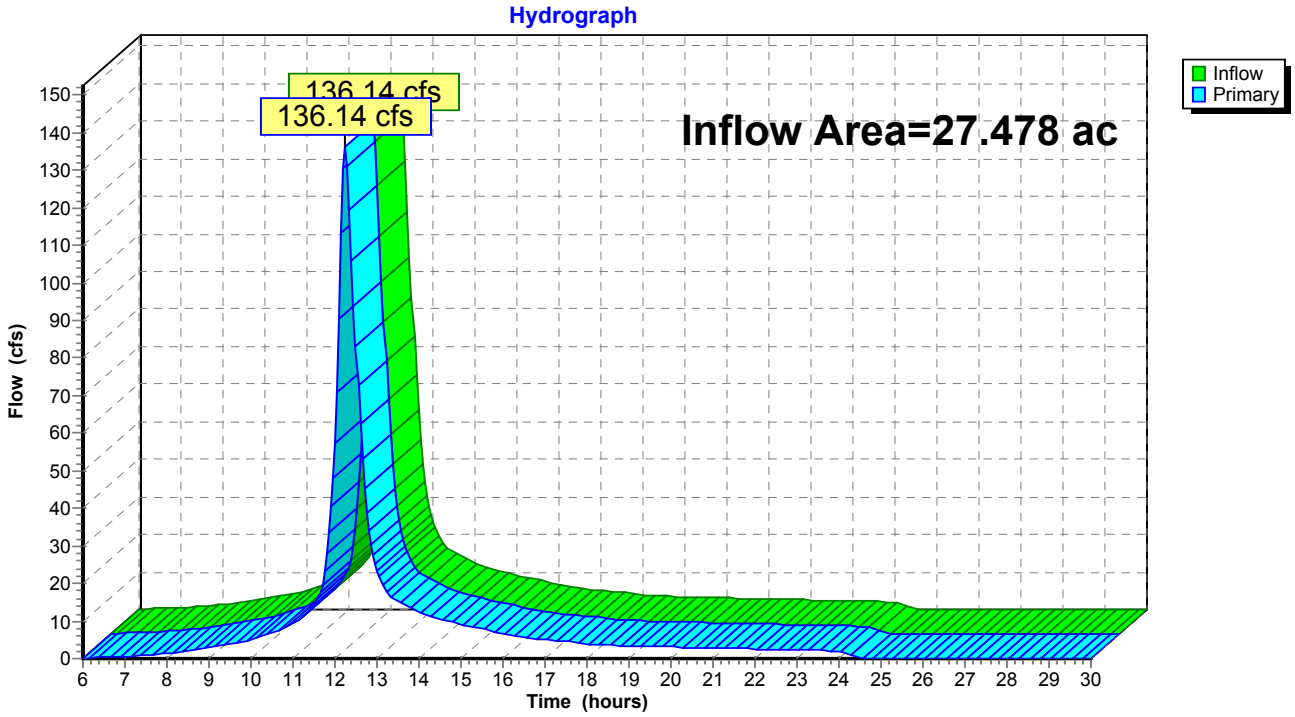


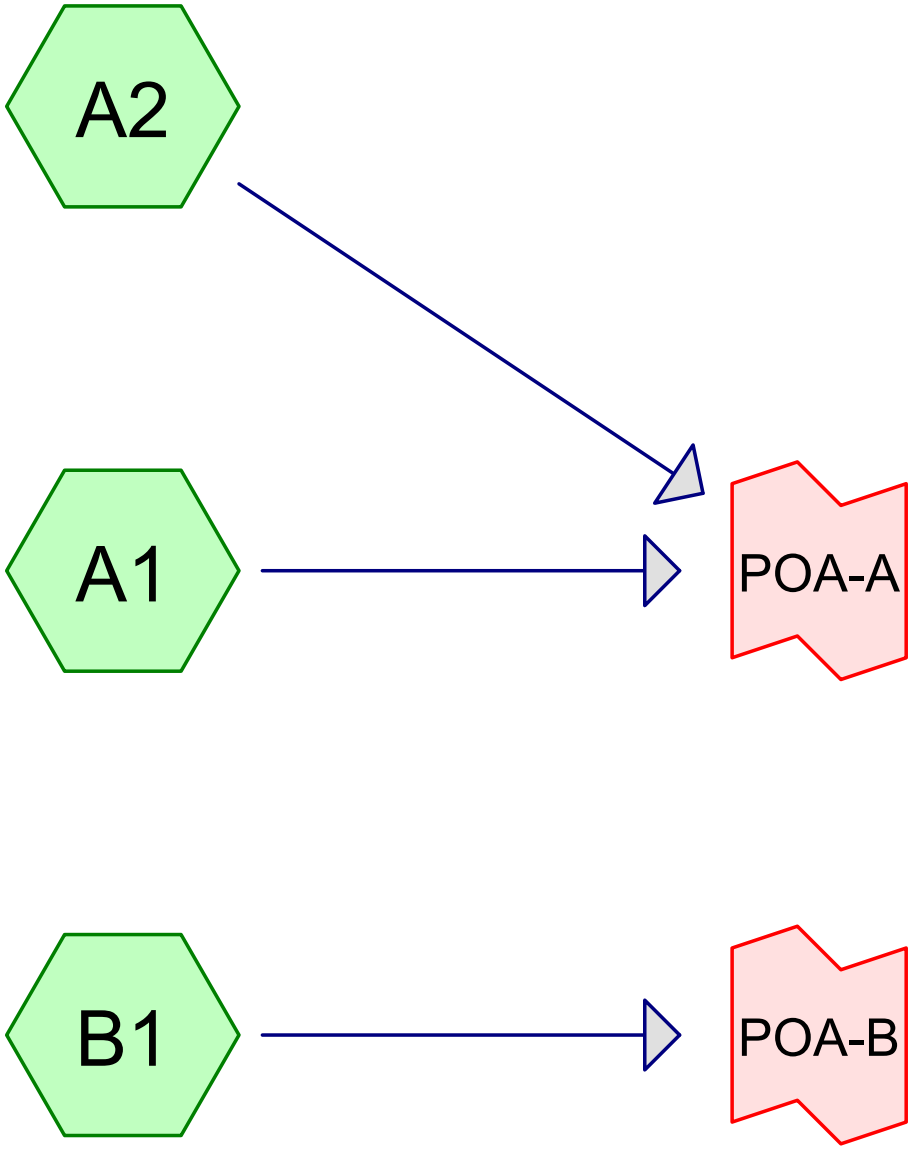
Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.00% Impervious, Inflow Depth > 6.15" for 100-yr event
Inflow = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af
Primary = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:





Subcat Reach Pond Link

Routing Diagram for BW Chester Rd Blanford MA Post - Reduce A2
Prepared by Weston & Sampson Engineers, Inc, Printed 3/14/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type III 24-hr		Default	24.00	1	3.37	2
2	10-yr	Type III 24-hr		Default	24.00	1	5.48	2
3	25-yr	Type III 24-hr		Default	24.00	1	6.79	2
4	100-yr	Type III 24-hr		Default	24.00	1	8.82	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.083	94	Fallow, bare soil, HSG D (A1)
0.279	91	Gravel roads, HSG D (A1, A2, B1)
0.075	58	Meadow, non-grazed, HSG B (A1)
32.715	78	Meadow, non-grazed, HSG D (A1, A2, B1)
0.269	98	Unconnected pavement, HSG D (A1, B1)
0.001	98	Unconnected pavement, HSG D - Array Poles (A1, B1)
0.006	55	Woods, Good, HSG B (A1)
1.650	77	Woods, Good, HSG D (A1, B1)
35.080	**78**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.081	HSG B	A1
0.000	HSG C	
34.999	HSG D	A1, A2, B1
0.000	Other	
35.080		**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	0.083	0.000	0.083	Fallow, bare soil	A1
0.000	0.000	0.000	0.279	0.000	0.279	Gravel roads	A1, A2, B1
0.000	0.075	0.000	32.715	0.000	32.790	Meadow, non-grazed	A1, A2, B1
0.000	0.000	0.000	0.271	0.000	0.271	Unconnected pavement	A1, B1
0.000	0.006	0.000	1.650	0.000	1.657	Woods, Good	A1, B1
0.000	**0.081**	**0.000**	**34.999**	**0.000**	**35.080**	**TOTAL AREA**	

Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentA1: Runoff Area=303,460 sf 2.55% Impervious Runoff Depth=1.40"
Flow Length=540' Tc=12.0 min CN=78 Runoff=9.15 cfs 0.812 af

SubcatchmentA2: Runoff Area=27,681 sf 0.00% Impervious Runoff Depth=1.60"
Flow Length=479' Tc=6.0 min CN=81 Runoff=1.17 cfs 0.085 af

SubcatchmentB1: Runoff Area=1,196,927 sf 0.34% Impervious Runoff Depth=1.40"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=30.69 cfs 3.204 af

Link POA-A: Inflow=10.02 cfs 0.897 af
Primary=10.02 cfs 0.897 af

Link POA-B: Inflow=30.69 cfs 3.204 af
Primary=30.69 cfs 3.204 af

Total Runoff Area = 35.080 ac Runoff Volume = 4.101 af Average Runoff Depth = 1.40"
99.23% Pervious = 34.809 ac 0.77% Impervious = 0.271 ac

Summary for Subcatchment A1:

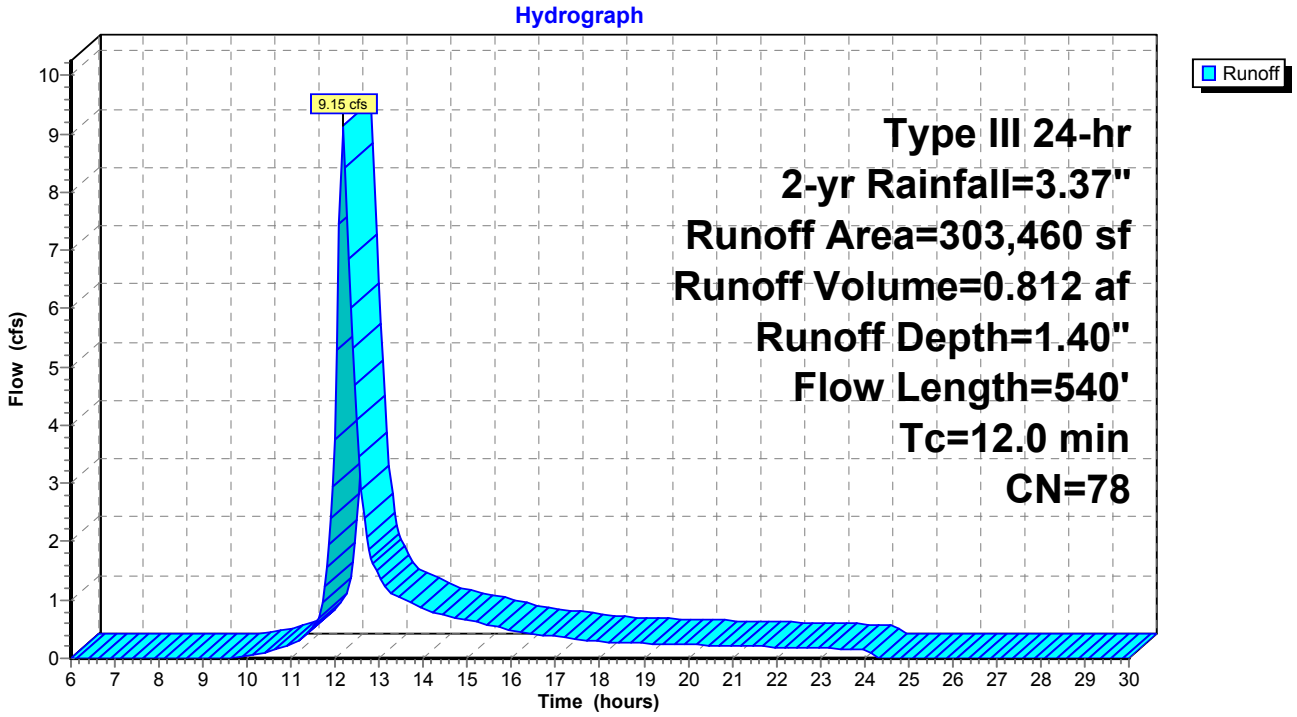
Runoff = 9.15 cfs @ 12.17 hrs, Volume= 0.812 af, Depth= 1.40"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.37"

	Area (sf)	CN	Description
	3,251	58	Meadow, non-grazed, HSG B
	279,818	78	Meadow, non-grazed, HSG D
	273	55	Woods, Good, HSG B
	7,498	77	Woods, Good, HSG D
	1,261	91	Gravel roads, HSG D
	3,625	94	Fallow, bare soil, HSG D
	7,726	98	Unconnected pavement, HSG D
*	8	98	Unconnected pavement, HSG D - Array Poles
	303,460	78	Weighted Average
	295,726		97.45% Pervious Area
	7,734		2.55% Impervious Area
	7,734		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A1:



Summary for Subcatchment A2:

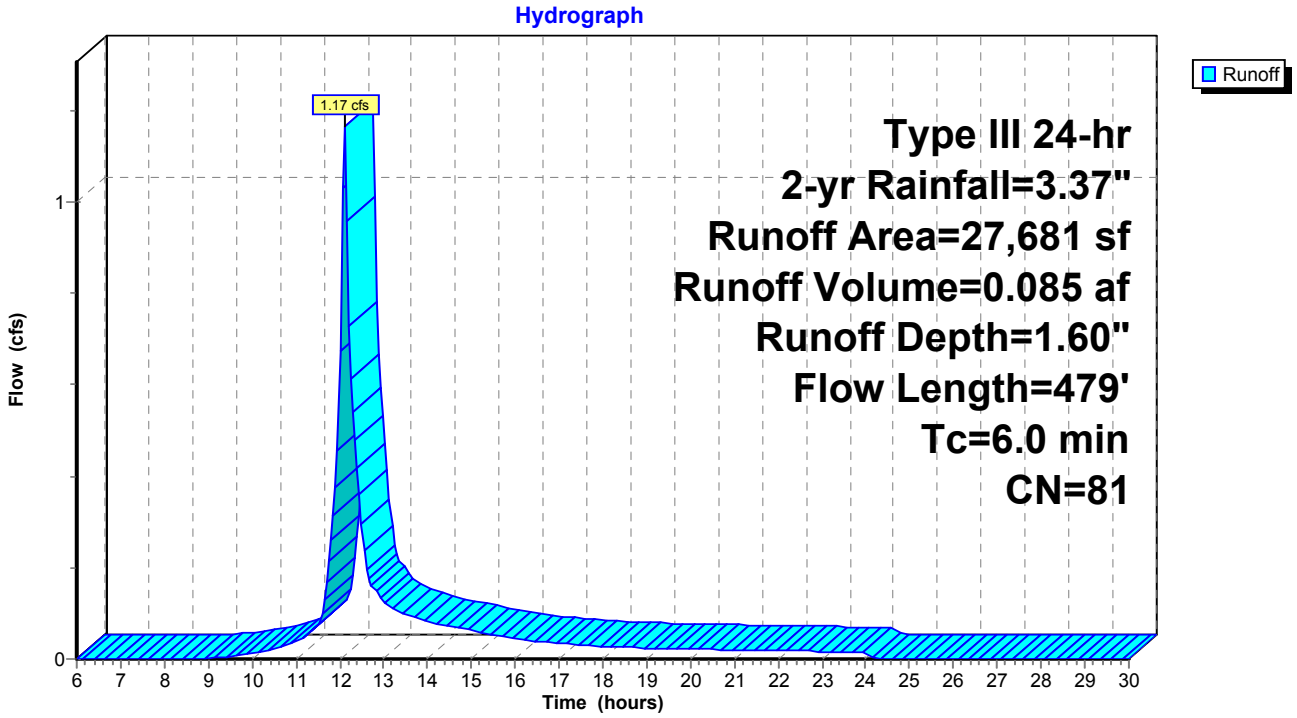
Runoff = 1.17 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 1.60"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.37"

Area (sf)	CN	Description
21,992	78	Meadow, non-grazed, HSG D
5,689	91	Gravel roads, HSG D
27,681	81	Weighted Average
27,681		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0083	0.78		**Sheet Flow, Gravel Road** Smooth surfaces n= 0.011 P2= 3.37"
0.7	20	0.0025	0.45		**Sheet Flow, Meadow** Smooth surfaces n= 0.011 P2= 3.37"
0.2	15	0.0267	1.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	414	0.0386	7.25	43.52	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.030 Earth, grassed & winding
2.5	479	Total, Increased to minimum Tc = 6.0 min			

Subcatchment A2:



Summary for Subcatchment B1:

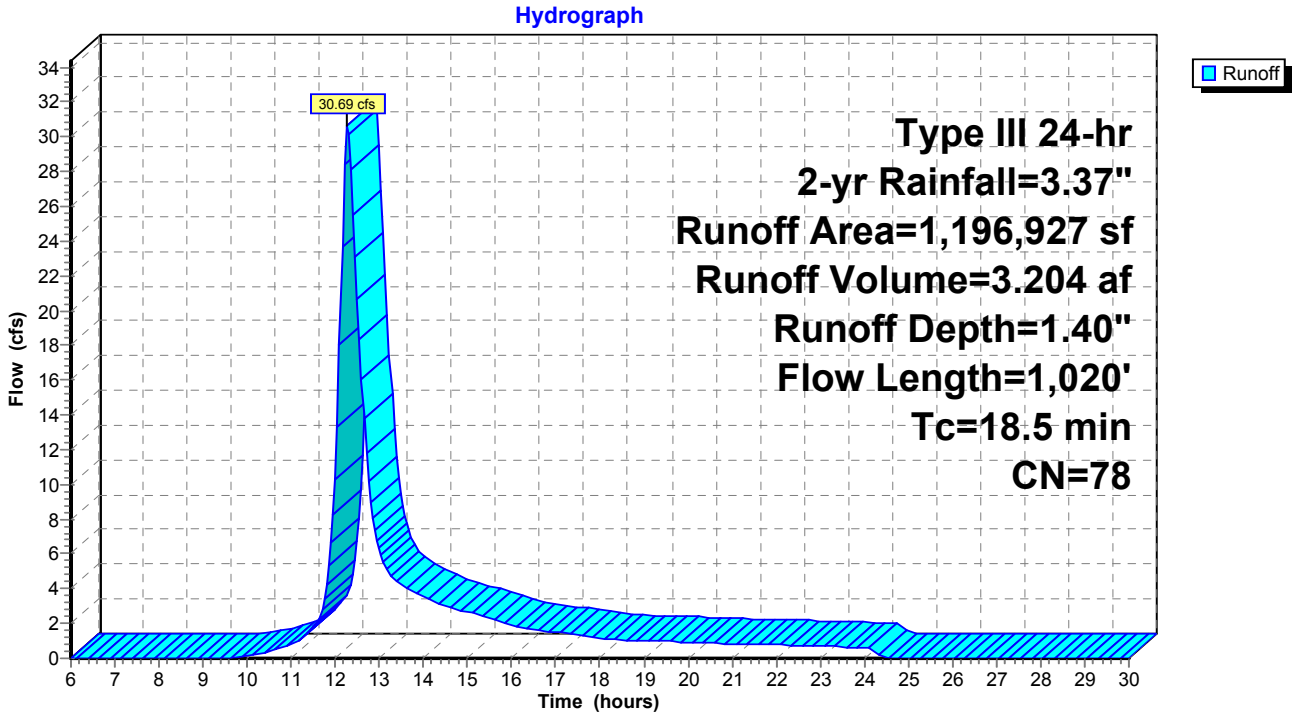
Runoff = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af, Depth= 1.40"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.37"

	Area (sf)	CN	Description
	1,123,270	78	Meadow, non-grazed, HSG D
	64,397	77	Woods, Good, HSG D
	5,211	91	Gravel roads, HSG D
	4,000	98	Unconnected pavement, HSG D
*	49	98	Unconnected pavement, HSG D - Array Poles
	1,196,927	78	Weighted Average
	1,192,878		99.66% Pervious Area
	4,049		0.34% Impervious Area
	4,049		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow**
					Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B1:

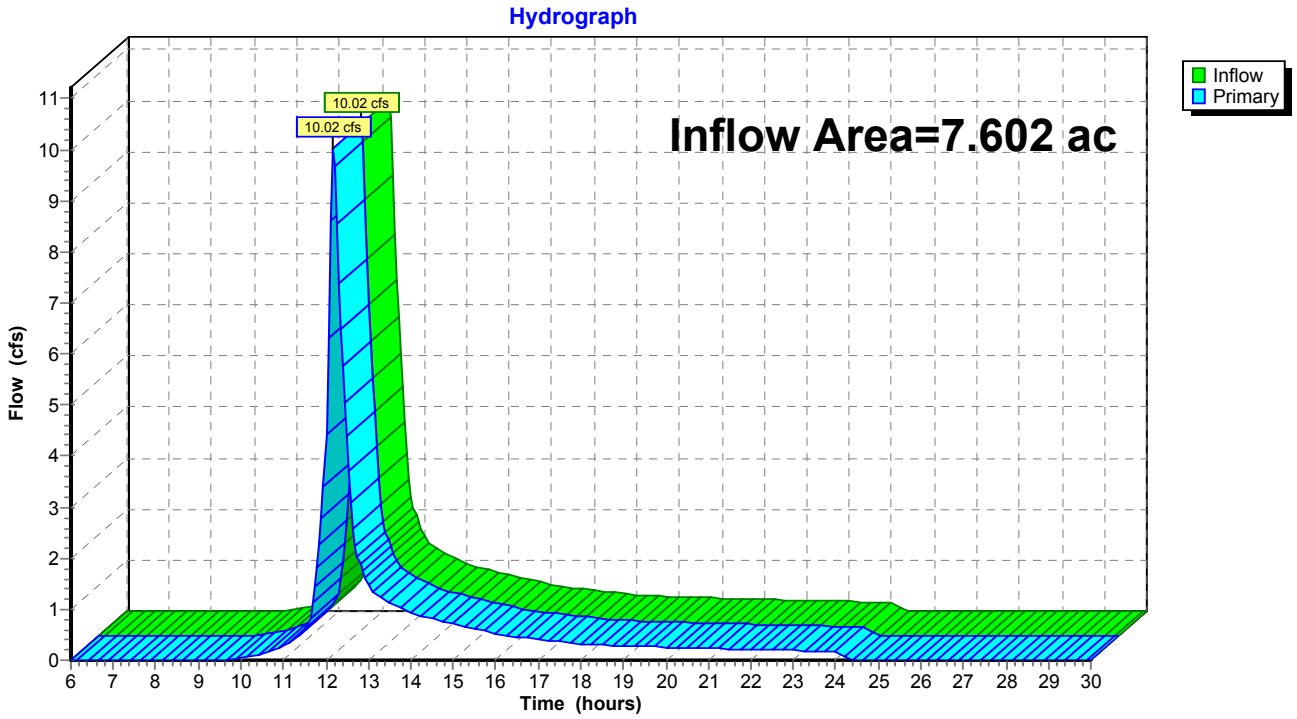


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.34% Impervious, Inflow Depth = 1.42" for 2-yr event
Inflow = 10.02 cfs @ 12.17 hrs, Volume= 0.897 af
Primary = 10.02 cfs @ 12.17 hrs, Volume= 0.897 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

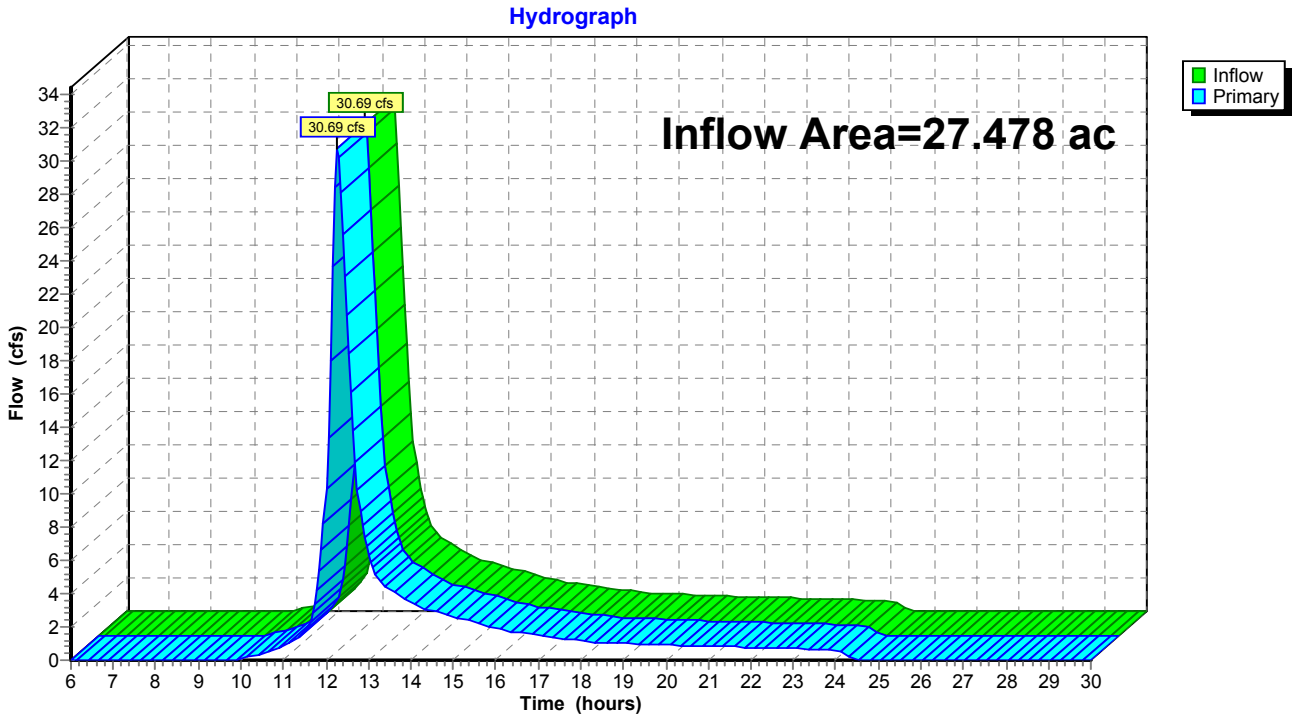


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.34% Impervious, Inflow Depth = 1.40" for 2-yr event
Inflow = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af
Primary = 30.69 cfs @ 12.27 hrs, Volume= 3.204 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentA1: Runoff Area=303,460 sf 2.55% Impervious Runoff Depth=3.12"
Flow Length=540' Tc=12.0 min CN=78 Runoff=20.83 cfs 1.813 af

SubcatchmentA2: Runoff Area=27,681 sf 0.00% Impervious Runoff Depth=3.41"
Flow Length=479' Tc=6.0 min CN=81 Runoff=2.48 cfs 0.181 af

SubcatchmentB1: Runoff Area=1,196,927 sf 0.34% Impervious Runoff Depth=3.12"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=69.90 cfs 7.153 af

Link POA-A: Inflow=22.69 cfs 1.994 af
Primary=22.69 cfs 1.994 af

Link POA-B: Inflow=69.90 cfs 7.153 af
Primary=69.90 cfs 7.153 af

Total Runoff Area = 35.080 ac Runoff Volume = 9.147 af Average Runoff Depth = 3.13"
99.23% Pervious = 34.809 ac 0.77% Impervious = 0.271 ac

Summary for Subcatchment A1:

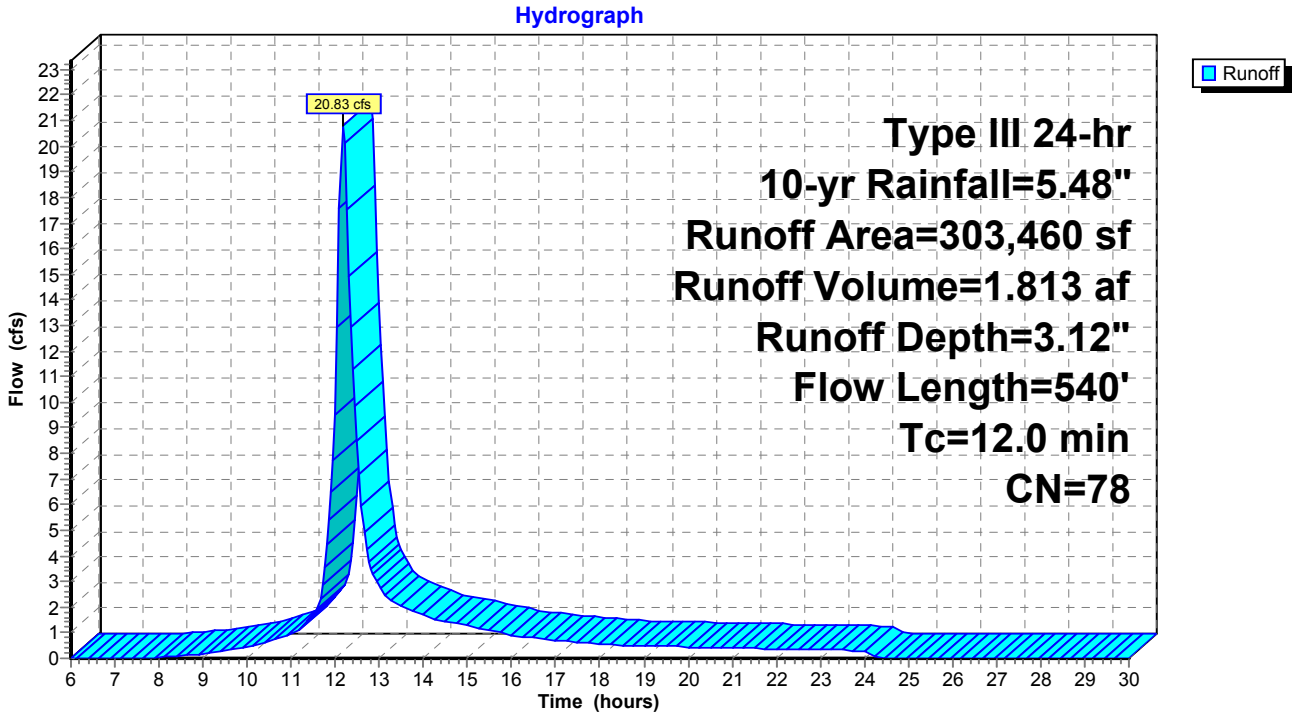
Runoff = 20.83 cfs @ 12.17 hrs, Volume= 1.813 af, Depth= 3.12"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.48"

	Area (sf)	CN	Description
	3,251	58	Meadow, non-grazed, HSG B
	279,818	78	Meadow, non-grazed, HSG D
	273	55	Woods, Good, HSG B
	7,498	77	Woods, Good, HSG D
	1,261	91	Gravel roads, HSG D
	3,625	94	Fallow, bare soil, HSG D
	7,726	98	Unconnected pavement, HSG D
*	8	98	Unconnected pavement, HSG D - Array Poles
	303,460	78	Weighted Average
	295,726		97.45% Pervious Area
	7,734		2.55% Impervious Area
	7,734		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A1:



Summary for Subcatchment A2:

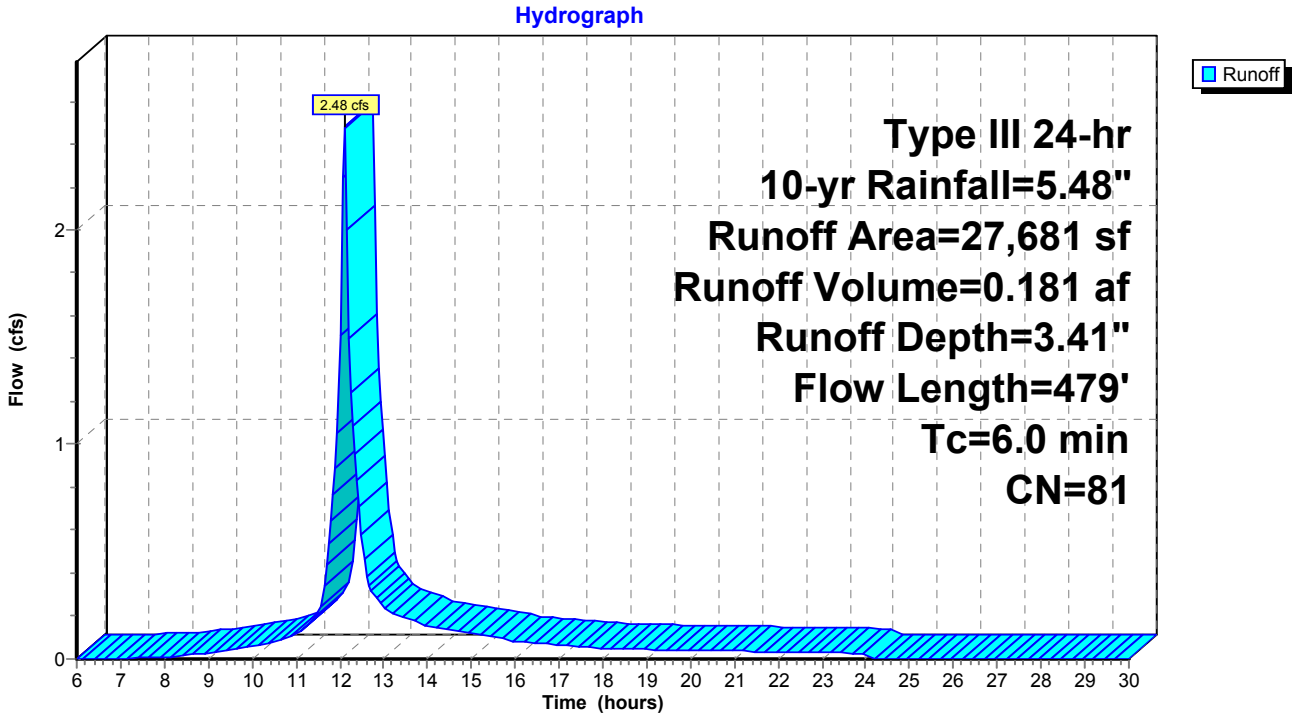
Runoff = 2.48 cfs @ 12.09 hrs, Volume= 0.181 af, Depth= 3.41"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.48"

Area (sf)	CN	Description
21,992	78	Meadow, non-grazed, HSG D
5,689	91	Gravel roads, HSG D
27,681	81	Weighted Average
27,681		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0083	0.78		**Sheet Flow, Gravel Road** Smooth surfaces n= 0.011 P2= 3.37"
0.7	20	0.0025	0.45		**Sheet Flow, Meadow** Smooth surfaces n= 0.011 P2= 3.37"
0.2	15	0.0267	1.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	414	0.0386	7.25	43.52	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.030 Earth, grassed & winding
2.5	479	Total, Increased to minimum Tc = 6.0 min			

Subcatchment A2:



Summary for Subcatchment B1:

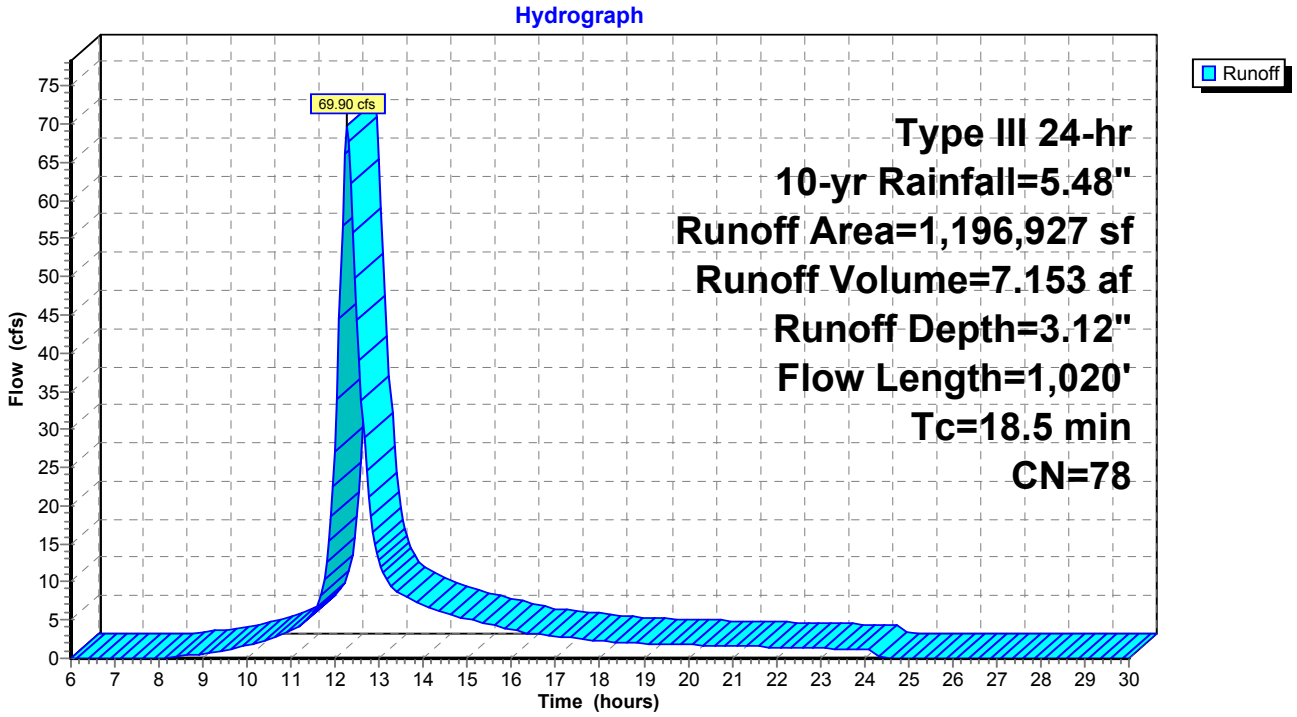
Runoff = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af, Depth= 3.12"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.48"

	Area (sf)	CN	Description
	1,123,270	78	Meadow, non-grazed, HSG D
	64,397	77	Woods, Good, HSG D
	5,211	91	Gravel roads, HSG D
	4,000	98	Unconnected pavement, HSG D
*	49	98	Unconnected pavement, HSG D - Array Poles
	1,196,927	78	Weighted Average
	1,192,878		99.66% Pervious Area
	4,049		0.34% Impervious Area
	4,049		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow**
					Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B1:

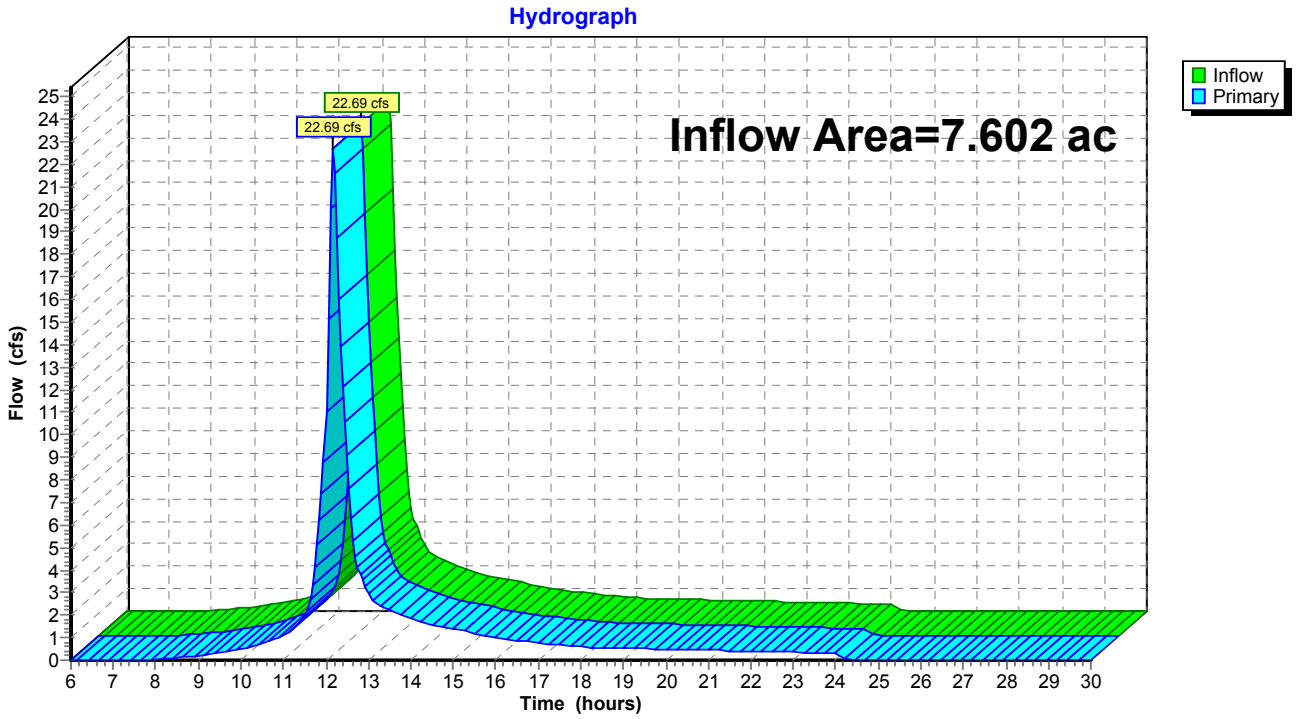


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.34% Impervious, Inflow Depth = 3.15" for 10-yr event
Inflow = 22.69 cfs @ 12.16 hrs, Volume= 1.994 af
Primary = 22.69 cfs @ 12.16 hrs, Volume= 1.994 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

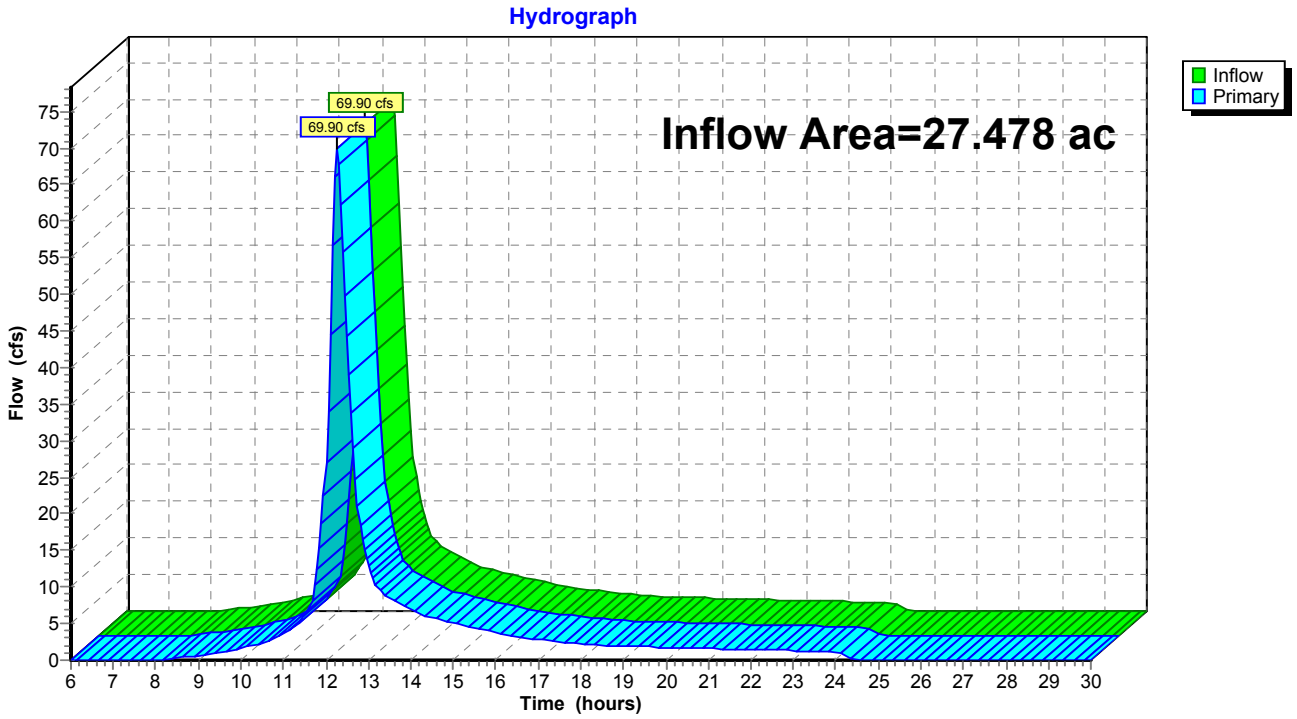


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.34% Impervious, Inflow Depth = 3.12" for 10-yr event
Inflow = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af
Primary = 69.90 cfs @ 12.26 hrs, Volume= 7.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentA1: Runoff Area=303,460 sf 2.55% Impervious Runoff Depth=4.28"
Flow Length=540' Tc=12.0 min CN=78 Runoff=28.49 cfs 2.487 af

SubcatchmentA2: Runoff Area=27,681 sf 0.00% Impervious Runoff Depth>4.61"
Flow Length=479' Tc=6.0 min CN=81 Runoff=3.32 cfs 0.244 af

SubcatchmentB1: Runoff Area=1,196,927 sf 0.34% Impervious Runoff Depth=4.28"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=95.63 cfs 9.811 af

Link POA-A: Inflow=30.98 cfs 2.732 af
Primary=30.98 cfs 2.732 af

Link POA-B: Inflow=95.63 cfs 9.811 af
Primary=95.63 cfs 9.811 af

Total Runoff Area = 35.080 ac Runoff Volume = 12.543 af Average Runoff Depth = 4.29"
99.23% Pervious = 34.809 ac 0.77% Impervious = 0.271 ac

Summary for Subcatchment A1:

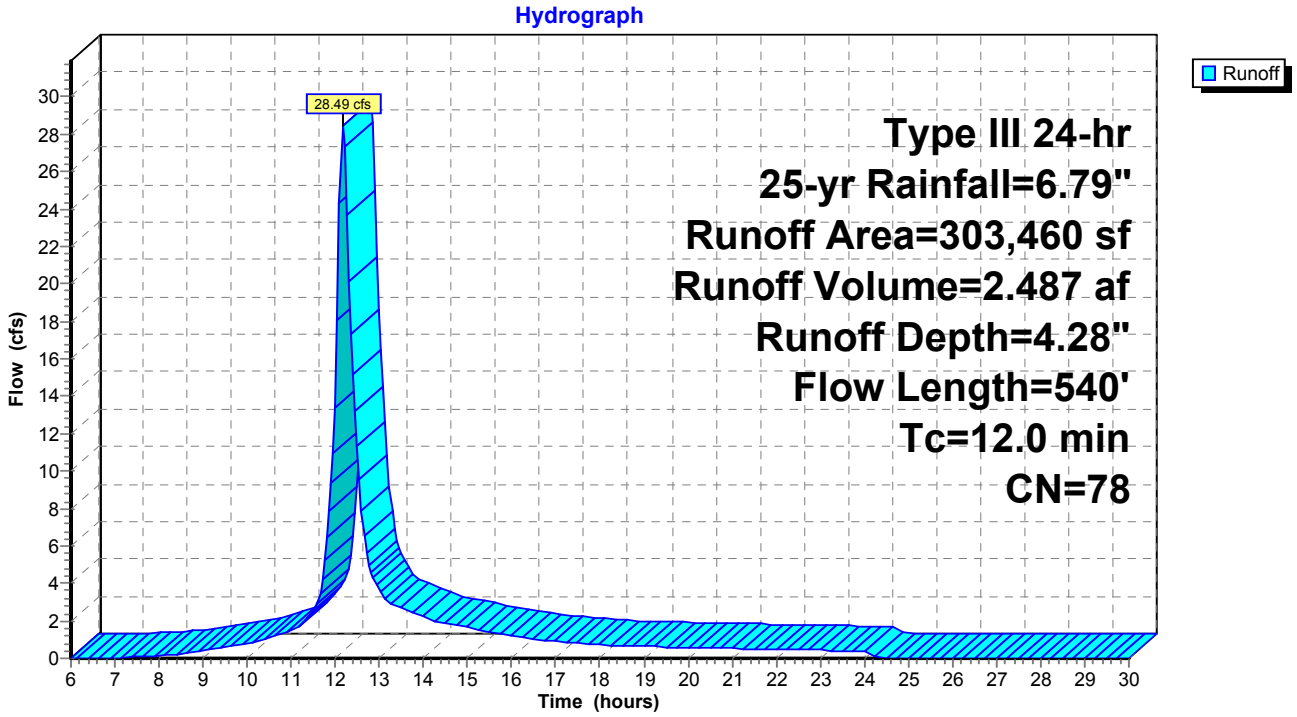
Runoff = 28.49 cfs @ 12.17 hrs, Volume= 2.487 af, Depth= 4.28"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.79"

	Area (sf)	CN	Description
	3,251	58	Meadow, non-grazed, HSG B
	279,818	78	Meadow, non-grazed, HSG D
	273	55	Woods, Good, HSG B
	7,498	77	Woods, Good, HSG D
	1,261	91	Gravel roads, HSG D
	3,625	94	Fallow, bare soil, HSG D
	7,726	98	Unconnected pavement, HSG D
*	8	98	Unconnected pavement, HSG D - Array Poles
	303,460	78	Weighted Average
	295,726		97.45% Pervious Area
	7,734		2.55% Impervious Area
	7,734		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A1:



Summary for Subcatchment A2:

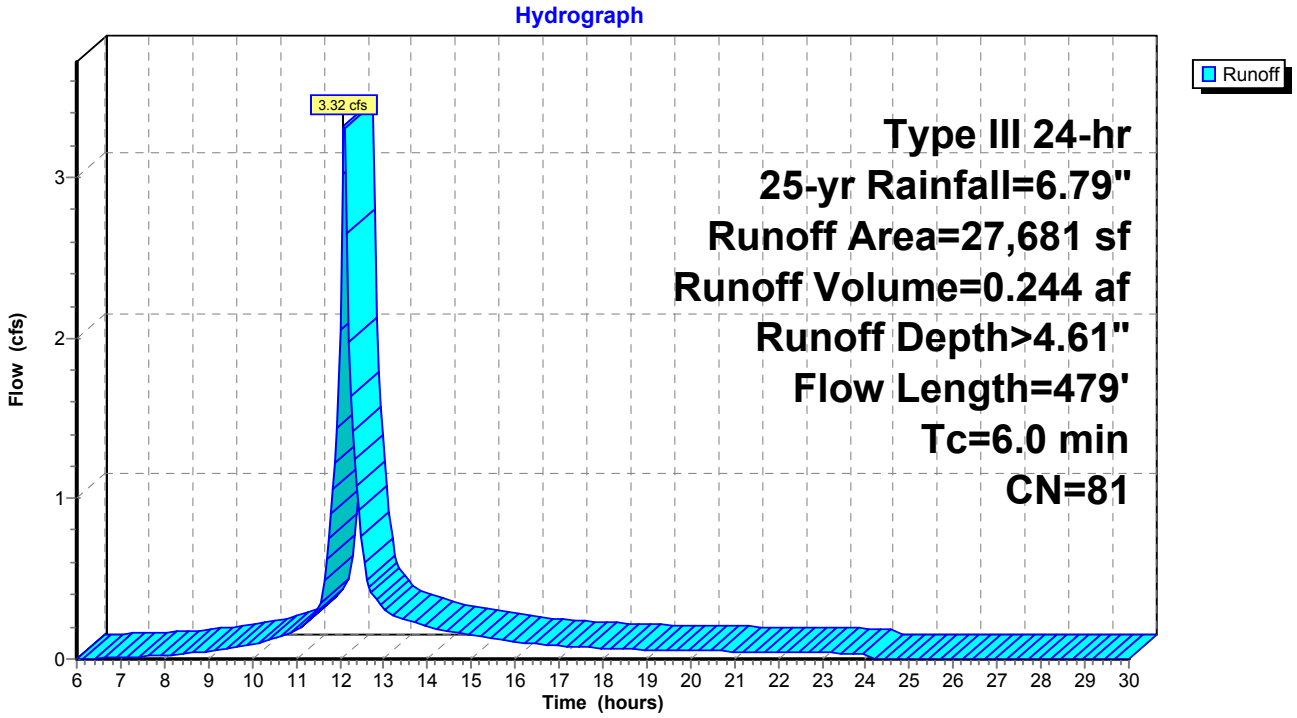
Runoff = 3.32 cfs @ 12.09 hrs, Volume= 0.244 af, Depth> 4.61"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.79"

Area (sf)	CN	Description
21,992	78	Meadow, non-grazed, HSG D
5,689	91	Gravel roads, HSG D
27,681	81	Weighted Average
27,681		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0083	0.78		**Sheet Flow, Gravel Road** Smooth surfaces n= 0.011 P2= 3.37"
0.7	20	0.0025	0.45		**Sheet Flow, Meadow** Smooth surfaces n= 0.011 P2= 3.37"
0.2	15	0.0267	1.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	414	0.0386	7.25	43.52	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.030 Earth, grassed & winding
2.5	479	Total, Increased to minimum Tc = 6.0 min			

Subcatchment A2:



Summary for Subcatchment B1:

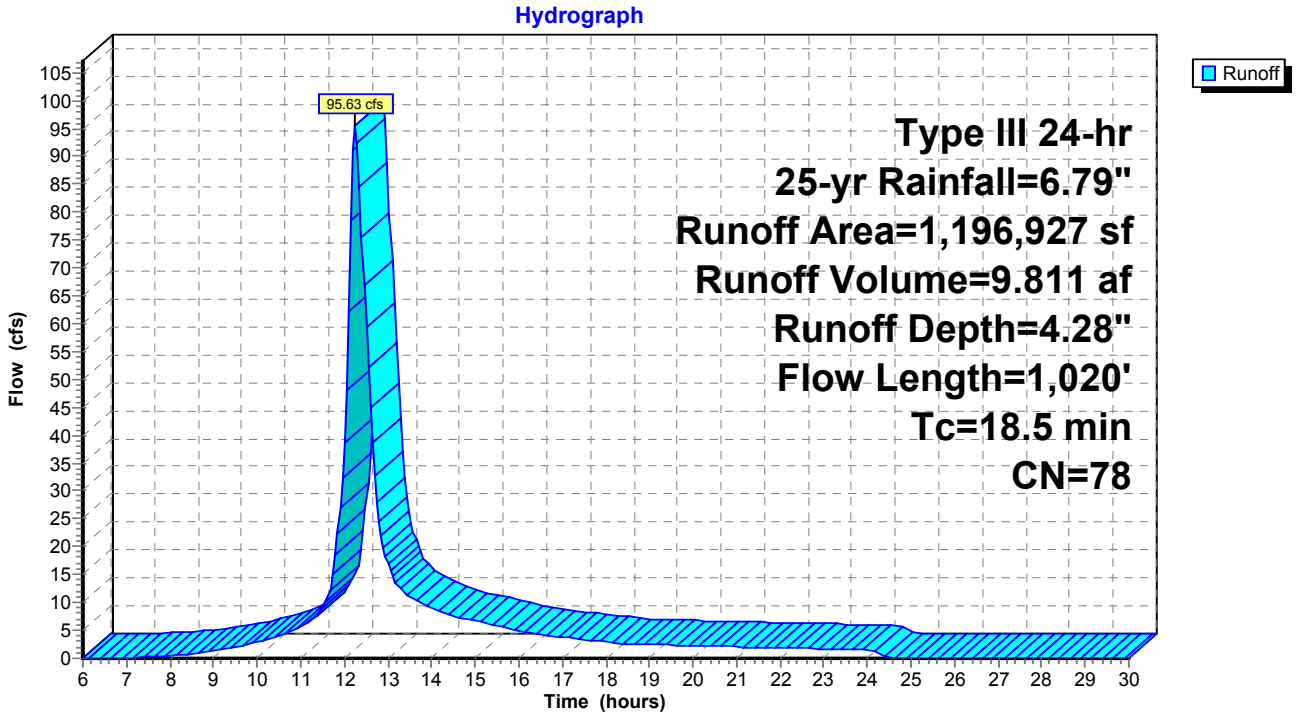
Runoff = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af, Depth= 4.28"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.79"

	Area (sf)	CN	Description
	1,123,270	78	Meadow, non-grazed, HSG D
	64,397	77	Woods, Good, HSG D
	5,211	91	Gravel roads, HSG D
	4,000	98	Unconnected pavement, HSG D
*	49	98	Unconnected pavement, HSG D - Array Poles
	1,196,927	78	Weighted Average
	1,192,878		99.66% Pervious Area
	4,049		0.34% Impervious Area
	4,049		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow**
					Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B1:

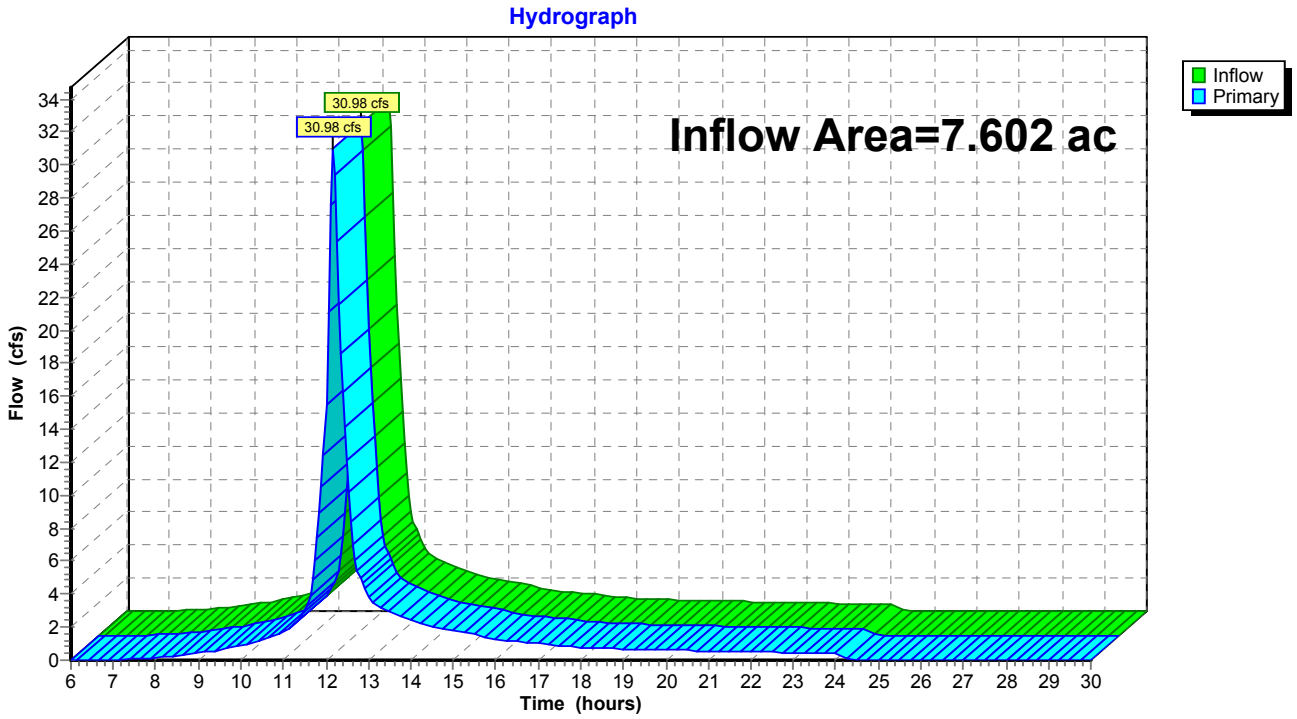


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.34% Impervious, Inflow Depth = 4.31" for 25-yr event
Inflow = 30.98 cfs @ 12.16 hrs, Volume= 2.732 af
Primary = 30.98 cfs @ 12.16 hrs, Volume= 2.732 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

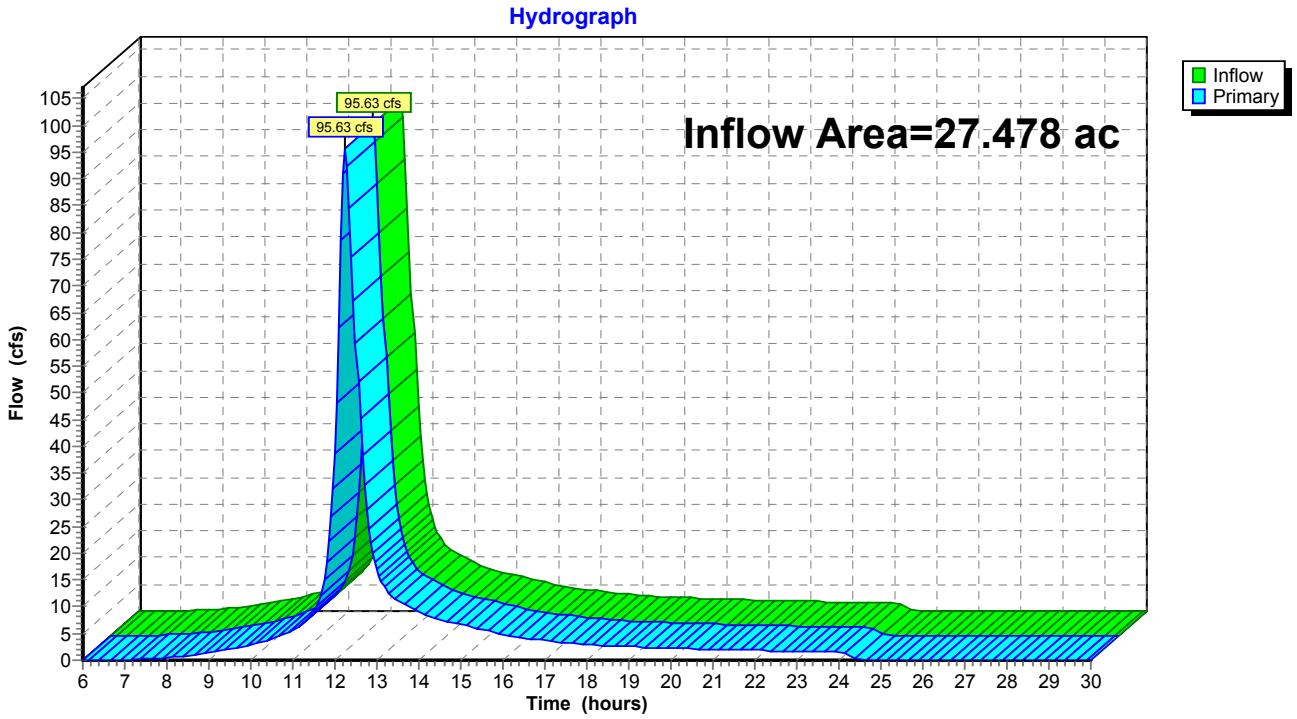


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.34% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af
Primary = 95.63 cfs @ 12.25 hrs, Volume= 9.811 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Time span=6.00-30.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentA1: Runoff Area=303,460 sf 2.55% Impervious Runoff Depth>6.15"
Flow Length=540' Tc=12.0 min CN=78 Runoff=40.54 cfs 3.572 af

SubcatchmentA2: Runoff Area=27,681 sf 0.00% Impervious Runoff Depth>6.51"
Flow Length=479' Tc=6.0 min CN=81 Runoff=4.63 cfs 0.345 af

SubcatchmentB1: Runoff Area=1,196,927 sf 0.34% Impervious Runoff Depth>6.15"
Flow Length=1,020' Tc=18.5 min CN=78 Runoff=136.14 cfs 14.090 af

Link POA-A: Inflow=44.01 cfs 3.917 af
Primary=44.01 cfs 3.917 af

Link POA-B: Inflow=136.14 cfs 14.090 af
Primary=136.14 cfs 14.090 af

Total Runoff Area = 35.080 ac Runoff Volume = 18.006 af Average Runoff Depth = 6.16"
99.23% Pervious = 34.809 ac 0.77% Impervious = 0.271 ac

Summary for Subcatchment A1:

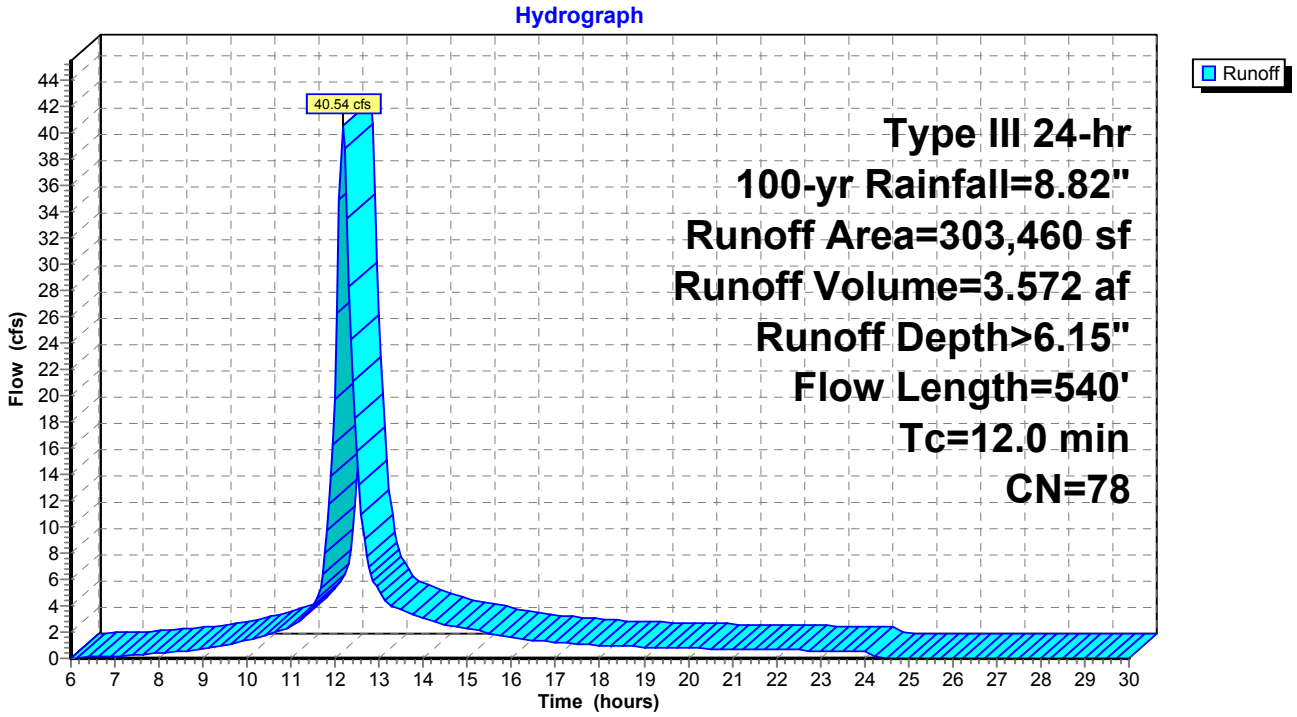
Runoff = 40.54 cfs @ 12.16 hrs, Volume= 3.572 af, Depth> 6.15"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.82"

	Area (sf)	CN	Description
	3,251	58	Meadow, non-grazed, HSG B
	279,818	78	Meadow, non-grazed, HSG D
	273	55	Woods, Good, HSG B
	7,498	77	Woods, Good, HSG D
	1,261	91	Gravel roads, HSG D
	3,625	94	Fallow, bare soil, HSG D
	7,726	98	Unconnected pavement, HSG D
*	8	98	Unconnected pavement, HSG D - Array Poles
	303,460	78	Weighted Average
	295,726		97.45% Pervious Area
	7,734		2.55% Impervious Area
	7,734		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0400	0.14		**Sheet Flow, Meadow** Grass: Dense n= 0.240 P2= 3.37"
2.4	193	0.0363	1.33		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
3.5	297	0.0404	1.41		**Shallow Concentrated Flow, Meadow** Short Grass Pasture Kv= 7.0 fps
12.0	540	Total			

Subcatchment A1:



Summary for Subcatchment A2:

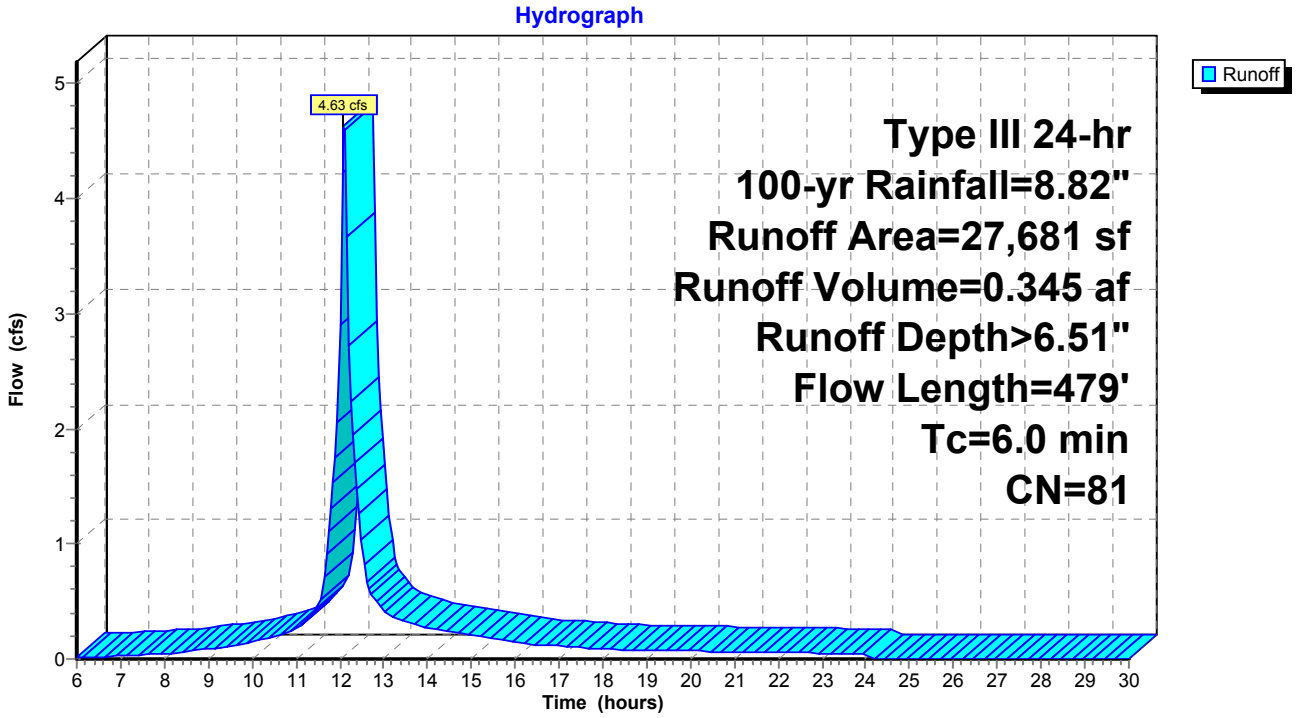
Runoff = 4.63 cfs @ 12.09 hrs, Volume= 0.345 af, Depth> 6.51"
Routed to Link POA-A :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.82"

Area (sf)	CN	Description
21,992	78	Meadow, non-grazed, HSG D
5,689	91	Gravel roads, HSG D
27,681	81	Weighted Average
27,681		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0083	0.78		**Sheet Flow, Gravel Road** Smooth surfaces n= 0.011 P2= 3.37"
0.7	20	0.0025	0.45		**Sheet Flow, Meadow** Smooth surfaces n= 0.011 P2= 3.37"
0.2	15	0.0267	1.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	414	0.0386	7.25	43.52	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 3.0 '/' Top.W=9.00' n= 0.030 Earth, grassed & winding
2.5	479	Total, Increased to minimum Tc = 6.0 min			

Subcatchment A2:



Summary for Subcatchment B1:

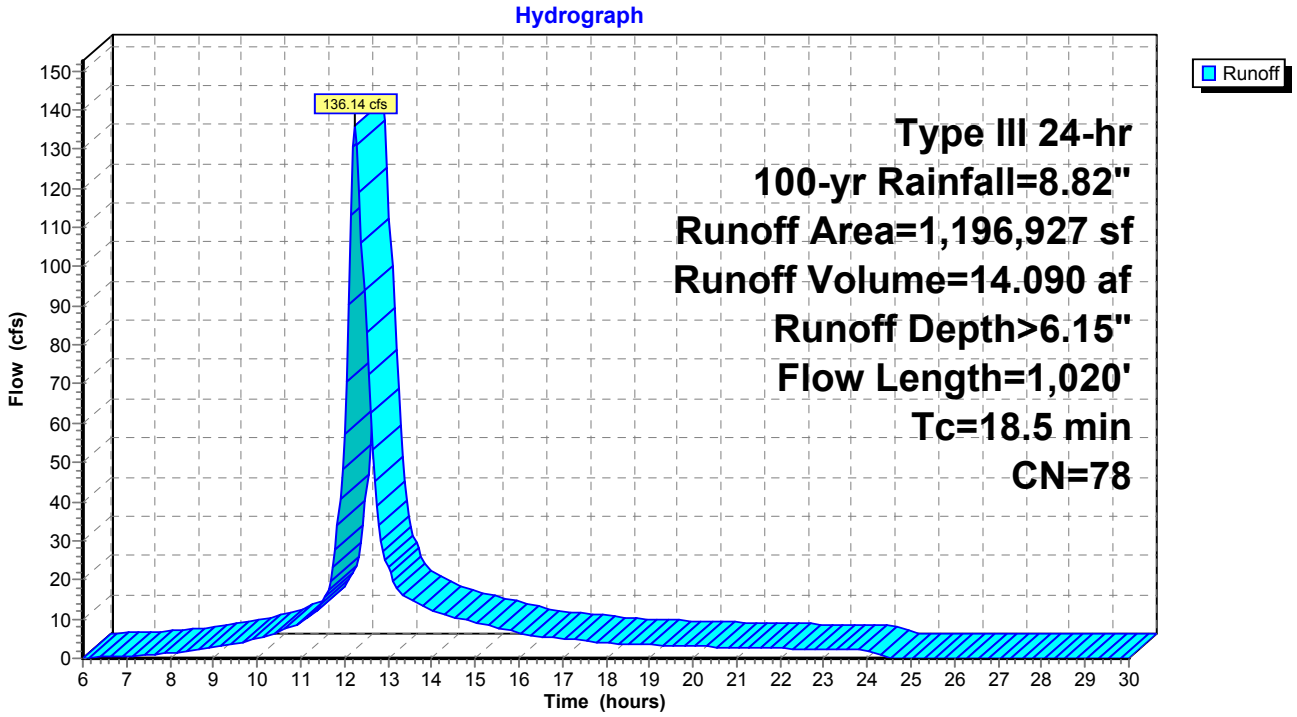
Runoff = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af, Depth> 6.15"
Routed to Link POA-B :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.82"

	Area (sf)	CN	Description
	1,123,270	78	Meadow, non-grazed, HSG D
	64,397	77	Woods, Good, HSG D
	5,211	91	Gravel roads, HSG D
	4,000	98	Unconnected pavement, HSG D
*	49	98	Unconnected pavement, HSG D - Array Poles
	1,196,927	78	Weighted Average
	1,192,878		99.66% Pervious Area
	4,049		0.34% Impervious Area
	4,049		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	50	0.0200	0.10		**Sheet Flow, Meadow**
					Grass: Dense n= 0.240 P2= 3.37"
1.8	111	0.0225	1.05		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.6	229	0.0437	1.46		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.1	246	0.0772	1.94		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
2.3	241	0.0622	1.75		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
1.5	124	0.0403	1.41		**Shallow Concentrated Flow, Meadow**
					Short Grass Pasture Kv= 7.0 fps
0.2	19	0.1316	1.81		**Shallow Concentrated Flow, Woods**
					Woodland Kv= 5.0 fps
18.5	1,020	Total			

Subcatchment B1:

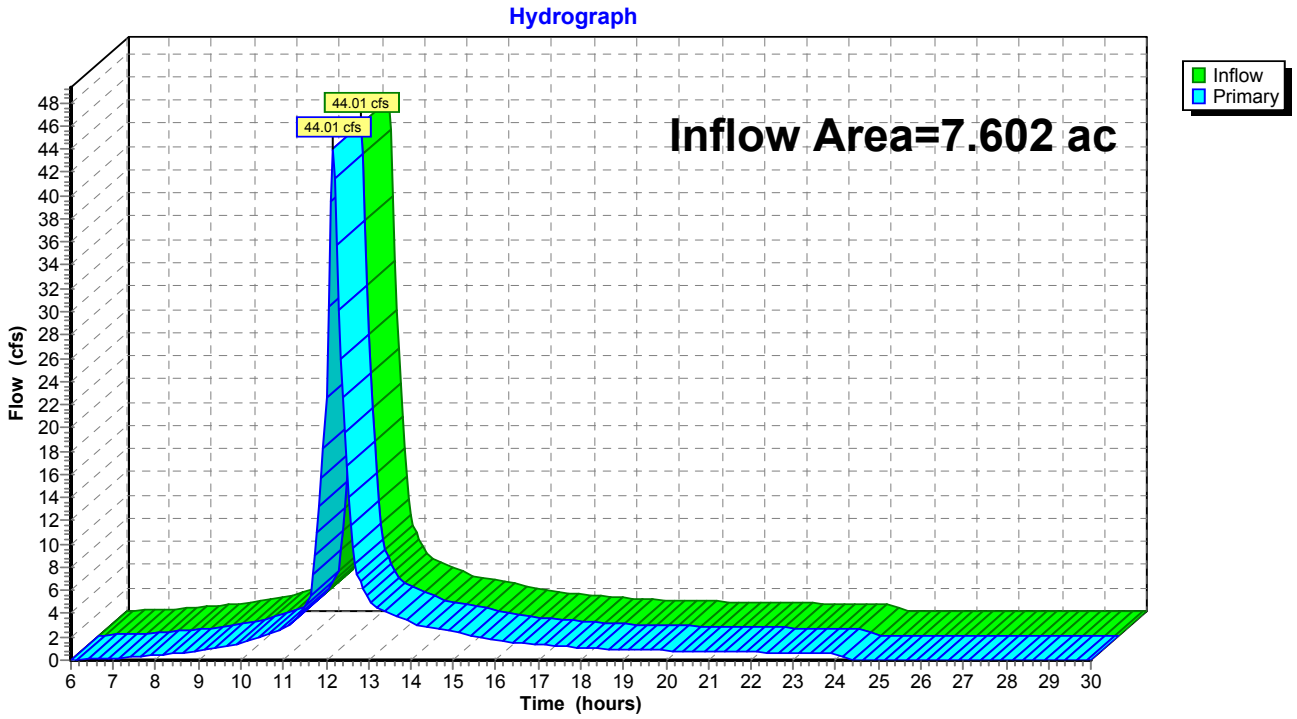


Summary for Link POA-A:

Inflow Area = 7.602 ac, 2.34% Impervious, Inflow Depth > 6.18" for 100-yr event
Inflow = 44.01 cfs @ 12.16 hrs, Volume= 3.917 af
Primary = 44.01 cfs @ 12.16 hrs, Volume= 3.917 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-A:

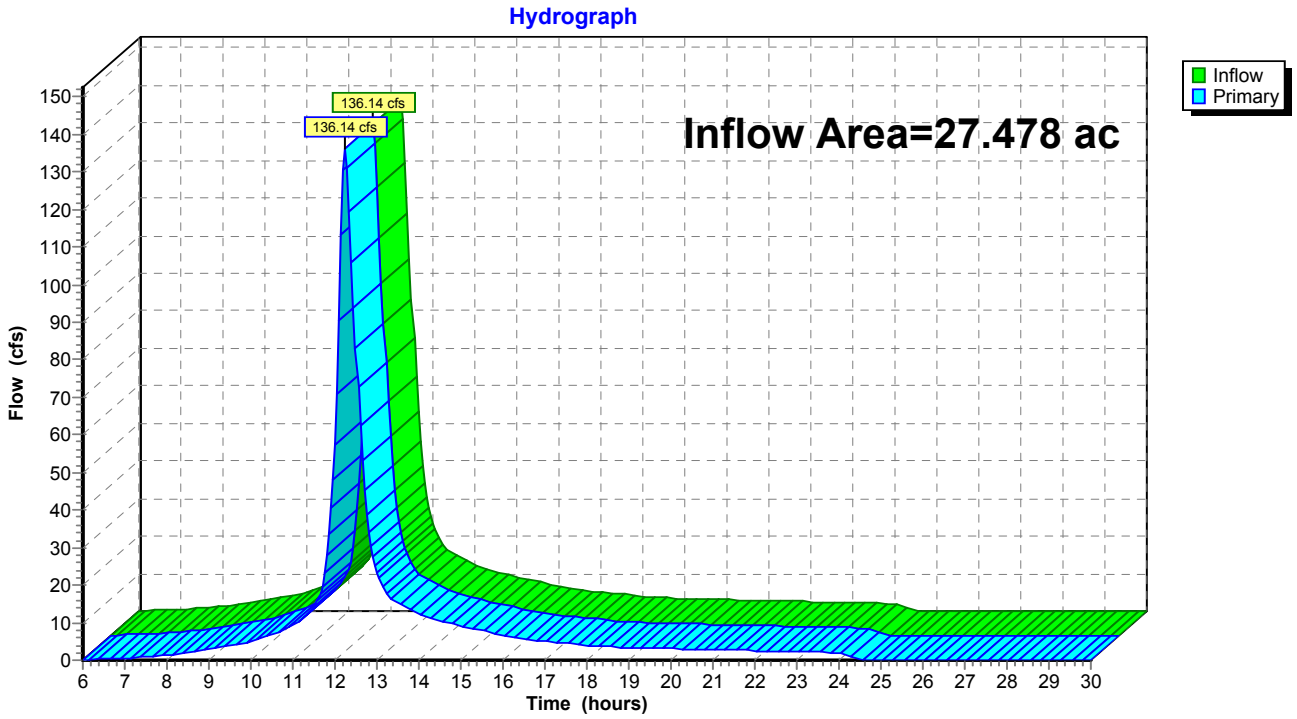


Summary for Link POA-B:

Inflow Area = 27.478 ac, 0.34% Impervious, Inflow Depth > 6.15" for 100-yr event
Inflow = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af
Primary = 136.14 cfs @ 12.25 hrs, Volume= 14.090 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 6.00-30.00 hrs, dt= 0.05 hrs

Link POA-B:



Attachment D - Supporting Calculations

Bluewave - Solar Development - 89 Chester Road
Blandford, MA

Standard 1: No New Untreated Discharges

Subcatchment	2-yr 24-hr Discharge Velocity (fps)	Discharge Location	Point of Analysis	Permissible Velocity (fps)	Improvements Needed	Proposed Improvements
A1	1.4	Overland flow offsite northerly	A	4	No	N/A
B1	1.8	Overland flow offsite westerly	B	4	No	N/A
A2	7.3	Overland flow offsite northerly	A	4	Yes	Check Dams

Notes:
1. Velocities calculated using HydroCAD modeling software.
2. Permissible Velocities referenced from the Massachusetts Stormwater Handbook Volume 3 Table 2.3.1 Example of Permissible Velocity Table for slopes between 5-10%.

Bluewave - Solar Development - 89 Chester Road
Blandford, MA

Standard 2: Peak Rate Attenuation

OFF-SITE SUMMARY		FLOW			VOLUME		
Point of Analysis	24-hour Storm Event	Existing Peak Runoff (cfs)	Proposed Peak Runoff (cfs)	Difference in Peak Runoff (cfs)	Existing Discharge Volume (af)	Proposed Discharge Volume (af)	Difference in Volume (af)
POA - A East - Off Site	2	10.0	10.0	0.0			
	10	22.7	22.7	0.0			
	25	31.1	31.0	-0.1			
	100	44.2	44.0	-0.2	3.9	3.9	0.0
POA - B West - Off Site	2	30.7	30.7	0.0			
	10	69.9	69.9	0.0			
	25	95.6	95.6	0.0			
	100	136.1	136.1	0.0	14.1	14.1	0.0

Attachment E - Long Term Pollution Prevention Plan

Long Term Pollution Prevention Plan

To meet the requirements of Standard 4 of the Massachusetts Stormwater Handbook, this Long Term Pollution Prevention Plan is provided to identify the proper procedures and practices for source control and pollution prevention.

Storage and Handling of Oil and other Hazardous Materials

There will be no hazardous materials stored or handled onsite with the exception of fuel for construction equipment. Fuel will be stored in approved storage containers, outside of wetland resource areas and associated buffer zones.

Operation and Maintenance of Stormwater Control Structures

Included in Attachment F is the Operation and Maintenance plan for this site, which includes maintenance requirements of the stormwater BMPs. Peebles Brook, LLC, or their Contractor, will be responsible for the implementation of the plan.

Landscaping

The landscaped areas will be maintained by the owner. There is no intent to use herbicides or pesticides for this project, nor will they be stored on site.

Septic System

There will be no septic system or wastewater produced on site.

Snow Management

Following construction, the solar system will be monitored remotely, and routine site visits will be performed 1-2 times per year. Snow removal will be performed as needed along the gravel road for site access to the entry gate. Salt and/or sand will not be stored on-site.

Non-Hazardous Waste Management/Good Housekeeping Practices

All non-hazardous waste is to be stored in designated trash or recycling containers onsite for periodic collection by the local trash collector, or Contractor during construction. Following construction all non-hazardous waste should not be stored onsite. Peebles Brook, LLC maintenance staff should inspect the site during maintenance visits, if trash is observed it should be collected and removed from the site.

Prohibition of Illicit Discharges

Illicit discharges to the on-site stormwater management system are strictly prohibited. Illicit discharges are defined as any direct or indirect non-stormwater discharge to the on-site stormwater system. There are no illicit discharges associated with the project.

Contact Information/Responsible Parties

Owner/Operator:
Peebles Brook, LLC
Marco Addonizio
116 Huntington Avenue, Suite 601
Boston, MA 02116

Attachment F - Stormwater Operation & Maintenance Plan

Stormwater Operation and Maintenance Plan

1.0 Introduction

The following document has been written to comply with the stormwater guidelines set forth by the Massachusetts Department of Environmental Protection (MassDEP). The intent of these guidelines is to encourage Low Impact Development techniques to improve the quality of the stormwater runoff. These techniques, also known as Best Management Practices (BMPs) collect, store, and treat the runoff before discharging to adjacent environmental resources.

2.0 Purpose

This Operation and Maintenance Plan (O&M Plan) is intended to provide a mechanism for the consistent inspection and maintenance of each BMP installed on the project site. Included in this O&M Plan is a description and an inspection form for each BMP type. Peebles Brook, LLC is the owner and operator of the system and is responsible for its upkeep and maintenance. This work will be funded on an annual basis through the owner's operating budget.

Owner/Operator:
Peebles Brook, LLC
Marco Addonizio
116 Huntington Avenue, Suite 601
Boston, MA 02116

Owner/Operator Signature: _____ Date: _____

In the event the Owner sells the property, it is the Owner's responsibility to transfer this plan as well as the past three years of operation and maintenance records to the new property owner. In the event the Owner sells the property, it is the Owner's responsibility to notify the Stormwater Authority of changes in ownership, assignment of Operation and Maintenance Plan responsibilities, or assignment of financial responsibility within 30 days of the change of ownership. The Owner understands that they are responsible for Operation and Maintenance activities until a copy of the updated Operation and Maintenance Plan has been furnished to the Stormwater Authority signed by the new owner or responsible person.

3.0 BMP Descriptions and Locations

Proposed stormwater BMPs are identified on the attached Site Plan and described below. A map showing the location of the system and facilities including all structural and nonstructural stormwater best management practices (BMPs) and associated easements has been included with this Stormwater Operation and Maintenance Plan.

3.1 Vegetated Swales (i.e., grassed channels / water quality swale)

Vegetated swales are installed to the east of the gravel access road to direct stormwater toward the roadside ditch.

4.0 Inspection, Maintenance Checklist and Schedule

Inspection and maintenance of stormwater BMPs identified in this plan shall be conducted at the frequencies outlined below for each item.

4.1 Vegetated Swales (i.e., grassed channels)

Vegetated swales are to be inspected semi-annually for the first year, and at least once a year thereafter. The grass should be inspected for growth and the side slopes for signs of erosion and

formation of rills and gullies. The bottom of the channels should be inspected for sediment accumulation. Use hand methods (i.e., rake and shovel) when cleaning out sediment to minimize the disturbance to vegetation and underlying soils.

Swales should be mowed on an as-needed basis during the growing season. The mower blades should be set to cut no lower than 3-4 inches. Any trash observed in the channels should be removed prior to mowing.

4.3 Inspections and Record Keeping

- An inspection form must be filled out every time maintenance work is performed.
- A binder is to be kept that contains all the completed inspection forms and any other related materials.
- A review of Operation & Maintenance actions should take place annually such that the Stormwater BMPs and vegetative cover are being maintained in accordance with this Operation & Maintenance Plan.
- Operation & Maintenance log forms for the last three years, at a minimum, should be maintained.
- The inspection and maintenance schedule may be refined in the future based on the findings and results of this Operation & Maintenance program or policy.
- An annual Operation and Maintenance Report and Certification with the Stormwater Authority on a form specified by the Stormwater Authority, along with an annual filing fee of $50 will be submitted to the Town of Blanford. This report is due annually on or before February 15 and shall document the work done during the prior calendar year. The Certification shall be signed by the responsible person(s) for ongoing operation and management.

5.0 Estimated Operations and Maintenance Budget

The estimated budget for stormwater operation and maintenance is approximately $2,500 bi-annually for the first year, then $2,000 annually thereafter.

INSPECTION CHECKLIST SHEET

Vegetated Swale (i.e., grassed channels / water quality swale)

Frequency: Vegetated swales should be inspected semi-annually for the first year, and at least once a year thereafter. Vegetated swales shall also be inspected following a rain storm event greater than or equal to the 2-year rainfall event (approximately 3.4-inches)

Channel Location: _____

Inspected By: _____ Date: _____

Observations: _____

_____

_____

Actions Taken: _____

_____

_____

Instructions: Inspect channel for grass growth and the side slopes for signs of erosion and formation of rills and gullies. Inspect the bottom of the channel should for sediment accumulation. Use hand methods (i.e., rake and shovel) when cleaning out sediment to minimize the disturbance to vegetation and underlying soils.

Mow the channel as-needed basis during the growing season. The mower blades should be set to cut no lower than 3-4 inches. All trash, debris, and sediments shall be disposed of in accordance with local, state, and federal regulations.

Attachment G - Construction Period Pollution and Erosion and Sedimentation Control Plan

SECTION 1: Introduction

The project applicant proposes construction of a single-axis tracker solar photovoltaic (PV) array with associated gravel access driveways and electrical appurtenances.

As part of this project, this "Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan" has been created to ensure that no further disturbance to the nearby wetland resources is created during the project.

SECTION 2: Construction Period Pollution Prevention Measures

Best Management Practices (BMPs) will be utilized as Construction Period Pollution Prevention Measures to reduce potential pollutants and prevent any off-site discharge. The objectives of the BMPs for construction activity are to minimize the disturbed areas, stabilize any disturbed areas, control the site perimeter, and retain sediment. Both erosion and sedimentation controls and non-stormwater best management measures will be used to minimize site disturbance and ensure compliance with the performance standards of the Wetlands Protection Act and Stormwater Standards. Measures will be taken to minimize the area disturbed by construction activities to reduce the potential for soil erosion and stormwater pollution problems. In addition, good housekeeping measures will be followed for the day-to-day operation of the construction site under the control of the contractor to minimize the impact of construction. This section describes the control practices that will be in place during construction activities. Recommended control practices will comply with the standards set in the MA DEP Stormwater Policy Handbook.

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

To minimize disturbed areas, work will be completed within well-defined work limits. These work limits are shown on the construction plans. The Contractor will not disturb native vegetation in the undisturbed wetland areas. The Contractor will be responsible to make sure that their workers and any subcontractors know the proper work limits and do not extend their work into the undisturbed areas. The protective measures are described in more detail in the following sections.

2.2 Control Stormwater Flowing onto and through the Project

Construction areas adjacent to wetland resources will be lined with straw wattle sediment barriers. The barriers will be inspected at least once every 7 calendar days, or every 14 calendar days and within 24 hours of a storm event of 0.25 inches or greater, and accumulated silt will be removed as needed.

2.3 Stabilize Soils

The Contractor should limit the area of land which is exposed and unvegetated during construction. In areas where the period of exposure will be greater than two months, mulching, the use of erosion control mats, or other protective measures will be provided as specified on the plans.

The Contractor should follow the seeding requirements outlined on the plans and will be responsible for maintaining the seeded areas until final acceptance is received. Final acceptance after 90 days following construction, or until the site reaches 70% stabilization, whichever is longer.

2.4 Proper Storage and Cover of Any Stockpiles

The location of the Contractor's storage areas for equipment and/or materials should be upon cleared portions of the job site or areas to be cleared as a part of this project, outside of wetlands and wetland buffer areas.

Adequate measures for erosion and sediment control such as the placement of straw wattle sediment barriers around the downstream perimeter of stockpiles will be employed to protect any downstream areas from siltation.

There will be no storage of equipment or materials in areas designated as wetlands.

2.5 Perimeter Controls and Sediment Barriers

Straw wattle (as detailed in the site plans) will be utilized to ensure that sedimentation does not occur outside the perimeter of the work area.

2.6 Storm Drain Inlet Protection

There are no storm drains in the work area.

2.7 Retain Sediment On-Site

The Contractor will be responsible for monitoring erosion control measures. Whenever necessary, the Contractor will clear sediment from the straw wattle sediment barriers that have been silted up during construction. Inspections must be documented using the attached Monitoring Form or inspection form associated with the site's Stormwater Pollution Prevention Plan (SWPPP).

2.8 Material Handling and Waste Management

Materials stored on-site will be stored in a neat, orderly manner in appropriate containers. Materials will be kept in their original containers with the original manufacturer's label. Substances will not be mixed with one another unless recommended by the manufacturer.

Waste materials will be collected and stored in a securely lidded metal container from a licensed management company. The waste and any construction debris from the site will be hauled off-site and disposed of properly. The contractor will be responsible for waste removal. Manufacturer's recommendations for proper use and disposal will be followed for materials. If portable sanitary waste facilities will be used on-site, sanitary waste will be collected from the units a minimum of once a week, by a licensed sanitary waste management contractor.

2.9 Designated Washout Areas

The Contractor should use washout facilities at their own facilities.

2.10 Proper Equipment/Vehicle Fueling and Maintenance Practices

On-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the risk of leakage. To ensure that leaks from stored equipment do not contaminate the site, oil-absorbing mats will be placed under oil-containing equipment during storage. Regular fueling and service of the equipment may be performed using approved methods and with care taken to minimize chance of spills. Repair of equipment or machinery within the 100-foot water resources area is not allowed. Any petroleum products will be stored in tightly sealed containers that are clearly labeled with spill control pads/socks placed under/around their perimeters.

2.11 Equipment/Vehicle Washing

The Contractor will be responsible to ensure that no equipment is washed on-site.

SECTION 3: Spill Prevention and Control Plan

The Contractor will be responsible for preventing spills in accordance with the project drawings and applicable federal, state, and local regulations. The Contractor will identify a properly trained site employee, involved with the day-to-day site operations to be the spill prevention and cleanup coordinator. The name(s) of the responsible spill personnel will be posted on-site. Each employee will be instructed that all spills are to be reported to the spill prevention and cleanup coordinator.

3.1 Spill Control Equipment

Spill control/containment equipment will be kept in the work area. Materials and equipment necessary for spill cleanup will be kept either in the work area or in an otherwise accessible on-site location. Equipment and materials will include, but not be limited to, absorbent booms/mats, brooms, dust pans, mops, rags, gloves, sand, plastic and metal containers specifically for this purpose. It is the responsibility of the Contractor to ensure the inventory will be readily accessible and maintained.

3.2 Notification

Workers will be directed to inform the on-site supervisor of a spill event. The supervisor will assess the incident and initiate proper containment and response procedures immediately upon notification. Workers should avoid direct contact with spilled materials during the containment procedures. Primary notification of a spill should be made to the local Fire Department and Police Departments. Secondary Notification will be to the certified cleanup contractor if deemed necessary by Fire and/or Police personnel. The third level of notification (within 1 hour), if required, is to the DEP or municipality's Licensed Site Professional (LSP) if the spill exceeds the reportable quantity for the material spilt. The specific cleanup contractor to be used will be identified by the Contractor prior to commencement of construction activities.

3.3 Spill Containment and Clean-Up Measures

Spills will be contained with granular sorbent material, sand, sorbent pads, booms or all of the above to prevent spreading. Certified cleanup contractors should complete spill cleanup. The material manufacturer's recommended methods for spill cleanup will be clearly posted and on-site personnel will be made aware of the procedures and the location of the information and cleanup supplies.

3.4 Hazardous Materials Spill Report

The Contractor will report and record any spill. The spill report will present a description of the release, including the quantity and type of material, date of the spill, circumstances leading to the release, location of spill, response actions and personnel, documentation of notifications and corrective measures implemented to prevent reoccurrence.

This document does not relieve the Contractor of the Federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302 and the State requirements specified under the Massachusetts Contingency Plan (M.C.P) relating to spills or other releases of oils or hazardous substances. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a twenty-four (24) hour period, the Contractor is required to comply with the response requirements of the above mentioned regulations. Spills of oil or hazardous material in excess of the reportable quantity will be reported to the National Response Center (NRC).

SECTION 4: Contact Information/Responsible Parties

Owner/Operator:
Peebles Brook, LLC
Marco Addonizio
116 Huntington Avenue, Suite 601
Boston, MA 02116

Engineer:
Rob Bukowski, PE
Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978-532-1900

Site Inspector:
TBD

Contractor:
TBD

SECTION 5: Erosion and Sedimentation Control

Erosion and Sedimentation Control features can be found in the attached project plans which include specifications for installation and monitoring control devices.

SECTION 6: Site Development Plan

The proposed site development plan is included in the attached plans.

SECTION 7: Operation and Maintenance of Erosion Control

The erosion control measures will be installed as detailed in project plans. If there is a failure of the controls, the Contractor is required to stop work until the failure is repaired.

Periodically throughout the work, the sediment that has been deposited against the controls will be removed to ensure that the controls are working properly.

SECTION 8: Inspection Schedule

During construction, the erosion and sedimentation controls will be inspected at least once every 7 calendar days, or once every 14 calendar days and within 24 hours of the end of a storm event of 0.25 inches or greater. Once the Contractor is selected, an on-site inspector will be identified to ensure that erosion and sedimentation controls are in place and working properly. A Monitoring Form is included for use by the on-site inspector.

Monitoring Form

Inspected By:_____ Date: _____Time:_____

YES	NO	DOES NOT APPLY	ITEM
			Do any erosion/siltation control measures require repair or clean out to maintain adequate function?
			Is there any evidence that sediment is leaving the site and entering the wetlands?
			Are any temporary soil stockpiles or construction materials located in non-approved areas?
			Are on-site construction traffic routes, parking, and storage of equipment and supplies located in areas not specifically designed for them?
			Are storage of fuels located outside of resource areas and associated buffer zones? Are fuels stored in proper storage containers?

Specific location, current weather conditions, and action to be taken:

_____

_____

_____

_____

_____

Other Comments:

_____

_____

_____

Pending the actions noted above I certify that the erosion and sedimentation controls at the site are in compliance with the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan.

Signature:_____ Date: _____

Attachment H - Illicit Discharge Statement

ILLICIT DISCHARGE COMPLIANCE STATEMENT

Illicit Discharge Compliance Statement

Section I – Purpose/Intent

Standard 10 of the Massachusetts Stormwater Handbook prohibits illicit discharges to stormwater management systems. The stormwater management system is the system for conveying, treating, and infiltrating stormwater on-site, including stormwater best management practices (BMPs) and any pipes intended to transport stormwater to the groundwater, a surface water, or municipal separate storm sewer system. Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater.

This Illicit Discharge Statement is related to work performed by Peebles Brook, LLC and their subcontractor(s). Site maintenance will be performed in accordance with the Site's Operation and Maintenance Plan and Long-Term Pollution Prevention Plan.

Section II - Prohibitions

Prohibition of Illicit Discharges
No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the Stormwater BMPs, into a watercourse, or into waters of the United States and/or Commonwealth.

Exemptions
The following activities are considered exempt: firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents.

Section III - Notification of Spills

In the event of a spill or release which may result in a discharge of pollutants or non-stormwater discharge to the on-site Stormwater BMPs, waters of the United States, and/or waters of the Commonwealth, the responsible parties, potentially responsible parties, or any person or persons managing the Site shall take all necessary steps to ensure containment and provide the required notification under local, state and/or federal law.

Michael Zimmer
Michael Zimmer (Mar 26, 2025 16:10 EDT)

Representative of Peebles Brook, LLC
Michael Zimmer

26-Mar-2025

Date

Illicit Discharge and Illegal Connection Statement

Final Audit Report 2025-03-26

Created:	2025-03-25
By:	Marco Addonizio (maddonizio@bluewavesolar.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAATJ7QRmG3UpB910wQnLDJGNx4_u7dNG0m

"Illicit Discharge and Illegal Connection Statement" History

Document created by Marco Addonizio (maddonizio@bluewavesolar.com)
2025-03-25 - 6:04:47 PM GMT

Document emailed to Michael Zimmer (mzimmer@bluewavesolar.com) for signature
2025-03-25 - 6:04:51 PM GMT

Email viewed by Michael Zimmer (mzimmer@bluewavesolar.com)
2025-03-26 - 8:09:54 PM GMT

Document e-signed by Michael Zimmer (mzimmer@bluewavesolar.com)
Signature Date: 2025-03-26 - 8:10:49 PM GMT - Time Source: server

Agreement completed.
2025-03-26 - 8:10:49 PM GMT

Appendix I – Abandonment & Decommissioning Plan

55 Walkers Brook Drive, Suite 100, Reading, MA 01867
Tel: 978.532.1900

March 28, 2025

Mr. Marco Addonizio
Peebles Brook, LLC
116 Huntington Ave – Suite 601
Boston, MA 02116

Re: Decommissioning Estimate
4.04 MW DC Solar PV / Battery Energy Storage System
89 Chester Road, Blandford, MA

Dear Marco,

Weston & Sampson Engineers, Inc. (Weston & Sampson) has developed a decommissioning cost estimate to dismantle and remove the proposed solar tracking array and accompanying electrical equipment for the 4.04 megawatt (MW) direct current (DC) Solar photovoltaic (PV) Development and coupled Battery Energy Storage System (BESS). The decommissioning cost, at the planning level, is considered the cost to disconnect, dismantle and remove all of the equipment associated with the solar array and BESS. The proposed array consists of a single axis-tilt ground mounted system with direct burial steel post racking and centrally located batteries. The removal involves the reverse order of installation, where the system is first disconnected from the utility grid, then the components would be removed in the reverse order they were installed.

The steel posts would be removed with an excavator and recycled/disposed. In the event that the piles have no useful purpose, they can be disposed as construction and demolition debris at a landfill. It Is estimated that the dual use array area would need to be restored. If required, the concrete equipment slab could also be broken up, removed and disposed, also as construction and demolition debris.

The decommissioning cost accounts for the labor and equipment needed to dismantle, remove and dispose of materials from the site. The decommissioning cost is evaluated for three basic components (labor, equipment and transportation/disposal costs) based on current market rates for labor, equipment operators and disposal values. Current costs are then escalated to account for the rate of inflation over the useful life the project, to estimate future costs. For the purpose of this estimate, the solar PV system is expected to have a useful life of 20 years, but could continue to be operated many years beyond the design life, albeit at a diminished capacity. The typical solar array delivers useful power diminishing at a rate of 0.5% per year, due to soiling and degradation of the silica photocells.

Decommissioning and Removal Tasks

- Disconnect and remove electrical equipment / BESS
- Remove approximately 6,960 solar panels
- Dismantle racking and posts
- Stockpile and truck all material away from site.
- Remove and dispose of concrete equipment pads

Below is a narrative description of the tasks involved in decommissioning the solar array and BESS:

Disconnect and Remove Electrical Equipment

This task involves a licensed electrician to de-energize the system, disconnect from the utility grid, along with unbolting and removal of the PV system equipment. The equipment includes transformers, inverters, combiner boxes, load break switches, primary metering, re-closers and relays, system level metering enclosures, and wiring.

Remove Solar Array Panels, Dismantle Racking and Posts

Based on similar installations, the racking would consist of W6x25 galvanized I-beam posts (or comparable C-channel), for the post driven or racking system. The post lengths typically vary between 150 to 165 inches, with embedment depths of seven to nine feet. A post removal rate of one post every three minutes is used to account

for time needed to move and position the excavator or backhoe, place chain around post, pull and stack on flatbed trailer. The total amount of galvanized steel posts, drive shaft, tracker gear rack, and hardware used in the assembly of utility scale solar arrays would be on the order of 120,000 to 140,000 pounds per megawatt, depending on the embedded post depths. For the proposed 4.04 MW array, the total amount of racking material is on the order of 484,800 to 565,600 pounds or 242.4 to 282.8 tons of steel.

Decommission and Remove Battery Energy Storage System (BESS)

While the anticipated lifespan of the BESS is greater than 20 years, it has been assumed that the BESS will be decommissioned at the same time as the array itself. Similar to how the decommissioning of the solar array takes place, decommissioning of BESS occurs in the reverse order of installation. Battery racks are removed from the storage system, palletized and disposed of at a licensed recycling facility per state and federal standards. Concurrently HVAC and other cooling equipment / suppression fluids are drained and disposed of at a licensed facility. Ancillary electrical wiring is removed and disposed of by a licensed electrical, and the storage containers are removed from the pads and sold for scrap or repurposing.

Remove and Dispose of Concrete Equipment Pads

The concrete equipment slab would be broken up and removed, resulting in roughly 11 truckloads (247 tons) of concrete rubble.

Site Restoration

Given the relatively simple demolition and few waste streams, only minor cleanup and debris disposal would be anticipated. It is assumed that gravel access roads will remain in place following shut down and decommissioning of the system. Some grass areas could be left as-is after equipment removal and allowed to reforest naturally, without the need for further restoration. The extent of restoration activity required for removal of equipment may result in further disturbance of the project area. Graded areas (i.e. stormwater basins) would be returned to pre-construction conditions, and the site would be seeded to promote revegetation.

Total Decommissioning Costs

Decommissioning Tasks	Estimated Cost
Remove Panels	$4,949
Remove Rack Wiring	$4,967
Dismantle Racks	$26,194
Remove Electrical Equipment	$3,924
Break Up Concrete Pads	$3,182
Remove Racks	$16,544
Remove Cable	$13,787
Remove Foundation Posts and Utility Poles	$29,375
Remove Battery Energy Storage System	$29,798
Remove Fence	$10,499
Grading	$8,484
Seed Disturbed Areas	$530
Trucking Costs	$4,772
Total	$157,005

Accordingly, our estimate of the current decommissioning cost is $157,005. To estimate the future cost of decommissioning, an inflation rate of 2.5% per year is applied over 20 years, resulting in an estimated future decommissioning cost of $250,996 in year 20. Below is the yearly future cost of system decommissioning.

Year	Future Cost (Based on 2.5% Inflation Rate)
1	$157,005
2	$160,930
3	$164,953
4	$169,077
5	$173,304
6	$177,637
7	$182,077
8	$186,629
9	$191,295
10	$196,078
11	$200,979
12	$206,004
13	$211,154
14	$216,433
15	$221,844
16	$227,390
17	$233,075
18	$238,901
19	$244,874
20	$250,996

If you have any questions or require any additional information, please contact us in our Reading, MA office at (978) 532-1900.

Sincerely,

Weston & Sampson Engineers, Inc.

Melinda Costello

Melinda Costello, PE
Project Manager

89 Chester Road, Blandford, MA
4.04 MW DC Solar PV Development
Peebles Brook, LLC
Decommissioning Plan and Estimate

Timeline:

Decommissioning of the system will occur within 150 days following the end of the lease term or if found to have fallen into disuse.

Assumptions:

Key assumptions include the following:
1) Fencing, electrical cabinetry, solar racks, solar panels, wiring and all other equipment are 100% recyclable.
2) The primary cost of decommissioning is the labor to dismantle and load the equipment plus trucking.
3) Concrete pads will be demolished on-site and transported to an ABC recycling facility where it will be accepted at no charge.
4) All other recyclables will be transported to the nearest Transfer Station that accepts the material.
5) Costs are based on NYSERDA Solar Guidebook for Local Governments. Estimates below are based on the Massachusetts solar market.
6) Stabilization or re-vegetation of the site will occur as necessary to minimize erosion.

Decommissioning Tasks:

Task		Cost
1)	**Remove Panels** The panels are bolted in. A laborer needs to unbolt the panel and remove the panel off the rack.	**$4,949**
2)	**Remove Rack Wiring** The panels are plugged together in the same manner as an electrical cord from a light is plugged into a wall socket. A laborer needs only to reach over and pull the plug. The string wires typically lie in a sling. A laborer needs only to reach into the sling and remove the strands of wire.	**$4,967**
3)	**Dismantle Racks** Racks will be dismantled and stockpiled for removal.	**$26,194**
4)	**Remove Electrical Equipment (Inverters, Transformers, Switchgear, Storage Containers)** Equipment will be removed from the equipment pads.	**$3,924**
5)	**Break Up Concrete Pads** Concrete will be broken up using an excavator and jackhammer.	**$3,182**
6)	**Remove Racks** Racks will be removed and stockpiled.	**$16,544**
7)	**Remove Cable** Cables will be removed and stockpiled.	**$13,787**
8)	**Remove Foundation Posts and Utility Poles** Posts and poles will be removed from the ground using appropriate equipment.	**$29,375**
9)	**Remove Battery Energy Storage System** Battery Energy Storage System shall be removed and transported to an off site licensed facility.	**$29,798**
10)	**Remove Fence** Fencing and posts will be removed.	**$10,499**
11)	**Grading** Graded areas (e.g., stormwater basins) will be returned to pre-construction conditions.	**$8,484**
12)	**Seed Disturbed Areas** Any graded areas will be seeded to promote revegetation.	**$530**
13)	**Trucking Costs** All stockpiled equipment and materials will be removed from the site.	**$4,772**
Total Decommissioning Cost Estimate		**$157,005**

Year	Inflation	2.5%									
Year 1	$	157,005	Year 7	$	182,077	Year 13	$	211,154	Year 19	$	244,874
Year 2	$	160,930	Year 8	$	186,629	Year 14	$	216,433	Year 20	$	250,996
Year 3	$	164,953	Year 9	$	191,295	Year 15	$	221,844			
Year 4	$	169,077	Year 10	$	196,078	Year 16	$	227,390			
Year 5	$	173,304	Year 11	$	200,979	Year 17	$	233,075			
Year 6	$	177,637	Year 12	$	206,004	Year 18	$	238,901			

89 Chester Road, Blandford, MA
1.5 MW Coupled BESS Project
Battery Energy Storage System (BESS) Decommissioning Plan and Estimate

Timeline:

Decommissioning of the BESS portion system will occur within 365 days following the end of the lease term or if found to have fallen into disuse.

Assumptions:

Key assumptions include the following:
1) Utilized BESS are comprised of Lithium-Ion Batteries or similar chemical composition with no recyclable value
2) The primary cost of BESS decommissioing is the transporation and disposal of the batteries.
3) Concrete pads will be demolished on-site and transported to an ABC recycling facility where it will be accepted at no charge.
4) All other recyclables will be transported to the nearest Transfer Station that accepts the material.
5) Costs are based on current market averages for battery weights and disposal costs.

Decommissioning Tasks:

Task		Cost
1)	**Remove Battery Racks** Batteries are inserted as racks into the storage container. Batteries will need to be removed and palletized for transportation and disposal.	**$7,200**
2)	**Remove and Dispose HVAC Equipment & Ancillary Wiring** HVAC Fluids will be drained, and HVAC equipment and ancilary wiring will be removed and disposed.	**$7,657**
3)	**Load And Dispose Battery Racks At Licensed Facility** Equipment will be removed from the equipment pads.	**$8,400**
4)	**Remove Containers** Containers Will Be Removed from Pads & Transported Off Site.	**$1,142**
5)	**Break Up & Dispose Concrete Pads / Footings** Concrete will be broken up using an excavator and jackhammer. Conduits greater than 3' in depth will be buried in place.	**$5,400**
Total Decommissioning Cost Estimate		**$29,798**

Appendix J – Certified Abutters List

300 feet Abutters List Report

Blandford, MA
March 17, 2025

Subject Property:

Parcel Number: 408-0-19.1
CAMA Number: 408-0-19.1
Property Address: 89 CHESTER ROAD

Mailing Address: MARTIN LLOYD JAMES MARTIN MARY E
89 CHESTER ROAD
BLANDFORD, MA 01008-9502

Abutters:

Parcel Number: 408-0-12
CAMA Number: 408-0-12
Property Address: 2 BEULAH LAND ROAD

Mailing Address: COOPER BRUCE COOPER VALERIE
PO BOX 808
BLANDFORD, MA 01008

Parcel Number: 408-0-13
CAMA Number: 408-0-13
Property Address: CHESTER ROAD

Mailing Address: GREEN APPLE FARMS IV LLC
250 WEST 57TH STREETSUITE 701
NEW YORK, NY 10107

Parcel Number: 408-0-14
CAMA Number: 408-0-14
Property Address: CHESTER ROAD

Mailing Address: PEPIN WILLIAM M PEPIN MARLENE B
121 FOREST PARK AVENUE
SPRINGFIELD, MA 01108

Parcel Number: 408-0-17
CAMA Number: 408-0-17
Property Address: CHESTER ROAD

Mailing Address: SPRINGWICH CELLULAR LTD PARTN C
\O AT&T PROPERTY TAX DEPT
1010 PINE ST 9E-L-01
ST LOUIS, MO 63101

Parcel Number: 408-0-18
CAMA Number: 408-0-18
Property Address: MASS PIKE

Mailing Address: MASSACHUSETTS COMMONWEALTH OF
N/A
BLANDFORD, MA 01008

Parcel Number: 408-0-19.2
CAMA Number: 408-0-19.2
Property Address: 87 CHESTER ROAD

Mailing Address: MARTIN LLOYD JAMES
89 CHESTER ROAD
BLANDFORD, MA 01008-9502

Parcel Number: 408-0-20
CAMA Number: 408-0-20
Property Address: 95 CHESTER ROAD

Mailing Address: DUPREY GERALD R DUPREY LINDA A
95 CHESTER ROAD
BLANDFORD, MA 01008

Parcel Number: 408-0-21
CAMA Number: 408-0-21
Property Address: CHESTER ROAD

Mailing Address: SMITH ALAN L SMITH DIANE L
PO BOX 139
BLANDFORD, MA 01008-0139

Parcel Number: 408-0-6
CAMA Number: 408-0-6
Property Address: 84 CHESTER ROAD

Mailing Address: GREGORY GILBERT V JR GREGORY LAURA P
84 CHESTER ROAD
BLANDFORD, MA 01008

Parcel Number: 408-0-7
CAMA Number: 408-0-7
Property Address: CHESTER ROAD

Mailing Address: MARTIN LLOYD JAMES MARTIN MARY E
89 CHESTER ROAD
BLANDFORD, MA 01008-9502

Town of Blandford
Board of Assessors
1 Russell Stage Rd
Suite 4
Blandford, MA 01008
Admin Asst.

Appendix K – Noise Level Calculations

55 Walkers Brook Drive, Suite 100, Reading, MA 01867
Tel: 978.532.1900

MEMORANDUM

TO: Marco Addonizio, Director of Project Development, BlueWave

FROM: Weston & Sampson Engineers, Inc.

DATE: March 28th, 2025

SUBJECT: Sound Pressure Calculations
Peebles Brook, LLC
89 Chester Road, Blandford, MA

Weston & Sampson Engineers, Inc. (Weston & Sampson), is pleased to provide Peebles Brook, LLC with the attached sound pressure calculations for the proposed solar photovoltaic (PV) and battery energy storage system (BESS) project located at 89 Chester Road, Blandford, MA (the site). As proposed, the project is a 4.04 MW (DC) solar array with 1.5 MW coupled BESS. This memo and corresponding calculations have been generated in response to Section 16.5.A.12 of the Town of Blandford Zoning Bylaws.

It is Weston & Sampson's understanding that the Town of Blandford Zoning Bylaw dictates that the impact of all noise sources generated by the project be assessed to determine the appropriate layout, design, and control measures. As proposed, there would be one centrally located equipment pad on the site, with 21 centrally located inverters, two transformers, and two BESS containers. Peebles Brook, LLC. provided Weston & Sampson with the specification sheets for the associated equipment. As the noise rating was not available for the selected BESS at this time, an industry standard of 70 (dBA) at one meter was used.

By using the Inverse Square Law and the associated decibel ratings for the proposed equipment, we calculated the drop in decibels to the closest adjacent property line for the equipment pad area. The tables below summarize the sound-emitting equipment, as well as the anticipated decibel rating at the closest property line.

Table 1. Sound-Emitting Equipment

Equipment	Listed Sound Pressure (dBA)	Distance of Observed Sound Level (meters)
Transformer	60	1
String Inverter	73	1
BESS	70	1

Table 2. Sound-Emitting Equipment Calculations			
Direction	Distance to Property Line (m)	Equipment Noise Level (dBA) at Property Line	Average Rural Noise Level (dBA)
North	39.15	59.6	50.0
East	128.30	49.3	50.0
South	159.40	42.4	50.0
West	192.00	40.8	50.0

A 5-decibal (dBA) sound penalty is included in each value above to provide a conservative estimate of the anticipated sound levels. As you can see, none of the above values have a significant impact on the noise generated at the property line. There will be no nighttime sound generated from the project, as the proposed equipment does not operate at night. Also, the performed calculations do not account for additional sound dampening that can be associated with vegetation or other structures, therefore these calculations can be considered as a theoretical maximum.

Should you have any questions, comments, or concerns please contact us at 978-532-1900. Thank you.

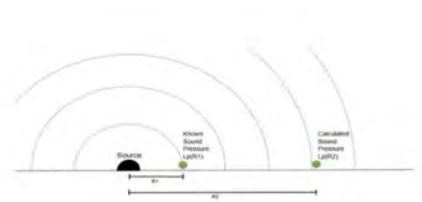
Sincerely,
WESTON & SAMPSON ENGINEERS, INC.

Andrew Hamel
Project Manager

Attachment:
Sound Pressure Calculations Sheet

Sound Attenuation: $Lp(R2) = Lp(R_1) - 20 * Log_{10}(R_2/R_1)$

$Lp(R_1)$	Known sound pressure at given distance
$Lp(R_2)$	Unknown sound pressure at second location
R1	Distance from noise source to known sound
R2	Distance from noise source to second location



Equipment Pad Area 1

$Lp(R_1)$	86.44	db(A)
R1	1	m
R2	39.15	m
$Lp(R_2)$	54.6	dB(A)

	Meters	dB(A)	Average Rural dB(A)
North	39.15	54.6	50.0
East	128.3	44.3	50.0
South	159.4	42.4	50.0
West	192	40.8	50.0

BESS

Noise Source (dB)	W	Total W	Total dB
70	0.00001	0.00002	73.0103
70	0.00001		

Invertor Sum

Noise Source (dB)	Power (W)	Total W	Total dB
73	1.9953E-05	0.000419	86.22
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
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73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		
73	1.9953E-05		

Transformer

Noise Source (dB)	W	Total W	Total dB
60	0.000001	0.000002	63.0103
60	0.000001	0.000001	

Equipment Pad 1 Sum

Noise Source (dB)	Power (W)	Total W	Total dB
73.0103	2E-05	0.0004408	86.44235
86.22	0.00041879		
63.0103	2E-06		